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UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA
SAN FRANCISCO DIVISION

HAPTIC, INC., Plaintiff, v. APPLE INC. Defendant.	Case No. 3:24-cv-02296-JSC **DEFENDANT APPLE INC.'S DISCLOSURE OF INVALIDITY CONTENTIONS**

Defendant Apple Inc. ("Apple") provides the following disclosure of Invalidity Contentions to Plaintiff Haptic, Inc. ("Haptic" or "Plaintiff") regarding U.S. Patent No. 9,996,738 (the "'738 patent," the "Patent-in-Suit," or the "Asserted Patent").

These invalidity contentions are made only as to the claims of the Patent-in-Suit that Plaintiff has identified in its Infringement Contentions served on May 30, 2024:

HAPTIC EX2026

Patent	Asserted Claims[1]	Haptic's Alleged Priority Date
'738 patent	**1**-2, 4-5, and 9	Feb. 13, 2015

Apple reserves the right to supplement these invalidity contentions at least per the parties' agreement and/or to the extent Plaintiff is allowed to change its Asserted Claims.

These invalidity contentions are being made before claim construction. The parties have only recently started general discovery and document production, and no party depositions have been noticed or taken. Accordingly, Apple reserves the right to supplement and amend these contentions to the extent additional information becomes available during discovery. Apple has served third-party discovery on companies and/or individuals that it is informed and believes have relevant prior art. Apple will also be taking third-party discovery from the individuals named as inventors on Plaintiff's patent filings and associated companies. Apple may also serve additional third-party discovery in the future including, but not limited to, based on discovery received from Plaintiff, the named inventors of the Asserted Patent, and/or the above-referenced third parties. Apple reserves the right to supplement and/or amend its invalidity contentions to include new prior art discovered from Plaintiff, from the named inventors, from these third-party sources, or other sources.

I. RESERVATIONS

A. General Reservation of Right

The information provided shall not be deemed an admission regarding the scope of any claims or the proper construction of those claims or any claim terms. In certain instances, Apple has applied the claims to the prior art in view of Plaintiff's allegations, admissions, or positions for purposes of these invalidity contentions only, to the extent Apple can discern Plaintiff's allegations. As of the date of service, Plaintiff's infringement contentions remain deficient, as explained in correspondence from Apple's counsel on July 11, 2024. The deficiencies include,

[1] The independent claim is bolded and underlined.

but are not limited to: lack of any infringement theory provided by Plaintiff with respect to all accused products; failure to identify the accused instrumentalities with specificity; failure to identify Plaintiff's infringement allegations under the doctrine of equivalents[2]; failure to identify any alleged direct infringer for Plaintiff's contributory infringement allegations; lack of citation to show that the pictured products and components are unmodified; lack of support regarding Plaintiff's alleged priority dates, etc. These deficiencies have prejudiced, and continue to prejudice, Apple's ability to prepare its defenses, including Apple's ability to prepare its invalidity contentions. This disclosure of invalidity contentions is not intended to be, and is not, an admission that any Asserted Claim is infringed by any of Apple's products, that any particular feature or aspect of any of the accused products practices any limitations of the Asserted Claims, or that any of the constructions implicit in Plaintiff's Infringement Contentions is reasonable, supportable, or proper. Rather, in some instances, Apple's application of the claims to the prior art is intended to apply Plaintiff's apparent interpretation of the claims.

B. Plaintiff's Infringement Contentions Served on May 30, 2024

Plaintiff's Infringement Contentions are deficient in numerous respects, as explained in Apple's deficiency letter served on July 11, 2024. Apple reserves the right to supplement or amend these Invalidity Contentions in view of Plaintiff's response, if any. Because Plaintiff's response to such deficiencies may lead to further grounds for invalidity, Apple specifically reserves the right to modify, amend, or supplement its contentions as Plaintiff modifies, amends, or supplements its disclosures and/or produces documents in discovery.

[2] Plaintiff has presented no substantive contentions of any alleged infringement under the doctrine of equivalents in its Infringement Contentions served on May 30, 2024. At most, Plaintiff has provided boilerplate reservations of rights, and made general references to the doctrine of equivalents, which is insufficient to preserve an infringement theory under the doctrine of equivalents. As a result, Plaintiff has waived any doctrine of equivalents theory. If Plaintiff is permitted to provide any information relating to infringement under the doctrine of equivalents, Apple may amend and supplement these invalidity contentions as appropriate.

C. The Intrinsic Record

Apple reserves the right to rely on applicable industry standards and prior art cited in the file histories of the Patent-in-Suit and any related U.S. and foreign patent applications as invalidating references or to show the state of the art. Apple further reserves the right to rely on the patent applicant's admissions concerning the scope of the prior art relevant to the Patent-in-Suit found in, *inter alia*: the patent prosecution history for the Patent-in-Suit and any related patents and/or parent applications or reexaminations (or *inter partes* review or post-grant review proceedings); any deposition testimony of the named inventor or inventors whose names were removed during prosecution of the Patent-in-Suit; any deposition testimony or other admissions by Plaintiff; and the papers filed and any evidence submitted by Plaintiff in connection with this or any related litigation or proceeding.

D. Rebuttal Evidence

Prior art not included in these invalidity contentions, whether known or not known to Apple, may become relevant. In particular, Apple is currently unaware of the extent, if any, to which Plaintiff will contend that limitations of the Asserted Claims of the Patent-in-Suit are not disclosed in the prior art identified herein or otherwise contend the Patent-in-Suit are not invalid. To the extent that such an issue arises, Apple reserves the right to identify other references that would render obvious the allegedly missing limitation(s) or the disclosed device or method, or otherwise rebut Plaintiff's argument(s).

E. Contextual Evidence

Apple's claim charts cite particular teachings and disclosures of the prior art as applied to the limitations of each of the Asserted Claims. However, persons having ordinary skill in the art generally may view an item of prior art in the context of his or her experience and training, other publications, literature, products, and understandings. Moreover, common sense may be employed as part of the obviousness analysis. As such, Apple may rely on the uncited portions of the prior art references and on other publications, expert testimony, and common sense as aids in understanding and interpreting the cited portions, as providing context thereto, and as additional

evidence that the prior art discloses a claim limitation or the claimed subject matter as a whole. Apple further reserves the right to rely on uncited portions of the prior art references, other publications, and testimony, including expert testimony, to establish bases for combinations of certain cited references that render the Asserted Claims obvious. The references discussed in the claim charts may disclose the elements of the Asserted Claims explicitly and/or inherently, and/or they may be relied upon to show the state of the art in the relevant time frame. The suggested obviousness combinations are provided in the alternative to anticipation contentions and are not to be construed as suggesting that any reference included in the combinations is not by itself anticipatory.

II. OVERVIEW OF THE TECHNOLOGY

The basic concepts, teachings, and techniques utilized by the control systems described in the Asserted Patent were well-known at the time of the claimed invention. For example, the Asserted Patent describes:

> A control system [that] includes a housing engaged to a mounting surface, a sensor contained within the housing, a server in communication with the sensor, and a terminal device in communication with the server. A gesture by a user associated with the mounting surface controls activity of the terminal device, such as a knock on a wall lowering a thermostat. The control system enables a mounting surface independent from the terminal device to become a controller for the terminal device. The sensor forms an interactive zone, and a contact interaction with the mounting surface within the interactive zone is detected by the sensor as data signals. The server receives the data signals, determines a data pattern corresponding to the data signals, and matches the data pattern with a gesture profile. The gesture profile is associated with a command transmitted to the terminal device to control activity of the terminal device.

'738 patent at Abstract. However, each of these components and functions was well known in the prior art.

A. Sensors

The Asserted Patent describes the use of a sensor 30 (including a sensor unit (accelerometer) 35) that forms an interactive zone 32 and detects a contact interaction 60 (e.g., a knock on a tabletop). *See, e.g.*, '738 patent at Fig. 3, 5.

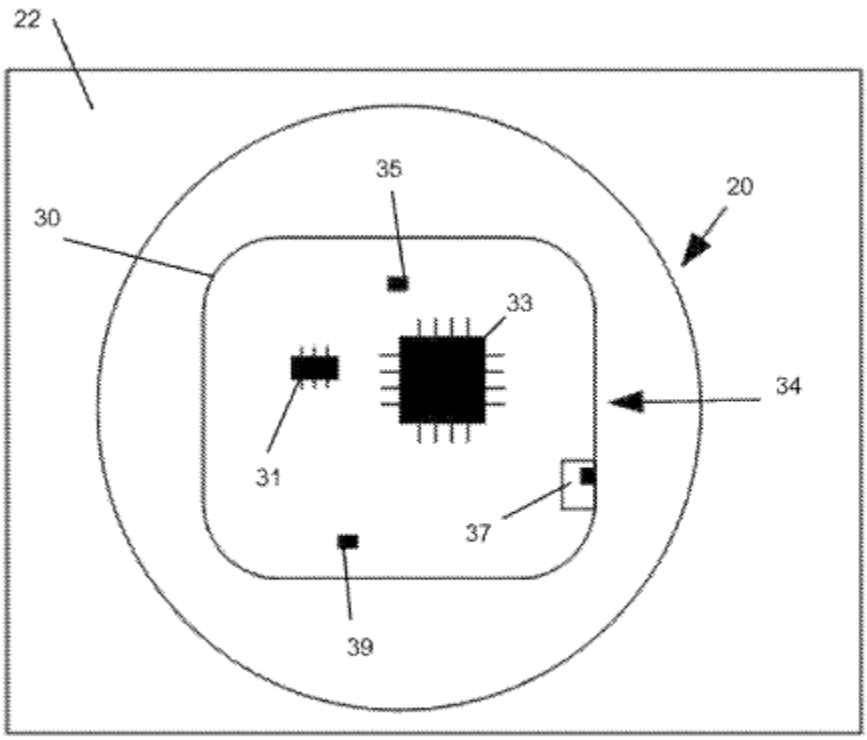


FIG. 3

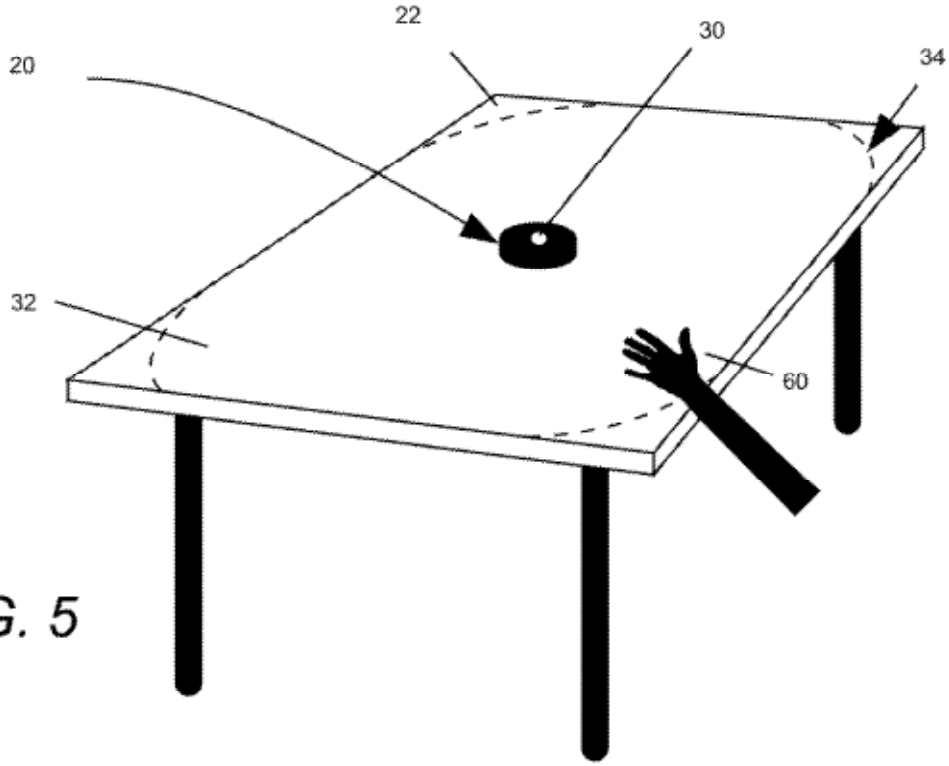
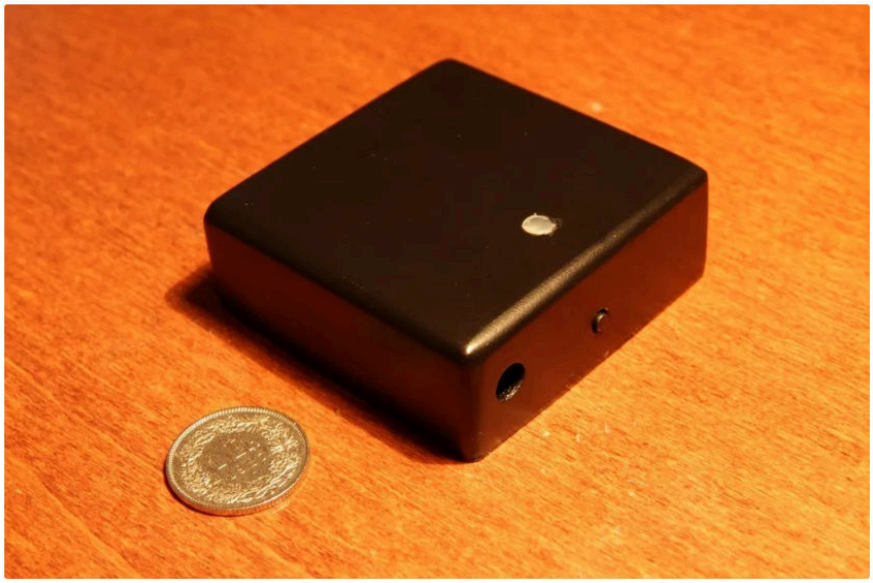


FIG. 5

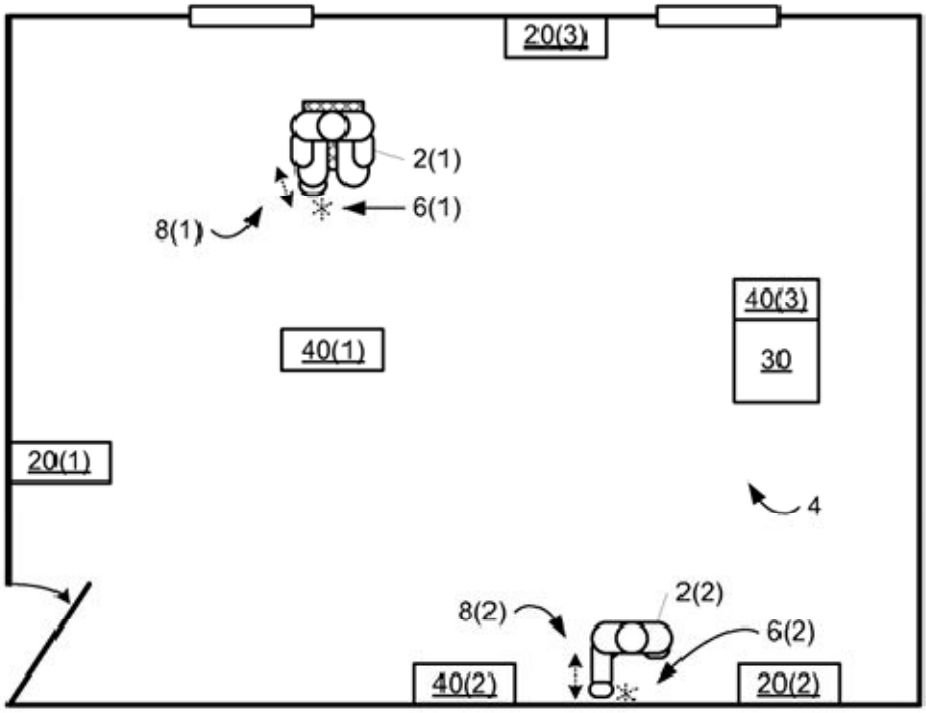
The use of sensors, including accelerometers, for this purpose was well-known in the prior art. For example, the toktoktok system discloses a device that includes a sensor to detect vibrations on a surface (e.g., a wall or a table).

Hack A Day: Reinventing The Clapper with a knock-based home automation controller (web.archive.org/web/20120312150152/https:/hackaday.com/tag/knock/) ("Clap On!... Clap Off!... was super awesome when The Clapper came out in the mid-eighties. Now [Mathieu Stephan] is trying to make the concept much more functional. He put together a controller that lets you knoch on walls to control things around the house. It's called the Toktoktok project and uses small boxes to receive user input and control items like lamps and computers.").



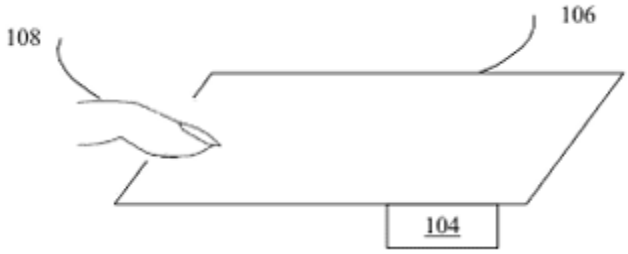
Indiegogo: The toktoktok box (www.indiegogo.com/projects/the-toktoktok-box#/) ("Indiegogo") (showing a toktoktok box, which includes a housing and a sensor).

Additional examples are disclosed in Bess, Murakoshi, Yeo, and Newton:

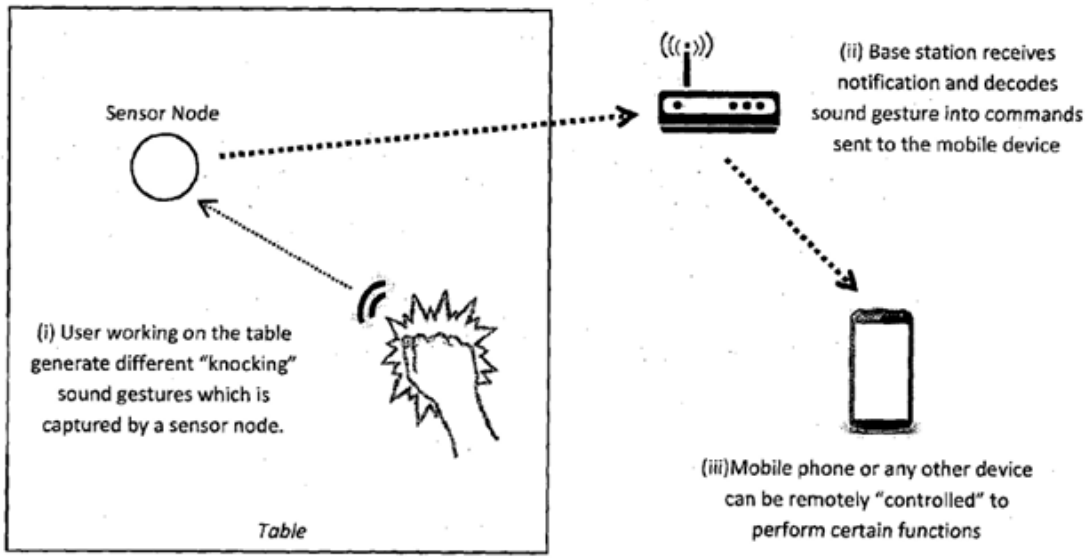


Bess at Fig. 1; *see also id*. at Abstract ("A system includes at least three accelerometers disposed in different locations of an area with a surface to capture respective vibration data corresponding

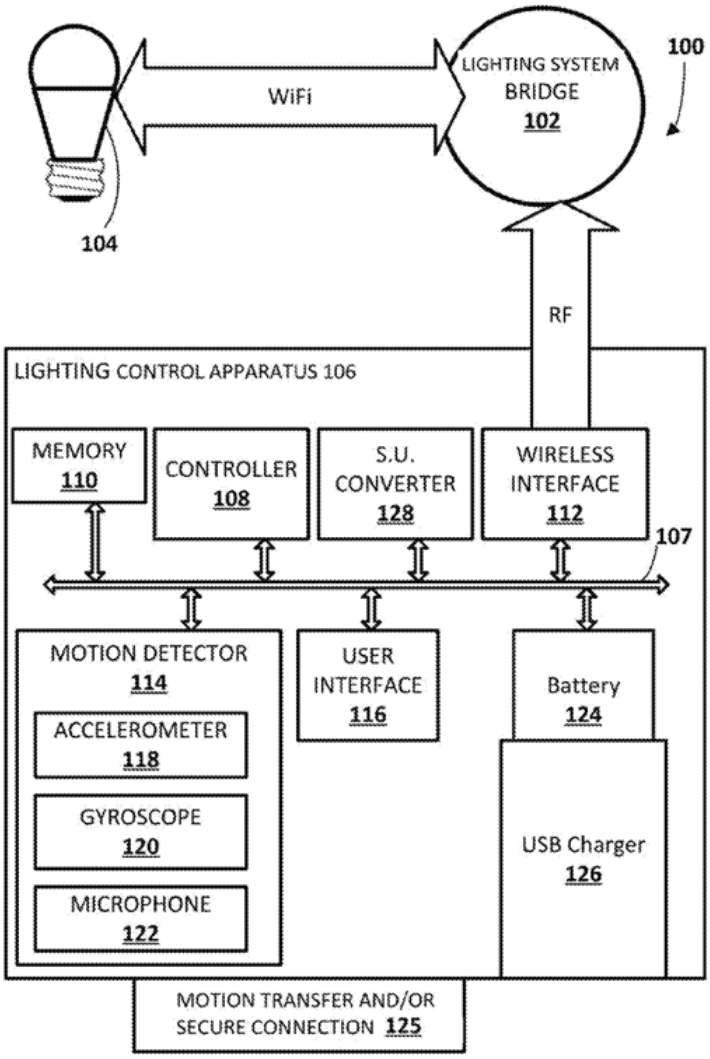
to a command tapped onto the surface by a user and a processing system to receive the vibration data from each accelerometer, identify the command and a location of the user from the vibration data, and generate a control signal based on the command and the location.”).



Murakoshi at Fig. 1 (disclosing an apparatus 104 that includes one or more sensors, such as sensor 206 (a 3-axis gyroscope (i.e., accelerometer)) operable to determine acceleration that corresponds to vibrations produced in the vibratory surface 106), [0037].

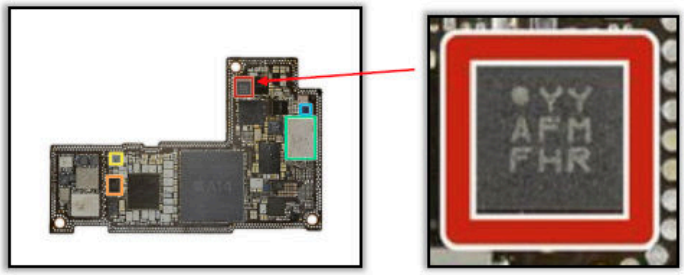


Yeo at Fig. 18; *see also id*. at 3:16-17 (“FIG. 18 is a schematic drawing of application as an input device for interacting with digital devices.”), 9:60-67 (“The in-built sensing capabilities of each sensor node enables it to be used an alternate input device that remaps its input measurements to inputs for other devices. For example, FIG. 18 shows cancelling a call without having to take the phone out by tapping on the pocket/hand carrier; augmenting a desktop space such that tapping/scratching on a physical table becomes an interaction mode to desktop computer.”).

