

Filed on behalf of: InductEV, Inc.

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

INDUCTEV, INC.,
Petitioner,

v.

WITRICITY CORPORATION,
Patent Owner.

IPR2023-01182
Patent 8,461,719

PETITIONER'S REPLY

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I. Introduction

The Petition showed claims 16 and 17 of the '719 patent (Ex.1001) would have been obvious to a POSA based on two distinct grounds against each claim. In its Response, PO asserts the “focus of the patent is on resonators that have quality factors (Q-factors) greater than 100.” POR 5. But PO does not dispute the prior art asserted in the Petition disclosed resonators with these high Q-factors. Instead, PO argues it would not have been obvious to “enclose[]” a resonator “in a low loss tangent material” in claim 16, or that the prior art taught a “network of capacitors” in claim 17. PO's arguments are not supported by evidence and contrary to law, and the prior art renders the claims obvious even under PO's faulty arguments.

II. The term “network of capacitors” should be given its plain meaning.

Independent claim 17 recites “at least one of the resonators includes a coil of a plurality of turns of a conducting material connected to a *network of capacitors*.” The Board should give this term its plain meaning, which is “any circuit topology including one or more capacitors.” Allen Suppl. (Ex.1036) ¶¶9-10. This is also the lexicographic definition provided by the patentee: “**a network of capacitors, as used herein, may in general refer to any circuit topology including one or more capacitors.**” '719 patent 52:32-38; *see Parkervision, Inc. v. Vidal*, 88 F.4th 969, 976 (Fed. Cir. 2023) (finding lexicography where patentee used the phrase “as used herein” and “refer to”). PO and its expert admit this is the controlling definition:

“[i]n the '719 patent, a network of capacitors is generally referred to as ‘a circuit topology including one or more capacitors.’” POR 12; Horenstein Tr. (Ex.1035) 100:2-11 (testifying 52:32-38 of the '719 patent “stands as the intended definition of ‘network of capacitors’”). That should end the analysis.

Nevertheless, PO proposes “network of capacitors” be construed “a circuit topology of passive components including one or more capacitors that provides two or more degrees of freedom.” POR 12; Horenstein Decl. (Ex.2011) ¶37. That construction should be rejected. The phrase “two or more degrees of freedom” appears nowhere in the intrinsic record, which PO argues must be inferred from “specific examples” in the specification. POR 13. That flouts black letter law; “it is improper to read a limitation from the specification into the claims.” *Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 904 (Fed. Cir. 2004). PO’s other arguments similarly fail.

PO argues its construction is necessary for the “network of capacitors” to “control the complex impedance” or address “environmental variations.” See POR 12-13. These functions are not recited in claim 17, and it is improper to import unrecited functional requirements into structural claims. See *Schwing GmbH v. Putzmeister Aktiengesellschaft*, 305 F.3d 1318, 1324 (Fed. Cir. 2002).

PO’s arguments based on the specification fare even worse. None of what PO cites redefines, disavows, or otherwise alters the meaning of “network of capacitors.”

POR 12-13. PO cites Figures 30-35, but those figures are described as showing topologies of “matching circuits,” not “network[s] of capacitors.” ’719 patent 9:21-10:10, 52:16-32, 53:1-56:68; Allen Suppl. ¶¶12-16 (discussing PO’s cited passages). Even more problematic, PO’s construction would exclude the capacitor topologies in Figures 36(a)-(d), which the ’719 patent expressly states are “four topologies of **networks of fixed and variable capacitors.**” ’719 patent 10:11-14, 57:34-40, Fig. 36; Allen Suppl. ¶17; Horenstein Tr. 92:18-93:5 (admitting Fig. 36 is excluded by PO’s construction). That dooms PO’s argument. *See Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1583 (Fed. Cir. 1996) (construction that excludes preferred embodiment is “rarely, if ever, correct”); ’719 patent 52:32-38.

Finally, PO cites extrinsic evidence that a “network” refers to components like “capacities” [*sic*] that are “connected together in some manner.” Horenstein Decl. ¶37 (quoting Ex.2013 197); *see* POR 12 (citing Ex.2013). This provides no support for PO’s “two degrees of freedom” construction. Instead, it reaffirms the plain meaning of “network of capacitors” is “any circuit topology including one or more capacitors,” consistent with the patentee’s express definition. Allen Suppl. ¶9.

III. Ground I: Claim 16 is obvious over Cook-554 alone or in combination with Pohjonen.

The Petition showed claim 16 is obvious over Cook-554 (Ex.1005) alone or in combination with Pohjonen (Ex.1009). Pet. 9-38. PO argues (1) Cook-554 is not

prior art, and (2) Cook-554 does not render obvious “wherein at least one of the resonators is enclosed in a low loss tangent material.” POR 31-49. Both are wrong.

A. Cook-554 is prior art.

Cook-554 is prior art because Cook-554's provisional application pre-dates the earliest provisional for the '719 patent, and the Cook Provisional (Ex.1006) supports both (1) claim 17 of Cook-554, and (2) every disclosure of Cook-554 relied on to invalidate the claims of the '719 patent. *See* Pet. 12-15.

PO identifies only one limitation of claim 17 that the Cook Provisional supposedly fails to support: “varying the impedance value of the power converting circuit to tune the resonant frequency of the resonant circuit based on the received power level.” In particular, PO argues the “cited pages” of CProv in the Petition do not show varying impedance “based on the received power level.” POR 33-34. PO is wrong. The Cook Provisional depicts a “receive power converter unit” in Figure 4-12 below, and describes how its subcomponents tune a variable impedance based on a received power level:

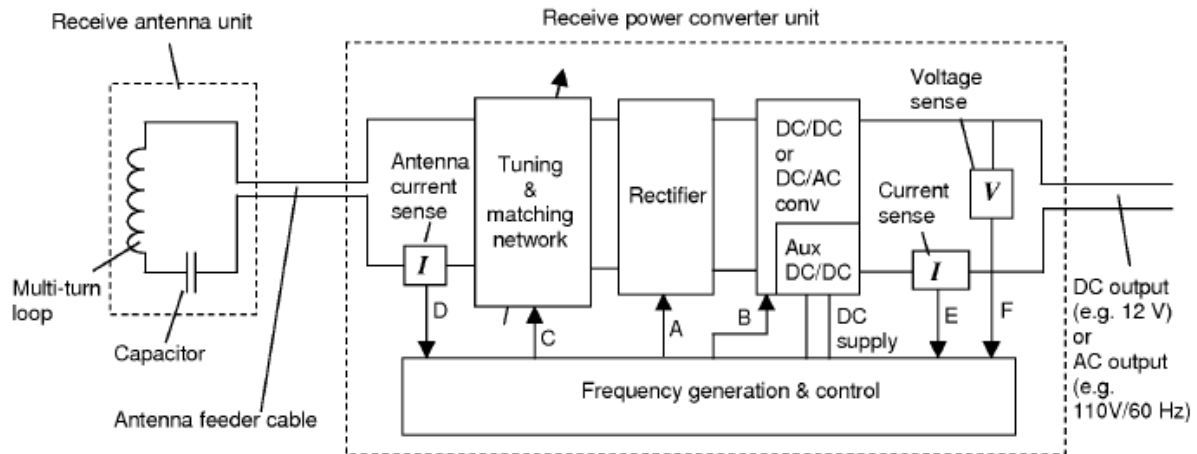


Figure 4-12: Receive subsystem

CProv Fig. 4-12; Pet. 15

The variable impedance is in the “Tuning and matching network,” which is controlled by the “frequency generation and control subunit.” CProv 44; Allen Suppl. ¶¶23-25. The “frequency generation and control subunit” takes measurements of the “antenna current” (D), and the “DC or AC output voltage and current” E and F. CProv 44-45; Pet. 14-15. These measurements are based on the “received power level” because power is derived from current and voltage. Allen Suppl. ¶25; Horenstein Tr. 32:18-33:7, 34:4-8, 35:4-8. “Based on these measurements,” the frequency generation and control subunit “computes and adjusts relevant operational parameters and configurations of the receive power converter unit in order to satisfy power demand by the receiver (within specified limits) and to maximise energy transfer efficiency.” CProv 44-45; *see also, e.g., id.* 31 (“receivers control system may determine the model parameters [of its resonator tank circuit] using specific

