

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SAMSUNG ELECTRONICS CO., LTD.;
SAMSUNG ELECTRONICS AMERICA, INC.,
Petitioner

v.

MULLEN INDUSTRIES LLC,
Patent Owner.

Case No. IPR2024-01472
U.S. Patent No. 11,190,633

**DECLARATION OF BRIAN W. ANTHONY
IN SUPPORT OF PETITION FOR INTER PARTES REVIEW
OF U.S. PATENT NO. 11,190,633**

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I. INTRODUCTION

1. I have been retained by Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc. (collectively, “Samsung” or “Petitioner”), as an independent expert in this proceeding before the Patent Trial and Appeal Board (“PTAB” or “Board”). I understand that Samsung is requesting that the Board institute an inter partes review (“IPR”) proceeding of U.S. Patent No. 11,190,633 (“the ’633 Patent”) (Ex 1001), currently assigned to Mullen Industries LLC (“Patent Owner” or “PO”).

2. I am not and have never been an employee of Samsung. I am being compensated at my usual and customary rate of \$500 per hour. No part of my compensation depends on the outcome of this proceeding, and I have no other interest in this proceeding.

3. I have been asked to provide my independent analysis of the ’633 Patent in light of the prior art publications cited below. I have also been asked to consider the state of the art and prior art available as of March 14, 2003. Based on the prior art discussed in this declaration, it is my opinion that Claims 1-39 of the ’633 Patent are unpatentable for the reasons provided below.

A. Qualifications

4. As indicated in my *curriculum vitae* (“CV”), included as Ex-1003, I am currently a Principal Research Scientist at the Massachusetts Institute of Technology

(“MIT”). My CV includes additional information about my professional history and contains further details on my experience, publications, patents, and other qualifications to render an expert opinion. Herein, I highlight experiences relevant to the technology of the patent at issue.

5. I earned a Bachelor of Science in Engineering from Carnegie Mellon University in 1994 and a Master’s degree in Engineering from MIT in 1998. My thesis topic related to anisotropic wave guides and acoustic non-destructive testing. In 2006, I earned my Ph.D. in Engineering from MIT. My research focused on high-performance computation, signal processing, and electro-mechanical system design.

6. In 1997, I co-founded Xcitex Inc., a company that specialized in video-acquisition and motion-analysis software. I served as the Chief Technology Officer and directed and managed product development until 2006. Our products included distributed wired and wireless systems for measurement and measurement notification, human in the loop interaction interfaces in domains such as diverse as manufacturing, military, and broadcast television. Many of our solutions addressed the same distributed system, messaging, and notification issues as those described and claimed in the ’633 Patent. For example, our hardware and software systems included multiple messaging pathways for communication control.

7. I joined MIT in 2006 and have been the Director of the Master of Engineering in Advance Manufacturing and Design Program for over ten years. The

degree program covers four main components—Manufacturing Physics, Manufacturing Systems, Product Design, and Business Fundamentals. Many of the courses, projects, and papers my students undertake involve technologies relevant to the '633 Patent, for example, notification systems for providing alerts in manufacturing and medical applications.

8. In 2011, I co-founded MIT's Medical Electronic Device Realization Center ("MEDRC") and currently serve as co-director. I am also the Director Technical Operation of the Center for Clinical and Translational Research (CCTR) at the Institute of Medical Engineering & Science, and Associate Director of MIT.nano at MIT. The MEDRC aims to create and deploy revolutionary medical technologies by collaborating with clinicians, the microelectronics, and medical devices industries. We integrate advanced expertise in computation, communications, optical and electrical sensing, ultrasound technologies, and consumer electronics. One focus is enhancing the usability and productivity of medical devices by leveraging cutting-edge image and signal processing, coupled with intelligent computer systems, to augment practitioners' diagnostic capabilities. In another focus, we specialize in wearable electronics designed for measurement and real-time notifications. Our research portfolio includes low power integrated circuits and systems, big data, micro electro-mechanical systems, bioelectronics, sensors, and microfluidics. Specific areas of innovation include wearable, non-

invasive and minimally invasive optical biosensor devices, medical imaging, laboratory instrumentation, and the data communication from these devices and instruments to healthcare providers and caregivers. My experience with these devices is directly applicable to the technology in the '633 Patent.

9. Furthermore, my research focuses on computational instrumentation, including the development of instrumentation and measurement solutions for manufacturing systems and medical devices. Additionally, my teaching interests include the design and modeling of large-scale systems in a wide variety of decision-making domains and developing optimization algorithms and software for analyzing and designing such systems. I teach or have taught courses in Electrical Engineering, Controls, Optics, Digital Communications, and Signal Processing, all pertinent subject matter to the '633 Patent. I teach or have taught courses in Manufacturing Engineering, Smart Manufacturing, Industrial Internet of Things all pertinent subject matter to the '633 Patent.

10. I have published approximately 100 papers, and have received a number of best paper and distinguished paper awards. I am a co-author of a number of papers that relate to the technology in the '633 Patent, such as:

- Gilbertson, M. W., & Anthony, B. W. (2013). An ergonomic, instrumented ultrasound probe for 6-axis force/torque measurement.

2013 35th Annual International Conference of the IEEE
Engineering in Medicine and Biology Society (EMBC), 140–143;

- Shih-Yu Sun, Matthew Gilbertson, and Brian W. Anthony, “Probe Localization for Freehand 3D Ultrasound by Tracking Skin Features,” Book Section, Medical Image Computing and Computer-Assisted Intervention, MICCAI 2014, Springer, 2014, Vol. 8674. Lecture Notes in Computer Science, pp. 365-372;
- J. H. Lee, C. M. Schoellhammer, G. Traverso, D. Blankschtein, R. Langer, K. E. Thomenius, D. S. Boning, B. W. Anthony, “Towards Wireless Capsule Endoscopic Ultrasound (WCEU),” IEEE International Ultrasonics Symposium (IUS), Chicago, IL, 2014, pp. 734-737; and
- Zakrzewski, A., Anthony, B. W., “Quantitative Elastography and its Application to Blood Pressure Estimation: Theoretical and Experimental Results,” 2013 IEEE Engineering in Medicine and Biology Society (EMBC), pp. 1136-1139.

B. Materials Considered

11. In forming my opinions, I reviewed the following documents, in addition to others I have cited in my declaration. I also relied on my own knowledge of and experience in the field of mechanical engineering, biomedical engineering,

electro-mechanical engineering, design or machine design, optical engineering, communication engineering, the development of physiological monitoring devices such as non-invasive biosensors, sensor system design and signal processing, and the design of distributed communications systems and human machine interfaces.

Ex. No.	Description
Ex-1001	U.S. Patent No. 11,190,633 (“the ’633 Patent”)
Ex-1004	Prosecution History of U.S. Patent No. 11,190,633
Ex-1005	U.S. Patent No. 6,477,117 to Narayanaswami (“Narayanaswami”)
Ex-1006	U.S. Patent Publication No. 2002/0115478 to Fujisawa (“Fujisawa”)
Ex-1007	U.S. Patent Publication No. 2001/0043514 to Kita (“Kita’514”)
Ex-1008	Certified translation of JP Patent Publication No. 2002/125039 to Kita (“Kita’039”)
Ex-1009	JP Patent Publication No. 2002/125039 to Kita
Ex-1010	U.S. Patent Publication No. 2002/0137552 to Cannon (“Cannon”)
Ex-1011	Nokia 8890 User Guide (2000) (“Nokia”)
Ex-1012	Wayback Page for Accessing Nokia 8890 User Guide
Ex-1020	Claim Mapping Table
Ex-1021	Petition for <i>Inter Partes</i> Review, Paper 1, <i>Apple Inc. v. Mullen Industries LLC</i> , No. IPR2022-01389 (PTAB Aug. 9, 2022) (“Apple Petition”)
Ex-1022	Decision Granting Institution of <i>Inter Partes</i> Review, Paper 9, <i>Apple Inc. v. Mullen Industries LLC</i> , No. IPR2022-01389 (PTAB Mar. 2, 2023) (“Apple DI”)

Ex. No.	Description
Ex-1023	Patent Owner Response, Paper 13, <i>Apple Inc. v. Mullen Industries LLC</i> , No. IPR2022-01389 (PTAB June 6, 2023) (“Apple POR”)
Ex-1024	Chandra Narayanaswami et al., <i>IBM’s Linux Watch: The Challenge of Miniaturization</i> , 35 IEEE 33 (2002)
Ex-1025	IBM, Linux Watch, <i>Linux on a Wrist Watch 1999-2001</i>
Ex-1026	<i>Casio Watch 50th Anniversary</i> , Casio, available at: https://www.casio.com/us/watches/50th/Heritage/1990s/ (last accessed Aug. 13, 2024)
Ex-1027	Chandra Narayanaswami et al., <i>Designing a New Form Factor for Wearable Computing</i> , 1 IEEE 42 (2002)
Ex-1028	Chandra Narayanaswami et al., <i>What Would You Do with a Hundred MIPS on Your Wrist?</i> , IBM Research Report (2001)
Ex-1029	Chandra Narayanaswami et al., <i>Application Design for a Smart Watch with a High Resolution Display</i> , IEEE 7 (2000)
Ex-1030	M.T. Raghunath & Chandra Narayanaswami, <i>User Interfaces for Applications on a Wrist Watch</i> , Personal & Ubiquitous Computing 17 (2002)
Ex-1031	Noboru Kamijoh et al., <i>Linux Watch: Hardware Platform for Wearable Computing Research</i> , PCM 1 (2001)
Ex-1032	U.S. Patent No. 5,612,931 to Sato
Ex-1033	Dario Bonino et al., <i>dWatch: A Personal Wrist Watch for Smart Environments</i> , 10 Procedia Computer Science 300 (2012)
Ex-1034	Daniel Siewiorek et al., <i>SenSay: A Context-Aware Mobile Phone</i> , 3 ISWC 248 (2003)
Ex-1035	Asim Smailagic et al., <i>Metronaut: A Wearable Computer with Sensing and Global Communication Capabilities</i> , 1 Personal Technologies 260 (1997)

Ex. No.	Description
Ex-1036	S. Agarwal et al., <i>On the Scalability of Data Synchronization Protocols for PDAs and Mobile Devices</i> , 16 IEEE 22 (2002)
Ex-1037	Anind K. Dey & Gregory D. Abowd, <i>CybreMinder: A Context-Aware System for Supporting Reminders</i> in Proceedings of the 2nd International Symposium on Handheld and Ubiquitous Computing, 172 (2000)
Ex-1038	Hans-W. Gellersen et al., <i>Multi-Sensor Context-Awareness in Mobile Devices and Smart Artifacts</i> , 7 Mobile Networks and Applications 341 (2002)
Ex-1039	Nitin Sawhney & Chris Schmandt, <i>Nomadic Radio: Speech and Audio Interaction for Contextual Messaging in Nomadic Environments</i> , 7 ACM Transactions on Computer-Human Interaction (TOCHI) 353 (2000)
Ex-1040	U.S. Patent No. 6,539,336 to Vock
Ex-1041	Casio VIVCEL Manual
Ex-1042	U.S. Patent No. 6,661,432 to Shiraishi
Ex-1043	Certified translation of JP Patent Publication No. JP2002223475 to Nakatake
Ex-1044	JP Patent Publication No. JP2002223475 to Nakatake
Ex-1045	U.S. Patent No. 5,878,354 to Hasegawa
Ex-1046	U.S. Patent Publication No. 2001/0037355 to Britt Jr.
Ex-1047	U.S. Patent No. 6,993,363 to Hsu
Ex-1048	U.S. Patent Publication No. 2002/0168990 to Valade
Ex-1049	U.S. Patent No. 8,064,887 to Logan

Ex. No.	Description
Ex-1050	Paolo Bonato, <i>Wearable Sensors/Systems and Their Impact on Biomedical Engineering</i> , IEEE Engineering in Medicine and Biology Magazine 18 (2003)
Ex-1051	Thomas Degen et al., <i>SPEEDY: A Fall Detector in a Wrist Watch</i> , Seventh IEEE International Symposium on Wearable Computers, Proceedings 184 (2003)
Ex-1052	Masaaki Fukumoto et al., “ <i>Body Coupled FingerRing</i> ”: <i>Wireless Wearable Keyboard</i> , Proceedings of the ACM SIGCHI Conference on Human Factors in Computing Systems 147 (1997)
Ex-1053	Cho Gilsoo et al., <i>Wearable Computers</i> , 2 IEEE Pervasive Computing 490 (1998)
Ex-1054	Ken Hinckley et al., <i>Sensing Techniques for Mobile Interaction</i> , Proceedings of the 13th Annual ACM Symposium on User Interface Software and Technology 91 (2000)
Ex-1055	Kiyoshi Itao, <i>Micromechatronics Technology for Wearable Information and Communication Equipment</i> , Sensors and Materials 325 (1998)
Ex-1056	Pieter Jonker et al., <i>Philosophies and Technologies for Ambient Aware Devices in Wearable Computing Grids</i> , Computer Communications 1145 (2003)
Ex-1057	Noboru Kamijoh et al., <i>Energy Trade-Offs in the IBM Wristwatch Computer</i> , Proceedings Fifth International Symposium on Wearable Computers 133 (2001)
Ex-1058	Quentin Ladetto & Bertrand Merminod, <i>In Step with INS: Navigation for the Blind, Tracking Emergency Crews</i> , GPS World 30 (2002)
Ex-1059	Gerwin Meijer et al., <i>Methods to Assess Physical Activity with Special Reference to Motion Sensors and Accelerometers</i> , 38 IEEE Transactions on Biomedical Engineering 221 (1991)

Ex. No.	Description
Ex-1060	Kazushige Ouchi et al., <i>LifeMinder: A Wearable Healthcare Support System Using User's Context</i> , Proceedings 22nd International Conference on Distributed Computing Systems Workshops 791 (2002)
Ex-1061	Hangewei Qian et al., <i>Fall Detection for the Elderly by Accelerometers</i> , 9 International Journal of Information Technology 1 (2003)
Ex-1062	Jun Rekimoto, <i>GestureWrist and GesturePad: Unobtrusive Wearable Interaction Devices</i> , Proceedings Fifth International Symposium on Wearable Computers 21 (2001)
Ex-1063	Sung Park et al., <i>Design of a Wearable Sensor Badge for Smart Kindergarten</i> , Proceedings, Sixth International Symposium on Wearable Computers 231 (2002)

II. LEGAL STANDARDS

12. In forming my opinions and considering the subject matter of the '633 Patent and its claims in light of the prior art, I am relying on certain legal principles that counsel in this case explained to me. My understanding of these concepts is summarized below.

13. I understand that earlier publications and patents may act to render a patent unpatentable for one of two reasons: (1) anticipation, and (2) obviousness.

A. Anticipation

14. It is my understanding that the claims of a patent are anticipated by a prior art reference if each and every element of the claim is found either explicitly or inherently in the reference. I understand that inherency requires a showing that

the missing descriptive matter in the claim is necessarily present in the allegedly anticipating reference, and that it would have been so recognized by a person of ordinary skill in the art (“POSITA”).

15. I understand that when a challenged claim covers several structures, either generically or as alternatives, the claim is deemed anticipated if any of the structures within the scope of the claim is found in the prior art reference.

16. Although anticipation typically involves the analysis of a single prior art reference, I understand that additional references may be used to show that the prior art reference has enabling disclosure (i.e., allows a POSITA to make the invention without undue experimentation), to explain the meaning of a term used in the prior art reference, and/or to show that a characteristic is inherent in the prior art reference.

B. Obviousness

17. As explained to me by counsel, I understand that a claim is invalid as obvious if it would have been obvious to a person of ordinary skill in the art at the time the alleged invention was made. This means that even if all of the elements of the claim cannot be found in a single prior art reference that would anticipate the claim, a person of ordinary skill in the art who was aware of the prior art would have been able to come up with the claimed invention. This may be the case, for example, where the missing element represents only an insubstantial difference over the prior

art or a reconfiguration of a known system. I understand that in an obviousness determination, the person of ordinary skill in the art is presumed to have knowledge of all material prior art.

18. I understand that an obviousness analysis requires an understanding of the scope and content of the prior art, any differences between the alleged invention and the prior art, and the level of ordinary skill in evaluating the pertinent art.

19. I understand that when a product is available, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill in the art can implement a predictable variation, obviousness likely bars its patentability. For the same reason, if a technique has been used to improve one device and a person of ordinary skill in the art would have recognized that it would improve similar devices in the same way, using the technique would have been obvious.

20. I understand that whether a prior art reference renders a patent claim unpatentable as obvious is determined from the perspective of a person of ordinary skill in the art at the time of the alleged invention. I have been told that there is not requirement that the prior art contain an express suggestion to combine known elements to achieve the claimed invention, but a suggestion to combine known elements to achieve the claimed invention may come from the prior art, as filtered through the knowledge of one skilled in the art. In addition, I have been told that

the inferences and creative steps a person of ordinary skill in the art would employ are relevant to the determination of obviousness.

21. I understand that one may consider, e.g., whether (1) the change was merely the predictable result of using prior art elements according to their known functions, or whether it was the result of true inventiveness; (2) there is some teaching or suggestion in the prior art to make the modification or combination of elements claimed in the patent; (3) the claimed innovation applies a known technique that had been used to improve a similar device or method in a similar way; (4) the claimed invention would have been obvious to try, meaning that the claimed innovation was one of a relatively small number of possible approaches to the problem with a reasonable expectation of success by those skilled in the art; (5) the invention merely substituted one known element for another known element in order to obtain predictable results; (6) the invention merely applies a known technique to a known device, method, or product to yield predictable results; or (7) known work in one field of endeavor may have prompted variations of it for use in either the same field or a different one based on design incentives or other market forces that would have been predictable to a person of ordinary skill in the art.

22. I further understand that certain factors may support or rebut the obviousness of a claim. I understand that such secondary considerations include, among other things, commercial success of the patented invention, skepticism of

those having ordinary skill in the art at the time of the invention, unexpected results of the invention, any long-felt but unsolved need in the art that was satisfied by the alleged invention, the failure of others to make the alleged invention, praise of the alleged invention by those having ordinary skill in the art, and copying of the alleged invention by others in the field. I understand that there must be a nexus—that is, a connection—between any such secondary considerations and the alleged invention. I also understand that contemporaneous and independent invention by others is a secondary consideration tending to show obviousness.

23. I am not aware of any allegations by the named inventor of the '633 Patent or any assignee of the '633 Patent that any secondary considerations tend to rebut the obviousness of the '633 Patent.

24. Additionally, I understand that in considering obviousness, it is important not to use the benefit of hindsight derived from the patent under consideration.

C. Level of Ordinary Skill in the Art

25. When interpreting a patent, I understand that it is important to identify the relevant art pertaining to that patent, as well as the level of ordinary skill in that art at the time of the claimed invention. The “art” is the field of technology to which the patent is related.

26. I am informed and understand that the POSITA is a hypothetical person

who is presumed to know the relevant prior art. I understand that the actual inventor's skill is not determinative of the level of ordinary skill. I further understand that factors that may be considered in determining level of skill include: (i) the types of problems encountered in the art; (ii) prior art solutions to those problems; (iii) the rapidity with which innovations are made; (iv) the sophistication of the technology; and (v) the educational level of active workers in the field. I understand that not all such factors may be present in every case, and one or more of them may predominate.

27. I understand that a POSITA is one who is presumed to be aware of all pertinent art, thinks along conventional wisdom in the art, and is a person of ordinary creativity.

28. A person of ordinary skill in the art at the relevant time, which I have been told to consider as March 14, 2003 ("POSITA") would have had at least a Bachelor of Science degree in computer science, computer engineering, electrical engineering, electro-mechanical engineering, design or machine design, or a similar degree with one or two years of experience with operating system, user interface software, and application software in mobile devices, such as cell phones, personal digital assistants, and smart watches. A higher level of education or skill might make up for less experience, and vice versa.

29. Based on my knowledge, skill, and experience, I have an understanding

of the capabilities of a person of ordinary skill in the relevant art. For example, from my industry experience, I am familiar with what an engineer designing a remote and distributed notification system would have known and found predictable in the art. From teaching and supervising my post-graduate students, I also have an understanding of the knowledge that a person with this academic experience possesses. Furthermore, I possessed the knowledge of a POSITA myself at least as of 1997.

D. Claim Construction

30. I understand that the United States Patent and Trademark Office interprets claim terms in an *inter partes* review proceeding under the same claim construction standard that is used in a United States federal court. I understand that under this standard, the meaning of claim terms is considered from the viewpoint of a POSITA at the time of the alleged invention.

31. I have been informed that claim terms are generally given their ordinary and customary meaning as understood by one of ordinary skill in the art in light of the specification and the prosecution history pertaining to the patent. I understand, however, that claims terms are generally not limited by the embodiments described in the specification.

32. I understand that in addition to the claims, specification, and prosecution history, other evidence may be considered to ascertain the meaning of

claim terms, including textbooks, encyclopedias, articles, and dictionaries. I have been informed that this other evidence is often less significant and less reliable than the claims, specification, and prosecution history.

III. SUMMARY OF GROUNDS

33. I understand that Petitioner challenges the validity of Claims 1-39 of the '633 Patent. It is my opinion that the following grounds demonstrate that the claims of the '633 Patent are invalid.

Ground	Summary
1	Claims 1-18, 22, 27, 29, and 35 are obvious over Narayanaswami (Ex-1005) in view of Kita'514 (Ex-1007)
2	Claims 20, 23-26, 31, and 36-39 are obvious over Narayanaswami in view of Kita'514 and Kita'039 (Ex-1008)
3	Claims 12-13, 15-17, 19-21, and 28-34 are obvious over Narayanaswami in view of Kita'514, Kita'039, and Cannon (Ex-1010)
4	Claims 1-10, 13, 16, 18-19, 22-27, 32, and 35-39 are obvious over Fujisawa (Ex-1006) in view of Kita'514
5	Claims 11-12, 14-15, 17, 19-21, and 28-34 are obvious over Fujisawa in view of Kita'514 and Cannon

IV. THE '633 PATENT

A. Overview of the '633 Patent

34. The '633 Patent relates to a system for providing incoming call and other cell phone event notifications to a remote notification device included in, for example, a user's wristwatch. Ex-1001, 3:8-18, 4:13-22. The '633 Patent explains

that cell phones typically generate a sound or vibrate to notify a user of an incoming call or other alert. *Id.*, 1:23-29. According to the '633 Patent, however, if the phone is in a location where a user cannot hear or feel the phone, like in a purse, then the user may miss the notification. *Id.*, 1:30-38. Thus, the patent purports to provide a system “that allow[s] incoming calls, or other cell phone events or notifications, to be recognized by a user even when the user cannot hear or sense audio signals or vibration signals physically emanating from the cellular phone.” *Id.*, 1:47-51.

35. More specifically, the '633 Patent teaches a remote notification device connected wirelessly to a cell phone that can detect an incoming call (or calendar event, missed call, or text message, etc.) received by the phone and provide a supplemental notification signal to the user. *Id.*, 1:52-2:11, 3:8-18. The notification may be an audible signal, mechanical vibration, or other type of signal. *Id.*, 1:61-64, 3:56-60.

36. Figure 2 below illustrates the wireless remote notification device described in the specification. *Id.*, Fig. 2.¹

¹ Throughout, I have added emphasis and annotations unless otherwise specified.

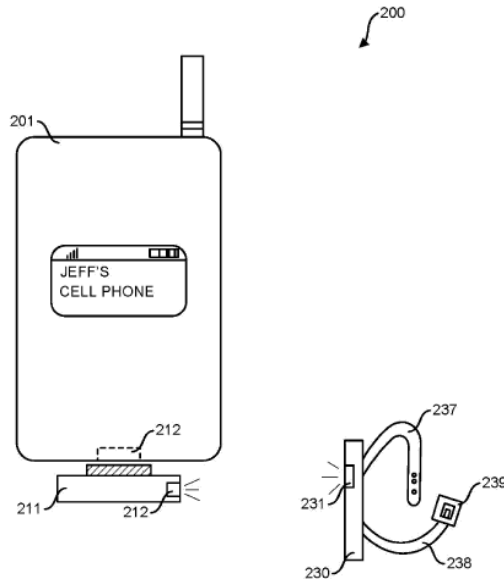


FIG. 2

37. Communication device 231 on remote notification device 230 (depicted as a watch) responds to signals from communication device 211 on cell phone 201 and alerts the user of the notification. *Id.*, 3:9-21. The remote notification device connects with the phone to “transmit/receive signals wirelessly to/from” the remote communication device. *Id.*, 3:65-4:2. The remote notification device “may be embedded into a device” such as a user’s watch and “may attach to a user by a variety of devices (e.g., bands 237 and buckle 239).” *Id.*, 4:13-21.

38. As explained in detail below, it is my opinion that the ’633 Patent claims are obvious in view of the prior art.

B. Prosecution History of the ’633 Patent

39. The ’633 Patent was filed February 4, 2014 as a continuation of application U.S. Patent No. 8,682,398, filed April 23, 2012, which is a continuation

of U.S. Patent No. 8,165,640, filed March 9, 2004. The '633 Patent also claims priority to provisional application No. 60/455,218, filed March 14, 2003. Ex-1001. I apply the earliest alleged priority date of the '633 Patent for my analysis herein, which I understand is March 14, 2003.

40. I understand that during prosecution, Applicant initially focused on the “watch band” and “buckle” limitations as the inventive aspect of the sole independent claim, arguing, “Applicant’s inclusion of a low technology buckle with bands coupled with a high technology watch generates a whimsical and festive nature of the device—an element that creates a whimsical and festive nature is bona fide patentable.” Ex-1004, 137-144. Ten additional office actions followed. During lengthy prosecution, the independent claim grew, eventually leading to a Notice of Allowance.

41. The Examiner’s stated reason for allowance was that the “[p]rior art of record ... fails to teach or suggest the limitation (underlined)” of the amended independent claim, which recites “said device includes motion sensing operable to distinguish between a plurality of different types of motion.” Ex-1004, 486 (citing paragraph [0031] of the specification).

42. I understand that the Petition and this Declaration presents arguments not considered during prosecution. See Ex-1004. I also understand that the prior art combinations in the Petition and this Declaration were not before the PTO during

prosecution. *Id.*

V. TECHNOLOGY BACKGROUND

A. Watches For Use With Mobile Telephonic Devices To Provide Notifications of Events On the Mobile Device Were Known

43. Watches for use with mobile telephonic devices to provide notifications of events on the mobile device were known by 2003. “The first example of a smart watch dates back to 2000 with the IBM Linux Watch.” Ex-1033 (Bonino), 301. Prior art regarding IBM’s Linux Watch states in 2002 that the watch was able to “run some personal information management application such as calendars, address books, to-do lists, and email summaries” and was able to “interact wirelessly with other computers running specific applications” including PCs and PDAs. Ex-1024 (Challenge of Miniaturization), 33.

