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

DECLARATION OF IVAN ZATKOVICH
IN SUPPORT OF PATENT OWNER'S RESPONSE

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[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 *Pro Hac Vice* 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-preso-pdf.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 Transcript of Petitioners' Expert, Dr. Kevin Jeffay	No

I. Introduction

1. I have been retained by Ubiquitous Connectivity, LP ("Patent Owner") as a technical expert in connection with the proceeding identified above. I submit this declaration in support of the Patent Owner's Response to the Petition for Inter Partes Review ("IPR") of U.S. Patent No. 8,064,935 ("the '935 patent"). I have been retained to provide a technical opinion concerning the '935 patent with respect to the challenges presented by the Petitioners.

2. I am being compensated for my time working on this matter at my customary hourly rate for consulting work of this nature. I have no personal stake nor interest in the outcome of the present proceeding or in either party to this proceeding.

3. In forming my opinions stated in this declaration, I reviewed and am familiar with the '935 patent. I understand that Petitioner has requested IPR of the '935 patent. I have also reviewed the materials Petitioner cited in support of its petition, including the Declaration of Dr. Kevin Jeffay (Ex. 1003).

II. Background and Qualifications

4. Exhibit 2005 is a copy of my curriculum vitae with a list of cases where I have been retained in the past 5 years.

5. I received a Bachelor's degree in Computer Science, with a minor in Electrical Engineering Digital Circuit Design, from the University of Pittsburgh in

1980. I completed a Master's thesis in Computer Networks in 1981 at the University of Pittsburgh, the results of which were published in Byte Magazine. My Master's thesis involved designing a heterogeneous network architecture that allowed substantially different computer systems to communicate with a common command interface. The primary application used to test the network was a search game that allowed multiple players on different computers to navigate through a shared matrix. The application maintained a common database of player locations across all computers in real time.

6. I have over 30 years of experience in computer science and computer network architecture involving a diverse set of implementations including Telecommunication, CTI (Computer Telephony Integration), early wireless/cell phone communication, booking and provisioning systems. I specialize in systems for eCommerce, Geolocation, Supply Chain, and Logistics.

7. I have been a Principal Consultant with eComp Consultants for over ten years. eComp Consultants provides professional consulting services relating to computer and technical matters in a wide range of industries, including embedded Internet systems, cellular telephony, and cloud-based services. Such consulting services include working with clients (such as Amazon.com, Microsoft, GEICO, Verizon, and McGraw-Hill) on specific information technology projects, process improvement, project management, and other technology issues.

8. At eComp Consultants, I have been frequently called upon to provide my expert opinion on matters concerning patent disputes. I have been qualified as a technical expert in over 24 matters and have specifically analyzed and testified about computer systems for managing and tracking shipments and supply chain and logistics management. A complete list of the cases in which I have testified in the last five years is included in Exhibit 2005.

9. In my professional career, I have worked for companies such as Digital Equipment Corp., GTE Data Services (now Verizon), and Eva-Tone, Inc. on projects designing, developing, and integrating software and hardware for major computer and telecommunications systems and networks and on projects designing and developing eCommerce, content management, and web publishing systems.

10. I worked for Digital Equipment Corp. from approximately 1980 until 1987. There I designed and developed computer models that could simulate a manufacturer's supply chain, including tracking the status of the delivery of parts and other goods. I also designed a computer network that could handle Just-in-Time (JIT) ordering and shipping. I also designed and developed the communications drivers to operate within the DECNet architecture. This work also involved designing and implementing relational databases that could handle the complex workflows.

11. I worked for GTE Data Services (now Verizon) from approximately 1987 until 1996. There I worked on designing the network architecture for a communications system that had service provisioning and service booking capabilities. I also designed and developed automated Geolocation, and geographic mapping applications including truck routing for customer services and Facilities management.

12. I worked for Eva-Tone, Inc. from approximately 2002 until 2007. There I designed and implemented systems for enterprise resource planning and supply chain management. My work also entailed designing and implementing an eCommerce system that allowed the company to book shipments using a variety of carriers and transport modes, including bulk, drop shipping, and container shipping, and manage and track shipments being handled by multiple carriers. Another eCommerce system I designed and implemented for Eva-Tone's customer, Pro Marine USA, required developing separate interfaces to different freight carriers (e.g. UPS, FedEx, USPS) since each carrier implemented a separate API to access their in-house carrier systems. I understand that this system is still in use today.

13. Specific project I have developed or managed that are related to this matter include:

- **Digital Equipment Corporation** –

- Developed TMS, a Computer Telephony Interface system for interfacing computers with telephone lines including receiving and sending computer commands and messages.
- Designed Computer control systems and user control panels for remote control of manufacturing equipment.

- **Verizon**
  - Implemented systems for provisioning, configuration, and update of Mobile Phones and wireless devices.
  - Implemented remote monitoring of telephone facilities including central office switch buildings. Application included remote control of zoned X10 monitoring devices and alarm activation operating on local secure networks and external networks.
  - Designed and developed Automated Geolocation, Geographic mapping and Facilities Management system based on Customer & Equipment location.
- **GIS Dispatch Mapping** (AWAS) – Implemented Geographic based mobile field services for locating subscribers and displaying routing information on a geographic map.
- **Utility Partners -** Development of remote appliance monitoring and control applications using Zigbee wireless multi-hop mesh network system, for monitoring of utility buildings, security and alarm notification. Also, implemented system for remote meter reading and appliance control.
- **eComp Consultants -** Development of mobile applications (iPhone and Android), high speed wireless communications, wifi security mesh networks, and performed evaluation of secure networks, protected data storage systems, and wireless telecommunication systems.

14. I have been retained as a testifying expert on the following matters related to remote control, cellular communications, and geolocation.

- **Black Hills v. Samsung et.al. – ITC Patent Litigation** – Analysis of Mobile based location sharing and event driven mobile applications such as AT&T FamilyMap, Google+ Location, and Latitude. Providing infringement assertions against Samsung, LG, and Toshiba (smart phones & mobile tablets).
- **Black Hills v. Sonos – Patent Litigation**
  Testifying expert for central control of multiple remote devices including, creating a multi-hop mesh network for relaying communications through network nodes.
- **ABC v. ENC, CISCO, et.al. – Patent Litigation**
  Testifying expert for Remote control of legacy monitoring systems including relaying keypad entry and display information to a remote user interface. Provided Infringement reports, invalidity rebuttal reports, and deposition.
- **KeyNetics v. Samsung - Patent Litigation**
  Testifying expert regarding the programming mobile phones for access to Proximity Sensors, Motion sensors, accelerometer devices, and determine threshold and index of activity allowable before triggering events.

15. By virtue of at least the above education and experiences, I have gained a detailed understanding of the technology that is the subject of my Declaration. For example, my experience with computer network architecture, cellular device communication, geolocation, and remote control and monitoring of devices is relevant to the subject matter of the Ubiquitous Patents. As such, I am

qualified to provide opinions regarding the state of the art at the time of the invention (2004), how one of ordinary skill in the art at that time would have interpreted and understood the Ubiquitous Patents.

III. Relevant Legal Standards

16. I am not an attorney and I have no opinions on the law. Patent Owner's legal counsel has provided me with legal standards and asked me to apply those standards to the facts and to my opinions in the present IPR.

A. Obviousness

17. I understand that Petitioners have asserted that the challenged claims of the '935 patent are invalid as being obvious under 35 U.S.C. § 103 in light of the prior art. I understand that in an IPR, a claim may be invalid under § 103 if the Petitioner establishes by a preponderance of the evidence that the invention as a whole would have been obvious to a person of ordinary skill in the art ("POSITA") at the time the invention was made. I understand that it is not permissible to use hindsight or *ex post* reasoning in assessing whether a claimed invention is invalid for obviousness. For example, an invention should not be considered in view of what a POSITA would know today, nor can it be reconstructed after the fact by reading into the prior art the teachings of the invention at issue.

18. I understand that obviousness cannot be proven merely by showing that an invention is a combination of elements that were previously known in the

prior art. Rather, in an IPR, a patent challenger must further establish by a preponderance of the evidence that there were apparent reasons that would have prompted a POSITA to have combined these known elements in the fashion claimed by the patent. Such reasons might include, for example, teachings, suggestions, or motivations to combine that would have been apparent to a POSITA.

B. Enabling Disclosure

19. I understand that non-enabled disclosures of a prior-art reference cannot be used to invalidate a patent.

20. In order to be enabling, I understand that a reference must permit persons having ordinary skill in the field of technology of the patent to make and use the relevant disclosure at the applicable time without having to conduct undue experimentation and with a reasonable likelihood of success.

21. In deciding whether a person having ordinary skill would have require undue experimentation in order to make and use the invention, I understand that several factors may be considered: (1) the time and cost of any necessary experimentation; (2) how routine any necessary experimentation is in the field of the claimed subject matter; (3) whether the patent discloses specific working examples of the claimed invention; (4) the amount of guidance presented in the patent; (5) the nature and predictability of the field of the patented subject matter;

(6) the level of ordinary skill in the field of the claimed subject matter; and (7) the scope of the claimed invention.

