

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLE INC.
Petitioner,

v.

THL HOLDING COMPANY, LLC,
Patent Owner.

U.S. Patent No. 11,265,680 to Howard, et al.

Case No.: IPR2024-00398

PATENT OWNER'S RESPONSE TO PETITION

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Exhibit No.	Description
2001	Patent Owner's Disclaimer of Claims 1-10 and 20-27
2002	Declaration of Dr. Martin J. Feuerstein
2003	Curriculum Vitae of Dr. Martin J. Feuerstein

Patent Owner submits the following Response (“Response”) to the Petition (“Pet.”, Paper 1) for Inter Partes Review regarding claims 1-12 and 15-20 (“Challenged Claims”) of U.S. Patent No. 11,265,680 (“the ’680 Patent”) filed by Apple Inc., (“Apple” or “Petitioner”), and the Board’s Decision on Institution (“DI,” Paper 6).

I. INTRODUCTION

The Petition challenged Claims 1-12 and 15-20 of the ’680 Patent on six grounds. In its Decision on Institution, the Board first analyzed independent claim 10 and determined “Petitioner has demonstrated a reasonable likelihood that it would prevail in its challenge to at least claim 10 as unpatentable based on obviousness over Kalliola, Vauclair, and Kalayjian.” (DI, 43.) With respect to claim 1, however, the Board determined that the proposed combination failed to disclose limitation 1(d)(v), which recites “the pairing signal generated by the graphical user interface.” (DI, 45-47.)

Following the Board’s Decision on Institution, THL disclaimed challenged claims 10-12 and 15-20 pursuant to 35 U.S.C. § 253(a) and 37 C.F.R. § 1.321(a) (Ex. 2001), leaving only challenged claims 1-9 at issue in this IPR. Thus, this Response focuses on the patentability of challenged claims 1-9.

As explained in detail below, the Board was correct in its determination that Vauclair – the only prior art cited for limitation 1(d)(v) – does not disclose or suggest

the “pairing signal generated by the graphical user interface.” For this reason, Petitioner has not demonstrated that claim 1, or dependent claims 2-9, are unpatentable as obvious.

II. OVERVIEW OF THE '680 PATENT

The '680 Patent is titled “Wireless Device and Methods for Use In a Paging Network.” (Ex. 1001.) The '680 Patent describes “a location system for use with a handheld wireless communication device.” (*Id.* at 4:52–54.) The wireless communication device (110) can be “a smart phone, digital book, netbook, personal computer with wireless data communication or other wireless communication device that includes a wireless transceiver for communicating over a long range wireless network . . . and/or a short-range wireless network.” (*Id.* at 4:55–62.) In one example, an adjunct device (100) can be coupled to wireless communication device (110). (*Id.* at 5:31–34.) The adjunct device (100) together with the wireless communication device (110) cooperate to assist a user in wirelessly locating a remotely-located wireless device (120). (*Id.* at 5:34-44.) Figure 1 below illustrates an example adjunct device 100 coupled to a wireless communication device 110 and locating remotely-located wireless device 120.

