

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ALIVECOR, INC.,
Petitioner,

v.

APPLE INC.,
Patent Owner

Case IPR2023-00948
Patent 10,866,619

PATENT OWNER'S SUR-REPLY TO PETITIONER'S REPLY

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RELEVANT CLAIM LANGUAGE

Claim 1	
[1.pre]	An electronic device comprising:
[1.a]	an enclosure having an enclosed volume and an opening formed in a sidewall;
[1.b]	a processor positioned in the enclosed volume;
[1.c]	a button assembly within the opening, the button assembly comprising: an input member having an input surface; and a biometric 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 biometric characteristic;
[1.c.i]	a button assembly within the opening, the button assembly comprising: an input member having an input surface;
[1.c.ii]	[a button assembly within the opening, the button assembly comprising:]...a biometric 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 biometric characteristic;

[1.d]	a seal positioned between a sealing surface of the button assembly and the enclosure;
[1.e]	a flexible conduit coupled to the biometric sensor and configured to transmit the output signal to the processor; wherein:
[1.f]	a portion of the flexible conduit is sandwiched between the seal and the sealing surface or between the seal and the enclosure.
Claim 2	
[2.pre]	The electronic device of claim 1, wherein the button assembly further comprises:
[2.a]	a tactile dome switch configured to compress in response to a press on the input surface;
[2.b]	a plunger positioned below the biometric sensor and above the tactile dome switch, the plunger displacing and compressing the tactile dome switch in response to the press on the input surface;
[2.c]	a retainer defining an aperture housing the plunger;
[2.d]	the retainer defines the sealing surface of the button assembly
Claim 3	
[3.pre]	The electronic device of claim 1, wherein:

[3.a]	the seal includes a gasket and a pressure sensitive adhesive (PSA) layer; and
[3.b]	the portion of the flexible conduit is positioned between the gasket and the sealing surface of the button assembly.
Claim 4	
The electronic device of claim 1, wherein the seal is overmolded around the portion of the flexible conduit.	
Claim 5	
The electronic device of claim 1, wherein the flexible conduit passes through an aperture in the seal.	
Claim 6	
The electronic device of claim 1, further comprising a passage extending from the opening to the enclosed volume, wherein the flexible conduit passes through the passage.	
Claim 7	
[7.pre]	The electronic device of claim 6, wherein:
[7.a]	an enclosure shelf is defined at the bottom of the opening;
[7.b]	the passage is formed in the enclosure shelf;
[7.c]	the seal encircles the passage.

Claim 8

The electronic device of claim 6, wherein the portion of the flexible conduit encircles the passage.

Claim 9

The electronic device of claim 1, wherein the biometric sensor is a fingerprint sensor and the biometric characteristic is a fingerprint.

Claim 10

The electronic device of claim 1, wherein: the biometric sensor comprises an array of capacitive sensing elements that are configured to detect either or both of ridges and grooves of a user's finger.

LIST OF EXHIBITS

APPLE-2001	Memorandum: Interim Procedure for Discretionary Denials in AIA Post - Grant Proceedings with Parallel District Court Litigation (June 21, 2022)
APPLE-2002	Plaintiff Apple Inc.'s Disclosure of Asserted Claims and Infringement Contentions, <i>Apple Inc. v. AliveCor, Inc.</i> , 22-CV07608-HSG (N.D.Cal Jul. 25, 2023)
APPLE-2003	Declaration of Michael Amon
APPLE-2004	Transcript of April 13, 2024 deposition of Dr. Ronald D. Berger
APPLE-2005	Ahmer Syed, "Packaging Challenges for the Next Generation of Mobile Devices," IMAPS 2017 KEYNOTE SLIDES, 50th International Symposium on Microelectronics - Raleigh, NC USA, Oct. 9-12, 2017 ("Syed")
APPLE-2006	U.S. Patent Publication No. 2017/0032169 ("Pi")
APPLE-2007	U.S. Patent No. 8,031,186 ("Oestergaard")
APPLE-2008	Order Granting Motion to Stay, <i>Apple Inc. v. AliveCor, Inc.</i> , 4-22-cv-07608 (NDCA Dec. 29, 2023)
APPLE-2009	Declaration and Curriculum Vitae of Dr. Brian Anthony

I. INTRODUCTION

AliveCor's Reply ("Reply") fails to meaningfully address deficiencies identified in Apple's Patent Owner Response ("POR"). The Reply instead rehashes the flawed arguments offered in the Petition, and in doing so, mischaracterizes several aspects of the record in attempting to cure these deficiencies. The Reply thereby confirms the discussion in the POR—the asserted prior art does not disclose or render obvious distinct requirements of the *button assembly* of claim 1 to (1) comprise a *biometric sensor*, (2) be *within [an] opening [formed in a sidewall]*, and (3) include a structural arrangement where *[a] portion of the flexible conduit* is *sandwiched* between (a) a *seal* and a *sealing surface*, or (b) the *seal* and the *enclosure*. The patentability of the Challenged Claims should therefore be confirmed.

II. "BIOMETRIC CHARACTERISTIC" DOES NOT REQUIRE CONSTRUCTION

Claim language relating to "biometric characteristic" itself "accurately captures the scope of the invention, and there is no need for construction." POR, 12. Ignoring plain meaning, AliveCor instead maintains that column 5, lines 9 to 14 of the '619 patent specification provides "clear" lexicography. Reply, 1. This position is both factually and legally flawed. And, because there is no dispute that the "biometric characteristic" encompasses fingerprints, the Board need not

construe the term in addressing the merits of the invalidity challenges presented in the Petition.

AliveCor misapplies *Abbott Labs* when suggesting “as used herein” within 5:9-14 is definitional. Reply, 1 (citing *Abbott Labs v. Andrx Pharms., Inc.*, 473 F.3d 1196, 1210-11 (Fed. Cir. 2007)). In *Abbott Labs*, the Federal Circuit analyzed the phrase “as used herein, means...” and specifically emphasized the word “means” in finding that the patent at-issue “unambiguously provides definitions of other claim terms...” *Abbott Labs*, 473 F.3d, at 1210. These “definitions” were therefore based on the use of word “means” in reference to claim terms within the specification—not merely the phrase “as used herein.” The word “means” is not used in the ’619 patent at the cited lines (5:9-14), and thus, the rationale of *Abbott Labs* is not entirely on point. Regardless, the Federal Circuit ultimately reached the opposite outcome than that urged by AliveCor here because it eventually found that the written description “does not as unambiguously signify that the written description is definitional.” *Id.* (emphasis added). Thus, like *Abbott Labs*, no construction is necessary here because there is no unambiguous definition.