22. No one or more of these factors is alone dispositive. Instead, I understand that whether the degree of required experimentation is undue is evaluated based upon all of the evidence. In sum, the question is whether a person having ordinary skill would have needed to experiment unduly to have made and used the relevant disclosure.

C. Independent and Dependent Claims

23. I understand that a claim in dependent form shall be construed to incorporate by reference all the limitations of the independent claim (and any intervening claims) from which it depends. Therefore, I understand that to prove that a dependent claim is invalid, a prior art reference or combination of references or general knowledge in the art must disclose each and every claim limitation of the dependent claim, in addition to each and every limitation of the claims from which it depends.

IV. The ’935 Patent

24. 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.

25. 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.

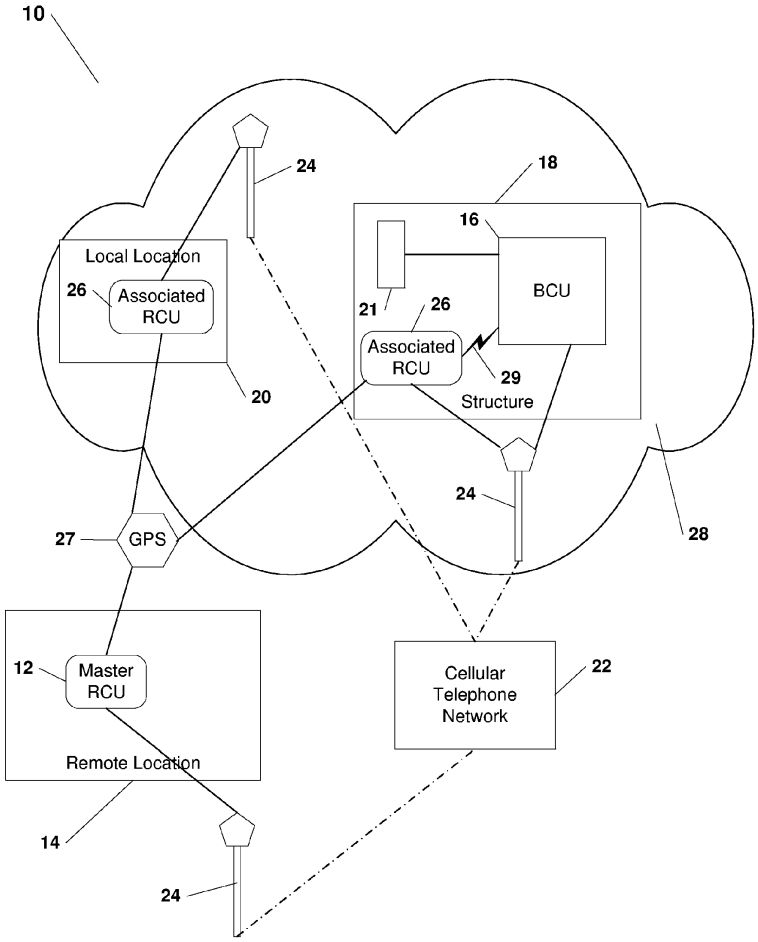


Fig. 1

26. The base control 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 control unit and the remote unit have "direct two-way communication" (*id.*, 3:13-25), "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.

27. The base control 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.

28. Likewise, the remote unit may send to the base control 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.

V. Claim Construction

A. Level of Ordinary Skill in the Art

29. A POSITA at the time of the priority date of the '935 patent 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. 1014, 50.

30. I understand that Petitioners propose a similar definition that would not change my analysis or my conclusions reflected herein. *See* Ex. 1003, Jeffay Decl. ¶ 10.

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

31. 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, '935 patent at 15:5-8.

32. I understand that Petitioners did not propose a specific construction for "microcontroller." However, in discussing their proposed grounds of invalidity, Petitioners equated the term "microcontroller" with the term "microprocessor": "A POSITA would have understood the 'microcontroller' to be a generic processor."

'935 Petition at 24 (citing Ex. 1003, Jeffay Declaration ¶ 257). I understand that Petitioners' expert admitted he did not consult any dictionaries or textbooks in forming his view. Ex. 2015, Jeffay Tr. 54:7-18.

33. A POSITA would not have understood that a generic processor, including a microprocessor, is a microcontroller. Notably, Petitioners' expert does not identify what properties or characteristics a microcontroller would have had as of the priority date of the '935 patent, nor does he explain why a microprocessor would be considered a microcontroller. He merely offers the conclusion without identifying similarities or acknowledging differences between microcontrollers and microprocessors.

34. As of the '935 patent's effective filing date in November 2004, it is my opinion that a POSITA would have understood that a microprocessor was very different from a microcontroller. A POSITA would have understood that microprocessors and microcontrollers fall into distinct classes of integrated circuits for performing logical functions. A POSITA would have both understood the differences between microprocessors and microcontrollers and found those differences to be significant.

Microprocessors

35. Microprocessors address a technical need for circuitry that performs logical functions at relatively high performance levels through the use of a

relatively large amount of specialized circuitry that improves the performance of the microprocessor (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.

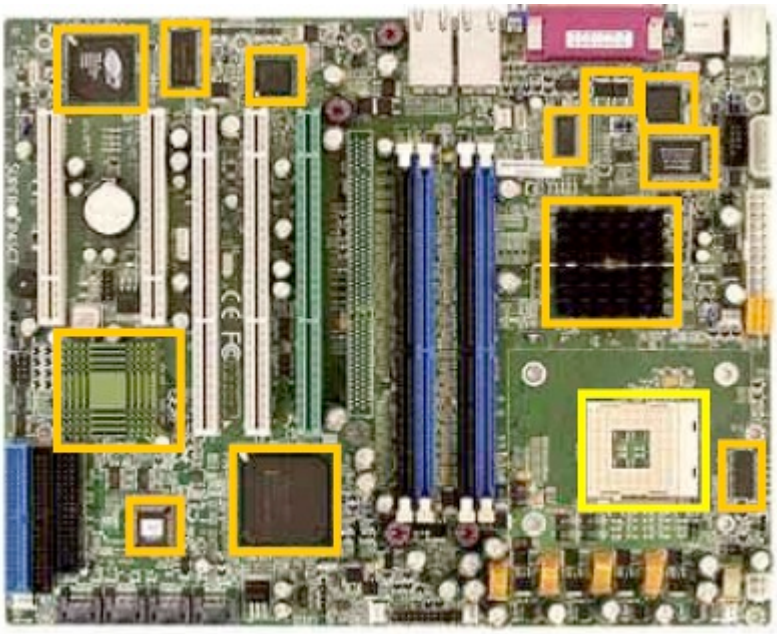
36. Microprocessors are often described as the "brains" or "heart" of a computer rather than as a computer unto itself because microprocessors within a computer are typically accompanied by numerous other integrated circuits that collectively support the logical or electronic needs of a microprocessor. For example, as of the priority date for the '935 patent, 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. 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, Jeffay Tr. 65:18-70:22.

37. Microprocessors, both as of the priority date of the '935 patent and now, are mounted on a circuit board called a "computer motherboard" or simply a "motherboard." A motherboard contains the memory chips, communications chips, clocking circuitry, and other components that support the microprocessors' logical and electronic needs. An example of a motherboard from 2004 is shown below.[2]

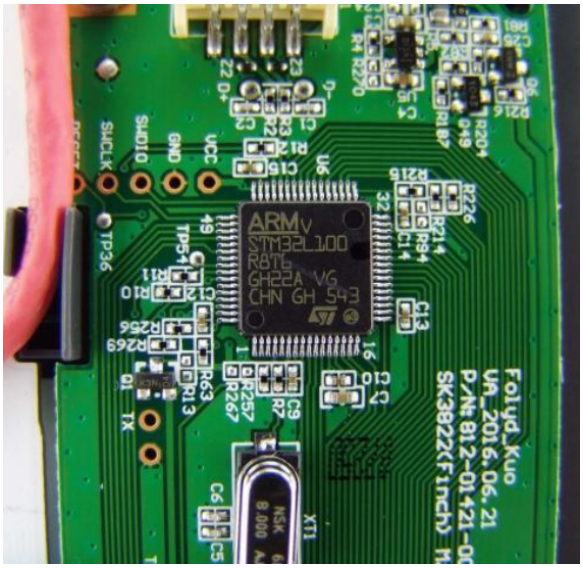


[2] Ex. 2008, Supermicro Article (annotations added). Exhibit 2008 is a true and correct copy of an article by Alex Mendison titled "Motherboard marries Pentium-4 with PCI-X," dated May 17, 2004, available at https://www.supermicro.com/newsroom/news/articles/news051704.cfm.