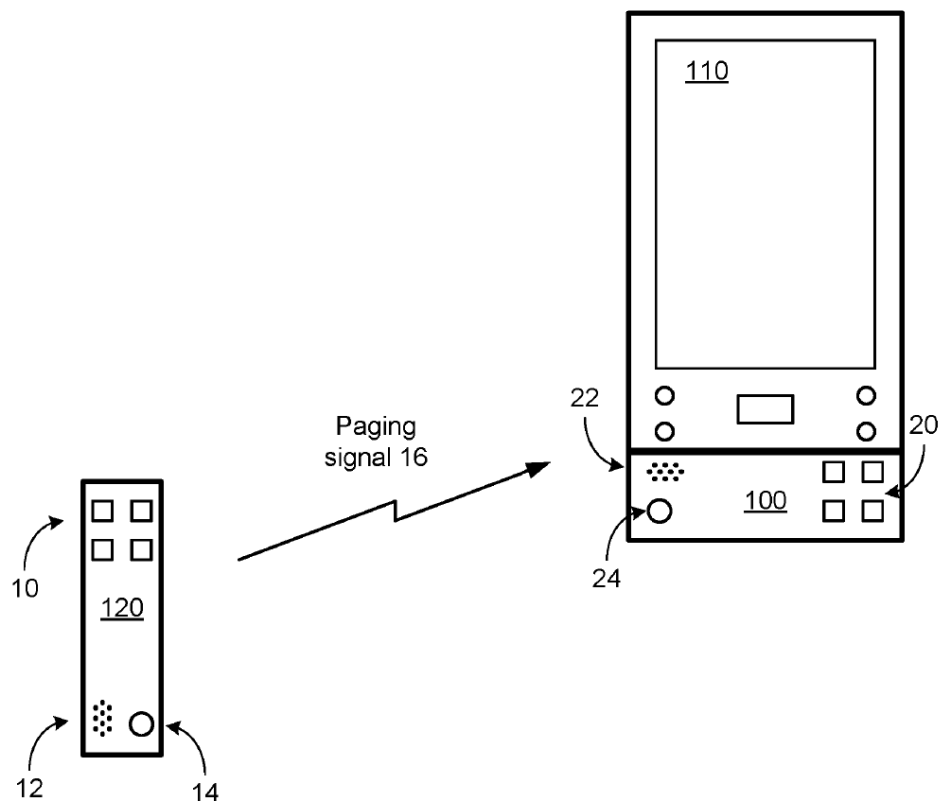


FIG. 1

The '680 Patent describes the adjunct device 100 and the remote wireless device 120 as follows.

Wireless device 120 is shown that includes a user interface that includes push buttons 10, a light emitter 14 such as a light emitting diode (LED) or other emitter, and sound emitter 12 such as a beeper, buzzer, speaker or other audio device. While particular user interface devices are shown, the wireless device can similarly include other devices such as a touch screen or other display screen, a thumb wheel, trackball, and/or other input or output devices. The user interface of the wireless device 120 generates a location request signal in response to an indication from a user by for instance, pushing one of the push buttons 10.

Wireless device 120 further includes a short-range wireless transmitter that transmits an RF paging signal, such as paging signal 16 in response to the location request signal. The short-range wireless transmitter can be part of a transceiver that operates in conjunction with a communication standard such as 802.11, Bluetooth, ZigBee, ultra-wideband, Wimax or other standard short or medium range communication protocol, or other protocol.

Adjunct device 100 includes a housing that is coupleable to the handheld wireless communication device 110 via a communication port of the handheld wireless communication device 110. The adjunct device 100 includes a short-range wireless receiver that receives the RF paging signal, such as paging signal 16. The short-range wireless receiver of adjunct 100 can also be part of a transceiver that operates in conjunction with a communication standard such as 802.11, Bluetooth, ZigBee, ultra-wideband, Wimax or other standard short or medium range communication protocol, or other protocol. In particular, the short-range wireless receiver of adjunct device 100 is configured to receive the paging signal 16 generated by wireless device 120.

Adjunct device includes its own user interface having push buttons 20, sound emitter 22 and light emitter 24 that emit audio and/or visual alert signals in response to the paging signal 16 to assist the user in locating the handheld wireless communication device. As with the user interface of wireless device 120, the user interface of adjunct device 100 can

similarly include other devices such as a touch screen or other display screen, a thumb wheel, trackball, and/or other input or output devices.

(*Id.*, 5:11-53.)

The '680 Patent explains that the features and functions of the wireless communication device 110 and the adjunct device 100 may be integrated into an “enhanced handheld wireless communication device.”

While many of the descriptions of the present invention contained herein focus on functions and features ascribed to an adjunct device operating in conjunction with a handheld wireless communication device, the functions and features of the adjunct device handheld wireless communication device combination can be implemented in an enhanced handheld wireless communication device that includes structure and functionality drawn from an adjunct device, such as adjunct devices 100, 100', 101 and 103. Handheld wireless communication device 300 presents such a device that includes a handheld wireless communication device portion having the standard components of a handheld wireless communication device and an adjunct portion that adds the components necessary to provide the additional functions and features of the adjunct device 100, 100', 101 and 103. In summary, handheld wireless communication device 300 includes the structure and functionality of any of the embodiments of handheld wireless communication device 110 and adjunct device 100, 100', 101 and 103, within a single housing, and without the external connections required to couple adjunct device 100, 100', 101 or 103 to handheld wireless communication device 110.

(*Id.*, 29:59-30:14.)

The '680 Patent explains that the adjunct device 100 and/or the wireless communication device 110 may be paired with one or more remote wireless devices 120. (*Id.*, 15:53-16:3.)