measurements (e.g., **antenna current and voltage, input power, etc.**)"); Allen Suppl. ¶¶24-25. PO does not dispute one "operational parameter" that is computed and adjusted is the resonant frequency. Pet. 15 (citing CProv 55, 44, 57, Fig. 4-12). Thus, the Cook Provisional supports "varying the impedance value of the power converting circuit to tune the resonant frequency of the resonant circuit based on the received power level."

Rather than address these disclosures, PO quotes portions of the Cook Provisional stating tuning can address "detuning effects," "aging" components, among other factors. POR 34. But that is what tuning can "compensate for" (*id.*), not what tuning is "based on" as recited in claim 17. Allen Suppl. ¶26. Because the Cook Provisional supports each element of Cook's claim 17, Cook qualifies as prior art as of the Cook Provisional's filing date. Pet. 13-15.

B. Cook-554 renders obvious the "enclosed" limitation alone or in combination with Pohjonen.

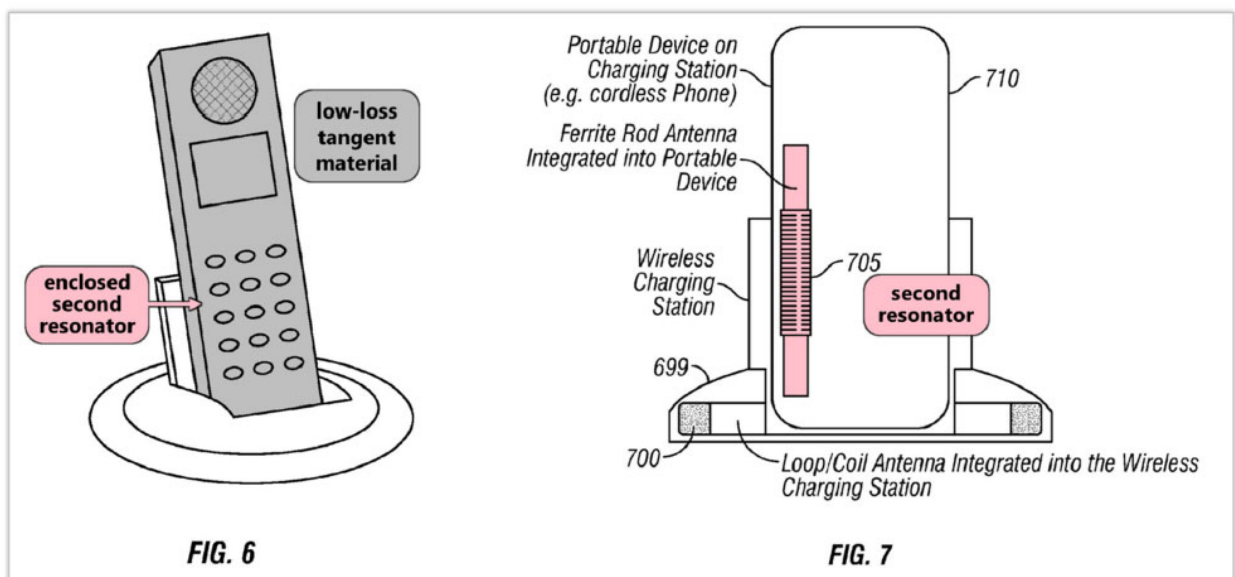
The Petition showed Cook-554 renders obvious "wherein at least one of the resonators is enclosed in a low loss tangent material" alone or in view of Pohjonen. Pet. 32-37. PO disagreements have no merit.

1. Cook-554 discloses a resonator enclosed within a portable phone.

The Petition demonstrates Cook-554's second resonator is "integrated into" and "internal" to a "mobile, handheld device." Pet. 33-37. PO argues Cook-554 does

not teach an enclosed resonator because (1) “integrated into” could mean something other than “enclosed,” (2) the Cook Provisional does not use the word “internal,” and (3) the figures cannot be relied upon. POR 35-38. PO is wrong on each point.

First, a POSA would have understood Cook-554's disclosure of a resonant antenna “integrated into” and “internal” to a portable device to mean the resonant antenna is enclosed by the external housing of the portable device. Pet. 32-37; Allen Decl. (Ex.1003) ¶149; Allen Suppl. ¶¶30-31. In particular, PO attacks the isolated phrase “integrated into,” arguing “[a] POSA would clearly understand there are a number of different manners by which the resonator could be ‘integrated into’ the device without being enclosed in the device.” POR 38. These generalized arguments ignore the context of Cook-554, which discloses a resonant antenna integrated “into” and “internal” to the portable device as depicted, for example, in Figures 6 and 7.



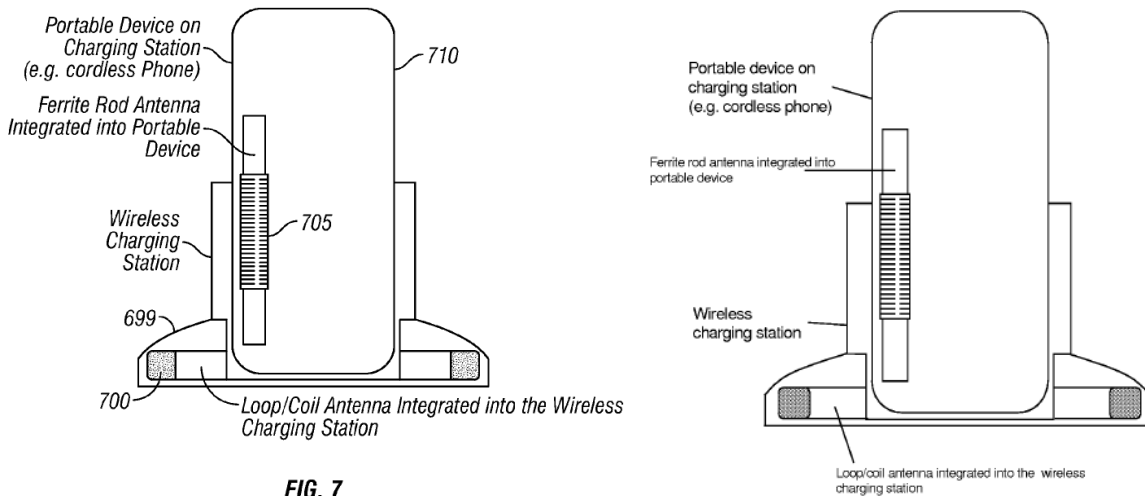
Pet. 33-34

Neither PO nor its declarant cite to any evidence suggesting Cook-554 intended for its resonant antenna to instead be uncovered and exposed to the outside of a portable device's enclosure. Finding no support in Cook-554, PO cites to embodiments in a different reference, Cook-523, using the term "integrated into." But other than sharing the same lead inventor, Cook-523 is not relevant to Cook-554. Cook-554 does not cite or incorporate Cook-523 for any of its disclosures. Even if a POSA were to consider Cook-523, it does not support PO's argument. Allen Suppl. ¶32. Cook-523's figures depict an *internal* housing for a resonator antenna; none of the figures depict the outer cover of the portable device (e.g., that would include the keys for a mobile phone as in Cook-554's Figure 6). Allen Suppl. ¶32; Horenstein Tr. 85:10-23. But even if PO were correct Cook-523's Figures taught open outer enclosures, that is still not what *Cook-554* taught. *Cf.* Pet. 32-38.