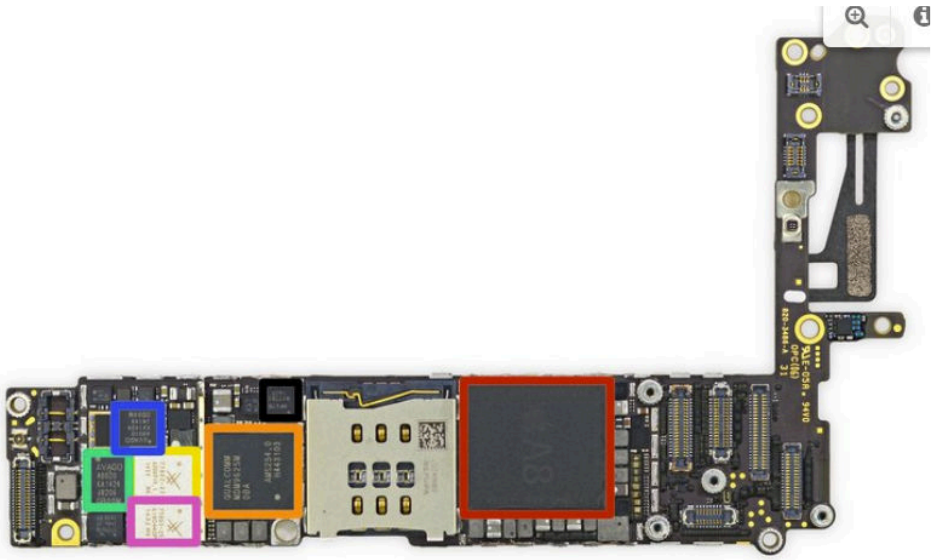


Newton at Fig. 1, Abstract ("A lighting control apparatus (106) may include an accelerometer (118), a wireless communication interface (112), and a secure connection (125) for securing the lighting control apparatus to a surface. The secure connection may be configured to transfer motion imparted on the surface to the accelerometer. A controller (108) may be coupled with the accelerometer and the wireless communication interface. The controller may be configured to: receive, from the accelerometer, a signal representative of motion sensed by the accelerometer; determine, based on the signal from the accelerometer, that the sensed motion satisfies a motion criterion; and transmit, over the wireless communication interface to a lighting unit (104) or a lighting system bridge (102), data configured to cause one or more lighting units to emit light having one or more selected properties."); *see also* Johnson; Khaira; Pryor; Krum; Yun.

Furthermore, under Plaintiff's apparent theory of infringement, the accelerometer in a mobile phone can be the claimed sensor. Infringement Contentions, Ex. A.

[1.3] a "sensor" contained within said housing,	Each Accused Product has "a sensor contained within said housing." The "sensor" comprises at least the accelerometer contained within the logic board assembly and/or any other sensors. In the iPhone 12 Pro Max, the sensor includes at least the component referred to as "IMU" and/or "U7300" and/or "BMI282AA." The image below shows the sensor contained within the logic board assembly:  *Source*: iFixit, iPhone 12 Pro Max Teardown, https://www.ifixit.com/Teardown/iPhone+12+Pro+Max+Teardown/138640.

However, numerous prior art mobile phones included accelerometers that performed the same function. For example, the iPhone 6 (as well as every prior model of iPhone) includes an accelerometer for detecting, among other things, impacts on the outside surface of the phone.



- InvenSense MP67B 6-axis Gyroscope and Accelerometer Combo

iFixit at Step 15; *see also* iPhone 4; Samsung Galaxy III; LG G2; Nokia Phones.

B. Housing engaged to a mounting surface

In the Asserted Patent, the sensor (accelerometer) is contained within a housing 20 and the housing is engaged to a mounting surface 22 that receives the contact interaction. *See, e.g.*, '738 patent at Figs. 3-4.

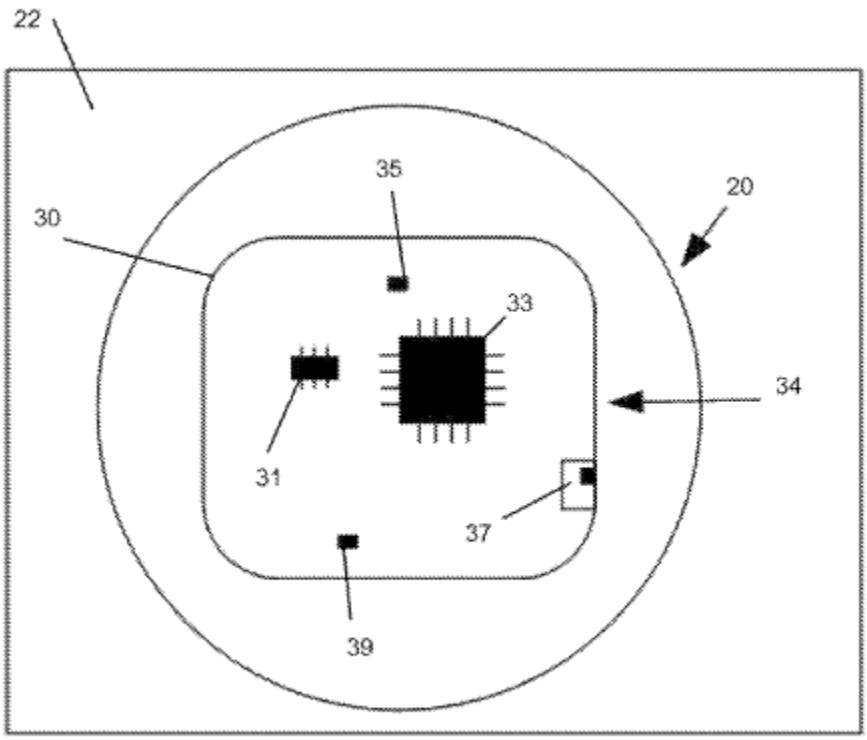


FIG. 3

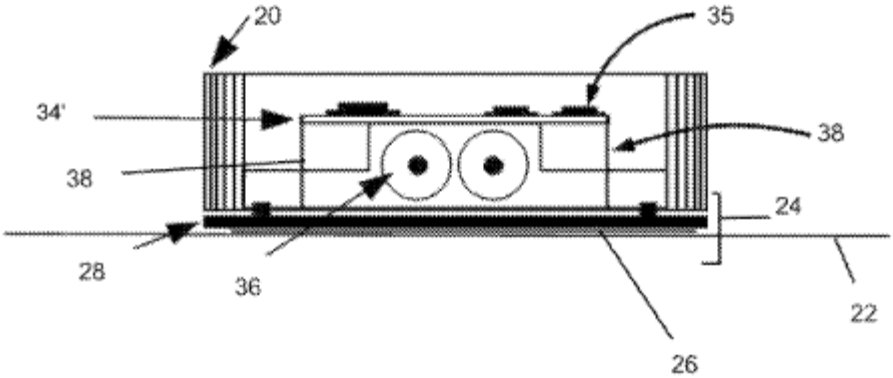
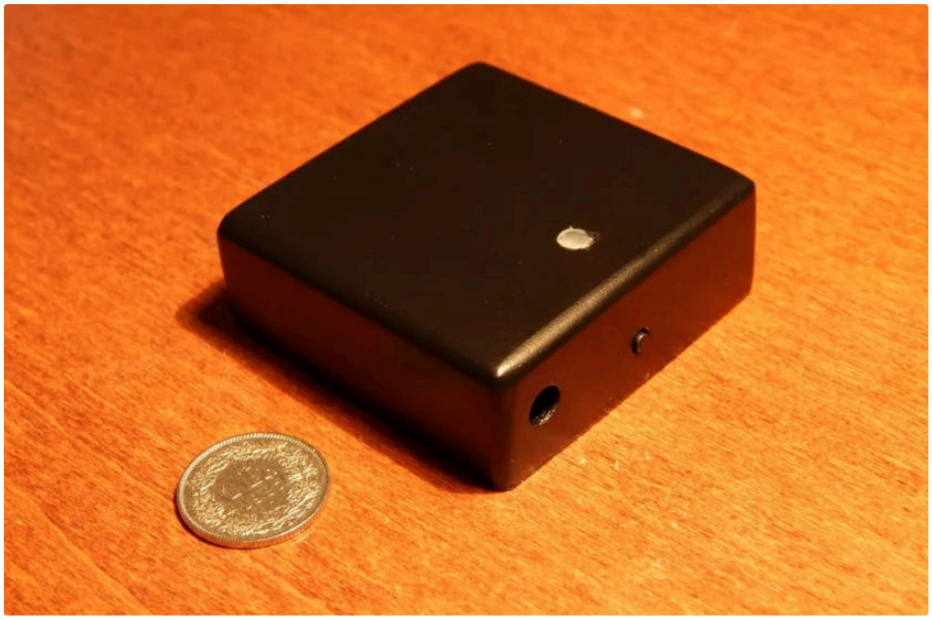


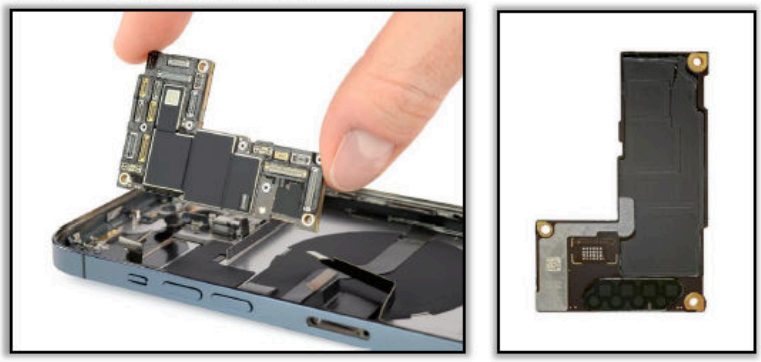
FIG. 4

This arrangement was well-known in the prior art. For example, the toktoktok system includes a housing engaged to mounting surface.

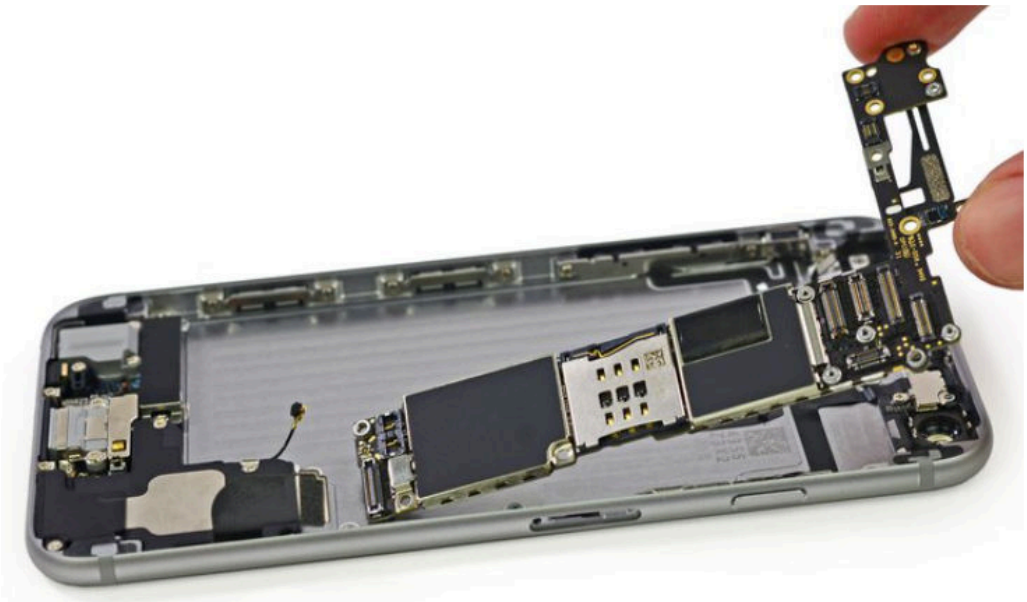


Indiegogo (showing the housing of the toktoktok system and a mounting surface); *see also* Bess at Fig. 1, Abstract ("A system includes at least three accelerometers disposed in different locations of an area with a surface to capture respective vibration data corresponding to a command tapped onto the surface by a user and a processing system to receive the vibration data from each accelerometer, identify the command and a location of the user from the vibration data, and generate a control signal based on the command and the location.").; Murakoshi at Fig. 1 (disclosing an apparatus 104 with housing engaged to a vibratory surface 106); Stewart at Fig. 1, 5:9-37; Newton at Abstract ("A lighting control apparatus (106) may include an accelerometer (118), a wireless communication interface (112), and a secure connection (125) for securing the lighting control apparatus to a surface. The secure connection may be configured to transfer motion imparted on the surface to the accelerometer."), 9:50-56 ("Secure connection and motion transfer component 125 may include but are not limited to various adhesives (e.g., activated by removing tape), hook and loop fasteners (e.g., Velcro), double sided foam tape (e.g., with removable tape to activate), suction cup(s), one or more magnets, one or more screws or a clips, and so forth."); Marks at Figs. 1, 6, [0040] ("As shown in FIG. 6, the remote transmitter 22 is attachable by means of an adhesive surface 27.").

Furthermore, under Plaintiff's apparent theory of infringement, the printed circuit board ("PCB") assembly of a smartphone inside the smartphone's exterior shell is a housing engaged to a mounting surface. Infringement Contentions, Ex. A.

[1.2.a] a "housing"	The "housing" comprises the logic board assembly that contains the sensor, any components of the logic board assembly (including at least the printed circuit board (PCB), the system on a chip (SoC), and other chips mounted on the logic board assembly), and any materials covering the logic board assembly. The images below show the housing of the exemplar iPhone 12 Pro Max:  *Source*: iFixit, iPhone 12 Pro Max Teardown, https://www.ifixit.com/Teardown/iPhone+12+Pro+Max+Teardown/138640

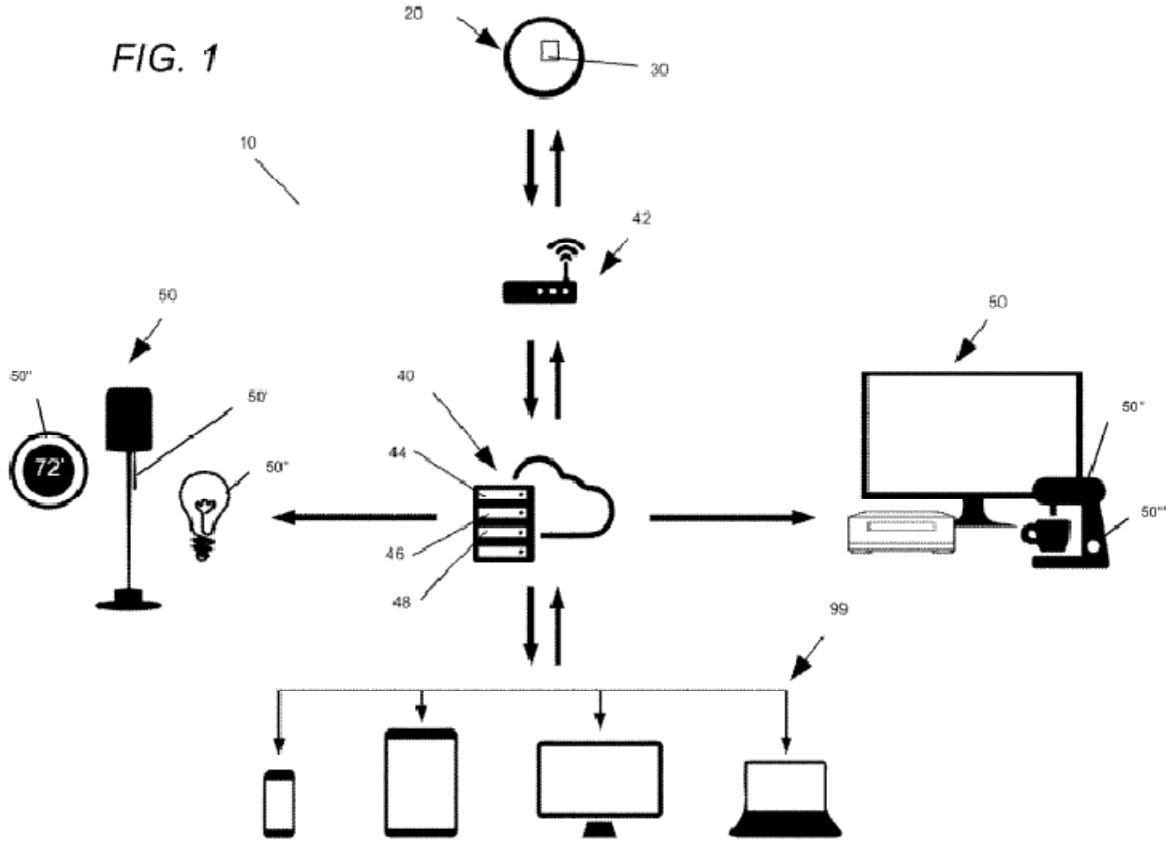
However, this was a standard feature of smartphones sold before 2015. For example, the iPhone 6 (as well as every prior model of iPhone) includes a logic board assembly that contains the sensor.



iFixit at Step 14; *see also* iPhone 4; Samsung Galaxy III; LG G2; Nokia Phones.

C. Server

The Asserted Patent describes "a server in communication with the sensor." '738 patent at Abstract. The server 40 comprises a routing module 44, a processing module 46, and an output module 48. *See, e.g., id.* at Fig. 1.



Such servers were well-known in the prior art. For example, Orr discloses "a server system 110." Orr at [0027].

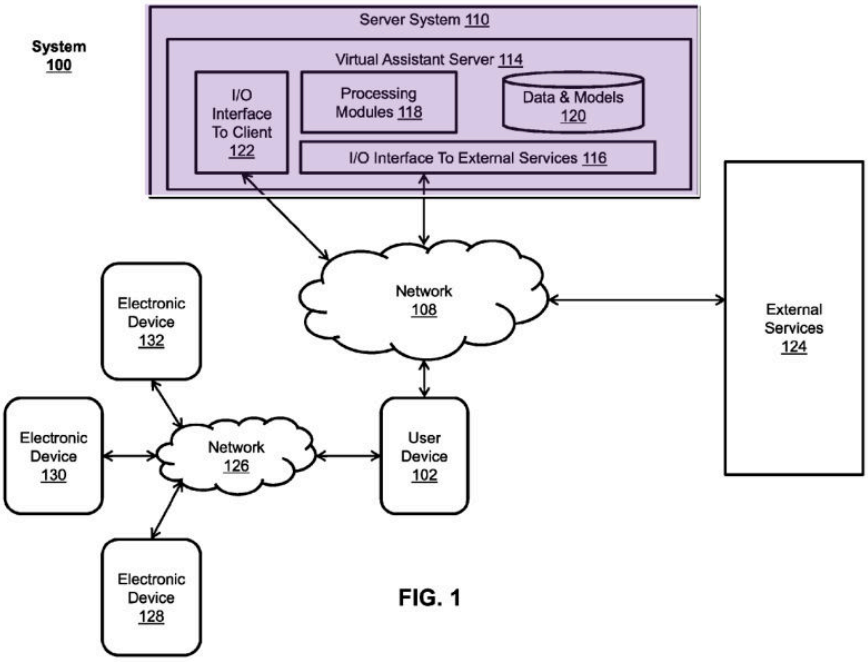
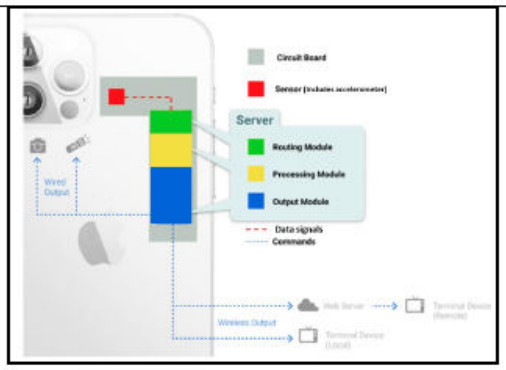


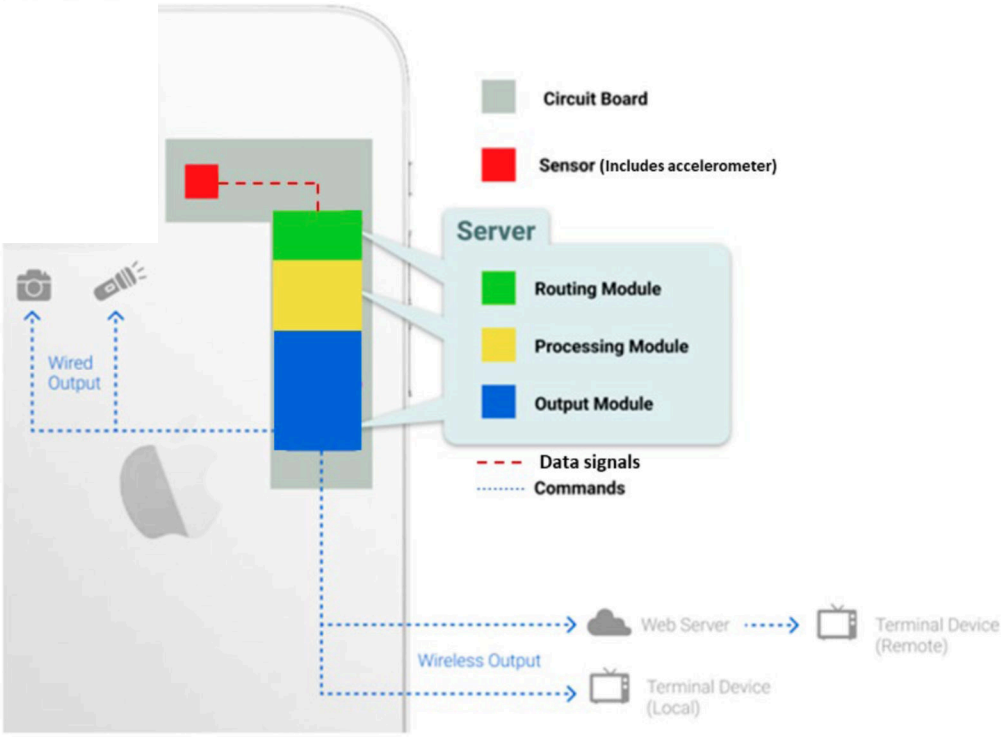
FIG. 1

Id. at Fig. 1 (annotated). As shown above, the server includes an I/O interface 122, a processing module 118, and a I/O interface 116. *Id*.; *see also* Sharp KK at Abstract (similar). Similarly, the Bump app used a server for gesture recognition. *See, e.g*., https://www.zdnet.com/home-and-office/networking/eight-burning-questions-for-bump-co-founder-jake-mintz/ ("When two phones bump, software on the phone sends up a variety of sensor data to an algorithm running on the Bump servers -- data like the location of the phone, the accelerometer readings, the IP address, etc."); *see also* Johnson at 29:9-16 ("Therefore, every component forms part of the cloud which comprises servers, applications and clients as defined above. The cloud can be in communication with the intelligent door lock system 10, the vibration tapping sensing device of the mobile device 210, and the like."); Avrahami at [0050] ("Example data includes web pages, text messages, images, sound files, video data, classifier training data or other data sets to be sent to and/or received from one or more network servers or other devices by the device 600 via one or more wired or wireless networks, or for use by the device 600."); Bess at [0041] (confirming the "processing device may be … a server").

