Petitioner's Demonstratives

Anker Innovations Ltd. v. Powermat Technologies Ltd.

Case No. IPR2024-00994

U.S. Patent No. 9,048,696

September 16, 2025

FISH & RICHARDSON

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

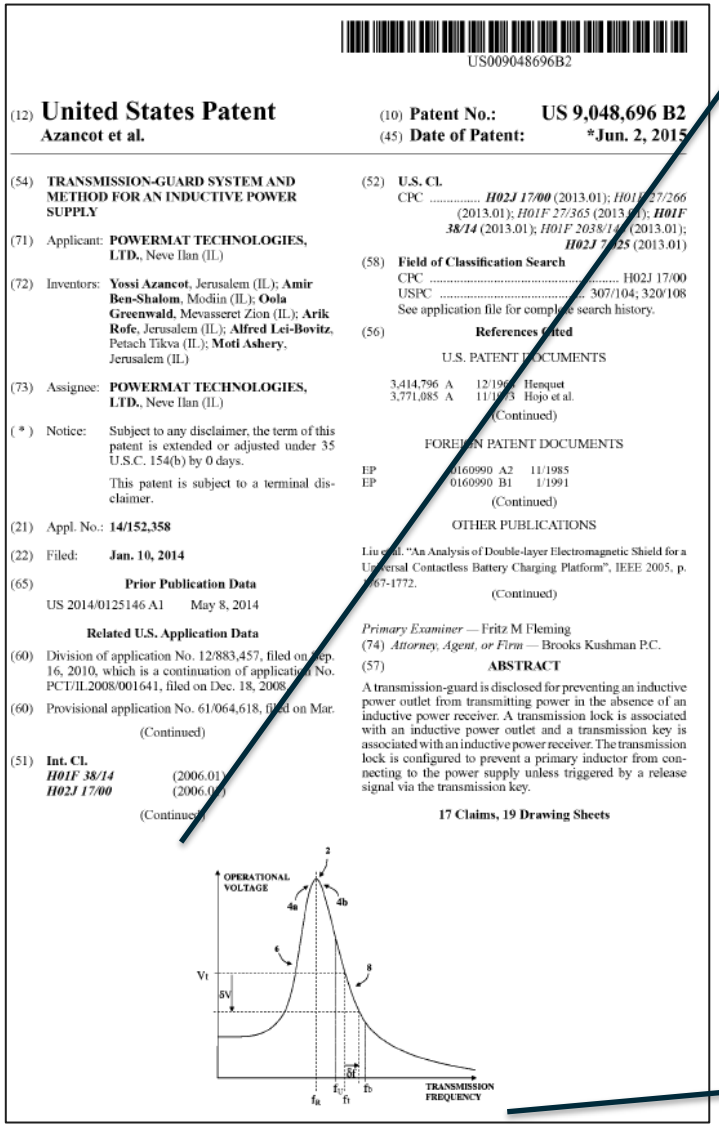
Exhibit 1103
Anker v. Powermat
IPR2024-00994

Table of Contents

- Overview of the ’696 Patent, the Instituted Grounds, and the Disputed Issues……..…. 3
- **Issue 1:** Claim Construction – Element [1.7] “substantially different from” ……..…… 9
- **Issue 2:** Baarman392 Grounds – Element [1.7] “substantially different from” ……..…… 17
- **Issue 3:** Baarman392 Grounds – “Motivation to combine” arguments ……..…… 25
- **Issue 4:** Baarman392 Grounds – Dependent claim 2 ……..…… 30
- **Issue 5:** Onishi Grounds – Element [1.4] “said inductive coupling having a characteristic resonant frequency” …… 33
- **Issue 6:** Onishi Grounds – Element [1.7] “substantially different from” ……..……... 37
- **Issue 7:** Onishi Grounds – Dependent claim 2 ……..…… 43
- **Issue 8:** Onishi Grounds – “Motivation to combine” arguments ……..…… 46

Overview of the ’696 Patent, the Instituted Grounds, and the Disputed Issues

U.S. Patent No. 9,048,696 (“the ’696 patent”)



US009048696B2

(12) **United States Patent**
Azancot et al.

(10) **Patent No.: US 9,048,696 B2**
(45) **Date of Patent: *Jun. 2, 2015**

(54) **TRANSMISSION-GUARD SYSTEM AND METHOD FOR AN INDUCTIVE POWER SUPPLY**

(71) Applicant: **POWERMAT TECHNOLOGIES, LTD.**, Neve Ilan (IL)

(72) Inventors: **Yossi Azancot**, Jerusalem (IL); **Amir Ben-Shalom**, Modiin (IL); **Oola Greenwald**, Mevasseret Zion (IL); **Arik Rofe**, Jerusalem (IL); **Alfred Lei-Bovitz**, Petach Tikva (IL); **Moti Ashery**, Jerusalem (IL)

(73) Assignee: **POWERMAT TECHNOLOGIES, LTD.**, Neve Ilan (IL)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **14/152,358**

(22) Filed: **Jan. 10, 2014**

(65) **Prior Publication Data**

US 2014/0125146 A1 May 8, 2014

Related U.S. Application Data

(60) Division of application No. 12/883,457, filed on Sep. 16, 2010, which is a continuation of application No. PCT/IL2008/001641, filed on Dec. 18, 2008.

(60) Provisional application No. 61/064,618, filed on Mar.

(Continued)

(51) **Int. Cl.**
H01F 38/14 (2006.01)
H02J 17/00 (2006.01)

(Continued)

(52) **U.S. Cl.**
CPC ***H02J 17/00*** (2013.01); *H01F 27/266* (2013.01); *H01F 27/365* (2013.01); ***H01F 38/14*** (2013.01); *H01F 2038/143* (2013.01); ***H02J 7/025*** (2013.01)

(58) **Field of Classification Search**
CPC H02J 17/00
USPC 307/104; 320/108
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

3,414,796 A 12/1968 Henquet
3,771,085 A 11/1973 Hojo et al.

(Continued)

FOREIGN PATENT DOCUMENTS

EP 0160990 A2 11/1985
EP 0160990 B1 1/1991

(Continued)

OTHER PUBLICATIONS

Liu et al. “An Analysis of Double-layer Electromagnetic Shield for a Universal Contactless Battery Charging Platform”, IEEE 2005, p. 767-1772.

(Continued)

Primary Examiner — Fritz M Fleming
(74) *Attorney, Agent, or Firm* — Brooks Kushman P.C.

(57) **ABSTRACT**

A transmission-guard is disclosed for preventing an inductive power outlet from transmitting power in the absence of an inductive power receiver. A transmission lock is associated with an inductive power outlet and a transmission key is associated with an inductive power receiver. The transmission lock is configured to prevent a primary inductor from connecting to the power supply unless triggered by a release signal via the transmission key.

17 Claims, 19 Drawing Sheets

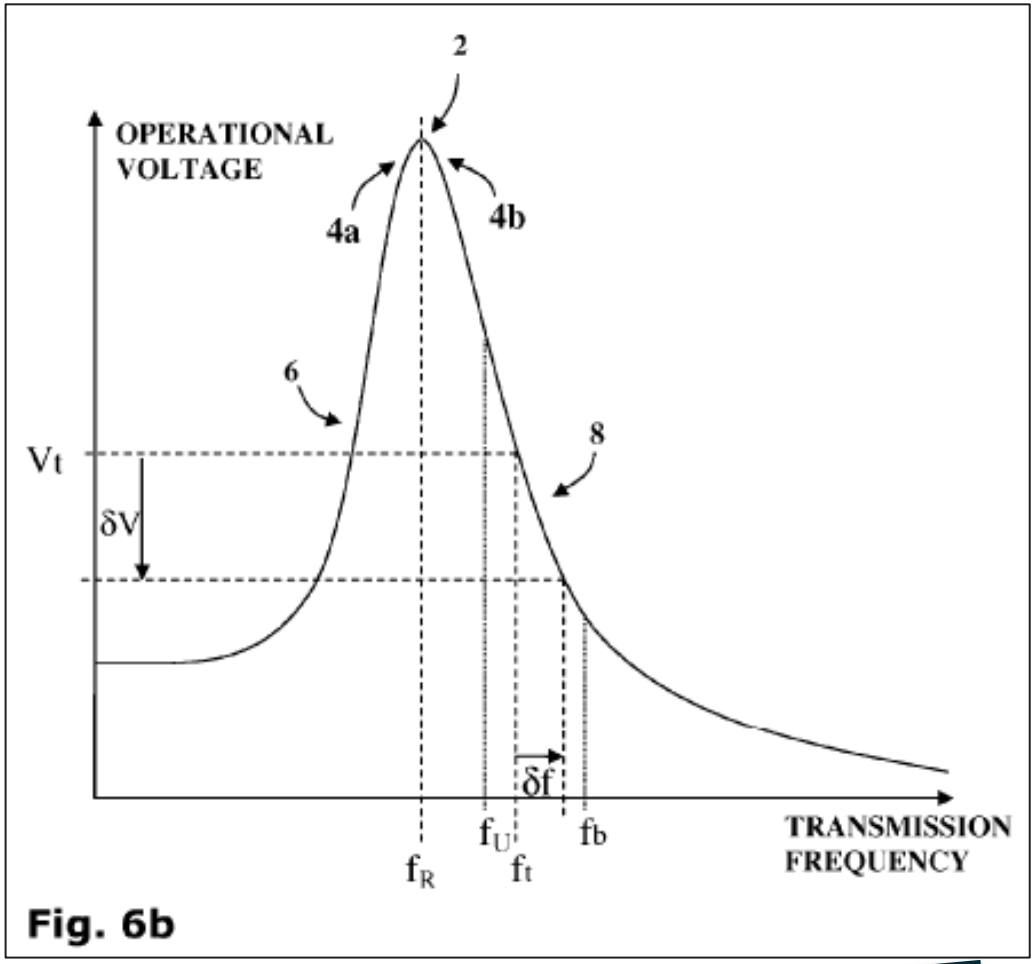


Fig. 6b

Pet., 3-4; EX1003, ¶¶25-29.

U.S. Patent No. 9,048,696 ("the '696 patent")

It is a particular feature of embodiments of the current invention that the driver **6230** (FIG. **6***a*) 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.

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. A transmission frequency f_t, higher than the resonant frequency f_R of the system, produces an induced voltage of V_t. The induced voltage can be increased by reducing the transmission frequency and can be reduced by increasing the transmission frequency. For example, an increase in transmission frequency of δf produces a decrease in induced voltage of δV.

EX1001, 21:16-23; 21:56-65.

