

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ANKER INNOVATIONS LTD.,
Petitioner,

v.

POWERMAT TECHNOLOGIES LTD.,
Patent Owner.

Case IPR2024-00995
Patent No. 9,083,204

**PETITIONER'S REPLY TO
PATENT OWNER'S RESPONSE TO PETITION**

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EXHIBITS

EX1001	U.S. Patent No. 9,083,204 to Azancot (“the ’204 patent”)
EX1002	Excerpts from the Prosecution History of the ’204 Patent (“the Prosecution History”)
EX1003	Expert Declaration of Gary Woods, Ph.D.
EX1004	U.S. Pub. No. 2008/0197804 (“Onishi”)
EX1005	U.S. Pub. No. 2007/0236169 (“Purdy”)
EX1006	U.S. Pub. No. 2008/0079392 (“Baarman392”)
EX1007	PCT Publication No. WO2006/031133 (“Malpas”)
EX1008	U.S. Pub. 2009/0212736 (“Baarman736”)
EX1009	Excerpts from Ronald J. Tocci et al., <i>Digital Systems: Principles and Applications</i> , Pearson Education International, 10 th Edition (2007) (“Tocci”)
EX1010	Declaration of June Munford
EX1011	U.S. Provisional App. Serial No. 61/064,618 (March 17, 2008)
EX1012	U.S. Provisional App. Serial No. 61/071, 151 (April 15, 2008)
EX1013	U.S. Provisional App. Serial No. 61/129,526 (July 2, 2008)
EX1014	U.S. Provisional App. Serial No. 61/129,859 (July 24, 2008)
EX1015	U.S. Provisional App. Serial No. 61/129,970 (August 4, 2008)
EX1016	U.S. Patent No. 9,048,696 to Azancot (“the ’696 patent”)
EX1017	Complaint, <i>Powermat Technologies Ltd. v. Anker Innovations Ltd.</i> , Case No. 5:23-cv-00052 (E.D. Tex.), June 5, 2023
EX1018	Waiver of Service, <i>Powermat Technologies Ltd. v. Anker Innovations Ltd.</i> , Case No. 5-23-cv-00052 (E.D. Tex.), September 27, 2023
EX1019	Petitioner’s <i>Sotera</i> Stipulation

EX1020-1100	[RESERVED]
EX1101	Second Expert Declaration of Gary Woods, Ph.D.
EX1102	Transcript of April 23, 2025 Deposition of Dr. Patrick Mercier in IPR2024-00994
EX1103	Transcript of August 7, 2025 Deposition of Dr. Patrick Mercier in IPR2024-00995 and IPR2024-00996

I. INTRODUCTION

The Patent Owner's Response (POR) fails to refute the Petition's showing that claims 1-6, 8, and 10-13 of the '204 Patent are unpatentable.

Regarding the Baarman392-Tocci combination, the POR overlooks that Baarman392's operating frequency range encompasses the near-linear region of the frequency-amplitude graph. Accordingly, the system in the Baarman392-Tocci combination readily achieves transmission frequencies "substantially different" from the characteristic resonant frequency of the inductive couple each time the transmission frequency is incrementally increased or decreased through the near-linear region of the operating frequency range exactly as Baarman392 describes. This fact alone nullifies most of PO's arguments on the disputed claim limitations.

Regarding Onishi, the POR disregards remarkable similarity between Onishi's operating frequencies and the '204 Patent's preferred embodiments. Like the '204 Patent, Onishi discloses off-resonant transmission frequencies in the near-linear region of the frequency-amplitude graph. PO attempts to distinguish Onishi by injecting unclaimed limitations in the terms "substantially different" and "incremental value," but neither construction has merit. *Axonics, Inc. v. Medtronic, Inc.*, 75 F.4th 1374, 1380-84 (Fed. Cir. 2023); *Apple Inc. v. Andrea Elecs. Corp.*, 949 F.3d 697, 706-07 (Fed. Cir. 2020).

II. CLAIM CONSTRUCTION

A. “Substantially Different” (Claims 1, 10)

The Board correctly observed in the Institution Decision that “a non-resonant transmission frequency *substantially different* from said characteristic resonant frequency of said inductive couple” encompasses frequencies that lie within one of the near-linear regions of a frequency-amplitude graph associated with the inductive couple. ID, 26. The Board’s preliminary construction reflects the same construction presented in the Petition, and PO does not dispute that a “substantially different” frequency would be in the near-linear region. *See* Pet., 7-9; POR, 28. PO’s arguments do not stop there, however. According to PO, a transmission frequency “substantially different” than the resonant frequency further implies a requirement that the claimed system implement “a linear control technique for predictably regulating power transfer.” POR, 27. To the extent a “linear control technique” involves anything more than a non-resonant transmission frequency in the near-linear region of the frequency-amplitude graph, this additional aspect of PO’s construction is wrong and should be rejected. EX1101, ¶¶7-10.

To be sure, nothing in the claims, specification, or file history provides any proper legal basis to re-define “substantially different” to further require linear control. The patentee did not act as a lexicographer to define “substantially different” in the specification, and the portions of the specification that describe

linear control are merely “examples” or “embodiments.” *See* EX1001, 4:14-17 (“Preferably”, “Optionally”), 21:16-23 (“of embodiments,” “Preferably”); 21:56-65 (“For example”), 22:45-64 (“One example”); *Home Diagnostics, Inc. v. LifeScan, Inc.*, 381 F.3d 1352, 1358 (Fed. Cir. 2004) (“Absent a clear disavowal or contrary definition in the specification or the prosecution history, the patentee is entitled to the full scope of its claim language.”); *Hill-Rom Servs. v. Stryker Corp.*, 755 F.3d 1367, 1371-73 (Fed. Cir. 2014); *Samsung Elecs. Co. v. Power2B, Inc.*, 2025 U.S. App. LEXIS 7354 (Fed. Cir. Mar. 31, 2025). The discussion of “substantially different” in the file history also lacks any mention of linear control (e.g., incremental increases/decreases in transmission frequency) as a requirement for this claim term. *See, e.g.*, EX1002, 102-105, 55-64 (file history including no discussion of incremental change as a requirement for “substantially different” frequency); EX1101, ¶¶7-10.