The '680 Patent teaches that the adjunct device may send a “paging signal” to the short-range wireless receiver on the remote wireless device 120, causing the remote device to flash a light or emit a sound to help a user locate the remote device:

[T]he wireless device 120 includes its own short-range wireless receiver that receives a paging signal 112 transmitted by adjunct device 110. In response to the paging signal 112, a light or sound emitter of wireless device 120 emits a detectable alert signal that helps the user locate the personal object. In an embodiment of the present invention, the adjunct device 100 operates in a similar fashion to wireless device 120 to initiate the paging signal 112. In particular, the transmission of paging signal 112 can be initiated by pressing a button or otherwise interacting with the user interface of adjunct 100. In a further embodiment, handheld wireless communication device 100 includes an interactive application that generates application data that is passed to adjunct device 100 via the communication port of the handheld wireless communication device 100. Adjunct device 100 responds to such application data by initiating the transmission of the paging signal 112. In either case, a user of handheld wireless communication device 110 that wishes to locate his or her key 30, or other object coupled to wireless device 120, initiates the paging signal 112. The user can then

locate the wireless device 120 and corresponding object by homing in on the visual and/or audio emissions of the wireless device 120.

(*Id.*, 7:47-8:2.)

The '680 Patent describes multiple approaches for estimating or calculating the distance or direction to the remote wireless device 120. In one embodiment, illustrated in Figures 6 through 8, a directional antenna and signal strength are used to determine the direction from the handheld wireless device 110 to the remote device 120.

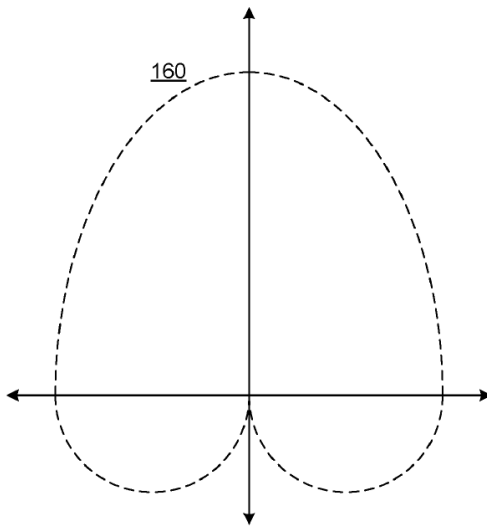


FIG. 7

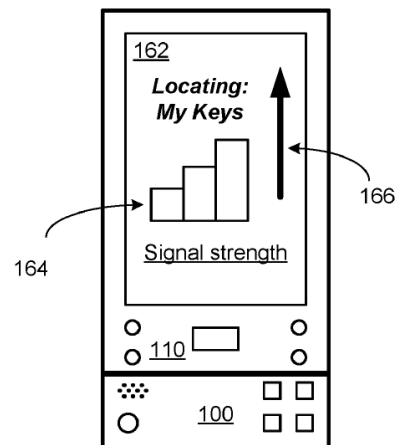


FIG. 8

The '680 Patent explains that, separate from or in addition to signal strength, “time of flight” calculations may be implemented to determine the distance to the remote device.

In an embodiment of the present invention, a time of flight can be used instead of or in addition to signal strength to determine the distance to a remote device. In particular, the time can be measured from the transmission of the paging signal to the reception of the location signal. This time delay (round trip flight time) can indicate the distance to the remote device. The time delay, T_d , can be represented as follows:

$$T_d = T_{f1} + T_{f2} + T_p$$

where, T_p represents the processing time to generate the location signal in response to the paging signal and to recognize the location signal, T_{f1} represents the flight time for the paging signal to travel to the remote device and T_{f2} represents the flight time for the location signal to travel from the remote device to the adjunct device. Considering the processing time T_p to be fixed, the distance to a remote device, D_{ft} , can be approximated based on the following:

$$D_{ft} = C(T_f) = c(T_d - T_p)$$

where c is a proportionality constant that is based on the speed of light in air and $T_f = (T_{f1} + T_{f2})$.

(*Id.*, 34:34-55.)

The '680 Patent also discloses locating the remote wireless device 120 in two and three-dimensional space using signal strength and/or round trip signal delay.

