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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MASIMO CORPORATION,
Petitioner

v.

APPLE INC.,
Patent Owner

Case No. IPR2023-00634
Patent No. 10,627,783

**PETITIONER'S REPLY IN SUPPORT OF PETITION FOR *INTER PARTES*
REVIEW OF U.S. PATENT NO. 10,627,783**

TABLE OF CONTENTS

	Page No.
I. INTRODUCTION	1
II. CLAIM CONSTRUCTION	3
III. ARGUMENT.....	6
A. Apple’s arguments depend on an incorrect legal standard.	6
B. None of Apple’s Arguments Have Merit With Respect to the Obviousness of Claim 9 based on Kotanagi and Honda	7
1. Apple does not dispute the Petition’s motivations to combine Kotanagi and Honda.....	7
2. Kotanagi’s dimensions would not have prevented the combination.....	8
3. Honda’s generalized goals of “quick and efficient” charging would not have stymied a Kotanagi/Honda combination.....	11
4. Apple’s arguments fail to account for the potential to enlarge the cover and place a coil around the optical elements.....	15
5. The Fraser reference Apple cites actually undermines Apple’s argument and shows expectation of success.....	17
6. Apple’s argument based on Fraser contorts the physics of wireless charging.	20
7. Apple’s modeling is fundamentally flawed.....	26
C. Claim 11 Would Have Been Obvious	28
D. Claim 15	28

TABLE OF CONTENTS
(*cont'd*)

	Page No.
E. Claim 16	28
F. Claim 1	32
G. Claims 6.....	32
H. Claim 12	35
I. Claims 2–5, 7–8, 10, 13–14, and 17–20.....	36
IV. CONCLUSION.....	37

TABLE OF AUTHORITIES

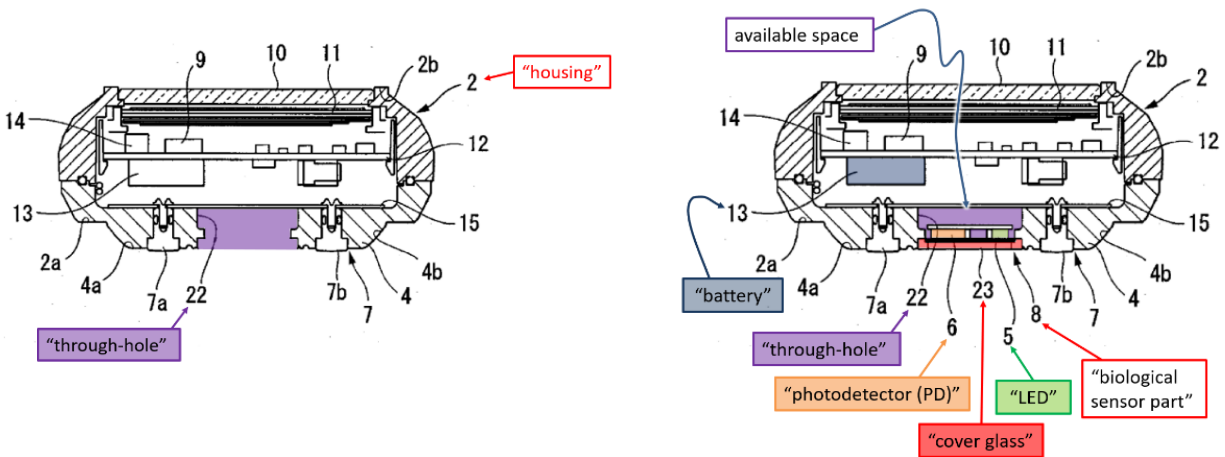
Page No(s).

<i>Google LLC v. EcoFactor, Inc.</i> , 92 F.4th 1049 (Fed. Cir. 2024)	5
<i>In re Heck</i> , 699 F.2d 1331 (Fed. Cir. 1983)	11
<i>Intel Corp. v. Qualcomm Inc.</i> , 21 F.4th 784 (Fed. Cir. 2021)	6, 9, 11
<i>Janssen Pharm., Inc. v. Teva Pharm., Inc.</i> , No. 2022-1258 (Fed. Cir. Apr. 1, 2024)	8
<i>KSR Int’l Co. v. Teleflex Inc.</i> , 550 U.S. 398 (2007)	10, 11
<i>Medichem, S.A. v. Rolabo, S.L.</i> , 437 F.3d 1157 (Fed. Cir. 2006)	<i>passim</i>
<i>In re Mouttet</i> , 686 F.3d 1322 (Fed. Cir. 2012)	6
<i>Pfizer Inc. v. Sanofi Pasteur Inc.</i> , 94 F.4th 1341 (Fed. Cir. 2024)	3
<i>In re Urbanski</i> , 809 F.3d 1237 (Fed. Cir. 2016)	11, 15

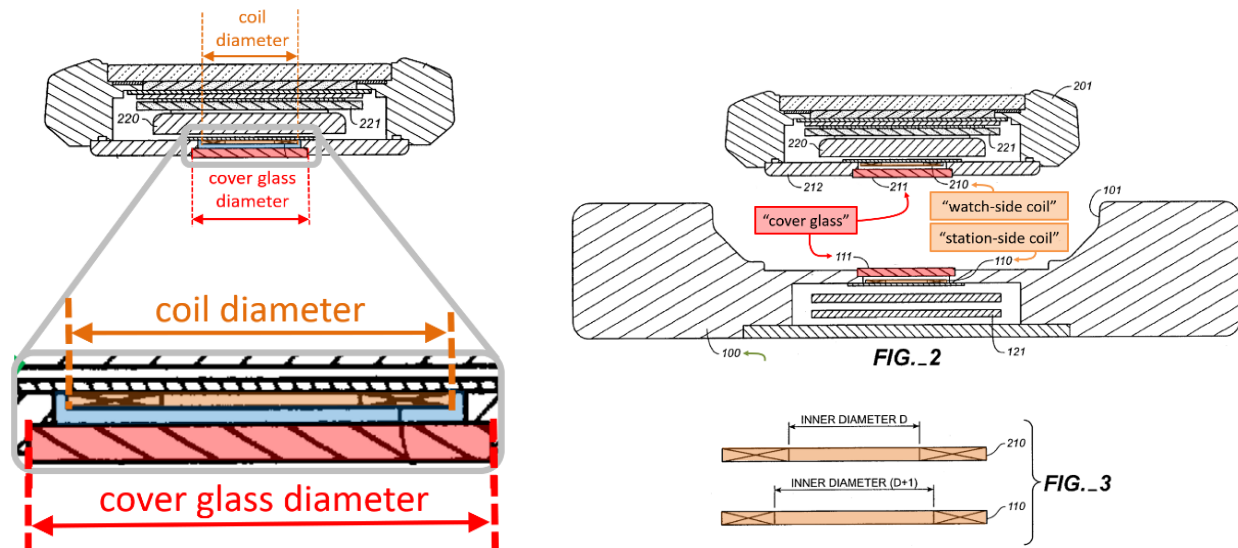
I. INTRODUCTION

Apple’s POR identifies no missing elements in the Petition’s claim analysis and instead alleges distinguishing features that are not claimed. Such features include touch input, force input, and a compact, interchangeable attachment system. POR, 1–2. Apple also argues that the coil in Masimo’s combination would be in the wrong place, be too small, have too few turns, and lack “quick and efficient” charging. *See, e.g., id.*, 37–40. But the ’783 patent does not disclose, let alone claim, sizing or other details Apple asserts are necessary for successful wireless charging.

Apple also argues the Petition does not demonstrate “how or why” a POSITA would have made the proposed obviousness combinations. But each ground explains what a POSITA would do, and how—often using detailed figures such as those shown below (*e.g.*, Pet., 21, 33, 38, 39, 40, 78, 83)¹:



¹ Figures herein include colored annotations.



The petition also provides detailed motivations (e.g., Pet., 31–33, 56, 68–69).

Apple alleges Kotanagi and Honda somehow “refute” or teach away from the combination. POR, 1, 3–5. But Apple fails to credit the references’ full combined teachings, which include, from Honda, basic wireless charging coils. A POSITA would have enlarged Kotanagi’s cover glass and considered various trade-offs to position and configure the charging coil. Apple’s expert, Dr. Anthony, admitted that a POSITA could have used these references to align the coils as claimed. EX1052, 210:6–11. And Apple’s own evidence shows that even coils smaller than 10 mm provide sufficient power. EX2028 at 1–2, 5. Where it was known that a variable (here, coil diameter of 10 mm) would achieve an effective result (providing sufficient power), it is reasonable to conclude a POSITA would have modified the

variable to achieve that result. *Pfizer Inc. v. Sanofi Pasteur Inc.*, 94 F.4th 1341, 1347–49 (Fed. Cir. 2024). EX1060, ¶316.²

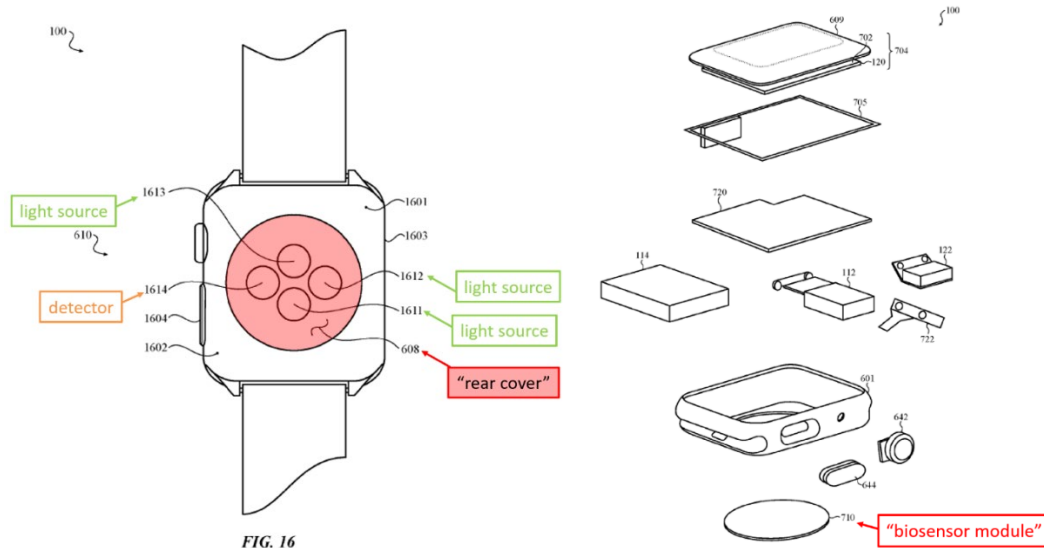
Apple admits that putting Honda’s charging coil in Kotanagi “could” function, but distracts by pointing to Fraser’s allegedly “better alternative.” POR, 3–5, 56. Obviousness does not require the most desirable combination. Moreover, Apple contorts wireless-charging physics. Correctly understood, Fraser helps show the ’783 patent is invalid. EX1060, ¶317.

