UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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ALIVECOR, INC.,

Petitioner

v.

APPLE INC.,

Patent Owner

_____

Case No. IPR2023-00949

U.S. Patent No. 10,866,619 B2

_____

PETITION FOR *INTER PARTES* REVIEW

UNDER 35 U.S.C. §312 AND 37 C.F.R. §42.104

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LIST OF EXHIBITS

Exhibit	Short Name	Description
Ex. 1001	’619 Patent	U.S. Patent No. 10,866,619 B2 (“the ’619 Patent”)
Ex. 1002	’619 File History	Prosecution History of U.S. Patent No. 10,866,619 B2
Ex. 1003	Berger Declaration	Declaration of Dr. Ronald D. Berger
Ex. 1004	Kim	U.S. Patent No. 10,620,828
Ex. 1005	Jung	U.S. Patent Pub. No. 2016/0100499
Ex. 1006	Dunlap	U.S. Patent No. 9,651,513
Ex. 1007	Meyers	U.S. Patent Pub. No. 2015/0071509
Ex. 1008	Evans	U.S. Patent No. 8,694,793
Ex. 1009	Pare	U.S. Patent No. 6,131,464
Ex. 1010	Chaudhri	U.S. Patent No. 9,740,381
Ex. 1011	Choung	U.S. Patent Pub. No. 2015/0245514
Ex. 1012	Hwang	U.S. Patent No. 8,750,919
Ex. 1013	Polany	U.S. Patent No. 7,535,799
Ex. 1014	Choi	U.S. Patent Pub. No. 2017/0099742
Ex. 1015	Chang	U.S. Patent No. 10,133,910
Ex. 1016	Mittleman	U.S. Patent No. 8,367,958
Ex. 1017	Aapro	U.S. Patent No. 7,486,517
Ex. 1018	Vittu	U.S. Patent No. 9,973,669

Exhibit	Short Name	Description
Ex. 1019	Wagman	U.S. Patent No. 9,973,840
Ex. 1020	Dave	U.S. Patent Pub. No. 2013/0108082
Ex. 1021	Berger CV	Curriculum vitae of Dr. Ronald Berger
Ex. 1022	Kim-KR	KR 10-2016-0162565 and certified translation thereof
Ex. 1023	Kim-KR-Pub.	KR 10-2018-0062654 and certified translation thereof
Ex. 1024	National Judicial Caseload Profile	U.S. District Courts – National Judicial Caseload Profile (accessed via https://www.uscourts.gov/sites/default/files/fcms_na_distprofile0331.2022.pdf)
Ex. 1025	Complaint	Complaint for Patent Infringement, *Apple Inc., v. AliveCor, Inc.*, Case No. 4:22-cv-07608-HSG (N.D. Cal. 2022)

AliveCor, Inc. ("Petitioner") seeks IPR under 35 U.S.C. §§311–319 and 37 C.F.R. §42 of Claims 11-20 ("the Challenged Claims") of Patent No. 10,866,619 ("'619 Patent"). Petitioner requests cancellation of the Challenged Claims.

I. STANDING UNDER 37 C.F.R. §42.104(a)

Petitioner certifies that the '619 Patent is available for IPR and that Petitioner is not barred or estopped from requesting IPR.

II. PAYMENT OF FEES

Petitioner authorizes Account No. 16-0605 to be charged.

III. OVERVIEW OF CHALLENGES AND RELIEF REQUESTED

Pursuant to 42.22(a)(1) and 42.104(b)(1)-(2), Petitioner requests cancellation of the Challenged Claims pursuant to the grounds below. Additional support is provided in the Declaration of Dr. Berger (Ex-1003).

Ground 1: Claims 11, 14, 16, and 19 are unpatentable under 35 U.S.C. §§102 and/or 103 over *Kim*.

Ground 2: Claims 11-14, and 16-20 are unpatentable under 35 U.S.C. §103 over *Kim*.

Ground 3: Claims 11-14, 16-17, are 19-20 are unpatentable under 35 U.S.C. §103 over *Jung* in view of *Meyers*.

Ground 4: Claims 11-17, and 19 are unpatentable under 35 U.S.C. §§ 102 and/or 103 over *Chang*.

IV. SUMMARY OF THE ’619 PATENT

A. The ’619 Patent’s Specification

The ’619 Patent relates generally to an electronic device with a biometric button assembly (*see* Ex. 1001, Abstract). According to the specification’s “Background” section, many traditional buttons were unable to sense biometric characteristics, and difficult to seal against liquid and contaminants (*id.*, 1:14-22). The ’619 Patent purported to solve these problems by describing “a button with a biometric sensor” having a “flexible conduit” that “cooperates with a seal to restrict ingress of contaminants into the electronic device” (*id.*, 4:18-28). Figure 2A (shown below) is a cross-sectional view of “biometric button assembly 210” (*id.*, 8:14-23):

Ex. 1001, Fig. 2A

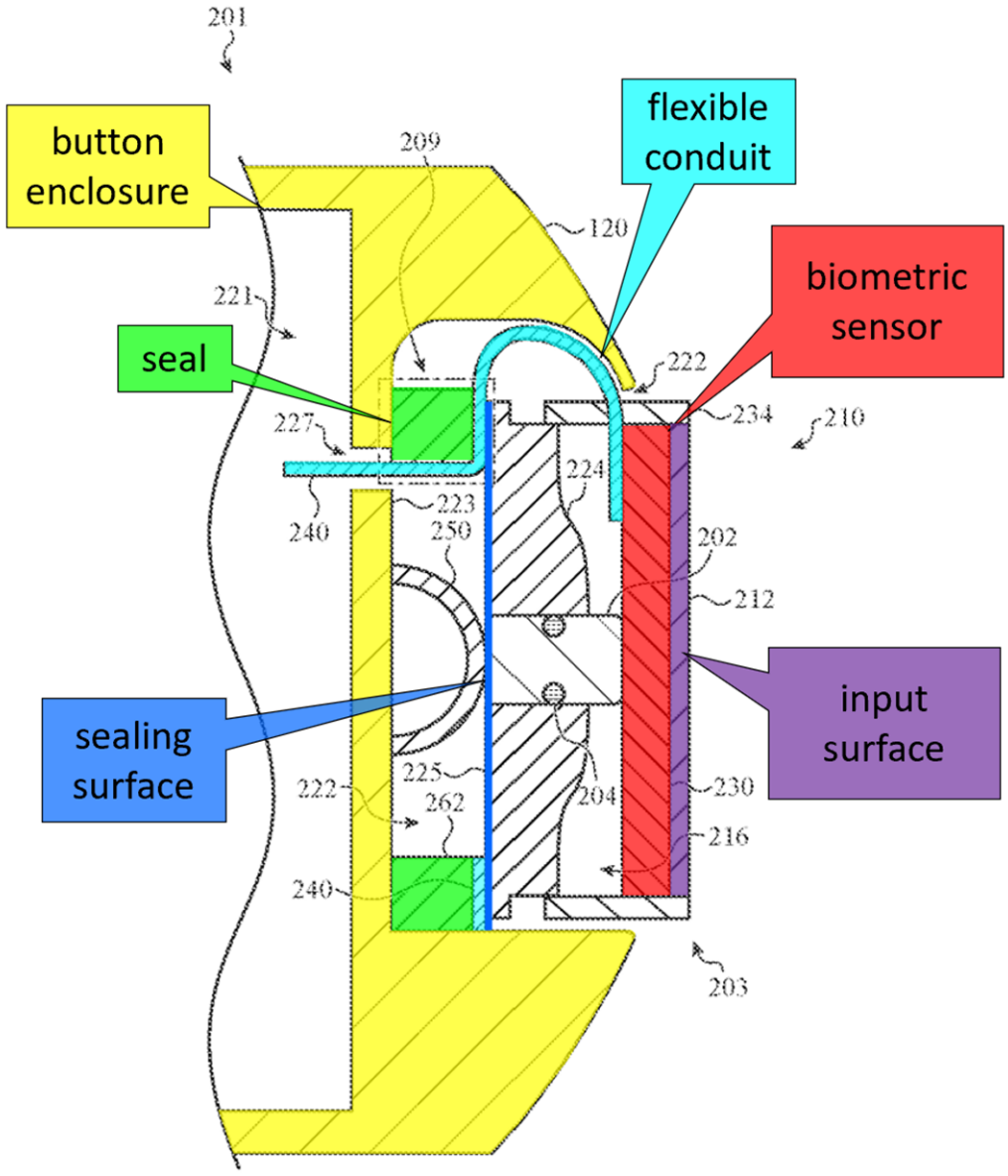


FIG. 2A

Figure 2A further shows "biometric button assembly 210 is disposed in an opening of an enclosure 120" (yellow) and "[t]he biometric button assembly 210 is configured to move or displace in response to an input to the input surface 212, *e.g.*, a user touch to the input surface" (purple) (*id.*, 8:24-34). Behind "input surface 212"

is "biometric sensor 230" (red), for example a fingerprint sensor that "produces an output signal in response to a user input ... such as a user touch" (*id.*, 3:63-4:17). Figure 2A also discloses the "flexible conduit 240" (teal) (*id.*, 9:11-16). This component "receives the output signal of the biometric sensor 230 and provides the output signal to the processor of the electronic device 100" (*id.*, 9:11-16).

The purported invention of the '619 Patent involves using the "flexible conduit" to "form part of a seal that blocks or inhibits the ingress of foreign debris or contaminants into the enclosure" (*id.*, 5:53-60). Specifically, Figure 2A discloses that "[t]he flexible conduit 240 portion stacked on top of the seal 262" (green) is "disposed below a sealing surface 225" (blue) "of the button assembly 210" (*id.*, 11:16-31). But "[o]ther configurations of the seal region 209 are possible. For example, a portion of the flexible conduit 240 may be positioned below the seal 262, such that a stack is formed of seal 262 then flexible conduit 240" (*id.*, 9:45-57). In this configuration, the "flexible conduit 240" "may form part of a seal that blocks or inhibits the ingress of foreign debris or contaminants into the enclosure" (*id.*, 5:53-60; Ex. 1003, ¶¶56-59).

B. The Prosecution History

The Examiner initially rejected all pending claims under §§102, 103 in view of U.S. Patent No. 9,972,459 and U.S. Patent Pub. No. 2016/0098016 (Ex. 1002, 144-153). Subsequently, Applicant and Examiner conducted an interview (Ex. 1002,

162-164), where the Examiner stated that "[p]ossible amendments further defining the relationship between the sealing surface, the flexible conduit and the portion of flexible conduit were discussed" (Ex. 1002, 163). In response, Applicant amended pending claims 1, 11, and 16 to state that a portion of the flexible conduit was "sandwiched" between either (1) the seal and the sealing surface or (2) the seal and the enclosure (Ex. 1002, 165-178). Applicant also amended pending claim 16 to incorporate the following limitations from then-pending claims 17 and 18:

- a flexible conduit electrically coupled to the fingerprint sensor and configured to transmit the output signal to the processor; and
- a seal positioned between the button housing and a surface of the opening.

(Ex. 1002, 172-173; Ex. 1003, ¶¶60-63).

V. SUMMARY OF THE PRIOR ART

A. Kim (Ex. 1004); Kim-KR (Ex. 1022)

Patent No. 10,620,828 ("*Kim*") is titled "Electronic Device Having Combined Button." *Kim* is prior art under at least 35 U.S.C. §102(a)(2) (AIA).

First, *Kim* meets the "ministerial requirements" of 35 U.S.C. §119. *Apple Inc., v. Telefonaktiebolaget LM Ericsson*, IPR2022-00341, Paper 10 at 14-21 (PTAB Sept. 14, 2022). For example, *Kim* claims priority to Korean patent application number 10-2016-0162565 (Ex. 1022) ("*Kim-KR*"), filed on December 1, 2016 (Ex.

1022, Cover). A certified translation of *Kim-KR* is also included in Exhibit 1022.[1] *Kim* properly claimed benefit to *Kim-KR* (Ex. 1001, (30)), was filed co-pending with *Kim-KR* (Ex. 1001, (22); Ex. 1022; Ex. 1023), and shared common inventors with *Kim-KR* (Ex. 1001, (72); Ex. 1022, 2-4). Thus, *Kim*, was effectively filed on December 1, 2016, and qualifies as prior art under AIA §102.

Second, *Kim-KR* describes the subject matter relied upon in *Kim*. *See* MPEP §2154.01(b) ("If the subject matter relied upon is described in the application to which there is a priority or benefit claim, the U.S. patent document is effective as prior art as of the filing date of the earliest such application, regardless of where filed."); *see also Apple Inc., v. Telefonaktiebolaget LM Ericsson*, IPR2022-00341, Paper 10 at 14-21 (PTAB Sept. 14, 2022). In the limitation-by-limitation analysis presented in Section VII, below, this Petition provides citations to Ex. 1004 and Ex. 1022, showing that every disclosure relied on in *Kim* was described in *Kim-KR*. *See* MPEP §§2151, 2154.01. Additionally, for efficient comparison of the subject matter

[1] *Kim-KR* was published without substantive edits on June 11, 2018. A copy of the publication (KR 10-2018-0062654), as well as a certified translation thereof is included as Ex. 1023 ("*Kim-KR-Pub.*"). Citations to *Kim-KR* likewise encompass the identical material present in *Kim-KR-Pub.*

described in *Kim* and *Kim-KR*, Petitioner provides a chart that compares the applicable excerpts/figures in *Kim* with the corresponding excerpts/figures in *Kim-KR* (Ex. 1003, ¶¶64-73, Appendix A). Indeed, *Kim's* disclosure and claims are materially similar to the disclosure and claims in *Kim-KR*.

Thus, *Kim-KR* fully supports the *Kim* disclosure and claims, so *Kim* is entitled to an effective filing date of December 1, 2016.

B. Jung (Ex. 1005)

Patent Pub. No. 2016/0100499 ("*Jung*") is titled "Electronic Device Adopting Key-Waterproof Structure and Method for Waterproofing Key Thereof" and published on April 7, 2016. *Jung* is prior art under at least 35 U.S.C. §102(a)(1) (AIA) (Ex. 1003, ¶¶74-80).

C. Meyers (Ex. 1007)

Patent Pub. No. 2015/0071509 ("*Meyers*") is titled "Biometric sensor stack structure" and published on March 12, 2015. *Meyers* is prior art under at least 35 U.S.C. §102(a)(1) (AIA) (Ex. 1003, ¶¶81-87).

D. *Chang* (Ex. 1015)

Patent No. 10,133,910 ("*Chang*") is titled "Electronic device with key module and method of manufacturing the same" and was filed in the U.S. on January 20, 2017. *Chang* is prior art under at least 35 U.S.C. §102(a)(2) (AIA) (Ex. 1003, ¶¶88-93).

VI. LEVEL OF ORDINARY SKILL IN THE ART

A person of ordinary skill in the art ("POSITA") at the time of the alleged invention of the '619 Patent would have been a person with a working knowledge of physiological monitoring technologies, a Bachelor of Science degree in an academic discipline emphasizing the design of electrical, computer, or software technologies, and training or at least one to two years of related work experience with capture and processing of data or information, including but not limited to physiological monitoring technologies (Ex. 1003, ¶¶37-38). More education can supplement practical experience and vice versa (*id.*).

VII. THE CHALLENGED CLAIMS ARE UNPATENTABLE

A. Ground 1: Claims 11, 14, 16, and 19 are Unpatentable Under 35 U.S.C. §§102 and/or 103 over Kim

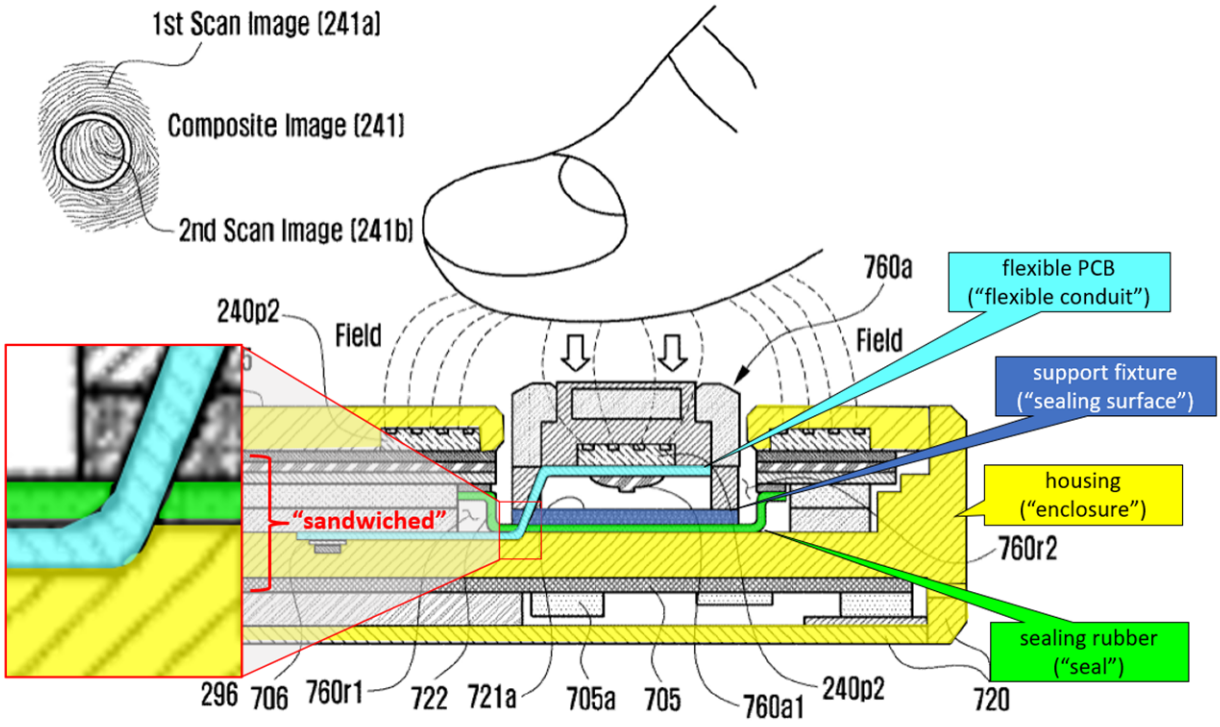
Kim discloses and/or renders obvious claims 11, 14, 16, and 19 of the '619 Patent.

1. Overview of Ground 1 (Kim)

Kim discloses an electronic device with a housing, a mechanical button located in an opening of the housing, and a processor located within the housing and connected to the mechanical button (Ex. 1004, Abstract; Ex. 1022, Abstract).

Annotated Figure 10(b), below, shows the flexible printed circuit board ("PCB") sandwiched between the sealing rubber and the housing (Ex. 1004, Fig. 10(b); Ex. 1022, Fig. 10(b); Ex. 1003, ¶¶64-73).

Ex. 1004, Fig. 10(b); Ex. 1022, Fig. 10(b)



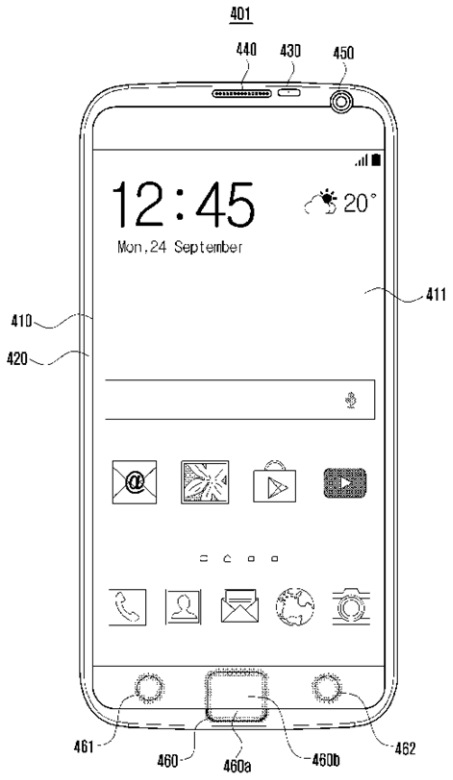
2. Claim 11

i. Claim 11: [11.pre] A fingerprint sensing system for a wearable device comprising:

Kim discloses element [11.pre]. Figure 4 shows "an electronic device" (Ex. 1004, 2:49-50; *see also* 4:20-31, Figs. 4-5, 6A, 6B; Ex. 1022, ¶¶8, 12-13, Figs. 4-5, 6A, 6B; Ex. 1003, ¶¶95-97). *Kim's* electronic device can include "a wearable device" (Ex. 1004, 4:19-31; Ex. 1022, ¶¶12-13) (Ex. 1003, ¶¶98-99).

Ex. 1004, Fig. 4; Ex. 1022, Fig. 4

FIG. 4



Kim discloses a "***capacitive fingerprint sensor*** 240p2 embedded in the physical button 760a" (Ex. 1004, 20:57-59, 22:11-12; *see also* Ex. 1004, 21:27-41; Ex. 1022, ¶161, 167-170, 176).[2] *Kim* also teaches "[t]he electronic device 701 may compose fingerprint images" (Ex. 1004, 21:58-22:3; Ex. 1022, ¶¶173-174; Ex. 1003, ¶¶100-104).

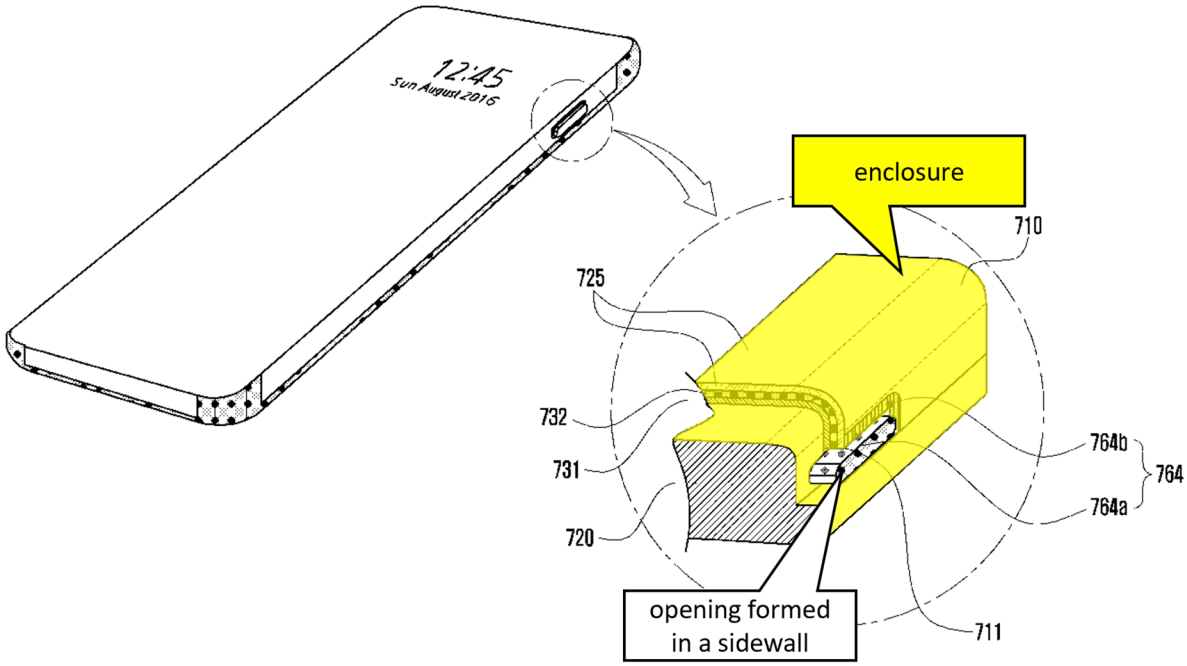
[2] All emphasis is added unless otherwise noted.

ii. Claim 11: [11.a] an enclosure defining an enclosed volume and an opening along an exterior surface:

Kim discloses element [11.a] (*see* Fig. 18 (annotated below)).

Ex. 1004, Fig. 18; Ex. 1022, Fig. 18

FIG. 18



First, *Kim* discloses an enclosure defining an enclosed volume, teaching a "housing 720" and "cover glass 725" (Ex. 1004, 22:4-27; Ex. 1022, ¶¶175-178; Ex. 1003, ¶¶105-107). *Kim* discloses "a processor located ***inside the housing*** and … a memory located ***inside the housing***" (Ex. 1004, 2:7-11; *see also* Ex. 1004, Abstract; Ex. 1022, ¶6, Abstract). *Kim* also discloses that there are components inside of the "cover glass," such as the "display panel" (Ex. 1004, 15:1-13; Ex. 1022, ¶102). A

POSITA would have known that a "processor," "memory," and "display panel" are physical components located "inside" the housing that occupy space, and therefore have understood that *Kim's* housing and cover glass would have an enclosed volume (Ex. 1003, ¶107).

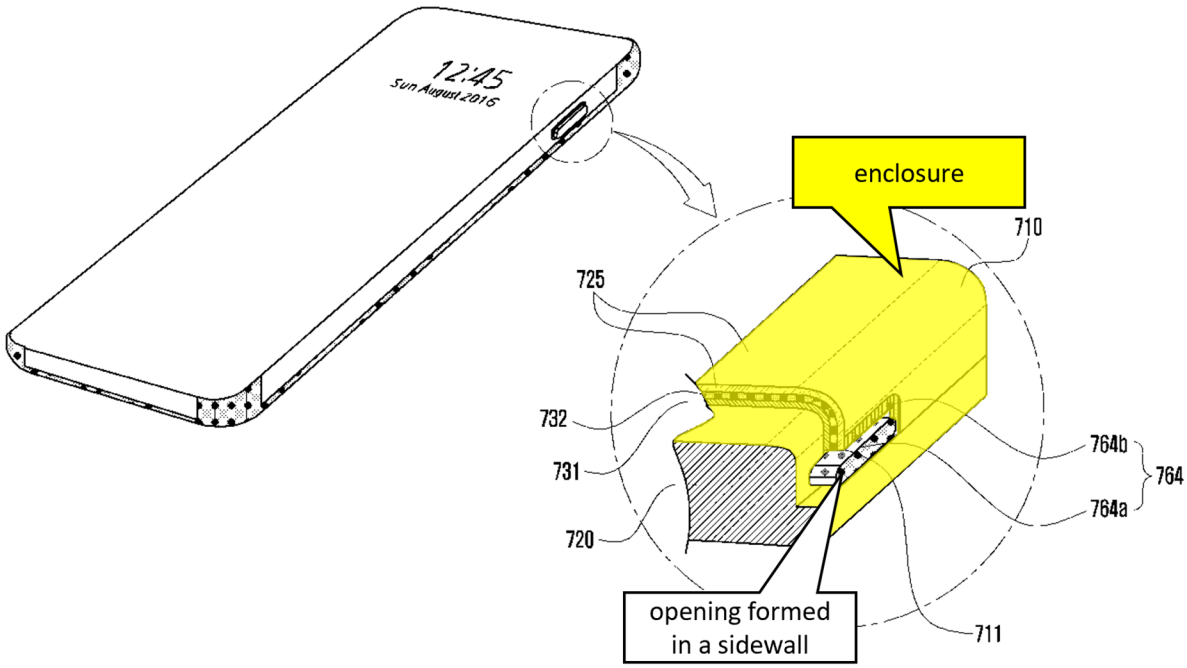
Kim's Figure 18 (above) shows an enclosure defining an enclosed volume (Ex. 1004, 3:22-24; Ex. 1022, ¶8; Ex. 1003, ¶108).

The '619 Patent teaches that the "enclosure" is a "structure" that may be "constructed from multiple materials" including metals, polymers, and glass "operably connected together" in order to "define[] an internal volume of the electronic device" (Ex. 1001, 6:3-17; Ex. 1003, ¶109). Because *Kim* discloses a "housing 720" and "cover glass 725" operably connected together to form a structure that defines an internal volume of the electronic device, *Kim* discloses this limitation the same way as the '619 Patent (Ex. 1003, ¶110).

Second, *Kim* discloses an enclosure with "opening 711" formed along an exterior surface wherein "a part of the home button 760-1 which is the combined button may be positioned" (Ex. 1004, 18:19-24; Ex. 1022, ¶132; Ex. 1003, ¶111). Element [11.a] is disclosed in Figure 18 (annotated below):

Ex. 1004, Fig. 18; Ex. 1022, Fig. 18

FIG. 18



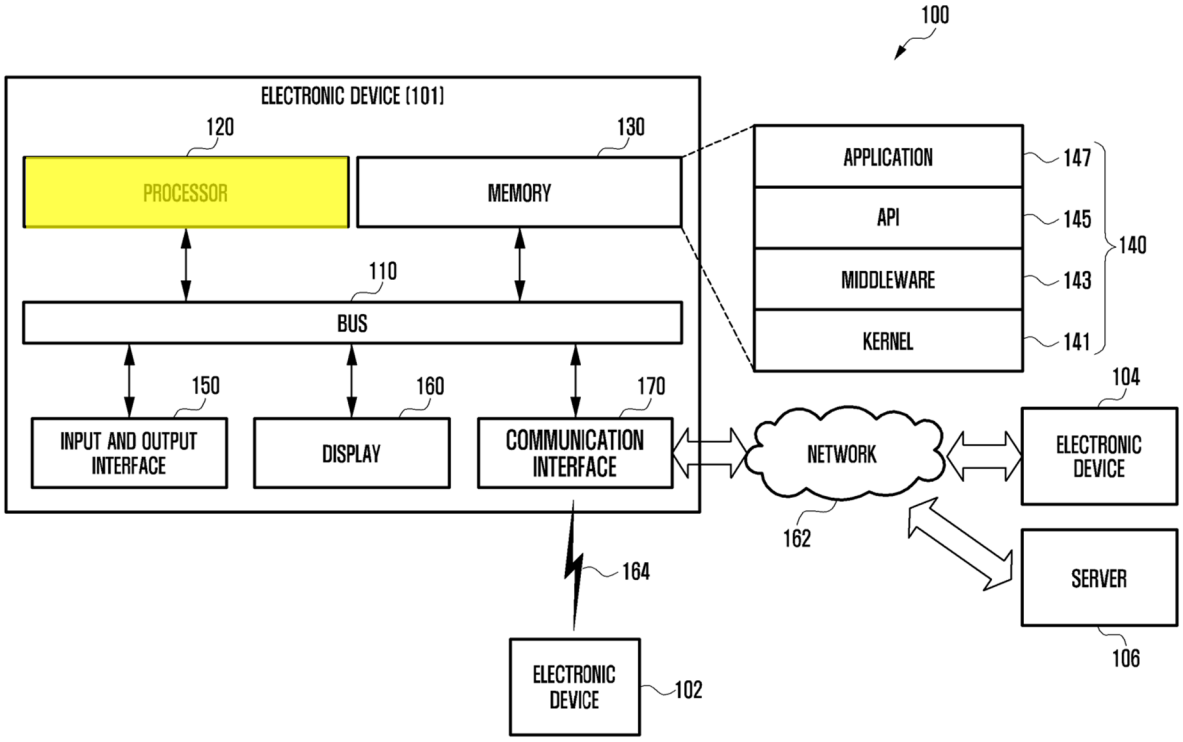
Furthermore, element [11.a] would have been well known to a POSITA, who would have been familiar with electronic devices with sealed and/or insulated button assemblies, and would have understood those assemblies were not limited to the front face of a device (Ex. 1003, ¶112). Instead, a POSITA would have understood a sealed and/or insulated button assembly from one location on a device would be constructed equally on a rear or sidewall (Ex. 1003, ¶¶112-113).

iii. Claim 11: [11.b] a processor disposed in the enclosed volume;

Kim discloses element [11.b].

Ex. 1004, Fig. 1; Ex. 1022, Fig. 1

FIG. 1

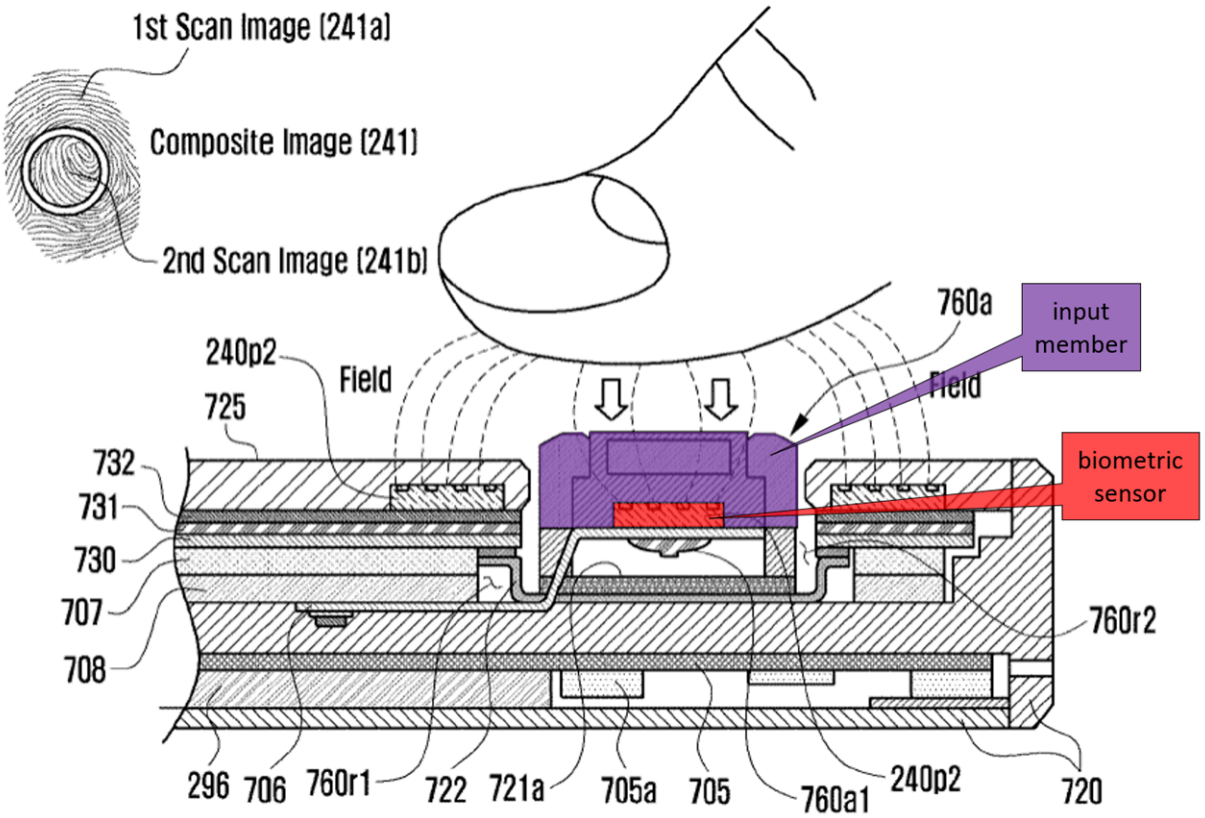


Kim discloses "a processor located ***inside*** the housing" (Ex. 1004, 2:7-11; *see also* Ex. 1004, Abstract, Figs. 1-3, 1:38-2:38, 5:1-28; Ex. 1022, ¶¶5-7, 17-19; element [11.a]) (Ex. 1003, ¶¶114-115). Furthermore, a POSITA would have located the processor in the enclosed volume to protect it from debris, impact, and other potentially damaging external stimuli (Ex. 1003, ¶¶116-117).

iv. Claim 11: [11.c] a button assembly positioned in the opening and defining an input surface, the button assembly comprising: a fingerprint sensor positioned inward from the input surface; and a retainer positioned inward from the input surface and defining a sealing surface;

Kim discloses element [11.c] (*see* element [11.a]; Figure 10(b); Ex. 1003, ¶118). Furthermore, Figure 10(b) shows a "cross-sectional view of [the] ***combined button***" located in an opening of the enclosure (Ex. 1004, 21:20-22; Ex. 1022, ¶166), which includes an input surface that may be pressed downward (Ex. 1003, ¶¶119-121).