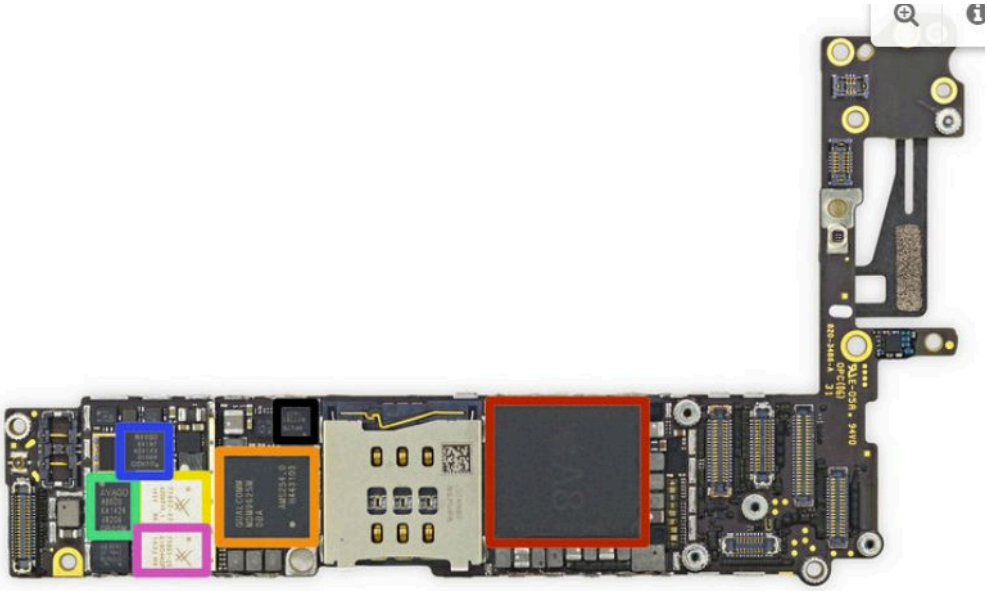
Furthermore, under Plaintiff's apparent theory of infringement, a server is merely the combination of a smartphone's processor, circuitry connecting the processor to the accelerometer, and circuitry connecting the processor to a terminal device. Infringement Contentions, Ex. A.

[1.10] a server in communication with said sensor,	Each Accused Product contains "a server in communication with said sensor." As discussed in greater detail below, the sensor is in communication with other components on the logic board assembly, one or more of which comprises a server. The connection between the server and the sensor can be wireless or wired, and may also include a router, Wi-Fi, Bluetooth, or a local area network. The following simplified block diagram shows an exemplary configuration of a server in the Accused Products:
	

However, this was a standard feature of smartphones sold before 2015. For example, the iPhone 6 (as well as every prior model of iPhone) includes these components.



iFixit at Step 11.

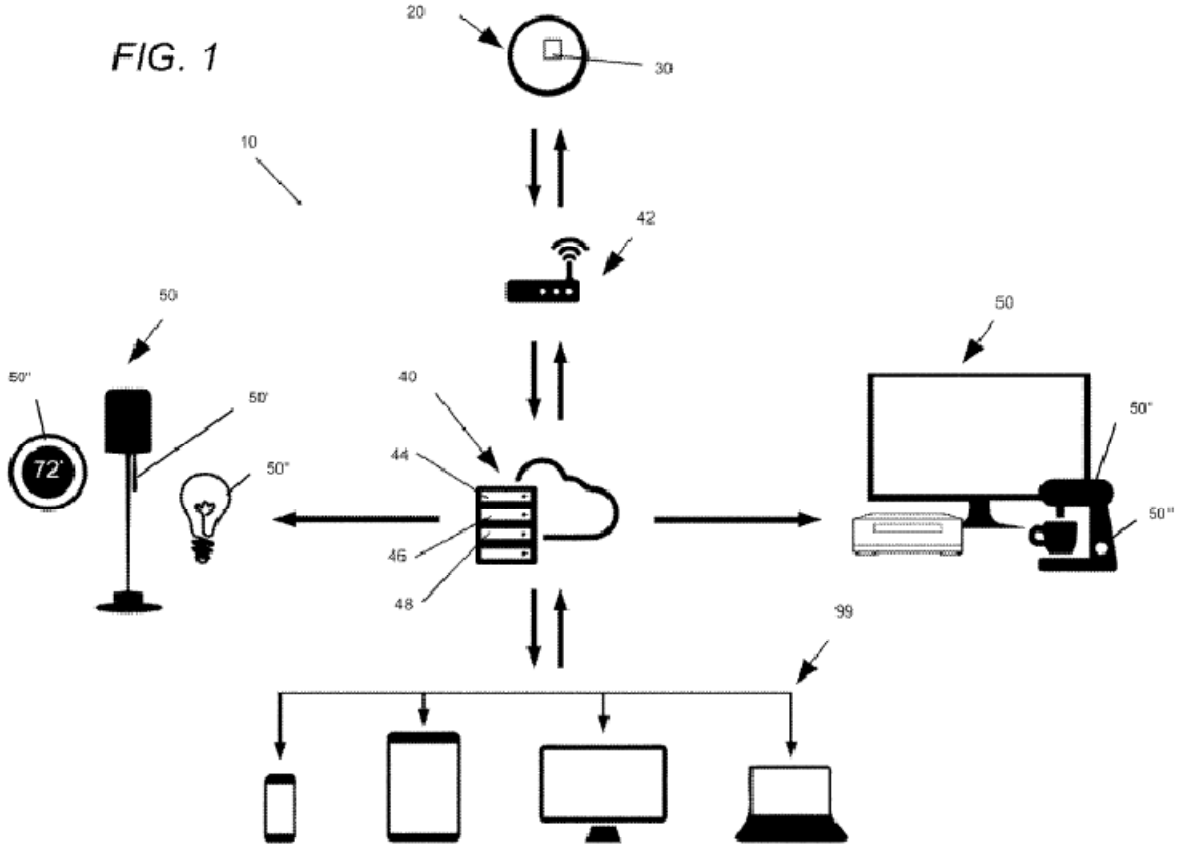


iFixit at Step 15; *see also* iPhone 4; Samsung Galaxy III; LG G2; Nokia Phones.

D. Terminal device

The Asserted Patent further describes a terminal device that includes a receiving module and a switch. In the specification, "the terminal device 50 can be an appliance, such as a television, stereo or coffee machine with a switch 50'''. Alternatively, the terminal device 50 may be a device

running software, a light with a switch 50' or climate regulator, such as a thermostat, fan or lighting fixture." '738 patent at 9:65-10:4, Fig. 1.



Such terminal devices were well-known in the prior art. For example, the totktoktok system includes an electronic device (e.g., a lamp) plugged into a switching socket and a computer with an RF receiver.

So who is it made for and how can you use it?

Toktoktok is made for **everyone**, as it is so simple to implement.
But more specifically, it is particularly suited for **persons having a low-mobility**.
Currently, the toktoktok system is composed of toktoktok boxes, lamp/power switching sockets and RF receivers for computers.
Therefore, it will allow you to:
- **add additional switches** in convenient places
- **not spend 10 minutes** looking for the light switch, especially if you are in the dark
- **switch off all electronic devices** when leaving the house
- **control your computer music player** from anywhere
- **quickly turn off your computer** (not the hard way): this is for people (like me) that like watching films from their beds....
- **simplify your life...**

Indiegogo. Additional examples are disclosed in Bess, Murakoshi, Yeo, and Newton:

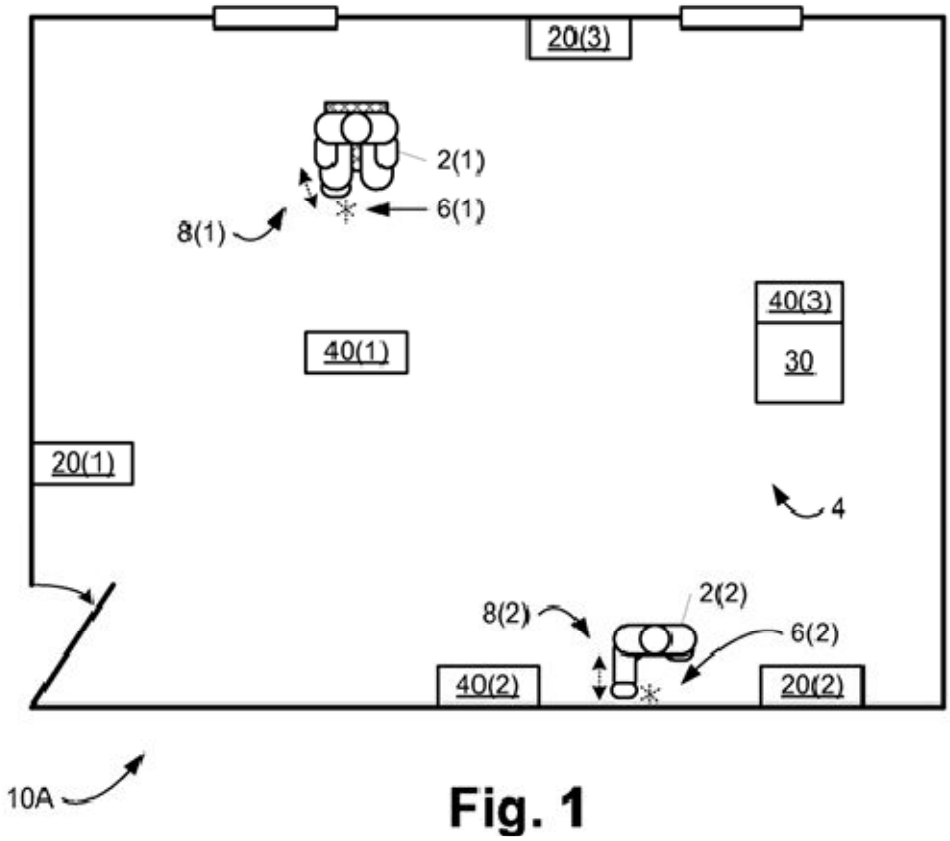
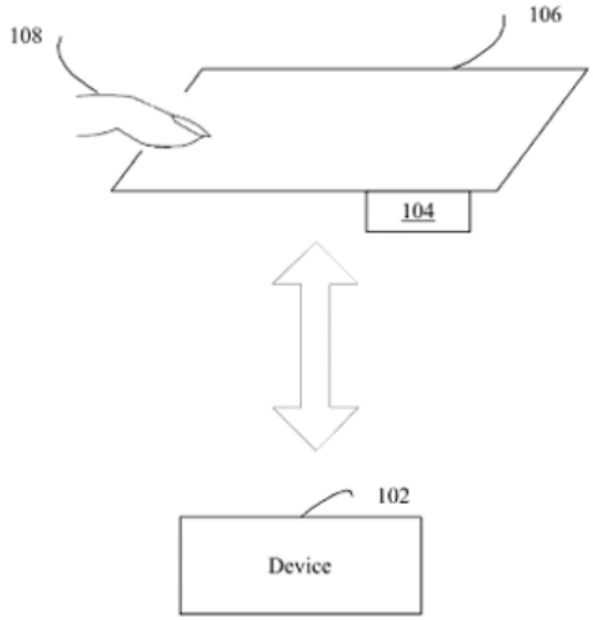
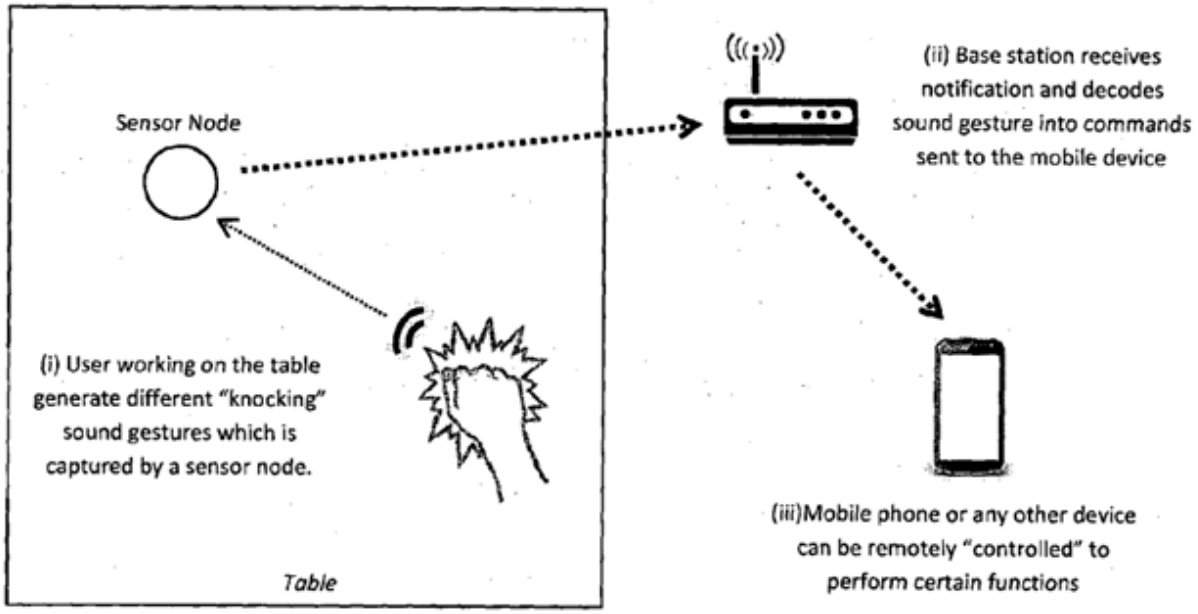


Fig. 1

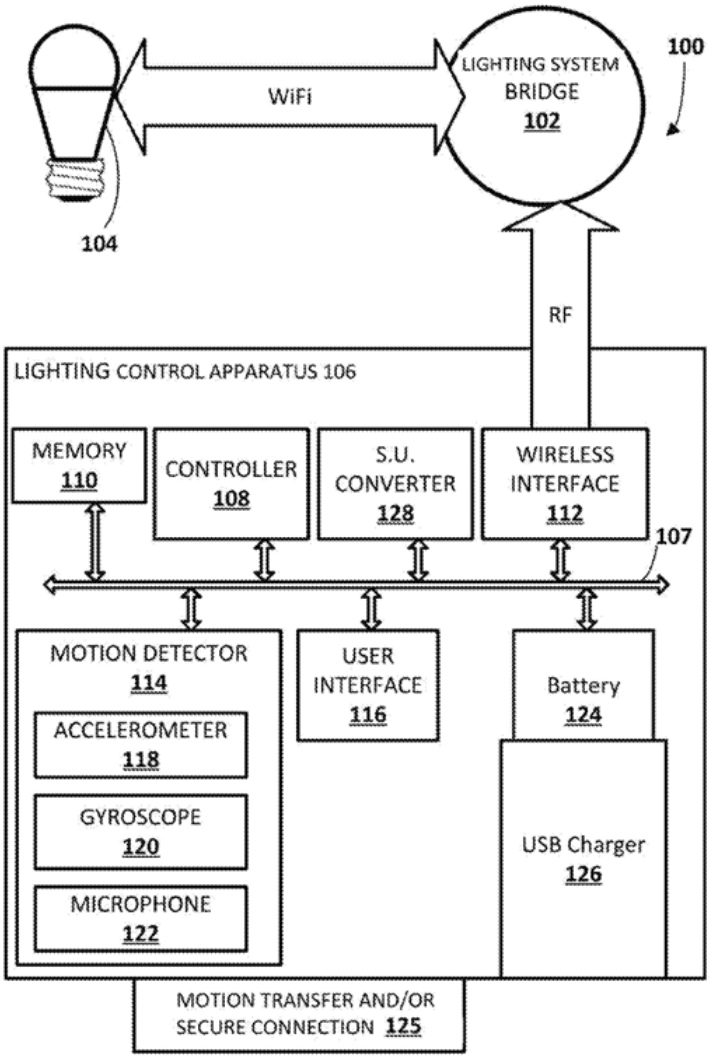
Bess at Fig. 1; *see also id*. at Abstract ("A system includes at least three accelerometers disposed in different locations of an area with a surface to capture respective vibration data corresponding to a command tapped onto the surface by a user and a processing system to receive the vibration data from each accelerometer, identify the command and a location of the user from the vibration data, and generate a control signal based on the command and the location."), [0009] ("Accordingly, the system described herein may be used to turn on lights, adjust the temperature, or notify authorities that someone has fallen and cannot get up, cannot reach a nurse call button, or is blocked from reaching a location, for example.").



Murakoshi at Fig. 1, Murakoshi at [0017] (disclosing that "device 102 may correspond to a machine that may be operated by a user" such as "mobile phones, laptops, tablet computers, televisions, Personal Digital Assistant (PDA) devices, vehicles, home appliances, media playing devices, and/or any other device operable by a user"); *see also id*. at [0064] (describing a lamp), [0084] (same).

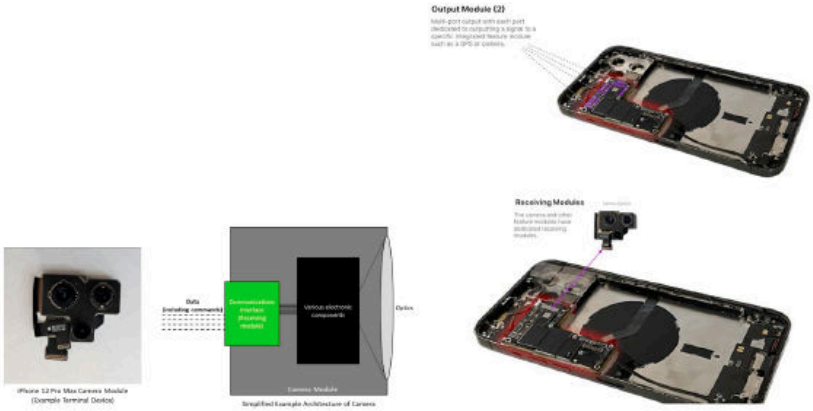


Yeo at Fig. 18 (illustrating control of a mobile phone).

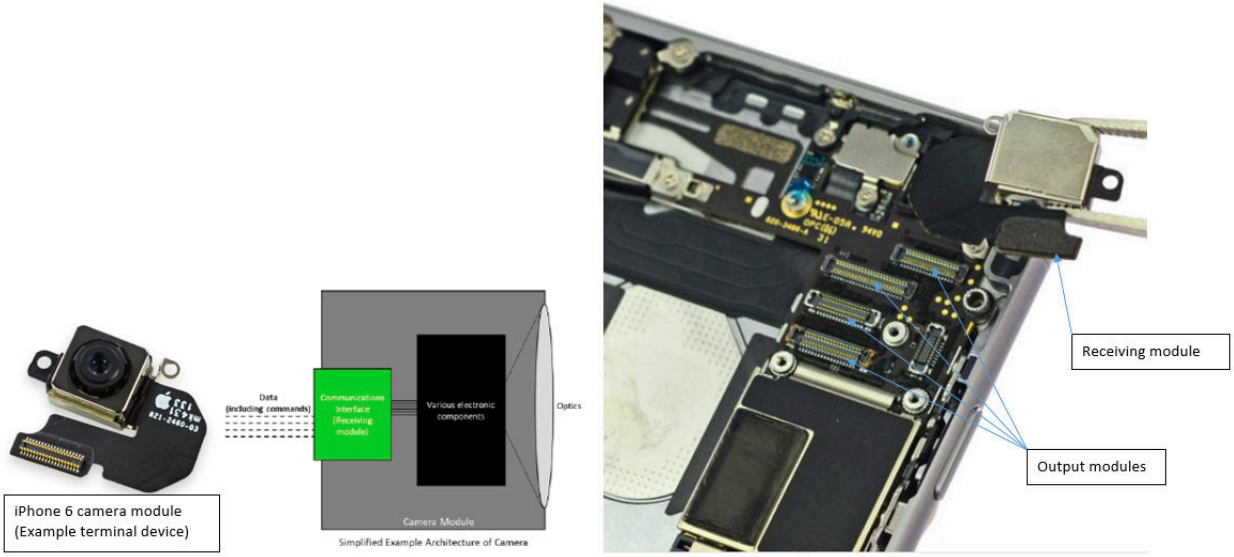


Newton at Fig. 1 (showing a smart light); *see also* Johnson; Khaira; Pryor; Krum; Yun.

Furthermore, under Plaintiff's apparent theory of infringement, components of a smartphone (e.g., the camera, flashlight, speaker, etc.) can be terminal devices. Infringement Contentions, Ex. A.

[1.14] a terminal device being comprised of a receiving module and	Each Accused Product contains and/or interacts with a "terminal device being comprised of a receiving module." More than one terminal device can be connected to the server, and the control system can also be used with multiple terminal devices. In each of the Accused Products, gestures can be associated with independent terminal devices internal to the iPhone and/or independent terminal devices external to the iPhone. Examples of terminal devices comprised of a receiving module internal to the iPhone include at least the iPhone's camera, flashlight, speaker, lock controls, audio player, volume up, volume down, smartphone GUI (Lock Screen command), mute control, the screen, and other internal iPhone functions. These internal terminal devices contain receiving modules and have associated integrated electronics to receive commands from the output module. The image below illustrates one example of an internal terminal device and its corresponding receiving module: 

However, these were standard features of smartphones sold before 2015. For example, the iPhone 6 (as well as every prior model of iPhone) included similar components.

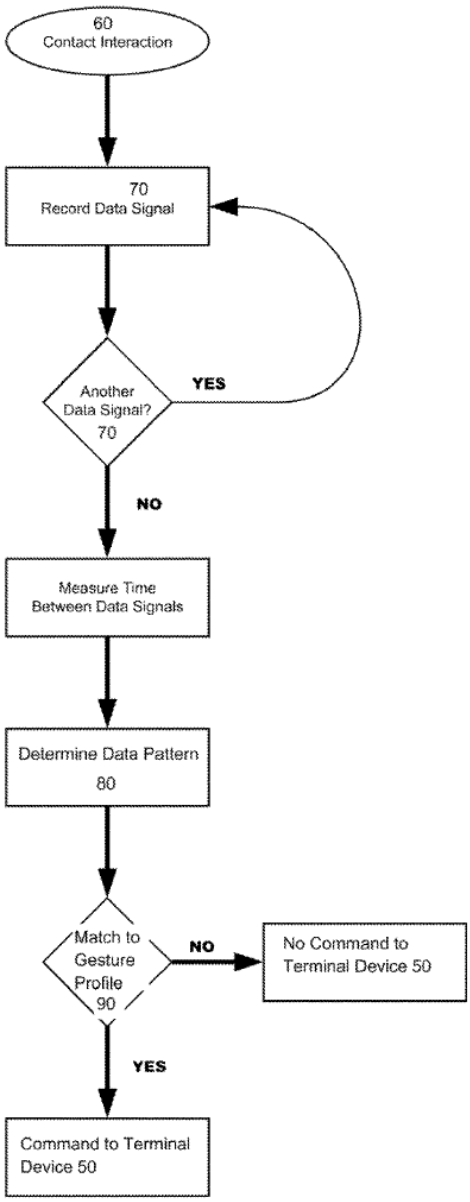


iFixit at Step 13 (annotated); *see also* iPhone 4; Samsung Galaxy III; LG G2; Nokia Phones.

E. Gesture recognition/control

The Asserted Patent further describes determining a data pattern corresponding to the data signals received from the sensor, matching the data pattern with a gesture profile, and associating the gesture profile with a control command. *See, e.g.*, '738 patent at Fig. 2.

