

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SAMSUNG ELECTRONICS CO., LTD.
Petitioner

v.

MOJO MOBILITY INC.
Patent Owner

Case No. IPR2023-01093
Patent No. 11,201,500

PATENT OWNER'S PRELIMINARY RESPONSE

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TABLE OF CONTENTS

I.	INTRODUCTION	1
II.	BACKGROUND	8
A.	The '500 Patent	8
B.	Claim Construction	14
C.	Person of Skill in the Art.....	14
III.	ARGUMENT.....	14
A.	The Petition Should Be Denied Under <i>Fintiv</i> As The Issues Presented By This Petition And Petitioner's Seventeen Other Petitions Will Be Resolved First In The Underlying District Court Case And Institution Of This Petition And The Other Seventeen Petitions Would Greatly Multiply The Proceedings, Rather Than Simplify Matters.....	14
B.	The Petition Fails To Establish That It Would Have Been Obvious To Combine The Five Cited References In Grounds 1 – 3.....	25
1.	The petition fails to provide the required showing for obviousness	25
2.	The Petition fails to address the multiple reasons as to why it would not have been obvious to combine the four or five references in each Ground.....	27
3.	The Petition fails to show with the required particularity that a POSITA would have been motivated to combine the alleged prior art	29
C.	The Petition Fails To Demonstrate The Independent Challenged Claim Is Invalid.....	35
1.	The Petition's suggested combination of four references fails to establish obviousness of the claim requirements of "periodically receive[ing] information corresponding to one or more output voltages or currents of the one or more receiver rectifier circuits . . ." and "regulate[ing] . . . the one or more output voltages or current of the one or more receiver rectifier circuits by adjusting the frequency or duty	

cycle of the one or more drive circuits during the charging or powering of the one or more portable devices” (Limitations [1.K-L])	36
2. The Petition fails to show that Okada and Odendaal render the planar coil limitations obvious (Limitation 1.B).....	44
a. Okada’s power transfer system is deliberately based on multi-tapped solenoid coils, not planar coils.	45
b. The Petition does not identify any multi-tap planar coil, shown by any reference in the combination—yet such a coil would be required to replace Okada’s solenoid coils with planar coils as Okada’s embodiments rely on tapped coils.	50
c. Use of only part of a planar coil would substantially impact the transmission efficiency of the coil, and would require an unknown alignment determination process.....	51
3. The Petition fails to show that it would have been obvious to combine Okada and Berghegger to arrive at the “a drive circuit [that operates] near a first resonant frequency” (Limitation 1.F)	55
D. Ground 1 Fails To Establish That The Additional Limitation In Dependent Claim 2 Was Obvious.	60
E. Ground 2 Fails to Establish That The Additional Limitation In Dependent Claim 4 Was Obvious.	63
F. Ground 3 Fails To Establish That The Additional Limitation In Dependent Claim 18 Was Obvious.	63
IV. CONCLUSION.....	65

TABLE OF AUTHORITIES

	Page(s)
CASES	
<i>Apple v. Fintiv</i> , IPR2020-00019, Paper 11 (PTAB March 20, 2020)	passim
<i>DeSilva v. DiLeonardi</i> , 181 F.3d 865 (7th Cir. 1999)	43
<i>E-One, Inc. v. Oshkosh Corp.</i> , IPR2019-00161, Paper 16 (PTAB May 15, 2019)	21
<i>General Plastic Industrial Co., Ltd. v. Canon Kabushiki Kaisha</i> , IPR2016-01357, Paper 19 (PTAB Sept. 6, 2017).....	18
<i>In re Clay</i> , 966 F.2d 656 (Fed. Cir. 1992)	61
<i>In re Gorman</i> , 933 F.2d 982 (Fed. Cir. 1991)	30
<i>In re Magnum Oil Tools Int’l, Ltd.</i> , 829 F.3d 1364 (Fed. Cir. 2016)	25, 42
<i>In re NuVasive, Inc.</i> , 842 F.3d 1376 (Fed. Cir. 2016)	26
<i>Johns Manville Corp. v. Knauf Insulation, Inc.</i> , IPR2018-00827, Paper 9 (PTAB Oct. 16, 2018).....	61
<i>KEYnetik, Inc. v. Samsung Electronics Co., Ltd.</i> , 841 Fed.App’x. 219 (Fed. Cir. 2021)	26
<i>Maxlite, Inc. v. Jiaxing Super Lighting Electric Appliance Co., Ltd.</i> , IPR2020-00208, Paper 32 (PTAB Oct. 12, 2021).....	21
<i>MyPort, Inc. v. Samsung Elecs. Co., Ltd.</i> , Case No. 2:22-CV-00114-JRG, Dkt. 73 (E.D. Tex. June 13, 2023)	18
<i>Next Caller, Inc. v. TrustID, Inc.</i> , IPR2019-00961, Paper 10 (PTAB Oct. 16, 2019).....	21