38. This image has been annotated to identify in yellow the location where a microprocessor would be added to the motherboard and identifies in orange the presence of other integrated circuits that support the logical and electrical needs of the microprocessor. The large number of relatively complex integrated circuits that accompany the microprocessor shown above is characteristic of computing solutions employing microprocessors generally—that is, high performance with high complexity and cost. Microprocessors are therefore frequently used in personal computers and servers, which seek to provide 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.

Microcontrollers

39. 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. A microcontroller with a similar function is shown below.



This microcontroller does not rely on dozens of additional integrated circuits to operate but is instead largely independent.[3]

40. 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. 2015, Jeffay Tr. 53:8-54:2, 91. This is because microcontrollers provide specialized computing

[3] Ex. 2009, Logitech Review. Exhibit 2009 is a true and correct copy of an article by Chad Sebring titled "Logitech G213 Prodigy RGB Gaming Keyboard Review," dated Feb. 8, 2017, available at https://www.tweaktown.com/reviews/8028/logitech-g213-prodigy-rgb-gaming-keyboard-review/index4.html..

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.

41. Whereas microprocessors are sometimes called the heart of a computer, a microcontroller is a computer unto itself and Dr. Jeffay agrees. Ex. 2015, Jeffay Tr. 55:9-56:14. 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, Jeffay Tr. 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, Jeffay Tr. 78:16-20.

42. Ex. 2006 is a true and correct copy of excerpts from the Microsoft Computer Dictionary, Fifth Edition, published in 2002. I am familiar with the Microsoft Computer Dictionary in its various editions. A POSITA would have considered this dictionary a reliable resource in understanding terms such as "microcontroller" and "microprocessor."

43. 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 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* Jeffay Tr. 70:1-75:2.[4]

[4] While this dictionary was published in 2005, Petitioners' expert testified that he did not think the meaning of "microcontroller" changed between the November

44. Exhibit 2007 is a true and correct copy of excerpts from the Comprehensive Dictionary of Electrical Engineering, Second Edition, published in 2005. I am familiar with the Comprehensive Dictionary, which is edited by Phillip LaPlante, Ph.D., who was associate professor of software engineering at Pennsylvania State's Great Valley Graduate Center when this dictionary was published. Ex. 2007 at xv. A POSITA would have considered this dictionary a reliable resource in understanding terms such as "microcontroller" and "microprocessor." While this dictionary was published in 2005, the meaning of the term had not changed since the '935 patent's priority date in November 2004.

45. The Comprehensive Dictionary of Electrical Engineering also clarifies that while microcontrollers are often single-chip solutions, they are not necessarily confined to a single chip. Instead, they are designed to complete the particular task for which they are designed "with a minimal quantity of chips." This is in keeping

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2004 priority date of the '935 patent and the 2005 publication of this dictionary (or between 1994 and 2004). Ex. 2015, Jeffay Tr. 72:4-18; 55:9-18. I understand 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").

with the knowledge a POSITA would have had in 2004—that available microcontrollers used a minimal number of chips. Ex. 2015, Jeffay Tr. 64:6-8. The Comprehensive Dictionary of Electrical Engineering also specifically contrasts microcontrollers from microprocessors (a term it separately defined), as would have a POSITA in November 2004.

46. The microcontroller disclosed in the '935 patent for use with the base unit is consistent with the understanding of "microcontroller" described above. Figure 4 "is a block diagram of the base control unit of the system of FIG. 1." Ex. 1001, '935 patent at 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 subsystems. As discussed

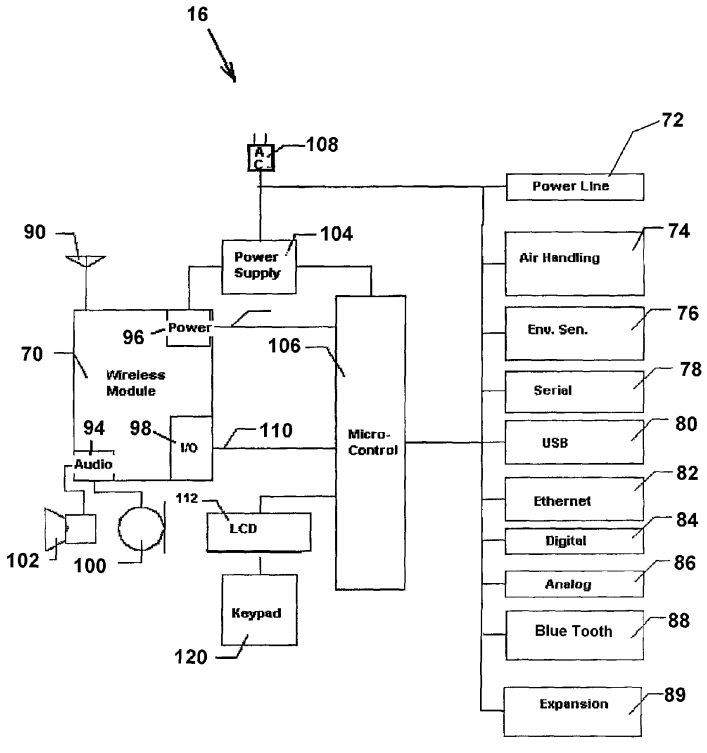


Fig. 4

above, 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.

47. 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." *Id.* at 4:62-66. Again, this is consistent with typical microcontrollers, which, as reflected in the Microsoft Computer Dictionary's definition of "microcontroller," are typically designed and then programmed for particular tasks. Ex. 2006, Microsoft Computer Dictionary, Fifth Edition (2002), at 558.

48. Based on the '935 patent's disclosure and the ordinary meaning of "microcontroller," it is my opinion that 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."

49. I understand that 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, Jeffay Decl. ¶ 267. Specifically, I understand that 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, '935 patent at 4:10-13.

50. Dr. Jeffay overlooks that Figure 3 relates to the remote unit rather than the base unit. 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 master remote control unit 12 and associated remote control units 26 are

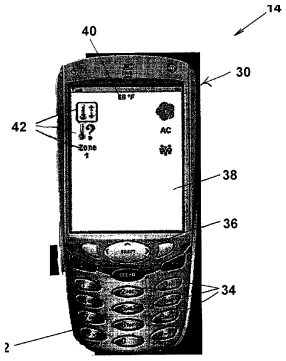


Fig. 2

Java/J2ME enable[d] cellular telephones 30." *See, e.g.,* Ex. 1001, '935 patent at 4:1-2; *see also id.* at Figs. 2 & 3; 4:10-35.

51. Thus, a POSITA would understand that 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, Jeffay Tr. 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, Jeffay Tr. 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.[5] 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, Jeffay Tr. 90:6-19. That would tell a POSITA that the inventors used

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

"microcontroller" consistent with its ordinary meaning as reflected in the Microsoft Computer Dictionary and the Comprehensive Dictionary of Electrical Engineering.

52. I understand that 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 admitted during deposition that this would be true of microcontrollers as defined in the Microsoft Dictionary and Comprehensive Dictionary of Electrical Engineering, so it does not support his view that the inventors used "microcontroller" inconsistently with its ordinary meaning. Ex. 2015, Jeffay Tr. 93:15-96:17.

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

A. Petitioners Fail to Identify Adequate Motivation to Combine Oinonen and Whitley

53. I understand that Petitioners assert that the combination of Oinonen and Whitley would have rendered 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).

54. In my opinion, Petitioners failed to establish the proposed combination of Oinonen and Whitley because Petitioners failed to identify an

adequate motivation to combine Oinonen and Whitley relevant to the elements of the challenged claims.

55. I understand that 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, Jeffay Tr. 135:1-5. I understand that the Board, in its Institution Decision, agreed with Patent Owner that the challenged claims do not require monitoring and controlling multiple devices. *See* Decision at 15. Thus, Whitley's disclosure on this point provides no motivation to combine relevant to the claimed invention.

56. I also understand that Petitioners' expert indicated that Oinonen discloses monitoring activities over time. Ex. 2015, Jeffay Tr. 135:6-136:16. Thus, in my opinion this point similarly provides no motivation to combine Oinonen and Whitley relevant to the claimed invention.

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

57. 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." I understand that Petitioners assert that Oinonen and Whitley each disclose a base unit having the capability to communicate with a remote unit via SMS messaging. However, while Oinonen and Whitley mention SMS messaging, it is my opinion that they would not have enabled a POSITA to implement the claimed SMS messaging in a base unit without undue experimentation. Therefore, it is my understanding that Oinonen and Whitley cannot be applied as prior art against claim 1 of the '935 patent (or other claims including similar recitations). *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").

58. It is my opinion that 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.

59. 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.

60. First, it is my opinion that 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. 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.

61. It is my opinion that 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.

62. It is also my opinion that 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 is my opinion that it would be impossible to send SMS messages from a computing device acting as the "base unit" claimed in the '935 patent.

63. It is my opinion that 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, it is my opinion that 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.

64. 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, it is my opinion that 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.