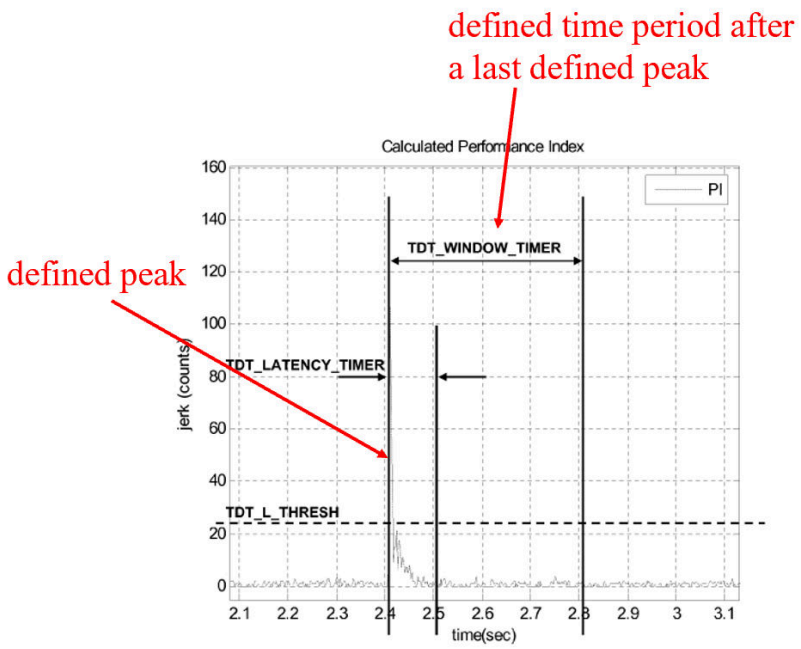
FIG. 2



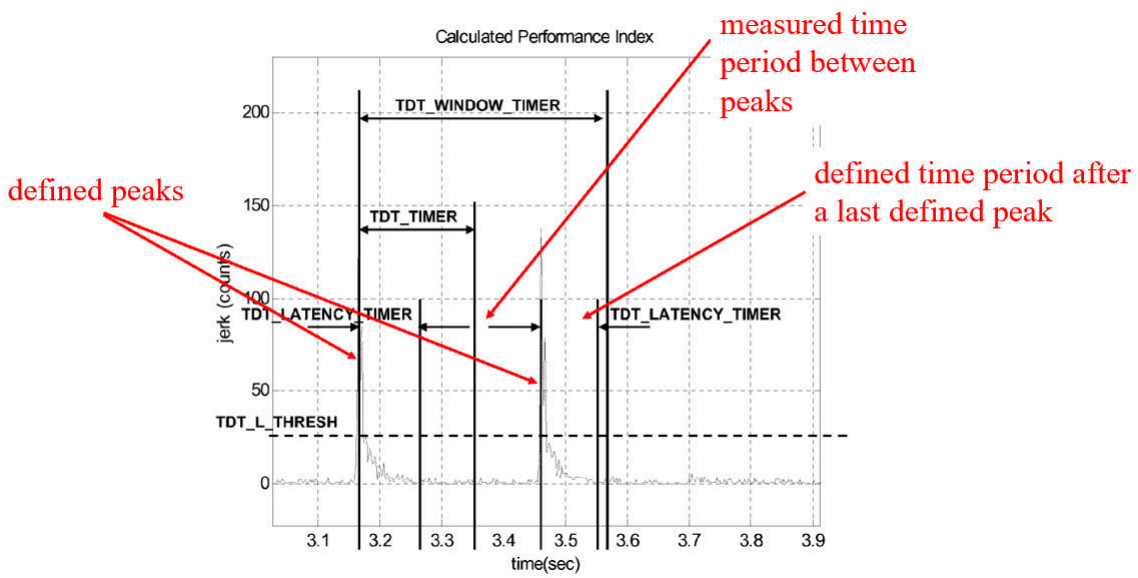
This functionality was well-known in the prior art. For example, Sachs discloses a motion gesture detection system in which "[m]otion gesture(s) are recognized from the motion data from a set of motion gestures available for recognition in the active operating mode." Sachs at Abstract, Fig. 9. Sachs describes that in the system, motion data is sensed, and the motion data is analyzed

to recognize the motion gestures captured by the data. *Id*. at Fig. 9. Sachs further describes that "gesture recognition allows a user to easily select particular device functions by simply moving, shaking, or tapping the device [and p]rior gesture recognition for motion sensing devices typically consists of examining raw sensor data such as data from gyroscopes or accelerometers, and either hard-coding patterns to look for in this raw data, or using machine learning techniques… to learn patterns from this data." *Id*. at [0009]. And Sachs describes that the motion data associated with a user gesture is examined to detect a particular gesture (contact interaction) and that it is known to use patterns (data patterns) of the motion data (data signals) to match the user motion to an associated gesture (gesture profile) and command. *Id*. at [0009]-[0010], [0015], [0101]. Relatedly, Sachs describes that a flexible recognition of gestures can use the timing between different features in the gesture motion data (a measured time period between each defined peak). *Id*. at [0079] ("the timing between different features in motion data can be expressed and detected based on multiples and/or fractions of a basic time period used in that gesture… [t]he basic time period can be, for example, the time between two data features.").

Similarly, Kim discloses that "[t]he shock of [a] tap is transmitted through the body of the device to the accelerometer when tapping occurs [and t]he peak rises to a maximum[.]" Kim at [0011], [0013], [0031], [0041]. Further, Kim describes that "a latency timer sets the time period that a tap event will only be characterized as a single tap [such that a] second tap has to occur outside of the latency timer [and if] a second tap occurs inside the latency time, it will be ignored as it occurred too quickly." *Id*. at [0037].



Id. at Fig. 4 (annotated).



Id. at Fig. 5 (annotated).

Tap detection was also a feature of off-the-shelf accelerometers such as the Bosch sensor included in the iPhone 6. *See, e.g.*, Bosch datasheets.

14 BIT, DIGITAL, TRIAXIAL ACCELERATION SENSOR WITH INTELLIGENT ON-CHIP MOTION-TRIGGERED INTERRUPT CONTROLLER

Key features

• Ultra-Small package	LGA package (12 pins), footprint 2mm x 2mm, height 0.95mm
• Digital interface	SPI (4-wire, 3-wire), I²C, 2 interrupt pins V_{DDIO} voltage range: 1.2V to 3.6V
• Programmable functionality	Acceleration ranges ±2g/±4g/±8g/±16g Low-pass filter bandwidths 500Hz - <8Hz up to an max. output data read out of 2kHz (unfiltered)
• On-chip FIFO	Integrated FIFO with a depth of 32 frames
• On-chip interrupt controller	Motion-triggered interrupt-signal generation for - new data - any-motion (slope) detection - tap sensing (single tap / double tap) - orientation recognition

BMA280 Spec at 2, 31-33.

4.7.6 Tap sensing

Tap sensing has a functional similarity with a common laptop touch-pad or clicking keys of a computer mouse. A tap event is detected if a pre-defined slope of the acceleration of at least one axis is exceeded. Two different tap events are distinguished: A 'single tap' is a single event within a certain time, followed by a certain quiet time. A 'double tap' consists of a first such event followed by a second event within a defined time frame.

Single tap interrupt is enabled (disabled) by writing ´1´ (´0´) to bit *(0x16) s_tap_en*. Double tap interrupt is enabled (disabled) by writing ´1´ (´0´) to bit *(0x16) d_tap_en*.
While temporary latching is used do not simultaneously enable single tap interrupt and double tap interrupt.

The status of the single tap interrupt is stored in bit *(0x09) s_tap_int*, the status of the double tap interrupt is stored in bit *(0x09) d_tap_int*.

The slope threshold for detecting a tap event is set by bits *(0x2B) tap_th*. The meaning of *(0x2B) tap_th* depends on the range setting. 1 LSB of *(0x2B) tap_th* corresponds to a slope of 62.5mg in 2g-range, 125mg in 4g-range, 250mg in 8g-range, and 500mg in 16g-range.

In figure 8 the meaning of the different timing parameters is visualized:

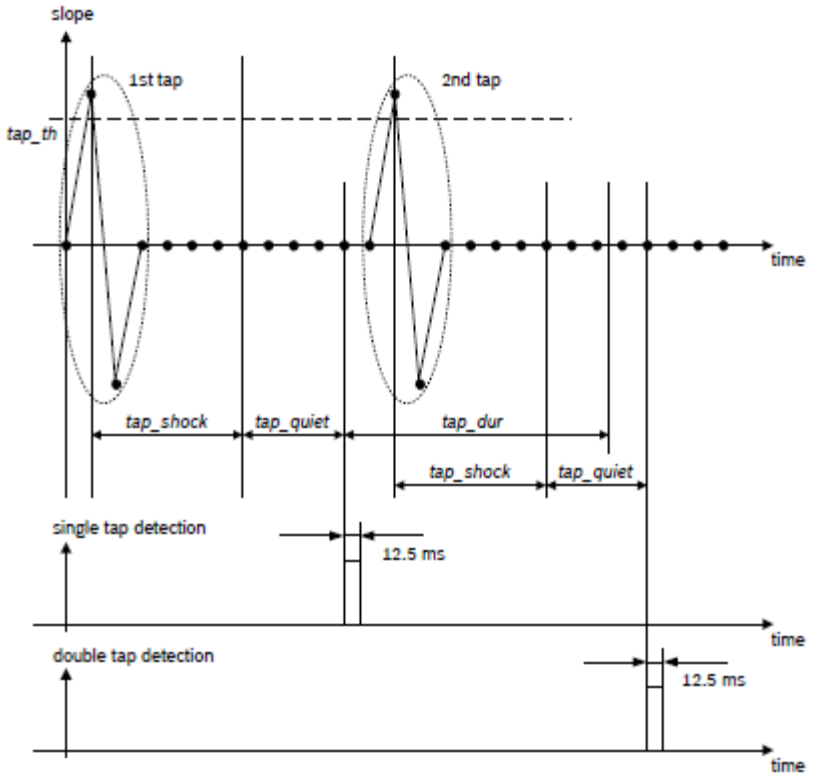


Figure 8: Timing of tap detection

Id. at 31-33; *see also* NXP Semiconductor Inc. (formerly Freescale Semiconductor) MMA8450Q data sheets (disclosing built-in tap detection); Tuck (same); Analog Devices ADXL345 data sheets (same); TDK MPU-6000 data sheets (same); https://www.eetimes.com/theres-more-to-mems-than-meets-the-iphone/ ("The STMicroelectronics accelerometer used in the iPhone supplies analog acceleration values for all three directions, covering a range of ±2 g's. That makes it suitable not only for sensing orientation but also for applications that Apple could add at any time. … Besides intelligent power management, there are about a dozen other applications of consumer devices that make full use of a MEMS accelerometer's capabilities, according to Freescale Semiconductor Inc. (Austin, Texas), whose three-axis accelerometers have the built-in ability to recognize single and double taps. … 'The accelerometer can recognize any type of motion, and different motion patterns can trigger different menu functions,' said Michelle Kelsey, inertial sensor products marketing manager at Freescale[.]").

Not surprisingly, numerous systems used tap detection for device control. *See, e.g.*, Murokoshi; Bess; toktoktok; BeyondTouch (including related publications); TouchAnywhere; InvenSense MotionProcessing™ Technology Demo; Hudson (Whack gestures); Knock to Unlock iPhone app; Knock Knock iPhone app; Samsung Galaxy III; Nokia Phones; LG G2; Kunal Naik's Knock Knock system.

III. PRIORITY DATE

Plaintiff's Infringement Contentions allege that "[t]he priority date of the Asserted Patent is February 13, 2015." Infringement Contentions, Cover at 7.

Plaintiff bears the burden to prove it is entitled to a priority date earlier than February 12, 2016. Plaintiff has not demonstrated that any Asserted Claim is entitled to an earlier priority date. In fact, based on Apple's preliminary investigations, the Asserted Claims cannot date back to February 13, 2015. For example, the Asserted Patent claims priority to U.S. Provisional Application No. 62/115,769 (the "'769 provisional"), which was filed February 13, 2015. But the '769 provisional contains no disclosure of at least the following limitations of the Asserted Claims:

- "engagement means"
- "attachment means"
- "transmission portion"
- "a server"
- "means for initiating activity"
- "defined peak"
- "defined time period after a last defined peak"

Therefore, no Asserted Claim is entitled to the alleged priority date (February 13, 2015). Apple thus reserves the right to assert later priority dates based on any findings as to the priority date of the Asserted Claims by the Court, information learned through discovery, or otherwise. Apple further reserves the right to amend its invalidity contentions should Plaintiff fail to prove that any Asserted Claim is entitled to an earlier priority date.

IV. IDENTIFICATION OF PRIOR ART

The following patents, publications, systems, and admitted prior art are prior art to the Asserted Claims of the Asserted Patent under at least 35 U.S.C. §§ 102(a)(1) and/or 102(a)(2).

Apple also incorporates as if fully set forth in these Invalidity Contentions the complete prosecution histories for the Asserted Patent and related patents, including the prior art and supporting documents cited in those prosecution histories. Apple may cite or rely upon the prosecution histories, the examiner's findings, and the prior art cited therein to support or provide context for these Invalidity Contentions.

Apple not only relies upon the prior art disclosed in these Invalidity Contentions, but also relies on any commercial embodiments and accompanying literature (or other evidence and/or witness testimony) of the various assignees that correspond to the respective disclosures found within the prior art disclosed in these contentions. The assignees' various and respective commercial embodiments and/or corresponding literature (or other evidence and/or witness testimony) anticipate and/or render obvious the claims of the Asserted Patent for at least the reasons disclosed in these Invalidity Contentions, as well as for other independent reasons found within the commercial embodiments and corresponding literature. Apple also reserves the right to rely on related patents, published applications, foreign patents or publications, and other patent documents as necessary to establish prior art status or clarify the disclosures cited. Apple further reserves the right to rely on the earliest publication or priority dates to which each of the prior art references are entitled, including dates on which a claim of priority may be based for patent references that are any of a divisional, continuation, or continuation-in-part of an earlier filed patent application.

Apple reserves the right to revise its claim charts to rely on any of these references to prove the invalidity of the claims of the Asserted Patent in a manner consistent with the Federal Rules of Civil Procedure, the Court's Local Rules, and this Court's Orders.

A. Patents and Published Patent Applications

Number	Inventor(s)	Date Filed	Date Issued/ Published
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U.S. Patent No. 5,971,761	Chitunda Tillman, Sr.	Nov. 12, 1998	Oct. 26, 1999
U.S. Patent No. 6,335,722 B1	Masayuki Tani, et al.	Oct. 24, 1994	Jan. 1, 2002
U.S. Patent No. 6,520,013 B1 ("Wehrenberg 013")	Paul James Wehrenberg	Oct. 2, 2000	Feb. 18, 2003
U.S. Patent App. Pub. No. 2004/0169674 A1 ("Linjama")	Jukka Linjama	Dec. 30, 2003	Sept. 2, 2004
U.S. Patent App. Pub. No. 2004/0214617 A1	Koji Kanazawa, et al.	Mar. 22, 2004	Oct. 28, 2004
U.S. Patent App. Pub. No. 2005/0046584 A1	David S. Breed	Sep. 13, 2004	Mar. 3, 2005
U.S. Patent App. Pub. No. 2005/0246109 A1	Won-chul Bang, et al.	Dec. 3, 2004	Nov. 3, 2005
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U.S. Patent App. Pub. No. 2007/0079206 A1	Manish Arora, et al.	Aug. 24, 2006	Apr. 5, 2007
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International Pub. No. WO 2009/071919 A1	Roderick Murray-Smith, et al.	Dec. 8, 2008	Jun. 11, 2009
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Number	Inventor(s)	Date Filed	Date Issued/ Published
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U.S. Patent App. Pub. No. 2011/0087454 A1 ("Lee")	James M. Lee, et al.	Oct. 1, 2009	Apr. 14, 2011
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U.S. Patent No. 8,442,797 B2	Dong Yoon Kim, et al.	Mar. 30, 2010	May 14, 2013
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U.S. Patent App. Pub. No. 2014/0111415 A1 ("Gargi")	Ullas Gargi, et al.	Jan. 2, 2013	Apr. 24, 2014
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U.S. Patent App. Pub. No. 2014/0191938 A1	José Alonso Ybanez Zepeda	Jan. 8, 2013	Jul. 10, 2014
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Number	Inventor(s)	Date Filed	Date Issued/ Published
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U.S. Patent No. 9,712,895 B2 ("Yeo")	Kian Peen Yeo, et al.	Dec. 20, 2013	Jul. 18, 2017
U.S. Patent No. 9,812,004 B1	Yaniv Boshernitzan and Ohad Nezer	Mar. 16, 2017	Nov. 7, 2017
U.S. Patent No. 9,817,521 B2	Kevin Li	Nov. 2, 2013	Nov. 14, 2017
U.S. Patent App. Pub. No. 2017/0336870 A1	Julia Breanne Everett, et al.	Apr. 21, 2017	Nov. 23, 2017
U.S. Patent No. 10,051,716 B2 ("Newton")	Philip Steven Newton, et al.	Nov. 13, 2015	Aug. 14, 2018
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U.S. Patent No. 11,421,445 B2	Jason Johnson, et al.	Jan. 11, 2018	Aug. 23, 2022
U.S. Patent App. Pub. No. 2024/0118783 A1 ("Chen")	Kevin Will Chen, et al.	Dec. 18, 2023	Apr. 11, 2024

B. Publications

Title	Author/ Publisher	Pub. Date
PCB Piezotronics Model 3741D4HB100G DC Accelerometer Installation and Operating Manual	PCB Piezotronics	2002
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Apple Announces Record iPhone & iPhone 6s Plus Sales (https:www.apple.com/newsroom/2015/09/28Apple-Announces-Record-iPhone-6s-iPhone-6s-Plus-Sales/)	Apple	Sept. 28, 2015
Knock to Show the Apple Watch Clock in Nightstand Mode (https://www.youtube.com/watch?v=bh71imTAZkU)	OSXDaily	Sept. 28, 2015
iTunes Preview Remote (web.archive.org/web/201510300114555/ https://itunes.apple.com/app/remote/ id284417350&mt=8)	Apple	Oct. 30, 2015
Home App for HomeKit – Hue, August, Ecobee, Automation & Scene creation (https://www.youtube.com/watch?v=WLCcdG8qLJA)	Andrew OHara, MAOmagic	Nov. 3, 2015

Title	Author/ Publisher	Pub. Date
Knock to Show the Clock on Apple Watch When in Nightstand Mode (https://osxdaily.com/2015/11/19/knock-for-clock-apple-watch-nightstand-mode/)	OSXDaily	Nov. 19, 2015
BeyondTouch IUI Camera Ready Video: Extending the Input Language with Built-in Sensors on Commodity Smartphones, IUI 2015 (https://www.youtube.com/watch?v=I8yUpgDEsHw)	Cheng Zhang, et al.	Dec. 15, 2015
Beyond the touchscreen: An Exploration of Extending Interactions on Commodity Smartphones, ACM Trans. Interact. Intell. Syst. Vol. 6, No. 2, Article 16 ("Zhang 2016)	Cheng Zhang, et al.	Aug. 2016
How iFixit Became King of the iPhone Teardown, Vice	Jason Koebler	Nov. 3, 2017
LG G2 D800 Take Apart Repair Guide (www.repairsuniverse.com/blogs/repair-guides/lg-g2-d800-take-apart-repair-guide)	RepairsUniverse	Jun. 4, 2018
LG G2 (D800) – Device layout – AT&T (www.att.com/ device-support/article/wireless/KM1293447/LG/ G2D800) ("Device Layout")	AT&T	
Nokia 5500 Sport Price in United States (mobgsm.com/mobile/nokia-5500-sport)	MobGsm	
MPU-6050 Six-Axis (Gyro+Accelerometer) MEMS MotionTracking Device (invensense.tdk.com/products/motion-tracking/6-axis/ mpu-6050/)	TDK InvenSense	
Samsung Galaxy S III (https://en.wikipedia.org/wiki/ Samsung_Galaxy_S_III)	Wikipedia	
Kunal Naik GitHub Knock Knock Project Page (https://kunalnaik.github.io/projects/) ("GitHub")	Kunal Naik	
Secret Knock Detecting Door Lock (https://www.instructables.com/Secret-Knock-Detecting-Door-Lock/)	Grathio	
Knock (https://hackaday.com/tag/knock/)	Hackaday	
iFixit begins live teardown of iPhone 6 Plus, revealing 2906 mAh battery	Reddit post	
As requested: X-Ray of my iPhone 6 plus- better image!	Reddit post	
PCB Piezotronics Model 337A30 ICP Accelerometer Installation and Operating Manual	PCB Piezotronics	

Apple additionally identifies and relies on patent or publication references that describe or are otherwise related to the prior art systems identified below. Apple's investigation into prior art patent and publication references remains ongoing, and Apple reserves the right to identify and rely on additional patent or publication references that are identified through further investigation or discovery. Apple reserves the right to supplement as further prior art is identified through investigation or discovery.

C. Systems

System	Person or Entity[3]	Date
iPhone 6/6 Plus	Apple	At least September 9, 2014
Watch	Apple	At least September 9, 2014
iPhone 4	Apple	At least 2010
iPhone 6S/6S Plus	Apple	At least September 9, 2015
AirPlay	Apple	At least November 22, 2010
Remote (iPhone app)	Apple	At least 2013
Alfred Remote (iPhone app)	Running with Crayons Ltd.	At least January 27, 2015
HomeKit/Home app	Apple	At least September 17, 2014
Knock to Unlock (iPhone app)	William Henderson	At least 2013
Knock Knock (iPhone app)	Ankur Jain	At least August 19, 2015
Workflow (iPhone app)	DeskConnect, Inc.	At least December 2014
Bump (iPhone app)	Google	At least 2009
Galaxy III	Samsung	At least 2012
Galaxy S4	Samsung	At least April 24, 2013
Smart Home app	Samsung	At least April 2, 2014
BeyondTouch	Cheng Zhang	At least 2013
Nokia 5500 prototype, 5500 sport, and ELEN demonstration unit ("Nokia Phones")	Nokia	At least February 2007
G2	LG	At least August 7, 2013
One	HTC	At least March 25, 2014
Knock Knock	Kunal Naik	At least Spring 2015
Knock to unlock PC	Joonas	At least October 21, 2013
Toktoktok	Mathieu Stephan	At least March 8, 2012
No-touchscreen picture frame	Wasabi	At least September 10, 2011
Knock detecting lock	Steve Hoefer	At least November 4, 2009

[3] Apple has subpoenaed several of these entities to obtain additional information on the system identified herein. Apple may issue subpoenas to, and/or request letters rogatory for, one or more additional entities for the same purpose. To the extent any of those subpoenas and/or letters rogatory result in the production of relevant documents or testimony, Apple will supplement these Invalidity Contentions as necessary.

