

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ANKER INNOVATIONS LTD.,
Petitioner,

v.

POWERMAT TECHNOLOGIES LTD.,
Patent Owner.

IPR2024-00994
Patent 9,048,696 B2

Before KEN B. BARRETT, PATRICK R. SCANLON, and
JOHN R. KENNY, *Administrative Patent Judges*.

BARRETT, *Administrative Patent Judge*.

DECISION
Granting Institution of *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

A. Background and Summary

Anker Innovations Ltd. (“Petitioner”)¹ filed a Petition requesting *inter partes* review of U.S. Patent No. 9,048,696 B2 (“the ’696 patent,” Ex. 1001). Paper 2 (“Pet.”). The Petition challenges the patentability of claims 1–7 and 9–14 of the ’696 patent. Powermat Technologies Ltd. (“Patent Owner”)² filed a Preliminary Response to the Petition. Paper 6 (“Prelim. Resp.”).

An *inter partes* review may not be instituted “unless . . . the information presented in the petition . . . shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” 35 U.S.C. § 314(a). Having considered the arguments and evidence presented by Petitioner and Patent Owner, we determine that Petitioner has demonstrated a reasonable likelihood of prevailing on at least one of the challenged claims of the ’696 patent. Further, we decline to discretionarily deny *inter partes* review. Accordingly, we institute an *inter partes* review as to all the challenged claims of the ’696 patent on all the grounds of unpatentability set forth in the Petition.

B. Related Proceedings

Both parties identify, as matters involving or related to the ’696 patent: *Powermat Technologies Ltd. v. Anker Innovations Ltd.*, 5:23-cv-00052 (E.D. Tex.); *Powermat Technologies Ltd. v. Shenzhen DAK*

¹ Petitioner identifies Anker Innovations Ltd. as the real party in interest. Pet. 83.

² Patent Owner identifies Powermat Technologies Ltd. as the real party in interest. Paper 4, 1.

Technology Co., Ltd. d/b/a Choetech, 6:21-cv-00723 (W.D. Tex.); *Powermat Technologies Ltd. v. Shenzhen Huashuntong Logistics Co., Ltd. d/b/a Nanami*, 6:21-cv-00724 (W.D. Tex.); and *Powermat Technologies Ltd. v. Shenzhen Kaixinghui Technology Co., Ltd. d/b/a Yootech*, 6:21-cv-00725 (W.D. Tex.). Pet. 84; Paper 4, 1.

C. The '696 Patent

The '696 patent pertains to inductive electrical power transfer. Ex. 1001, 1:19–20. “Inductive power coupling, as known in the art, allows energy to be transferred from a power supply to an electric load without connecting wires.” *Id.* at 1:27–29. “A power supply is wired to a primary coil and an oscillating electric potential is applied across the primary coil, thereby inducing an oscillating magnetic field,” which induces an oscillating current in a secondary coil. *Id.* at 1:29–35. “When electrical energy is transferred from a primary coil to a secondary coil the coil pair are said to be inductively coupled.” *Id.* at 1:37–39.

Figure 6b is reproduced below.

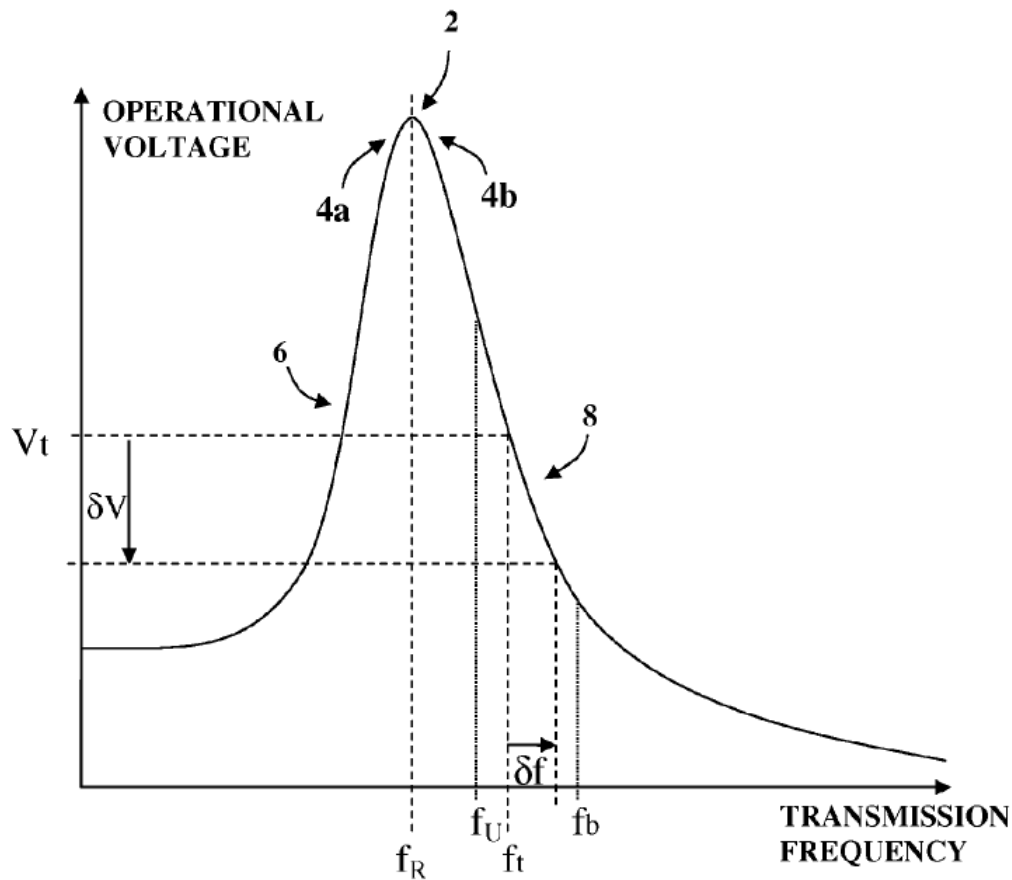


Fig. 6b

Figure 6b is “a graph showing how the amplitude of the operational voltage varies according to the transmission frequency.” *Id.* at 21:1–3. The induced voltage can be increased or decreased by a corresponding change in transmission frequency. *See id.* at 21:61–65 (describing the depicted example where an increase in transmission frequency of δf produces a decrease in induced voltage of δV). As shown in the figure, the voltage is at its highest when the transmission frequency is equal to the resonant frequency f_R of the system, at resonance peak 2. *Id.* at 21:3–6. According to the '696 patent, “the slope of the graph is steepest in the regions 4a, 4b to either side of the resonance peak 2,” and “a small variation in frequency

results in a large change in induced voltage.” *Id.* at 21:6–12. “For this reason prior art inductive transfer systems are typically very sensitive to small fluctuations in environmental conditions or variations in alignment between the induction coils.” *Id.* at 21:12–15; *see also id.* at 21:34–36 (“As a result of the changing alignment, the combined inductance of the coil pair changes which in turn changes the resonant frequency of the system.”).

The ’696 patent states,

It is a particular feature of embodiments of the current invention that the driver . . . is configured and operable to transmit a driving voltage which oscillates at a transmission frequency which is substantially different from the resonant frequency of the inductive couple. Preferably the transmission frequency is selected to lie within one of the near-linear regions 6, 8 where the slope of the frequency-amplitude graph is less steep.

Id. at 21:16–23; *see also id.* at 21:56–59 (“Referring back to FIG. 6*b*, the frequency of transmission is selected to be in the approximately linear region 8 of the curve between a lower frequency value of f_L , and an upper frequency value of f_U .”).

The Specification further states,

If the inductive power outlet . . . transmits power at the resonant frequency of the system, even a small lateral movement would reduce significantly the amplitude of the induced voltage. In contradistinction, according to embodiments of the present invention, the inductive power outlet . . . transmits power at a frequency in one of the regions 6, 8 to either side of the resonance peak 2 (FIG. 6*b*) where the slope of the resonance graph is much shallower. Consequently, the system has a much larger tolerance of variations such as lateral movement.

Id. at 21:37–46.

According to the '696 patent,

Another advantage of non-resonant transmission is that the transmission frequency may be used to regulate power transfer. In known inductive power transfer systems, power is typically regulated by altering the duty cycle of the transmission voltage provided by the driver. Thus, it will be appreciated that when the transmission frequency is not equal to the resonance frequency of the system, the driver . . . may be configured to adjust the transmission frequency in order to regulate the power transfer.

Id. at 21:47–55.

D. Illustrative Claim

Of the challenged claims of the '696 patent, claim 1 is an independent claim. The remaining challenged claims depend directly or indirectly from claim 1. Claim 1, reproduced below with bracketed annotations³ inserted, is illustrative.

1. [1P] An inductive power outlet operable to transfer power to an inductive power receiver, said inductive power outlet comprising:
 - [1.1] a platform for supporting said inductive power receiver;
 - [1.2] at least one primary inductive coil embedded in said platform;
 - [1.3] an alignment mechanism configured to facilitate alignment between said primary inductive outlet and said inductive power receiver [1.4] such that an inductive couple is formed between said primary inductive coil and a secondary inductive coil of said inductive power receiver, said inductive couple having a characteristic resonant frequency; and

³ We utilize Petitioner's annotations for claim 1 but have retained the paragraph formatting from the issued patent.