<i>Oyster Optics, LLC, v. Infierna Corp.</i> , Case No. 2:19-CV-00257-JRG, Dkt. 87 (E.D. Tex. July 17, 2020).....	19
<i>Plas-Pak Indus., Inc. v. Sulzer Mixpac AG</i> , 600 Fed. App'x 755 (Fed. Cir. 2015)	44
<i>Regents of University of California v. Broad Institute, Inc.</i> , 903 F.3d 1286 (Fed. Cir. 2018)	26
<i>Sand Revolution II, LLC v. Continental Intermodal Group – Trucking LLC</i> , IPR2019-01393, Paper 24 (PTAB June 16, 2020)	18
<i>SAS Institute Inc. v. Iancu</i> , 138 S. Ct. 1348 (2018).....	35
<i>Satco Products, Inc. v. The Regents of the University of California</i> , IPR2021-00794, Paper 14 (PTAB Nov. 10, 2021).....	20
<i>Solas OLED Ltd. v. Samsung Display Co., Ltd.</i> , Case No. 2:19-CV-00152-JRG, Dkt. 133 (E.D. Tex. July 17, 2020).....	19
<i>Sotera Wireless, Inc. v. Masimo Corp.</i> , IPR2020-01019, Paper 12 (PTAB Dec. 1, 2020)	23
<i>Stanley Black & Decker, Inc., et al. v. Zircon Corp.</i> , IPR2020-01572, Paper 10 (PTAB April 19, 2021)	21
<i>Vector Flow, Inc. v. HID Glob. Corp.</i> , IPR2023-00353, Paper 8 (PTAB July 27, 2023).....	25
<i>Verizon Business Network Services, Inc. v. Huawei Techs. Co.</i> , IPR2020-01141, Paper 12 (PTAB Jan. 14, 2021)	22
<i>Wasica Fin. GmbH v. Cont'l Auto. Sys., Inc.</i> , 853 F.3d 1272 (Fed. Cir. 2017)	42

STATUTES

35 U.S.C. § 102	17
35 U.S.C. § 103	17
35 U.S.C. § 312(a)(3).....	34, 42

35 U.S.C. § 313	1
35 U.S.C. § 314(a)	1, 16
35 U.S.C. § 315 (e) (2).....	24

OTHER AUTHORITIES

37 C.F.R. § 42.107	1
77 Fed. Reg. 48,756, 48,763 (Aug. 14, 2012)	34

TABLE OF EXHIBITS

Exhibit	Description
2001	Samsung's District Court Invalidity Contentions
2002	<i>Mojo Mobility Inc v. Samsung Electronics Co., Ltd, et al.</i> , Case No. 2-22-cv-00398, Dkt. 41 (Mojo's Response to Samsung's District Court Motion to Stay Pending IPR) (E.D. Tex. Aug. 11, 2023).
2003	<i>Mojo Mobility Inc v. Samsung Electronics Co., Ltd, et al.</i> , Case No. 2-22-cv-00398, Dkt. 1 (Complaint) (E.D. Tex. Oct. 7, 2022).