System	Person or Entity[3]	Date
BMA250	Bosch	At least March 2011
BMA280/282	Bosch	At least August 2014
MMA8450Q	Freescale Semiconductor Inc. (now NXP)	At least 2010
ADXL345	Analog Devices	At least 2014
MPU-6000/6050	TDK Invensense	At least 2013
TouchAnywhere™	TDK Invensense	At least 2010
MotionProcessing™ Technology Demo	TDK Invensense	At least 2010

Apple's iPhone 4, iPhone 6, iPhone 6 Plus, iPhone 6S, iPhone 6S Plus, and Watch, HomeKit/Home application, AirPlay application, and Remote application each qualify as prior art under Section 102 because they were in public use and on sale no later than the earliest effective filing date of the Asserted Patent. *See, e.g.*, APL-HAPTIC_00000487 – APL-HAPTIC_00086621; APL-HAPTIC_00104211 – APL-HAPTIC_00104211; APL-HAPTIC_00171368 – APL-HAPTIC_00172807; APL-HAPTIC_00172916 – APL-HAPTIC_00215546; APL-HAPTIC_00248894 – APL-HAPTIC_00248920; APL-HAPTIC_00441968 – APL-HAPTIC_00442280; APL-HAPTIC_00483478 – APL-HAPTIC_00483479; APL-HAPTIC_00483548 – APL-HAPTIC_00523538; APL-HAPTIC_00523723 – APL-HAPTIC_00523725; APL-HAPTIC_00524218 – APL-HAPTIC_00524297; APL-HAPTIC_00524313 – APL-HAPTIC_00524335; APL-HAPTIC_00530556 – APL-HAPTIC_00530557; APL-HAPTIC_00531450 – APL-HAPTIC_00531483; APL-HAPTIC_00531488 – APL-HAPTIC_00531700; APL-HAPTIC_00531775 – APL-HAPTIC_00531777; APL-HAPTIC_00531805 – APL-HAPTIC_00531826; APL-HAPTIC_00531897 – APL-HAPTIC_00532316; APL-HAPTIC_00532325 – APL-HAPTIC_00532371.

Running with Crayons Ltd.'s Alfred Remote iPhone application qualifies as prior art under Section 102 because it was in public use and on sale no later than the earliest effective filing date of the Asserted Patent. *See, e.g.*, APL-HAPTIC_00523726 - APL-HAPTIC_00523730.

The Knock to Unlock iPhone application qualifies as prior art under Section 102 because it was in public use and on sale no later than the earliest effective filing date of the Asserted Patent. *See, e.g.*, APL-HAPTIC_00524454 - APL-HAPTIC_00524481.

The Knock Knock iPhone application qualifies as prior art under Section 102 because it was in public use and on sale no later than the earliest effective filing date of the Asserted Patent. *See, e.g.*, APL-HAPTIC_00524366 - APL-HAPTIC_00524389; APL-HAPTIC_00531619 - APL-HAPTIC_00531619.

The Workflow iPhone application qualifies as prior art under Section 102 because it was in public use and on sale no later than the earliest effective filing date of the Asserted Patent. *See, e.g.*, APL-HAPTIC_00531667 – APL-HAPTIC_00531680.

The Bump iPhone application qualifies as prior art under Section 102 because it was in public use and on sale no later than the earliest effective filing date of the Asserted Patent. *See, e.g.*, APL-HAPTIC_00523935 – APL-HAPTIC_00523941.

Samsung's Galaxy III qualifies as prior art under Section 102 because it was in public use and on sale no later than the earliest effective filing date of the Asserted Patent. *See, e.g.*, APL-HAPTIC_00526775 - APL-HAPTIC_00526780; APL-HAPTIC_00530620 - APL-HAPTIC_00530681; APL-HAPTIC_00530686 – APL-HAPTIC_00530950; APL-HAPTIC_00530962 - APL-HAPTIC_00531335.

Samsung's Galaxy S4 qualifies as prior art under Section 102 because it was in public use and on sale no later than the earliest effective filing date of the Asserted Patent. *See, e.g.*, APL-HAPTIC_00530578 - APL-HAPTIC_00530579.

Samsung's Smart Home application qualifies as prior art under Section 102 because it was in public use and on sale no later than the earliest effective filing date of the Asserted Patent. *See, e.g.*, APL-HAPTIC_00530682 - APL-HAPTIC_00530685.

The BeyondTouch system qualifies as prior art under Section 102 because it was in public use no later than the earliest effective filing date of the Asserted Patent. *See, e.g.*, APL-HAPTIC_00523873 - APL-HAPTIC_00523934.

Nokia's 5500 prototype, 5500 sport, and ELEN demonstration unit phones qualify as prior art under Section 102 because they were in public use and/or on sale no later than the earliest effective filing date of the Asserted Patent. *See, e.g.*, APL-HAPTIC_00525286 - APL-HAPTIC_00525831.

LG's G2 qualifies as prior art under Section 102 because it was in public use and on sale no later than the earliest effective filing date of the Asserted Patent. *See, e.g.*, APL-HAPTIC_00524482 - APL-HAPTIC_00525280.

HTC's One qualifies as prior art under Section 102 because it was in public use and on sale no later than the earliest effective filing date of the Asserted Patent. *See, e.g.*, APL-HAPTIC_00525832 - APL-HAPTIC_00525835.

The Knock Knock system qualifies as prior art under Section 102 because it was in public use no later than the earliest effective filing date of the Asserted Patent. *See, e.g.*, APL-HAPTIC_00524386 - APL-HAPTIC_00524388.

The Knock to Unlock a PC system qualifies as prior art under Section 102 because it was in public use no later than the earliest effective filing date of the Asserted Patent. *See, e.g.*, APL-HAPTIC_00524473 – APL-HAPTIC_00524477; APL-HAPTIC_00527027 - APL-HAPTIC_00527037.

The toktoktok system qualifies as prior art under Section 102 because it was in public use and on sale no later than the earliest effective filing date of the Asserted Patent. *See, e.g.*, APL-HAPTIC_00531336 - APL-HAPTIC_00531433.

The No-touchscreen Picture Frame system qualifies as prior art under Section 102 because it was in public use no later than the earliest effective filing date of the Asserted Patent. *See, e.g.*, APL-HAPTIC_00525282 - APL-HAPTIC_00525285.

The Knock Detecting Lock system qualifies as prior art under Section 102 because it was in public use no later than the earliest effective filing date of the Asserted Patent. *See, e.g.*, APL-HAPTIC_00524390 - APL-HAPTIC_00524453.

Bosch Sensortech's BMA250, BMA280, and BMA282 sensors qualify as prior art under Section 102 because they were in public use and on sale no later than the earliest effective filing date of the Asserted Patent. *See, e.g.*, APL-HAPTIC_00531497 - APL-HAPTIC_00531615; APL-HAPTIC_00531701 - APL-HAPTIC_00531774.

NXP Freescale Semiconductor's MMA8450Q sensor qualifies as prior art under Section 102 because it was in public use and on sale no later than the earliest effective filing date of the Asserted Patent. *See, e.g.*, APL-HAPTIC_00526666 – APL-HAPTIC_00526722; APL-HAPTIC_00527011 - APL-HAPTIC_00527026.

Analog Device's ADXL345 sensor qualifies as prior art under Section 102 because it was in public use and on sale no later than the earliest effective filing date of the Asserted Patent. *See, e.g.*, APL-HAPTIC_00523659 – APL-HAPTIC_00523722; APL-HAPTIC_00525866 - APL-HAPTIC_00525870.

InvenSense's MPU-6000/6050 sensor, TouchAnywhere™ technology, and MotionProcessing™ Technology Demo qualify as prior art under Section 102 because they were in public use and on sale no later than the earliest effective filing date of the Asserted Patent. *See, e.g.*, APL-HAPTIC_00526723 – APL-HAPTIC_00526774; APL-HAPTIC_00530620 – APL-HAPTIC_00530670; APL-HAPTIC_00530899 – APL-HAPTIC_00530950; APL-HAPTIC_00531624 – APL-HAPTIC_00531624; APL-HAPTIC_00531434 – APL-HAPTIC_00531434; APL-HAPTIC_00525281 - APL-HAPTIC_00525281.

D. Admitted Prior Art

Plaintiff expressly or implicitly admitted that certain elements recited in Asserted Claims of the Patent-in-Suit were known in the prior art and thus part of the state of the art. These admissions include, but are not limited to, the following claim limitations and prior art concepts. Apple reserves the right to identify additional examples of admitted prior art and to further support the admissions identified below by relying on additional portions of the patent specification, statements made during the prosecution history of the Asserted Patent and the prosecution history of any related application, and any statements by Plaintiff or the patent applicants.

Admitted Prior Art Concept	Cite to Intrinsic Record
terminal device	’738 patent at 1:51-2:44
sensor being comprised of an accelerometer	’738 patent at 2:53-62
gesture profile being associated with a command	’738 patent at 2:38-52, 3:5-15, 3:26-40
vibration data of contact interaction	’738 patent at 2:53-62
determining a data pattern corresponding to data signals of contact interaction and matching data pattern with a gesture profile	’738 patent at 2:53-62, 3:5-15
interactive surface by tapping	’738 patent at 3:17-25

Plaintiff also admitted that the following patent and patent application publications are prior art:

Number	Inventor(s)	Date Filed	Date Issued/ Published
US8788978	Roy W. Stedman; Deborah C. Russell	Jan. 21, 2011	July 22, 2014
US20100019922	Evert Jan Van Loenen et al.	Oct. 15, 2007	Jan. 28, 2010
US20120249416	Giuliano Maciocci et al.	Mar. 29, 2012	Oct. 4, 2012
US20140225824	Alexander Shpunt et al.	Feb. 13, 2014	Aug. 14, 2014
WO2013165348	Charles Bess et al.	April 30, 2012	Nov. 7, 2013

V. CHARTS SETTING FORTH WHERE IN THE PRIOR ART REFERENCE EACH ELEMENT OF THE ASSERTED CLAIMS ARE FOUND

Exhibits A-1 through A-26 provide detailed claim charts showing where each claim element may be found in the prior art identified above. Each of these Exhibits is without prejudice to Apple’s indefiniteness positions under 35 U.S.C. § 112(b) and assume that such positions have been rejected by the Court. Nothing in the Exhibits should be taken as a concession that the claims are not indefinite.

Apple relies on all portions and aspects of each item of prior art in support of Apple’s contention that such prior art satisfies each limitation of the Asserted Claims. Apple has provided specific supporting citations to the prior art, but these citations do not necessarily represent every

location, instance, or manner in which a particular claim limitation is satisfied by the prior art. Even where limitations are disclosed at multiple locations within a single item of prior art, Apple has not necessarily identified every iteration of every such disclosure. Apple therefore reserves the right to rely on additional, or different, portions/aspects of the prior art other than those specifically cited in the claim charts provided herewith.

For those references for which detailed claim charts are provided in the Exhibits, the Exhibit Number is listed next to the prior art reference in Section VI.A. Prior art references which are not associated with an Exhibit Number are additional prior art references that are pertinent to the invalidity of the Asserted Patent. At this time, Apple has not provided claim charts for each of these additional references, either because they are cited in conjunction with references for which charts have already been provided, are cited in these contentions, and/or because these references have similar disclosures to the prior art references for which invalidity charts have been provided and/or may be used to show the state of the art.

VI. INVALIDITY UNDER 35 U.S.C. §§ 102 AND 103

Apple contends that certain prior art references below anticipate one or more Asserted Claims and that to the extent the identified prior art references do not anticipate the Asserted Claims, those claims are invalid as obvious under 35 U.S.C. § 103 as described below and in the attached claim charts. To the extent that Plaintiff contends that the prior art reference fails to disclose one or more limitations of the Asserted Claims, Apple contends that any difference between the reference and the corresponding patent claims would have been obvious to one of ordinary skill in the art based on the combinations identified below and in the attached claim charts as well as information generally known to persons skilled in the art at the time of the alleged invention. Thus, all anticipation charts should be interpreted as both reflecting anticipation by the reference as well as invalidity due to the specific combinations identified below and in the attached claim charts as well as single reference obviousness, to the extent that Plaintiff contends that any limitation is missing.

A. Anticipation

Prior art references anticipating the Asserted Claims are provided in the lists below. The prior art listed below anticipates the Asserted Claims under the proper construction of the claims and/or under Plaintiff's apparent interpretation of the claims as set forth by Plaintiff in its Complaint and Infringement Contentions.

Ex. #	Reference
A-1	Apple iPhone 6
A-2	Apple Watch
A-3	Knock to Unlock app
A-4	Knock Knock app
A-5	toktoktok
A-6	BeyondTouch
A-7	Samsung Galaxy III
A-8	Nokia Phones
A-9	LG G2
A-10	Murakoshi
A-11	Bess
A-12	Li
A-13	Kasar
A-14	Wehrenberg
A-15	Chen
A-16	Gargi
A-17	Yeo
A-18	Newton
A-19	Yun
A-20	Johnson

Ex. #	Reference
A-21	Khaira
A-22	Krum
A-23	Linjama
A-24	MS
A-25	Apple iPhone 4

B. Obviousness

Each of the prior art references identified above renders obvious one or more of the Asserted Claims alone and/or when viewed in combination with other prior art references as described below and in the attached claim charts. Apple's contentions that the references described in these Invalidity Contentions, in various combinations, render the Asserted Claims obvious under 35 U.S.C. § 103 are in no way an admission or suggestion that each reference does not independently anticipate the Asserted Claims under 35 U.S.C. § 102. Furthermore, the specific combinations described in these Invalidity Contentions are not intended to be exhaustive, as there are many possible combinations of these references, and it is not practical, particularly at this early stage before further factual investigation and claim construction proceedings, to identify and list all potentially relevant combinations. Apple reserves the right to identify additional combinations in later stages of the case.

Apple provides information regarding exemplary combinations below. Each of these exemplary combinations is listed for purposes of explaining and exemplifying which references would be combined with a reasonable expectation of success under the motivations to combine described in the paragraphs below. These combinations are not intended to be exclusive or limiting but rather intended to provide notice of the reasoning behind the motivations to combine and the references that would be combined thereunder. In many instances, multiple different motivations would apply to a particular combination (for example, if multiple references were both authored by the same person and referred to the same product/system, then both of those motivations would apply) and the specific combinations were not duplicated.

Should any prior art cited above be deemed not to disclose, explicitly or inherently, any limitation of a claim, Apple reserves the right to argue that any such difference between that prior art and the corresponding claim would have been obvious to one of ordinary skill in the art. To the extent that such an argument is deemed a "combination" analysis for purposes of obviousness, Apple discloses its present intention to rely on the separate combination of the knowledge of a person of ordinary skill in the art with each item of prior art identified above.

C. Exemplary Combinations

Below is a listing of exemplary combinations of references that would render obvious the Asserted Claims of the Asserted Patent.

- Apple iPhone 6/6S in view of Apple Watch, Knock to Unlock app, Knock Knock app, BeyondTouch, TouchAnywhere, InvenSense MotionProcessing™ Technology Demo, Samsung Galaxy III, McGrath, LG G2, Nokia Phones, Ronkainen, Haggman, Li, Johnson, Kasar, Wehrenberg, Chen, Avrahami, Linjama, MS, Gargi, Yun, Khaira, Sachs, Kim, Hudson, Tuck, Zhang-UbiComp 2013, Zhang-UIST 2013, Zhang 2015, Zhang 2016, Bosch Sensortec BMA250/BMA280/BMA282, Analog Devices ADXL345, TDK MPU-6000, NXP Freescale Semiconductor MMA8450Q, AirPlay, Apple Remote app, Alfred Remote app, Apple HomeKit, Workflow, Kuhnel, Ha, Park Seok-gyu, Murakoshi, Yeo, CN103067630, CN202502390, Orr, Bump, Sharp KK, Bess, Heo, Hinckley, Culbert, and/or iPhone 6S.
- Apple Watch in view of iPhone 6/6S, Knock to Unlock app, Knock Knock app, BeyondTouch, TouchAnywhere, InvenSense MotionProcessing™ Technology Demo, Samsung Galaxy III, McGrath, LG G2, Nokia Phones, Ronkainen, Haggman, Li, Johnson, Kasar, Wehrenberg, Chen, Avrahami, Linjama, MS, Gargi, Yun, Khaira, Sachs, Kim, Hudson, Tuck, Zhang-UbiComp 2013, Zhang-UIST 2013, Zhang 2015, Zhang 2016, Bosch Sensortec BMA250/BMA280/BMA282, Analog Devices ADXL345, TDK MPU-6000, NXP Freescale Semiconductor

MMA8450Q, AirPlay, Apple Remote app, Alfred Remote app, Apple HomeKit, Workflow, Kuhnel, Ha, Park Seok-gyu, Murakoshi, Yeo, CN103067630, CN202502390, Orr, Bump, Sharp KK, and/or Bess.

- Knock to Unlock in view of iPhone 6/6S, Apple Watch, Knock to Unlock app, Knock Knock app, BeyondTouch, TouchAnywhere, InvenSense MotionProcessing™ Technology Demo, Samsung Galaxy III, McGrath, LG G2, Nokia Phones, Ronkainen, Haggman, Li, Johnson, Kasar, Wehrenberg, Chen, Avrahami, Linjama, Ms, Gargi, Yun, Khaira, Sachs, Kim, Hudson, Tuck, Zhang-UbiComp 2013, Zhang-UIST 2013, Zhang 2015, Zhang 2016, Bosch Sensortec BMA250/BMA280/BMA282, Analog Devices ADXL345, TDK MPU-6000, NXP Freescale Semiconductor MMA8450Q, AirPlay, Apple Remote app, Alfred Remote app, Apple HomeKit, Workflow, Kuhnel, Ha, Park Seok-gyu, Murakoshi, Yeo, CN103067630, Orr, Bump, Sharp KK, and/or Bess.
- Knock Knock in view of iPhone 6/6S, Apple Watch, Knock Knock app, BeyondTouch, TouchAnywhere, InvenSense MotionProcessing™ Technology Demo, Samsung Galaxy III, McGrath, LG G2, Nokia Phones, Ronkainen, Haggman, Li, Johnson, Kasar, Wehrenberg, Chen, Avrahami, Linjama, MS, Gargi, Yun, Khaira, Sachs, Kim, Hudson, Tuck, Zhang-UbiComp 2013, Zhang-UIST 2013, Zhang 2015, Zhang 2016, Bosch Sensortec BMA250/BMA280/BMA282, Analog Devices ADXL345, TDK MPU-6000, NXP Freescale Semiconductor MMA8450Q, AirPlay, Apple Remote app, Alfred Remote app, Apple HomeKit, Workflow, Kuhnel, Ha, Park Seok-gyu, Murakoshi, Yeo, CN103067630, CN202502390, Orr, Bump, Sharp KK, and/or Bess.
- BeyondTouch in view of Orr, Bump, Sharp KK, Bess, AirPlay, Apple Remote app, Alfred Remote app, Apple HomeKit, Samsung Smart Home app, Workflow, Kuhnel, Ha, Park Seok-gyu, CN103067630, CN202502390, Li, iPhone 6/6S, Apple Watch, Knock to Unlock app, Knock Knock app, TouchAnywhere, InvenSense

MotionProcessing™ Technology Demo, Samsung Galaxy III, McGrath, LG G2, Nokia Phones, Ronkainen, Haggman, Johnson, Kasar, Wehrenberg, Chen, Avrahami, Linjama, MS, Gargi, Yun, Khaira, Sachs, Kim, Hudson, Tuck, Zhang-UbiComp 2013, Zhang-UIST 2013, Zhang 2015, Zhang 2016, Bosch Sensortec BMA250/BMA280/BMA282, Analog Devices ADXL345, TDK MPU-6000, and/or NXP Freescale Semiconductor MMA8450Q.

- Samsung Galaxy III in view of Apple iPhone 6/6S, Apple Watch, Knock to Unlock app, Knock Knock app, BeyondTouch, TouchAnywhere, InvenSense MotionProcessing™ Technology Demo, McGrath, LG G2, Nokia Phones, Ronkainen, Haggman, Li, Johnson, Kasar, Wehrenberg, Chen, Avrahami, Linjama, MS, Gargi, Yun, Khaira, Sachs, Kim, Hudson, Tuck, Zhang-UbiComp 2013, Zhang-UIST 2013, Zhang 2015, Zhang 2016, Bosch Sensortec BMA250/BMA280/BMA282, Analog Devices ADXL345, TDK MPU-6000, NXP Freescale Semiconductor MMA8450Q, AirPlay, Apple Remote app, Alfred Remote app, Apple HomeKit, Workflow, Samsung Smart Home app, Kuhnel, Ha, Park Seok-gyu, Murakoshi, Yeo, CN103067630, CN202502390, Orr, Bump, Sharp KK, Bess, Heo, Hinckley, and/or iPhone 6S.
- LG G2 in view of Apple iPhone 6/6S, Apple Watch, Knock to Unlock app, Knock Knock app, BeyondTouch, TouchAnywhere, InvenSense MotionProcessing™ Technology Demo, Samsung Galaxy III, McGrath, Nokia Phones, Ronkainen, Haggman, Li, Johnson, Kasar, Wehrenberg, Chen, Avrahami, Linjama, MS, Gargi, Yun, Khaira, Sachs, Kim, Hudson, Tuck, Zhang-UbiComp 2013, Zhang-UIST 2013, Zhang 2015, Zhang 2016, Bosch Sensortec BMA250/BMA280/BMA282, Analog Devices ADXL345, TDK MPU-6000, NXP Freescale Semiconductor MMA8450Q, AirPlay, Apple Remote app, Alfred Remote app, Apple HomeKit, Workflow, Samsung Smart Home app, Kuhnel, Ha, Park Seok-gyu, Murakoshi,

Yeo, CN103067630, CN202502390, Orr, Bump, Sharp KK, Bess, Heo, Hinckley, and/or iPhone 6S.

- Nokia Phones in view of Apple iPhone 6/6S, Apple Watch, Knock to Unlock app, Knock Knock app, BeyondTouch, TouchAnywhere, InvenSense MotionProcessing™ Technology Demo, Samsung Galaxy III, McGrath, LG G2, Ronkainen, Haggman, Li, Johnson, Kasar, Wehrenberg, Chen, Avrahami, Linjama, MS, Gargi, Yun, Khaira, Sachs, Kim, Hudson, Tuck, Zhang-UbiComp 2013, Zhang-UIST 2013, Zhang 2015, Zhang 2016, Bosch Sensortec BMA250/BMA280/BMA282, Analog Devices ADXL345, TDK MPU-6000, NXP Freescale Semiconductor MMA8450Q, AirPlay, Apple Remote app, Alfred Remote app, Apple HomeKit, Workflow, Samsung Smart Home app, Kuhnel, Ha, Park Seok-gyu, Murakoshi, Yeo, CN103067630, CN202502390, Orr, Bump, Sharp KK, Bess, Heo, Hinckley, and/or iPhone 6S.
- Li in view of Stewart, Marks, Orr, Bump, Sharp KK, Bess, AirPlay, Apple Remote app, Alfred Remote app, Apple HomeKit, Workflow, Samsung Smart Home app, Kuhnel, Ha, Park Seok-gyu, Murakoshi, Yeo, iPhone 6/6S, Knock to Unlock app, Knock Knock app, BeyondTouch, TouchAnywhere, InvenSense MotionProcessing™ Technology Demo, Samsung Galaxy III, McGrath, LG G2, Nokia Phones, Ronkainen, Haggman, Johnson, Kasar, Wehrenberg, Chen, Avrahami, Linjama, MS, Gargi, Yun, Khaira, Sachs, Kim, Hudson, Tuck, Zhang-UbiComp 2013, Zhang-UIST 2013, Zhang 2015, Zhang 2016, Bosch Sensortec BMA250/BMA280/BMA282, Analog Devices ADXL345, TDK MPU-6000, NXP Freescale Semiconductor MMA8450Q, Newton, toktoktok, Slupsky, and/or Knock Knock.
- Toktoktok in view of Murakoshi, Bess, Ha, Kasar, Khaira, Krum, Newton, Stewart, Slupsky, Wehrenberg, Bosch Sensortec BMA250/BMA280/BMA282, Analog Devices ADXL345, TDK MPU-6000, NXP Freescale Semiconductor

MMA8450Q, Carullo, O'Reilly, Orr, Bump, Sharp KK, Marks, Apple iPhone 6/6S, Apple Watch, Knock to Unlock app, Knock Knock app, BeyondTouch, TouchAnywhere, InvenSense MotionProcessing™ Technology Demo, Samsung Galaxy III, McGrath, LG G2, Nokia Phones, Ronkainen, Haggman, Li, Johnson, Chen, Avrahami, Linjama, MS, Gargi, Yun, Sachs, Kim, Hudson, Tuck, Zhang-UbiComp 2013, Zhang-UIST 2013, Zhang 2015, and/or Zhang 2016.

