

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLE INC.,
Petitioner

v.

THL HOLDING COMPANY, LLC,
Patent Owner

Case No. IPR2024-00400
Patent No. 11,350,246

**PETITION FOR *INTER PARTES* REVIEW
OF U.S. PATENT NO. 11,350,246 (CLAIMS 20-27)**

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I. INTRODUCTION

Apple Inc. (“Petitioner”) respectfully requests *inter partes* review (“IPR”) of Claims 20-27 (the “Challenged Claims”) of U.S. Patent No. 11,350,246 (“the ’246 Patent”). The Challenged Claims encompass a hotchpotch of well-known features from prior mobile communication devices and using a Bluetooth transceiver to estimate the distance to a target—a well-known technique prior to the ’246 Patent. *Dec.*, ¶¶82-85.¹

Because the Challenged Claims recite numerous known features, Petitioner’s proposed Grounds rely on a combination of multiple references. “The criterion [for obviousness], however, is not the number of references, but what they would have meant to a person of ordinary skill[.]” *In re Gorman*, 933 F.2d 982, 986 (Fed. Cir. 1991). Given the well-known nature of each claim limitation, the Challenged Claims are obvious and should be canceled.

II. SUMMARY OF THE ’246 PATENT

A. Description of the ’246 Patent

The ’246 Patent describes “a location system for use with a handheld wireless communication device 110[.]” ’246 *Patent* (Ex. 1001), 4:52-54. Device 110 includes long and short-range transceivers for wireless communication and user interfaces, such as a touchscreen. *Id.*, 4:55-64, 5:4-10. An adjunct device 100 couples with

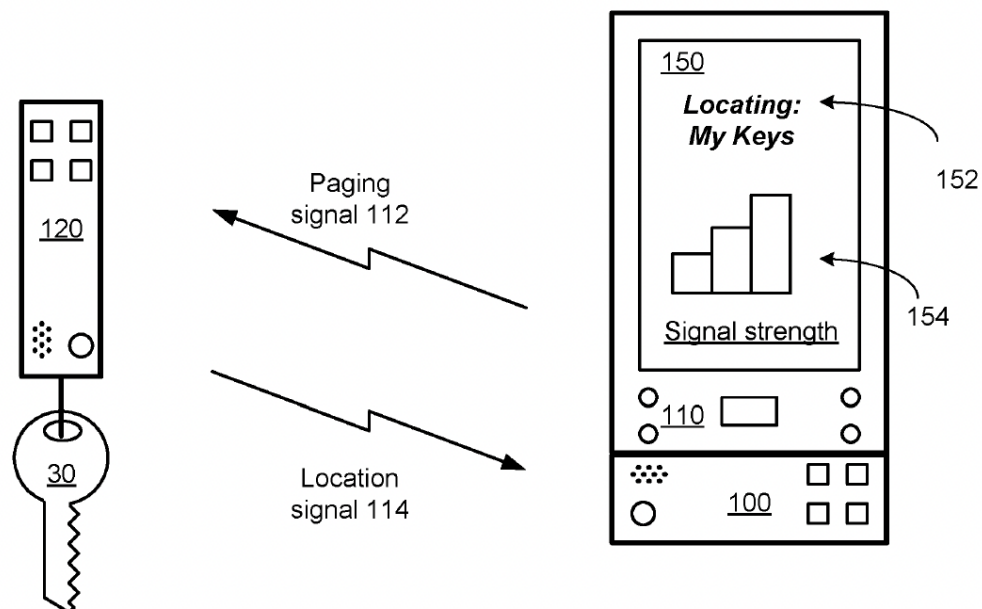
¹ All references to “*Dec.*” are to Exhibit 1003, Declaration of Dr. R. Michael Buehrer.

wireless communication device 110 and includes a short-range wireless receiver for communicating using various communication protocols, such as Bluetooth or UWB.

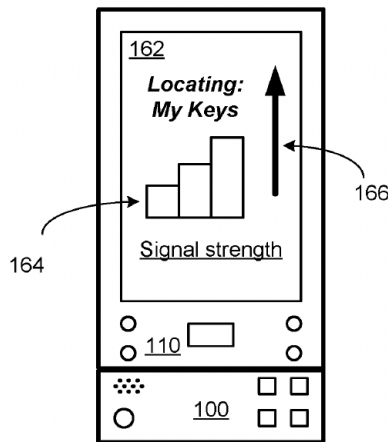
Id., 5:31-44.

Adjunct device 100 may be used to locate wireless device 120, which can be attached to keys, clothing, etc. *Id.*, 7:38-52. Wireless device 120 also includes a short-range wireless receiver that receives a paging signal 112 transmitted by adjunct device 110 and “emits a detectable alert signal that helps the user locate the personal object” coupled to the wireless device. *Id.*, 7:47-52. The detectable alert may be a light or a sound. *Id.*

The wireless device 120 may also transmit “a location signal 114 via short-range wireless transceiver 130, such as a beacon signal or other location signal” to adjunct device 100. *Id.*, 10:42-44.



Id., Fig. 6. Information from the location signal 114 transmitted by the wireless device and to the adjunct device, such as signal strength information of the location signal or time of flight, is used to determine a distance or direction of the wireless device 120 from the adjunct device 100. *Id.*, 10:53-56, 11:23-27, 11:4-7 (describing time of flight). The signal strength 164 and an indication of direction 166 can be shown on the screen of the wireless communication device 110:



Id., Fig. 8.

B. Field of Endeavor and Problem Solved by the Inventors

The claimed invention of the '246 Patent relates to wireless/mobile communication devices. '246 Patent, 2:8-9 (defining the Technical Field of the Invention as "relat[ing] to wireless communication devices"), 40:21. These wireless/mobile communication devices use wireless transceivers to perform functions relating to transmitting signals in response to user interactions with the device and receiving signals from other wireless devices. *Id.*, Abstract, 4:52-5:4,

5:54-59, 7:52–8:28, 10:37-59, 15:53-67, 31:18-28, Figs. 1, 4-6, 16. Thus, the field of endeavor of the '246 Patent includes wireless communication devices that send and/or receive wireless signals within a network. *Dec.*, ¶¶45-47.

The '246 Patent is reasonably pertinent to the problem of employing a first wireless device, such as a mobile communication device, to locate a second wireless device. For example, the Detailed Description begins with reference to FIG. 1 and a “location system for use with a handheld wireless communication device,” indicating to a POSITA that at least one problem faced is location determination of a wireless communication device. *'246 Patent*, 4:52-55; *Dec.*, ¶49.

C. Priority and Summary of the Prosecution History

The '246 Patent claims priority to a patent application filed on February 26, 2010. However, claim 26 recites new matter that was added for the first time in the as-filed claims of the application that issued as the '246 Patent. Because new matter was added to the claims after March 16, 2013, the AIA versions of §§ 102 and 103 apply to all Challenged Claims. For all Challenged Claims other than claim 26, Petitioner adopts February 26, 2010, as the earliest effective filing date for purposes of this proceeding. For the reasons discussed below, the earliest effective filing date of claim 26 is January 19, 2022.

The only rejection the Challenged Claims faced during prosecution of the '246 Patent was a nonstatutory double patenting rejection that Applicant overcame by

filing a terminal disclaimer. *'246 Patent File History* (Ex. 1002), 135-151, 248-261, 265-266. None of the references cited in the Grounds were cited or considered during prosecution of the *'246 Patent*.

D. Priority of Claim 26

The *'246 Patent* is a continuation in a chain of patents that ultimately claim priority from an application filed on February 26, 2010, which was published as USPN 8,588,806 ("*'806 Patent*"). The *'806 Patent* and the *'246 Patent* share a common specification. *Compare '806 Patent* (Ex. 1004) *with '246 Patent*.

Claim 26 recites "The mobile communication device of claim 22 wherein the second mobile communication device is **not paired** with the selected remote device." The claims from which Claim 26 depends require the *second* mobile communication device to provide the estimated position of the selected remote device to the mobile communication device via a wireless network. *'246 Patent*, Claims 21-22. There is no written description in the *'806 Patent* to support the negative limitation of "wherein the second mobile communication device is **not paired** with the selected remote device."

For a claim to be entitled to "the filing date of an earlier application under 35 U.S.C. § 120, each application in the chain leading back to the earlier application must comply with the written description requirement of 35 U.S.C. § 112." *Lockwood v. Am. Airlines, Inc.*, 107 F.3d 1565, 1571 (Fed. Cir. 1997). Each

application in the chain must therefore “reasonably convey[] to those skilled in the art that the inventor had possession of the [later-claimed] subject matter as of the filing date.” *Ariad Pharms., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010) (*en banc*). “While a negative limitation need not be recited in the specification *in haec verba*, there generally must be something in the specification that conveys to a skilled artisan that the inventor intended the exclusion.” *Novartis Pharm. Corp. v. Accord Healthcare, Inc.*, 38 F.4th 1013, 1017 (Fed. Cir. 2022).

The ’806 Patent specification only ever describes devices that are paired with one another (as opposed to Claim 26’s recited devices **not paired** with one another). ’806 Patent, Abstract, 14:57-15:5, 15:39-44, 16:50-55, 16:65-17:9, 18:4-6, 18:40-42, 20:15-20, 20:45-47, 20:63-21:4, 25:58-61, 26:4-5, 27:14-17, 27:42-47, 30:66-31:15, 34:39-42. The ’806 Patent also never discloses any reasons why devices would not be paired with one another, such as disadvantages or alternatives to paired devices. ’806 Patent; Dec., ¶56. Thus, there is nothing in the ’806 Patent specification that conveys to a POSITA the inventors intended for the second mobile communication device and the selected remote device to be “not paired,” as recited by Claim 26. Dec., ¶56.

The first time this limitation appeared was on January 19, 2022, in the as-filed claims of the application that issued as the ’246 Patent. (Ex. 1002, 65). Therefore, the earliest effective filing date for Claim 26 is January 19, 2022.

E. Level of Skill of a Person Having Ordinary Skill in the Art

A person of ordinary skill in the art (POSITA) at the time of the '246 Patent would have been a person having a bachelor's degree in computer science, computer engineering, electrical engineering, or a similar technical field and 2-4 years of experience with wireless ranging and positioning systems, wireless communication devices, and associated computer programming. *Dec.*, ¶35. Additional industry experience or technical training may offset less formal education, while advanced degrees or additional formal education may offset lesser levels of industry experience. *Id.*

III. REQUIREMENTS UNDER 37 C.F.R. § 42.104

A. Grounds for Standing Under 37 C.F.R. § 42.104(a)

Petitioner certifies the '246 Patent is eligible for IPR.

B. Identification of Challenge Under 37 C.F.R. § 42.104(b)

The Challenged Claims are unpatentable on the following grounds.

Ground	Claim(s)	35 U.S.C. §	References
1	20, 27	103	Sweeney (Ex. 1005), Kalliola (Ex. 1006), Turunen (Ex. 1007), Mohammadian (Ex. 1008), Kalayjian (Ex. 1009), and Vauclair (Ex. 1010)

2	21-26	103	Sweeney, Kalliola, Turunen, Mohammadian, Kalayjian, Vauclair, and Thorn (Ex. 1011)
3	26	103	Sweeney, Kalliola, Turunen, Mohammadian, Kalayjian, Vauclair, Thorn, and Lopatin (Ex. 1012)

C. Claim Construction Under 37 C.F.R. § 42.104(b)(3)

In this proceeding, claims are interpreted under the same standard applied by Article III courts (i.e., the *Phillips* standard). 37 C.F.R. § 42.100(b); *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (*en banc*). For all terms not included below, Petitioner applies the ordinary and customary meaning of the claim terms as understood by a POSITA.²

For purposes of this proceeding only, Petitioner applies THL’s construction in the parallel litigation for the following claim terms:

Claim Terms	THL’s Constructions
Beacon (20)	“Signal”
Pairing signals (20)	“Processor signals to initiate a Bluetooth pairing sequence”

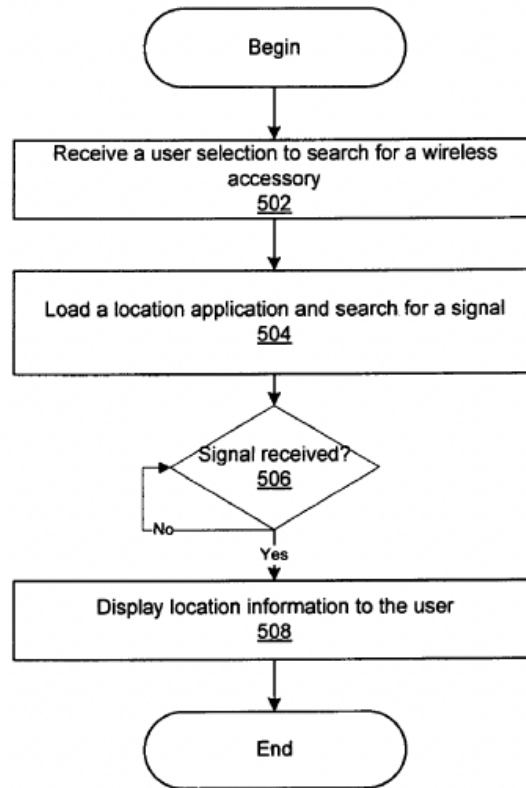
² Petitioner’s application of prior art to the Challenged Claims is not a waiver of any argument in litigation that any claim term in the ’246 Patent is indefinite or invalid.

THL's Proposed Constructions (Ex. 1013), 11-15; *Western Digital Corporation v. Spex Technologies, Inc.*, IPR2018-00084, Paper 14, at 11 (PTAB Apr. 25, 2018); *10X Genomics, Inc. v. Bio-Rad Laboratories, Inc.*, IPR2020-00086, Paper 8, at 19-20 (PTAB Apr. 27, 2020).

IV. SHOWING OF ANALOGOUS, PRIOR ART

A. Sweeney

Sweeney published on March 5, 2009, qualifying as prior art under §102(a)(1)-(2) (or §102(a), (e) under Pre-AIA). Sweeney discloses “[a] system and method of locating a wireless accessory.” *Sweeney*, Abstract. Sweeney discloses a wireless device, such as a cellular telephone, linked (e.g., via Bluetooth) with a wireless accessory, such as a hands-free earpiece that may be moved from “location to location” and thus may become lost or stolen. *Id.*, [0015]-[0018]. The wireless device includes a “location application” that “may indicate an approximate location of the wireless device 104 from the wireless accessory 106 based on the signal strength of the wireless link 108.” *Id.*, [0020], Figs. 1, 3, 5. The location of the wireless accessory may be shown on a map of a GUI of the wireless device. *Id.*, [0028], [0040].



Id., Fig. 5.

Sweeney is analogous to the claimed invention of the '246 Patent because it is from the same field of endeavor. Sweeney is directed to a mobile communication device that sends/receives wireless signals. *Dec.*, ¶101.

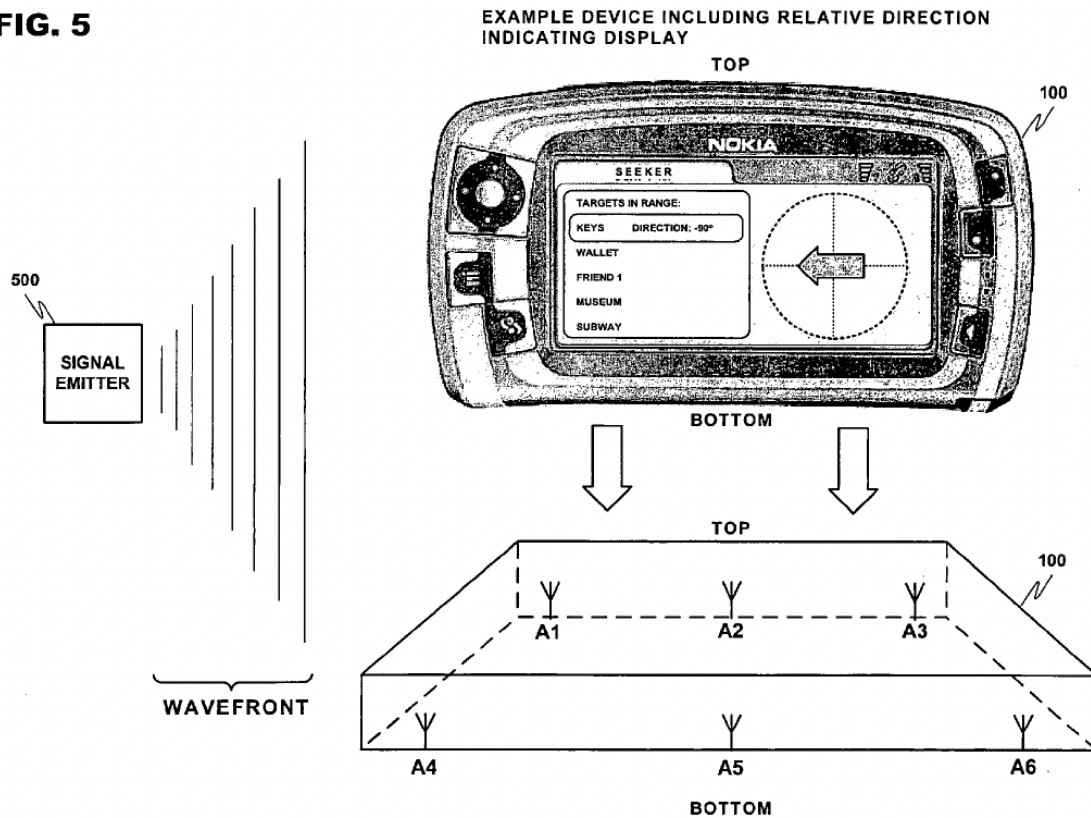
Sweeney is also reasonably pertinent to the particular problem with which the inventor of the '246 Patent was involved because it is directed to solving the same problem of using the wireless device to help the user locate wireless accessories. *Id.*, ¶102.