While the foregoing description has focused on location in a two dimensional sense, three-dimensional location can be accomplished in a similar fashion. In particular, directional antennas can be employed in both the x-y and x-z or y-z planes to distinguish z-axis, as well as x and y axis, coordinates. It should be noted that multiple directional antennas can be employed that are arranged orthogonally or non-orthogonally as long as the null directions span either all or substantially all of three dimensional space or a portion of three dimensional space that is of interest. Further more complex antenna designs with three-dimensional antenna patterns can likewise be employed in a similar fashion to determine directionality in three-dimensions. Three dimensional location can be useful, for example, in locating objects on different floors of a building or other structure such as a mine or a ship, determining of a person with a remote device has fallen overboard, as well as other three-dimensional applications. In addition or alternative to providing three dimensional direction finding, multiple antennas can be employed in a diversity receiver that, for example includes two or more receivers. Such configurations can be employed to mitigate the effects of fading, multipath interference and other path losses to provide more stable reception of signals, and more stable measurement of signal strength, round trip signal delay, etc.

(Id., 15:28-52.)

In some embodiments in the '680 Patent, an orientation sensor is implemented to determine the rotation of the handheld wireless device (110) relative to the remote

wireless device (120). With respect to Figure 7, for example, the specification explains:

In an alternative embodiment, the user is instructed to “turn around” to gather 360 degrees of directional data. The signal strength data can be analyzed in conjunction with one or more orientation sensors of the handheld wireless communication device 110, to determine a direction to the wireless device 120. In particular, the location application can determine the particular orientation of the device corresponding to the point where the null of antenna pattern 160 is aligned with the direction to the wireless device 120, and feedback that direction to the user via a directional indicator.

(*Id.*, 11:43-52.)

Figure 15 illustrates a display screen indicating a direction 166' to the remote wireless device. As the user rotates the handheld wireless communication device 110, indication of direction 166' varies based on the updated direction. (*Id.*, 14:47-62.)

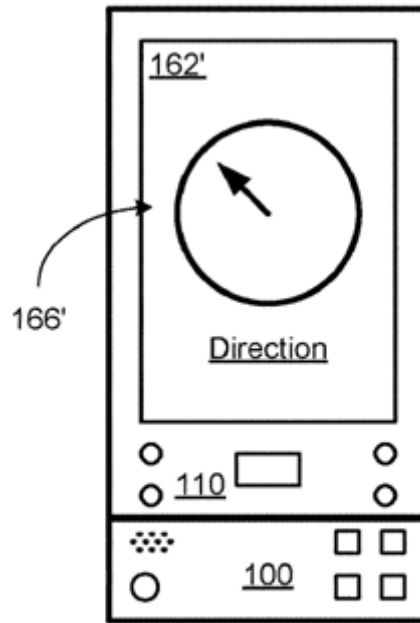


FIG. 15

Claim 1 of the '680 Patent recites the following limitations, each numbered in the manner presented in the Petition:

Claim Designation	Claim Language
Claim 1[P]	A mobile communication device comprising:
Claim 1(a)	a plurality of wireless transceivers;
Claim 1(b)	a memory that stores operational instructions;
Claim 1(c)	a touch screen; and
Claim 1(d)(i)	a processor coupled to the memory and to the touch screen,
Claim 1(d)(ii)	wherein the processor executes the operational instructions that cause the processor to present a graphical user interface via the touch screen and
Claim 1(d)(iii)	wherein the processor operates in association with the graphical user interface to:
Claim 1(d)(iv)	generate a pairing signal in response to a first indication from a user to pair the mobile communication device to at least one remote device,
Claim 1(d)(v)	wherein the at least one of the plurality of wireless transceivers, responds to the pairing signal generated by the graphical user interface by communicating RF signals to pair the mobile communication device to the at least one remote device;
Claim 1(d)(vi)	generate a first location request signal in response to a second indication from the user to locate the at least one remote device,
Claim 1(d)(vii)	wherein at least one of the plurality of wireless transceivers transmits a first RF signal to the at least one remote device in response to the first location request signal; and
Claim 1(d)(viii)	present a display that visually assists the user to determine a location of the at least one remote device,
Claim 1(d)(ix)	wherein at least one of the plurality of wireless transceivers receives a second RF signal from the at least one remote device that facilitates determining the location of the at least one remote device,
Claim 1(d)(x)	wherein the display visually assists the user to determine the location of the at least one remote device via an arrow pointing in a direction to the at least one remote device.