B. “Incremental Value” (Claims 1, 13)

PO attempts to import multiple unrecited limitations into claims 1 and 13 by loading the term “incremental value” with meaning that is both inconsistent with the breadth of the plain language of the claims and unsupported by the

specification.¹ In particular, PO contends that the claimed increase/decrease of the non-resonant transmission frequency by an “incremental value” cannot be carried out by “selecting a discrete transmission frequency value.” POR, 34. PO instead argues that these limitations require “a series of small adjustments (*e.g.*, $+\delta f_1$ or $-\delta f_2$) for reaching a particular value (or frequency range in this instance).” POR, 32, 34. Further, PO posits that the “incremental value” must represent a “gradual change” by unspecified “small” amounts. POR, 32. Not so. The Board should reject PO’s construction for at least the reasons that it earlier declined in the Institution Decision to adopt PO’s same construction presented in the POPR—especially as the POR highlights no new, meaningful evidence that would warrant a different outcome. ID, 27-32.

At the outset, Petitioner agrees with PO that “incremental value” should be interpreted according to its plain and ordinary meaning. EX1101, ¶¶10-14. However, PO’s perversion of the plain and ordinary meaning to import unclaimed limitations from preferred embodiments of the ’204 Patent (or elsewhere) must be rejected. *IQRIS Techs. LLC v. Point Blank Enters.*, 130 F.4th 998, 1003-04 (Fed.

¹ There is no dispute that Baarman392 (Grounds 2A-2B) discloses incremental frequency changes under any reasonable interpretation of “incremental value.” PO only applies its construction against Onishi (Ground 1).

Cir. 2025) (“not inclined to import limitations from the preferred embodiments into the claimed invention”). Nothing in the language or structure of the claims supports reading in a requirement for “a *series* of small adjustments ... for reaching a particular value (or frequency range ...).” POR, 32 (emphasis added). Elements [1.7]/[1.8], for example, each recite just a single incremental increase/decrease in the non-resonant transmission frequency, respectively. Claim 13 is similar. EX1101, ¶15.

The specification does not support PO’s construction. The POR cites portions of the specification that describe a “series of feedback signals” that trigger a corresponding series of incremental frequency adjustments supports, but these are not essential features. They are instead described in the context of “[o]ne *example* [] power regulation method,” while the specification explicitly acknowledges that “*other* power regulations methods ... may be used.” EX1001, 22:45-23:15 (emphasis added).

PO’s assertion that increasing/decreasing the non-resonant transmission frequency by an “incremental value” necessarily excludes “select[ion] [of] a discrete transmission frequency value” is likewise based on erroneous assumptions of fact and law. EX1101, ¶¶16-17. PO assumes without basis that there is a meaningful distinction between increasing/decreasing a transmission frequency by “adding or subtracting” an incremental value and “selecting from a finite number

of discrete values” to obtain even the same increased/decreased frequency. *See* POR, 29 (citing EX2009, ¶¶127-128), 57. There is not. The specification never describes this distinction, nor does it explain if its incremental frequency adjustments are carried out by addition/subtraction, selection of a discrete frequency, or otherwise. EX1001, 22:60-23:7, FIG. 6d. The specification’s silence cannot support PO’s request to import a negative limitation, even implicitly. *Novartis Pharms. Corp. v. Accord Healthcare, Inc.*, 38 F.4th 1013, 1017 (Fed. Cir. 2022) (“silence will not generally suffice to support a negative claim limitation”).

Lacking support in the intrinsic evidence, PO then cherry picks definitions from various dictionaries to support its construction. *See* POR, 32-34 (citing EX2006, EX2007, EX2008, EX2014). Noticeably, however, ***none*** of the dictionary definitions delineate between addition/subtraction of a value and realizing an incremental change by selection of a discrete value a particular distance from the current value. Many definitions likewise omit any requirement for a series of gradual changes or the like. *See, e.g.*, EX2006 (“2. Something added or gained.”), EX2007 (“3. *maths* a small positive or negative change in a variable or function”), EX2008 (“2. A small variation in a quantity or variable.”); EX1101, ¶18.

Even if the term “incremental value” is entitled to little patentable weight,

the Board correctly noted in the Institution Decision that this is “due to how the claim is drafted rather as a result of reading out the term.” ID, 31 (citing *SimpleAir, Inc. v. Sony Ericsson Mobile Commc’ns AB*, 820 F.3d 419, 429 (Fed. Cir. 2016) (“The preference for giving meaning to all terms ... is not an inflexible rule that supersedes all other principles of claim construction.”)); EX1103, 66:16-67:12, 76:22-77:5.

Just because PO’s imported limitations are incorrect does not mean that Petitioner would read out the term “incremental value.” As Dr. Woods explains, the term “incremental value” in the claims qualifies the magnitude of the increase/decrease in transmission frequency. EX1101, ¶19. For example, in the context of claims 1 and 13, an increase/decrease in the non-resonant transmission frequency by an “incremental value” would be sufficiently large to produce a corresponding decrease/increase in transmitted power. *Id.* This is consistent with the requirement in claim 1 for the driver to provide less/more power by the incremental frequency change. EX1001, 28:40-45. At the same time, an incremental increase/decrease would not be so large to foreclose frequency changes within the near-linear region altogether. EX1101, ¶19. This is consistent both with common definitions of “incremental” that refer to relatively “small” changes and with the specification that illustrates in FIG. 6b an incremental frequency change δf within the near-linear region 8. EX1001, FIG. 6b; EX1101,

¶19. The specification confirms that incremental values can have different sizes, but it does not otherwise impose a specific limit on the size of the incremental change within near-linear region 8. *See* EX1001, 23:5-7 (“may be greater than, less than or equal”), FIG. 6b.