Ex. 1004, Fig. 10(b); Ex. 1022, Fig. 10(b)



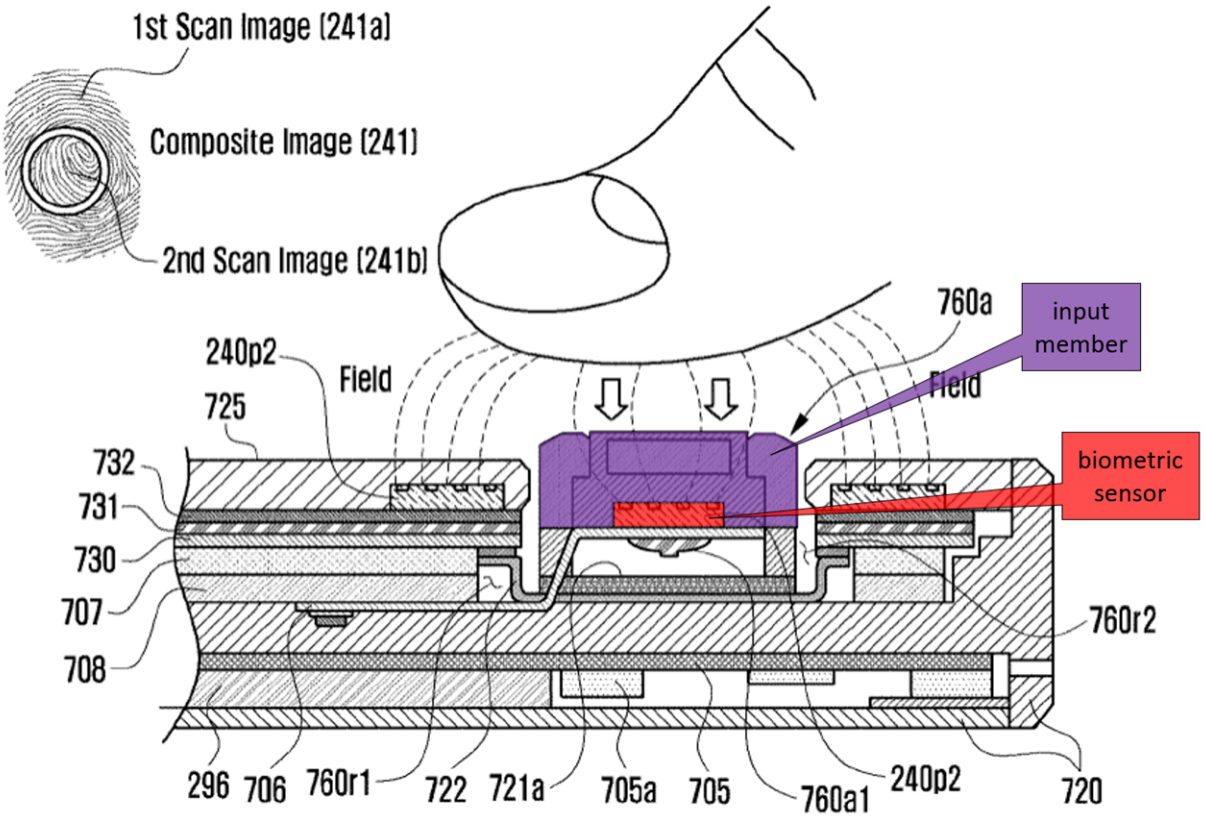
The ’619 Patent states that “[t]he button assembly 110 includes an input member 112 that may be touched, pressed, or otherwise interacted with by a user” (Ex. 1001, 6:49-59; Ex. 1003, ¶122). Because *Kim* discloses a “combined button” with a surface that similarly may pressed by a user, *Kim* discloses this limitation the same way as the ’619 Patent (*see also* Ex. 1004, 13:42-67, 16:48-17:12; Ex. 1022, ¶¶89-92, ¶¶118-120; Ex. 1003, ¶¶122-124).

Element [11.c] includes two sub-elements:

> ***(a) Claim 11: [11.c.i] a button assembly positioned in the opening and defining an input surface, the button assembly comprising: a fingerprint sensor positioned inward from the input surface;***

Kim discloses element [11.c.i] (Ex. 1003, ¶125). *Kim* discloses that the “combined button” includes a fingerprint sensor positioned inward from the input surface, as illustrated in at least *Kim*’s Figure 10(b) (annotated below) (Ex. 1003, ¶126).

Ex. 1004, Fig. 10(b); Ex. 1022, Fig. 10(b)



First, *Kim* discloses a "***capacitive fingerprint sensor*** 240p2 embedded in the physical button 760a" (Ex. 1004, 20:57-59, 22:11-12; *see also* Ex. 1004, 21:27-41; Ex. 1022, ¶161, 167-170, 176). *Kim* also teaches "[t]he electronic device 701 may compose fingerprint images" (Ex. 1004, 21:58-22:3; Ex. 1022, ¶¶173-174; Ex. 1003, ¶127).

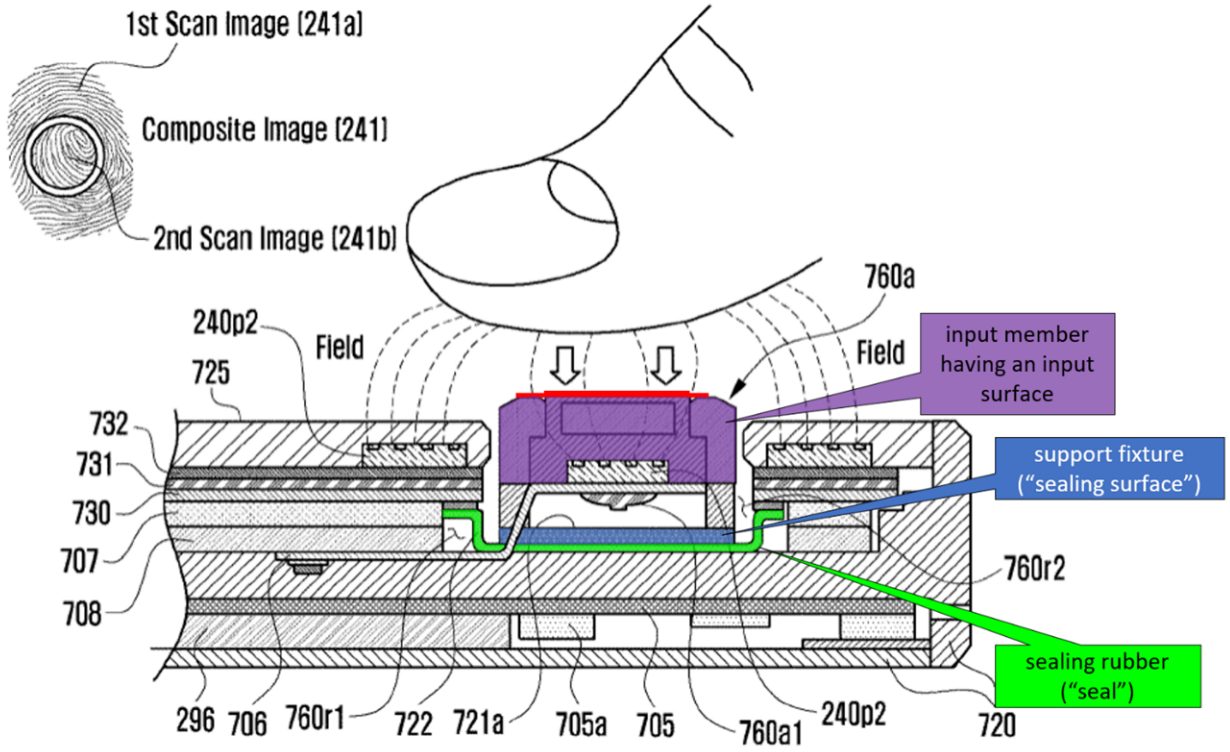
Second, *Kim* discloses that "capacitive fingerprint sensor 240p2" is "located ***under*** the physical button 760a" (Ex. 1004, 23:7-8; *see also* Ex. 1004, 17:3-5, 18:8-

13, 18:28-32, 18:47-53, 19:1-2, 19:26-30, 19:47-51, 23:6-10; Ex. 1022, ¶¶120, 130, 134, 139, 143, 146, 150, 187; Ex. 1003, ¶¶128-129).

(b) Claim 11: [11.c.ii] a button assembly positioned in the opening and defining an input surface, the button assembly comprising: ... a retainer positioned inward from the input surface and defining a sealing surface;

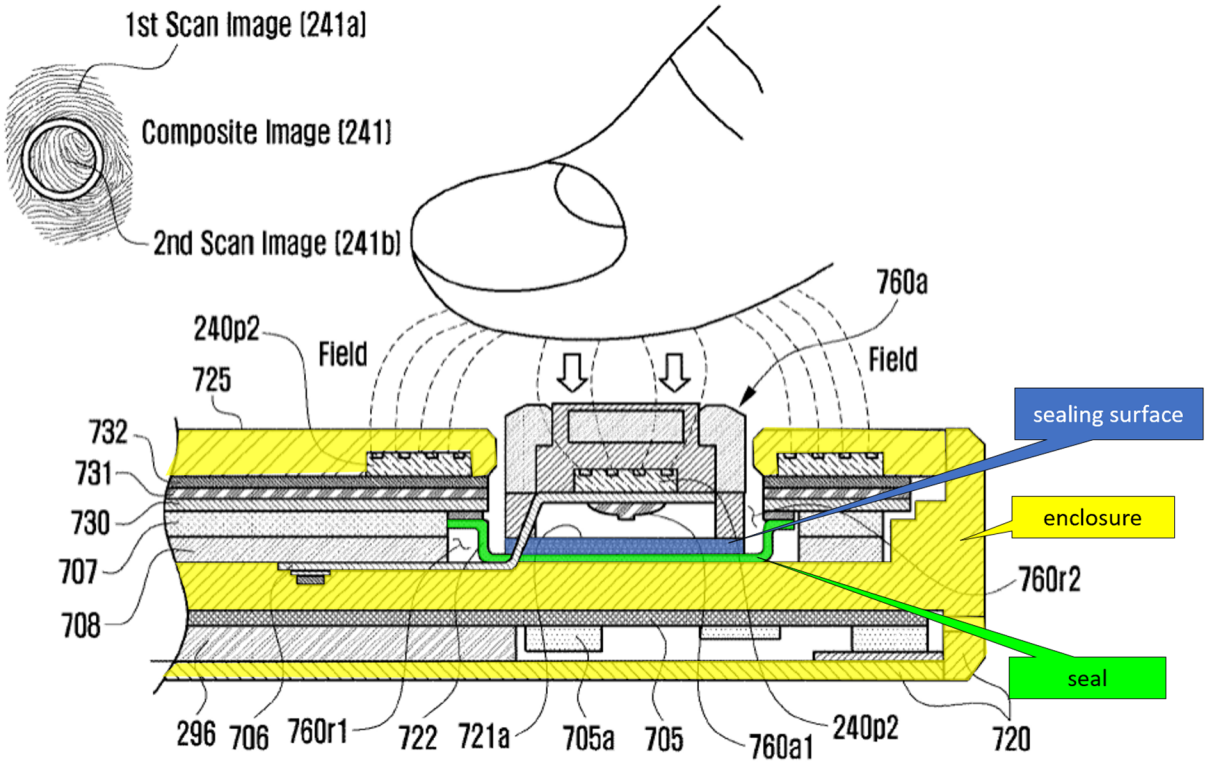
Kim discloses element [11.c.ii] (*see* Figure 10(b) (annotated below); Ex. 1003, ¶¶130-131).

Ex. 1004, Fig. 10(b); Ex. 1022, Fig. 10(b)



First, *Kim* discloses a seal, as illustrated in Figure 10(b) (annotated below).

Ex. 1004, Fig. 10(b); Ex. 1004, Fig. 10(b)



For example, *Kim* discloses use of "sealing rubber 722" (Ex. 1004, 22:35-40; *see also* Ex. 1004, 20:27-50, 22:28-42; Ex. 1022, ¶¶156-159, 179-181), which creates the claimed "seal.". As *Kim* explains, the "sealing rubber 722 may have a sealing and waterproof function" (Ex. 1004, 20:47-48; Ex. 1022, ¶159; Ex. 1003, ¶132).

Second, *Kim* discloses the seal is positioned between a sealing surface of the button assembly and the enclosure. For example, *Kim* discloses a "support fixture 721a" (Ex. 1004, 22:28-34; Ex. 1022, ¶179), which includes the claimed "sealing surface" (Ex. 1003, ¶133). *Kim*'s Figure 10(b) (annotated above) discloses that

"sealing rubber 722" (green) is positioned between a sealing surface (blue) and the enclosure (yellow). Likewise, Figure 10(b) shows the sealing surface positioned inward from the input surface (Ex. 1003, ¶133).

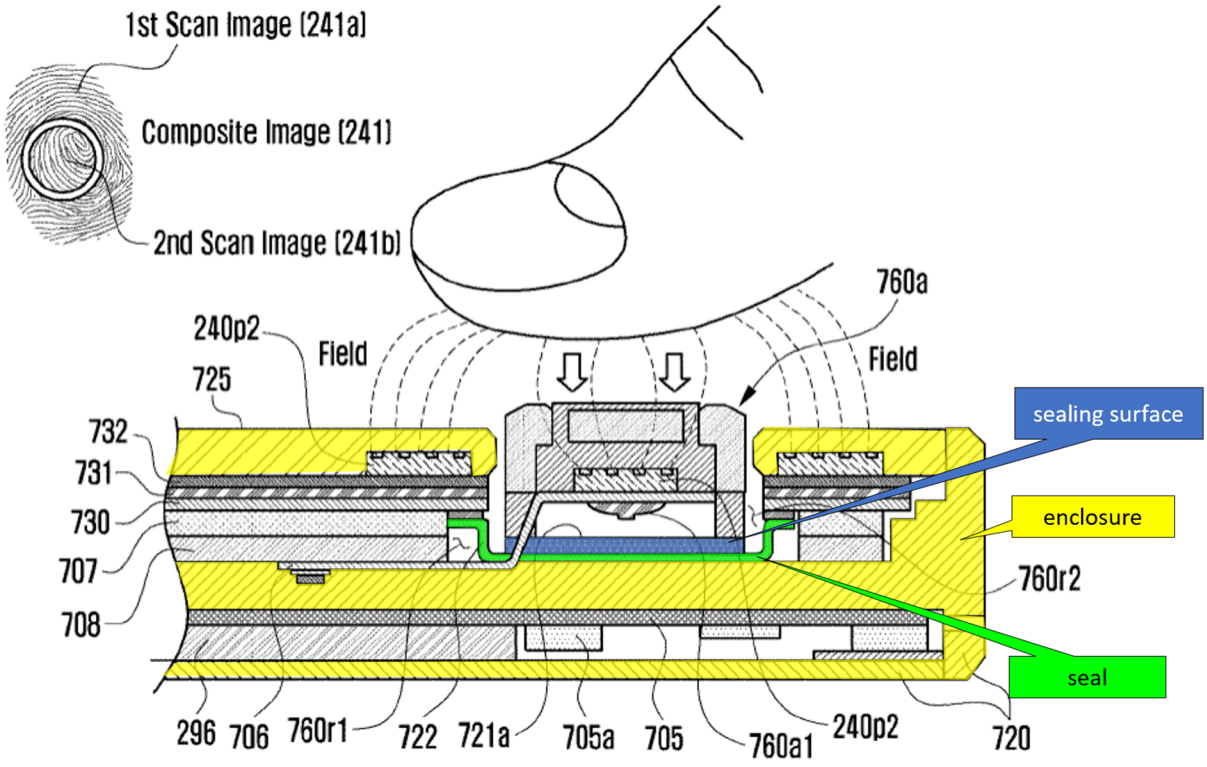
The '619 Patent teaches that (1) multiple "configurations of the retainer 224 are possible," (2) it provides "a stop to displacement of the button housing" and (3) "[t]he retainer 224 lower surface forms a sealing surface 225 for the button assembly 310" (Ex. 1001, 16:54-60; Ex. 1003, ¶134). As depicted above, a POSITA would have understood support fixture 721a of *Kim* likewise serves as "a stop to the displacement of the button housing" and includes a "lower surface [that] forms a sealing surface … for the button assembly" (Ex. 1003, ¶134) As such, a POSITA would have understood support fixture 721a constitutes a retainer as envisioned by the '619 Patent (Ex. 1003, ¶134).

Furthermore, a POSITA would have understood that because support fixture 721a defines an aperture housing the plunger, that retainer should be formed of a rigid, durable material that would withstand repeated user presses on the input surface (Ex. 1003, ¶135). A POSITA would further have understood a rigid, durable retainer would be one of a limited number of surfaces that could be used as a sealing surface of the button assembly and, given its location relative the plunger, would be used as a sealing surface by the POSITA (Ex. 1003, ¶¶135-136).

v. Claim 11: [11.d] a seal disposed between the sealing surface of the retainer and a surface of the opening;

Kim discloses element [11.d], as illustrated in at least Figure 10(b) (annotated below).

Ex. 1004, Fig. 10(b); Ex. 1004, Fig. 10(b)



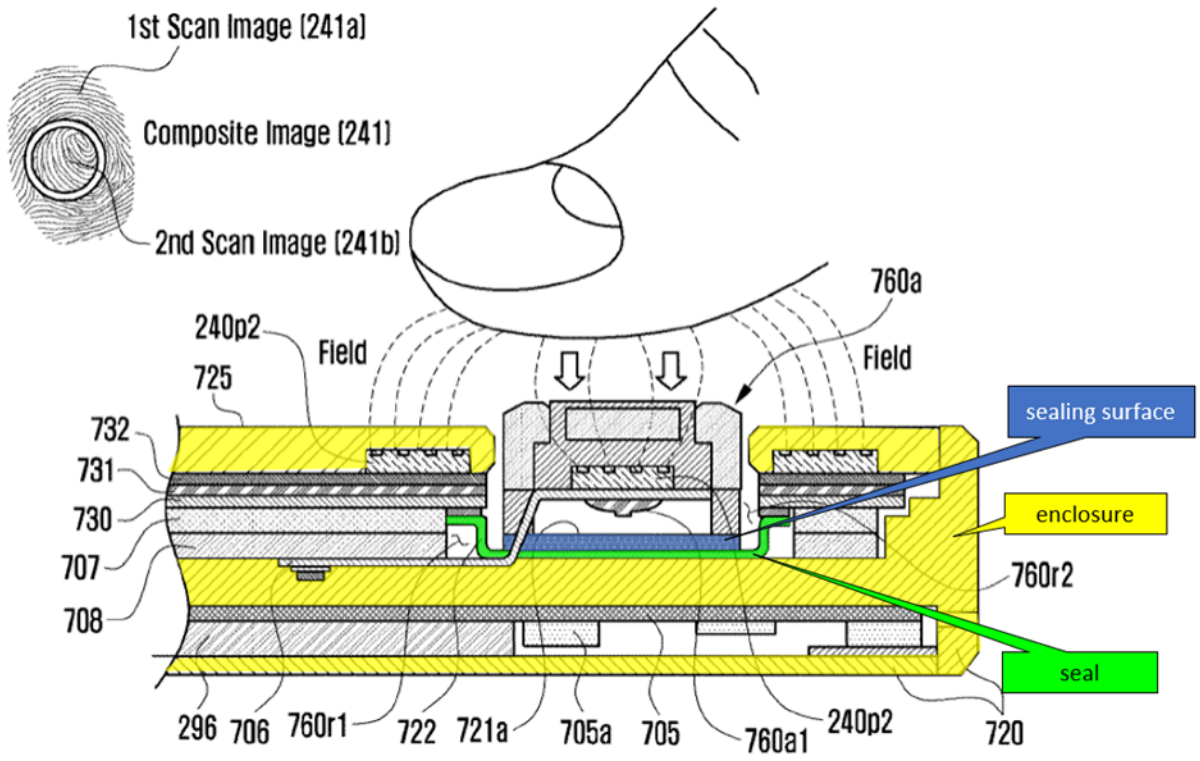
First, *Kim* discloses a seal. For example, *Kim* discloses use of "sealing rubber 722" (Ex. 1004, 22:35-40; *see also* Ex. 1004, 20:27-50, 22:28-42; Ex. 1022, ¶¶156-159, 179-181), which creates the claimed "seal" of element [11.d]. As *Kim* explains, the "sealing rubber 722 may have a sealing and waterproof function" (Ex. 1004, 20:47-48; Ex. 1022, ¶159; Ex. 1003, ¶¶137-139).

Second, *Kim* discloses the seal is positioned between a sealing surface of the retainer and a surface of the opening. For example, *Kim* discloses a "support fixture 721a" (Ex. 1004, 22:28-34; Ex. 1022, ¶179), which includes the claimed "sealing surface of the retainer" of element [11.d] (Ex. 1003, ¶140). *Kim*'s Figure 10(b) (annotated above) discloses that "sealing rubber 722" (green) is positioned between a sealing surface of the retainer (blue) and the enclosure (yellow) (Ex. 1003, ¶140).

Furthermore, a POSITA would have known button assemblies in mobile electronic devices would be sealed to prevent ingress of potentially damaging substances, and common sealing techniques included using a rubber gasket or a pressure sensitive adhesive ("PSA") layer, rending this limitation obvious in view of the general knowledge of a POSITA and well within their skill (Ex. 1003, ¶141).

Given the configuration of the retainer and button assembly discussed in element [11.c.ii], above, the "sealing surface of the retainer" is located at the bottom of the button assembly (Ex. 1003, ¶142). A seal (green) disposed between the sealing surface of the retainer (blue) and a surface of the enclosure (yellow) which defines the opening (*i.e.*, a "surface of the opening") (Ex. 1004, Fig. 10(b); Ex. 1022, Fig. 10(b); Ex. 1003, ¶¶142-143).

Ex. 1004, Fig. 10(b); Ex. 1022, Fig. 10(b)



vi. Claim 11: [11.e] a passage extending from the opening to the enclosed volume;

Kim discloses element [11.e].

As discussed above, the opening contains a button assembly which includes electrical components, such as a fingerprint sensor. *See* elements [1.c]-[1.d]. *Kim* also teaches the battery for the electronic device and main PCB are located inside the enclosed volume (Ex. 1004, 22:4-9; Ex. 1022, ¶175; Ex. 1003, ¶¶144-145).

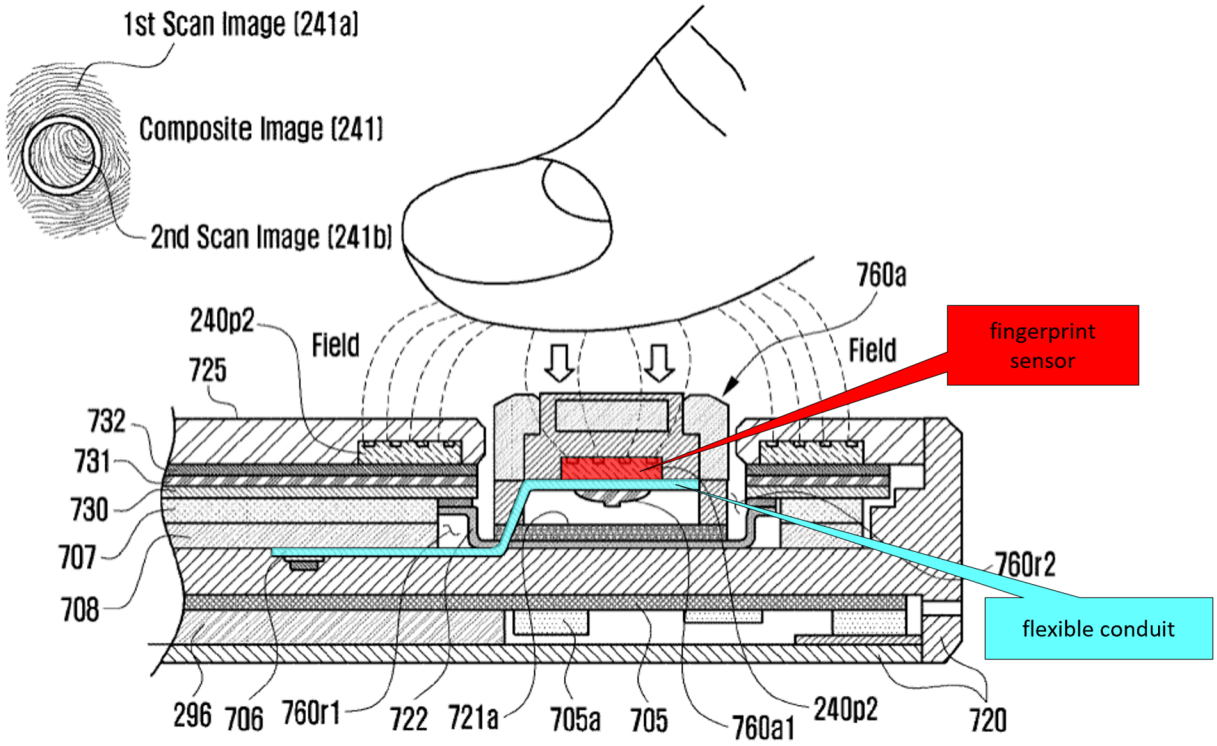
Moreover, because *Kim* includes electrical components located in the opening of the enclosure which are separated from a power supply by the enclosure wall, a

POSITA would have understood that the claimed passage is necessary to connect the components to the power supply (Ex. 1003, ¶146). Likewise, a POSITA would have known a fingerprint sensor outputs an electrical signal that should be electrically connected to a processor disposed within the enclosure. For these connections to occur, *Kim* discloses a passage between the opening and the enclosed volume (Ex. 1003, ¶¶146-147).

vii. Claim 11: [11.f] a flexible conduit electrically connecting the fingerprint sensor to the processor; wherein:

Kim discloses element [11.f] (*see* Figure 10(b) (annotated below); Ex. 1003, ¶¶148-150).

Ex. 1004, Fig. 10(b); Ex. 1022, Fig. 10(b)



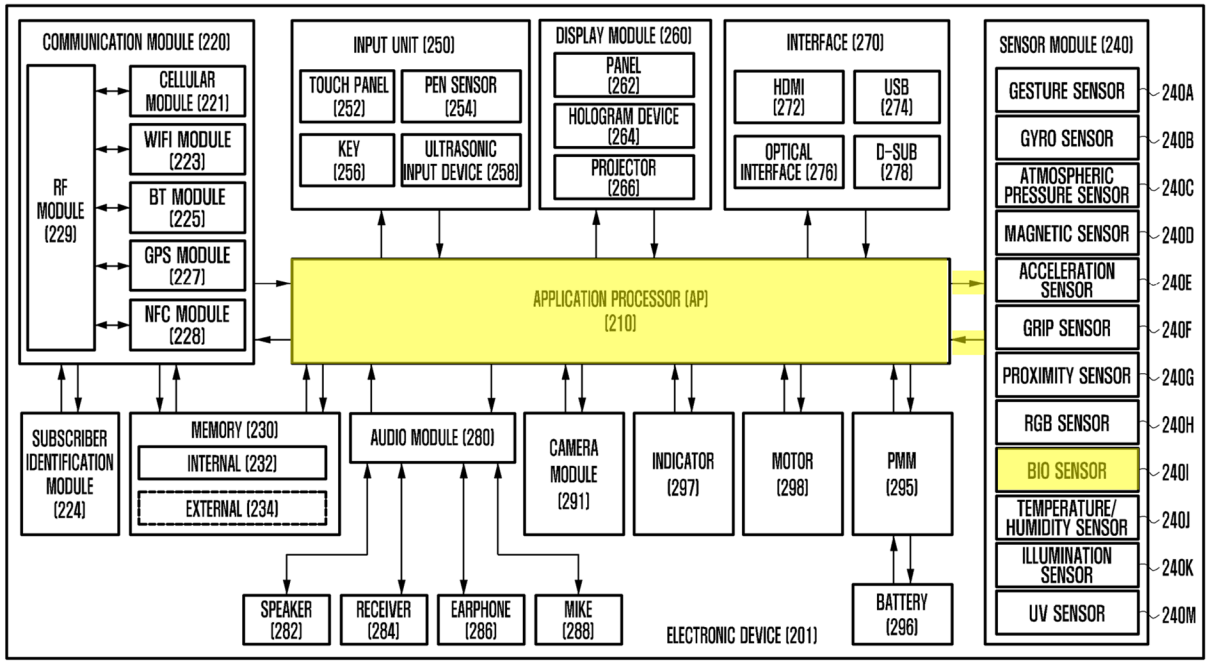
First, *Kim* discloses a "flexible PCB 706," which corresponds to the claimed "flexible conduit" of element [1.e] (Ex. 1004, 22:9-27; *see also* Ex. 1004, 19:63-20:26, 23:6-21; Ex. 1022, ¶¶153-155, 176-178, 187-189; Ex. 1003, ¶151).

Second, *Kim* discloses "***flexible PCB 706 may be electrically connected to the capacitive fingerprint sensor 240p2*** embedded in the physical button 760a." (Ex. 1004, 22:9-17; Ex. 1022, ¶¶176-177; *see also* Ex. 1004, 20:59-60; Ex. 1022, ¶¶161, 176). Figure 10(b) shows "flexible PCB 706" (teal) coupled to the biometric sensor (red) (Ex. 1003, ¶152).

This electrical connection is further illustrated in Figure 2, which shows arrows between the "application processor" and the "sensor module 240," which includes "biometric sensor 240I" (Ex. 1004, Fig. 2, 7:33-38, 9:13; Ex. 1022, Fig. 2, ¶¶33, 43; Ex. 1003, ¶152). A POSITA would have understood Figure 2 depicts an electrical connection, such that the biometric sensor will transmit an output signal to the application processor, and that this connection is enabled by flexible PCB 706 (Ex. 1003, ¶152).