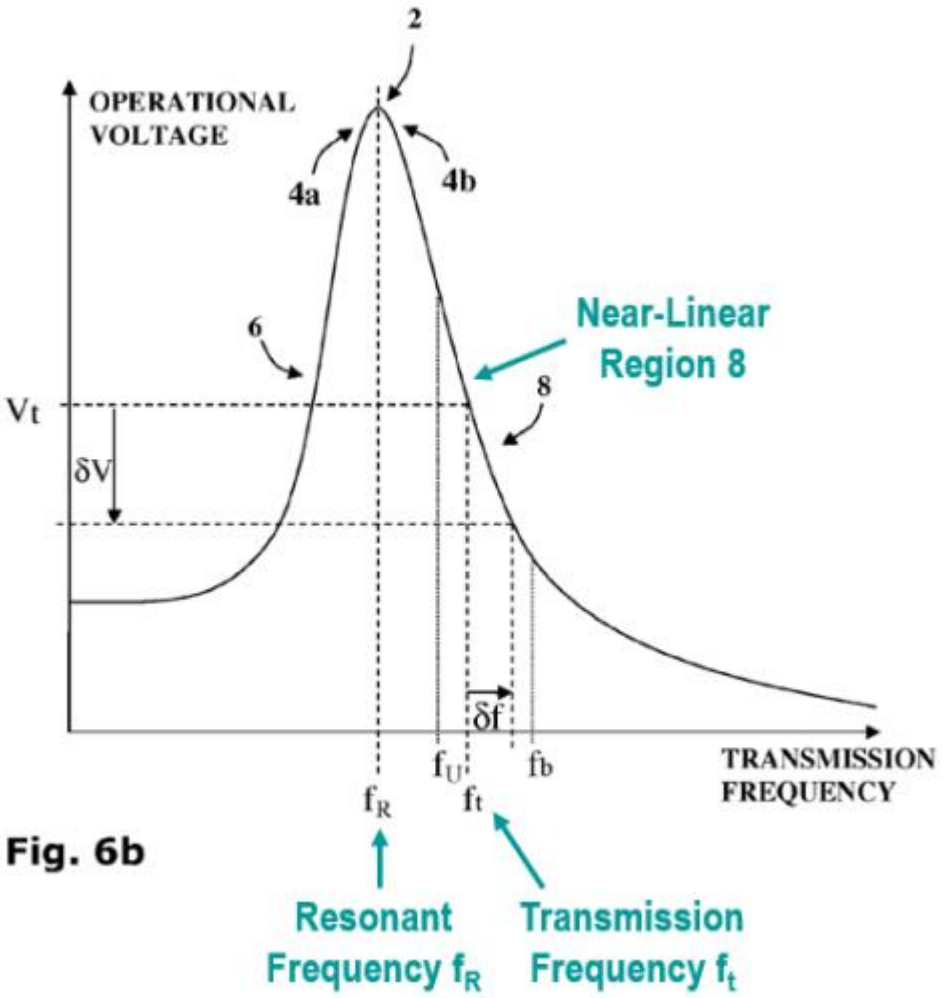


Fig. 6b

Pet., 7-8; EX1003, ¶¶36-41.

U.S. Patent No. 9,048,696 ("the '696 patent")

Independent Claim 1:

1. An inductive power outlet operable to transfer power to an inductive power receiver, said inductive power outlet comprising:

a platform for supporting said inductive power receiver;

at least one primary inductive coil embedded in said platform;

an alignment mechanism configured to facilitate alignment between said primary inductive outlet and said inductive power receiver 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

a driving circuit wired to said primary inductive coil, 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;

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.

EX1001, 28:25-46.

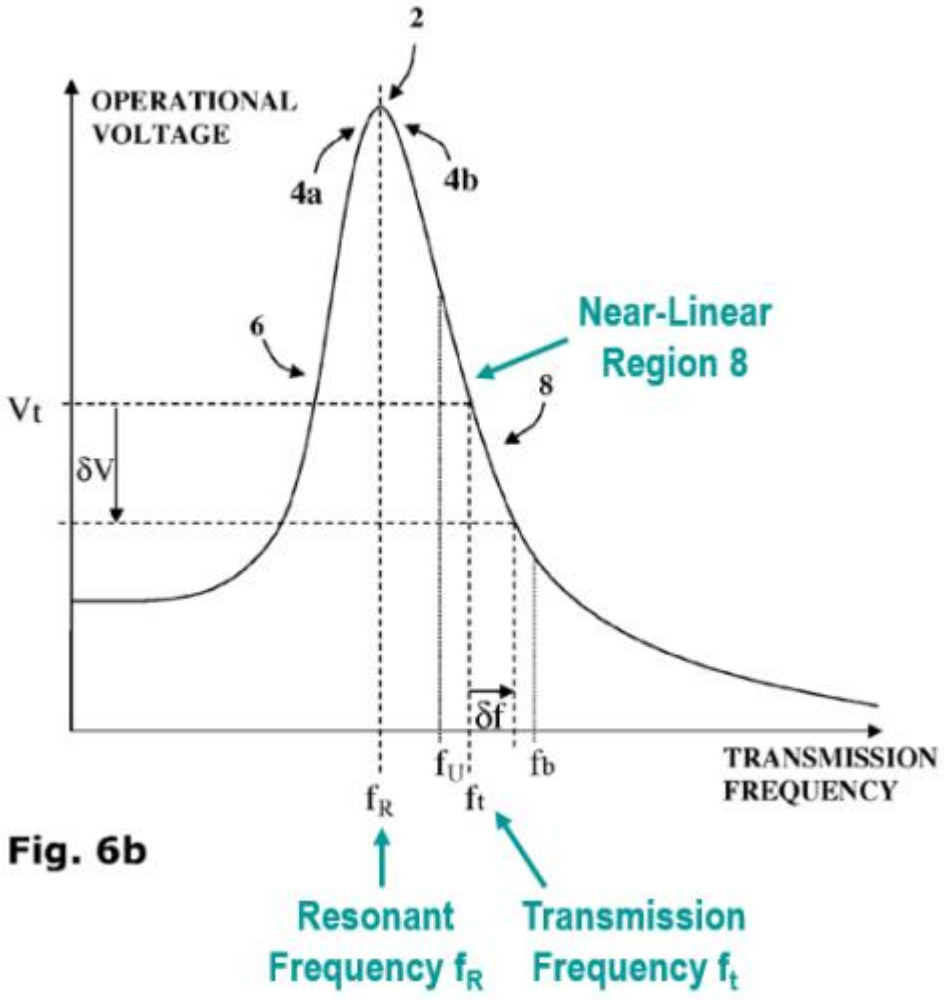


Fig. 6b

Pet., 7-8, vii; EX1003, ¶¶36-41.

The Petition

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

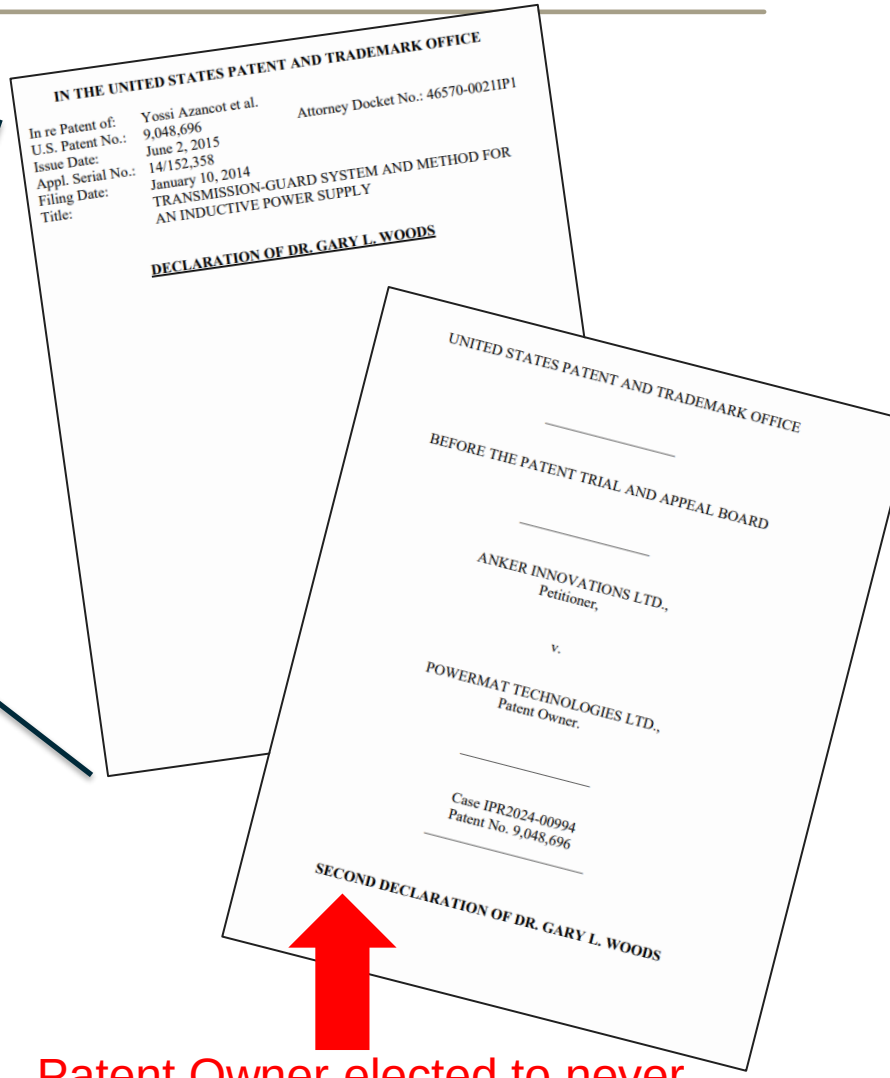
In re Patent of:	Yossi AZANCOT et al.	
U.S. Patent No.:	9,048,696	Attorney Docket No.: 46570-0021IP1
Issue Date:	June 2, 2015	
Appl. Serial No.:	14/152,358	
Filing Date:	January 10, 2014	
Title:	TRANSMISSION-GUARD SYSTEM AND METHOD FOR AN INDUCTIVE POWER SUPPLY	

Mail Stop Patent Board
Patent Trial and Appeal Board
U.S. Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450

PETITION FOR *INTER PARTES* REVIEW OF UNITED STATES PATENT NO. 9,048,696 PURSUANT TO 35 U.S.C. §§ 311–319, 37 C.F.R. § 42

Petitioner requests IPR on Grounds 1A-2B listed below. An expert declaration from Gary Woods, Ph.D., supports Grounds 1A-2B. *See* EX1003.

Ground	Claims	Basis of Rejection
1A	1-7, 9-10, 13-14	§103 – Obvious based on Onishi (EX1004) in view of Flowerdew (EX1005)
1B	11-13	§103 – Obvious based on Onishi in view of Flowerdew and Partovi (EX1007)
2A	1, 3-5, 7, 9-14	§103 – Obvious based on Baarman392 (EX1008) in view of Partovi
2B	2, 6	§103 – Obvious based on Baarman392 in view of Partovi and Tocci (EX1009)



Patent Owner elected to never cross-examine Dr. Woods after his reply testimony.

Pet., 1-2; Reply, 2

Issues Disputed by Patent Owner

Onishi Grounds 1A-1B

1. Element [1.4] - "said inductive coupling having **a characteristic resonant frequency**"
2. Element [1.7] – "configured and operable to … at a transmission frequency **substantially different from** said characteristic resonant frequency"
3. Dependent claim 2 – "configured to .. **increase/decrease said transmission frequency**"
4. "**Motivation to combine**" arguments

Baarman392 Grounds 2A-2B

1. Element [1.7] – "configured and operable to … at a transmission frequency **substantially different from** said characteristic resonant frequency"
2. "**Motivation to combine**" arguments
3. Dependent claim 2 – "configured to .. **increase/decrease said transmission frequency**"

Patent Owner's proposed claim construction.