B. Kalliola

Kalliola published on March 20, 2008, qualifying as prior art under §102(a)(1)-(2) (or §102(b) under Pre-AIA). Kalliola describes a need for “a directional and/or location finding method and system that allows a user to track or locate a signal beacon[.]” *Id.*, [0011]. Kalliola seeks to provide an application that “work[s] in conjunction with various resources within the wireless communication device in order to provide a visual representation of the relative direction towards, or location of, an object, place, etc. maintaining a broadcast beacon.” *Id.*

The system includes a wireless communication device (WCD) that may be a cellular telephone or other handheld wireless device, such as a “wirelessly enabled palmtop or laptop computer.” *Id.*, [0034], [0037]. The WCD communicates wirelessly via near-field (e.g., RFID), short-range (e.g., Bluetooth, WLAN, UWB), and long-range (e.g., cellular) networks. *Id.*, Fig. 1, [0034]-[0036], [0046], [0048], [0049]. The system also includes signal emitter devices “such as battery-operated transmitters in a keychain, in a wallet, embedded in an ID badge, mounted in a vehicle such as an automobile, motorcycle, scooter, bicycle or in a piece of clothing, may be activated remotely by a user as needed.” *Id.*, [0075]. As depicted in Fig. 5, a position-indicating signal transmitted by the signal emitter is received by an antenna array on the WCD, and the WCD determines the direction to the signal emitter, which is displayed for the user as an arrow:

FIG. 5



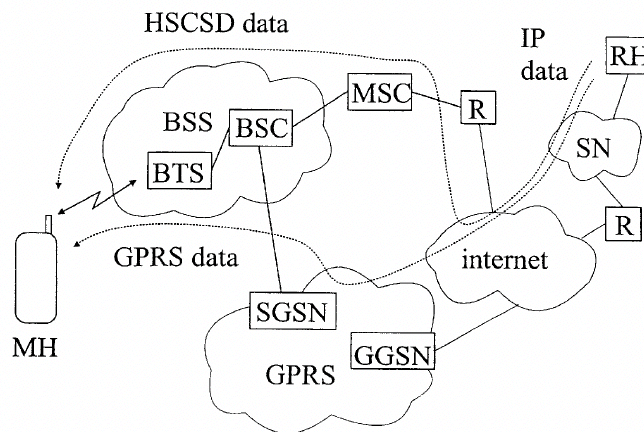
Id., Fig. 5, [0067] (“The array may provide directional field sensing that is interpreted into a direction for display on WCD 100. Signal emitter 500 may emit a position-indicating transmission that is receivable via the antenna array.”).

Kalliola is analogous to the claimed invention of the '246 Patent because it is from the same field of endeavor. Kalliola is directed to a mobile communication device that sends/receives wireless signals. *Dec.*, ¶113.

Kalliola is also reasonably pertinent to the particular problem with which the inventor of the '246 Patent was involved because it is directed to solving the same problem. Kalliola proposes using the WCD to help the user locate wireless devices (i.e., signal emitters). *Id.*, ¶114.

C. Turunen

Turunen issued on November 26, 2002, qualifying as prior art under §102(a)(1)-(2) (or §102(b) under Pre-AIA). Turunen describes “[a] method of transmitting Internet data between a mobile host and a remote host coupled via the Internet and a GSM/GPRS cellular telephone network.” *Turunen*, Abstract. The mobile host (MH) “communicates with a Base Transceiver Station (BTS) of a Base Station Subsystem (BSS) of the GSM network.” *Id.*, 5:39-41. As shown in Figure 2, the MH (depicted as a cellular telephone) sends and receives wireless signals via the GSM/GPRS cellular network:

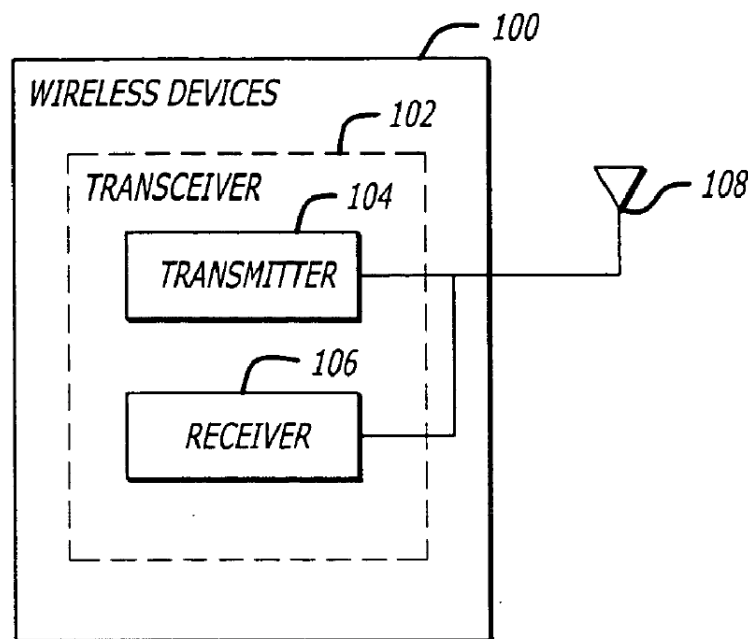


Id., Fig. 2; *see also, id.*, 5:13-14 (“FIG. 2 illustrates schematically a mobile host coupled to the Internet via a GSM/GPRS cellular telephone network”).

Turunen is analogous to the claimed invention of the '246 Patent because it is from the same field of endeavor. Turunen is directed to a mobile host that sends/receives wireless signals. *Dec.*, ¶119.

D. Mohammadian

Mohammadian published on June 1, 2006, qualifying as prior art under §102(a)(1)-(2) (or §102(b) under Pre-AIA). Mohammadian describes “[p]ortable devices capable of wireless communications...including mobile telephones and personal digital assistants (PDAs).” *Mohammadian*, [0004]. Specifically, wireless device 100 is “equipped with a transceiver 102” that “may be a UWB transceiver[.]” *Id.*, [0026]. “The transceiver 102 may include a transmitter 104 and a receiver 106 coupled to an elliptic dipole antenna formed around a substrate 108.” *Id.* “The receiver 106 may be used to downconvert a signal from the antenna 108” and “[t]he transmitter 104...provide[s] upconversion for the baseband signal to a frequency suitable for over the air transmission through the antenna 108.” *Id.*



Id., Fig. 1.

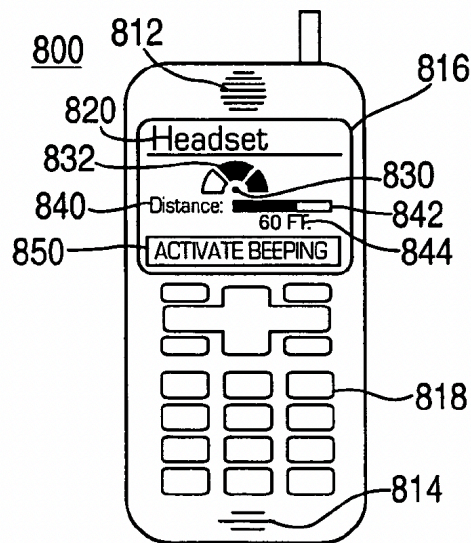
Mohammadian is analogous to the claimed invention of the '246 Patent because it is from the same field of endeavor. Mohammadian is directed to a wireless device that sends/receives wireless signals. *Dec.*, ¶124.

E. Kalayjian

Kalayjian published on May 29, 2008, qualifying as prior art under §102(a)(1)-(2) (or §102(b) under Pre-AIA). Kalayjian describes “[a] method and system for locating objects using a Bluetooth communications protocol” where a first device, such as a cellular phone, is paired with a second device, such as a wireless Bluetooth headset.³ *Kalayjian*, Abstract, [0033]-[0034]. “When a user wants to locate one of the slave devices 320, 400 and 500, the user can initiate the location discovery process through master device 310.” *Id.*, [0038]. “Master device 310 can transmit a signal to a slave device,” and “[u]pon receiving the signal, the slave device can guide a user to its location and/or notify a user of the distance from master device 310 to the slave device.” *Id.* The second devices “guide a user to their location by emitting auditory or visual signals,” which “allows a user to follow the sound or light to the misplaced object.” *Id.*, [0039].

³ Kalayjian calls the first device the “master device” and the second device the “slave device.” *Kalayjian*, Abstract. Unless quoted, Petitioner calls the “master device” the “first device” and the “slave device” the “second device.”

The second devices also “transmit[] a return signal to master device 310,” which calculates the distance between the devices “by comparing the amount of time delay between the transmission of the signal sent from the master device to the slave device and the reception of the return signal from the slave device.” *Id.*, [0040]-[0041]. The first device also uses directional antennas “to determine the direction towards the slave device from the master device.” *Id.*, [0042]. The distance 840 and direction 830 information is presented on the display of the first device:



Id., Fig. 8, [0049].

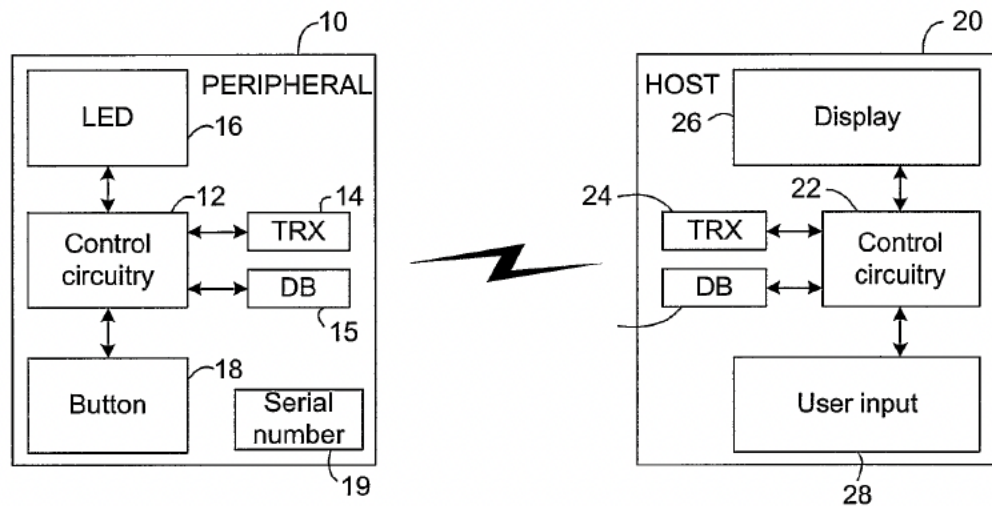
Kalayjian is analogous to the claimed invention of the '246 Patent because it is from the same field of endeavor. Kalayjian is directed to a first device 310 that sends/receives wireless signals. *Dec.*, ¶134.

Kalayjian is also reasonably pertinent to the particular problem with which the inventor of the '246 Patent was involved because it is directed to solving the

same problem of using the first device to help the user locate wireless devices, such as the user's Bluetooth headset. *Dec.*, ¶135.

F. Vauclair

Vauclair published on December 25, 2008, qualifying as prior art under §102(a)(1)-(2) (or §102(b) under Pre-AIA). Vauclair describes a pairing process between a first electronic device 10, which “is regarded as a peripheral device,” such as “a mobile telephone handsfree kit,” and a second electronic device 20, which “is regarded as a host device,” such as a “mobile telephone.” *Vauclair*, [0022]. The first and second devices “communicate according to any wireless or wired protocol” including “Bluetooth.” *Id.* The peripheral device 10 includes “control circuitry 12, in the form of a suitably programmed processor” that “is connected to transceiver (TRX) circuitry 14, which handles radio frequency communications with other electronic devices able to use the same wireless protocol.” *Id.*, [0024]. Likewise, “host second electronic device 20 has control circuitry 22, in the form of a suitably programmed processor” that “is connected to transceiver (TRX) circuitry 24, which handles radio frequency communications with other electronic devices able to use the same wireless protocol.” *Id.*, [0028].



Id., Fig. 1.

Vauclair describes a pairing process between the host device 20 and the peripheral device 10 where the host device 20 sends and receives wireless signals from the peripheral device 10. *Id.*, Fig. 2, [0034] (“The process of pairing the first and second electronic devices 10, 20 according to a first embodiment of the invention will now be described with reference to FIG. 2, which shows the signals sent between the devices...”).

Vauclair is analogous to the claimed invention of the ’246 Patent because it is from the same field of endeavor. Vauclair is directed to a host device 20 that sends/receives wireless signals. *Dec.*, ¶140.

G. Thorn

Thorn published on March 5, 2009, qualifying as prior art under §§102(a)(1)-(2) (or §§102(a), (e) under Pre-AIA). Thorn describes “methods, computer program

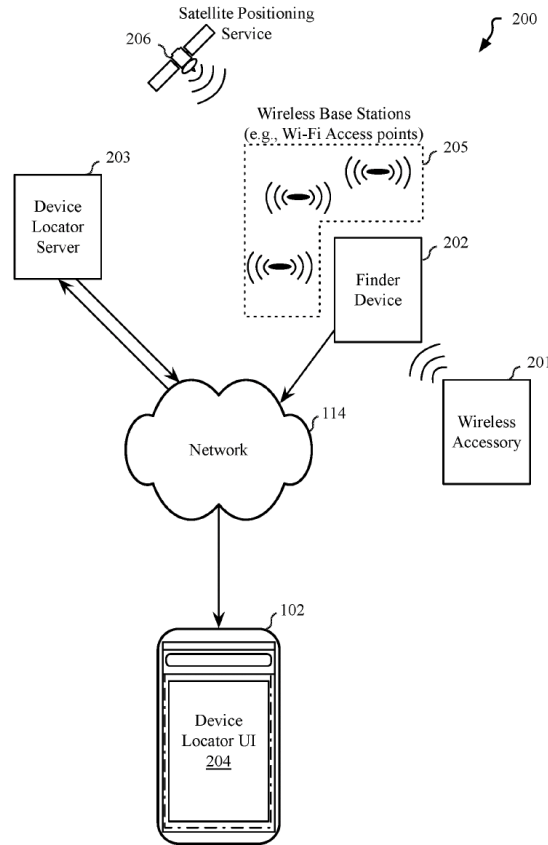
products, terminals, and systems for providing location information associated with moveable objects.” *Thorn*, [0004]. A first mobile terminal, such as a “cellular radiotelephone,” PDA, or a laptop/palmtop computer, “periodically receives unique Identification (ID) Information from RFID tags coupled to moveable objects, such as a wallet, a briefcase, a set of keys, rental equipment, etc.” *Id.*, [0028], [0030]. *Thorn* also teaches using Bluetooth-enabled tags instead of RFID. *Id.*, [0032]. “The first terminal can then send the ID information to a database to determine if the moveable object is associated with the first terminal.” *Id.*, [0030]. “If the moveable object is not associated with the first terminal, the first terminal can determine location information, using for example GPS and/or location information that is available through a network in which the first terminal communicates.” *Id.*

Thorn is analogous to the claimed invention of the ’246 Patent because it is from the same field of endeavor. *Thorn* is directed to a mobile terminal that sends/receives wireless signals. *Dec.*, ¶145.

Thorn is also reasonably pertinent to the particular problem with which the inventor of the ’246 Patent was involved because it is directed to solving the same problem of using the mobile terminal device to help locate Bluetooth tag attached to an object. *Id.*, ¶146.

H. Lopatin

Lopatin published on April 2, 2020, qualifying as prior art to Claim 26 under §102(a)(1)-(2). *See* Section II.D. Lopatin describes “techniques to enable secure crowdsourced locator services for lost or misplaced devices that cannot communicate with a wide area network.” *Lopatin*, [0022]. “FIG. 2 illustrates a system 200 to locate a wireless accessory 201 that lacks access to a wide area network[.]” *Id.*, [0030]. “[T]he wireless accessory 201 can periodically transmit a wireless beacon signal” that can be detected by a “finder device” and that “convey[s] information about the wireless accessory 201” including “device status, such as a lost status, alarm status, or a near-owner status.” *Id.*, [0031]-[0033]. “When the finder device 202 receives a beacon signal from the wireless accessory 201, the finder device 202 can transmit a location for the finder device over the wide area network 114 to a device locator server 203.” *Id.* “The device owner, using the device locator UI 204, can query the device locator server 203 for location data that may have been transmitted to the device locator server by a finder device 202 of the wireless accessory 201.” *Id.*



Id., Fig. 2.

Lopatin is analogous to the claimed invention of the '246 Patent because it is from the same field of endeavor. Lopatin is directed to a mobile communication device that sends/receives wireless signals. *Dec.*, ¶152.

Lopatin is also reasonably pertinent to the particular problem with which the inventor of the '246 Patent was involved because it is directed to solving the same problem of using the mobile device to help locate the wireless accessory. *Id.*, ¶153.

V. MOTIVATION TO COMBINE INTERNAL EMBODIMENTS OF SWEENEY

Sweeney discloses “[i]llustrative embodiments provide a system and method for locating wireless accessories.” *Sweeney*, [0014], [0063] (disclosing “a small number of embodiments for implementing the invention and is not intended to be limiting in scope”). Sweeney refers to various “embodiments” throughout its disclosure. *See, e.g., id.* at [0017], [0025], [0053]. To the extent THL contends each embodiment is distinct, a POSITA would have found it obvious to combine multiple disclosed embodiments in Sweeney. *Dec.*, ¶¶93-100 (opining that disclosures related to Figs. 1-5 are not distinct embodiments), ¶¶155-157. Sweeney generally introduces each embodiment with the generic nomenclature of “[i]n one embodiment” ([0020]) or “[i]n another embodiment” ([0021]), thus indicating to a POSITA that each introduction of an embodiment is simply introducing another feature the invention may include. *Id.*, ¶156. Therefore, a skilled person would understand Sweeney’s location application was operable to perform various features per the POSITA’s design goals. *Id.*, ¶157. Combining Sweeney’s multiple embodiments, which are just various features of the invention, is combining prior art elements according to known methods to yield the predictable results otherwise disclosed in Sweeney. *Id.* There would have been a reasonable expectation of success in the combination, at least because Sweeney discloses that the illustrative embodiments provide the disclosed system and method for locating wireless

accessories, thus indicating an expectation of success in selecting from the illustrative embodiments. *Id.*; *Sweeney*, [0014].