Ex. 1004, Fig. 2; Ex. 1022, Fig. 2

FIG. 2



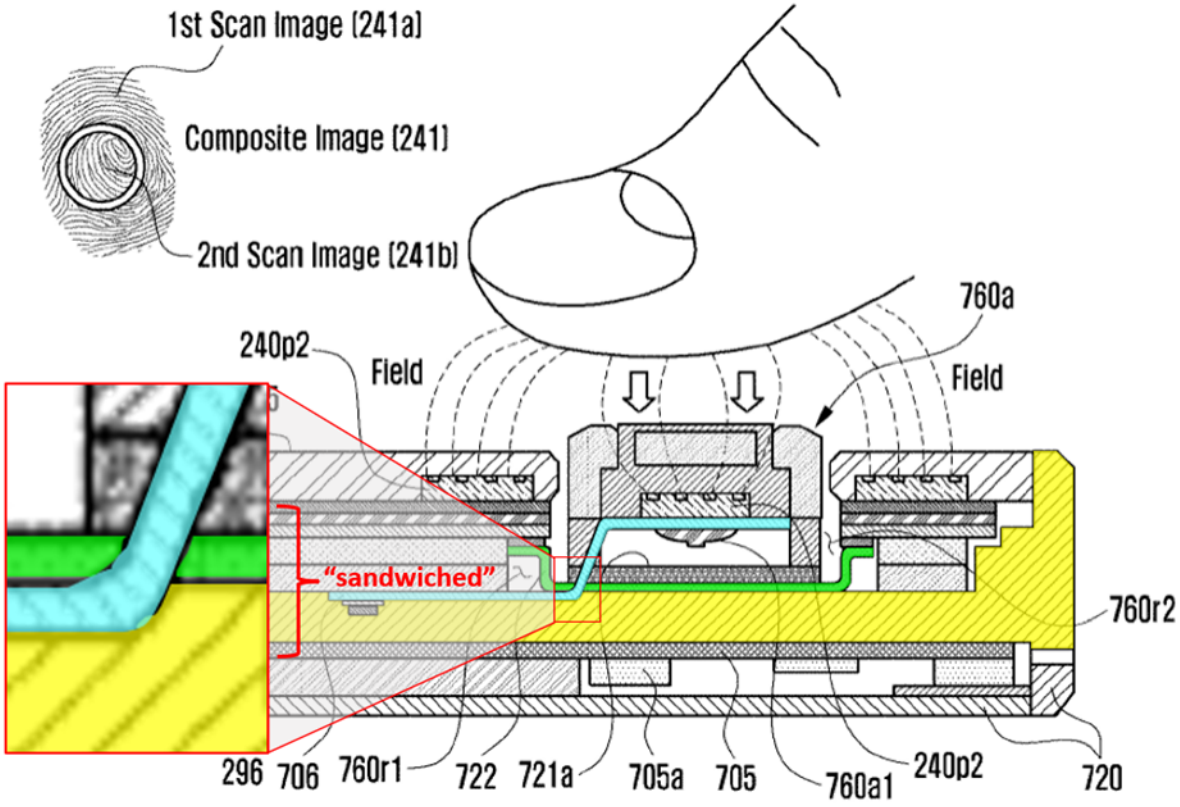
A POSITA would have understood the purpose of the electrical connection between "flexible conduit 706" and "fingerprint sensor 240p2" was to transmit an output signal from "fingerprint sensor 240p2" to the "application processor" (Ex. 1003, ¶153). Furthermore, a POSITA would have known to electrically connect a fingerprint sensor and a processor with a flexible PCB, such that the flexible conduit would transmit the sensor's output signal to the processor, so that the electronic device may do something with the output signal (*e.g.*, use the output or "fingerprint" for biometric authentication) (Ex. 1003, ¶154). A POSITA would have also known that flexible PCBs should be used in mobile devices, which have relatively smaller volume and profile. Consequently, this limitation would have been obvious in view

of this general knowledge and well within the skill of a POSITA (Ex. 1003, ¶¶154-155).

viii. Claim 11: [11.g] a portion of the flexible conduit is sandwiched between the seal and the sealing surface of the retainer or between the seal and the surface of the opening.

Kim discloses element [11.g] (*see* Figure 10(b) (annotated below); Ex. 1003, ¶156).

Ex. 1004, Fig. 10(b); Ex. 1022, Fig. 10(b)

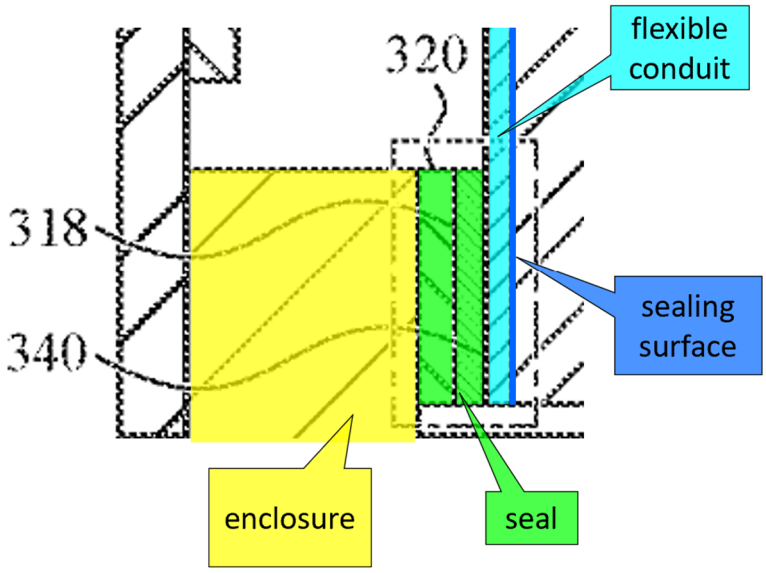


Kim discloses the claimed "flexible conduit," "seal," and "enclosure." *See* elements [11.a], [11.d], [11.f]. Furthermore, Figure 10(b) discloses a portion of the

flexible conduit (*i.e.*, *Kim*'s "flexible PCB 706," teal) is sandwiched between the seal (*i.e.*, *Kim*'s "sealing rubber 722," green) and the surface of the opening (*i.e.*, *Kim*'s "housing 720," yellow) (Ex. 1003, ¶157).

Indeed, *Kim* discloses element [11.g] the same way as the '619 Patent, which teaches that "a gasket seal (such as face seal 318) may further be applied below the lower PSA portion, such that ***a sandwich … is formed of PSA, flexible conduit 340, PSA, and then the gasket seal***" (Ex. 1001, 17:35-46; Ex. 1003, ¶158). This "sandwiching" is illustrated in the '619 Patent's Figure 3A (excerpted and annotated below). The '619 Patent also discloses that "sandwiching" includes a "stack" of elements (Ex. 1001, 23:39-43 ("[i]n one embodiment, the compressible layer 404 is a heat activated (HAF) silicon sandwich [which] is a stack of … five elements"); Ex. 1003, ¶158).

Ex. 1001, Fig. 3A (excerpted and annotated)



Likewise, *Kim* discloses a "stack" of elements including "a portion of the flexible conduit," a "seal," and an "enclosure" (Ex. 1003, ¶159).

Furthermore, a POSITA would have known a common way to electrically connect a fingerprint sensor and processor was with a flexible PCB (*see* element [11.f]), and that button assemblies and fingerprint sensors in mobile electronic devices would be sealed to prevent ingress of potentially damaging substances (Ex. 1003, ¶160). From this, a POSITA would have been motivated to provide the seal by sandwiching existing, known components (*i.e.*, the enclosure and flexible conduit), to protect ingress points (*i.e.*, the pathway between the flexible conduit and internal electronics) (Ex. 1003, ¶160). Using these existing, known components would have saved costs and promoted an efficient use of limited space within the

mobile device. Consequently, this limitation would have been obvious and well within the skill of a POSITA which likewise would have provided a reasonable expectation of success (Ex. 1003, ¶¶160-161).

3. Claim 14: The fingerprint sensing system of claim 11, wherein the fingerprint sensor is further configured to detect a touch.

Kim discloses claim 14. *See* claim 11.

Kim discloses a capacitive fingerprint sensor, which a POSITA would have understood functions by detecting a touch (Ex. 1004, 21:27-41; Ex. 1022, ¶¶167-170; Ex. 1003, ¶¶162-165).

4. Claim 16

i. Claim 16: [16.pre] A watch comprising:

Kim discloses element [16.pre]. *Kim's* electronic device can include "a wearable device (*e.g.*, … ***a smart watch***)" (Ex. 1004, 4:19-31; Ex. 1022, ¶¶12-13; Ex. 1003, ¶¶166-168).

ii. Claim 16: [16.a] an enclosure defining an enclosed volume and an opening formed in a sidewall;

Kim discloses element [16.a] for substantially the same reasons as elements [11.a], [11.c], incorporated herein (Ex. 1003, ¶¶169-170).

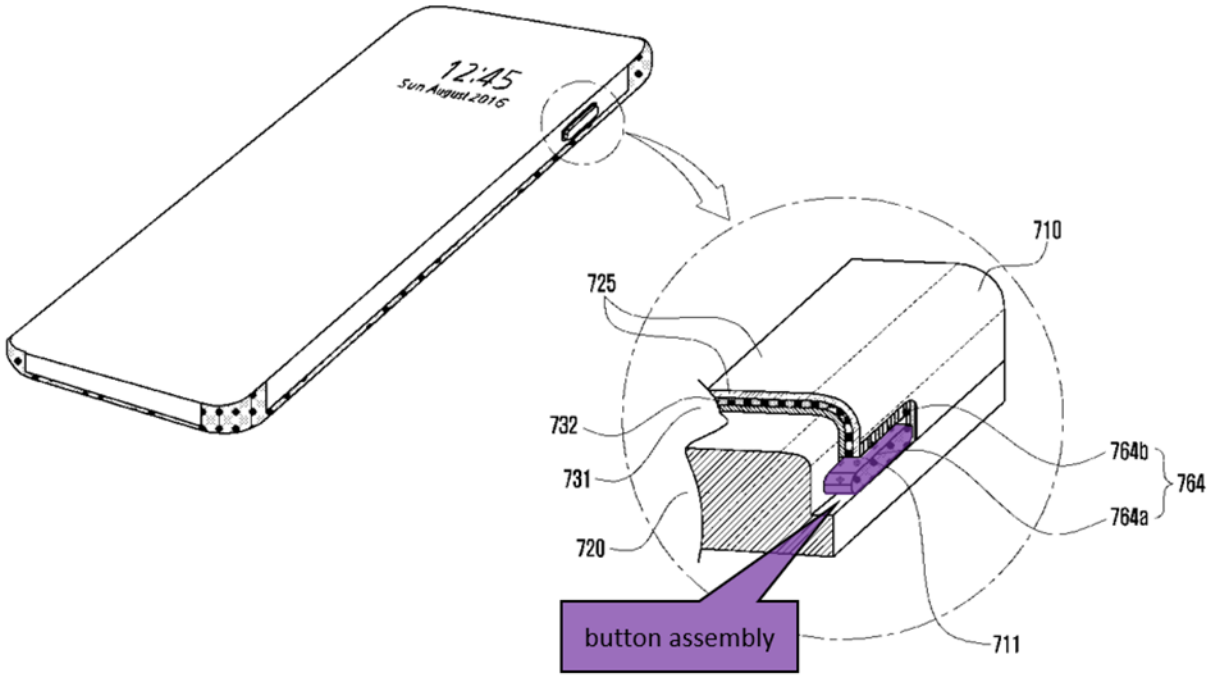
Kim further contemplates the "combined button" is a button assembly within an opening formed in a sidewall. For example, *Kim* discloses "a power button ... located on the ***lateral*** [*i.e.*, side] ***surface*** of the electronic device 600 ***may also be***

the combined button," and "***the combined button is not limited to the home button***" (Ex. 1004, 13:46-53, 17:10-12; Ex. 1022, ¶¶89, 166; Ex. 1003, ¶171).

Figure 18 "shows … a ***combined button***" (Ex. 1004, 3:22-24; Ex. 1022, ¶8; Ex. 1003, ¶¶171-172).

Ex. 1004, Fig. 18; Ex. 1022, Fig. 18

FIG. 18



iii. Claim 16: [16.b] a processor disposed in the enclosed volume;

Kim discloses element [16.b] for substantially the same reasons as element [11.b], incorporated herein (Ex. 1003, ¶¶173-175).

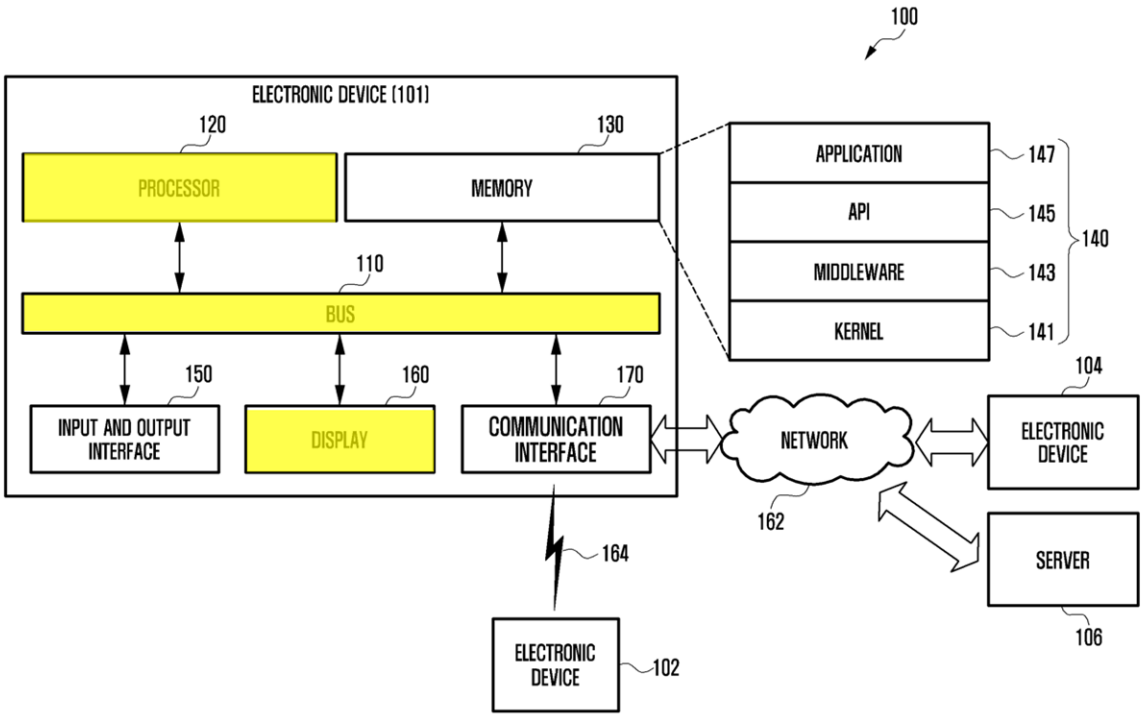
iv. Claim 16: [16.c] a display positioned within the enclosure and operably coupled to the processor;

Kim discloses element [16.c].

The electronic device taught by *Kim* includes "a touch screen display being disposed and visible through the first opening" (Ex. 1004, 1:38-46; Ex. 1022, ¶5; Ex. 1003, ¶¶176-179). Figure 1 shows the display operably connected to the processor:

Ex. 1004, Fig. 1; Ex. 1022, Fig. 1

FIG. 1



v. Claim 16: [16.d] a watchband attached to the enclosure and configured to couple the watch to a user;

Kim discloses element [16.d].

Kim discloses a smart watch (*see* element [16.pre]). A POSITA would have understood that a smart watch requires a watchband (Ex. 1003, ¶¶180-181). Because the claimed enclosure constitutes the outer surface of the watch, it would be obvious in view of the general knowledge of a POSITA to connect the watchband to the enclosure, in order to couple the watch to the user (Ex. 1003, ¶¶182-183).

vi. Claim 16: [16.e] a button assembly disposed within the opening, the button assembly comprising: a button housing; an input member with an input surface; a fingerprint sensor positioned below the input member and configured to produce an output signal in response to a touch on the input surface, the output signal corresponding to a fingerprint; a touch sensor configured to detect the touch; a flexible conduit electrically coupled to the fingerprint sensor and configured to transmit the output signal to the processor; and

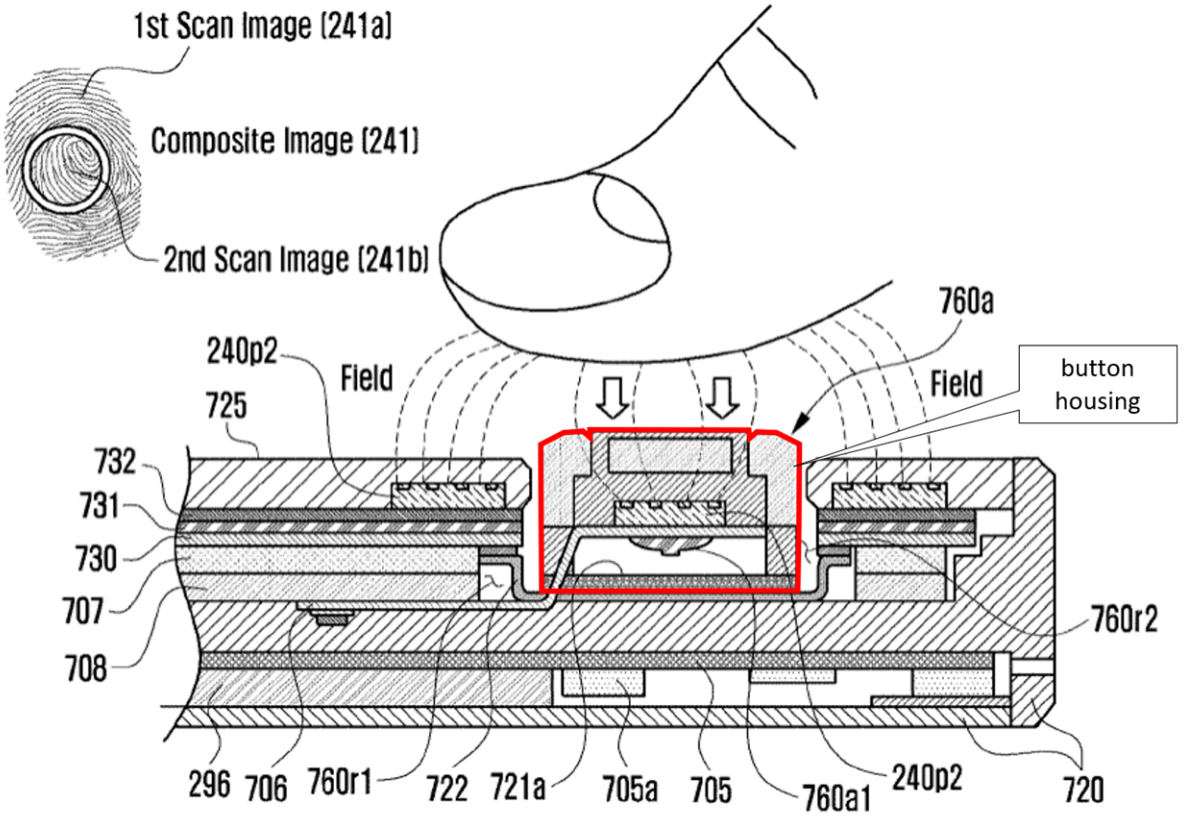
Kim discloses element [16.e] for substantially the same reasons as element [11.c], incorporated herein (Ex. 1003, ¶¶184-187).

Element [16.e] contains five sub-elements:

(a) Claim 16: [16.e.i] a button assembly disposed within the opening, the button assembly comprising: a button housing;

Kim discloses element [16.e.i] for substantially the same reasons as element [11.c], incorporated herein (Ex. 1003, ¶¶188-189). The button housing is depicted below.

Ex. 1004, Fig. 10(b); Ex. 1022, Fig. 10(b)



Kim's "FIGS. 10(a) and 10(b) show a front view and a cross-sectional view of [the] combined button," with the housing comprising the external surface (Ex. 1004, 21:20-26; Ex. 1022, ¶¶166-167; Ex. 1003, ¶¶190-191).

(b) Claim 16: [16.e.ii] a button assembly disposed within the opening, the button assembly comprising: ... an input member with an input surface;

Kim discloses element [16.e.ii] for substantially the same reasons as element [11.c], incorporated herein (Ex. 1003, ¶¶192-198).

(c) Claim 16: [16.e.iii] a button assembly disposed within the opening, the button assembly

comprising: ... a fingerprint sensor positioned below the input member and configured to produce an output signal in response to a touch on the input surface, the output signal corresponding to a fingerprint;

Kim discloses element [16.e.iii] for substantially the same reasons as claims [11.c.i] and 14, incorporated herein (Ex. 1003, ¶¶199-200).

Furthermore, a POSITA would have been familiar with fingerprint sensors, and would have understood that the "output signal" from a fingerprint sensor would correspond to a fingerprint (Ex. 1003, ¶¶201-202). Likewise, a POSITA would have understood capacitive fingerprint sensors function in response to user touches. Consequently, this limitation would have been obvious in view of the general knowledge of a POSITA and well within their skill (Ex. 1003, ¶¶202-203).

(d) Claim 16: [16.e.iv] a button assembly disposed within the opening, the button assembly comprising: ... a touch sensor configured to detect the touch;

Kim discloses a touch sensor configured to detect the touch.

Kim discloses a capacitive fingerprint sensor embedded into the button assembly (*see* elements [11.c.i], 14), which a POSITA would have understood functions by detecting minor electrical changes from a user's touch (Ex. 1003, ¶¶204-206).

(e) Claim 16: [16.e.v] a button assembly disposed within the opening, the button assembly comprising: ... a flexible conduit electrically

coupled to the fingerprint sensor and configured to transmit the output signal to the processor;

Kim discloses element [16.e.v] for substantially the same reasons as elements [11.f] and [16.e.iii], incorporated herein (Ex. 1003, ¶¶207-212).

vii. Claim 16: [16.f] a seal positioned between the button housing and a surface of the opening;

Kim discloses element [16.f] for substantially the same reasons as elements [11.d] and [16.e.i], incorporated herein (Ex. 1003, ¶¶213-215).

viii. Claim 16: [16.g] wherein a portion of the flexible conduit is sandwiched between the seal and the button housing or between the seal and the surface of the opening.

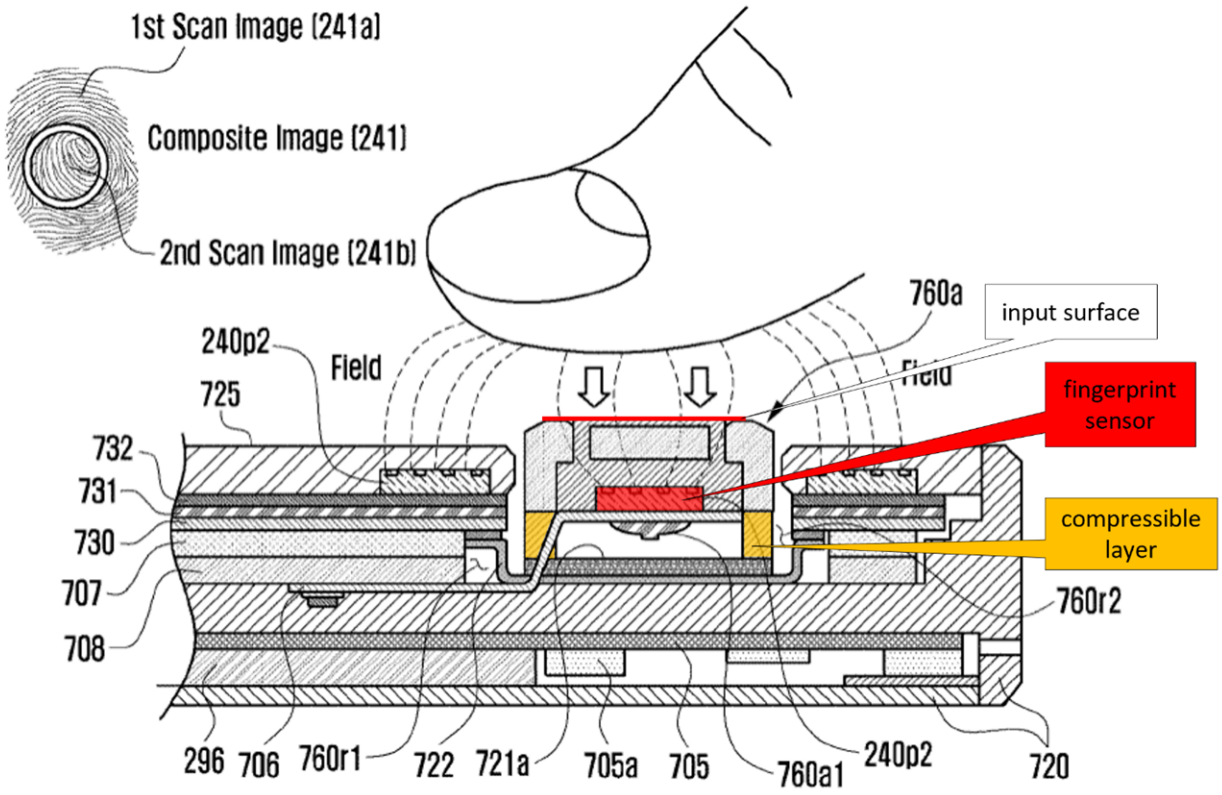
Kim discloses element [16.g] for substantially the same reasons as elements [11.g] and [16.e.i], incorporated herein (Ex. 1003, ¶¶216-218).

5. Claim 19: The watch of claim 16, further comprising a compressible layer disposed below the fingerprint sensor, the compressible layer compressing to receive a displacement or a deflection of the input member upon receipt of a user force to the input surface.

Kim discloses claim 19. *See* claim 16.

Figure 10(b) shows the compressible layer (orange) is disposed below the fingerprint sensor (red), and compresses following a force on the input surface (red line) (Ex. 1003, ¶¶219-222).

Ex. 1004, Fig. 10(b); Ex. 1022, Fig. 10(b)



Furthermore, a POSITA would have known that tactile dome switches were where the dome switch moves downward and compresses against a solid surface in response to a press on the input surface (Ex. 1003, ¶223). This known dome switch configuration is depicted in *Kim* (*id.*). A POSITA would have understood that compression of the dome switch is required for operation (Ex. 1003, ¶224).

In Figure 10(a), the only surface that can contact dome switch 760a1 is support fixture 721a. For the dome switch to operate as intended, a POSITA would have understood the layer highlighted in orange must compress to receive a displacement

of the input member upon receipt of a user force to the input surface (Ex. 1003, ¶¶225-226).

B. Ground 2: Claims 11-14 and 16-20 are Unpatentable Under 35 U.S.C. §103 over Kim

Kim further renders obvious claims 11-14 and 16-20 of the '619 Patent. Ground 1 (§VII.A) analyzes, *inter alia*, how *Kim* renders obvious claims [11.pre]-[11.f], 14, 16, and 19 of the '619 Patent. These limitations are incorporated herein. Ground 2 address only the limitations that are further rendered obvious by *Kim*.

1. Overview of Ground 2 (Kim)

Kim is described above (§VII.A.1).

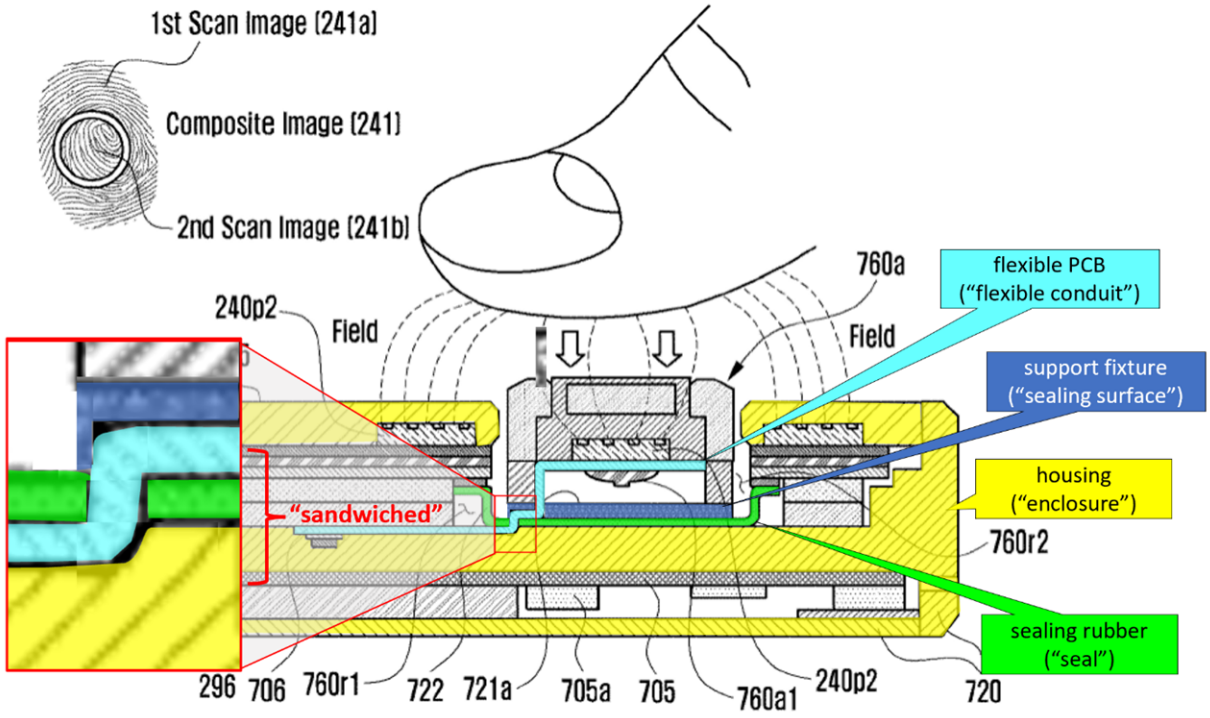
2. Claim 11

ix. Claim 11: [11.g]

Kim discloses element [11.g]. *See* Ground 1, element [11.g].

Alternatively, a POSITA would have understood the flexible PCB could be routed throughout several different pathways in the electronic device, depending on the structure and goals of the device in question, to effectively utilize internal space of the mobile terminal. For example, a POSITA would have understood the flexible PCB would be routed between the seal (*i.e.*, the gasket) and the sealing surface, as depicted in altered and annotated Figure 10(b), to avoid interference with moving pieces of the button assembly (Ex. 1003, ¶¶239-242).

Ex. 1004, Fig. 10(b) (altered and annotated); Ex. 1022, Fig. 10(b)



Furthermore, a POSITA would have known a common way to electrically connect a fingerprint sensor to a processor was with a flexible conduit, such as a flexible PCB, and that button assemblies and fingerprint sensors in mobile electronic devices should be sealed in order to prevent ingress of potentially damaging substances (Ex. 1003, ¶243). From this, a POSITA would have been motivated to provide the seal by sandwiching existing, known components (*i.e.*, the enclosure and flexible conduit) to save costs and promote an efficient use of limited space within the device while still ensuring that the device is sealed against potentially damaging substances. (Ex. 1003, ¶243; *see also* Ex. 1015, 12:12-19; Ex. 1011, [0055]; Ex. 1008, 6:67-7:2). Consequently, this limitation would have been obvious in view of

the general knowledge of a POSITA and well within their skill (Ex. 1003, ¶¶243-244).

3. Claim 12: The fingerprint sensing system of claim 11, wherein the flexible conduit extends through the passage.

Kim renders claim 12 obvious (Ex. 1003, ¶245). *See* claim 11.

Kim discloses the claimed passage. *See* Ground 1, element [11.e].

Furthermore, claim 12 would have been well known to a POSITA, who would have known that a fingerprint sensor located outside of the enclosure outputs an electrical signal that should be electrically connected via the flexible PCB to an integrated circuit or processor disposed within the enclosure (Ex. 1003, ¶246). For these connections to occur, a POSITA would have understood that *Kim's* flexible conduit extends through the claimed passage (Ex. 1003, ¶¶246-247).

4. Claim 13: The fingerprint sensing system of claim 11, wherein the flexible conduit is coupled to a second flexible conduit that extends through the passage.

Kim renders claim 13 obvious (Ex. 1003, ¶248). *See* claim 11.

Kim teaches its components "may be formed of one or more components" (Ex. 1004, 10:37-46; Ex. 1022, ¶60) and "the singular forms of terms are intended to include the plural forms as well" (Ex. 1004, 4:13-18; Ex. 1022, ¶9). *Kim* teaches its flexible PCB may have multiple "portions" each of which constitutes a "chip on panel" (Ex. 1004, 20:4-13; Ex. 1022, ¶154; Ex. 1003, ¶¶249-250).

Thus, a POSITA would have understood the flexible PCB 706 would include multiple portions, each of which constitutes a separate "chip on panel" (Ex. 1003, ¶251; claims 11, 12). Therefore, a POSITA would have understood that *Kim's* flexible PCB would be formed of multiple flexible PCBs connected together, wherein only one extends through the passage (Ex. 1003, ¶¶251-252).

5. Claim 17

i. Claim 17: [17.pre]: The watch of claim 16, further comprising:

Kim discloses element [17.pre]. *See* claim 16.

ii. Claim 17: [17.a]: a passage extending from the opening to the enclosed volume; wherein

Kim discloses element [17.a] for substantially the same reasons as element [11.e], incorporated herein (Ex. 1003, ¶¶268-270).

iii. Claim 17: [17.b]: the flexible conduit extends from the opening to the enclosed volume through the passage.

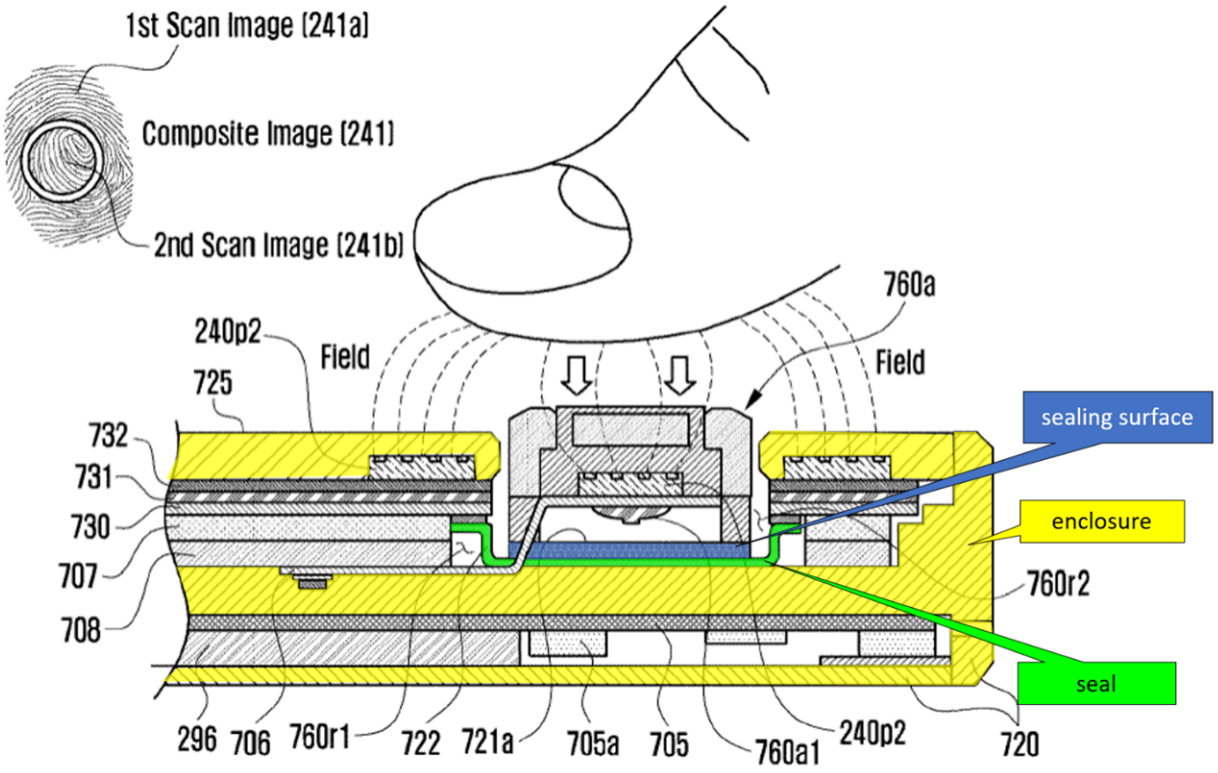
Kim discloses element [17.b] for substantially the same reasons as element [12], incorporated herein (Ex. 1003, ¶¶271-273).

