

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

RESIDEO TECHNOLOGIES, INC. and
CENTRAL SECURITY GROUP – NATIONWIDE, INC.,¹
Petitioners,
v.
UBIQUITOUS CONNECTIVITY, LP,
Patent Owner.

Case IPR2019-01335

Patent 8,064,935 B2

PATENT OWNER'S RESPONSE

¹ Central Security Group – Nationwide, Inc., who filed a petition in IPR2019-01609, has been joined as a petitioner in this proceeding.

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Patent Owner's Current Index of Exhibits

Exhibit No.	Description	Previously Submitted
2001	U.S. Patent No. 7,031,663 ("Heinonen")	Yes
2002	U.S. Patent Publication No. 2004/0092282 ("Kim")	Yes
2003	Declaration of Daniel A. Kent in Support of Patent Owner's Motion for the <i>Pro Hac Vice</i> Admission of Daniel A. Kent	Yes
2004	Declaration of Ivan Zatkovich in Support of Patent Owner's Preliminary Response	No
2005	Curriculum Vitae of Ivan Zatkovich	No
2006	Excerpts from Microsoft Computer Dictionary, Fifth Edition	No
2007	Excerpts from the Comprehensive Dictionary of Electrical Engineering, Second Edition	No
2008	Supermicro Article (https://www.supermicro.com/newsroom/news/articles/news051704.cfm)	No
2009	Logitech Microcontroller (https://www.tweaktown.com/reviews/8028/logitech-g213-prodigy-rgb-gaming-keyboard-review/index4.html)	No
2010	Nokia Q4 2004 Disclosure (https://www.nokia.com/system/files/files/q4-2004-earnings-release-pdf.pdf)	No
2011	Nokia Q4 2003 Disclosure (https://www.nokia.com/system/files/files/q4-2003-presopdf.pdf)	No
2012	Fortune Article (https://money.cnn.com/magazines/fortune/fortune_archive/2005/01/24/8234055/index.htm)	No
2013	NY Times Article (https://www.nytimes.com/2004/10/15/technology/nokia-profit-off-in-quarter-handset-price-cuts-cited.html)	No
2014	Gnokii FAQ (https://web.archive.org/web/20040110222318/http://www.gnokii.org/faq.shtml)	No
2015	Deposition of Petitioners' Expert, Dr. Kevin Jeffay (May 7, 2020)	No

Ubiquitous Connectivity, LP (“Patent Owner”) submits this Response to the Petitions filed by Resideo Technologies, Inc. and Central Security Group – Nationwide, Inc. regarding U.S. Patent No. 8,064,935.

I. The ’935 Patent

The ’935 patent “relates to a remote monitoring and control system for an environment,” such as a home automation system, that allows users to monitor and control characteristics of the environment from a remote location. Ex. 1001, 1:18-19. Before the ’935 patent, these systems had several deficiencies, including their lack of “bidirectional communications” between the user and the environment. *Id.*, 2:39-63. For example, upon receiving an alert from a service provider about an alarm in the home environment, the user had to separately call a phone number for the system and use “telephone interfaces, including voice, DTMF, and Caller ID ... to exercise control of their facilities remotely.” *Id.*, 2:39-42. The user could not communicate with the system directly by the same means through which the user received the alert. *Id.*, 2:39-48.

Seeking to address this and other deficiencies of home automation systems, the '935 patent discloses a “system [having] on demand bidirectional communication between a remote access unit and a multifunctional base control unit in a geographically remote location.” *Id.*, 1:18-22. As shown in FIG. 1, reproduced at right, the system 10 has a remote unit 12 that interfaces with a base control unit 16 within a structure 18 to monitor and control associated environmental devices 21 in or around the structure. *Id.*, 3:51-67.

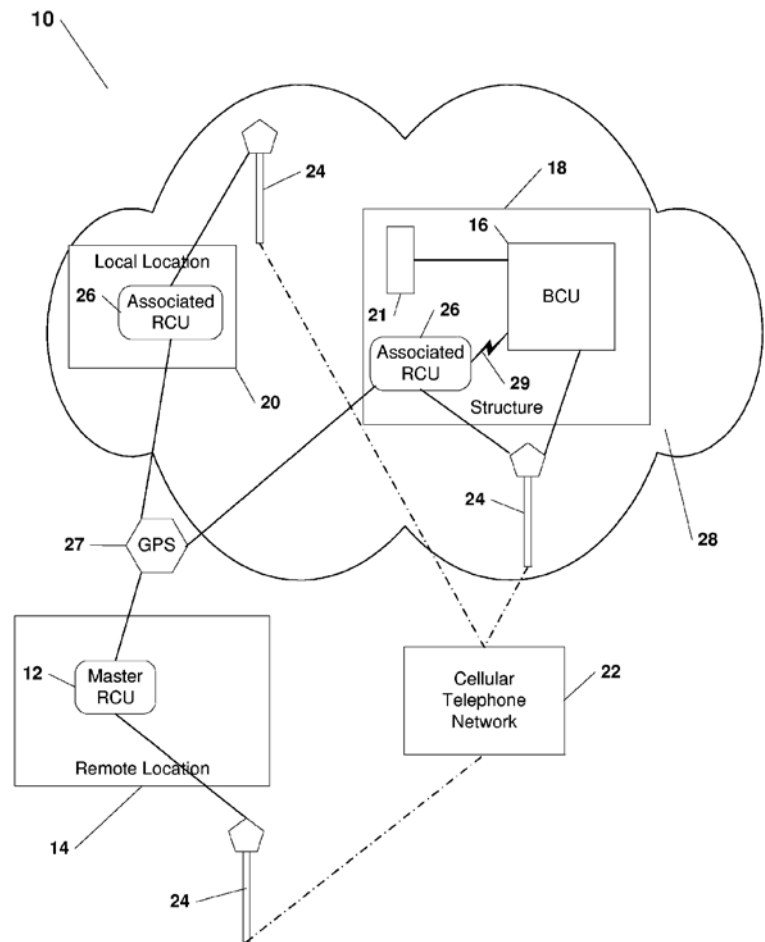


Fig. 1

The base unit 16 connects to the environmental devices 12 through one or more communication interfaces. *Id.* The environmental devices include devices like a burglar alarm, HVAC, freezer, water heater, refrigerator, thermostat, lighting, etc. *Id.*, 9:6-11, 11:50-52. The base unit monitors the environmental devices through “sensors provid[ing] continuous measurement and status of target environmental characteristics,” such as “utilities status, moisture and humidity

detection, door and window condition, and the like.” *Id.*, 11:47-50. The base unit and the remote unit have “direct two-way communication” (*id.*, 3:13-25), for example, “through a short message and/or the data bearer cellular telephone network 22” (*id.*, 3:51-57). In one embodiment, the short message format could be simple message service (SMS). *See, e.g., id.*, 7:9-11. In other embodiments, it could use other wireless messages (e.g., through other data bearer services). *Id.*, 3:60-67.

The base unit sends messages to the remote unit that include information about the monitored environmental characteristics. For example, “the base station unit 16 sends ... a message to the remote control unit 12 to notify it that the temperature in zone 0 is currently 72 degrees.” *Id.*, 7:54-58. In another example, “the base control unit notifies the remote control unit of an activation of an alarm system ... [and], the remote control unit receives textual messages and graphical indicators to alert the user.” *Id.*, 7:28-32.

Likewise, the remote unit may send to the base unit a message including a command for the environmental device. For example, “the operator may invoke ... a command from the remote control unit 14 to the base control unit 16 to activate a select device such as the HVAC unit, a water heater, a refrigeration appliance or other discrete device remotely.” *Id.*, 12:1-5.

II. Claim Construction

A. Level of Ordinary Skill in the Art

Patent Owner proposes that a person of ordinary skill in the art (“POSITA”) in November 2004 would have had at least a bachelor’s degree in electrical engineering or computer science, and at least two years of industry experience in the field of computers and communications. Higher levels of education may substitute for less experience, and more experience may substitute for the specific level of education. *See* Ex. 2004, Declaration of Ivan Zatkovich ¶¶29. Petitioners propose a similar definition that would not change the analysis reflected herein. *Id.* ¶¶30.

B. “Microcontroller” (claims 3, 14, 18, and 21)

Independent claims 18 and 21 of the ’935 patent recite the term “microcontroller,” as do dependent claims 3 and 14. For example, claim 18 recites “a microcontroller configured to process the second message including the command, and to send the command through the communication interface to the environmental device.” Ex. 1001, 15:5-8.

While Petitioners did not propose a specific construction for “microcontroller,” they equate the term “microcontroller” to “microprocessor”: “A POSITA would have understood the ‘microcontroller’ to be a generic processor.” ’935 Petition at 24 (citing Ex. 1003, ¶¶257). Petitioners’ expert admitted he did not consult any dictionaries or textbooks in forming his view. Ex. 2015, 54:7-18.

A POSITA would not have understood that a generic processor, including a microprocessor, is a microcontroller. Ex. 2004, ¶33. Notably, Petitioners' expert does not identify what characteristics a microcontroller would have had in November 2004 nor explain why a microprocessor would be considered a microcontroller. He merely offers the conclusion.

As of November 2004, a POSITA would have understood that a microprocessor was very different from a microcontroller and considered the differences significant. A POSITA would have understood that microprocessors and microcontrollers fall into distinct classes of integrated circuits for performing logical functions. Ex. 2004, ¶34.

Microprocessors

Microprocessors address a technical need for circuitry that performs logical functions at relatively high performance levels using a large amount of specialized circuitry that improves the microprocessor's performance (reflected by the amount of computation tasks that can be performed within a period of time) at the expense of higher complexity and cost relative to other integrated circuits that perform logical functions. Ex. 2004, ¶35.

Microprocessors are often described as the "brains" or "heart" of a computer rather than as a computer unto itself because microprocessors within a computer are typically accompanied by numerous other integrated circuits that collectively

support the logical or electronic needs of a microprocessor. For example, as of November 2004, microprocessors in computers, such as personal computers or servers, were typically accompanied by multiple separate integrated circuits for performing functions such as storing data (e.g., memory chips), providing network communications (e.g., network interface cards and/or chips), and one or more additional integrated circuits providing functions such as clocking and input/output communications. Ex. 2004, ¶36. This is reflected in the definition of “microprocessor” provided by the Microsoft Computer Dictionary, Fifth Edition (2002):

A central processing unit (CPU) on a single chip. A modern microprocessor can have several million transistors in an integrated-circuit package that can easily fit into the palm of one’s hand. Microprocessors are the heart of all personal computers. When memory and power are added to a microprocessor, all the pieces, excluding peripherals, required for a computer are present.

Ex. 2006, Microsoft Computer Dictionary, Fifth Edition (2002), at 560; *see also* Ex. 2015, 65:18-70:22.

Microcontrollers

In contrast to microprocessors, microcontrollers are meant to provide simpler, but more complete and more cost-effective, solutions to some particular logical-processing tasks. Intel’s 8042 is one such microcontroller—it provided the

dedicated function of monitoring the use of a computer keyboard and communicating information about which keys were pressed to a microprocessor within a computer. Ex. 2004, ¶39.