VI. GROUND 1: CLAIMS 20 AND 27 ARE OBVIOUS OVER SWEENEY, KALLIOLA, TURUNEN, MOHAMMADIAN, KALAYJIAN, AND VAUCLAIR

A. Claim 20

1. Claim 20[P]

Sweeney discloses “a wireless device configured to locate a wireless accessory,” where the wireless device may be a cell phone. *Sweeney*, [0005], [0002] (“[W]ireless devices, such as cell phones...”), [0032], Fig. 1 (depicting wireless device 104 as a cell phone). A POSITA would have understood that a cell phone is an example of a mobile communication device.⁴ *Dec.*, ¶160. Sweeney confirms the wireless device is a communication device because it “include[s] a transceiver configured to transmit the signal to the wireless accessory and receive location information from the wireless device.” *Id.*, [0005], [0016].⁵ The wireless device is mobile because the user **moves** it while locating the wireless accessory. *Id.*, [0022]. Sweeney’s wireless device is thus a mobile communication device. *Dec.*, ¶¶160-162.

⁴ Claim language identified with *italics* and underline for clarity.

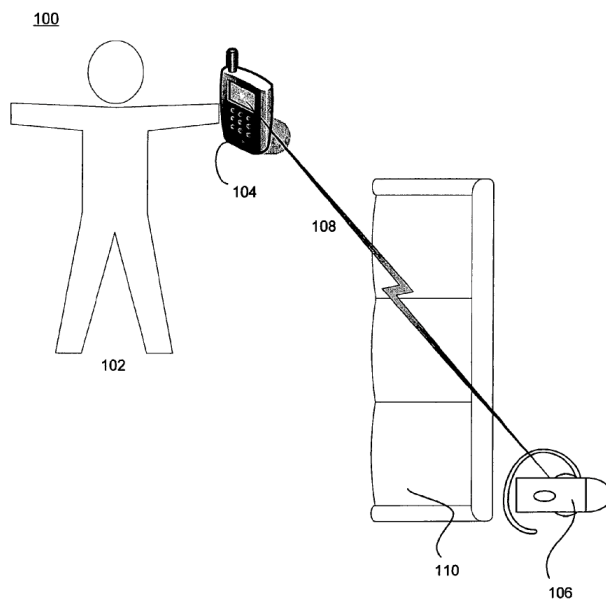
⁵ All emphasis and annotations added by Petitioner unless noted otherwise.

2. **Claim 20(a)**

Sweeney-Kalliola-Turunen-Mohammadian renders obvious a plurality of wireless transceivers. See Claims 20(a)(i)-20(a)(iii).

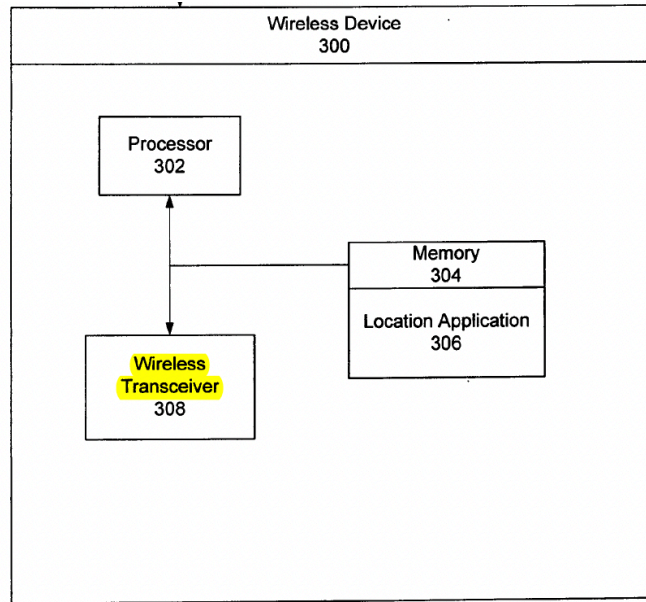
3. **Claim 20(a)(i)**

Sweeney teaches an exemplary wireless environment 100 that includes “a wireless user 102, a wireless device 104, a wireless accessory 106, a wireless link 108, and an obstacle 110.” Sweeney, [0015]. “[T]he wireless link 108 may be a **Bluetooth®** connection[.]” *Id.*, [0017], [0033].



Id., Fig. 1.

To facilitate communication via the wireless link, the wireless device includes a wireless transceiver:



Id., Fig. 3 (excerpt); [0034] (“FIG. 3 includes a wireless device 300 which may include...a **wireless transceiver** 308.”), [0005] (“The wireless device may further include a **transceiver** configured to transmit the signal to the wireless accessory and receive location information from the wireless device.”), [0041] (disclosing wireless *accessory’s* transceiver communicates with wireless *device* via Bluetooth); *Dec.*, ¶164.

Because Sweeney teaches that the wireless device and wireless accessory communicate via Bluetooth and that the wireless device’s transceiver transmits and receives signals from the wireless accessory, Sweeney teaches that the wireless transceiver is a Bluetooth transceiver. *Dec.*, ¶¶165-166. Alternatively, it would have been obvious that the transceiver is or includes a Bluetooth transceiver, at least because Sweeney teaches applying a known technique (performing Bluetooth communications) to a known device (wireless device that may be a cellular

telephone) that improves with a predictable result (performing Bluetooth communications for a mobile device). *Id.*, ¶167.

4. *Claim 20(a)(ii)*

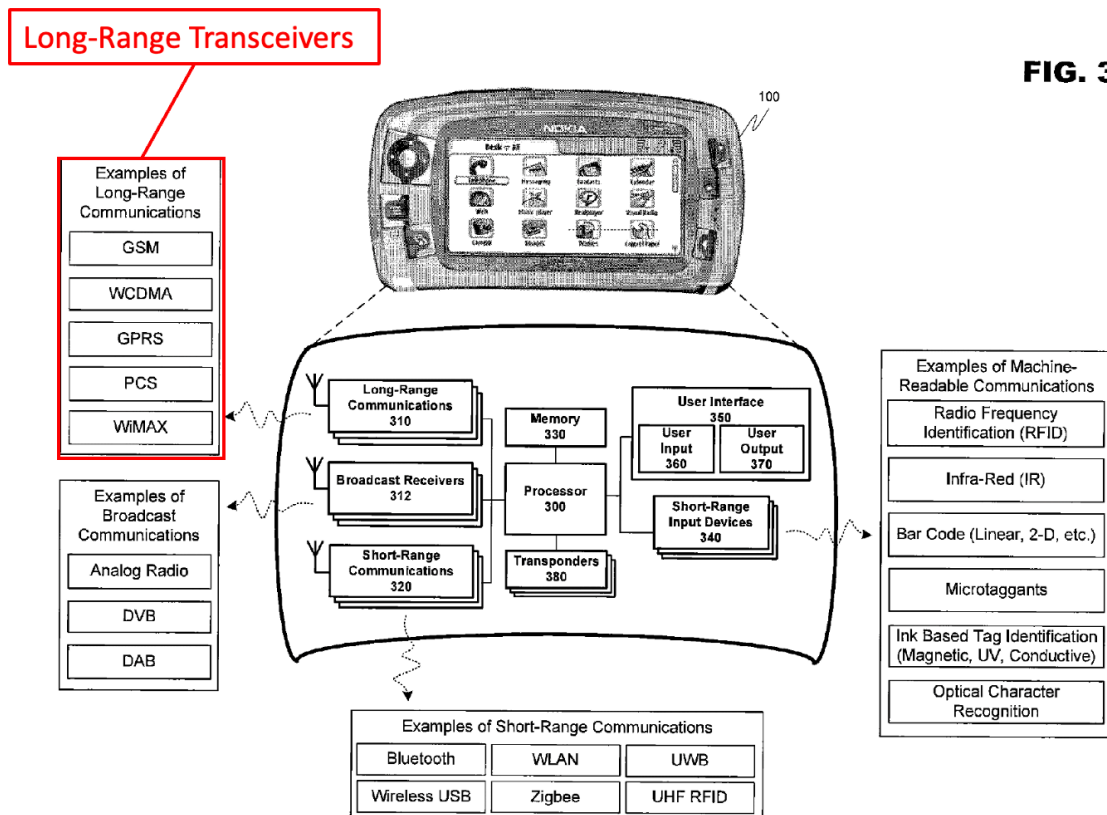
Sweeney teaches that the wireless device is a cell phone. *Sweeney*, [0002], [0032]. In related art, Kalliola provides specificity on long-range transceivers commonly included in cell phones.

(a) **Kalliola’s Teachings**

Kalliola teaches a “wireless communication device” (WCD) that “may both **transmit and receive information over a wide variety of wireless communication networks**, each with different advantages regarding speed, range, quality (error correction), security (encoding), etc.” *Kalliola*, [0033], [0004] (“These wireless communication devices (WCDs) have become commonplace for both personal and business use, allowing users to **transmit and receive voice**, text and graphical data from a multitude of geographic locations. The communication networks utilized by these devices span different frequencies and cover different transmission distances, **each having strengths desirable for various applications.**”).

Kalliola’s WCD includes “[l]ong-range communications 310,” which “performs functions related to the exchange of information over large geographic areas (such as cellular networks) via an antenna.” *Id.*, [0046]. Because the long-range

communications 310 transmits and receives information across a cellular network, Kalliola teaches or renders obvious a wireless transceiver, including a long-range transceiver. Dec., ¶¶169-171, ¶174. The long-range “communication methods include technologies from the previously described 1G to 3G” and provide “**basic voice communications (e.g., via GSM)[.]**” Kalliola, [0046]; see also, [0004]-[0005] (describing cellular telephones “allowing users to transmit and receive voice” and 1G to 3G cellular networks providing voice communications). Thus, Kalliola also teaches a long-range transceiver configured to send and receive telephone calls via a telephony network (e.g., a GSM network):



Dec., ¶172 (citing Kalliola, Fig. 3).

Kalliola also at least inherently teaches that long-range communications 310 is a long-range transceiver because a POSITA would have known that to perform the disclosed wireless transmission/reception of voice/data across cellular networks, such as GSM, necessarily requires a long-range wireless transceiver. *Dec.*, ¶175. Finally, a POSITA would have found Kalliola renders obvious a long-range transceiver at least because (1) Kalliola expressly suggests the long-range communications transmitting and receiving voice/data; (2) “the present invention may be implemented using a variety of wireless communication equipment”; and (3) wireless long-range transceivers were ubiquitous in mobile communication devices prior to the '246 Patent's effective filing date. *Kalliola*, [0004]-[0006], [0008], [0037]; *Dec.*, ¶176.

Kalliola's long-range communications 310 also “establish[es] data communications sessions, such as General Packet Radio Service (GPRS) sessions and/or Universal Mobile Telecommunications System (UMTS) sessions.” *Kalliola*, [0046], [0036] (disclosing wireless Internet access via long-range networks); *Dec.*, ¶177. In related art, Turunen teaches the specific type of data communicated using GPRS sessions.

(b) Turunen's Teachings

Turunen teaches a “method of transmitting **Internet data** between a mobile host and a remote host coupled via the Internet and a GSM/GPRS cellular telephone

network.” *Turunen*, Abstract, 5:30-32 (discussing mobile host connected to the Internet via a cellular network). The network allows for communication of *Internet data*: “**Internet data** may be transmitted between the MH and the Internet via either of these links.” *Id.*, 5:33-38. Thus, Turunen teaches a mobile communication device that *communicates Internet data* via a GSM cellular network utilizing a GPRS link. *Dec.*, ¶178.

(c) Motivation to Combine

A POSITA would have found it obvious and been motivated to modify Sweeney’s wireless device to include *a long-range transceiver...*, per Kalliola and Turunen. *Dec.*, ¶¶179-182. Sweeney teaches that the wireless device may be a cellular phone. *Sweeney*, [0002]. A POSITA would have expected a cellular phone to include *a long-range transceiver configured to send and receive telephone calls via a telephony network*. *Dec.*, ¶179. Therefore, a POSITA would have been motivated to combine the known prior art elements of Sweeney’s wireless device/cell phone and Kalliola’s long-range cellular transceiver to yield the predictable result of a mobile communication device that is able to send and receive telephone calls via a telephony network. *Id.*, ¶180.

As noted by Kalliola, cellular networks were originally developed “in the late 1970s to early 1980s.” *Kalliola*, [0005]. Cellular networks and transceivers providing voice communications were commonplace well prior to the ’246 Patent.

Dec., ¶181. Given the ubiquity and predictability of cellular transceivers at the time of the '246 Patent, there would have been a reasonable expectation of success incorporating a long-range cellular transceiver, such as taught by Kalliola, into Sweeney's wireless device. *Id.*

A POSITA would have also found it obvious and been motivated to configure Sweeney-Kalliola's cellular transceiver to communicate Turunen's Internet data using Kalliola's GPRS link. *Id.*, ¶182. At the time of the '246 Patent, cellular devices that communicated Internet data via 3G networks were commonplace in the market and expected to communicate Internet data. *Id.* Given the popularity of cellular devices providing Internet access, a POSITA would have been motivated to combine these prior art elements according to known methods to yield the predictable result of enabling Sweeney's wireless device to wirelessly communicate Internet data using GPRS data communication sessions on the GSM network. *Id.* GPRS was specifically designed to handle Internet communications and had been in use for nearly a decade prior to the invention of the '246 Patent; thus, there would have been a reasonable expectation of success configuring Sweeney-Kalliola's cellular transceiver to wirelessly communicate Internet data using GPRS data communication sessions. *Id.*

5. *Claim 20(a)(iii)*

(a) **Mohammadian's Teachings**

Mohammadian recognizes that “[p]ortable devices capable of wireless communications are currently available in several different forms, including mobile telephones and personal digital assistants (PDAs).” *Mohammadian*, [0004]. “Ultra-Wideband (UWB) technology is just one example of emerging technology being developed to support such devices.” *Id.* “UWB provides high speed communications over an extremely wide bandwidth,” and “UWB signals are transmitted in very short pulses that consume very little power.” *Id.*

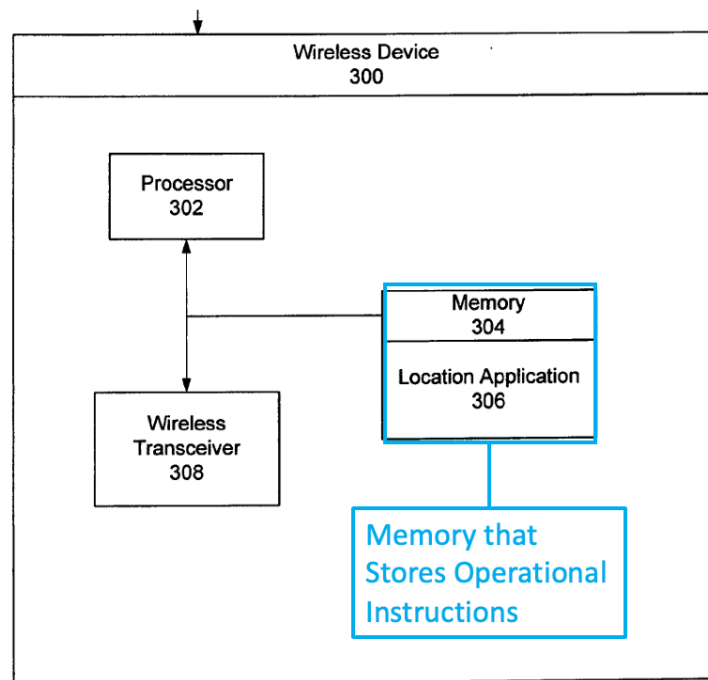
Mohammadian teaches “wireless device 100...equipped with a **transceiver 102**” where the transceiver 102 is “a **UWB transceiver** capable of code division multiple access (CDMA) communications, or any other type of communications.” *Id.*, [0026]; Fig. 1. “The transceiver 102 may include a transmitter 104 and a receiver 106 coupled to an elliptic dipole antenna formed around a substrate 108.” *Id.* However, “**multiple antennas** of similar construction may be used to achieve gain due to spatial displacement of the **antennas** and combining techniques utilized by the receiver 106.” *Id.*; *see also*, [0024] (“In the case of diversity applications, **multiple antennas** may be arranged on the portable wireless device with adequate spacing to provide sufficient diversity gain.”). Thus, Mohammadian teaches an ultra-wideband transceiver coupled to two or more antennas. *Dec.*, ¶¶183-184.

(b) Motivation to Combine

A POSITA would have found it obvious and been motivated to combine Sweeney's wireless device with a UWB transceiver coupled to two or more antennas, per Mohammadian. *Id.*, ¶185. Per Mohammadian, a POSITA would have understood that UWB provided mobile communication devices, such as Sweeney's cell phone, with "high speed communications" using "very little power." *Id.* (citing Mohammadian, [0004]). It was also well-known for mobile communication devices to include multiple types of transceivers, including Bluetooth, UWB, WLAN, cellular, etc., due to the features and advantages of different wireless communication networks. *Id.*, ¶¶186-187. Moreover, including multiple antennas was known to greatly improve the performance of UWB transceivers. *Id.*, ¶188. Thus, a POSITA would have been motivated to improve similar wireless communication devices in the same way by modifying Sweeney's wireless device to include a UWB transceiver coupled to two or more antennas to enable the wireless device to take advantage of high-speed communications while consuming minimal power. *Id.*, ¶189. Given the predictability of standardized wireless communication protocols, such as UWB, there would have been a reasonable expectation of success configuring Sweeney's wireless device to include the claimed UWB transceiver, per Mohammadian. *Id.*, ¶190.

6. *Claim 20(b)*

Sweeney's wireless device includes "a **memory** for storing the set of **instructions** which may include a location application for locating a wireless accessory." *Sweeney*, [0006], [0036]. Sweeney teaches the location application 306 is a "set of instructions" loaded into memory 304, where the "**set of instructions** may be executed by the processor 302 to perform the wireless location features and methods as herein described." *Id.*, [0037] Therefore, memory 304, storing the set of instructions that includes the location application, teaches Claim 20(b). *Dec.*, ¶¶191-192.



Id., ¶192 (citing *Sweeney*, Fig. 3).