III. THE BAARMAN392-TOCCI COMBINATION RENDERS OBVIOUS CLAIMS 1-6, 8, AND 10-13 (GROUND 2)²

A. Element [1.5]

The POR fails to refute the Petition’s showing that Baarman392 discloses a “non-resonant transmission frequency substantially different from said characteristic resonant frequency of said inductive couple” as recited in claim 1. POR, 63-68; EX1101, ¶¶57-65.

As an initial matter, the POR correctly acknowledges Baarman392’s express disclosure of an inverter that drives a primary charging coil at “off-resonance” frequencies—including frequencies that are “*relatively far* from resonance.” EX1006, [0038], [0056]; POR, 64. Such plain disclosure certainly would have indicated to a POSITA that Baarman392’s transmission frequencies include a frequency “substantially different” from the resonant frequency of the inductive couple. EX1101, ¶58. Notwithstanding these disclosures, PO contends that

² Petitioner first addresses Ground 2 in this Reply as the parties’ disputes in this Ground do not appear to turn on claim construction.

Baarman's "off-resonance" frequencies, which are shown to be located on the side of the frequency-amplitude graph in FIG. 3, include no "substantially different" transmission frequency as recited in claim 1. POR, 55-56; EX1006, FIG. 3. But this argument simply is not credible, especially considering the striking similarity between the transmission frequencies illustrated in FIG. 3 of Baarman392 and FIG. 6b of the '696 Patent. Pet., 67-68; EX1006, FIG. 3; EX1001, FIG. 6b; EX1101, ¶58. It also overlooks Baarman392's explanation that operating off resonance allows for a "generally predictable" increase in power transfer when the transmission frequency is changed. EX1006, [0038] (emphasis added), *see also* [0056] (explaining that the charger circuit can "operat[e] relatively far from resonance"). Such a predictable change in power transfer indicates that Baarman392's operating frequencies lie in the near-linear region of the frequency-amplitude graph. EX1101, ¶58; EX1001, 21:16-46 (conceding that the near-linear region exhibits "a much larger tolerance of variations").

PO's focus on frequency B at the far end of Baarman392's operating range also misguided. PO hangs its hat on a supposed distinction between Baarman392's description of frequency B as "*somewhat less* than the resonant frequency" and the claim requirement for a "*substantially different*" non-resonant frequency. POR, 64-66. But Dr. Woods explains that a POSITA would not have seen a meaningful difference between the vocabulary used in each document. EX1101, ¶59.

Baarman392 leaves the designer with the option of choosing an appropriate frequency B that is “somewhat less” than resonance, and a POSITA would have understood Baarman392’s description to encompass a “substantially different” frequency at least at the far end of the near-linear region closest to resonance (similar to f_U in FIG. 6b of the ’204 Patent). EX1101, ¶59.

The notion that Baarman392 does not operate in the near-linear region between frequencies A and B is also incorrect. EX1101, ¶60. Baarman392 in FIG. 3 shows a range of operating frequencies from A to B. EX1006, [0038] (“[g]enerally, the inverter 10 is operated between frequency A and frequency B”). Even under PO’s construction, the claim requirement for a “substantially different” non-resonant transmission frequency is satisfied if **any** operating frequency between A and B lies in the near-linear portion of the frequency amplitude graph. Here, the evidence is compelling that the operating frequencies bounded by A and B in Baarman392 must include the linear/near-linear region of the curve, and therefore encompasses operating frequencies that are “substantially different” from the characteristic resonant frequency as claimed. EX1101, ¶60; EX1006, [0056] (disclosing operating frequencies that extend from “near the resonant frequency” to “far from resonance”). Even Dr. Mercier—Patent Owner’s declarant—conceded that the linear/near-linear region is an inherent feature of all parabolic resonance curves for an inductive couple. EX1102, 29:17-30:23. In this context, there can be

no reasonable dispute that Baarman's operating frequencies include frequencies in the linear/near-linear region. EX1101, ¶60.

The POR also points to Baarman392's description of "piece-wise lineariz[ation]" applied to the control loop between frequencies A and B as evidence that none of these frequencies lie in a near-linear region of the frequency-amplitude graph. POR, 66-68 (citing EX1006, [0038]). Not so. The parties agree that a "substantially different" frequency need not lie in a *perfectly* linear region of the resonance curve. Pet., 7-9; POR, 28. "Substantially different" instead encompasses frequencies in a *near*-linear region—i.e., a region to which piecewise linearization could still be performed to achieve even tighter control and greater linearity, if desired. *Id.*; EX1101, ¶¶61-63. Moreover, Baarman392's option of linearizing the frequency range between A and B does not imply that no near-linear region exists within this range. *Id.* To the contrary, piecewise linearization would have been useful to ensure predictable control across the entire range of operating frequencies, even if the range included but extended beyond the near-linear region. *Id.* A POSITA certainly would have appreciated Baarman392's intention to piecewise linearize the entire operating range between frequencies A and B in at least some cases to provide more predictable control over the power transmitted by the primary coil across a wider range of frequencies and power levels than could be achieved by operation in the near-linear region alone (e.g., by including operating frequencies

between A and B that extended beyond the near-linear region where piecewise linearization would be more impactful). *Id.*; EX1006, [0038], [0056], FIG. 3. PO's assumption that piecewise linearization is inconsistent with operating in the linear/near-linear region of the resonance curve is not borne out by the evidence. *Id.*