Reply 3, 7-8, 16-17,18-19, 22, 24; POR, ii-iii

Issue 1:

Claim Construction – Element [1.7] "substantially different from"

Element [1.7] "substantially different from"
CLAIM CONSTRUCTION

Claim Language

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.

Prosecution History

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.

EX1002, 70.

Petition & Dr. Woods

Thus, 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. EX1003, ¶¶36-41….

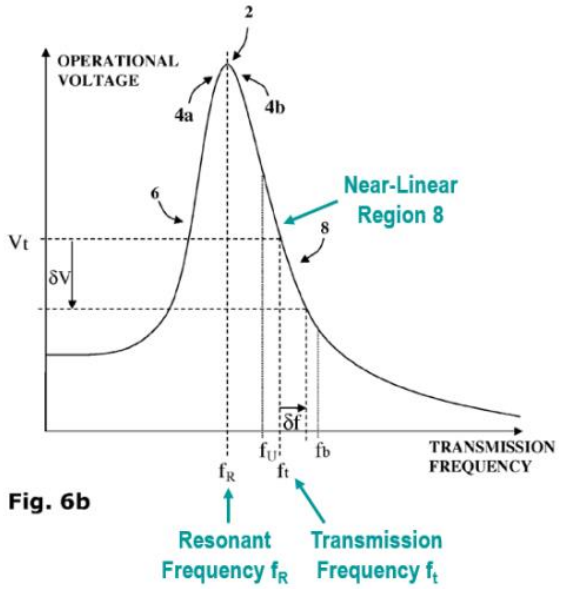


Fig. 6b

Pet. 7-9; EX1003, ¶¶37-43

Element [1.7] “substantially different from”
CLAIM CONSTRUCTION

Institution Decision

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.”

Inst. Dec., 22.

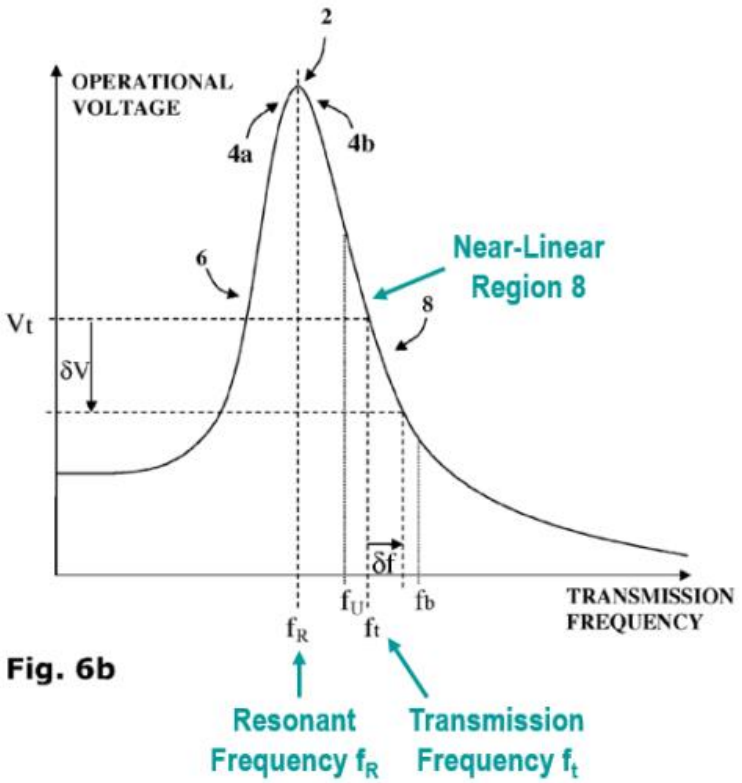


Fig. 6b

Pet, 8; EX1003, ¶¶39-41; Reply, 2-3; EX1101, ¶¶7-15

Element [1.7] "substantially different from"
CLAIM CONSTRUCTION

Patent Owner's Varying Positions Over Time

2015

> 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.

EX1002, 70.

2024

> 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. Mercier Dec. at ¶ 59.

POPR, 25

2025 . . .

Reply, 2-3; EX1101, ¶¶8-9

Element [1.7] "substantially different from"
CLAIM CONSTRUCTION

Patent Owner's Varying Positions Over Time

2015 . . .

2024 . . .

2025

Importation #1

Importation #2

> Accordingly, a POSITA would understand that the selection of a transmission frequency within the near-linear regions of a frequency-amplitude graph (*i.e.*, selection of a transmission frequency that is substantially different from the characteristic resonant frequency) will enable a linear control technique for predictably regulating power transfer. *Id.* at ¶ 112. Thus, a POSITA would define the "transmission frequency [that is] substantially different from the characteristic resonant frequency," as recited in claim 1, to further allow for some incremental change (increase or decrease) in frequency while remaining in one of the near-linear regions of the frequency-amplitude graph. *Id.*

POR, 29.

Reply, 2-3; EX1101, ¶¶8-11

Element [1.7] "substantially different from"
CLAIM CONSTRUCTION

Legal Precedent:

Hill-Rom Servs. v. Stryker Corp., 755 F.3d 1367, 1371-73 (Fed. Cir. 2014) ("Absent such language, we do not import limitations")

Samsung Elecs. Co. v. Power2B, Inc., 2025 U.S. App. LEXIS 7354 (Fed. Cir. Mar. 31, 2025) ("The fact that the specification repeatedly refers to preferred embodiments … does not justify importing such a limitation into the independent claims. … the preferred embodiments cannot limit otherwise broad claims in the absence of an unmistakable disavowal of claim scope.").

Reply, 2-3.

Dr. Woods (citing to '696 patent specification):

> . . . . None of these descriptions for "substantially different," nor any other teachings in the '696 Patent, include the exact substance of PO's construction. In other words, based on my review, the specification of the '696 never defines the phrase "transmission frequency substantially different from said characteristic resonant frequency" to further require that the transmission frequency "allow for some incremental change (increase or decrease) in frequency while remaining in the near-linear regions of the frequency-amplitude graph."

Patent Owner elected to never cross-examine Dr. Woods after his reply testimony.

Reply, 2-3; EX1101, ¶¶10-11

Element [1.7] "substantially different from"
CLAIM CONSTRUCTION

Dr. Woods:

11. Even if these teachings were to support PO's and Dr. Mercier's construction, which they do not for at least the reasons I discussed above, these teachings would only describe example embodiments of the '696 Patent, which I understand should not be imported into the claims. *See* EX1001, 4:141-17 ("Preferably," "Optionally"), 21:16-23 ("of embodiments," "Preferably"); 21:56-65 ("For example"), 22:45-64 ("One example").

Patent Owner elected to never cross-examine Dr. Woods after his reply testimony.

'696 patent at col. 4:

Preferably, the transmission frequency lies within a range in which induced voltage varies approximately linearly with frequency. Optionally, the driver is configured to adjust the transmission frequency in response to the feedback signals.

'696 patent at col. 22:

In some embodiments, a microcontroller in the driver **6230** may use such feedback parameters to calculate the required transmission frequency and to adjust the driver accordingly. Alternatively, simple feedback signals may be provided indicating whether more or less power is required.

One example of a power regulation method using simple feedback signals is shown in the flowchart of FIG. **6***d*. . . .

'696 patent at col. 21:

It is a particular feature of embodiments of the current invention that the driver **6230** (FIG. **6***a*) 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.

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. A transmission frequency f_t, higher than the resonant frequency f_R of the system, produces an induced voltage of V_t. The induced voltage can be increased by reducing the transmission frequency and can be reduced by increasing the transmission frequency. For example, an increase in transmission frequency of δf produces a decrease in induced voltage of δV.

Reply, 2-3; EX1101, ¶¶10-11

Element [1.7] "substantially different from"
CLAIM CONSTRUCTION

Prosecution History

The Applicant notes that the term "*substantially different from said characteristic resonant frequency*" is used in the specification at least in paragraph [0161]. The meaning of the term is further illustrated in Fig. 6b which shows a graph showing how the amplitude of the operational voltage varies according to the transmission frequency and indicates that the required transmission frequency is shifted away from the resonant peak of the graph. Paragraph [0161] of the current application is cited in its entirety below:

> *[0161] It is a particular feature of embodiments of the current invention that the driver 6230 (FIG. 6a) 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.*

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.

No discussion at all in prosecution history of any further requirements for linear control or allowance for incremental change in "substantially different from …" frequency

EX1002, p. 70 (Pet., 7-9, Reply, 2-3)

Issue 2:

Baarman392 Grounds – Element [1.7] "substantially different from"

Baarman392 – Element [1.7] "substantially different from"

Baarman392 discloses "substantially different from" for the same reasons as the '696 patent's preferred embodiment:

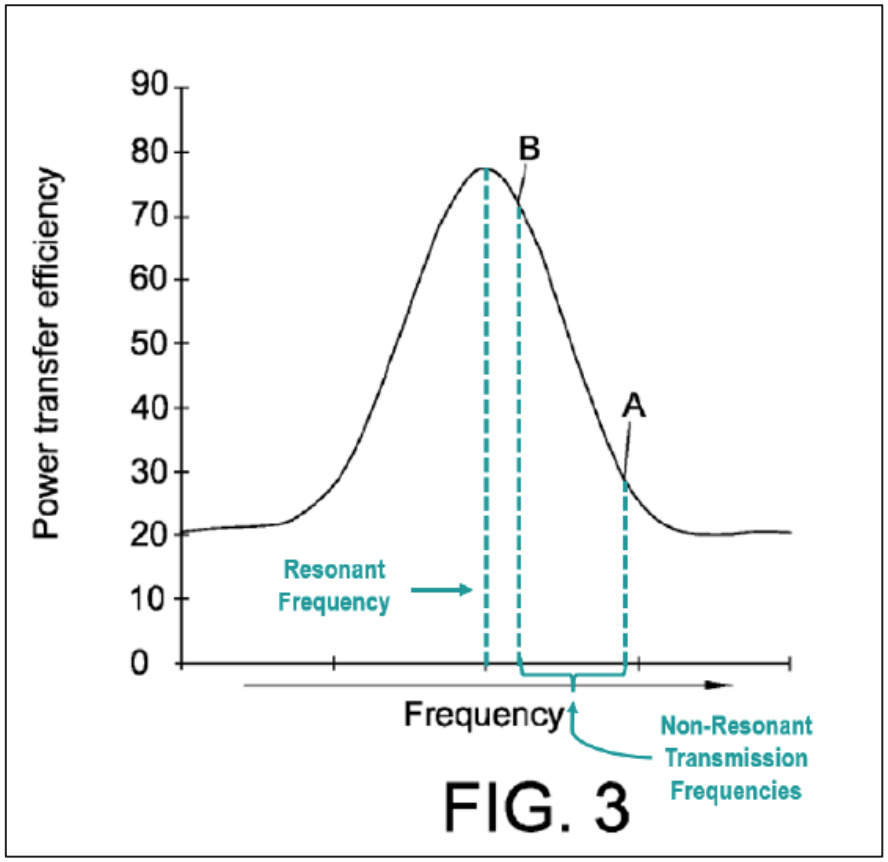


FIG. 3

[0038] 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.