II. CLAIM CONSTRUCTION

The parties have no claim construction disputes for any claim but Claim 11, which Apple argues “precludes a cover from being part of the claim[ed] biosensor module.” POR, 17. Masimo showed that “biosensor module” should be construed as “a portion of the device that includes one or more sensors and optionally includes a cover.” Pet., 14. Masimo’s construction is correct and consistent with the ’783 Patent’s statements: “the biosensor module 710 includes the rear cover 608” (EX1001, 28:9–10) and “[t]he biosensor module may also include an optically transparent rear cover” (*id.*, 2:50–51). Masimo’s construction is also consistent with

² In general, a single citation to EX1060 is provided after paragraphs supported by Dr. Duckworth’s testimony.

the '783 Patent's figures, which label the same round, disc-shaped structure as both rear cover 608 and biosensor module 710³:



See EX1001, Figs. 16, 7.

Apple points to Claim 9 to argue the cover must be “different and separate from” the claimed biosensor module. POR, 1, 5, 57. Apple reasons that a cover cannot be “disposed over” and pass optical signals to and from the biosensor module, while simultaneously forming part of that module. *Id.*, 1, 5, 16–17, 56–58. To the contrary, the word “cover” naturally suggests that its role is to be “disposed over.” A cover can be part of a module just as a clear plastic lid can be both disposed over, and part of, a container, allowing a view of its contents. Indeed, the '783 patent

3 The biosensors themselves (e.g., light sources 1611–1613, detector 1614) are also part of the module. EX1001, 28:19–21; 37:48, 38:20–36.

states the biosensor module may “include” an optically transparent rear cover operative to “pass light into the user.” EX1001, 2:50–54. Likewise, because the rear cover 608 is part of the biosensor module 710, a “shelf or flange” *of that cover* can form a seal “between *the biosensor module 710*” and the housing. *Id.*, 28:15–17 (emphasis added). Masimo’s construction is fully consistent with the ’783 patent’s disclosure. EX1060, ¶¶363–64. Even Apple’s construction broadly references detection “components” and does not preclude the biosensor module from including a cover. POR, 17. Moreover, Anthony admitted that the exploded view above shows biosensor module 710 fitting together with the housing, and thereby covering the opening. EX1052, 69:2–12. EX1060, ¶365.

Apple cites *Becton Dickinson* and *Engel* to argue that separately listing claim elements implies they are “distinct” components, not “one and the same.” POR, 58. Masimo never argues a cover and module are “one and the same.” Apple’s cases support reliance on the specification to interpret claim language. *See Google LLC v. EcoFactor, Inc.*, 92 F.4th 1049, 1058 (Fed. Cir. 2024) (relying on the specification, and stating *Becton Dickinson* and *Engel* “do not create a per se rule that separately listed claim elements are distinct components, regardless of the intrinsic record.”). Here, the specification explains the biosensor module can include a cover.

III. ARGUMENT

A. Apple's arguments depend on an incorrect legal standard.

Apple's POR repeatedly argues Masimo's proposed combinations are inferior to allegedly faster-charging alternatives. POR, 4–5, 31, 50, 55–56, 61, 68. But this inherently admits that Masimo's proposed combinations include all the claim limitations, since charging speed is not claimed.

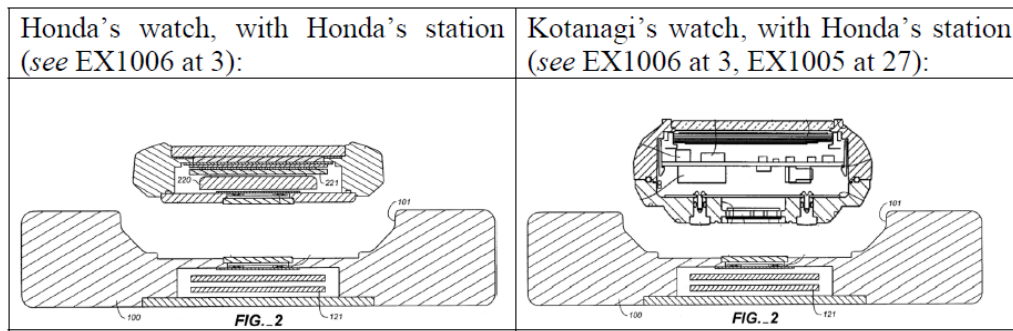
Moreover, Apple's repeated arguments do not negate Masimo's motivations to combine, because the combination need not be the best possible alternative. *In re Mouttet*, 686 F.3d 1322, 1334 (Fed. Cir. 2012) (existence of “better alternatives” “does not mean that an inferior combination is inapt for obviousness.”). Masimo met its burden by showing how and why to use Honda to add a coil to Kotanagi, achieving the claimed wireless charging functionality. The Board correctly concluded that Apple's “arguments regarding alternative, unclaimed locations for the coil and alleged undesirable outcomes (e.g., reduced efficiency)” do not undermine Masimo's contentions. Inst. Dec., 36–37; *See Intel Corp. v. Qualcomm Inc.*, 21 F.4th 784 at 800 (Fed. Cir. 2021) (showing of “suitable option” sufficient); *In re Mouttet* at 1334. EX1060, ¶¶334–36.

B. None of Apple’s Arguments Have Merit With Respect to the Obviousness of Claim 9 based on Kotanagi and Honda

1. Apple does not dispute the Petition’s motivations to combine Kotanagi and Honda.

Apple does not dispute that:

- (1)Kotonagi and Honda disclose all the limitations of Claim 9;
- (2)Kotanagi teaches “contactless” charging is desirable for biosensing watches (EX1005 ¶53);
- (3)wireless charging can be an improvement over Kotanagi’s wired charging (EX1052, 45:13–46:2, 169:16–171:7);
- (4)Honda provides details for wireless charging for biosensing watches (EX1006, abstract, 6:14–20; 8:40–42; EX1003 ¶130);
- (5)both references have glass-covered rear openings (EX1006, 4:44–58; EX1005 ¶48);
- (6)Honda positions a wireless receive coil behind its glass (EX1006 at 3);
and
- (7)Kotanagi’s watch profile fits intimately into Honda’s charging station (aligning glass cover with charging coil):

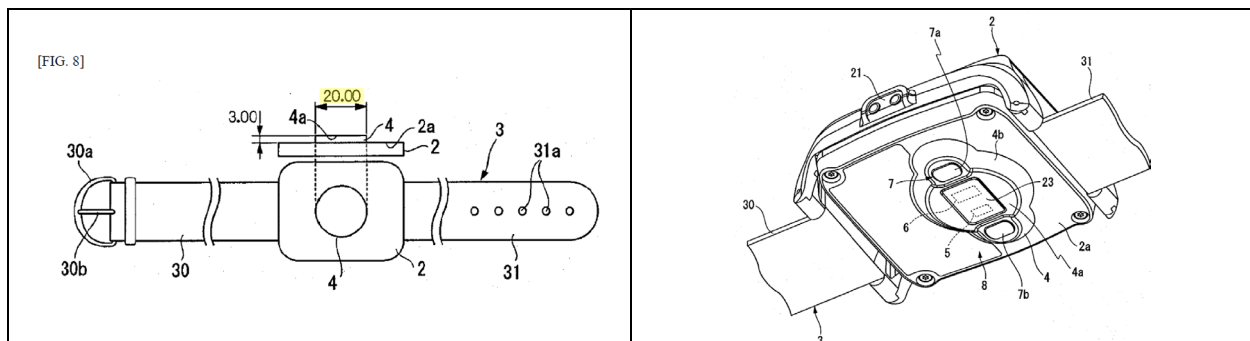


Pet., 94. Thus, Apple acquiesces to the motivations to combine. *E.g.*, Pet., 18, 23–25, 30–33, 35–36, 49–50. EX1060, ¶319.

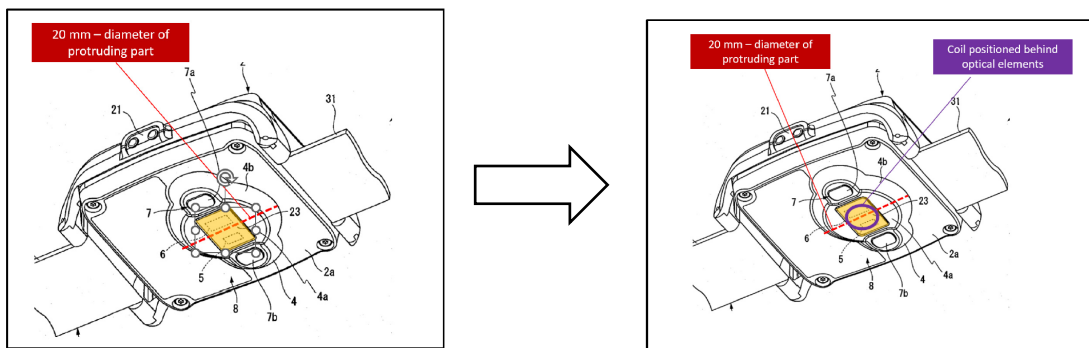
2. Kotanagi's dimensions would not have prevented the combination.

Apple argues a 20 mm “size restriction” on Kotanagi’s protruding part 4 limits coil size to 10 mm, constraining charging speed. POR, 20, 30–31, 33, 34. As an initial matter, the ’783 patent claims no absolute size or charging speed, so these are not relevant. *See Janssen Pharm., Inc. v. Teva Pharm., Inc.*, No. 2022-1258 (Fed. Cir. Apr. 1, 2024).

Apple’s size-restriction logic is speculative. Kotanagi provides a diameter for its Figure 8 embodiment, but not for its Figure 5 embodiment:



EX1005, 28, 26. Apple applies the left-hand 20 mm diameter to the non-circular protrusion in the right-hand embodiment. POR, 20. A POSITA would not have imputed dimensions between embodiments. Moreover, Anthony admitted Figures 5 and 8 have different sizes and scaling factors. EX1052, 80:11–22. Apple’s 10 mm coil size assertion—“roughly half or less than half (~10 mm or less)” —is based on superimposing assumed dimensions on Figure 5’s oblique perspective:



POR at 33–34. EX1060, ¶¶322–323.

Even if Kotanagi’s coil were limited to 10 mm, a paper cited by Apple validates that 6.5 and 9.5 mm coils are “suitable to charge wearable and medical devices.” EX2028, 2, 5. For example, it shows that a 9-turn receiver coil of 9.5 mm diameter (RX7) can produce 8 Watts from a matching diameter transmitter coil, separated by 1 cm. EX2028, Table 3, Fig. 13. Anthony admitted that the wattages in Figure 13 “are a good power level.” EX1052, 112:8–113:4.