III. LEVEL OF ORDINARY SKILL

The level of ordinary skill in the art for evaluating the '680 Patent and the relevant prior art must be assessed as of its priority date, February 26, 2010. A Person of Ordinary Skill in the Art ("POSITA") is a hypothetical individual who applies the conventional wisdom and technical knowledge available in the field at the time. This concept is key to understanding how the '680 Patent and the prior art would have been interpreted by a person skilled in the technical field of wireless communications during that period.

Several factors are considered when determining the appropriate level of ordinary skill, including the types of problems commonly encountered in the field, prior art solutions to those problems, the pace of technological advancement, the complexity of the technology involved, and the educational and professional background of those working in the field. The level of skill reflects the abilities of someone familiar with wireless technology, particularly in areas such as communication devices, signal processing, and wireless ranging systems.

Petitioner has proposed that a POSITA would have "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" (Pet., 4-5; Ex. 1003, ¶ 35.) Patent Owner agrees that this description reasonably

represents the level of ordinary skill necessary to understand and implement the teachings of the '680 Patent, as well as the prior art cited in this proceeding. (Ex. 2002, ¶ 22.) Therefore, this level of skill is appropriate for assessing the patentability of the claims at issue in this case.

IV. CLAIM CONSTRUCTION

Claim terms are generally interpreted according to their ordinary and customary meaning as understood by a person of ordinary skill in the art (POSITA), considering the claims, the specification, and the prosecution history of the patent. In the parallel district court litigation, Patent Owner proposed specific constructions for terms such as “pairing signal,” as a “[p]rocessor signal to initiate a wireless device pairing sequence[,]” and both the Petitioner and the Board applied this construction in the Petition and Decision on Institution. (Pet., 6; DI, 21-22.) Patent Owner adopts that interpretation in the analysis below. (Ex. 2002, ¶ 48.)

V. THE CHALLENGED CLAIMS ARE NOT OBVIOUS

A. Ground #1: The proposed combination fails to teach limitation [1(d)(v)].

In Ground #1, the Petition asserts that claims 1, 4, 7-8 are obvious over the combination of Kalliola and Vauclair. (Pet., 13-56.) This combination fails to teach or suggest limitation [1(d)(v)], which recites “wherein the at least one of the plurality of wireless transceivers, responds to the *pairing signal generated by the graphical*

user interface by communicating RF signals to pair the mobile communication device to the at least one remote device.” (Emphasis added.) (Ex. 2002, ¶ 50.)

The Petition asserts this limitation is taught by paragraphs 30 and 36 of Vauclair, which reference Figure 1. (Pet., 33-34.) These paragraphs and Figure 1 of Vauclair are reproduced below (with color added):