AliveCor then points to *Sinorgchem* for its view that use of quotation marks is a “strong indication” of a definition. Reply, 1 (citing *Sinorgchem Co. v. ITC*, 511 F.3d 1132, 1136 (Fed. Cir. 2007)). There, although the Federal Circuit acknowledged quotation marks *may* signal a definition, it focused the lexicography

analysis on the patentee's use of the word "is" in relation to presentation of an express definition. *Sinorgchem*, 511 F.3d at 1136 ("the word 'is,' again a term used here in the specification, may 'signify that a patentee is serving as its own lexicographer.'") (citing *Abbott*, 473 F.3d at 1210). But the relevant portion (5:9-14) of the '619 patent does not use the word "is" in discussing "biometric characteristic."

Because the words "means" and "is" are not used in the relevant portion (5:9-14) of the '619 patent, AliveCor's claim construction positions are distinguishable from those at issue in *Abbott* and *Sinorgchem*. Nor is AliveCor able to affirmatively identify clear and express disavowal of claim scope to justify its view of "clear" lexicography. *See* Ex-1001, 5:9-14. It attempts to disprove the alternative—that use of permissive language alone does not foreclose lexicography. *See* Reply, 1 (fn 3) (citing *Tele-Publishing, Inc. v. Facebook, Inc.*, 205 F. Supp. 3d 142, 170 (D. Mass. 2016)). But AliveCor's reliance on *Tele-Publishing* is similarly questionable because, there, the Federal Circuit's analysis related to a different type of permissive language. *See Tele-Publishing*, 205 F. Supp. 3d at 170 (declining to read "may include" as permissive because "'may' does not address what profile information 'may' include but rather what the Personals On-Line Network 'may' include.")). In contrast, the relevant portion (5:9-14) of the '619 patent includes the phrase "may refer to" in describing an

exemplary embodiment of the claim term “biometric characteristic.” *See* POR, 10 (citing Ex-1001, 5:9-14).

The factual distinctions discussed above only confirm that construction of “biometric characteristic” is not required in this proceeding. Based on the Petition’s application of asserted prior art, each of AliveCor’s grounds appear to map disclosures relating to fingerprints to the “biometric characteristic.”

AliveCor also incorrectly presumes that usage of “biometric characteristic” and “human physical characteristic” within the ’619 patent specification somehow are mutually exclusive of one another. *See* Reply, 3 (citing Ex-1001, 4:51-59). This interpretation is contradicted by the ’619 patent specification’s reference to “fingerprint” as an example of each. EX-1001, 4:57-59 (“[t]he sensed **human physical characteristic** may vary widely, but may include **fingerprint**...”); and *also id.*, 5:13-14 (“**Ifingerprints** and DNA are example biometric characteristics”). Thus, AliveCor’s interpretation that characteristics, such as “heart rate” and “blood pressure,” cannot be a “biometric characteristic” is incorrect. *See* POR, 11. It is also unsupported by any testimonial evidence.

III. KIM FAILS TO ANTICIPATE OR RENDER CLAIM 1 OBVIOUS (GROUNDS 1, 2)

A. AliveCor’s “Single Invention” Characterization Contradicts Kim’s Express Disclosure

AliveCor’s anticipation challenge based on Kim “fails as a matter of law because it combines two distinct embodiments, e.g., Kim’s Figure 10 and Figure 18 embodiments.” POR, 18-19.

Attempting to cure this deficiency, AliveCor now resorts to characterizing Kim as disclosing a “single invention.” *See* Reply, 3, 4, 6. But this contradicts Kim’s unambiguous disclosure of “various embodiments” of an “electronic device having a combined button implemented as a combination of a physical button and a virtual button...” Ex-1004, 2:29-34.¹ Kim also uses the term “embodiment” more than seventy times within its disclosure, further indicating that Kim describes several different embodiments rather than a “single invention.” AliveCor’s characterization is also unsupported by expert testimony, and relies entirely on attorney argument regarding Kim’s disclosure (which, as discussed above, references distinct “embodiments”).

¹ As explained in §III.B, AliveCor also misinterprets Kim’s descriptions of its “combined button.”

AliveCor's citation to *Chamberlain* is unable to save its anticipation theory based on Kim. *See* Reply, 4 (citing *Chamberlain Grp., Inc. v. Techtronic Indus. Co.*, 935 F.3d 1341, 1350 (Fed. Cir. 2019)). As acknowledged by AliveCor, *Chamberlain* explained that, for anticipation based on two embodiments within a single reference, a person of ordinary skill in the art (POSITA) would need to "at once envisage" the combination. *See* Reply, 4. But, absent generic broadening disclosures within Kim, AliveCor is unable to identify any specific teaching or suggestion relating to Kim's Figures 10 and 18 embodiments that would have led a POSITA to envisage AliveCor's proposed combination. Instead, "[t]he most relevant disclosure relating to Kim's Figure 18 embodiment that contemplates a fingerprint sensor" is one that "provides no further indication that the fingerprint sensor would have included specific fingerprint sensing elements of the Figure 10 embodiment (e.g., fingerprint sensors 240p1, 240p2)[.]" POR, 31-32 (citing Ex-1004, 19:26-30). This is consistent with Dr. Anthony's testimony discussing the challenges to AliveCor's proposed combination. *See* APPLE-2009, ¶¶67-80.

B. AliveCor Overplays Kim's Description of "Combined Button"

Kim's disclosure of multiple distinct embodiments (with respect to the structure and positioning of button assemblies with an electronic device) is consistent with its use of the term "combined button." *See, e.g.*, Ex-1001, 2:42-3:25. Kim references the term "combined button" to generically refer to "a

combination of a physical button and a virtual button.” POR, 20-21 (citing Ex-1004, 2:30-34). Further, “Kim’s usage of the ‘combined button’ term within the descriptions of its Figure 10 and Figure 18 embodiments does not itself suggest that Kim contemplates combining the teachings of each embodiment.” *Id.*, 21.

AliveCor now asserts that “*Kim* teaches its ‘combined button’ can be placed anywhere on the device without modification.” Reply, 5. And yet, AliveCor cannot identify within Kim a specific example of a “combined button” with the assembly components depicted in Figure 10 and placed in the position shown in Figure 18. *See* Ex-1004, 2:62-67, 3:1-3, 3:4-6, 3:29-30, 17:10-12, 17:23-30. As one example, AliveCor’s reference to 17:10-12 of Kim is irrelevant because this disclosure is focused on Kim’s Figure 6 embodiment and lacks the elements of the “combined button” example depicted in Figure 10. *See* Reply, 5-6.