6. Claim 18: The watch of claim 16, further comprising: a fastener attaching the button housing to the enclosure and placing the seal in compression.

Kim renders claim 18 obvious. *See* claim 16.

Kim discloses a button housing separated from the enclosure by the seal (claims [16.e]-[16.g]).

Ex. 1004, Fig. 10(b); Ex. 1022, Fig. 10(b)



A POSITA would have understood the button housing of *Kim* is attached to the portion of the enclosure underneath the seal (which would necessarily place the seal in compression), because Figure 10(b) does not depict any points of attachment to the side of the button housing (Ex. 1003, ¶¶274-278).

7. Claim 20: The watch of claim 16, further comprising an electrical isolation sheet disposed between the button housing and the enclosure.

Kim renders claim 20 obvious. *See* claim 16.

A POSITA would have understood that electrical isolation techniques are beneficial to prevent interference with sensitive electronic components disposed in

the button assembly of *Kim* (such as capacitive fingerprint sensors) (Ex. 1003, ¶¶280-282). Specifically, it was well known in the art that electrical isolation sheets were needed so that capacitance would be measured "between the user's finger and the fingerprint recognition sensor, not between any other object and the fingerprint sensor" (Ex. 1003, ¶282; *see also* Ex. 1007, ¶¶[0079]-[0080]). Therefore, a POSITA would have been motivated to include an electrical isolation sheet disposed between the button housing and the enclosure, to ensure the proper operation of the fingerprint sensor (Ex. 1003, ¶¶282-283).

C. Ground 3: Claims 11-14, 16-17, and 19-20 are Unpatentable Under 35 U.S.C. §103 over *Jung* in view of *Meyers*

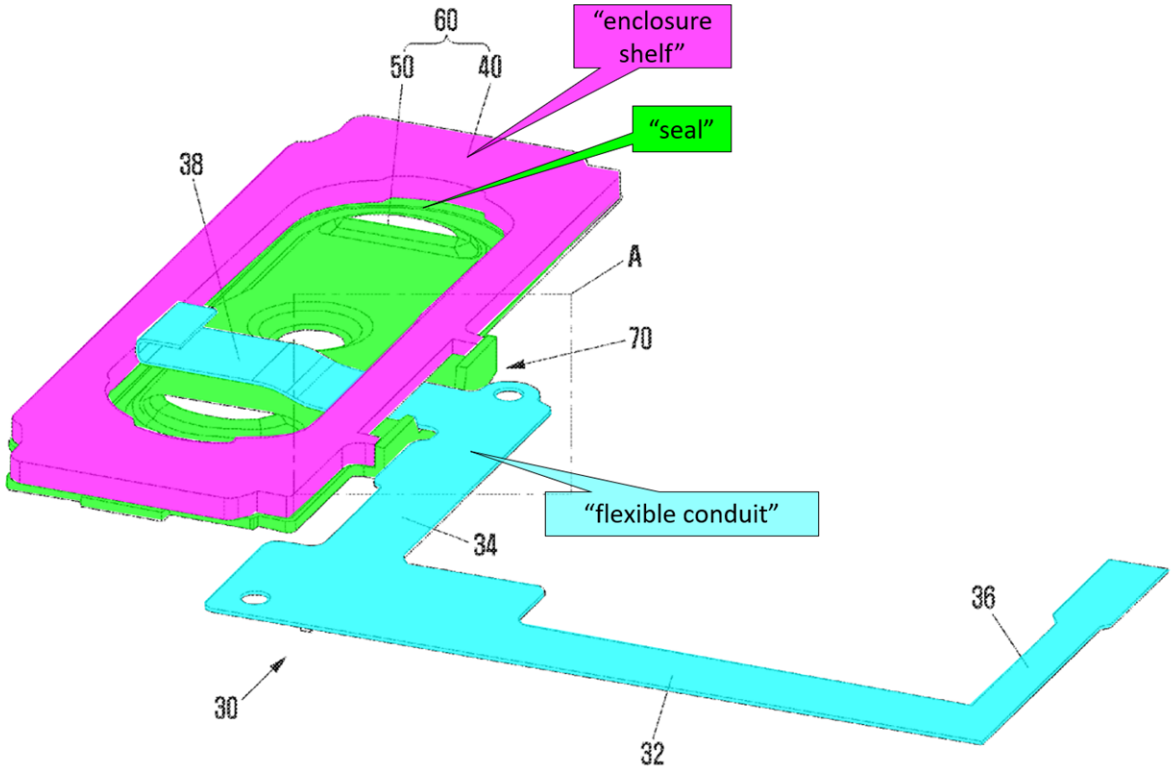
Jung in view of *Meyers* discloses and/or renders obvious claims 11-14, 16-17, and 19-20 of the '619 Patent.

1. Overview of Ground 3

i. Jung

Jung discloses an electronic device with "a key-waterproof structure including … an insert-injected sealing area" (Ex. 1005, Abstract, [0012]). Annotated Figure 10, below, shows a flexible conduit (teal) passing through a passageway or opening in the enclosure shelf (pink), and pressed against a seal (green) (Ex. 1005, Fig. 10; Ex. 1003, ¶¶74-80).

Ex. 1005, Fig. 10



ii. Meyers

Meyers discloses "[v]arious structures and methods … for packaging a biometric sensor, such as a capacitive biometric sensor" (Ex. 1007, Abstract). Specifically, *Meyers'* "[e]mbodiments incorporate various placements of the biometric sensor, structure surrounding [the] biometric sensor, [and] connection structures (electrical, physical, or both)" (Ex. 1007, Abstract). Figure 1 of *Meyers* "shows an assembly of parts disposed to form the fingerprint recognition sensor 102

circuit and position the sensor 102 circuit below a push button" (Ex. 1007, ¶[0042]; Ex. 1003, ¶¶81-87).

Ex. 1007, Fig. 1

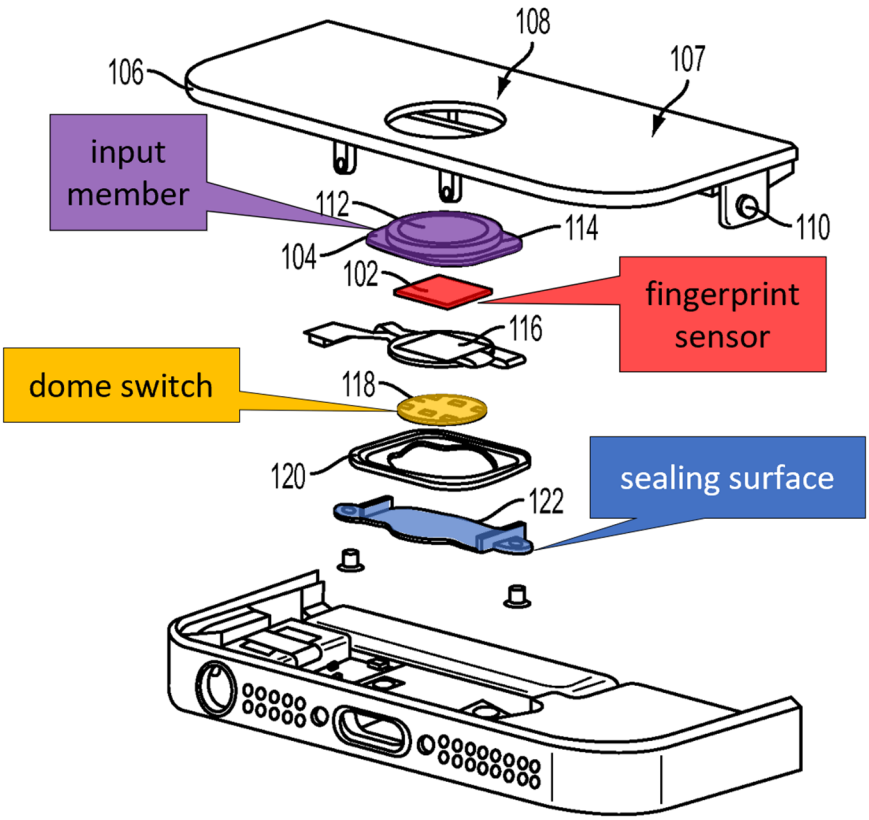


FIG. 1

iii. Motivation to Combine

Jung and *Meyers* are generally directed to the same technical field of button structures within mobile devices. *Jung* is directed to "mobile phones" and other "portable device[s]," having "a home-key that implement various functions in a one-touch type to enhance the user's convenience" (Ex. 1005, [0003]-[0007]; Ex. 1003,

¶285). And *Meyers* is "directed to fingerprint sensor systems for electronic devices, including, but not limited to, fingerprint image sensors for smartphones (or smart phones), tablet computers, media players, personal computers, and other portable electronics and mobile devices," where "the fingerprint sensor is disposed beneath a control button or display element (Ex. 1007, ¶[0036]; Ex. 1003, ¶285).

In particular, *Jung* discloses "[a]n electronic device and a method of waterproofing a key thereof" (Ex. 1005, Abstract). "The device includes a body, a display device disposed in the body, a key disposed in the body, and a key-waterproof structure..." (Ex. 1005, [0012]). *Jung* also discloses a "biometric sensor" such as a "fingerprint sensor" (Ex. 1005, [0060]). But *Jung* does not expressly disclose the structure of its "fingerprint sensor" (Ex. 1003, ¶286). To supply this teaching, a POSITA would have turned to *Meyers*, which expressly discloses the structure of a "fingerprint sensor" button assembly. Indeed, *Meyers* teaches that its button assembly should be incorporated in devices using biometric recognition (Ex. 1007, Abstract, ¶¶[0003], [0011]; Ex. 1003, ¶286).

A POSITA would have been motivated to implement *Meyers*' "fingerprint sensor" button assembly in *Jung*'s "key-waterproof structure" because this would have involved use of known technique to improve similar devices in the same way (Ex. 1003, ¶287). A POSITA would also have known that it was important to seal a fingerprint sensor because fingers can introduce potentially damaging moisture and

dust (Ex. 1003, ¶287). For example, *Evans* discloses that "[f]ingerprints may be deposited in natural secretions from the eccrine glands present in friction ridge skin (secretions consisting primarily of water)" (Ex. 1008, 6:67-7:2). Sealing a fingerprint sensor prevents ingress of contaminants that could potentially damage a fingerprint sensor's electronic circuitry (Ex. 1003, ¶287). Thus, a POSITA would have been motivated to waterproof *Meyers*'s "fingerprint sensor" button assembly using *Jung*'s "key-waterproof structure" and in view of the well known understanding that electronic components should be protected from contaminants, would have had a reasonable expectation of success (*see* Ex. 1005, [0007] ("The home-key, which implements various functions using one touch, ***should be provided with a waterproof structure***."); Ex. 1003, ¶287).

2. Claim 11

i. Claim 11: [11.pre]

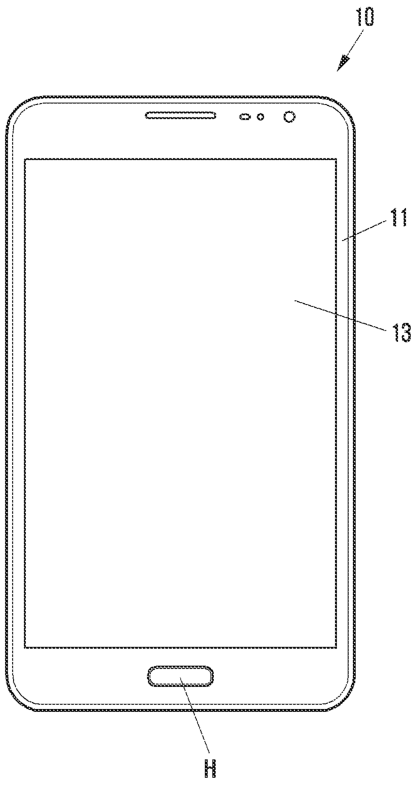
Jung in view of *Meyers* renders element [11.pre] obvious (Ex. 1003, ¶288).

Jung teaches its electronic device may be "a wearable device" (Ex. 1005, [0037]). *Meyers* discloses "fingerprint recognition sensor 102" which "can be used to determine substantial features of the user's fingerprint" for user authentication (Ex. 1007, ¶¶[0047]-[0048]; Ex. 1003, ¶¶289-293).

ii. Claim 11: [11.a]

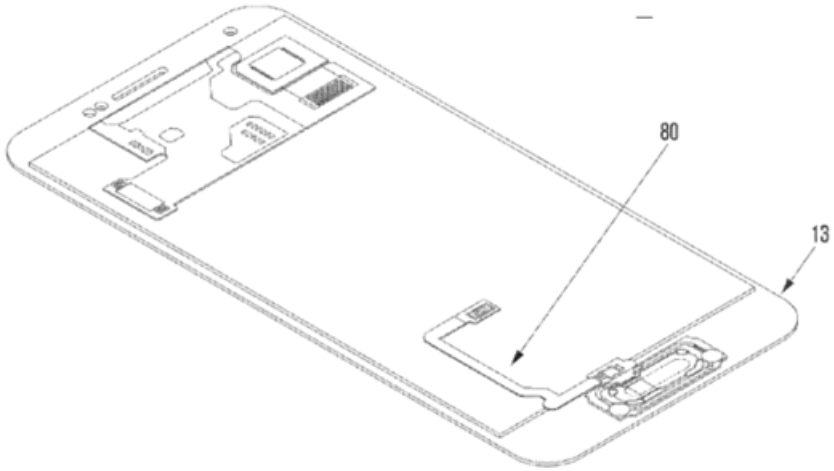
Jung in view of *Meyers* renders element [11.a] obvious (Ex. 1003, ¶¶294-295).

Ex. 1005, Fig. 4A



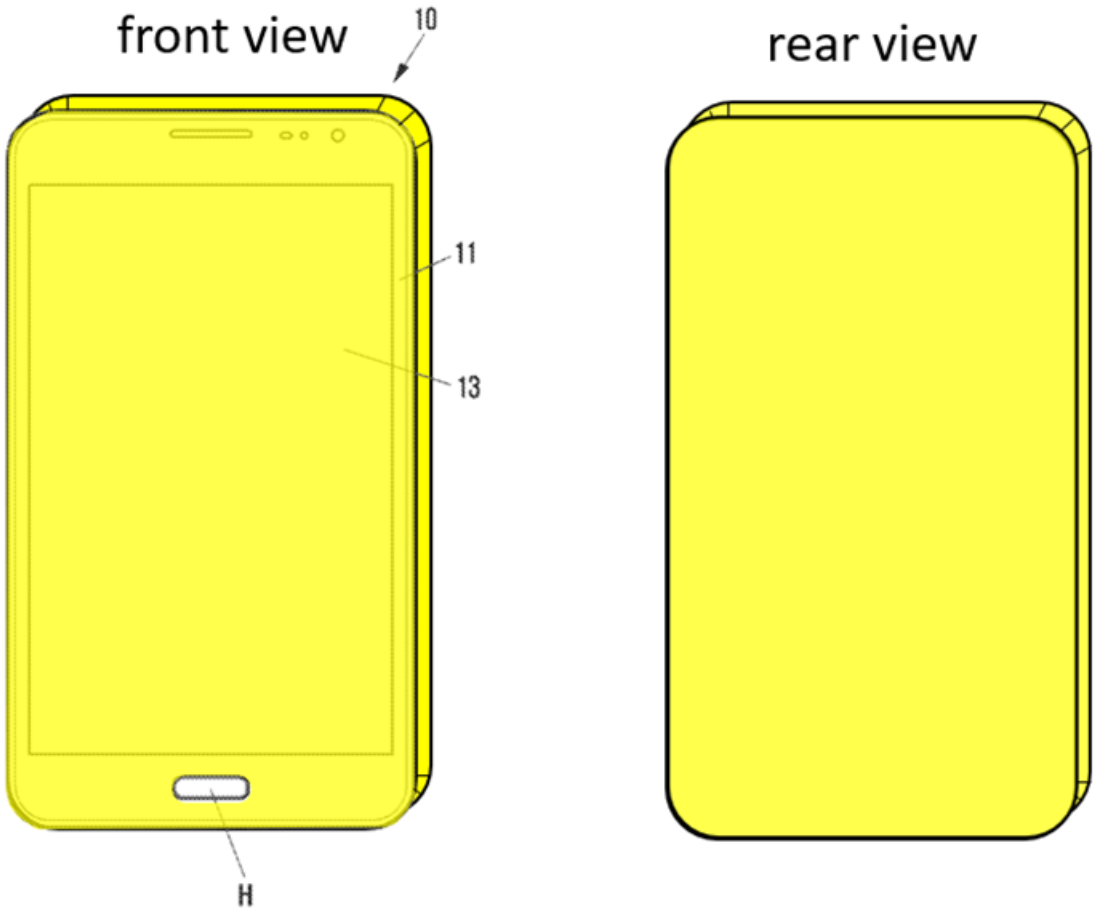
First, *Jung* discloses an enclosure having an enclosed volume (Ex. 1005, [0019]). *Jung's* Figure 12 "illustrat[es] … the ***back surface*** of a display device … of FIG. 4A" (Ex. 1005, [0028]; Ex. 1003, ¶296).

Ex. 1005, Fig. 12



From this, a POSITA would have understood that *Jung*'s electronic device has front, side, and rear surfaces, as depicted in altered and annotated Figure 4A, below (Ex. 1003, ¶297):

Ex. 1005, Fig. 4A (altered and annotated)



Indeed, *Jung* discloses element [11.a] the same way as the '619 Patent, which discloses the "enclosure" is a "structure" that may be "constructed from multiple materials" including metals, polymers, and glass "operably connected together" in order to "define[] an internal volume of the electronic device" (Ex. 1001, 6:3-17; Ex. 1003, ¶¶298-299).

Second, *Jung* renders obvious that the enclosure has an opening along an exterior surface, stating "other keys for performing various functions rather than the

home-key may be applied to the key-waterproof structure of the present disclosure" (Ex. 1005, [0123]; Ex. 1003, ¶¶300-302).

iii. Claim 11: [11.b]

Jung in view of *Meyers* renders element [11.b] obvious (Ex. 1003, ¶303).

Ex. 1005, Fig. 2

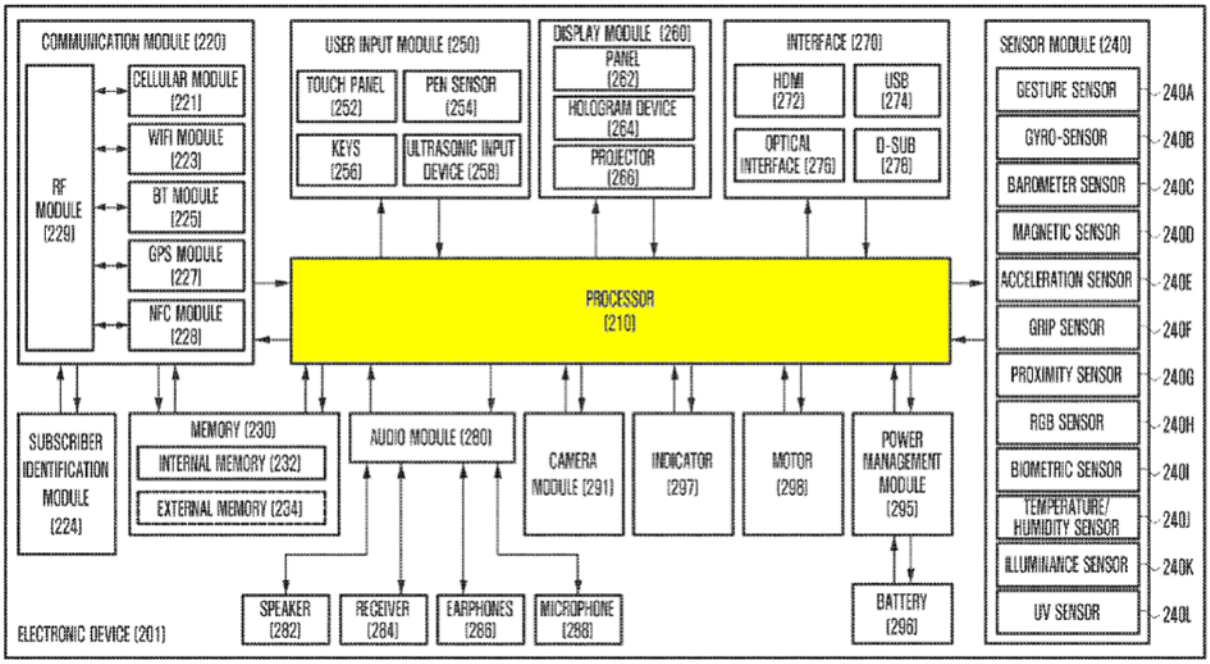


Figure 2 of *Jung* discloses a "processor 210." Because the electronic components of *Jung* are depicted as positioned in the enclosed volume, a POSITA would have understood the processor is positioned in the enclosed volume (Ex. 1005, Fig. 4A). Elsewhere, *Jung* defines the relationship between the processor and other components of the electronic device (Ex. 1005, Figs. 1-3, [0039], [0041]-[0044], [0050]-[0051]; Ex. 1003, ¶¶304-305).

iv. Claim 11: [11.c]

Jung in view of *Meyers* renders element [11.c] obvious (Ex. 1007, Fig. 1; Ex. 1003, ¶306).

Ex. 1007, Fig. 1

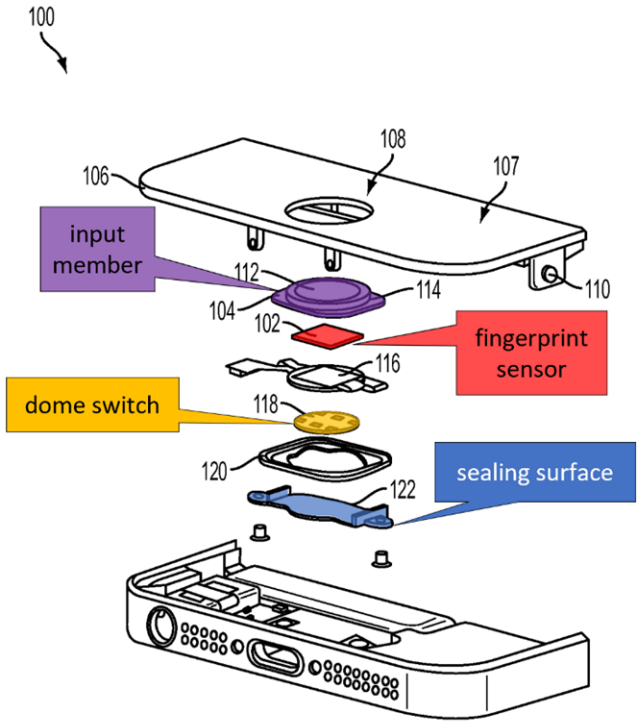


FIG. 1

The button assembly of *Meyers* includes a button 104 (*i.e.*, an input member) (purple) that includes a lens 112 (*i.e.*, an input surface) (Ex. 1007, ¶[0044] ("button 104 includes a lens 112, at least a portion of the lens 112 helping to form a recessed shape, with the effect of guiding the user's finger onto the button"); Ex. 1003, ¶¶307-310).

Claim element [11.c] contains two sub-elements:

(a) Claim 11: [11.c.i]

Jung in view of *Meyers* renders element [11.c.i] obvious (Ex. 1003, ¶311). *Meyers'* fingerprint recognition sensor 102 (*i.e.*, the biometric sensor) (red) is located below (inward from) the input surface of the input member (purple) (Ex. 1007, ¶[0045] ("button 104 is ***disposed above*** and coupled to a fingerprint recognition sensor 102 circuit"), Fig. 1; Ex. 1003, ¶¶311-313).

Ex. 1007, Fig. 1

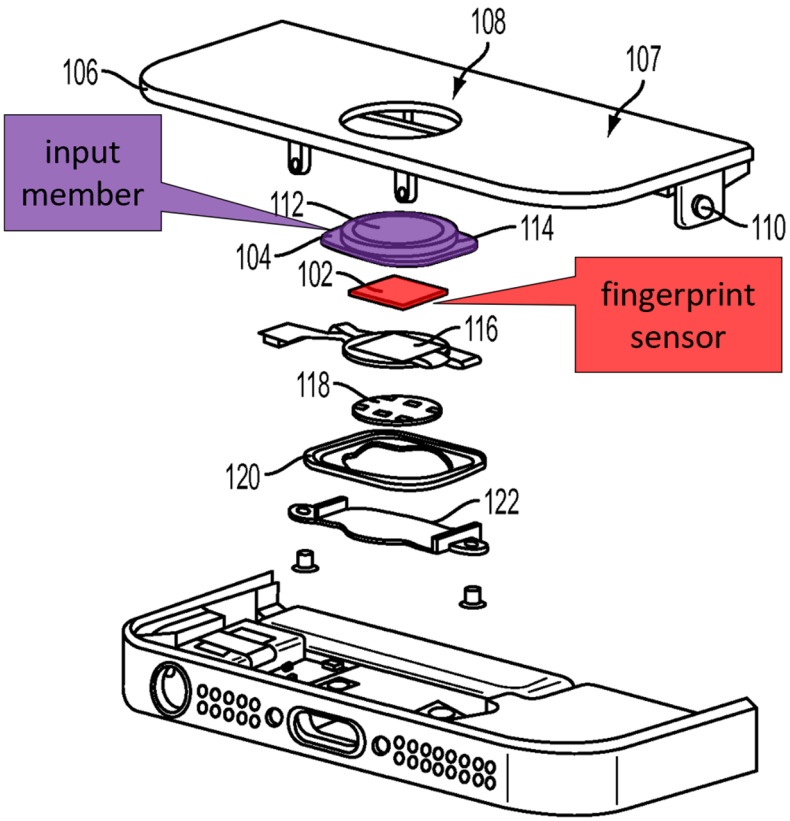


FIG. 1

(b) Claim 11: [11.c.ii]

Jung in view of *Meyers* renders element [11.c.ii] obvious.

Figure 1 of *Meyers*, annotated below, depicts both the retainer (*i.e.*, the button support plate 122) in blue, and the input surface of the input member (*i.e.*, the lens 112 located on button 104) in purple (Ex. 1007, ¶[0052]; Ex. 1003, ¶¶314-315). *See* element [11.c].

Ex. 1007, Fig. 1

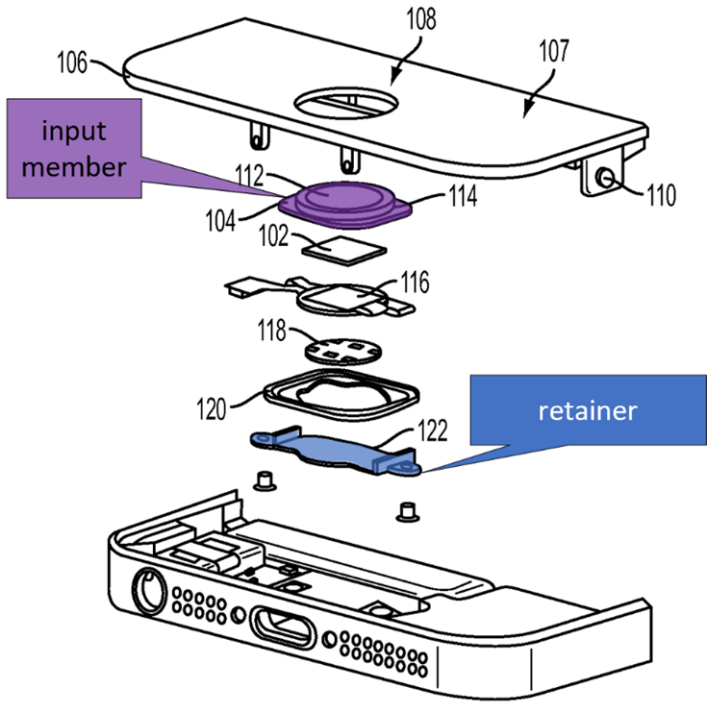


FIG. 1

When *Meyers'* button assembly is combined with *Jung's* button housing, the retainer will define a sealing surface against the seal (green) (Ex. 1003, ¶¶316-317).

Ex. 1005, Fig. 10; Ex. 1007, Fig. 1

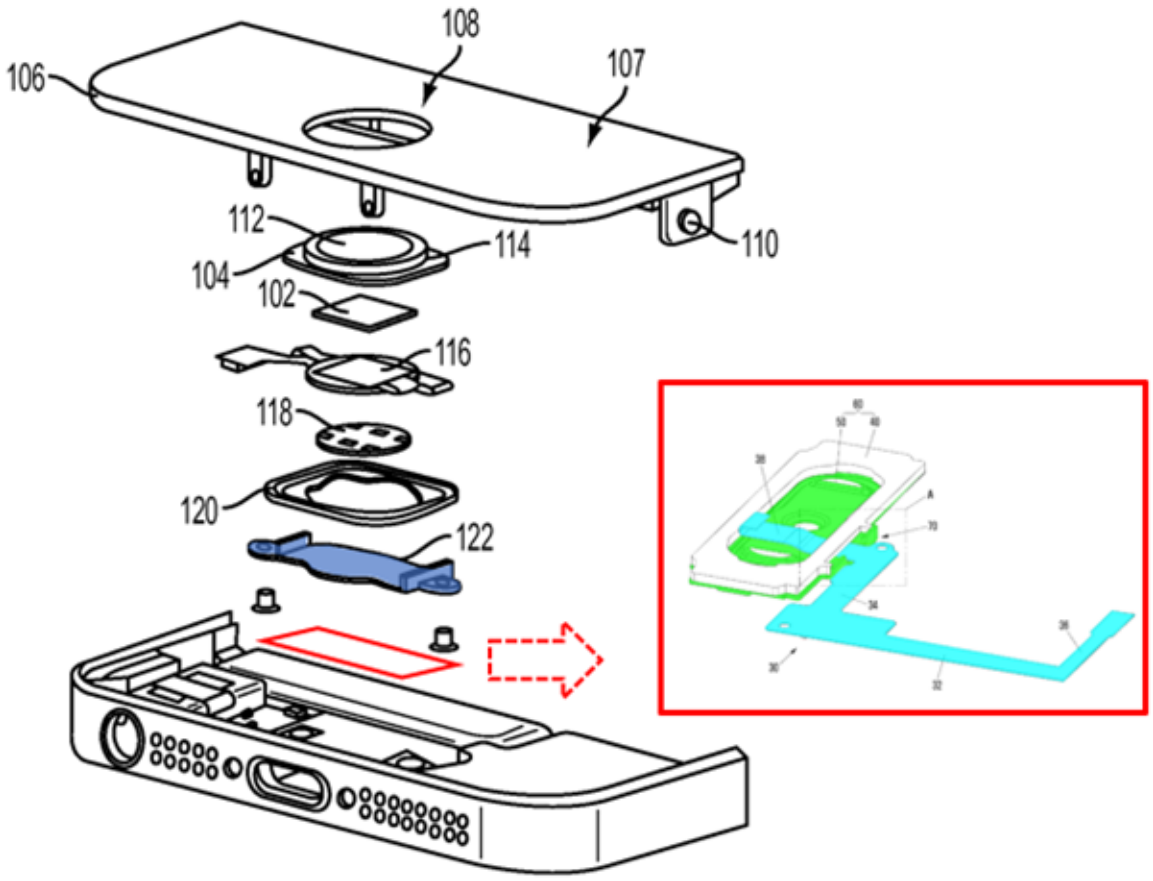


FIG. 1

The ’619 Patent teaches that (1) multiple “configurations of the retainer 224 are possible,” (2) it provides “a stop to displacement of the button housing” and (3) “[t]he retainer 224 lower surface forms a sealing surface 225 for the button assembly 310” (Ex. 1001, 16:54-60; Ex. 1003, ¶318). A POSITA would have understood the button support plate 122 of *Meyers* likewise serves as “a stop to the displacement of

the button housing" and includes a "lower surface [that] forms a sealing surface … for the button assembly" (Ex. 1003, ¶318). As such, a POSITA would have understood button support plate 122 constitutes a retainer (Ex. 1003, ¶¶318-319).