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

65. Oinonen discloses the idea of a computing device communicating with other devices using SMS without disclosing a technical solution for doing so. This is seen, for example, in the following passage:

> One purpose of the present invention is to achieve a monitoring and control system whereby information is transmitted between a peripheral device and a mobile station. Further, information is transmitted by using e.g. short messages or the like. The system of the present invention is

Ex. 1016, Oinonen at 4:41-45. This passage offers no technical details for how to interface a computer with a cellular phone to facilitate using the computer to send SMS messages.

66. It is my opinion that Oinonen does not disclose sufficient detail regarding the hardware/software interface for communicating between a cellular phone and a computing device using SMS messaging.

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

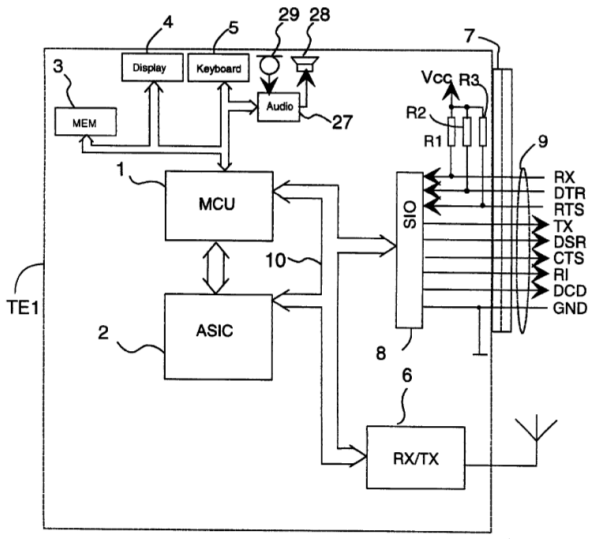


Fig. 3

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

68. 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. As of November 2004, RS-232 interfaces were commonly used as interfaces between computing devices and landline modems as suggested by Oinonen. *See id.* at 6:4-8 (mentioning use of RS-232 interfaces in modems). Thus, in my opinion, 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

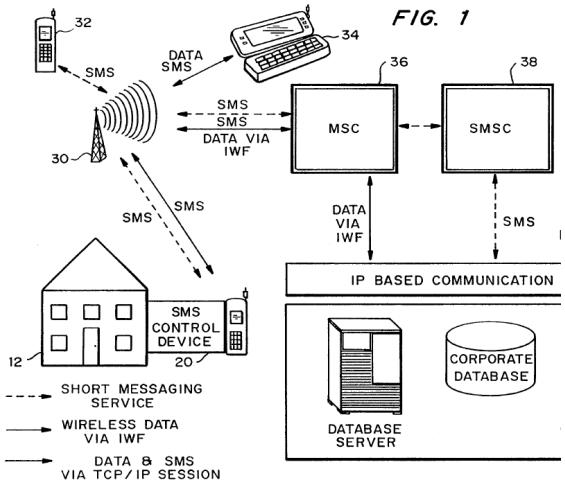
or modified a cellular phone to have such an interface given the complexity of such an endeavor (well beyond "undue experimentation").

69. 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 id.* at 6:60-67; 8:33-55; and 9:34-64.

70. 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 in my opinion Oinonen would not have enabled a POSITA in November 2004 to send or receive SMS messages from a computing device.

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

71. 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.



72. 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, in my opinion, fails to teach the first technical requirement necessary for implementing such capability.

73. 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, Whitley at 3:15-25; *see also id.* at 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).

74. Whitley's remaining disclosures are similarly non-enabling. *See, e.g., id.* at 2:19-21 (merely describing a general capability for sending/receiving SMS messages via a computing device); 2:29-3:2 (similar); 3:22-25 (similar); 4:14-16; 9:9-25; 10:10-14; and 12:7-9 (describing data communication at 9600 baud but through some unexplained "supporting sub-components").

75. In my opinion, 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, in my opinion, a POSITA would not have known how to implement a computing device that communicated via SMS without undue experimentation. It is my understanding that Whitley therefore does not qualify as prior art without respect to that functionality.

2. Claim 2

76. Claim 2 depends from claim 1. Therefore, it is my opinion that Oinonen and Whitley do not render claim 2 obvious for the reasons discussed regarding claim 1.

3. Claim 3

77. Claim 3 depends from claim 1. Therefore, it is my opinion that Oinonen and Whitley do not render claim 3 obvious for the reasons discussed regarding claim 1.

78. Moreover, it is my opinion that Oinonen and Whitley do not teach the additional recitations of claim 3: "The system as recited in claim 1 wherein said base unit is a microcontroller-based processing unit having customizable application specific software." Neither Oinonen nor Whitley discloses the claimed microcontroller for at least the reasons discussed with respect to the "microcontroller" element of independent claim 18.

4. Claim 7

79. Claim 7 depends from claim 1. Therefore, it is my opinion that Oinonen and Whitley do not render claim 7 obvious for the reasons discussed regarding claim 1.

5. Claim 11

80. Similar to claim 1, claim 11 recites a base unit capable of sending and receiving SMS messages. Ex. 1001, '935 patent at 14:19-37. In my opinion, neither Oinonen nor Whitley enable a POSITA to implement this claimed functionality for the reasons discussed regarding claim 1.

6. Claim 12

81. Claim 12 depends from claim 11. Therefore, it is my opinion that Oinonen and Whitley do not render claim 12 obvious for the reasons discussed regarding claim 11.

82. Further, for the reasons the Board explained in the Institution Decision, it is my opinion that Petitioner has not sufficiently demonstrated that Oinonen or Whitley teach the additional recitations of claim 12:

83. Further, it is my opinion that the Board properly found that Petitioner has not sufficiently demonstrated that Oinonen or Whitley teach the additional recitations of claim 12 for the following reasons:

> First, Petitioner's vague identification of Oinonen's "various wired connections" and Whitley's "variety of wired . . . connections" fails to identify with sufficient particularity where these wired connections are located, and whether they are located "*between the first wireless connection and the second wireless connection*" as required by claim 12. Second, to the extent Petitioner relies on Oinonen and Whitley's disclosure of an interface *between a base unit and environmental device*, Petitioner fails to sufficiently explain how such an interface is a "connection interfacing *between the first wireless connection and the second wireless connection,*" as required by claim 12.

See Institution Decision at 26.

7. Claim 13

84. Claim 13 depends from claim 11. Therefore, it is my opinion that Oinonen and Whitley do not render claim 13 obvious for the reasons discussed regarding claim 11.

8. Claim 14

85. Claim 14 depends from claim 11. Therefore, it is my opinion that Oinonen and Whitley do not render claim 14 obvious for the reasons discussed regarding claim 11.

86. Moreover, it is my opinion that neither Oinonen nor Whitley discloses the claimed microcontroller for at least the reasons discussed with respect to the "microcontroller" element of independent claim 18.

9. Claim 15

87. Claim 15 depends from claim 11. Therefore, it is my opinion that Oinonen and Whitley do not render claim 15 obvious for the reasons discussed regarding claim 11.

10. Claim 17

88. Claim 17 depends from claim 11. Therefore, it is my opinion that Oinonen and Whitley do not render claim 17 obvious for the reasons discussed regarding claim 11.

11. Claim 18

a) Neither Oinonen nor Whitley teaches the claimed "microcontroller"

89. 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, '935 patent at 15:5-8. I understand that 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, I understand that Petitioners' expert states that "[b]oth the microprocessor and application-specific integrated circuit (ASIC), operate as the claimed 'microcontroller.'" Ex. 1003, Jeffay Decl. ¶ 268.

90. As discussed above regarding claim construction, it is my opinion that a POSITA would not have understood that the claimed "microcontroller" is a generic processor. A POSITA, in my opinion, 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.

91. Likewise, it is my opinion that a POSITA would never have understood an ASIC to be a microcontroller. 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). Ex. 2015, Jeffay Tr. 132:18-133:2. Rather, an ASIC is a series of logic gates *hardwired* for a single, defined function. *See* Ex. 2006, Microsoft Computer Dictionary, Fifth Edition (2002), at 60, 385; *see also* Ex. 2015, Jeffay Tr. 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, Jeffay Decl. 100:18-20.

92. While I understand that Petitioners' expert testified during deposition that "ASIC" is the more modern term for "microcontroller" (Ex. 2015, Jeffay Tr. 100:7-11), dictionaries contemporaneous with the '935 patent's priority date defined them separately—and very differently. I understand that Dr. Jeffay admitted he had no support for his assertion that a POSITA would have understood ASIC to be the modern term for microcontroller. Ex. 2015, Jeffay Decl. ¶ 107:7-13.

93. In contrast to an ASIC, a microcontroller can be configured, through programming, for its intended task. As I understand Petitioners' expert acknowledged, microcontrollers are programmable devices. Ex. 2015, Jeffay Tr. 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. 2015, Jeffay Tr. 107:14-108:9. An ASIC is hardwired for a particular task and therefore must be specifically designed for each particular device into which it is incorporated. Ex. 2015, Jeffay Tr. 105:10-107:6.