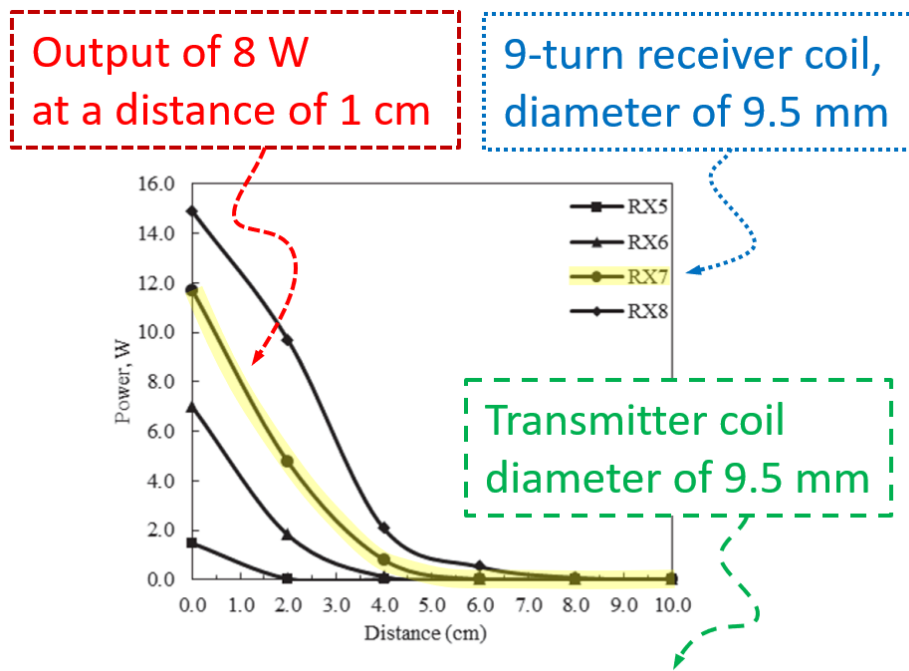


Figure 13: Output power over distance using TX3 ($D_{T2} = D_{R2} = 9.5 \text{ mm}$).

EX2028, Fig. 13. Accordingly, Apple’s own evidence shows Masimo’s combination is a “suitable option.” *Intel Corp.*, 21 F.4th at 800. EX1060, ¶320.

Further, if a larger coil were needed for quicker or more efficient charging, a POSITA would have enlarged Kotanagi’s opening and cover glass to make room. Such modifications are consistent because, for example, Kotanagi explains its protrusion “may have any shape,” and its embodiments are non-limiting. EX1005 ¶¶ 74, 75. EX1060, ¶321.

Anthony admitted that (1) engineers often optimize using trade-offs to address constraints (EX1052, 19:17–20:20); and (2) Honda includes no coil size constraints (EX1052, 177:2–178:15). Thus, a POSITA having “ordinary creativity” (*see KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 421 (2007)) would have considered coil sizes

and shapes, and adjustments to accommodate them. *Medichem, S.A. v. Rolabo, S.L.*, 437 F.3d 1157, 1165 (Fed. Cir. 2006) (“simultaneous advantages and disadvantages” do not necessarily “obviate motivation to combine.”); *see* Inst. Dec., 36–37. EX1060, ¶¶324–26.

3. Honda’s generalized goals of “quick and efficient” charging would not have stymied a Kotanagi/Honda combination.

Apple argues that Kotanagi’s alleged 10-mm coil restriction and the combination’s coil placement frustrate Honda’s goal of “quick and efficient” wireless charging. POR, 3, 7, 31, 36–41, 49, 52. As explained above, Kotanagi has no “size restriction.” Moreover, Honda never states a threshold rate or amount for “quick” and “efficient.” In any event, the ’783 patent claims no absolute size restrictions or charging speed. As explained above, Kotanagi’s goal of contactless charging (EX1005 ¶53) would have led to Honda for wireless charging (EX1006, 1:4–6).

If Honda’s primary purpose was specific to “quick and efficient” wireless charging, it still would have motivated a POSITA to modify Kotanagi to include wireless charging generally. *KSR*, 550 U.S. at 420 (“familiar items may have obvious uses beyond their primary purposes”); *Intel Corp.*, 21 F.4th at 800 (a reference’s intended purpose does not control the obviousness inquiry); *In re Heck*, 699 F.2d 1331, 1333 (Fed. Cir. 1983) (prior-art patents not limited to described

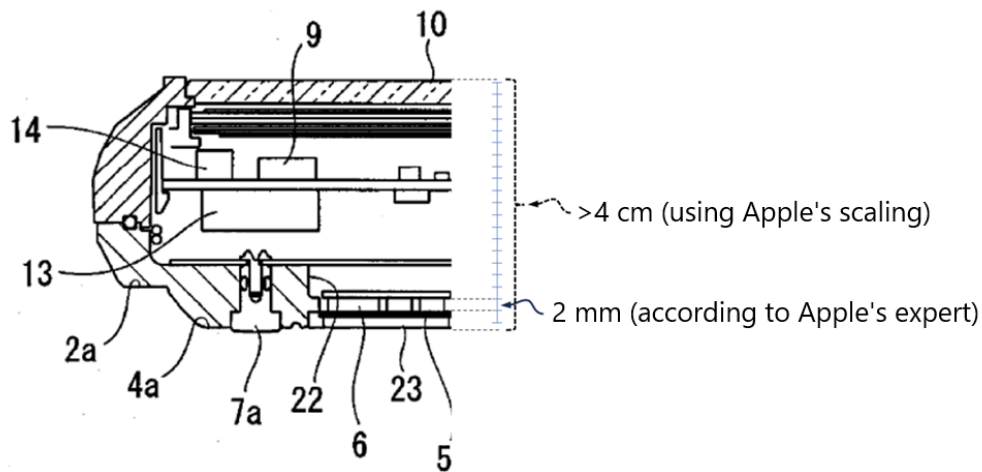
invention or problems solved, but “relevant for all they contain”); *see In re Urbanski*, 809 F.3d 1237, 1243 (Fed. Cir. 2016) (references combinable based on desirable properties of one, despite foregoing benefits of the other). EX1060 ¶¶ 328–29.

In any event, Anthony admitted that depending on intended use, devices “can benefit from either fast charge or trickle charge or a little bit of charge.” EX1052, 18:22–19:6. Thus, independent of any particular charging speed, Honda’s teachings about wireless charging (such as use of a coil) would have motivated the combination, including suggesting potential modifications to a POSITA. EX1060, ¶327.

Apple argues that the Kotanagi/Honda combination frustrates Honda’s stated goal of quick and efficient charging by “demanding precisely the increased spacing that Honda expressly seeks to avoid.” POR, 38–39. But Apple does not allege any particular separation distance precludes such charging. Instead, it merely cites the unremarkable proposition that charging efficiency decreases as distance increases. A POSITA would have considered coil spacing and adjustments to accommodate coils as part of ordinary engineering. *Medichem*, 437 F.3d at 1165. Likewise, Honda describes the relative effectiveness of coils with different gaps between them. EX1006, 2:39–43 (as gap between coils increases, “the degree of magnetic coupling weakens”), 2:55–60; *id.*, 13:14–16 (as separation distance decreases, transmission efficiency increases); *see* POR, 38. Honda’s teachings would have encouraged a

POSITA to balance coil placement with the degree of coupling and would not have discouraged the combination. Indeed, Anthony admitted the engineering process involves trade-offs like this. EX1052, 19:17–20:20. EX1060, ¶330–31.

Anthony states that the thickness of Kotanagi’s protrusion—*i.e.*, the distance between surfaces 2a and 4a—is “at least 2 mm.” EX2019 ¶129. He then argues the board 24 is roughly aligned with surface 2a, so a 2-mm-thick protrusion would require a coil placed behind board 24 to be *at least* 2 mm away from the outer surface 4a. *Id.* But Figures 6 and 7 show board 24 within the protrusion, so it is placed *no more* than 2 mm away from the outer surface 4a. Nothing in Kotanagi would have prevented a POSITA from placing board 24 less than 2 mm away from outer surface 4a to minimize the separation distance between coils. Anthony then speculates without support that Kotanagi’s optical elements 7a and 7b “span 2 mm or more in depth/vertical dimension.” EX2019 ¶129. That speculation is inconsistent with Kotanagi’s disclosure of a 2-mm-thick protrusion. EX1005 ¶28. Optical elements spanning 2 mm within a 2-mm-thick protrusion would leave no room for Kotanagi’s cover glass and flexible board. Additionally, Anthony’s assumptions that the optical elements are 2 mm thick and the figures are drawn to scale would implausibly suggest the watch is more than four centimeters thick. EX1060, ¶330.



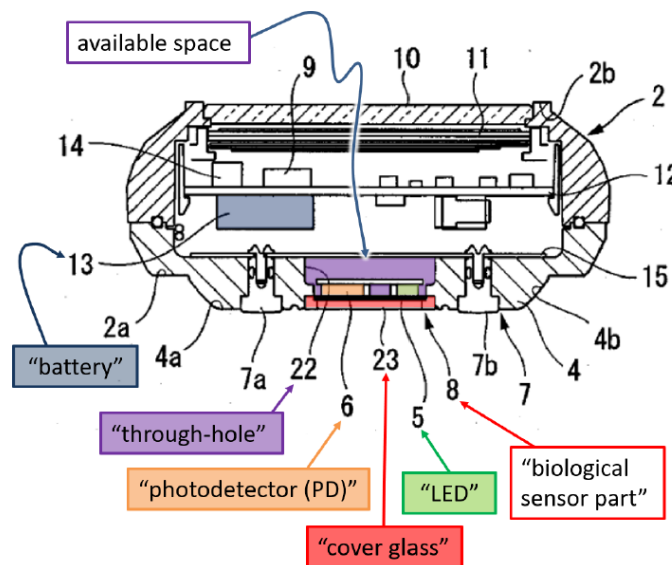
Apple’s estimation of the 2 mm thick optical elements (photodiode and LED) misstates the state of the art in 2014. *See* EX2019, ¶129. In 2014 a POSITA would have known that optical elements on the back of a biosensing watch would have been configured as thin as 50 μm . EX1053, [0092] (LED 20 μm thick); [0093] (photodiode 20 μm thick); [0069] (substrate 10 μm thick). In Kotanagi, such elements “touch the inside of the glass cover 23” (EX1005, ¶55), so they would have added much less than 2 mm to the coil separation distance. EX1060; ¶¶330–31.

Apple next argues that positioning a coil “behind Kotanagi’s optical elements” would cause undesirable “noise and interference.” POR, 39–40. However, Honda expressly discloses both wireless charging and heart rate sensors, in the same device, without undue noise or interference. EX1006, 1:4–6, 6:17–20. In any event, a POSITA would have evaluated and accepted some noise or interference in exchange for the benefit of achieving wireless charging. *See*

Medichem, 437 F.3d at 1165; *Urbanski*, 809 F.3d at 1243. Moreover, Masimo also proposed positioning the coil **around** the optical elements. EX1060, ¶¶332–33.

4. Apple’s arguments fail to account for the potential to enlarge the cover and place a coil around the optical elements.