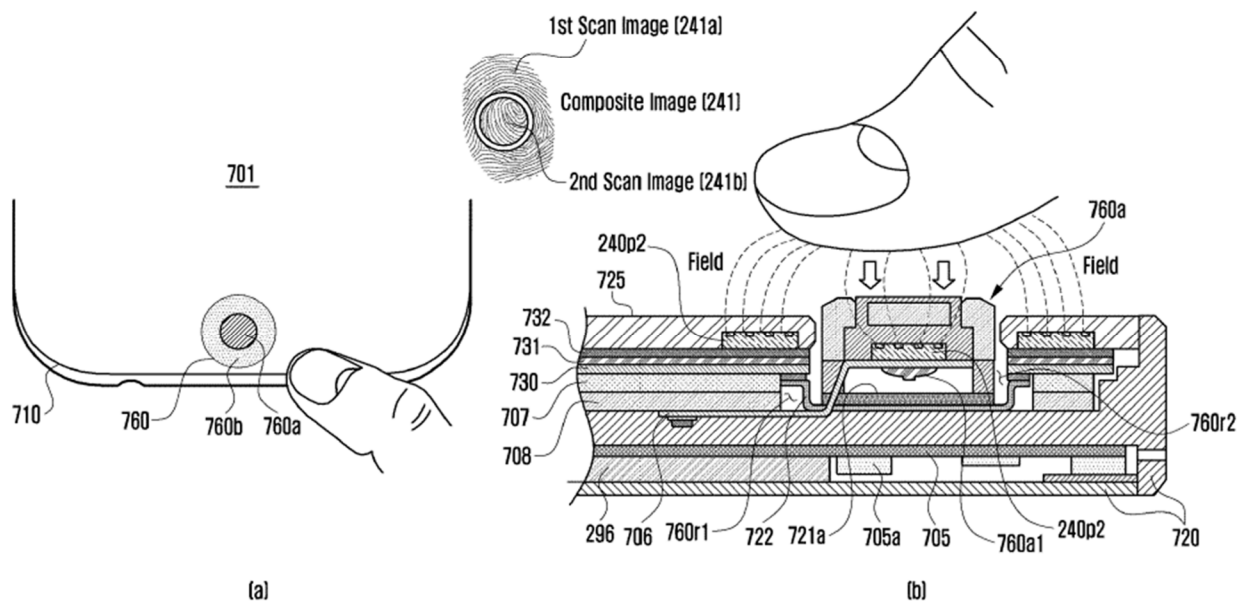
C. AliveCor Mischaracterizes Kim In Asserting That “Side Sensors” Of Kim’s Figure 10 Embodiment Are Optional

The Petition’s application of Kim to the *biometric sensor* recited in [1.c.ii] is “substantively flawed[.]” because “AliveCor identifies only one of two fingerprint sensors” within the “fingerprint sensor assembly of Kim’s Figure 10(b) embodiment.” POR, 35 (citing Ex-1004, 22:14-17).

AliveCor now points to three portions of Kim—specifically, 21:63-22:3, 22:14-17, and 22:18-27—and states that “Kim is plainly referring to optional side

sensors.” Reply, 8. But even in 21:63-22:3, Kim describes that a “user fingerprint” is acquired/captured using “the **first** fingerprint sensor corresponding to the physical button 760a and the **second** fingerprint sensor corresponding to the virtual button 760b in the home button 760. Ex-1004, 21:63-22:3 (emphasis added). This is shown in Figure 10 of Kim below:

FIG. 10



Ex-1004, FIGS. 10(a) (left), 10(b) (right)

As noted above, 21:63-22:3 enumerates two distinct fingerprint sensors in relation to components depicted in Figure 10(a) (e.g., physical button 760a, virtual button 760b) arranged in a specific fashion. They are each *part of* the Figure 10 embodiment—not optional elements. Their removal, which AliveCor suggests is

contemplated by disclosure relating to Figure 10, would materially alter functionality of the embodiment since it combines “fingerprint images 241a and 241b respectively obtained by the first and second fingerprint sensors into a single fingerprint image 241.” Ex-1004, 21:63-22:3. Indeed, Dr. Anthony testified that omission of one of these fingerprint sensors “contradicts how a POSITA would have understood functionality of the fingerprint sensor assembly of Kim’s Figure 10 embodiment” because data collected by each is used to “generate a composite fingerprint image.” APPLE-2009, ¶83. Thus, record evidence—both from Kim and related expert testimony—confirms that AliveCor’s characterization of the “side sensors” being optional in the Figure 10 embodiment should not be credited.

IV. THE JUNG-MYERS COMBINATION FAILS TO RENDER CLAIM 1 OBVIOUS (GROUND 3)

A. AliveCor’s Motivation to Combine Presumes Jung Contemplates Button Assemblies with Fingerprint Sensors

AliveCor’s obviousness challenge based on the Jung-Myers combination fails because “a POSITA would not have sought out Myers disclosure of fingerprint sensor assemblies because Jung does not contemplate any button assembly with an incorporated fingerprint sensor.” POR, 39 (citing APPLE-2009, ¶86).

AliveCor now asserts that “[t]he *Myers* button structure is precisely the type of” key that “Jung explicitly contemplates being used with its key-waterproof

structure.” Reply, 15. But AliveCor is unable to substantiate this position with any teaching or suggestion within Jung for incorporating a fingerprint sensor within its button assembly. Rather, it is forced to point to broadening disclosure that Jung’s button assembly may be applied to “keys for performing various functions,” but fingerprint sensing is not listed as one of those functions. *Id.* (citing Ex-1005, [0123]). The other portions of Jung cited in the Reply fare no better. *See* Ex-1005, [0012], [0037], [0060], [0122].

The purported motivations identified in the Reply also starkly contrast the broadening disclosure within Jung relied on by AliveCor. For example, AliveCor purports that “a POSITA would have known it was important to seal a fingerprint sensor to protect its electronic circuitry.” Reply, 14. But again, this presupposes a POSITA reviewing Jung would have been concerned with improvements to fingerprint sensors. This would not be the case since Jung’s disclosure of fingerprint sensors is “limited to a single paragraph relating to a ‘sensor module 240[,]’” “amongst several types of sensing elements,” and includes some sensors that “a POSITA would have not perceived relevant to button assemblies.” POR, 39-40 (citing Ex-1005, [0060]); *see* APPLE-2009, ¶87.