Second, PO argues the Petition cannot rely on Cook-554's teaching that antenna 705 is "internal" to the portable device in Figure 7 because the word "internal" does not also appear in the Cook Provisional. POR 36. That is not required. *Dynamic Drinkware* only requires subject matter relied on in a non-provisional is "sufficient[ly] support[ed]" in the provisional, not that the disclosures are identical. Pet. 13; *Dynamic Drinkware, LLC v. Nat'l Graphics, Inc.*, 800 F.3d 1375, 1381-82 (Fed. Cir. 2015); *see Ariad Pharms., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1352

(Fed. Cir. 2010) (en banc) (“[T]he description requirement does not demand” identical terminology). That is more than met here.

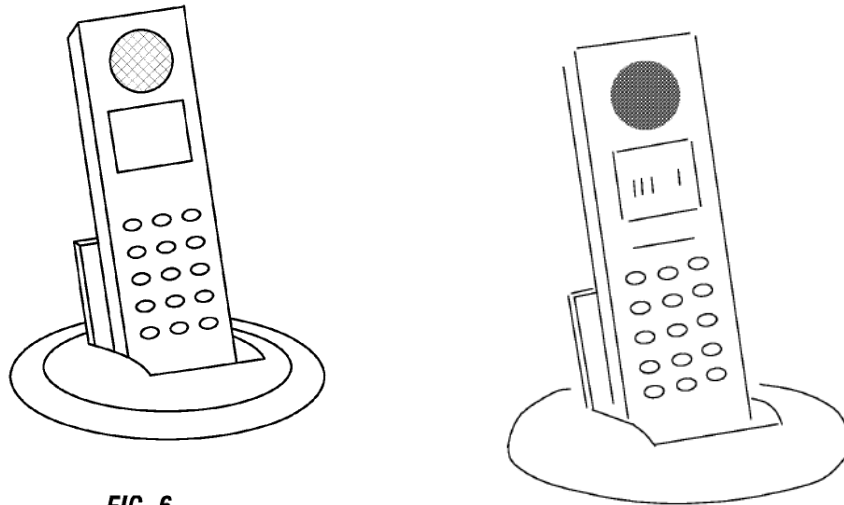
As an initial matter, Cook-554’s disclosure of an “internal” antenna relates to antenna 705 in Figure 7, which is the same substantively as CProv Figure 4-4:



Cook-554 Fig. 7 (left) and CProv Fig. 4-4 (right)

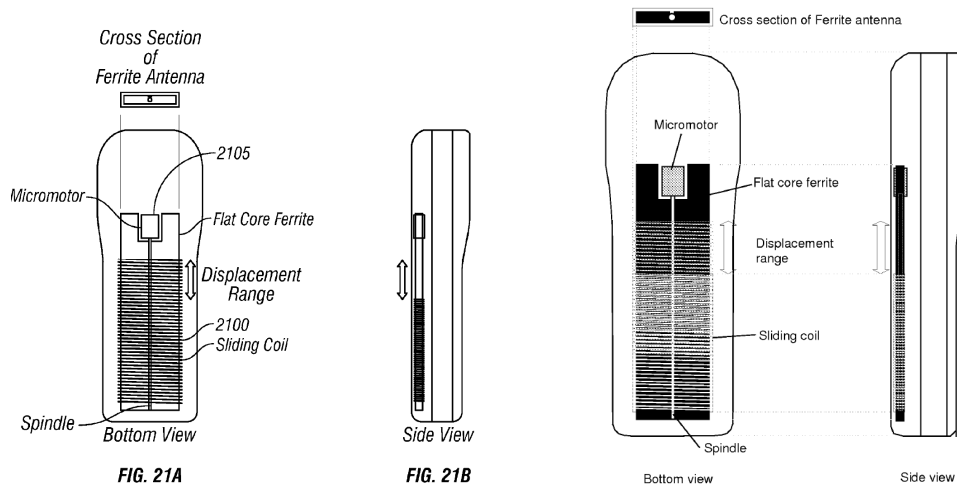
Both figures explicitly label the “[f]errite rod antenna *integrated into* [the] portable device.”¹ And as the Petition showed, a POSA would not read these figures in context with Cook-554 Figure 6 and CProv Figure 4-3, which illustrate the same portable device from an exterior view, showing an external case with screen and buttons. Pet. 33-35.

¹ All emphasis added unless otherwise noted.

**FIG. 6****Cook-554 Fig. 6 (left) and Cook Provisional Fig. 4-3 (right)**

These figures, which show an outer cover without the antenna visible, reinforce to a POSA that the ferrite rod antenna is internal to the device's outer enclosure. Allen Suppl. ¶¶34-35. Enclosing the antenna internally is also supported by the explanation that the "use of a metallic housing must be avoided" and the antenna should be integrated in parts "providing better penetration of magnetic fields." CProv 51, 58.

Still more support for an "internal" antenna is provided in CProv Figure 5-6, which was carried forward in Cook-554 Figure 21A-B:



Cook-554 Figs. 21A-21B (left) and CProv 56, Fig. 5-6 (right)

When confronted with these figures, PO's expert admitted a POSA would have understood CProv to teach resonators "*inside* the portable device." Horenstein Tr. 72:19-73:3 (emphasis added) (also conceding CProv Fig. 5-6 is the same as Cook-554 Fig. 21A-B); *see also id.* 70:10-71:3 (admitting Cook-554 Fig. 21 shows antenna "inside of the device").

Third, PO argues Cook's figures are "simple diagrammatic drawings" and cannot be relied on. POR 37. PO misapplies the law. Drawings can be used as prior art for features clearly disclosed by the drawing. *See Krippelz v. Ford Motor Co.*, 667 F.3d 1261, 1265, 1268-70 (Fed. Cir. 2012) (using a patent drawing to determine the relative location of a lamp and side mirror); *In re Mraz*, 455 F.2d 1069, 1072-73 (C.C.P.A. 1972) ("We [do] not mean that things patent drawings show clearly are to be *disregarded*."). (original emphasis). Here, Figure 6 clearly shows an outer case for a mobile device where the antenna is not visible; Figure 7 removes the outer case

but shows the antenna internal to the portable device. Likewise, PO's expert admitted Figures 21A-B clearly show to a POSA a resonator "inside" the outer cover. Horenstein Tr. 72:19-73:3; Allen Suppl. ¶37. Because there is "no question that a person of ordinary skill, reviewing these figures, would understand them to show" a resonator enclosed within an outer cover, they are prior art disclosures of that feature. *Krippelz*, 667 F.3d at 1269.