Masimo’s Petition annotates Kotanagi’s Figure 7 to show “available space” where a POSITA would have positioned a coil:

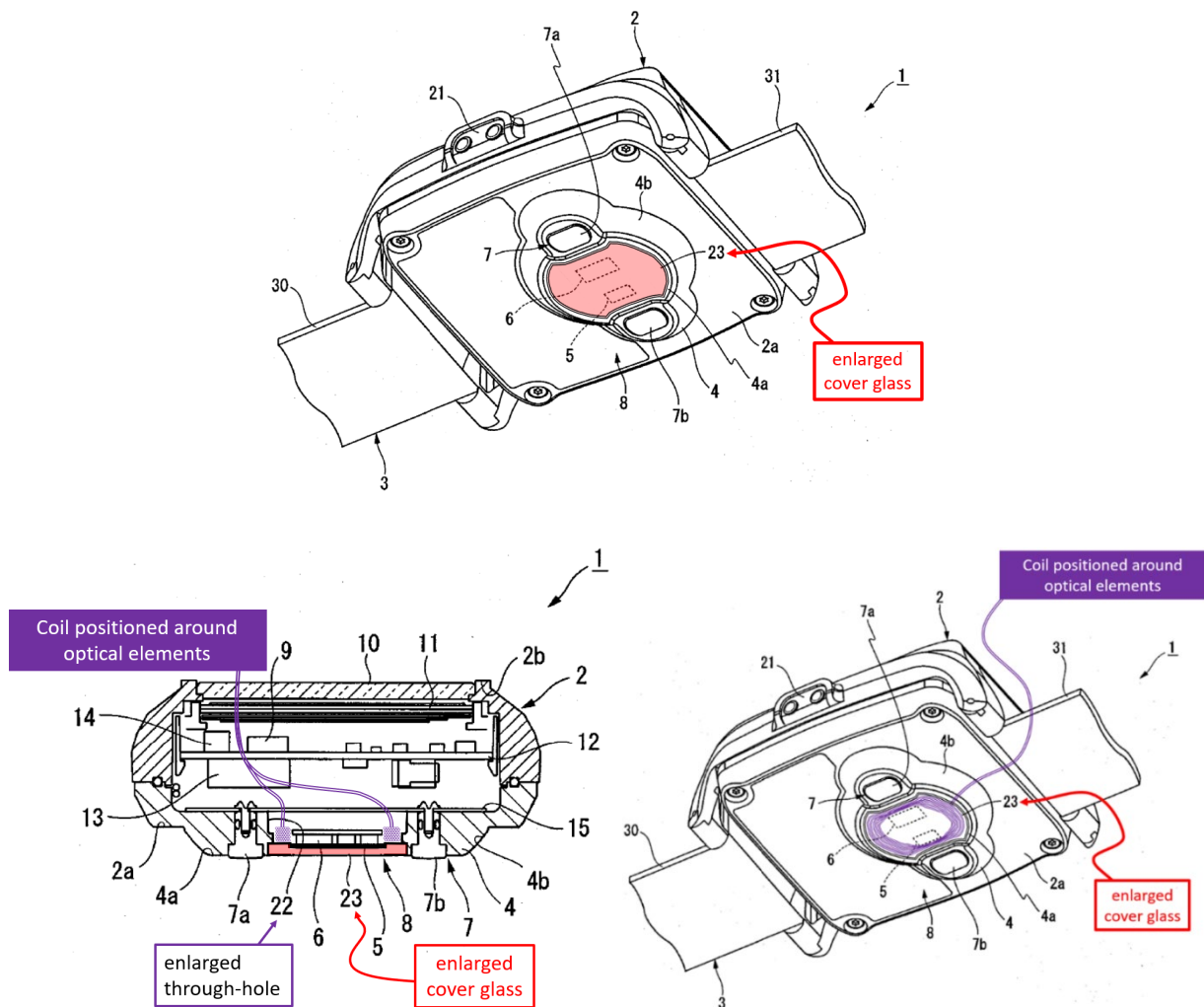


See Pet., 31, 32, 40, 49, 65, 84; EX1005, 27. The available space, shaded in purple, is both behind (above) and to the sides of the PD 6 and the LED 5. Accordingly, Masimo argued:

[A] POSITA would have used Honda’s teachings to either: ... or 2) enlarge Kotanagi’s opening and cover glass to make room for a coil behind the cover glass, surrounding the LED and PD. In either case, the resulting magnetic flux would pass through the biosensor module, including the cover glass, as taught by Honda.

Pet., 39.

Apple's size-restriction arguments discussed above (*see supra* § III(B)(2)) ignore the option of placing the coil around the optical elements. If the entire protruding part 4 could not be enlarged (*see* POR, 34, 36, 52), a POSITA would have enlarged the cover glass within that protruding part and inserted a coil behind the enlarged glass.



See EX1005, 26, 27 (Figs. 5, 7); *compare* POR, 36, 51, 54. EX1060, ¶¶337–38.

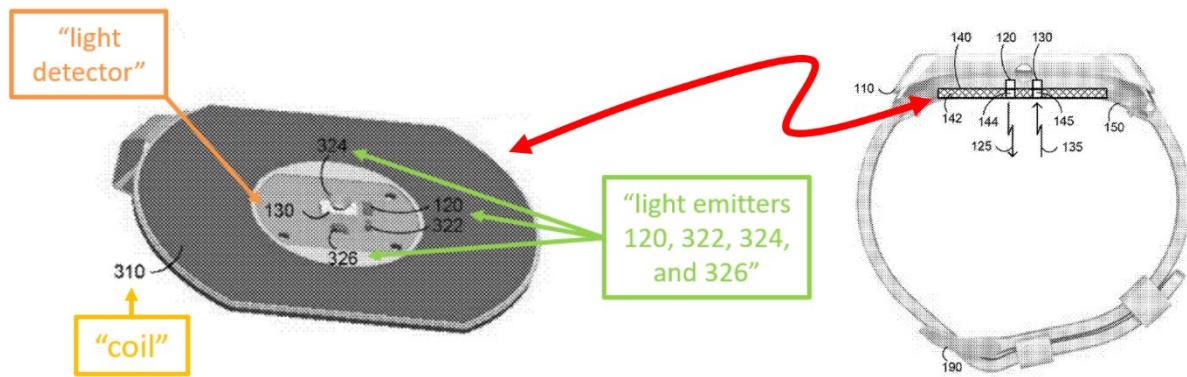
This modification moots Apple’s arguments (POR, 51–52) that the coil “would not fit.” A POSITA would have been capable and motivated to make these modifications. EX1060, ¶339.

Apple argues that Honda discourages putting a coil around the optical elements because air-core coils are superior (POR, 40–41, 52). But Honda also explains that in some electronic devices “a coil having a core can be used.” EX1006, 6:45–47. And Fraser confirms that a coil can surround optical elements and still provide charging. *See infra* § III(B)(5). In any case, putting a Honda-style coil into Kotanagi’s available space—whether enlarged or not—would have been desirable, and a POSITA would have expected success. EX1060, ¶343.

5. The Fraser reference Apple cites actually undermines Apple’s argument and shows expectation of success.

Apple points to Fraser⁴ as a “better alternative” than the Kotanagi/Honda combination. Fraser teaches a wide perimeter coil 310, that need not be circular, surrounding central optical elements (i.e., not an air core) while still providing effective charging. POR, 42–50; EX1006, 6:47; *see* EX1041 ¶ [0026].

⁴ The Petition used Fraser for Ground 5. Pet., 100–103.



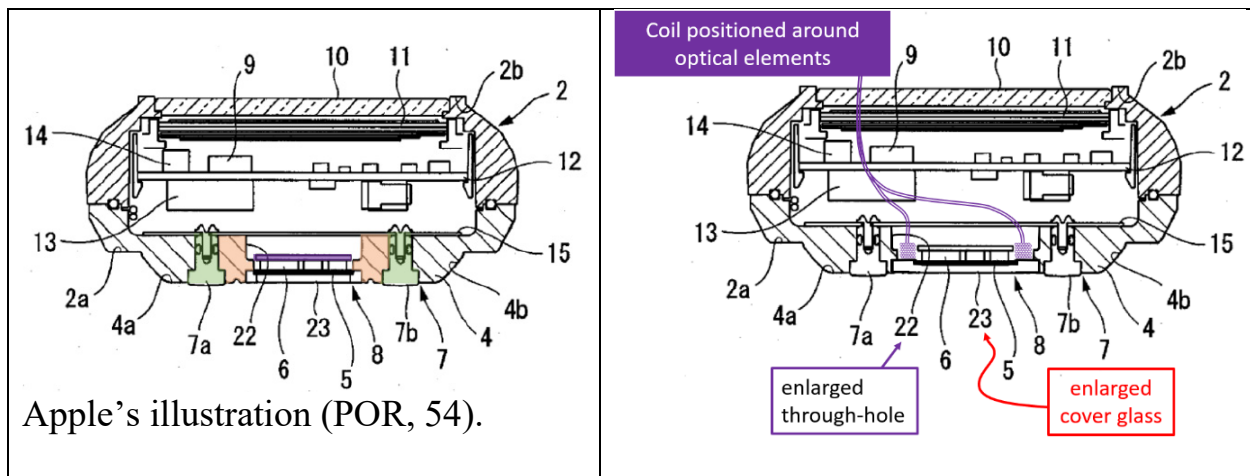
See EX1041, 4, 2 (Figs 3, 1). Apple argues that a larger, Fraser-type coil is better than a Kotanagi-Honda combination. POR, 42 (referencing figure, 36). But this attempt to use an allegedly “better” combination is legally flawed. *Supra* § III(A). EX1060, ¶344.

Apple argues that Fraser provides a superior coil because (1) it allegedly is larger than the coil in Masimo’s combination and (2) it surrounds the optical elements. POR 44–46. But as shown above, even 6.5–9.5-mm-diameter coils provide sufficient current. Further, one of Masimo’s proposed alternatives is a larger coil, surrounding the optical elements, consistent with Fraser’s teachings. Pet., 39. EX1060, ¶345.

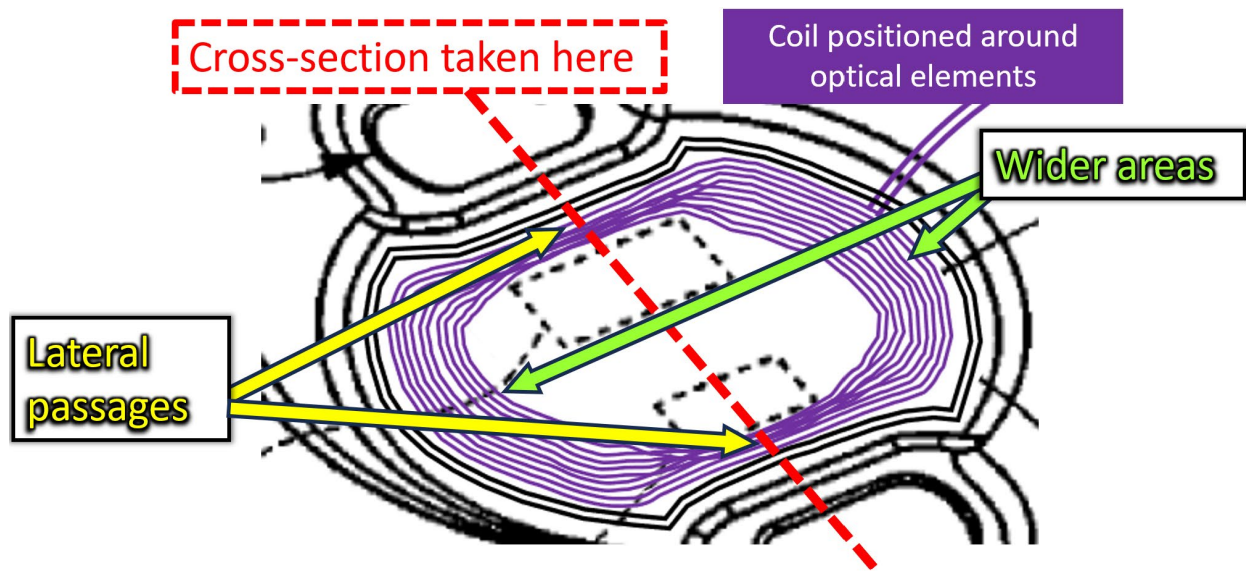
Apple argues that if Kotanagi’s coil were configured in view of Fraser to extend beyond the cover, any wireless power transmission would pass through the rear housing surface and not the cover. POR, 42. However, Masimo proposes enlarging the cover so that a larger coil would *not* extend beyond the cover. Pet.,

39. Honda's teaching that transmitting wireless power through glass is desirable would have motivated a POSITA to implement Masimo's proposal. EX1060, ¶346.