94. The ’935 patent expressly discloses 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, ’935 patent at 10:34-36; *see also 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”).

95. Thus, it is my opinion that a POSITA would understand that neither Oinonen’s microprocessor nor its ASIC constitutes a microcontroller as recited in claim 18.

96. I understand that Petitioners also 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). I understand that Petitioners’ expert relies on this same disclosure in his declaration. *Id.* ¶ 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."

97. 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, a POSITA would understand that microprocessors and microcontrollers are very different computing solutions.

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

98. Similar to claim 1, claim 18 recites a base unit capable of sending and receiving SMS messages. Ex. 1001, '935 patent at 14:65-15:4. In my opinion,

neither Oinonen nor Whitley enable a POSITA to implement this claimed functionality for the reasons discussed regarding claim 1.

12. Claim 19

99. As discussed above, Petitioners' proposed obviousness combination fails 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 with respect to any claims of the '935 patent.

13. Claim 21

100. 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, '935 patent at 16:18-22. In my opinion, neither Oinonen nor Whitley discloses the claimed microcontroller for at least the reasons discussed with respect to the "microcontroller" element of independent claim 18.

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

1. Claim 4

101. Claim 4 depends from claim 1. Petitioners point to nothing in Sears that overcomes the deficiencies in Oinonen and Whitley regarding claim 1.

Therefore, it is my opinion that Oinonen, Whitley, and Sears do not render claim 4 obvious for the reasons discussed regarding claim 1.

102. Moreover, it is my opinion that 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."

103. 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, Jeffay Tr. 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, Jeffay Tr. 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.

104. 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.

105. 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, Oinonen at 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. Moreover, even if Oinonen could be interpreted as suggesting sending/receiving SMS messages via custom software, none of the cited excerpts disclose or suggest any details for interfacing a custom "app" with functions for sending or receiving SMS messages.

106. As discussed above with regard to enablement of sending/receiving SMS messages in the base unit, a first hardware/software interface would be needed for doing so and a second software API, for controlling or directing circuits and software in the base unit to send/receive SMS messages, would also be needed. Oinonen ignores these necessary implementation details related to enabling SMS messaging via custom programmability. Dr. Jeffay cites Oinonen for the idea of using software generally to send/receive SMS messages but not for informing a POSITA how to implement doing so. *See* Ex. 2015, Jeffay Decl. ¶ 400. Thus, Oinonen fails to enable the additional limitation of claim 4.

107. Similarly, Whitley mentions that a gateway is programmed to generate a SMS message containing text without suggesting whether that programming is custom programming. *See* Ex. 1023, Whitley at 9:17-11:14 (discussing high-level aspects of sending/receiving messages). Whitley does not disclose or suggest that SMS message communication occurs with custom software or explain how to implement the above-described aspects of such software-controlled SMS messaging. *See also* Ex. 2015, Jeffay Decl. ¶¶ 401-02 (citing to Whitley's conceptual disclosures). Therefore, Whitley also fails to disclose the first hardware/software interface and the second software API that would be needed to disclose custom programmability as recited in claim 4. Additionally, to the extent that Whitley could be interpreted as disclosing custom programmability for SMS messages, Whitley provides no enabling explanation for how to accomplish sending/receiving SMS messages via custom programming. Thus, Whitley fails to disclose or enable the additional limitation of claim 4.

108. Sears fails to cure the shortcomings of Oinonen and Whitley. Sears describes aspects of what could be called an "app store" for applications that execute on a mobile device. *See* Ex. 1019, Sears at [0012] (describing a way to search for mobile apps online); [0036] (describing ways to upload Java apps for subsequent user retrieval); [0039] (describing ways for users to find apps of particular types); and [0041] (organizing apps by device type and other

characteristics). Nothing in Sears discloses or suggests SMS messaging much less implementation details for a custom application to implement SMS messaging. Thus, Sears fails to disclose or suggest the additional limitation of claim 4. Accordingly, none of the cited references disclose and enable a capability for sending/receiving SMS messages via custom programming so Petitioners have not established that claim 4 would have been obvious.

2. Claims 5 and 6

109. Claims 5 and 6 depend from claim 4 (which depends from claim 1). As discussed above, Petitioners have not established that claims 1 or 4 would have been obvious in view of Oinonen, Whitley and Sears, so claims 5 and 6 would not have been obvious for at least that reason.

110. Moreover, it is my opinion that Oinonen, Whitley and Sears do not disclose (or enable) the additional recitation of claim 5 ("The system as recited in claim 4 wherein said custom programmability is a JAVA programming kernel") or the additional recitation of claim 6 ("The system as recited in claim 4 wherein said custom programmability is a J2ME programming kernel").

111. For claims 5 and 6, Petitioners also rely on the Sears reference. However, while Sears generally relates to Java programming and "app stores," as discussed for claim 4, it does not teach building a Java or J2ME app that is able to utilize a phone's SMS capability to exchange data with a base unit. Therefore, it

does not cure the deficiencies discussed above with respect to claim 4. Thus, the applied references would not have rendered obvious claims 5 or 6.

3. Claim 16

112. Claim 16 depends from claim 11. Petitioners point to nothing in Sears that overcomes the deficiencies in Oinonen and Whitley regarding claim 11. Therefore, it is my opinion that Oinonen, Whitley, and Sears do not render claim 16 obvious for the reasons discussed regarding claim 11.

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

113. 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, it is my opinion that Oinonen, Whitley, Antila, and Sears do not render claim 8 obvious for the reasons discussed regarding claim 1.

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

1. Petitioners Fail to Identify Adequate Motivation to Combine Oinonen, Whitley, Antila and Ehlers

114. I understand that Petitioners assert that the combination of Oinonen, Whitley, Antila and Ehlers would have rendered obvious dependent claims 9 and 10 of the ’935 patent. I understand Petitioners to base this assertion on the allegation that a POSITA would have been motivated, at least for claim 9, to incorporate the “improved user interface” reflected in Ehlers into the mobile

devices disclosed by Oinonen and Whitley. *See* '935 Petition at 39 ("To enhance the energy monitoring functionality of Whitley and to participate in demand reduction and other known energy management programs, a POSITA would have sought to incorporate the disclosure of Ehlers into the combination of Oinonen and Whitley."). *See also id.* at 40 ("Ehlers provides an improved user interface …"). Note that claim 9 depends from claim 8, which recites a mobile device display, so claim 9 concerns icons displayed on a mobile device display.

115. A POSITA would have recognized that the user interface reflected in Ehlers was not realizable on the mobile device displays disclosed by Oinonen and Whitley so a POSITA would not have been motivated to pursue that combination. Those references disclose mobile devices with small screens, consistent with then-current mobile devices. *See, e.g.,* Ex. 1023, Whitley Fig. 1 elements 32 and 34 (small screens) and Ex. 1016, Oinonen at Figures 1 and 2 (illustrating unnumbered small-screen mobile devices).[6] iPhones and Android phones (with their large 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.

[6] Note that Oinonen's TE1 device (Figure 3) is not a mobile device.

116. By contrast, Ehlers disclosed a rich user interface that would only have been realizable on a large display. This display is consistent with an external monitor on a personal computer (or on a laptop) but is inconsistent with then-current mobile device displays. Petitioners overlook this important technical distinction between the references and fail to address them in their motivation-to-combine allegations.

117. Given the state of the art as of the priority date of the Ubiquitous Patents, a POSITA would not have been motivated to combine the large display in Ehlers with the very limited mobile device displays disclosed by Whitley because doing so 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 computing device, but rather being the first to achieve success in building one.

118. To the extent that very early mobile phones with small screens and graphical user interfaces existed (e.g., Nokia Communicator 9000), those devices still would have required modification to achieve the combination Petitioners propose. A motivation to make that modification would not have existed 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*.

119. 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.

120. Icons triggering *programs* are very different from icons triggering individual *functions within a particular program*. Claim 9 recites "selectable graphic icons corresponding to current environmental information being monitored or controlled." I.e., an icon reflecting a specific monitored/controlled *condition*, such as a light turned on or the temperature of a water heater.

121. 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 icons for triggering 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 state of the art, at that time, for software development tools 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

internal structure of the software compiler. 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. Petitioners' motivation-to-combine arguments fail to address these points as well.

122. Therefore, I disagree that a POSITA would have had a motivation to combine the applied references for this additional reason.

2. Claim 9

123. Claim 9 depends from claim 1. Petitioners point to nothing in Antila or Ehlers that overcomes the deficiencies in Oinonen and Whitley regarding claim 1. Therefore, it is my opinion that Oinonen, Whitley, Antila, and Ehlers do not render claim 9 obvious for the reasons discussed regarding claim 1.

3. Claim 10

124. Claim 10 depends from claim 1. Petitioners point to nothing in Antila or Ehlers that overcomes the deficiencies in Oinonen and Whitley regarding claim 1. Therefore, it is my opinion that Oinonen, Whitley, Antila, and Ehlers do not render claim 10 obvious for the reasons discussed regarding claim 1.