2. POSAs would have been motivated to enclose Cook-554's resonant antenna in a low loss tangent material.

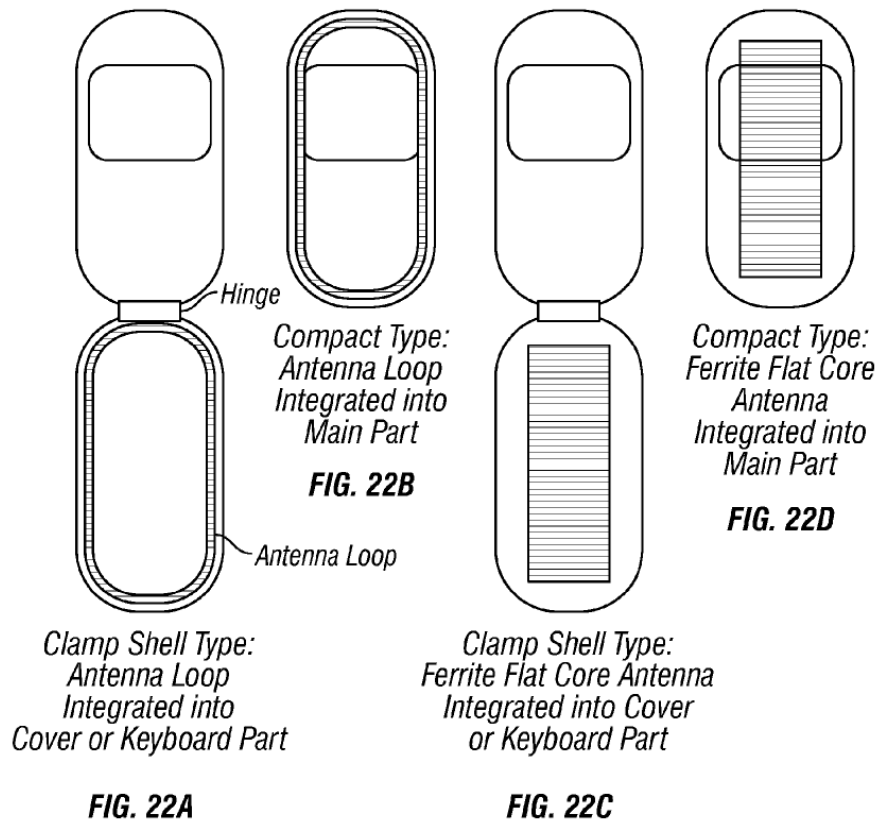
The Petition shows, and PO does not dispute, low-loss tangent materials were common and typical for forming outer enclosures of mobile phones at the time of Cook-554 and Pohjonen, and a POSA would have had a reasonable expectation of success implementing such an enclosure in Cook-554. Pet. 18-19. The Board should reject PO's scattershot arguments otherwise.

First, a POSA would be motivated to enclose Cook-554's antenna in low loss tangent material in view of Cook-554's express teachings to avoid metallic housing, reduce losses, and provide better penetration of magnetic fields. Pet. 35-36. PO does not dispute low loss tangent materials satisfy these criteria and would be a suitable option for enclosing Cook-554's resonant antenna. PO simply disagrees whether that is enough, because it may also be possible to make the outer cover from materials without a low loss tangent. POR 39-40; *see also id.* 44-45 (arguing the advantages of using metal in electronic housing). PO misapplies the law.

Obviousness does not require that arriving at the claimed invention is the *only* option, or even the “the *best* option, only that it be a *suitable* option.” *PAR Pharm., Inc. v. TWI Pharms., Inc.*, 773 F.3d 1186, 1197-98 (Fed. Cir. 2014) (original emphasis); *In re Fulton*, 391 F.3d 1195, 1200 (Fed. Cir. 2004) (combinations do not have to be “preferred, or the most desirable” to “provide motivation”). And “if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill.” *KSR Int’l Co. v. Teleflex, Inc.*, 550 U.S. 398, 417 (2007). That is the case here. Cook-554 taught antennas enclosed within the outer cover of mobile phones, and mobile phone covers made from injection molded plastics having low loss tangents were “typical” because they were effectively transparent to radio waves and could protect a device from damage during manufacturing or use. Pet. 18-19; Allen Decl. ¶114.

Second, PO argues Cook-554 taught a POSA to use low-loss tangent materials as “part” of an enclosure, resulting in an antenna that is not “enclose[d].” POR 40-44. PO misinterprets Cook-554. Initially, the quoted passage refers only to Cook-554’s Figures 22A-22D, whereas Cook-554’s Figures 6-7 and 21A-21B independently show antennas enclosed by an outer cover. Allen Suppl. ¶¶ 34-37, 43; *see* Horenstein Tr. 70:10-71:3, 72:19-73:3. Furthermore, the “part” Cook-554 refers to is the entire portion where the receive antenna is enclosed, e.g., the “keyboard

part” of a flip phone separated from the “main part” by a hinge, in Figures 22A and 22C.



Cook-554 Figs. 22A-22D

Even PO's expert conceded a POSA would have understood the antenna in Figure 22C "could be inside the device." Horenstein Tr. 82:22-25. And Dr. Horenstein admitted in his experience, phones would not include antennas "on the outside." *Id.* 83:1-21. Notably, PO has no response to Pohjonen explaining low loss tangent outer cover material is "equally well applicable to portable radio devices" that "consist of ... flip covers or other movable outer cover elements" like Cook-554's Figures 22A and 22C. Pohjonen 12; Pet. 20.

Third, PO cites to other references, including Cook-523, Dabov (Ex.1016), and Zhang (Ex.1015), to argue Cook-554 could have been implemented using a “cover” without “**enclosing** the antenna in a low loss tangent material.” POR 41 (original emphasis); *see id.* 40-44. But the Petition does not propose combining Cook-554 with any of Cook-523, Dabov, or Zhang. PO also mischaracterizes the references, which expressly taught antennas that are “enclose[d]” or “inside” of low loss tangent materials. Allen Suppl. ¶42; *see, e.g.*, Zhang 10:41-56 (“plastic caps” are “used to **enclose** an antenna”); Dabov 10:27-50 (antenna is “molded into” an “antenna chassis 922” made from low loss tangent materials so the antenna is “inside” the chassis). Regardless, even if alternative options exist, that is irrelevant because PO does not dispute a well-known and suitable option for Cook-554’s antenna would be to enclose it in a low loss tangent material. *See PAR Pharm*, 773 F.3d at 1197-98.

Fourth, PO asserts Pohjonen taught a portable radio device including an outer cover with a “patch of thermoplastic material at the location of the radiating antenna element.” POR 43. PO omits this “patchwork solution” in Pohjonen is “another embodiment” that is “[i]nstead of making the ... the whole outer cover 202 consist of the low-loss thermoplastic.” Pohjonen 7. The existence of alternative embodiments in the prior art does not save the claimed approach from being obvious. *In re Applied Materials, Inc.*, 692 F.3d 1289, 1298 (Fed. Cir. 2012).

Fifth, PO does not dispute a low loss tangent enclosure would adequately protect Cook-554's antenna, and do so efficiently, but argues there is no evidence an antenna needs protection. POR 45-47. That is incorrect. The Petition and Dr. Allen cited numerous references (including Cook-554, Pohjonen, Dabov, Tamura (Ex.1011), Wang-041 (Ex.1013), Hassler (Ex.1027), Yeh (Ex.1018), and Levine (Ex.1017)) demonstrating how protecting antennas during manufacture and use was a known problem, and using low loss tangent materials to enclose the antenna was a known solution. Pet. 18-20, 33; Allen Decl. ¶114.