Apple argues that a coil around Kotanagi's optical elements would be limited in size and turns, constraining power transmission, due to lack of space between the optical elements and the housing as shown in the figure below on the left. POR, 53–56. However, Masimo proposed to enlarge Kotanagi's opening and cover glass to make room for the coil around the optical elements (Pet., 39), as shown in the right-hand figure below.



See EX1005, Fig 7. Indeed, Anthony admitted that the “orange-ish pink-ish area” could be used for a coil. EX1052, 191:21–192:17. Moreover, the cross section view does not show the much wider area available for most of the wireless charging coil on either side of these narrower lateral passages. The wider area provides room for more coil loops to press up against the enlarged glass, reducing their separation distance from the charging coil:



See supra § III(B)(4).

Apple speculates that using a Fraser-like coil in Kotanagi would have reduced charging efficiency. POR, 45. But the claims do not recite any charging efficiency, and Apple’s speculation is based on flawed modeling, as shown below. EX1060, ¶347.

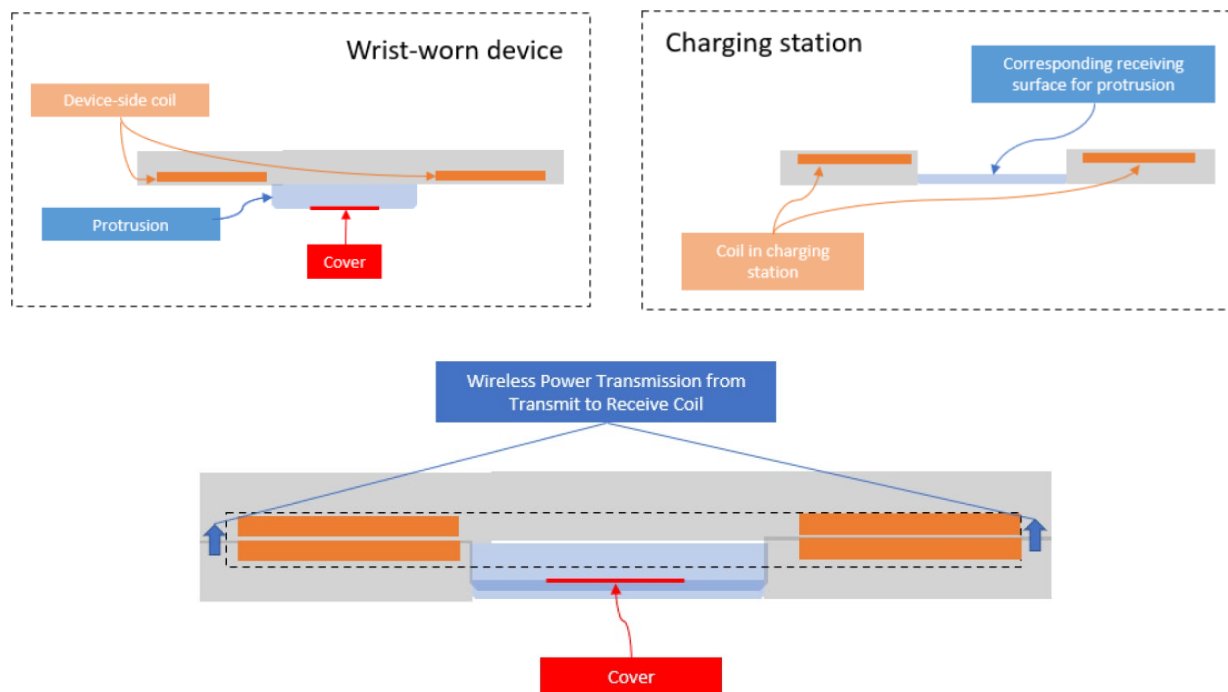
Thus, Fraser supports the motivation to combine and expectation of success.

6. Apple’s argument based on Fraser contorts the physics of wireless charging.

Apple argues that a Kotanagi/Honda combination would not charge efficiently and provides Fraser as an alternative that it alleges would charge efficiently. Apple argues that Fraser’s larger coil, extending laterally beyond a central cover, would provide efficient wireless power that somehow passes around, but not through, that cover. POR, 46. First, Apple’s alternative Fraser argument does not address

Masimo’s combination; Masimo never proposed placing a coil that extends laterally beyond the cover. Second, even in Apple’s hypothetical, a centrally positioned cover would pass wireless power to the receive coil.

Apple creates the mockup below to support its argument that the cover would not pass wireless power.



POR, 47–48. In the combined figure, Apple places blue arrows outside the coils, purporting to show wireless power transfer happening far away from the red cover. Apple argues that because the cover glass 23 in the center of the figure above is “spaced away” from the coils, it “would not be the conduit for the wireless power transmission.” *Id.*

Apple's statements exhibit a fundamental misunderstanding of wireless charging. As Apple's cited Mohamad paper explains, current through the transmitter coil produces a magnetic flux or field flowing through the center of two aligned coils, which produces current in the receive coil:

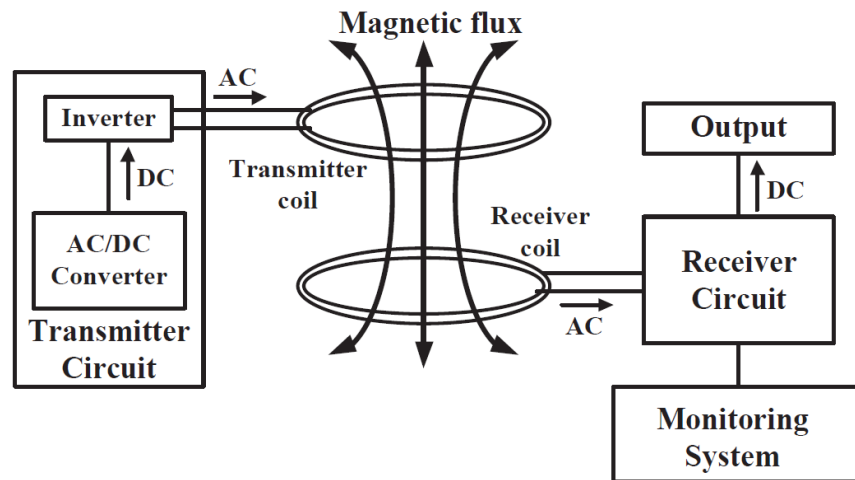
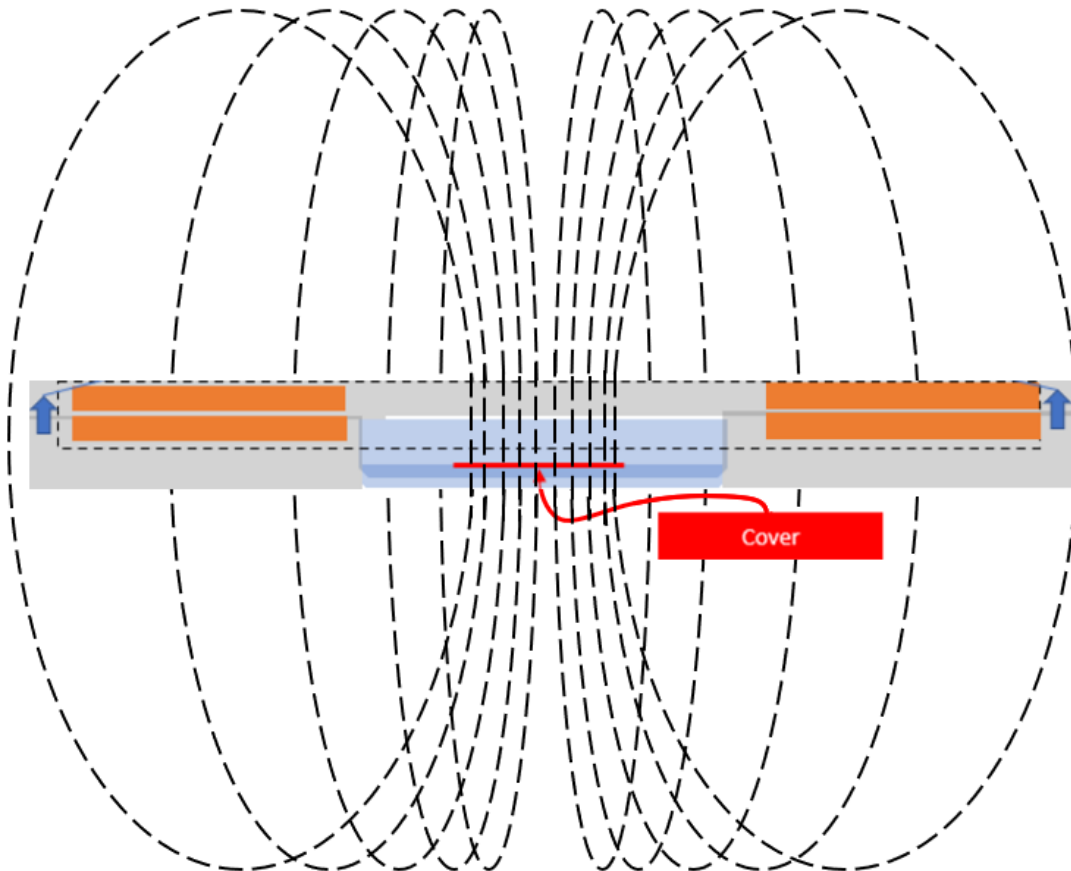


Figure 3: Block diagram of a wireless power transfer

EX2028, 2. Anthony admitted that the magnetic field causes inductive power transfer. EX1052, 180:5–10. In addition, other Apple articles show the magnetic field or flux going through the center of the coils. See EX2024 Fig. 5 (illustrating high magnetic flux density [red] in the center, for configurations a and b); EX2023, 40 (showing central magnetic flux B). Thus, when wireless charging coils are aligned as shown in Apple's own figure (POR, 48), wireless power transmission occurs through the center (including through any glass cover that may be present there). EX1060, ¶¶348–52.