AliveCor also posits that Myers’ teachings improve Jung’s button assembly by providing “additional sealing,” which “would further achieve the known goal of preventing ingress of potentially damaging moisture and dust.” Reply, 17. For

evidentiary support, AliveCor points to paragraph 242 of the Berger Declaration, which states “a person of ordinary skill in the art would have been motivated to **waterproof Meyers’s ‘fingerprint sensor’ button assembly using Jung’s ‘key-waterproof structure’**.” Ex-1003, ¶242 (emphasis added); *see* Reply, 17. To the extent that “additional sealing” is deemed to provide any benefit, Dr. Berger testified that such improvement would have been provided to Myers based on the teachings of Jung (i.e., Myers *in view of* Jung). This is not a combination proposed in the Petition. The discrepancy also “suggests hindsight bias in combining the teachings of Jung and Myers to satisfy requirements of the button assembly.” *See* POR, 41-42. Regardless, AliveCor’s logic fails because Myers already teaches a “gasket 1025” that “may form a seal” for waterproofing, and AliveCor does not explain what it believes is “additional sealing.” *Id.*

B. The Jung-Myers Combination Still Fails To Satisfy The Requirements of Limitations [1.a] and [1.c]

Beyond a lack of motivation to combine, the Jung-Myers Combination is also substantively defective because “[t]he Petition fails to establish that the button assembly provided by the combination would have been positioned in an *opening [formed in a sidewall]*.” POR, 46 (citing APPLE-2009, ¶99).

In the Reply, AliveCor initially cites to the same broadening disclosure in Jung discussed above—the button assembly being applied to “other keys for

performing various functions” (Reply, 20). This description, alone, is insufficient to disclose or suggest positioning within a sidewall, particularly since Jung primarily describes its button assembly as a “home-key.” AliveCor then cites to Jung’s reference to a “wrist watch,” which, according to AliveCor, “a POSITA would have understood includes a key located in a sidewall.” Reply, 20 (citing Ex-1005, [0037]). But paragraph [0037] of Jung discusses a wrist watch amongst various electronic devices, including those that have no relevance to the ’619 patent, and does not explain why a POSITA would have understood this example to include a “key located in a sidewall.” Worse, this paragraph fails to address positioning of button assemblies within a wrist watch. Because AliveCor is focused on the claims of the ’619 patent, it seems to have disregarded that a button assembly may also be implemented in a front face of the wrist watch (consistent with other disclosures in Jung). And these configurations would not satisfy the requirement of claim 1 for a button assembly to be in an *opening [formed in a sidewall]*.

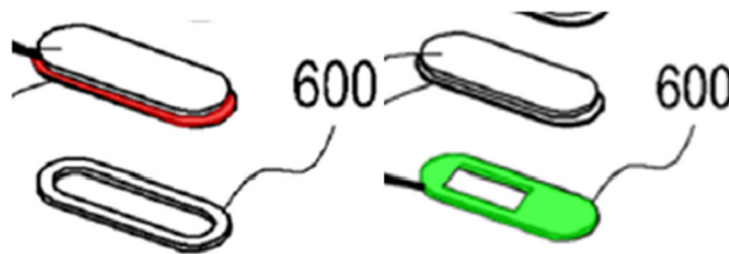
V. CHANG FAILS TO ANTICIPATE OR RENDER CLAIM 1 OBVIOUS (GROUND 4)

A. AliveCor’s Alteration Of Sealing Member 600 Is Not Congruent With Chang

AliveCor’s anticipation and obviousness challenges based on Chang are deficient because they either rely on “an embodiment in Chang that fails to satisfy

all requirements of the **button assembly**” or “fail[] to sufficiently address how a POSITA would have arranged elements of Chang to achieve the **button assembly**.” POR, 21-22.

AliveCor now characterizes Chang as teaching a “non-annular sealing member,” and purports that “when sealing member 600 is implemented in a non-annular shape, there is ‘sandwiching’ (element [1.f]).” Reply, 21-22. To be clear, 14:24-29 of Chang (leveraged by AliveCor for its purported disclosure of the “non-annular sealing member”) merely describes an “**alternative[]**” implementation.” Reply, 21 (citing Ex-1015, 14:24-29, and Pet. 96). What 14:24-29 fails to describe, however, is the *specific* alterations proposed in the Petition to achieve satisfaction of limitation [1.f]. See APPLE-2009, ¶51. Those alterations modify the original sealing member 600 depicted in Chang’s Figure 3 (depicted on the left below) to “have a solid structure with a rectangular window” (depicted on the right below). POR, 51.



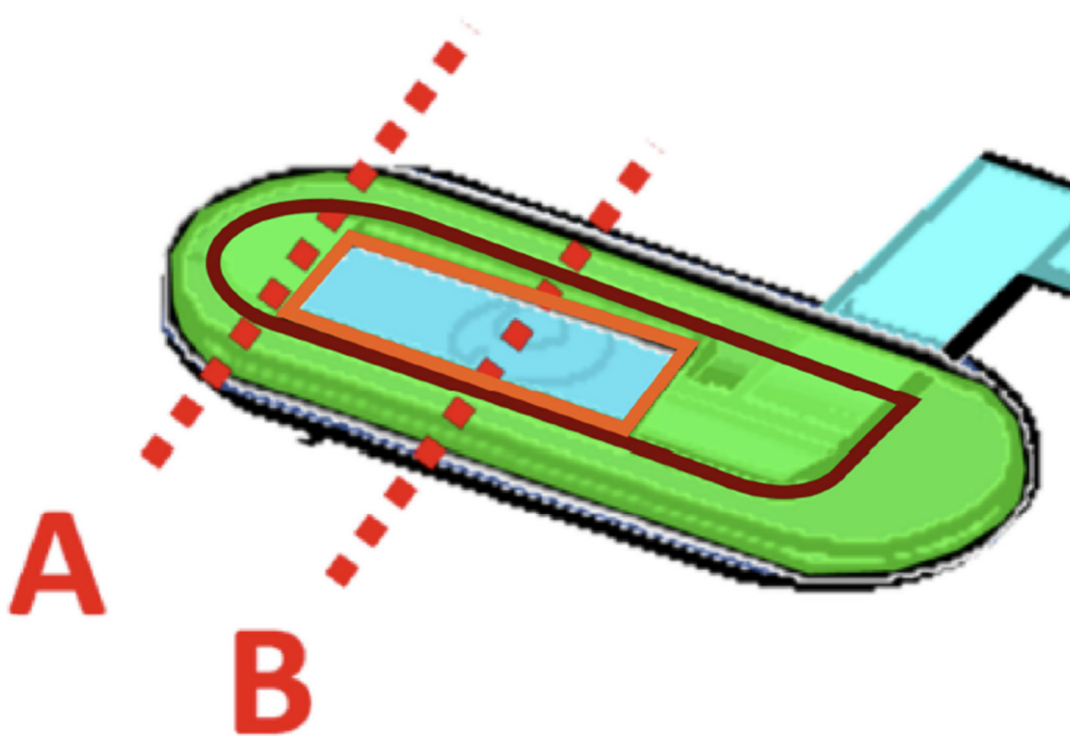
POR, 51 (citing Pet. at 92 and 94)

As shown above, the alterations require two modifications: (1) to the shape (from annular to non-annular), and (2) to the size and shape of the opening (reduction in size, change from oval to rectangular window). Even if AliveCor's interpretation of 14:24-29 (as suggesting non-annular sealing members) is credited, there is no teaching or suggestion within this portion of Chang for the other modifications. The Reply cites to several other portions of Chang, but they all fail to address the modified opening. *See* Ex-1015, 10:13-21, 10:32-42, 10:59-11:3, 11:36-41. AliveCor therefore "fails to provide any indication that a POSITA would have arrived at the Chang Combination based on the teachings within Chang." POR, 26.