- Murakoshi in view of toktoktok, Bess, Ha, Kasar, Khaira, Krum, Newton, Stewart, Slupsky, Wehrenberg, Bosch Sensortec BMA250/BMA280/BMA282, Analog Devices ADXL345, TDK MPU-6000, NXP Freescale Semiconductor MMA8450Q, Orr, Bump, Sharp KK, toktoktok, Marks, Apple iPhone 6/6S, Apple Watch, Knock to Unlock app, Knock Knock app, BeyondTouch, TouchAnywhere, InvenSense MotionProcessing™ Technology Demo, Samsung Galaxy III, McGrath, LG G2, Nokia Phones, Ronkainen, Haggman, Li, Johnson, Chen, Avrahami, Linjama, MS, Gargi, Yun, Sachs, Kim, Hudson, Tuck, Zhang-UbiComp 2013, Zhang-UIST 2013, Zhang 2015, and/or Zhang 2016.
- Yeo in view of Stewart, toktoktok, Marks, Murakoshi, Bess, Ha, Kasar, Khaira, Krum, Newton, Stewart, Slupsky, Wehrenberg, Bosch Sensortec BMA250/BMA280/BMA282, Analog Devices ADXL345, TDK MPU-6000, NXP Freescale Semiconductor MMA8450Q, Orr, Bump, Sharp KK, Bess, Apple iPhone 6/6S, Apple Watch, Knock to Unlock app, Knock to Unlock, Knock Knock app, Knock Knock, BeyondTouch, TouchAnywhere, InvenSense MotionProcessing™ Technology Demo, Samsung Galaxy III, McGrath, LG G2, Nokia Phones, Ronkainen, Haggman, Li, Johnson, Chen, Avrahami, Linjama, Ms, Gargi, Yun, Sachs, Kim, Hudson, Tuck, Zhang-UbiComp 2013, Zhang-UIST 2013, Zhang 2015, CN202502390, and/or Zhang 2016.
- Newton in view of iPhone 6/6S, Samsung Galaxy III, LG G2, Nokia Phones, Bosch Sensortec BMA250/BMA280/BMA282, Analog Devices ADXL345, TDK MPU-

6000, NXP Freescale Semiconductor MMA8450Q, Stewart, Marks, toktoktok, Slupsky, Li, Orr, Bump, Sharp KK, Bess, Apple Watch, Knock to Unlock app, Knock Knock app, BeyondTouch, TouchAnywhere, InvenSense MotionProcessing™ Technology Demo, Samsung Galaxy III, McGrath, LG G2, Nokia Phones, Ronkainen, Haggman, Johnson, Kasar, Wehrenberg, Chen, Avrahami, Linjama, Ms, Gargi, Yun, Khaira, Sachs, Kim, Hudson, Tuck, Zhang-UbiComp 2013, Zhang-UIST 2013, Zhang 2015, Zhang 2016, AirPlay, Apple Remote app, Alfred Remote app, Apple HomeKit, Workflow, Kuhnel, Ha, Park Seok-gyu, Murakoshi, CN103067630, and/or Yeo.

- Kasar in view of iPhone 6/6S, Samsung Galaxy III, LG G2, Nokia Phones, Bosch Sensortec BMA250/BMA280/BMA282, Analog Devices ADXL345, TDK MPU-6000, NXP Freescale Semiconductor MMA8450Q, Orr, Bump, Sharp KK, Bess, Yun, AirPlay, Apple Remote app, Alfred Remote app, Apple HomeKit, Workflow, Kuhnel, Ha, Park Seok-gyu, Stewart, Slupsky, Marks, Murakoshi, CN103067630, CN202502390, and/or Yeo.
- Wehrenberg in view of iPhone 6/6S, Samsung Galaxy III, LG G2, Nokia Phones, Bosch Sensortec BMA250/BMA280/BMA282, Analog Devices ADXL345, TDK MPU-6000, NXP Freescale Semiconductor MMA8450Q, Slupsky, Orr, Bump, Sharp KK, Bess, Yun, AirPlay, Apple Remote app, Alfred Remote app, Apple HomeKit, Workflow, Kuhnel, Ha, Park Seok-gyu, CN103067630, CN202502390, Murakoshi, and/or Yeo.
- MS in view of Apple Watch, Knock to Unlock app, Knock Knock app, BeyondTouch, TouchAnywhere, InvenSense MotionProcessing™ Technology Demo, Samsung Galaxy III, McGrath, LG G2, Nokia Phones, Ronkainen, Haggman, Li, Johnson, Kasar, Wehrenberg, Chen, Avrahami, Linjama, Gargi, Yun, Khaira, Sachs, Kim, Hudson, Tuck, Zhang-UbiComp 2013, Zhang-UIST 2013, Zhang 2015, Zhang 2016, Bosch Sensortec BMA250/BMA280/BMA282, Analog

Devices ADXL345, TDK MPU-6000, NXP Freescale Semiconductor MMA8450Q, iPhone 6/6S, Stewart, Marks, Slupsky, toktoktok, Bess, Ha, Krum, Newton, Stewart, Wehrenberg, Orr, Bump, Sharp KK, AirPlay, Apple Remote app, Alfred Remote app, Apple HomeKit, Workflow, Kuhnel, Park Seok-gyu, Murakoshi, CN103067630, CN202502390, and/or Yeo.

- Gargi in view of Apple Watch, Knock to Unlock app, Knock Knock app, BeyondTouch, TouchAnywhere, InvenSense MotionProcessing™ Technology Demo, Samsung Galaxy III, McGrath, LG G2, Nokia Phones, Ronkainen, Haggman, Li, Johnson, Kasar, Wehrenberg, Chen, Avrahami, Linjama, Gargi, Yun, Khaira, Sachs, Kim, Hudson, Tuck, Zhang-UbiComp 2013, Zhang-UIST 2013, Zhang 2015, Zhang 2016, Bosch Sensortec BMA250/BMA280/BMA282, Analog Devices ADXL345, TDK MPU-6000, NXP Freescale Semiconductor MMA8450Q, iPhone 6/6S, Stewart, Marks, Slupsky, toktoktok, Bess, Ha, Krum, Newton, Stewart, Wehrenberg, Orr, Bump, Sharp KK, AirPlay, Apple Remote app, Alfred Remote app, Apple HomeKit, Workflow, Kuhnel, Park Seok-gyu, Murakoshi, CN103067630, CN202502390, and/or Yeo.
- Khaira in view of Apple Watch, Knock to Unlock app, Knock Knock app, BeyondTouch, TouchAnywhere, InvenSense MotionProcessing™ Technology Demo, Samsung Galaxy III, McGrath, LG G2, Nokia Phones, Ronkainen, Haggman, Li, Johnson, Kasar, Wehrenberg, Chen, Avrahami, Linjama, MS, Gargi, Yun, Sachs, Kim, Hudson, Tuck, Zhang-UbiComp 2013, Zhang-UIST 2013, Zhang 2015, Zhang 2016, Bosch Sensortec BMA250/BMA280/BMA282, Analog Devices ADXL345, TDK MPU-6000, NXP Freescale Semiconductor MMA8450Q, Slupsky, iPhone 6/6S, Samsung Galaxy III, LG G2, Nokia Phones, Stewart, Marks, toktoktok, Bess, Ha, Krum, Newton, Stewart, Orr, Bump, Sharp KK, AirPlay, Apple Remote app, Alfred Remote app, Apple HomeKit, Workflow,

Samsung Smart Home app, Kuhnel, Park Seok-gyu, Murakoshi, CN103067630, CN202502390, and/or Yeo.

- Bess in view of Apple Watch, Knock to Unlock app, Knock Knock app, BeyondTouch, TouchAnywhere, InvenSense MotionProcessing™ Technology Demo, Samsung Galaxy III, McGrath, LG G2, Nokia Phones, Ronkainen, Haggman, Li, Johnson, Kasar, Wehrenberg, Chen, Avrahami, Linjama, MS, Gargi, Yun, Kasar, Khaira, Sachs, Kim, Hudson, Tuck, Zhang-UbiComp 2013, Zhang-UIST 2013, Zhang 2015, Zhang 2016, Bosch Sensortec BMA250/BMA280/BMA282, Analog Devices ADXL345, TDK MPU-6000, NXP Freescale Semiconductor MMA8450Q, Slupsky, Stewart, Marks, iPhone 6/6S, Newton, toktoktok, CN202502390, and/or Knock Knock.
- Krum in view of Apple Watch, Knock to Unlock app, Knock Knock app, BeyondTouch, TouchAnywhere, InvenSense MotionProcessing™ Technology Demo, Samsung Galaxy III, McGrath, LG G2, Nokia Phones, Ronkainen, Haggman, Li, Johnson, Kasar, Wehrenberg, Chen, Avrahami, Linjama, MS, Gargi, Yun, Kasar, Khaira, Sachs, Kim, Hudson, Tuck, Zhang-UbiComp 2013, Zhang-UIST 2013, Zhang 2015, Zhang 2016, Bosch Sensortec BMA250/BMA280/BMA282, Analog Devices ADXL345, TDK MPU-6000, NXP Freescale Semiconductor MMA8450Q, Slupsky, Stewart, Marks, iPhone 6/6S, Newton, toktoktok, CN202502390, and/or Knock Knock.
- Chen in view of Apple Watch, Knock to Unlock app, Knock Knock app, BeyondTouch, TouchAnywhere, InvenSense MotionProcessing™ Technology Demo, Samsung Galaxy III, McGrath, LG G2, Nokia Phones, Ronkainen, Haggman, Li, Johnson, Kasar, Khaira, Wehrenberg, Avrahami, Linjama, MS, Gargi, Yun, Khaira, Sachs, Kim, Hudson, Tuck, Zhang-UbiComp 2013, Zhang-UIST 2013, Zhang 2015, Zhang 2016, Bosch Sensortec BMA250/BMA280/BMA282, Analog Devices ADXL345, TDK MPU-6000, NXP

Freescale Semiconductor MMA8450Q, Slupsky, iPhone 6/6S, Stewart, Marks, toktoktok, Orr, Bump, Sharp KK, Bess, AirPlay, Apple Remote app, Alfred Remote app, Apple HomeKit, Workflow, Kuhnel, Ha, Park Seok-gyu, CN103067630, Murakoshi, CN202502390, and/or Yeo.

- Johnson in view of Apple Watch, Knock to Unlock app, Knock Knock app, BeyondTouch, TouchAnywhere, InvenSense MotionProcessing™ Technology Demo, Samsung Galaxy III, McGrath, LG G2, Nokia Phones, Ronkainen, Haggman, Li, Kasar, Wehrenberg, Chen, Avrahami, Linjama, MS, Gargi, Yun, Khaira, Sachs, Kim, Hudson, Tuck, Zhang-UbiComp 2013, Zhang-UIST 2013, Zhang 2015, Zhang 2016, Bosch Sensortec BMA250/BMA280/BMA282, Analog Devices ADXL345, TDK MPU-6000, NXP Freescale Semiconductor MMA8450Q, Stewart, Marks, toktoktok, Ha, Orr, Bump, Sharp KK, Bess, CN103067630, and/or iPhone 6/6S.
- Linjama in view of Apple iPhone 6/6S, Apple Watch, Knock to Unlock app, Knock Knock app, BeyondTouch, TouchAnywhere, InvenSense MotionProcessing™ Technology Demo, Samsung Galaxy III, McGrath, LG G2, Nokia Phones, Ronkainen, Haggman, Li, Johnson, Kasar, Wehrenberg, Chen, Avrahami, MS, Gargi, Yun, Khaira, Sachs, Kim, Hudson, Tuck, Zhang-UbiComp 2013, Zhang-UIST 2013, Zhang 2015, Zhang 2016, Bosch Sensortec BMA250/BMA280/BMA282, Analog Devices ADXL345, TDK MPU-6000, NXP Freescale Semiconductor MMA8450Q, Stewart, Marks, toktoktok, Orr, Bump, Sharp KK, Bess, AirPlay, Apple Remote app, Alfred Remote app, Apple HomeKit, Workflow, Samsung Smart Home app, Kuhnel, Ha, Park Seok-gyu, Murakoshi, CN103067630, CN202502390, and/or Yeo.
- Yun in view of Stewart, Marks, toktoktok, Bess, Ha, Kasar, Khaira, Krum, Newton, Stewart, Wehrenberg, Bosch Sensortec BMA250/BMA280/BMA282, Analog Devices ADXL345, TDK MPU-6000, NXP Freescale Semiconductor

MMA8450Q, Li, Orr, Bump, Sharp KK, Bess, toktoktok, Slupsky, AirPlay, Apple Remote app, Alfred Remote app, Apple HomeKit, Workflow, Samsung Smart Home app, Kuhnel, Ha, Park Seok-gyu, Murakoshi, Yeo, CN103067630, CN202502390, and/or iPhone 6/6S.

D. Motivation to Combine

In general, a claimed invention is unpatentable if the differences between it and the prior art "are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains." 35 U.S.C. § 103; *Graham v. John Deere Co*., 383 U.S. 1, 13-14 (1966). In view of the Supreme Court's *KSR International Co. v. Teleflex Inc*., 550 U.S. 398 (2007) ("*KSR*") decision, the USPTO issued a set of Examination Guidelines setting forth a number of potential rationales for combining prior art references. *See* Examination Guidelines for Determining Obviousness under 35 U.S.C. § 103 in view of the Supreme Court Decision in *KSR*. Those rationales include:

- Combining prior-art elements according to known methods to yield predictable results;
- Simple substitution of one known element for another to obtain predictable results;
- Use of a known technique to improve similar devices (methods, or products) in the same way;
- Applying a known technique to a known device (method, or product) ready for improvement to yield predictable results;
- "Obvious to try"—choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success;
- Known work in one field of endeavor that may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations would have been predictable to one of ordinary skill in the art; and

- Some teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art or to combine prior-art teachings to arrive at the claimed invention.

These rationales are consistent with the Supreme Court's emphasis in *KSR* that "the results of ordinary innovation" from the perspective of a person of ordinary skill are not patentable, and further that "[a] person of ordinary skill is also a person of ordinary creativity, not an automaton." 550 U.S. at 421, 427. Apple contends that one or more of these rationales apply in considering the obviousness of the Asserted Claims.

For example, a person of ordinary skill in the art at the time of the alleged invention of the Asserted Patent would have been motivated to combine or adapt known or familiar methods in the art, especially where market forces prompted such variations. Moreover, each of the above-identified references describes methods that were known to offer improvements and benefits to the art, and, accordingly, one of skill in the art would have been motivated to combine or modify the references as identified in each of the combinations above.

Furthermore, since there were a finite number of predictable solutions, a person of ordinary skill in the art had a good reason to pursue the known options. The above-identified prior art references merely use those familiar elements for their primary or well-known purpose in a manner well within the ordinary level of skill in the art. Accordingly, common sense and the knowledge of the prior art render the claims invalid under Section 102 or Section 103.

A person of ordinary skill would also have been motivated to combine the above prior art based on his/her knowledge, the nature of the problem to be solved, and the teachings of the prior at. The identified prior art addresses the same or similar technical issues and suggests the same or similar solutions to those issues. Moreover, some of the prior art refer to or discuss other prior art, illustrating the close technical relationship among the prior art. As one example, the references listed above are directed to the same or similar technology.

One of skill in the art would have been further motivated to look at all of the available documentation for a particular product/system to understand the operation. One of skill in the art

would have combined that knowledge from the various related references because it would be clear that the references were related. For at least this reason, one of skill in the art could consider it obvious to combine the references that collectively teach a product or system. The references were identified in the charts for each such system/product, and Apple intends to rely upon the combination of references in each of the system/product charts.

One of skill in the art would have been further motivated to combine the different publications and patents that were authored by employees of the company or assigned to the same assignee and related to the same subject matter.

One of skill in the art would have been further motivated to combine different references that were authored, developed, or invented by the same individual(s) related to the same subject matter. The common inventor/author/architect references themselves demonstrate that they relate to continued work in a common field of effort and continued related developments in that field. One of skill in the art would, therefore, combine the references related to each individual. Similarly, based on the teachings of the references and/or the knowledge of one of ordinary skill, one of skill in the art would have been further motivated to combine different references from the same company.

Finally, as explained below and in the attached charts, all concepts recited in the Asserted Claims of the Asserted Patent represent well-known features. Thus, the Asserted Claims of the Asserted Patent are invalid under 35 U.S.C. § 103 because they do nothing more than combine known techniques and apparatuses according to their known and ordinary uses to yield predictable results.

1. Housing Element

Each Asserted Claim recites limitations directed to "a housing." For example, claim 1 recites "a housing."

By February 12, 2016, control systems with a housing were well-known in the prior art. *See, e.g.*, Apple iPhone 4; iPhone 6; Apple iPhone 6S; Apple Watch; Samsung Galaxy III; LG G2; Bess; BeyondTouch; Knock to Unlock; toktoktok; Yeo; Li; Murakoshi; Newton; Kasar;

Wehrenberg; Johnson; MS; Yun; Slupsky; Khaira; InvenSense MotionProcessing™ Technology Demo.

To the extent any anticipatory reference is found not to include a housing, as noted in the above-referenced charts, it would have been obvious in view of Apple iPhone 6; Apple Watch; Samsung Galaxy III; LG G2; Bess; Beyond Touch; Knock to Unlock; toktoktok; Yeo; Li; Murakoshi; Newton; Kasar; Wehrenberg; Johnson; MS; Yun; Slupsky; and/or Khaira to include this feature. In addition to the reasons identified above, one skilled in the art would have been motivated to make this modification at least because a housing protects the sensor elements and/or provides a structure for a user to hold or mount the sensor elements. *See, e.g.*, Slupsky at [0035]-[0036] ("Sensors may be isolated from harmful environments, such as corrosive atmospheres, or hazardous conditions, such as combustible gases, by containment of the sensor within a housing. In other sensing devices, there are requirements including available power, reliability, and protection of and from the ambient environment that limit their applicability and which reduce their utility."); Li at [0035] ("While the gesture detector 42 may be adhered to the outer surface 44 of the body 26, the gesture detector 42 may be preferably adhered to an inner surface of the bottom portion 120 of the body 26 for added protection from physical damage.").

2. Engagement Means

Each asserted claim recites limitations directed to elements of "an engagement means for a mounting surface . . . wherein said engagement means of said housing comprises: an attachment means between said housing to said mounting surface; and a transmission portion connecting said sensor to said attachment means of said housing and being comprised of a material with flexibility different than said mounting surface so as to set a rigid position of said sensor relative to said mounting surface," wherein "said contact interaction generating said data signals of said sensor through said transmission portion."

Control systems with such engagement means were well-known in the prior art. *See, e.g.*, Apple iPhone 4/6/6S; Apple Watch; Samsung Galaxy III; Nokia Phones; LG G2; BeyondTouch;

Knock to Unlock; Knock Knock; toktoktok; Li; Yeo; Newton; Stewart; Bess; Zwart; Slupsky; Marks.

To the extent any anticipatory reference is found not to include the claimed engagement means, as noted in the above-referenced charts, it would have been obvious in view of Apple iPhone 4/6/6S; Apple Watch; Samsung Galaxy III; Nokia Phones; LG G2; BeyondTouch; Knock to Unlock; Knock Knock; toktoktok; Li; Yeo; Newton; Stewart; Bess; Zwart; Slupsky; and/or Marks to include this feature. In addition to the reasons identified above, one skilled in the art would have been motivated to make this modification at least because an engagement means that comprises an attachment means and a transmission portion is conventional and such positioning secures the accelerometer relative to the housing, deceases extraneous noise or vibrations to the accelerometer, allows for transmission of the vibration signal data, and/or decreases wear on the accelerometer. *See, e.g.*, Slupsky at [0035]-[0036] ("Sensors may be isolated from harmful environments, such as corrosive atmospheres, or hazardous conditions, such as combustible gases, by containment of the sensor within a housing. In other sensing devices, there are requirements including available power, reliability, and protection of and from the ambient environment that limit their applicability and which reduce their utility.").

Furthermore, the process of mounting a sensor within a housing and fixing a housing to a surface, was within the common knowledge of a skilled artisan by the earliest possible priority date, including the use of brackets to hold a sensor in place and fasteners, adhesives, etc. to couple a housing to a surface. *See, e.g.*, Stewart at 5:8-37 (disclosing that "accelerometers are positioned … within the case 14" using brackets and that the case includes case mounts at the corners), Fig. 1; *see also, e.g.*, Newton at Abstract ("The secure connection may be configured to transfer motion imparted on the surface to the accelerometer."); Marks at [0040] ("As shown in FIG. 6, the remote transmitter 22 is attachable by means of an adhesive surface 27."); toktoktok (also disclosing the use of adhesive); Yeo at 7:44-53 ("The flat surfaces of the sensor node allow adhesive material eg: Scotch® Reusable Tabs to be used to facilitate mounting to a surface. Sensor nodes can be redeployed easily, hence it should be easy to mount and detach, and the mounting mechanism

needs to have a long 'adhesive lifetime' without its 'stickiness' wearing off over time. Also a micro suction cup based material eg: Inventables® Suction Cup Tape could be used. This adhesive material can be shaped to a circular ring that would fit on the flat surface of the sensor node."); Li at [0035] ("A glue or adhesive may simply and quickly adhere the gesture detector 42 to the body 26. While any adhesive compound may be used, the adhesive may be chosen to minimize attenuation as the vibration 72 travels through the adhesive. However, the gesture detector 42 may alternatively be mechanically adhered, such as by fastener or weld. The gesture detector 42 may be soldered or welded to the body 26, especially when the body 26 is constructed of aluminum, magnesium, stainless steel, or any other metal. The gesture detector 42 may be soldered, TIG welded, or MIG welded to the body 26.").

A skilled artisan would have been further motivated to pursue the above-discussed combinations for several reasons. First, they would have understood that an accelerometer must be fixed within the apparatus by some mechanism to orient the accelerometer within the housing and to prevent the accelerometer from moving around within the housing. Fixing the accelerometer within the housing would prevent the accelerometer from being loose within the housing, moving around and possibly being damaged. Furthermore, Murakoshi's description that such sensors are "integral" to the apparatus would have motivated a skilled artisan to investigate ways to fix an accelerometer within a device and would have looked to other accelerometer references. Murakoshi at [0030]. A skilled artisan would have recognized that the brackets, sidebeams, adhesives, etc. fix an accelerometer in position within the casing, and still allow the accelerometer to detect vibrations.

Second, a skilled artisan would have been motivated to mount the accelerometer within a housing using support flexures, brackets and side beams and to mount the housing to a surface using case mounts to enable the accelerometer to effectively detect vibrations without interference from housing components. *See, e.g.*, *id.* at [0021]; Stewart at 7:61-64 ("The accelerometers are suspended within the case of the multisensor to minimize any deleterious mechanical feedback between the accelerometer and case.").