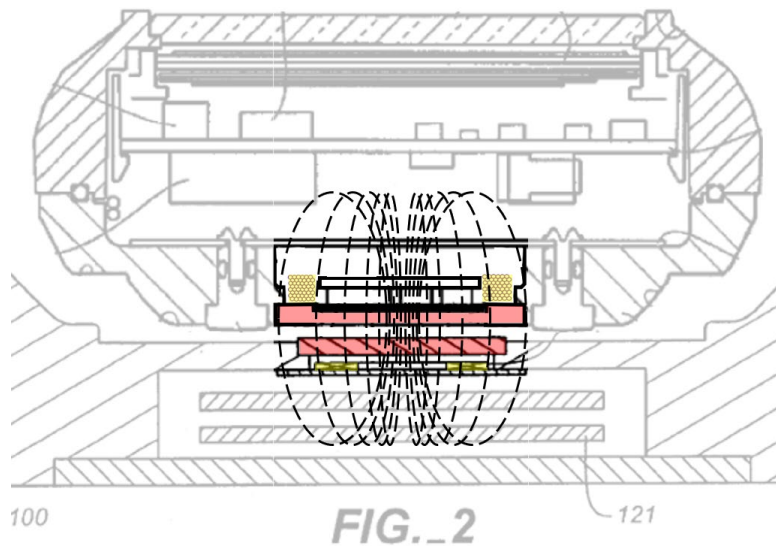
Based on the above understanding, the diagram below shows how even in

Apple's Fraser-style example, wireless power would pass through a cover where the magnetic field lines are concentrated.



EX1060, ¶349.

This central concentration and overall shape of the magnetic field results from the geometry and orientation of the two aligned charging coils, so power traverses a centrally-positioned cover, independent of coil size, and *whether the cover has been enlarged or not. Id.* A similar magnetic field (shown with the lines below) would transfer power in Masimo's combination of Kotanagi and Honda (enlarged cover glass approach):



See EX1005, Fig. 7. Anthony admitted that the evidence shows a two-coil arrangement concentrates flux density in the center of the coils. EX1052, 115:20–117:4; 117:21–118:8; 204:20–207:2. EX1060, ¶¶349–50.

Honda's Figure 10 corroborates that magnetic flux level is highest in the center of paired coils:

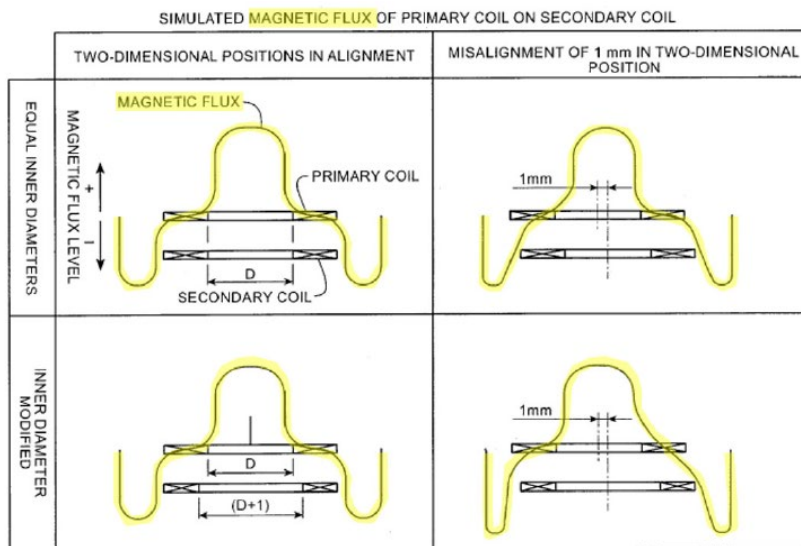
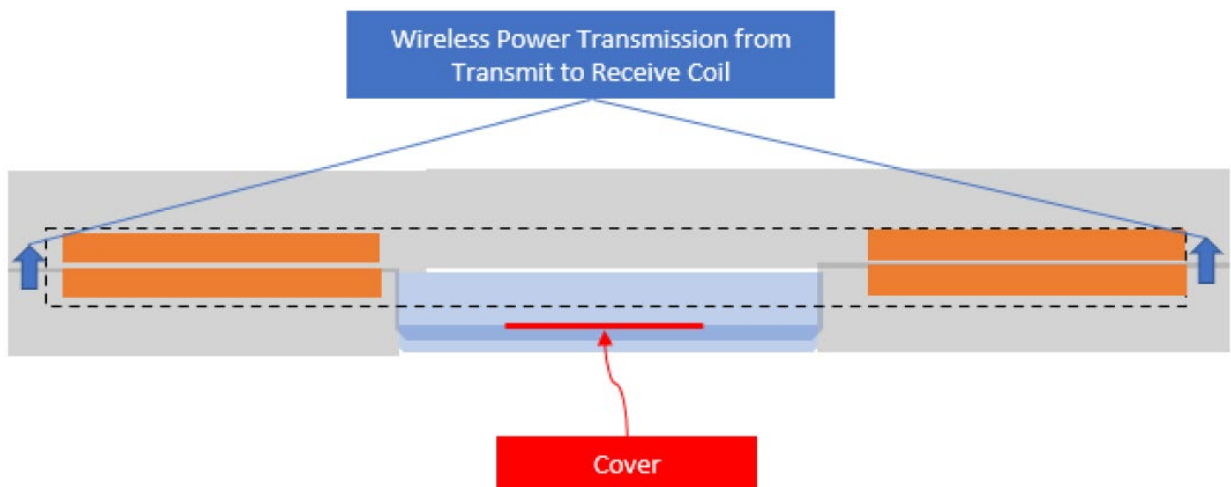


FIG. 10

EX1006, 9. EX1060, ¶351.

Nevertheless, Anthony argued that even though *magnetic flux* passes through the cover, *power* does *not* transfer through the cover. EX1052, 154:22–155:12. This is utterly incoherent, given that wireless power transfer means using a current in a driving coil to create a magnetic field, which induces a current in a nearby receive coil. A POSITA would have understood that the magnetic field is the only physical thing passing between devices for wireless charging. Accordingly, a POSITA would also have understood that a cover configured to “pass wireless power” is one that passes the magnetic field. As shown above, the magnetic field passes through the center of the coils, where the cover is located. EX1060 ¶353.

When confronted with the discrepancy between the above evidence and the blue arrows on Apple’s figure (POR, 48), Anthony admitted that the blue arrows in his diagram are “not showing the exact location of where the power is all transferred.” EX1052 157:11–21.



Anthony then repeatedly changed explanations, each time insisting that

wireless power would only pass *within* the dashed box in the figure above. EX1052, 156:9–22, 157:22–158:21. None of Anthony’s explanations are credible because they deny the physical law that magnetic fields are continuous. For the illustrated coils, the continuous magnetic field would extend beyond the dashed box. A POSITA would have understood that such a field also passes through the centrally located glass cover in Masimo’s combination. EX1060, ¶353.

7. Apple’s modeling is fundamentally flawed.

Apple also purported to model a Fraser-like device and a Kotanagi/Honda-like device to show that Fraser is a “better alternative.” POR, 44–45; EX2019 ¶145, ¶170. Apple’s modeling suffers from numerous errors, including that Fraser provides no dimensions for its coil. EX1052, 146:17–149:19. Moreover, Apple’s modeling does not account for the engineering tradeoffs a POSITA would have considered. *See* § III(B)(2)–(4); EX1060, ¶¶354–55.

The modeling concludes, unremarkably, that increasing coil diameter and providing more turns results in faster charging. Anthony admitted that the modeling’s broad conclusions are unsurprising in view of basic principles of physics. EX1052, 138:15–139:10. As explained above, the claims do not require any charging speed and a POSITA would have taken coil size into account when making the combination. EX1060, ¶356.

Even so, the modeling suffers from additional significant flaws.

No Absolute Numbers. The modeling results are expressed in comparative ranges (e.g., 1 versus 100 hours) (POR, 45) providing no real-world reference for comparison. If Kotanagi’s battery 13 can last through the day, a comparatively small or slower coil could accomplish the relevant charging task overnight. A trickle charge may be sufficient—and even preferred over fast charging, when considering battery life. *See* EX1052, 18:22–19:6. Indeed, Apple’s EX2028 concludes that wireless charging with currents below sixteen watts is nevertheless “suitable to charge wearable and medical devices.” EX2028, 5. EX1060, ¶357.

No Inputs or Equations. Anthony admitted that his declaration did not disclose variables needed to evaluate the veracity of the model. For example, the declaration did not disclose the Z, V, I and R matrices (EX1052, 118:13–119:17), the discretization output (*id.*, 123:10–17), the basis functions (*id.*, 124:6–13), and the interaction matrix (*id.*, 125:10–16). EX1060, ¶358.

Improper Coil Assumptions. Apple assumes that space limitations in Kotanagi would “reduce” the number of possible coil loops to 10–20, failing to show any calculations for this result. POR, 53; EX2019, ¶170. But Honda teaches a watch-sized device with a coil wound from a wire three meters long. EX1006, 6:58–59. Such a wire wound in a 10 mm diameter coil would have ~95 loops, much more than the arbitrary 10–20 turns assumed by Apple. *See* EX1052, 189:16–191:7. EX1060, ¶359.

Irrelevant References. Apple provides a cursory string citation with 10 references to substantiate its modeling methodology. But these references relate to wireless power transfer for vehicles (EX2031); charging with coils with more than 28-centimeter diameters and 0.7 meter separations (EX2029); and “high-power long-distance wireless charging” (EX2032). Anthony never explains how these support his modeling. EX1060, ¶360.

For the reasons above, Claim 9 is unpatentable and Apple’s arguments fail to demonstrate otherwise.

C. Claim 11 Would Have Been Obvious

Apple’s patentability argument for Claim 11 relies entirely upon its claim-construction argument that the claimed biosensor module cannot include a cover. POR, 56–59. Apple’s argument fails because the biosensor module may include a cover. *See supra* § II.

D. Claim 15

Apple’s arguments for Claim 15 rely entirely on its arguments for Claim 9. POR, 59–61. Apple’s Claim 15 arguments are wrong for the same reasons explained above for Claim 9. EX1060, ¶367.

E. Claim 16

The parties dispute whether Claim 16’s “magnetic coupling” requires magnets to facilitate alignment of the watch device with the underlying dock or is satisfied

by the electromagnetic coupling between the coil on the watch and the dock. POR, 62.

Masimo explained that Honda discloses “[w]hen the electronic watch 200 is placed onto the station 100, the station-side coil 110 and the watch-side coil 210 are physically out of contact with each other, but *magnetically coupled* with each other....” EX1006, 6:36–40 (emphasis added). Apple argues that this is not magnetic coupling as used in Claim 16 because such coupling is already inherently present in Claim 15. POR, 62. However, Claim 15 does not recite any magnetic coupling with a dock. Claim 16 adds the external dock. Thus, Honda’s teachings satisfy this limitation. Pet., 54–55. EX1060, ¶368.