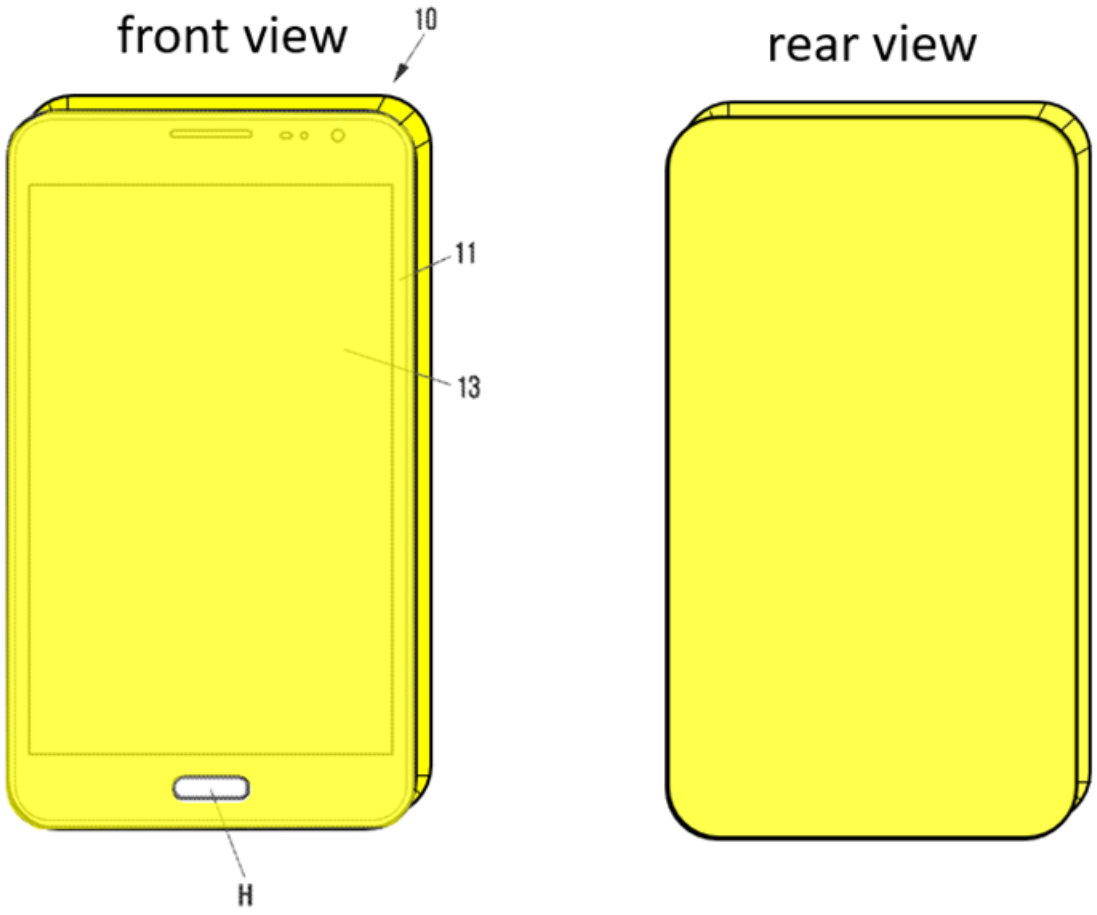
v. Claim 11: [11.d]

Jung in view of *Meyers* renders element [11.d] obvious.

Jung in view of *Meyers* discloses a seal, a retainer defining a sealing surface, and an opening along an exterior surface of the enclosure. *See* elements [11.c.ii], [11.a].

Jung's opening constitutes a hole in the exterior surface of the enclosure, which is sized so that a button assembly can be inserted therein (Ex. 1005, Fig. 4; Ex. 1003, ¶¶320-323). Figure 4A has been annotated, below, to depict the opening (uncolored) and the side, and rear surfaces:

Ex. 1005, Fig. 4A (altered and annotated)



The perimeter of the claimed opening is defined by the perimeter of the opening for home-key "H", while the depth of the opening is defined by the front and rear surfaces of the enclosure, as depicted above (Ex. 1003, ¶324). In other words, a POSITA would have understood the "opening" is the space that remains in the absence of home-key "H," bounded by the front and rear surfaces of the electronic device (Ex. 1003, ¶324).

As discussed above, *Meyers* discloses a button assembly that includes a retainer with a sealing surface (*i.e.,* a button support plate, blue), (Ex. 1003, ¶325). *See* element [11.c.ii], above.

Ex. 1007, Fig. 1

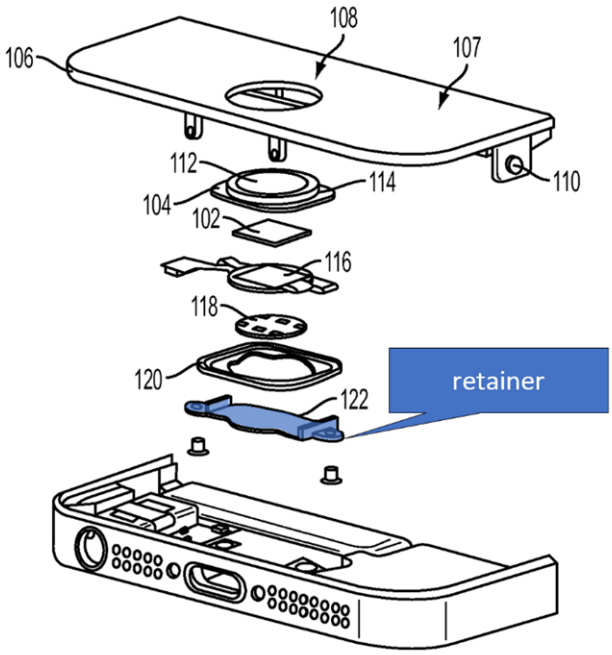
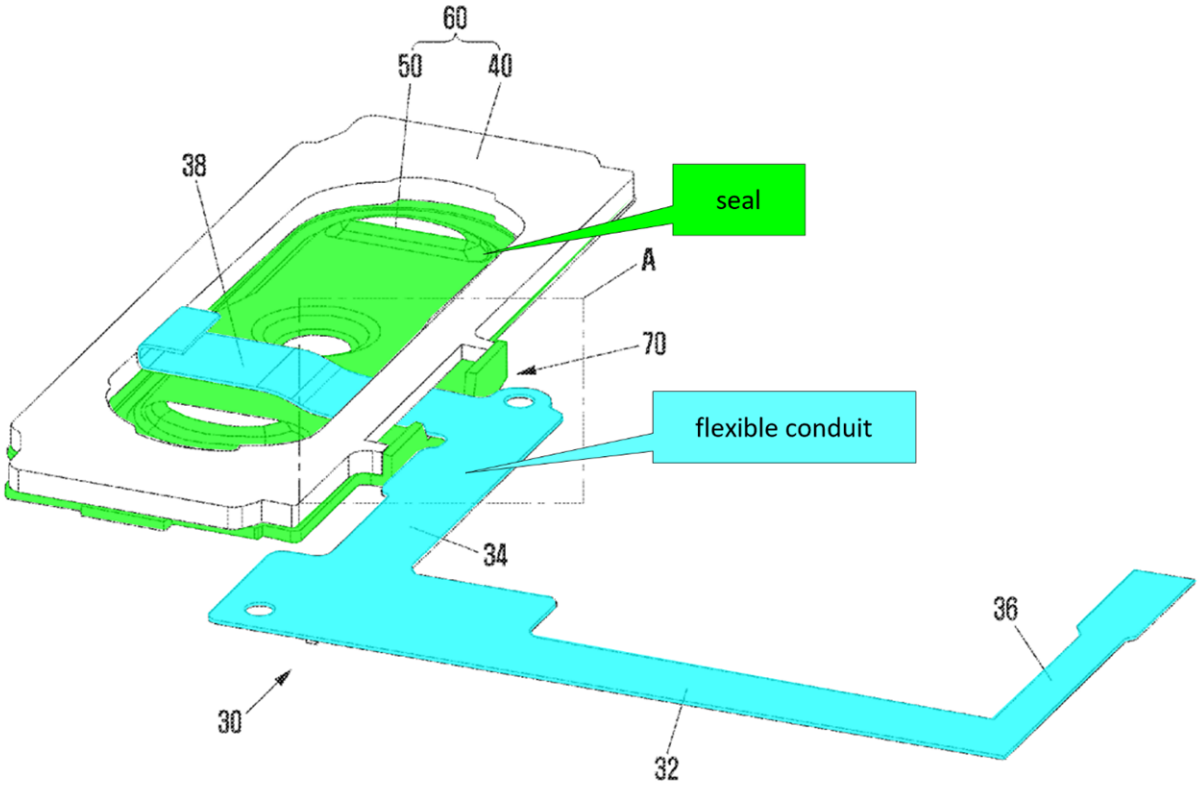


FIG. 1

Likewise, *Jung* Figure 10, below, depicts bracket 40 and silicon rubber 50 (the "seal") in green (Ex. 1003, ¶326). *See* claim element [1.d].

Ex. 1005, Fig. 10



When assembled, the button assembly of *Meyers* is inserted into the opening of the bracket 40, and rests on top of (1) the key bonding portion 38 of flexible PCB 30 and (2) the silicon rubber 50 (green) (Ex. 1003, ¶327).

Ex. 1005, Fig. 10; Ex. 1007, Fig. 1

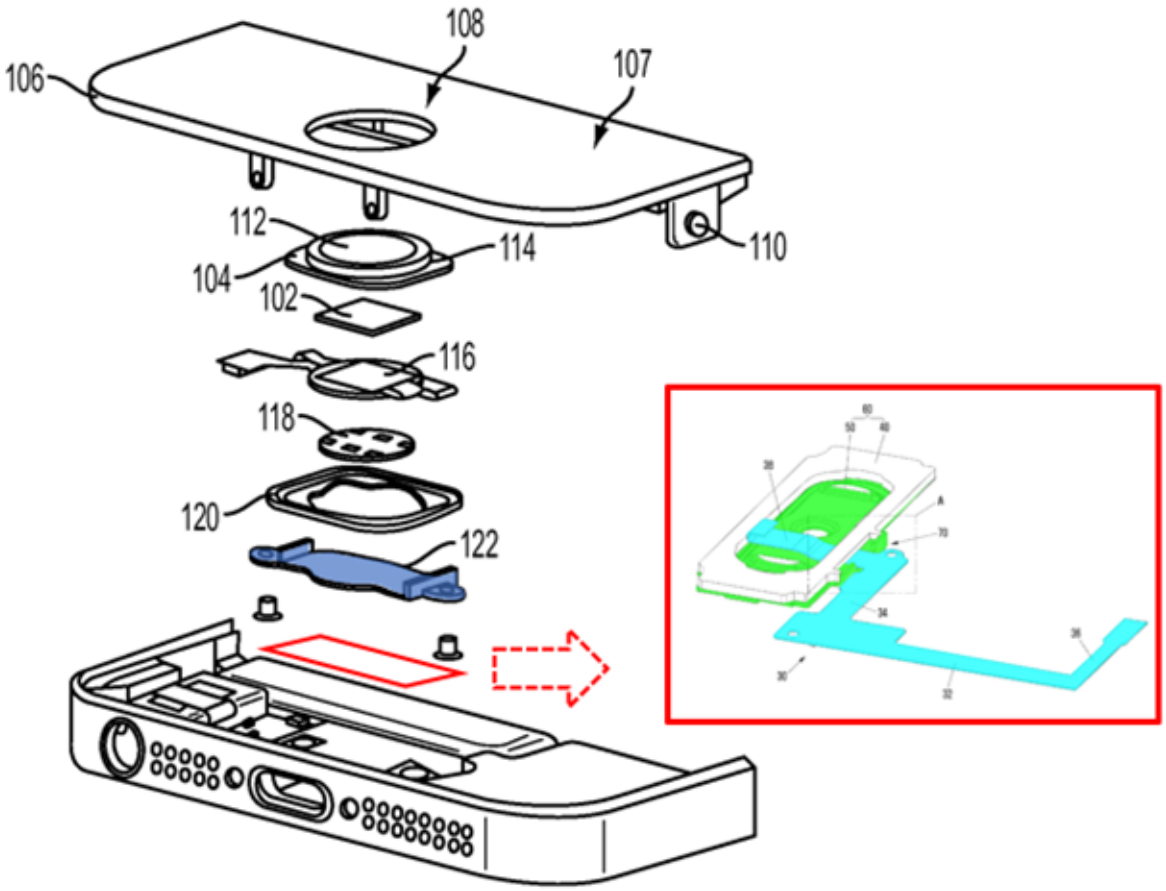


FIG. 1

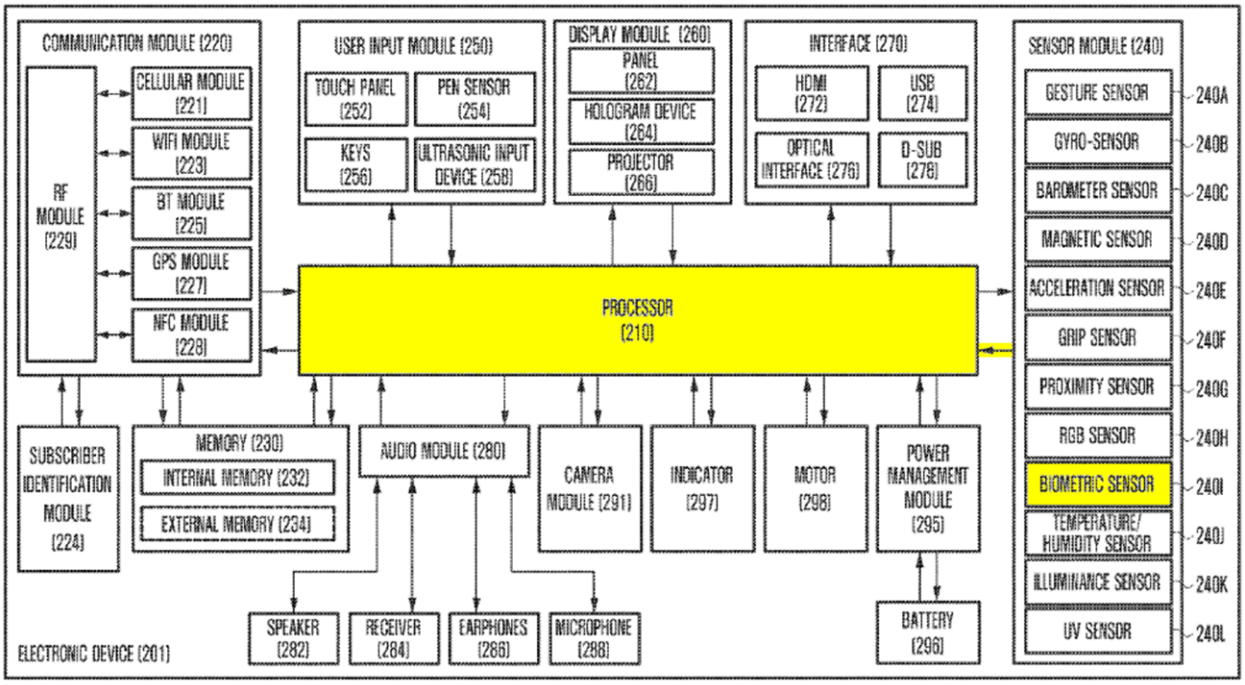
In this configuration, the silicon rubber 50 (*i.e.*, the seal) of *Jung* is located between button support plate 122 (*i.e.*, the sealing surface of the button assembly) of *Meyers* and the enclosure (Ex. 1003, ¶328). Specifically, the entire key waterproofing structure disclosed by *Jung* is located *inside* of the enclosure. Because the enclosure surrounds the button assembly, the seal is located between the bracket

and the portion of the enclosure defining the rear of the electronic device (Ex. 1003, ¶¶328-329).

vi. Claim 11: [11.e]

Jung in view of *Meyers* renders element [11.e] obvious (Ex. 1003, ¶330). *Jung* discloses the claimed enclosure. *See* element [11.a]. Likewise, *Jung* discloses a "flexible printed circuit board 30" that includes a "key bonding portion 38 … to which the oval home-key H is bonded" (Ex. 1005, [0098], Fig. 10; Ex. 1003, ¶331). Figure 2 of *Jung*, below, also shows the processor in communication with the biometric sensor.

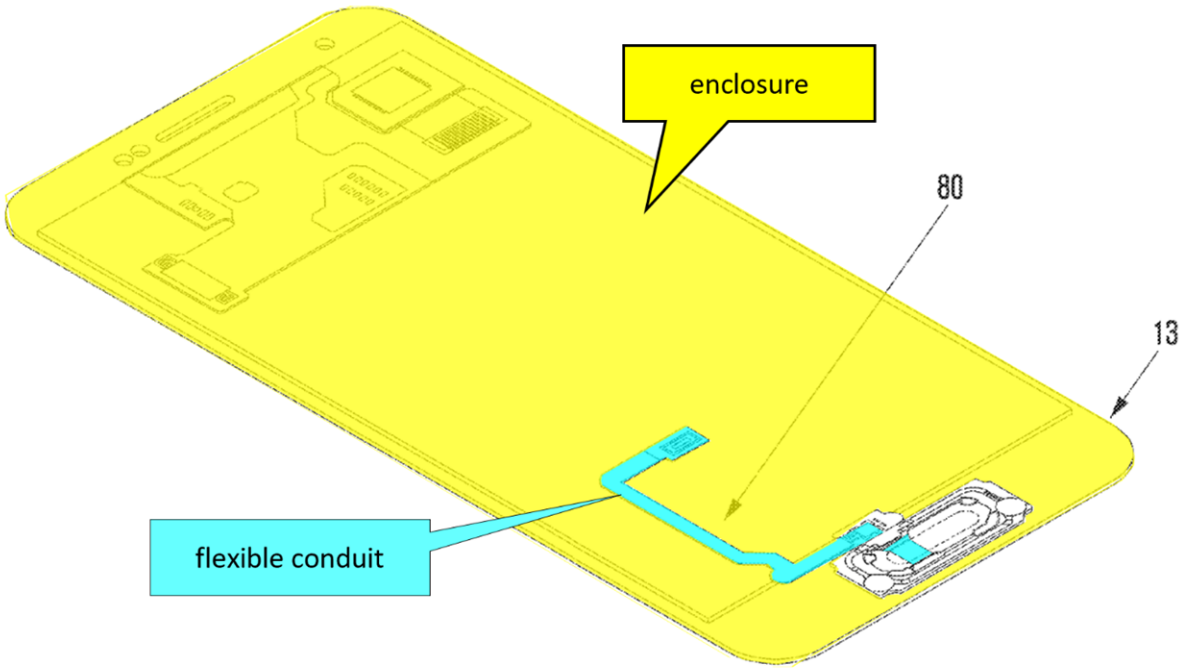
Ex. 1005, Fig. 2



Jung's flexible PCB 30 provides for communication between the processor and the biometric sensor, passing from the fingerprint sensor (in the opening of the

enclosure) to the processor (in the enclosed volume) (Ex. 1005, Fig. 12; Ex. 1003, ¶332).

Ex. 1005, Fig. 12



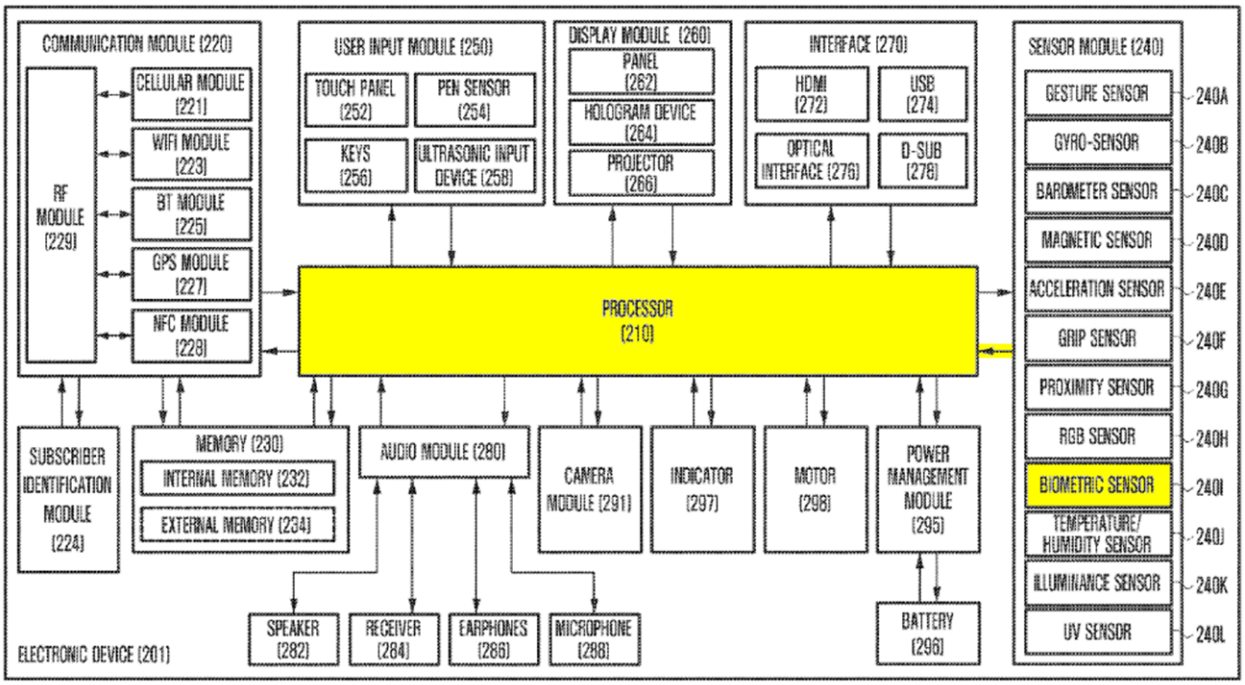
As depicted in Figure 12, the flexible conduit (teal) extends through a passageway from the opening (uncolored) in the outer wall of the enclosure (yellow) into the enclosed volume of the device (Ex. 1003, ¶¶333-334).

vii. Claim 11: [11.f]

Jung in view of *Meyers* renders element [11.f] obvious (Ex. 1003, ¶335). *Jung* discloses a "flexible printed circuit board 30" that includes a "key bonding portion 38 … to which the oval home-key H is bonded" (Ex. 1005, [0098], Fig. 10; Ex. 1003, ¶¶336).

Figure 2 of *Jung*, below, also shows the processor in communication with the biometric sensor.

Ex. 1005, Fig. 2



A POSITA would have understood substituting the button assembly of *Meyers* in place of *Jung's* home-key H for the reasons disclosed above with respect to motivation to combine would result in the *Jung's* flexible conduit being electrically coupled to the *Meyers'* biometric sensor, so it can communicate with *Jung's* processor (Ex. 1003, ¶¶337-338). A POSITA would have further understood *Jung's* Figure 2 depicts this connection, such that the biometric sensor will transmit an output signal to the processor (Ex. 1003, ¶338).

Furthermore, a POSITA would have understood that, in order for the flexible conduit to communicate with the fingerprint sensor or the processor, it must be electrically connected to both components (Ex. 1003, ¶¶339-340).

viii. Claim 11: [11.g]

Jung in view of *Meyers* renders element [11.g] obvious (Ex. 1003, ¶341). The annotated figure below discloses a portion of *Jung's* flexible conduit (teal) sandwiched between *Jung's* seal (green) and the sealing surface of *Meyers'* retainer (blue) (Ex. 1003, ¶341).

Ex. 1005, Fig. 10; Ex. 1007, Fig. 1

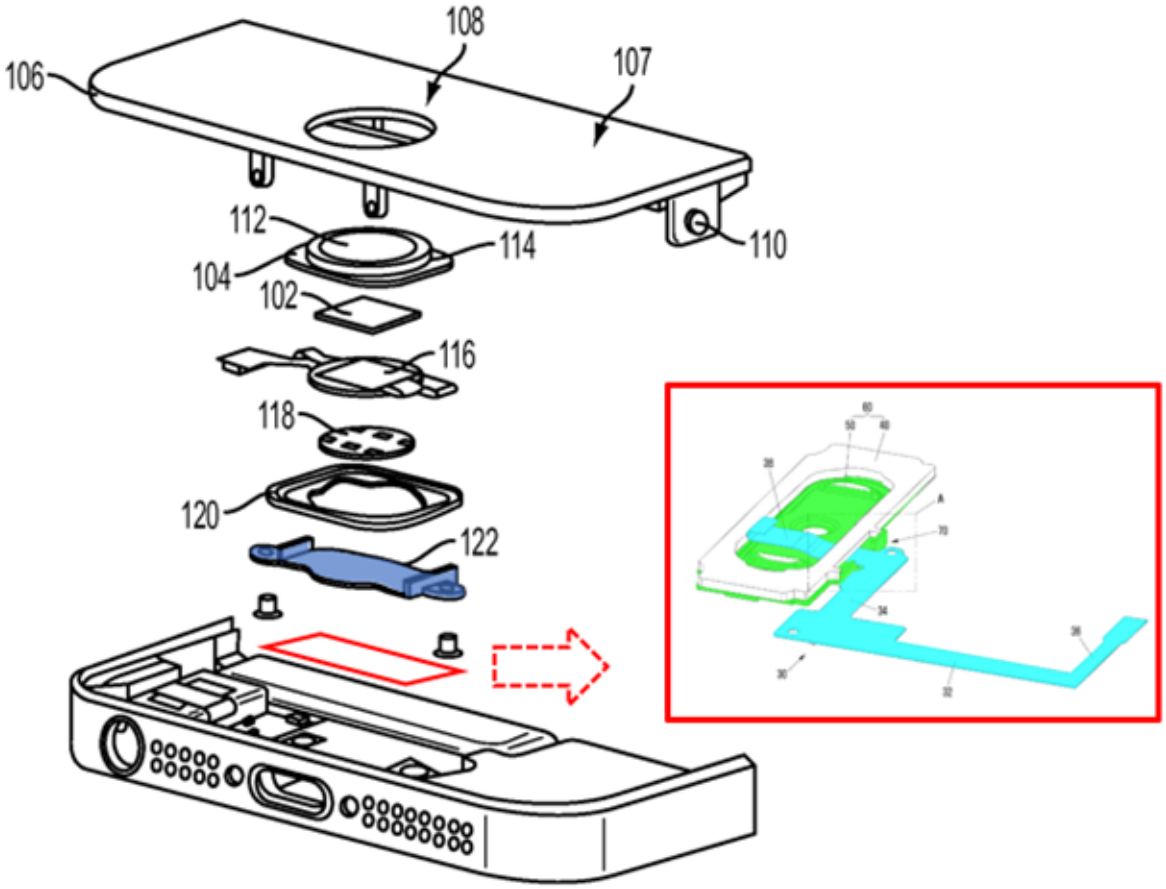


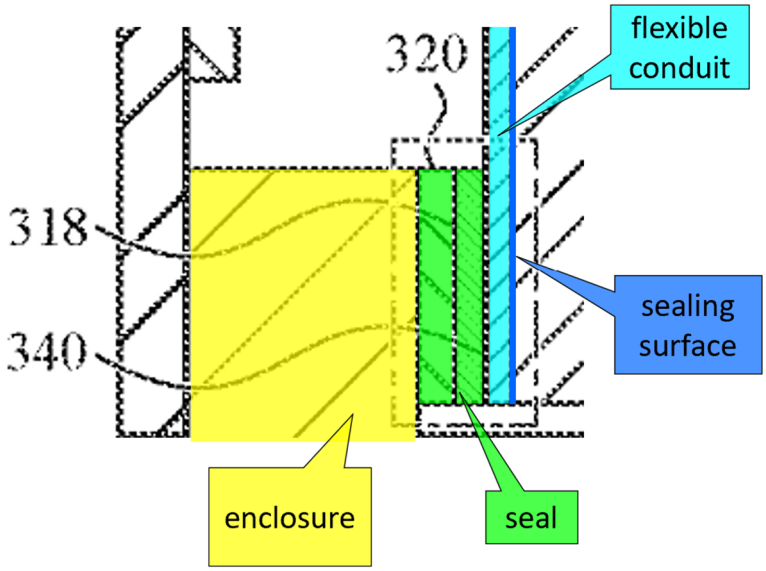
FIG. 1

Jung discloses the claimed "flexible conduit," "seal," and "enclosure" (elements [1.a], [1.d], [1.f]). Furthermore, a POSITA would have understood that when *Meyers'* button assembly is combined with *Jung's* waterproof-key assembly (as depicted above), a portion of *Jung's* "flexible printed circuit board 30," (teal) is

sandwiched between its seal (*i.e.*, "silicon rubber 50") (green) and *Meyers'* button support plate 122 (blue) (Ex. 1003, ¶342).

Indeed, *Jung* in view of *Meyers* discloses this limitation in the same way as the '619 Patent, which teaches "a gasket seal (such as face seal 318) may further be applied below the lower PSA portion, such that ***a sandwich … is formed of PSA, flexible conduit 340, PSA, and then the gasket seal***" (Ex. 1001, 17:35-46; Ex. 1003, ¶343). "Sandwiching" is illustrated in at least the '619 Patent's Figure 3A (excerpted annotated below). The '619 Patent discloses that "sandwiching" includes a "stack" of elements (Ex. 1001, 23:39-43; Ex. 1003, ¶343).

Ex. 1001, Fig. 3A (excerpted and annotated)



Likewise, *Jung* in view of *Meyers* discloses a "stack" of elements including "a portion of the flexible conduit," a "seal," and a "sealing surface" of the retainer, (Ex. 1003, ¶344).

Furthermore, a POSITA would have known a common way to electrically connect a fingerprint sensor to a processor was with a flexible PCB, and that button assemblies would be sealed to prevent ingress of potentially damaging substances (Ex. 1003, ¶345). Therefore, a POSITA would have been motivated to provide the seal by sandwiching existing, known components, such as a sealing surface of the button assembly and flexible conduit. Using these existing, known components would have saved costs and promoted an efficient use of limited space within the mobile device (Ex. 1003, ¶¶345-346; *see also* Ex. 1015, 12:12-19; Ex. 1011, [0055]; Ex. 1008, 6:67-7:2).

3. Claim 12

Jung in view of *Meyers* renders claim 12 obvious (Ex. 1003, ¶¶347-348). *Jung* in view of *Meyers* renders the claimed passage obvious. *See* claim 11.

Jung's flexible PCB 30 provides for communication between the processor and the biometric sensor, passing from the fingerprint sensor (in the opening of the enclosure) to the processor (in the enclosed volume) (Ex. 1003, ¶349).

Ex. 1005, Fig. 12

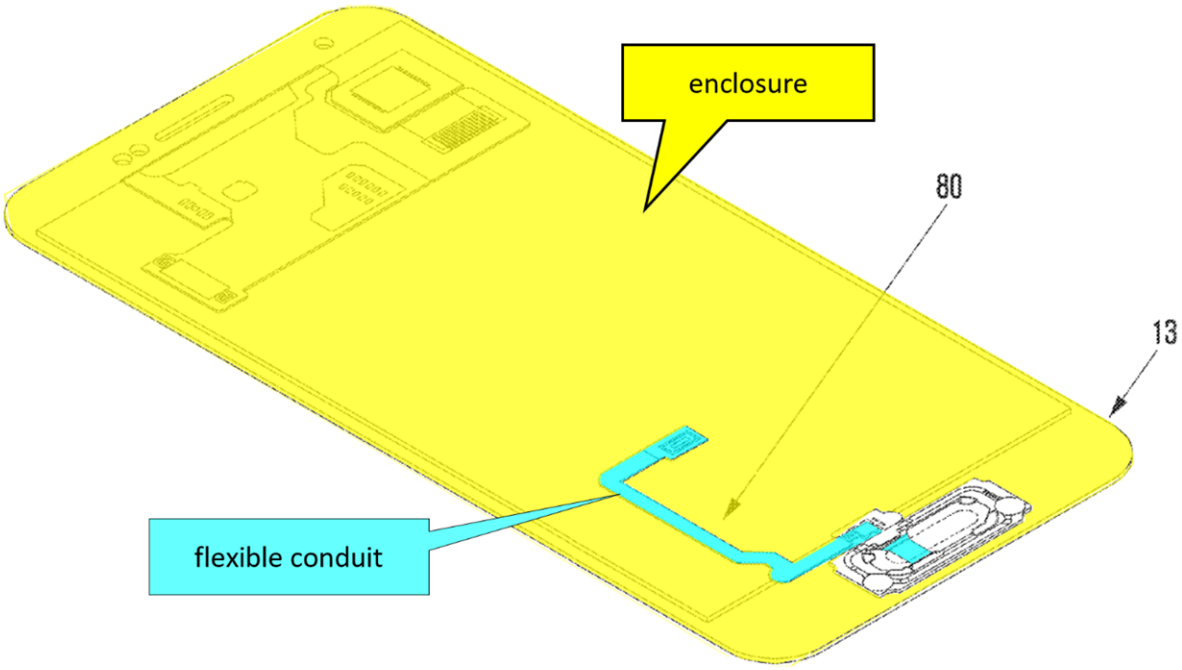


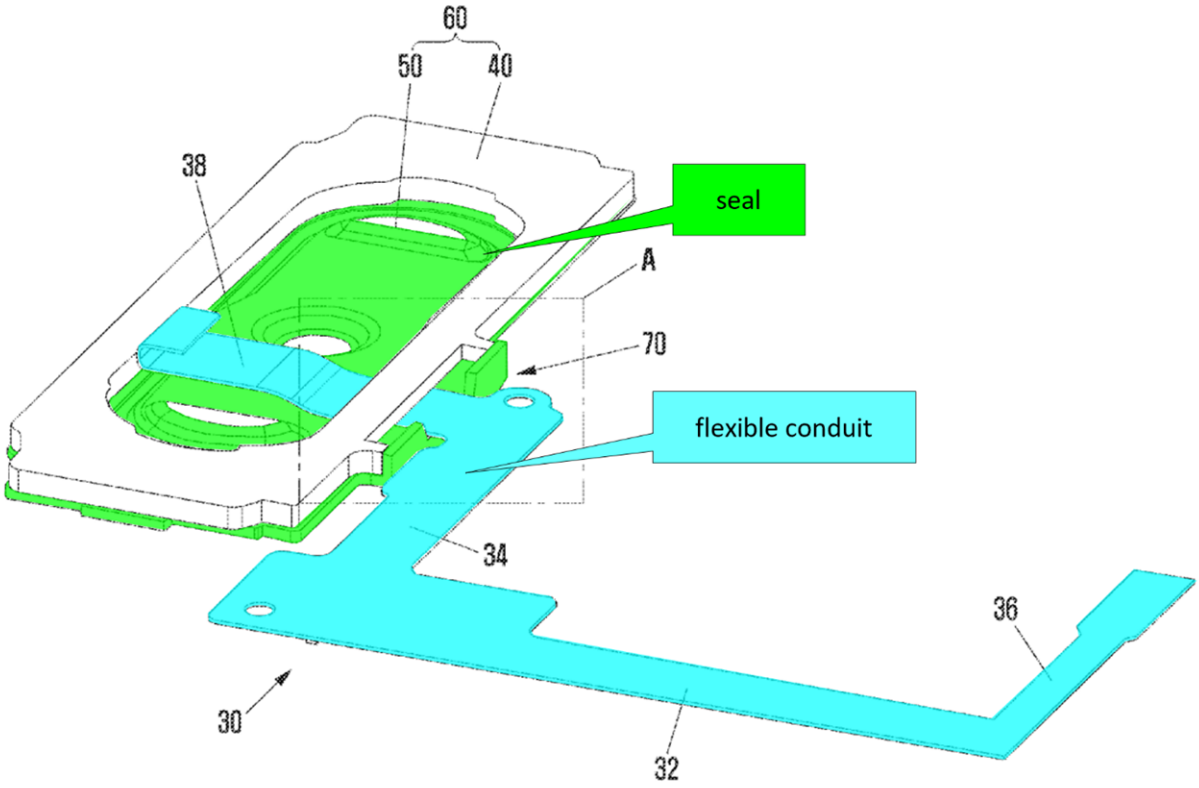
Figure 12 shows the flexible conduit (teal) extends through a passageway from the opening (uncolored) in the outer wall of the enclosure (yellow) into the enclosed volume of the device (Ex. 1003, ¶¶350-351).