Third, a skilled artisan would have understood that there are multiple known mechanisms for coupling an apparatus to a surface and would have been capable of selecting between the known possibilities to achieve entirely predictable results.

3. Sensor Elements

Each Asserted Claim recites limitations directed to elements of "a sensor." Specifically, claim 1 recites " a sensor contained within said housing, said sensor forming an interactive zone defined by a range of said sensor, said sensor being comprised of an accelerometer, said interactive zone being aligned with said mounting surface and overlaying said mounting surface outside a perimeter of said housing, said sensor being in a fixed position relative to said engagement means, wherein a contact interaction associated with said mounting surface within said interactive zone is detected by said sensor as data signals, said contact interaction being comprised of an impact on said mounting surface, said data signals being comprised of vibration data of said contact interaction." Similarly, claim 2 recites, "wherein said interactive zone of said sensor aligns with said mounting surface, said interactive zone being coplanar with said mounting surface." And claim 5 recites, "wherein said contact interaction is comprised of a plurality of impacts on said mounting surface[.]"

Control systems with such sensors were well-known in the prior art. *See, e.g.*, Apple iPhone 4/6/6S; Apple Watch; Samsung Galaxy III; Nokia Phones; LG G2; Beyond Touch; TouchAnywhere; InvenSense MotionProcessing™ Technology Demo; Knock to Unlock; Knock Knock; toktoktok; Yeo; Li; Murakoshi; Newton; Kasar; Wehrenberg; Johnson; MS; Yun; Khaira; Chen; Linjama; NXP Freescale Semiconductor MMA8450Q; Bosch Sensortec BMA250/BMA280/BMA282; STMicroelectronics accelerometers (e.g., LSM330DLC, LIS331DLH, LIS3LV02DL, and LIS3LV02DQ); Analog Devices ADXL345 and/or ADXL311; TDK MPU-6000; Kionix – KGF01; Wehrenberg 013; Kim; Carullo; CN103067630; Slupsky; Avrahami; CN202502390; O'Reilly.

To the extent any anticipatory reference is found not to include the claimed sensor elements, as noted in the above-referenced charts, it would have been obvious in view of Apple

iPhone 4/6/6S; Apple Watch; Samsung Galaxy III; Nokia Phones; LG G2; Beyond Touch; TouchAnywhere; InvenSense MotionProcessing™ Technology Demo; Knock to Unlock; Knock Knock; toktoktok; Yeo; Murakoshi; Newton; Kasar; Wehrenberg; Johnson; MS; Yun; Khaira; Chen; Linjama; NXP Freescale Semiconductor MMA8450Q; Bosch Sensortec BMA250/BMA280/BMA282; ST Microelectronics accelerometers (e.g., LSM330DLC, LIS331DLH, LIS3LV02DL, and LIS3LV02DQ); Analog Devices ADXL345 and/or ADXL311; TDK MPU-6000; Kionix – KGF01; Wehrenberg 013; Kim; Carullo; CN103067630; Slupsky; Avrahami; CN202502390 and/or O'Reilly to include these features. In addition to the reasons identified above, one skilled in the art would have been motivated to make this modification at least because a sensor, particularly an accelerometer, is a conventional component used in a control system to create an interactive zone and to detect vibrations generated from user interactions within that interaction zone. *See, e.g.*, Johnson at 9:20-21 ("As a non-limiting example, an accelerometer 16, well known to those skilled in the art, detects acceleration."); Kasar at [0007] ("One particular embodiment employs an accelerometer within the docketing station configured to sense vibration of a surface on which the docketing station and electronic device are disposed."); Khaira at [0008] ("An accelerometer might be realized in any relevant technology, such as integrated Circuit (i.e. micro electro-mechanical systems, i.e. MEMS), gravity gradiometers, piezoelectric, piezoresistive, capacitive, quantum tunneling, etc."); Bess at Abstract; Avrahami at [0009] ("For example, a mobile phone can utilize a built-in accelerometer to detect the tap of a user's finger on the surface surrounding the phone, determine the location of the tap and perform an action depending on where the tap occurred."); *id.* at [0040] ("Modifications to current mobile devices to implement technologies described herein may only need to be software modifications, as many current mobile devices already possess built-in accelerometers and gyroscopes that detect device movement.").

4. Gesture Recognition and Control Elements

Each asserted claims recites limitations directed to gesture recognition and control. For example, claim 1 recites "determining a data pattern corresponding to said data signals of said

contact interaction and matching said data pattern with a gesture profile, said gesture profile being associated with a command." Similarly, claim 4 recites, "said data signals having a respective defined peak corresponding to each impact, a defined time period after a last defined peak, said data pattern being comprised of each defined peak and said defined time period after said last defined peak." And claim 5 recites, "said data signals having a respective defined peak corresponding to each impact, a measured time period between each defined peak, and a defined time period after a last defined peak, said data pattern being comprised of each defined peak, each measured time period, and said defined time period after said last defined peak."

Control systems with such gesture recognition functionality were well-known in the prior art. *See, e.g.*, Apple iPhone 6; Apple iPhone 6S; Apple Watch; Knock to Unlock app; Knock Knock app; Knock Knock system; TouchAnywhere; InvenSense MotionProcessing™ Technology Demo; Beyond Touch; Zhang-UbiComp 2013; Zhang-UIST 2013; Zhang 2015; Zhang 2016; Samsung Galaxy III; MgGrath 2014; LG G2; Nokia Phones; Ronkainen; Haggman; Li; Kasar; Wehrenberg; Chen; Culbert; Avrahami; Linjama; MS; Gargi; Yun; Khaira; Johnson; Sachs; Kim; Lee; Hudson; Tuck; Bosch Sensortec BMA250/BMA280/BMA282; NXP Freescale Semiconductor MMA8450Q; Analog Devices ADXL345; TDK MPU-6000; Heo; Hinckley; toktoktok; Murakoshi; Bess; CN202502390; Krum.

To the extent any anticipatory reference is found not to include the claimed gesture recognition functionality, as noted in the above-referenced charts, it would have been obvious in view of Apple iPhone 6, Apple iPhone 6S, Apple Watch, Knock to Unlock app, Knock Knock app, Knock Knock system, TouchAnywhere, InvenSense MotionProcessing™ Technology Demo, BeyondTouch, Zhang-UbiComp 2013, Zhang-UIST 2013, Zhang 2015, Zhang 2016, Samsung Galaxy III, MgGrath, LG G2, Nokia Phones, Ronkainen, Haggman, Li, Kasar, Wehrenberg, Chen, Culbert, Avrahami, Linjama, MS, Gargi, Yun, Khaira, Johnson, Sachs, Kim, Lee, Hudson, Tuck, Bosch Sensortec BMA250/BMA280/BMA282, NXP Freescale Semiconductor MMA8450Q, Analog Devices ADXL345, TDK MPU-6000, Heo, Hinckley, toktoktok, Murakoshi, Bess, CN202502390, Pryor, and/or Krum to include this feature. In addition to the reasons identified

above, one skilled in the art would have been motivated to make this modification for at least the following reasons:

- Improving accessibility. *See, e.g.*, Linjama at [0002] ("Traditionally the user controls the device by pressing keys or other controls located on a limited area on the surface of the device. The system response is presented in graphical display. This type of user interface is not very usable e.g. in the following cases. If the device is very small with small keys in the keyboard and the user has thick gloves in his/hers hand, there is no access to keys. If the device is very small with a small display and there is limited sight or the user does not wear glasses, it is difficult for the user to have access to the display."), [0005] ("The present invention describes a solution for interaction with handheld or wearable device by providing at least some limited control of the device other than e.g. pressing a specific key in the keyboard. The method of the present invention is a combination of using a motion sensor tuned for sensing the control action (e.g. a tap) of the user and tactile feedback pulse signal, which is perceivable in a wide range of conditions."); Pryor at [0008] ("There exists also a need for devices … to insure the general well being of seniors and disabled persons living at home. For those who are sight impaired or under stress, there is also a need for easier to see, easier to operate and less distracting controls."); Gargi at [0015] ("Force-triggered non-visual responses can also serve as an accessibility feature for users who have a visual impairment, in some examples."); Avrahami at [0010] ("Extending the interaction space of a device allows users to interact with the device with their whole hand or both hands, instead of just with one or a few fingers (that typically only interact with a touch screen or control buttons).").
- Increasing the number of input modalities and/or extending the input language of a smartphone (e.g., allowing the phone to be used eyes-free with the phone in a user's pocket, purse, or armband while walking, or holding the phone with two hands;

allowing for user input without occluding the limited screen area with the fingers; allowing for indirect interaction, by touching the surface (e.g., a table) on which the phone is placed). *See, e.g.*, Zhang-UbiComp13 at Abstract; Zhang 2015; *see also* Tuck ("Tapping is a new way that users employ interacting with hand held products that have an integrated accelerometer. For example, a single tap can be used to silence the sound; a double tap could be used to send an incoming call directly to voicemail."); Li at Abstract ("A supplemental surface area allows gesture recognition on outer surfaces of mobile devices. Inputs may be made without visual observance of display devices. Gesture control on outer surfaces permits socially acceptable, inconspicuous interactions without overt manipulation."); Ms at [0003] ("The particular user input may involve a direct contact with a limited area surface (e.g., a button, a touchpad, etc.). The limited area surface may require user to view the limited area surface to interact with it. In addition, the limited area surface may also require a user to extract the electronic device from a container (e.g., a pocket, a wallet, a purse, a protective case, a cover, etc.). These requirements may cause a delay (e.g., a time to extract the device from the container, a time to locate the limited area surface, etc.) and/or may cause a user to decide not to access the device. The delay or the failure to access the device may result in a disturbance (e.g., a phone ring) and/or an undesired result (e.g., a missed call, a transfer to voicemail, a different music track, a distraction, a loss of vehicle control, a missed direction, etc.). The undesired result may further result in an additional delay and/or inefficiency (e.g., an access to voicemail, a u-turn to find a missed location, a repeat of an already heard audio segment, etc.)."); McGrath at 215 ("To access rich functionalities and data items on a mobile device, a user often needs to navigate dep hierarchies of interfaces and deal with mode-switching issues, which can be frustrating, time consuming and error-prone. Thus, it is important to enable new input events to expand the bandwidth of mobile interaction."); Kim at [0005]

("Mobile devices are getting smaller and smaller for portability these days. The reduction in size limits the space available for input devices (such as buttons and keypads). Many researchers have been studying gesture recognition to remove traditional input devices. In certain environments, a simple motion can be a more effective input. The advent of MEMS (Micro-Electro-Mechanical System) technology dramatically reduced the size of accelerometers which can detect an object's motion. Tapping is a very simple motion. It is intuitive and not necessary to learn. If tapping a device anywhere on its surface could be used to control the device, then it would be a unique input methodology."); https://www.eetimes.com/theres-more-to-mems-than-meets-the-iphone/ ("The STMicroelectronics accelerometer used in the iPhone supplies analog acceleration values for all three directions, covering a range of ±2 g's. That makes it suitable not only for sensing orientation but also for applications that Apple could add at any time. … Besides intelligent power management, there are about a dozen other applications of consumer devices that make full use of a MEMS accelerometer's capabilities, according to Freescale Semiconductor Inc. (Austin, Texas), whose three-axis accelerometers have the built-in ability to recognize single and double taps. … 'The accelerometer can recognize any type of motion, and different motion patterns can trigger different menu functions,' said Michelle Kelsey, inertial sensor products marketing manager at Freescale."); Ronkainen at 263 ("In real life usage contexts of mobile devices, one often runs into the problem that such devices are designed for handheld use. However, in practice the devices spend most of their time not held in the hand but stored in a pocket or bag. It would often be beneficial to perform an initial action for a task whilst keeping the device in storage – for instance, silence a ringtone before picking up a phone and answering a call."); Gargi at [0015] ("Generating force-triggered non-visual responses can enable a user to access functionality of a computing device without having to go through the process

of unlocking or turning on the device's screen, and without directly handling the computing device. A user can make use of functions of the computing device while the computing device remains in the user's pocket, with the user tapping the device through the cloth of the user's pants, for example. A user can also tap or squeeze a computing device to activate certain features without having to look at the computing device, such as when the user is driving."); Culbert at [0003] ("One problem with existing portable media devices such as cellular telephones is that users can become distracted from other activities while interfacing with the media device's video display, graphical user interface (GUI), and/or keypad. For example, a runner may carry a personal media device to listen to music or to send/receive cellular telephone calls while running. In a typical personal media device, the runner must look at the device's display to interact with a media application in order to select a song for playing. Also, the user likely must depress the screen or one or more keys on its keypad to perform the song selection. These interactions with the personal media device can divert the user's attention from her surroundings which could be dangerous, force the user to interrupt her other activities, or cause the user to interfere with the activities of others within her surroundings. Accordingly, there is a need for providing a user interface in a personal media device that minimizes either or both a user's physical and visual interactions with the personal media device, especially while the user is performing other activities that require, for example, the user's visual senses."); MPU-6000 Spec at 7 ("MotionInterface™ is becoming a 'must-have' function being adopted by smartphone and tablet manufacturers due to the enormous value it adds to the end user experience. In smartphones, it finds use in applications such as gesture commands for applications and phone control, enhanced gaming, augmented reality, panoramic photo capture and viewing, and pedestrian and vehicle navigation. With its ability to precisely and accurately track user motions, MotionTracking technology can convert

handsets and tablets into powerful 3D intelligent devices that can be used in applications ranging from health and fitness monitoring to location-based services. Key requirements for MotionInterface enabled devices are small package size, low power consumption, high accuracy and repeatability, high shock tolerance, and application specific performance programmability – all at a low consumer price point.”).

- Simplifying the control of a device. *See, e.g.*, Khaira at [0004] (“There is a trend in the control of electronics to attempt to simplify the user interface. The use of voice recognition is the direction that is currently the most common to address this. There is an additional way to greatly simplify the control of a Tabletop Speaker System (TSS) and that is through the use of physical gestures instead of buttons, dials and sliders. This can be achieved by reducing the number of controls to a single “magic” button and including accelerometer and proximity detection to the TSS. The inclusion of these detectors makes it possible to determine that a user is tapping the case or gesturing (hand movement near the TSS).”); Haggman at [04] (“There is potential for confusion among users as more functions are combined into smaller and fewer buttons.”); McGrath at 215 (“The capacitive touchscreen, as the major input medium of mobile devices, has been overloaded with interaction behaviors. To access rich functionalities and data items on a mobile device, a user often needs to navigate dep hierarchies of interfaces and deal with mode-switching issues, which can be frustrating, time consuming and error-prone.”); Hudson at Abstract (“We introduce Whack Gestures, an inexact and inattentive interaction technique. This approach seeks to provide a simple means to interact with devices with minimal attention from the user – in particular, without the use of fine motor skills or detailed visual attention (requirements found in nearly all convention interaction techniques. For mobile devices, this could enable interaction without ‘getting it out,’ grasping, or even glancing at the device.”); Ronkainen at Abstract

("By carefully designing the user interface, the tap can be used to activate logically similar functionality on the devices, leading to a simple but useful interaction method.").

- Allowing touch-enhanced motion gestures and motion-enhanced touch gestures, such as distinguishing between hard and soft taps. *See, e.g.*, Hinckley at Abstract ("Hybrid touch + motion gestures exhibit interaction properties that combine the strengths of multitouch with those of motion sensing. This affords *touch-enhanced motion* gestures … [and] *motion-enhanced touch* …") (emphasis original); *see also id*. at 801 ("The widespread availability of mobile devices with both touch and motion-sensing presents an opportunity to explore novel interaction techniques that leverage synergistic roles for touch and motion as complementary modalities."); Heo at Abstract ("We introduce an interaction technique that increases touch screen input vocabulary by distinguishing a strong tap from a gentle tap without the use of additional hardware.").
- Allowing a driver to input commands without diverting their eyes from the road. *See, e.g.*, Krum at [0002]-[0006], [0011].
- Improving the durability of the interface. *See, e.g.*, Ms at [0004] ("The limited area surface may also contain a moving part (e.g., a button mechanism) and/or an unsealed edge (e.g., a crack next to a touchpad edge and/or a button edge). The moving part may allow a foreign substance (e.g., a fluid and/or a dirt) to enter a housing for the electronic device. The foreign substance may accelerate a breakdown of the moving part and/or a component of the electronic device (e.g., a processor, a memory, a hard drive, a speaker, a microphone, etc.). The breakdown of the moving part and/or the component of the electronic device may prevent the electronic device from operating, which may result in a further delay and/or inefficiency (e.g., a repair cost, a replacement cost, etc.)."); Haggman at [03].

- Preventing inadvertent control inputs that may result in delay and/or inefficiency. *See, e.g.*, Ms at [0005] ("the particular user input may involve a sound greater than a threshold volume. By exceeding the threshold volume, the sound may cause a disturbance. The audible sound may also be easily generated by environmental sources, which may cause the electronic device to be controlled in undesired ways (e.g., a call disconnect, a mute, a video end, a power on, a power off, etc.). These undesired effects may also result in a delay and/or inefficiency.").
- Allowing a phone to effectively identify the specific command based on a user's gesture pattern.
- Saving processing power.

5. Server Elements

Each asserted claim recites limitations directed to elements of "a server." Specifically, claim 1 recites: "a server in communication with said sensor, said server being comprised of a routing module, a processing module [that performs the gesture recognition] being connected to said routing module [that receives the data signals from the sensor], and an output module connected to said processing module" wherein "said output module transmit[s] said command to said receiving module [of a terminal device]."

Control systems comprising such a server were well-known in the prior art. *See, e.g.*, Sharp KK; Orr; Khaira; Kasar; Johnson; Yeo; Li; Newton; Wehrenberg; Chen; Avrahami; Murakoshi; Mutagi; Bump; Bess; Gargi; Yun.

To the extent any anticipatory reference is found not to include the claimed server, as noted in the above-referenced charts, it would have been obvious in view of Sharp KK, Orr, Khaira, Kasar, MS, Johnson, Yeo, Li, Newton, Wehrenberg, Chen, Avrahami, Murakoshi, Mutagi, Bump, Bess, Gargi, and/or Yun to include this feature. In addition to the reasons identified above, one skilled in the art would have been motivated to make this modification at least because processing of the vibratory signals arising from the user interactions at the surface could be offloaded to a server, including a cloud-based server. Processing the vibratory signals at a server would offload

processing from the apparatus, requiring less processing power at the apparatus and potentially decreasing the size of the apparatus. *See, e.g.*, Johnson at 5:50-58 ("As used herein a mobile device includes, but is not limited to, a cell phone, such as Apple's iPhone®, other portable electronic devices, such as Apple's iPod Touches®, Apple's iPads®, and mobile devices based on Google's Android® operating system, and any other portable electronic device that includes software, firmware, hardware, or a combination thereof that is capable of at least receiving the signal, decoding if needed, exchanging information with a server to verify information."); *id.* at 29:9-16 ("Therefore, every component forms part of the cloud which comprises servers, applications and clients as defined above. The cloud can be in communication with the intelligent door lock system 10, the vibration tapping sensing device of the mobile device 210, and the like. In one embodiment, the cloud includes all or a portion of the back-end 68 elements. Communication with the vibration tapping sensing device 11 can be via the cloud."); Avrahami at [0050] ("Example data includes web pages, text messages, images, sound files, video data, classifier training data or other data sets to be sent to and/or received from one or more network servers or other devices by the device 600 via one or more wired or wireless networks, or for use by the device 600."); Sharp KK at Abstract ("This equipment operation device generates audio information data containing the content of speech audio inputted in order to remotely operate equipment controlled by the equipment operation device in question or another equipment operation device, and transmits the audio information data to an audio analysis server. The audio analysis server analyzes the received audio information data, determines the equipment to be operated and the command content, and generates a command code corresponding to the result of the determination. The audio analysis server transmits the command code to the equipment operation device that controls the equipment to be operated. The equipment operation device controls the actuation of the equipment to be controlled by the equipment operation device in question in accordance with the received command code."); Orr at [0027] ("Server system 110 can provide server-side functionalities for any number of clients residing on a respective user device 102"); Bess at [0041] ("A processing device may be … a server…").

Using a sever may also allow the sensor data to be combined with additional data that may not necessarily be available to the device comprising the sensor. *See, e.g.*, Bump; https://www.zdnet.com/home-and-office/networking/eight-burning-questions-for-bump-co-founder-jake-mintz/ ("When two phones bump, software on the phone sends up a variety of sensor data to an algorithm running on the Bump servers -- data like the location of the phone, the accelerometer readings, the IP address, etc. The algorithm looks at all the bumps coming in from around the world and figures out exactly which two phones felt the same physical bump in the real world. From there, Bump can simply route whatever information is to be sent from one phone to the other, or initiate any other type of interaction between the two phones.").

6. Terminal Device Elements

Each asserted claim recites limitations directed to "a terminal device." For example, claim 1 recites, "a terminal device being comprised of a receiving module and means for initiating activity of said terminal device corresponding to said command, said terminal device being in communication with said server, [and] said output module transmitting said command to said receiving module." And claim 9 recites, "an additional terminal device being comprised of an additional receiving module and additional means for initiating activity of said additional terminal device corresponding to an additional command, said additional terminal device being in communication with said server, said output module transmitting said additional command to said additional receiving module."

Control systems with such terminal devices were well-known in the prior art. *See, e.g.*, Kasar; Gargi; Wehrenberg; Chen; Yeo; CN202502390; Newton; Yun; Haggman; Li; Murakoshi; Sharp KK; Orr; Mutagi; Ms; Johnson; Linjama; Khaira; Ha; CN103067630; KR101239177; Slupsky; Avrahami; Ronkainen; Ronkainen Presentation; Hudson; Heo; Hinckley; McGrath; Kuhnel; Tuck; Pryor; Bess; Krum; Apple iPhone 6; Apple Watch; HomeKit; Samsung Galaxy III; Nokia Phones; LG G2; Knock Knock app; Knock to Unlock app; AirPlay; Apple Remote app; Alfred Remote app; TouchAnywhere; InvenSense MotionProcessing™ Technology Demo;

BeyondTouch; Zhang-UbiComp 2013; Zhang-UIST 2013; Zhang 2015; Zhang 2016; toktoktok; Kuhnel; Ha; Marks; Park Seok-gyu.

To the extent any anticipatory reference is found not to include the claimed terminal device(s), it would have been obvious in view of Kasar, Gargi, Wehrenberg, Chen, Yeo, CN202502390, Newton, Yun, Haggman, Li, Murakoshi, Sharp KK, Orr, Mutagi, Ms, Johnson, Linjama, Khaira, Ha, CN103067630, KR101239177, Slupsky, Avrahami, Ronkainen, Ronkainen Presentation, Hudson, Heo, Hinckley, McGrath, Kuhnel, Tuck, Pryor, Bess, Krum, Apple iPhone 6, Apple Watch, HomeKit, Samsung Galaxy III, Nokia Phones, LG G2, Knock Knock app, Knock to Unlock app, AirPlay, Apple Remote app, Alfred Remote app, TouchAnywhere, InvenSense MotionProcessing™ Technology Demo; BeyondTouch, Zhang-UbiComp 2013, Zhang-UIST 2013, Zhang 2015, Zhang 2016, toktoktok, Kuhnel, Ha, Marks, and/or Park Seok-gyu to include this feature. In addition to the reasons identified above, one skilled in the art would have been motivated to make this modification at least because "[m]obile phones seem to present the perfect user interface for interacting with smart environments, e.g. smart-home systems, as they are nowadays ubiquitous and equipped with an increasing amount of sensors and interface components, such as multi-touch screens." Kuhnel at Abstract; *see also* CN103067630 at Abstract ("The method of generating the wireless control command through the gesture movement of the mobile phone makes full use of the mobile phone. . . ."). Furthermore, "having a dedicated remote controller for each controlled device is not desirable when there are a plurality of controlled devices. Consequently, a remote controller often controls a plurality of devices." Ha at [0001]; *see also id.* at [0002] ("There is a real market need to facilitate controlling a plurality of controlled devices through a remote controller by a user."). In addition, by "control[ling] a plurality of controlled members" via "the gesture movement of the mobile phone," "[t]he number of remote controls is greatly reduced," and "the method of generating the wireless control command through the gesture movement of the mobile phone provides convenience for work and lives of people." CN103067630 at Abstract.