Pet., 63-65; EX1003, ¶¶119-120

Baarman392 – Element [1.7] "substantially different from"

Dr. Woods testified about Baarman392's FIG. 3 in the context of Baarman392's teaching at [0038] and elsewhere:

[0038]; *see also id.*, [0015]-[0019], [0055]-[0057], FIG. 7. As shown here, Baarman392's inverter 10 (in connection with driver 16) —i.e., components of the claimed **driving circuit**—produces a driving voltage at a non-resonant transmission frequency within a near-linear region of the power transfer curve. Consistent with the specification and file history of the '696 patent, Baarman392's operating frequencies (e.g., between frequencies A and B) fall within the scope of being "substantially different" from the characteristic resonant frequency of the inductive couple. *Above*, Section VII. Indeed, the strikingly similar positions of Baarman392's transmission frequencies between A and B 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 Baarman392 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. EX1001, 21:16-23, 21:56-65, FIG. 6b.

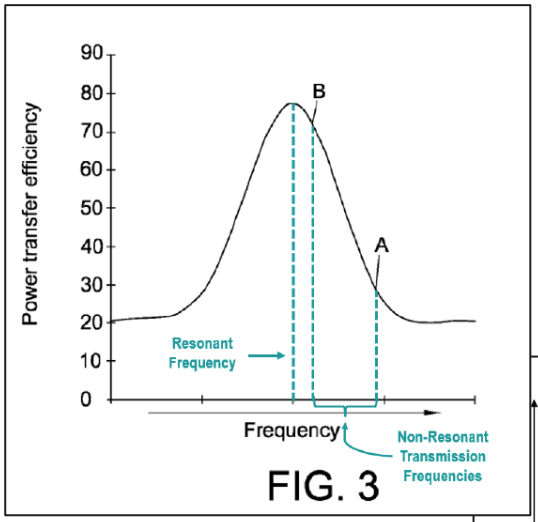


FIG. 3

EX1003, ¶120

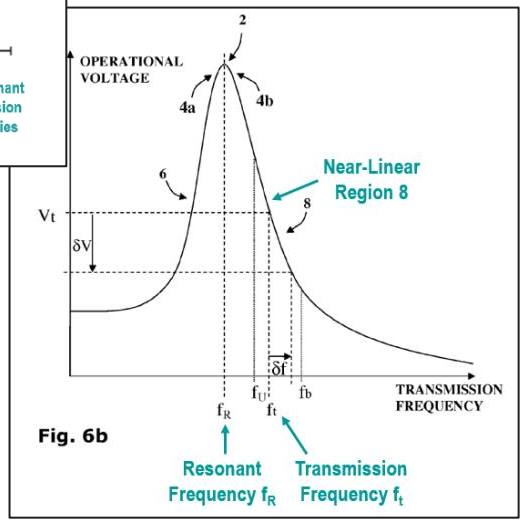


Fig. 6b

Legal Precedent:

In re Mraz, 455 F.2d 1069, 1072 (CCPA 1972) (that which "patent drawings show clearly" should not be "disregarded").

Alivecor, Inc. v. Apple Inc., 130 F.4th 1006, 1015 (Fed. Cir. 2025) ("To restrict each reference's teachings to the particular way … would improperly fail to read these references for all that they disclose")

Pet., 64-65; EX1003, ¶120; Reply, 19-22 and 15-16; EX1101, ¶¶56-61

Baarman392 – Element [1.7] "substantially different from"

Baarman392's operating algorithm incrementally passes through the near-linear region, which region is included in Baarman392's frequency-amplitude curve.

Dr. Mercier's Admission:

Q. Do all parabolic frequency curves for an inductive power transmission system have an approximately linear region?

THE WITNESS: I was trying to think of a counter example. I can't think of a counter example at the moment.

EX1102, 29:7-15 (Reply, 20-21; EX1101, ¶57)

Dr. Woods Reply Testimony:

Dr. Mercier appears to agree that the linear/near-linear region is an inherent feature of all resonance curves for an inductive couple. EX1102, 29:7-15. In this context, it is clear that Baarman392's operating frequencies include frequencies in the linear/near-linear region.

EX1101, ¶57 (Reply, 20-21)

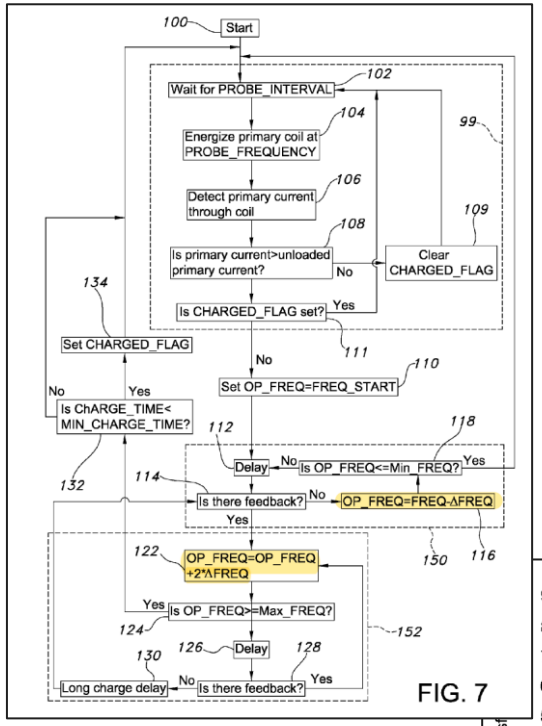


FIG. 7

EX1008, FIG. 7 (Pet., 52-53, 64)

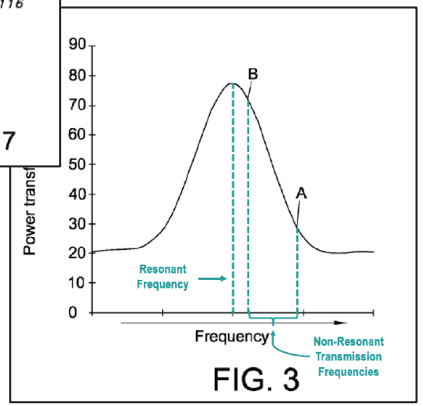


FIG. 3

EX1008, FIG. 3 (Pet. 64)

Baarman392 – Element [1.7] "substantially different from"

Patent Owner's first argument: Baarman392's *discrete point "B"* is "somewhat less" than the resonant frequency [POR, 55-56]

Dr. Woods:

56. PO and Dr. Mercier argue that Baarman392 discloses using a frequency that is "somewhat less than the resonant frequency" and not "substantially different." EX1008, [0038]; POR, 55-58; EX2006, ¶¶150-154. This argument ignores that rest of Baarman392's paragraph [0038] which clarifies 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." EX1008, [0038] (emphasis added), *see also* [0056] (explaining that the charger circuit can "operat[e] relatively far from resonance"). A POSITA would have understood that a change in operating frequency which results in a generally predictable change in power transfer would be an operating frequency that is analogous to a frequency chosen to lie in the near-linear region identified in FIG. 6b of the '696 patent.

Patent Owner elected to never cross-examine Dr. Woods after his reply testimony.

Baarman392:

[0038] 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

Reply, 20-21; EX1101, ¶¶55-57

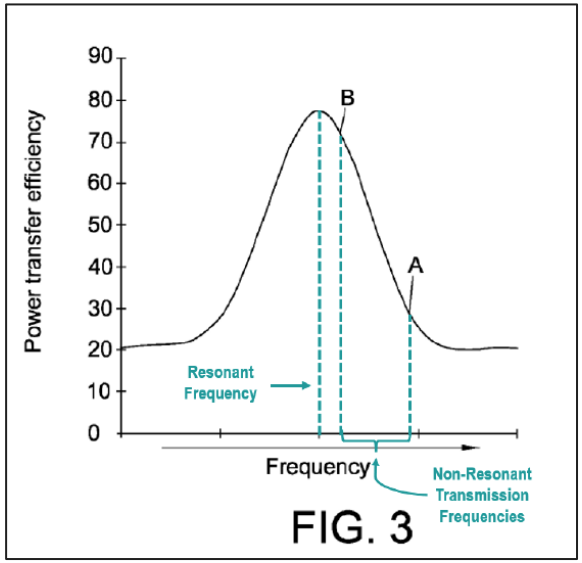
Baarman392 – Element [1.7] "substantially different from"

Patent Owner's first argument: Baarman392's *discrete point "B"* is "somewhat less" than the resonant frequency [POR, 55-56]

Dr. Woods:

57. Additionally, Baarman392 in FIG. 3 shows a range of frequencies from A to B in which the operating frequency can be applied. EX1008, FIG. 3, [0038]. Baarman392 states "[g]enerally, the inverter 10 is operated between frequency A and frequency B." EX1008, [0038]. I understand that element [1.7] is satisfied if even just one of Baarman392's operating frequencies is positioned in the linear or near-linear portion of the frequency amplitude graph. In other words, I understand that Baarman392 is only distinguishable if ***none*** of the frequencies between A and B qualify as "substantially different." *Id.*; EX1002, 70. Here, it is clear that the operating frequencies bounded by A and B in Baarman392 encompass the linear/near-linear region of the curve, and therefore includes frequencies that are "substantially different" from the characteristic resonant frequency as claimed.

EX1101, ¶57 (Reply, 20-21)



EX1008, FIG. 3 (Pet. 64)

Dr. Mercier's Admission:

Q. Do all parabolic frequency curves for an inductive power transmission system have an approximately linear region?

THE WITNESS: I was trying to think of a counter example. I can't think of a counter example at the moment.

EX1102, 29:7-15 (Reply, 20-21; EX1101, ¶57)

Baarman392 – Element [1.7] "substantially different from"

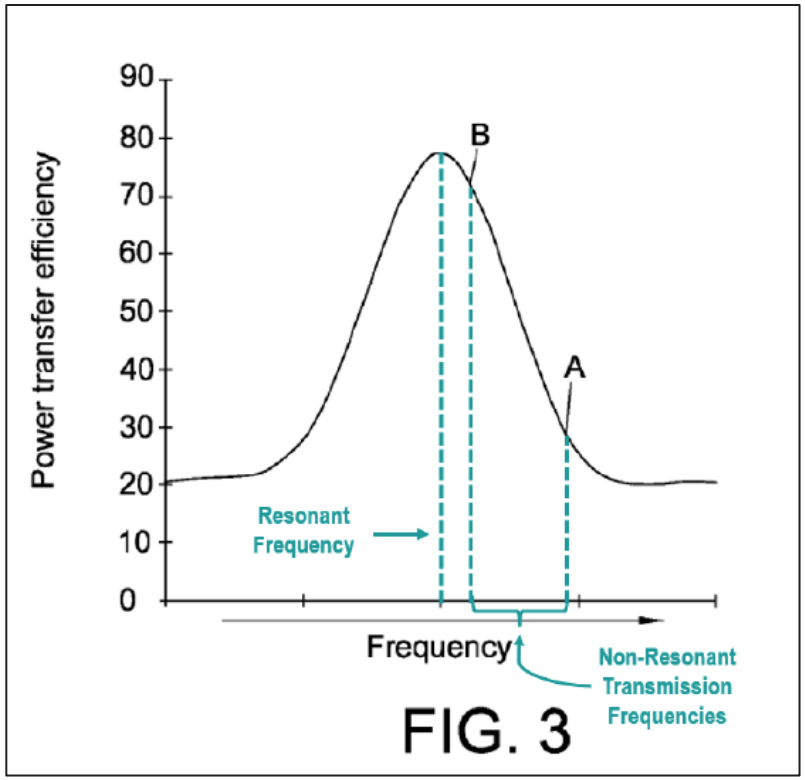
Patent Owner's second argument: For the "range between frequency A and frequency B," this range can be "piece-wise linearized" [POR, 58]

Dr. Woods Reply Testimony:

inductive couple." POR, 58-59; EX2006, ¶155. First, a POSITA would have understood that "near-linear" (e.g., the region shown in FIG. 6b of the '696 Patent) is different from linear in that it allows some variation from a perfect linear response. Accordingly, the region between A and B in Baarman392's FIG 3 being piece-wise linearized can be consistent with a "***near***-linear" curve. A "near-linear" curve can still be piecewise linearized to achieve even tighter control and greater linearity, if desired.