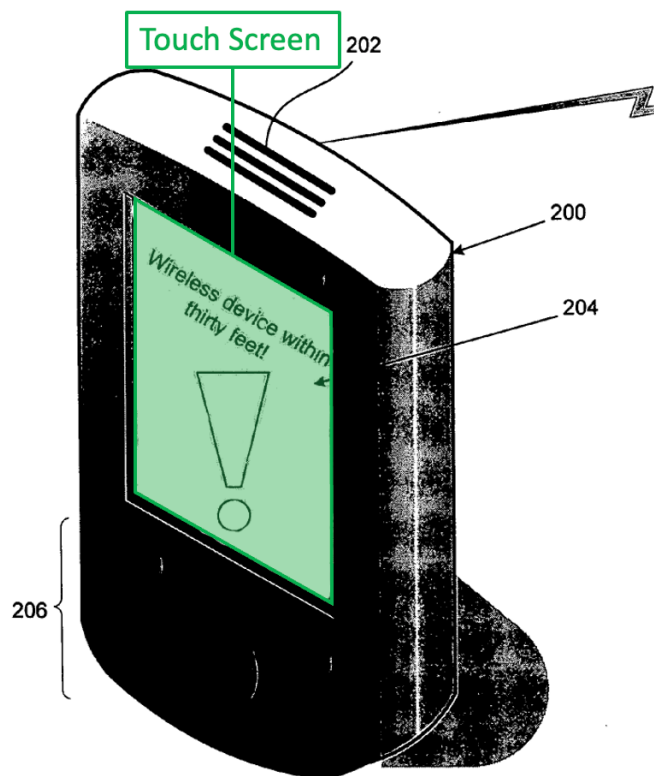
Alternatively, it would have been obvious, and a POSITA would have been motivated to implement Sweeney's location application 306 as a set of instructions

as expressly suggested by Sweeney. *Id.*, ¶193. There would have been a reasonable expectation of success given the predictability of programming at the time of the '246 Patent. *Id.*, ¶194.

7. **Claim 20(c)**

Sweeney's wireless device includes display 204, which "may be a liquid crystal display (LCD), **touch screen**, or other display element suitable for visually displaying information to the user and/or receiving user input." *Sweeney*, [0030].

Thus, Sweeney's wireless device includes a touch screen:



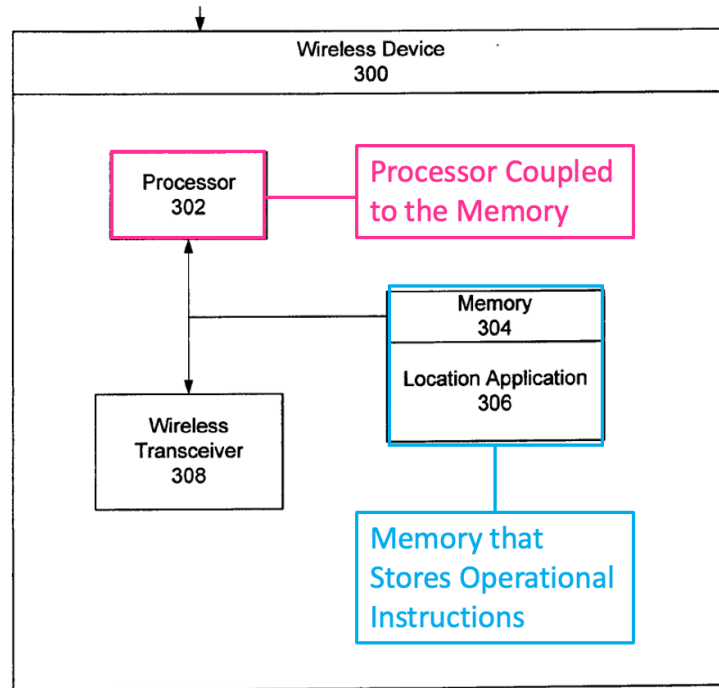
Dec., ¶195 (citing *Sweeney*, Fig. 2).

Although Sweeney’s list of three display elements does not qualify as a large list of elements requiring an obviousness analysis, it would have been obvious to a POSITA to include a touchscreen display as expressly suggested by Sweeney. *Dec.*, ¶196. Touchscreens were ubiquitous in smartphones since Apple iPhone’s release in 2007. *Id.* A POSITA would have been motivated to include a touchscreen as a user input, per Sweeney, thus representing a combination of prior art elements according to known methods to yield predictable results and with a reasonable expectation of success given the ubiquity in mobile devices. *Id.*

8. Claim 20(d)(i)

(a) Sweeney Teaches “a processor coupled to the memory”

Sweeney’s wireless device includes “a **processor** for executing a set of instructions.” *Sweeney*, [0006], [0036], [0034]. Sweeney’s wireless device also includes memory 304. *Id.*, [0037]; Claim 20(b). Figure 3 expressly discloses the processor coupled to the memory:



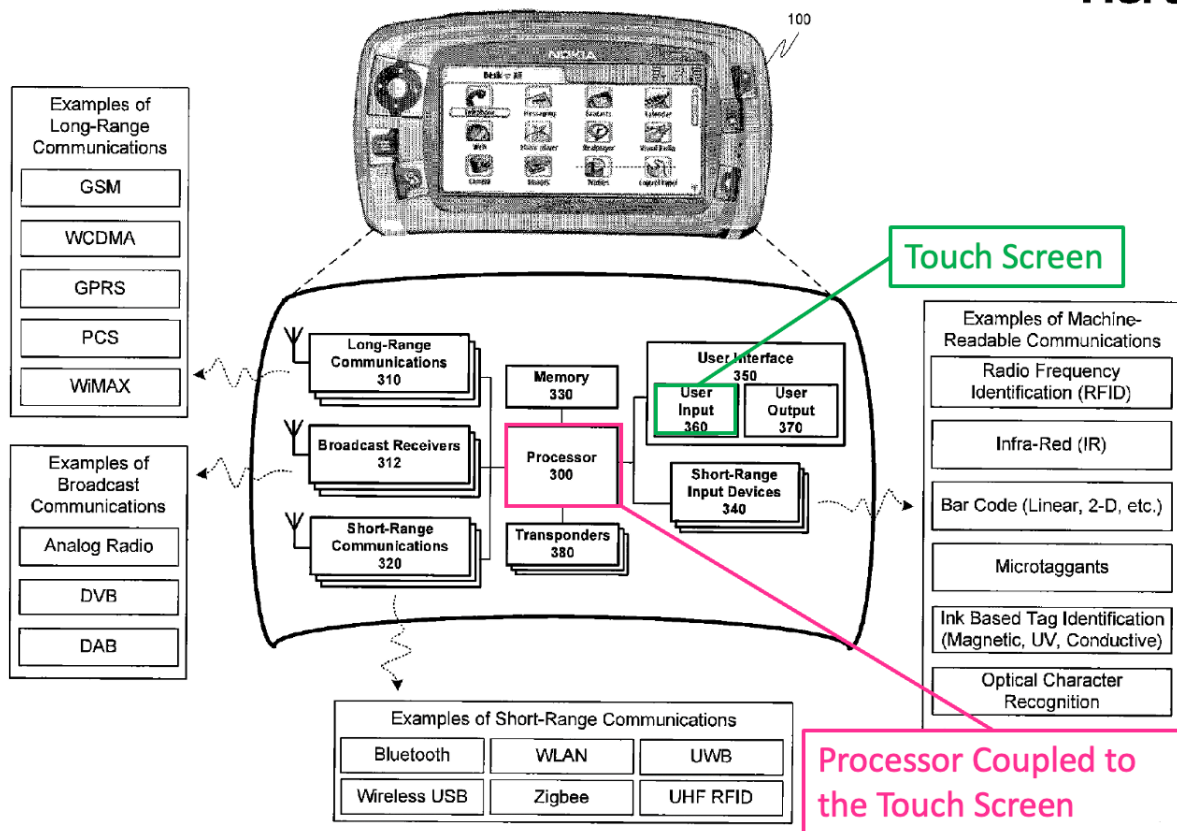
Dec., ¶197 (citing *Sweeney*, Fig. 3).

A POSITA also would have understood that *Sweeney* inherently teaches the processor 302 is coupled to the memory 304, at least because the location application with associated instructions is stored on the memory, and the processor executes the instructions. *Sweeney*, [0036]-[0037]; Claim 20(b). Thus, the processor necessarily is coupled to the memory to execute the instructions stored on the memory. *Dec.*, ¶199.

(b) Kalliola Teaches “a processor coupled...to the touch screen”

Sweeney’s wireless device includes a touch screen “for visually displaying information to the user and/or receiving user input.” *Sweeney*, [0030]; Claim 20(c). In related art, Kalliola provides specificity of coupling a processor to a touch screen.

Kalliola's WCD includes a user interface 350 that "includes a user input 360" including a touch screen. *Kalliola*, [0050]. Kalliola also teaches "**coupling** separate hardware components corresponding to **processor 300**,...user interface 350,...through one or more bus interfaces." *Id.*, [0053]. Because user interface 350 includes user input 360, which in turn includes touch screen, Kalliola expressly teaches a processor coupled...to the touch screen:

FIG. 3

Dec., ¶201 (citing Kalliola, Fig. 3).

(c) **Motivation to Combine**

It would have been obvious, and a POSITA would have been motivated to configure Sweeney's processor to be coupled to the touch screen, per Kalliola. *Id.*, ¶202. The combination of coupling the known prior art elements of a touch screen to the processor yields the predictable result of passing the user's inputs via the touch screen so that the processor can interpret the user's input and take the appropriate actions. *Id.* There would have been a reasonable expectation of success given the predictability of coupling processors to other hardware components including input elements such as touchscreens. *Id.*

9. ***Claim 20(d)(ii)***

Sweeney teaches processor 302 and a location application that may be embodied as a "set of instructions" or a "program," where "[t]he set of instructions may be executed by the processor 302 to perform the wireless location features and methods as herein described." *Sweeney*, [0037], [0038] (disclosing location application "coordinat[ing] the tools and resources available through the wireless device 300 to search for the wireless accessory 310"). Sweeney thus teaches the processor is configured to execute the operational instructions, which upon execution, cause the processor to perform the claimed functions. *Dec.*, ¶¶158-159, ¶203.

Claim 20 recites a series of performed steps. A POSITA would have understood or found obvious that for each claimed step of the Challenged Claims, Sweeney's processor alone or Sweeney's processor as modified to perform the claimed step would execute operational instructions (e.g., the set of instructions embodied as the location application) to cause the processor to perform the claimed step. *Id.*, ¶158. Because Sweeney expressly teaches processor 302 executes the set of instructions embodied as the location application ([0037]), and because Sweeney repeatedly discloses the location application performing the various functional steps relied on for the Grounds' mappings (e.g., [0054], [0038]), Sweeney teaches alone or in combination with the referenced mapped for the particular step a processor that is configured to execute operational instructions, as claimed. *Id.* If the claim mapping requires modification of Sweeney's system to perform the claimed step, a POSITA would have understood it would have been obvious for Sweeney's processor and stored computer program instructions to perform the claimed step per the motivations to combine provided in the mapping for the particular claimed step. *Id.*, ¶159.

10. Claim 20(d)(iii)

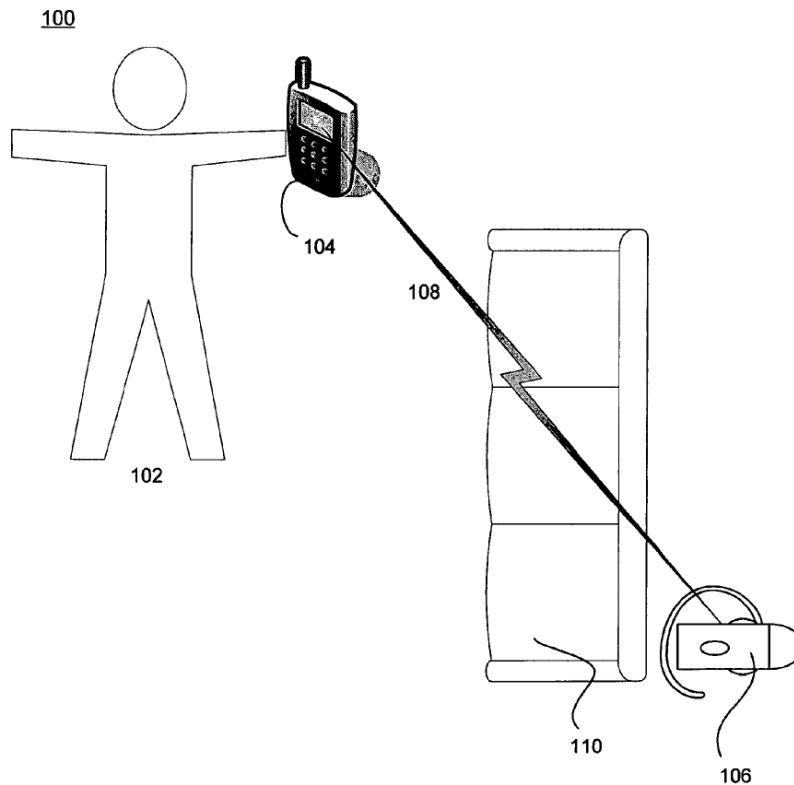
Sweeney teaches that “the wireless device 104 may display a **graphical user interface (GUI)** that provides the user instructions of how to systematically search for the wireless device 104 and provides feedback regarding distance and location if

available.” *Sweeney*, [0022], [0061]. “The display 204 may display a GUI for providing user input and location information.” *Id.*, [0029]. Display 204 is a touch screen. *See* Claim 20(c). Because the processor executes “set of instructions...to perform the wireless location features and methods,” including displaying the GUI on the touchscreen display 204, *Sweeney* teaches present[ing] a graphical user interface via the touch screen. *Dec.*, ¶¶204-205.

11. Claim 20(d)(iv)

(a) Sweeney Teaches “a plurality of remote devices”

Sweeney teaches “a system and method for locating a wireless accessory” where the wireless accessory is “a hands-free earpiece, a keyboard, a speaker, a mouse, a microphone, or other accessory suitable for communication with the wireless device 104 through a wireless link 108.” *Sweeney*, [0006], [0016]. The wireless accessory 106 is remote from the wireless device 104 and is therefore a remote device:



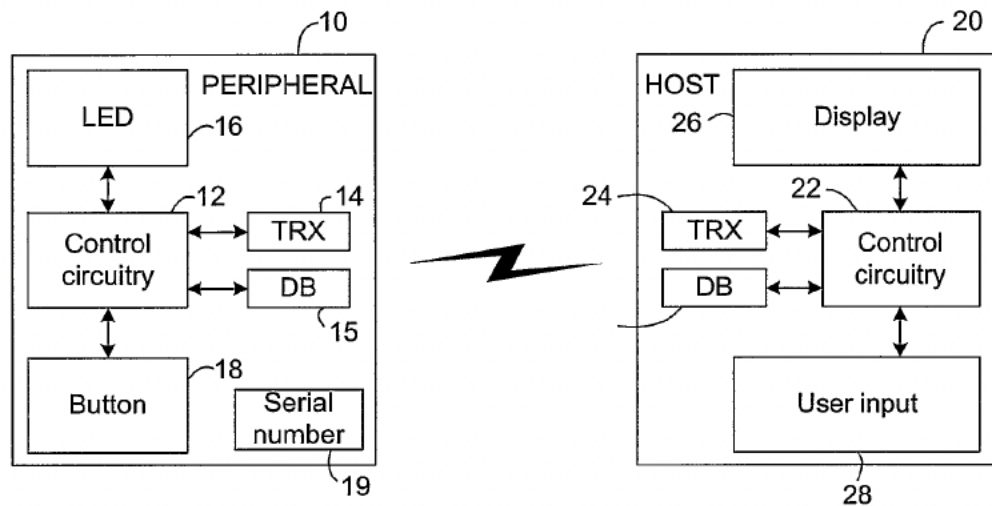
Id., Fig. 1; *Dec.*, ¶207.

Sweeney teaches that the user may locate multiple wireless accessories (a plurality of remote devices): “In one example, the wireless user 102 may be able to search for **wireless accessories** and devices to which the wireless device 104 **had previously connected.**” *Sweeney*, [0025]. Sweeney also teaches that “[t]he location application 306 may also store...**wireless accessories** used by the wireless device 300” and that the “user may **select a wireless accessory from a list** or otherwise indicate that the user desires to find the wireless accessory.” *Id.*, [0040], [0053]. Thus, Sweeney teaches that the wireless device connects with a plurality of remote devices. *Dec.*, ¶208.

Sweeney teaches the wireless device and wireless accessories communicate via Bluetooth. *Sweeney*, [0041] (disclosing Bluetooth communication) [0017], [0033]; *Dec.*, ¶209. In related art, Vauclair teaches the detailed specifics of a Bluetooth pairing process.

(b) Vauclair’s Disclosure Regarding Pairing

Apple applies THL’s construction of pairing signals as “processor signals to initiate a Bluetooth pairing sequence.” *See* Section III.C. Vauclair teaches a pairing process between a first electronic device 10, which “is regarded as a peripheral device,” such as “a mobile telephone handsfree kit,” and a second electronic device 20, which “is regarded as a host device,” such as a “mobile telephone.” *Vauclair*, [0022]. The first and second devices “communicate according to any wireless or wired protocol” including “Bluetooth.” *Id.* Both the peripheral (first) and host (second) devices 10, 20 include suitably programmed processors connected to transceiver (TRX) circuitry 14, 24 for handling “radio frequency communications with other electronic devices able to use the same wireless protocol.” *Id.*, [0024], [0028].



Id., Fig. 1; *Dec.*, ¶¶210-211.