In sum, PO does not dispute element 16[e]'s requirement for an antenna enclosure made of a low loss tangent material is the application of a known technique to a piece of prior art ready for the improvement. Pet. 19; *see* POR 39-47. Nor does PO dispute a POSA would have had a reasonable expectation of success enclosing Cook-554's second resonator in a low loss tangent outer cover. Pet. 20; *see* POR 39-47. PO does not dispute every other limitation is disclosed, and therefore Claim 16 should be found invalid.

3. A POSA would have been motivated to combine Cook-554 and Pohjonen.

If not obvious by Cook-554 alone, Claim 16 is obvious by the combination of Cook-554 and Pohjonen. Pet. 17-21. Rather than address the substantial similarities and common goals of Cook-554 and Pohjonen supporting obviousness, PO argues Pohjonen's entire disclosure is "not appropriate" for combination because Cook-

554's antennas are non-radiative, whereas Pohjonen's allegedly are radiative. POR 49. PO is wrong.

PO does not provide any evidence or explanation from Pohjonen or Cook-554 (or any other reference) to support its theory. There is no evidence Pohjonen's teachings regarding outer cover materials are limited exclusively to radiating antennas, or Cook-554's primarily non-radiative antennas would not benefit from Pohjonen's teachings regarding a low loss tangent outer cover. To the contrary, Pohjonen taught covers made from "low-loss thermoplastic" had "several functions" including being "essentially transparent ... to radio waves," and provides "required mechanical strength, stiffness and support." Pohjonen 9. Pohjonen also indicates its disclosures are not limited to any particular antenna design. Pohjonen 2 (stating losses of the "antenna element itself are typically not of importance"), 9 (invention "does not limit the form" of the antenna element). It is undisputed Cook-554's antenna, even if a different design, also transmits power at radio frequencies and would benefit from covers having sufficient mechanical strength, stiffness and support. Pet. 17-21; Allen Suppl. ¶48.

PO also argues Cook-554's and Pohjonen's antennas are "subject to different design constraints." POR 48. But PO does not state what those design constraints are, provide any evidence they are relevant to the design of the *outer cover* of a portable device, or suggest the benefits of low loss tangent material apply only to

one type of antenna. To the contrary, it stands un rebutted Pohjonen's low loss tangent outer covers are designed to enclose antennas made of "good [] conductor materials," which describes the inductive component of Cook-554's second resonator. Pet. 20-21. Similarly, the '719 patent confirms non-radiative magnetic antennas benefit from low loss tangent materials because they have small dissipative losses at radio frequencies ('719 patent 34:53-57), which is the same benefit Pohjonen taught and Cook-554 states as a design objective. Pohjonen 2-4; Cook-554 17:1-2, 19:30-35.

IV. Ground 2: Claim 17 is obvious over Cook-554.

Cook-554 renders obvious claim 17. Pet. 38-53. The only element PO challenges is element [17e]: "wherein at least one of the resonators includes a coil of a plurality of turns of a conducting material connected to a network of capacitors." Although only one resonator is required, the Petition showed both Cook-554's source resonator and receive resonator satisfy that element. Pet. 38-45. PO disagrees, arguing that neither the source or device resonator in Cook-554 satisfy the "network of capacitors" limitation for two reasons. POR 49-54. Both reasons fail.

First, PO argues Cook-554's banks of capacitors connected to the source resonator coil in the "Tuning Network" in Figure 13, or the banks of capacitors connected to the receive resonator coil in the "Tuning & Matching Network" in Figure 15, cannot satisfy the claimed "network of capacitors" because they are not

“component parts of the resonator(s).” POR 52. The POR does not elaborate on what it means to be a “component part[]” of a resonator, but cites the following annotated figures appearing only in Dr. Horenstein’s declaration:

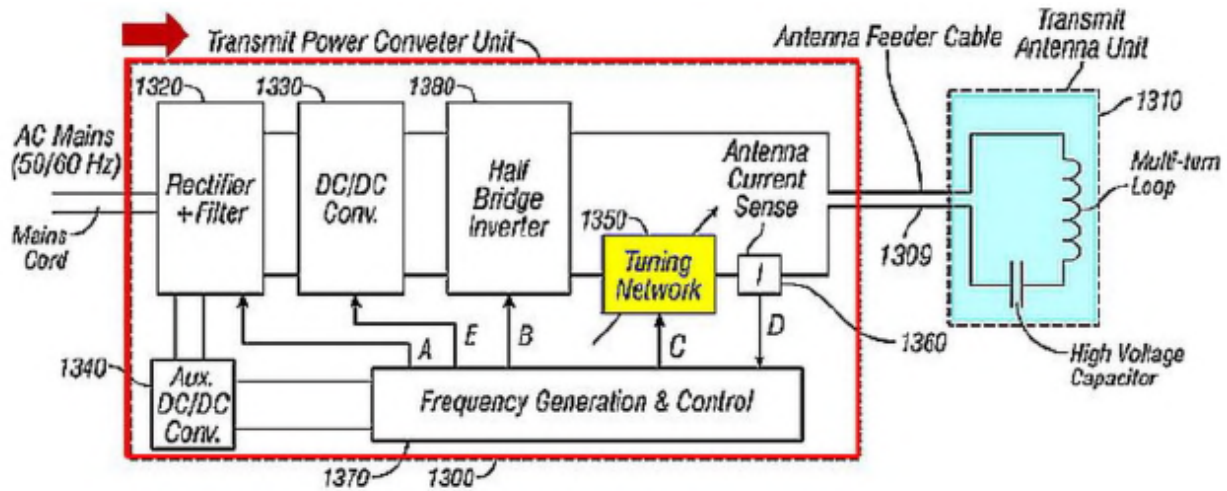


FIG. 13

Cook-554 Fig. 13, annotated

Horenstein Decl. ¶121

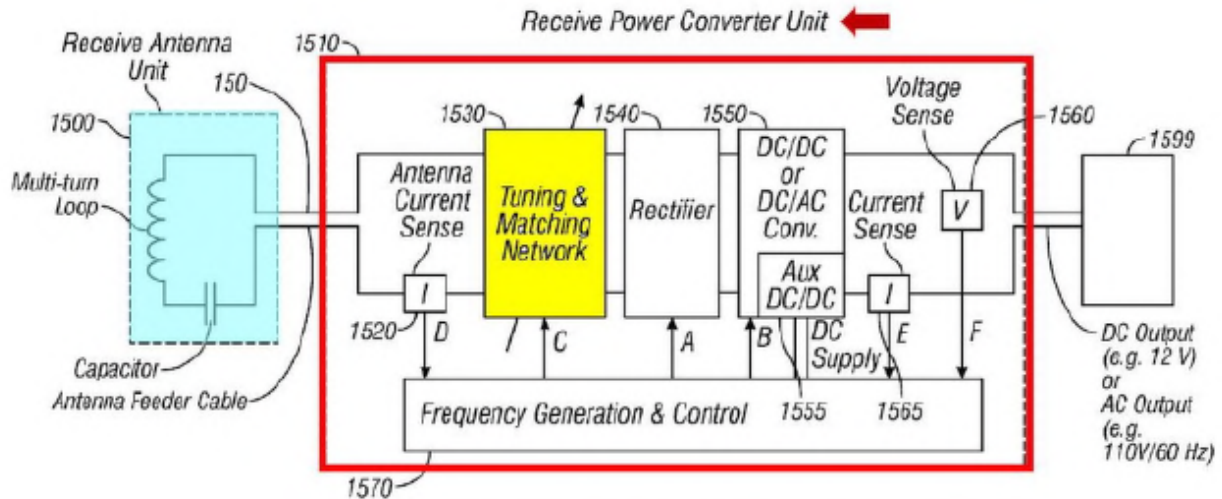


FIG. 15

Horenstein Decl. ¶122

PO's expert contends only components in the shaded blue boxes are "component parts" of a resonator, expressly excluding the tuning networks in the red box. But Dr. Horenstein's opinions are based on a flawed and unsupported interpretation that would require construing "connected to" to require a "direct connection" meaning there are "no intervening circuits or other components to the resonator." Horenstein Tr. 44:22-45:5. The POR does not provide any evidence supporting this narrow interpretation, and the Board should reject PO's arbitrary box drawing exercise for that reason alone.