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

1. Claim 20

125. 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, '935 patent at 16:1-4. The "command" referenced in this claim element is "a command for the environmental device." *Id.* at 15:32-39. I understand that 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.

126. In my opinion, neither passage from Menard cited by Petitioners satisfies this claim element. 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:

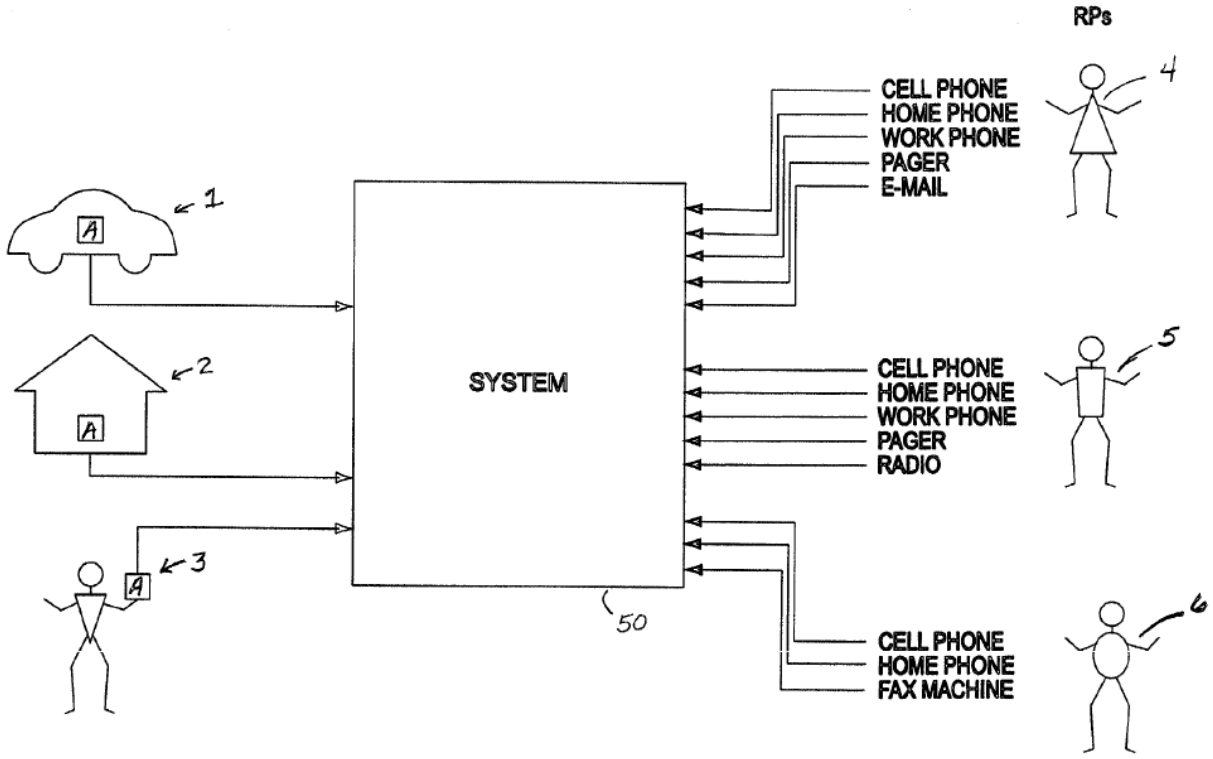


FIG. 1

See Ex. 1020, Menard Fig. 1; ¶ [0011].

127. 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. See *id*. The arrangement of alarm sources 1, 2 and 3, relative to system 50 in FIG. 1, also indicates to a POSITA 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, Menard [0071].

128. 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 to a POSITA that the further notification or processing is based on the *system* (that is, the monitoring service) executing instructions received from RPs or other users:

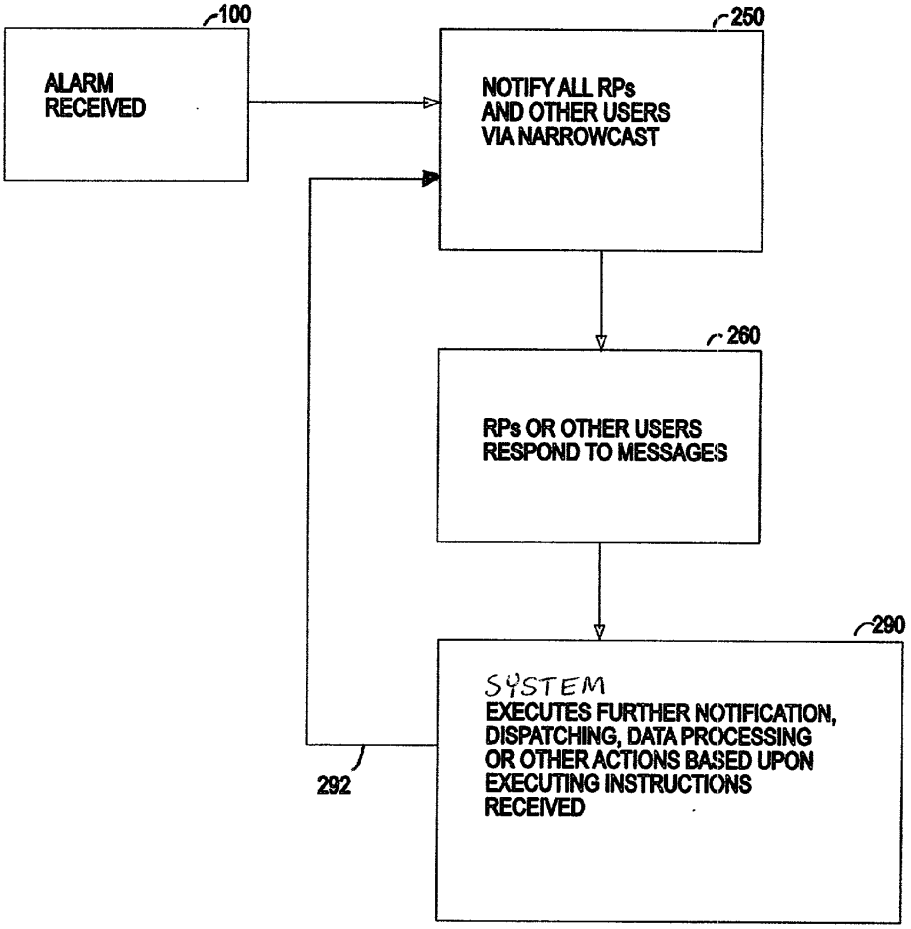


FIG. 2

129. Petitioners' expert agreed that step 290 of Figure 2 references the *system* executing instructions. Ex. 2015, Jeffay Tr. 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.

130. 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." *Id.* ¶ [0077].

131. 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." Menard ¶ 0077. 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 to a POSITA that the monitoring service sends a notification based on the alarm system performing some command from remote users. Therefore, it is my opinion that Menard's Paragraph [0068] does not disclose the present limitation of the '935 patent's claim 20.

132. The same is true of the other passage cited by Petitioners, Menard's Paragraph [0179]. This paragraph is similar to Paragraphs [0068] and [0077]: "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, Jeffay Tr. 173:12-174:18. Thus, it is my opinion that Menard does not disclose this limitation.

133. 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 that an open door suggests that an improper entry may have occurred).

134. Because false alarms were known to be frequent (then and now), and because frequent dispatch of fire or police in response to false alarm conditions would be problematic for many reasons, then-current systems used a human to apply judgment on whether the alarm was a false alarm after investigating and prior to calling the fire department or police. This investigation and application of

judgment was not something that then-current in-building alarm system could have done. Therefore, then-current systems used central stations to perform the investigation and apply human judgment. Any confirmation message arising from the conclusion of that investigation and judgment would emanate from the entity performing the investigation and judgment; e.g., Menard's central station or system 50.

135. For the foregoing reasons, it is my opinion that the cited combination fails to teach or suggest all elements of claim 20, and Petitioners' ground of invalidity fails on that basis.

2. Claim 22

136. Claim 22 recites a base unit that is configured to, *inter alia*, "create a control command for the environmental device based on the control information" received in a control message from a remote unit. The base unit is also configured to "send the control command to the environmental device via the controller." Claim 22 then recites that the base unit is configured to "send a status message indicating execution of said control information to the remote device." Ex. 1001, '935 patent at 16:37-38. I understand that Petitioners assert that Menard discloses this element for the same reasons as the similar element of claim 20, and it is my opinion that Petitioners' argument fails for the same reasons discussed with respect to that claim.

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

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

137. I understand that Petitioners assert that Bielski and Wu would have rendered 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). It is my opinion that Petitioners fail to establish that Bielski and Wu can be properly combined.