Vauclair teaches a pairing process where the user “establish[es] an ad hoc wireless network between the first and second electronic devices 10, 20” by “operat[ing] the host device 20[.]” *Vauclair*, [0036], [0034]-[0035]. “For example, **to initiate the process, the user may select a pairing option from a menu, using the user input 28.**” *Id.*, [0036], [0049] (teaching “the host device 20 requests the initiation of a pairing procedure with the peripheral device 10”), [0030] (disclosing user input 28). Vauclair also teaches the selection of a menu option sends a signal to control circuitry: “user input 28...allow[s] the user **to select from available menu options, to send a signal to the control circuitry.**” *Id.*, [0030]. Thus, Vauclair teaches generat[ing] pairing signals (i.e., the signal sent to the control circuitry responsive to the user selection of a menu option) in response to an indication[] from a user via the...user interface (selection of the pairing option from a menu via the

Vauclair user input) to pair the mobile communication device to a peripheral device (selection of the pairing option results in the initiation of the pairing process). *Dec.*, ¶¶212-213.

Vauclair teaches the control circuitry is “in the form of a suitably programmed **processor**” and has features “required for the primary function of the device 20,” including “the establishment of device pairing.” *Vauclair*, [0028]. Therefore, the signal sent to the control circuitry is a “processor signal,” applying THL’s construction. *Dec.*, ¶¶214-215.

After receiving this signal, the control circuitry/processor initiates the Bluetooth pairing sequence depicted in Figs. 2-3. *Vauclair*, [0037]-[0057], pinpoint at [0049], [0051], [0028] (describing control circuitry 22 connected to transceiver circuitry 24), Figs. 2-3; *Dec.*, ¶214 (opining a POSITA would understand that the pairing process sequence beginning at Step P1 of Fig. 3 is performed responsive to the user selecting a pairing option from the menu). Thus, Vauclair teaches “to initiate a Bluetooth pairing sequence,” applying THL’s construction. *Dec.*, ¶214.

Thus, reading Vauclair’s teachings collectively, Vauclair teaches (1) a pairing option is presented on a menu [0036]; (2) user selects pairing option [0036]; and (3) in response to the user selection of the pairing option, a signal is generated and sent to the control circuitry to initiate the Bluetooth pairing sequence. *Vauclair*, [0030], [0037]-[0049]. *Dec.*, ¶215.

(c) Combination of Sweeney and Vaclair Teaches Claim 20(d)(iv)

It would have been obvious to further modify Sweeney's wireless device to perform Claim 20(d)(iv)'s functionality, per Vaclair. *Dec.*, ¶216. Sweeney's wireless device communicates with a plurality of wireless accessories (remote devices) via Bluetooth. *Id.* Sweeney teaches "the user may have been required to **link the wireless device 200 and the wireless accessory 208** one or more times to enable the wireless device 200 to search for or identify a signal or link from the wireless accessory 208 when the wireless accessory 208 is lost or misplaced." *Sweeney*, [0032]. Further, Sweeney teaches a GUI for receiving user input, while Vaclair teaches the user selecting a pairing option from a menu. *Id.*, [0029]; *Vaclair*, [0036]. Vaclair also teaches generating processor signals to initiate a Bluetooth pairing sequence in response to a user selecting a pairing option from a menu via user input 28. *Dec.*, ¶216. Thus, Sweeney-Vaclair teaches a mobile communication device that generates processor signals to initiate a Bluetooth pairing sequence in response to indications from the user via the GUI to pair the wireless device to each of a plurality of wireless accessories. *Id.*

Additionally, a POSITA would have known or found obvious given Vaclair's teaching of the device receiving an indication of the pairing option, and given Sweeney's teaching linking to **multiple** wireless accessories to allow the wireless device to locate the wireless accessories (plural), that the system is

configured to receive indications (plural) of selected remote devices for generating pairing signals (plural) for pairing each of the wireless accessories. *Id.*, ¶217.

(d) Motivation to Combine

Per Vauclair, a POSITA would have found it obvious and been motivated to modify Sweeney's wireless device to include a Bluetooth pairing menu to enable a user to initiate a Bluetooth pairing process between the wireless device and each of the wireless accessories by selecting a pairing option from the menu. *Id.*, ¶218. A POSITA would have understood that pairing allows two Bluetooth devices to recognize each other on subsequent connections. *Id.* Sweeney also teaches requiring the user to **"link the wireless device 200 and the wireless accessory 208[.]"** *Sweeney*, [0032]. A POSITA would have understood that Sweeney's wireless device would need to be paired with the wireless accessories to recognize them during subsequent connections and enable the wireless device to search for or identify signals from each wireless accessory. *Dec.*, ¶218.

The proposed combination of Sweeney-Kalliola with Vauclair would have been obvious, at least for combining known, prior art elements according to known methods to yield predictable results. *Id.*, ¶219. The claim requires the known technique of generating pairing signals in response to indications from the user to pair the mobile communication device with a plurality of remote devices. *Id.* Sweeney describes a wireless device that communicates with wireless accessories

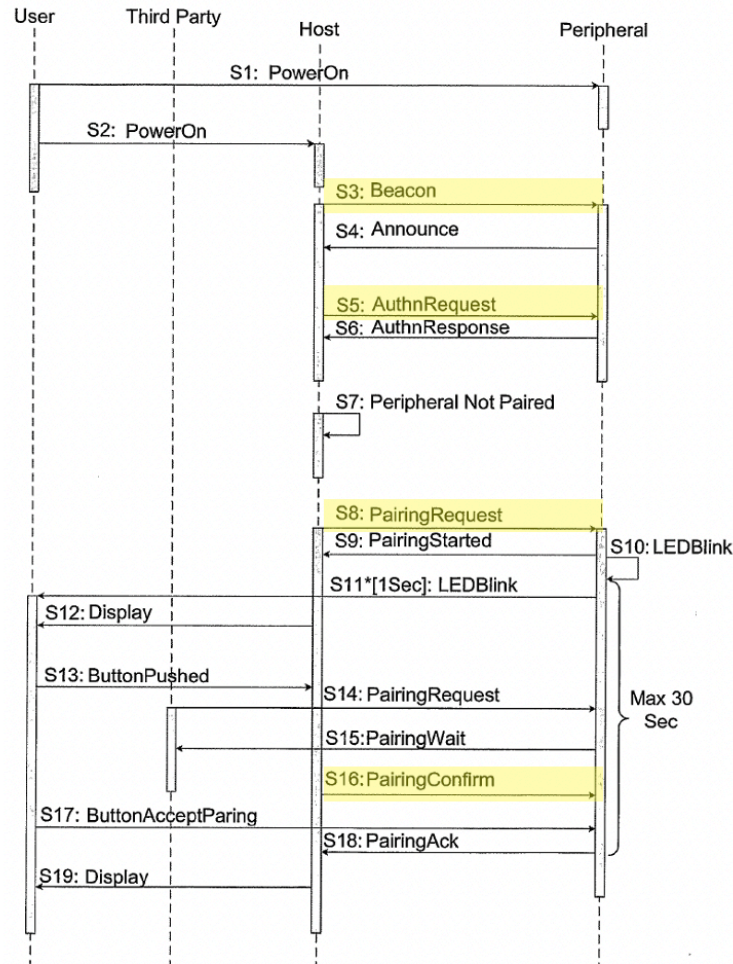
via a Bluetooth transceiver but does not include details of the initial Bluetooth pairing process between the wireless device and each wireless accessory. *Id.* Vauclair describes allowing the user to select a pairing option from a menu on a host device, which causes the host device's transceiver to communicate a series of pairing signals to the peripheral device to complete a pairing process. *Id.* The only difference between the claim and the prior art is the combination of the known prior art elements into a single device. *Id.* Because there is no change to the respective functions of either Sweeney's locating system or Vauclair's pairing process, this combination would have predictably resulted in a wireless device that allows the user to pair with a plurality of wireless accessories. *Id.*

Bluetooth pairing was well-known for a decade prior to the alleged invention of the '246 Patent. *Id.*, ¶220. As such, GUIs allowing users to initiate Bluetooth pairing and the signaling between a Bluetooth host device and a peripheral device during the pairing process were well understood to POSITAs at the time of the '246 Patent. *Id.* Therefore, there would have been a reasonable expectation of success configuring Sweeney's wireless device to present a pairing menu to the user on the touchscreen and configuring the Bluetooth transceiver to initiate the Bluetooth pairing in response to the user's request to pair the wireless device to each of the wireless accessories. *Id.*

12. Claim 20(d)(v)

(a) Vauclair's Disclosure Regarding Communicating RF Signals During Pairing

Vauclair teaches the host device's Bluetooth transceiver responds to the pairing signals by communicating RF signals to pair the host device to the peripheral device. *Dec.*, ¶¶221-224. Vauclair teaches the transceiver circuitry 24 “handles **radio frequency communications** with other electronic devices able to use the same wireless protocol.” *Vauclair*, [0028]. After the user selects the pairing option from the menu and the pairing signal is sent to the control circuitry, “the host device 20 then seeks a nearby peripheral device...by sending a beacon signal (S3 in FIG. 2) containing its identification.” *Vauclair*, [0037], Figs. 2-3. Vauclair's Fig. 2 “shows the signals sent between the devices” during the pairing process. *Id.*, [0034]. Annotated Fig. 2, below, emphasizes the RF signals the host device's transceiver circuitry communicates to the peripheral device during the pairing process:



Id., ¶223 (citing *Vauclair*, Fig. 2); *Dec.*, ¶224.

A POSITA would have understood or found obvious the mapped RF signals would have been sent when pairing each wireless accessory, per Claim 20(d)(iv)’s rationale. *Dec.*, ¶225.

(b) Motivation to Combine

Per *Vauclair*, it would have been obvious, and a POSITA would have been motivated to configure Sweeney’s Bluetooth transceiver per Claim 20(d)(v). *Dec.*, ¶226. *Vauclair* teaches the pairing process requires the host device (Sweeney’s

wireless device) to transmit a series of RF signals to the peripheral device (Sweeney's wireless accessory). *Id.* A POSITA would have understood that pairing allows two Bluetooth devices to recognize each other on subsequent connections. *Id.*, ¶227. It would have been obvious to a POSITA for Sweeney's wireless device to be paired with each of the wireless accessories to recognize the wireless accessories during subsequent connections. *Id.*

A POSITA would have been motivated to combine prior art elements according to known methods to yield predictable results. *Id.*, ¶228. The only difference between the claim and the prior art is the combination of Sweeney's wireless device and Vauclair's well-known pairing process. *Id.* Because there is no change to the respective functions of either Sweeney's wireless device or Vauclair's pairing process, this combination would have predictably resulted in a wireless device that allows the user to pair with the plurality of wireless accessories. *Id.* Bluetooth pairing was a conventional feature of Bluetooth-enabled mobile communication devices for several years prior to the invention of the '246 Patent, further indicating a reasonable expectation of success. *Id.*, ¶229.

13. Claim 20(d)(vi)

Vauclair teaches the host and peripheral devices exchange a series of signals during the pairing process. *See* Claim 20(d)(v). In this exchange, peripheral device 10 “replies with an announcement (S4 in FIG. 2) containing its **identification**” and

“host device 20 receives the **peripheral device identification** in step P2 of the process in FIG. 3[.]” *Vauclair*, [0038]-[0039], Figs. 2-3. Vauclair further teaches the peripheral device identifier “**uniquely** identifies the peripheral device 10.” *Id.*, [0051], Abstract (“A device identification, **relating uniquely to the peripheral device**, is displayed on the host device.”). Thus, Vauclair teaches that a unique device identifier associated with the remote device[] is shared with the mobile communication device during pairing. *Dec.*, ¶230.

It would have been obvious, and a POSITA would have been motivated to configure Sweeney’s wireless device to utilize Vauclair’s pairing process to pair each of the plurality of remote devices to the wireless device. *See*, Claims 20(d)(iv)-20(d)(v). Because Vauclair’s pairing process includes sharing the peripheral device’s unique device identifier with the host device, the combination of Sweeney and Vauclair also renders obvious Claim 20(d)(vi) for similar reasons. *Id.*; *Dec.*, ¶231.

14. Claim 20(d)(vii)

(a) Sweeney’s Teachings

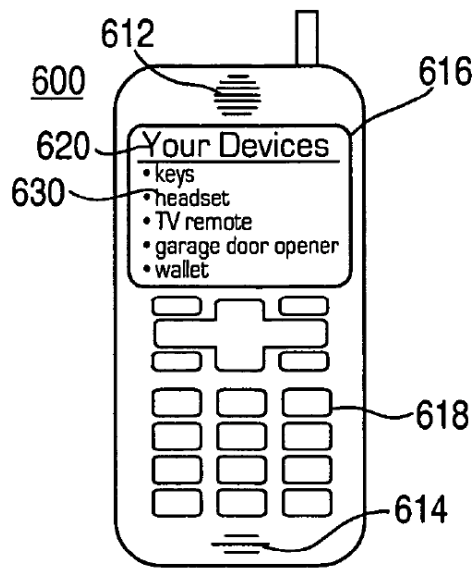
Sweeney teaches “a process for searching for a wireless accessory” that begins “with the wireless device receiving a user selection to search for a wireless accessory” where the user “enter[s] the selection using **a graphical user interface (GUI), interface, or program of the wireless device.**” *Sweeney*, [0053], Fig. 5 (step

502). For example, the “user may select a wireless accessory from a list” displayed on the GUI. *Id.* Sweeney also teaches that the user “may specify **a name**, identifier, or other information for searching, scanning, or sending a signal to the wireless accessory 106.” *Id.*, [0025]; *Dec.*, ¶¶232-234.

In related art, Kalayjian teaches a similar object-finding system that displays a list of names associated with each of the plurality of remote devices on a GUI.

(b) Kalayjian’s Teachings

Kalayjian’s GUI “include[s] list 630 of the slave devices that are associated with master device 600.” *Kalayjian*, [0047], Fig. 6. “Device 600 can permit a user to select a slave device from list 630.” *Id.* As shown in list 630 below, each second [“slave”] device has a name associated with it, which was created by the user after pairing. *Id.*, [0035] (“Once a master device has been paired to slave device 400, a user can create or edit **an identifying name** in the master device’s user interface **to correspond to the object that device 400** has been attached to.”); *Dec.*, ¶236.



Id., Fig. 6.

(c) Motivation to Combine

It would have been obvious, and a POSITA would have been motivated to configure Sweeney's wireless device to display a list of names of remote devices, per Claim 20(d)(vii) and Kalayjian. *Dec.*, ¶237. Sweeney teaches the user must select a wireless accessory via the GUI and that each wireless accessory has an associated name. *Sweeney*, [0025], [0053], Fig. 5 (step 502). Per Kalayjian's teachings, it would have been obvious to configure Sweeney's GUI to display a list of names associated with each of the wireless accessories to allow the user to select the wireless accessory for location. *Dec.*, ¶237. A POSITA would have been motivated to combine the prior art elements of Sweeney's GUI via which the user selects a wireless accessory and Kalayjian's GUI that displays a list of names associated with paired remote devices to predictably allow the user to easily view and select the wireless accessory the user

desires to locate. *Id.*. Given the predictability of GUIs at the time of the '246 Patent, there would have been a reasonable expectation of success configuring Sweeney's GUI to display the names associated with each of the wireless accessories as taught by Kalayjian. *Id.*

15. Claim 20(d)(viii)

Sweeney teaches, “[t]he **user may enter the selection using a graphical user interface (GUI), interface**, or program of the wireless device.” *Sweeney*, [0053]; *see also*, [0006] (“The **location application may receive user input** to search for a signal of the wireless accessory...”). Thus, Sweeney teaches the processor executing the location application (*see* Claim 20(d)(ii)) receive[s] a selection of a selected remote device of a plurality of remote devices in response to selection, via the graphical user interface. *Dec.*, ¶238.

In related art, Kalayjian teaches selection of the name associated with the selected remote device. *Id.*, ¶¶239-240. Kalayjian teaches the user selects a second device from list 630, which is a list of names associated with the second devices. *See* Claim 20(d)(vii); *Kalayjian*, [0047], Fig. 6. Once the selection of a selected second device is received by the first device, the GUI “displays status information 730 about the selected slave device.” *Kalayjian*, [0048], Fig. 7.

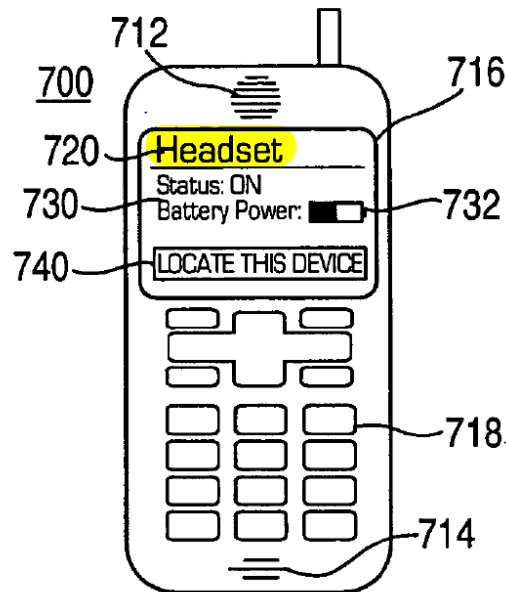
For the reasons discussed for Claim 20(d)(vii), it would have been obvious to a POSITA to configure Sweeney's GUI to display a list of names associated with

each of the wireless accessories to allow the user to easily select the wireless accessory that they wish to locate. *See* Claim 20(d)(vii). When configuring Sweeney’s wireless device to receive a selection of a desired wireless accessory, it would have been obvious, and a POSITA would have been motivated to configure Sweeney’s GUI to receive a selection of a selected wireless accessory (a selected remote device) when the user selects the name of the wireless accessory from the list, per Kalayjian. *Dec.*, ¶241. Allowing the user to select the name of a wireless accessory displayed on the GUI would have been a reliable way for the wireless device to receive a selection of a desired wireless accessory. *Id.*, ¶242. Thus, a POSITA would have been motivated to combine the known prior art elements of Sweeney’s location application GUI that receives the user’s selection of a wireless accessory from a list of names associated with remote devices, per Kalayjian, to yield the predictable result of allowing the user to easily select the wireless accessory that they wish to locate. *Id.*, ¶243. Given the predictability GUIs at the time of the ’246 Patent, there would have been a reasonable expectation of success modifying Sweeney’s wireless device as described above. *Id.*

16. Claim 20(d)(ix)

Kalayjian teaches that once a second device is selected, “Screen 716 can include title 720 to identify the selected slave device.” *Kalayjian*, [0048]. Fig. 7

shows the GUI (screen 716) visually indicating the selection of the selected “Headset” second device:



Id., Fig. 7; *Dec.*, ¶244.