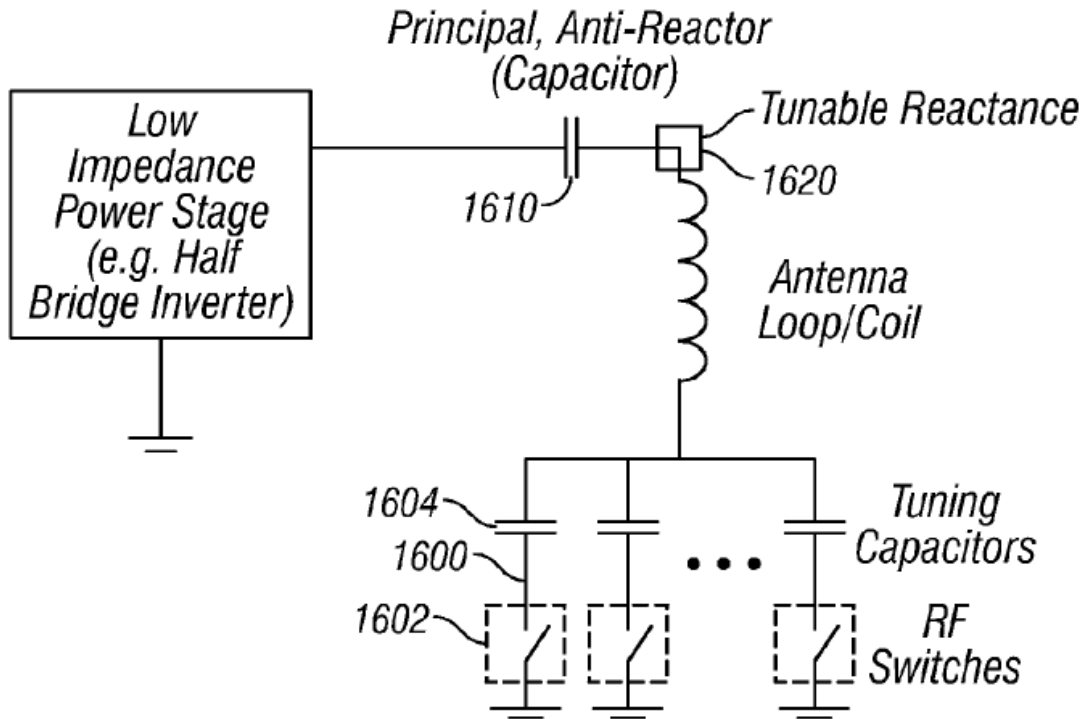
Moreover, the claim language, specification, and plain meaning indicate "connected to" in claim 17 is not limited to "direct" connections. For example, other claims expressly recite components with "direct electrical connections." '719 patent cls. 1, 2, 3, 9. The corresponding absence of "direct" in claim 17 points against

narrowing the term “connected to” to require direct connections. *See Ancora Techs., Inc. v. Apple, Inc.*, 744 F.3d 732, 735 (Fed. Cir. 2014) (rejecting construction using narrowing terminology recited in other claims). Likewise, the specification uses “connected to” to include direct, indirect, or even inductive (wireless) connections. ’719 patent 58:48-49 (“The power supplies and the power consumers may be **connected to** magnetic resonators **directly or indirectly or inductively**.”). And the Federal Circuit has found “[t]he ordinary meaning of ‘connected to’ encompasses indirect linkages.” *Douglas Dynamics, LLC v. Buyers Prods. Co.*, 717 F.3d 1336, 1342 (Fed. Cir. 2013).

Contrary to PO’s expert’s unsupported interpretation of claim 17, the only structural requirement in element 17[e] is a multi-turn coil “connected to” a network of capacitors. That is shown in Cook-554’s Figures 13 and 15, as annotated in the Petition, wherein the coil is connected both to (1) a principal capacitor in the antenna unit, and (2) a tunable capacitor bank in the Tuning Network (Fig. 13) or Tuning & Matching Network (Fig. 15). Pet. 44-45. In both the annotated figures and corresponding text, the Petition clearly maps the components in the antenna units and the tuning/matching networks as part of each resonator. *See* Pet. 38 (“a source resonator including a ‘transmit antenna unit’ and associated ‘tuning network’”); 40 (“The ‘source resonator’ also includes Cook-554’s tuning circuit.”); 41 (“a ‘receive antenna unit’ and ‘tuning and matching network’ correspond[] to the claimed

‘second resonator’”). Notably, PO’s expert states a POSA “would understand that ‘network of capacitors’ (with capacitors in the plural)” is satisfied by a circuit having just one capacitor. Horenstein Decl. ¶40. Thus the claimed “network of capacitors” is met by the capacitors in the antenna unit and/or tuning networks illustrated, for example, in Figures 13 and 15.

There is also no meaningful dispute Cook-554’s coils are at least indirectly connected to a bank of capacitors. *See* Horenstein Tr. 46:18-47:4 (tuning network in Figure 13 is “connected to” the coil “through two different components”), 47:9-19 (Fig. 15 tuning and matching network is “connected” to coil by the antenna feeder cable), 73:4-18. But a POSA would have understood they are connected under PO’s narrower interpretation of “connected to” as well. For example, Cook-554’s Figure 16 depicts connections between the antenna coil and a bank of capacitors with no intervening circuits or other components.

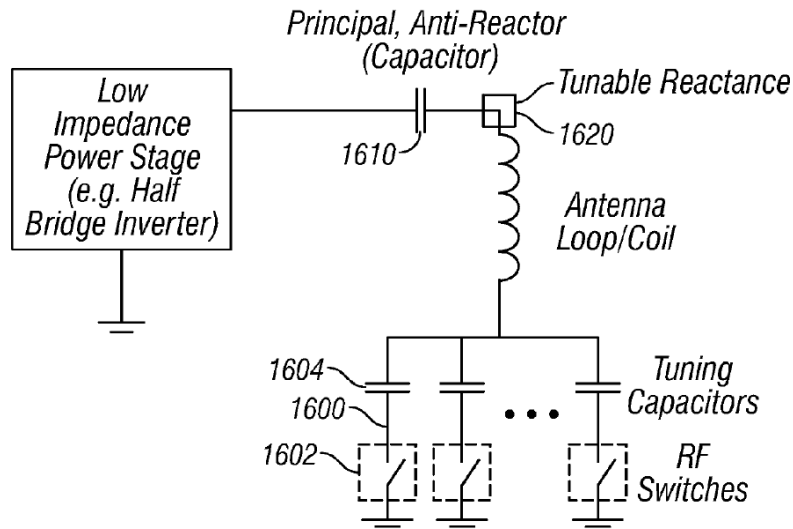
**FIG. 16**

Cook-554 Fig. 16, 17:41-51; CProv 52-57; Allen Suppl. ¶¶56-58; *see also* Pet. 41.