44. Watches with such capabilities including the Linux Watch were also known to include components such as two bands, a belt buckle, a battery, control circuitry, an input device, and memory. For example, IBM’s Linux Watch was known by 2002 to be “a complete computer system that runs Linux, displays X11 graphics, and has wireless connectivity.” Ex-1024 (Challenge of Miniaturization), 33. It included a main board having an ARM processor from Cirrus Logic, on-chip ROM for initial boot, integrated LCD controller, infrared controller, “serial communication, sound and other interfaces,” and “two serial ports for connecting to other devices such as PCs and PDAs.” *Id.* at 34. The OLED display was “to reside

on a silicon chip that the processor would see as static RAM,” which “would then turn on one of the LEDs in the array” on the display.” *Id.* at 35. It included “a touch screen and roller wheel as input devices” and “a rechargeable battery to supply the peak current that the watch would draw.” *Id.* As of 1999, the hardware specifications stated that the watch “would have an ARM EP 7211 processor, 8 Mbytes of flash memory, 8 Mbytes of DRAM, a touch screen, a roller wheel, infrared and Bluetooth wireless interfaces, X11 graphics, and a speaker and microphone.” *Id.* at 35-36. The watch had “attached wrist straps,” which “use[d] standard buckles and band holder pins.” *Id.* at 38, Fig. 1 (showing two bands); *see also* Ex-1025, 1 (depicting the Linux Watch with two bands and a buckle and describing the watch as containing “a powerful processor along with eight megabytes of flash memory and another eight megabytes of dynamic random access memory,” “a touch-sensitive screen and a roller wheel”); Ex-1028, 4-5 (describing the Linux Watch’s processor, battery, memory, display, LED, touch screen, roller wheel, two bands).

45. Vock also describes a watch, which like “normal watches,” includes “a band 1022” that “secures the watch 1020 on a user’s wrist so that the watch face 1024 can be viewed.” Ex-1040 (Vock), 44:27-29, Fig. 39 (depicting a smart watch with two bands—one connected to the lug on the left and one to the right), Fig. 38 (depicting the buckle that affixes the watch bands to one another); *see also* Ex-1045 (Hasegawa), 4:47-57, Figs. 4-5 (showing a watch with two bands and a

buckle that communicates with a mobile phone).

B. Watches For Receiving Wireless Communication Signals From Mobile Devices Regarding Different Types of Events Were Known

46. Watches for receiving wireless communication signals from mobile devices regarding different types of events such as calendar notifications, reminders, text messages, and voice messages were known by 2003. For example, prior art regarding IBM's Linux Watch stated in 2002 that the watch was able to "run some personal information management application such as calendars, address books, to-do lists, and email summaries" and was able to "interact wirelessly with other computers running specific applications." Ex-1024 (Challenge of Miniaturization), 33; *see also* Ex-1025, 1 ("the watch will provide users with calendar, address book and to-do list functions"). The watch could also be used "to communicate with PCs, personal digital assistants (PDAs), and other wireless-enabled devices, viewing condensed e-mail and receiving pager-like messages." Ex-1024 (Challenge of Miniaturization), 33-34. For instance, "[t]ouching a corner of the watch face, the traveler brings up his agenda." *Id.* at 33.

A few blocks later, the watch vibrates, indicating a new message—e-mail from his son: "Dad, don't forget my Chicago Cubs cap." He also has a message from his secretary, who has gotten him a seat on the 12:30 p.m. flight and bumped his afternoon meeting with the marketing director to 4:00 p.m. Speaking into the watch, he sends a message to his wife's cell phone: "Flight delay. Can't pick up Rob after baseball." At the airport newsstand, the watch vibrates again, this time with a text message from his wife saying that their son has a ride home with

a friend.

Id.; see also Ex-1053 (Gilsoo), 501 (“A similar venture by Timex and Motorola has yielded the Beepwear. This is a full-featured digital watch that also includes a full featured pager. Users are able to receive complete text messages from both pages and voice mail. The watch alerts the user of a new messages by either beeping or flashing.”).

47. An IBM research paper from 2001 relating to the Linux Watch listed common applications that were requested for a smart watch including, for example: “Alarms - Hourly, Daily, Event Triggered, Twice Daily, Thrice Daily (reminder for medicines)”; “Managing Time: Personal Information Management (PIM) Functions. Some examples include calendar schedule, to do, phone/addresses, micro-email” and “Multi-user calendars - holds calendar of manager, spouse, team members, children, etc.”; “Just in Time information: Dynamic retrieval - pull, push and demand pull paradigms. Examples include a calendar that is always up to date” and “customized information delivery - stock quotes, weather, traffic.” Ex-1028, 6; see also Ex-1029 (IBM Linux watch application design), 10 (“All textual information on the wrist watch computer such as list of appointments, todo lists, email messages, etc., are stored as WML cards.”); Ex-1030, 22 (same), 24 (“[R]elative alarms are useful to remind people to shut off the stove in twenty minutes Simple text messages like those shown in Fig. 8 can be easily shown on the LCD display.”).

48. Casio's watches before 2003 were also known to include these features.

For example, the VDB-1000 had a "Casio Telememo function" that allowed users to "keep track of calendar entries, addresses, and more." Ex-1026, 1. Moreover, Casio's VIVCEL watch notified "users of incoming calls with vibrating alerts" and its HBX-100 watch allowed "data from a PIM (personal information manager) to be shared between the devices, including schedules, telephone directories, and task lists." *Id.* at 13; *see also* Ex-1053 (Gilsoo), 501 ("Finally, one of the most developed and sophisticated versions of the digital watch is the Casio Data Bank. This watch comes in a variety of styles, and utilizes a touch screen interface with the watch. The touch screen not only displays the time and date, but also has eight selectable icons that activate features such as a scheduler that includes a calendar to remind the wearer of important dates, a tele-memo that store 200 pages of names, phone numbers, addresses, appointments, and notes.").

49. Furthermore, Cannon teaches an indication unit for a portable wireless device, such as a mobile phone, that communicates wirelessly with the user's wristwatch such that when the user wearing the watch returns to the vicinity of the portable wireless device, the user is notified of any pending messages requiring the user's attention. Ex-1010 ¶¶9, 23. Cannon teaches that "a pending message requiring the user's attention may be an incoming message, e.g., incoming phone message, or a message indicating an upcoming appointment, birthday, or other event, etc." (Ex-

1010 ¶24) as well as a “voice message, text message, appointment or other reminder message, etc.” Ex-1010 ¶23. For example, “[i]f the message is a reminder message, it may come from a scheduling program being run by the portable wireless device” and “automatically notify the user” at “a predetermined time (e.g., one day, several hours, etc.)” before the upcoming event or appointment. Ex-1010 ¶25.

50. Watches were also known to be able to receive wireless communication signals from mobile devices regarding incoming calls and missed calls. For example, Britt Jr. teaches a method comprising “receiving a transmission from a first caller; identifying the first caller; and vibrating a device in a predetermined manner based on said first caller’s identity.” Ex-1046 (Britt Jr.) ¶¶8, 37 (“attachable embodiments of the portal device 150 include ... a pocket watch configuration” and “a sports configuration (e.g., wherein the portal device is strapped firmly around a user’s arm)”); *see also* Ex-1043 (Nakatake), Abstract (“When a mobile phone 2 receives an incoming voice call or data via a base station 1, the mobile phone 2 provides notification of the incoming voice call or data reception to the wrist watch 3 which also has built-in short-range wireless communicating means via a wireless device of the built-in short-range wireless communicating means.”); Ex-1048 (Valade) ¶¶1 (“The present invention relates to a method of notifying events received by one mobile terminal to another terminal connected to said one mobile terminal.”), 3 (“The arrival of a telephone call recorded by the Voicemail Service is notified to

users by a message displayed on their mobile telephone, and thus users are informed of the arrival of a message when they again have access to their mobile telephone.”), 4 (“Mobile terminals can also receive text, sound, or image messages (in particular text messages conforming to the Short Message Service (SMS) protocol).”), 5 (“All the above messages are notified to users on their mobile telephone, as a result of which users know that they can download or consult the data received, for example e-mails, **missed calls**, multimedia data, etc.”), 6 (“All the above messages, regardless of their type, are referred to generically as ‘events’ in the remainder of the description.”), 20 (“The invention enables the arrival of an event at a mobile terminal to be notified to any type of terminal connected thereto over a wireless interface, for example ... a wristwatch, etc. ... and to issue a notification for the attention of the user in the form of an audible, vibratory, visual, etc. message.”).

51. Additionally, receiving wireless communication signals regarding different types of events was a well-known feature in mobile devices by the time of the invention. For example, the Nokia Guide (Ex-1011) teaches a calendar that “keeps track of reminders, calls you need to make, meetings, and birthdays,” which “can even sound an alarm when it’s time for you to make a call or go to a meeting.” Ex-1011 (Nokia Guide), 96. When the user sets “calendar notes for the displayed date, the appropriate icon(s) appear in the lower right-hand corner” of the display including, for example, birthday, meeting, call, and other reminders. *Id.* at 97. The

Nokia Guide also teaches that the phone “saves the numbers and names (if available) of the last 10 callers that have tried unsuccessfully to reach” the user” and “[t]he screen tells you how many calls were missed” as well as “the caller’s name and number” if that information is stored in memory. *Id.* at 42. The Nokia Guide further teaches that when the user receives a voice message the “phone lets you know by beeping, displaying an icon on the screen, or showing a text message.” *Id.* at 44. When the user “receive[s] a text message, the phone displays Message received” and a corresponding icon indicator, “and makes a sound (depending on the ‘Message alert tone’).” *Id.* at 90; *see also* Ex-1034 (Siewiorek), 1 (“SenSay is a context-aware mobile phone that adapts to dynamically changing environmental and physiological states. ... SenSay augments its contextual knowledge by tapping into applications such as electronic calendars, address books, and task lists.”); Ex-1035 (Smailagic), 1-2 (“The initial applications of the mobile unit include navigation, personal scheduling, and collaboration between units and a central information server. ... The scheduling application: Displays user’s schedule[;] Schedules individual and group events[;] Provides convenient entry of schedule events.”); Ex-1036 (Agarwal), 12 (“[S]olutions based on the Intellisync technology have been deployed to allow school administrations of the New York City Board of Education to efficiently synchronize e-mail and calendar information between their Palm OS handhelds and the New York Board of Education’s Microsoft Exchange server.”).

52. A POSITA would have been motivated to include the features of mobile devices into a wristwatch for several reasons, largely driven by the technological advancements, market demand, and the inherent benefits of miniaturization and wearable computing. Here are expanded points on why a POSITA would have pursued such a combination:

(1) **Technological Advancements:** By the early 2000s, rapid advances in technology had already made it possible to incorporate significant computational power, memory, high-resolution displays, and wireless communication systems into small, portable devices like wristwatches. IBM's Linux Watch, as described in Ex-1029 (at 7), demonstrated that wristwatches were capable of running personal information management (PIM) applications such as calendars, address books, email summaries, and interacting wirelessly with other devices. These technological improvements motivated designers to miniaturize mobile device functions for wearable form factors, like a wristwatch, as the components became smaller, faster, and more efficient. The inclusion of mobile device features in wristwatches was simply a natural extension of these technological trends.

(2) **Portability and Convenience:** The wristwatch form factor provides an ideal platform for wearable computing because it is inherently portable and convenient. As highlighted in Ex-1029 (at 7) and Ex-1030 (at 17-18), the wristwatch is "always with you" and can be "instantly viewed with the flick of a wrist," which

makes it an attractive form factor for displaying notifications, managing personal information, and enabling quick access to communication features like incoming calls, emails, or text messages. A POSITA would have recognized that mobile devices already perform many of these functions, and integrating them into a wristwatch would make such functions even more accessible and convenient for users on the go.

(3) **User Demand for Integration:** By 2003, there was a growing market demand for smart devices that could combine multiple functionalities into a single, compact device. Mobile phones had already begun to incorporate features such as calendars, alarms, address books, and messaging systems, as shown in Ex-1011 (Nokia Guide). Users had come to expect these functionalities in their mobile devices, and extending these features into a wristwatch form factor would cater to this demand. A POSITA would have been motivated to meet user expectations by integrating mobile device features into a wristwatch, creating a more versatile and user-friendly product.

(4) **Improved Usability and Always-On Access:** A POSITA would have recognized the benefits of having key mobile device features, such as notifications for calendar events, reminders, and text messages, accessible on a wristwatch, which is worn constantly by the user. This allows users to receive notifications and interact with their personal information without needing to retrieve a mobile phone from

their pocket or bag, thus improving usability and reducing friction in user interaction.

As noted in Ex-1029, the wristwatch is a “familiar device” that naturally addresses the challenges of size and portability associated with mobile computing.

(5) Miniaturization and Wearable Computing Trends: IBM’s research into the Linux Watch (Ex-1028 (at 1-4, 7), Ex-1029) reflected a larger industry trend toward miniaturization and wearable computing. By 2001, it was clear that mobile computing was becoming smaller, more powerful, and more efficient. The wristwatch, as a form factor, provided an ideal platform for testing the limits of miniaturization, mechanical packaging, power management, and user interface design. A POSITA would have been motivated to combine mobile device features, such as wireless communication and personal management applications, into a wristwatch to take advantage of these technological developments and respond to the growing interest in wearable computers.

(6) Synergies with Other Devices: A POSITA would also have been motivated to integrate mobile device features into a wristwatch to enable better interoperability with other wireless devices such as PCs, PDAs, and smartphones. As described in Ex-1024, the Linux Watch could already communicate wirelessly with other computers, and devices like Casio’s watches (Ex-1026) were capable of sharing data between personal information managers (PIMs) and mobile phones. Integrating mobile device features such as notifications for calls, messages, and

appointments into a wristwatch would create a seamless ecosystem where the watch could serve as an extension of the mobile device, offering continuous updates and alerts without needing to directly interact with the phone.

(7) **Energy Efficiency and Power Management:** Power management was an ongoing challenge for mobile devices, especially those designed for constant wear, such as wristwatches. A POSITA would have recognized that integrating mobile device features into a wristwatch would allow for innovative approaches to power management by optimizing the display and notifications for lower power consumption. For example, as stated in Ex-1028 (at 1-4), the wristwatch could support “smaller” and “faster processors” and more efficient use of power, which would make it practical to integrate mobile device functionality in a way that did not overly drain battery life.

53. Furthermore, a POSITA would have been motivated to include the features of mobile devices into a wristwatch based on industrial applications of distributed notification systems in areas such as sports, healthcare, and emergency management and first responders. Each of these industries relies on real-time communication and alerts to improve efficiency, safety, and performance, making the wristwatch an ideal platform for delivering critical information through a wearable device.

C. Watches For Distinguishing Between A Plurality of Different Types of Motion Were Known

54. Watches for distinguishing between a plurality of different types of motion, including human motion, were known by 2003. For example, Casio's ALT-7000 watch in 1992 included "twin sensors for measuring altitude, barometric pressure, and temperature." Ex-1026, 4. Casio's CPW-100 watch in 1992 "incorporated a sensor for measuring compass bearings using geomagnetic readings," which "enabled users to stay on course even in poor visibility." *Id.* Casio's ATC-1100 in 1993 "had built-in magnetic, pressure, and temperature sensors" with integrated "altimeter, barometric pressure and direction readings, and thermometer. *Id.* at 6-7; *see also id.* at 10 (DPX-500). Casio's PRT-1GPJ watch in 1999 delivered "the first wristwatch in the world with GPS functionality" that "not only used location data from GPS satellites to determine the user's latitude and longitude, but also provided a graphic display of the direction and distance to a specified destination from the user's location." *Id.* at 15. A POSITA would have understood that GPS is used to detect motion of different types, from changes in position, altitude, and direction to metrics like velocity. *See, e.g.,* Ex-1010 (Cannon), claim 8 ("the motion sensor utilizes a global positioning system (GPS) receiver to detect motion"). Moreover, watches could detect velocity or speed and show, for example, miles per hour or kilometers per hour on the display. *See, e.g.,* Ex-1040 (Vock), 8:15-10:11 (speed sensing unit can determine the user's "[s]peed for any particular

period or run” and “provide[] substantially real-time data to the user such as the speed reached in a recent run” was “‘25 mph’ or ‘15 mph’” and show it on the “watch data unit”); Ex-1051 (Degen), 185-87 (SPEEDY watch detects “velocity towards the ground” because “speed estimation is only the first step in the process of detecting a potentially harmful fall”).

55. Additionally, prior art relating to IBM’s Linux Watch in 2002 stated that “[i]f the target device will have I/O devices—such as an accelerometer and GPS receiver—that are hard to stimulate using the keyboard and mouse, you can connect these I/O devices directly to the desktop computer.” Ex-1027 (Designing a New Form Factor), 45. Moreover, “the most recent version of the Linux Wristwatch prototype ... added a fingerprint sensor, a two-axis accelerometer, a battery that has five times the capacity, a battery gauge, three small dedicated buttons, and twice the memory capacity” *Id.* at 47. “Refinements in software” achieved by these additions “included power management, networking, mobility, and security.” *Id.* The IBM Linux Watch also included “[a] tilt switch ... to detect arm motions for gesture input.” Ex-1031 (Linux Watch Hardware Platform), 2; *see also* Ex-1032 (Sato), Abstract (teaching a watch with “an attitude-detecting switch incorporated in the instrument,” which “detects the attitude, and outputs a switch signal to a CPU” that “in turn, drives a lighting device for lighting a liquid crystal display” of the watch thereby reducing power consumption (1:43-47)), 4:48-5:19 (describing how the

attitude-detecting switch is turned on and off based on wrist watch movements), Figs. 1, 6-7, 11.

56. Furthermore, Vock describes a watch for sensing and displaying various measures of motion or forces while a user is participating in a sport or athletic activity. “FIG. 38 shows a ‘shock’ or ‘G’ or power digital watch 1020 constructed according to the invention.” Ex-1040 (Vock), 44:26-27. “The watch 1020 also holds a power sensing unit 1032” (*id.*, 44:33-34), which “provides a measure of the intensity or how ‘hard’ the user played during a particular activity.” *Id.*, 10:15-17. The power sensing unit includes, for example, one or more microphones or accelerometers. *Id.*, 44:55-56. The watch also includes an altimeter to provide a “dual drop distance and-power watch embodiment.” *Id.*, 44:66-45:5. The power and drop described in Vock are measures of the user’s motion. For example, Vock teaches that “this embodiment takes advantage of the fact that many Sports include waving and movement of the user’s arm (e.g., tennis and volley-ball); and thus power is determined through the techniques herein to inform the user of this performance data, through the watch 1020.” Ex-1040 (Vock), 44:43-47.

57. There are many other examples in the literature by 2003 of sensors being used to detect motion in wearable devices (including wrist watches). For example, accelerometers “are used to measure patterns of movement.” Ex-1050 (Bonato), 20 (using an accelerometer in a wearable device to “analyze patterns of

acceleration signals recorded from both healthy individuals and poststroke hemiplegic subjects and demonstrate that characteristic patterns mark acceleration signals recorded from patients with different degrees of impairment”). They are also used for fall detection and were used for this purpose in the SPEEDY wristwatch by 2003. Ex-1051 (Degen), 184-185 (two sensors measure acceleration on three axes with detection based on norm of acceleration); *see also* Ex-1061 (Qian), 1 (wireless accelerometers can be used for fall detection), 2 (“Body attached accelerometers and gyroscopes have been used to detect human activities, including falls. ... 3-axis accelerometer is the most powerful sensor for wearable device, and it is normally integrated in mobile phones.”). Accelerometers are additionally used in wearable devices to detect shock and gestures. Ex-1062 (Rekimoto), 23 (“Gesturewrist is a wristwatch-type input device that recognizes human hand gestures by capacitively measuring wrist-shape changes and also measuring forearm movements. Figure 2 shows the current Gesturewrist prototype. This device consists of two input sensors (capacitance and acceleration sensors), and one tactile feedback actuator. The prototype is fabricated by attaching the sensors and actuators to a conventional wristwatch. ... Gesturewrist recognizes hand gestures by measuring the changes of the arm shape on the inside of the wristband.”), 24 (“In addition to the hand-shape measurement, an acceleration sensor (Analog Devices ADXL202) is mounted on the wristwatch dial. This sensor is a solid-state 2-axis sensor and measures the

inclination of the forearm.”); Ex-1052 (Fukumoto), 148 (“A small accelerometer is worn on the base of each finger to detect the typing shocks generated by tapping the finger on any typing surface such as the thigh, knee or desk.”); *see also* Ex-1054 (Hinckley), 92 (adding a two-axis linear accelerometer (tilt sensor) among other sensors to a mobile device, which combined “to capture natural, informative gestures”); Ex-1056 (Jonker), 1147 (“Inertial sensors sense accelerations and rotations. This means that they can follow changes in position. These motion, or inertial sensors are quite fast, so they can track fast motions.”), 1147-48 (“Motion sensors are cheap sensors that only sense a change of motion. Using this information the PDA may determine what the bearer is doing: sitting, walking, running, etc. use this information to display the activity of the user.”); Ex-1058 (Ladetto), 3 (“accelerometers detect step occurrences and the direction of displacement (forwards, backwards, left, and right)”); Ex-1059 (Meijer), 221 (“Motion sensors may be applied for the assessment of physical activity.”), 222 (“[O]f all portable movement counters, the electronic accelerometers are the most promising ones due to their accuracy in measuring accelerations, the ease of calibration by gain adjustment, and the still growing possibilities of data storage on a single chip which will extend the length of time a subject can be studied as well as diminish the time resolution to shorter intervals. ... [T]he goal one is aiming at when using an accelerometer is to assess movements of the body in order to get a quantitative

measure of physical activity.”), 227 (“[A]n accelerometer based on a piezoelectric sensor seems to be superior to other motion sensors.”); Ex-1060 (Ouchi), 791 (“a wristwatch-shaped wearable sensor module and a personal digital assistant (PDA) ... equipped with sensors of accelerometer, pulse meter, thermometer, galvanic skin reflex (GSR) electrodes and Bluetooth module to communicate with the PDA, monitors the user’s context: health conditions, movements and behaviors”), 792 (“the microcontroller recognizes pulse rate from pulse waves and movements (‘Walking’, ‘Running’, ‘Working’, and ‘Quiet’) from accelerations on the wrist in real time”).

58. GPS, magnetocompass, inclination sensors, and gyroscopes were also used in watches by 1998 to detect position. Ex-1055 (Itao), 329-330 (“A miniature space watch with GPS, magnetocompass, inclination sensor, gyroscope and watch functions will initiate a new era of measurement technology. This will also become a milestone toward wearable computers. ... For the measurement of space (position), a gyroscope, inclination (gravity) sensor and magnetocompass will generally be used simultaneously.”); *see also* Ex-1058 (Ladetto), 4-5 (“altitude can [] be obtained from GPS data”).

59. Tilt sensors have also been used for gesture detection and power management including in the IBM wristwatch. Ex-1057 (Kamijoh), 136 (“The processor supports two power saving modes called *Idle* and *Standby* which are

described below. In addition, we ensured the input devices on the watch, namely a touch panel, a roller wheel and a tilt sensor, consumed no power in the *Standby* mode.”); Ex-1054 (Hinckley), 96 (tilt sensor detects “gestures and automatically reformat[s] the display to suit the current viewing orientation”), 99 (tilt sensor can prevent the device “from powering up due to transient signals” and “prevent undesired power-off or screen dimming due to the default system inactivity time-outs”). And barometers have been used to detect speed. Ex-1058 (Ladetto), 4 (“With barometer data, [the Pedestrian Navigation Module] can determine 3-dimensional speed.”); Ex-1063 (Sung), 5 (“Two dual-axis accelerometers (ADXL202E) combined with a single tri-axis magnetometer (HMC1023) make up the Orientation/Tilt Sensing Unit. Each type of sensors by themselves can provide separate sensing data of either the student’s acceleration (motion detection) or the presence of ferrous material nearby. When combined, these two different type of sensor can act as a tilt-compensated compass which provides accurate Orientation/Tilt of the iBadge. The dual-axis accelerometer is soldered perpendicularly to the iBadge and it provides pitch and roll of the iBadge with respect to Earth’s gravity. The magnetometer with X, Y, and Z axis measures the earth magnetic field along each axis which in turn can be used to discover the orientation of iBadge with respect to the earth’s magnetic field.”).

60. A POSITA would have recognized the importance of including motion

sensing to differentiate between a plurality of different types of motion in a wristwatch for several reasons, as outlined by the state of the art by 2003 including:

(1) **Improved Usability and Convenience:** One of the key reasons for incorporating motion sensing into a wristwatch is to enhance the overall usability and convenience of the device. By distinguishing between different types of motion, the watch could intelligently respond to specific user actions without requiring manual input. For example, detecting wrist rotations could trigger the display to light up, allowing users to easily check the time or other information without the need for pressing buttons. *See, e.g.,* Ex-1026, 14; Ex-1032. This improves the user experience by making interactions with the watch more seamless, natural, and hands-free, particularly in situations where manual operation would be inconvenient (e.g., during exercise or driving).

(2) **Enhanced Power Management:** One of the significant challenges in wearable technology is power consumption, and motion sensing provides an effective solution. A POSITA would have recognized that a wristwatch equipped with motion sensors could conserve power by only activating certain functions when necessary. For example, Casio watches and IBM's Linux Watch incorporated tilt sensors to activate displays when the user rotated their wrist. This type of power management ensures that energy-intensive functions (like the display backlight) are only activated when the watch senses motion indicative of the user checking the

device. In the broader context of wearable technology, differentiating between types of motion—such as distinguishing between active user engagement and idle states—would allow the watch to optimize power usage and prolong battery life, a critical feature for always-on devices. *See, e.g.,* Ex-1027, 47 (fingerprint sensor, accelerometer, battery, buttons, memory added to Linux Watch to refine “power management, networking, mobility, and security”).

(3) Context-Aware Features and Advanced Functionality: By enabling a wristwatch to differentiate between various types of motion, the device becomes more context-aware and capable of providing advanced functionalities tailored to specific activities. For example, motion sensors such as accelerometers and gyroscopes can help the device identify specific user activities—whether the user is walking, running, or even playing sports like tennis or volleyball. As noted in Vock’s teaching, the ability to measure shock, power, and drop distances provides valuable performance data in sports applications. A POSITA would have recognized that such context-aware features, which track and respond to user motion, would open new possibilities for fitness tracking, performance monitoring, and even gesture-based controls, making the watch more versatile and appealing to a wider audience.

(4) Safety and Navigation Benefits: Motion sensing would also have significant implications for safety and navigation. Casio’s CPW-100 and PRT-1GPJ watches incorporated sensors to measure compass bearings and GPS data,

respectively, allowing users to navigate effectively even in poor visibility or remote locations. A POSITA would have understood that differentiating between types of motion, such as stationary versus active motion, would further enhance the functionality of these sensors. For example, by recognizing when the user is stationary, the watch could automatically provide more accurate directional or location-based data, crucial for hikers or adventurers relying on their devices for navigation in unfamiliar environments. Additionally, motion differentiation could be used to alert users of sudden or unusual movements, contributing to safety during activities like hiking or extreme sports.

(5) **Personalization and Gesture Recognition:** Another reason a POSITA would have recognized the importance of differentiating motion types is the potential for personalization and gesture recognition. The integration of accelerometers and tilt switches, as seen in IBM's Linux Watch, allows for personalized interactions such as gesture-based inputs. Ex-1031, 2. A POSITA would have understood that distinguishing between a variety of gestures—such as raising the wrist to activate the display or shaking the watch to dismiss notifications—would offer users a customizable experience that adapts to their personal preferences and needs. These features add layers of convenience and efficiency, enabling users to interact with the device in more intuitive and personalized ways.