A microcontroller's circuitry for performing logical computations is generally simpler in form and lower in performance than that of a microprocessor. Further, microcontrollers typically include other components, such as main memory including read-only memory (ROM) and/or random-accessible memory (RAM) that would not be included within a microprocessor. Ex. 2004, ¶40; Ex. 2015, 53:8-54:2, 91. This is because microcontrollers provide specialized computing functions as a single chip or as one of a small number of chips that provide a much simpler—and much less expensive—computing solution. Microcontrollers are typically used as low-cost solutions to meet modest design goals with relative ease and low technical investment. Microcontrollers generally range in price from pennies to several dollars while microprocessors generally range in price from tens of dollars to hundreds of dollars. Ex. 2004, ¶40.

Whereas microprocessors are sometimes called the heart of a computer, a microcontroller is a computer unto itself, and Petitioners' expert agrees. Ex. 2015, 55:9-56:14 Ex. 2004, ¶41. This is reflected in the definition of "microcontroller" provided by the Microsoft Computer Dictionary, Fifth Edition:

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. 2006, Microsoft Computer Dictionary, Fifth Edition (2002), at 558 (emphasis added); *see also* Ex. 2015, 58:4-66:16. As Dr. Jeffay acknowledged, the microcontroller disclosed as part of the '935 patent's base unit is an embedded system when included as part of a larger system. Ex. 2015, 78:16-20; Ex. 2004, ¶41.²

The Microsoft Dictionary's understanding of a microcontroller as a special-purpose computing device is consistent with that provided by another technical dictionary published in the same timeframe as the '935 patent's effective filing date:

An integrated circuit chip that is designed primarily for control systems and products. In addition to a CPU, a microcontroller

² While Petitioners' expert referred to the Microsoft Dictionary as "chatty" and Microsoft-centric, other peers view it as reliable. *See, e.g.*, IPR2019-01567, Ex. 1004 at 77 (Declaration by a Regents' Professor in Georgia Tech's School of Interactive Computing relying on the same Microsoft Dictionary).

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. 2007, Comprehensive Dictionary of Electrical Engineering (2nd Ed.) at 439 (emphasis added); *see also* Ex. 2004, ¶43; Ex. 2015, 70:1-75:2.³ The Comprehensive Dictionary also clarifies that while microcontrollers are often single-chip solutions, they are not necessarily confined to a single chip. Instead,

³ While this dictionary was published in 2005, Petitioners' expert testified that he did not think the meaning of "microcontroller" changed between November 2004 and the 2005 publication of this dictionary (or even between 1994 and 2004). Ex. 2015, 72:4-18; 55:9-18; Ex. 2004, ¶44. It is therefore appropriate evidence of the meaning of "microcontroller." *IDB Ventures v. Charlotte Russe Holdings*, 2018 U.S. Dist. LEXIS 186212, at *8 n.1 (E.D. Tex. Oct. 31, 2018) (approving reliance on dictionary definition "roughly contemporaneous" with the application "absent some indication that the meaning of a particular term to persons of skill in the art changed between the date of the patent application and the publication date of the dictionary").

they are designed to complete the particular task for which they are designed “with a minimal quantity of chips.” This is in keeping with the knowledge a POSITA would have had in 2004—that available microcontrollers used a minimal number of chips. Ex. 2004, ¶43; Ex. 2015, 64:6-8. The Comprehensive Dictionary also specifically contrasts microcontrollers from microprocessors (a term it separately defined), as would have a POSITA in November 2004. Ex. 2004, ¶43.

The microcontroller disclosed in the '935 patent for use with the base unit is consistent with the understanding of “microcontroller” described above. Ex. 2004, ¶45. Figure 4 “is a block diagram of the base control unit of the system of FIG. 1.” Ex. 1001, 3:44-45. A POSITA would understand that Figure 4 shows a fairly sophisticated microcontroller given the variety of subsystems with which it interacts. A POSITA would

further understand that the base unit’s microcontroller includes I/O circuitry components to interact with the subsystems given that no external I/O circuitry is illustrated between the microcontroller and the

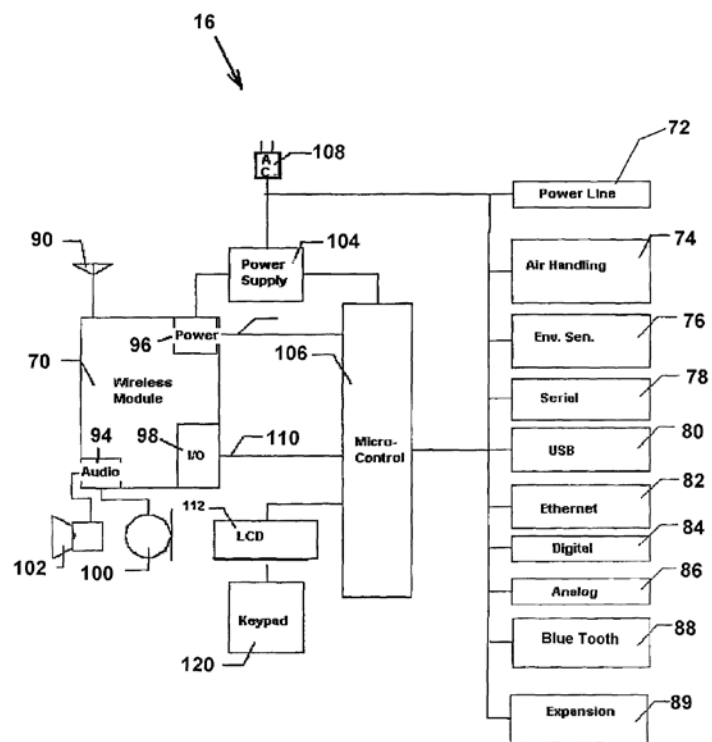


Fig. 4

subsystems. This is consistent with typical microcontrollers known in the art at the time—they included built-in I/O circuitry. Figure 4 also illustrates that the base unit’s microcontroller works in conjunction with an LCD, keypad, wireless module, and power supply, but it does not include separate memory or timing circuits. Again, this is consistent with the typical microcontroller of that timeframe, which included onboard main memory and timing circuits. Ex. 2004, ¶46.

Furthermore, the base unit’s microcontroller is not a general-purpose processor (or microprocessor) capable of performing functions unrelated to the disclosed invention. It is specifically designed and then programmed for “remote control and remote monitoring of the various subsystems within the residential environment.” Ex. 1001, 4:62-66. Again, this is consistent with typical microcontrollers, which, as reflected in the Microsoft Dictionary’s definition of “microcontroller,” are typically designed and then programmed for particular tasks. Ex. 2006 at 558; Ex. 2004, ¶47.

Based on the ’935 patent’s disclosure and the ordinary meaning of “microcontroller,” a POSITA would have understood the term “microcontroller,” as used in the ’935 patent’s claims, to mean “a special-purpose computing device including at least a CPU, main memory, timing circuits, and I/O circuitry designed for a minimal quantity of chips and then programmed to handle a particular task.” Ex. 2004, ¶48.

Petitioners' expert asserts that a POSITA would understand that a generic processor in an embedded system constitutes a microcontroller based on the '935 patent's description of a remote unit in connection with Figure 3. *See* Ex. 1003, ¶267. Specifically, he observes that the remote unit shown in Figure 3 includes a microcontroller "electrically interconnected with random access memory 44, read only memory 46, the keypad 32, and the LCD display 38." *Id.*; Ex. 1001, 4:10-13.

Dr. Jeffay overlooks that Figure 3 relates to the remote unit rather than the base unit. In contrast, each instance of the term "microcontroller" in the claims of the '935 patent relates to the base unit rather than the remote unit. It is not surprising that the remote unit includes both a microcontroller and separate ROM and RAM (not to mention a keypad and LCD, which a POSITA would not expect to be part of a microcontroller). The '935 patent's primary example of a remote unit is a cell phone: "Referring to FIG. 2, the

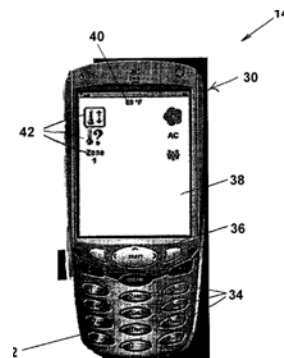


Fig. 2

master remote control unit 12 and associated remote control units 26 are Java/J2ME enable[d] cellular telephones 30." *See, e.g.*, Ex. 1001, 4:1-2; *see also id.* at Figs. 2 & 3; 4:10-35.

Thus, the '935 patent reflects that the remote unit is not a dedicated device intended for use solely in connection with the disclosed system for remotely controlling environmental devices. The preferred remote unit is a cell phone that,

even as of 2004, had a variety of other functions. Ex. 2015, 85:17-87:8. A POSITA would have understood that such a device might well have included a microcontroller containing its own onboard main memory and other circuitry as well as separate ROM and RAM given the breadth of functionality the overall device would provide. Ex. 2015, 87:6-89:19. Thus, the mere fact that the remote unit shown in Figure 3's block diagram includes a microcontroller as well as additional ROM or RAM would not indicate to a POSITA that the inventors of the '935 patent intended to use the term "microcontroller" inconsistently with its ordinary meaning.⁴ That is particularly true given that Figure 4, as discussed above, shows that the base unit (a device dedicated to the disclosed system) includes no separate ROM or RAM. Ex. 2015, 90:6-19. That would tell a POSITA that the inventors used "microcontroller" consistent with its ordinary meaning as reflected in the Microsoft Computer Dictionary and the Comprehensive Dictionary of Electrical Engineering. Ex. 2004, ¶¶49-51.

Petitioners' expert also observed that the microcontroller shown in Figure 3 could run a Java application and communicate/control components in the base unit and attached devices via traditional communication buses. However, he testified

⁴ Petitioners' expert acknowledged that even the microcontroller in Figure 3 might include memory of its own. Ex. 2015, 91:3-9.

this would be true of typical microcontrollers, so it does not support his view that the inventors used “microcontroller” inconsistently with its ordinary meaning. Ex. 2015, 93:15-96:17; Ex. 2004, ¶52.

III. The Proposed Grounds of Invalidity Based on Oinonen and Whitley Fail

A. Petitioners Fail to Properly Establish the Proposed Combination of Whitley and Oinonen

Petitioners assert that the combination of Oinonen and Whitley renders obvious every independent claim of the '935 patent except claims 20 and 22 (where Petitioners rely on Oinonen and Whitley for all but the final element). Petitioners fail to establish that Oinonen and Whitley can be properly combined for two reasons discussed below.

1. Petitioners Fail to Identify any Relevant Failing of Oinonen that Would Prompt a POSITA to Turn to Whitley

Petitioners fail to establish the proposed combination of Oinonen and Whitley because Petitioners did not sufficiently explain what Oinonen fails to disclose or why a POSITA would turn to Whitley.