4. Claim 13

Jung in view of *Meyers* renders claim 13 obvious. *See* claim 11.

Jung in view of *Meyers* discloses a flexible conduit extending through the passage. *See* claim elements [11.f], [12]. *Jung's* flexible PCB 30 is below (Ex. 1003, ¶¶352-353).

Ex. 1005, Fig. 10



Jung specifically teaches flexible PCB 30 has multiple portions, including a "central vertical portion 32," "first bent portion 34," and "second bent portion 36." (Ex. 1005, [0098]; Ex. 1003, ¶354).

Jung explains the flexible PCB is "assembled according to an embodiment of the present disclosure" (Ex. 1005, [0113]) and includes "assembling the flexible printed circuit board 30 through the silicon-not-attached portion 70 of the insert-injected product 60" (Ex. 1005, [0120]; Ex. 1003, ¶355).

Given the disclosures that (1) the flexible PCB contains multiple portions, and (2) the flexible PCB is ***assembled*** through the silicon seal, a POSITA would have

understood *Jung* discloses multiple flexible PCBs which can be combined or assembled together to form the disclosed flexible PCB 30, wherein a second flexible conduit that extends through the passage (Ex. 1003, ¶¶356-357).

5. Claim 14

Jung in view of *Meyers* renders claim 14 obvious (Ex. 1003, ¶358). *See* claims [11.c.i], 11.

Meyers discloses "fingerprint recognition sensor 102" is configured to produce a biometric characteristic as an output in response to a touch on the input surface (Ex. 1007, ¶[0047]). *Meyers'* fingerprint sensor "can be used to determine substantial features of the user's fingerprint" for user authentication (Ex. 1007, ¶[0048]; Ex. 1003, ¶359).

Notably, *Meyers* discloses the fingerprint sensor (1) is a capacitive fingerprint sensor disposed for capacitive coupling to the epidermis of the user's finger, and (2) produces as an output a 2D array of fingerprint information (Ex. 1007, ¶¶[0047]-[0048]). A POSITA would have understood a capacitive fingerprint sensor responds to a user's touch on the input surface, and a 2D array of fingerprint information constitutes an output signal corresponding to a biometric characteristic (Ex. 1003, ¶¶360-361).

6. Claim 16

i. Claim 16: [16.pre]

Jung in view of *Meyers* renders element [16.pre] obvious (Ex. 1003, ¶¶362-364).

Jung teaches its electronic device may be "a wrist watch" (Ex. 1005, [0037]).

ii. Claim 16: [16.a]

Jung in view of *Meyers* renders element [16.a] obvious for substantially the same reasons as element [11.a], [11.c], incorporated herein (Ex. 1003, ¶¶365-366).

A POSITA would have understood the key-waterproof structure of *Jung* would be applied to any of the electronic devices disclosed therein (Ex. 1005, [0019], [0037]; claim [11.a]; Ex. 1003, ¶¶367-368). Therefore, a POSITA would have understood that the key-waterproof structure can be applied to one or more keys and/or buttons, including keys located in the sidewall of the electronic device (Ex. 1003, ¶¶367-368). Indeed, waterproofing keys located in the sidewall of the electronic device was well within the general knowledge of a POSITA (*see, e.g.,* Ex. 1004, 13:46-53, 17:10-12; Ex. 1022, ¶¶89, 166; Ex. 1003, ¶¶367-369).

iii. Claim 16: [16.b]

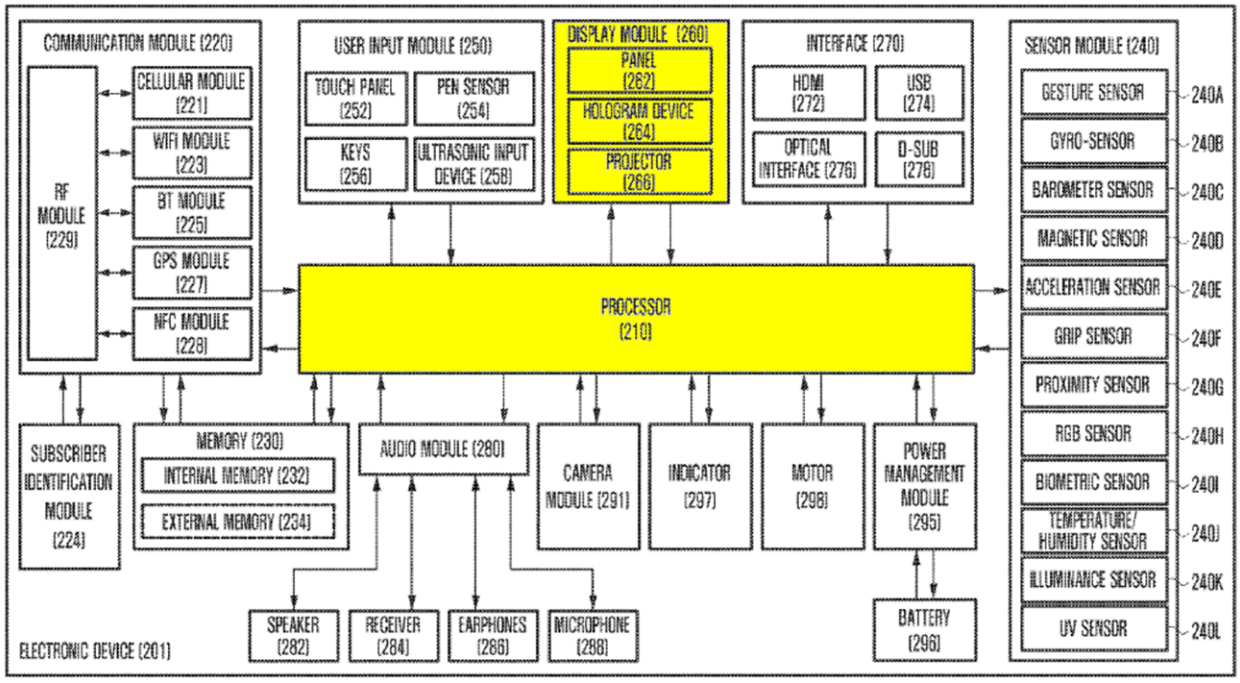
Jung in view of *Meyers* renders element [16.b] obvious for substantially the same reasons as element [11.b], incorporated herein (Ex. 1003, ¶¶370-372).

iv. Claim 16: [16.c]

Jung in view of *Meyers* renders element [16.c] obvious (Ex. 1003, ¶373).

Jung discloses a device that "includes a body, [and] a display device disposed in the body" which is operably connected to the processor (Ex. 1006, [0012]; Ex. 1003, ¶¶374-376).

Ex. 1005, Fig. 2



v. Claim 16: [16.d]

Jung in view of *Meyers* renders element [16.d] obvious. A POSITA would have understood a smart watch necessarily includes a watchband, and that it would be obvious to a POSITA to connect the watchband of the disclosed watch to the enclosure of the electronic device, in order to couple the watch to the user (Ex. 1003, ¶¶377-380).

vi. Claim 16: [16.e]

Jung in view of *Meyers* renders element [16.e] obvious for substantially the same reasons as element [11.c], incorporated herein (Ex. 1003, ¶¶381-384).

Element [16.e] contains five sub-elements:

(a) Claim 16: [16.e.i]

Jung in view of *Meyers* renders element [16.e.i] obvious.

The button housing of *Meyers* is depicted in an expanded view, below. The exterior of the housing is comprised in large part by button 104, lens 112, ground ring 114, and button support plate 122 (Ex. 1007, ¶[0044]; Ex. 1003, ¶¶385-387).

Ex. 1007, Fig. 1

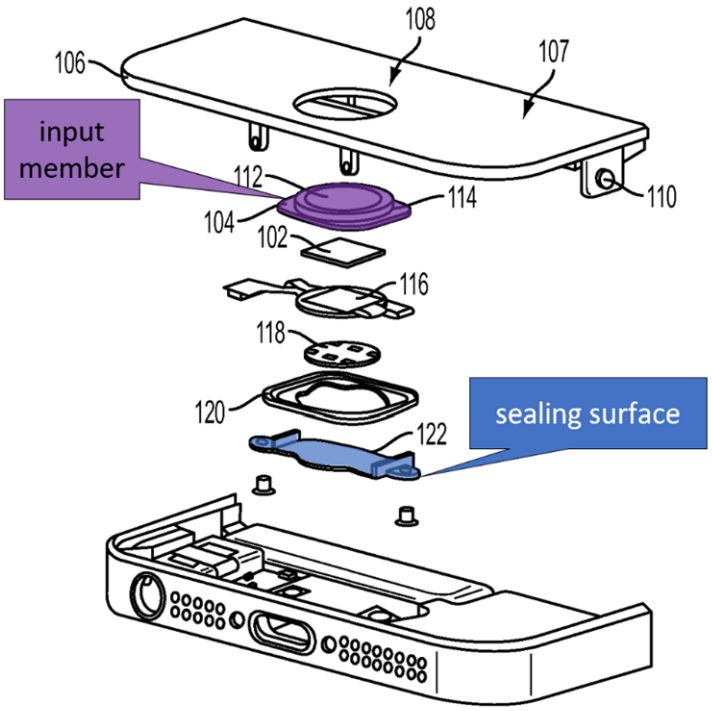


FIG. 1

(b) Claim 16: [16.e.ii]

Jung in view of *Meyers* renders element [16.e.ii] obvious for substantially the same reasons as element [11.c], incorporated herein (Ex. 1003, ¶¶388-392).

(c) Claim 16: [16.e.iii]

Jung in view of *Meyers* renders element [16.e.iii] obvious for substantially the same reasons as claims [11.c.i] and 14, incorporated herein (Ex. 1003, ¶¶393-400).

(d) Claim 16: [16.e.iv]

Jung in view of *Meyers* renders element [16.e.iv] obvious for substantially the same reasons as claims [11.c.i] and 14, incorporated herein (Ex. 1003, ¶¶401-402).

Jung in view of *Meyers* discloses a capacitive fingerprint sensor embedded into the button assembly, which a POSITA would have understood functions by detecting minor electrical changes when the ridges of a user's fingerprint touch the sensor (Ex. 1007, Abstract; Ex. 1003, ¶¶402-403).

(e) Claim 16: [16.e.v]

Jung in view of *Meyers* renders element [16.e.v] obvious for substantially the same reasons as element [11.f], incorporated herein (Ex. 1003, ¶¶404-406).

vii. Claim 16: [16.f]

Jung in view of *Meyers* renders element [16.f] obvious for substantially the same reasons as elements [11.d] and [16.e.iv], incorporated herein (Ex. 1003, ¶¶407-409).

viii. Claim 16: [16.g]

Jung in view of *Meyers* renders element [16.g] obvious for substantially the same reasons as elements [11.g] and [16.e.iv], incorporated herein (Ex. 1003, ¶¶410-412).

7. Claim 17

i. Claim 17: [17.pre]

Jung in view of *Meyers* renders element [17.pre] obvious. *See* claim 16.

ii. Claim 17: [17.a]

Jung in view of *Meyers* renders element [17.a] obvious for substantially the same reasons as element [11.e], incorporated herein (Ex. 1003, ¶¶413-416).

iii. Claim 17: [17.b]

Jung in view of *Meyers* renders element [17.b] obvious for substantially the same reasons as element [12], incorporated herein (Ex. 1003, ¶¶417-419).

8. Claim 19

Jung in view of *Meyers* renders claim 19. *See* claim 16.

Meyers teaches "flexible element 116 [is] disposed both to receive any force imposed by the user's finger on the button 104, and to transmit that force to a tactile dome switch 118" (Ex. 1007, ¶[0049]; Ex. 1003, ¶¶420-421). Flexible element 116 (*i.e.*, the compressible layer) (red box) is located below fingerprint sensor 102 (red):

Ex. 1007, Fig. 1

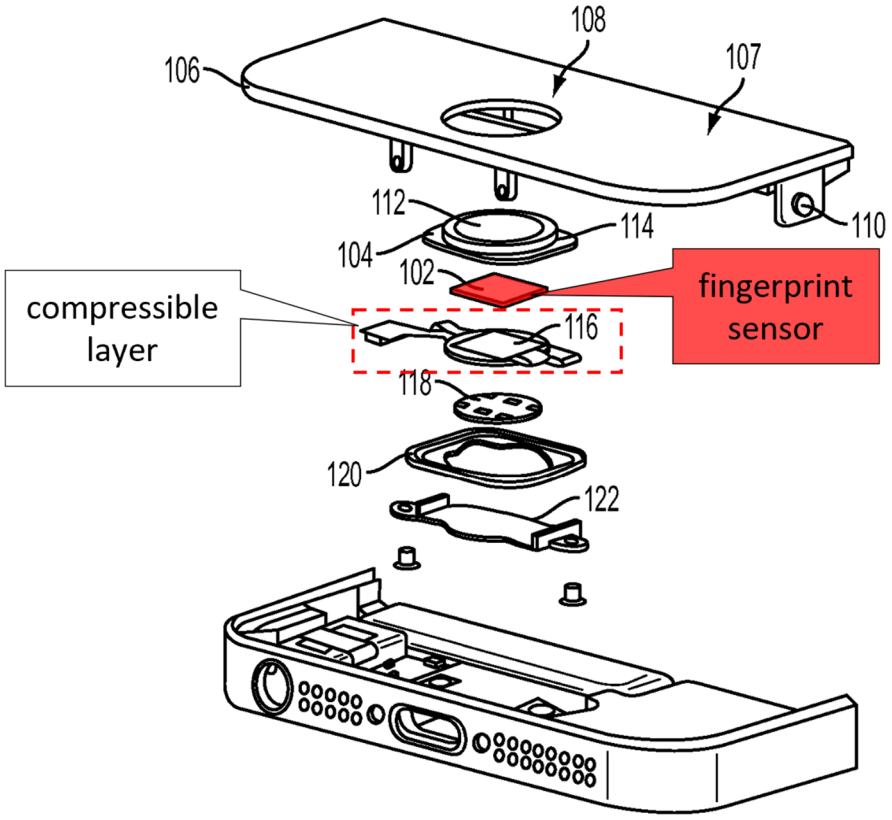


FIG. 1

A POSITA would have understood that when a user places a force on the input member, it causes flexible element 116 to be compressed and transmits that force to the tactile dome switch 118 (Ex. 1003, ¶¶422-423).

9. Claim 20

Jung in view of *Meyers* renders claim 20 obvious. *See* claim 16.

Meyers teaches the use of a ground ring 114 that can be used to shield electromagnetic effects, and provide capacitance isolation or other electromagnetic

isolation (Ex. 1007, ¶[0044]), and that the ground ring 114 has a base plate (or sheet) that can be aligned with the electrical device (Ex. 1003, ¶¶424-426).

Furthermore, a POSITA would have understood electrical isolation techniques are beneficial to prevent interference with sensitive electronic components disposed in the button assembly of *Meyers*, and that installing an electrical isolation sheet in place of (or in addition to) the ground ring 114 of *Meyers* would increase the effectiveness of the ground ring's electrical isolation capabilities (Ex. 1003, ¶¶427-428).

D. Ground 4: Claims 11-17, and 19 are Unpatentable Under 35 U.S.C. §§102 and/or 103 over *Chang*

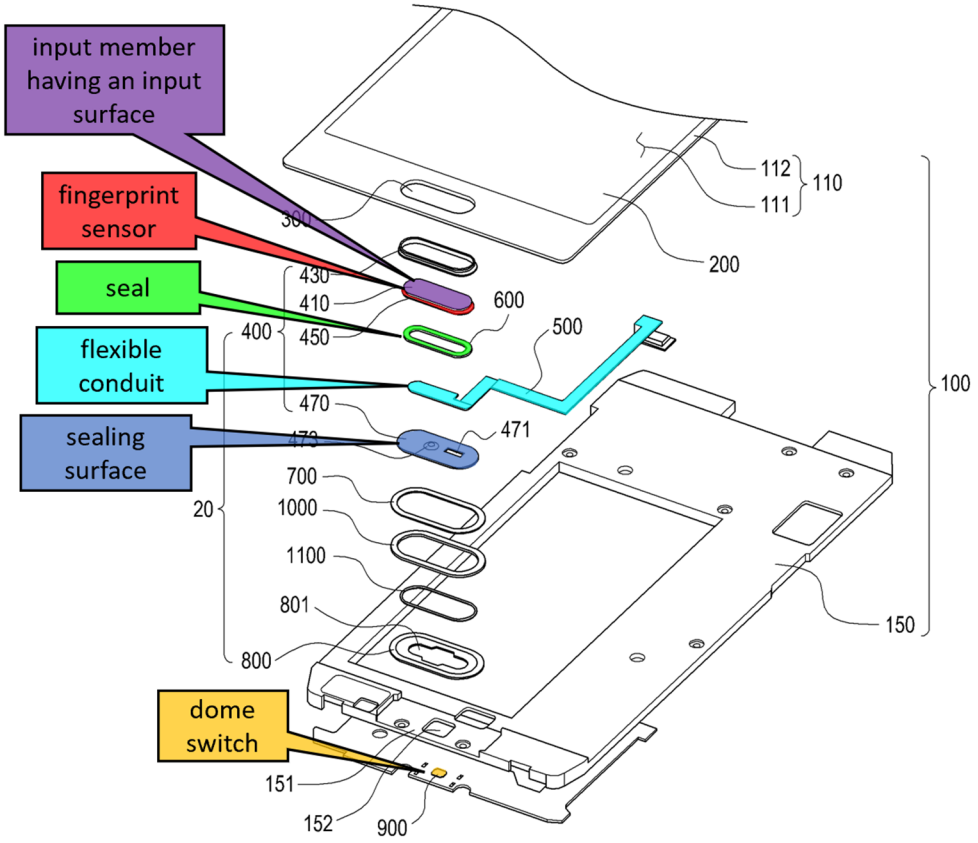
Chang discloses and/or renders obvious claims 11-17, and 19 of the '619 Patent.

1. Overview of Ground 4 (Chang)

Chang discloses "an electronic device including an input device in which an instable waterproof point is removed and a key click feeling is improved with a simple structure" (Ex. 1015, 1:54-57). According to *Chang*, "a key module may include: a fingerprint recognizing member … an annular structure configured to enclose the fingerprint recognizing member … and a flexible conductive member extending from the circuit region into the space through the opening" (Ex. 1015, 2:25-39). Annotated Figure 3, below, shows the relationship between key module

20 (and sub-components thereof), and dome switch 900 (Ex. 1015, Fig. 3; Ex. 1003, ¶¶88-93).

Ex. 1015, Fig. 3



2. Claim 11

i. Claim 11: [11.pre]

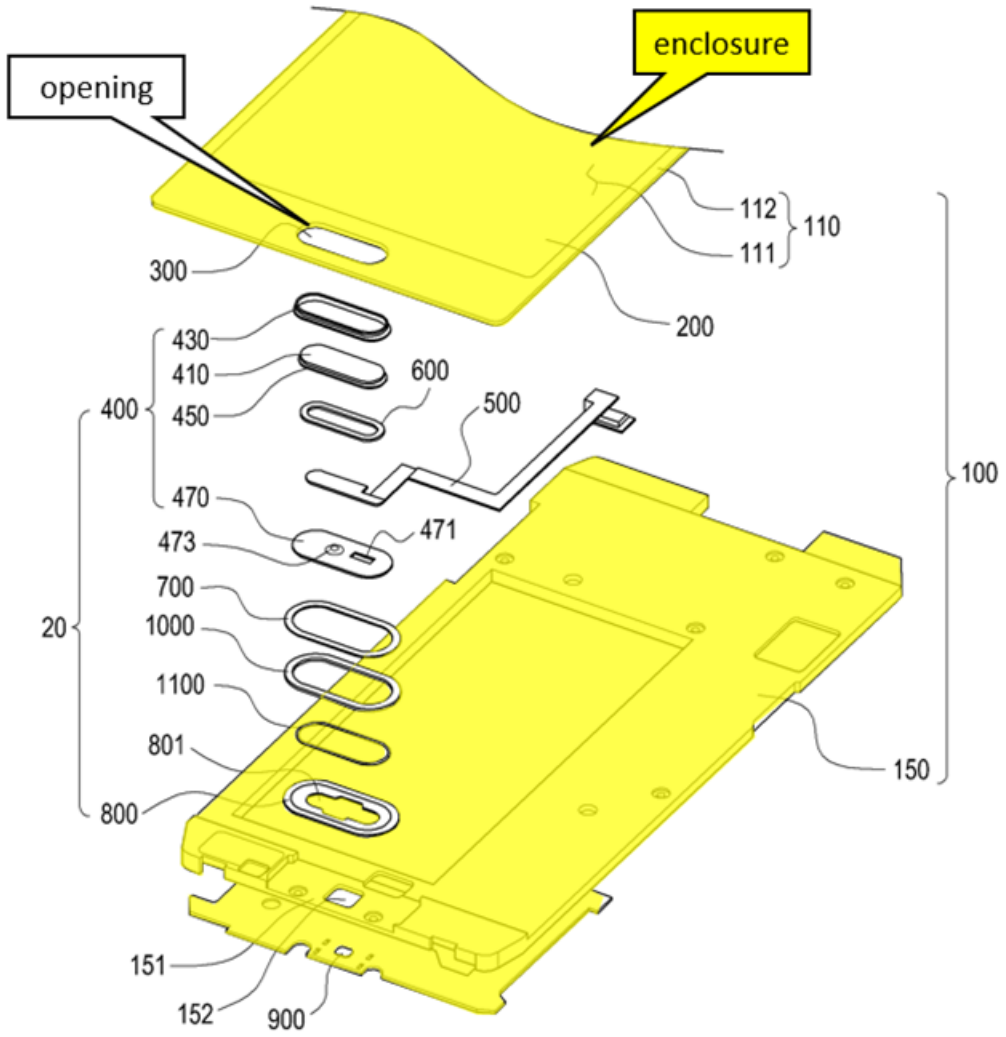
Chang discloses element [11.pre]. *Chang* teaches the disclosed button assembly "may include a fingerprint recognizing member 450" used "to recognize a fingerprint" (Ex. 1015, 1:58-2:24, 9:59-63; Ex. 1003, ¶¶430-432).

Chang further discloses its fingerprint sensing system is suitable for various electronic devices, including wearable devices (Ex. 1015, 5:5-20; Ex. 1003, ¶¶433-434).

ii. Claim 11: [11.a]

Chang discloses element [11.a] (Ex. 1003, ¶¶435-436).

Ex. 1015, Fig. 3



First, *Chang* discloses "a housing 100, a display 200, a first opening 300, and a key module 20" located in the first opening 300 (Ex. 1015, 7:35-40; Ex. 1003, ¶437).

Chang's housing 100 is an enclosure having an enclosed volume bounded by a "first plate 110," a "second plate 130," and "a side member 150" (Ex. 1015, 7:41-52). A POSITA would have understood the "enclosure" would also include the display of *Chang*, insofar as *Chang* teaches "display 200 may be disposed in the space formed between the first plate 110 and the second plate 130 and may be configured to include a screen region exposed through the first region 111 of the first plate 110" (Ex. 1015, 8:10-16; Ex. 1003, ¶¶438-440).

iii. Claim 11: [11.b]

Chang discloses element [11.b] (Ex. 1003, ¶441).

Ex. 1015, Fig. 13

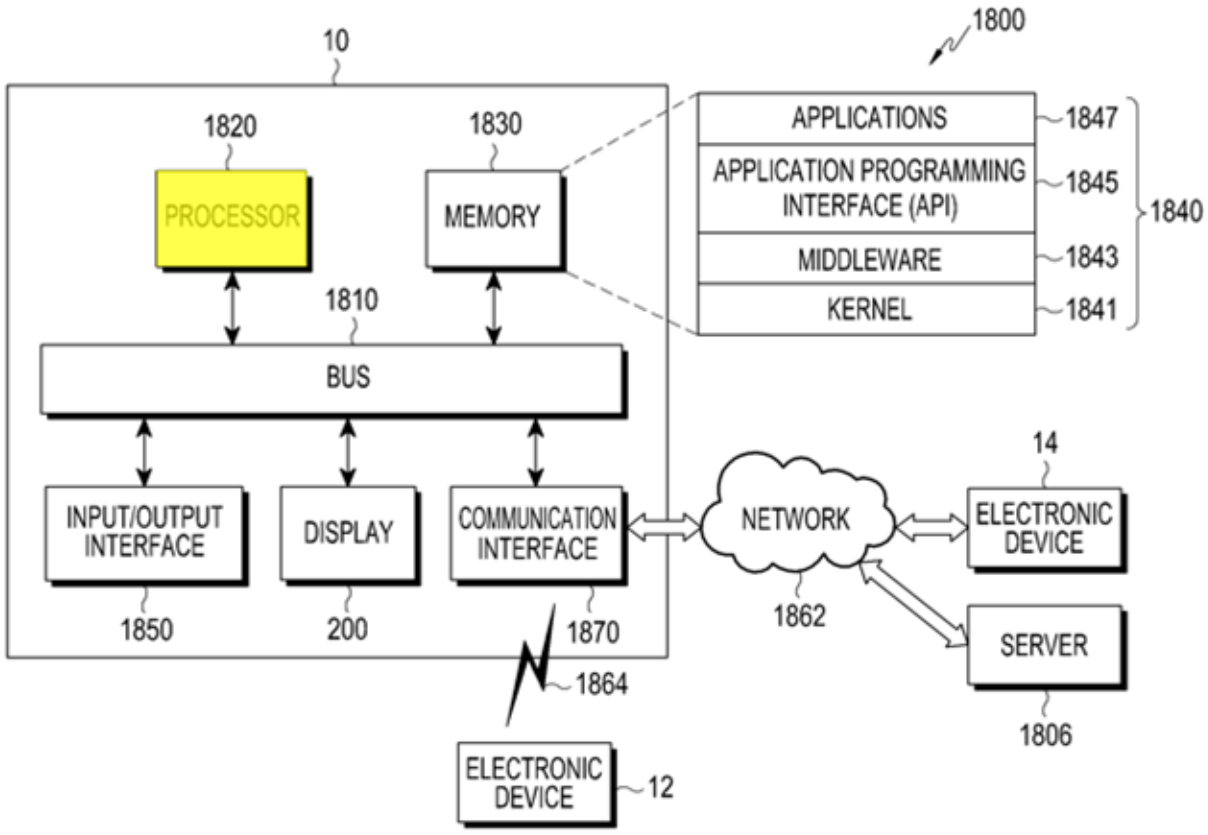


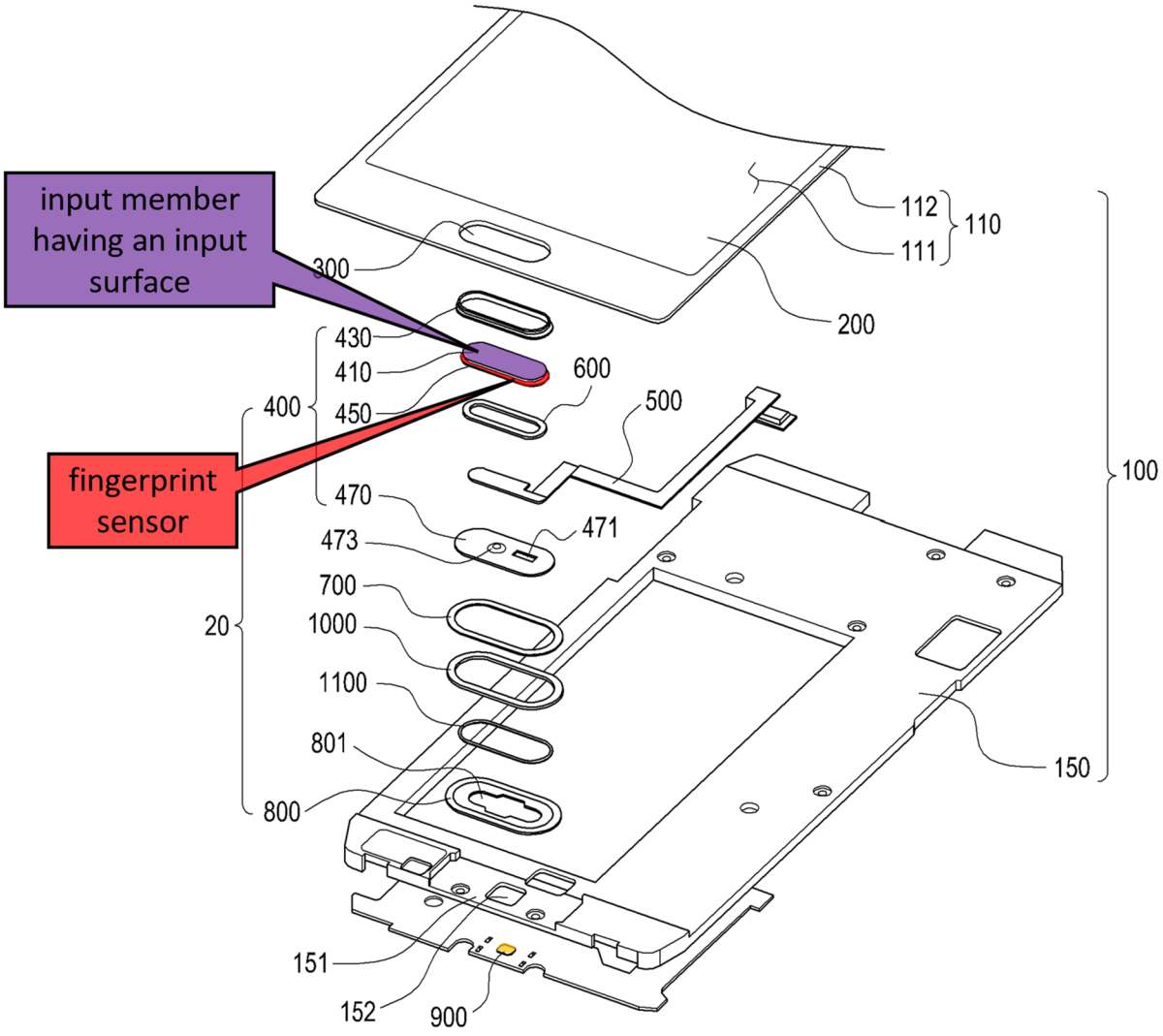
FIG.13

Chang discloses "electronic device 10 may include … a processor" (Ex. 1015, 18:64-19:7, 21:46-61, 22:59-23:16, Figs. 13-15), which is located in "a space" bounded by side member 150, first plate 110, and second plate 130 (Ex. 1015, 7:62-8:9; Ex. 1003, ¶¶442-444).

iv. Claim 11: [11.c]

Chang discloses element [11.c] (Ex. 1003, ¶¶445-451). *Chang* discloses a "button structure 400" with an input member having an input surface (purple) located above the fingerprint sensor (red) in the opening 300.

Ex. 1015, Fig. 3



Element [11.c] contains two sub-elements:

(a) Claim 11: [11.c.i]

Chang discloses element [11.c.i] (Ex. 1003, ¶452). *See* claims [11.c].

Chang teaches the disclosed button assembly "may include a fingerprint recognizing member 450" used "to recognize a fingerprint" (Ex. 1015, 1:58-2:24, 9:59-63; Ex. 1003, ¶¶453-454). A POSITA would have understood that because the cover layer "may be formed above the fingerprint recognizing member 450," the fingerprint recognizing member is "positioned below" the input member. (Ex. 1015, 10:22-31; Ex. 1003, ¶¶455-456).

(b) Claim 11: [11.c.ii]

Chang discloses element [11.c.ii] (Ex. 1003, ¶457).