(6) **Historical Precedent and Proven Benefits:** By 2003, several wristwatches had already successfully integrated motion-sensing technology. For instance, Casio's ALT-7000 (measuring altitude, barometric pressure, and temperature) and CPW-100 (compass bearings using geomagnetic readings) demonstrated that motion and environmental sensors were practical and useful in wearable devices. Ex-1026, 4, 7, 10. These precedents would have further motivated a POSITA to implement motion-sensing capabilities in wristwatches, recognizing the established benefits in usability, power management, and added functionality. Additionally, IBM's Linux Watch incorporated both accelerometers and tilt switches to enhance usability and refine functions such as power management, networking, and gesture detection, offering a direct example of how these features could improve the overall user experience.

D. Watches For Providing Various Types of User-Perceivable Notification Signals To the User Dependent on the Wireless Communication Signals Were Known

61. Watches for providing various types of user-perceivable notification signals such as vibration, audio, and display using amplifiers, speakers, and LEDs to the user dependent on the wireless communication signals were known by 2003. Moreover, it was also known that a user could select the same type of signal for notification of multiple different events or a different type of signal for notification of each different event.

62. For example, the prior art IBM Linux Watch was capable of producing vibration and audio signals through a speaker and had “an organic light-emitting diode (OLED) display.” Ex-1024 (Challenge of Miniaturization), 33, 35; *see also* Ex-1029 (IBM Linux Watch application design), 12 (“When an alarm is activated the wrist watch computer plays a sound on the speaker and presents the associated message title if any, on the display. ... We allow the user to set a *quiet time* from the clock face screen. ... This application quickly allows the user to turn off audible alarms until a specified time as shown in Figure 6.”); Ex-1030, 24-25 (same). Casio’s VIVCEL watch allowed the user to “select either tone or vibration for the alarm and hourly time signal operations” and toggle between vibration and tone “for the alarm and hourly time signal operations.” Ex-1041 (Casio VIVCEL Manual), 3.

63. Moreover, Cannon teaches that “a pending message requiring the user’s attention may be an incoming message, e.g., incoming phone message, or a message indicating an upcoming appointment, birthday, or other event, etc.” (Ex-1010 ¶24) as well as a “voice message, text message, appointment or other reminder message, etc.” Ex-1010 ¶23. Cannon further teaches that the user indication “might be an audible signal, a vibration, flashing lights or other indication which a user will quickly notice upon his return to a portable wireless device.” Ex-1010 ¶34; *see also id.* ¶6 (“a typical message-waiting indicator might be a flashing envelope to signify there is a message waiting” or “an available annunciation message may be indicated

by another display icon”), Fig. 4; *see also* Ex-1049 (Logan), 21:31-55 (“The ‘web of rules’ defined by the user could detect and inform the user of a rich variety of events. For instance, if the user’s electronic watch was in proximity to her car during the day on Monday through Friday, then the user’s cell phone and briefcase should also be in proximity to the car. ... Thus, the user can define a rule which states that, if the watch is within the range of the car during business hours on Monday through Friday, and further if either the cell phone or the briefcase are not in the vicinity of the car at that time, the user should be alerted in of a variety of user-defined ways. ... In the foregoing example, the user can be notified by a actuating a suitable alarm on a device known to be with the user (e.g., by causing her watch [to] sound an audible alarm or vibrate.”), 22:42-46 (“The rule-based system may be used to produce ‘place-based’ alarms. The user may define a rule such as ‘If my wristwatch is at my office and the time of day is between 5:00 pm and 6:00 pm, then activate an audio alarm on my wrist-watch.’”).

64. Britt Jr. also teaches a system wherein a user can select the same or different types of user-perceivable notification signals corresponding to multiple events on a portable device such as a pocket watch or other device “strapped firmly around a user’s arm.” Ex-1046 (Britt Jr.) ¶37. Specifically, Britt Jr. states that “many wireless and non-wireless telephony devices offer ‘distinctive ring’ features.” *Id.* ¶72. For example, “a telephony device may be configured to identify a caller and

ring in a specified way based on the identity of the caller. For example, a user may configure his/her telephone to announce a call from ‘Caller A’ by two short rings followed by a third long ring. Distinctive ring features are particularly useful for telephones which do not have caller ID displays and/or in situations where the caller ID displays are not easily viewable.” *Id.* “Many wireless and non-wireless telephony devices also include a ‘vibrate alert’ feature which, when selected by the user, will cause the telephony device to vibrate rather than ring.” *Id.* ¶73. A “distinctive vibrate” feature “allows users to identify callers based on the manner in which the portal device 150 vibrates” such that “when that user switches the portal device to ‘distinctive vibrate’ (e.g., during a meeting) a call from ‘Caller A’ will then be announced by two short vibrate periods followed by one long vibrate period. It will be appreciated that various other ring/vibrate ‘fingerprints’ may be configured consistent with the underlying principles of the invention.” *Id.* ¶74. Britt Jr. further teaches that “the user of the portal device 150 may configure the device (in conjunction with the portal sever 110) to vibrate/ring in the same manner for emails, IP telephony calls, instant messages, etc, transmitted by Caller A (i.e., in addition to standard telephone calls). Alternatively, or on addition, the portal device 150 may be configured to vibrate/ring in a slightly different manner when Caller A transmits an email message than when Caller A makes a telephone call. For example, the vibration/ring pattern may be the same but it may be followed by an additional

Vibration/ring. Alternatively, or in addition, the speed of the vibration/ring pattern may be different. Various other vibration/ring patterns may be employed to identify ‘callers’ consistent with the underlying principles of the invention.” *Id.* ¶76; *see also* Ex-1047 (Hsu), 1:39-41 (“Typically, the user can select between several different types of available ringing tones and one or more vibration modes.”), 2:63-65 (“the monitor tool may be worn in a manner similar to a wrist-watch or incorporated into a housing with a wristwatch”), 4:66-5:2 (the network sends alerts “when there is an incoming call ... or an incoming data message (e-mail or the like)”), 5:25-31 (the watch “allows the user to easily perceive the various alert signals”), 7:20-35 (microprocessor provides instructions “to generate various output tones through the speaker 32, upon occurrence of various conditions, such as a user selected ring tone in response to an incoming call or message” or “to cause perceptible vibrations ... as an alternative to or in addition to one or more of the ringing alert tones”), 8:57-61 (“[d]epending on the user-selected mode of operation, the microprocessor 51 may instruct the tone generator 59 to output a selected tone through the speaker 43 or instruct the piezoelectric element 61 to generate perceptible vibrations”), 10:24-32 (the watch’s microprocessor operates similarly to the mobile device to provide alerts signals to the user).

65. Allowing the user to select the same or different user-perceivable notification signal corresponding to multiple events was also a well-known feature

in mobile phones by the time of the invention. Specifically, the Nokia Guide “profiles feature lets you adjust and customize the phone’s ringing tones for different events, environments, and caller groups.” Ex-1011 (Nokia Guide), 46. For example, the Nokia Guide allows the user to “create groups of names in your phone book and give each group a different ringing tone” so that “[w]hen someone from that group calls, you’ll know because of the ringing tone.” *Id.* at 63. The profiles feature also lets the user “set your phone’s sound settings to whatever environment you find yourself in, whether it’s a meeting or a soccer game” because “[e]ach profile contains setting for your phone’s ringing option, ringing tone, ringing volume, vibrating alert, message alert tone, keypad tones, and warning and game tones” and “[l]ights.” *Id.* at 68-69 (the phone “comes programmed with 35 ringing tones”). The user can also “set[] the tone your phone makes when you get a message.” *Id.* at 71; *see also* Ex-1034 (Siewiorek), 4 (action module supports basic operations that are “configurable” such as ringer control (off/low/medium/high), vibrate control (on/off), sending an SMS to a caller making call suggestions, and providing access to an electronic calendar; “user interfaces communicate the phone’s status to the user and permit manual override of the phone’s decisions while allowing the input of preferences”; “Figure 7 shows the SenSay user interface on the mobile phone for overriding the phone’s state to the user’s preference”), 7 (“[I]f the user is running ... while a meeting is scheduled in their electronic calendar at the same time, the phone

would enter the Uninterruptible state because a calendar appointment is given a higher priority.”); Ex-1037 (Dey), 3 (“The tool provides an audio or vibration signal” but “[b]oth types of cues may be inappropriate in various situations (e.g., audio cues in a meeting are disruptive and vibration cues while jogging may not be noticed). This suggests that the manner in which reminders are delivered is also extremely important.”), 7-8 (“CybreMinder determines what is the most appropriate delivery mechanism for each reminder recipient. The default signal is to show the reminder on the closest available display, augmented with an audio cue. However, if the recipient wishes, they can specify a configuration file that will override this default. A user’s configuration file contains information about all of the available methods for contacting the user, as well as rules defined by the user on which method to use in which situation.”); Ex-1038 (Gellerson), 10 (“State of the art mobile phones support so-called profiles to group settings, such as notification mode, input and output modality, and reaction to incoming messages and calls. Users can define profiles for different situations and specify behavior desired in those situations.”); Ex-1039 (Sawhney), 6 (“On some pagers and mobile phones users can define ringing tones for preferred people or caller groups The Profile function on the Nokia 6100 phones enables users to adjust the ringing tones according to various situations and caller group identification.”), 14-17 (“In Nomadic Radio, the user is notified of message arrival using a variety of auditory cues, synthetic speech and scaled audio,

based on the inferred priority of the message and user context. Messages are scaled dynamically to unfold as seven increasing levels of notification. ... In Nomadic Radio, ambient auditory cues are continuously played in the background to provide an awareness of the operational state of the system and ongoing status of messages being downloaded (Figure 6). The sound of flowing water provides an unobtrusive form of ambient awareness that indicates the system is active (silence indicates sleep mode). Such a sound tends to fade into the perceptual background after a short time, so it does not distract the listener. The pitch is increased during file downloads, momentarily foregrounding the ambient sound. A short e-mail message sounds like a splash while a two-minute audio news summary is heard as faster flowing water while being downloaded. This implicitly indicates message size without the need for additional audio cues and prepares the listener to hear (or deactivate) the message before it becomes available. Such peripheral awareness minimizes cognitive overhead of monitoring incoming messages relative to notifications played as distinct auditory cues, which incur a somewhat higher cost of attention on part of the listener. ... In a related project, 'email glances' were formulated as a stream of short sounds indicating category, sender and content flags (from keywords in the message). In Nomadic Radio, message priority inferred from email content filtering provides distinct auditory cues (assigned by the user) for group, personal, timely, and important messages. In addition, auditory cues such as telephone ringing

indicate voice mail, whereas an extracted sound of a station identifier indicates a news summary.”); Ex-1042 (Shiraishi) 6:21-24 (“notification of information to the user is performed by giving signs which act on one of five senses of the user, based on the contents of plurality of types of information and the state of the user”), 16:64-17:8 (notifying by vibration, audio, and display), 14:9-10 (“the portable device 1 is worn by a user by being wound around a wrist”), Fig. 1A (same), 15:35-45 (same), 18:62-65 (“pressing of the zoom-in button 14B opens a window which enables setting of desired date and time and selection of desired notification means such as alarming tone, beep, vibration or the like”), 19:1-17 (“The notification unit is switchable to select one of three portions: namely, a first notification portion that performs notification in accordance with the state or condition of the user, a second notification portion that performs the notification based on the content of the information, and a third notification portion that performs notification in accordance with the degree of importance or urgency. For instance, weak blinking is selected for a time period in which the user is sleeping. In case of a meeting, arrival of a mail is notified by way of vibration rather than sound, so as not to disturb the meeting. It is possible to arrange such that a notification of arrival of a mail is made by voice which announces the name of the user. Various other notification means are usable such as tone changing means, voice changing means, vibration generating means, smell generating means, light generating means, electricity generating means for

giving an electrical shock, and so forth.”).

66. A POSITA would have understood that this feature in mobile phones could be applied to wristwatches for the same reasons described in Section V.B above. In addition, a POSITA would have understood that many of the features found in mobile phones, particularly user-perceivable notification signals (vibration, audio, and display) and customizable notifications for different events, could be readily applied to wristwatches for several reasons:

(1) **User-Centric Design:** A POSITA would have recognized that user-centric design principles were driving the development of both mobile phones and wristwatches. In mobile phones, the ability to customize notifications based on different events and contexts was well established, as seen in devices like the Nokia 6100, which allowed users to assign unique ring tones to different caller groups or set distinct notification profiles for different environments (e.g., silent mode for meetings, loud mode for outdoor use). A POSITA would have understood that this same philosophy—allowing users to personalize how and when they receive alerts—would be equally important in wristwatches, especially as these devices took on more communication-related functions. For example, a user could set their wristwatch to vibrate for calendar reminders but use an audible tone for incoming calls, thus creating a seamless and customized notification experience across both

their phone and wristwatch and to create appropriate alerts based on the user's preferences and environment.

(2) **Practical Advantages of Unified Notification Systems:** As mobile phones and wristwatches became more integrated, particularly through wireless communication, having a unified system for notifications across devices would be highly beneficial. A POSITA would have understood that applying mobile phone-like notification systems to wristwatches would create a cohesive user experience, where both devices work in tandem to deliver consistent alerts. For example, a user could set their phone and watch to use the same vibration pattern for a text message or assign a different ring tone to their watch for incoming calls. This would allow users to interact with both devices in a more seamless manner, reducing confusion and improving efficiency. A POSITA would also have appreciated that integrating mobile phone notification features into wristwatches could reduce cognitive load by streamlining user interactions with multiple devices. By applying mobile phone notification systems to wristwatches, users could filter and manage notifications more effectively, receiving only the most relevant alerts on their watch while leaving less urgent notifications for their phone.

E. Watches For Sending Wireless Communication Signals to Mobile Devices Were Known

67. Watches for sending wireless communication signals to mobile devices including to answer an incoming call, send voice signals, and send voice signals for

an active call were known by 2003. For example, prior art regarding IBM's Linux Watch stated in 2002 that the user "[s]peaking into the watch, [] sends a message to his wife's cell phone: 'Flight delay. Can't pick up Rob after baseball.'" Ex-1024, 33. This example highlights how the Linux Watch was already capable of two-way communication, effectively functioning as a portable communication device. Such functionality underscored the growing potential for watches to serve as independent communication hubs, enabling users to initiate and manage voice communication without relying solely on the mobile phone. Moreover, several smart watches were commercially available by 2000 that had a telephone feature including the NTT PHS Personal Handy Phone System and Samsung's Watchphone Anycall. Ex-1029, 7, 9 ("The wrist watch includes a microphone and speaker, so that speech based interfaces are possible."); Ex-1030, 18 (same), 20 (same); *see also* Ex-1039 (Sawhney), 7 ("A good example of a wearable audio interface is embodied in the Wristwatch-type PHS telephone developed by NTT. A combination of voice recognition and four operation buttons are used for all call-handling functions. ... [M]ost users preferred communication via the watch's built-in loudspeaker, rather than the wear ear-microphone units."). This user preference reflects the potential for wristwatches to become even more functional and user-friendly, integrating communication features in ways that complemented everyday activities. This demonstrates further integration of mobile communication functions into

wristwatches, allowing them to serve as extensions or replacements for traditional mobile phones. Ex-1043 (Nakatake), Abstract (“When a mobile phone 2 receives an incoming voice call or data via a base station 1, the mobile phone 2 provides notification of the incoming voice call or data reception to the wrist watch 3 which also has built-in short-range wireless communicating means via a wireless device of the built-in short-range wireless communicating means. The wrist watch 3 determines whether or not voice or data needs to be transferred to the wrist watch, and transmits the result to the mobile phone 2. If transfer is required, voice communication or data display is performed using the microphone 35 and earphone 34 or the LCD 33 on the wrist watch 3, respectively.”); Ex-1053 (Gilsoo), 501 (“Another popular watch manufacturer, Swatch Telecom, is developing a digital watch that contains a cordless phone. Further in the future, Swatch is planning a version of the watch that not only tells time, but will also function as a mobile cellular telephone.”). This demonstrates that wristwatches were not just capable of passive communication (i.e., receiving notifications) but could actively participate in managing voice and data communications, further integrating with mobile phones to enhance the overall user experience.

68. By 2003, the concept of wristwatches being able to send wireless communication signals to mobile devices—including initiating calls, transmitting voice signals, and managing active voice communications—was well-established in

the prior art. Watches like the IBM Linux Watch, Samsung's Watchphone Anycall, and NTT's PHS demonstrated that wristwatches were evolving into powerful communication tools, capable of handling complex interactions that were previously the domain of mobile phones. These early smartwatches featured built-in microphones, speakers, and wireless communication systems, enabling users to make and receive calls, send voice messages, and interact with other mobile devices. This progression would have been clearly understood by a POSITA, who would have recognized the value of integrating these wireless communication capabilities into wristwatches to enhance usability, convenience, and portability.

VI. THE PRIOR ART IN THE APPLIED INVALIDITY GROUNDS

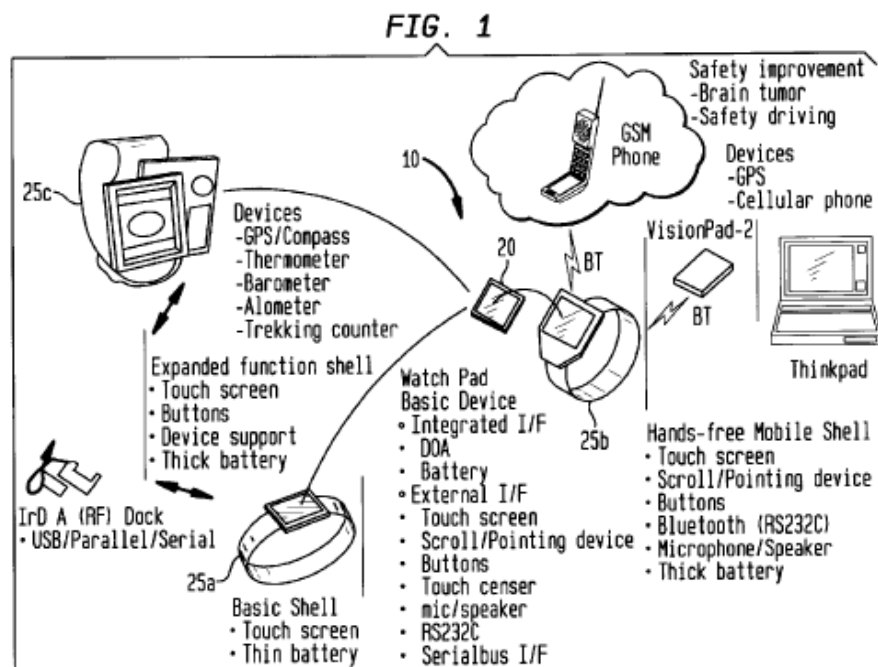
A. Narayanaswami (U.S. Patent No. 6,477,117) (Ex-1005)

69. Narayanaswami (U.S. Patent No. 6,477,117) was filed June 30, 2000, issued November 5, 2002. As explained to me by counsel, I understand that Narayanaswami qualifies as prior art under pre-AIA 35 U.S.C. §102(e).

70. Narayanaswami teaches a system that “looks like a regular watch but is capable of receiving information from adjunct devices such as a PC, a mobile computer, other pervasive devices being carried by the user and directly from a network via a wireless communications mechanism.” Ex-1005, 3:28-33. The watch includes a user interface that allows the user to receive notifications on the watch. Ex-1005, Abstract. For example, “caller Id information may be displayed on the

Wrist Watch display when the cell phone that belongs to that person rings.” Ex-1005, 8:3-5. Moreover, an alarm may come from the user’s PC, which maintains a list of the user’s appointments, “indicating what the appointment was,” and this information may be inputted to the watch so that it “subsequently activate[s] the alarm at the programmed time, and accordingly indicate[s] the associated text.” Ex-1005, 9:23-31.

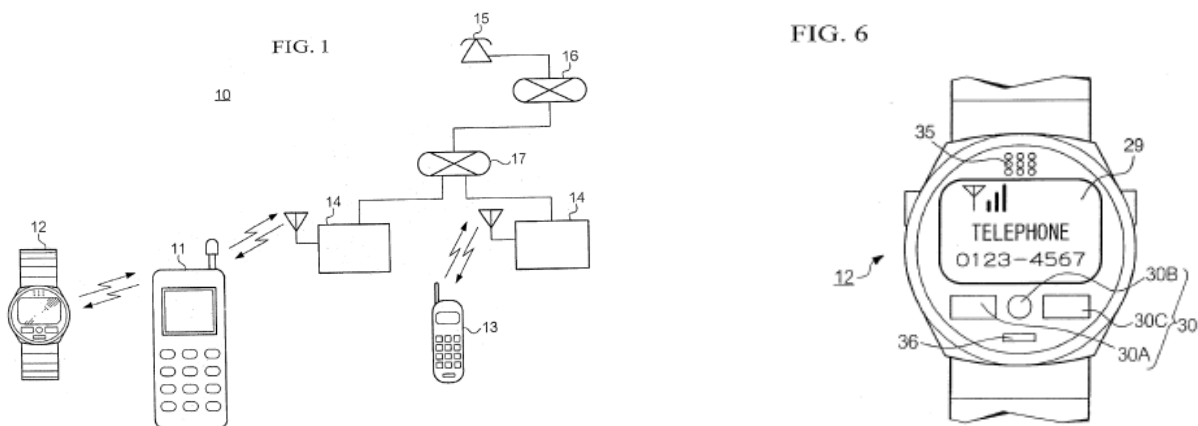
71. Narayanaswami further teaches, as shown in Figure 1 below, that its “base card 20 may be implemented in ... an expanded function shell 25c, providing touch screen, buttons and support for various devices such as GPS/compass, thermometer, barometer, altimeter, etc.” Ex-1005, 3:40-50. Additional sensors may also “be attached to the Wrist Watch device over an interface” such as “tilt and motion (velocity, direction, speed) sensors.” Ex-1005, 6:15-19.



B. Fujisawa (U.S. Patent Publication No. 2002/0115478) (Ex-1006)

72. Fujisawa (U.S. Patent Publication No. 2002/0115478) was filed as a PCT application on June 21, 2001 and published August 22, 2002. As explained to me by counsel, I understand that Fujisawa qualifies as prior art under 35 U.S.C. §102(e).

73. Fujisawa teaches a “watch-shaped information processing device 12,” shown in Figure 1 below, which “performs bidirectional radio communication with the mobile telephone 11.” Ex-1006 ¶128, Fig. 1; *see also id.* ¶7 (“The local and bidirectional communication may be a Bluetooth communication.”). For example, “[w]hen there is an incoming call to a mobile telephone, it sends an incoming call notification signal to” the watch, which allows the user to communicate with other users in a mobile telephone system. Ex-1006, Abstract, Fig. 6.



74. The watch performs a variety of functions, such as call answering, recording and playback of voicemail messages, and email, in conjunction with the mobile telephone. *See, e.g.,* Ex-1006, Figs. 18, 19, 28.

FIG. 18

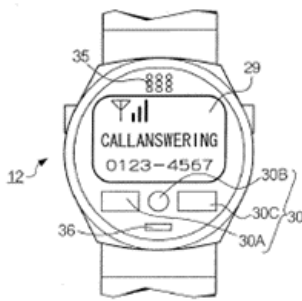


FIG. 19

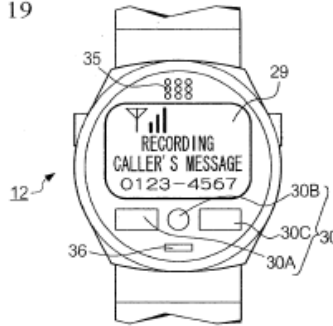


FIG. 28



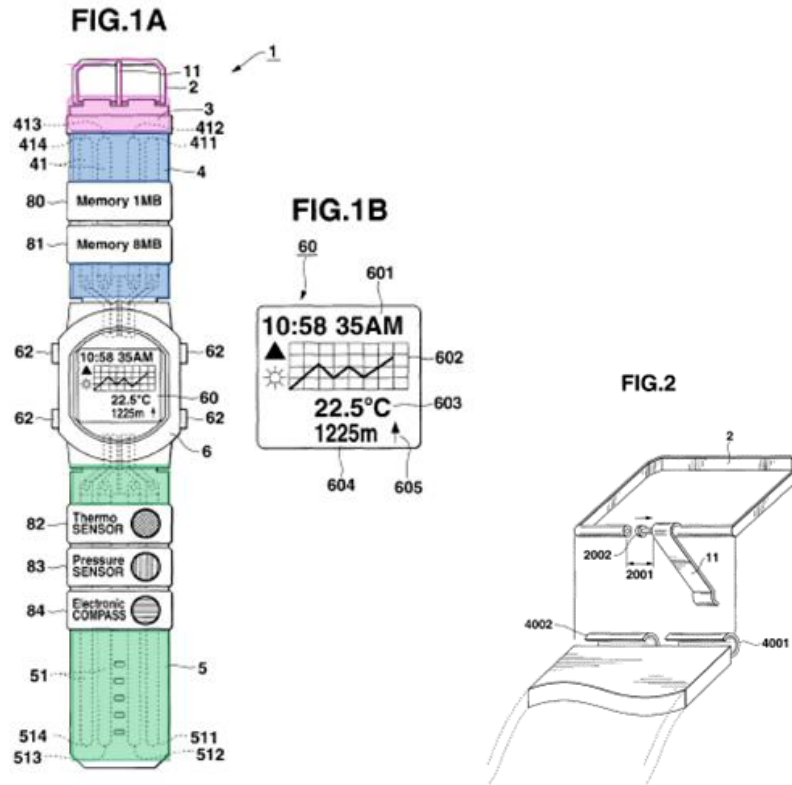
75. Fujisawa also describes various mechanisms to notify a user of an incoming call, including “the electronic sound unit 26 to produce a buzzer sound or an electronic sound, the vibrator 27 to produce a vibration, or the light emitting unit 28 to blink light emitting device such as an LED.” Ex-1006 ¶156.

C. Kita’514 (U.S. Patent Publication No. 2001/0043514) (Ex-1007)

76. Kita’514 (U.S. Patent Publication No. 2001/0043514) was filed May 15, 2001 and published November 22, 2001. As explained to me by counsel, I understand that Kita’514 qualifies as prior art under 35 U.S.C. §102(b).

77. Kita’514 teaches a wearable information processing device such as a wristwatch that has two watch bands and a buckle. Ex-1007 ¶¶11, 181. As shown in Figures 1-2 below, “a pair of wrist bands 4 [(green)] and 5 [(blue)] ... are attached to opposing ends of the body case 6 to serve as members for securely wearing the wristwatch 1 on a body (wrist)” and “wrist band 4 is removably joined to a buckle member 2 [(pink)] by means of a buckle member through hole 4001 and a notch 4002.” Ex-1007 ¶¶109-110, Figs. 1-2. Kita’514 also teaches that band fastening loop member 3, buckle member 2, and center fastening pin 11 “are attached to an end of

the wrist band 4.” Ex-1007 ¶120; *see also id.*, Figs. 12 and 18 (showing a buckle and two watch bands).



78. Kita’514 further teaches that the control circuit of its wristwatch references a “sensor function module table 1666” to determine whether “a function module unit fitted on and connected to the wrist bands 4 and 5 provides a sensor function.” Ex-1007 ¶399. As shown in Figure 53 below, sensor functions include an accelerometer, barometer for detecting altitude and depth, direction sensor, positioning meter, and speed meter. Ex-1007, Fig. 53.