AliveCor also attempts to address Dr. Anthony's testimony regarding the "several technical hurdles that would have rendered Chang inoperable." APPLE-2009, ¶114²; *see also id.*, ¶¶115-27. It does so by focusing on Chang's disclosure of electrical contacts between sealing member and circuit region 453 and then

² Dr. Anthony explained that "when the Chang Combination is assembled, the circular portion of the conductive member 500 is required to be positioned below the sealing member 600 because the area defined by its boundaries...is **larger** than the area provided by the rectangular window..." APPLE-2009, ¶123 (emphasis added). This results in a stacking arrangement that fails to satisfy limitation [1.f].

concludes that the “opening in non-annular sealing member 600 is sized to allow electrical contact...” Reply, 23 (citing Ex-1015, 10:31-21). Even if true, this explanation does not address why the Petition modified the size of a circular portion of the conductive member 500, but failed to account for the size difference with the size of the rectangular window (or opening) on the altered sealing member 600. This is shown below:³



³ According to AliveCor, “A” and “B” each represent cross-sections along particular portions of the structural arrangements shown in Chang’s Figure 3. Pet., 98-99.

APPLE-2009, ¶123 (annotating an excerpted figure depicted on Pet. at 99)

Dr. Anthony testified that “AliveCor appears to have modified the size of the circular portion of the conductive member 500 when positioning the circular portion underneath the altered sealing member 600.” *Id.*, 122. And yet AliveCor modified the size of circular portion in a way that still prevents entry into the rectangular window.

Unable to address these defects, AliveCor now hedges by noting that conductive member 500 is “flexible and, when placed in compression during the assembly process would not result in a cavity...” Reply, 24. This statement is merely attorney argument and not supported by record evidence. It is also rebutted by Dr. Anthony’s testimony, which explained that “for the entire part of the conductive member 500 to be fit within the space/volume defined by the rectangular window of the altered structure of sealing member 600, conductive member 500 would need to be flowable or bulk deformable.” APPLE-2009, ¶118. Further, “[a] POSITA also would not have understood conductive member 500 to be flowable or bulk deformable because Chang describes that flexible conductive member 500 may include ‘a Flexible Printed Circuit Board (FPCB)’.” *Id.*, ¶119. *See* Ex-1015, 12:42-49.

**B. Even if Appropriate, AliveCor's Alteration Still Fails to Satisfy
The Requirements Of Limitation [1.f]**

AliveCor's application of Chang to limitation [1.f] is "deficient regardless of whether it includes the original sealing member 600 (depicted in Chang's Figure 3), or AliveCor's altered sealing member 600." POR, 61 (citing APPLE-2009, ¶128). For the sealing member 600 depicted in Chang's Figure 3 (i.e., the unaltered sealing member 600), the cross section shown in Figure 10 confirms that "a portion of conductive member 500 (highlighted in teal) is arranged co-planar with (i.e., not positioned below) the sealing member 600 (highlighted in green) and lower plate 470 (highlighted in blue)" and thereby fails to satisfy the *sandwiched* requirement of [1.f]. POR, 62-63.

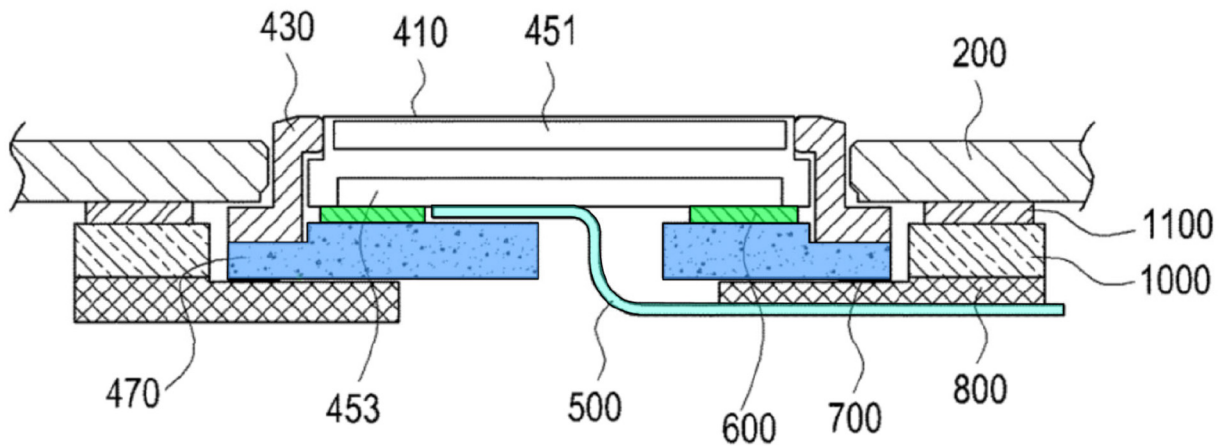
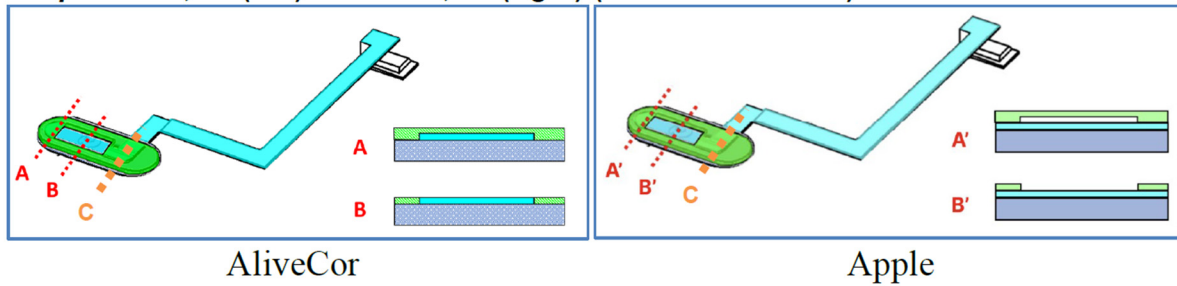


FIG.10

POR, 63 (annotating Ex-1015, FIG. 10)

The Reply misleadingly attributes the POR's discussion of Figure 10 to the altered sealing member and then states "Figure 10 is irrelevant because it illustrates a cross-sectional cut occurring at a different location, marked 'C' below..." See Reply, 25-26.