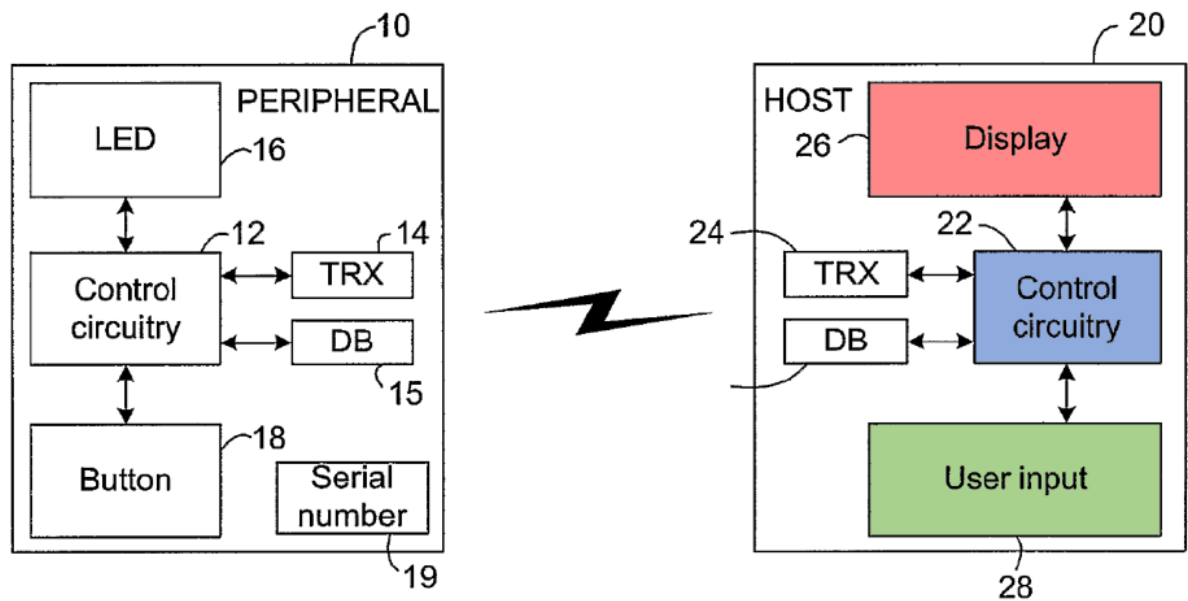


FIG. 1

[0030] Since the second electronic device is much more complex than the first, it is provided with a more complex user interface. In this illustrated example, it is provided with a *display 26*, which operates under the control of the *control circuitry 22*, and can for example display detailed messages, or menu options, to the user. The second electronic device is also provided with *user input 28, which may for example include a keypad, and one or more scroll buttons, allowing*

the user to select from available menu options, to send a signal to the control circuitry 22.

[0036] When the user wishes to establish an ad hoc wireless network between the first and second electronic devices 10, 20, for example in order to be able to transfer data between the two devices, he operates the host device 20 as required in order to control this process.

For example, to initiate the process, the user may select a pairing option from a menu, using the user input 28.

(Ex. 1005, Fig. 1, ¶¶ [0030], [0036].)

This disclosure in Vauclair makes clear that it is the “user input” 28 (e.g., “a keypad, and one or more scroll buttons[]”) that generates the pairing signal in response to user input and “sends [that] signal to the control circuitry 22” for pairing the two devices. (*Id.*, ¶ [0030].) But the “user input” 28 in Vauclair does not include the claimed “graphical” component. Thus, contrary to the claim requirement, “the pairing signal” is **not** “generated by the graphical user interface.” Vauclair explains that the “display” 26 provides graphical *output* to the user. (*Id.*) The display 26 “can for example display detailed messages, or menu options, to the user.” (*Id.*) But it is the “user input” 28, not the “display” 26, through which “the user may select a pairing option;” (*Id.*, ¶ [0036]), and the “user input” 28 “sends [that] signal to the control circuitry 22” for pairing the two devices (*Id.*, ¶ [0030].) Thus, Vauclair fails

to teach limitation [1(d)(v)], which recites a “pairing signal generated by the graphical user interface.” (Ex. 2002, ¶ 52-53.)

For this claim limitation, the Petition cites Dr. Buehrer’s declaration at paragraph 168, which is reproduced below (emphasis in original).

Vauclair also teaches generat[ing] a pairing signal, where the pairing signal [is] generated by the graphical user interface (as recited in Claim 1(d)(v)). As discussed above, Vauclair teaches the user’s selection of the pairing option from the menu via user input 28, thus teaching a first indication...to pair. Vauclair at [0036]. Vauclair further teaches that “user input 28...allow[s] the user **to select from available menu options, to send a signal to the control circuitry.**” *Id.* at [0030] (emphasis added). Therefore, Vauclair teaches generat[ing] a...signal (i.e., the signal sent to the control circuitry responsive to the user selection of a menu option), where the signal [is] generated by the graphical user interface (i.e., the signal is generated at the GUI because the signal is responsive to user selection of the pairing option).

(Ex. 1003, ¶ 168.)

Dr. Buehrer acknowledges that “Vauclair teaches the user’s selection of the pairing option” is “via user input 28” and that the “signal [is] sent to the control circuitry responsive to the user selection of a menu option[.]” (*Id.*) Thus, the signal described in Vauclair is plainly generated by the “user input” 28, not “display” 26, and as explained above, user input 28 is not a “graphical user interface.” Dr. Buehrer is thus conclusory and incorrect when he states at the end of his paragraph

168 (and paragraph 170) that Vauclair discloses the claimed pairing “signal [is] generated by the graphical user interface.” (Ex. 2002, ¶ 55.)