Petitioners assert that Oinonen itself discloses all of the elements of independent claims 1, 11, 18, 19, and 21 (and all but the final element of claims 20 and 22, for which they rely on Menard), so it is unclear why they contend a POSITA would be motivated to turn to Whitley for the claimed features. *See* Petition at 15-48. This same failing led the Board to reject a proposed obviousness

combination in *LG Electronics v. Cellular Communications Equipment*, IPR2016-00197, Paper 7 (Apr. 29, 2016). There, “the Petition assert[ed] that Ho by itself or Ho and Zhang ‘independently’ disclose most of the elements of the challenged claims.”” *Id.* at 7. Like here, the petitioner in *LG Electronics* “relie[d] on [the secondary reference], apparently, only to the extent that [the primary reference] do[es] not disclose” some particular claim element. *Id.*

As the Board has stated in an opinion designated informative, such a failure dooms a proposed obviousness combination. *See Johns Manville. v. Knauf Insulation*, IPR2018-00827, Paper 9 at 12 (Oct. 16, 2018) (informative); *see also Sanofi-Aventis v. AstraZeneca Pharm.*, IPR2016-00348, Paper 10 at 6 (Jun. 28, 2016) (rejecting proposed obviousness combination that “fails to explain any specific combination of teachings” because it “creates an ambiguity as to which reference(s) Petitioner proposes would have been relied upon by a [POSITA] ... to achieve the subject matter of the challenged claims”); *see also Apple v. ContentGuard Holdings*, IPR2015-00449, Paper 10 at 13 (July 15, 2015) (petitioner failed to “explain with any particularity which claim limitations are absent from [primary reference] or [secondary reference]”).

In *LG Electronics*, unlike here, the petitioner at least identified the claim element that petitioner thought potentially absent from the primary reference. Nonetheless, the proposed combination failed because the petitioner provided “no

indication in the Petition that [the primary reference] has any deficiencies related to this element.” *Id.* at 8. Thus, it was “unclear why a person of ordinary skill would turn to [the secondary reference] for the teaching of an element that, according to Petitioner, is already taught by [the primary reference].” *Id.* The same is true here. Petitioner identifies no failing in Oinonen that would provoke a POSITA to turn to Whitley. Ex. 2015, 143:2-13.

2. Petitioners Fail to Identify Adequate Motivation to Combine Oinonen and Whitley Relevant to the Challenged Claims

Petitioners also fail to establish the proposed combination of Oinonen and Whitley because Petitioners fail to identify adequate motivation to combine Oinonen and Whitley relevant to the elements of the challenged claims. Ex. 2004, ¶54. Petitioners’ reasoning for adding Whitley to Oinonen centers on Whitley’s purported ability to remotely monitor/control multiple devices and disclosure relating to monitoring devices over time. *See* Petition at 15, 16. But none of the challenged claims recites multiple environmental devices—they only require “an environmental device.” Ex. 2015, 135:1-5. And Petitioners’ expert indicated that Oinonen itself discloses monitoring activities over time (Ex. 2015, 135:6-136:16), so Whitley’s disclosure on these points provided no motivation to combine Oinonen and Whitley. Ex. 2004, ¶55-56.

The Board agreed with Patent Owner that the challenged claims do not

require monitoring and controlling multiple devices. *See* Decision at 15. In explaining why it determined—for purposes of institution—that Petitioners had set forth sufficient rationale for combining Oinonen and Whitley, the Board cited *KSR Int’l Co. v. Teleflex, Inc.*, 550 U.S. 398 (2007). However, *KSR* did not hold that the motivation to combine need not relate to the claim elements at issue. Rather, “[a]ny need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements *in the manner claimed.*” *Id.* at 420 (emphasis added).

Thus, as the Board has recognized in other decisions, the motivation to combine must provide a reason for combining the *claimed elements*: “It is Petitioner’s burden to demonstrate ‘that a skilled artisan would have been motivated to combine the teachings of the prior art references to *achieve the claimed invention*, and that the skilled artisan would have had a reasonable expectation of success in doing so.” *John Manville*, IPR2018-00827, Paper 9 at 13 (informative) (quoting *Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1367-68 (Fed. Cir. 2016)).

This principle was also applied in *LG Electronics*, where the Board rejected a purported motivation to combine that did not provide motivation regarding the relevant claim element:

This reasoning, however, addresses only the general motivation for

creating an efficient reporting mechanism for multiple component carrier systems, which [the primary reference] itself already does. It does not explain why a person of ordinary skill would find it advantageous to specifically look to [the secondary reference] for its teaching of [the claim element at issue].

LG Electronics, IPR2016-00197, Paper 7 at 8. Thus, the Board determined that the petition did not sufficiently show “why one of ordinary skill in the art—without improper hindsight—would have combined Ho and Zhang to account for all the features of the challenged claims.” *Id.* at 9.

The same is true here. For this additional reason, Petitioners fail to establish the proposed combination of Oinonen and Whitley.

B. Ground 1A: Claims 1-3, 7, 11-15, 17-19, and 21 are Not Unpatentable Over Oinonen and Whitley

1. Claim 1: Neither Oinonen nor Whitley Enables a Base Unit to Send and Receive SMS Messages

Claim 1 recites, *inter alia*, that “the base unit is configured to send a first SMS message . . . to the remote unit” and that “the remote unit is configured to send a second SMS message . . . to the base unit.” Petitioners assert that Oinonen and Whitley each disclose a base unit having this capability. However, while Oinonen and Whitley mention SMS messaging, they would not have enabled a POSITA to implement the claimed SMS messaging in a base unit without undue experimentation. Ex. 2004, ¶57. Therefore, they cannot be applied as prior art

against this claimed feature. *See Amgen v. Hoechst Marion Roussel*, 314 F.3d 1313, 1354 (Fed. Cir. 2003) (recognizing that a non-enabled disclosure cannot invalidate a patent because “it is not truly prior art”).

Oinonen and Whitley are not enabled for sending or receiving SMS messages from a base unit (e.g., a computing device) because those references merely disclose the *idea* of sending and/or receiving SMS messages with a computing device without disclosing *how* a POSITA could have done so. Moreover, a POSITA would not have known how to send SMS messages from a computing device without explicit teaching because (1) the general capability for doing so was not provided by the applied references; (2) that capability was not generally known in the art; and (3) that capability could not have been developed by a POSITA without very considerable (and undue) experimentation, if at all. Oinonen and Whitley fail to disclose how to satisfy at least two technical requirements for a solution enabling a computing device sending/receiving SMS messages using an associated cellular phone. Ex. 2004, ¶¶58-59.

First, the solution would require that the computing device acting as the base unit be coupled to a cell phone that would send and receive the base unit’s SMS messages via a hardware and software interface. *Id.* ¶60. A hardware interface capable of this function could take the form of a series of wires connecting the computing device to its associated cellular phone through ports on those devices.

An alternative hardware interface could take the form of a wireless interface (e.g., Bluetooth) on both devices that allowed the computing device to communicate with the cellular phone wirelessly. Neither Oinonen nor Whitley describes such a hardware interface. *Id.* ¶60.

A software interface consistent with this technical requirement would include software, on the computing device and on the cellular phone, for communicating through the wired or wireless hardware interface. Although some cellular-phone makers provided a hardware port for coupling a cellular phone with a computing device, not all such phone makers included software and engineering documentation for communicating through that port. Neither Oinonen nor Whitley disclose how to do so. *Id.* ¶61.

A second technical requirement is the presence of software, on the cellular phone, that provides a software interface (API) for the SMS functions on the cellular phone to be controlled or directed by communications with a computing device. This second requirement provides a functional link between the hardware/software interface discussed above, allowing the hardware/software interface to communicate with SMS-specific software/hardware on the cellular phone. Absent this link, it would be impossible to send SMS messages from a computing device acting as the “base unit” claimed in the ’935 patent. *Id.* ¶62.

A POSITA could not have reverse engineered the software capability

required for communicating with a cellular phone's SMS hardware and software without a very substantial development effort (well beyond ordinary experimentation). Moreover, regardless of the amount of experimentation, a POSITA may not have had any reasonable chance of success because phone makers (then and now) took precautions to prevent third parties from learning about and utilizing hardware and software capabilities that were not intended for use by third parties. *Id.* ¶63.

The integrated circuits used by cellular-phone makers (then and now) were very complex and the technical details for how these integrated circuits operated, and how software could be made to interface with these integrated circuits, were not publicly available. Indeed, such details were very closely guarded secrets (and still are). Thus, a POSITA could not have reverse engineered a cellular phone or its cellular-related circuits to develop software that would allow an external computing device to send/receive SMS messages through an associated cellular phone. *Id.* ¶64.

Oinonen fails to enable SMS messaging between the remote unit and the base unit

Oinonen discloses the idea of a computing device communicating with other devices using SMS without disclosing a technical solution for doing so. *See, e.g.,* Ex. 1016, 4:41-45. Oinonen does not disclose sufficient detail regarding the hardware/software interface for communicating between a cellular phone and a

computing device using SMS messaging. Ex. 2004, ¶66.

Specifically, Oinonen discloses a first hardware/software interface as illustrated in the figure below.

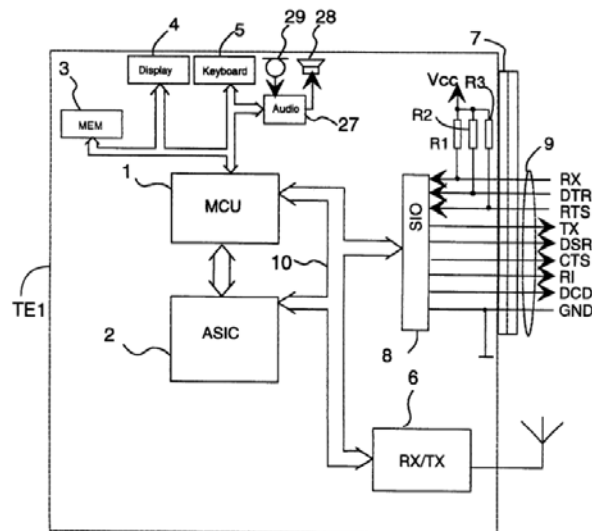


Fig. 3

Ex. 1016, Fig. 3. Oinonen describes the above-illustrated interface as an RS-232 interface. *Id.*, 6:38-42. The particular functions of each signal within the interface are also described by Oinonen in overview terms. *Id.*, 6:9-38, 6:43-59.

While Oinonen mentions that such interfaces were usable with data telecommunications equipment (e.g., a computer modem for use over a telephone line), Oinonen fails to disclose or suggest any particular cellular phone with such an interface. Ex. 2004, ¶68. As of November 2004, RS-232 interfaces were commonly used as interfaces between computing devices and landline modems as suggested by Oinonen. *See* Ex. 1016, 6:4-8 (mentioning use of RS-232 interfaces in modems). Thus, Oinonen's proposal to use an RS-232 interface for

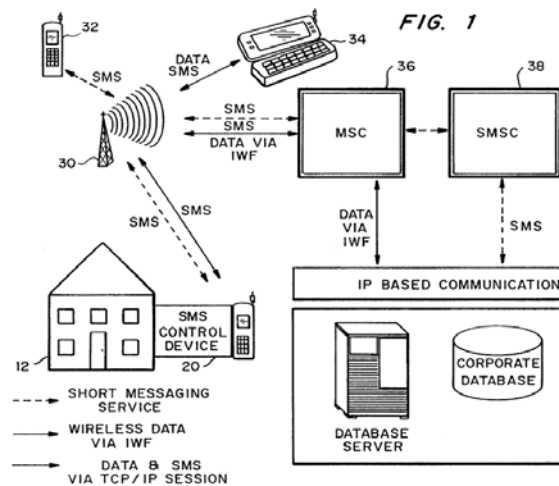
communicating between a cellular phone and a computing device (but not a landline modem) was of little value to a POSITA because a POSITA could not have realistically created or modified a cellular phone to have such an interface given the complexity of such an endeavor (well beyond “undue experimentation”). Ex. 2004, ¶67.