FIG.53

1666

MODULE ID CODE	MODULE SPECIFICATION CODE	FUNCTION
0100	0000	SENSOR SYSTEM (MEASUREMENT PROCESSING)
0100	0100	THERMOMETER (°C)
0100	0010	BAROMETER (hPa) —ALTITUDE, DEPTH—
0100	0011	DIRECTION SENSOR (°)
0100	0011	POSITIONING METER (° , ")
0100	0101	ACCELEROMETER (G)
0100	0110	SPEED METER (km/h)
0100	0111	RADIATION THERMOMETER (°C)
0100	1000	PULSE RATE MEASUREMENT (PULSE/SECOND)
0100	1001	SPHYGMOMANOMETER (mmHg)
0100	1111	SENSOR SYSTEM RESERVED

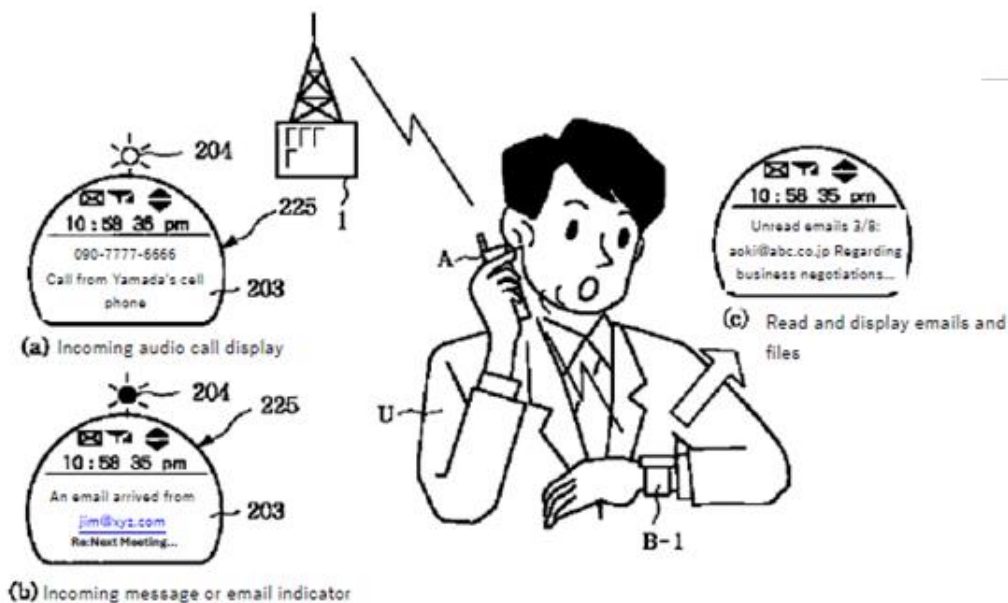
D. Kita'039 (JP Patent Publication No. 2002/125039) (Ex-1008)

79. Kita'039 (JP Patent Publication No. 2002/125039) was filed October 16, 2000 and published April 26, 2002. As explained to me by counsel, I understand that Kita'039 qualifies as prior art under 35 U.S.C. §102(a).

80. Kita'039 teaches that a mobile-phone type parent terminal “forms a wireless link relationship with the child terminal” (Ex-1008 ¶33) that is a wristwatch. Ex-1008 ¶32. As depicted in Figure 12 below, “if a user U carries the parent terminal A in a breast pocket or the like and wears the child terminal B-2 on their arm, the user U can recognize an incoming call by LED 204, and as depicted in FIG. 12(a), various information related to the audio call can be displayed on the display unit 225

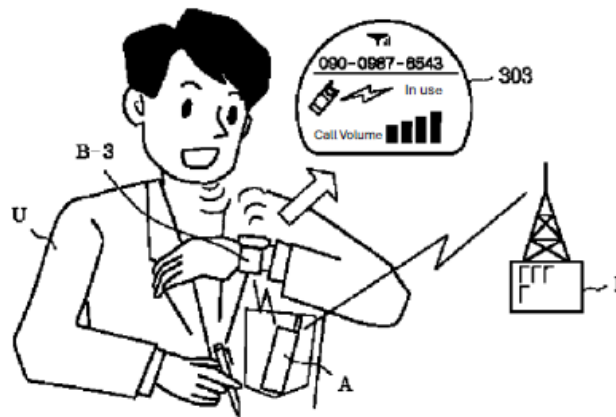
of the child terminal B-2 while performing a call start operation on the parent terminal A.” Ex-1008 ¶61, Fig. 12. The user can also “display incoming messages and e-mails” on the watch as shown in Figure 12(b) “and can read and display e-mails and files” as shown in 12(c). Ex-1008 ¶67; *see also id.* ¶24 (“various types of information, characters constituting an e-mail, and the like are displayed on the display unit 425”).

[FIG. 12]



81. Kita’039 also teaches that the user can start a “hands-free call” from the user’s watch, which allows the user to “make and receive calls while checking the call status on the display unit 303.” Ex-1008 ¶¶77-78, 80, Fig. 17.

[FIG. 17]

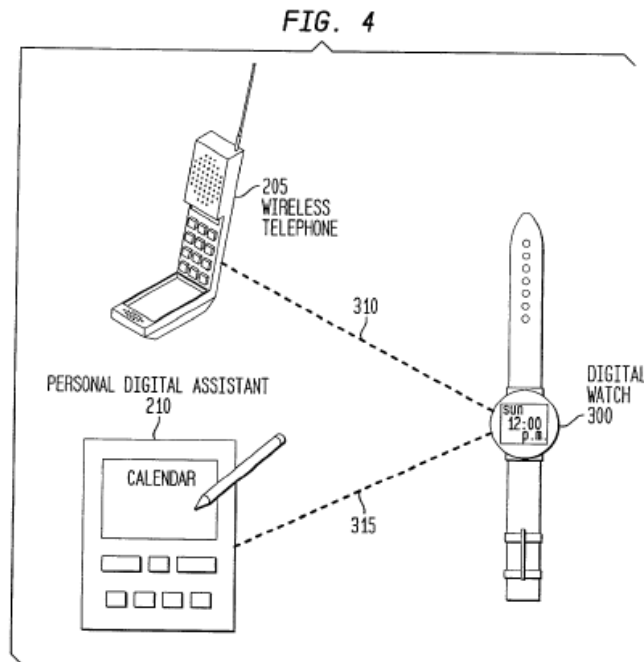


E. Cannon (U.S. Patent Publication No. 2002/0137552) (Ex-1010)

82. Cannon (U.S. Patent Publication No. 2002/0137552) was filed March 20, 2001 and published September 26, 2002. As explained to me by counsel, I understand that Cannon qualifies as prior art under 35 U.S.C. §102(e).

83. Cannon teaches an indication unit for a portable wireless device, such as a mobile phone, that communicates wirelessly with the user's wristwatch such that when the user wearing the watch returns to the vicinity of the portable wireless device, the user is notified of any pending messages requiring the user's attention. Ex-1010 ¶¶9, 23. Cannon teaches that "a pending message requiring the user's attention may be an incoming message, e.g., incoming phone message, or a message indicating an upcoming appointment, birthday, or other event, etc." (Ex-1010 ¶24) as well as a "voice message, text message, appointment or other reminder message, etc." Ex-1010 ¶23. Cannon further teaches that the user indication "might be an audible signal, a vibration, flashing lights or other indication which a user will

quickly notice upon his return to a portable wireless device.” Ex-1010 ¶34, Fig. 4.



VII. CLAIM CONSTRUCTION

84. I do not believe that any claim term requires explicit construction to resolve the issues presented in this Petition. I apply the plain and ordinary meaning to each claim term, as that plain and ordinary meaning would have been understood by a POSITA.

85. I reserve the right to offer opinions on any claim constructions proposed in this proceeding or to offer opinions on additional constructions in the district court.

VIII. DETAILED EXPLANATION OF THE UNPATENTABILITY GROUNDS

A. Ground 1: Claims 1-18, 22, 27, 29, and 35 are obvious over Narayanaswami in view of Kita'514.

1. A POSITA would have been motivated to combine Narayanaswami's teachings with Kita'514's teachings and would have had a reasonable expectation of success.

86. A POSITA would have been motivated to combine the teachings of Narayanaswami and Kita'514 and had a reasonable expectation of success in doing so because each relates to the same well-known smart watch technologies (e.g., a watch that has sensing, processing, or interface features beyond those required for functionality of time). Ex-1005, Title, Abstract, 3:51-4:36; Ex-1007 ¶¶ 153-155, Fig. 18A; *see also* Ex-1033 (Bonino), 301 (“The first example of a smart watch dates back to 2000 with the IBM Linux Watch.”); Ex-1029, 7 (“Several smart watches are available commercially today. Personal Information Management (PIM) applications are provided on the Seiko Ruputer™, the onHand PC™, the Casio PC-Unite™ and the Timex DataLink™.”); Ex-1024, 33 (“IBM’s wristwatch computer looks like an ordinary watch but runs Linux, features X11 graphics, and offers Bluetooth wireless connectivity.”). As such, they are analogous art.

87. Narayanaswami teaches a “smart watch” system that “looks like a regular watch but is capable of receiving information” such as information relating to an incoming call or e-mail from a mobile phone “via a wireless communications mechanism.” Ex-1005, 3:28-33, 7:38-56, 8:3-5. Narayanaswami also teaches that its

watch is expandable and may include “touch screen, buttons and support for various devices such as GPS/compass, thermometer, barometer, altimeter, etc.” (Ex-1005, 3:40-50) and as well as “tilt and motion (velocity, direction, speed) sensors.” Ex-1005, 6:15-19. Kita’514 teaches an “information processing terminal device” in the form of a wristwatch that has two watch bands and a buckle and is capable of receiving information such as e-mail via wireless communication. Ex-1007 Title, ¶¶109-110, 184, Figs. 1-2, 18. Kita’514 further teaches that the control circuit of its wristwatch determines whether “a function module unit fitted on and connected to” the watch bands “provides a sensor function” (Ex-1007 ¶399), such as, for example, an accelerometer, barometer for detecting altitude and depth, direction sensor, positioning meter, and speed meter. Ex-1007, Figs. 1, 53, ¶148.

88. While Narayanaswami does not describe the components of its watch band, it had been well known for decades to have two watch bands extending from a watch with a buckle to connect the bands to one another, as explicitly taught by Kita’514, because this configuration provides a user-adjustable band for different sized wrists. This was a standard wristwatch design by 2003. For example, Narayanaswami is assigned to IBM Corp. and teaches that its wristwatch system runs the Linux operating system. Ex-1005, Cover [73], 6:43-47. Other publications by Narayanaswami in 2002 relating to IBM’s Linux watch describes a watch having two watch bands and “standard buckles and band holder pins.” Ex-1024, Fig. 1, 38-

39; *see also* Ex-1025. A POSITA would thus have been motivated to implement Kita'514's two watch bands and buckle with Narayanaswami's watch as a familiar element with a predictable result, as exemplified by Narayanaswami's own work in the field. A POSITA would also have been motivated to combine the teachings of Narayanaswami and Kita'514 because both describe well-known comparable devices—programmable watches with PDA-like applications and features. Ex-1024, 33 (IBM's Linux watch includes “personal information management applications such as calendars” and “vibrates, indicating a new message”); Ex-1026, 1 (Casio's Data Bank watch “Telememo function to help users keep track of calendar entries”), 13 (Casio's “‘VIVCEL’ watch with vibrating alerts for incoming calls on mobile phones”). The two-band design with a buckle is mechanically, highly reliable, and aesthetically pleasing, all of which are critical considerations for wearable technology. A POSITA would have been motivated to use a proven, straightforward design to avoid introducing unnecessary complexity. Kita'514's configuration would have been seen as a robust solution that minimizes risk while providing the essential functionality required for securely wearing the smartwatch providing mechanical simplicity and reliability. In the competitive market of wearable technology, ensuring that a smartwatch is both functional and comfortable, as well as aesthetically pleasing, is critical for gaining consumer acceptance. A POSITA would have understood that the two-band design also allows the watch to sit securely

on the wrist without causing discomfort, even during extended use. Unlike rigid or overly complex fastening systems, the two-band configuration allows for slight adjustments in tension, ensuring that the watch fits snugly but not too tightly, by distributing the contact over a larger area. *See also* Section V.A (Technology Background) (citing Ex-1028, 4-5 (describing the Linux Watch's two bands); Ex-1040 (Vock), 44:27-29, Fig. 39 (depicting a smart watch with two bands—one connected to the lug on the left and one to the right), Fig. 38 (depicting the buckle that affixes the watch bands to one another); see also Ex-1045 (Hasegawa), 4:47-57, Figs. 4-5 (showing a watch with two bands and a buckle that communicates with a mobile phone)).

89. A POSITA would have had a reasonable expectation of success in combining Narayanaswami and Kita'514. Both describe watches that display the current time and include processors, memory, and wireless communications that allow the user to access information directly from the watch, such as phone calls or emails. Ex-1005, Abstract, 3:51-4:36; Ex-1007 ¶¶153-155, Fig. 18A. A POSITA would thus have understood that these references disclose interrelated teachings based on well-understood technologies that would have been amenable to various well-understood and predictable combinations. For example, because Narayanaswami and Kita'514 both describe watches having standard features and components, a POSITA would have understood that incorporating the two-piece

watch band, buckle, and other features of Kita'514 into Narayanaswami's watch would be well within the skill of a POSITA. And a POSITA would have been motivated to do so to meet customer expectations and enhance the functionality of the wearable device. While Narayanaswami's smartwatch includes advanced features like wireless communication, sensors (e.g., GPS, accelerometer), and a touch screen, it does not explicitly describe the components of its watch band. However, a POSITA would have understood that integrating these advanced features requires a reliable and adjustable wristband to ensure the watch stays in optimal position on the user's wrist for accurate sensor readings and comfortable interaction with the device. Implementing Kita'514's two watch bands and buckle would have provided the necessary support structure to accommodate these advanced features, ensuring that the smartwatch functions effectively during daily use.

2. Independent Claim 1

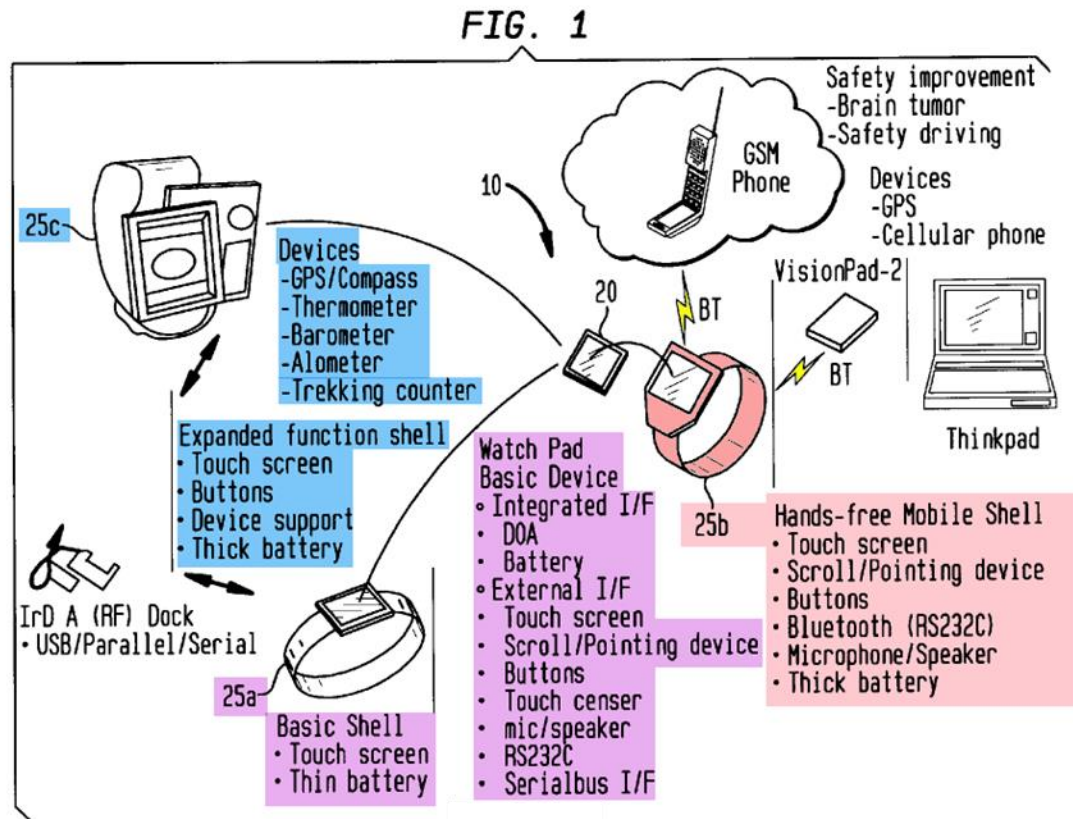
a. Element 1[pre]: A watch for use with a mobile telephonic device that provides notification of an incoming call, said watch comprising:

90. Narayanaswami in view of Kita'514 ("Narayanaswami-Kita'514") teaches² the preamble, to the extent it is limiting.

91. Narayanaswami teaches "[a] wearable mobile computing

² I use the term teaches, which I understand from Counsel includes both express teachings or those fairly suggested to a person of ordinary skill in the art.

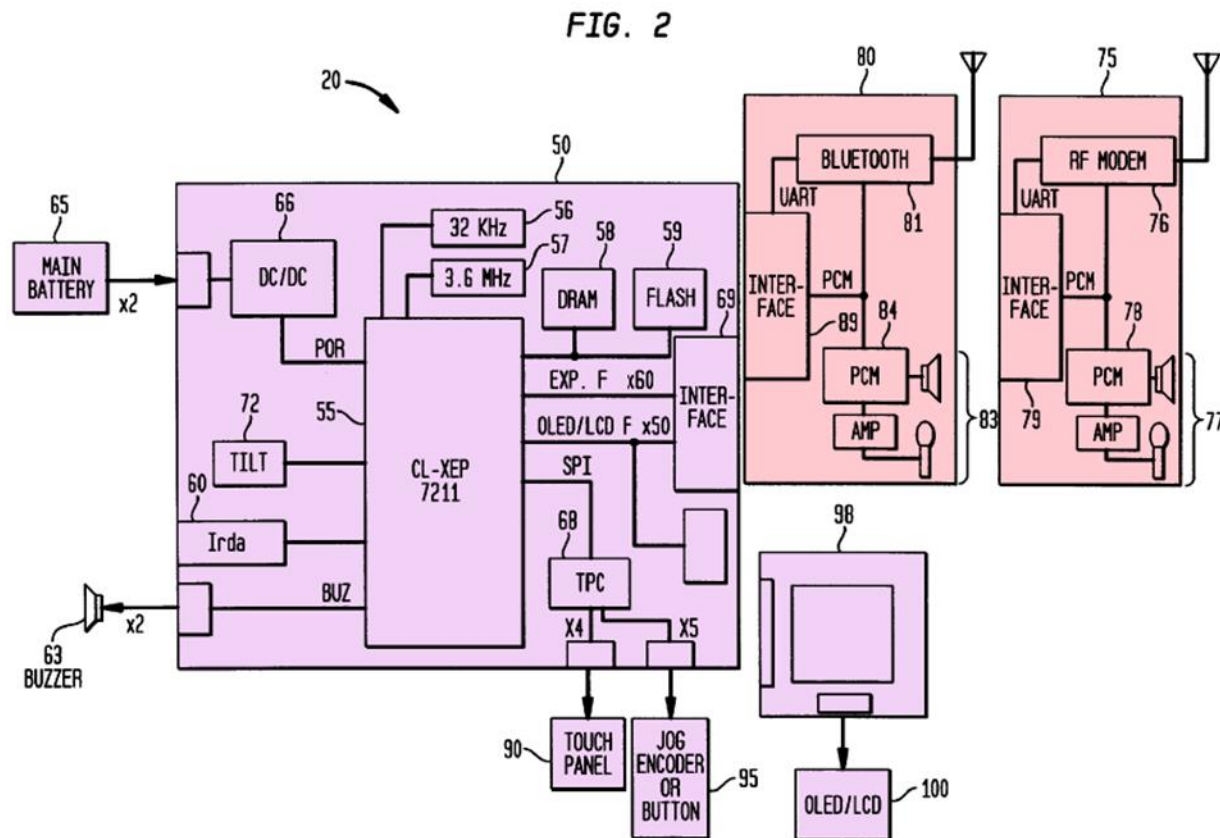
device/appliance (a wrist watch) with a high resolution display that is capable of wirelessly accessing information from a network and a variety of other devices.” Ex-1005, Abstract, Fig. 1. As discussed, with respect to annotated Figure 1 below, there is a basic shell, 25a, with the features highlighted below in purple, a “hand-free” shell, 25b, with the additional features highlighted in red, and an “expanded function shell,” 25c, that includes the additional features highlighted in blue. Ex-1005, 3:40-50, Fig. 1.



92. With respect to the hands-free shell embodiment, 25b, which also includes the base shell embodiment features, relevant features include (1) Bluetooth connection (“BT”) (above yellow to “GSM Phone” and IBM “VisionPad-2” or

“Thinkpad”); (2) battery; (3) touch screen display; and (4) GPS. Ex-1005, 3:40-47.

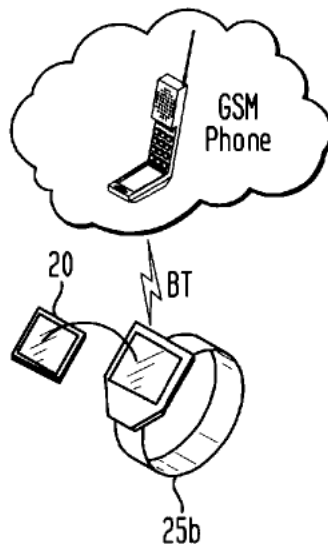
Additional sensor devices, including alternative GPS/compass and altimeter can be incorporated the expanded function shell, 25c. *Id.*, 3:47-50. As shown in Figure 2 below, base circuit 20 (purple) and accessory card 75 or 80 (red) (having features corresponding to hands-free shell 25b) are joined through electronic interfaces 69, 79, and 89 by means of “expansion tabs (not shown),” creating a single integrated device having all the features of shells 25a and 25b. Ex-1005, 4:37-59, Fig. 2.



93. A POSITA would have understood that the combined base 20 with accessory card 75 or 80 would become integral to ensure a reliable electrical connection through the expansion tabs or, regardless, it would have also been

obvious to also assemble into one contiguous unit in order to improve performance, improve usability, reduce cost, or improve manufacturing concerns. Moreover, a POSITA would have also understood that additional features of expanded function shell 25c would be made electrically and mechanically connectable to base 20 through locking tabs or the like to allow for a reliable connection, battery sharing, and a full-featured watch, such as the Linux watch. These additional features and the design choices required would have been evident to a POSITA in striving to create a product with a target performance while considering multiple design and manufacturing trade-offs.

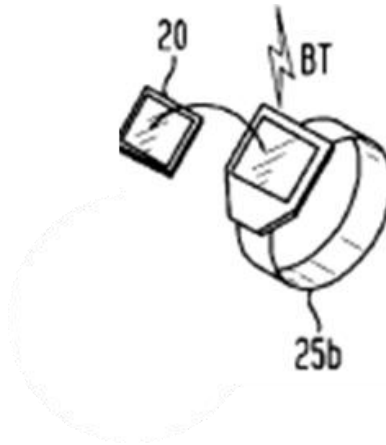
94. The watch includes a user interface that allows the user “to efficiently interact with alarms and notifications on the watch.” Ex-1005, Abstract. For example, “caller Id information may be displayed on the Wrist Watch display when the cell phone that belongs to that person rings.” Ex-1005, 8:3-5.



b. Element 1[a]: a watch band; a second watch band; a buckle, wherein said buckle is coupled to said second watch band; and

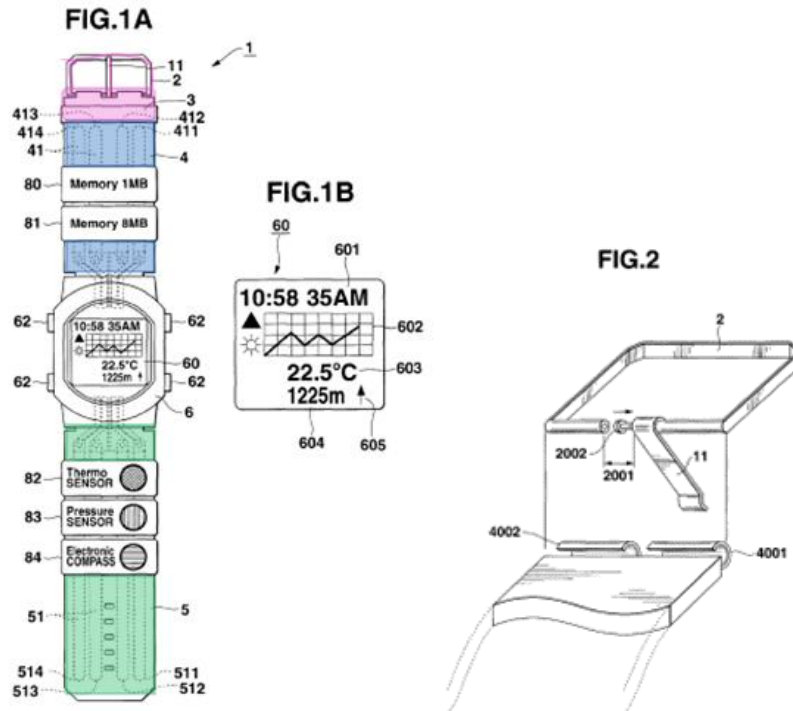
95. Narayanaswami-Kita'514 teaches Element 1[a].

96. Narayanaswami teaches a watch with a watch band. Ex-1005, Fig. 1.

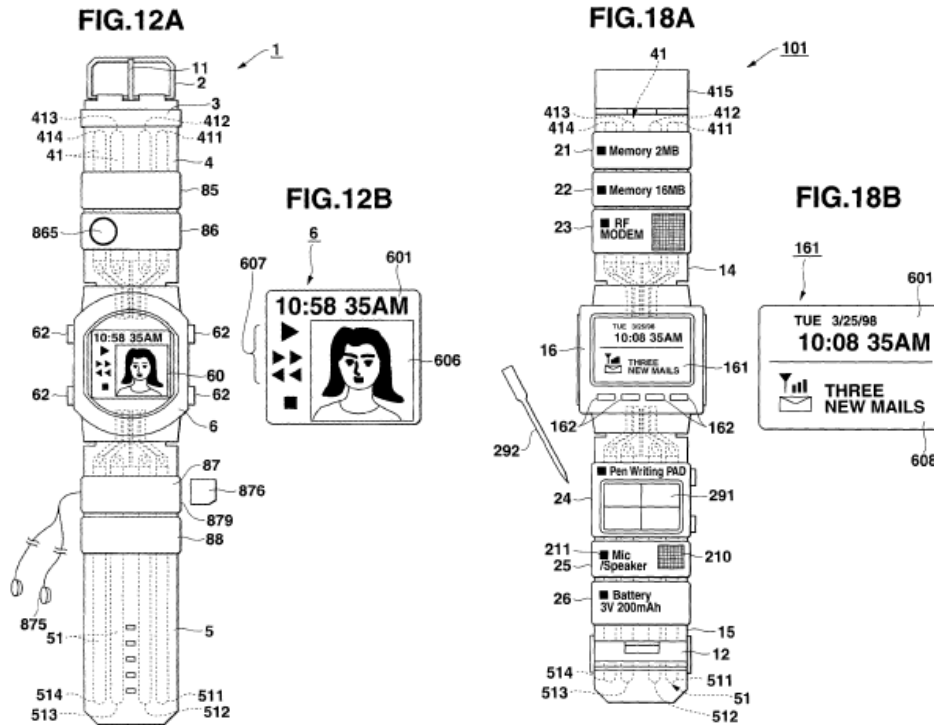


Narayanaswami does not explicitly teach the specific elements of the claimed watch band but Kita'314 provides these teachings.