138. I understand that 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.

139. I understand that 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, it is my opinion that the

mere simplicity, low cost, and widespread use of SMS would not have provided a motivation to combine Wu with Bielski. Ex. 2015, Jeffay Tr. 147:15-148:7.

140. While I understand that 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, Jeffay Tr. 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, it is my opinion that Wu's disclosure regarding the advisability of combining SMS messages would have motivated a POSITA to avoid SMS messaging.

141. While I understand that Petitioners also rely on SMS's widespread adoption (*id.* 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. Wu teaches implementing SMS using the gnokii driver, 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.[7] 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.[8]

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[7] Ex. 2014, gnokii FAQ. Exhibit 2014 is a true and correct copy of an FAQ page for the gnokii project captured on January 10, 2004, available from the Internet Archive at https://web.archive.org/web/20040110222318/http:/www.gnokii.org/faq.shtml. 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.

[8] 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). Exhibit 2010 is a true and correct copy of a Nokia Press Release dated January 27, 2005, available at https://www.nokia.com/system/files/files/q4-2004-earnings-release-pdf.pdf. Ex. 2011 is a true and correct copy of a presentation by Jorma Ollila, Chairman and CEO of Nokia, titled, "Conference Call Fourth Quarter 2003 Financial Results," dated January 22, 2004, and available at https://www.nokia.com/system/files/files/q4-2003-preso-pdf.pdf. Exhibit 2012 is a true and correct copy of an article by Nelson D. Schwartz titled, "Has Nokia Lost It?" dated January 24, 2005, and available at

142. It is my opinion that 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. It is my opinion that this is particularly true of Nokia since it was perceived as being very late in implementing smart-phone technology (and executing poorly when it did).[9] Bielski itself expresses a desire to operate using standard—not manufacturer-specific—protocols. Ex. 1017, Bielski ¶¶ [0030], [0057]. It is my opinion that the gnokii software, specifically designed for the particular requirements of Nokia phones, could not be readily adapted to work with phones from other providers. Thus, it is my opinion that a POSITA would have been particularly disinclined to implement Wu's Nokia-centric solution. This is supported by Petitioners' own expert, who

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https://money.cnn.com/magazines/fortune/fortune_archive/2005/01/24/8234055/index.htm.

[9] Ex. 2013, NYT Article; Ex. 2012, Fortune Article. Exhibit 2013 is a true and correct copy of an article by Alan Cowell titled, "Nokia Profit Off in Quarter; Handset Price Cuts Cited," dated October 15, 2004, and available at https://www.nytimes.com/2004/10/15/technology/nokia-profit-off-in-quarter-handset-price-cuts-cited.html.

says that a POSITA would have avoided solutions that result in "limiting the number of mobile devices that could be used." Ex. 1003, Jeffay Decl. ¶ 499.

143. Further, gnokii was written in the "C" programming language (both the version current in 2004 and earlier versions), as can be seen in the gnokii code available at https://gnokii.org/git.shtml. 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, Jeffay Tr. 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 flaws in gnokii would provide a POSITA further motivation against using it.

144. Finally, I understand that 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). I understand that *Hulu* held that "the fact that the combination might have been successful does not meant that an ordinarily skilled artisan would have been motivated to make the combination." *Id.*

145. For the reasons discussed above, it is my opinion that a POSITA would not have been motivated to combine Bielski with Wu.

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

146. 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]. It is my opinion that 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). 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. *Id.* ¶ [0063]. I understand that Petitioners' expert acknowledged that Bielski includes no such express disclosure. Ex. 2015, Jeffay Tr. 114:14-115:2.

147. In fact, the next paragraph explains that the user enters 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." *Id.* ¶ [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, ’935 patent at 2:39-48. 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, it is my opinion that Bielski’s disclosure must be referring to the DTMF audio signals that the ’935 patent’s claimed solution improved upon.

148. While I understand that Petitioners cite Wu as also disclosing SMS messaging from a remote unit to a base unit, it is my opinion that a POSITA would not have been motivated to combine Bielski and Wu for the reasons discussed above. Therefore, it is my opinion that Wu cannot cure Bielski’s deficiency.

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

149. It is my opinion that Bielski does not enable a POSITA to implement the recited SMS-capable base unit without undue experimentation. Specifically, it is my opinion that 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 or teach how to perform the two technical requirements necessary for implementing the claimed functionality. In particular, it is my opinion that Bielski does not teach the two technical requirements necessary for implementing the claimed SMS-capable base unit discussed in connection with Ground 1A.

150. As seen below, 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.

> **[0037]** In an embodiment of the present invention, the communication system comprises a check unit which is embodied as an embedded PC or WEB server on which one or more applications concerning the monitoring, control and/or regulation of one or more devices are stored, wherein the mobile terminal has a browser and wherein the one or more devices can be controlled and/or regulated and/or monitored by means of the browser using the application or the applications in connection with network elements of a telecommunication network.

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].

151. 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.

152. 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. Thus, it is my opinion that Bielski did not enable a computing device that sent/received SMS messages by directing or controlling a cellular phone. Therefore, it cannot be applied as prior art against claim 1 of the '935 patent. *See Amgen*, 314 F.3d at 1354.

153. Furthermore, as discussed above, it is my opinion that a POSITA would not have been motivated to combine Bielski and Wu, so Wu cannot cure Bielski's failures.

2. Claim 2

154. Claim 2 depends from claim 1. Therefore, it is my opinion that Bielski and Wu do not render claim 2 obvious for the reasons discussed regarding claim 1.

3. Claim 3

155. Claim 3 depends from claim 1. Therefore, it is my opinion that Bielski and Wu do not render claim 3 obvious for the reasons discussed regarding claim 1.

156. Moreover, it is my opinion that neither Bielski nor Wu discloses the claimed microcontroller for the reasons discussed with respect to the "microcontroller" element of independent claim 18.

4. Claim 4

157. Claim 4 depends from claim 1. Therefore, it is my opinion that Bielski and Wu do not render claim 4 obvious for the reasons discussed regarding claim 1.

158. Moreover, it is my opinion that 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, it is my opinion that claim 4 would not have been obvious because a POSITA would not have been motivated to combine Wu with Bielski for the reasons discussed above for those references. Bielski was not enabled for SMS communications via software and Wu was associated with outdated Nokia phones that would not have been a commercially viable platform on which to build a solution in 2004 (and therefore a POSITA would not have been motivated to combine Bielski and Wu).

159. 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, Jeffay Tr. 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, Jeffay Tr. 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.

160. Bielski and Wu 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). Thus, nothing in Bielski or Wu would have enabled a POSITA to implement that capability in November 2004.

161. For example, Bielski states in very generalized terms that its mobile terminal can send/receive data including commands. *See* Ex. 1017, Bielski at 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, even if Bielski could be interpreted as suggesting sending/receiving SMS messages via custom software, none of the cited excerpts disclose or suggest any details for interfacing a custom "app" with functions for sending or receiving SMS messages (custom programmability).

162. As discussed above with regard to enablement of sending/receiving SMS messages in the base unit, a first hardware/software interface would be needed for doing so and a second software API, for controlling or directing circuits and software in the base unit to send/receive SMS messages, would also be needed. Bielski ignores these necessary implementation details related to enabling SMS messaging via custom programmability. Dr. Jeffay cites Bielski for the idea of using custom apps generally but not for informing a POSITA how to implement sending/receiving SMS messages via software (custom programmability). *See* Ex. 2015, Jeffay Decl. ¶ 573. Thus, Bielski fails to disclose and to enable the additional limitation of claim 4.

163. 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 has no explicit discussion of a custom software application, running on a mobile phone, that sends/receives SMS messages. Although Wu discloses gnokii software as ostensibly facilitating SMS communications for

outdated Nokia phones through a "short message driver" (a building block for sending messages), which a POSITA would not have been motivated to combine with Bielski as discussed in conjunction with claim 1, Wu does not disclose a custom software application interfacing with gnokii to provide the claimed custom programmability. Thus, Wu fails to disclose claim 4.

164. Accordingly, neither Bielski nor Wu disclose and enable a capability for sending/receiving SMS messages via custom programming, so Petitioners have not established that claim 4 would have been obvious.

5. Claim 7

165. Claim 7 depends from claim 1. Therefore, it is my opinion that Bielski and Wu do not render claim 7 obvious for the reasons discussed regarding claim 1.

6. Claim 8

166. Claim 8 depends from claim 1. Therefore, it is my opinion that Bielski and Wu do not render claim 8 obvious for the reasons discussed regarding claim 1.

7. Claim 9

167. Claim 9 depends from claim 1. Therefore, it is my opinion that Bielski and Wu do not render claim 9 obvious for the reasons discussed regarding claim 1.

168. Additionally, it is my opinion that neither Bielski nor Wu discloses the additional limitation of claim 9 so the combination of those references could not have rendered obvious claim 9. The reasons for this conclusion follow.