Oinonen also fails to disclose how the interface could be used to control a cellular phone. At most, Oinonen states without explanation that the RS-232 interface could be used to control a cellular phone without describing any technical solution for doing so. *See* Ex. 1016, 6:60-67, 8:33-55, 9:34-64; Ex. 2004, ¶68.

As discussed above, a POSITA would have needed a software API for directing or controlling the cellular circuitry and software to send/receive SMS messages to implement Oinonen’s conceptual suggestion of using a computer to control peripheral devices through SMS messages. Oinonen did not disclose or suggest a technical solution for doing so, so Oinonen would not have enabled a POSITA in November 2004 to send or receive SMS messages from a computing device. Ex. 2004, ¶69.

Whitley fails to enable SMS messaging between the remote unit and the base unit

Whitley discloses the idea of using a computing device to send SMS messages through a cellular phone. Whitley’s Figure 1 illustrates this concept as seen below.



Whitley's Figure 1 illustrates an SMS control device 20 including a cellular phone communicating with a cellular phone 32.

Whitley does not disclose how a computing device would communicate with an associated cell phone through a hardware/software interface, and therefore fails to teach the first technical requirement necessary for implementing such capability. Ex. 2004, ¶72. Whitley also fails to disclose software for receiving communications through the hardware/software interface and directing or controlling the cellular phone to send/receive SMS messages in response to such communications. Instead, Whitley speaks in generalities that would provide no guidance to a POSITA in implementing Whitley's mere suggestion. *See, e.g.*, Ex. 1023, 3:15-25, 8:1-6 (stating that a goal of the described system is to route messages from wireless gateways to terminals (computing devices) without teaching how such routing is accomplished); Ex. 2004, ¶73. Whitley's remaining disclosures are similarly non-enabling. Ex. 2004, ¶74; Ex. 1023, 2:19-21 (merely

describing a general capability for sending/receiving SMS messages via a computing device), 2:29-3:2, 3:22-25, 4:14-16, 9:9-25, 10:10-14, 12:7-9.

A POSITA could not have put Whitley's conceptual statements to use without inventing a new infrastructure for transferring data between a cellular phone and a computing device (well beyond undue experimentation). Notably, Whitley fails to disclose or suggest either of the above-described aspects of a technical solution for sending/receiving SMS messages by a cellular phone through a controlling computing device. Therefore, a POSITA would not have known how to implement a computing device that communicated via SMS without undue experimentation, and Whitley does not qualify as prior art with respect to that functionality. Ex. 2004, ¶75.

2. Claims 2, 3, and 7

Claims 2, 3, and 7 depend from claim 1. Therefore, Oinonen and Whitley do not render these claims obvious for the reasons discussed regarding claim 1. Ex. 2004, ¶¶76-77, 79. Moreover, regarding claim 3, Oinonen and Whitley do not teach its "microcontroller" recitation for the reasons discussed regarding independent claim 18. *Id.*, ¶78.

3. Claim 11

Similar to claim 1, independent claim 11 recites a base unit capable of sending and receiving SMS messages. Ex. 1001, 14:19-37. Neither Oinonen nor

Whitley enable a POSITA to implement this claimed functionality for the reasons discussed regarding claim 1. Ex. 2004, ¶80.

4. Claims 12, 13, 14, 15, and 17

Claims 12, 13, 14, 15, and 17 depend from claim 11. Therefore, Oinonen and Whitley do not render these claims obvious for the reasons discussed regarding claim 11. *Id.* ¶¶81-88.

Moreover, regarding claim 12, Petitioner has not sufficiently demonstrated its additional recitations for the reasons stated by the Board. *See* Institution Decision at 26. Ex. 2004, ¶83.

Moreover, regarding claim 14, neither Oinonen nor Whitley discloses its “microcontroller” recitation as discussed regarding independent claim 18. *Id.* ¶86.

5. Claim 18

a) Neither Oinonen nor Whitley teaches the claimed “microcontroller”

Claim 18 recites that the claimed base unit includes, *inter alia*, “a microcontroller configured to process the second message including the command, and to send the command through the communication interface to the environmental device.” Ex. 1001, 15:5-8. Petitioners assert that a POSITA would have understood the “microcontroller” to be a generic processor. *See* Petition at 24. Petitioners then point to Oinonen’s disclosure of a microprocessor and an application-specific integrated circuit (ASIC) as satisfying the “microcontroller”

element. *Id.* at 24-25. While Petitioners do not expressly state how Oinonen's microprocessor and ASIC purportedly satisfy the microcontroller element, Petitioners' expert states that "[b]oth the microprocessor and application-specific integrated circuit (ASIC), operate as the claimed 'microcontroller.'" Ex. 1003, ¶268.

As discussed above regarding claim construction, a POSITA would not have understood that the claimed "microcontroller" is a generic processor. A POSITA would understand that microcontrollers and microprocessors are distinctly different devices, as reflected by the fact that they are separately defined in technical dictionaries from the era. Ex. 2006 at 558, 560; Ex. 2007 at 439. A microcontroller includes various onboard circuitry that a microprocessor does not contain. Specifically, a POSITA would have understood the claimed microcontroller to be "a special-purpose computing device including at least a CPU, main memory, timing circuits, and I/O circuitry designed for a minimal quantity of chips and then programmed to handle a particular task." A generic microprocessor does not meet this standard understanding of microcontroller because it does not necessarily include main memory, timing circuits, or I/O circuitry, nor is a generic microprocessor designed for a particular task, nor is it specifically intended to function with a minimal quantity of chips. Ex. 2004, ¶90.

Likewise, a POSITA would never have understood an ASIC to be a

microcontroller. Ex. 2004, ¶91. As discussed above, a POSITA would understand that a microcontroller, and especially the specific microcontroller disclosed and claimed in the '935 patent, would include at least a CPU, main memory, timing circuits, and I/O circuitry. An ASIC does not include even a CPU (as illustrated by the fact that Oinonen's ASIC is paired with a separate microprocessor). *Id.*; Ex. 2015, 132:18-133:2. Rather, an ASIC is a series of logic gates *hardwired* for a single, defined function. *See* Ex. 2006 at 60, 385; *see also* Ex. 2015, 100:14-17 (describing an ASIC as “essentially a program that’s burned into silicon”); 106:4-107:6. Once the program is burned into the silicon, it is not programmable. Ex. 2015, 100:18-20. While Petitioners’ expert testified during deposition that “ASIC” is the more modern term for “microcontroller” (Ex. 2015, 100:7-11), dictionaries contemporaneous with the '935 patent’s priority date defined them separately—and very differently. Dr. Jeffay could identify no support for his assertion. Ex. 2015, 107:7-13.

In contrast to an ASIC, a microcontroller can be configured, through programming, for its intended task. Ex. 2004, ¶93. As Petitioners’ expert acknowledged, microcontrollers are programmable devices. Ex. 2015, 63:11-16. That means that someone designing a hardware component, such as the '935 patent’s base unit, would be able to identify a suitable off-the-shelf microcontroller and program it for the particular intended task. In contrast, an ASIC is never an

off-the-shelf component. ASICs are a form of custom integrated circuit design that is expensive and engineering intensive on the front end. Ex. 2004, ¶93; Ex. 2015, 107:14-108:9. An ASIC, unlike a microcontroller, is *hardwired* for a particular task and therefore must be specifically designed for each particular device into which it is incorporated. Ex. 2015, 105:10-107:6.

The '935 patent expressly indicates that the disclosed microcontroller includes the type of programmability that ASICs cannot provide by their very nature: “The application software [within the base unit’s microcontroller 106] includes a macro language interpreter to enable efficient end-user customization and future expansion to the system.” Ex. 1001, 10:34-36; *id.* at 5:44-47 (“programming and customization of the applications software in the base control unit can be performed from anywhere in the world with an Internet connection”); Ex. 2004, ¶94. Thus, a POSITA would understand that neither Oinonen’s microprocessor nor its ASIC constitutes a microcontroller as recited in claim 18. Ex. 2004, ¶95.

Petitioners next assert that Whitley teaches the claimed microcontroller by disclosing “a processor, such as an Intel 386 or 486 processor.” Petition at 25 (quoting Ex. 1023 at 9:4-5). Petitioners’ expert relies on this same disclosure in his declaration. Ex. 1003, ¶270. As discussed above, a microprocessor is not a microcontroller because it is not a computer in and of itself programmed for a

particular task. The Intel 386 and 486 processors disclosed by Whitley are prime examples of microprocessors of their day—a CPU intended for use in general-purpose computing platforms that are sophisticated enough to handle a wide variety of functional and performance requirements and to execute multiple computer programs simultaneously. They are not “a special-purpose computing device including at least a CPU, main memory, timing circuits, and I/O circuitry designed for a minimal quantity of chips and then programmed to handle a particular task.” Ex. 2004, ¶96.

This is an important distinction for someone desiring to practice the ’935 patent. As discussed above, microcontrollers provide a specific, though generally modest, functionality for a low price. In contrast, microprocessors provide broader and higher performance capabilities but at a greatly increased cost. The result is that a base unit incorporating a microcontroller could be sold at a much lower price than a base unit incorporating a microprocessor. That is particularly true given that a base unit containing a microprocessor would also need separate main memory, timing circuits, and I/O circuitry since they are generally not included in a microprocessor. In addition to increasing cost, using a microprocessor in combination with the additional required circuitry would also increase the complexity of the resulting device. In short, microprocessors and microcontrollers are very different computing solutions. Ex. 2004, ¶97.

**b) Neither Oinonen nor Whitley Enables SMS
Messaging Between the Base Unit and Remote Unit**

Similar to claim 1, claim 18 recites a base unit capable of sending and receiving SMS messages. Ex. 1001, 14:65-15:4. Neither Oinonen nor Whitley enable a POSITA to implement this claimed functionality for the reasons discussed regarding claim 1. Ex. 2004, ¶98.

6. Claim 19

As discussed above, Petitioners' proposed obviousness combination fails for all claims because they do not adequately disclose how Oinonen and Whitley would need to be combined to teach all claim elements. Therefore, they have not established a proper ground of invalidity based on obviousness. *Id.*, ¶99.

7. Claim 21

Claim 21 is directed to a base unit that comprises, *inter alia*, “a microcontroller configured to process the second message including the command, and to send the command through the communication interface to the environmental device.” Ex. 1001, 16:18-22. Neither Oinonen nor Whitley discloses the claimed microcontroller for at least the reasons discussed with respect to the “microcontroller” element of independent claim 18. Ex. 2004, ¶100.

**C. Ground 1B: Claims 4-6 and 16 are Not Unpatentable Over
Oinonen, Whitley, and Sears**

1. Claim 4-6

Claims 4, 5, and 6 depend from claim 1. Petitioners point to nothing in Sears

that overcomes the deficiencies in Oinonen and Whitley regarding claim 1.

Therefore, Oinonen, Whitley, and Sears do not render claims 4-6 obvious for the reasons discussed regarding claim 1. Ex. 2004, ¶¶101, 109.

Claim 4

Oinonen, Whitley and Sears do not disclose (or enable) the additional recitations of claim 4: “The system as recited in claim 1 wherein said remote unit is a cellular telephone handset with custom programmability.”