[1.5] a driving circuit wired to said primary inductive coil,
[1.6] said driving circuit comprising a switching unit
configured and operable to provide an oscillating driving
voltage across said primary inductive coil such that a
secondary voltage is induced in the secondary inductive
coil;

[1.7] wherein said driving circuit is configured and operable to
produce said oscillating driving voltage at a transmission
frequency substantially different from said characteristic
resonant frequency of said inductive couple.

Ex. 1001, 28:25–46.

E. Evidence

Petitioner relies on the following references:

Name	Reference	Exhibit No.
Onishi	US 2008/0197804 A1, published Aug. 21, 2008	1004
Flowerdew	US 7,211,986 B1, filed July 1, 2004, issued May 1, 2007	1005
Partovi	US 2007/0279002 A1, published Dec. 6, 2007	1007
Baarman392	US 2008/0079392 A1, published April 3, 2008	1008
Tocci	RONALD J. TOCCI ET AL., DIGITAL SYSTEMS: PRINCIPLES AND APPLICATIONS (10th ed. 2007)	1009

Petitioner also relies on the declaration of Dr. Gary L. Woods (Ex. 1003) in support of its arguments, and Patent Owner relies on the declaration of Dr. Patrick Mercier (Ex. 2001) in support of its arguments. The parties also rely on other exhibits as discussed below.

F. Asserted Grounds of Unpatentability

Petitioner asserts that the challenged claims are unpatentable on the following grounds:

Claim(s) Challenged	35 U.S.C. § ⁴	Reference(s)/Basis
1–7, 9, 10, 13, 14	103(a)	Onishi, Flowerdew
11–13	103(a)	Onishi, Flowerdew, Partovi
1, 3–5, 7, 9–14	103(a)	Baarman392, Partovi
2, 6	103(a)	Baarman392, Partovi, Tocci

II. 35 U.S.C. § 325(d)

Patent Owner contends that we should exercise discretion under 35 U.S.C. § 325(d) to deny the Petition, applying the Board’s precedential decision in *Advanced Bionics, LLC v. MED-EL Elektromedizinische Geräte GmbH*, IPR2019-01469, Paper 6 (PTAB Feb. 13, 2020) (precedential) (“*Advanced Bionics*”). Prelim. Resp. 26–34. For the reasons below, we do not exercise discretion to deny institution under § 325(d).

Section 325(d) provides that, in determining whether to institute an *inter partes* review, “the Director may take into account whether, and reject the petition or request because, the same or substantially the same prior art or arguments previously were presented to the Office.” 35 U.S.C. § 325(d). The Board uses a two-part framework in determining whether to exercise its discretion under § 325(d), specifically:

- (1) whether the same or substantially the same art previously was presented to the Office or whether the same or substantially

⁴ For purposes of this Decision, we assume the challenged claims have an effective filing date prior to March 16, 2013, the effective date of the relevant aspects of the Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (“AIA”), and we apply the pre-AIA version of 35 U.S.C. § 103.

the same arguments previously were presented to the Office;
and
(2) if either condition of [the] first part of the framework is satisfied, whether the petitioner has demonstrated that the Office erred in a manner material to the patentability of challenged claims.

Advanced Bionics, Paper 6 at 8. The art or arguments presented in the Petition are not “substantially the same” as those previously presented to the Office when there are differences between them that are material to the Office’s prior consideration of the art and arguments. *Wolfspeed, Inc. v. Trs. of Purdue Univ.*, IPR2022-00761, Paper 13 at 7–8 (Vidal Mar. 30, 2023).

A. Prosecution History

Independent claim 1, the only independent claim before us, calls for a “driving circuit [that] is configured and operable to produce said oscillating driving voltage at a transmission frequency *substantially different* from said characteristic resonant frequency of said inductive couple.” Ex. 1001, 28:43–46 (emphasis added). During prosecution, as in this *inter partes* review, a dispositive issue was whether the prior art taught the “substantially different” aspect of that limitation.

Original application claim 1 recited, for the corresponding limitation, “said driving voltage oscillates at a transmission frequency *significantly different* from said characteristic resonant frequency of said inductive couple.” Ex. 1002, 264 (emphasis added). The Examiner issued a non-final office action that, *inter alia*, rejected the original claims as being indefinite and as obvious over Malpas (WO 2006/031133, Ex. 1017). *Id.* at 129–134. The applicant amended claim 1 to the form substantively as-issued. *See id.* at 106; *id.* at 69 (after-final amendment stating, “Claim 1 has been amended to remove a semicolon thereby correcting a typographical error.”). In

amending the claim, the applicant, *inter alia*, added an alignment mechanism, added structure related to the transmission frequency (“said driving circuit is configured and operable to produce said oscillating driving voltage at a transmission frequency”), and changed “significantly” to “substantially.” *See id.* at 106. The applicant argued that “it is clear that Malpas describes systems at which the transmission frequency is selected to be as close as possible to the resonant natural frequency of the pick-up,” as opposed to the claimed “substantially different” frequency. *See id.* at 113.

In the final rejection, the Examiner withdrew the indefiniteness rejection but maintained the Malpas obviousness rejection. *See id.* at 84–93.

An interview between the applicant and the Examiner was held, and “[a]greement was reached that remarks directed to the claim language, Malpas, Figure 6B, and [0160+] would overcome the rejection of record.” *Id.* at 77 (brackets in original).

The applicant filed a response to the final office action, arguing that “one having ordinary skill in the art would appreciate that the term ‘*substantially different from said characteristic resonant frequency*’ recited in claims 1 and 17, in view of at least Fig. 6b, should be interpreted to mean that the frequency of the driving voltage is selected so as to lie within one of the near-linear regions of a frequency-amplitude graph associated with the inductive couple.” *Id.* at 70. The applicant further argued that, “[b]y contrast, Malpas describes systems at which the transmission frequency is selected to be as close as possible to the resonant natural frequency of the pick-up.” *Id.*

The Examiner subsequently issued a notice of allowability without including a statement of reasons for allowance. *See id.* at 48.

B. Discussion

Patent Owner agrees that Petitioner’s primary references, Baarman392 and Onishi, were not considered during prosecution, but argues that those two references are substantially the same as a reference that is listed on the face of the ’696 patent, Baarman263 (US 2009/0174263; Ex. 2002). *See* Prelim. Resp. 28–32. Patent Owner asserts that Partovi “was previously considered by the Examiner in an IDS [Information Disclosure Sheet],” that Flowerdew is cumulative to Baarman263, and that Tocci is cumulative of Young (US 5,455,467; Ex. 2005), which was listed on an IDS. *See id.* at 30–33. Patent Owner does not allege that the Examiner discussed any of the purported substantially same references.

For Petitioner’s primary references, Baarman392 and Onishi, Patent Owner compares Petitioner’s contentions regarding the “substantially different” limitation 1.7 made in the District Court and in the Petition. *See* Prelim. Resp. 28–29, 31. Patent Owner asserts that Petitioner, in the District Court, contends that prosecution reference Baarman263 “discloses the driving circuit being configured and operable to produce said oscillating driving voltage at *a transmission frequency substantially different* from said characteristic resonant frequency of said inductive couple.” *Id.* at 29 (citing Ex. 2004, 32) (emphasis added). Patent Owner notes that the Petition contends, “With respect to FIG. 3, Baarman392 explains that ‘[g]enerally, the inverter 10 is *operated between frequency A and frequency B.*’ . . . As shown here, Baarman392’s inverter 10 . . . produces a driving voltage at *a non-resonant transmission frequency within a near-linear region of the power transfer curve.*” *Id.* at 29 (citing Pet. 63–64; alternations by Patent Owner; emphases ours). Thus, the Petition’s contentions regarding Baarman392 refer to specific, near-linear regions of the curve, whereas the

District Court contention regarding Baarman263 is in terms of “substantially different.” Patent Owner also argues that the curves depicted in the Petition and prosecution references are almost identical. *Id.* at 30. However, Patent Owner does not assert that prosecution reference Baarman263 contains a discussion, like that of the Petition’s Baarman392 reference, of the purportedly near-linear range between frequency A and frequency B. *See id.*; *see* Ex. 1008 ¶ 38 (Baarman392 stating, “even if the inverter 10 is not operating at resonance, significant power transfer can occur when the inverter is operating off-resonance. Generally, the inverter 10 is operated between frequency A and frequency B. . . . Between frequency A and frequency B, the power transfer curve can be piece-wise linearized by a software lookup table located in the controller 20.”).

As discussed above, the applicant, in an After-Final Response, argued that “substantially different” means a frequency on the near-linear portion of the curve. *See* Ex. 1002, 70. The Examiner soon thereafter allowed the claims. We do not agree with Patent Owner’s argument that the two references are substantially the same because the reference not considered by the Examiner specifically discusses operation in what Petitioner contends is the near-linear portion of the curve.