If magnetic coupling further requires magnets to facilitate alignment of the watch device with the underlying dock, Masimo relies on Park for such magnetic coupling. Park discloses permanent magnets in the watch and dock for more precise alignment and securement. Pet., 55–57. Apple argues that Honda’s socket would align a watch so effectively that Park’s further magnetic alignment would not be needed. POR, 62–63. But Honda itself contradicts this, stating alignment is “difficult” and accuracy problems arise from the “modest degree of displacement” resulting from “simply seating” a device into a “station.” EX1006, 1:52–53. Accordingly, Honda provides one solution of modifying the inner diameter of one of the coils to counter misalignment:

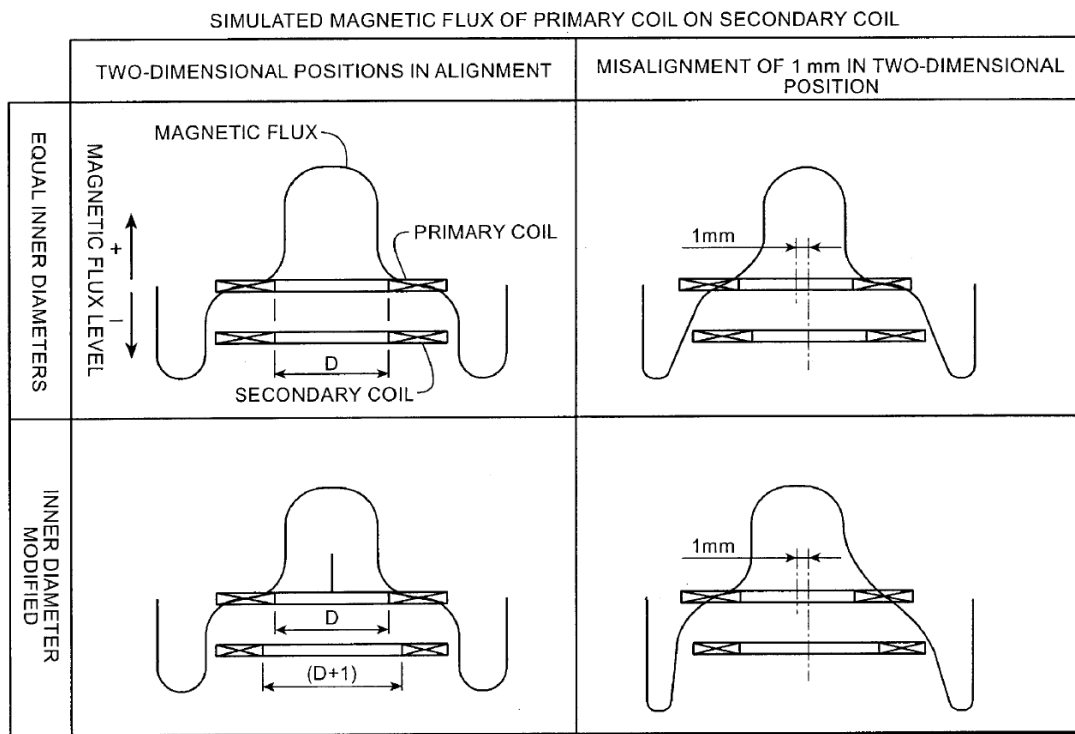
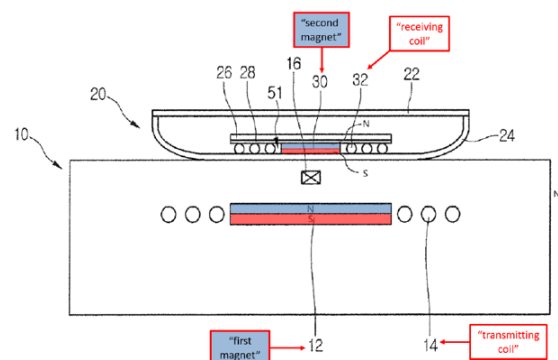
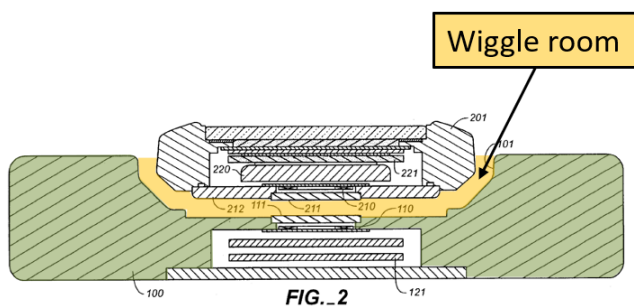


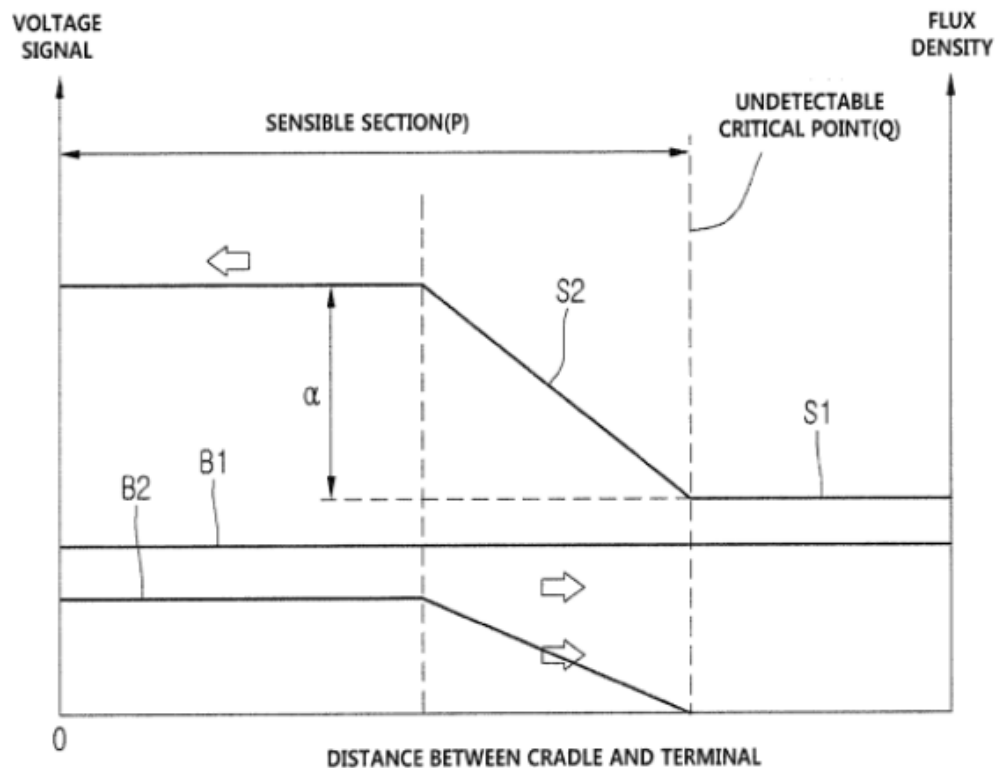
FIG. 10

EX1006, Fig. 10. A POSITA reading Honda would have sought additional solutions to offset any alignment issues. EX1060, ¶¶369–72.

Park's solution is elegant: insert corresponding permanent magnets. Whereas Honda's socket has wiggle room ("a modest degree of displacement"), Park's alignment (and securement) is precise:



See EX1006, Fig. 2; EX1015, Fig. 14; Pet., 54–55. Using Park’s terminology, Honda’s socket can roughly align a device within a detectable range (less than the “critical point”), and Park’s alignment system can perform further alignment:



EX1015, Fig. 11. Apple argues there is no evidence that Honda’s socket approach is “deficient.” POR, 63–65. But Honda recognizes and addresses misalignment regardless of the socket. EX1006, Abstract. This would have further motivated a POSITA to use Park’s elegant and more complete magnet solution, in addition to Honda’s initial socket solution for alignment. EX1060, ¶¶371–72.

Apple argues Park’s magnets would interfere with wireless charging. POR, 65. But, like Honda, Park’s disclosure is provided specifically for a wireless

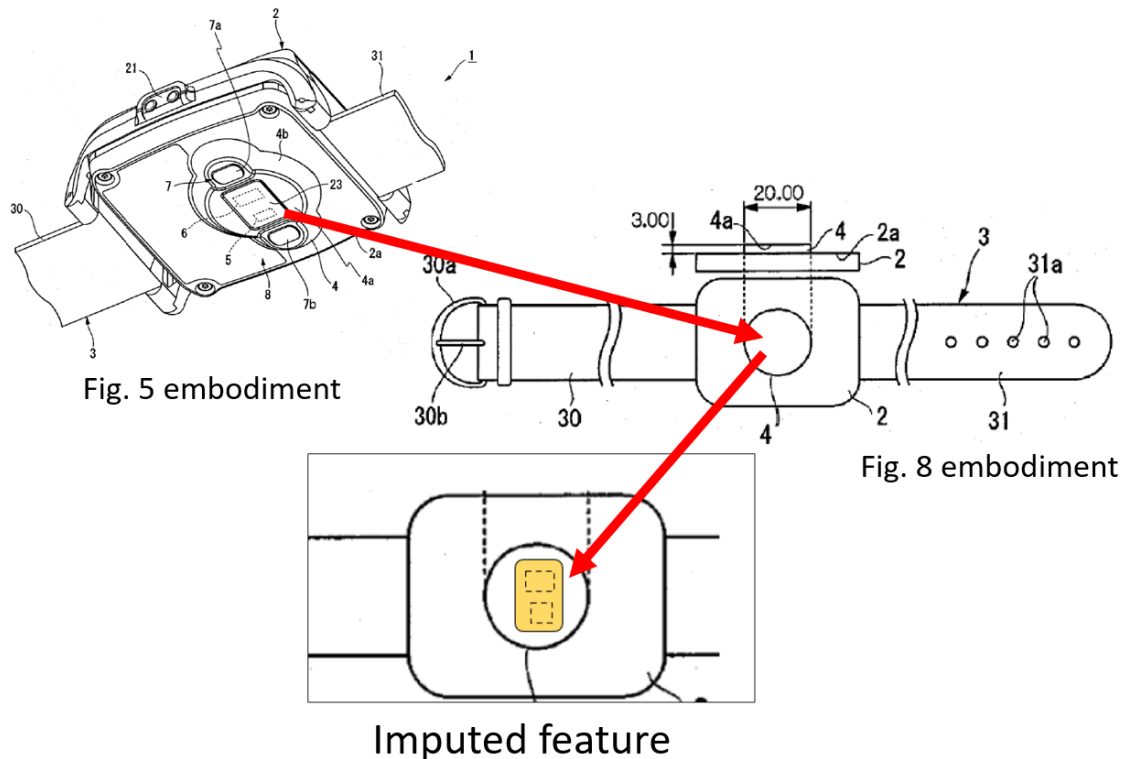
charging system (e.g., EX1015, 6), so any potential interference would not have frustrated the common purpose of Honda and Park. Moreover, a POSITA would have known to position the magnets to address any such effect, or include shielding if needed, as taught by Park. EX1015, 37 (“shielding material for minimizing the effects of magnetic fields and electric fields may also be used between the first magnet (12) and the transmitting coil (14).”) A POSITA would have known how to balance the benefits of precise alignment against any potential drawbacks, through engineering trade-offs, consistent with *Medichem, S.A.*, 437 F.3d at 1165 *see* EX1052, 19:17–20:20 (explaining the standard engineering trade-off process). EX1060, ¶¶373–74.