59. Again I note that Element [1.7] only requires the transmission frequency in "the ***near***-linear region." Accordingly, a curve being piece wise linearized could include regions that are linear and/or near-linear and this would have been clear to a POSITA when reviewing FIG. 3 of Baarman392. In other words, the portion on the graph between A and B being "piece-wise linearized" does not preclude every position of the region between A and B from being linear or near-linear. In fact, a POSITA would have understood and found obvious using a piece-

Patent Owner elected to never cross-examine Dr. Woods after his reply testimony.



Reply, 21-22; EX1101, ¶¶58-59

Baarman392 – Element [1.7] "substantially different from"

Patent Owner's third argument: The portion "between frequency B and the beginning of the near-linear region" is performed "non-linearly" [POR, 59]

(Based on construction argument that imports "linear control technique")

Dr. Woods Reply Testimony:

61. Finally, I note that even under PO's construction, Baarman392 would still expressly teach Element [1.7], because at least one of the possible operating frequencies (between A and B in Baarman392's FIG. 3) would allow for "some incremental change" within the near-linear region:

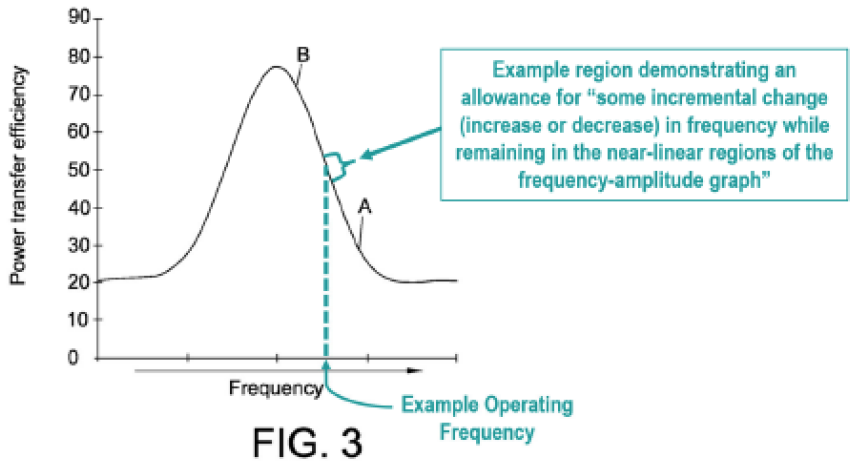


FIG. 3

EX1008, FIG. 3 (annotated), [0038].

Patent Owner elected to never cross-examine Dr. Woods after his reply testimony.

EX1101, ¶61 (Reply, 19-20)

Issue 3:

Baarman392 Grounds – "Motivation to combine" arguments

Baarman392 Grounds – "Motivation to combine"

The Petition articulated multiple reasons to combine Baarman392 and Partovi, supported by Partovi's express disclosure and expert testimony of Dr. Woods:

First, a POSITA 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." EX1007, [0082] ("magnet" elements, "mechanical means (dimples, protrusions, etc.)"), [0096] ("lights," "LEDs," "displays," or "audio signals or messages"), [0135], EX1003, ¶106. Indeed, 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. EX1003, ¶106; *Intel*, 61 F.4th at1380 ("[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.").

Second, a POSITA also would have been motivated to implement the Baarman392-Partovi combination to allow a user to more conveniently and rapidly place the rechargeable device on the charging platform in an optimized or otherwise stable position for charging without requiring tedious repositioning of the receiver device for achieving coil alignment. EX1003, ¶107. For example, a POSITA also would have understood that implementing a magnetic alignment mechanism (as suggested by Partovi) would have advantageously biased the receiver device into an optimal charging position (e.g., by using a magnetic field to "snap" the device toward the aligned position). EX1003, ¶107.

Third, a POSITA also would have been motivated to implement the Baarman392-Partovi combination because—in addition or alternative to Partovi's magnetic alignment mechanism (described above)—Partovi's suggestion for providing further confirmation in the form of surface dimples/protrusions, audible alignment indications, and/or visual alignment indications would have been particularly beneficial for elderly users or users with hearing or visual impairments. EX1003, ¶108.

Patent Owner never addressed the Petition's second or third motivations.

Pet. 54-56; EX1003, ¶¶104-109

Baarman392 Grounds – "Motivation to combine"

Patent Owner's first argument: Partovi's alignment mechanism would result a tight coupling contrary to Baarman392's disclosure of a "loosely coupled" system. [POR, 60-62]

Dr. Woods Reply Testimony:

63. First, as discussed above, Partovi is clear that in the wireless charger, "the frequency of the switch can be changed to move the circuit into, ***and out of, resonance to create the appropriate voltage in the receiver***." EX1007, [0078]. *See Above* Section VI. For these same reasons, nothing regarding Partovi's alignment mechanism precludes it from being used in a system that transmits power at a frequency substantially different from the resonant frequency of the couple (*i.e.*, as taught by Baarman392).

64. Second, a POSITA would readily recognize that the solution in Baarman392 would function even in a tightly coupled scenario. In other words, Baarman392's solution would operate even with a steep power transfer curve to achieve the desired behavior. *See* EX1008, [0038]. PO's assertion that Baarman392 "expressly state[s]" that "a tightly coupled charging system like Partovi would cause the slope of the power transfer curve to become too steep to achieve the behavior desired" is not supported anywhere in Baarman392 let alone expressly. *See* EX1008, [0038].

Patent Owner elected to never cross-examine Dr. Woods after his reply testimony.

Reply, 22-23; EX1101, ¶¶63-64

Baarman392 Grounds – "Motivation to combine"

Patent Owner's first argument: Partovi's alignment mechanism would result a tight coupling contrary to Baarman392's disclosure of a "loosely coupled" system. [POR, 60-62]

Dr. Woods Reply Testimony:

65. Third, a POSITA would understand that even with Partovi's alignment mechanism a loose coupling between the primary and second coils could occur for many different reasons. In other words, while improved, the resulting coupling from Partovi's alignment mechanism could still result in a loose coupling between a primary and secondary analogous to the example demonstrated in Baarman392. For example, a POSITA would have understood that the coupling relies on several factors including those which would not be eliminated via alignment alone, such as

Patent Owner elected to never cross-examine Dr. Woods after his reply testimony.

Reply, 23; EX1101, ¶65

Baarman392 Grounds – "Motivation to combine"

Patent Owner's second argument: "[R]egarding element [1.7], Petitioner appears to mix embodiments of Baarman in its citation to [0015]-[0019] and [0055]-[0057] …" [POR, 63]

Dr. Woods Reply Testimony:

66. Finally, PO's argument that the Petition appears to mix embodiments of Baarman392 for teaching [1.7] is incorrect. POR, 63-64. Based on the corresponding heading "DESCRIPTION OF THE CURRENT EMBODIMENT" it is clear that the citations to FIGs. 3, 7 and paragraphs [0038], [0055]-[0057] all correspond to the "current embodiment." *See* EX1008, between [0024] and [0025] ("DESCRIPTION OF THE CURRENT EMBODIMENT"); [0038] ("the illustrated embodiment"); [0055]-[0057]. The only other citations for Element [1.7] are "*see also*" cites to the Baarman392's summary. Further, the "current embodiment" of Baarman392, as modified by the additional references outlined in my first declaration and the Petition, satisfies all elements of the challenged claims.

Petition (Element [1.7]):

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." EX1006, [0038]; *see also id.*, [0015]-[0019], [0055]-[0057], FIG. 7; EX1003, ¶120. As shown here, Baar-

Baarman392's "Current Embodiment"

DESCRIPTION OF THE CURRENT EMBODIMENT

[0032] An inductive charging system in accordance with an embodiment of the present invention in shown in FIG. **2**. The inductive charging system **4** is configured to inductively

[0038] 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 exem-

[0055] The controller **20** then determines whether a feedback signal, discussed previously, has been received. If not, then the frequency is decreased by ΔFREQ. Step **116**. In this embodiment, a decrease in the frequency moves the system toward resonance, and therefore increases the power transfer from the charger circuit **6** to the battery **34**.

Patent Owner elected to never cross-examine Dr. Woods after his reply testimony.

Reply, 23-24; Pet., 64; EX1101, ¶66; EX1001, [0032], [0038], [0055]

Baarman392 Grounds – "Motivation to combine"

Patent Owner's second argument: "[R]egarding element [1.7], Petitioner appears to mix embodiments of Baarman in its citation to [0015]-[0019] and [0055]-[0057] …" [POR, 63]

Baarman392's "Current Embodiment"

[0038] 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.

[0055] The controller **20** then determines whether a feedback signal, discussed previously, has been received. If not, then the frequency is decreased by ΔFREQ. Step **116**. In this embodiment, a decrease in the frequency moves the system toward resonance, and therefore increases the power transfer from the charger circuit **6** to the battery **34**.

[0057] The frequency is then compared with Min_FREQ. Step **118**. Min_FREQ is the predetermined minimum operating frequency for the inverter. Generally, Min_FREQ is somewhat greater than the resonant frequency for the tank circuit **12**. If the frequency is less than or equal to that of Min_FREQ, then the controller **20** returns to probing. If not, then the controller **20** waits for a predetermined period time (Step **112**) and then checks for the occurrence of a feedback signal. Step **114**.