Compare Pet., 99 (left) with POR, 60 (right) (further annotated)



Reply, 26

As noted above, the POR's discussion of Figure 10 demonstrated that arrangement of the "the sealing member 600 depicted in Chang's Figure 3" (i.e., original, unaltered sealing member 600) and conductive member 500 is one that fails to satisfy the *sandwiching* requirement of limitation [1.f]. Setting this aside, the portrayal in page 26 of the Reply is still wrong because AliveCor disregards that a portion of conductive member 500 along the cross-section is still *below* a body of the altered sealing member (because, as altered, the sealing member has a solid body). In contrast, Figure 10 of Chang shows a co-planar arrangement of conductive member 500 and sealing member 600. *See* APPLE-2009, ¶47.

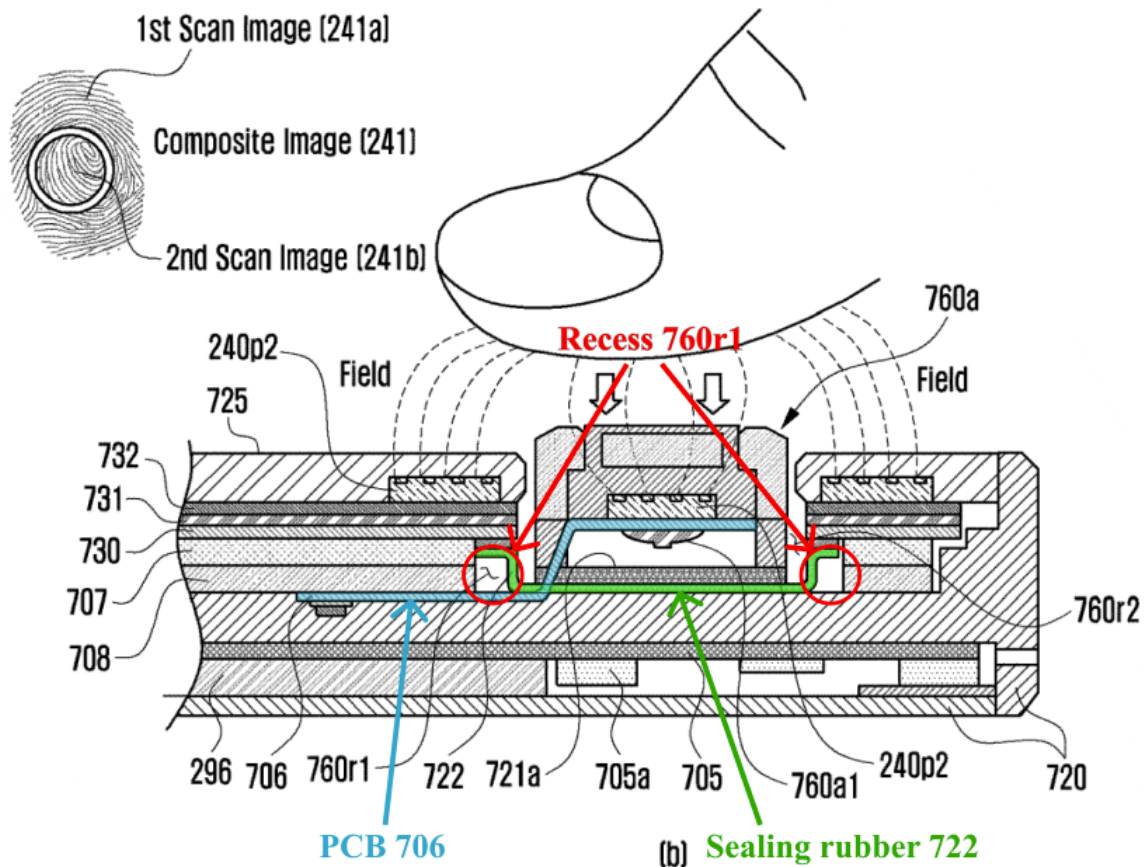
VI. ALIVECOR'S CHALLENGES TO CLAIM 4 ARE ALSO DEFICIENT

A. AliveCor Fails To Demonstrate Why A POSITA Would Have Understood Kim's Sealing Rubber 722 To Be Overmolded

AliveCor's challenge to claim 4 based on Kim (Ground 2) is deficient because Kim's rubber seal 722 is not overmolded and "a POSITA would not have

found it obvious to construct Kim's rubber seal 722 with overmolding..." APPLE-2009, ¶140. This is because, in the context of Kim, overmolding would not have made sense for sealing rubber 722 because its edges "are raised and form a recess 760r1 that sits between the rubber seal 722 and the flexible PCB 706." *Id.* As shown in the annotated Figure 10(b) of Kim below, sealing rubber 722 (green) is arranged relative to PCB 706 (blue) such that its edges are not overmolded to PCB 706 because they form recess 760r1 (circled in red):

FIG. 10



Ex-1004, Fig. 10(b) (annotated)

AliveCor fails to address Dr. Anthony’s testimony and instead states “[b]ut no claim language requires overmolding around *every* component; instead, the claimed seal “is overmolded around the portion of the flexible conduit” that is sandwiched.” Reply, 28. Because Kim’s seal is not (and cannot) be overmolded, AliveCor is forced to change its theory and alleges—for the first time in its

Reply—that *only the portion* of Kim’s sealing rubber 722 is overmolded. *Id.* This interpretation is not supported by any record evidence. Nor does the record evidence support an interpretation of Kim’s Figure 10(b) in which (1) a portion of a seal is partially formed by overmolding and (2) another portion is partially formed by some other sealing technique. Rather, as shown above, Kim’s Figure 10(b) makes clear that PCB 706 passes through sealing rubber 722 in the same way it passes through the support fixture 721a (which is not overmolded with sealing rubber 722). AliveCor admits this, because it maps the seal arrangement shown in Figure 10(b) to claim 5, which recites that “the flexible conduit passes through an aperture on the seal.” Pet., 28-29. This is a different sealing arrangement than overmolding, and AliveCor’s mapping to this sealing arrangement for claim 5 confirms that the sealing arrangement shown in Kim’s Figure 10(b) does not suggest overmolding.