PO's expert also argues a tuning network cannot form part of the claimed resonator unless it forms an "impedance-matching network for the multi-turn loop." *See* Horenstein Decl. ¶121. Nothing in claim 17 requires impedance matching. Regardless, Cook-554 taught its tuning and matching network is used for impedance-matching too. *See, e.g.,* Cook-554 14:26-39, 13:58-63; CProv 43-44; Allen Suppl. ¶58; Horenstein Tr. 49:6-18 (admitting Fig. 15 performs impedance matching); *see also, e.g.,* Cook-554 3:25-27, 4:47-60, 6:53-62, 14:26-27; CProv Fig. 3-1, 26-27, 43-44.

Second, PO argues Cook-554's capacitors do not constitute a "network of capacitors" under its faulty construction, "a circuit topology of passive components including one or more capacitors that provides two or more degrees of freedom." POR 53. PO's construction is wrong as discussed above, and PO does not dispute the claims are invalid under the plain meaning applied in the Petition. Pet. 43-47; Allen Suppl. ¶52.

Nevertheless, Cook-554 discloses a "network of capacitors" even under PO's construction. Allen Suppl. ¶58; *Axonics, Inc. v. Medtronic, Inc.*, 75 F.4th 1374, 1384 (Fed. Cir. 2023) (holding Petitioner can address obviousness under new constructions in reply). PO does not dispute Cook-554 discloses "a circuit topology of passive components including one or more capacitors." POR 49-54. As to the "two or more degrees of freedom," PO's expert confirmed a circuit topology including a variable capacitor and a variable inductor provides two degrees of freedom and is a "network of capacitors" under PO's construction. Horenstein Tr. 95:15-96:14. That is what Cook-554 discloses, explaining its tuning and matching networks may include "tunable capacitor(s) *and/or* tunable inductances, e.g., electrically tuneable [*sic*] reactors." Cook-554 17:35-38, 6:49-67, 14:26-39; Cprov 51-52, 26-27, 44; Allen Suppl. ¶58. For example, Cook-554's Figure 16 depicts a tuning circuit comprising tunable capacitors 1604, which provide a first degree of freedom, and a tunable reactance 1620 that provides a second degree of freedom.

**FIG. 16**

See Cook-554 Fig. 16, 17:46-63; Cprov 51-57; Allen Suppl. ¶58.

The Board should therefore find claim 17 unpatentable.

V. Ground 3: Claim 16 is obvious over Cook-523 and Pohjonen.

The Petition showed claim 16 is rendered obvious by the combination of Cook-523 and Pohjonen. Pet. 53-63. PO's arguments otherwise should be rejected.

A. POSAs would have been motivated to enclose Cook-523's resonant antenna in a low loss tangent material.

PO first repeats its flawed arguments that a POSA would not have been motivated to enclose an integrated antenna. These arguments have no merit for the reasons described in Section III.B.2 for Ground 1. For example, like it did in Ground 1 for Cook-554, PO fails to address Cook-523's disclosure that its antennas are "preferably of a small size to allow it to fit into a mobile, handheld device." Pet. 55 (quoting Cook-523 1:31-45).

Additionally, PO argues none of Cook-523's Figures 12A-C and 13A-B illustrating housings for an antenna, in isolation, satisfy the claims or motivate a POSA to enclose the antenna in a low loss tangent material. POR 55-58. That mischaracterizes the Petition, which does not rely solely on these figures in isolation. Pet. 55, 57, 63. And PO does not assert these embodiments teach away from the combination, nor do they. PO's various arguments about Cook-523's housings as being metallic or non-metallic, enclosed or not enclosed, external or internal, do not change that a POSA would have been motivated to *add* an outer enclosure and typical materials for such outer enclosures had low loss tangents as disclosed by Pohjonen. Allen Suppl. ¶62.

PO seems to interpret Cook-523's figures as illustrating mobile phones with an integrated antenna, ready for use. Horenstein Tr. 84:10-13; *but see id.* 85:1-19. This is nonsensical, as none of the figures depict the portions of a portable phone a user would interact with, e.g., the buttons on an outer enclosure. As explained in the Petition, a POSA would have understood the housings in Figures 12A-C and 13A-B are not the outer enclosures of a mobile phone. Allen Suppl. ¶62. Instead, Cook-523's figures depict the internal antenna components of a portable device, which a POSA would have been motivated to enclose in combination with Pohjonen. Pet. 56-57; Allen Suppl. ¶62. PO's arguments otherwise fail for at least the same reasons as Ground 1 above.

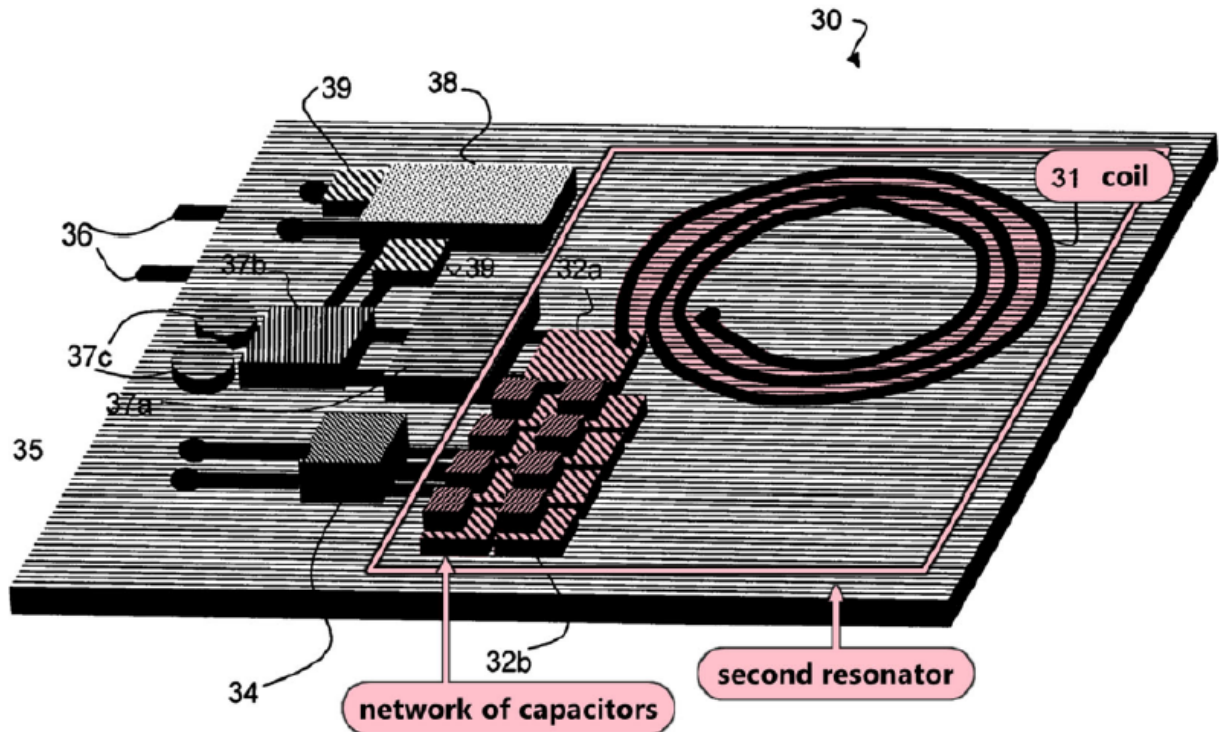
B. POSAs would have looked to Pohjonen.