It would have been obvious, and a POSITA would have been motivated to configure Sweeney’s GUI to visually indicate[] the selection of the selected remote device, per Kalayjian. *Dec.*, ¶245. A POSITA would have understood that a user would desire visual feedback to confirm that they selected the desired wireless accessory. *Id.* Thus, a POSITA would have been motivated to combine the known technique of confirming selection of the correct wireless accessory by display the accessory’s name on a screen, per Kalayjian, to improve Sweeney’s wireless device with the predictable result of allowing the user to confirm their selection. *Id.* Because providing visual feedback to confirm user input was well understood at the time of

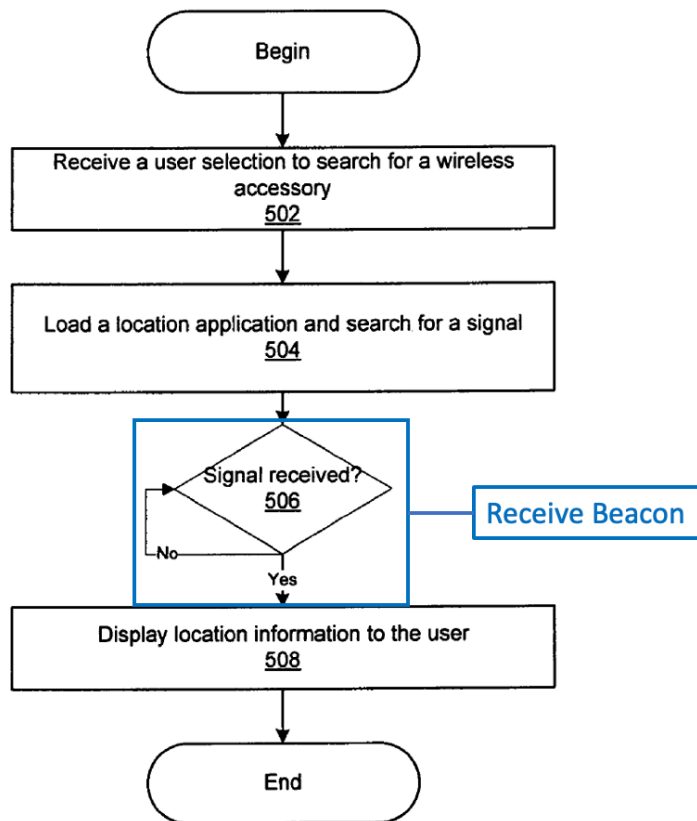
the '246 Patent, there would have been a reasonable expectation of success configuring Sweeney's GUI to visually display the name of the selected wireless accessory. *Id.*

17. Claim 20(d)(x)

Apple applies THL's construction of beacon as "signal." *See* Section III.C. After the user selects a wireless accessory, Sweeney's wireless device determines whether the selected wireless accessory is in range of the Bluetooth transceiver. *Dec.*, ¶¶247-249. After the wireless device receives the user input to search for the wireless accessory, the wireless device "scan[s] for the wireless accessory and inform[s] the user once the wireless [accessory] is **in range of the wireless device**." *Sweeney*, [0054]; [0038] ("For example, as the user searches for the wireless accessory 310 or receives an alert or indication that the wireless accessory 310 is **in range of the wireless device 300**,..."). "Next, the wireless device **determines whether the signal is received (step 506)**. If the wireless device determines the signal is not received, the wireless device continues to search in step 506." *Id.*, [0054], Fig. 5 (step 506), [0004]-[0006] ("User input to search for the wireless accessory may be received. A **determination may be made whether a signal is received** from the wireless accessory."). "[T]he location application 306 receives an indication from the wireless **transceiver 308** that a **signal has been received** from the wireless accessory 310[.]" *Id.*, [0038]. As discussed above, transceiver 308 is a

Bluetooth transceiver. See Claim 20(a)(i). The signal received by the wireless device's Bluetooth transceiver qualifies as the claimed beacon applying THL's construction.

In step 506, Sweeney's location application executing on the processor meets Claim 20(d)(x):



Dec., ¶249 (citing Sweeney, Fig. 5).

18. Claim 20(d)(xi)

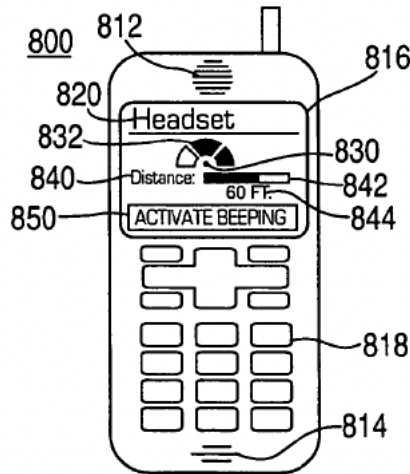
(a) Sweeney's Teachings

Sweeney teaches “the wireless user 102 may enable the wireless device 104 to transmit a signal through the wireless link 108 **commanding the wireless**

accessory 106 to emit an alert to the wireless user 102 indicating the location of the wireless accessory 106.” *Sweeney*, [0023]. “The wireless device 104 may activate the wireless accessory 106 to **play an alarm** until the wireless accessory 106 is located by the wireless user 102.” *Id.* The wireless accessory includes speaker 316, which is “used to **output an alert, alarm, or message** to a user to indicate a location of the wireless accessory 310.” *Id.*, [0042]. “[T]he location application 306 may be enabled wherein once the wireless accessory 310 and the wireless device 300 begin communication through their respective transceivers, 308 and 312[,] [t]he speaker 316 of the wireless accessory 310 may **play a selected alert** to enable the user to find the wireless accessory 310.” *Id.*, *see also* [0052] (disclosing step 410 of playing an alarm/alert); *Dec.*, ¶250. In related art, Kalayjian teaches a GUI that allows the user to trigger the remote device to emit an audio alert.

(b) Kalayjian’s Teachings

Kalayjian’s second device includes a “speaker 324 to emit sounds operable to guide a user to its location.” *Kalayjian*, [0034]. “FIG. 8 includes a screenshot of the user interface of master device 800 when the master device is attempting to locate a slave device.” *Kalayjian*, [0049]. As shown below, “[s]creen 816 can include **graphical button 850** to **enable the user to prompt the slave device to beep[.]**” *Id.*



Id., Fig. 8.

Because Kalayjian teaches that graphical button 850 (“ACTIVATE BEEPING”) is selected by the user to prompt the second device to beep, Kalayjian teaches an indication from the user via the graphical user interface. *Dec.*, ¶¶251-253. A POSITA would have understood that the user selecting the “ACTIVATE BEEPING” button would be a second indication because it comes after the mapped first indications to pair the devices (Claim 20(d)(iv)). *Id.*, ¶255.

(c) Vaclair’s Teachings

Vaclair teaches user input 28 “allow[s] the user to select from available menu options, to **send a signal to the control circuitry 22[,]**” which includes “a suitably programmed processor.” *Vaclair*, [0030]. Thus, Vaclair teaches generat[ing a]... signal in response to user input via the graphical user interface. *Dec.*, ¶254.

(d) Motivation to Combine

It would have been obvious, and a POSITA would have been motivated to configure Sweeney's location application to display a GUI that allows the user to command the wireless accessory to emit an audio alert, per Kalayjian and Vauclair. *Dec.*, ¶255. Specifically, a POSITA would have been motivated to modify Sweeney's GUI such that it includes a graphical button that, when pressed, generates an audio alert signal causing the wireless device to trigger the wireless accessory to play an alarm. *Id.* By providing a graphical button, as taught in Kalayjian, a POSITA would understand the benefit that a user would have the option to trigger an audio alert from the wireless accessory they are attempting to locate, consistent with Sweeney's and Kalayjian's teachings. *Id.*, ¶256.

The only difference between the claim and the prior art is the combination of the known prior art elements into a single device. *Id.*, ¶257. Because there is no change to the respective functions of either Sweeney's wireless device/wireless accessory, Kalayjian's audio alert, or Vauclair's signal generation in response to user input, this combination would have predictably resulted in a wireless device that triggers an audio alert signal in response to the user selecting an "ACTIVATE BEEPING" button displayed on the GUI. *Id.*

The modification would have only required minor software changes as Sweeney already teaches generating an audio alert at the wireless accessory. *Id.*,

¶258. For these reasons, there would have been a reasonable expectation of success modifying Sweeney’s GUI to allow the user to command the wireless accessory to emit an audio alert. *Id.*

19. Claim 20(d)(xii)

Sweeney and Kalayjian teach Claim 20(d)(xii). Sweeney teaches “the wireless user 102 may enable the wireless device 104 to **transmit a signal through the wireless link 108 commanding the wireless accessory 106 to emit an alert** to the wireless user 102 indicating the location of the wireless accessory 106.” *Sweeney*, [0023] (further disclosing “The wireless device 104 may activate the wireless accessory 106 to play an alarm until the wireless accessory 106 is located by the wireless user 102.”), [0022] (disclosing indicating direction “audibly”); Claim 20(d)(xi). The wireless link 108 is a Bluetooth link, and the wireless device’s Bluetooth transceiver transmits signals to the wireless accessory. *Sweeney*, [0017] (“[T]he wireless link 108 may be a Bluetooth® connection.”), [0005] (“The wireless device may further include a transceiver configured to transmit the signal to the wireless accessory...”); Claim 20(a)(i); *Dec.*, ¶259.

The audio alert audibly assist[s] the user in determining a location of the selected remote device. *Dec.*, ¶260. Sweeney teaches “the location application 306 may be enabled wherein once the wireless accessory 310 and the wireless device 300 begin communication through their respective transceivers, 308 and 312[,] [t]he

speaker 316 of the wireless accessory 310 may play a selected alert to **enable the user to find the wireless accessory 310.**” *Id.*, [0042], [0023] (disclosing emitting alarm until user locates wireless accessory).

A POSITA would have understood that a Bluetooth signal is an RF signal. *Dec.*, ¶261. Thus, the Bluetooth signal transmitted by the wireless device commanding the wireless accessory to emit an alert qualifies as a first RF signal to the selected remote device...wherein the first RF signal indicates a request to the selected remote device to emit an audio alert to audibly assist the user in determining a location of the selected remote device. *Id.*

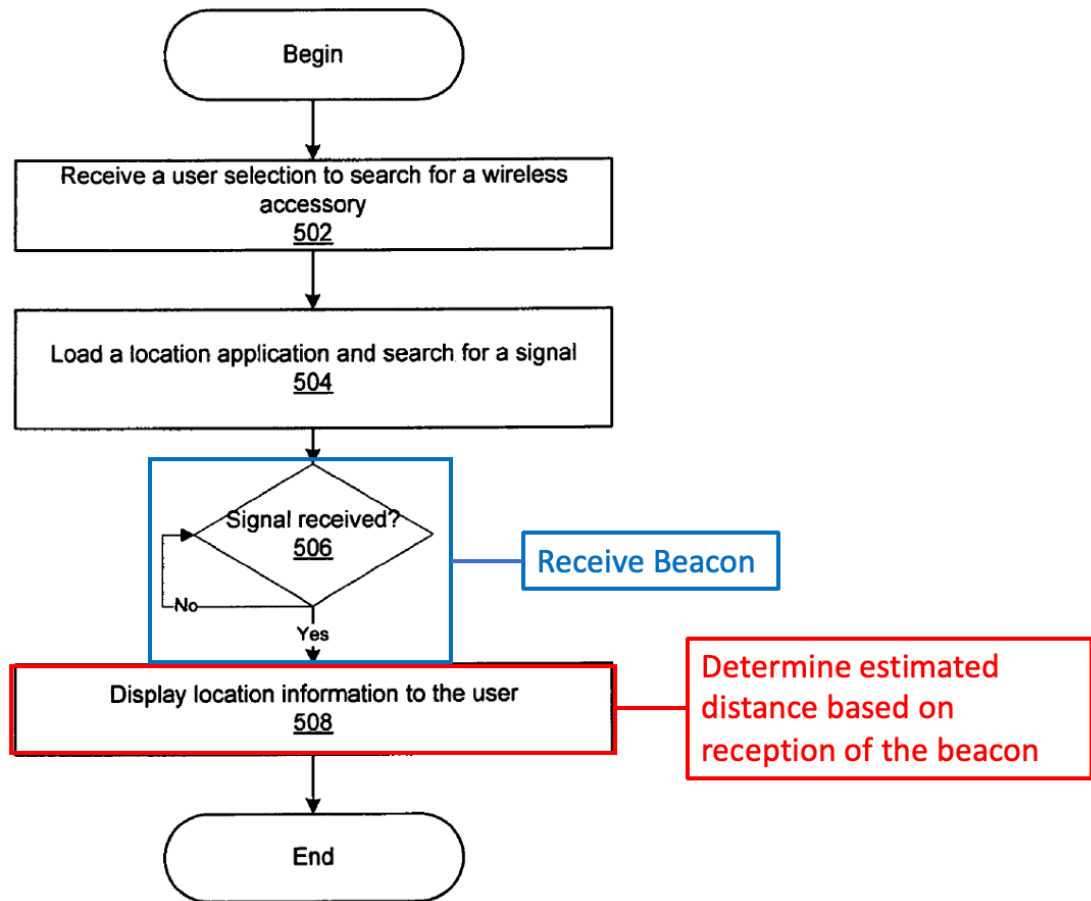
Kalayjian teaches that after the user presses the “ACTIVATE BEEPING” button, the Bluetooth transceiver responds by transmitting a Bluetooth signal to the second device to prompt it to beep. *Kalayjian*, [0007], [0038]-[0039], [0049], [0054], Fig. 10 (step 1020); *Dec.*, ¶262.

Per Claim 20(d)(xi), it would have been obvious to configure Sweeney’s GUI to generate an audio alert signal in response to the user selecting an “ACTIVATE BEEPING” button displayed on Sweeney’s GUI. *See* Claim 20(d)(xi); *Dec.*, ¶263. It would have further been obvious, and a POSITA would have been motivated to configure Sweeney’s Bluetooth transceiver to transmit a Bluetooth signal to the selected wireless accessory in response to the audio alert signal, per Kalayjian, for the same reasons. *Id.*

20. Claim 20(d)(xiii)

Per Sweeney, “If **the signal** is received in step 506 [*the beacon* per Claim 20(d)(x)], the wireless device displays location information to the user (step 508)[,]” where the location information includes “an approximate **distance** to the wireless device determined and based on **the signal strength** received from the wireless accessory.” *Sweeney*, [0055], Fig. 5 (step 508). “[T]he location application executed by the wireless device 104 may indicate an approximate location of the wireless device 104 from the wireless accessory 106 based on the signal strength of the wireless link 108.” *Id.*, [0020]. “The strength of the signal may be related to **a distance between the wireless device 104 and the wireless accessory 106.**” *Id.*, [0022]; *Dec.*, ¶¶264-265.

Sweeney receives the signal in step 506 (i.e., *the beacon*) via the Bluetooth transceiver (*see* Claim 20(d)(x)), and the location application searches for the signal (*Sweeney*, [0054]). Thus, Sweeney’s location application executing on the processor performs Claim 20(d)(xiii):



Dec., ¶266 (citing *Sweeney*, Fig. 5).

21. Claim 20(d)(xiv)

Sweeney teaches “the wireless device **displays location information** to the user (step 508)” where the location information includes “an approximate **distance** to the wireless device[.]” *Sweeney*, [0055], Fig. 5 (step 508), Fig. 6. “The display 204 may **display a GUI** for providing user input and location information” where “[t]he location information may include an indication that a signal is being received, the name of the wireless accessory 208, last registered connection to the wireless accessory 208, **approximate distance to the wireless accessory 208**, and

approximate direction to the wireless accessory 208.” *Id.*, [0029]. “The **graphical user interface may also display** textual indicators indicating an **estimated or determined distance** and location to the wireless accessory 208[.]” *Id.*; *Dec.*, ¶267.

Sweeney also teaches “[t]he location application 306 may display an arrow, **map**, or text for helping the user find the wireless accessory 310.” *Sweeney*, [0040], [0038] (“The numerous signal strength readings may be converted to a **map**... indicators for guiding the user to the wireless accessory 310.”), [0055] (“In one embodiment, the wireless device displays approximate **distance** and **location information**.”); *Dec.*, ¶268.

Because Sweeney teaches taking numerous signal strength measurements and using the multiple measurements to determine distance and direction, a POSITA would have understood Sweeney teaches or renders obvious displaying an estimated position of the selected remote device on a map. *Dec.*, ¶269. Specifically, a POSITA would have known that with both distance and direction, an estimated position can be determined, and Sweeney already teaches displaying a map with location information from the numerous signal strength readings. *Id.* (citing *Sweeney*, [0038], [0040]).