97. As shown in Figures 1-2 below, Kita'514 teaches that “a pair of wrist bands 4 [(blue)] and 5 [(green)] ... are attached to opposing ends of the body case 6 to serve as members for securely wearing the wristwatch 1 on a body (wrist)” and “wrist band 4 is removably joined to a buckle member 2 [(pink)] by means of a buckle member through hole 4001 and a notch 4002.” Ex-1007 ¶¶109-110, Figs. 1-2.



98. Kita'514 further teaches that “a band fastening loop member 3, the buckle member 2 and the center fastening pin 11 are attached to an end of the wrist band 4.” Ex-1007 ¶120; *see also id.*, Figs. 12, 18 (showing a buckle and two watch bands), ¶¶183 (first wrist band 14 of Fig. 18 connects with buckle member 12 of second wrist band 15), 187 (“buckle member 12 is attached to an end of the wrist band 15”).



99. A POSITA would have been motivated to incorporate Kita'314's two-band strap and buckle with Narayanaswami's watch, and had a reasonable expectation of success in doing so for the reasons described above in Section VIII.A.1. *See also* Section V.A (Technology Background).

- c. **Element 1[b]: a device operable to receive first wireless communication signals associated with a first event and second wireless communication signals associated with a second event from said mobile telephonic device, wherein said first event and second event are different,**

100. Narayanaswami-Kita'514 teaches Element 1[b].

101. Narayanaswami teaches that its watch receives wireless communication signals associated with a first event from the mobile device. Narayanaswami describes various wireless communication protocol drivers, such as

“IrDA system driver 214, RF-Modem subsystem driver 216, Bluetooth system driver 218” (Ex-1005, 6:53-55) as well as circuitry to implement wireless communications between the watch and a cell phone. Ex-1005, 4:60-5:1, Fig. 1 (element 25b with Bluetooth (“BT”) connection to GSM phone). Moreover, Narayanaswami teaches that “caller Id information may be displayed on the Wrist Watch display when the cell phone that belongs to that person rings.” Ex-1005, 8:3-5. The caller Id information is first communications signals associated with a first event (e.g. a call event).

102. Narayanaswami teaches that its watch receives wireless communication signals associated with a second event from the mobile device, which is different from the first event.³ For example, Narayanaswami teaches that an alarm may come from the user’s PC, which maintains a list of the user’s appointments, “indicating what the appointment was,” and this information may be inputted to the watch so that it “subsequently activate[s] the alarm at the programmed time, and accordingly indicate[s] the associated text.” Ex-1005, 9:23-31. A POSITA would have understood that the transmission of such information (such as communication signals (e.g., text or e-mail) or appointments) from the PC to the

³ For purposes of this Petition only, to streamline possible issues, Petitioner assumes the narrowest possible interpretation of this limitation, that the second event different from the first event requires a different kind of event, e.g., a call and an email message as opposed to two different call events.

watch would have been done wirelessly over the Bluetooth or other communication link (e.g., radio, optical, Irda), as represented by the Bluetooth connections “BT” shown in Figure 2. Narayanaswami explicitly teaches the use of wireless communication protocols (e.g., Bluetooth) for transferring data between the watch and other devices such as cell phones. Given that Bluetooth is mentioned as a means of communication for call-related data, it would have been consistent and logical for a POSITA to apply the same wireless technology to the transmission of other types of data, such as appointment reminders from a PC. The presence of Bluetooth connections in Narayanaswami’s figures and descriptions further reinforces the understanding that wireless communication is a key aspect of the system’s operation.

103. Further, while Narayanaswami describes the appointment as originating at a user’s PC, Narayanaswami also states that the watch can execute and update a calendar application by synchronizing with “other devices.” Ex-1005, 7:3-9 (synchronization manager “synchronize[s] data between the Wrist Watch and the other devices” by receiving data from the communication channel, decoding the data, and updating the data for the associated application such as “an update to a calendar event”), 7:38-58 (“launching an application directed to displaying/maintaining calendars and appointments”). This appointment and calendaring capability is also taught in Narayanaswami’s literature relating to the IBM Linux watch prior to 2003. *See, e.g.*, Ex-1028, 5; Ex-1029, 10; Ex-1030, 22.

104. In view of these related teachings in Narayanaswami, a POSITA would have been motivated to have the second wireless communication signals (e.g., associated with a calendar invite) from a cell phone as obvious given that Narayanaswami teaches that its watch “synchronizes” with “other devices,” which would have included a cell phone having a calendar capability (or a PDA with cell phone capability). *See, e.g.*, Ex-1034 (Siewiorek), 1 (“SenSay is a context-aware mobile phone that adapts to dynamically changing environmental and physiological states. ... SenSay augments its contextual knowledge by tapping into applications such as electronic calendars, address books, and task lists.”), 7 (“[I]f the user is running ... while a meeting is scheduled in their electronic calendar at the same time, the phone would enter the Uninterruptible state because a calendar appointment is given a higher priority.”); Ex-1036 (Agarwal), 12 (“[S]olutions based on the Intellisync technology have been deployed to allow school administrations of the New York City Board of Education to efficiently synchronize e-mail and calendar information between their Palm OS handhelds and the New York Board of Education’s Microsoft Exchange server.”); Ex-1035 (Smailagic), 1-2 (“The initial applications of the mobile unit include navigation, personal scheduling, and collaboration between units and a central information server. ... The scheduling application: Displays user’s schedule[;] Schedules individual and group events[;] Provides convenient entry of schedule events.”). Accordingly, calendar

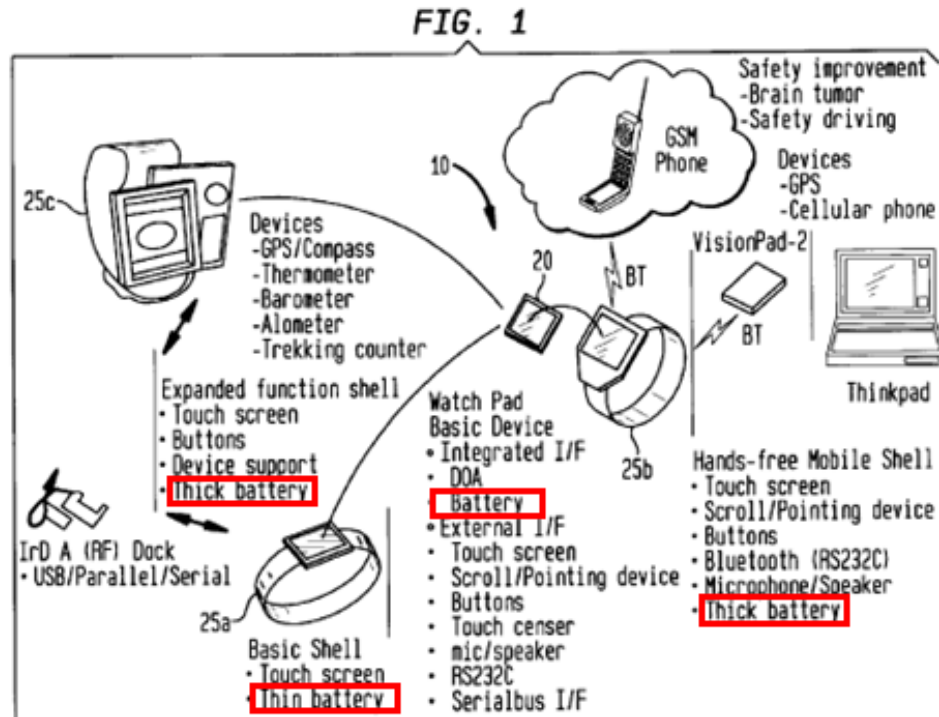
synchronization data, associated with calendar events, received over the communication channel from a cell phone is second communication signals associated with a second event.

105. As I also explained in my Technology Background, watches for receiving wireless communication signals from mobile devices regarding different types of events such as incoming calls, calendar notifications, reminders, text messages, missed calls, and voice messages were known by 2003. *See* Section V.B (Technology Background) (citing, e.g., Ex-1024, 33; Ex-1025, 1; Ex-1028, 6; Ex-1029, 10; Ex-1030, 22, 24; Ex-1026, 1, 13; Ex-1053, 501; Ex-1046 ¶¶8, 37; Ex-1043, Abstract; Ex-1048 ¶¶1, 3-6, 20).

d. Element 1[c]: said device includes a battery,

106. Narayanaswami-Kita'514 teaches Element 1[c].

107. Narayanaswami teaches that the device includes a battery, either “thick” or “thin.” Ex-1005, Fig. 1. In the case of the “hands-free mobile shell,” a thick battery is used. *Id.*



- e. **Element 1[d]: said device includes motion sensing operable to distinguish between a plurality of different types of motion,**

108. Narayanaswami-Kita'514 teaches Element 1[d].⁴

109. Narayanaswami's device includes motion sensing to distinguish between a plurality of different types of motion. Base shell 25a contains a tilt sensor and hands-free shell 25b includes GPS. Ex-1005, 3:43-44. And, as explained above (Element 1[pre]), Narayanaswami teaches its "expanded function shell 25c, providing touch screen, buttons and support for various devices such as

⁴ I note that Claim 1 does not recite sensing motion or making use of information gathered through sensing motion. And none of the dependent claims further limits or even recites aspects of the motion sensing recited in the independent claim other than Claim 18's recitation that one of the types of motion is "human motion."

GPS/compass, thermometer, barometer, altimeter, etc.” (Ex-1005, 3:40-50), which would become integral through an additional electrical interface such as the ones joining base 20 with accessory cards 75 or 80. Expanded function shell 25c also includes “trekking counter.” Ex-1005, Fig. 1. A POSITA would have understood that GPS, tilt, compass, altimeter sensors, and trekking counter are all capable of sensing motion and distinguishing between types of motion and that rapid variation in barometric pressure (as measured by a barometer), for example, can also be used to detect rapid elevation changes in height over time (i.e., vertical motion). Ex-1010, Cl. 8 (“the motion sensor utilizes a [(GPS)] receiver to detect motion”). GPS can sense positional changes over time and can therefore determine velocity (i.e., whether the watch-wearing user is moving fast as if in a moving car, slow as if walking, or stopped as if sitting still). Similarly, an altimeter can sense altitude changes over time and can therefore determine whether the user is in a rising-vertical motion or falling-vertical motion. GPS and an altimeter distinguish between different types of motion because GPS senses three-dimensional movement and an altimeter senses vertical movement. A trekking counter is a device used to monitor and track various metrics during a trekking or hiking activity. These devices typically count steps, distance traveled once the user has entered their stride length, and sometimes more advanced metrics, such as estimated calories burned once a user has entered their weight. Trekking counters may be standalone devices or

features in wearable tech like smartwatches and fitness bands.

110. A POSITA would have also understood that tilt sensor 72 is a type of motion sensed (motions which includes a change in angle (tilt) relative to gravity) with sensors such as the ball-in-a-tube sensor disclosed in the '633 Patent (Ex-1001, 5:13-15) and that sensing velocity is also motion sensing. Ex-1031, 2 (“[a] tilt switch is used to detect arm motions for gesture input”). Furthermore, a POSITA would have recognized that the compass sensor, which detects change in angle relative to the Earth’s magnetic field also contribute to the device's ability to differentiate between motions (motions which includes a change in angle (orientation) relative to magnetic north)—analogous to a tilt sensor, with tilt relative to magnetic-field orientation instead of to gravity.

111. Narayanaswami further teaches that “additional sensors may be attached to the Wrist Watch device,” including “tilt and motion (velocity, direction, speed) sensors.” Ex-1005, 6:15-19. As explained above (Element 1[pre]), a POSITA would have been motivated to electrically and mechanically integrate additional sensors based on Narayanaswami’s express teaching or suggestion to do so or to incorporate them into the body of the watch. This motivation would stem from Narayanaswami’s explicit suggestions, aimed at increasing the device’s performance. By integrating sensors, a POSITA would have recognized several potential benefits, including improved overall performance by providing more

comprehensive motion tracking and redundancy, which ensures accuracy and reliability in sensor readings. Moreover, integrating sensors could reduce costs by simplifying the design and assembly process and addressing manufacturing concerns related to complexity and durability. Additionally, embedding sensors within the watch's structure, as suggested by Narayanaswami, would streamline the design, leading to a more compact and user-friendly product. A POSITA, in striving to create a product, would have naturally considered these additional features and carefully evaluated the design choices necessary to achieve the desired functionality. This process would involve balancing multiple design and manufacturing trade-offs, such as cost, complexity, and user experience, to develop a product that meets target performance goals. Ex-1007 ¶¶120-122 (“[b]us line wires 41 and 51 are embedded in the wrist bands”). For these reasons, Narayanaswami alone teaches Element 1[d].

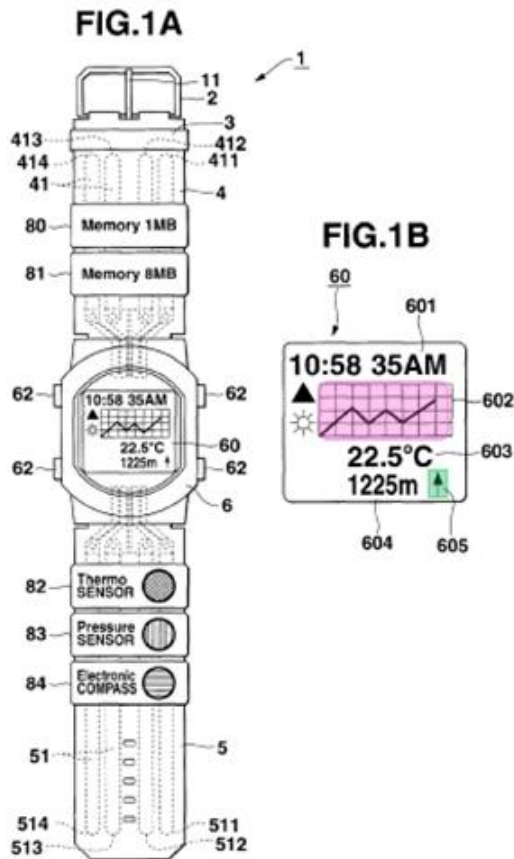
112. To the extent that additional teachings are needed assuming PO repeats arguments it made in the Apple IPR, which the Board rejected at the institution stage, Kita'514 also meets this limitation. Kita'514 teaches that the control circuit of its wristwatch references a “sensor function module table 1666” to determine whether “a function module unit fitted on and connected to the wrist bands 4 and 5 provides a sensor function.” Ex-1007 ¶399. As shown in Figure 53 below, sensor functions include an accelerometer, barometer for detecting altitude and depth, direction sensor, positioning meter, and speed meter. Ex-1007, Fig. 53.

FIG.53

1666

MODULE ID CODE	MODULE SPECIFICATION CODE	FUNCTION
0100	0000	SENSOR SYSTEM (MEASUREMENT PROCESSING)
0100	0100	THERMOMETER (°C)
0100	0010	BAROMETER (hPa) —ALTITUDE, DEPTH—
0100	0011	DIRECTION SENSOR (°)
0100	0011	POSITIONING METER (° ' ")
0100	0101	ACCELEROMETER (G)
0100	0110	SPEED METER (km/h)
0100	0111	RADIATION THERMOMETER (°C)
0100	1000	PULSE RATE MEASUREMENT (PULSE/SECOND)
0100	1001	SPHYGMOMANOMETER (mmHg)
0100	1111	SENSOR SYSTEM RESERVED

113. Kita’514 further describes using the altimeter and compass sensors to display altitude changes (602) (pink) and direction changes (605) (green), as shown in Fig. 1 below. Ex-1007 ¶148, Fig. 1.



114. It would have been obvious to a POSITA in view of these teachings to use Kita'514's accelerometer to sense and indicate acceleration changes, such as with a "g-force" indicator. A POSITA would have understood how to integrate the output of the accelerometer to derive velocity changes over time, and then further integrate this data to determine positional changes over time. This process is fundamental in motion analysis, enabling the device to track and interpret various types of movement. Moreover, a POSITA would have recognized the value of incorporating additional sensors to enhance the device's functionality, whether by providing redundancy to improve reliability or by introducing new capabilities to

detect a broader range of motion types. A POSITA would thus have understood that the Narayanaswami-Kita'514 watch would have benefited from an accelerometer operable to distinguish between a plurality of different types of motion, such as falling motion (zero g) or hard impact (high g). This would significantly enhance the watch's utility in various contexts, from safety monitoring to athletic performance tracking.

115. A POSITA would have been motivated to implement Kita'514's motion sensing with Narayanaswami's smart watch and had a reasonable expectation of success in doing as exemplified by other prior art publications authored by Narayanaswami by 2003 relating to IBM's Linux watch stated that "the most recent version of the Linux Wristwatch prototype" included "a two-axis accelerometer." Ex-1027, 47 (2002). A POSITA would thus have understood this as a familiar element with a predictable result, as exemplified by Narayanaswami's own work in the field. This prior inclusion of an accelerometer in a smartwatch developed by Narayanaswami demonstrates that the integration of such motion-sensing technology was already a familiar and viable approach within the field. A POSITA would also have been motivated to combine the teachings of Narayanaswami and Kita'514 because both describe well-known comparable devices—programmable watches with PDA-like applications and features. Ex-1024, 33; Ex-1026, 1, 13. The combination of these technologies would have been used

and understood to improve user experience, expand the range of detectable motions, and offer more precise and responsive features. This alignment between the teachings of Narayanaswami and Kita'514, coupled with the prior success of accelerometer integration in related devices, would have provided a POSITA with a strong motivation to pursue this combination, with a clear expectation of success.

116. As I also explained in my Technology Background, wearable devices such as watches for distinguishing between a plurality of different types of motion, including human motion, were known by 2003. *See* Section V.C (Technology Background) (citing, *e.g.*, Ex-1026, 4, 6-7, 10; Ex-1027, 45, 47; Ex-1031, 2; Ex-1032, 4:48-5:19, Figs. 1, 6-7, 11; Ex-1040, 44:26-27, 44:33-34, 10:15-17, 44:55-56, 44:66-45:5, 44:43-47; Ex-1050, 20; Ex-1051, 184-185; Ex-1061, 1-2; Ex-1062, 23-24; Ex-1052, 148; Ex-1054, 92, 96, 99; Ex-1056, 1147, 1147-48; Ex-1058, 3-5; Ex-1059, 221-222, 227; Ex-1060, 791-792; Ex-1055, 329-330; Ex-1057, 136; Ex-1063, 5). Moreover, a POSITA would have recognized the importance of including motion sensing to differentiate between a plurality of different types of motion in a wristwatch for several reasons, as outlined by the state of the art by 2003 including improved usability and convenience, enhanced power management, context-aware features and advanced functionality, safety and navigation benefits, personalization and gesture recognition, and historical precedent and proven benefits. *See* Section V.C (Technology Background).

- f. Element 1[e]: said device is operable to provide first user-perceivable notification signals that are dependent upon said received first communication signals, and**

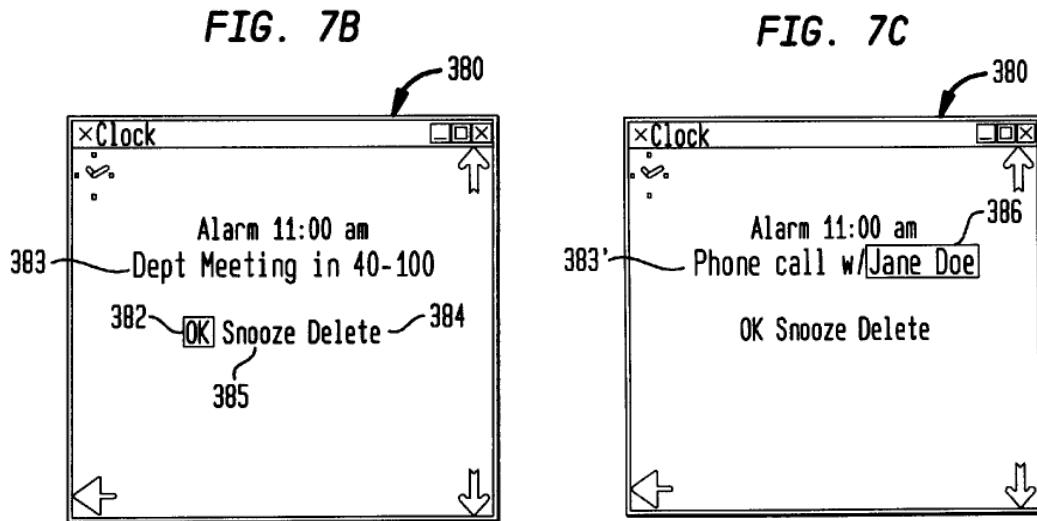
117. Narayanaswami-Kita'514 teaches Element 1[e].

118. Narayanaswami teaches that “caller Id information may be displayed on the Wrist Watch display when the cell phone that belongs to that person rings.” Ex-1005, 8:3-5. The display of the caller Id information is a “user-perceivable notification signal” dependent on the received first communication signals (i.e., an incoming call).

- g. Element 1[f]: said device is operable to provide second user perceivable notification signals that are dependent upon said second communication signals.**

119. Narayanaswami-Kita'514 teaches Element 1[f].

120. Narayanaswami teaches providing a user-perceivable notification signal dependent on the second communication signals. For example, Narayanaswami teaches that an alarm may come from the user's PC, which maintains a list of the user's appointments, “indicating what the appointment was,” and this information may be inputted to or synchronized with the watch so that it “subsequently activate[s] the alarm at the programmed time, and accordingly indicate[s] the associated text.” Ex-1005, 9:23-31. This is depicted as a familiar reminder as shown in Figures 7B-C:



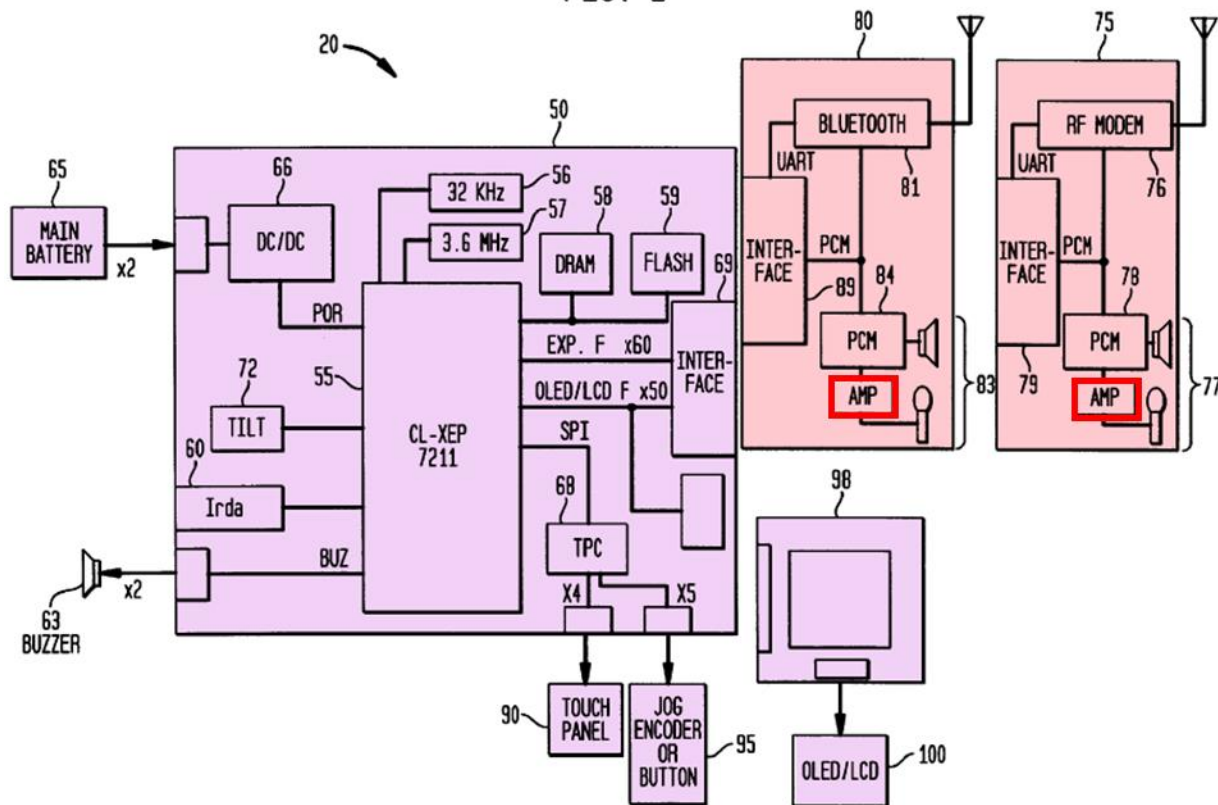
121. The alarm activated at the watch at the programmed time is a user-perceivable notification signal dependent on the second communication signals associated with second event (i.e., the calendar appointment).

3. Dependent Claims 2-18, 22, 27, 29, and 35

a. Claim 2: The watch of claim 1, further comprising an amplifier.

122. Narayanaswami teaches an amplifier. Ex-1005, Fig. 2 (“amp”).

FIG. 2



123. As explained above (Element 1[pre]), the amplifier is part of the hands-free “accessory card, i.e., either card 75 or 80, in the expanded-shell Wrist Watch designs that support PCM audio” and “includes a speaker and a microphone combination 77, 83 respectively.” Ex-1005, 4:37-48; *see also id.*, Fig. 1 (hands free module).

b. Claim 3: The watch of claim 1, wherein said user-perceivable notifications signals comprise audible notification signals.

124. Narayanaswami teaches that “when an alarm is activated, an audible sound is generated.” Ex-1005, 9:66-57; *see also id.*, 10:24 (“the alarm rings”), 11:25 (“audible alarms will ring”), 11:32-33 (“alarms produce audible tones”). A POSITA

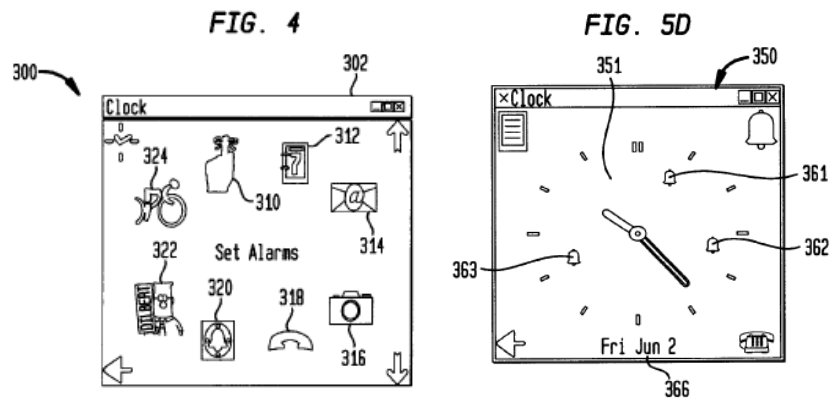
would have also been motivated to provide for well-known audible indicators to represent incoming call (e.g., ring-tone) and appointment reminders (e.g., chime or the like).