The additional arguments on p. 68 of the POR fare no better. POR, 68; EX1101, ¶¶64-65. PO focuses on “operation of the inverter between frequency B and the beginning of the near-linear region,” which under PO's hypothetical would be *outside* the near-linear region and allegedly not “substantially different” from the characteristic resonant frequency. POR, 68. But the possibility of *some* operating frequencies being outside the near-linear region does not detract from *other* operating frequencies that do lie within the near-linear region and therefore meet the requirements of Element [1.5]. EX1101, ¶¶64-65. Baarman392's operation in the range of operating frequencies that fall within the near-linear region would naturally provide linear control (with or without further piecewise linearization). *Id.*

B. Element [1.7]

The Petition explained that “Baarman392-Tocci's driver would have predictably provided less power by increasing the non-resonant transmission frequency by twice the value of ΔFREQ when the first Boolean logic signal is detected” Pet., 72. PO raises two objections to this mapping, but neither withstands scrutiny. EX1101, ¶66.

First, PO incorrectly contends that “[t]his alleged increase of the transmission frequency—from frequency B to frequency A in Figure 3 [of Baarman392]—would occur at or near the resonant frequency” and is thus “not an incremental increase to a *non-resonant* transmission frequency in the near-linear region.” POR, 69. This argument assumes that the frequency increase necessarily occurs at frequency B, but this simply is not the case. Baarman392 explains that the operating frequency is incrementally adjusted between a “Min_FREQ” and “Max_FREQ,” and that a feedback signal indicating an abnormal charging condition, which triggers an incremental frequency increase, can be received at *any* operating frequency between Min_FREQ and Max_FREQ—not merely at Min_FREQ or frequency B. EX1006, [0054]-[0061], FIG. 7. The evidence here is clear that the operating frequencies between Min_FREQ and Max_FREQ (corresponding to frequency B and frequency A) encompass the near-linear region of the frequency-amplitude graph associated with the inductive couple. EX1101, ¶56. Accordingly, Baarman392 explicitly provides an incremental increase to a “substantially different’ non-resonant transmission frequency in the near-linear region. EX1101, ¶¶67-68. Even if the frequency increase occurred at Min_FREQ or frequency B, it would have been understood and obvious to a POSITA that these frequencies can be selected to lie within the near-linear region as well. EX1006, [0038] (“[f]requency B is somewhat less than the resonant frequency”); EX2010,

33:12-20; EX1101, ¶¶67-68.

PO's second objection that "operation of [Baarman392's] inverter between frequency B and frequency A is performed non-linearly" rests on similar errors. POR, 70. As discussed above, Baarman392's operating frequencies between frequency B and frequency A encompass the near-linear region of the frequency-amplitude graph and Baarman392's system thus *does* provide linear control in the near-linear region by incrementally increasing the transmission frequency by $2 \cdot \Delta \text{FREQ}$ when an abnormal charging condition is detected. EX1006, [0059], FIG. 6; EX1101, ¶69. Moreover, PO's objection is immaterial because Element [1.7] does not require linear control; it merely describes that the driver is configured to provide less power by incrementally increasing the non-resonant transmission frequency. EX1101, ¶69; ID, 26 (declining to import requirement for linear control).

C. Element [1.8]

PO next fails to rebut the Petition's showing that the Baarman392-Tocci *combination* renders Element [1.8] obvious. POR, 70-71; Pet., 72-73; EX1101, ¶¶70-71. Noticeably, PO's arguments on Element [1.8] only address the teachings of Baarman392 *alone*, but they altogether ignore the cited teachings of Tocci, and critically, ignore the Petition's proposed modification of Baarman392 based on Tocci to incorporate a second Boolean logic signal as the claimed "second signal []

detected by the detector.” *See* Pet., 73 (“the predictable Baarman392-Tocci combination would have been implemented so that a normal charging condition would be represented by a second Boolean logic signal (*second signal*) such as HIGH”), 57-61 (detailed analysis of “The Baarman392-Tocci Combination”), 70-71. Even if Baarman392 alone does not expressly disclose details of a second signal that triggers the driver to provide more power by incrementally decreasing the non-resonant transmission frequency, the Petition provided ample evidence that these features would have been obvious to a POSITA when further accounting for the teachings of Tocci. Pet., 72-73; EX1003, ¶¶104-111, 127-28; EX1101, ¶¶70-71. PO has waived any arguments that the Baarman392-Tocci *combination* fails to render [1.8] obvious (it does not). *See* Scheduling Order (Paper 8), p. 9 (“arguments not raised in the response may be deemed waived”).

D. Element [10.1]

PO fails to rebut the Petition’s showing that the Baarman392-Tocci combination renders Element [10.1] obvious for each of the reasons analyzed above in connection with Element [1.5]. EX1101, ¶72.

E. Element [13]

PO fails to rebut the Petition’s showing that the Baarman392-Tocci combination renders Element [13] obvious for each of the reasons analyzed above in connection with Elements [1.7]-[1.8]. EX1101, ¶73.