Additionally, a POSITA would have found it obvious to display a position on a map per Sweeney’s teachings, as a map is a known technique of navigating a user to a location. *Id.*, ¶270. Sweeney teaches the necessary information for determining

a position via the multiple signal strength readings for determining distance and direction. *Id.* It would have been advantageous to use this information already determined by Sweeney to display position in a familiar format of a map to a user. *Id.* There would have been a reasonable expectation of success in any modifications to Sweeney, as such modifications would be minimal software changes of displaying a particular position on the map already taught by Sweeney. *Id.*

To the extent THL argues that Sweeney does not teach displaying the estimated distance and the map on the same at least one display and to the extent such is required by Claim 20, it would have been obvious, and a POSITA would have been motivated to configure Sweeney's GUI to present a display including the estimated position of the selected wireless accessory on a map with the estimated distance. *Id.*, ¶271. A POSITA would have understood that both pieces of information would have been valuable to a user attempting to locate the selected wireless accessory, such as displaying absolute position of the remote device (wireless accessory) relative to the user's current location on a map. *Id.* Thus, a POSITA would have been motivated to combine Sweeney's known techniques of displaying an estimated distance and displaying the estimated position of the wireless accessory on a map to yield the predictable result of a display that provides the information the user needs to determine the location of the wireless accessory more easily. *Id.* Given the predictability of GUIs, there would have been a reasonable

expectation of success configuring Sweeney's GUI to present a display including the estimated position of the wireless accessory on a map and the estimated distance to the wireless accessory. *Id.*

B. Claim 27

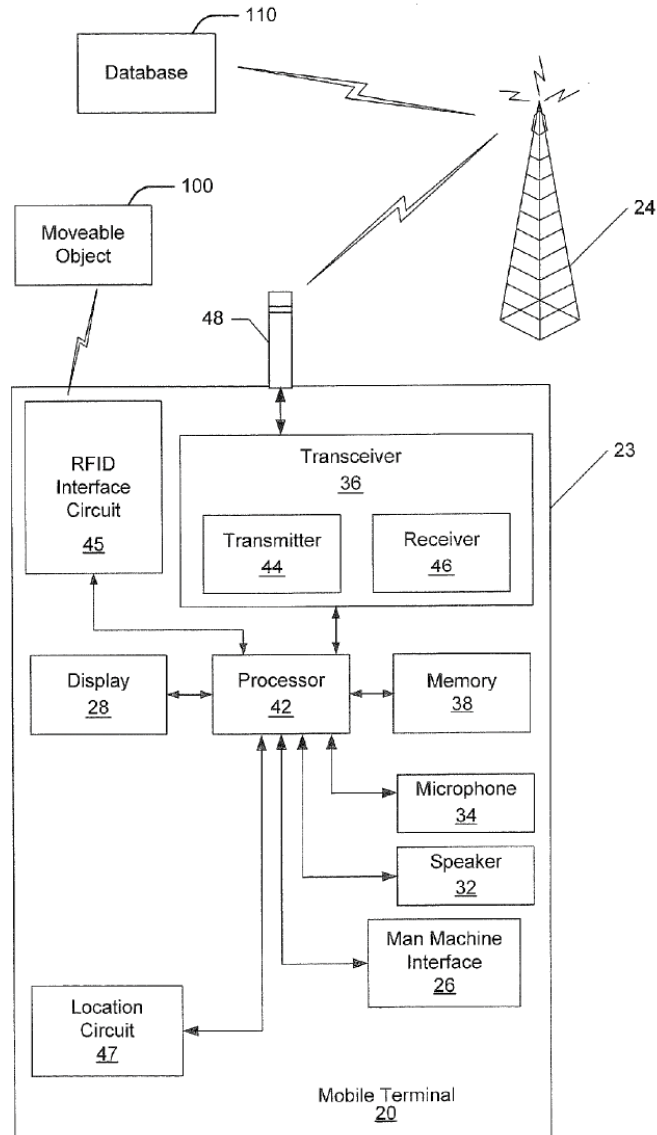
Sweeney teaches Claim 27. *See* Claim 20(d)(xiii); *Sweeney*, [0022], [0055] (“The location information may include an approximate distance to the wireless device determined and based on the signal strength received from the wireless accessory.”); *Dec.*, ¶272.

VII. GROUND 2: CLAIMS 21-26 ARE OBVIOUS OVER SWEENEY, KALLIOLA, TURUNEN, MOHAMMADIAN, KALAYJIAN, VAUCLAIR, AND THORN

A. Claim 21

1. Thorn's Teachings

Thorn discloses methods and systems “for providing location information associated with movable objects.” *Thorn*, [0014], Abstract. The system includes mobile terminals that communicate with a base station transceiver 24 in a wireless communication network. *Id.*, [0034], [0036]. Each mobile terminal 20 includes a transceiver 36 for wireless communication. *Id.*, [0034]-[0035]. The wireless communication network may be “any type of wireless communications network,” including a cellular network. *Id.*, [0029], [0037]. Each mobile terminal 20 wirelessly communicates via Bluetooth or RFID with a moveable object 100. *Id.*, [0030], Fig. 1, [0041], [0032].



Id., Fig. 2; *Dec.*, ¶¶273-275.

In Thorn’s method, a first user of a first terminal happens upon a lost movable object, such that the first terminal is proximate the movable object. *Thorn*, [0053]. Because the first terminal is proximate the movable object, the location of the first terminal “correspond[s] to the location of the movable object.” *Id.* The first terminal sends location information corresponding to the movable object to a second terminal.

Id., [0053], [0064]-[0065], [0047]-[0048] and [0011]-[0012] (disclosing GPS as exemplary location determination method). The location information for the first terminal (and corresponding location of the movable object) is transmitted by the first terminal to the second terminal “via the communications network.” *Id.*, [0053], [0064]-[0065], Figs. 6A-6B (disclosing similar location method). Thorn, [0055]-[0056] and Fig. 4 disclose a similar functionality as discussed at [0053] that includes periodic updating of the movable object’s location:

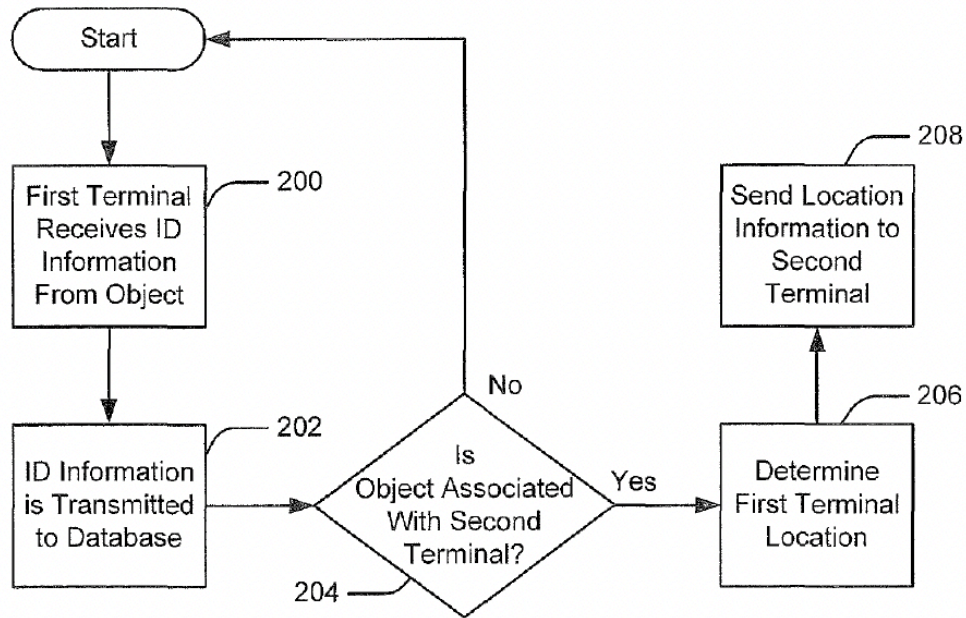


FIG. 4

Id., Fig. 4, [0055]-[0056], [0059]-[0060]; *Dec.*, ¶¶276-278.

Regarding the claimed based on information received at one of the plurality of wireless transceivers via a wireless network, Thorn teaches each of the terminals

includes transceiver 36 for performing wireless communication across a communications network, such as a cellular network. *Thorn*, [0034]-[0035], [0029]. *Thorn* also teaches the location information can be transmitted from the first terminal and to the second terminal “via the communications network.” *Id.*, [0053]. A POSITA would have understood or found obvious the transmission of the location information via the communications network is performed by receiving information at the second terminal’s cellular transceiver. *Dec.*, ¶279.

Thorn therefore teaches that the estimated position of the selected remote device (the location of the movable object proximate to the first terminal) is determined based on information received (the location information) at one of the plurality of wireless transceivers via a wireless network (location information received by the transceiver of the second terminal). *Id.*, ¶280.

2. *Motivation to Combine*

A POSITA would have found it obvious and been motivated to configure Sweeney’s object-finding system to locate wireless accessories outside the range of the wireless device’s Bluetooth transceiver using *Thorn*’s long-range location-finding method. *Dec.*, ¶281. A POSITA would have understood the user may have left their wireless accessory at a location far away from their current location and out of range of the wireless device’s Bluetooth transceiver. *Id.* Sweeney similarly teaches “the wireless user 102 may move the wireless accessory 106 from location

to location,” and “[t]his use and corresponding movement increases the chance that the wireless accessory 106 will be lost, stolen, or otherwise misplaced by the wireless user 102.” *Sweeney*, [0018]. In this instance, it would have been advantageous to utilize Thorn’s long-range location-finding method to send the location of the wireless accessory to the wireless device via the cellular network and display a map depicting the estimated position on the wireless device’s touchscreen. *Dec.*, ¶281. Thus, a POSITA would have found it obvious and been motivated to configure Sweeney’s modified wireless device to display the estimated position of the wireless accessory based on information received at its cellular transceiver and from another user’s mobile device, per Thorn. *Id.*

A POSITA would have recognized that Sweeney’s object-finding system would only be able to find objects located within range of the wireless device’s Bluetooth transceiver. *Id.*, ¶282. Configuring Sweeney’s wireless device to also utilize Thorn’s long-range method would have predictably enabled Sweeney’s wireless device to locate the wireless accessory over a wide geographical area, thereby eliminating the need for the user to be within Bluetooth range of the wireless accessory. *Id.* This modification would have predictably improved the system’s flexibility and robustness, thereby increasing user satisfaction. *Id.* For these reasons, a POSITA would have been motivated to configure Sweeney’s object-finding

system to use Thorn's long-range finding method to improve similar object-finding systems in the same way. *Id.*

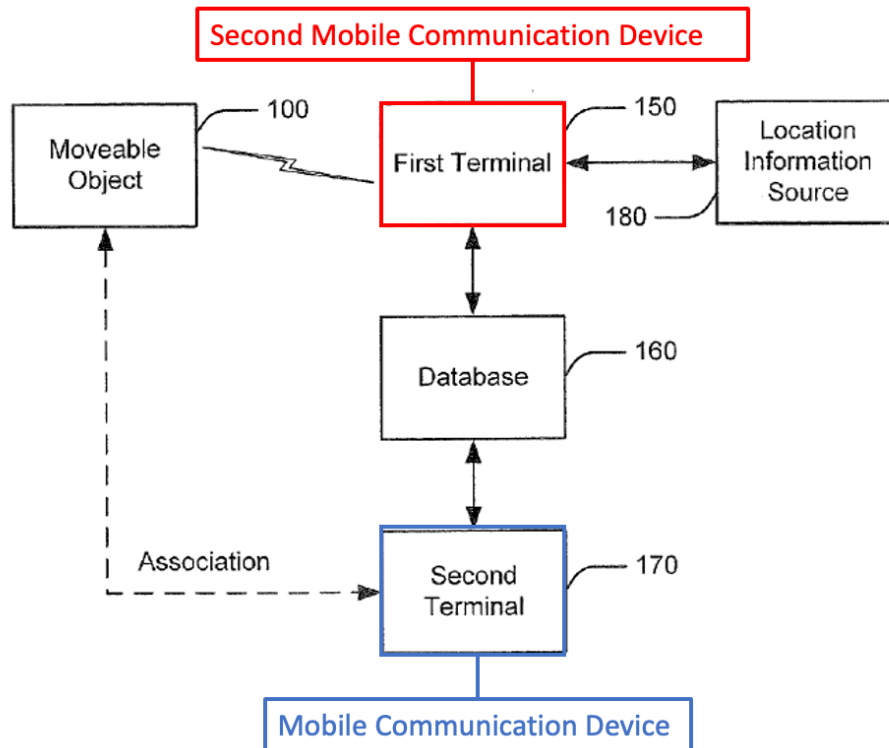
The Sweeney-Kalliola wireless device includes the long-range cellular transceiver hardware required to implement Thorn's long-range location-finding method. *See* Claim 20(a)(ii). Therefore, this modification would not have required any further hardware changes to Sweeney's wireless device or changed its principle of operation. *Dec.*, ¶283. Thus, there would have been a reasonable expectation of success configuring Sweeney's wireless device to implement Thorn's long-range location-finding method. *Id.*

B. Claim 22

Thorn teaches Claim 22. The location of the remote device is based on information received from the first mobile terminal, namely the location of the first terminal proximate to the movable object. *Thorn*, [0053], [0064]-[0065]; Claim 21.

To avoid any confusion about the first/second nomenclature for the mobile devices, Petitioner notes that in the scenario described in *Thorn*, [0053], the second terminal corresponds to the claimed mobile communication device **receiving** the location information. If the mobile communication device of Claim 20 is designated the "first device" for ease of reference, this means that Thorn's **second** terminal corresponds to Claim 20's **first** device, as Thorn's **second** terminal is the terminal **receiving** the location information of the lost object proximate the first terminal.

Dec., ¶284. Conversely, Thorn's **first** terminal corresponds to Claim 22's **second mobile communication device**, because Thorn's first terminal sends the location of the movable object to Thorn's second terminal. *Id.*



Id. (citing Thorn, Fig. 3).

C. Claim 23⁶

Thorn teaches the information includes the estimated position information of the moveable object (position information). See Claims 21-22.

⁶ Because Claim 23 includes a list of alternatives and uses the disjunctive “or,” Petitioner interprets this claim as a Markush group. *Abbott Labs v. Baxter Pharmaceutical Products, Inc.*, 334 F.3d 1274, 1280-81 (Fed. Cir. 2003); MPEP 2173.05(h).

Thorn also teaches the estimated position of the moveable object is based on the GPS position of the second mobile communication device (i.e., Thorn's first terminal), thus teaching coordinate information. *Thorn*, [0006], [0011]; *Dec.*, ¶287.

D. Claim 24

Thorn teaches that the information is based on GPS coordinates. See Claim 23; see also, Claims 21-22; *Dec.*, ¶288.

E. Claim 25

1. Thorn's Teachings

Thorn teaches a scenario where “multiple traveling companions shar[e] a common resource, such as, for example a travel book.” *Thorn*, [0057]. “In the case when one of the travelers wishes to use the resource, the location may be determined relative to which of the travelers is in possession of the resource.” *Id.* In this scenario, it would have been obvious for each traveler's terminal to be paired with the moveable object (i.e., the travel book), per Kalayjian's teachings. *Dec.*, ¶289.

2. Kalayjian's Teachings

Kalayjian teaches “determining a slave device's relative location...using **more than one master device** and determining the distance of the slave device **to each master device**.” *Kalayjian*, [0046]. Thus, Kalayjian teaches more than one first device, i.e., a second mobile communication device. *Dec.*, ¶290. Kalayjian teaches each first device must be paired with the second (remote) device to communicate with it. *Kalayjian*, [0054] (“At step 1010, a master device is paired with one or more

slave devices using a Bluetooth communications protocol.”), [0055], Figs. 10-11.

Kalayjian thus teaches the second mobile communication device is paired with the selected remote device. *Dec.*, ¶290.

3. *Motivation to Combine*

It would have been obvious to a POSITA to configure Sweeney’s wireless device (mobile communication device) to receive an estimated position of the wireless accessory from a second wireless device (second mobile communication device). *See* Claims 21-22. Per Thorn and Kalayjian, it would have been obvious to allow Sweeney’s wireless accessory to be paired with more than one wireless device so that users of both wireless devices may share access to and track the location of the wireless accessory. *Dec.*, ¶291. If the user of the second wireless device (the second mobile communication device) is in possession of the shared wireless accessory when the user of the first wireless device (mobile communication device) attempts to locate it, then Sweeney’s wireless device, as modified by Thorn and Kalayjian, would receive the estimated position of Sweeney’s wireless accessory from the second wireless device, which is paired with the wireless accessory (per Kalayjian). *Id.*

A POSITA would have found it obvious and been motivated to configure Sweeney-Thorn’s second wireless device to be paired with the selected wireless accessory. *Id.*, ¶292. Per Thorn, multiple users may share a common resource. *Id.* It

would have been obvious for each user's wireless device to be paired with the shared wireless accessory so that each of the users can track the wireless accessory's location. *Id.* Thus, a POSITA would have been motivated to combine the prior art elements of (1) Sweeney's object locating system with Thorn's teaching of multiple user's sharing a common resource and determining the location of the resource relative to which of the users is in possession of it; and (2) Kalayjian's teaching of pairing multiple mobile communication devices to the same remote device. *Id.* The combination would have yielded the predictable result of an object finding system where multiple users are able to track the location of a shared wireless accessory. *Id.* A POSITA would have understood this modification would have only required software minor changes. *Id.*, ¶293. Given the predictability of programming at the time of the '246 Patent, there would have been a reasonable expectation of success configuring Sweeney-Thorn's second wireless device to be paired with the selected wireless accessory. *Id.*; *Keynetik, Inc. v. Samsung Electronics Co., Ltd.*, No. 2022-1127, Slip Op., at 4 ("Normally, once the function to be performed by software has been identified, writing code to achieve that function is within the skill of the art.") (Not Reported in Fed. Rptr.).

F. Claim 26

For the scenario discussed at Thorn, [0053], "the first terminal 150 does **not** have an association with the movable object 100." *Thorn*, [0053], [0030] (disclosing

a first terminal sends ID information for a movable object to a database to “determine if the moveable object is associated with the first terminal. **If the moveable object is not associated with the first terminal**, the first terminal can determine location information...”), [0039] (disclosing database including “terminal information associated with the movable object”). Therefore, Thorn expressly teaches the first mobile terminal (*the second mobile communication device*) is not associated with (*is not paired with*) the movable object (*the at least one remote device*). Dec., ¶¶295-296 (further opining Thorn’s terminals “not associated” with each other includes terminals *not paired*).

A POSITA would have found it obvious and been motivated to modify Sweeney to include Thorn’s teaching of “not associated” terminals. Such would be desirable in situations where a user happens upon a lost wireless accessory, as expressly contemplated by Thorn, [0058], but the user’s mobile device is not otherwise paired with the unknown, lost wireless accessory, for the same reasons provided for Claims 21-22. *See* Claims 21-22; Dec., ¶296.