For Petitioner’s Onishi reference and prosecution reference Baarman263, Patent Owner’s arguments are like those just discussed for Baarman392. *See* Prelim. Resp. 31–32. Patent Owner again argues that the references’ disclosed curves are similar and that the contentions in the Petition and in the District Court are similar. *Id.* Like above, Petitioner’s contentions and Onishi’s disclosures pertain to operating at specific frequencies on the purported near-linear portion of the curve. *See* Pet. 27

(contending that “Onishi discloses that the power transmission section 12 . . . is configured and operable to supply an oscillating driving voltage to primary coil L1 (primary inductive coil) that oscillates at a non-resonant transmission frequency (e.g., frequencies f1, f2, or f3) that is substantially different from the characteristic resonant frequency (e.g., frequency f0),” and “each of frequencies f1, f2, and f3 lie in a near-linear region of the frequency-response curve.”); e.g., Ex. 1004 ¶ 181 (“In FIG. 4, the frequency f1 is a frequency used when transmitting "1" during normal power transmission. The frequency f1 is a basic frequency during power transmission. . . . A frequency f3 is a frequency used in the power-saving mode.”). And, again, Patent Owner does not assert that prosecution reference Baarman263 contains a discussion, like that of the Petition’s Onishi reference, of operating at points in the purportedly near-linear range. We do not agree with Patent Owner’s argument that Onishi and Baarman263 are substantially the same.

Petitioner’s Partovi, Flowerdew, and Tocci references pertain to Petitioner’s contention that alignment mechanisms and that expressing binary conditions as Boolean variables were well known. *See, e.g.*, Pet. 14–15, 46, 54, 71–72. Neither of those teachings is alleged to have been material issues during prosecution. Rather, the value of those references to an obviousness analysis is their combination with a reference directed to the “substantially different” limitation.

Although Partovi, having appeared on an IDS, is art previously presented to the Office, *Advanced Bionics*, Paper 6 at 7–8, none of the other references were. And, as argued by Petitioner, no combination based on Petitioner’s primary references, Baarman392 and Onishi—with their

material curve-location teachings—was before the Office during prosecution. *See* Pet. 82 (arguing, “nothing in the file history suggests that the Examiner ever considered the combinations of prior art references advanced in Grounds 1A–2B of this Petition.”). Accordingly, although we have considered Patent Owner’s request for exercise of discretion to deny institution under 35 U.S.C. § 325(d), on the record before us, we determine that § 325(d) is not sufficiently implicated such that its statutory purpose would be undermined by institution of a review. We, therefore, decline to deny the Petition under § 325(d).

III. ANALYSIS OF PETITIONER’S CHALLENGES

A. Principles of Law

Petitioner bears the burden of persuasion to prove unpatentability of the claims challenged in the Petition, and that burden never shifts to Patent Owner. *Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015).

A patent claim is unpatentable under 35 U.S.C. § 103(a) if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4) if present, any objective evidence of

obviousness or non-obviousness.⁵ *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

B. The Level of Ordinary Skill in the Art

In determining the level of ordinary skill in the art, various factors may be considered, including the “type of problems encountered in the art; prior art solutions to those problems; rapidity with which innovations are made; sophistication of the technology; and educational level of active workers in the field.” *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995) (quoting *Custom Accessories, Inc. v. Jeffrey–Allan Indus., Inc.*, 807 F.2d 955, 962 (Fed. Cir. 1986)).

Petitioner contends that:

[A] person of ordinary skill in the art at the time of the alleged invention (“POSITA”) would have had a bachelor’s degree or higher in electrical engineering, at least 3 years of experience designing or researching electronic circuits, and familiarity with power electronics and inductive power transfer circuits.

Pet. 6 (citing Ex. 1003 ¶ 20).

Patent Owner, at this stage, does not disagree or propose a different definition of the person of ordinary skill in the art. However, Patent Owner’s declarant, Dr. Mercier, opines that

[A]t the time of the ’696 Patent, a POSITA would have a working knowledge of wireless charging and inductive charging. The person would have gained this knowledge through an undergraduate Bachelor of Science degree in electrical engineering, computer engineering, computer science, or a related field, with at least two years of experience working in the field of wireless or inductive charging device design, or testing of such wireless or inductive charging device testing, or

⁵ The parties have not directed our attention to any objective evidence of obviousness or non-obviousness.

an equivalent combination of academic study and work experience. More education (e.g., a Master's degree) or work experience any relevant field may compensate for a deficit in one of the relevant qualifications stated above.

Ex. 2001 ¶ 26.

We observe that, in Dr. Mercier's definition, the undergraduate degree categories are a bit broader and the experience possibly a bit more specific than in Petitioner's definition. However, at this stage and absent argument to the contrary by the parties, we discern no material difference between the parties' definitions. Petitioner's definition is consistent with the level of ordinary skill reflected in the prior art references of record. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (recognizing that the prior art itself may reflect an appropriate level of skill in the art). For purposes of this decision, we apply Petitioner's definition of the person of ordinary skill in the art. We note, however, that were we to adopt Dr. Mercier's assessment, the outcome of this Decision would be the same.

C. Claim Construction

We apply the same claim construction standard used in district court actions under 35 U.S.C. § 282(b), namely that articulated in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). *See* 37 C.F.R. § 42.100(b). In applying that standard, claim terms generally are given their ordinary and customary meaning as would have been understood by a person of ordinary skill in the art at the time of the invention and in the context of the entire patent disclosure. *Phillips*, 415 F.3d at 1312–13. “In determining the meaning of the disputed claim limitation, we look principally to the intrinsic evidence of record, examining the claim language itself, the written description, and the prosecution history, if in evidence.” *DePuy Spine, Inc.*

v. Medtronic Sofamor Danek, Inc., 469 F.3d 1005, 1014 (Fed. Cir. 2006) (citing *Phillips*, 415 F.3d at 1312–17). “[W]hile extrinsic evidence can shed useful light on the relevant art, . . . it is less significant than the intrinsic record in determining the legally operative meaning of claim language.” *Phillips*, 415 F.3d at 1317 (internal quotation marks omitted).

Petitioner contends that, “[g]iven the noticeable overlap between the preferred embodiment of the ’696 patent and the prior art/predictable combinations articulated in Grounds 1A–2B, Petitioner submits that most claim elements do not require a formal construction for purposes of resolving controversies in this proceeding.” Pet. 6. Petitioner address the meaning of the recited “substantially different” transmission frequency. *See id.* at 6–9.

Patent Owner states, “it is undisputed that ‘most claim elements do not require a formal construction for purposes of resolving the controversies in this proceeding.’” Prelim. Resp. 22 (quoting Pet. 6). Patent Owner asserts that, “[h]owever, context is required to understand the scope and meaning of some of the terms, even if the Board does not formally engage in claim construction.” *Id.* at 22–23. Patent Owner also addresses the meaning of “substantially different.” *Id.* at 23–25.

Substantially Different

Independent claim 1 recites that the “driving circuit is configured and operable to produce said oscillating driving voltage at a transmission frequency *substantially different* from said characteristic resonant frequency of said inductive couple.” Ex. 1001, 28:43–46 (emphasis added); *see also id.* at 30:19–22 (Independent method claim 15, not challenged here, similarly reciting, “wherein said oscillating driving voltage has a

transmission frequency substantially different from said characteristic resonant frequency of said inductive couple.”).

The parties do not direct our attention to any claim language that further indicates the scope of “substantially different.”

The Specification, discussing Figure 6b (reproduced above), states that the slope of the frequency-amplitude graph is steepest in the regions 4a, 4b to either side of the resonance peak, and “[t]hus in inductive transfer systems, which operate at or around resonance, a small variation in frequency results in a large change in induced voltage.” Ex. 1001, 21:6–10. The Specification further states, “[f]or this reason prior art inductive transfer systems are typically very sensitive to small fluctuations in environmental conditions or variations in alignment between the induction coils.” *Id.* at 21:12–15; *see* Prelim. Resp. 24 (citing the same). According to the ’696 patent, “[i]t is a particular feature of embodiments of the current invention that the driver . . . is configured and operable to transmit a driving voltage which oscillates at a transmission frequency which is substantially different from the resonant frequency of the inductive couple.” Ex. 1001, 21:16–20. The Specification then states the following: “Preferably the transmission frequency is selected to lie within one of the near-linear regions 6, 8 [of Figure 6b] where the slope of the frequency-amplitude graph is less steep.” *Id.* at 21:20–23; *see also id.* at 21:56–59 (“Referring back to FIG. 6b, the frequency of transmission is selected to be in the approximately linear region 8 of the curve between a lower frequency value of f_L and an upper frequency value of f_U .”⁶); Pet. 7–8 (citing the same).

⁶ The parties are encouraged to discuss further this description of this “approximately linear region 8,” including their respective understandings of

Both parties note that the meaning of “substantially different” was discussed in the prosecution history. *See* Pet. 8; Prelim. Resp. 23. During prosecution, the Examiner maintained in the Final Rejection that independent claim 1, along with others, would have been obvious over Malpas. Ex. 1002, 89. An interview was conducted after this Final Rejection, and “[a]greement was reached that remarks directed to the claim language, Malpas, Figure 6B, and [0160+] would overcome the rejection of record.” *Id.* at 77 (second brackets in original).

In a response to the final Office Action, the applicant quoted paragraph 161 of the application (corresponding to column 21, lines 16–23 in the issued patent), and argued:

The claims must be interpreted in light of the specification as they would be understood by one of ordinary skill in the art. As such, one having ordinary skill in the art would appreciate that the term “*substantially different from said characteristic resonant frequency*” recited in claims 1 and 17, in view of at least Fig. 6b, should be interpreted to mean that the frequency of the driving voltage is selected so as to lie within one of the near-linear regions of a frequency-amplitude graph associated with the inductive couple.