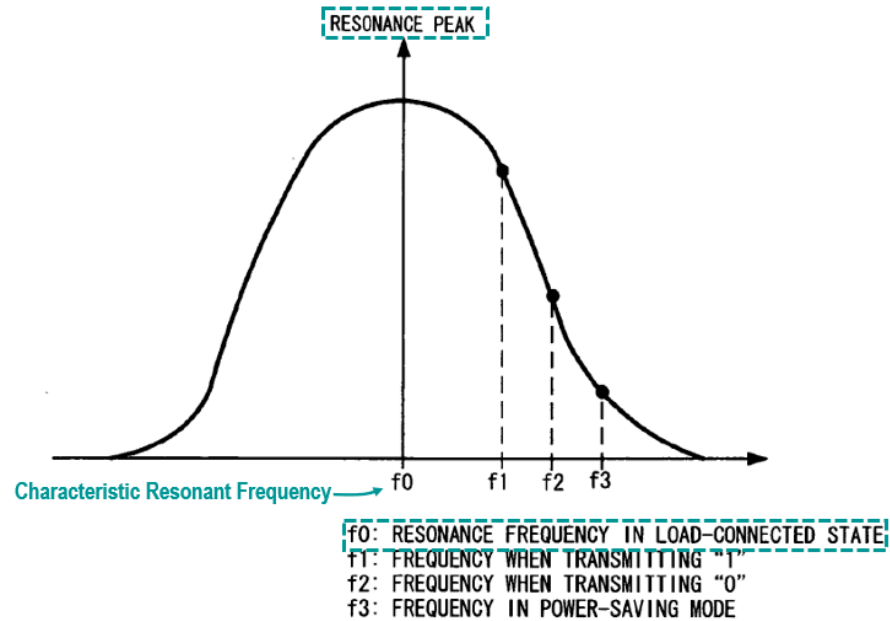
IV. ONISHI ANTICIPATES CLAIMS 1-6, 8, AND 10-13 (GROUND 1A)

A. Element [1.2]

PO's argument that Onishi lacks a "characteristic resonant frequency" of "an inductive couple" as recited in Element [1.2] reveals a flawed understanding of Onishi's disclosure and confusion over the basic physics of inductive coupling. EX1101, ¶20. The argument stems entirely from PO's strained reading of a single sentence in paragraph [0180] of Onishi that is divorced of context and contradicted by the very *next sentence* of Onishi's disclosure. POR, 36-42; EX1101, ¶¶20-26.

In more detail, PO trains its focus on the first sentence in paragraph [0180], which states that "FIG. 4 is a view showing the resonance characteristics of *the induction coil* and applications of frequencies." EX1004, [0180]. Based on the singular form of "coil" in this sentence, PO argues that FIG. 4 depicts "the resonance characteristics of the *induction coil*' (*i.e.*, primary coil L1), ..., not in the context of the resonance characteristics of an inductive couple formed by an induction coil (*i.e.*, primary coil L1) *and* a secondary coil (*i.e.*, secondary coil L2)." POR, 37 (emphasis in original).

FIG. 4



EX1004, FIG. 4 (as annotated in Petition, p. 20); EX1101, ¶¶20-21.

According to Dr. Woods, the notion that FIG. 4 does not represent the characteristics of a coupled system is wrong and belied by overwhelming evidence to the contrary. EX1101, ¶22. The next sentence in the same paragraph clarifies what FIG. 4 represents, namely “[t]he resonance characteristics of the primary coil L1 *and* the secondary coil L2 *when the portable telephone 510 is placed on the charger 500* (cradle) (i.e., *when load exists* with respect to the power transmission device 10) (see FIG. 1A) have a symmetrical and broad mountain shape, *as shown in FIG. 4.*” EX1004, [0180] (emphasis added). Onishi is thus unambiguous that FIG. 4 does not illustrate the frequency-response of an isolated coil as PO avers, but

instead illustrates the “resonance characteristics of the primary coil L1 *and* the secondary coil L2” when the coils are brought in electromagnetic proximity of each other for charging—i.e., in an *inductively coupled* state. EX1101, ¶¶22-23. The text of FIG. 4 itself even explicitly labels frequency f_0 as the “RESONANCE FREQUENCY IN LOAD-CONNECTED STATE.” EX1004, FIG. 4; *see also id.*, [0180]-[0182]; *see also* EX1001, 21:1-65 (explaining that FIG. 6b depicts the “amplitude of the operational voltage” of a single, coupled coil), FIG. 6b; EX1102, 18:21-19:6, 20:13-20:22, 24:5-21.

PO mischaracterizes Dr. Woods deposition testimony. *See* POR, 38-40. Dr. Woods offered no “admissions” that support PO’s position. Dr. Woods instead correctly acknowledged that Onishi’s primary coil L1 and secondary coil L2 may have different resonant frequencies in isolation (uncoupled), while elaborating that the characteristic resonant frequency of an inductive couple formed between L1 and L2, and thus the shared characteristic resonant frequency of the coils when coupled, may be different from their respective resonant frequencies in isolation (uncoupled). EX2007, 8:22-10:14, 9:10-21; *see also id.*, EX1101, ¶¶24-25; EX2007, 11:9-13:6.

PO’s argument also fails for a more basic reason independent of any textual analysis of Onishi. Namely, a characteristic resonant frequency is an inherent physical property of any inductive couple like that disclosed in Onishi. EX1101, ¶¶26. Both parties’ experts agree. *Id.*; EX1102, 29:18-30:23, 33:15-41:15. Onishi

discloses one such inductively coupled system. EX1004 (“The primary coil L1 ... is electromagnetically coupled with the secondary coil L2 ...”); EX1101, ¶26.

B. Element [1.5]

1. Onishi Discloses Transmission Frequencies f_1 , f_2 , and f_3 Substantially Different from the Characteristic Resonant Frequency of the Inductive Couple

Onishi and the '204 Patent both describe transmission frequencies in essentially the same region of a frequency-amplitude graph. EX1101, ¶¶27-34. In the preferred embodiment of the '204 Patent, the transmission frequency is selected between f_U and f_b as illustrated in FIG. 6b below. During prosecution, PO described the region between f_U and f_b as “near-linear,” although though the patent offers no more specific/quantitative guidance about this region such as the degree of linearity required.