F. Claim 1

Apple’s arguments for Claim 1 rely entirely on its arguments for Claim 9. POR, 66–68. Claim 1 arguments are wrong for the same reasons explained above for Claim 9. EX1060, ¶375.

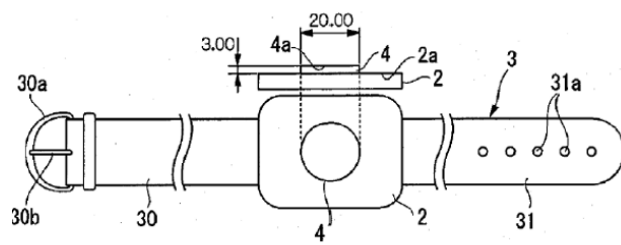
G. Claims 6

For Claim 6, Apple argues that the protruding disk illustrated in Kotanagi’s Figure 8 embodiment cannot be the claimed “cover” because the rectangular window from the Figure 5 embodiment should also be imputed into the Figure 8 embodiment:

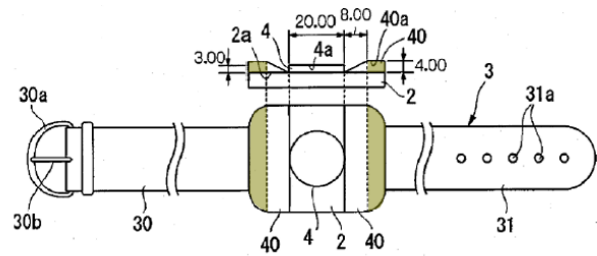


See POR, 72. Although inserting an extra rectangular feature is possible, Kotanagi does not require it. A POSITA would have understood that Figure 8 intends to convey that any LED or PD is hidden behind the circular cover, without a separate rectangular window. EX1060, ¶377.

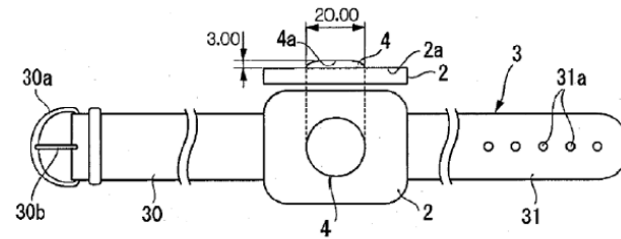
Apple also argues that the disk in Kotanagi's Figure 8 cannot be a cover because it does not illustrate electrodes. POR, 72–73. But any electrodes would not need to be located within the illustrated disk (and no Kotanagi embodiment shows electrodes on a disk). Rather Kotanagi's Figures 11–13 show electrode-ready versions of Kotanagi's Figures 8–10 with ridges off to the sides:



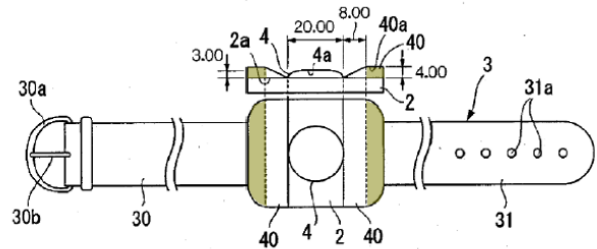
[FIG. 9]



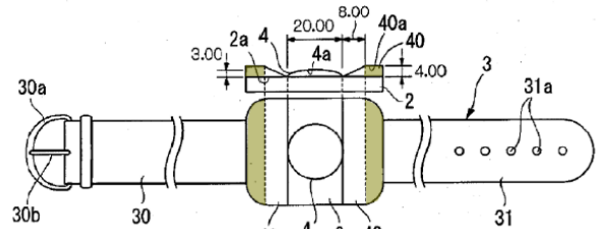
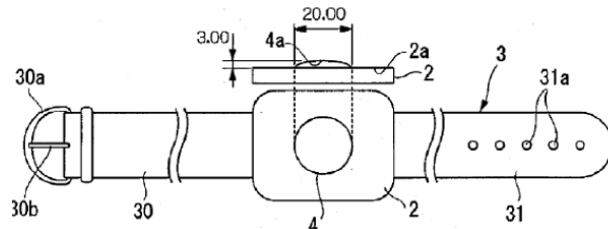
[FIG. 12]



[FIG. 10]



[FIG. 13]



Figs. 8–10
No electrodes

Figs. 11–13

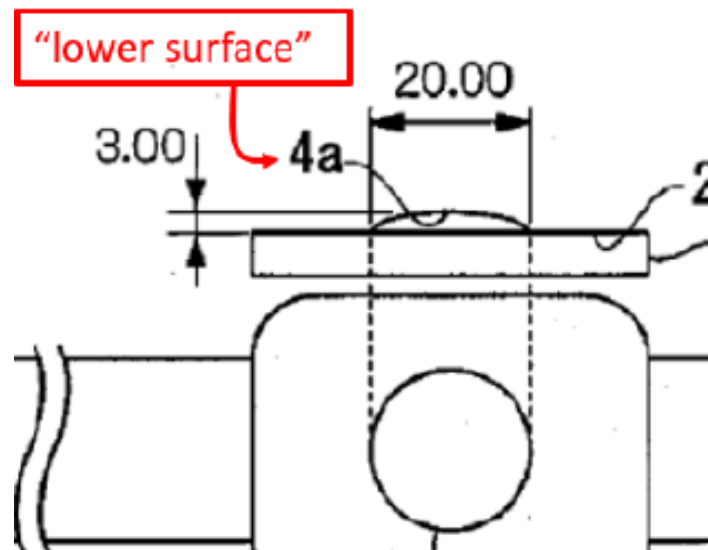
Electrode-ready ridges

Although Kotanagi does not expressly state an electrode function for the ridged parts 40, it does explain that these ridged parts “come into contact with the living body . . . before the protruding part 4” (EX1005 ¶83), similar to the description of electrodes in the Figure 5 embodiment (*id.* ¶64, “since . . . electrodes 7a and 7b . . . protrude slightly more than the lower surface 4a of the protruding part 4, they easily come into contact with the living body surface”). Accordingly, a POSITA would have taken Kotanagi’s Figures 8–13 at face value as teaching disks covering the second opening. EX1060, ¶¶378–79.

Nevertheless, the Petition provides evidence of obviousness that goes beyond Kotanagi alone, asserting that Kotanagi and Honda together meet the limitations of Claim 6. Pet., 78–80. Apple completely ignores *Honda’s* teaching of a round ceramic cover having the claimed diameter and forming a water-tight seal. As the Petition explains, a POSITA would have modified Kotanagi and included Honda’s teachings of a waterproof round glass window for electromagnetic coupling. EX1060, ¶380.

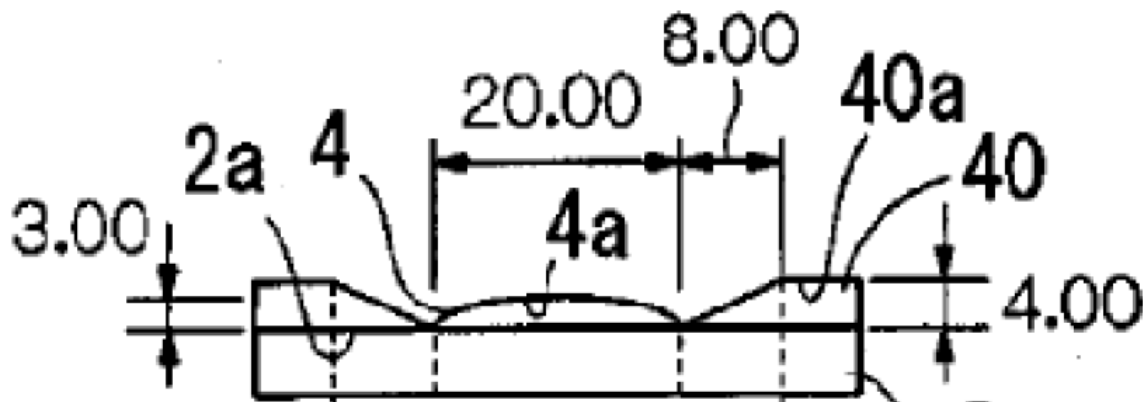
H. Claim 12

Regarding Claim 12, Apple does not dispute that Kotanagi teaches the claimed “disk having a convex shape that protrudes away from the housing”:



EX 1005, Fig. 10; *see id.*, Fig. 13. Instead, similar to Claim 6, Apple argues that this convex protrusion cannot be a “cover” because it must include electrodes. POR, 74. To the contrary, as explained above, no Kotanagi embodiment shows electrodes on

a round disk, but Figures 11–13 provide ridged parts 40 that contact the body “before” the disk (EX1005 ¶83):



Id., Fig. 13. In any case, a POSITA would have understood from Kotanagi’s Figures 10 and 13 that a disk can form a convex “cover glass” that spans the through-hole 22. Pet., 88. EX1060, ¶¶382–83.

For Claim 12, Apple again ignores the secondary references—Honda (Pet., 88–91), Jabori (*id.*, 91), and Park (*id.*, 91–92)—and motivations to combine (*id.*, 92–93). In view of these teachings, a POSITA would have made modifications to use Kotanagi’s disk with a reciprocally concave dock. Apple has not provided any response to the Petition’s discussion of these modifications. EX1060, ¶384.

I. Claims 2–5, 7–8, 10, 13–14, and 17–20

Apple’s arguments for Claims 2–5, 7–8, 10, 13–14, and 17–20 rely entirely on its arguments for their related independent claims. POR, 75. These claims are invalid for the reasons provided above and in the Petition. EX1060, ¶385.

IV. CONCLUSION

Petitioner respectfully requests that the Board cancel claims 1–20 of the '783 patent.

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Dated: April 19, 2024

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CERTIFICATE OF COMPLIANCE

The undersigned certifies that the foregoing **PETITIONER’S REPLY IN SUPPORT OF PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT NO. 10,627,783**, exclusive of the parts exempted as provided in 37 C.F.R. § 42.24(c), contains 5,573 words and therefore complies with the type-volume limitations of 37 C.F.R. § 42.24(c).

Respectfully submitted,

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CERTIFICATE OF SERVICE

I hereby certify that, pursuant to 37 C.F.R. § 42.6(e) and with the agreement of counsel for Patent Owner, a true and correct copy of **PETITIONER’S REPLY IN SUPPORT OF PETITION FOR INTER PARTES REVIEW OF U.S. PATENT NO. 10,627,783** is being served electronically on April 19, 2024, to the e-mail addresses shown below:

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