VIII. GROUND 3: CLAIM 26 IS OBVIOUS OVER SWEENEY, KALLIOLA, TURUNEN, MOHAMMADIAN, KALAYJIAN, VAUCLAIR, THORN, AND LOPATIN⁷

A. Claim 26

1. *Lopatin's Teachings*

Lopatin teaches an object locating system where a mobile device 102 attempts to locate a wireless accessory 201. *Lopatin*, [0030], Fig. 2. “The wireless accessory 201 can be paired with the mobile device 102 using a wireless technology standard, such as but not limited to Bluetooth.” *Id.*, [0030]. When lost, the wireless accessory 201 transmits a beacon signal conveying “that the wireless accessory 201 has determined itself to be lost or has been placed into a lost state by the owner of the device.” *Id.*, [0032]. “The beacon signal can be detected by a finder device 202, which is locally proximate to the wireless accessory 201.” *Id.*, [0033]. “The finder device 202 **can be a similar device as the mobile device 102.....**” *Id.* Thus, finder device 202 qualifies as a second mobile communication device. *Dec.*, ¶¶297-298.

Lopatin teaches the mobile device receives the wireless accessory's location information from the finder device via a wireless network. *Lopatin*, [0033] (disclosing transmitting location over wide area network). *Dec.*, ¶299.

Lopatin expressly teaches the finder device (second mobile communication

⁷ Ground 3 is an alternative ground should the Board find that Claim 26 has an EEFD of January 19, 2022.

device) is not paired with the wireless accessory. *Dec.*, ¶300. When the mobile device user places the wireless accessory 201 in “explicit lost mode,” “the wireless accessory 201 **cannot be paired** with another device unless unlocked by the owner.” *Lopatin*, [0050]. *Lopatin* teaches a scenario where the finder device’s user (second user) finds the wireless accessory that is in lost mode and is blocked from pairing with it. *Id.*, [0080], Fig. 10; *Dec.*, ¶300. Because the second user is unable to pair the finder device with the wireless accessory, the finder device is, by definition, not paired with the wireless accessory. *Dec.*, ¶301.

2. *Motivation to Combine*

A POSITA would have found it obvious and been motivated to modify Sweeney to include Lopatin’s teachings. Such would be desirable in situations where a user happens upon a lost object, but the user’s mobile device is not otherwise paired with the unknown, lost object, for the same reasons provided for Claims 21-22. *See* Claims 21-22; *Dec.*, ¶302.

IX. DISCRETION UNDER 35 U.S.C. § 314(A)

Petitioner stipulates that if the Petition is instituted, Petitioner will not seek resolution in the district court of any ground of invalidity raised in the Petition or that could have been raised in the Petition. *Sotera Wireless v. Masimo*, IPR2020-01019, Paper 12 at 18-19 (Dec. 1, 2020) (precedential). This stipulation “mitigates concerns of potentially conflicting decisions and duplicative efforts between the

district court and the PTAB,” and the Director has instructed that the Board will not discretionarily deny institution under 35 U.S.C. § 314(a). *Interim Procedure for Discretionary Denials*, pp. 7-8 (June 21, 2022).

X. CONCLUSION

For the foregoing reasons, Petitioner respectfully requests *inter partes* review of the Challenged Claims.

Respectfully submitted,

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XI. MANDATORY NOTICES UNDER 37 C.F.R. § 42.8

A. Real Parties-in-Interest Under 37 C.F.R. § 42.8(b)(1)

Petitioner is the real party in interest.

B. Related Matters Under 37 C.F.R. § 42.8(b)(2)

The '246 Patent is presently the subject of a patent infringement lawsuit filed against Petitioner in the United States District Court for the Western District of Texas Waco Division. *THL Holding Company, LLC v. Apple, Inc.*, Case No. 6:23-cv-00077.

C. Lead and Back-Up Counsel Under 37 C.F.R. § 42.8(b)(3)

Petitioner provides the following designation and service information for lead and back-up counsel. 37 C.F.R. § 42.8(b)(3) and (b)(4).

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D. 37 C.F.R. § 42.8(b)(4) – Service Information

Please address all correspondence to the lead and backup counsel as shown above. Petitioner consents to electronic service by e-mail at the e-mail addresses provided above.

CLAIM LISTING APPENDIX
U.S. Patent No. 11,350,246, Claims 20-27

Claim Designation	Claim Language
Claim 20[P]	A mobile communication device comprising:
Claim 20(a)	a plurality of wireless transceivers including
Claim 20(a)(i)	a Bluetooth transceiver,
Claim 20(a)(ii)	a long-range transceiver configured to send and receive telephone calls via a telephony network and to communicate Internet data and
Claim 20(a)(iii)	one or more ultrawideband transceivers coupled to two or more antennas;
Claim 20(b)	a memory that stores operational instructions;
Claim 20(c)	a touch screen; and
Claim 20(d)(i)	a processor coupled to the memory and to the touch screen,
Claim 20(d)(ii)	wherein the processor is configured to execute the operational instructions, which upon execution, cause the processor to:
Claim 20(d)(iii)	present a graphical user interface via the touch screen;
Claim 20(d)(iv)	generate pairing signals in response to indications from a user via the graphical user interface to pair the mobile communication device to each of a plurality of remote devices,
Claim 20(d)(v)	wherein the Bluetooth transceiver responds to the pairing signals by communicating RF signals to pair the mobile communication device to each of the plurality of remote devices,
Claim 20(d)(vi)	wherein a unique device identifier associated with each of the plurality of remote devices is shared with the mobile communication device during pairing;
Claim 20(d)(vii)	display, via the graphical user interface, a name associated with each of the plurality of remote devices;
Claim 20(d)(viii)	receive a selection of a selected remote device of the plurality of remote devices in response to selection, via the graphical user interface, of the name associated with the selected remote device, wherein the graphical user interface visually indicates the selection of the selected remote device;

Claim Designation	Claim Language
Claim 20(d)(ix)	wherein the graphical user interface visually indicates the selection of the selected remote device;
Claim 20(d)(x)	determine whether the selected remote device is in range of the Bluetooth transceiver, wherein the selected remote device is determined to be in range of the Bluetooth transceiver based on reception, via the Bluetooth transceiver, of a beacon from the selected remote device;
Claim 20(d)(xi)	generate an audio alert signal in response to a second indication from the user via the graphical user interface,
Claim 20(d)(xii)	wherein the Bluetooth transceiver transmits a first RF signal to the selected remote device in response to the audio alert signal, wherein the first RF signal indicates a request to the selected remote device to emit an audio alert to audibly assist the user in determining a location of the selected remote device;
Claim 20(d)(xiii)	determine an estimated distance to the selected remote device, based on the reception, via the Bluetooth transceiver, of the beacon from the selected remote device; and
Claim 20(d)(xiv)	present at least one display, via the graphical user interface, wherein the at least one display includes an estimated position of the selected remote device on a map, and wherein the at least one display indicates the estimated distance to the selected remote device.
Claim 21	The mobile communication device of claim 20, wherein the estimated position of the selected remote device is determined based on information received at one of the plurality of wireless transceivers via a wireless network.
Claim 22	The mobile communication device of claim 21, wherein the information is received from a second mobile communication device.
Claim 23	The mobile communication device of claim 22, wherein the information indicates one or more of: position information, signal strength information, proximity information, or coordinate information.
Claim 24	The mobile communication device of claim 23, wherein the information is based on GPS coordinates.

Claim Designation	Claim Language
Claim 25	The mobile communication device of claim 22 wherein the second mobile communication device is paired with the selected remote device.
Claim 26	The mobile communication device of claim 22 wherein the second mobile communication device is not paired with the selected remote device.
Claim 27	The mobile communication device of claim 20 wherein the estimated distance to the selected remote device is determined based on a strength of the beacon from the selected remote device.

APPENDIX OF EXHIBITS

Exhibit 1001	U.S. Patent No. 11,350,246 to Howard et al.
Exhibit 1002	File History of U.S. Patent No. 11,350,246
Exhibit 1003	Declaration of R. Michael Buehrer, Ph.D.
Exhibit 1004	U.S. Patent No. 8,588,806 to Howard et al.
Exhibit 1005	U.S. Patent Publication No. 2009/0058670A1 to Sweeney et al.
Exhibit 1006	U.S. Patent Publication No. 2008/0068265A1 to Kalliola et al.
Exhibit 1007	U.S. Patent No. 6,487,595 to Turunen et al.
Exhibit 1008	U.S. Patent Publication No. 2006/0114166A1 to Mohammadian et al.
Exhibit 1009	U.S. Patent Publication No. 2008/0125040A1 to Kalayjian
Exhibit 1010	U.S. Patent Publication No. 2008/0320587A1 to Vauclair et al.
Exhibit 1011	U.S. Patent Publication No. 2009/0058651 to Thorn
Exhibit 1012	U.S. Patent No. 2020/0107164 to Lopatin et al.
Exhibit 1013	THL's Opening Claim Construction Brief dated September 14, 2023
Exhibit 1014	ISO/IEC 24730-2:2006(E) <i>Information technology – Real-time locating systems (RLTS) – Part 2: 2,4 GHz air interface protocol</i> . International Organization for Standardization and the International Electrotechnical Commission (2006)
Exhibit 1015	Hui Liu, Houshang Darabi, Pat Banerjee, and Jing Liu, <i>Survey of Wireless Indoor Positioning Techniques and Systems</i> , IEEE Transactions on Systems, Man, and Cybernetics-Part C: Applications and Reviews, Vol. 37, No. 6 (November 2007)
Exhibit 1016	<i>A Comprehensive Look into the RTLS System</i> , https://www.mokosmart.com/look-into-rtls-system/ (August 2021, retrieved August 25, 2023)
Exhibit 1017	Roy Want, Andy Hopper, Veronica Falcão, and Jonathan Gibbons, <i>The Active Badge Location System</i> , ACM Transactions on Information Systems, Vol. 10, No. 1 (January 1992)
Exhibit 1018	Paramvir Bahl and Venkata N. Padmanabhan, <i>RADAR: An In-Building RF-based User Location and Tracking System</i> , Proceedings IEEE INFOCOM 2000. Conference on Computer Communications. Nineteenth Annual Joint Conference of the IEEE Computer and Communications Societies pp. 775-784 (March 2000)
Exhibit 1019	Bob Paddock, <i>A Guide to online information about: Radio Frequency Identification (RFID)</i> ,

	https://web.archive.org/web/20060513161655/http://archive.chipcenter.com/circuitcellar/october00/c1000rp52.htm (August 2001, retrieved September 7, 2023) (“Paddock”)
Exhibit 1020	Gwen Moritz, <i>Larry W. Fullerton: World Class Innovator</i> , Arkansas Business, https://www.arkansasbusiness.com/article/58921/larry-w-fullerton-world-class-innovator (Apr. 15, 2002)
Exhibit 1021	IEEE Standard for Information technology– Local and metropolitan area networks– Specific requirements– Part 15.4: Wireless Medium Access Control (MAC) and Physical Layer (PHY) Specifications for Low-Rate Wireless Personal Area Networks (WPANs): Amendment 1: Add Alternate PHYs, IEEE Std 802.15.4a-2007 (Amendment to IEEE Std 802.15.4-2006) (2007)
Exhibit 1022	Kaveh Pahlavan, Xinrong Li, and Juha-Pekka Mäkelä, <i>Indoor Geolocation Science and Technology</i> , IEEE Communications Magazine (March 2002)
Exhibit 1023	Jeffrey Hightower and Gaetano Borriello, <i>A Survey and Taxonomy of Location Systems for Ubiquitous Computing</i> , Technical Report UW-CSE 01-08-03 (August 2001)
Exhibit 1024	<i>PARC History – A Legacy of Innovation and Inventing the Future</i> , https://www.parc.com/about-parc/parc-history/ (retrieved June 26, 2023)
Exhibit 1025	<i>Touchscreens That Changed the World</i> , https://www.guifx.com/touchscreens-that-changed-the-world/ (retrieved June 26, 2023)
Exhibit 1026	<i>iPhone User’s Guide</i> , Apple Inc. (2007)
Exhibit 1027	<i>Majority of smart phones now have touch screens</i> , https://www.canalys.com/newsroom/majority-smart-phones-now-have-touch-screens 2/7 (February 8, 2010, retrieved October 11, 2023)
Exhibit 1028	Steve Kolokowsky and Trevor Davis, <i>Touchscreens 101: Understanding Touchscreen Technology and Design</i> , Cypress Semiconductor Corp. (June 2009)
Exhibit 1029	U.S. Patent Publication No. 2006/0026521A1 to Hotelling et al.
Exhibit 1030	<i>The History of Bluetooth</i> , The History of Bluetooth - Auris, Inc (theauris.com) Auris, Inc. (retrieved June 26, 2023)
Exhibit 1031	<i>Ericsson T39 User’s Guide First Edition</i> , Ericsson Mobile Communications AB (March 2001)

Exhibit 1032	<i>How does Bluetooth work?</i> , Scientific American https://www.scientificamerican.com/article/experts-how-does-bluetooth-work/#:~:text=Bluetooth%20technology%20uses%20the%20principles,devices%20that%20are%20actively%20inquiring , (November 5, 2007, retrieved September 8, 2023)
Exhibit 1033	IEEE Std. 802.15.1-2005, entitled “IEEE Standard for Information technology—Telecommunications and information exchange between systems—Local and metropolitan area networks—Specific requirements—Part 15.1: Wireless Medium Access Control (MAC) and Physical Layer (PHY) Specifications for Wireless Personal Area Networks (WPANs)”
Exhibit 1034	<i>Specification of the Bluetooth System</i> , Bluetooth Core Specification version 1.2 (November 5, 2003)
Exhibit 1035	Varun Almalu and David Cheng, <i>Bluetooth Triangulator</i> , Department of Computer Science and Engineering, University of California, San Diego, (2006)
Exhibit 1036	Josef Hallberg, Marcus Nilsson, Kåre Synnes, <i>Positioning with Bluetooth</i> , 10 th International Conference on Telecommunications (April 2003)
Exhibit 1037	Julie A. Kientz, Shwetak N. Patel, Arwa Z. Tyebkhan, Brian Gane, Jennifer Wiley, and Gregory D. Abowd, <i>Where’s My Stuff? Design and Evaluation of a Mobile System for Locating Lost Items for the Visually Impaired</i> , Proceedings of the 8 th international ACM SIGACCESS conference on Computers and accessibility (October 2006)
Exhibit 1038	<u>Microsoft Computer Dictionary</u> , Microsoft Press (5th ed. 2002)
Exhibit 1039	Gerard Goggin, <u>Cell Phone Culture</u> , Routledge (2012)
Exhibit 1040	Rakesh Singh Kshetrimayum, <i>An Introduction to UWB Communication Systems</i> , 28 IEEE Potentials 9 (2009)
Exhibit 1041	Wasim Q. Malik and Andreas F. Molisch, <i>Ultrawideband antenna arrays and directional propagation channels</i> , Proc. Europe Conf. Antennas Propagation (2006)
Exhibit 1042	Harry Newton, <u>Newton’s Telecom Dictionary</u> (20th updated and expanded edition ed. 2004)
Exhibit 1043	P. Orsatti, F. Piazza & Q. Huang, <i>A 20-mA-Receive, 55-mA-Transmit, Single-Chip GSM Transceiver in 0.25-/Spl Mu/m CMOS</i> , 34 IEEE Journal of Solid-State Circuits 1869 (1999)
Exhibit 1044	Doug Bedell, <i>Sophisticated cell phones replacing PDAs</i> , The Dallas Morning News, April 13, 2004,

	https://www.recordnet.com/story/business/2004/04/13/sophisticated-cell-phones-replacing-pdas/50709728007/
Exhibit 1045	Frank S. Park, Chinmay Gangakhedkar & Patrick Traynor, <i>Leveraging Cellular Infrastructure to Improve Fraud Prevention</i> , IEEE Annual Computer Security Applications Conference 350 (2009)
Exhibit 1046	Aaron Beach, Mike Gartrell & Richard Han, <i>Solutions to Security and Privacy Issues in Mobile Social Networking</i> , 4 in 2009 International Conference on Computational Science and Engineering 1036 (2009)
Exhibit 1047	Christian Bettstetter, Hans-Jorg Vogel & Jorg Eberspacher, <i>GSM Phase 2+ General Packet Radio Service GPRS: Architecture, Protocols, and Air Interface</i> , 2 IEEE Communications Surveys 2 (1999)
Exhibit 1048	Christian Gehrman, Joakim Persson & Ben Smeets, <u>Bluetooth Security</u> (2004)
Exhibit 1049	Holly S. Vitense, Julie A. Jacko & V. Kathlene Emery, <i>Multimodal Feedback: Establishing a Performance Baseline for Improved Access by Individuals with Visual Impairments</i> , Proceedings of the Fifth International ACM Conference on Assistive Technologies 49 (2002)
Exhibit 1050	Louis Leung, Ran Wei, <i>More than just talk on the move: uses and gratifications of the cellular phone</i> , 77 Journalism and Mass Communication Quarterly 308 (2000)
Exhibit 1051	James Bao-Yen Tsui, <u>Fundamentals of Global Positioning System Receivers A Software Approach</u> , John Wiley & Sons, Inc. (2 nd Ed., 2005)

CERTIFICATION OF WORD COUNT

The undersigned certifies pursuant to 37 C.F.R. §42.24 that the foregoing Petition for *Inter Partes* Review, excluding any table of contents, mandatory notices under 37 C.F.R. §42.8, certificates of service or word count, or appendix of exhibits, contains 14,000 words according to the word-processing program used to prepare this document (Microsoft Word).

Dated: January 19, 2024

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**CERTIFICATE OF SERVICE ON PATENT OWNER
UNDER 37 C.F.R. § 42.105(a)**

Pursuant to 37 C.F.R. §§ 42.6(e) and 42.105(b), the undersigned certifies that on January 19, 2024, a complete and entire copy of this Petition for *Inter Partes* Review and Exhibits were provided via Federal Express to the Patent Owner by serving the correspondence address of record for the '246 Patent:

Garlick & Markison
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Further, a courtesy copy of this Petition for *Inter Partes* Review was sent via email to Patent Owner's litigation counsel:

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