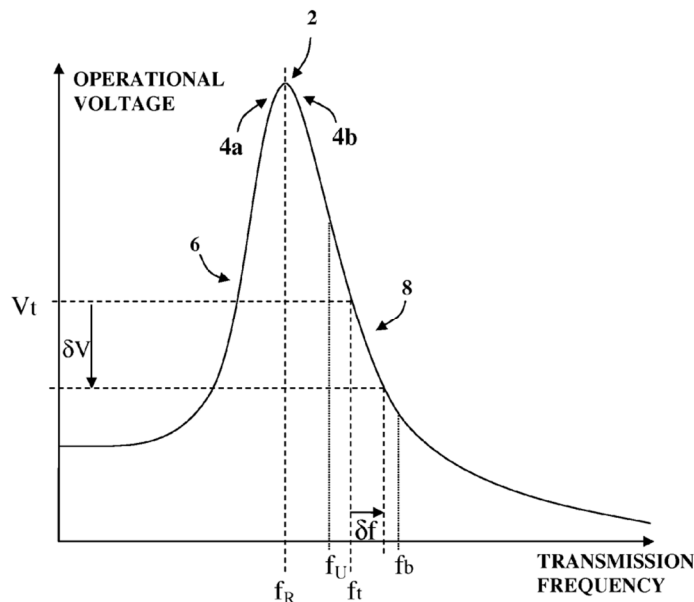
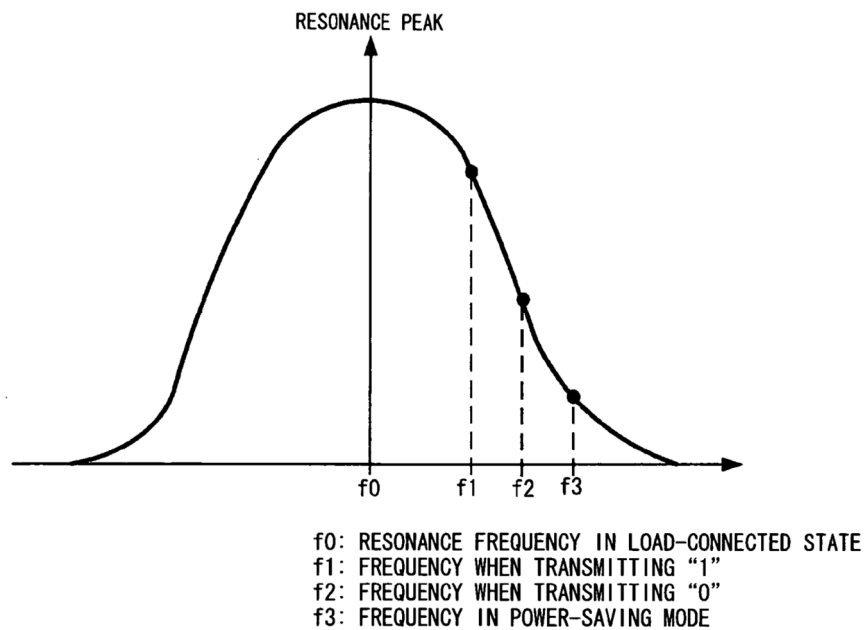


Fig. 6b

EX1001, FIG. 6B; *see also id.*, 21:16-23, 21:56-65.

Onishi similarly discloses three transmission frequencies (f_1 , f_2 , f_3) that each lie within substantially the same region of the frequency-amplitude graph as the region identified in FIG. 6b of the '204 Patent:



EX1004, FIG. 4, [0180]-[0181]. As Dr. Woods observed in his first declaration, “the substantially similar positions of Onishi’s frequencies f_1 , f_2 , and f_3 in the frequency-response curve as the transmission frequency (e.g., f_t in FIG. 6B) identified as ‘substantially different’ in the [’204] specification confirms that Onishi discloses a transmission frequency that is ‘substantially different’ from the characteristic resonant frequency ... ” at least to the same extent as the '204 Patent.

EX1003, ¶59; EX1101, ¶¶27-28.

Despite the clear overlap between Onishi’s disclosure and the '204 Patent, PO

contends that none of f_1 , f_2 , or f_3 qualifies as a frequency that is “substantially different.” For instance, as to f_1 and f_2 , PO argues that these frequencies “are at or near the resonance frequency” and therefore not “substantially different.” POR, 44. The primary support PO draws for this argument comes from paragraph [0053] of Onishi, which explains that “[t]he transmission frequency during power-saving power transmission is set at a frequency apart from the resonance frequency (resonance peak) as compared with the frequency during normal power transmission[]”³ EX1004, [0053]; POR, 38-39. But this sentence only addresses the *relative* positions of the transmission frequencies during normal power transmission (f_1 , f_2) and during power-saving power transmission (f_3). EX1004, [0053] (“*as compared with*”). Nothing in paragraph [0053] or elsewhere in Onishi implies that f_1 and f_2 “are at or near the resonance frequency” as alleged. Frequencies f_1 and f_2 are merely positioned closer to resonance than f_3 , much like f_U is relatively closer to resonance than f_b in FIG. 6b of the ’204 Patent. EX1101, ¶¶29-30; *see also id.* ¶¶24-25, 27, 29-30.

PO’s contention that f_1 and f_2 are necessarily at or near resonance merely

³ Frequencies f_1 and f_2 are used during normal power transmission while frequency f_3 is used during power-saving power transmission. EX1004, [0134], [0162], [0181], [0211], [0214]-[0215].

because f_3 is even further from resonance is illogical and contrary to the clear disclosure in FIG. 4, which shows f_1 and f_2 set significantly apart from f_0 . EX1004, FIG. 4. EX1101, ¶30; *see also* EX1004, [0181] (“the relationship ‘ $f_1 > f_2 > f_3$ ’ is satisfied”); *cf.* EX1102, 42:2-44:1 (acknowledging that in the ’204 Patent the near-linear region includes frequencies that are closer to the resonance frequency as compared to other frequencies in the near-linear region); *see also id.*, 18:21-19:6, 20:13-22, 24:5-21, 29:17-30:23, 34:7-16, 36:6-9, 40:20-41:11, 48:6-49:13, 65:17-66:2. PO’s related criticisms of the “broad mountain shape” of Onishi’s graph are also baseless since, as shown in FIG. 4, frequencies f_1 and f_2 both fall well outside the broad cap of the curve and are instead positioned on the near-linear slope to the side of the broad cap. EX1004, [0180], FIG. 4; EX1101, ¶30.