In its Decision on Institution, the Board observed, consistent with THL’s explanation above, that Vauclair fails to disclose limitation [1(d)(v)]:

Our emphasis above underscores that Vauclair discloses that it is “user input 28” that allows the user “to select from available menu options, *to send a signal to the control circuitry 22.*” Ex. 1005 ¶ 30 (emphasis added). It is thus the “user input 28” that “send[s] a signal to the control circuitry 22.” *Id.* While Vauclair discloses that display 26 can present menu options, *id.*, it does not disclose anything more than that it is the action of user input that selects and sends a signal. *See id.* While the Buehrer Declaration states that “the signal [is] generated by the graphical user interface (i.e., the signal is generated at the GUI because the signal is responsive to user selection of the pairing option),” Ex. 1003 ¶ 168 (emphasis added) (alteration in original), we preliminarily find that this testimony is conclusory because there is no explanation as to why the presentation of menu options on the display in Vauclair, with selection by user input, teaches that it is the *graphical user interface that generates the signal*. Instead, as discussed above, Vauclair teaches that it is user input 28 that “send[s] a signal to the control circuitry 22.” Ex. 1005 ¶ 30.

(DI, 46-47, emphasis in original.)

Neither the Petition nor Dr. Buehrer locate claim limitation [1(d)(v)] in any prior art reference other than Vauclair, propose modifying Vauclair or any other

prior art reference to arrive at this claim limitation, or provide a reasoned factual basis explaining why a POSITA would have had a reason to do so.

If, as here, a single element of the claim is absent from the prior art, the claim is not invalid as obvious. *See CFMT, Inc. v. YieldUp Int'l Corp.*, 349 F.3d 1333, 1342, 68 USPQ2d 1940 (Fed. Cir. 2003) (“[O]bviousness requires a suggestion of all limitations in a claim[.]”) (citing *In re Royka*, 490 F.2d 981, 985, 180 USPQ 580 (CCPA 1974)); *In re Rijckaert*, 9 F.3d 1531, 1534, 28 USPQ2d 1955 (Fed. Cir. 1993) (reversing obviousness rejection where prior art did not teach or suggest all claim limitations). Since the Supreme Court’s decision in *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398 (2007), the Federal Circuit has reiterated that all claim elements of an invention at issue must be found to exist in the prior art references before proceeding with an obviousness analysis. *See Abbott Laboratories v. Sandoz, Inc.*, 544 F.3d 1341, 1351, 89 USPQ2d 1161 (Fed. Cir. 2008). And Petitioner is not permitted to introduce a new obviousness rationale in its reply to this Patent Owner's Response. *See* 37 C.F.R. § 42.23(b); *Yita LLC v. MacNeil IP LLC*, 69 F.4th 1356, 1365-66 (Fed. Cir. 2023), cert. denied, 144 S. Ct. 499, 217 L. Ed. 2d 261 (2023).

Because the proposed combination in Ground #1 fails to teach or suggest claim limitation [1(d)(v)], the Petition has failed to demonstrate that claim 1, and dependent claims 4, 7-8, are invalid as obvious.

B. Grounds #2, #3 and #5 fail to demonstrate that the challenged claims are obvious.

Grounds #2, #3 and #5 address challenged dependent claims 2-3, 5-6 and 9. In those grounds, the Petition does not further address limitation [1(d)(v)]. Thus, for the same reasons that claim 1 is not obvious over the proposed combination of Ground #1, dependent claims 2-9 are nonobvious for at least their dependence from claim 1. (Ex. 2002, ¶ 57.)

VI. CONCLUSION

For the reasons outlined above, the Petition and its supporting materials fail to demonstrate that the challenged claims 1-9 of the '680 Patent are invalid as obvious to a POSITA at the time of the invention. The prior art cited by Petitioner fails to teach or suggest all limitations of those claims. Accordingly, Patent Owner respectfully requests that the Board find claims 1-9 patentable.

Dated: October 31, 2024

Respectfully submitted,

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Certificate of Service

The undersigned hereby certifies that on October 31, 2024 a complete and entire copy of PATENT OWNER'S RESPONSE TO PETITION, was served via electronic mail to the attorneys listed below:

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Certificate of Compliance Pursuant to 37 C.F.R. § 42.24

This paper complies with the type-volume limitation of 37 C.F.R. § 42.24. The paper contains 3,746 words, excluding the parts of the paper exempted by §42.24(a).

This paper also complies with the typeface requirements of 37 C.F.R. § 42.6(a)(ii) and the type style requirements of § 42.6(a)(iii)&(iv).

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