Ex. 1002, 70. The applicant continued, arguing that the claims are distinguishable over Malpas.

A person having ordinary skill in the art, upon reading Malpas, would have understood that in order to transmit power to a remote pick-up, it would be necessary to use a transmission frequency *at or near to the resonant frequency of the pick-up* (as opposed to the invention recited in instant claims 1 and 17, as currently presented, wherein the transmission frequency is selected to be *different* from the characteristic frequency of the

the location of a lower frequency value of f_L and the significance of the point identified on Figure 6b as frequency f_b .

inductive couple formed between the primary and secondary coils).

Id. at 71; *see also id.* at 70 (“By contrast, Malpas describes systems at which the transmission frequency is selected to be as close as possible to the resonant natural frequency of the pick-up.”).

Petitioner contends that, “regardless of the outermost boundaries of the scope of a transmission frequency ‘substantially different’ from a characteristic resonant frequency as claimed, the specification plainly establishes that it must at least encompass the frequencies within one of the near-linear regions of the frequency-amplitude graph.” Pet. 8–9 (citing Ex. 1003 ¶¶ 36–41). According to Petitioner, “[w]here, as here, the prior art aligns with the preferred embodiment of a patent and the patent’s claim scope encompasses the preferred embodiment, the Board is equipped to compare that patent’s vague claim language to the prior art for purposes of considering unpatentability.” *Id.* at 7 (citing *Chicago Mercantile Exchange, Inc. v. 5th Market, Inc.*, CBM2013-00027, Paper 33, 3 (PTAB 2014); *SAP America, Inc. v. Lakshmi Arunachalam*, CBM2013-00013, Paper 61, 29 (PTAB 2014)). Petitioner further contends that “the Board need not formally construe this claim phrase” because “[a]ll grounds [in the Petition] include references that expressly disclose and/or align with FIG. 6b’s preferred embodiment of a transmission frequency that is ‘substantially different’ from a characteristic resonant frequency,” and that the grounds “render obvious the Challenged Claims under any construction that is consistent with the specification of the ’696 patent.” *Id.* at 9 (citing Ex. 1003 ¶¶ 42–43).

Patent Owner points to the above-discussed applicant’s argument during prosecution regarding the meaning of “substantially different” and to

the Specification’s statement that, in prior art systems that operate at or around the resonance frequency, a small variation in frequency results in a large change in induced voltage. Prelim. Resp. 23–24. Patent Owner further argues that “[a]n additional benefit to transmitting at a non-resonant frequency substantially different from the resonant frequency is the ability to linearly regulate power transfer, for example, by adjusting transmission frequency to change the induced voltage.” *Id.* at 24–25 (citing Ex. 1001, 21:61–63; Ex. 2001 ¶¶ 37–39). Patent Owner then argues:

Accordingly, and as explained by Dr. Mercier, a POSITA would define the “transmission frequency [that is] substantially different from the characteristic resonant frequency,” as recited in claim 1, to: (1) lie within the linear or non-linear regions of a frequency-amplitude graph, and (2) allow for some incremental change (increase or decrease) in frequency while remaining in the near-linear/linear regions of the frequency-amplitude graph. *Id.* at 25 (citing Ex. 2001 ¶ 59).

As to the first part, we understand Patent Owner to mean the linear or *near*-linear region—consistent with the quoted applicant’s use of the term “near-linear”—rather than a linear or *non*-linear region, which seemingly would encompass the entire curve. As to the second part, we understand Patent Owner to be referring to the purported benefit of linear control, and we determine that Patent Owner has not explained adequately why such a benefit should be read into the claim term “substantially different,” particularly where the quoted Specification support does not explicitly mention linear regulation.⁷ *See* Ex. 1001, 21:61–63 (“The induced voltage

⁷ To the extent that Patent Owner relies on its declarant’s testimony as an explanation of Patent Owner’s claim construction position, we remind Patent Owner about the prohibition on incorporation by reference. *See* 37 C.F.R. § 42.6(a)(3); Consolidated Trial Practice Guide, November 2019, 35–36

can be increased by reducing the transmission frequency and can be reduced by increasing the transmission frequency.”).

On this record and for purposes of this decision, we determine that—consistent with the Specification’s description of the frequency that is “[p]referably . . . selected” and applicant’s argument regarding the same during prosecution—“a 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. *See* Ex. 1001, 21:20–24; Ex. 1002, 70. At this time and for purposes of this Decision, we need not and do not reach the issue of the outer bounds of the scope of “substantially different.”

We also note that independent claim 1 is an apparatus claim and the subject limitation 1.7 further defines the “driving circuit” recited in limitations 1.5 and 1.6. Specifically, limitation 1.7 requires a driving circuit that is “configured and operable to produce said oscillating driving voltage at a transmission frequency” that is “substantially different” from the inductive couple’s resonant frequency. Ex. 1001, 28:43–46. In future briefing, the parties’ arguments regarding the prior art references should focus on that recited structure, i.e., a circuit that is configured and operable to produce the recited frequency.

(available at <https://www.uspto.gov/TrialPracticeGuideConsolidated>) (“[P]arties that incorporate expert testimony by reference in their petitions, motions, or replies without providing explanation of such testimony risk having the testimony not considered by the Board.”).

*D. The Alleged Obviousness of Claims 1–7, 9, 10, 13, and 14
over Onishi and Flowerdew (Ground 1A)*

Petitioner alleges that claims 1–7, 9, 10, 13, and 14 of the '696 patent would have been obvious over Onishi and Flowerdew. *See* Pet. 14–28 (addressing the proposed combination and claim 1). Petitioner contends that Onishi discloses all or much of the claimed subject matter, and relies on Flowerdew for the teaching of an alignment mechanism. *See id.* at 14–15, 20–21. Patent Owner argues that Onishi fails to disclose the “substantially different” frequency recited in limitation 1.7 and the “inductive couple having a characteristic resonant frequency” of limitation 1.4. *See* Prelim. Resp. 35–46.

1. Onishi (Ex. 1004)

Onishi pertains to “a power transmission control device provided in a power transmission device of a non-contact power transmission system.” Ex. 1004 ¶ 10. “[T]he non-contact power transmission system transmit[s] power from the power transmission device to a power reception device by electromagnetically coupling a primary coil and a secondary coil to transmit the power to a load of the power reception device.” *Id.*

[W]hen the power transmission device has detected that a battery included in the load has been fully charged, the power-transmission-side control circuit stop[s] normal power transmission to the power reception device and perform[s] power-saving power transmission that transmits a small amount of power as compared with the normal power transmission.

Id. ¶ 12. “The 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, for example.” *Id.* ¶ 53.

Onishi's Figure 4 is reproduced below.

FIG. 4

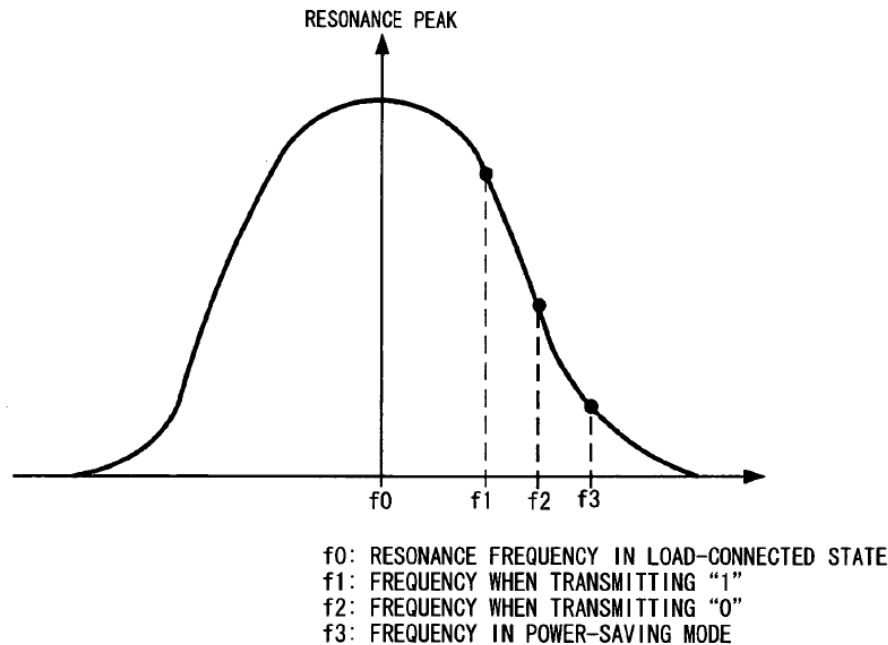


Figure 4 depicts the resonance characteristics of induction frequencies with the horizontal axis indicating the frequency, and the vertical axis indicating the resonance peak value. *Id.* at 1004 ¶ 180.⁸ “The resonance characteristics of the primary coil L1 and the secondary coil L2 when the portable telephone . . . is placed on the charger . . . (i.e., when load exists with respect to the power transmission device 10) . . . have a symmetrical and broad mountain shape, as shown in FIG. 4, for example.” *Id.* “[T]he frequency f1 is a frequency used when transmitting ‘1’ during normal power transmission” and “is a basic frequency during power transmission.” *Id.*

⁸ We acknowledge Patent Owner's argument that Onishi's Figure 4 depicts the characteristics of only the primary coil and not the inductive couple. *See* Prelim. Resp. 44–45. Whether that is correct is an issue for trial.