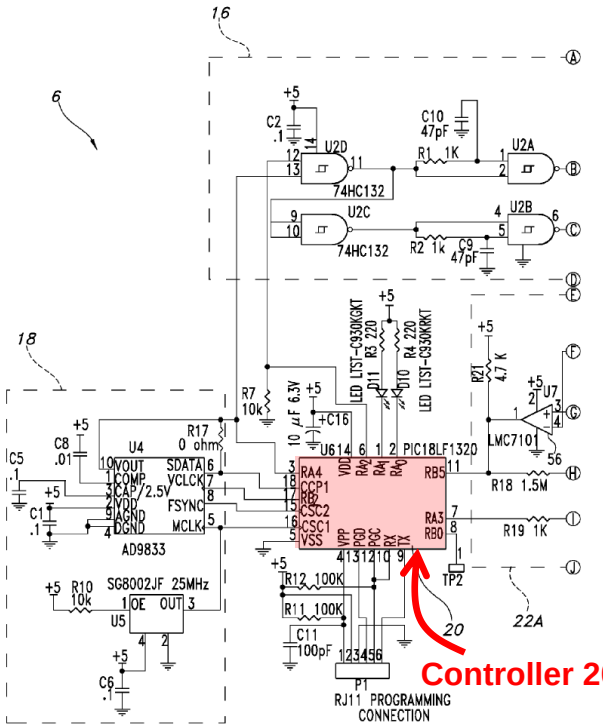


FIG. 4A

Reply, 23-24; Pet., 64; EX1101, ¶66; EX1001, [0032], [0038], [0055]

Issue 4:

Baarman392 Grounds – Dependent claim 2's recitation of "configured to .. increase/decrease said transmission frequency"

Baarman392 Grounds – Dependent claim 2

Claim language:

[2.P] The inductive power outlet of claim 1 said inductive power outlet comprising a signal detector adapted to detect a first signals and a second signal, and said driver is configured to:

[2.1] **increase** said transmission frequency when said **first signal** is detected by the detector; and

[2.2] **decrease** said transmission frequency when said **second signal** is detected by the detector.

Dr. Woods:

153. Furthermore, as described above in Element [2.P], the predictable Baarman392-Partovi-Tocci combination would have been implemented so that an abnormal charging condition would be represented by a first Boolean logic signal (**first signal**) such as HIGH. *Above*, Section XI.B; Element [2.P]; EX1007, 57. In this context, Baarman392-Partovi-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 by the peak detector 22 and controller 20 (collectively, the claimed **signal detector**).

155. Further, as described above in Element [2.P], 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 LOW. *Above*, Section XI.B; Element [2.P]-[2.1]; EX1009, 57. In this context, Baarman392-Partovi-Tocci's driver would have predictably provided more power by decreasing the non-resonant transmission frequency by ΔFREQ when the second Boolean logic signal is detected by the peak detector 22 and controller 20 (collectively, the claimed **signal detector**).

Baarman392:

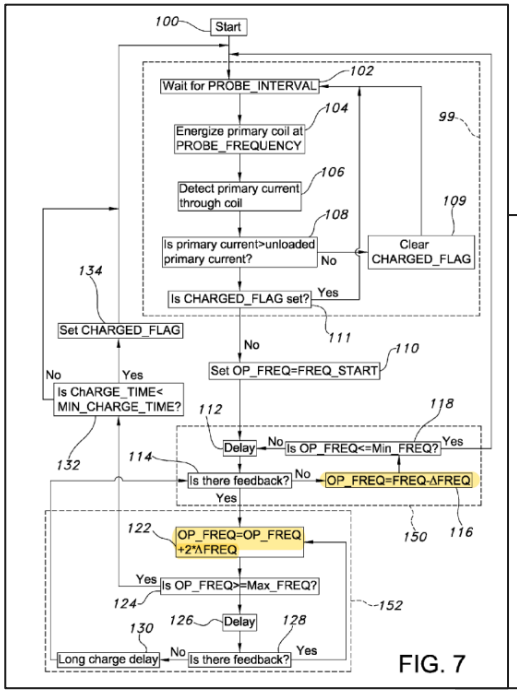


FIG. 7

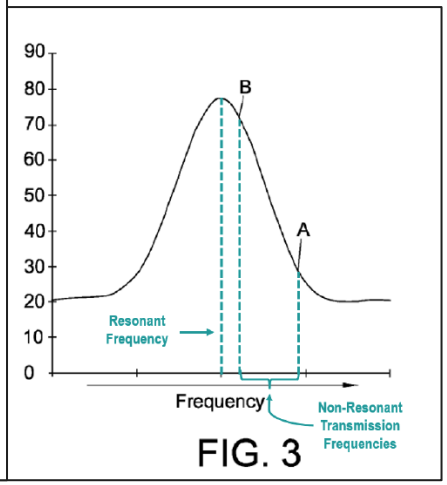


FIG. 3

Pet., 75-80; EX1003, ¶¶153, 155; EX1008, FIGs. 3, 7

Baarman392 Grounds – Dependent claim 2

Patent Owner's argument: Baarman392's operation at frequency B that "is somewhat less than the resonant frequency" is not substantially different from the resonant frequency, and "any change in frequency" will be "non-linear." [POR, 64-66]

(Based on construction argument that imports "linear control technique")

Dr. Woods Reply Testimony:

68. First, Baarman392 explains that modifying the frequency between A and B results in a "generally predictable" change in power. EX1008, [0038] ("a decrease in the operating frequency of the inverter 10 will result in a generally predictable increase in the power transferred."). This means Baarman392 expressly discloses operating in the near-linear region of a frequency amplitude graph (e.g., as

Patent Owner elected to never cross-examine Dr. Woods after his reply testimony.

A as shown in FIG. 3. *Id., see also* [0038], FIG. 3. A POSITA would recognize that this would include at least one decrease in frequency, but more commonly multiple decreases in frequency, that is within a portion of the curve between B and A that is linear or near-linear to meet Element [2.2]. Similarly, Baarman392 discloses repeatedly increasing the transmission frequency (twice the value of ΔFREQ) until the operating frequency exceeds a maximum frequency. EX1008, FIG. 7, [0059]. In other words, in at least some instances the frequency is increased by "twice the value of ΔFREQ" from A until the operating frequency would be greater than B as shown in FIG. 3. *Id., see also* [0038], FIG. 3. A POSITA again would recognize that this also would include at least one increase in frequency, but more commonly multiple increases in frequency, within the linear or near-linear portion of the resonant curve.

Reply, 24-26; Pet., 64; EX1101, ¶¶68-69; EX1001, [0032], [0038], [0055]

Issue 5:

Onishi Grounds – Element [1.4] "said inductive coupling having a characteristic resonant frequency"

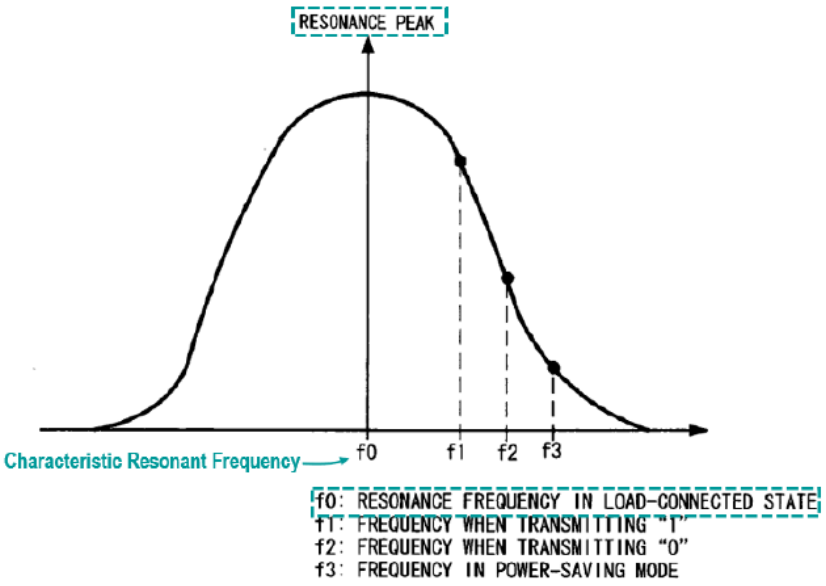
Onishi – Element [1.4] "said inductive couple having a characteristic resonant frequency"

Petition cited to Onishi's FIG. 4 and paragraphs [0137], [0180]:

[0137] The primary coil L1 (power-transmission-side coil) is electromagnetically coupled with the secondary coil L2 (power-receiving-side coil) to form a power transmission transformer. For example, when power transmission is necessary, the portable telephone **510** is placed on the charger **500** so that a magnetic flux of the primary coil L1 passes through the secondary coil L2, as shown in FIGS. 1A and 1B.

[0180] FIG. **4** is a view showing the resonance characteristics of the induction coil and applications of frequencies. The 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. **1**A) have a symmetrical and broad mountain shape, as shown in FIG. **4**, for example. In FIG. **4**, the horizontal axis indicates the frequency, and the vertical axis indicates the resonance peak value.

FIG. 4



Pet. 21-22; EX1003, ¶¶61-62; EX1004, [0137], [0180], FIG. 4

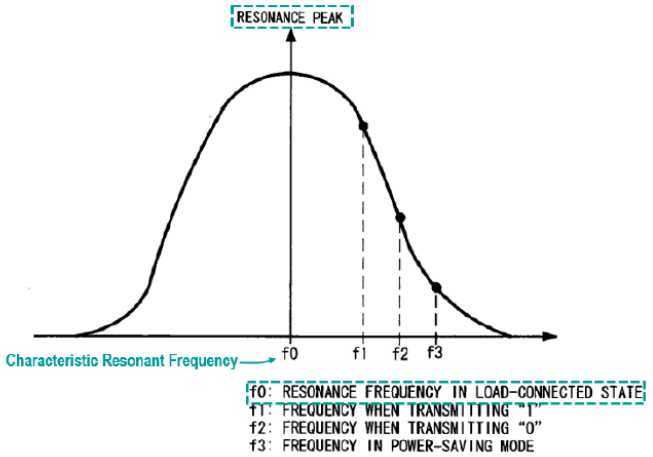
Onishi – Element [1.4] "said inductive couple having a characteristic resonant frequency"

Patent Owner's argument: "Onishi does not disclose that the primary coil L1 and the secondary coil L2 share a characteristic resonant frequency," as Onishi's discussion in paragraph [0180] is allegedly "only in the context" of a single coil. [POR, 31-37]

Dr. Woods Reply Testimony:

18. PO's and Dr. Mercier's position is contradicted by further disclosure in paragraph [0180] and FIG. 4 of Onishi. Specifically, the next sentence in paragraph [0180] clarifies what FIG. 4 represents, that is "[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). Paragraph [0180] is unambiguous that FIG. 4 does not illustrate the frequency-response of a single coil in isolation, 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. The text of FIG. 4 itself even explicitly labels frequency f0 as the "RESONANCE FREQUENCY IN LOAD-CONNECTED STATE." EX1004, FIG. 4; *see also id.*, [0180]-[0182].

FIG. 4



Patent Owner elected to never cross-examine Dr. Woods after his reply testimony.

Reply, 3-7; EX1101, ¶18

Onishi – Element [1.4] "said inductive couple having a characteristic resonant frequency"

Patent Owner's argument: "Onishi does not disclose that the primary coil L1 and the secondary coil L2 share a characteristic resonant frequency," as Onishi's discussion in paragraph [0180] is allegedly "only in the context" of a single coil. [POR, 31-37]

Dr. Woods Reply Testimony:

21. Finally, a POSITA would have understood that an inductive couple between a primary and secondary coil used for transmitting power would have "a characteristic resonant frequency" because this is an inherent physical property of an efficient inductive couple used for transmitting power in an inductively coupled system like Onishi.