Despite AliveCor’s Reply arguments, record evidence confirms Kim’s sealing rubber 722 is not overmolded. Dr. Anthony’s testimony regarding sealing rubber 722 is consistent with how AliveCor’s expert, Dr. Berger, defines “overmolding” as “a technique in which a one [*sic*] material is **molded over a substrate** often by injection.” Ex-1003, ¶206 (emphasis added). The ’619 patent also contrasts different sealing arrangements, including those where “flexible conduit 240 is stacked over the entire seal 262 and the relevant portion of the

flexible conduit 240 covers or overlaps substantially all of a sealing surface of the seal 262[,]” and “[o]ther configurations of the seal region 209” that may involve overmolding. Ex-1001, 9:37-54. Consistent with Dr. Berger’s definition of “overmolding” and the ’619 patent, Dr. Anthony then testified that if sealing rubber 722 is overmolded (i.e., “molded over” PCB 706 as a substrate), then sealing rubber 722 would “conform to and take the shape of the structure over which it is overmolded and thus would reside against the flexible PCB 706.” APPLE-2009, ¶140. Dr. Anthony then confirmed his declaration testimony during deposition. *See* Ex-1027, 132:17-133:1.

AliveCor also references an “obvious to try” theory found nowhere in the Petition’s one-page analysis for claim 4 in Ground 2. *See* Pet., 40-41. Beyond being impermissibly new, this theory is also unsupported in the context of Kim’s disclosure because overmolding is not suitable to provide the sealing arrangement depicted in Figure 10(b). Overmolding provides neither a predictable solution nor a reasonable expectation of success. Indeed, none of the overmolding techniques described in the additional documents cited by Dr. Berger are able to achieve the sealing arrangement depicted in Figure 10(b) where the seal 722 “separates the display recess 760r1 and the home button recess 760r2” and is “adhered to the force touch panel 730 with an adhesive.” Ex-1004, 22:38-42; *see* Reply, 27 (fn 17) (citing Ex-1019, 39:44-46, Ex-1020, [0052]); *see also* Ex-1003, ¶¶52, 207.

Because overmolding cannot achieve these functions, an overmolded seal would not have been suitable for the intended purpose of Kim's seal 722. For these and other reasons identified by Dr. Anthony, a POSITA would not have looked to overmolding as a sealing technique for sealing rubber 722 and would have instead looked to alternative sealing techniques. *See* APPLE-2009, ¶¶134-39.

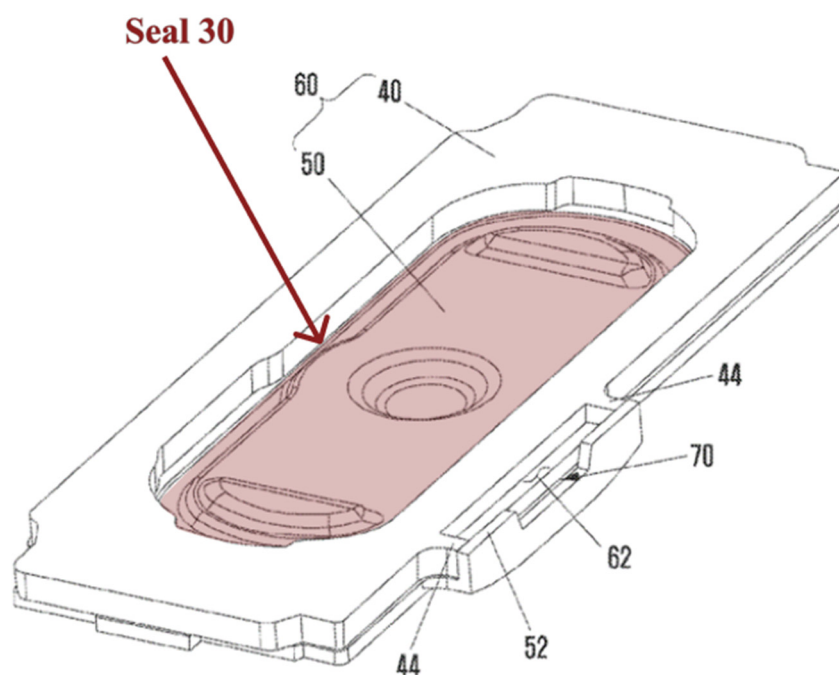
B. Jung Does Not Disclose or Suggest Overmolding And AliveCor Is Unable To Demonstate Otherwise

AliveCor's challenge to claim 4 based on Jung-Meyers (Ground 3) is also deficient because AliveCor's relied-upon description from Jung (Ex-1005, [0122]) describes "how the flexible circuit board 30, bracket 40, and silicon rubber 50 attach, not how the silicon rubber 50 (seal) is formed and whether it is overmolded on the flexible circuit board 30." APPLE-2009, ¶145.

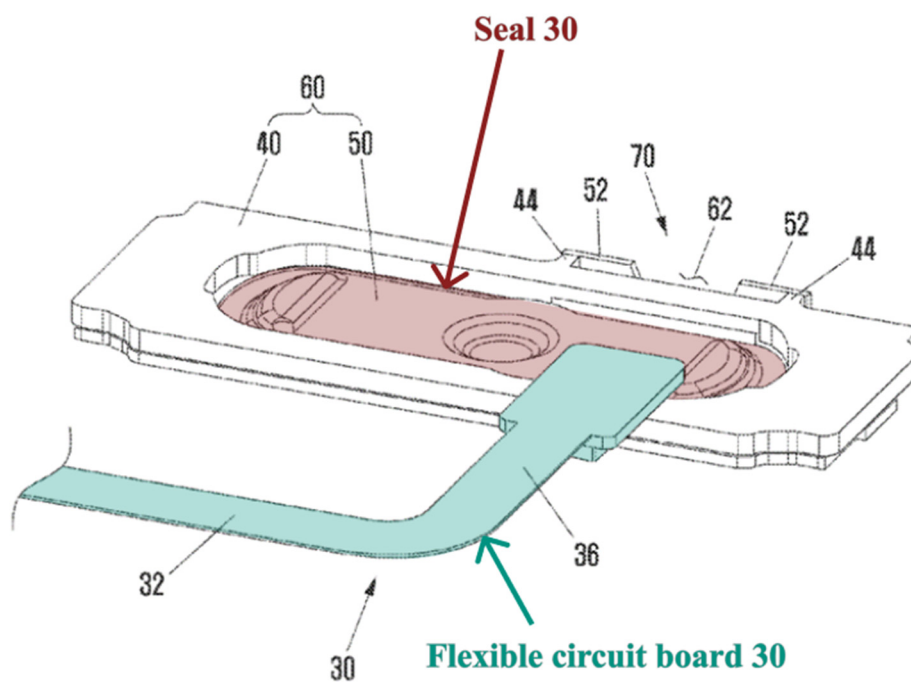
AliveCor ignores this testimony and instead uses circular logic to argue that "[b]ecause *Jung*'s insert-injected seal (mapped to the silicon rubber 50) is overmolded around the portion of the flexible conduit (mapped to the flexible circuit board 30), it is irrelevant whether the 'silicon-not-attached portion' is applied later." Reply, 29-30. This statement oversimplifies Apple's position, and does so by conflating all injection processes with overmolding. But Dr. Anthony testified that "[a]ttaching separately molded/formed components is not overmolding." *Id.* This is consistent with the '619 patent, which similarly