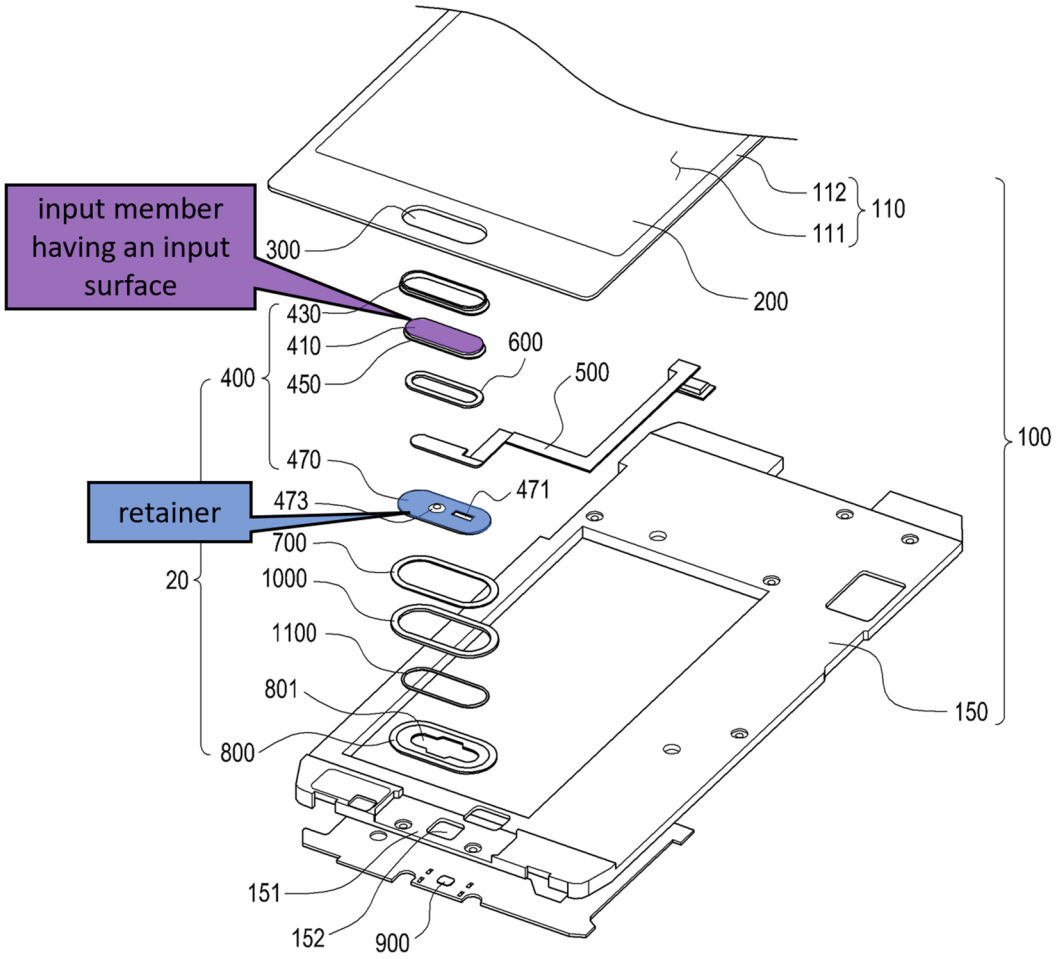
Chang discloses button structure 400 includes "lower plate 470" which functions as the claimed "sealing surface" (Ex. 1015, 9:64-67; Ex. 1003, ¶¶458-460). A POSITA would have understood that "lower plate 470" constitutes a sealing surface of the retainer, because *Chang* teaches the seal "may be interposed between the lower plate 470 and the fingerprint recognizing member 450 in order to block external foreign matter (e.g., a fluid, such as moisture)" (Ex. 1015, 12:9-19; Ex. 1003, ¶460).

The '619 Patent teaches the retainer provides "a stop to displacement of the button housing" and its "lower surface forms a sealing surface 225 for the button assembly" (Ex. 1001, 16:54-60). As depicted above, a POSITA would have understood *Chang's* lower plate 470 likewise serves as "a stop to the displacement

of the button housing" and includes a "lower surface [that] forms a sealing surface … for the button assembly." As such, a POSITA would have understood lower plate 470 constitutes the claimed retainer (Ex. 1003, ¶461).

Thus, a POSITA would have understood the top surface of the "retainer" defines the claimed sealing surface (blue) positioned inward from the input surface (purple) (Ex. 1015, Fig. 3; Ex. 1003, ¶¶462-464).

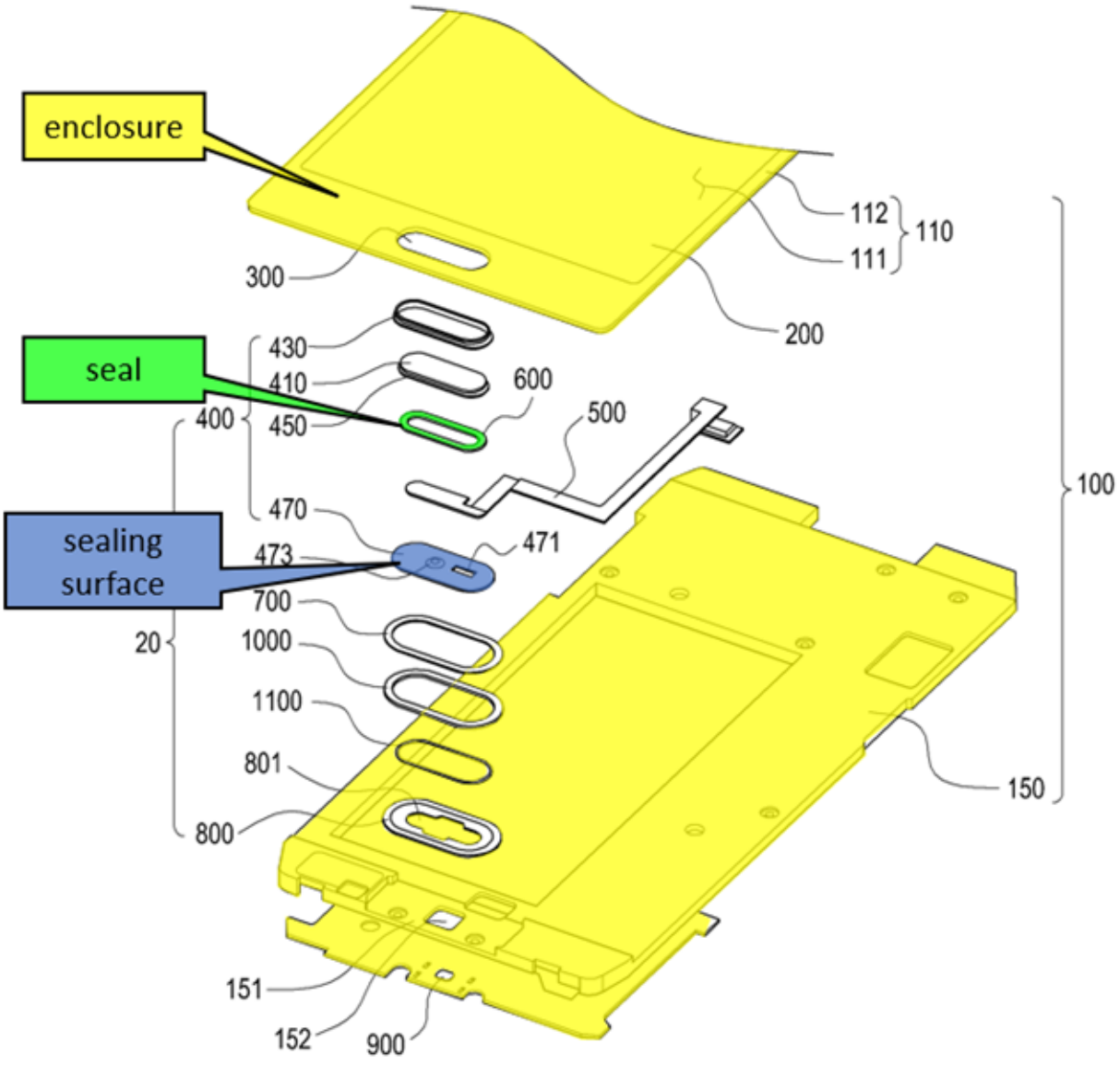
Ex. 1015, Fig. 3



v. Claim 11: [11.d]

Chang discloses element [11.d] (Ex. 1003, ¶¶465-466).

Ex. 1015, Fig. 3



First, *Chang* discloses "key module 20 may include … sealing members 600, 700, and 1100" (Ex. 1015, 7:35-40), which are "provided for the waterproof function of the key module" (Ex. 1015, 8:31-41; *see also* Ex. 1015, 12:9-23, 14:16-19). A

POSITA would have understood sealing member 600 is the claimed "seal" (Ex. 1003, ¶467).

Second, *Chang* discloses button structure 400 includes "lower plate 470" which is the claimed "sealing surface" (Ex. 1015, 9:64-67; Ex. 1003, ¶468). *See* element [11.c.ii]. A POSITA would have understood "lower plate 470" constitutes a sealing surface, because *Chang* teaches the seal "may be interposed between the lower plate 470 and the fingerprint recognizing member 450 in order to block external foreign matter" (Ex. 1015, 12:9-19; Ex. 1003, ¶468).

Finally, the seal (green) is positioned between a sealing surface of the retainer (blue) and a surface of the opening along an exterior surface of the enclosure (yellow) (Ex. 1015, Fig. 3; Ex. 1003, ¶469). Given the top surface of the opening 300 is coplanar with the face of the enclosure, a POSITA would have understood a seal located between the sealing surface of the retainer and the enclosure is also located between the sealing surface of the retainer and a surface of the opening (Ex. 1003, ¶¶470-471). *See, e.g.,* Figs. 1, 3, 4A, 5A.

vi. Claim 11: [11.e]

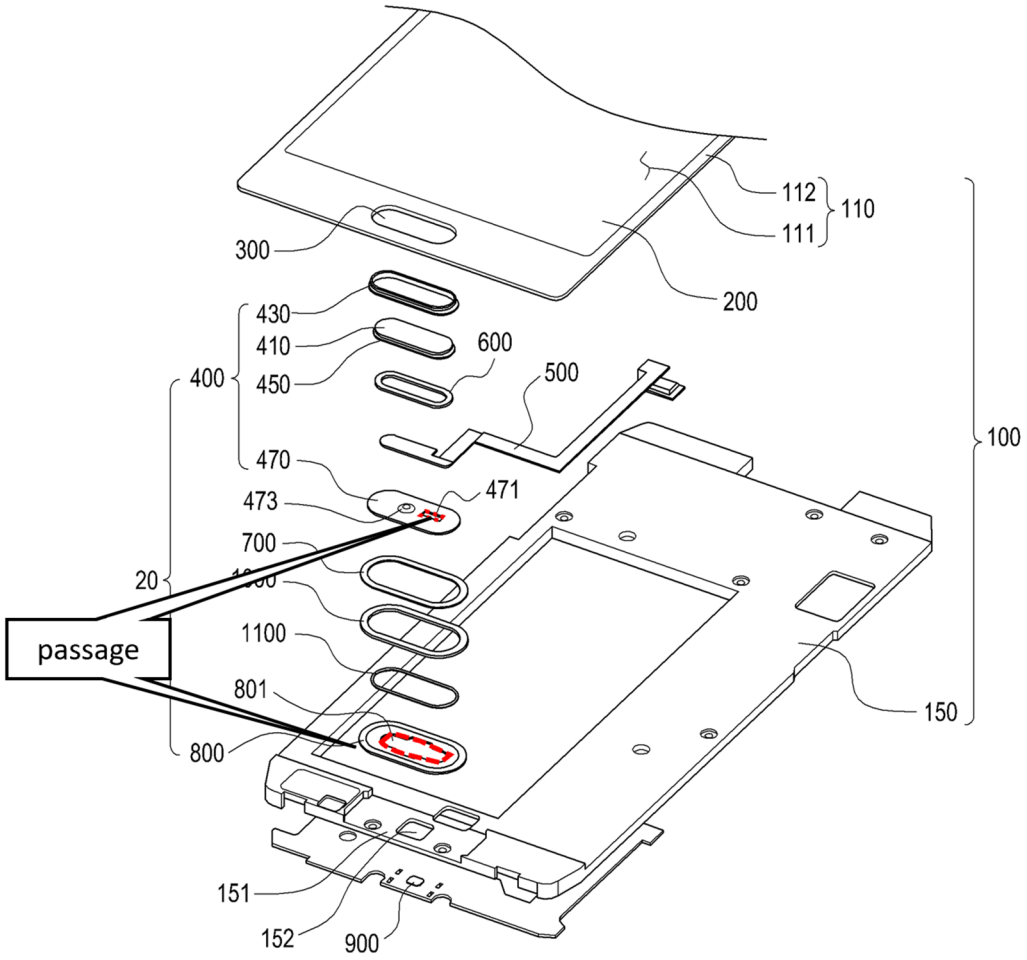
Chang discloses element [11.e] (Ex. 1003, ¶472).

Chang teaches "flexible conductive member 500 may finally extend to the inside of the electronic device 10 via a second opening 471 of a lower plate 470 and

a third opening 801 of an elastic member 800" (Ex. 1015, 9:20-28, Fig. 3; Ex. 1003, ¶¶472-475).

As shown, the passage begins in the opening of the enclosure (which houses the button assembly), and extends to the enclosed volume (Ex. 1003, ¶473).

Ex. 1015, Fig. 3



This configuration is further depicted in Figure 4B (Ex. 1003, ¶¶474-475):

Ex. 1015, Fig. 4B

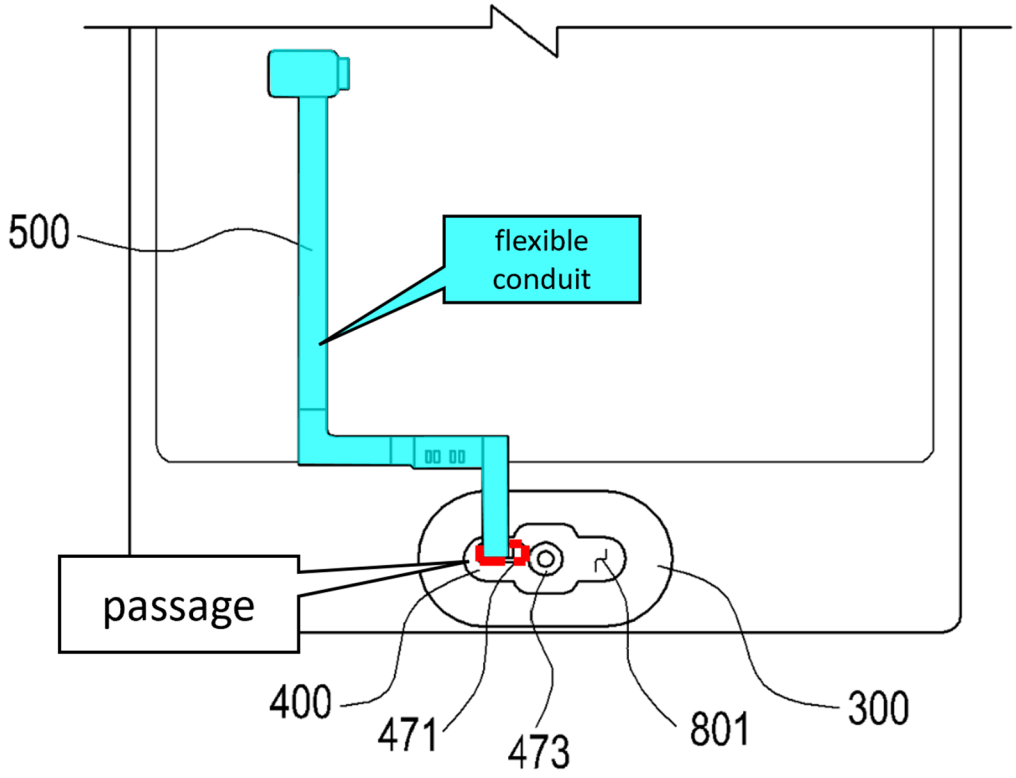


FIG.4B

vii. Claim 11: [11.f]

Chang discloses element [11.f].

First, *Chang* teaches flexible conductive member 500 (*i.e.*, a flexible conduit) is "connected with the fingerprint recognizing member 450" (Ex. 1015, 11:28-35; Ex. 1003, ¶¶476-477).

Likewise, *Chang* teaches the flexible conduit is configured to transmit the output signal (described in element [1.c.ii], above) to the processor, in part because

it "is electrically connectable to other electronic components" (Ex. 1015, 11:28-35). A POSITA would have understood *Chang's* flexible conduit is electrically connected to the processor (Ex. 1003, ¶478).

Chang also explains "flexible conductive member 500 … may transfer a signal … from the fingerprint recognizing member 450, to the inside of the electronic device" (Ex. 1015, 13:1-10). Again, a POSITA would have understood *Chang's* flexible conduit is electrically connected to both the fingerprint sensor and the processor (Ex. 1015, Fig. 14; Ex. 1003, ¶¶479-482).

Ex. 1015, Fig. 14

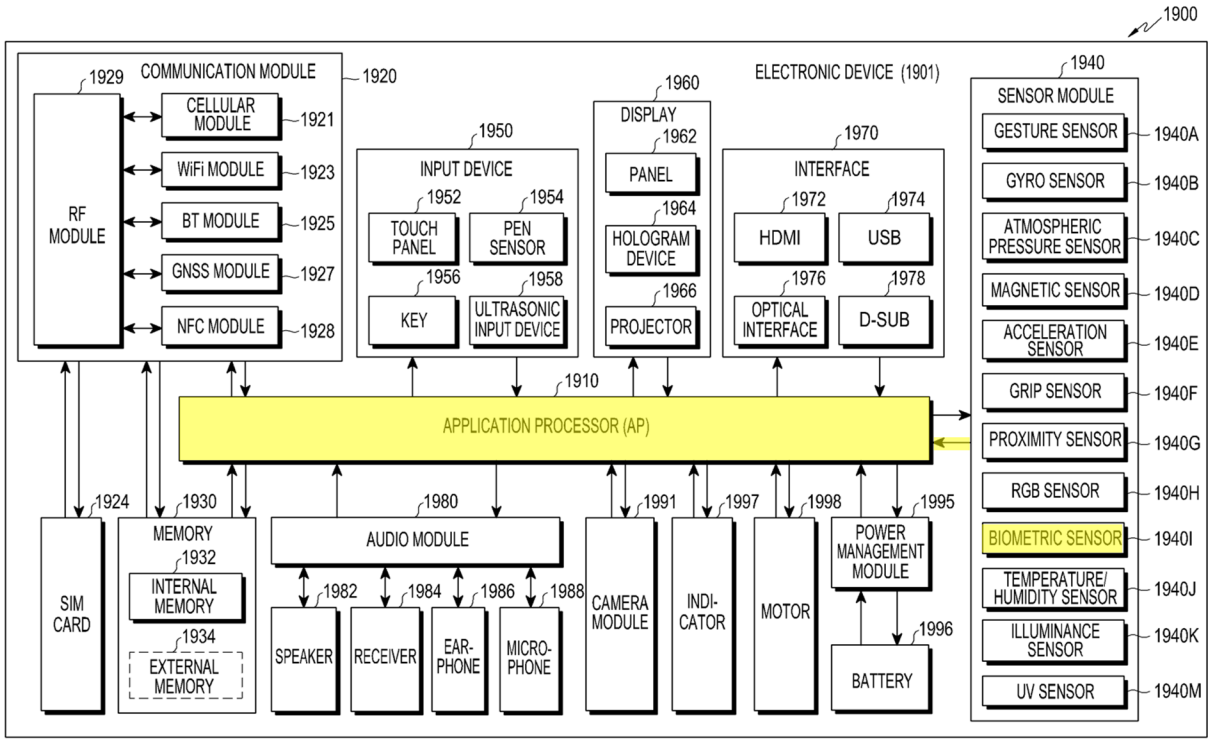
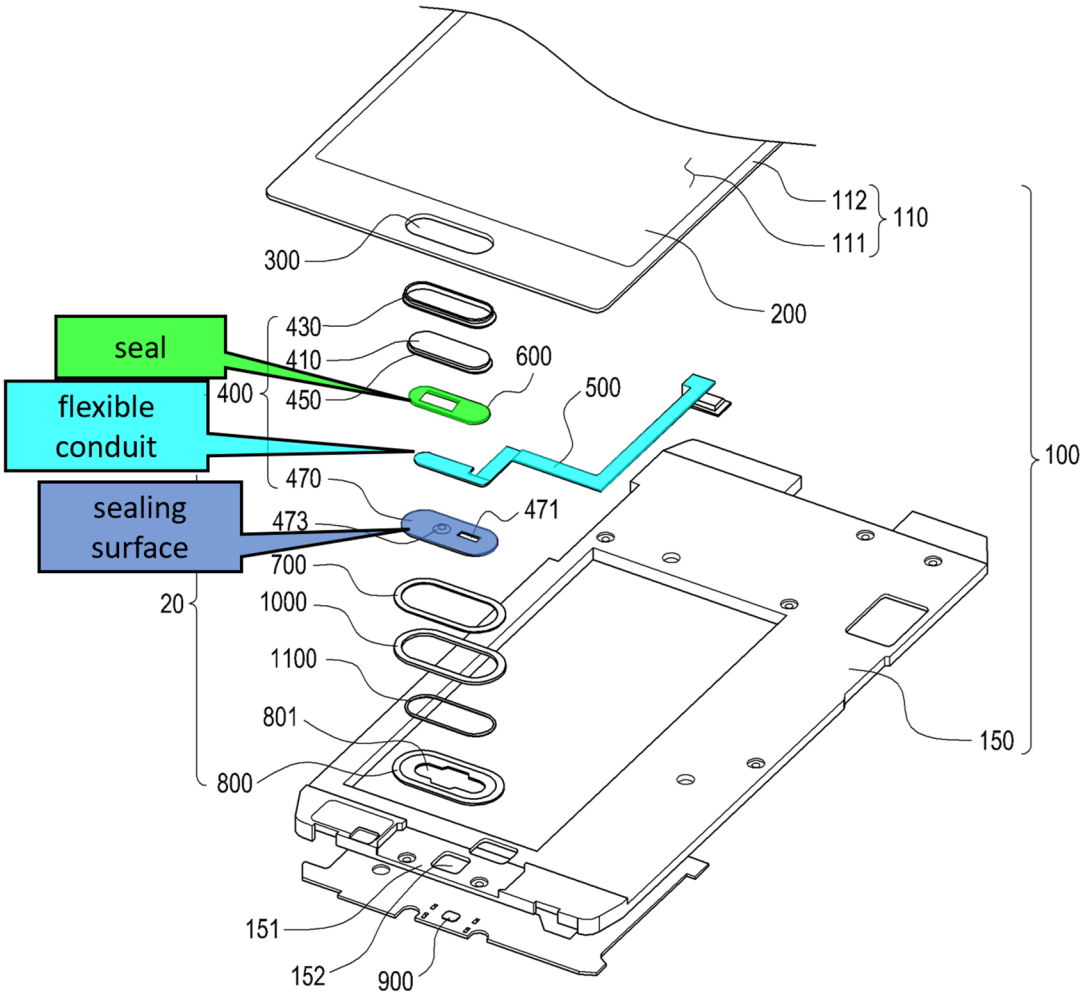


FIG.14

viii. Claim 11: [11.g]

Chang renders element [11.g] obvious (Ex. 1003, ¶483). A portion of the flexible conduit is sandwiched between the seal and the sealing surface of the retainer, as depicted in Figure 3 (altered and annotated below).

Ex. 1015, Fig. 3 (altered and annotated)



Chang discloses the claimed "flexible conduit," "seal," and "sealing surface." *See* elements [1.a], [1.d], [1.f]. Furthermore, *Chang's* Figure 3 discloses that a

portion of the flexible conduit (*i.e.*, "flexible conductive member 500," teal) is sandwiched between the seal (*i.e.*, "sealing member 600," green) and the sealing surface of the retainer (*i.e.*, "lower plate 470," blue) (Ex. 1003, ¶484).

Chang describes sealing member 600, as "provid[ing] for the waterproof function of the key module" (Ex. 1015, 7:35-40, 8:31-41) and that it "may block moisture that flows in from the outside" (Ex. 1015, 14:16-19; Ex. 1003, ¶485).

Chang discloses that sealing member 600 "may be interposed between the lower plate 470 and the fingerprint recognizing member 450 in order to block external foreign matter (*e.g.*, a fluid, such as moisture)" (Ex. 1015, 12:12-19, 14:20-24, Fig. 3; Ex. 1003, ¶¶486-487). *Chang* also describes sealing member 600 as having two faces (Ex. 1015, Fig. 3), which are "respectively attached to the top face of the lower plate 470 and the bottom face of the fingerprint recognizing member 450 via taping" (Ex. 1015, 12:12-19; Ex. 1003, ¶488).

Moreover, *Chang's* fingerprint sensor includes a "circuit region 453," which "may be a printed circuit board (PCB), and may include a plurality of contact points formed on the lower portion thereof to be electrically contacted with another printed circuit board" such as the flexible PCB (Ex. 1015, 10:13-21, 12:44-49; Ex. 1003, ¶¶489).

A POSITA would have understood that sealing member 600 is (1) located between lower plate 470 and fingerprint recognizing member 450, (2) has at least

two planar faces, wherein the first face is attached to lower plate 470 and the second face is attached to fingerprint recognizing member 450, and (3) contains an opening to allow fingerprint recognizing member 450 to be connected to flexible conductive member 500 (Ex. 1003, ¶490).

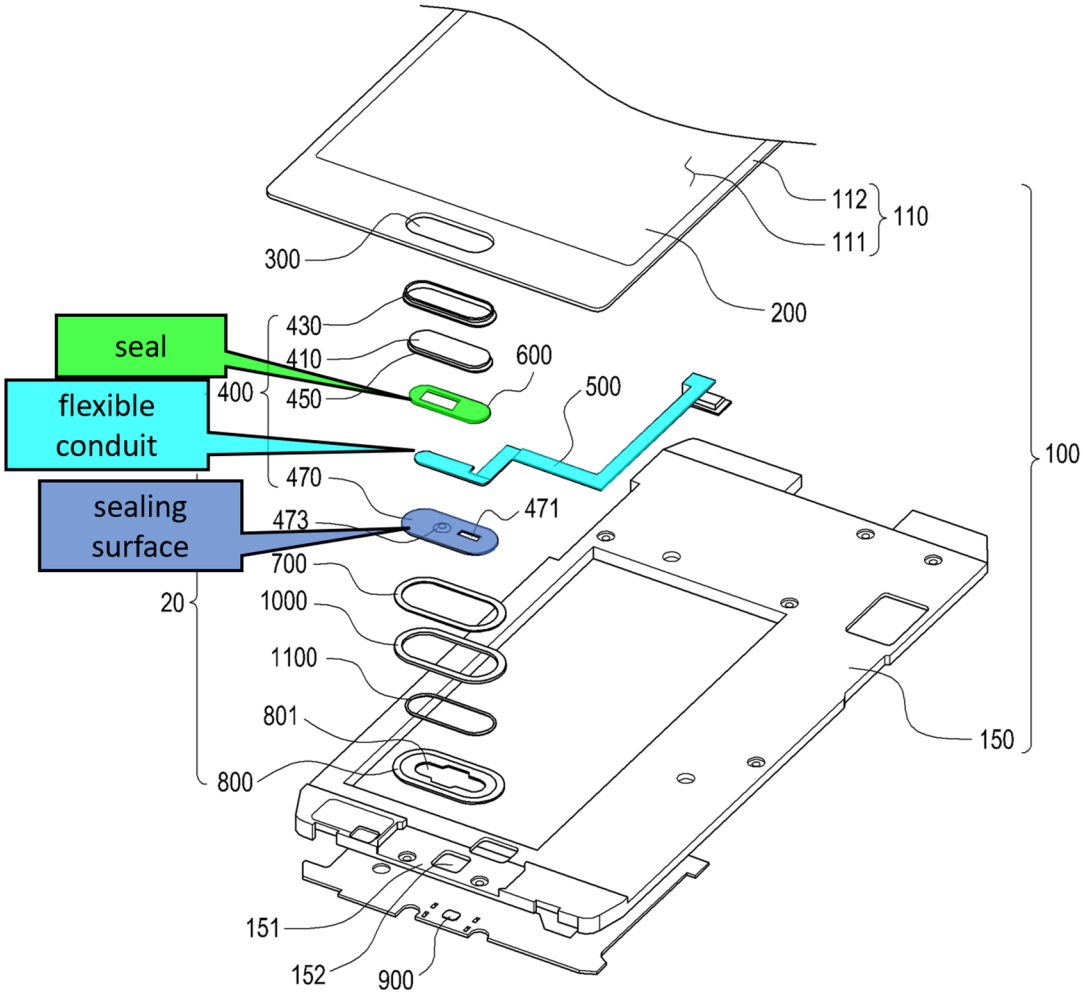
Chang teaches the sealing member 600 ***may*** be constructed in a ring shape (Figure 3), but explains that is an "[a]lternative" embodiment (Ex. 1015, 14:24-29). Given that, a POSITA would have understood that *Chang* ***also*** teaches a sealing member 600 that ***is not*** designed in an annular or ring shape (Ex. 1015, 14:24-29; Ex. 1003, ¶¶491-492).

Therefore, a POSITA would have understood that sealing member 600 would be constructed as depicted below, such that the planar faces are adjacent to both lower plate 470 and fingerprint recognizing member 450, and the opening is in the shape of the "contact points formed on the lower portion [of the fingerprint recognizing member 450] to be electrically contacted with another printed circuit board" such as flexible conductive member 500 (Ex. 1015, 10:13-21; Ex. 1003, ¶493).

For example, *Chang* teaches its button structure "may be variously modified and designed according to the structural shape or design of the electronic device 10 and the user's convenience" (Ex. 1015, 10:32-42; Ex. 1003, ¶494). In addressing the design characteristics which should be considered while adapting the depicted

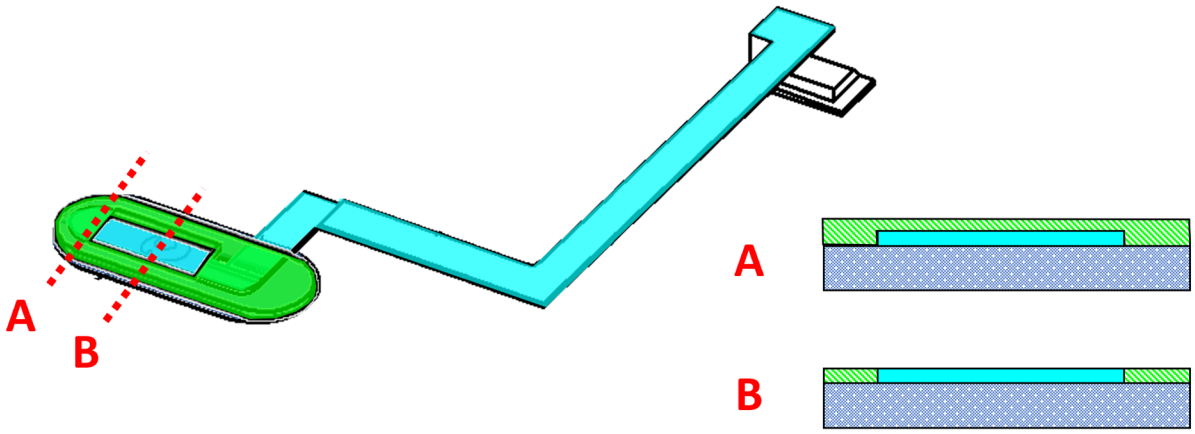
configuration, *Chang* teaches the disclosed design is "not limited to the ring shape, and may be subjected to a design change to various shapes as long as they may prevent respective components from being separated to the outside and safely fix the respective components" (Ex. 1015, 10:59-11:3; Ex. 1003, ¶494). Specifically, *Chang* teaches the "second opening 471 is provided in a rectangular shape having a size that allows the flexible conductive member 500 to pass therethrough, but may be implemented in various shapes such that ***various shapes of conductive members 500 may pass therethrough***" (Ex. 1015, 11:36-42; Ex. 1003, ¶494). The configuration depicted below would allow for the maximum sealing surface, while still providing an open in the size and shape of "circuit region 453" located on fingerprint recognizing member 450 (*see, e.g.,* Ex. 1015, Fig. 7A).

Ex. 1015, Fig. 3 (altered and annotated)



The seal (green), flexible conduit (teal), and sealing surface (blue) are depicted in a condensed configuration, below left. Section cuts along the red dashed lines "A" and "B" are depicted below right (Ex. 1003, ¶495).

Ex. 1015, Fig. 3 (altered and annotated)

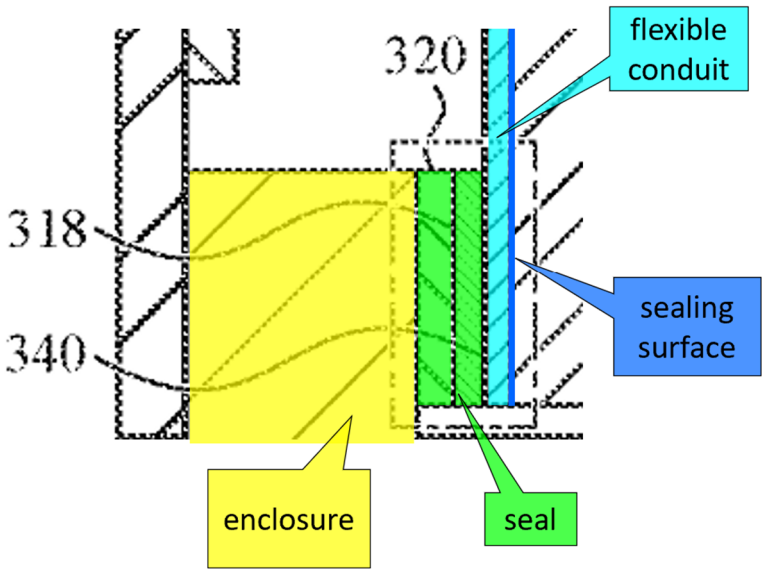


As shown in section cut A, at least a portion of the flexible conduit (teal) is sandwiched between the seal (green) and the sealing surface of the retainer (blue). A POSITA would have understood this embodiment of *Chang*'s sealing member would have included additional "sealing" material and, therefore, further promoted *Chang's* stated goal of providing a "waterproof structure in order to prevent a fluid from infiltrating into the interior of the portable terminals" (Ex. 1015, 1:23-50, *see also* Ex. 1015, 2:53-67, 12:62-67; Ex. 1003, ¶496).