Patent Owner elected to never cross-examine Dr. Woods after his reply testimony.

Dr. Mercier Cross-Examination Testimony:

Q. Do all parabolic frequency curves for an inductive power transmission system have a characteristic resonant frequency for the inductive couple?

Dr. Mercier's answer:

If you have a parabolic-shaped curve, as in your original question, then yes, I would say there is a characteristic resonant frequency in all cases. But if it's not parabolic-shaped, then it may be different.

Reply, 3-7; EX1101, ¶21

Issue 6:

Onishi Grounds –Element [1.7] "substantially different from"

Onishi – Element [1.7] "substantially different from"
CLAIM CONSTRUCTION (refer also to "issue 1" above)

Claim Language

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.

Prosecution History

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.

EX1002, 70.

Petition & Dr. Woods

Thus, 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.

EX1003, ¶¶36-41….

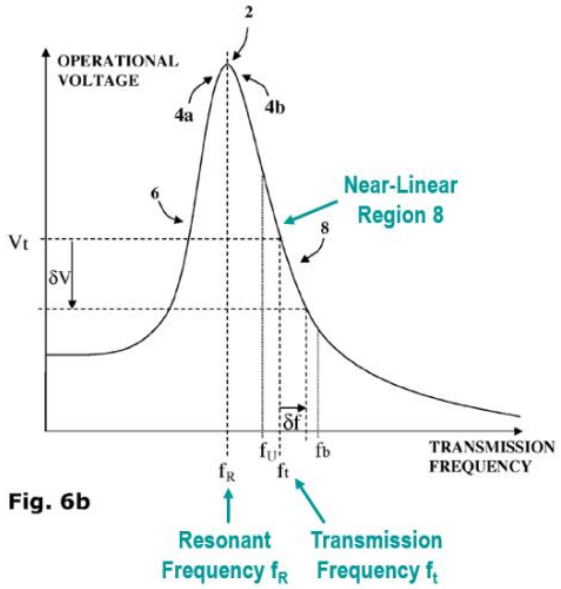


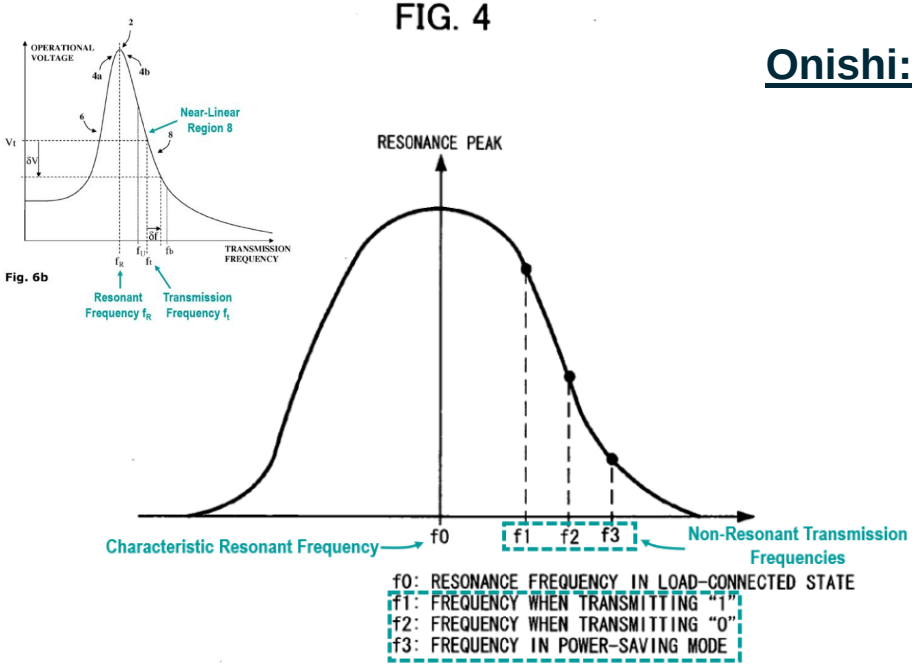
Fig. 6b

Pet. 7-9; EX1003, ¶¶37-43

Onishi – Element [1.7] "substantially different from"

Onishi discloses "substantially different from" for the same reasons as the '696 patent's preferred embodiment:

FIG. 4



Onishi:

[0181] 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. The frequency **f2** is a frequency used when transmitting "0" (see FIGS. **3**A and **3**B). A frequency **f3** is a frequency used in the power-saving mode. As is clear from FIG. **4**, the relationship "f1>f2>f3" is satisfied.

Dr. Woods Testimony:

transmission, for example."), [0171], FIG. 3A. Moreover, each of frequencies f1, f2, and f3 lie in a near-linear region of the frequency-response curve and thus, as noted during prosecution (*Above*, Section VI.B (citing EX1002, 62)), fall within the scope of being "substantially different" from the characteristic resonant frequency f0. EX1001, 21:16-23, 21:56-65, FIG. 6b; EX1002, 62, *above* Section VII. Indeed, the strikingly similar positions of Onishi's frequencies f1, f2, and f3 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. EX1001, 21:16-23, 21:56-65, FIG. 6b; *above* Section VII.

Legal Precedent:

In re Mraz, 455 F.2d 1069, 1072 (CCPA 1972) (that which "patent drawings show clearly" should not be "disregarded").

Alivecor, Inc. v. Apple Inc., 130 F.4th 1006, 1015 (Fed. Cir. 2025) ("To restrict each reference's teachings to the particular way … would improperly fail to read these references for all that they disclose")

Pet., 27-28; EX1003, ¶¶67-68; EX1004, [0181]

Onishi – Element [1.7] "substantially different from"

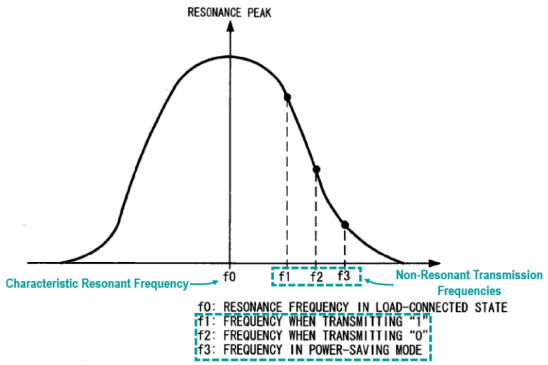
Patent Owner's first argument: Onishi's normal power transmission frequencies (f1 and f2) are not substantially different from the resonant frequency [POR, 42-44]

Dr. Woods Reply Testimony:

30. I understand that PO contends that none of f1, f2, nor f3 qualify as a frequency that is "substantially different" from the characteristic resonant frequency (e.g., f0). POR, 37-48. As I discussed above, these arguments are inconsistent with strong evidence that a POSITA would have understood each of f1, f2, and f3 to fall in the same linear/near-linear region of the frequency-amplitude graph as the transmission frequencies in FIG.6b of the '696 Patent.

Patent Owner elected to never cross-examine Dr. Woods after his reply testimony.

FIG. 4



32. PO's contention that f1 and f2 are necessarily at or near resonance because f3 is even further from resonance is contrary to the express disclosure in FIG. 4, which shows f1 and f2 set significantly apart from f0. EX1004, FIG. 4. If Onishi had intended f1 and f2 to be at or near resonance, f0, Onishi would have depicted f1, and f2 closer toward resonance than they are in FIG. 4 . In other words, the substantial separation between the frequencies f0, f1, and f2 would have been understood by a POSITA as a clear indication that f1 and f2 are substantially different from the resonant frequency f0.

Reply, 8-13; EX1101, ¶¶30, 32

Onishi – Element [1.7] "substantially different from"

Patent Owner's second argument: Onishi's power-saving mode frequency (f3) is not substantially different from the resonant frequency [POR, 44-48]

Patent Owner elected to never cross-examine Dr. Woods after his reply testimony.

Dr. Woods Reply Testimony:

EX1004, [0181], [0214]-[0215], [0226], FIG. 4. I note that f3 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. *See also* EX1004, [0181], [0214]-[0215], [0226], FIG. 4. PO's arguments also ignore the similarity between the position of "f3" in Onishi to the near-liner region in the '696 patent. EX1004, FIG. 4 (position of f1, f2) *cf.* EX1001, FIG. 6b (position F_u).

37. Second, Onishi explains that f3 "is a frequency used in the power-saving mode" at a position 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 f3 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.

'696 Patent (paras. [0053], [0064]):

management function of the load. Specifically, power consumption is sufficiently reduced during power-saving power transmission. 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.

Specifically, when the power reception device has changed from a low-load state (power-saving state) to a high-load state (recharge state), the amplitude of the induced voltage in the primary coil increases. Therefore, the power transmission device can reliably detect a change in load state by determining a change in amplitude using the threshold value, for example. Note that the load state change detection method is not limited to the above method. Another method may also be used.

Reply, 8-13; EX1101, ¶¶36-37

Onishi – Element [1.7] "substantially different from"

Patent Owner's third argument: The Petition's reliance on Onishi's FIG. 4 is improper because it is not drawn to scale and lacks vertical axis labels. [POR, 38-42]

Dr. Woods Reply Testimony:

42. A POSITA also would not require FIG. 4 to show "particular sizes" or even a particular frequency to understand whether they are "substantially different" and lie within the near-linear region, but would instead look to the position of the frequencies relative to a frequency-amplitude curve. This is exactly what is shown in FIG. 6b of the '696 Patent. Additionally, as I discussed above in Section V.B.1, Onishi is not silent on the position of the frequencies f1, f2, f3 relative to the frequency amplitude graph. *See above* Section V.B.1

43. Additionally, it would have been clear to a POSITA that FIG. 4 is a frequency-amplitude graph for an inductive couple. *See above* Section V.A. A POSITA would have readily known that the y-axis relates to a measurement (e.g., voltage, current, or power) in the system indicative of power transferred via the inductive couple in view of Onishi's disclosure. *See* EX1004, [0171] (the "power value of the resonant circuit becomes a maximum at the resonance peak, and decreases as the resonance frequency moves away from the resonance peak"), [0053]; *see also above* Section V.A (Element [1.4]). This is sufficient for a POSITA to determine that the frequencies f1, f2, f3 are in the near-linear region of a frequency-amplitude graph for an inductive couple. In particular, regardless of whether the Y-axis in FIG. 4 is power (i.e., watts), voltage (volts), or current (amps) the illustrated amplitude curve and positioning of frequencies f1, f2, f3, would demonstrate that the frequencies were selected to be substantially different from the characteristic resonant frequency when compared to the region from f_U to f_b shown in FIG. 6B of the '696 patent.

Patent Owner elected to never cross-examine Dr. Woods after his reply testimony.

Legal Precedent:

In re Mraz, 455 F.2d 1069, 1072 (CCPA 1972) (that which "patent drawings show clearly" should not be "disregarded").