125. Indeed, as I explained in my Technology Background (*see* Section V.D), it was known that a user could select the same type of signal for notification of multiple different events or a different type of signal for notification of each different event. For example, Britt Jr. teaches a system where a user can select the same or different types of user-perceivable notification signals corresponding to multiple events on a portable device such as a pocket watch or other device “strapped firmly around a user’s arm.” Ex-1046 (Britt Jr.) ¶37. Specifically, Britt Jr. states that “many wireless and non-wireless telephony devices offer ‘distinctive ring’ features.” *Id.* ¶72. For instance, “a telephony device may be configured to identify a caller and ring in a specified way based on the identity of the caller. For example, a user may configure his/her telephone to announce a call from ‘Caller A’ by two short rings followed by a third long ring. Distinctive ring features are particularly useful for telephones which do not have caller ID displays and/or in situations where the caller ID displays are not easily viewable.” *Id.*; *see also* Ex-1047 (Hsu), 1:39-41 (“Typically, the user can select between several different types of available ringing tones and one or more vibration modes.”), 2:63-65 (“the monitor tool may be worn in a manner similar to a wrist-watch or incorporated into a housing with a

wristwatch”), 7:20-35 (microprocessor provides instructions “to generate various output tones through the speaker 32, upon occurrence of various conditions, such as a user selected ring tone in response to an incoming call or message”).

c. Claim 4: The watch of claim 1, wherein said device further comprises a display.

126. Narayanaswami teaches a wristwatch “capable of wirelessly accessing information and equipped with an interactive user interface and *high resolution display* for providing a variety of desktop PC-like functions.” Ex-1005, 2:13-16, 9:2-4, Figs. 4, 5D.



d. Claim 5: The watch of claim 1, wherein said device further comprises a vibrator.

127. Narayanaswami teaches that “the Wrist Watch time-keeping/alarm function may be provisioned with the ability to produce a silent alert such as a vibration.” Ex-1005, 12:26-28. The vibration would be created by the claimed “vibrator.”

e. Claim 6: The watch of claim 1, wherein said device further comprises a speaker.

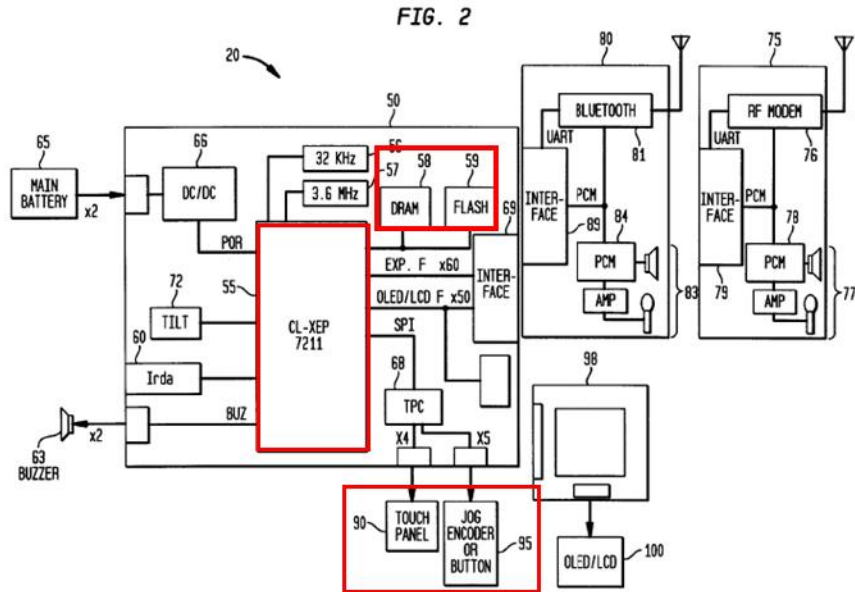
128. Narayanaswami teaches that the watch accessory cards “includes a speaker and a microphone combination 77, 83 respectively.” Ex-1005, 4:37-48.

f. Claim 7: The watch of claim 1, wherein said device further comprises an LED.

129. Narayanaswami teaches that “[a]n interface 69 is provided for a unit 98 housing a high resolution (VGA equivalent) emissive Organic *Light Emitting Diode* (OLED) high contrast display 100.” Ex-1005, 6:5-8.

g. Claim 8: The watch of claim 1, wherein said device further comprises control circuitry, an input device, and memory.

130. Narayanaswami teaches that “base card 20 includes a first or main card 50 housing the core processing unit, I/O, and memory.” Ex-1005, 3:51-54. Moreover, Narayanaswami teaches that user interface manager 255 processes “events received from user input devices such as the roller wheel (jog encoder) and touch panel for the appropriate applications.” Ex-1005, 6:64-67. Figure 2 below depicts the hardware architecture of the wristwatch system, including CPU component CL-EP7211 (connected to control circuitry), memory components 58 and 59, and input device components 90 and 95. Ex-1010, Fig. 2, 3:51-4:36.



- h. Claim 9: The watch of claim 1, wherein said device further comprises a display, a speaker, a vibrator, control circuitry, an input device, and memory.**

131. Narayanaswami-Kita'514 teaches Claim 9 for the reasons described above for Claims 4 (display), 5 (vibrator), 6 (speaker), 8 (control circuitry, input device, memory).

- i. Claim 10: The watch of claim 1, wherein said first user-perceivable signals are indicative of an incoming call.**

132. Narayanaswami-Kita'514 teaches Claim 10 for the reasons described above for Element 1[e]. *See, e.g.*, Ex-1005, 8:3-5 (“caller Id information may be displayed on the Wrist Watch display when the cell phone that belongs to that person rings”).

- j. Claim 11: The watch of claim 1, wherein said second user-perceivable signals are indicative of a calendar notification.**

133. Narayanaswami-Kita'514 teaches Claim 11 for the reasons described

above for Element 1[f]. *See, e.g.*, Ex-1005, 9:23-31 (alarm is activated relating to calendar appointment).

k. Claim 12: The watch of claim 1, wherein said second user-perceivable signals are indicative of a reminder.

134. Narayanaswami-Kita'514 teaches Claim 12 for the reasons described above for Element 1[f]. Narayanaswami teaches a reminder after stopping an alarm (i.e., the second user-perceivable signals). For example, Narayanaswami teaches that “a user may stop the alarm, select a snooze option where the user will receive subsequent reminders (i.e., the alarm to activate) after a predefined time interval.” Ex-1005, 8:28-32. Moreover, this was a known feature in the IBM Linux watch, as described by literature authored by Narayanaswami. Ex-1029, 12 (“reminder to shut off stove in 20 minutes” shown on watch); Ex-1030, 24; Ex-1028, 5.

135. As I also explained in my Technology Background, watches for receiving wireless communication signals from mobile devices regarding reminders were known by 2003. *See* Section V.B (Technology Background) (citing, e.g., Ex-1028, 6; Ex-1010 ¶¶23-25).

l. Claim 13: The watch of claim 1, wherein said second user-perceivable signals are indicative of a missed call.

136. Narayanaswami teaches that “[i]f the user does not interact with the watch at all when the alarm is activated, this may mean either: 1) the user did not hear the alarm although the watch is on the wrist, or 2) the watch is not on the user’s

wrist at all.” Ex-1005, 11:13-16. And “[i]f the watch is on the user’s wrist, then the alarm will automatically revert to the snooze setting after a preset time interval.” Ex-1005, 11:18-20. Narayanaswami thus treats calls as an event that triggers an alarm and if the user does not respond to the call, then the watch will provide an alarm at a preset time after the call is missed. This alarm based on a missed call thus corresponds to “second user-perceivable signals ... indicative of a missed call,” as claimed. Further, a POSITA would have been motivated to set such an alarm as a result of a missed call so that the user is made aware that the call had been received but was unanswered. *Id.*

137. As I also explained in my Technology Background, watches for receiving wireless communication signals from mobile devices regarding missed calls were known by 2003. See Section V.B (Technology Background) (citing, e.g., Ex-1048 (Valade) ¶¶5 (“All the above messages are notified to users on their mobile telephone, as a result of which users know that they can download or consult the data received, for example e-mails, **missed calls**, multimedia data, etc.”), 6 (“All the above messages, regardless of their type, are referred to generically as ‘events’ in the remainder of the description.”), 20 (“The invention enables **the arrival of an event at a mobile terminal to be notified to** any type of terminal connected thereto over a wireless interface, for example ... **a wristwatch**, etc. ... and to issue a notification for the attention of the user in the form of an audible, vibratory, visual,

etc. message.”)). This feature was also a known feature in mobile devices, which a POSITA would have been motivated to include into a wristwatch for several reasons, including portability and convenience, user demand for integration, improved usability and always-on access, miniaturization and wearable computing trends, synergies with other devices, and energy efficiency and power management. See Section V.B (Technology Background); Ex-1011 (Nokia), 33 (“Your phone saves the numbers and names ... of the last 10 callers that have tried unsuccessfully to reach you. The screen tells you how many calls were missed” and “[i]f the caller’s name and number are stored in memory, that information appears.”). Since a POSITA would have known to store missed call information, a POSITA similarly would have been motivated to notify a user about those missed calls, so that the user could take appropriate actions. Given that storing and displaying missed call information was a standard feature in mobile phones, a POSITA would have understood the value of implementing a similar feature in a smartwatch. By integrating this capability, the smartwatch could provide a seamless user experience, ensuring that users are promptly notified of missed communications and can take appropriate action. A POSITA would have recognized the utility of such a feature in enhancing the functionality of the smartwatch, aligning it with user expectations for mobile communication devices and, because of the technological advancements I discussed above, would have had a reasonable expectation of success.

- m. Claim 14/15/16: The watch of claim 1, wherein said first user-perceivable signals are indicative of an incoming call and said second user-perceivable signals are indicative of a [calendar notification/reminder/missed call].**

138. Narayanaswami-Kita'514 teaches Claim 14 for the reasons described above for Claims 1 and 10-11, Claim 15 for the reasons described above for Claims 1, 10, and 12, and Claim 16 for the reasons described above for Claims 1, 10, and 13.

- n. Claim 17: The watch of claim 1, wherein said first user-perceivable signals are indicative of an incoming call, said second user-perceivable signals are indicative of a reminder, and said device is configured to receive third wireless communication signals associated with a third event.**

139. Narayanaswami-Kita'514 teaches Claim 17's first and second user-perceivable signals indicative of an incoming call and reminder, respectively, for the reasons described above for Claims 1, 10, 12, and 15.

140. Narayanaswami teaches receiving wireless communication signals associated with additional types of events (i.e., a third event) including "excerpts of personalized data, such as traffic information, weather reports, school closings, stock reports, sports scores, etc., from the world wide web," which "may be received as notifications or alarms on the Wrist Watch system 10." Ex-1005, 7:58-63.

- o. Claim 18: The watch of claim 1, wherein at least one of said plurality of different types of motion is a human motion.**

141. Narayanaswami-Kita'514 teaches Claim 18 for the reasons described above for Element 1[d]. In particular, Narayanaswami's tilt sensor monitors the motion of the human user's wrist to determine whether the user is wearing the watch and Narayanaswami's trekking counter tracks human motion. Ex-1005, 5:13-15, 6:15-19, Fig. 1; Ex-1032 (Sato).

142. Moreover, Kita'514's accelerometer, barometer (detecting altitude and depth), direction sensor, positioning meter, and speed meter functions on the wristwatch would all detect the motion of the human wearing the device. Ex-1007, Figs. 1, 53, ¶¶148, 399; *see also* Section V.C (Technology Background).

- p. Claim 22/35: The watch of claim 1/27, wherein said device is operable to send wireless communication signals to said mobile telephonic device.**

143. Narayanaswami-Kita'514 teaches Claims 22/35 (and 27 below).

144. As explained above (Element 1[pre]), Narayanaswami teaches that its wristwatch communicates with a mobile phone over Bluetooth (or other) using wireless application protocol (WAP). The "application software ***enables communication between the other device and the Wrist Watch*** by ... ***transmitting back information sent from the Wrist Watch.***" Ex-1005, 7:67-8:3; *see also id.*, 7:3-9 ("The synchronization manager 250 is provided to synchronize data between the

Wrist Watch and the other devices. Particularly, it receives the data from the communication channel and operates in conjunction with the right application to decode the sent data and update the data for the application receiving the data. An example of this would be an update to a calendar event.”).

- q. **Claim 27: The watch of claim 1, wherein said device is operable to receive third wireless communication signals associated with a third event, wherein each of said first event, second event, and third event is different, and said device is operable to provide third user-perceivable notification signals that are dependent upon said third wireless communication signals.**

145. Narayanaswami-Kita’514 teaches Claim 27 for the reasons described above for Claims 1, 3-5, 12-13, and 17, because Narayanaswami teaches receiving wireless communication signals associated with at least three different types of events such as an incoming call, calendar, reminder, missed call, and alarm notification (e.g., for traffic information) and providing at least three different types of user-perceivable notification signals that are dependent on the wireless communication signals such as audible, vibration, and display signals.

- r. **Claim 29: The watch of claim 27, wherein said first user-perceivable signals are indicative of an incoming call, said second user-perceivable signals are indicative of a reminder, and said third user-perceivable signals are indicative of a missed call.**

146. Narayanaswami-Kita’514 teaches Claim 29 for the reasons described above for Claims 1, 15-17, and 27.

B. Ground 2: Claims 20, 23-26, 31, and 36-39 are obvious over Narayanaswami in view of Kita’514 and Kita’039.

- 1. A POSITA would have been motivated to combine Narayanaswami-Kita’514’s teachings with Kita’039’s teachings and would have had a reasonable expectation of success.**

147. A POSITA would have been motivated to combine the teachings of Narayanaswami-Kita’514 and Kita’039 in order to enhance functionality, redundancy, performance, and would have had a reasonable expectation of success in doing so because each relates to the same well-known smart watch technologies. *See supra* Section VIII.A.1; Ex-1008 ¶¶70-73.

148. Kita’039 teaches that a mobile phone “parent terminal” “forms a wireless link relationship” with a wristwatch “child terminal.” Ex-1008 ¶¶32-33. The user is able to answer an incoming call and send voice signals to the user’s mobile phone from the user’s wristwatch. For example, when an incoming call is received by the mobile phone, information relating to the call is displayed on the watch’s display and “a call start operation” is performed. Ex-1008 ¶61, Fig. 12. The user can also “make and receive calls” from the watch. Ex-1008 ¶¶77-78, 80, Fig. 17. Additionally, “incoming messages and e-mails” may be displayed on the watch. Ex-1008 ¶67; *see also id.* ¶24 (“various types of information, characters constituting an e-mail, and the like are displayed”).

149. As described in Section VIII.A, Narayanaswami-Kita’514 teaches a

watch that sends wireless communication signals to the mobile device. Ex-1005, 7:67-8:3. Narayanaswami-Kita'514 does not explicitly teach that the wireless communication signals are signals to answer an incoming call. But it would have been obvious that they could be, as taught by Kita'039 and other publications by Narayanaswami. Ex-1024, 33 ("Speaking into the watch, he sends a message to his wife's cell phone: 'Flight delay. Can't pick up Rob after baseball.'"); Ex-1030, 18 ("the Samsung Watchphone Anycall™ are watches with a telephone"). A POSITA would thus have been motivated to implement Kita'039's answer a call and voice signal features with the Narayanaswami-Kita'514 watch to add convenience as exemplified by Narayanaswami's own work in the field. Additionally, Kazunori Kita is the first named inventor on both Kita'514 and Kita'039 and a POSITA would have understood them to teach complementary features of similar devices in the same field of endeavor.

150. As I also explained in my Technology Background, watches for sending wireless communication signals to mobile devices including to answer an incoming call, send voice signals, and send voice signals for an active call were known by 2003. See Section V.E (Technology Background) (citing, e.g., Ex-1024, 33; Ex-1029, 7, 9; Ex-1030, 18, 20; Ex-1039, 7; Ex-1043, Abstract; Ex-1053, 501). Watches like the IBM Linux Watch, Samsung's Watchphone Anycall, and NTT's PHS demonstrated that wristwatches were evolving into powerful communication tools,

capable of handling complex interactions that were previously the domain of mobile phones. These early smartwatches featured built-in microphones, speakers, and wireless communication systems, enabling users to make and receive calls, send voice messages, and interact with other mobile devices. This progression would have been clearly understood by a POSITA, who would have recognized the value of integrating these wireless communication capabilities into wristwatches to enhance usability, convenience, and portability. *See* Section V.E (Technology Background).

151. A POSITA would have had a reasonable expectation of success in combining Narayanaswami-Kita’514 and Kita’039. All three describe watches that display the current time and include processors, memory, and wireless communications that allow the user to access information directly from the watch, such as phone calls or emails. *See supra* Section VIII.A.1; Ex-1008 ¶¶70-73. A POSITA would thus have understood that these references disclose interrelated teachings based on well-understood technologies that would have been amenable to various well-understood and predictable combinations.

2. Dependent Claims 20, 23-26, 31, and 36-39

a. Claim 20: The watch of claim 1, wherein said first user-perceivable signals are indicative of a text message.

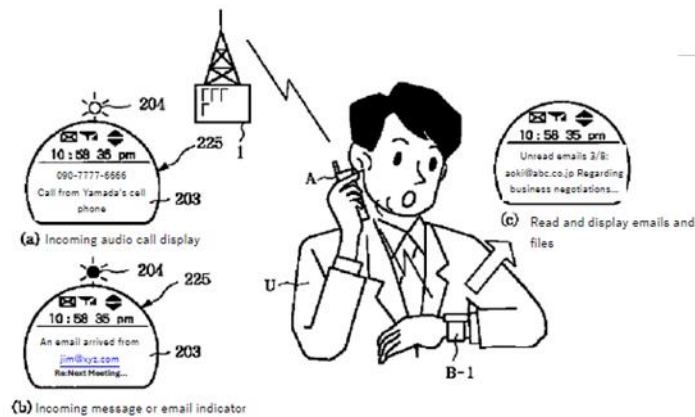
152. Narayanaswami-Kita’514 in view of Kita’039 (“Narayanaswami-Kita’514-Kita’039”) teaches Claim 20.

153. Kita’039 teaches that “various types of information, *characters*

constituting an e-mail, and the like are displayed on the display unit 425.” Ex-1008

¶24. Moreover, as shown in Figure 12 below, Kita’039 teaches that “if a user U carries the parent terminal A in a breast pocket or the like and wears the child terminal B-2 on their arm, the user can display ***incoming messages and e-mails*** as depicted in FIG. 12(b), and can read and display e-mails and files as depicted in FIG. 12(c).” Ex-1008 ¶67, Fig. 12. A POSITA would have understood that displaying characters “and the like” and “incoming messages” would include text messages. Text, whether in an email or a text message, is fundamentally a sequence of characters represented by digital codes. Since both types of messages involve the transmission and display of text, the technology to render these characters on a screen is the same. Therefore, it would have been obvious to a POSITA that the same characters and encoding used in emails could be utilized for text messages, and vice versa. Both emails and text messages typically use standardized character encodings such as ASCII or Unicode. These encoding systems are designed to represent characters in a consistent way across different platforms and devices. Therefore, the same characters that are used in emails can be displayed in text messages without any alteration. This commonality in encoding ensures that any text, whether in an email or a text message, can be displayed in the same way.

[FIG. 12]



154. It would have been obvious that the Narayanswami-Kita'514 watch could provide user-perceivable notification signals indicative of a text message, as taught by Kita'039 and other publications by Narayanaswami. Ex-1024, 33 ("At the airport newsstand, the watch vibrates again, this time with a text message from his wife saying that their son has a ride home with a friend."); Ex-1030, 24 ("Simple text messages ... can be easily shown on the LCD display, so long as one chooses an appropriately sized font."). This was also a well-known feature in mobile phones by 2003, which a POSITA would have understood could be applied to wristwatches, as I explained in Section V.B (Technology Background). Ex-1011 (Nokia), 81 ("When you receive a text message, the phone displays Message received and the  indicator, and makes a sound.").

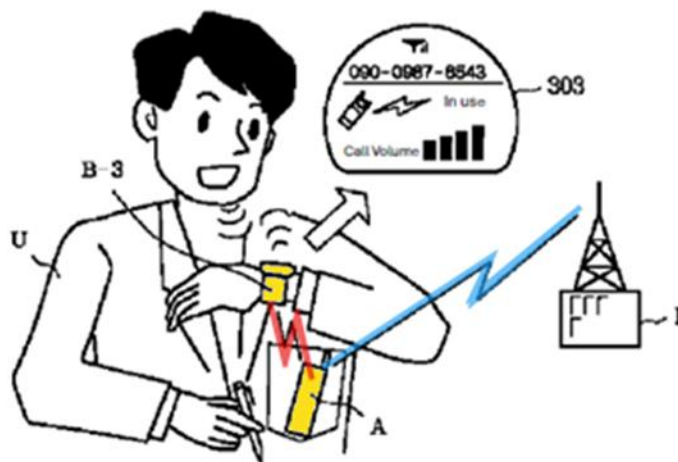
155. A POSITA would have had a reasonable expectation of success in combining Narayanaswami-Kita'514 with Kita'039 for the reasons described above in Section VIII.B.1.

- b. Claim 23/36: The watch of claim 22/35, wherein said wireless communication signals operable to be sent to said mobile telephonic device comprise wireless communication signals to answer an incoming call.**

156. Narayanaswami-Kita'514-Kita'039 teaches Claims 23/36.

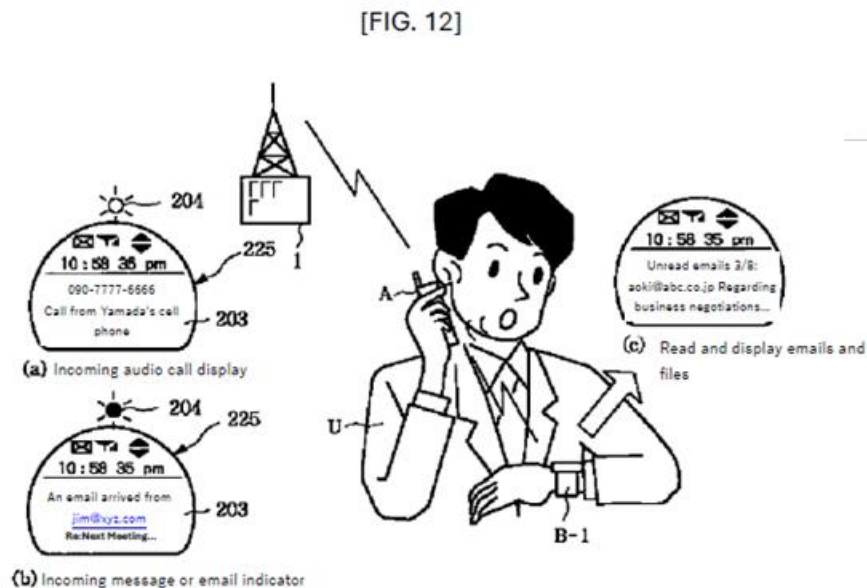
157. Kita'039 teaches that a mobile phone "parent terminal" "forms a wireless link relationship" with the wristwatch "child terminal." Ex-1008 ¶¶32-33. First, as depicted in Figure 17 below, Kita'039 teaches that a user "can make and receive calls while checking the call status on the display unit 303 of the child terminal B-3." Ex-1008 ¶80, Fig. 17. A POSITA would have recognized the user interacting with watch B-3 as indicated by the soundwaves emanating from the user's mouth and the watch, whereas the communications between the watch and cell phone A (red) and the cell phone to tower 1 (blue), all happen wirelessly while the phone remains in the user's pocket.

[FIG. 17]



158. Kita'039 further teaches "incoming call processing." Ex-1008 ¶31. For

example “the user U can recognize an incoming call by LED 204, and as depicted in FIG. 12(a), various information related to the audio call can be displayed on the display unit 225 of the child terminal B-2 while performing a call start operation on the parent terminal A.” Ex-1008 ¶61, Fig. 12. Kita’039’s “call start operation” corresponds to the claimed “wireless communication signals operable to be sent to said mobile telephonic device comprise wireless communication signals to answer an incoming call” because they cause an incoming call operation on the mobile device to be executed and received on the child terminal. *See also* Section V.E (Technology Background).



- c. **Claim 24/37: The watch of claim 22/35, wherein said wireless communication signals operable to be sent to said mobile telephonic device comprise voice signals.**

159. Narayanaswami-Kita’514-Kita’039 teaches Claims 24/37 for the reasons described above for Claims 23 and 36.

160. Additionally, Kita'039 teaches that a "hands-free switch" of the child terminal can be turned on by the parent terminal "when a call is in progress between the base station 1 and the parent terminal A ... and the child terminal B-3, receiving this transmission, displays on the display unit 303 that a hands-free call is in progress." Ex-1008 ¶77. "As a result, the call audio signal received by the parent terminal A is transmitted to the child terminal B-3, the call audio is generated from the speaker 327 of the child terminal B-3, the call audio signal detected by the microphone 328 is transmitted to the parent terminal A, and then a hands-free state is created in which the call audio signal is transmitted from the parent terminal A to the base station 1." Ex-1008 ¶78. Kita'039's "call audio signal detected by the microphone 328 [that] is transmitted to the parent terminal" corresponds to the claimed "wireless communication signals operable to be sent to said mobile telephonic device comprise voice signals" because they are the voice signals that the user speaks into the watch's microphone. *See also* Section V.E (Technology Background).

- d. Claim 25/38: The watch of claim 22/35, wherein said wireless communication signals operable to be sent to said mobile telephonic device comprise wireless communication signals to answer an incoming call and wireless communication signals comprising voice signals.**

161. Narayanaswami-Kita'514-Kita'039 teaches Claims 25/38 for the reasons described above for Claims 23-24 and 36-37.

- e. **Claim 26/39: The watch of claim 25/38, wherein said wireless communication signals comprising voice signals comprise voice signals operable to be utilized by said mobile telephonic device for an active call.**

162. Narayanaswami-Kita'514-Kita'039 teaches Claim 26/39 for the reasons described above for Claims 23-25 and 36-38.

- f. **Claim 31: The watch of claim 27, wherein said first user-perceivable signals are indicative of an incoming call, said second user-perceivable signals are indicative of a reminder, and said third user-perceivable signals are indicative of a text message.**

163. Narayanaswami-Kita'514-Kita'039 teaches Claim 31 for the reasons described above for Ground 1 (Claims 1, 10, and 12) and Claim 20.

C. Ground 3: Claims 12-13, 15-17, 19-21, and 28-34 are obvious over Narayanaswami in view of Kita'514, Kita'039, and Cannon.

- 1. **A POSITA would have been motivated to combine Narayanaswami-Kita'514-Kita'039's teachings with Cannon's teachings and would have had a reasonable expectation of success.**

164. A POSITA would have been motivated to combine the teachings of Narayanaswami-Kita'514-Kita'039, with Cannon and would have had a reasonable expectation of success in doing so because each relates to the same well-known smart watch technologies. *See supra* Section VIII.B.1; Ex-1010 ¶¶22-23. The functionality of wearable devices, particularly smartwatches, by integrating various types of notifications and interactions, was important to users.

165. Cannon teaches an indication unit for a mobile device that

communicates wirelessly with the user's wristwatch such that when the user wearing the watch returns to the vicinity of the mobile device, the user is notified of any pending messages. Ex-1010 ¶¶9, 23. A pending message includes an "incoming phone message," "a message indicating an upcoming appointment, birthday, or other event, etc." (Ex-1010 ¶24), a "voice message, text message, appointment or other reminder message, etc." Ex-1010 ¶23. Cannon further teaches that the user indication "might be an audible signal, a vibration, flashing lights or other indication which a user will quickly notice upon his return to a portable wireless device." Ex-1010 ¶34.