As Petitioners’ expert testified, the only custom programmability the ’935 patent discloses is specifically the ability to “communicate application data on SMS between the remote control units and the base control unit,” which as he also testified, the ’935 patent discloses implementing in Java (or J2ME). Ex. 2015, 180:7-182:19. As Dr. Jeffay testified, the “custom” language means that the apps implementing this functionality “aren’t found on regular cell phone handsets.” Ex. 2015, 181:7-9. As Dr. Jeffay put it, “in modern 2020 parlance what I’d say is that this phone has apps on it that are not typically found on standard telephones.” *Id.* at 180:22-181:3. This is how a POSITA would have understood the “custom programmability” limitation recited in claim 4. Ex. 2004, ¶103.

Oinonen, Whitley and Sears do not disclose (or enable) providing such custom programmability (i.e., permitting a user to add an “app” to his or her cell phone that utilized the phone’s built-in SMS capability to send application data to a

base unit and receive data from the base unit). Even if such an idea had been disclosed, nothing in Oinonen, Whitley or Sears would have enabled a POSITA to implement that capability in November 2004. Ex. 2004, ¶104.

For example, Oinonen merely states that software executes functions in response to receiving a message on the mobile station. These disclosures are the extent of Oinonen's discussion of sending/receiving SMS messages via software. See Ex. 1016, 4:41-45; 4:57-61; 5:3-13; 7:1-4; 8:33-37; 9:51-55; 12:4-7; and 12:49-51. None of these excerpts suggest performing this function through custom programmability. Ex. 2004, ¶105.

Further, Oinonen does not enable such custom programmability even if it were disclosed. As discussed regarding Ground 1A, building a custom app for controlling a phone's SMS functionality would require a first hardware/software interface and a second software API for controlling or directing circuits and software in the base unit to send/receive SMS messages. Oinonen ignores these necessary implementation details related to enabling SMS messaging via custom programmability. Petitioners cite nothing providing such information. Ex. 1003, ¶400. Thus, Oinonen fails to enable the additional limitation of claim 4. Ex. 2004, ¶106.

Similarly, Whitley does not disclose that SMS message communication occurs with custom software or explain how to implement the above-described

aspects of such software-controlled SMS messaging. Ex. 1003, ¶¶401-02 (citing to Whitley’s conceptual disclosures). Therefore, Whitley fails to disclose or enable the claimed “custom programmability.” Ex. 2004, ¶107.

Sears fails to cure the shortcomings of Oinonen and Whitley. Sears describes aspects of what could be called an “app store” for applications executing on a mobile device. *See* Ex. 1019, [0012], [0039]. Nothing in Sears discloses or suggests SMS messaging, much less implementation details for a custom application to implement SMS messaging. Ex. 2004, ¶108.

Accordingly, the proposed combination does not disclose sending/receiving SMS messages via custom programming, and therefore fails to render claim 4 obvious. *Id.*

Claims 5 and 6

Claims 5 and 6 depend from claim 4, further specifying that the custom programmability is a “JAVA programming kernel” (claim 5) or “a J2ME programming kernel” (claim 6). While Petitioners rely on Sears as teaching custom programmability using Java and J2ME, Sears fails to cure the shortcomings of Oinonen and Whitley regarding teaching or enabling a POSITA to implement a custom app for communicating application data on SMS between the remote control unit and the base control unit as discussed regarding claim 4. Thus, the proposed combination does not render claims 5 or 6 obvious. *Id.*, ¶¶110-111.

2. Claim 16

Claim 16 depends from claim 11. Because Petitioners point to nothing in Sears overcoming the deficiencies in Oinonen and Whitley regarding claim 11, the proposed combination does not render claim 16 obvious for the reasons discussed regarding claim 11. Ex. 2004, ¶112.

D. Ground 1C: Claim 8 is Not Unpatentable Over Oinonen, Whitley, Antila, and Sears

Claim 8 depends from claim 1. Petitioners point to nothing in Antila or Sears that overcomes the deficiencies in Oinonen and Whitley regarding claim 1. Therefore, Oinonen, Whitley, Antila, and Sears do not render claim 8 obvious for the reasons discussed regarding claim 1. Ex. 2004, ¶113.

E. Ground 1D: Claims 9 and 10 are Not Unpatentable Over Oinonen, Whitley, Antila, and Ehlers

1. Claim 9

Claims 9 and 10 depend from claim 1. Petitioners point to nothing in Antila or Ehlers that overcomes the deficiencies in Oinonen and Whitley regarding claim 1. Therefore, Oinonen, Whitley, Antila, and Ehlers do not render claims 9 or 10 obvious for the reasons discussed regarding claim 1. Ex. 2004, ¶¶123-24.

Claim 9

Additionally, Petitioners fail to establish motivation for combining the cited references and therefore the proposed ground of invalidity for claim 9 fails. Claim 9 depends from claim 8, which recites a mobile device display, so claim 9 concerns

icons displayed on a mobile-device display. Claim 9 further recites “wherein said liquid crystal module includes selectable graphic icons corresponding to current environmental information being monitored or controlled.” Ex. 1001, 14:12-15. A POSITA would not have found it obvious to combine Ehlers’ user interface with Oinonen and Whitley as Petitioners assert because Ehlers’ user interface was not realizable on the mobile device displays disclosed by Oinonen and Whitley. Ex. 2004, ¶114.

Oinonen and Whitley disclose mobile devices with small screens, consistent with then-current mobile devices. *See, e.g.*, Ex. 1023, Whitley Fig. 1 (elements 32 and 34 showing small-screened mobile devices); Ex. 1016, Oinonen Figures 1 and 2 (similar). iPhones and Android phones (with their large, high-resolution screens) were years away at the time of Oinonen and Whitley. Therefore, a POSITA would have understood Oinonen and Whitley’s mobile-phone illustrations to reflect then-current mobile devices employing small displays; by contrast, Ehlers disclosed a rich user interface realizable only on a large display. Ex. 2004, ¶¶115-16. This display is consistent with an external monitor on a personal computer (or laptop) but inconsistent with then-current mobile device displays. *Id.* Petitioners fail to address important technical distinctions between the references.

In November 2004, a POSITA would not have been motivated to combine Ehlers’ large display with Oinonen or Whitley’s small mobile-device displays.

That would have effectively required marrying a personal computer—with all its attendant design and manufacturing complexity—with a mobile device. Such a combination was far beyond what a POSITA could have done at that time, with any reasonable expectation of success, and without undue experimentation. If a POSITA could have done so, iPads would have been available years earlier. The iPad’s success arose not from being the first to *conceive* of a large-screen device, but rather being the first to successfully build one. *Id.* ¶117.

Any existing mobile-phone device (e.g., Nokia Communicator 9000) would have required extensive modification to achieve the combination Petitioners propose. Motivation to do so would not have existed in November 2004 because a POSITA would not have had a reasonable chance of success and doing so would have required undue experimentation *to achieve the specific type of claimed icons*. *Id.* ¶118.

Early mobile phones with graphical user interfaces provided icons that activated programs when tapped. For example, a user could execute an email program by tapping an icon associated with that program. Icons triggering *programs* are very different from icons triggering individual *functions within a particular program*. *Id.* ¶119-120. Claim 9 recites “selectable graphic icons corresponding to current environmental information being monitored or controlled.” That is, an icon reflecting a specific monitored/controlled *condition*

(e.g., turning off a light).

A POSITA would have recognized that early mobile phones with graphical user interfaces at most would have been programmable to provide icons for triggering programs rather than functions within a particular program. Moreover, a POSITA would have had a very difficult time modifying the software compiler that produced applications and associated icons for those phones so that the software compiler produced an application and icons associated with specific functions within that application. The relatively crude software-development tools available for early mobile phones would have made such modifications either very difficult or impossible for a POSITA because the POSITA would have lacked any information about the compiler's internal structure. Thus, the POSITA would not have known how to modify the software compiler to implement monitored-condition-specific icons rather than program-specific icons. Accordingly, the POSITA would not have had a reasonable chance of success and therefore would not have been motivated to pursue such a path. *Id.* ¶121. Petitioners' motivation-to-combine arguments fail to address these points as well.

Therefore, a POSITA would not have had a motivation to combine the applied references and Petitioners' proposed ground of invalidity fails. *Id.*, ¶122.

**F. Ground 1E: Claims 20 and 22 are Not Unpatentable Over
Oinonen, Whitley, and Menard**

1. Claim 20

Claim 20 recites, *inter alia*, “a transmitter operatively associated with the controller for sending a second wireless message to the remote unit, wherein the second wireless message includes information indicating that the command has been executed.” Ex. 1001, 16:1-4. The “command” referenced in this claim element is “a command for the environmental device.” *Id.* at 15:32-39. Petitioners do not assert that Oinonen or Whitley discloses this claim element but instead assert that it is taught by Menard. *See* Petition at 47.

Neither passage from Menard cited by Petitioners satisfies this claim element. Ex. 2004, ¶126. The first passage, Paragraph [0068], describes Menard’s Figure 2. Figure 2 describes how the “present system” responds to an alarm signal. As shown in Menard’s Figure 1 and as described in Menard’s Summary, the “system” is not a base unit located within a house or business but instead a monitoring service remote from the house or business:

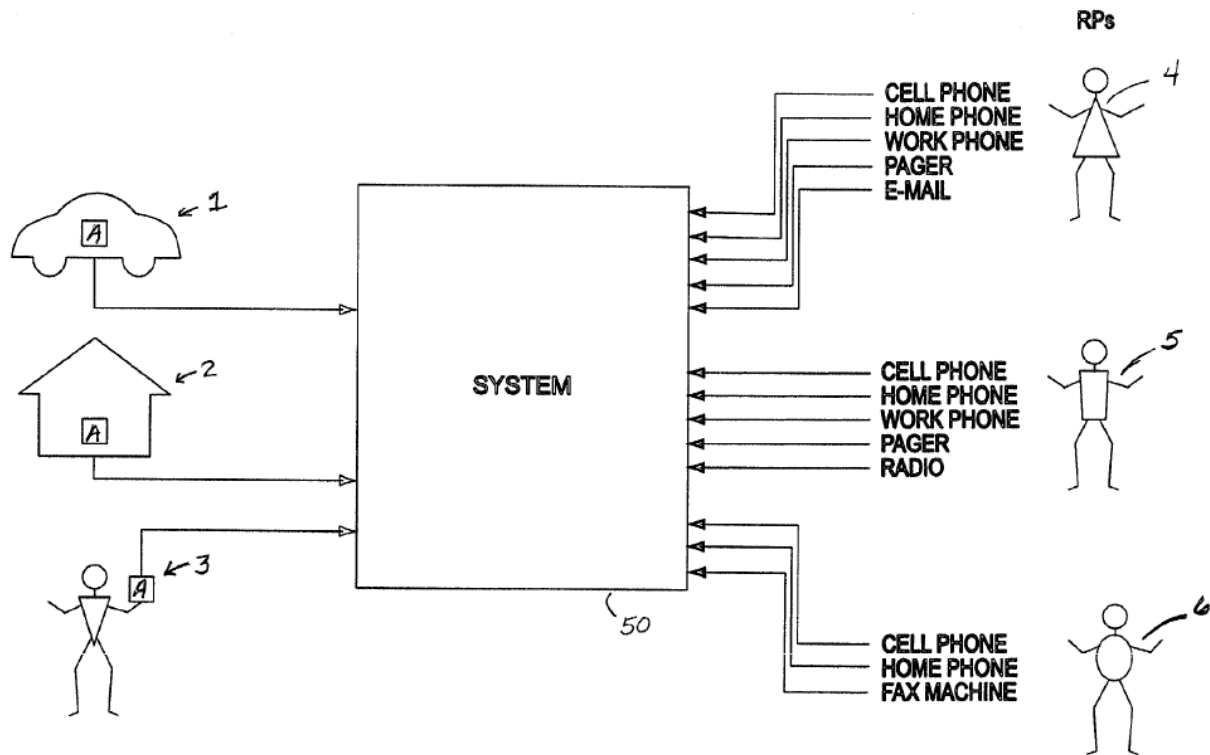


FIG. 1

See Ex. 1020, Menard Fig. 1; ¶[0011].