Alivecor, Inc. v. Apple Inc., 130 F.4th 1006, 1015 (Fed. Cir. 2025) ("To restrict each reference's teachings to the particular way … would improperly fail to read these references for all that they disclose")

Reply, 13-16; EX1101, ¶¶42-43

Issue 7:

Onishi Grounds – Dependent claim 2's recitation of "configured to .. increase/decrease said transmission frequency"

Onishi Grounds – Dependent claim 2

Claim language:

[2.P] The inductive power outlet of claim 1 said inductive power outlet comprising a signal detector adapted to detect a first signals and a second signal, and said driver is configured to:

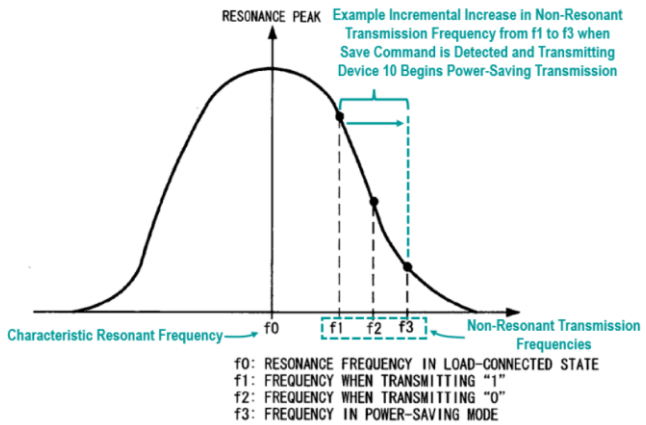
[2.1] **increase** said transmission frequency when said **first signal** is detected by the detector; and

[2.2] **decrease** said transmission frequency when said **second signal** is detected by the detector.

Dr. Woods:

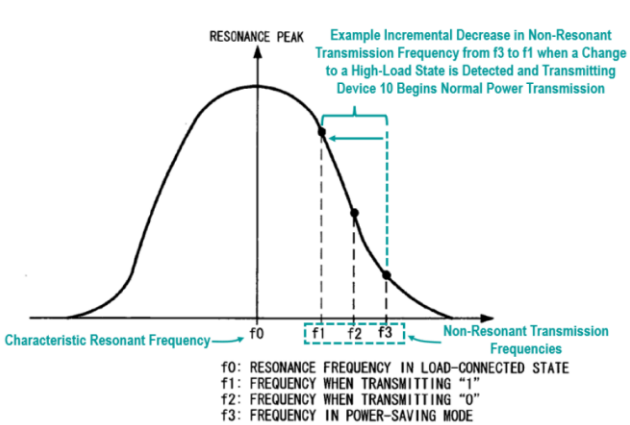
When initiating power-saving power transmission, power transmission section 12 (component of the **driver/driving circuit**) increases the transmission frequency from "f1" or "f2" to "f3," as shown in FIG. 4:

FIG. 4



When beginning normal power transmission, power transmission section 12 (component of the **driver/driving circuit**) decreases the transmission frequency from "f3" to "f1" or "f2", as shown in FIG. 4:

FIG. 4



Pet. 28-38; EX1003, ¶¶77-78

Onishi Grounds – Dependent claim 2

Patent Owner's Argument: Each increase/decrease in Onishi's frequencies f1, f2, and f3 occur outside the near-linear region and therefore entails a "non-linear" change in frequency. [POR, 50]

Dr. Woods Reply Testimony:

46. Dr. Mercier and the POR contend that the Onishi-Flowerdew Combination fails to renders Obvious Claim 2 based on their incorrect analysis that frequencies f1, f2, and f3 are not substantially different from the characteristic resonant frequency. EX2006, ¶¶140-143; POR, 49-51. However, as I discussed above for Section V.B (Element [1.7]), the frequencies disclosed in Onishi (e.g., f1, f2, f3) are substantially different from the characteristic resonant frequency. *See above* Section V.B. Accordingly, all changes in frequencies (i.e., increasing or decreasing) and importantly those discussed in the Petition any my first declaration will result in a movement along the near-linear portions of the resonant curve. *See above* Section V.B; Pet., 28-38; *See also* EX1003, ¶¶69-78.

Patent Owner elected to never cross-examine Dr. Woods after his reply testimony.

47. I also note that claim 2 never recites that the transmission frequency *after* the increase/decrease must also be substantially different from the resonant frequency of the inductive couple, or that the transmission frequency must remain in the linear/near-linear region of the graph. EX1001, 28:47-54. Regardless, Onishi would still meet these constraints even if claim 2 was narrowly interpreted to require them, especially since f1, f2, and f3 all lie in the linear/near-linear region of the graph as I discussed above. *See above* Section V.B. For each of these reasons, and those discussed in further detail in the Petition, claim 2 would have been obvious based on Onishi-Flowerdew

Reply, 16-17; EX1003, ¶¶46-47

Issue 8:

Onishi Grounds – "Motivation to combine" arguments

Onishi Grounds – "Motivation to combine" with Flowerdew

Petition articulated multiple reasons:

First, 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." EX1005, 7:52-61, 11:25-44, 2:59-3:14 ("make transfer efficiency as high as possible"); EX1003, ¶52. Indeed, the efficiency of the inductive couple between the primary and secondary coils would have predictably increased by using such a conventional option. EX1003, ¶52.

Second, a POSITA would have been motivated to implement the Onishi-Flowerdew combination to advantageously improve user convenience when placing the rechargeable device on the charger platform. EX1003, ¶53 (citing to EX1005, 11:25-44 and 7:52-61). The evidence here confirms that implementing such conventional improvements in Onishi's charger would have benefited the user both in terms of automatically guiding the rechargeable device toward a more optimized and stable position for charging and conveniently confirming a visual indication of a preferred orientation (without requiring tedious adjustments each time). EX1005, 11:25-44 ("geometrical advantageous," "tend to create a preferential stable orientation," and ""utilized to indicate a preferred orientation"), 7:52-61 ("indicating a preferred alignment"); EX1003, ¶53.

Third, Flowerdew expressly suggests a known technique to address a conventional problem—namely, aligning the primary and secondary coils in a wireless charger system in a rapid and error-free manner. EX1003, ¶54. Here, Onishi describes a wireless charger system that inductively couples a primary coil with a secondary coil (of a portable device) but does not *expressly* detail a solution for promoting alignment of the coils. EX1004, [0124]-[0131], [0180]-[0181], FIGS. 1A-2, 5; EX1003, ¶54. Flowerdew suggests a known technique to do so. EX1005, 7:52-61, 11:25-44, 2:59-3:14. Under the law in such circumstances, "then there is a motivation to combine." *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.").

Patent Owner never addressed the Petition's second or third motivations.

Pet. 14-17; EX1003, ¶¶49-55

Onishi Grounds – "Motivation to combine" with Flowerdew

Patent Owner's Argument: Onishi's single charging coil would not provide the horizontal coupling allegedly required by Flowerdew. [POR, 51-52]

Dr. Woods Reply Testimony:

> 49. Specifically, I note that the Petition does not propose to combine Flowerdew's horizontal coupling and long solenoidal coil with Onishi's charging system. Instead, the Petition and my first declaration addressed the obviousness of applying Flowerdew's suggestion for a conventional alignment mechanism in Onishi's charger—without ever proposing bodily incorporation of a specific coil configuration or alignment mechanism that would not be equally suitable to Onishi's charger. Pet., 15-17; EX1003, ¶¶49-55. The Petition and my first declaration cited evidence that a POSITA would have had multiple motivations to implement Onishi's charger in accordance with Flowerdew's suggestion and explained why a POSITA would have reasonably expected success. Pet., 14-17; EX1003, ¶¶49-55. A POSITA would have been more than capable of implementing such conventional features in Onishi's system.

Patent Owner elected to never cross-examine Dr. Woods after his reply testimony.

Legal Precedent

In re Mouttet, 686 F.3d 1322, 1332 (Fed. Cir. 2012) ("The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference.")

Intel Corp. v. PACT XPP Schweiz AG, 61 F.4th 1373, 1379 (Fed. Cir. 2023) ("The motivation-to-combine analysis is a flexible one. Any need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed. … And a person of ordinary skill is also a person of ordinary creativity, not an automaton.")

Reply, 17-18; EX1101, ¶¶48-50

Onishi Grounds – "Motivation to combine" with Partovi

Petition articulated multiple reasons:

First, a POSITA would have been motivated to implement the Onishi-Flowerdew combination to include an additional/confirmatory alignment mechanism using magnets, protrusions, audible, and/or visual indications (as suggested by Partovi) so as to advantageously provide built-in confirmation/feedback to the user that the receiver was properly positioned on the charger. EX1003, ¶93; EX1007, [0096] ("to help guide the user to place the mobile device on a primary coil for maximum reception").

Patent Owner never addressed the Petition's first or second motivations.

Second, a POSITA would have been motivated to do so because—beyond Flowerdew's suggested shaped surface features (described above)—Partovi's further suggestion for a combination of magnetic alignment elements (for biasing or "snapping" the receiver device to the desired orientation), mechanical protrusions, audible alignment indications, and/or visual alignment indications would have been recognized as particularly useful for elderly users or users with hearing or visual impairments who would benefit from a variety of alignment verification options. EX1003, ¶94.

Pet. 46-48; EX1003, ¶¶91-95

Onishi Grounds – "Motivation to combine" with Partovi

Patent Owner's Argument: Partovi's magnetic alignment mechanism is intended for resonant power transmission systems, rendering it non-obvious for use in Onishi's non-resonant transmission. [POR, 53-54]

Dr. Woods Reply Testimony:

52. PO and Dr. Mercier's position is contradicted by the express teachings in Partovi. For example Partovi states that "the frequency of the switch can be changed to move the circuit into, ***and out of, resonance to create the appropriate voltage in the receiver***." EX1007, [0078]. Accordingly, Partovi expressly contemplates driving a frequency that is "out-of" resonance to create the appropriate voltage in the receiver, such as to operate at any of the frequencies f1, f2, f3, to induce the appropriate voltage in the secondary coil.

Patent Owner elected to never cross-examine Dr. Woods after his reply testimony.

53. I also note that the citations to Partovi in the POR are taken out of context and do not support PO's conclusion that "Partovi is specifically directed to the use of magnetic alignment to facilitate operation at resonance." POR, 53-54, *see also* EX2006, ¶147. Specifically, PO relies on paragraph [0118] and [0047] to support its position. Partovi is clear that solution in cited paragraph [0118] is an "embodiment" of Partovi and paragraph [0047] states "power transfer efficiency between the primary coil and the secondary should be maximized" to support a conclusion that "methods where the entire pad is energized are not as attractive." To be clear, nothing in Partovi requires the wireless charger to operate at resonance and, as discussed above, Partovi expressly recognizes that there are systems which should operate off-resonance to "to create the appropriate voltage in the receiver" EX1007, [0078]. The argument that a non-resonant transmission system would be incompatible with a magnetic alignment mechanism is also contradicted by the '696 Patent's disclosure. *See* EX1001, 10:3-12.

Partovi:

[0078] In accordance with an embodiment, this can be done by a look up table in a memory location connected to a microprocessor or by using an algorithm pre-programmed into the microprocessor. Alternatively, the frequency of the switch can be changed to move the circuit into, and out of, resonance to create the appropriate voltage in the receiver. In

Reply, 18-19; EX1101, ¶¶51-53; EX1008, [0078]

THANK YOU