166. As described in Sections VIII.A-VIII.B, Narayanaswami-Kita'514-Kita'039 teaches a watch that provides user-perceivable notification signals indicative of an incoming call, calendar notification, missed call, reminder, and text message. It would have been obvious that the Narayanaswami-Kita'514-Kita'039 watch could also provide user-perceivable notification signals indicative of a voice message, as taught by Cannon. A POSITA would thus have been motivated to implement Cannon's voice message notification with the Narayanaswami-Kita'514-Kita'039 watch as a familiar element with a predictable result, as exemplified by Narayanaswami's own work in the field. *See* Ex-1024, 33. These were also well-known features in mobile phones by 2003, which a POSITA would have been motivated to include into a wristwatch, as I explained in Section V.B (Technology

Background). Ex-1011 (Nokia), 44 (“When you receive a voice message, your phone lets you know by beeping, displaying an icon on the screen, or showing a text message.”). Integrating Cannon’s voice message notification would have been seen as a natural extension of the existing functionality, providing a more comprehensive notification system that aligns with user expectations and needs.

167. Additionally, a POSITA would have been motivated to allow the user to select different types of user-perceivable notification signals for different events, as taught by Cannon, in the Narayanaswami-Kita’514-Kita’039 watch. For example, a user could select different sounds for different events such as selecting a ring sound for an incoming call, an alarm sound for a reminder, and a vibration sound for a text message. This was also a well-known feature in mobile phones by 2003, which a POSITA would have been motivated to include into a wristwatch, as I explained in Section V.D (Technology Background). Ex-1011 (Nokia), 62-63 (“[a]ssign[ing] a ringing tone to a caller group”). A POSITA would have recognized that such customization options would make the smartwatch more versatile and user-friendly, meeting the consumer demand for personalized technology.

168. As I also explained in my Technology Background, watches for receiving wireless communication signals from mobile devices regarding voice messages were known by 2003. See Section V.B (Technology Background) (citing Ex-1053, 501; Ex-1048 ¶¶3-6, 20). Moreover, it was also known that a user could

select the same type of signal for notification of multiple different events or a different type of signal for notification of each different event. *See* Section V.D (Technology Background) (citing, e.g., Ex-1024, 33, 35; Ex-1029, 12; Ex-1030, 24-25; Ex-1041, 3; Ex-1049, 21:31-55, 22:42-46; Ex-1046 ¶¶37, 72-74, 76; Ex-1047, 1:39-41, 2:63-65, 4:66-5:2, 5:25-31, 7:20-35, 8:57-61, 10:24-32).

169. A POSITA would have had a reasonable expectation of success in combining Narayanaswami-Kita’514-Kita’039 and Cannon. All four describe watches that display the current time and include processors, memory, display, and wireless communications that allow the user to access information directly from the watch, such as phone calls, emails, or other types of messages. *See supra* Section VIII.B.1; Ex-1010 ¶¶22-23, Fig. 4.

2. Dependent Claims 12-13, 15-17, 19-21, and 28-34

a. Claim 12: The watch of claim 1, wherein said second user-perceivable signals are indicative of a reminder.

170. Narayanaswami-Kita’514 teaches Claim 12 for the reasons described above in Ground 1.

171. Narayamaswami-Kita’514-Kita’039 in view of Cannon (“Narayamaswami-Kita’514-Kita’039-Cannon”) also teaches this limitation. Cannon teaches providing an indication to the user as “an annunciation message as a reminder for an appointment or other event, e.g., a birthday.” Ex-1010 ¶6. Specifically, Cannon states that “[i]f the message is a reminder message, it may come

from a scheduling program being run by the portable wireless device” and “automatically notify the user” at “a predetermined time (e.g., one day, several hours, etc.)” before the upcoming event or appointment. Ex-1010 ¶25; *see also* Section V.B (Technology Background).

b. Claim 13: The watch of claim 1, wherein said second user-perceivable signals are indicative of a missed call.

172. Narayanaswami-Kita’514 teaches Claim 13 for the reasons described above in Ground 1.

173. Narayamaswami-Kita’514-Kita’039-Cannon also teaches this limitation. Cannon teaches storing and notifying the user regarding any type of message “that a user would want to be notified and/or reminded of ... in quick fashion ***upon returning to the vicinity of the portable wireless device***” (Ex-1010 ¶30) such as an “***incoming phone message***.” *Id.* ¶24. Specifically, when the user returns to the vicinity of the device, “indication unit 100 will check for pending messages and notify the user of same by one or both of notification units 135, 130, as appropriate.” *Id.* ¶¶23, 26. A POSITA would have understood that an incoming phone message is “indicative of a missed call” because it is a phone message notification sent to the user when they are again near the mobile device. By 2003, it was well established that mobile devices provided notifications for various events, including missed calls. A POSITA would have been familiar with the typical behavior of mobile devices where, if a call is not answered, the device registers it as

a missed call and generates a corresponding notification. This notification can take various forms, such as an icon, a short word display, or a sound/vibration alert, indicating that the user has missed an incoming call. Therefore, a notification of an “incoming phone message” would naturally have been understood as a signal related to a missed call, particularly when the user returns to the vicinity of the device after being away. In Cannon, the device is specifically designed to check for “pending messages” and notify the user as soon as they return to the device’s vicinity. Given that a missed call is the most common type of “pending message” that a user might miss while away, a POSITA would logically have interpreted the “incoming phone message” mentioned in Cannon as being indicative of a missed call notification. *See also* Section V.B (Technology Background) (citing, e.g., Ex-1048 ¶¶5-6, 20).

- c. **Claim 15/16: The watch of claim 1, wherein said first user-perceivable signals are indicative of an incoming call and said second user-perceivable signals are indicative of a [reminder/missed call].**

174. Narayanaswami-Kita’514 teaches Claims 15/16 for the reasons described above in Ground 1 (Claims 1, 10, and 12-13). Narayamaswami-Kita’514-Kita’039-Cannon also teaches these limitations for the reasons described above for Claims 12-13.

- d. **Claim 17: The watch of claim 1, wherein said first user-perceivable signals are indicative of an incoming call, said second user-perceivable signals are indicative of a reminder, and said device is configured to receive third wireless communication signals associated with a third event.**

175. Narayanaswami-Kita’514 teaches Claim 17 for the reasons described above in Ground 1.

176. Narayamaswami-Kita’514-Kita’039-Cannon also teaches this limitation. Cannon teaches receiving *third wireless communication signals associated with a third event* such as, for example, a “voice message, text message, [or] appointment.” Ex-1010 ¶¶23-24.

- e. **Claim 19: The watch of claim 1, wherein said first user-perceivable signals are indicative of a voice message.**

177. Cannon teaches notifying “the user of the pending message which requires his immediate attention” including a “voice message.” Ex-1010 ¶23; see also *id.* ¶34 (“the user indication 130 and/or 135 might be an audible signal, a vibration, flashing lights or other indication”), Claim 13 (“the pending message is a voice mail.”).

178. A POSITA would have been motivated to combine Narayanaswami-Kita’514-Kita’039 with Cannon and had a reasonable expectation of success in doing so for the reasons described above in Section VIII.C.1. And additionally because other publications by Narayanaswami included this feature. Ex-1024, 33

(“Speaking into the watch, he sends a message to his wife’s cell phone: ‘Flight delay. Can’t pick up Rob after baseball.’”); *see also* Section V.B (Technology Background).

f. Claim 20: The watch of claim 1, wherein said first user-perceivable signals are indicative of a text message.

179. Narayamaswami-Kita’514-Kita’039 teaches Claim 20 for the reasons described above in Ground 2.

180. Narayamaswami-Kita’514-Kita’039-Cannon also teaches this limitation. Cannon teaches notifying “the user of the pending message which requires his immediate attention” including a “text message.” Ex-1010 ¶23; *see also id.* ¶34; Section V.B (Technology Background).

g. Claim 21: The watch of claim 1, wherein said device is operable to allow a user to select a type of user-perceivable signal for said first user-perceivable signals that is different than a type of user-perceivable signal for said second user-perceivable signals.

181. Cannon teaches providing user perceivable signals to the user that are dependent upon the wireless communication signals received relating to particular events (e.g., a “voice message, text message, appointment or other reminder message”). Ex-1010 ¶23; *see also id.* ¶24. For example, Cannon teaches that “the user indication 130 and/or 135 might be an audible signal, a vibration, flashing lights or other indication which a user will quickly notice upon his return to a portable wireless device.” Ex-1010 ¶34. Cannon further teaches that “a typical message-

waiting indicator might be a flashing envelope to signify there is a message waiting” or “an available annunciation message may be indicated by another display icon.” Ex-1010 ¶6, Claims 14 (audible indication), 15 (vibration).

182. A POSITA would have been motivated to allow the user to select different types of user-perceivable signals for different events because this was a well-known feature in mobile phones by 2003, which a POSITA would have been motivated to include into a wristwatch, as I explained in Section V.D (Technology Background), for several reasons, including a user-centric design and the practical advantages of a unified notification system. Ex-1046 (Britt, Jr.) ¶76; *see also* Ex-1011 (Nokia), 62-63; Ex-1034 (Siewiorek), 4 (action module supports basic operations that are “configurable” such as ringer control (off/low/medium/high), vibrate control (on/off), sending an SMS to a caller making call suggestions, and providing access to an electronic calendar; “user interfaces communicate the phone’s status to the user and permit manual override of the phone’s decisions while allowing the input of preferences”; “Figure 7 shows the SenSay user interface on the mobile phone for overriding the phone’s state to the user’s preference”); Ex-1037 (Dey), 3 (“The tool provides an audio or vibration signal” but “[b]oth types of cues may be inappropriate in various situations (e.g., audio cues in a meeting are disruptive and vibration cues while jogging may not be noticed). This suggests that the manner in which reminders are delivered is also extremely important.”), 7-8 (“CybreMinder

determines what is the most appropriate delivery mechanism for each reminder recipient. The default signal is to show the reminder on the closest available display, augmented with an audio cue. However, if the recipient wishes, they can specify a configuration file that will override this default. A user's configuration file contains information about all of the available methods for contacting the user, as well as rules defined by the user on which method to use in which situation.”); Ex-1038 (Gellerson), 10 (“State of the art mobile phones support so-called profiles to group settings, such as notification mode, input and output modality, and reaction to incoming messages and calls. Users can define profiles for different situations and specify behavior desired in those situations.”); Ex-1039 (Sawhney), 6 (“On some pagers and mobile phones users can define ringing tones for preferred people or caller groups The *Profile* function on the Nokia 6100 phones enables users to adjust the ringing tones according to various situations and caller group identification.”). For example, a user could select different sounds for different events such as selecting a ring sound for an incoming call and an alarm sound for a reminder.

183. The ability to select different types of user-perceivable signals for different events would have been highly desirable because it aligns with user preferences, helps prioritize notifications, minimizes distractions, addresses accessibility needs, reduces notification fatigue, and provides contextual awareness.

Users have varying preferences when it comes to how they want to be notified of different events. Allowing users to select different types of signals enables them to customize their device according to their personal preferences and lifestyles. Moreover, different events often carry different levels of importance. For example, an incoming call from a family member might be considered more urgent than a calendar reminder. By allowing users to assign different signals to different events, the device would help users prioritize their attention based on the significance of each event. A loud ringtone for calls can signify urgency, while a softer notification sound for a calendar reminder can indicate something less immediate. This differentiation helps users manage their time and attention more effectively. Additionally, in various environments, such as meetings, classrooms, or public spaces, users might want to minimize distractions. By allowing the user to choose specific types of notifications, such as silent vibrations or flashing lights, users can stay informed about important events without causing interruptions to those around them. This flexibility allows the device to adapt to different social contexts, enhancing its utility in various settings. Furthermore, different types of user-perceivable signals cater to a wide range of accessibility needs. For example, users with hearing impairments might prefer visual or vibration notifications over auditory ones. Conversely, users with visual impairments might rely more on auditory cues. Offering a variety of signal options ensures that the device is accessible to a broader

range of users, improving inclusivity and user experience. By assigning distinct signals to different events, users can also quickly identify the nature of the notification without needing to check their device each time it alerts them. This can reduce stress and make the experience of using the device more pleasant and efficient. Users may also find it beneficial to adjust notification types based on the context of their current environment or activity. For example, a user might choose a silent mode with vibration while at work or in a movie theater, but switch to an audible alert when at home. *See also* Section V.D (Technology Background).

- h. Claim 28: The watch of claim 27, wherein said device is operable to allow a user to select different types of user-perceivable signals for each of said first user-perceivable signals, said second user-perceivable signals, and said third user-perceivable signals.**

184. Narayamaswami-Kita'514-Kita'039-Cannon teaches Claim 28 for the reasons described above for Claim 21.

- i. Claim 29/30/31: The watch of claim 27, wherein said first user-perceivable signals are indicative of an incoming call, said second user-perceivable signals are indicative of a reminder, and said third user-perceivable signals are indicative of a [missed call/voice message/text message].**

185. Narayanaswami-Kita'514 teaches Claim 29 for the reasons described above in Ground 1 (Claims 1, 10, and 12-13), Claim 30 for the reasons described above in Ground 1 (Claims 1, 10, and 12) and Claim 19, and Claim 31 for the reasons described above in Ground 1 (Claims 1, 10, and 12) and Ground 2 (Claim 20).

Narayamaswami-Kita'514-Kita'039-Cannon also teaches these limitations for the reasons described above for Claims 12-13 and 19-20.

- j. Claim 32/33: The watch of claim 27, wherein said first user-perceivable signals are indicative of an incoming call, said second user-perceivable signals are indicative of a missed call, and said third user-perceivable signals are indicative of a [voice message/text message].**

186. Narayamaswami-Kita'514-Kita'039-Cannon teaches Claim 32 for the reasons described above for Ground 1 (Claims 1, 10, and 13) and Claims 13 and 19 and Claim 33 for the reasons described above in Ground 1 (Claims 1, 10, and 13), Ground 2 (Claim 20), and Claims 13 and 20.

- k. Claim 34: The watch of claim 27, wherein said first user-perceivable signals are indicative of an incoming call, said second user-perceivable signals are indicative of a voice message, and said third user-perceivable signals are indicative of a text message.**

187. Narayamaswami-Kita'514-Kita'039-Cannon teaches Claim 34 for the reasons described above for Ground 1 (Claims 1 and 10), Ground 2 (Claim 20), and Claims 19-20.

- D. Ground 4: Claims 1-10, 13, 16, 18-19, 22-27, 32, and 35-39 are obvious over Fujisawa (Ex-1006) in view of Kita'514.**

- 1. A POSITA would have been motivated to combine Fujisawa's teachings with Kita'514's teachings and would have had a reasonable expectation of success.**

188. A POSITA would have been motivated to combine the teachings of Fujisawa with Kita'514 and would have had a reasonable expectation of success in

doing so because each relates to the same well-known smart watch technologies. Ex-1006 ¶¶132-136, Fig. 1; Ex-1007 ¶¶ 153-155, Fig. 18A. As such, they are analogous art.

189. Fujisawa teaches a watch that “performs bidirectional radio communication with” a mobile device. Ex-1006 ¶128, Fig. 1. For example, when an incoming call is received by the mobile device, “an incoming call notification signal” is sent to the watch, which allows the user to communicate with other users in the system. Ex-1006, Abstract, Fig. 6. As explained in Section VIII.A.1, Kita’514 teaches a wristwatch that has two bands and a buckle (Ex-1007 ¶¶109-110, Figs. 1-2) and “a function module unit fitted on and connected to” the watch bands, which “provides a sensor function” (Ex-1007 ¶399), such as, for example, an accelerometer, barometer for detecting altitude and depth, direction sensor, positioning meter, and speed meter. Ex-1007, Figs. 1, 53, ¶148.

190. A POSITA would have been motivated to implement Kita’514’s two watch bands and buckle with Fujisawa’s watch for the reasons explained in Section VIII.A.1. *See also* Section V.A (Technology Background) (citing Ex-1028, 4-5 (describing the Linux Watch’s two bands); Ex-1040 (Vock), 44:27-29, Fig. 39 (depicting a smart watch with two bands—one connected to the lug on the left and one to the right), Fig. 38 (depicting the buckle that affixes the watch bands to one another); *see also* Ex-1045 (Hasegawa), 4:47-57, Figs. 4-5 (showing a watch with

two bands and a buckle that communicates with a mobile phone)).

191. Moreover, a POSITA would have found it beneficial to implement Kita'514's motion sensing features such as its accelerometer, barometer, direction sensor, positioning meter, and/or speed meter, in Fujisawa's watch so that it could distinguish between a plurality of different types of motion including, changes in altitude, direction, speed, and/or position for features such as Kita's climb indicator. Ex-1007 ¶148, Fig. 1. Such differentiation is helpful to avoid false notifications that could confuse or frustrate the user. A POSITA would have also understood that adding motion sensing to Fujisawa's watch would improve, for example, usability, convenience, and power management because the watch only uses energy when it senses movement (e.g., the watch display light is only turned on when the watch senses that the user has rotated their wrist). Indeed, these were known benefits of adding motion sensing to conventional watches such as the Linux/Casio watches by 2003. Ex-1027, 47 (fingerprint sensor, accelerometer, battery, buttons, memory added to Linux Watch to refine "power management, networking, mobility, and security"); Ex-1031, 2 (Linux Watch "tilt switch is used to detect arm motions for gesture input"); Ex-1026, 4 (Casio's ALT-7000 watch "with twin sensors for measuring altitude, barometric pressure" and CPW-100 watch "for measuring compass bearings using geomagnetic readings ... enabled users to stay on course even in poor visibility"), 7, 10. For example, Casio watches used a simple tilt sensor

to light the display when a user rotated their wrist to view the time. Ex-1026, 14; Ex-1032. Such features were well known in watches by 2003. A POSITA would have understood that these capabilities would enhance power management by adjusting the watch's settings based on the user's movement patterns, improve networking by enabling context-aware communication, boost mobility by providing accurate tracking of the user's location, enhance security through gesture-based authentication, and refine gesture detection for more intuitive user interactions. Such features were well-known and a POSITA would have understood their value in creating a more versatile and user-friendly device.

192. As I also explained in my Technology Background, wearable devices such as watches for distinguishing between a plurality of different types of motion were known by 2003. See Section V.C (Technology Background) (citing, *e.g.*, Ex-1026, 4, 6-7, 10; Ex-1027, 45, 47; Ex-1031, 2; Ex-1032, 4:48-5:19, Figs. 1, 6-7, 11; Ex-1040, 44:26-27, 44:33-34, 10:15-17, 44:55-56, 44:66-45:5, 44:43-47; Ex-1050, 20; Ex-1051, 184-185; Ex-1061, 1-2; Ex-1062, 23-24; Ex-1052, 148; Ex-1054, 92, 96, 99; Ex-1056, 1147, 1147-48; Ex-1058, 3-5; Ex-1059, 221-222, 227; Ex-1060, 791-792; Ex-1055, 329-330; Ex-1057, 136; Ex-1063, 5).

193. Moreover, as I explained in Section V.C (Technology Background), a POSITA would have recognized the importance of including motion sensing to differentiate between a plurality of different types of motion in a wristwatch for

several reasons, as outlined by the state of the art by 2003 including:

(1) **Improved Usability and Convenience:** One of the key reasons for incorporating motion sensing into a wristwatch is to enhance the overall usability and convenience of the device. By distinguishing between different types of motion, the watch could intelligently respond to specific user actions without requiring manual input. For example, detecting wrist rotations could trigger the display to light up, allowing users to easily check the time or other information without the need for pressing buttons. *See, e.g.,* Ex-1026, 14; Ex-1032. This improves the user experience by making interactions with the watch more seamless, natural, and hands-free, particularly in situations where manual operation would be inconvenient (e.g., during exercise or driving).

(2) **Enhanced Power Management:** One of the significant challenges in wearable technology is power consumption, and motion sensing provides an effective solution. A POSITA would have recognized that a wristwatch equipped with motion sensors could conserve power by only activating certain functions when necessary. For example, Casio watches and IBM's Linux Watch incorporated tilt sensors to activate displays when the user rotated their wrist. This type of power management ensures that energy-intensive functions (like the display backlight) are only activated when the watch senses motion indicative of the user checking the device. In the broader context of wearable technology, differentiating between types

of motion—such as distinguishing between active user engagement and idle states—would allow the watch to optimize power usage and prolong battery life, a critical feature for always-on devices. *See, e.g.*, Ex-1027, 47 (fingerprint sensor, accelerometer, battery, buttons, memory added to Linux Watch to refine “power management, networking, mobility, and security”).

(3) Context-Aware Features and Advanced Functionality: By enabling a wristwatch to differentiate between various types of motion, the device becomes more context-aware and capable of providing advanced functionalities tailored to specific activities. For example, motion sensors such as accelerometers and gyroscopes can help the device identify specific user activities—whether the user is walking, running, or even playing sports like tennis or volleyball. As noted in Vock’s teaching, the ability to measure shock, power, and drop distances provides valuable performance data in sports applications. A POSITA would have recognized that such context-aware features, which track and respond to user motion, would open new possibilities for fitness tracking, performance monitoring, and even gesture-based controls, making the watch more versatile and appealing to a wider audience.

(4) Safety and Navigation Benefits: Motion sensing would also have significant implications for safety and navigation. Casio’s CPW-100 and PRT-1GPJ watches incorporated sensors to measure compass bearings and GPS data, respectively, allowing users to navigate effectively even in poor visibility or remote

locations. A POSITA would have understood that differentiating between types of motion, such as stationary versus active motion, would further enhance the functionality of these sensors. For example, by recognizing when the user is stationary, the watch could automatically provide more accurate directional or location-based data, crucial for hikers or adventurers relying on their devices for navigation in unfamiliar environments. Additionally, motion differentiation could be used to alert users of sudden or unusual movements, contributing to safety during activities like hiking or extreme sports.

(5) **Personalization and Gesture Recognition:** Another reason a POSITA would have recognized the importance of differentiating motion types is the potential for personalization and gesture recognition. The integration of accelerometers and tilt switches, as seen in IBM's Linux Watch, allows for personalized interactions such as gesture-based inputs. Ex-1031, 2. A POSITA would have understood that distinguishing between a variety of gestures—such as raising the wrist to activate the display or shaking the watch to dismiss notifications—would offer users a customizable experience that adapts to their personal preferences and needs. These features add layers of convenience and efficiency, enabling users to interact with the device in more intuitive and personalized ways.

(6) **Historical Precedent and Proven Benefits:** By 2003, several

wristwatches had already successfully integrated motion-sensing technology. For instance, Casio's ALT-7000 (measuring altitude, barometric pressure, and temperature) and CPW-100 (compass bearings using geomagnetic readings) demonstrated that motion and environmental sensors were practical and useful in wearable devices. Ex-1026, 4, 7, 10. These precedents would have further motivated a POSITA to implement motion-sensing capabilities in wristwatches, recognizing the established benefits in usability, power management, and added functionality. Additionally, IBM's Linux Watch incorporated both accelerometers and tilt switches to enhance usability and refine functions such as power management, networking, and gesture detection, offering a direct example of how these features could improve the overall user experience.

194. A POSITA would have had a reasonable expectation of success in combining Fujisawa and Kita'514. Both describe watches that display the current time and include processors, memory, and wireless communications that allow the user to access information directly from the watch, such as phone calls or emails. Ex-1006 ¶¶132-136, Fig. 1; Ex-1007 ¶¶153-155, Fig. 18A. Because Fujisawa and Kita'514 both describe watches having standard features and components, a POSITA would have understood that incorporating the two-piece watch band, buckle, and motion sensing functions of Kita'514 into Fujisawa's watch would have been obvious to consider (amongst multiple design and manufacturing features and

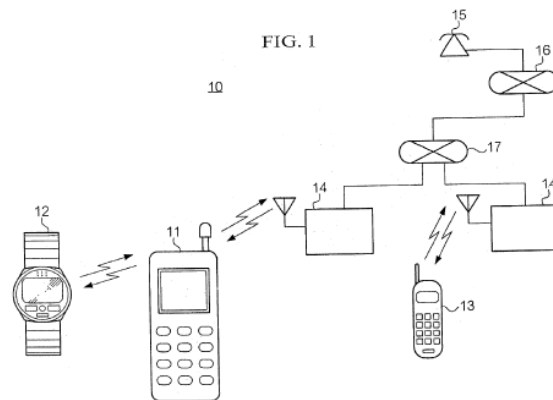
tradeoffs) and be well within the skill of a POSITA.

2. Independent Claim 1

- a. **Element 1[pre]: A watch for use with a mobile telephonic device that provides notification of an incoming call, said watch comprising:**

195. Fujisawa in view of Kita'514 ("Fujisawa-Kita'514") teaches the preamble, to the extent it is limiting.

196. Fujisawa teaches that "[w]hen there is an incoming call to a mobile telephone, it sends an incoming call notification signal to a watch-shaped information processing device." Ex-1006, Abstract, Fig. 1.

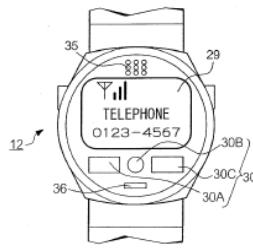


- b. **Element 1[a]: a watch band; a second watch band; a buckle, wherein said buckle is coupled to said second watch band; and**

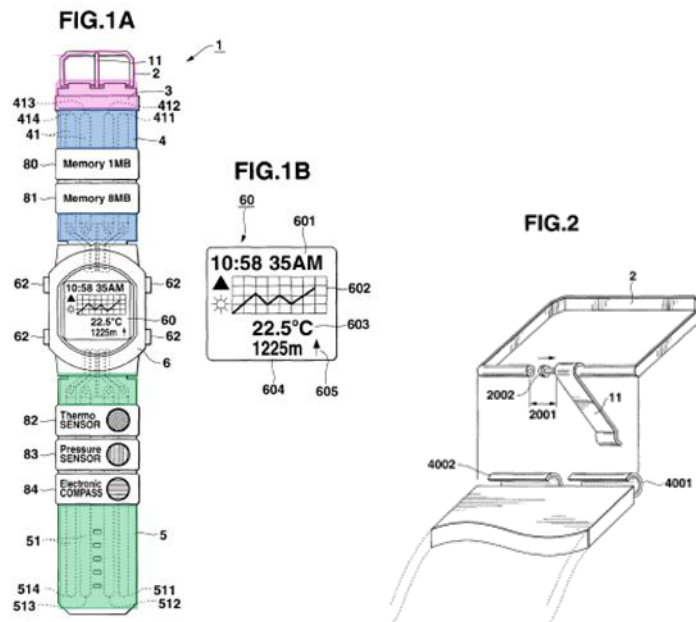
197. Fujisawa-Kita'514 teaches Element 1[a].

198. Fujisawa teaches a watch with a watch band. Ex-1006, Fig. 6.

FIG. 6



199. Fujisawa does not explicitly teach the specific elements of the claimed watch band but Kita'514 provides such teachings for the reasons described in Element 1[a] (Ground 1). Ex-1007 ¶¶109-110, 120, 183, 187, Figs. 1-2, 12, 18.



200. A POSITA would have been motivated to incorporate Kita'514's two-band strap and buckle with the Fujisawa watch, and had a reasonable expectation of success in doing so for the reasons described above in Section VIII.D.1. *See also* Section V.A (Technology Background).