contrasts sealing arrangements that involve stacked arrangements and others that involve overmolding. *See* Ex-1001, 9:37-54. Further, “Jung’s flexible circuit board 30 and silicon rubber 50 do not have an injection based connection[,]” and “Jung’s bracket 40 and silicon rubber 50 are sealed with an opening 70 where the flexible circuit board 30 is later inserted.” *Id.*

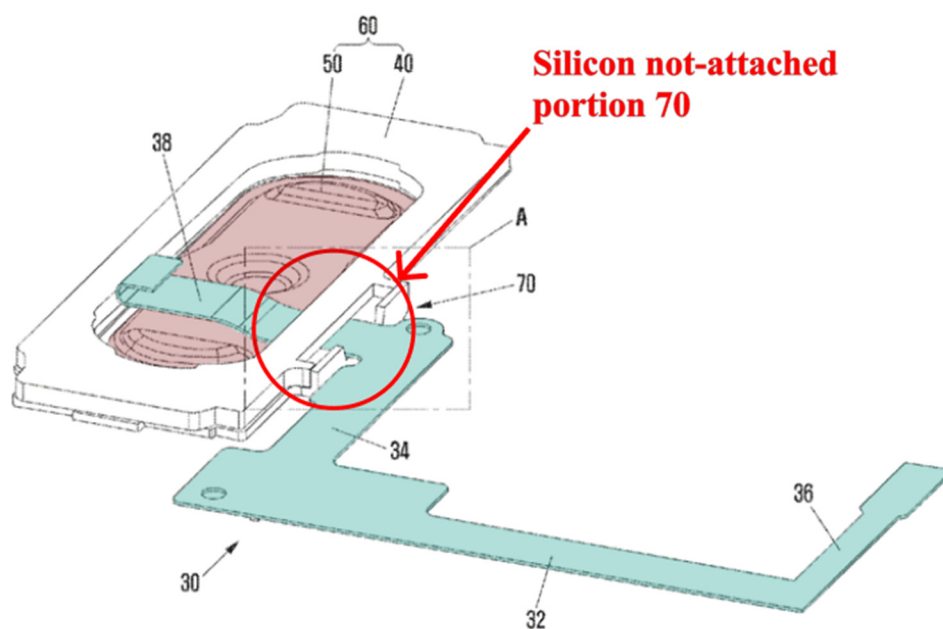
In cross-examination, AliveCor failed to obtain deposition testimony meaningfully undermining these opinions. *See generally* Ex-1027, 90:21-106, 4. This is not surprising because Jung is clear that its seal 50 is a separate component from its flexible circuit board 30 and the flexible circuit board 30 is only assembled through the silicon not-attached portion 70 after insert injection has been performed. This process is clearly shown in Figures 8-11 of Jung:



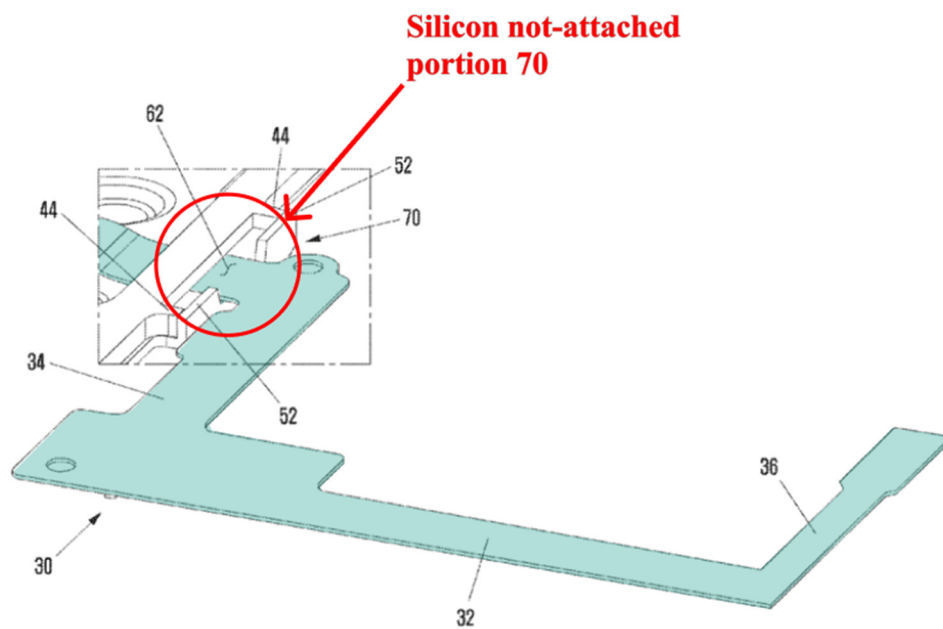
Ex-1005, FIG. 8 (annotated)



Ex-1005, FIG. 9 (annotated)



Ex-1005, FIG. 10 (annotated)



Ex-1005, FIG. 11 (annotated)

VII. CONCLUSION

For the foregoing reasons, Patent Owner Apple respectfully requests a final written decision confirming patentability of the Challenged Claims.

Respectfully submitted,

Date: August 28, 2024

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CERTIFICATION UNDER 37 CFR § 42.24(d)

Under the provisions of 37 CFR § 42.24(d), the undersigned hereby certifies that the word count for the foregoing Patent Owner's Sur-Reply to Petitioner's Reply totals 4,446, which is less than the 5,600-word allowed under 37 CFR § 42.24(c)(4).

Respectfully submitted,

Date: August 28, 2024

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CERTIFICATE OF SERVICE

Pursuant to 37 C.F.R. § 42.6(e)(4), the undersigned certifies that on August 28, 2024, a complete and entire copy of this Patent Owner's Sur-Reply to Petitioner's Reply was provided via email, to the Petitioner by serving the email correspondence addresses of record as follows:

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