As it did for Ground 1, PO emphasizes alleged differences between the antenna designs of Pohjonen and Cook-523, but PO does not dispute Pohjonen is analogous art to Cook-523, nor does PO provide any explanation as to why the differences in antenna design would prevent or discourage a POSA from looking to Pohjonen's teachings about materials used for mobile phone enclosures. POR 58-59. PO's arguments are also particularly inapplicable to Cook-523. For example, PO primarily argues Pohjonen applies only to "radiative" antennas, but PO does not dispute Cook-523 expressly taught its antennas will "in fact radiate." Cook-523 2:48-53; Pet. 56. PO has not rebutted the significant evidence that POSAs would have looked to Pohjonen in relation to its disclosure for outer cases for mobile phones, and that a POSA would have had a reasonable expectation of success applying Pohjonen's cover to Cook-523's second resonator. *See* Pet. 55-58; *supra* Section III.B.3.

VI. Ground 4: Claim 17 is obvious over Lee and Cook-523.

The Petition showed Lee (Ex.1008) and Cook-523 renders claim 17 obvious. Pet. 66-80. PO does not challenge a POSA could have and would have combined Lee and Cook-523. *See* POR 59-64. PO only disputes whether Lee discloses "at least one of the resonators includes a coil of a plurality of turns of a conducting material connected to a network of capacitors." POR 60. Lee does disclose that element. Lee

taught a second resonator including a spiral coil 31 connected to a network of capacitors 32a and 32b as shown below:

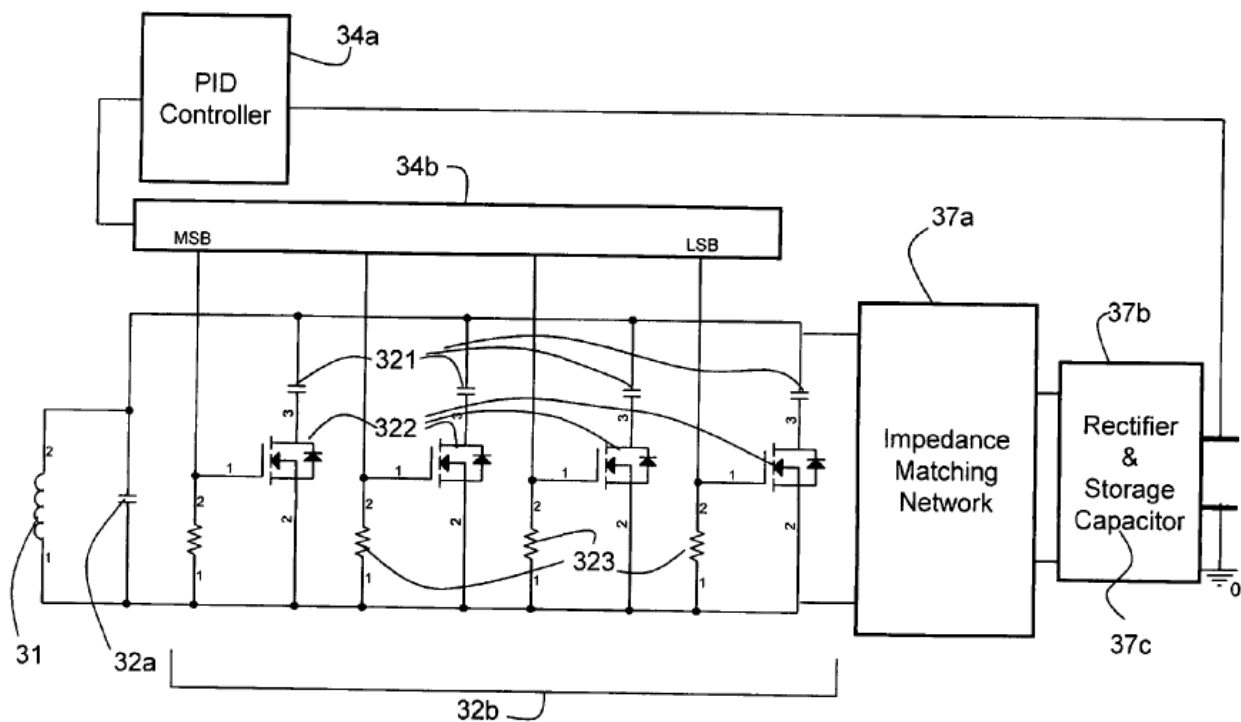


Pet. 78 (annotating Lee Fig. 12)

PO disagrees, arguing Lee does not state the switched capacitor bank is part of the “resonator.” POR 61. But there is no requirement that a prior art reference “disclose the elements in the very same terms used by the patent.” *Adasa Inc. v. Avery Dennison Corp.*, 55 F.4th 900, 910 (Fed. Cir. 2022), *cert. denied*, 143 S. Ct. 2561 (2023). All that is required is Lee disclose the elements of the claim to a POSA, which Lee does. As discussed in Section IV for Ground 2, claim 17 requires a resonator that includes a coil connected to a network of capacitors, which can be

“one or more” capacitors. Lee, in turn, taught an LC resonant circuit with a coil “in parallel *connection with*” the “main capacitor 32a” and the “bank of switched capacitors 32b which are also in parallel.” Lee [0075]; Pet. 78-79.

Lee further illustrates its coil 31 is connected to the main capacitor and switched capacitors 32b in Figure 13 below:



Lee Fig. 13, [0075]

The capacitor bank in particular is used to adjust the resonant frequency of the resonator “so that it can stay matched with the RF driving frequency.” Lee [0078];

Allen Suppl. ¶67. It is therefore part of the “LC network that has a resonant frequency.” Allen Suppl. ¶67.²

Second, PO argues the capacitor bank is not a “network of capacitors” under its construction. POR 62-64. PO’s construction is wrong for the reasons explained in Section II, and PO has not disputed the capacitor bank is a “network of capacitors” under the meaning as applied in the Petition, e.g., “any circuit topology including one or more capacitors.” Additionally, Lee teaches that its capacitors 32a and 32b are further connected to an Impedance Matching Network 37a (Lee Fig. 13, [0075]), which performs the impedance-matching function PO alleges would require “two degrees of freedom.” Horenstein Decl. ¶45; Horenstein Tr. 49:19-24; *see also* POR 63-64. Because that “two degrees of freedom” is the only portion of its construction PO argues is missing, claim 17 is obvious even under PO’s incorrect construction.

VII. Conclusion

For the reasons set forth above, the Board should deny the Petition for Inter Partes Review.

² PO argues that Lee “repeatedly refers to the LC network as what provides the resonant frequency for the secondary unit.” POR 61. This is a red herring and describes a component the Petition does not cite to or rely on.

Respectfully submitted,

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CERTIFICATE OF COMPLIANCE WITH 37 C.F.R. § 42.24

I hereby certify that this Petitioner's Reply complies with the word count limitation of 37 C.F.R. § 42.24(c)(1) because it contains 5,528 words using Microsoft Word's counting feature, excluding the cover page, signature block, and the parts of the Petitioner's Reply exempted by 37 C.F.R. § 42.24(c).

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CERTIFICATE OF SERVICE

Pursuant to 37 C.F.R. § 42.6(e), I certify that on this 30th day of August, 2024, a true and correct copy of the foregoing **Petitioner's Reply and all Exhibits** were served by electronic mail on Patent Owner's lead and backup counsel at the following email addresses:

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