169. Petitioner identifies a portion of Bielski, disclosing a button within a user interface, as the claimed icon. *See* Petition at 66. *See also* Ex. 1003, ¶ 592. Dr. Jeffay opines that Bielski discloses program icons and buttons relating to environmental information but he does not opine that Bielski discloses or suggests the claimed icons relating to environmental information. My review of Bielski leads me to conclude that Bielski does not disclose the icons recited in claim 9 because Bielski is limited to the disclosures Dr. Jeffay cites (which do not disclose claim 9).

170. Petitioner also identifies a portion of Wu as disclosing selectable text in support of the obviousness of claim 9. *See* Petition at 67; Ex. 1003, ¶ 593. Dr. Jeffay 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's text neither disclosed a graphical icon generally nor disclosed an icon corresponding to environmental condition as recited in claim 9.

171. 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." My review of Wu

leads me to conclude that Wu's image is not selectable. Thus, Wu's image does not satisfy the requirements of claim 9.

172. For the reasons discussed above, it is my opinion that neither Bielski nor Wu disclose the claimed icon. Therefore, a combination of Bielski and Wu could not have rendered obvious claim 9.

8. Claim 11

173. Similar to claim 1, claim 11 recites a base unit capable of sending and receiving SMS messages. Ex. 1001, '935 patent at 14:19-37. As discussed regarding claim 1, it is my opinion that Bielski does not enable this functionality and that a POSITA would not have been motivated to combine Wu with Bielski. Therefore, it is my opinion that the proposed combination does not satisfy this claim element.

9. Claim 12

174. Claim 12 depends from claim 11. Therefore, it is my opinion that Bielski and Wu do not render claim 12 obvious for the reasons discussed regarding claim 11.

175. Further, for the reasons the Board explained in the Institution Decision, it is my opinion that Petitioner has not sufficiently demonstrated that Bielski or Wu teach claim 12's additional recitations. *See* Institution Decision at 53.

10. Claim 13

176. Claim 13 depends from claim 11. Therefore, it is my opinion that Bielski and Wu do not render claim 13 obvious for the reasons discussed regarding claim 11.

11. Claim 14

177. Claim 14 depends from claim 11. Therefore, it is my opinion that Bielski and Wu do not render claim 14 obvious for the reasons discussed regarding claim 11.

178. Moreover, it is my opinion that neither Bielski nor Wu discloses the claimed microcontroller for the reasons discussed with respect to the "microcontroller" element of independent claim 18.

12. Claim 15

179. Claim 15 depends from claim 11. Therefore, it is my opinion that Bielski and Wu do not render claim 15 obvious for the reasons discussed regarding claim 11.

13. Claim 17

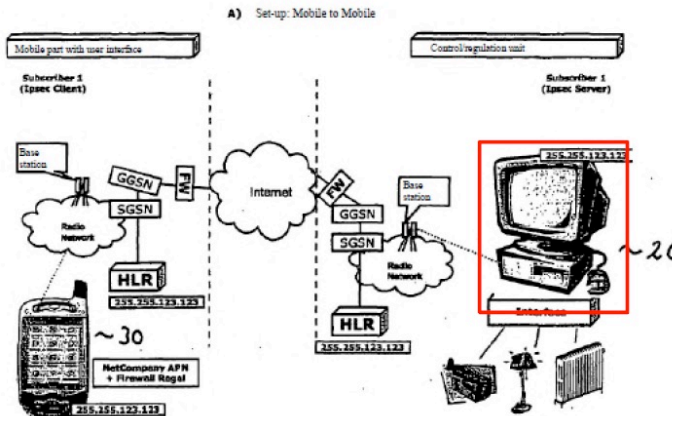
180. Claim 17 depends from claim 11. Therefore, it is my opinion that Bielski and Wu do not render claim 17 obvious for the reasons discussed regarding claim 11.

14. Claim 18

a) Bielski and Wu do not disclose the claimed "microcontroller"

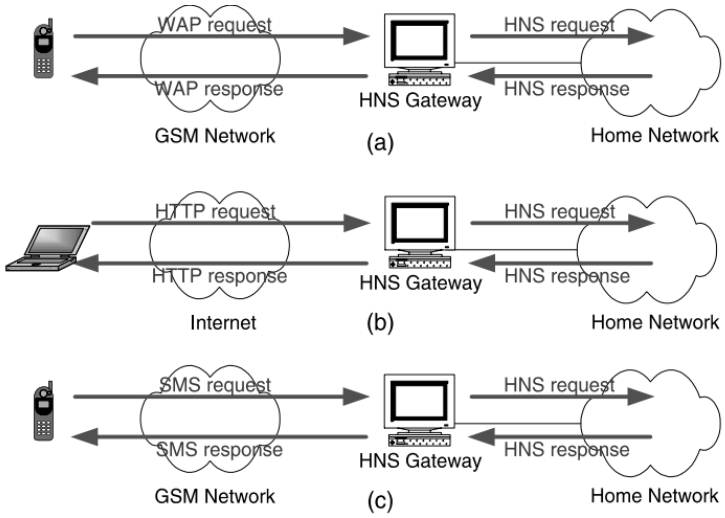
181. Claim 18 recites that the claimed base unit includes, *inter alia*, "a microcontroller configured to process the second message including the command, and to send the command through the communication interface to the environmental device." Ex. 1001, '935 patent at 15:5-8. I understand that Petitioners' 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."

182. I understand that Petitioners' expert points out that Bielski discloses that its "check and communication unit can be embodied as a computer, such as an embedded PC." Ex. 1003, Jeffay Decl. ¶ 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 I understand Dr. Jeffay admits, Bielski discloses only "a computer includ[ing] a processor." Ex. 1003, Jeffay Decl. ¶ 678.

183. Wu 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 I understand Dr. Jeffay admits, "Wu depicts the HNS gateway as a computer." Ex. 1003, Jeffay Decl. ¶ 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, Jeffay Decl. ¶ 681.



184. 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. 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."

185. Thus, it is my opinion that neither Bielski nor Wu discloses the claimed "microcontroller." 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

186. Similar to claim 1, claim 18 recites a base unit capable of sending and receiving SMS messages. Ex. 1001, '935 patent at 14:59-15:8. As discussed regarding claim 1, it is my opinion that Bielski does not enable this functionality and that a POSITA would not have been motivated to combine Wu with Bielski. Therefore, it is my opinion that the proposed combination does not satisfy this claim element.

15. Claim 19

187. As discussed above, Petitioners' proposed obviousness combination fails 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 with respect to any claims of the '935 patent.

16. Claim 21

188. 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, '935 patent at 16:18-22. In my opinion, neither Bielski nor Wu discloses the claimed microcontroller for at least the reasons discussed with respect to the "microcontroller" element of independent claim 18.

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

1. Claims 5 and 6

189. Claims 5 and 6 depend from claim 4 (which depends from claim 1). As discussed above, Petitioners have not established that claims 1 or 4 would have been obvious in view of Bielski and Wu, and Sears fails to cure the shortcomings of those references, so claims 5 and 6 would not have been obvious in view of Bielski, Wu and Sears for at least that reason.

190. Moreover, it is my opinion that Bielski, Wu and Sears do not disclose (or enable) the additional recitation of claim 5 ("The system as recited in claim 4 wherein said custom programmability is a JAVA programming kernel") or the

additional recitation of claim 6 ("The system as recited in claim 4 wherein said custom programmability is a J2ME programming kernel").

191. For claims 5 and 6, Petitioners rely on the Sears reference for disclosing custom Java/J2ME programs. As previously discussed in conjunction with Ground 2A, neither Bielski nor Wu disclose enabling details of custom software for sending/receiving SMS messages via software. As also discussed in conjunction with Ground 1B, Sears also does not teach building a Java or J2ME app that is able to utilize a phone's SMS capability to exchange data with a base unit. Therefore, Sears does not cure the deficiencies discussed above for Bielski and Wu with respect to claim 4. Thus, the applied references would not have rendered obvious claims 5 or 6.

2. Claim 16

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

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

193. Claim 10 depends from claim 1. Petitioners point to nothing in Ehlers that overcomes the deficiencies in Bielski and Wu regarding claim 1. Therefore, it

is my opinion that Bielski, Wu, and Ehlers do not render claim 10 obvious for the reasons discussed regarding claim 1.

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

1. Claim 20

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

2. Claim 22

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

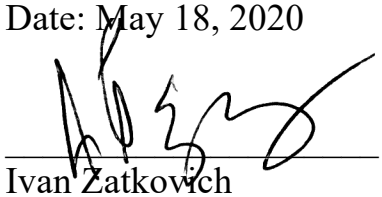
VIII. Conclusion

196. In this declaration, I have presented my opinions regarding the proposed grounds of invalidity based on the information available to me. My opinions are subject to change in view of any additional information I may receive, including information or opinions provided by or on behalf of Petitioners. I reserve the right to supplement my opinions accordingly.

I hereby declare that all statements made herein of my own knowledge are

true and that all statements made on information and belief are believed to be true, and further that these statements are made with knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Date: May 18, 2020



Ivan Zatkovich