¶ 181. “The frequency f2 is a frequency used when transmitting ‘0’ (see FIGS. 3A and 3B),” and “[a] frequency f3 is a frequency used in the power-saving mode.” *Id.*

2. *Flowerdew (Ex. 1005)*

Flowerdew pertains to inductive battery chargers. Ex. 1005, 1:5–7. According to Flowerdew, “[t]o make the efficiency of power transfer as high as possible it is necessary to contain the magnetic field so that all, or most, of the field in the first coil is linked to the second.” *Id.* at 2:61–64. Flowerdew states, “[t]he present invention provides a contactless charging system utilizing induction which does not require a housing with a compartment or recess that must be mechanically matched to the item being charged.” *Id.* at 4:42–45. “In an embodiment of the invention, the charger takes the form of a shallow concave (herein also referred to as ‘dished’ or a ‘dish’) or similarly shaped upper charging surface.” *Id.* at 4:49–52.

Flowerdew, referring to Figure 5 (not shown here), discloses

Charging surface 357 may include a plurality of dished recesses to permit the secure and defined location of a plurality of items placed on the surface. The dished recesses may be optimized for the alignment of some subset of items that are placed on the surface to receive power from charger 302. In a further embodiment of the invention, charging surface 357 possesses one or more markers indicating a preferred alignment and/or orientation for items that may placed on that part of the surface to receive power from charger 302.

Id. at 7:52–61.

3. *The Alleged Obviousness of Independent Claim 1 over Onishi and Flowerdew*

- a. *[1P] An inductive power outlet operable to transfer power to an inductive power receiver, said inductive power outlet comprising:*

Petitioner contends that, “[t]o the extent the preamble is a limitation, Onishi discloses ‘a charger 500 (cradle) (i.e., electronic instrument)’ (**inductive power outlet**) that includes a power transmission device 10 and a ‘portable telephone 510 (i.e., electronic instrument)’ (**inductive power receiver**) that includes a power reception device 40.” Pet. 17 (citing Ex. 1004 ¶¶ 31, 124–131; Ex. 1003 ¶ 56).

Patent Owner does not raise any arguments regarding this contention. See Prelim. Resp. 35–46. We determine that Petitioner has shown sufficiently for purposes of institution that Onishi teaches or suggests the preamble.

- b. *[1.1] a platform for supporting said inductive power receiver;*

Petitioner contends that “Onishi discloses that the charger/cradle (**inductive power outlet**) includes an exterior housing (**platform**) for supporting the portable telephone or other electronic instrument (**inductive power receiver**).” Pet. 18–19 (citing Ex. 1004 ¶¶ 39, 124–126, 137, 174, 180, Fig. 1A; Ex. 1003 ¶ 58).

Patent Owner does not raise any arguments regarding this contention. See Prelim. Resp. 35–46. We determine that Petitioner has shown sufficiently for purposes of institution that Onishi teaches or suggests the subject matter of limitation 1.1.

c. [1.2] at least one primary inductive coil embedded in said platform;

Petitioner contends that “Onishi discloses that the charger/cradle’s power transmission device 10 includes ‘a primary coil L1 (power-transmission-side coil)’ (*at least one primary inductive coil*).” Pet. 20 (citing Ex. 1004 ¶ 128, Fig. 2; Ex. 1003 ¶ 59). Petitioner further contends that, “a[s] depicted in FIG. 1A . . . , power transmission device 10 including primary coil L1 is embedded within the exterior housing (*platform*) of the charger/cradle (*inductive power outlet*).” *Id.* (citing Ex. 1004 ¶¶ 125, 128, 131, 137, 174, 180, Figs. 1A–2; Ex. 1003 ¶ 59).

Patent Owner does not raise any arguments regarding these contentions. *See* Prelim. Resp. 35–46. We determine that Petitioner has shown sufficiently for purposes of institution that Onishi teaches or suggests the subject matter of limitation 1.2.

d. [1.3] an alignment mechanism configured to facilitate alignment between said primary inductive outlet and said inductive power receiver

Petitioner contends that “Onishi’s charger includes a ‘cradle’ to support the power reception device, which at least suggests the use of a mechanical alignment mechanism.” Pet. 14 (citing Ex. 1004 ¶¶ 39, 120, 124–131, 161, 174, Fig. 1A; Ex. 1003 ¶ 49). Petitioner further contends that, “[t]o the extent Onishi does not expressly describe the use of a conventional ‘alignment mechanism,’ such a feature was commonly implemented in similar wireless charging systems to achieve several known benefits,” and that “Flowerdew plainly suggests using alignment mechanisms such as shaped surface features and directional logos/markers to promote alignment of the coils of the charger and device.” *Id.* at 14–15 (citing Ex. 1005, 2:59–3:14, 7:52–61, 11:25–44; Ex. 1003 ¶ 50).

Petitioner offers several reasons why a person of ordinary skill in the art would have been motivated to make the proposed combination. *See* Pet. 15–17, 20–21. For example, Petitioner contends that “a POSITA would have been motivated to implement Onishi in a manner that includes an alignment mechanism as suggested by Flowerdew (e.g., a dished recess or other shaped surface feature, a directional logo/marker, or both) so that the primary and secondary coils would be more readily ‘optimized’ for alignment and the inductive ‘coupling is maximized.’” *Id.* at 15 (citing Ex. 1005, 2:59–3:14, 7:52–61, 11:25–44; Ex. 1003 ¶ 52).

Patent Owner does not raise any arguments regarding these contentions. *See* Prelim. Resp. 35–46. We determine that Petitioner has shown sufficiently for purposes of institution that the proposed combination teaches or suggests the subject matter of limitation 1.3 and has shown that a person of ordinary skill in the art would have been motivated to make the combination.

- e. [1.4] such that an inductive couple is formed between said primary inductive coil and a secondary inductive coil of said inductive power receiver, said inductive couple having a characteristic resonant frequency; and*

Petitioner contends that Onishi’s coils L1 and L2 (mapped to the primary inductive coil and secondary inductive coil, respectively) form an inductive couple and that “the predictable [Onishi-Flowerdew] combination would further improve/enhance Onishi’s inductive coupling of coils L1 and L2 having a characteristic resonant frequency (e.g., frequency f_0) by more consistently and reliably aligning the coils for power transmission.” Pet. 21–22 (citing Ex. 1004 ¶¶ 3, 125, 128–133, 137, 180–181, Figs. 2, 4, 5; Ex. 1003 ¶ 61). Petitioner additionally contends that “Onishi further discloses that the inductive couple between primary coil L1 and secondary

coil L2 has a characteristic resonant frequency ‘f0’, indicated by the ‘RESONANCE PEAK’ in FIG. 4.” *Id.* at 22 (citing Ex. 1004 ¶¶ 53, 171, 180; Ex. 1003 ¶ 62).

Patent Owner argues that “Onishi does not disclose that the primary coil L1 and the secondary coil L2 share a characteristic resonant frequency.” Prelim. Resp. 43. Specifically, Patent Owner argues that Onishi’s discussion of the resonance frequency is only in the context of the primary coil L1, and not in the context of an inductive couple formed by the two coils. *See id.* at 43–44 (citing Ex. 1004 ¶¶ 135, 171, 180). According to Patent Owner, “Figure 4 only illustrates ‘a view showing the resonance characteristics **of the induction coil.**”” *Id.* at 45 (quoting Ex. 1004 ¶ 180).

Patent Owner, for example, points to the recitation of a coil (singular) in the first sentence of Onishi’s paragraph 180. *See id.* at 43–44. That sentence states, “FIG. 4 is a view showing the resonance characteristics of the induction coil and applications of frequencies.” Ex. 1004 ¶ 180. However, the next sentence in Onishi refers to both coils, stating, “[t]he resonance characteristics of the primary coil L1 and the secondary coil L2 [when under load] . . . have a symmetrical and broad mountain shape, as shown in FIG. 4, for example.” *Id.* Patent Owner acknowledges this latter sentence but argues that, “in view of the preceding sentence that emphasizes ‘the resonance characteristics of [only] the induction coil’ (i.e., primary coil L1), it is unclear if this disclosure is referring to the resonance characteristic frequency of an inductive couple or to the resonance characteristic frequency of only the primary coil L1.” Prelim. Resp. 44 n.4 (alteration in original).

Patent Owner does not cite to testimony of Dr. Mercier in support of its interpretation of Onishi. *See id.* at 43–46; *see* Ex. 2001, 2 (the table of

contents for Dr. Mercier’s declaration indicating that the testimony primarily pertains to the background of the technology and claim construction). Petitioner’s declarant, Dr. Woods, on the other hand, testifies that that inductive couple between the two coils has a characteristic resonant frequency f_0 . Ex. 1003 ¶ 62 (“Onishi further discloses that the inductive couple between primary coil L1 and secondary coil L2 has a characteristic resonant frequency ‘ f_0 ’, indicated by the ‘RESONANCE PEAK’ in FIG. 4.”). That testimony is, at this stage, unrebutted.

We determine, based on the current record, that Petitioner has shown sufficiently for purposes of institution that the proposed combination of Onishi and Flowerdew teaches or suggests the subject matter of limitation 1.4.

f. [1.5] a driving circuit wired to said primary inductive coil, Petitioner contends that “Onishi discloses a power transmission section 12 which, in connection with at least voltage detection circuit 14, provides the claimed ‘*driving circuit*’ wired to primary coil L1 (*primary inductive coil*).” Pet. 23 (citing Ex. 1004 ¶¶ 132–139, 197–200, Figs. 2, 5; Ex. 1003 ¶ 63); *see also id.* at 23–25.