Menard describes FIG. 1 as illustrating a “central station ... coupled to three representative alarm signal sources.” *Id.* ¶[0054]. Menard describes that alarm sources 1, 2 and 3 can communicate with the central station through several mechanisms including a “home telephone,” reflecting that the central station is outside of the location where the alarm is generated because a landline telephone line would not provide intra-home communication. *Id.* The arrangement of alarm sources 1, 2 and 3, relative to system 50 in FIG. 1, also indicates that the central station is at a location removed from the locations of elements 1, 2 and 3, based on the graphical relationship between home 2, automobile 1 and person 3 to the

system 50 at the central station; e.g., system 50 is outside of home 2. *See also, e.g.*, Ex. 1020, [0071].

As Figure 2 describes, when the monitoring service receives an alarm signal, it notifies all responsible parties (“RPs”) at step 250. It further discloses that when RPs or other users (e.g., someone in the home where the alarm signal originated) respond, the “system executes further notification, dispatching, data processing or other actions based upon executing instructions received.” *Id.* Fig. 2. Menard’s Figure 2 indicates that the further notification or processing is based on the *system* (that is, the monitoring service) executing instructions received from RPs or other users:

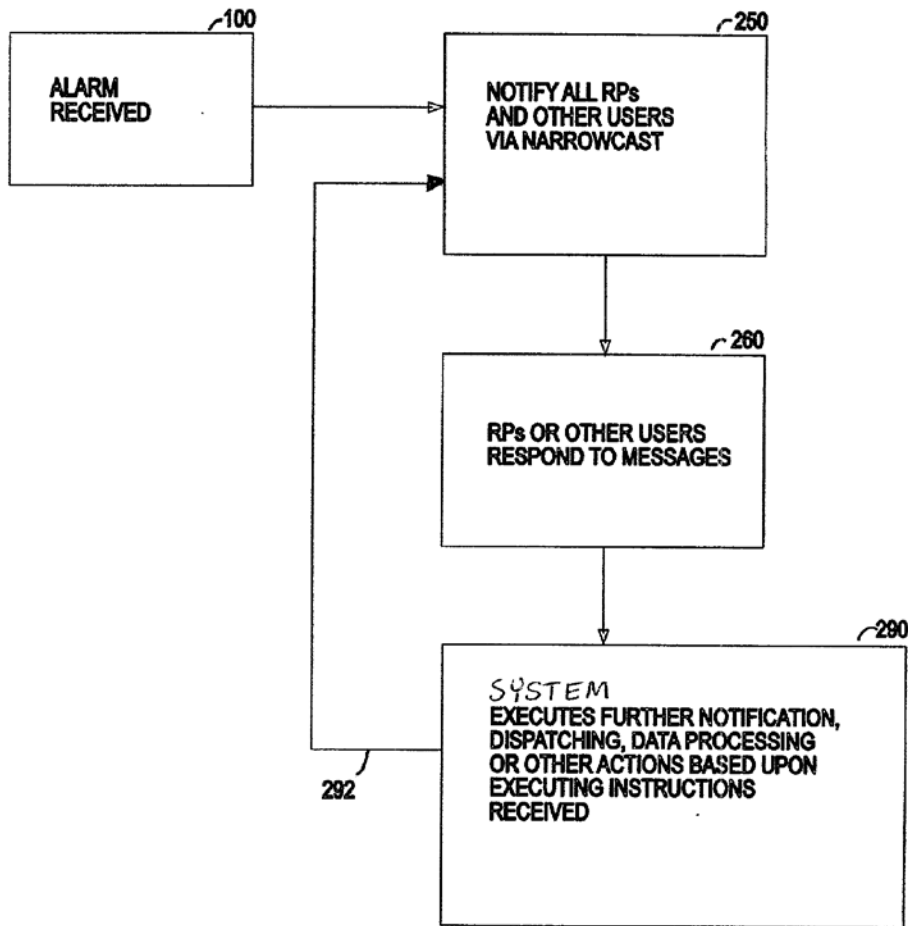


FIG. 2

Ex. 2004, ¶128. Petitioners' expert agreed that step 290 of Figure 2 references the *system* executing instructions. Ex. 2015, 170:19-173:11. Therefore, Figure 2 does not disclose the system sending notifications based on an *environmental device in a monitored home* executing instructions. Ex. 2004, ¶129.

Menard gives an example of what such further notification entails in Paragraph [0077]. This paragraph describes an embodiment illustrated in Figure 7 regarding the processing of an alarm signal from a home. It says that “with a home

alarm system, the procedure at 250 may include simultaneously notifying, and seeking responses from, both spouses at their respective cell phones, work phones, e-mails, and fax numbers in addition to the home telephone.” Ex. 1020, ¶[0077].

Whether a responsible party cancels the alarm or indicates that the alarm should proceed to dispatch, the monitoring service then notifies all RPs of the outcome: “if the alarm is cancelled, the present system automatically updates the RPs of this outcome at 450. Similarly, upon a dispatch 300 ... the present system notifies the RPs of the dispatch event.” *Id.* Thus, the only “further notifications” that Menard discloses relate to what the *monitoring service or responsible parties* do. Neither Figure 2 nor Paragraph [0068] discloses that the monitoring service sends a notification based on the alarm system performing some command from remote users. Therefore, Menard’s Paragraph [0068] does not disclose the present limitation of the ’935 patent’s claim 20. Ex. 2004, ¶131.

The same is true of Menard’s Paragraph [0179]: “In one embodiment, after instructions from an RP are completed, another round of notification may occur. In addition, selected RPs may be notified of the outcome of the process. For example, the notification may entail a message such as ‘the police were dispatched at 10:05 AM,’ or ‘response was canceled by RP Susan Smith’ or ‘RP Jones received message and acknowledged receipt.’” Again, these notifications do not indicate that an environmental device (e.g., Menard’s alarm system) has executed some

command. Rather, these notifications only provide information about actions taken by responsible parties or the monitoring service. Ex. 2015, 173:12-174:18. Thus, Menard does not disclose this limitation. Ex. 2004, ¶132-34.

Menard's shortcoming on this point is not surprising. Petitioners have identified nothing in Menard showing that its third-party monitoring service has any knowledge about whether the alarm system in a monitored home executes any particular command. Menard's disclosures are consistent with systems available at the time of Menard's filing. Specifically, then-current alarm systems employed relatively simple mechanisms for detecting the existence of a condition (e.g., door is open; window was broken) and communicating that condition to another system for consideration (e.g., notifying a central office). Such systems used a human to determine whether the alarm needed further attention. Any confirmation message arising from the conclusion of that investigation and judgment would emanate from central office (like Menard) rather than the environmental device. *Id.* ¶¶133-35.

2. Claim 22

Claim 22 recites that the base unit is configured to “send [a] control command to the environmental device via the controller” and to “send a status message indicating execution of said control information to the remote device.” Ex. 1001, 16:37-38. Petitioners assert that Menard discloses this element for the

same reasons as claim 20's similar recitation. This fails for the same reasons discussed regarding claim 20. Ex. 2004, ¶136.

IV. The Proposed Grounds of Invalidity Based on Bielski and Wu Fail

A. Petitioners Fail to Properly Establish the Proposed Combination of Bielski and Wu

Petitioners assert that Bielski and Wu render obvious every independent claim of the '935 patent except claims 20 and 22 (where Petitioners rely on Bielski and Wu for all but the final claim element). Petitioners fail to establish that Bielski and Wu can be properly combined for two reasons discussed below.

1. Petitioners Fail to Identify Adequate Motivation to Combine Bielski and Wu

Petitioners acknowledge that while Bielski discloses the use of SMS messages for communication between a base unit and a remote unit, it does not further describe the details of the communications protocols. Bielski, they assert, "states that such protocols were standardized and known in the art." Petition at 50. Therefore, they say, a POSITA would have been motivated to modify Bielski's disclosure by implementing the SMS functionality disclosed by Wu. *Id.* at 50-51.

Petitioners first assert that Wu provides motivation to use SMS "as it is disclosed as being simple to implement because it consists of only two layers, allows for reduced costs, and is already widely implemented whereas WAP and HTTP were not." *Id.* at 51. But this merely provides motivation to use SMS, which Petitioners say Bielski discloses. Thus, the mere simplicity, low cost, and

widespread use of SMS would not have provided motivation to combine Wu with Bielski. Ex. 2015, 147:15-148:7; Ex. 2004, ¶139.

While Petitioners' expert testified during deposition that Wu also discloses combining SMS messages to reduce cost (since SMS messaging often carried a per-message charge in the 2004 timeframe), this actually provides motivation *against* using SMS in the first place because other communication techniques did not carry *any* per-message fee. Ex. 2015, 147:15-151:5. Further, combining SMS messages as Wu discloses would create complex, clunky messages and could potentially delay communication of important information. Thus, if anything, Wu's disclosure regarding the advisability of combining SMS messages would have motivated a POSITA to avoid SMS messaging altogether. Ex. 2004, ¶140.

While Petitioners next rely on SMS's widespread adoption (Petition at 52), the fact that virtually all mobile phones at the time supported SMS would actually motivate a POSITA not to use Wu's particular SMS implementation. Ex. 2004, ¶141. Wu teaches implementing SMS using a driver from gnokii, which Wu says "is an open source organization that provides tools and a user space driver for Nokia GSM mobile phones under Linux, various UNIXs and Windows." Ex. 1018 at 499. Thus, Wu's SMS implementation was designed specifically for Nokia

mobile phones.⁵ While Nokia was a leading mobile-phone manufacturer, almost 70% of the market was captured by other manufacturers. Moreover, Nokia's remaining market share was rapidly declining, dropping about 20% from 2002-2004.⁶

No company looking to manufacture a “smart” climate-control system, alarm system, or the like would be motivated to design its product such that it could only be controlled by Nokia phones, thereby limiting its customer base to customers of one phone-maker. That is particularly true of Nokia since it was perceived as being very late in implementing smart-phone technology (and executing poorly when it did).⁷ Ex. 2004, ¶142. Bielski itself expresses a desire to

⁵ Ex. 2014, gnokii FAQ. The gnokii FAQ page identifies various Nokia phones as supported models as well as several other phones that were known to work with gnokii though they were not specifically “supported models.” These compatible phones were primarily Nokia phones, along with a few others that were outdated by the time of the effective filing date.

⁶ Ex. 2010, Nokia Q4 2004 Disclosure (Q4 2004: 32% market share); Ex. 2011, Nokia Q4 2003 Disclosure (Q4 2003: 38% market share); Ex. 2012, Fortune Article (51% market share in 2002).