Indeed, *Chang* discloses this limitation the same way as the '619 Patent, which states "a gasket seal (such as face seal 318) may further be applied below the lower PSA portion, such that ***a sandwich ... is formed of PSA, flexible conduit 340, PSA, and then the gasket seal***" (Ex. 1001, 17:35-46; Ex. 1003, ¶497). "Sandwiching" is illustrated in the '619 Patent's Figure 3A (excerpted and annotated below). The '619

Patent also discloses that "sandwiching" includes a "stack" of elements (Ex. 1001, 23:39-43; Ex. 1003, ¶497).

Ex. 1001, Fig. 3A (excerpted and annotated)



Because *Chang* discloses a "stack" of elements including "a portion of the flexible conduit," a "seal," and a "sealing surface," *Chang* discloses element [11.g] the same way as the '619 Patent (Ex. 1003, ¶498).

To the extent a POSITA would not find claim element [11.g] explicitly disclosed by *Chang*, it is nevertheless rendered obvious. In summary, a POSITA would have understood that *Chang* discloses a button assembly that, while depicted in an oval or ring shape, would be modified to fit the structural shape or design of the electronic device in question so as to ensure a sufficient seal is formed. Modification of the button assembly would include modification of the size and

shape of both the fingerprint sensor, and the flexible conductive member attached thereto, among other things (Ex. 1003, ¶499). In order to meet the stated purpose of ensuring the electronic components are separated to the outside and safely affixed, a POSITA would have understood that the seal would need to be modified in accordance with the button assembly (Ex. 1003, ¶499). In making these modifications, a POSITA would choose the sandwiching configuration depicted in the annotated figures, above, in order to ensure that the electrical connection between the flexible conductive member and the fingerprint sensor is sufficiently sealed (Ex. 1003, ¶¶499-500).

3. Claim 12

Chang discloses claim 12 (Ex. 1003, ¶¶501-502). *See* claim 11.

Chang teaches "flexible conductive member 500 may finally extend to the inside of the electronic device 10 via a second opening 471 of a lower plate 470 and a third opening 801 of an elastic member 800" (Ex. 1015, 9:20-28, Fig. 3; Ex. 1003, ¶¶503-506). *See* element [11.e].

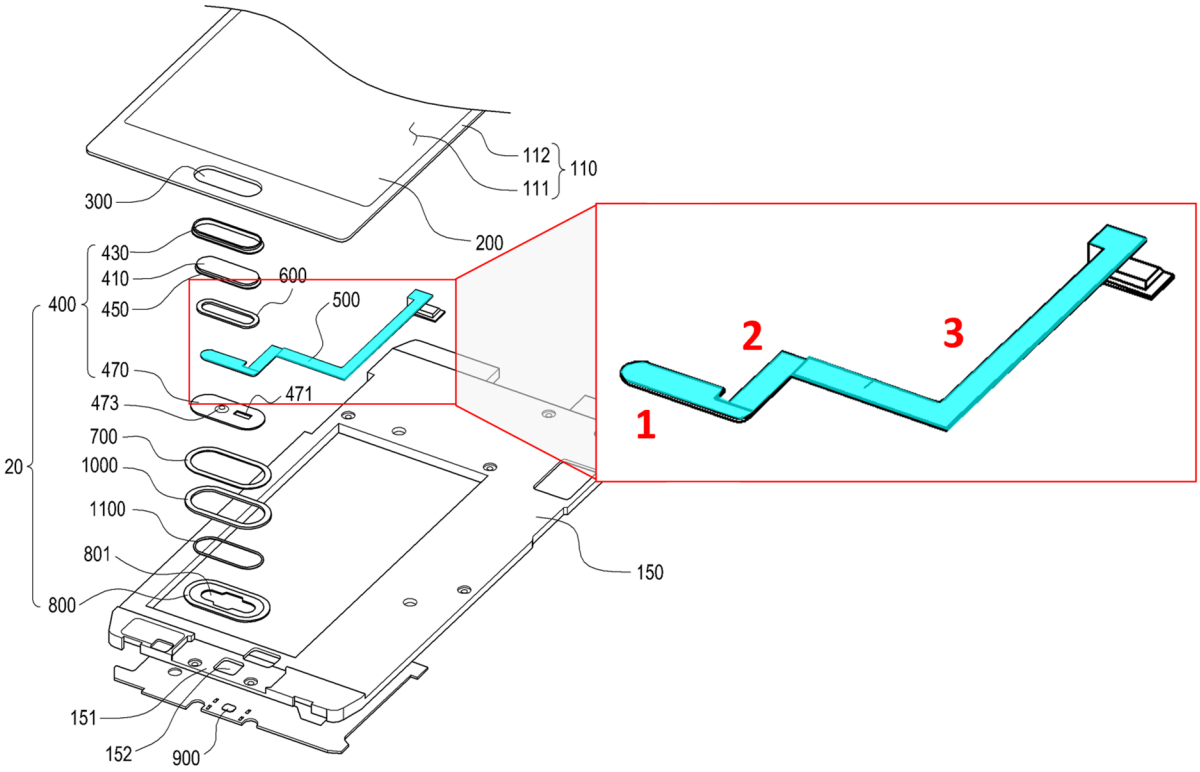
4. Claim 13

Chang discloses claim 13 (Ex. 1003, ¶¶507-508). *See* claim 11.

Chang discloses "flexible conductive member 500 may be implemented plurally" (Ex. 1015, 11:36-42). A POSITA would have understood flexible conductive member 500 consists of multiple segments coupled to one another,

wherein the second segment extends through the passage (Ex. 1015, Fig. 3; Ex. 1003, ¶509).

Ex. 1015, Fig. 3



Likewise, *Chang* discloses that it is the second flexible conductive member 500 (labeled "2" in the above annotation), which extends through the passage (Ex. 1003, ¶¶510-511). *See* element [11.e].

5. Claim 14

Chang discloses claim 14 (Ex. 1003, ¶¶512-513). *See* claim 11; *see also* element [11.c.i].

Chang teaches the disclosed button assembly "may include a fingerprint recognizing member 450" used "to recognize a fingerprint" (Ex. 1015, 1:58-2:24, 9:59-63; Ex. 1003, ¶514).

Chang further discloses the fingerprint recognizing member "may transfer a[n output] signal … from the fingerprint recognizing member 450, to the inside of the electronic device 10" (Ex. 1015, 13:1-10; Ex. 1003, ¶514). A POSITA would have understood the "signal" discussed herein is an electrical representation of a fingerprint. *Chang* also teaches operation of the fingerprint recognizing member "may be performed merely by a touch" (Ex. 1015, 11:43-59; Ex. 1003, ¶¶514-515).

6. Claim 15

i. Claim 15: [15.pre]: The fingerprint sensing system of claim 11, wherein:

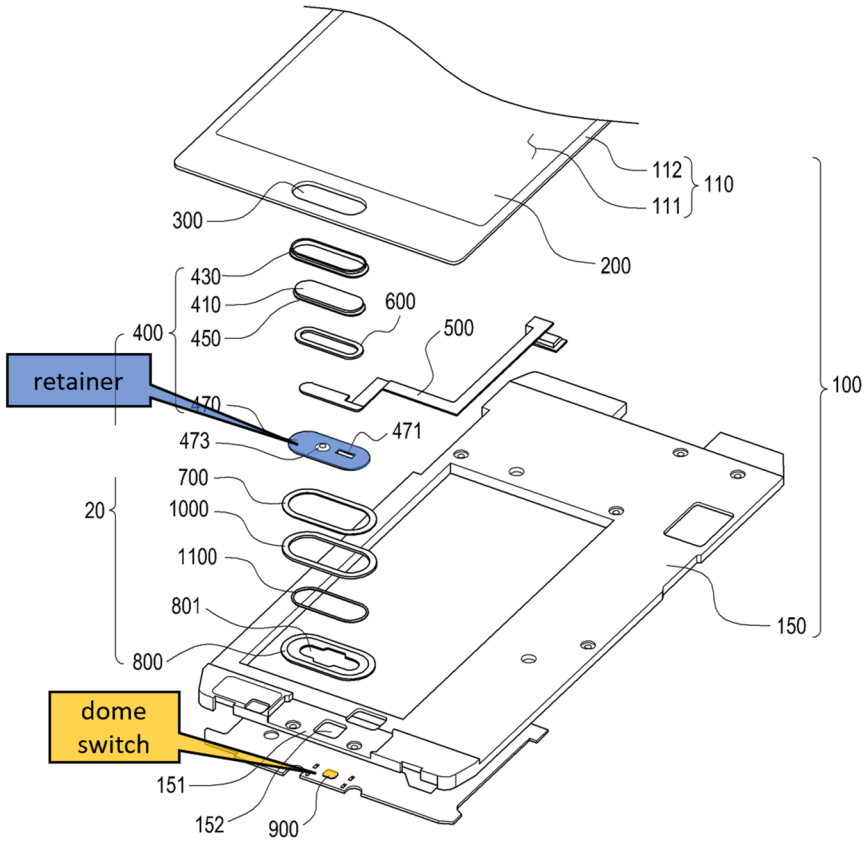
Chang discloses element [15.pre] (Ex. 1003, ¶¶516-517). *See* claim 11.

ii. Claim 15: [15.a]: the button assembly further comprises a tactile dome switch disposed inward from the retainer; and

Chang discloses element [15.a] (Ex. 1003, ¶518).

Chang discloses a "dome switch 900" and a retainer (element [11.c.ii]). Figure 3 shows the dome switch disposed inward from the retainer (Ex. 1015, 9:1-19, Fig. 3; Ex. 1003, ¶¶519-523).

Ex. 1015, Fig. 3



iii. Claim 15: [15.b]: the tactile dome switch compresses in response to a press on the input surface.

Chang discloses element [15.b] (Ex. 1003, ¶¶524-526).

Chang discloses its button assembly is activated via dome switch 900 "may be elastically and mechanically deformed by the user's click to transmit the signal to the inside of the electronic device 10" (Ex. 1015, 9:1-19, 9:38-49; Ex. 1003, ¶520).

7. Claim 16

i. Claim 16: [16.pre]

Chang discloses element [16.pre].

Chang further discloses its fingerprint sensing system is suitable for wearable devices such as watches (Ex. 1015, 5:5-20; Ex. 1003, ¶¶527-529).

ii. Claim 16: [16.a]

Chang discloses element [16.a] for substantially the same reasons as element [11.a], incorporated herein (Ex. 1003, ¶¶530-531).

Although the key module opening depicted above is on the front wall of the electronic device, *Chang* explicitly teaches the depiction in Figure 3 is exemplary only, and the key module described therein "may be variously applied to various keys such as a side key" (Ex. 1015, 7:18-26; Ex. 1003, ¶¶532-533).

iii. Claim 16: [16.b]

Chang discloses element [16.b] for substantially the same reasons as element [11.b], incorporated herein (Ex. 1003, ¶¶534-536).

iv. Claim 16: [16.c]

Chang discloses element [16.c].

Figure 13 shows the display operably connected to the processor:

Ex. 1015, Fig. 13

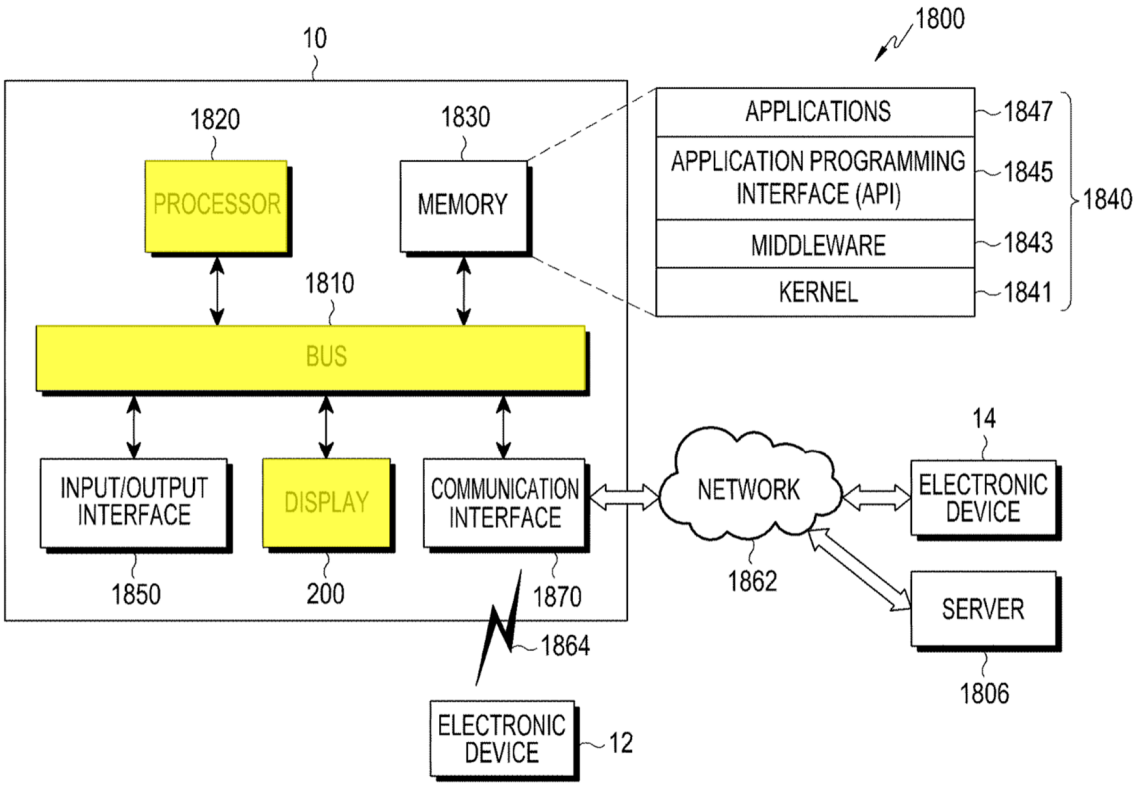


FIG.13

Chang discloses "display 200 may be disposed in the space formed between the first plate 110 and the second plate 130 and may be configured to include a screen region exposed through the first region 111 of the first plate 110" (Ex. 1015, 8:10-20; *see also* Figure 1; Ex. 1003, ¶¶537-539). *Chang's* processor "may further include a Graphic Processing Unit (GPU) and/or an image signal processor" (Ex. 1015, 21:46-61). A POSITA would have understood that a processor with a GPU and/or image signal processor is operably coupled to a display, as depicted in Figure 13, above (Ex. 1003, ¶¶540-541).

v. Claim 16: [16.d]

Chang discloses element [16.d].

Chang discloses an electronic device, wherein the electronic device is a watch. *See* element [16.pre]. Given the claimed enclosure constitutes the outer surface of the electronic device, a POSITA would have understood to connect the watchband of the disclosed watch to the enclosure of the electronic device in order to couple the watch to the user (Ex. 1003, ¶¶542-544).

vi. Claim 16: [16.e]

Chang discloses element [16.e] for substantially the same reasons as element [11.c], incorporated herein (Ex. 1003, ¶¶545-548).

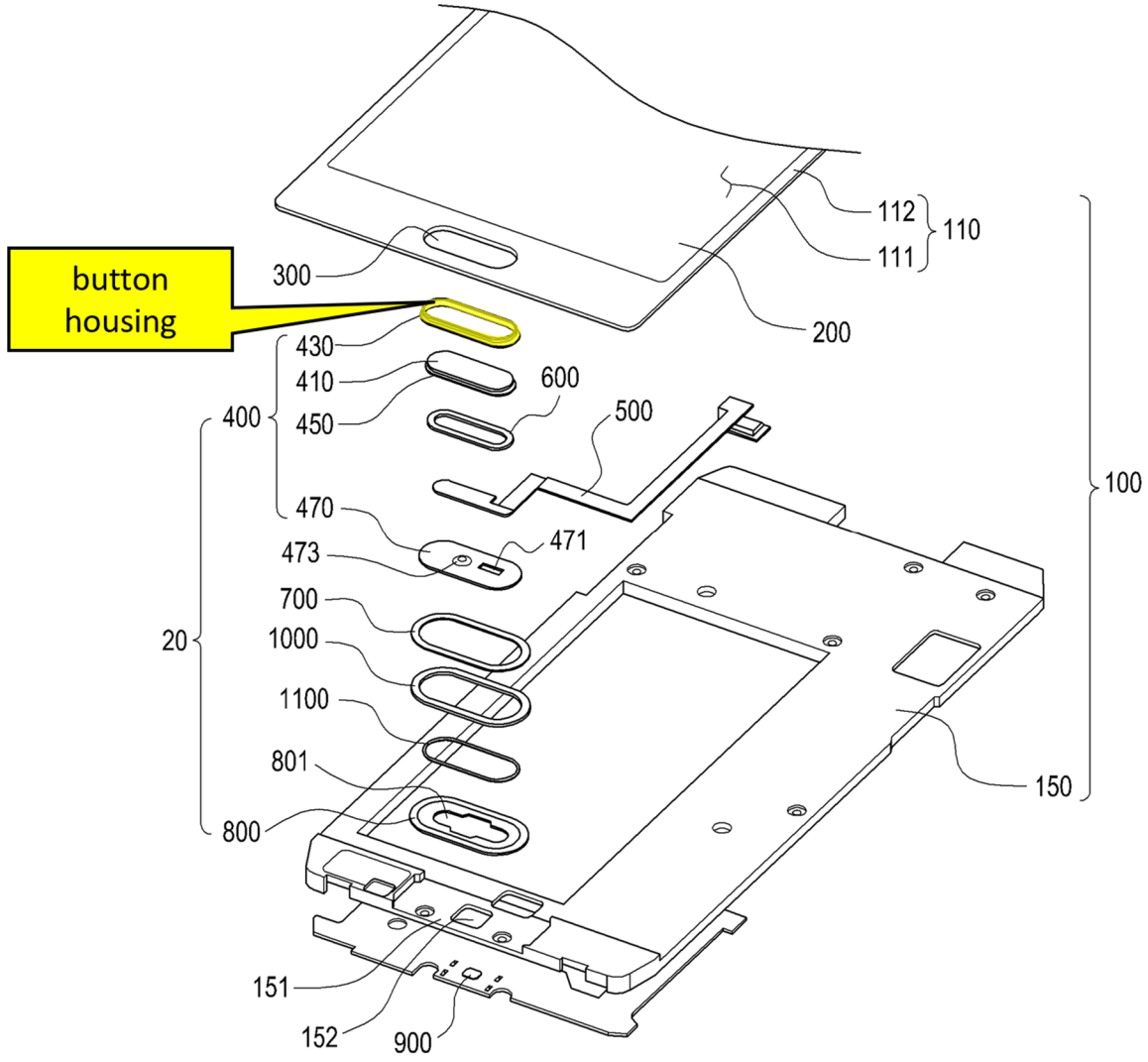
Element [16.e] contains five sub-elements:

(a) Claim 16: [16.e.i]

Chang discloses element [16.e.i].

Chang discloses "key module 20 may include … ***an annular structure 430***" which functions as the claimed button housing (Ex. 1015, 9:59-63; Ex. 1003, ¶¶549-550).

Ex. 1015, Fig. 3



Chang teaches annular structure 430 serves as a housing, insofar as it "may be arranged along the outer peripheral surfaces of the cover layer 410 and the fingerprint recognizing member 450" (Ex. 1015, 10:43-49; Ex. 1003, ¶551). A POSITA would have understood this is consistent with the description of the button

housing, as explained by the '619 Patent, which "forms an exterior structure of the biometric button assembly 210" (Ex. 1001, 12:63-13:10; Ex. 1003, ¶¶551-552).

(b) Claim 16: [16.e.ii]

Chang discloses element [16.e.ii] for substantially the same reasons as element [11.c], incorporated herein (Ex. 1003, ¶¶553-555).

(c) Claim 16: [16.e.iii]

Chang discloses element [16.e.iii] for substantially the same reasons as claims [11.c.i] and 14, incorporated herein (Ex. 1003, ¶¶556-558).

(d) Claim 16: [16.e.iv]

Chang discloses element [16.e.iv] for substantially the same reasons that discloses claims [11.c.i] and 14, incorporated herein (Ex. 1003, ¶¶559-560).

Moreover, *Chang* explicitly discloses a touch sensor, stating "key module 20 … is a data input device, and may be formed of a touch pad, a touch screen, or the like, in addition to a key input device to which data may be input mainly by a finger pushing operation" (Ex. 1015, 7:4-17; Ex. 1003, ¶¶561-563).

(e) Claim 16: [16.e.v]

Chang discloses element [16.e.v] for substantially the same reasons as claims [11.f], and 14, incorporated herein (Ex. 1003, ¶¶564-566).

vii. Claim 16: [16.f]

Chang discloses element [16.f] for substantially the same reasons as elements [11.d], and [16.e.iv], incorporated herein (Ex. 1003, ¶¶567-569).

viii. Claim 16: [16.g]

Chang discloses element [16.g] for substantially the same reasons as elements [11.g], and [16.e.iv], incorporated herein (Ex. 1003, ¶¶570-573).

8. Claim 17

i. Claim 17: [17.pre]

Chang discloses element [17.pre] (Ex. 1003, ¶574). *See* claim 16.

ii. Claim 17: [17.a]

Chang discloses element [17.a] for substantially the same reasons as element [11.e], incorporated herein (Ex. 1003, ¶¶575-577).

iii. Claim 17: [17.b]

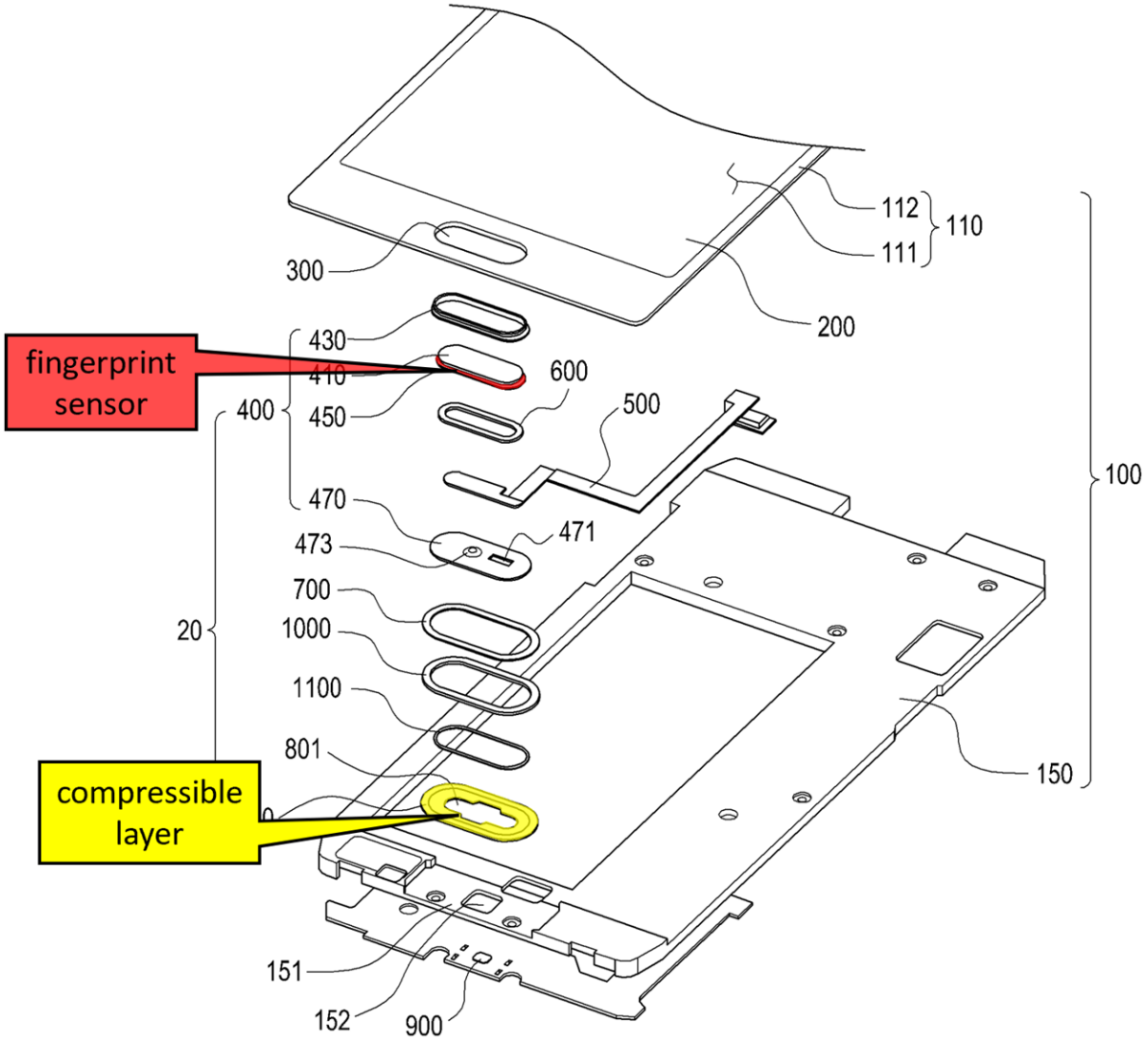
Chang discloses element [17.b] for substantially the same reasons as claim 12, incorporated herein (Ex. 1003, ¶¶578-580).

9. Claim 19

Chang discloses claim 19. *See* claim 16.

Chang's elastic member 800 (*i.e.*, the compressible layer) is depicted below (Ex. 1015, 13:11-18 ("elastic member 800 enables the button structure 400, which is pushed by the user's compression, to repeat click functions by returning to the initial position thereof"), Fig. 3; Ex. 1003, ¶¶581-584).

Ex. 1015, Fig. 3



VIII. PRIOR ART NOT PREVIOUSLY PRESENTED TO THE OFFICE

The prior art here was not cited during original prosecution. As a result, none of the grounds rely on the same or substantially the same prior art previously considered during prosecution. Therefore, the Board should not exercise its

discretion under 35 U.S.C. §325(d). *Adobe, Inc. v. Realtime Adaptive Streaming LLC*, IPR2019-00712, Paper 9 at 18-19 (PTAB Sept. 12, 2019).

IX. THE *FINTIV* FACTORS FAVOR INSTITUTION

The Board balances six factors in considering discretionary denial under 35 U.S.C. § 314(a) when parallel litigation exists. *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11 (PTAB Mar. 20, 2020) (precedential). Here, the factors ("*Fintiv* factors") favor institution.

Fintiv Factor 1 (potential for stay) is at least neutral given that no stay motion has yet been filed. *See Sand Revolution II, LLC v. Cont'l Intermodal Grp. – Trucking LLC*, IPR2019-01393, Paper 24 at 7 (PTAB June 16, 2020) (informative) (declining to speculate about a district-court stay).

Fintiv Factor 2 (timing of trial) favors institution. It is a practical impossibility that a trial would occur before the Final Written Decision because these Petitions are being filed prior to the District Court's case management conference, and no schedule or trial date has been set. The median-time-to-trial for civil cases in N.D. Cal. is 31.1 months (Ex. 1024 (National Judicial Caseload Profile), 66). Assuming that timing from the original filing date of December 2, 2022, the trial date is July 7, 2025, over 7 months after the final written decision.

Fintiv Factor 3 (litigation investment) favors institution. The district court case is at the very outset, and although the parties have served preliminary discovery

requests, discovery has not yet begun in earnest. More importantly, the parties have not yet served infringement contentions, invalidity contentions, or begun claim construction briefing. In short, Petitioner acted promptly in response to Patent Owner's filing of the Complaint.

Fintiv Factor 4 (overlap of issues) favors institution. At the time of filing this Petition, Patent Owner has not served infringement contentions. These Petitions nonetheless address all claims of the '619 Patent. Moreover, Petitioners stipulate herein that if this IPR proceeding is instituted, they will withdraw any identical grounds from the District Court litigation, eliminating any overlap in issues. The Board has found that such stipulations weigh in favor of institution. *See Sand Revolution II, LLC v. Continental Intermodal Grp – Trucking LLC*, IPR2019-01393, Paper 24 at 12 n.5 (PTAB June 16, 2020).

Fintiv Factor 5 (overlap in parties) weighs against institution because Petitioner is a party in this Petition as well as in the parallel district court litigation.

Fintiv Factor 6 (other circumstances) favors institution because this Petition "plainly lead[s] to a conclusion that one or more claims are unpatentable" because it is "highly likely…[to] prevail with respect to at least one challenged claim. *CommScope Technologies LLC v. Dali Wireless, Inc.*, IPR2022-01242, Paper 23 at 4 (PTAB Feb. 27, 2023) (precedential).

As discussed above, the ’619 Patent was only granted after the applicant amended the claims to identify an allegedly unique configuration of the seal, sealing surface, and enclosure (§VII). Each of Grounds 1-4 are highly likely to prevail with respect to at least one challenged claim, insofar as they each sets out a distinct configuration which meets the point of alleged novelty found in the ’619 Patent.

X. CONCLUSION

Petitioner respectfully requests cancellation of the Challenged Claims.

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

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

The real party-in-interest is Petitioner AliveCor, Inc.

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

A claim of infringement of the '619 Patent was asserted in *Apple Inc. v. AliveCor, Inc.*, Case 4:22-cv-07608-HSG, filed on December 2, 2022. Petitioner is simultaneously filing (1) a petition for IPR of claims 1-10 of the '619 Patent under the case heading IPR2023-00948, and (2) a petition for IPR of related U.S. Patent No. 10,076,257 under the case heading IPR2023-00950. Petitioner's explanation of the need for parallel petitions accompanies this filing.

C. Designation of Counsel Under 37 C.F.R. §42.8(b)(3)

Petitioner provides the following designation of counsel.

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Pursuant to 37 C.F.R §42.10(b), a Power of Attorney is being submitted with this Petition.

D. Service Information

Please address all correspondence and service to the address listed above. Petitioner consents to electronic service directed to apple-alivecor-ndcal@alston.com.

Date: June 7, 2023

By: /Christopher Douglas /
Christopher Douglas

CLAIMS APPENDIX

Claim	Recitation
[11.pre]	A fingerprint sensing system for a wearable device comprising:
[11.a]	an enclosure defining an enclosed volume and an opening along an exterior surface;
[11.b]	a processor disposed in the enclosed volume;
[11.c]	a button assembly positioned in the opening and defining an input surface, the button assembly comprising: a fingerprint sensor positioned inward from the input surface; and a retainer positioned inward from the input surface and defining a sealing surface;
[11.d]	a seal disposed between the sealing surface of the retainer and a surface of the opening;
[11.e]	a passage extending from the opening to the enclosed volume; and
[11.f]	a flexible conduit electrically connecting the fingerprint sensor to the processor; wherein:
[11.g]	a portion of the flexible conduit is sandwiched between the seal and the sealing surface of the retainer or between the seal and the surface of the opening.
12	The fingerprint sensing system of claim 11, wherein the flexible conduit extends through the passage.
13	The fingerprint sensing system of claim 11, wherein the flexible conduit is coupled to a second flexible conduit that extends through the passage.
14	The fingerprint sensing system of claim 11, wherein the fingerprint sensor is further configured to detect a touch.
[15.pre]	The fingerprint sensing system of claim 11, wherein:

Claim	**Recitation**
[15.a]	the button assembly further comprises a tactile dome switch disposed inward from the retainer; and
[15.b]	the tactile dome switch compresses in response to a press on the input surface.
[16.pre]	A watch comprising:
[16.a]	an enclosure defining an enclosed volume and an opening formed in a sidewall;
[16.b]	a processor disposed in the enclosed volume;
[16.c]	a display positioned within the enclosure and operably coupled to the processor;
[16.d]	a watchband attached to the enclosure and configured to couple the watch to a user; and
[16.e]	a button assembly disposed within the opening, the button assembly comprising: a button housing; an input member with an input surface; a fingerprint sensor positioned below the input member and configured to produce an output signal in response to a touch on the input surface, the output signal corresponding to a fingerprint; a touch sensor configured to detect the touch; a flexible conduit electrically coupled to the fingerprint sensor and configured to transmit the output signal to the processor; and
[16.f]	a seal positioned between the button housing and a surface of the opening;
[16.g]	wherein a portion of the flexible conduit is sandwiched between the seal and the button housing or between the seal and the surface of the opening.
[17.pre]	The watch of claim 16, further comprising:

Claim	**Recitation**
[17.a]	a passage extending from the opening to the enclosed volume; wherein
[17.b]	the flexible conduit extends from the opening to the enclosed volume through the passage.
18	The watch of claim 16, further comprising: a fastener attaching the button housing to the enclosure and placing the seal in compression.
19	The watch of claim 16, further comprising a compressible layer disposed below the fingerprint sensor, the compressible layer compressing to receive a displacement or a deflection of the input member upon receipt of a user force to the input surface.
20	The watch of claim 16, further comprising an electrical isolation sheet disposed between the button housing and the enclosure.

CERTIFICATION UNDER 37 C.F.R. §42.24

Under the provisions of 37 CFR §42.24, the undersigned hereby certifies that the word count for the foregoing Petition for inter partes review totals 13,981 words (Sections I-X), which is less than the 14,000 allowed under 37 CFR §42.24(a)(i).

Date: June 7, 2023

By: / Christopher Douglas /
Christopher Douglas

CERTIFICATE OF SERVICE

Pursuant to 37 C.F.R. §§42.6(e), 42.105, the undersigned hereby certifies that true and correct copies of the above-captioned PETITION FOR INTER PARTES REVIEW OF U.S. PATENT NO. 10,866,619, all associated exhibits, and Petitioner's Power of Attorney were served in their entireties on June 7, 2023, upon the following parties via UPS Next Day Air®:

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