Patent Owner does not raise any arguments regarding this contention. *See* Prelim. Resp. 35–46. We determine that Petitioner has shown sufficiently for purposes of institution that Onishi teaches or suggests the subject matter of limitation 1.5.

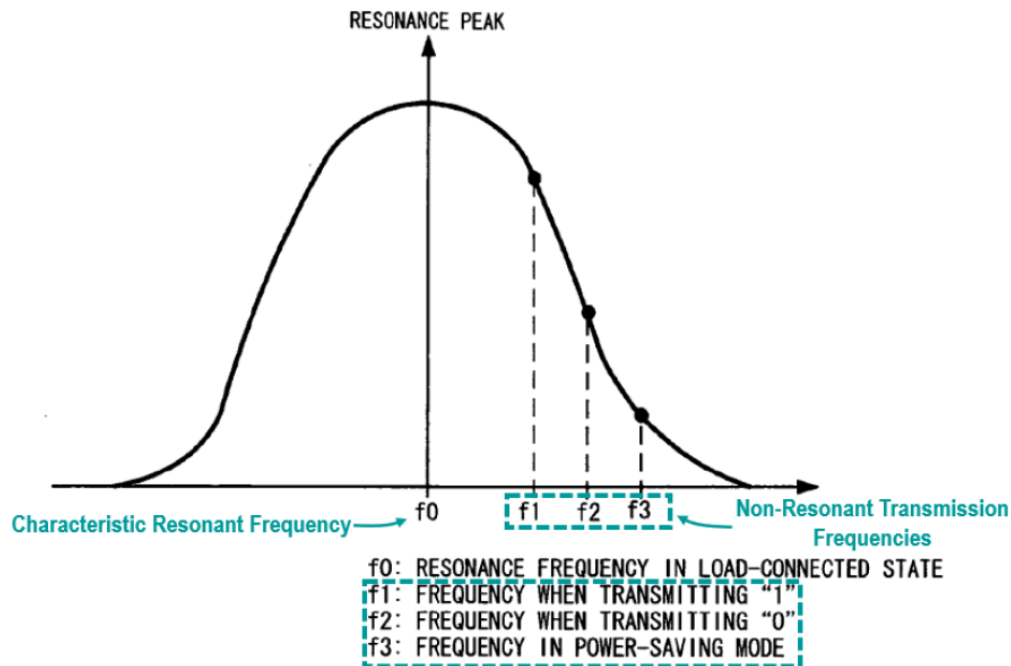
- g. *[1.6] said driving circuit comprising a switching unit configured and operable to provide an oscillating driving voltage across said primary inductive coil such that a secondary voltage is induced in the secondary inductive coil;*

Petitioner contends that “Onishi’s ‘power transmission section 12’ provides a ‘**switching unit**’ of the claimed ‘**driving circuit**’ configured and operable to provide an oscillating driving voltage across primary coil L1 such that a secondary voltage is induced in secondary coil L2.” Pet. 25; *see also id.* at 25–26 (citing Ex. 1004 ¶¶ 132–137, Figs. 2, 4, 5).

Patent Owner does not raise any arguments regarding this contention. *See* Prelim. Resp. 35–46. We determine that Petitioner has shown sufficiently for purposes of institution that Onishi teaches or suggests the subject matter of limitation 1.6.

- h. *[1.7] wherein said driving circuit is configured and operable to produce said oscillating driving voltage at a transmission frequency substantially different from said characteristic resonant frequency of said inductive couple.*

Petitioner contends that “Onishi discloses that the power transmission section 12 (component of the claimed ‘**driving circuit**’) is configured and operable to supply an oscillating driving voltage to primary coil L1 (**primary inductive coil**) that oscillates at a non-resonant transmission frequency (e.g., frequencies f_1 , f_2 , or f_3) that is substantially different from the characteristic resonant frequency (e.g., frequency f_0) of the inductive couple.” Pet. 27 (citing Ex. 1003 ¶ 67). Petitioner provides an annotated version of Onishi’s Figure 4, which we reproduce below.



Id. at 27. Above is Onishi's Figure 4, depicting the resonance characteristics of induction frequencies, with Petitioner's annotations indicating Petitioner's contentions that the figure depicts non-resonant transmission frequencies and the characteristic resonant frequency. Petitioner asserts that Onishi describes operating at the three transmission frequencies. *Id.* at 27–28 (citing Ex. 1004 ¶¶ 53, 171, 181, Fig. 3A, Ex. 1003 ¶ 68). Petitioner contends that “each of frequencies f_1 , f_2 , and f_3 lie in a near-linear region of the frequency-response curve and thus, as noted during prosecution . . . fall within the scope of being ‘substantially different’ from the characteristic resonant frequency f_0 .” *Id.* at 28 (citing the claim construction section of the Petition (Section IV) and Ex. 1003 ¶ 62). According to Petitioner, “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 '696 specification confirms that Onishi discloses and renders obvious a transmission frequency that is ‘substantially different’ from the characteristic resonant frequency regardless

of the outermost scope of this claim term.” *Id.* (citing Ex. 1001, 21:16–23, 21:56–65, Fig. 6b; Ex. 1003 ¶ 68).

Patent Owner argues that “none of f_1 , f_2 , and f_3 are described, shown, or otherwise disclosed as occurring within the near-linear regions of a frequency-amplitude graph associated with the inductive couple, as required by claim 1,” and that “they [are not] otherwise disclosed as substantially different from the characteristic resonant frequency of the inductive couple.” Prelim. Resp. 36.

For frequencies f_1 and f_2 , Patent Owner (Prelim. Resp. 36–37) quotes from Onishi’s paragraph 53, which states, “[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, for example.” Ex. 1004 ¶ 53. Based on this statement comparing the normal power frequencies f_1 and f_2 with the power-saving power frequency f_3 that is “set . . . apart” from the resonance peak, Patent Owner argues that “Onishi describes frequencies f_1 and f_2 as being at or near resonant frequency (f_0 in Onishi)—similar to the Malpas reference distinguished by Applicant during prosecution, and contrary to claim 1.” Prelim. Resp. 36–37 (citing Ex. 2001 ¶¶ 48–53 (Dr. Mercier describing Malpas and the applicant’s arguments during prosecution)).

For power-saving mode frequency f_3 , Patent Owner argues that being described as “apart” from resonance frequency f_0 is not enough to qualify as being “significantly different.” *Id.* at 38. Patent Owner further argues that Onishi’s Figure 4 “is at best unclear as to whether frequency f_3 lies within a near-linear or non-linear region of the resonance curve, the latter being in direct contravention of the stated location of the transmission frequency on a

frequency-amplitude graph.” *Id.* at 39 (citing Ex. 1002 ¶ 70 (the applicant’s argument that “substantially different” means on one of the near-linear regions of the curve)); *see also id.* at 40 (Patent Owner arguing that “operating in the non-linear region” would undermine the system predictability, which would be contrary to the purported “stated intent” of the ’696 patent). Patent Owner also argues that, “[i]n essence, the power-saving mode frequency [f3] falls within the range of frequencies that result in an operation voltage that is near zero or approaching zero non-linearly, thus the power-saving mode frequency is outside the linear and near-linear regions of the resonance curve.” *Id.* at 40–41.

Dr. Woods, however, testifies that the three frequencies (f1, f2, and f3) are in the near-linear region of the curve and are “substantially different” than the characteristic resonant frequency. *See* Ex. 1002 ¶ 68 (“each of frequencies f1, f2, and f3 lie in a near-linear region of the frequency-response curve and thus, as noted during prosecution . . . , fall within the scope of being ‘substantially different’ from the characteristic resonant frequency f0.”). At this stage, that testimony is unrebutted. *Cf.* Prelim. Resp. 37–40 (citing Dr. Mercier’s declaration for topics such as the prosecution history and linear controls, but not for an interpretation of Onishi’s disclosure).

Lastly, Patent Owner argues that Petitioner cannot use any similarities between the curves depicted in the challenged patent’s Figure 6B and Onishi’s Figure 4 to prove that Onishi’s frequencies f1, f2, and f3 are “substantially different” from the resonance frequency. *See* Prelim. Resp. 41–43. Patent Owner argues that Onishi’s figure is not drawn to scale and, “[d]espite any similarities that may exist between the ‘substantially

similar positions of Onishi’s frequencies f_1 , f_2 , and f_3 in the frequency-response curve’ and the ’696 Patent’s ‘transmission frequency (e.g., f_t in FIG. 6B),’ . . . absent quantitative values any similarities are merely speculative.” *Id.* at 42 (quoting Pet. 28; citing, *inter alia*, *Hockerson-Halberstadt, Inc. v. Avia Group Int’l Inc.*, 222 F.3d 951, 956 (Fed. Cir. 2000)).