⁷ Ex. 2013, NYT Article; Ex. 2012, Fortune Article.

operate using standard—not manufacturer-specific—protocols. Ex. 1017, Bielski ¶¶[0030], [0057]. The gnokii software, specifically designed for the particular requirements of Nokia phones, could not be readily adapted to work with phones from other providers. Ex. 2004, ¶142. Thus, a POSITA would have been particularly disinclined to implement Wu’s Nokia-centric solution. *Id.* This is supported by Petitioners’ own expert, who says that a POSITA would have avoided solutions that result in “limiting the number of mobile devices that could be used.” Ex. 1003, ¶499.

Further, gnokii was written in the “C” programming language. Petitioners’ expert testified that a POSITA would have understood that there was less support for C applications than Java in the context of mobile devices. Ex. 2015, 187:5-188:2. Moreover, he testified that C applications carry significantly greater security risks than, for example, Java applications (particularly important in the control of home systems like security systems). *Id.* at 188:3-189:13. These disadvantages would provide a POSITA further motivation against using gnokii. Ex. 2004, ¶143.

Finally, Petitioners argue that a POSITA could have implemented SMS communications using Wu. *See* Petition at 52. But “this is actually a statement of anticipated success in combining the references, rather than an articulated reason to combine them in the first instance.” *Hulu, LLC v. Sound View Innovations, LLC*, IPR2018-00582, Paper 34 at 22 (Aug. 5, 2019); Ex. 2004, ¶144. As *Hulu* held, “the

fact that the combination might have been successful does not mean that an ordinarily skilled artisan would have been motivated to make the combination.” *Id.*

For the reasons discussed above, a POSITA would not have been motivated to combine Bielski with Wu. Ex. 2004, ¶145.

2. Petitioners Fail to Explain any Other Relevant Failing of Bielski that Would Prompt a POSITA to Turn to Wu

As with Oinonen and Whitley, Petitioners assert that Bielski and Wu separately disclose each element of the independent claims (except claims 20 and 22, where they assert they teach all but the final claim element), without describing any specific combination of the two references, much less why such a combination would be necessary or desirable. *See* Petition at 52-77. At no point does Petitioner concede or acknowledge that either Bielski or Wu fails to disclose any limitation or explain the need for combining teachings of Bielski with Wu. Ex. 2015, 143:145:4.

Therefore, Petitioners’ proposed combination fails to properly set forth the proposed grounds of invalidity for the same reasons discussed with respect to its proposed combination of Oinonen and Whitley, as multiple Board decisions establish. *See Johns Manville*, IPR2018-00827, Paper 9 at 12; *LG Electronics*, IPR2016-00197, Paper 7 at 8; *Sanofi-Aventis*, IPR2016-00348, Paper 10 at 6.

B. Ground 2A: Claims 1-4, 7-9, 11-15, 17-19, and 21 are Not Unpatentable over Bielski and Wu

1. Claim 1

- a) The proposed combination does not render obvious sending an SMS message from a remote unit to a base unit**

Bielski includes only a single reference to SMS, mentioning that a mobile terminal may be informed about the status of monitored conditions “in the form of an SMS or by means of a voice mail.” Ex. 1017, Bielski ¶[0069]. Bielski does not disclose that a mobile terminal can send an SMS message to the “check and communication unit” (which Petitioners map to claim 1’s base unit). Ex. 2004, ¶146. While Bielski does disclose that the mobile unit may be used to enter and send commands to the check and communication unit, it does not say it can do this via SMS. Ex. 1017, ¶[0063]. Petitioners’ expert acknowledged that Bielski includes no such express disclosure. Ex. 2015, 114:14-115:2.

In fact, the next paragraph explains that the user enters by commands by “enter[ing] the dialing number of the check and communication unit 20, which is assigned to the building 10, into their mobile phone or presses the corresponding symbol on the display.” Ex. 1017, ¶[0064]. The reference to entering the dialing number would indicate to a POSITA that Bielski relied on known techniques for pressing telephone keys to send DTMF audio signals to a controller over a phone connection. Such techniques are identified in the ’935 patent’s Background section

as something the '935 patent improves upon. Ex. 1001, 7:3-8. That Bielski is referring to such DTMF audio signals when it talks about sending commands via a phone without the use of the Internet is reinforced by Bielski's statement that this can be done "by means of the . . . direct mobile communications or land line connection." Ex. 1017, Bielski ¶[0064]. A POSITA would understand that a land-line connection cannot be used to send SMS messages; thus, Bielski's disclosure must be referring to the DTMF audio signals that the '935 patent's claimed solution improved upon. Ex. 2004, ¶147.

While Petitioners cite Wu as also disclosing SMS messaging from a remote unit to a base unit, a POSITA would not have been motivated to combine Bielski and Wu for the reasons discussed above. Therefore, Wu cannot cure Bielski's deficiency. *Id.* ¶148.

b) The proposed combination does not enable the recited SMS-capable base unit

Bielski does not enable a POSITA to implement the recited SMS-capable base unit without undue experimentation. Bielski does not disclose a technical solution that would have enabled a POSITA to implement a computing device capable of sending and receiving SMS messages through an associated cellular phone. In particular, Bielski does not teach the two technical requirements necessary for implementing the claimed SMS-capable base unit discussed in connection with Ground 1A. Ex. 2004, ¶161.

Bielski discloses that an embedded PC or web server can communicate with a mobile device but does not disclose the hardware or software aspects of providing that communications connection. *See, e.g.*, Ex. 1017, Bielski ¶[0037]. Bielski's remaining disclosures are similarly lacking any guidance that would enable a POSITA to interface a computing device with a mobile phone for purposes of sending or receiving SMS messages. *Id.* ¶[0087]; Ex. 2004, ¶150.

Bielski also fails to disclose a technical solution concerning the second of the two technical requirements discussed earlier: a software API that Bielski's computing device could use to direct or control a cellular phone to send/receive SMS messages with the SMS-related circuitry and software. Although Bielski contemplates software applications that take advantage of such an API (see, e.g., Bielski ¶[0032]), Bielski fails to describe how this API would have been implemented. Ex. 2004, ¶151.

As discussed regarding Ground 1A, developing this critical component based on Bielski's mere "idea" would have required undue experimentation by a POSITA, if a POSITA could have succeeded at all. *Id.*, ¶152. Thus, Bielski did not enable a computing device that sent/received SMS messages by directing or controlling a cellular phone. *Id.* Therefore, it cannot be applied as prior art against claim 1 of the '935 patent. Ex. 2004, ¶164; *see Amgen*, 314 F.3d at 1354.

Furthermore, as discussed above, a POSITA would not have been motivated

to combine Bielski and Wu, so Wu cannot cure Bielski's failures. Ex. 2004, ¶153.

2. Claims 2-4 and 7-9

Claims 2-4 and 7-9 depends from claim 1. Therefore, Bielski and Wu do not render these claims obvious for the reasons discussed regarding claim 1. Ex. 2004, ¶154-57, 165-67.

Moreover, regarding claim 3, neither Bielski nor Wu discloses the claimed microcontroller for the reasons discussed with respect to the "microcontroller" element of independent claim 18. *Id.*, ¶156.

Claim 4

Regarding claim 4 specifically, Bielski does not disclose (or enable) the additional recitations of claim 4: "The system as recited in claim 1 wherein said remote unit is a cellular telephone handset with custom programmability."

Additionally, a POSITA would not have been motivated to combine Wu with Bielski for the reasons discussed regarding Ground 2A. *Id.*, ¶157.

As discussed regarding Ground 1B, the "custom programmability" recited in claim 4 provides the ability to "communicate application data on SMS between the remote control units and the base control unit," which as Petitioners' expert also testified, the '935 patent discloses implementing in Java (or J2ME). Ex. 2015, 180:7-182:19; Ex. 2004, ¶159.

Bielski does not disclose or enable such custom programmability. For

example, Bielski states in very generalized terms that its mobile terminal can send/receive data including commands. See Ex. 1017, Abstract, [0005], [0031]-[0032], [0036], [0040], [0062]-[0063], [0069], [0070], and [0072]. In some instances, Bielski states that a user enters commands into the mobile terminal and sends those commands; i.e., not under software control. See *id.* at [0063]. Moreover, none of the cited excerpts disclose or suggest any of the necessary details for interfacing a custom “app” with functions for sending or receiving SMS messages (custom programmability) discussed regarding Ground 1B. Thus, Bielski fails to disclose and to enable the additional limitation of claim 4. Ex. 2004, ¶160-62.

As discussed regarding Ground 2A, a POSITA would not have been motivated to combine Bielski and Wu. Moreover, Wu fails to cure the deficiencies of Bielski. Wu only describes in very general terms that the mobile terminal can send/receive SMS messages without disclosing any details for how that would be done. See Ex. 1018, Wu at Section 2. In particular, Wu does not expressly describe a custom software application, running on a mobile phone, that sends/receives SMS messages. Ex. 2004, ¶163. Specifically, Wu does not disclose a custom software application interfacing with the gnokii “short message driver” referenced by Wu to provide the claimed custom programmability. *Id.* Thus, Wu fails to cure Bielski’s deficiencies regarding claim 4 (in addition to being improperly combined

with Bielski). *Id.*, ¶¶163-64.

Claim 9

Regarding claim 9 specifically, neither Bielski nor Wu disclose a “liquid crystal module includ[ing] selectable graphic icons corresponding to current environmental information being monitored or controlled.” Ex. 1001, 14:12-15. Petitioners’ expert opines that Bielski discloses program icons and buttons relating to environmental information but does not opine that Bielski discloses the claimed icons relating to environmental information. Ex. 1003, ¶592. Therefore, Petitioners’ analysis does not extend to the specific icons recited in claim 9. Ex. 2004, ¶169.

Petitioners also assert that Wu discloses selectable text. Ex. 1003, ¶593. Petitioners’ expert does not reconcile the differences between the claimed “graphical icon” and the selectable text disclosed by Wu. Indeed, a POSITA would have understood that the plain language of “graphical icon” is inconsistent with Dr. Jeffay’s identification of Wu’s text. Therefore, Wu discloses neither a graphical icon generally nor the claimed graphical icon corresponding to an environmental condition. Ex. 2004, ¶170.

Wu’s disclosure of a capture image also fails to disclose or suggest the claimed icon. For example, claim 9 recites a “selectable graphical icon.” Dr. Jeffay failed to address the “selectable” aspect of “selectable graphical icon” in his

mapping of an image to the claimed “selectable graphical icon.” Thus, Wu’s non-selectable image does not satisfy the requirements of claim 9. *Id.*, ¶¶171-72.

3. Claim 11

Similar to claim 1, claim 11 recites a base unit capable of sending and receiving SMS messages. Ex. 1001, 14:19-37. As discussed regarding claim 1, Bielski does not enable this functionality and a POSITA would not have been motivated to combine Wu with Bielski. Therefore, the proposed combination does not satisfy this claim element. Ex. 2004, ¶173.

4. Claims 12-15, 17

Claims 12-15 and 17 depend from claim 11. Therefore, Bielski and Wu do not render these claims obvious for the reasons discussed regarding claim 11. Ex. 2004, ¶174-180.

Moreover, regarding claim 12, for the reasons the Board explained in the Institution Decision, Petitioner has not sufficiently demonstrated that Bielski or Wu teach claim 12’s additional recitations. *Id.* ¶175; *see* Institution Decision at 53.

Moreover, regarding claim 14, neither Bielski nor Wu discloses the claimed microcontroller for the reasons discussed with respect to the “microcontroller” element of independent claim 18. Ex. 2004, ¶178.