A skilled artisan would have been further motivated to combine a mobile device with one or more terminal devices (e.g., other mobile phones) to exchange contact information or initiate any other type of interaction between mobile devices. *See, e.g.*, Knock Knock app; https://www.engadget.com/2015-08-19-knock-knock-app.html ("Say you've just met someone at a party. It turns out you guys go to the same school, hang out at the same coffee shops and are both really into John Steinbeck. Now it's time for you to part ways and you want to keep in touch, but it seems a little forward to just ask for the person's phone number since you barely know each other. But if both of you have a new app called Knock Knock, you could extend him or her your contact info by just knocking twice on your phone (they would then have to knock twice on their phone to reciprocate)."); Bump; https://www.zdnet.com/home-and-office/networking/eight-burning-questions-for-bump-co-founder-jake-mintz/ ("When two phones bump, software on the phone sends up a variety of sensor data to an algorithm running on the Bump servers -- data like the location of the phone, the accelerometer readings, the IP address, etc. The algorithm looks at all the bumps coming in from around the world and figures out exactly which two phones felt the same physical bump in the real world. From there, Bump can simply route whatever information is to be sent from one phone to the other, or initiate any other type of interaction between the two phones."). Notably, the Knock Knock and Bump apps were designed and marketed to be used with mobile phones like the iPhone 6.

A skilled artisan would have been still further motivated to combine a mobile device with another password protected terminal device (e.g., a laptop computer) to manage the user's passwords. *See, e.g.*, Knock to Unlock app; https://katu.com/news/local/portland-startup-called-knock-aims-to-kill-the-password ("Using low-energy Bluetooth technology and the accelerometer found in modern phones, Knock aims to replace the tedium of remembering countless passwords."). Like the Knock Knock app, the Knock to Unlock app was also designed and marketed to be used with mobile phones like the iPhone 6.

VII. INVALIDITY UNDER 35 U.S.C. §112

A. Indefiniteness

Section 112(b) includes a definiteness requirement: "[t]he specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention." 35 U.S.C. § 112(b). "[A] patent is invalid for indefiniteness if its claims, read in light of the patent's specification and prosecution history, fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention." *Nautilus, Inc. v. Biosig Instruments, Inc.*, 134 S. Ct. 2120, 2124 (2014).

The definiteness requirement requires that the claim must set forth what the applicant regards as the invention and do so with sufficient particularity and definiteness. *Allen Eng'g Corp. v. Bartell Indus.*, 299 F.3d 1336, 1348 (Fed. Cir. 2002). Where it would be apparent to one of skill in the art, based on the patent specification, that the "invention" set forth in a claim is not what the patent applicant regarded as the invention, the claim is invalid. *Id.*

Based on Apple's present understanding of the Asserted Claims and Plaintiff's apparent interpretation of these claims as reflected in its Infringement Contentions, the following limitations of the Asserted Claims fail to satisfy the requirements of § 112(b) because the precise scope of at least the terms listed below cannot be determined with reasonable certainty by a skilled artisan when reading the claims in light of the specification and prosecution history.

- Claim 1:
  - "wherein a contact interaction associated with said mounting surface within said interactive zone is detected by said sensor as data signals, said contact interaction being comprised of an impact on said mounting surface, said data signals being comprised of vibration data of said contact interaction … said contact interaction generating said data signals of said sensor through said transmission portion"
    - Under Haptic's interpretation of the Asserted Claims, the specification of the Asserted Patent fails to provide a sufficiently

clear indication of the scope or meaning of this term. For example, it is not reasonably clear what constitutes a "contact interaction being comprised of an impact on said mounting surface." It also not reasonably clear what constitutes a sensor detecting a contact interaction as data signals that are generated through the transmission portion.

- "routing module … said routing module receiving said data signals from said sensor"
  - This term is subject to 35 U.S.C. 112(f) and the specification fails to disclose adequate corresponding structure to achieve the claimed function.
- "processing module … said processing module determining a data pattern corresponding to said data signals of said contact interaction and matching said data pattern with a gesture profile"
  - This term is subject to 35 U.S.C. 112(f) and the specification fails to disclose adequate corresponding structure to achieve the claimed function.
- "output module … said output module transmitting said command to said receiving module"
  - This term is subject to 35 U.S.C. 112(f) and the specification fails to disclose adequate corresponding structure to achieve the claimed function.
- "receiving module"
  - This term is subject to 35 U.S.C. 112(f) and the specification fails to disclose adequate corresponding structure to achieve the claimed function.

- Claim 9:

- "additional receiving module"
  - This term is subject to 35 U.S.C. 112(f) and the specification fails to disclose adequate corresponding structure to achieve the claimed function.

B. Written Description

35 U.S.C. § 112 includes a written description requirement: "The specification shall contain a written description of the invention…." 35 U.S.C. § 112(a). "To satisfy the written description requirement, a patent applicant must convey with reasonable clarity to those skilled in the art that, as of the filing date sought, he or she was in possession of the invention." *ICU Medical Inc. v. Alaris Medical Systems, Inc.*, 558 F.3d 1368, 1377 (Fed. Cir. 2009) (internal quotation marks and citations omitted); *see also Synthes USA, LLC v. Spinal Kinetics, Inc.*, 734 F.3d 1332, 1340 (Fed. Cir. 2013). "The test [for written description support] requires an objective inquiry into the four corners of the specification from the perspective of a person of ordinary skill in the art. Based on that inquiry, the specification must describe an invention understandable to that skilled artisan and show that the inventor actually invented the invention claimed." *Ariad Pharms., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010) (*en banc*).

The specification must describe the claimed invention in sufficient detail so that a skilled artisan can recognize what is claimed. "The appearance of mere indistinct words in a specification or a claim, even an original claim, does not necessarily satisfy that requirement." *University of Rochester v. G.D. Searle & Co.*, 358 F.3d 916, 923 (Fed. Cir. 2004) (internal quotation marks and citations omitted).

Based on Apple's present understanding of the Asserted Claims and Plaintiff's apparent interpretation of these claims as reflected in its Infringement Contentions, the following limitations of the Asserted Claims fail to satisfy the requirements of Section 112 for at least the following limitations:

- Claim 1:

- "wherein a contact interaction associated with said mounting surface within said interactive zone is detected by said sensor as data signals, said contact interaction being comprised of an impact on said mounting surface, said data signals being comprised of vibration data of said contact interaction … said contact interaction generating said data signals of said sensor through said transmission portion"
    - The specification of the Asserted Patent does not disclose a contact interaction that is detected by the sensor as data signals generated through the transmission portion. The specification does not convey to a skilled artisan that any named inventor of the Asserted Patent was in possession of the technology alleged to infringe.
- "routing module … said routing module receiving said data signals from said sensor"
    - This term is subject to 35 U.S.C. 112(f) and the specification fails to disclose adequate corresponding structure to achieve the claimed function.
- "processing module … said processing module determining a data pattern corresponding to said data signals of said contact interaction and matching said data pattern with a gesture profile"
    - This term is subject to 35 U.S.C. 112(f) and the specification fails to disclose adequate corresponding structure to achieve the claimed function. Furthermore, the specification does not describe the full scope of this limitation at least under Haptic's apparent interpretation of the Asserted Claims as reflected in its Infringement Contentions. The specification provides no algorithms for determining a data pattern corresponding to the data signals of the contact interaction or matching the data patterns with a gesture

profile and thus does not describe any algorithms used in the Accused Products that are alleged to be within the scope of this limitation. The specification also does not convey to a skilled artisan that any named inventor of the Asserted Patent was in possession of the technology alleged to infringe.

- "output module … said output module transmitting said command to said receiving module"
  - This term is subject to 35 U.S.C. 112(f) and the specification fails to disclose adequate corresponding structure to achieve the claimed function.
- "receiving module"
  - This term is subject to 35 U.S.C. 112(f) and the specification fails to disclose adequate corresponding structure to achieve the claimed function.
- "said contact interaction generating said data signals of said sensor through said transmission portion"
  - The specification does not describe generating the claimed data signals of the sensor through the transmission portion. The specification does not convey to a skilled artisan that any named inventor of the Asserted Patent was in possession of the technology alleged to infringe.

- Claim 4:
  - "said data signals having a respective defined peak corresponding to each impact, a defined time period after a last defined peak, said data pattern being comprised of each defined peak and said defined time period after said last defined peak"

- The specification does not describe this limitation. The specification does not describe the alleged data signals having a defined peak that corresponds to an impact or a defined time period after a last defined peak. Nor does the specification describe the claimed data pattern. The specification also does not convey to a skilled artisan that any named inventor of the Asserted Patent was in possession of the technology alleged to infringe.

- Claim 5:
  - "said data signals having a respective defined peak corresponding to each impact, a measured time period between each defined peak, and a defined time period after a last defined peak, said data pattern being comprised of each defined peak, each measured time period, and said defined time period after said last defined peak"
    - The specification does not describe this limitation. The specification does not describe the alleged data signals having a defined peak that corresponds to an impact, a measured time period between each defined peak, or a defined time period after a last defined peak. Nor does the specification describe the claimed data pattern. The specification also does not convey to a skilled artisan that any named inventor of the Asserted Patent was in possession of the technology alleged to infringe.
- Claim 9:
  - "additional receiving module"
    - This term is subject to 35 U.S.C. 112(f) and the specification fails to disclose adequate corresponding structure to achieve the claimed function.

C. Enablement

35 U.S.C. § 112 includes an enablement requirement: "The specification shall contain a written description … of the manner and process of making and using [the invention], in such full, clear, concise and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same…." 35 U.S.C. § 112(a). To satisfy the enablement requirement, the disclosure "must teach those skilled in the art how to make and use the full scope of the claimed invention without 'undue experimentation.'" *Genentech, Inc. v. Novo Nordisk A/S*, 108 F.3d 1361, 1366 (Fed. Cir. 1997); *MagSil Corp. v. Hitachi Glob. Storage Techs., Inc.*, 687 F.3d 1377, 1381 (Fed. Cir. 2012); *Sitrick v. Dreamworks, LLC*, 516 F.3d 993, 999 (Fed. Cir. 2008). If a specification teaches away from a substantial portion of the claim or does not enable the full scope of the claim, there is no enablement. *AK Steel Corp. v. Sollac*, 344 F.3d 1234 (Fed. Cir. 2003); *see also MagSil Corp.*, 687 F.3d at 1383- 84 (Fed. Cir. 2012).

Based on Apple's present understanding of the Asserted Claims and Plaintiff's apparent interpretation of these claims as reflected in its Infringement Contentions, the following limitations of the Asserted Claims fail to satisfy the requirements of Section 112 for at least the following limitations:

- Claim 1:
  - "processing module … said processing module determining a data pattern corresponding to said data signals of said contact interaction and matching said data pattern with a gesture profile"
    - The specification does not enable the full scope of this limitation at least under Haptic's apparent interpretation of the Asserted Claims. For example, the specification provides no algorithms for determining a data pattern or matching the data patterns with a gesture profile. Accordingly, the specification does not teach a skilled artisan how to implement the algorithms used in the Accused Products that are alleged to perform the claimed functions.

VIII. INVALIDITY UNDER 35 U.S.C. § 101

To be patentable subject matter under § 101, a claim must be directed to one of four eligible subject matter categories: "new and useful process, machine, manufacture, or composition of matter." 35 U.S.C. § 101. "Claims that fall within one of the four subject matter categories may nevertheless be ineligible if they encompass laws of nature, physical phenomena, or abstract ideas." *Digitech Image Techs., LLC v. Elecs. for Imaging, Inc.*, 758 F.3d 1344, 1350 (Fed. Cir. 2014) (citing *Diamond v. Chakrabarty*, 447 U.S. 303, 309 (1980)). The Supreme Court established a two-step test for deciding the subject matter eligibility of claims under § 101. *Alice Corp. Pty. Ltd. v. CLS Bank Int'l*, 134 S. Ct. 2347, 2355 (2014). First, the claims must be analyzed to determine whether they are drawn to one of the statutory exceptions, *i.e.*, a patent ineligible concept: an abstract idea, a law of nature, or a natural phenomenon. *See id*. Second, the elements of the claims must be viewed both individually and as an ordered combination to see if there is an "inventive concept." *Id.*; *see also Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1335-36 (Fed. Cir. 2016); *In re TLI Communs. LLC Patent Litig.*, 823 F.3d 607, 613 (Fed. Cir. 2016) ("we find that the claims fail to recite any elements that individually or as an ordered combination transform the abstract idea of classifying and storing digital images in an organized manner into a patent-eligible application of that idea"). The claims are examined to determine if they merely invoke well-understood, routine, conventional components and activity to apply an abstract idea. *See, e.g., Elec. Comm'n Techs. v. ShoppersChoice.com*, 958 F.3d 1179, 1180-82 (Fed. Cir. 2020).

Under Haptics' apparent interpretation of the Asserted Claims, each Asserted Claim is directed to ineligible subject matter under 35 U.S.C. § 101 and applicable case law authority.[4] For

[4] *See, e.g.*, *Alice Corp. Pty. Ltd. v. CLS Bank Int'l*, 573 U.S. 208 (2014); *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66 (2012); *Trading Techs. Int'l, Inc. v. IBG, LLC*, 921 F.3d 1084 (Fed. Cir. 2019); *ChargePoint, Inc. v. SemaConnect, Inc.*, 920 F.3d 759 (Fed. Cir. 2019); *SAP America, Inc. v. InvestPic, LLC*, 898 F.3d 1161 (Fed. Cir. 2018); *Interval Licensing LLC v. AOL, Inc.*, 896 F.3d 1335 (Fed. Cir. 2018); *Aatrix Software, Inc. v. Green Shades Software, Inc.*, 882 F.3d 1121 (Fed. Cir. 2018); *Two-Way Media Ltd. v. Comcast Cable Commc'ns, LLC*, 874 F.3d 1329 (Fed. Cir. 2017), *cert. denied*, 139 S. Ct. 378 (2018); *Intellectual Ventures I LLC v. Capital One Fin. Corp.*, 850 F.3d 1332 (Fed. Cir. 2017); *Apple, Inc. v. Ameranth, Inc.*, 842 F.3d 1229 (Fed. Cir. 2016); *Affinity Labs of Texas, LLC v. DIRECTV, LLC*, 838 F.3d 1253 (Fed. Cir.

example, each Asserted Claim is directed to the abstract idea of tapping on a surface to control a device. *See Thunder Power New Energy Vehicle Dev. Co. Ltd. v. Byton N. Am. Corp.*, 340 F. Supp. 3d 922 (N.D. Cal. 2018), aff'd, 777 F. App'x 517 (Fed. Cir. 2019) (finding that claims in a patent describing a vehicle operating system that captured and processed gesture signals from a driver and passenger were directed to abstract idea); *Uniloc USA, Inc. v. ADP, LLC*, 772 F. App'x 890, 900 (Fed. Cir. 2019) (finding that the user inputs selecting icons (or menu items) to control software applications is abstract; "The focus of the claims here is on the abstract idea of using a desktop interface to access an application server"); *Pantech Corp. v. LG Elecs. Inc.*, No. 522CV00113RWSJBB, 2023 WL 6260004, at *3 (E.D. Tex. Sept. 26, 2023) ("merely adding another user interface manipulation (e.g., tapping a menu for a fifth time after claim 1 requires four taps) cannot change the nature of the claim or result in a different abstract idea."); *see also Yu v. Apple Inc.*, 1 F.4th 1010, 1043 (Fed. Cir. 2021) (holding that the claim was "directed to the abstract idea of taking two pictures (which may be at different exposures) and using one picture to enhance the other in some way"); *Chamberlain Grp. v. Techtronic Indus. Co.*, 935 F.3d 1341 (Fed. Cir. 2019) ("the broad concept of communicating information wirelessly, without more, is an abstract idea"); *CyberSource Corp. v. Retail Decisions, Inc.*, 654 F.3d 1366, 1372-73 (Fed. Cir. 2011) (a concept that "can be performed in the human mind . . . is merely an abstract idea and is not patent eligible under § 101"); *Solutran, Inc. v. Elavon, Inc.*, 931 F.3d 1161, 1168 (Fed. Cir. 2019) (finding that the "physical nature" or "physicality" of a claim "is not by itself enough to

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2016); *Elec. Power Grp., LLC v. Alstom S.A.*, 830 F.3d 1350 (Fed. Cir. 2016); *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327 (Fed. Cir. 2016); *Genetic Techs. Ltd. v. Merial L.L.C.*, 818 F.3d 1369 (Fed. Cir. 2016); *Intellectual Ventures I LLC v. Capital One Bank (USA)*, 792 F.3d 1363 (Fed. Cir. 2015); *Internet Patents Corp. v. Active Network, Inc.*, 790 F.3d 1343 (Fed. Cir. 2015); *OIP Techs., Inc. v. Amazon.com, Inc.*, 788 F.3d 1359 (Fed. Cir. 2015); *Content Extraction & Transmission LLC v. Wells Fargo Bank, Nat'l Ass'n*, 776 F.3d 1343 (Fed. Cir. 2014); *DDR Holdings, LLC v. Hotels.com, L.P.*, 773 F.3d 1245 (Fed. Cir. 2014); *buySAFE, Inc. v. Google, Inc.*, 765 F.3d 1350 (Fed. Cir. 2014); *Digitech Image Techs., LLC v. Elecs. for Imaging, Inc.*, 758 F.3d 1344 (Fed. Cir. 2014); *CyberSource Corp. v. Retail Decisions, Inc.*, 654 F.3d 1366 (Fed. Cir. 2011); *Automated Tracking Sols., LLC v. Coca-Cola Co.*, 723 F. App'x 989 (Fed. Cir. 2018); *EasyWeb Innovations, LLC v. Twitter, Inc.*, 689 F. App'x 969, 971 (Fed. Cir. 2017); *Yu v. Apple Inc.*, 1 F.4th 1040 (Fed. Cir. 2021).

exempt the claims from being directed to an abstract idea"); *Zyrcuits IP LLC v. Acuity Brands, Inc.*, No. CV 20-1306-CFC, 2021 WL 3287801 (D. Del. Aug. 2, 2021) (explaining that a claim "may use technical jargon, but that does not mean it teaches a technical solution").

As shown above and in the attached charts, under Plaintiff's apparent interpretation of the Asserted Claims, all the remaining claim elements were well-understood, routine, and/or conventional components of a mobile phone. Thus, each Asserted Claim fails to claim patentable subject matter because it merely ties an abstract idea to generic, well-known, and conventional components and it fails to recite any elements that individually or as an ordered combination transform the abstract idea into a patent-eligible application of that idea.

IX. DOCUMENT PRODUCTION PURSUANT TO PATENT LOCAL RULE 3-4

A. Protective Order

The Court has issued a Protective Order (Dkts. 78-3, 79). Apple's document production is made pursuant to the provisions of that Protective Order. As discussed below, Apple is also making source code available for inspection pursuant to the terms of the Protective Order.

B. Patent Local Rule 3-4(a) Production

Apple has produced documents sufficient to show the operation of the accused instrumentalities: APL-HAPTIC_00000001 - APL-HAPTIC_00000486; APL-HAPTIC_00086622 - APL-HAPTIC_00104210; APL-HAPTIC_00104212 - APL-HAPTIC_00171367; APL-HAPTIC_00172808 - APL-HAPTIC_00172915; APL-HAPTIC_00215547 - APL-HAPTIC_00248893; APL-HAPTIC_00248921 - APL-HAPTIC_00441967; APL-HAPTIC_00442281 - APL-HAPTIC_00482753; APL-HAPTIC_00482878 - APL-HAPTIC_00483477; APL-HAPTIC_00483480 - APL-HAPTIC_00483547; APL-HAPTIC_00523539 - APL-HAPTIC_00523554; APL-HAPTIC_00532317 - APL-HAPTIC_00532324. Apple has additionally made source code available for inspection regarding the accused instrumentalities at Fish and Richardson's San

Diego office, located at 12860 El Camino Real, Suite 400, San Diego, CA 92130. Apple reserves the right to supplement this production as the case progresses.

C. Patent Local Rule 3-4(b) Production

Apple has produced the prior art it is relying on pursuant to Patent L.R. 3-3(a): APL-HAPTIC_00000487 – APL-HAPTIC_00086621; APL-HAPTIC_00104211 – APL-HAPTIC_00104211; APL-HAPTIC_00171368 – APL-HAPTIC_00172807; APL-HAPTIC_00172916 – APL-HAPTIC_00215546; APL-HAPTIC_00248894 – APL-HAPTIC_00248920; APL-HAPTIC_00441968 – APL-HAPTIC_00442280; APL-HAPTIC_00483478 – APL-HAPTIC_00483479; APL-HAPTIC_00483548 - APL-HAPTIC_00523538; APL-HAPTIC_00523659 - APL-HAPTIC_00532316; APL-HAPTIC_00532325 - APL-HAPTIC_00532371. Apple reserves the right to supplement this production as the case progresses.

D. Patent Local Rule 3-4(c) Production

Apple has produced agreements that may be related to the accused instrumentalities or that may be comparable to a license that would result from a hypothetical reasonable royalty negotiation in this case: APL-HAPTIC_00523555 through APL-HAPTIC_00523658. Apple will be producing one additional confidential agreement on July 26, following expiration of the required notice period for production of the agreement. Apple reserves the right to supplement this production as the case progresses.

E. Patent Local Rule 3-4(d) Production

Apple has produced documents sufficient to show the sales, revenue, cost, and profits for the products accused of infringement: APL-HAPTIC_00482754 through APL-HAPTIC_00482877. Apple reserves the right to supplement this production as the case progresses.

F. Patent Local Rule 3-4(e) Production

Apple is not presently aware of any agreements outside those produced in response to Patent Local Rule 3-4(c) that may be used to support its damages case. Apple reserves the right to supplement this production as the case progresses.

Dated: July 15, 2024

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CERTIFICATE OF SERVICE

I am employed in the County of San Mateo, my business address is Fish & Richardson P.C., 500 Arguello Street, Suite 400, Redwood City, California 94063. I am over the age of 18 and not a party to the foregoing action.

I am readily familiar with the business practice at my place of business for collection and processing of correspondence for personal delivery, for mailing with United States Postal Service, for facsimile, and for overnight delivery by Federal Express, Express Mail, or other overnight service.

On July 15, 2024, I caused a copy of the following document(s):

DEFENDANT APPLE INC.'S DISCLOSURE OF INVALIDITY CONTENTIONS

to be served on the interested parties in this action as follows:

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x **ELECTRONIC MAIL:** Such correspondence was transmitted by electronic mail to the addressees' email address as stated above.

I declare under penalty of perjury that the above is true and correct. Executed on July 15, 2024 at San Jose, California.

/s/ Rachael Nelson
Rachael Nelson