PO’s efforts to dismiss Onishi’s frequency f_3 as not “substantially different” from the characteristic resonant frequency are also deficient. EX1101, ¶31, *see also id.* ¶¶24, 26-30. Onishi expressly describes f_3 as a “transmission frequency during power-saving power transmission” that “is set at a frequency *apart* from the resonance frequency (resonance peak).” EX1004, [0053] (emphasis added); EX1101, ¶¶31-34. As shown in FIG. 4, frequency f_3 is “substantially different” from resonant frequency f_0 under any reasonable understanding of Onishi’s figure and under any reasonable interpretation of the claim term “substantially different.” EX1004, [0181], [0214]-[0215], [0226], FIG. 4. Indeed, f_3 must be set substantially

off-resonance to achieve the lower power transmission levels that are desired and characteristic of Onishi's power-saving power transmission mode. *Id.* Onishi's frequency f_3 is noticeably also not located far out on the tail of the graph but instead lies to the side of the peak in a similar position to frequencies near the boundary f_b in FIG. 6b of the '204 Patent. EX1004, FIG. 4 (position of f_1 , f_2) *cf.* EX1001, FIG. 6b; EX1101, ¶¶31-34.

Onishi explains that f_3 “is a frequency used in the power-saving mode” and is selected such that “the power transmission device can reliably detect a change in load state by determining a change in amplitude using the threshold value.” EX1004, [0181], [0064]. These teachings, in view of FIG. 4 of Onishi, indicate that the position of f_3 is not only set sufficiently apart from resonance to achieve lower power transfer, but also would not be so far from resonance that the power transmission device could not reliably detect the change in load state. EX1101, ¶¶39-42. A POSITA would have understood that frequencies at the far end of the near-linear region of the frequency amplitude graph would meet these criteria and that frequency f_3 would thus be set in the near-linear region of the graph. *Id.* This would allow for some incremental change (e.g., increase) without incurring a large unpredictable fluctuation of induced voltage in order to “reliably detect a change in load state by determining a change in amplitude using the threshold value.” EX1004, [0064], EX1101, ¶¶39-42. Contrary to PO's argument, f_3 being positioned

in a region where a small amount of power transmitted is consistent with positioning f_3 at the lower boundary of the near-linear region as shown in FIG. 4. EX1004, [0064], [0180]-[0181], FIG. 4.

2. Onishi's FIG. 4 is Sufficiently Clear to Illustrate Frequencies in the Near-Linear Region

PO's assertions that Onishi's FIG. 4 lacks sufficient detail to support anticipation of Element [1.5] have no merit. POR, 44-49; EX1101, ¶¶43-48. Although PO argues that FIG. 4 itself does not disclose the "the actual locations" of f_1 , f_2 , and f_3 on the frequency-amplitude graph, the Petition does not interpret FIG. 4 in a vacuum. The Petition instead analyzes FIG. 4 in the context of Onishi's detailed description of the figure and its explanation of the relationships between f_1 , f_2 , and f_3 . *See supra*, §IV.B.1. Onishi expressly discloses that these frequencies correspond to actual frequencies of the system in operation. EX1004, [0180]-[0181] ("applications of frequencies" and " f_1 is a frequency used... f_2 is a frequency used... f_3 is a frequency used"), FIG. 4, *see also* [0134], [0162], [0180], [0211]-[0212], [214]-[0215], [0226], [0230], [0232], [0234], FIG. 3A. Noticeably, Onishi's frequencies are positioned nearly identically to the transmission frequencies shown in the '204 Patent. *Compare* EX1004, FIG. 4 *with* EX1001, FIG. 6B; EX1101, ¶¶43-48. PO contends that the bounds of a near-linear region can be discerned for purposes of infringement without "numerical guidance" from the patent; it follows

that a POSITA also would have been capable of properly interpreting Onishi's FIG. 4 to understand that frequencies f_1 - f_3 each lie in the near-lin. *In re Epstein*, 32 F.3d 1559, 1568 (Fed. Cir. 1994); *Uber Techs., Inc. v. X One, Inc.*, 957 F.3d 1334, 1339 (Fed. Cir. 2020) ("specification ... is entirely silent ... suggesting that a [POSITA] was more than capable"); *In re Publicover*, 813 F. App'x 527, 532 (Fed. Cir. 2020) (rejecting argument that a POSITA would not know how to implement the prior art since the patent's "specification is just as sparse"); EX1103, 73:13-21 (Dr. Mercier: "The figure [6b] is not to scale."). Moreover, Dr. Woods explains that a POSITA would have understood FIG. 4 to clearly represent power transfer characteristics in Onishi's coupled system across a range of frequencies. EX1101, ¶47. Even though FIG. 4 does not include detailed dimensions, that does "not mean that things patent drawings show clearly are to be disregarded." *In re Mraz*, 455 F.2d 1069, 1072 (CCPA 1972); ID, 42; *see also Alivecor, Inc. v. Apple Inc.*, 130 F.4th 1006, 1015 (Fed. Cir. 2025) ("To restrict each reference's teachings ... would improperly fail to read these references for all that they disclose").