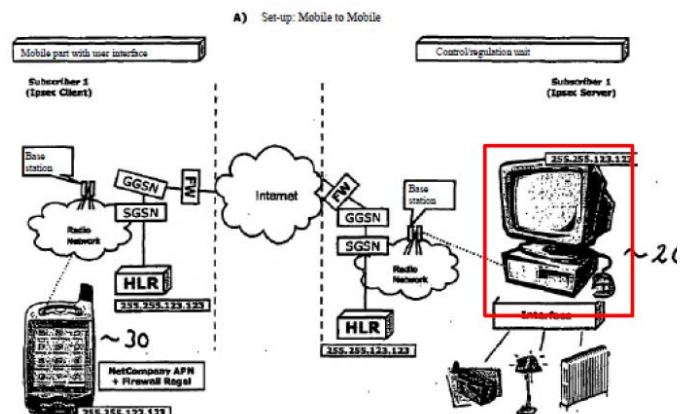
5. Claim 18

a) Bielski and Wu do not disclose the claimed “microcontroller”

Claim 18 recites that the claimed base unit includes, *inter alia*, “a microcontroller configured to process the second message including the command, and to send the command through the communication interface to the environmental device.” Ex. 1001, 15:5-8. Petitioners’ expert asserts that a POSITA would understand the claimed “microcontroller” to be a generic processor in an embedded system. As discussed above, that is incorrect because a POSITA would understand that microcontrollers and microprocessors are distinctly different devices. A POSITA would understand that the claimed “microcontroller” is a “a special-purpose computing device including at least a CPU, main memory, timing circuits, and I/O circuitry designed for a minimal quantity of chips and then programmed to handle a particular task.”

Petitioners’ expert notes that Bielski discloses that its “check and communication unit can be embodied as a computer, such as an embedded PC.”

Ex. 1003, ¶677 (citing Ex. 1017, Bielski ¶[0085]). As Dr. Jeffay points out in his annotated reproduction of Bielski’s Figure 4(a), Bielski’s computer is a



standard desktop computer from its era (element 20, surrounded by a red box). As Dr. Jeffay admits, Bielski discloses only “a computer includ[ing] a processor.” Ex. 1003, ¶678.

Wu similarly discloses a computer with a microprocessor rather than a microcontroller. Petitioners rely on Wu’s disclosure of an HNS gateway illustrated in Wu’s Figure 2. As Dr.

Jeffay admits, “Wu depicts

the HNS gateway as a

computer.” Ex. 1003, ¶681.

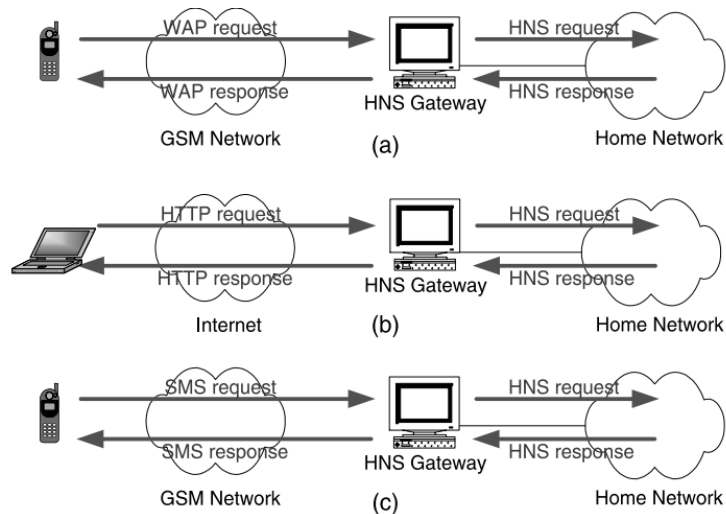
Specifically, Wu depicts the

HNS Gateway as a desktop

computer. Ex. 1018 at Fig. 2

(reproduced at right). Dr. Jeffay goes on to acknowledge that “a POSITA would have understood that a computer would include a microprocessor to control the general operations of the computer.” Ex. 1003, ¶681.

As discussed above, a microprocessor such as that disclosed in Bielski and Wu is not a microcontroller because it is not a computer unto itself, programmed for a particular task and containing main memory, timing circuits, and I/O circuitry. Processors such as that disclosed by Bielski and Wu are intended for use in general-purpose computing platforms like that pictured in Bielski’s Figure 4 and



Wu's Figure 2, which are sophisticated enough to handle a wide variety of functional and performance requirements and to execute multiple computer programs simultaneously. Ex. 2004, ¶184. They are not "a special-purpose computing device including at least a CPU, main memory, timing circuits, and I/O circuitry designed for a minimal quantity of chips and then programmed to handle a particular task." *Id.*

Thus, neither Bielski nor Wu discloses the claimed "microcontroller." *Id.*, ¶185. As discussed with respect to claim 18 in Ground 1A, this distinction between microcontrollers and microprocessors is important for someone desiring to practice the '935 patent.

b) The Proposed Combination Does Not Enable SMS Messaging Between the Base Unit and Remote Unit

Similar to claim 1, claim 18 recites a base unit capable of sending and receiving SMS messages. Ex. 1001, 14:59-15:8. As discussed regarding claim 1, Bielski does not enable this functionality and a POSITA would not have been motivated to combine Wu with Bielski. Therefore, the proposed combination does not satisfy this claim element. Ex. 2004, ¶186.

6. Claim 19

As discussed above, Petitioners' proposed obviousness combination fails for all claims because they do not adequately disclose how Bielski and Wu would need to be combined to teach all claim elements. Therefore, they have not established a

proper ground of invalidity based on obviousness. *Id.*, ¶187.

7. Claim 21

Claim 21 is directed to a base unit that comprises, *inter alia*, “a microcontroller configured to process the second message including the command, and to send the command through the communication interface to the environmental device.” Ex. 1001, 16:18-22. Neither Bielski nor Wu discloses the claimed microcontroller for at least the reasons discussed with respect to the “microcontroller” element of independent claim 18. Ex. 2004, ¶188.

C. Ground 2B: Claims 5, 6, and 16 are Not Unpatentable over Bielski, Wu, and Sears

1. Claims 5 and 6

Claims 5 and 6 depend from claim 1. Petitioners point to nothing in Sears that overcomes the deficiencies in Bielski and Wu regarding claim 1. Therefore, Bielski, Wu, and Sears do not render these claims obvious for the reasons discussed regarding claim 1. Ex. 2004, ¶189.

Moreover, claims 5 and 6 depend from claim 4. Sears fails to cure the shortcomings of Bielski and Wu regarding claim 4, so the proposed combination would not render claims 5 and 6 obvious.

As previously discussed regarding Ground 2A, neither Bielski nor Wu disclose enabling details of custom software for sending/receiving SMS messages via software as required by claim 4. As discussed regarding Ground 1B, Sears does

not teach or enable building a Java or J2ME app that is able to utilize a phone's SMS capability to exchange data with a base unit. Therefore, the proposed combination would not have rendered obvious claims 5 or 6. ¶190-91.

2. Claim 16

Claim 16 depends from claim 11. Petitioners point to nothing in Sears that overcomes the deficiencies in Bielski and Wu regarding claim 11. Therefore, Bielski, Wu, and Sears do not render claim 16 obvious for the reasons discussed regarding claim 11. *Id.*, ¶192.

D. Ground 2C: Claim 10 is Not Unpatentable over Bielski, Wu, and Ehlers

Claim 10 depends from claim 1. Petitioners point to nothing in Ehlers that overcomes the deficiencies in Bielski and Wu regarding claim 1. Therefore, Bielski, Wu, and Ehlers do not render claim 10 obvious for the reasons discussed regarding claim 1. *Id.*, ¶193.

E. Ground 2D: Claims 20 and 22 are Not Unpatentable over Bielski, Wu, and Menard

1. Claim 20

Petitioners do not assert that Bielski or Wu teaches the final element of claim 20 but instead rely on Menard. Menard does not teach the final element of claim 20 for the same reasons discussed with respect to Petitioner's Ground 1E. *Id.*, ¶194.

2. Claim 22

Petitioners do not assert that Bielski or Wu teaches the final element of claim 22 but instead rely on Menard. Menard does not teach the final element of claim 22 for the same reasons discussed with respect to Petitioner's Ground 1E. *Id.*, ¶195.

V. Unconstitutional Retroactive Application and Unconstitutional Appointment

The Board should decline to find the challenged claims invalid because the retroactive application of *inter partes* review to patents that were applied for before the America Invents Act (as the '935 patent was) violates the Fifth Amendment of the United States Constitution. Patent applicants whose applications were filed before the AIA's passage had no way of knowing that patents resulting from their investment of time, effort, and money would be subject to revocation through *inter partes* review (which differs substantially from earlier post-grant proceedings).

The unconstitutional nature of retroactive application of *inter partes* review is highlighted by the fact that *inter partes* reexamination was not made retroactive when passed by Congress. The constitutionality of retroactive application of *inter partes* review is the subject of at least one pending petition for writ of certiorari at the United States Supreme Court. *See Arthrex v. Smith & Nephew*, Dkt. 19-1204 (S. Ct. filed Apr. 6, 2020).

The Board should also decline to find the challenged claims invalid because

the Administrative Patent Judges (“APJs”) presiding over the proceeding were unconstitutionally appointed. The U.S. Constitution’s Appointments Clause requires that principal officers be nominated by the U.S. President and confirmed by the Senate. *See* U.S. Const. art. II, § 2. APJs are appointed by the Secretary of Commerce (35 U.S.C. § 6), which is permissible only if they are inferior officers. However, the Federal Circuit has held that APJs are not inferior officers. *See Arthrex v. Smith & Nephew*, 941 F.3d 1320, 1335 (Oct. 31, 2019). Therefore, the APJs governing this proceeding were unconstitutionally appointed.

The Federal Circuit attempted to fix this problem by severing a portion of the statute that provided job security for APJs. *Id.* at 1338. This did not cure the problem, however, because Congress intended APJs to be impartial and independent. *See* Arthrex’s petition for rehearing en banc, No. 18-2140, Dkt. 78 (Fed. Cir. filed Dec. 16, 2019). Furthermore, severance was insufficient to cure the violation. *Id.* While the Federal Circuit denied rehearing *en banc* (over dissenting opinions by Judge Dyk and Judge Hughes), this issue has been presented to the Supreme Court in at least one petition for writ of certiorari. *See Arthrex v. Smith & Nephew*, Dkt. 19-1204 (S. Ct. filed Apr. 6, 2020). Thus, the Federal Circuit’s ruling in *Arthrex* did not close this issue.

VI. Conclusion

For the foregoing reasons, Patent Owner respectfully requests that the Board

deny Petitioners' petitions with respect to all challenged claims.

Respectfully submitted,

Date: May 18, 2020

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CERTIFICATE OF WORD COUNT UNDER 37 C.F.R. § 42.24(D)

I hereby certify that the foregoing Patent Owner's Response contains 12,877 words, as measured by the word-processing software used to prepare the document, in compliance with 37 C.F.R. § 42.24(d).

Date: May 18, 2020

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CERTIFICATE OF SERVICE

Pursuant to 37 CFR §§ 42.6(e)(4) and 42.205(b), the undersigned certifies that on May 18, 2020, a copy of Patent Owner's Response, Certificate of Word Count, Patent Owner's Index of Exhibits, and the Exhibits to Patent Owner's Response were provided via electronic service to the Petitioner by serving the correspondence addresses of record as follows:

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