- c. **Element 1[b]: a device operable to receive first wireless communication signals associated with a first event and second wireless communication signals associated with a second event from said mobile telephonic device, wherein said first event and second event are different,**

201. Fujisawa-Kita'514 teaches Element 1[b].

202. Fujisawa teaches that its watch receives first wireless communication signals associated with a first event—an incoming call. Fujisawa teaches that an “incoming call notification signal is received in the antenna unit 21” of the watch “and the receiver circuit 23 demodulates the incoming call notification signal to the received data DRX (step S6).” Ex-1006 ¶155. The notification is received over an asynchronous connection less (ACL) link sent by the mobile device, which is the first wireless communication signal. Ex-1006 ¶¶237-238.

203. Fujisawa also teaches that its watch receives second wireless communication signals associated with a second event different from the first event—a missed call. Fujisawa teaches that “the caller’s telephone number and a message ‘recording caller’s message’ are shown on the display unit 29 of the watch-shaped information processing device 12A to inform the user that the call[er] is currently leaving a message.” Ex-1006 ¶272. The voice message is subsequently transmitted over a synchronous connection oriented (SCO) link sent by the mobile device, the second wireless communication signal. Ex-1006 ¶¶266, 270. *See also* Section V.B (Technology Background).

d. Element 1[c]: said device includes a battery,

204. Fujisawa-Kita'514 teaches Element 1[c].

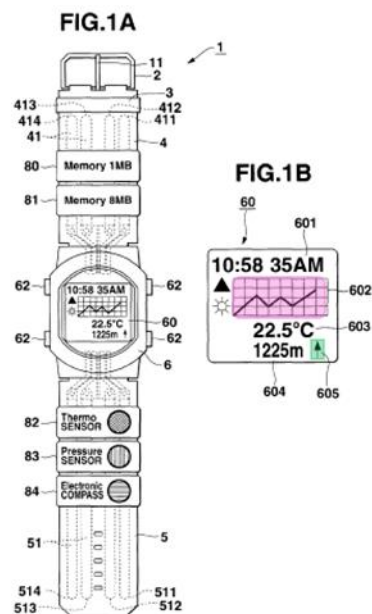
205. Fujisawa teaches that "[a] battery 34 supplies power to components of the watch-shaped information processing device 12." Ex-1006 ¶137.

e. Element 1[d]: said device includes motion sensing operable to distinguish between a plurality of different types of motion,

206. Fujisawa-Kita'514 teaches Element 1[d]. Kita'514 teaches this limitation for the reasons described above in Element 1[d] (Ground 1). Ex-1007 ¶148, Figs. 1, 53 (teaching motion sensing including an accelerometer, barometer for detecting altitude and depth, direction, position, and speed, which distinguish between a plurality of different types of motion).

FIG.53

MODULE ID CODE	MODULE SPECIFICATION CODE	FUNCTION
0100	0000	SENSOR SYSTEM (MEASUREMENT PROCESSING)
0100	0100	THERMOMETER (°C)
0100	0010	BAROMETER (hPa) —ALTITUDE, DEPTH—
0100	0011	DIRECTION SENSOR (°)
0100	0011	POSITIONING METER (° ' ")
0100	0101	ACCELEROMETER (G)
0100	0110	SPEED METER (km/h)
0100	0111	RADIATION THERMOMETER (°C)
0100	1000	PULSE RATE MEASUREMENT (PULSE/SECOND)
0100	1001	SPHYGMOMANOMETER (mmHg)
0100	1111	SENSOR SYSTEM RESERVED



207. A POSITA would have been motivated to combine Kita'514's motion

sensing with Fujisawa's watch, and had a reasonable expectation of success in doing so for the reasons described above in Section VIII.D.1. *See also* Section V.C (Technology Background).

- f. Element 1[e]: said device is operable to provide first user-perceivable notification signals that are dependent upon said received first communication signals, and**

208. Fujisawa-Kita'514 teaches Element 1[e].

209. Fujisawa teaches providing first user-perceivable signals that are dependent on the first received communication signals. Fujisawa teaches that "in order to notify the user of incoming call, the central control circuit 25 controls the electronic sound unit 26 to produce a buzzer sound or an electronic sound, the vibrator 27 to produce a vibration, or the light emitting unit 28 to blink light emitting device such as an LED." Ex-1006 ¶156. Control circuit 25 "extracts the telephone number of the caller from the received data DRX, and displays on the display unit 29 the telephone number and other related information, if any information[,] such as name of the caller is registered in advance" and "a phrase meaning call incoming." *Id.*

- g. Element 1[f]: said device is operable to provide second user perceivable notification signals that are dependent upon said second communication signals.**

210. Fujisawa-Kita'514 teaches Element 1[f] for the reasons described above for Element 1[b].

211. Fujisawa teaches providing second user-perceivable signals that are dependent on the second received communication signals because in response to the missed call signals, the watch displays “recording caller’s message” to the user. Ex-1006 ¶272.

3. Dependent Claims 2-10, 13, 16, 18-19, 22-27, 32, and 35-39

a. Claim 2: The watch of claim 1, further comprising an amplifier.

212. Fujisawa teaches that the watch includes multiple amplifiers, including “power amplifier 24F.” Ex-1006 ¶145. The watch also includes a speaker (Ex-1006 ¶139) so a POSITA would have understood that it has an audio amplifier. This would have been further obvious in view of Kita’514, which teaches an audio input/output module that includes an amplifying device. Ex-1007 ¶197.

b. Claim 3: The watch of claim 1, wherein said user-perceivable notifications signals comprise audible notification signals.

213. Fujisawa teaches that “the notification unit may be equipped with ... an electronic sound unit that makes notification operation by outputting electronic sound.” Ex-1006 ¶71; *see also id.* ¶156 (“electronic sound unit 26 ... produce[s] a buzzer sound or an electronic sound”). A POSITA would have also been motivated to provide for well-known audible indicators to represent incoming (e.g., ring-tone) and missed calls (e.g., chime or the like).

214. Indeed, as I explained in my Technology Background (*see* Section

V.D), it was known that a user could select the same type of signal for notification of multiple different events or a different type of signal for notification of each different event. For example, Britt Jr. teaches a system where a user can select the same or different types of user-perceivable notification signals corresponding to multiple events on a portable device such as a pocket watch or other device “strapped firmly around a user’s arm.” Ex-1046 (Britt Jr.) ¶37. Specifically, Britt Jr. states that “many wireless and non-wireless telephony devices offer ‘distinctive ring’ features.” *Id.* ¶72. For instance, “a telephony device may be configured to identify a caller and ring in a specified way based on the identity of the caller. For example, a user may configure his/her telephone to announce a call from ‘Caller A’ by two short rings followed by a third long ring. Distinctive ring features are particularly useful for telephones which do not have caller ID displays and/or in situations where the caller ID displays are not easily viewable.” *Id.*; *see also* Ex-1047 (Hsu), 1:39-41 (“Typically, the user can select between several different types of available ringing tones and one or more vibration modes.”), 2:63-65 (“the monitor tool may be worn in a manner similar to a wrist-watch or incorporated into a housing with a wristwatch”), 7:20-35 (microprocessor provides instructions “to generate various output tones through the speaker 32, upon occurrence of various conditions, such as a user selected ring tone in response to an incoming call or message”).

- c. **Claim 4: The watch of claim 1, wherein said device further comprises a display.**

215. Fujisawa teaches that the watch includes “display unit 29.” Ex-1006 ¶133.

- d. **Claim 5: The watch of claim 1, wherein said device further comprises a vibrator.**

216. Fujisawa teaches that the watch includes “vibrator 27.” Ex-1006 ¶133.

- e. **Claim 6: The watch of claim 1, wherein said device further comprises a speaker.**

217. Fujisawa teaches that the watch includes “speaker 35.” Ex-1006 ¶139.

- f. **Claim 7: The watch of claim 1, wherein said device further comprises an LED.**

218. Fujisawa teaches that the watch includes “light emitting unit 28,” which “has an LED or other light emitting device.” Ex-1006 ¶133.

- g. **Claim 8: The watch of claim 1, wherein said device further comprises control circuitry, an input device, and memory.**

219. Fujisawa teaches that “[t]he central control circuit 25 controls components of the watch-shaped information processing device 12.” Ex-1006 ¶132. Fujisawa further teaches external input unit 30, which is “equipped with buttons, a touch panel, and so on,” i.e., an input device (Ex-1006 ¶134), and nonvolatile memory 33, which “stores various data and programs.” Ex-1006 ¶136.

- h. Claim 9: The watch of claim 1, wherein said device further comprises a display, a speaker, a vibrator, control circuitry, an input device, and memory.**

220. Fujisawa-Kita'514 teaches Claim 9 for the reasons described above for Claims 4 (display), 5 (vibrator), 6 (speaker), and 8 (control circuitry, input device, memory).

- i. Claim 10: The watch of claim 1, wherein said first user-perceivable signals are indicative of an incoming call.**

221. Fujisawa-Kita'514 teaches Claim 10 for the reasons described above for Element 1[e]. Ex-1006 ¶¶155-156.

- j. Claim 13: The watch of claim 1, wherein said second user-perceivable signals are indicative of a missed call.**

222. Fujisawa-Kita'514 teaches Claim 13 for the reasons described above for Element 1[f]. Ex-1006 ¶¶266, 270, 272.

223. As I explained in my Technology Background, watches for receiving wireless communication signals from mobile devices regarding missed calls were known by 2003. See Section V.B (Technology Background) (citing, e.g., Ex-1048 (Valade) ¶¶5 (“All the above messages are notified to users on their mobile telephone, as a result of which users know that they can download or consult the data received, for example e-mails, **missed calls**, multimedia data, etc.”), 6 (“All the above messages, regardless of their type, are referred to generically as ‘events’ in the remainder of the description.”), 20 (“The invention enables **the arrival of an event at a mobile terminal to be notified to** any type of terminal connected thereto

over a wireless interface, for example ... **a wristwatch**, etc. ... and to issue a notification for the attention of the user in the form of an audible, vibratory, visual, etc. message.”)). This feature was also a known feature in mobile devices, which a POSITA would have been motivated to include into a wristwatch for several reasons, including portability and convenience, user demand for integration, improved usability and always-on access, miniaturization and wearable computing trends, synergies with other devices, and energy efficiency and power management. *See* Section V.B (Technology Background); Ex-1011 (Nokia), 33.

- k. Claim 16: The watch of claim 1, wherein said first user-perceivable signals are indicative of an incoming call and said second user-perceivable signals are indicative of a missed call.**

224. Fujisawa-Kita’514 teaches Claim 16 for the reasons described above for Claims 1, 10, and 13.

- l. Claim 18: The watch of claim 1, wherein at least one of said plurality of different types of motion is a human motion.**

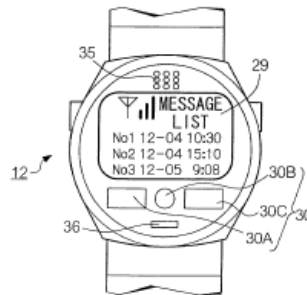
225. Fujisawa-Kita’514 teaches Claim 18 for the reasons described above for Ground 1 and Element 1[d]. Ex-1007, Figs. 1, 53, ¶¶148, 399. *See also* Section V.C (Technology Background).

- m. Claim 19: The watch of claim 1, wherein said first user-perceivable signals are indicative of a voice message.**

226. Fujisawa teaches that “when the central control circuit 25A receives ‘message playing operation by list’ ... it sees the address management table AMT

and acquires all the readout addresses for the caller's messages." Ex-1006 ¶290, Fig. 23.

FIG. 23



227. Central control circuit 25A uses the readout addresses to read "the incoming call time data and the caller data in the nonvolatile memory 33, and ***displays them on the display unit 29*** (step Sd5)." Ex-1006 ¶291. Fujisawa also teaches that the user "can record caller's messages in the watch-shaped information processing device 12A, so the user can ***hear the caller's message anywhere anytime.***" Ex-1006 ¶299; *see also* Section V.B (Technology Background).

n. Claim 22/35: The watch of claim 1/27, wherein said device is operable to send wireless communication signals to said mobile telephonic device.

228. Fujisawa-Kita's 514 teaches Claims 22/35 (and 27 below).

229. Fujisawa teaches that the watch can send wireless communication signals to the mobile phone. For example, Fujisawa teaches that "[w]hen there is an incoming call to the mobile telephone 11 or 11A, communication links between the caller's telephone and the mobile telephone 11 or 11A and between the mobile telephone 11 or 11A and the watch-shaped information processing device 12 or 12A

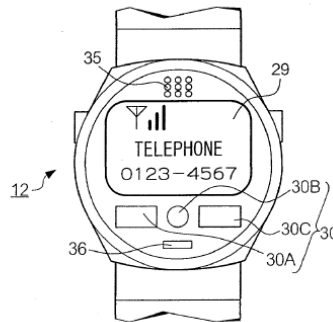
are established” and “the user makes telephone conversation with the caller” using the links. Ex-1006 ¶359. Moreover, Fujisawa teaches that “[t]he ACL link is an asynchronous communication link defined in the bluetooth technical specification.” Ex-1006 ¶188. And the asynchronous data “can be control data used for various instructions and controls among the watch-shaped information processing device 12A and the mobile telephone 11A.” *Id.* ¶189.

o. Claim 23/36: The watch of claim 22/35, wherein said wireless communication signals operable to be sent to said mobile telephonic device comprise wireless communication signals to answer an incoming call.

230. Fujisawa-Kita’514 teaches Claims 23/36 for the reasons described above for Claims 22/35. Fujisawa also teaches that “the user can perform a telephone communication” by using the watch’s microphone and speaker. Ex-1006 ¶359, Fig. 6. Specifically, the mobile phone “receives an incoming call” and then sends “an incoming call notification signal” to the watch. Ex-1006 ¶361. In response, the watch “notifies the user of the incoming call” and the user “uses the external input unit 30 to respond” by having the watch’s control circuit send the mobile phone “an instruction to establish a communication link” between the mobile phone and watch. Ex-1006 ¶362. The mobile phone then “forwards the answer for the incoming call to the radio base station,” “makes a telephone line with the caller’s telephone,” and “a communication line” with the watch. Ex-1006 ¶363. The user can then “make a telephone communication with the caller” by using the watch’s microphone and

speaker. Ex-1006 ¶364; *see also* Section V.E (Technology Background).

FIG. 6



- p. Claim 24/37: The watch of claim 22/35, wherein said wireless communication signals operable to be sent to said mobile telephonic device comprise voice signals.**

231. Fujisawa-Kita'514 teaches Claims 24/37 for the reasons described above for Claims 22-23 and 35-36. Ex-1006 ¶359 (“[u]sing the links, the user makes telephone conversation with the caller”); *see also* Section V.E (Technology Background).

- q. Claim 25/38: The watch of claim 22/35, wherein said wireless communication signals operable to be sent to said mobile telephonic device comprise wireless communication signals to answer an incoming call and wireless communication signals comprising voice signals.**

232. Fujisawa-Kita'514 teaches Claims 25/38 for the reasons described above for Claims 22-24 and 35-37.

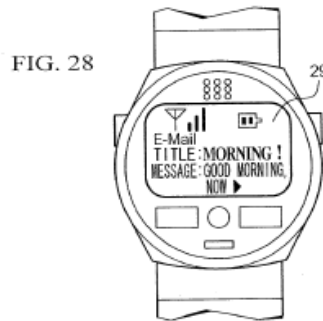
- r. **Claim 26/39: The watch of claim 25/38, wherein said wireless communication signals comprising voice signals comprise voice signals operable to be utilized by said mobile telephonic device for an active call.**

233. Fujisawa-Kita'514 teaches Claims 26/39 for the reasons described above for Claims 22-25 and 35-38.

- s. **Claim 27: The watch of claim 1, wherein said device is operable to receive third wireless communication signals associated with a third event, wherein each of said first event, second event, and third event is different, and said device is operable to provide third user-perceivable notification signals that are dependent upon said third wireless communication signals.**

234. Fujisawa-Kita'514 teaches Claim 27 for the reasons described above for Claims 1, 3-5, 10, 13, and 19 because Fujisawa teaches receiving wireless communication signals associated with at least three different types of events such as an incoming call, missed call, and voice message and providing at least three different types of user-perceivable notification signals that are dependent on the wireless communication signals such as audible, vibration, and display signals (Ex-1006 ¶156).

235. Fujisawa also teaches that a user can receive an email on the watch along with a corresponding notification. As shown in Figure 28 below, the display shows the user “an e-mail message, and title and part of the message.” Ex-1006 ¶348, Fig. 28.



- t. **Claim 32: The watch of claim 27, wherein said first user-perceivable signals are indicative of an incoming call, said second user-perceivable signals are indicative of a missed call, and said third user-perceivable signals are indicative of a voice message.**

236. Fujisawa-Kita'514 teaches Claim 32 for the reasons described above for Claims 1, 10, 13, and 19.

E. Ground 5: Claims 11-12, 14-15, 17, 19-21, and 28-34 are obvious over Fujisawa in view of Kita'514 and Cannon.

1. **A POSITA would have been motivated to combine Fujisawa-Kita'514's teachings with Cannon's teachings and would have had a reasonable expectation of success.**

237. A POSITA would have been motivated to combine the teachings of Fujisawa-Kita'514 with Cannon and would have had a reasonable expectation of success in doing so because each relates to the same well-known smart watch technologies. *See supra* Section VIII.D.1; Ex-1010 ¶¶22-23, Fig. 4.

238. As described in Section VIII.D, Fujisawa-Kita'514 teaches a watch that provides user-perceivable notification signals indicative of an incoming call, missed call, and voice message. *See, e.g.*, Ex-1006, Figs. 18, 19, 28. As also described in Section VIII.C.1, Cannon teaches notifying the user regarding “a message indicating

an upcoming appointment, birthday, or other event, etc.” (Ex-1010 ¶24), a “text message, appointment or other reminder message, etc.” Ex-1010 ¶23.

239. It would have been obvious that the Fujisawa-Kita’514 watch could also provide user-perceivable notification signals indicative of calendar notifications, reminders, and text messages, as taught by Cannon, because these were well-known features in watches by 2003 and providing notifications to the user for more types of events would improve usability. Ex-1024, 33 (“the watch vibrates again, this time with a text message from his wife saying that their son has a ride home with a friend.”); Ex-1030, 24 (“[a]n alarm can be associated with ... a calendar entry”; “alarms are useful to remind people to shut the stove off in twenty minutes”; “[s]imple text messages ... can be easily shown on the LCD display”); *see also* Section V.B (Technology Background). Incorporating these additional notifications would significantly enhance the usability and functionality of the smartwatch by allowing users to stay informed about more types of events directly from their wrist. This expansion of functionality would cater to the growing demand for smartwatches that serve as all-in-one personal assistants, offering timely and relevant alerts across various aspects of daily life.

240. As I also explained in my Technology Background, it was additionally known that a user could select the same type of signal for notification of multiple different events or a different type of signal for notification of each different event.

See Section V.D (Technology Background) (citing, e.g., Ex-1024, 33, 35; Ex-1029, 12; Ex-1030, 24-25; Ex-1041, 3; Ex-1049, 21:31-55, 22:42-46; Ex-1046 ¶¶37, 72-74, 76; Ex-1047, 1:39-41, 2:63-65, 4:66-5:2, 5:25-31, 7:20-35, 8:57-61, 10:24-32).

241. A POSITA would have had a reasonable expectation of success in combining Fujisawa-Kita'514 and Cannon. All three describe watches that display the current time and include processors, memory, display, and wireless communications that allow the user to access information directly from the watch, such as phone calls, emails, or other types of messages. *See supra* Section VIII.D.1; Ex-1010 ¶¶22-23, Fig. 4. These components enable the watches to access and present information directly on the watch, such as phone calls, emails, or other types of messages. The commonality of these foundational elements across the references indicates that they share a well-understood technological base, making them highly compatible for integration. The consideration of a POSITA would have been to make a smartwatch capable of delivering a more comprehensive set of notifications, thereby improving user experience by ensuring that users are promptly informed about a broader array of important events. The predictable and synergistic nature of this combination would have made it an obvious and desirable enhancement to the existing smartwatch design. A POSITA would thus have understood that these references disclose interrelated teachings based on well-understood technologies that would have been amenable to various well-understood and predictable

combinations.

2. Dependent Claims 11-12, 14-15, 17, 19-21, and 28-34

a. Claim 11: The watch of claim 1, wherein said second user-perceivable signals are indicative of a calendar notification.

242. Fujisawa-Kita’514 in view of Cannon (“Fujisawa-Kita’514-Cannon”) teaches Claim 11.

243. Cannon teaches that “a pending message requiring the user’s attention may be ... *a message indicating an upcoming appointment, birthday, or other event*, etc.” and “[i]n such a case, when controller 125 receives a control signal from the proximity detector, it checks the message storage unit 145 for a message set there.” Ex-1010 ¶24; *see also id.* ¶23 (the message to notify the user of may be an “appointment”); Section V.B (Technology Background).

b. Claim 12: The watch of claim 1, wherein said second user-perceivable signals are indicative of a reminder.

244. Fujisawa-Kita’514-Cannon teaches Claim 12 for the reasons described above for Ground 3. *See also* Section V.B (Technology Background)

c. Claim 14/15: The watch of claim 1, wherein said first user-perceivable signals are indicative of an incoming call and said second user-perceivable signals are indicative of a [calendar notification/reminder].

245. Fujisawa-Kita’514-Cannon teaches Claim 14 for the reasons described above for Ground 4 (Claims 1 and 10) and Claim 11 and Claim 15 for the reasons described above for Ground 3 (Claim 12) and Ground 4 (Claims 1 and 10).

- d. **Claim 17: The watch of claim 1, wherein said first user-perceivable signals are indicative of an incoming call, said second user-perceivable signals are indicative of a reminder, and said device is configured to receive third wireless communication signals associated with a third event.**

246. Fujisawa-Kita's 514-Cannon teaches Claim 17 for the reasons described above for Ground 3 (Claim 12) and Ground 4 (Claims 1, 10, and 27).

- e. **Claim 19: The watch of claim 1, wherein said first user-perceivable signals are indicative of a voice message.**

247. Fujisawa-Kita's 514-Cannon teaches Claim 19 for the reasons described above for Grounds 3-4. *See also* Section V.B (Technology Background).

- f. **Claim 20: The watch of claim 1, wherein said first user-perceivable signals are indicative of a text message.**

248. Fujisawa-Kita's 514-Cannon teaches Claim 20 for the reasons described above for Ground 3. *See also* Section V.B (Technology Background).

- g. **Claim 21: The watch of claim 1, wherein said device is operable to allow a user to select a type of user-perceivable signal for said first user-perceivable signals that is different than a type of user-perceivable signal for said second user-perceivable signals.**

249. Fujisawa-Kita's 514-Cannon teaches Claim 21 for the reasons described above for Ground 3. Fujisawa also teaches this limitation as shown below in Figure 36. Ex-1006 ¶¶447-62, Table 134; *see also* Section V.D (Technology Background).

FIG. 36

BLUETOOTH ADDRESS	DEVICE NAME	COMMUNICATION QUALITY FLAG			POWER OFF FLAG	NOTIFICATION REQUIREMENT FLAG	
		OK	Caution	NG			
ad0001	NOTEBOOK PC	1	0	0	0	1	
ad0002	PDA	1	0	0	1	1	
ad0003	MOBILE TELEPHONE	0	0	1	0	1	
ad0004	MP3 PLAYER	1	0	0	0	1	
ad0005	DIGITAL CAMERA	1	0	0	0	1	
ad0006							
ad0007							

NOTIFICATION DEVICE FOR CAUTION				NOTIFICATION DEVICE FOR NG			
DISPLAY UNIT	LIGHT EMITTING UNIT	ELECTRONIC SOUND UNIT	VIBRATOR	DISPLAY UNIT	LIGHT EMITTING UNIT	ELECTRONIC SOUND UNIT	VIBRATOR
1	0	0	1	1	1	1	1
1	0	0	1	1	0	0	1
1	1	0	0	1	1	1	1
1	0	0	1	1	0	0	1
0	1	0	0	1	0	1	1
.....							
.....							

- h. **Claim 28:** The watch of claim 27, wherein said device is operable to allow a user to select different types of user-perceivable signals for each of said first user-perceivable signals, said second user-perceivable signals, and said third user-perceivable signals.

250. Fujisawa-Kita's 514-Cannon teaches Claim 28 for the reasons described above for Ground 3.

- i. **Claim 29/30/31:** The watch of claim 27, wherein said first user-perceivable signals are indicative of an incoming call, said second user-perceivable signals are indicative of a reminder, and said third user-perceivable signals are indicative of a [missed call/voice message/text message].

251. Fujisawa-Kita's 514-Cannon teaches Claim 29 for the reasons described above for Ground 3 (Claim 12) and Ground 4 (Claims 1, 10, and 13), Claim 30 for

the reasons described above for Ground 3 (Claim 19) and Ground 4 (Claims 1, 10, 13, and 19), and Claim 31 for the reasons described above for Grounds 2-3 (Claim 20) and Ground 4 (Claims 1, 10, and 13).

- j. Claim 32/33: The watch of claim 27, wherein said first user-perceivable signals are indicative of an incoming call, said second user-perceivable signals are indicative of a missed call, and said third user-perceivable signals are indicative of a [voice message/text message].**

252. Fujisawa-Kita's 514-Cannon teaches Claim 32 for the reasons described above for Ground 3 (Claim 19) and Ground 4 (Claims 1, 10, and 13) and Claim 33 for the reasons described above for Grounds 2-3 (Claim 20) and Ground 4 (Claims 1, 10, and 13).

- k. Claim 34: The watch of claim 27, wherein said first user-perceivable signals are indicative of an incoming call, said second user-perceivable signals are indicative of a voice message, and said third user-perceivable signals are indicative of a text message.**

253. Fujisawa-Kita's 514-Cannon teaches Claim 34 for the reasons described above for Grounds 2-3 (Claim 20), Ground 3 (Claim 19), and Ground 4 (Claims 1, 10, and 19).

IX. CONCLUSION

254. For the reasons set forth above, I believe that Claims 1-39 of the '633 Patent is unpatentable in view of the prior art.

255. In signing this declaration, I recognize that it will be filed as evidence in a contested case before the Patent Trial and Appeal Board of the United States

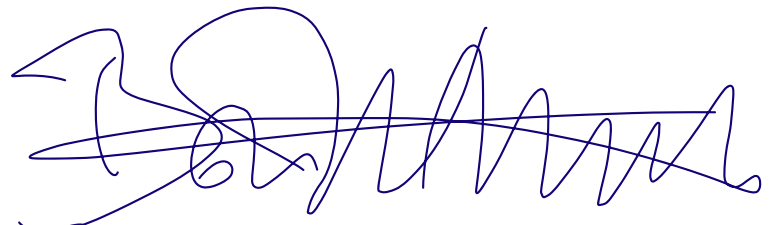
Patent and Trademark Office. I also recognize that I may be subject to cross-examination in the case and that cross-examination will take place in the United States. If cross-examination is required of me, I will appear for cross-examination within the United States during the time allotted for cross-examination.

256. I reserve the right to supplement my opinions in the future to respond to any arguments that the Patent Owner raises and to take into account new information as it becomes available to me.

257. I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Dated: September 30, 2024

Respectfully submitted,



Brian W. Anthony