While patent drawings not designated as being drawn to scale cannot be relied upon to define precise proportions of elements if the specification is completely silent on the issue, *Hockerson-Halberstadt, Inc.*, 222 F.3d at 956, that does “not mean that things patent drawings show clearly are to be disregarded.” *In re Mraz*, 455 F.2d 1069, 1072 (CCPA 1972) (emphasis omitted). A drawing teaches all that it reasonably discloses and suggests to a person of ordinary skill in the art. *In re Aslanian*, 590 F.2d 911, 914 (CCPA 1979). Based on the current record, we disagree with Patent Owner’s argument that Petitioner’s reliance on Onishi’s Figure 4 is “improper and misguided.” Prelim. Resp. 42–43.

We determine that Petitioner has shown sufficiently for purposes of institution that Onishi teaches or suggests the subject matter of limitation 1.7.

i. Conclusion as to Independent Claim 1

Having considered the parties’ arguments and evidence, we determine that Petitioner has demonstrated a reasonable likelihood of prevailing in its challenge to claim 1 as being obvious over Onishi and Flowerdew.

4. The Alleged Obviousness of Dependent Claims 2–7, 9, 10, 13, and 14 over Onishi and Flowerdew

The remaining claims in this ground depend directly or indirectly from independent claim 1. Petitioner, with the support of the testimony of

Dr. Woods, addresses the limitations of these claims. *See* Pet. 28–45. Patent Owner does not present arguments regarding Petitioner’s contentions beyond those already addressed. *See* Prelim. Resp. 35 (arguing that Petitioner has not met its burden for independent claim 1, and, “[a]s claims 2–6 and 9–14 each depend on claim 1, Petitioner cannot show that Onishi in view of Flowerdew renders obvious any of claims 1–7 and 9–14.”).

Having considered the parties’ arguments and evidence, we determine that Petitioner has demonstrated a reasonable likelihood of prevailing in its challenge to claims 2–7, 9, 10, 13, and 14 as being obvious over Onishi and Flowerdew.

*E. The Alleged Obviousness of Claims 11–13
over Onishi, Flowerdew, and Partovi (Ground 1B)*

Petitioner alleges that claims 11–13 would have been obvious over Onishi, Flowerdew, and Partovi. *See* Pet. 45–49.

1. Partovi (Ex. 1007)

Partovi pertains to inductive charging systems. Ex. 1007 ¶ 4. Partovi discloses, “the receiver battery can include a mechanical, magnetic, or optical method of alignment of the coils or wires of the charger and mobile device for optimum power transfer.” *Id.* ¶ 82. For the magnet embodiment, “[w]hen the mobile device is placed on or adjacent to the charger, the magnets attract and pull the two parts into alignment with the centers of the two coils or wires aligned.” *Id.* “Alternatively, audible, or visual signs (LEDs that get brighter with the parts aligned), or mechanical means (dimples, protrusions, etc.) can be used for alignment.” *Id.*

2. Discussion

Dependent claims 11–13 pertain to the alignment mechanism and particularly to, respectively, magnetic, audible indication, visual indication, and tactile indication. Ex. 1001, 29:28–30:4. Petitioner relies on Partovi for teachings in this regard, and offers multiple reasons why a person of ordinary skill in the art would have combined Partovi’s alignment mechanisms with the teachings of Onishi and Flowerdew. *See* Pet. 46–49 (citing, *inter alia*, Ex. 1007 ¶¶ 82–87, 90–91, 96, 135; Ex. 1003 ¶¶ 91–98). Patent Owner does not present arguments regarding Petitioner’s contentions beyond those already addressed. *See* Prelim. Resp. 46 (arguing, “Partovi fails to cure the above described deficiencies of Onishi.”).

Having considered the parties’ arguments and evidence, we determine that Petitioner has demonstrated a reasonable likelihood of prevailing in its challenge to claims 11–13 as being obvious over Onishi, Flowerdew, and Partovi.

F. The Alleged Obviousness of Claims 1, 3–5, 7, and 9–14 over Baarman392 and Partovi (Ground 2A)

Petitioner alleges that independent claim 1 and dependent claims 3–5, 7, and 9–14 would have been obvious over Baarman392⁹ and Partovi. *See* Pet. 54–65 (addressing claim 1 and the proposed combination). Patent Owner argues, “Petitioner has failed to show with particularity how the combination of Baarman392 and Partovi would render obvious claim

⁹ Petitioner cites to Exhibit 1006, which is a Purdy reference. We, like Patent Owner (Prelim. Resp. 47 n.5), understand Petitioner to be referring to Baarman392, Exhibit 1008.

charger circuit 6 generally includes a primary coil 15, a frequency controller 80 for applying power to the primary coil at a desired frequency and a feedback detector 82 for receiving feedback from the secondary circuit 8.” *Id.* “The secondary circuit 8 generally includes a secondary coil 30 for receiving inductive power from the charger circuit 6 and a feedback mechanism 84 for providing feedback to the charger circuit 6 indicative of the voltage or current in the secondary circuit 8.” *Id.* “The frequency controller 80 varies the frequency of the power applied to the primary coil 15 as a function of the feedback from the secondary circuit 8.” *Id.*

Figure 3 of Baarman392 is reproduced below.

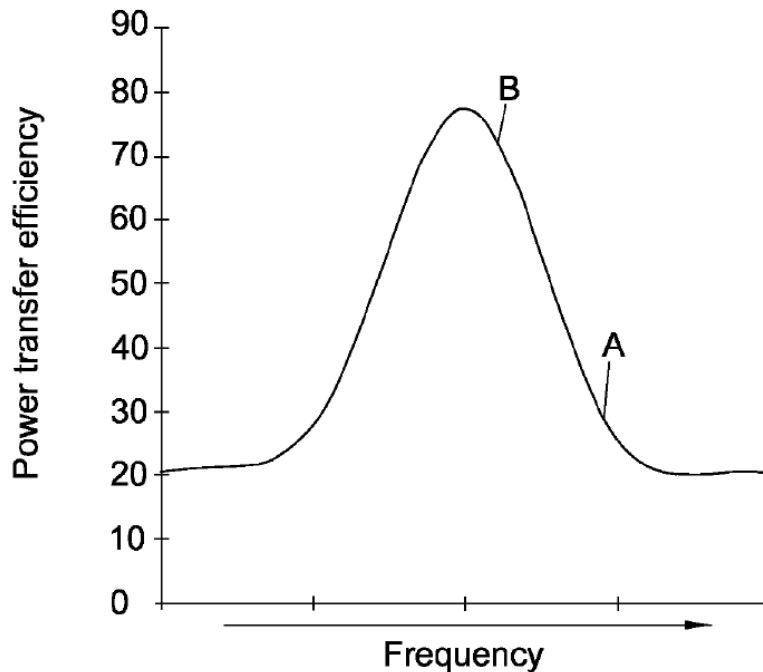


FIG. 3

Figure 3 depicts an exemplary power transfer curve for primary coil 15 and secondary coil 30. *Id.* ¶ 38.

Baarman392 states

In the illustrated embodiment, the primary coil 15 and the secondary coil 30 are loosely coupled. Because the two are loosely coupled in this embodiment, the slope of the power transfer curve about the resonant frequency is not as steep as if the coils 15, 30 were tightly coupled. An exemplary power transfer curve for the coils 15, 30 is shown in FIG. 3. In this embodiment, the power transfer is highest when the inverter 10 is operating at resonance. However, even if the inverter 10 is not operating at resonance, significant power transfer can occur when the inverter is operating off-resonance. Generally, the inverter 10 is operated between frequency A and frequency B. Frequency B is somewhat less than the resonant frequency. Between frequency A and frequency B, the power transfer curve can be piece-wise linearized by a software lookup table located in the controller 20. Thus, a decrease in the operating frequency of the inverter 10 will result in a generally predictable increase in the power transferred from the primary coil 15 to the secondary coil 30. As can be seen by the graph, it would be equally effective to use an operating frequency less than the resonant frequency. If so, then an increase in the operating frequency would lead to an increase in the power transfer, and vice-versa.

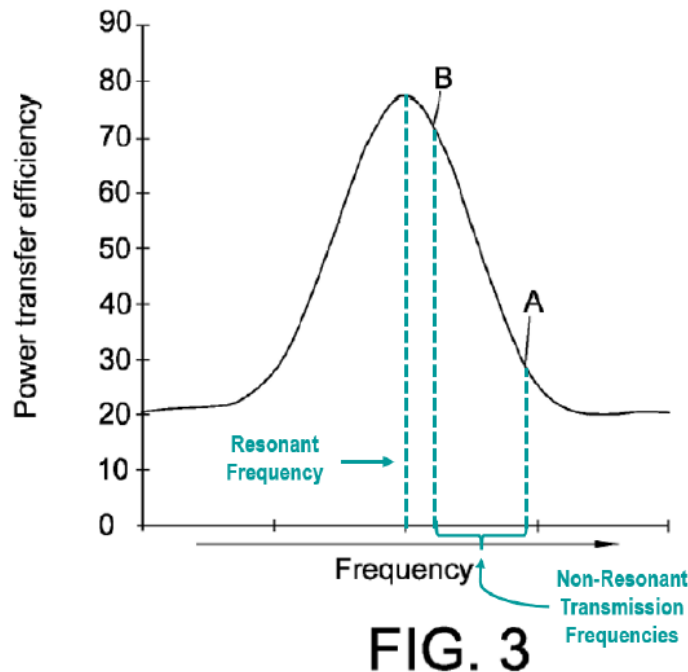
Id. ¶ 38.