C. Elements [1.7]-[1.8]

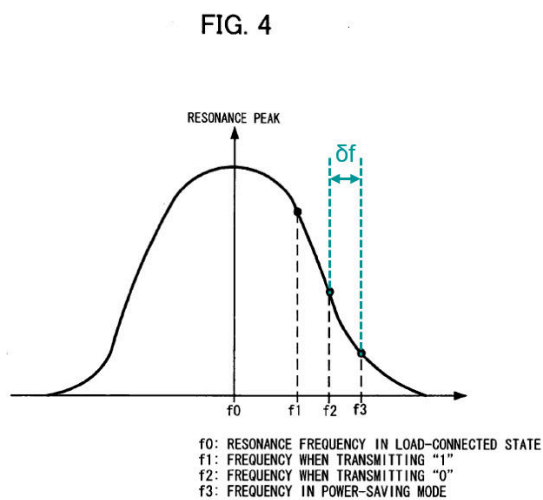
The POR's arguments on Elements [1.7]-[1.8] are identical in substance to PO's pre-institution arguments in the POPR. *Compare* POR, 55-62 with 38-43. These arguments are premised on PO's erroneous interpretation of "incremental value" as requiring a series of frequency adjustments (e.g., gradual adjustments to

an acceptable frequency range) as opposed to selection of a discrete frequency value an incremental distance from the current frequency. *See* POR, 28-34, 55-62; *supra*, §II.B; EX1101, ¶¶49-53. In the Institution Decision, the Board preliminarily (but correctly) found PO's arguments lacking and determined that the Petition had demonstrated a reasonable likelihood that Onishi discloses [1.7]-[1.8]. ID, 46-47. Here, the POR contains no new argument, and cites no new evidence, addressing why the Board's preliminary determination should be disturbed. It should not.

As the Petition explained, when initiating power-saving power transmission, Onishi's power transmission section 12 (a component of the *driver*) provides less power by increasing the non-resonant transmission frequency by an incremental value from "f1" or "f2" to "f3." EX1005, [0053], [0171], [0181], [0215], [0133]-[0136], FIG. 4. Likewise, when initiating normal power transmission, transmission section 12 provides more power by decreasing the non-resonant transmission frequency by an incremental value from "f3" to "f1" or "f2." *Id.*; Pet., 33-36. These concepts are illustrated in FIG. 4 below, which shows an incremental increase from f2 to f3 and an incremental decrease from f3 to f2, for example. EX1101, ¶52. The scale of Onishi's frequency change falls squarely within the bounds of an "incremental value." For example, Onishi's incremental frequency change is sufficiently large to impart a change in power delivery while also

sufficiently small to maintain transmission in the near-linear region. EX1101, ¶52.

In fact, the delta between Onishi's frequencies f_2 and f_3 (and between f_1 and f_2) is shown to be of a similar scale to the incremental increase δf depicted in FIG. 6b of the '204 Patent (e.g., as a portion of the near-linear region of the frequency-amplitude graph):



Onishi, FIG. 4 (annotated)

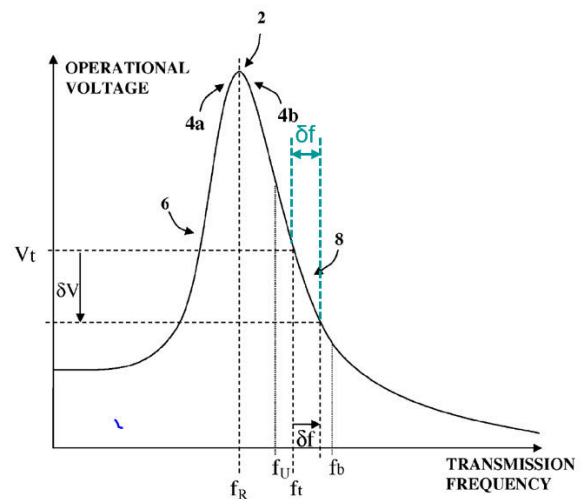


Fig. 6b

'204 Patent, FIG. 6b (annotated)

EX1101, ¶¶52-53.

D. Element [10.1]

PO fails to rebut the Petition's showing that Onishi discloses Element [10.1] obvious for each of the reasons analyzed above in connection with Element [1.5].

EX1101, ¶54.

E. Element [13]

PO fails to rebut the Petition's showing that Onishi discloses Element [13] for each of the reasons analyzed above in connection with Elements [1.7]-[1.8].

EX1101, ¶55.

V. THE ONISHI-PURDY COMBINATION RENDERS OBVIOUS CLAIMS 1-6, 8, AND 10-13 (GROUND 1B)

PO relies only on its same arguments from Ground 1A in contending that Ground 1B fails based on alleged deficiencies in Onishi's disclosure with respect to Elements [1.2], [1.5], and [10.1]. POR, 63. These arguments are unconvincing, and accordingly, should be rejected for the same reasons addressed above in Ground 1A. *Supra*, §V; EX1101, ¶56.

VI. CONCLUSION

The Challenged Claims are unpatentable based on Grounds 1A-2 for each of the reasons set forth in the Petition and this Reply.

Respectfully submitted,

Date: 08/20/2025

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CERTIFICATION UNDER 37 CFR §42.24

Under the provisions of 37 CFR § 42.24(d), the undersigned hereby certifies that the word count for the foregoing Petitioner's Reply to Patent Owner's Response totals 5,555 words, which is less than the 5,600 allowed under 37 CFR § 42.24(c)(4).

Respectfully submitted,

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CERTIFICATE OF SERVICE

Pursuant to 37 CFR § 42.6(e)(4), the undersigned certifies that on August 20, 2025, a complete and entire copy of this Petitioner's Reply to Patent Owner's Response and associated exhibits, were provided via email, to the Patent Owner by serving the email correspondence addresses of record as follows:

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