2. Discussion

Petitioner contends that Baarman392 discloses and teaches much of the subject matter of independent claim 1. *See* Pet. 54–65; *see also, e.g., id.* at 56–57 (contending that Baarman392 discloses a platform or at least renders it obvious, and “Partovi confirms that inductive charging devices like those disclosed in Baarman392 conventionally included such platforms.”). Petitioner further contends, “Baarman392 does not expressly describe an ‘alignment mechanism,’ but such features were conventionally used in similar wireless charger systems to achieve known benefits, as suggested by Partovi.” *Id.* at 54 (citing Ex. 1003 ¶ 105); *see also id.* at 58–

59 (addressing the “alignment mechanism” limitation 1.3). Petitioner provides contentions as to several reasons why a person of ordinary skill in the art would have made the proposed combination. *See id.* at 54–56. Petitioner, for example, contends that a person of ordinary skill in the art “would have been motivated to implement an alignment mechanism (suggested by Partovi) in Baarman392’s system so as to advantageously facilitate alignment of the primary and secondary coils ‘for optimum power transfer.’” *Id.* at 54–55 (citing Ex. 1007 ¶¶ 82, 96, 135; Ex. 1003 ¶ 106). Dr. Woods testifies that, “the efficiency of the inductive couple between Baarman392’s primary and secondary coils would have been enhanced and repeatably consistent by using such conventional options.” Ex. 1003 ¶ 106; *see* Pet. 55 (citing Ex. 1003 ¶ 106; *Intel Corp. v. PACT XPP Schweiz AG*, 61 F.4th 1373, 1380 (Fed. Cir. 2023) (“[I]f there’s a known technique to address a known problem using ‘prior art elements according to their established functions,’ then there is a motivation to combine.”)).

For the “substantially different” limitation 1.7, Petitioner provides an annotated version of Figure 3 of Baarman392, which we reproduce below.



Above is Figure 3 of Baarman392, depicting a power transfer curve (Ex. 1008 ¶ 38) with Petitioner’s annotations including labels indicating the resonant frequency and the range of non-resonant transmission frequencies in the range from point A to point B on the curve. Pet. 64. Petitioner asserts that Baarman392 teaches a driving circuit that “produces a driving voltage at a non-resonant transmission frequency within a near-linear region of the power transfer curve.” *Id.* at 64 (citing Ex. 1003 ¶ 120). Petitioner additionally asserts that “Baarman392’s transmission frequencies between A and B in the frequency-response curve” are “substantially similar” to “the transmission frequency (e.g., f_t in FIG. 6B)” that is identified as “substantially different” in the ’696 patent. *Id.*

Patent Owner notes that Baarman392 states that frequency B on the curve is “is somewhat less than the resonant frequency.” Prelim. Resp. 47 (quoting Ex. 1008 ¶ 38) (emphasis omitted). Patent Owner argues that, “[h]owever, frequencies ‘*somewhat less than* the resonant frequency’

are—by definition—not *substantially different from* the resonant frequency, as claimed.” *Id.* Patent Owner further argues that claim 1 requires a transmission frequency “‘meaningfully different from the characteristic resonant frequency’ in order ‘to mitigate against large unintended fluctuations in induced voltage,’” and therefore requires the frequency to be in the near-linear/linear region of a frequency-amplitude graph. *Id.* at 48 (quoting Ex. 2001 (Dr. Mercier’s Declaration) ¶ 62; citing Ex. 2001 ¶¶ 59, 63, 64). Patent Owner then argues

Baarman392 does not describe or conclusively show either of frequencies A or B as lying within such a region, and if anything, suggests a system lacking in *the stability and predictability that the claims of the ’696 Patent attempt to achieve* due to the express inclusion of a near (or “somewhat less than”) resonant frequency within the operable transmission frequency range. Accordingly, Baarman392 suggests operation at or near resonant frequency

Id. (emphasis added).

To the extent that Patent Owner argues that stability and predictability are required, we note that the claims do not expressly recite such language, and Patent Owner has not explained adequately why the claims should be so limited. Additionally, we note that Patent Owner’s argument is in terms of the discrete points A and B, whereas Baarman392 discloses that, “[g]enerally, the inverter 10 is operated between frequency A and frequency B,” i.e. a range from frequency A and frequency B. Ex. 1008 ¶ 38.

Patent Owner asserts that “Baarman392 describes its power transfer curve for this range [between frequency A and frequency B] as ‘piece-wise linearized by a software lookup table,’ and argues that, “[a]ccordingly, the requirement for approximation by a piece-wise linear function demonstrates that the graph in Figure 3 of Baarman392 does not disclose ‘the near-linear

regions of a frequency-amplitude graph associated with the inductive couple’ . . . as a piece-wise linear function is specifically used here to approximate a non-linear curve.” Prelim. Resp. 48–49 (citing Ex. 1008 ¶ 37; Pet. 8). On the present record, we do not agree with Patent Owner’s argument. The construction for “substantially different” frequencies we apply for purposes of this Decision is not limited to points on a *linear* portion of the curve. Even if Patent Owner’s interpretation of Baarman392 is correct, Patent Owner does not explain why the “non-linear curve” prior to being subjected to a piece-wise linear function is not indicative of a near-linear region of the curve, which would fall within the scope of “substantially different.”

Patent Owner argues that “Petitioner appears to mix embodiments of Baarman in its citation to [0015]–[0019] and [0055]–[0057] without explanation as to why POSITA would do so.” Prelim. Resp. 52 (citing Pet. 64) (brackets in original). In that regard, the Petition states, “Baarman392 further teaches that ‘[b]etween frequency A and frequency B, the power transfer curve can be piece-wise linearized by a software lookup table located in the controller 20’ such that ‘a decrease in the operating frequency of the inverter 10 will result in a generally predictable increase in the power transferred from the primary coil 15 to the secondary coil 30.’” Pet. 64 (quoting Ex. 1006 ¶ 38). As support for this proposition, Petitioner lists paragraphs 15 through 19 and 55 through 57 using a “*see also*” citation after the primary citation to paragraph 38. *Id.* Patent Owner does not explain adequately why the inclusion of those secondary citations is fatal to Petitioner’s case or indicate why these additional paragraphs, even if

referring to different specific embodiments, fail to support Petitioner's proposition without the need for a reason to combine them.

Patent Owner presents two more arguments. First, Patent Owner argues that Petitioner cannot rely on the purported similarities between the challenged patent's Figure 6b and Figure 3 of Baarman392 because they utilize different variables on the y-axis ("Operational Voltage" and "Power transfer efficiency," respectively). *See* Prelim. Resp. 49–50. Second, Patent Owner argues that there is no motivation to combine the references because "Baarman392 requires a loosely coupled system to ensure a less steep power transfer curve," but, "[i]n contrast, Partovi discloses a wireless charging system that uses moveable primary coils that move to be aligned with a mobile device, thereby maintaining a tight coupling between the primary coil and the secondary coil in the mobile device." *Id.* at 51; *see also id.* at 50–52. According to Patent Owner, "the Baarman392-Partovi system imagined by the Petition would be incompatible with both Baarman392 (loosely coupled) and Partovi (tightly coupled) and Petitioner has failed to demonstrate a likelihood of success that the resulting system would function, let alone anticipate the claim element." *Id.* at 52.

The issues raised by Patent Owner would benefit from further development at trial.

For the reasons discussed above, we determine that the Petition does demonstrate a reasonable likelihood of prevailing on its Onishi-based grounds (Grounds 1A and 1B) as to all the challenged. Therefore, we institute an *inter partes* review on all challenged claims on all asserted grounds. *See SAS Inst. Inc. v. Iancu*, 138 S. Ct. 1348, 1354, 1359–60 (2018); 37 C.F.R. § 42.108(a) ("When instituting *inter partes* review, the

Board will authorize the review to proceed on all of the challenged claims and on all grounds of unpatentability asserted for each claim.”). During trial, the parties will have the opportunity to further discuss their respective positions on the Baarman392-Partovi Ground 2A and on Ground 2A (Baarman392-Partovi-Tucci), which builds on that challenge.

IV. CONCLUSION

Petitioner has demonstrated a reasonable likelihood of prevailing in showing the unpatentability of at least one of the challenged claims of the '696 patent. Further, we decline to discretionarily deny *inter partes* review. Accordingly, we institute an *inter partes* review on all challenged claims on all asserted grounds. *See SAS Inst. Inc.*, 138 S. Ct. at 1354, 1359–60; 37 C.F.R. § 42.108(a). At this stage of the proceeding, we have not made a final determination with respect to the patentability of any of the challenged claims.

V. ORDER

For the foregoing reasons, it is

ORDERED that, pursuant to 35 U.S.C. § 314(a), an *inter partes* review of claims 1–7 and 9–14 of the '696 patent is instituted with respect to all grounds of unpatentability set forth in the Petition; and

FURTHER ORDERED that, pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4(b), *inter partes* review of the '696 patent shall commence on the entry date of this Order, and notice is hereby given of the institution of a trial.

IPR2024-00994
Patent 9,048,696 B2

PETITIONER:

Michael Hawkins
Nicholas Stephens
Thomas Reger
Joseph Bauer
FISH & RICHARDSON P.C.
hawkins@fr.com
nstephens@fr.com
reger@fr.com
jbauer@fr.com

PATENT OWNER:

Robert Pluta
William Barrow
MAYER BROWN LLP
rpluta@mayerbrown.com
wbarrow@mayerbrown.com