Mojo Mobility Inc. (“Patent Owner” or “Mojo”) submits this preliminary response in accordance with 35 U.S.C. § 313 and 37 C.F.R. § 42.107, responding to the Petition for *Inter Partes* Review (“Petition”) of claims 1, 3, 9, 11-13, and 20 of U.S. Patent No. 11,201,500 (the “’500 Patent”) filed by Samsung Electronics Co., Ltd. (“Petitioner” or “Samsung”).

I. INTRODUCTION

The Board should deny institution in its discretion under 35 U.S.C. § 314(a) for at least any one of the following reasons:

Procedurally, the petition should be denied on *Fintiv* grounds in light of the underlying district court litigation. Petitioner has filed *eighteen* IPR petitions challenging the validity of the seven patents at issue in the underlying district court case.¹ The eighteen IPR petitions contain in total 72 grounds and 34 prior art references. *Id.* Petitioner has asserted all these invalidity grounds (and more) in the

¹ See, e.g., (1) IPR2023-01086, (2) IPR2023-01087, (3) IPR2023-01088, (4) IPR2023-01089, (5) IPR2023-01090, (6) IPR2023-01091, (7) IPR2023-01092, (8) IPR2023-01093 (this IPR), (9) IPR2023-01101, (10) IPR2023-01102, (11) IPR2023-01098, (12) IPR2023-01099, (13) IPR2023-01100, (14) IPR2023-01124, (15) IPR2023-01094, (16) IPR2023-01095, (17) IPR2023-01096, (18) IPR2023-01097.

district court case. By way of this and it seventeen other petitions, Petitioner is seeking to convert what is a single proceeding—the district court case—into *eighteen* PTAB proceedings. Moreover, the district court case (which most likely will not be stayed) will hold trial five months before any Final Written Decision would be issued on the petitions. Accordingly, institution of this Petition and the seventeen other Petitions goes against the very principles and premise of the American Invents Act, as it would multiply and complicate the proceedings, rather than simplify matters.

Substantively, the Petition fails to establish the obviousness of combining all the references in each Ground—at least *five* references in each ground—in a manner that would result in the claimed subject matter and that would have been obvious to a POSITA. Notably, the Petition is unclear at best in some instances and nearly impossible to follow in others. For example, consider Petitioner’s entire argument for the closed loop feedback element (reproduced below).

- l) regulate in a closed loop feedback manner the one or more output voltages or currents of the one or more receiver rectifier circuits by adjusting the frequency or duty cycle of the one or more drive circuits during the charging or powering of the one or more portable devices.

The *Okada-Odendaal-Berghegger-Black* combination discloses/suggests this limitation. (Ex. 1002, ¶¶218-219.)

The analysis above demonstrates how/why a POSITA would have configured the *Okada-Odendaal-Berghegger* system to implement a closed-loop feedback control process where the “one or more communication and control circuits” (§§IX.A.1(e)-(f)) use device information received from PRM40 to control the disclosed “drive circuit(s)” during charging/powering by adjusting the frequency and/or duty cycle of the waveform applied to primary coil(s) 19 based on load variation information. (§§IX.A.1(c), 1(e), (g).) Also, for reasons explained for limitations 1(h) and 1(k), in the *Okada-Odendaal-Berghegger-Black* system, the load variation would have been measured as a voltage at the output of the receiver rectifier in PRM40, which is fed back to PTM10 with the power demand information for adjusting the frequency and/or duty cycle of the “drive circuit(s)” during charging/powering of the portable device. (*Id.*; §§IX.A.1(h), IX.A.1(k); Ex. 1006, 4:58-59, 5:65-6:29.) Accordingly, for the reasons explained (*see also* §§IX.A.1(a)-(b), IX.A.1(d)-(g), IX.A.1(i)-(j)), the *Okada-Odendaal-Berghegger-Black* combination discloses/suggests limitation 1(l). (Ex. 1002, ¶219.)

The entirety of the Petition’s analysis of this claim is *a single paragraph* that cites to numerous other sections of the Petition and other exhibits without any specificity. Those sections of the Petition also cite to other sections of the Petition and to other pieces of evidence. Petitioner essentially tells the Board and Patent Owner to go on

a treasure hunt for the evidence and the invalidity theory. Pet. at 61. This is not the required level of particularity this Board requires.

Moreover, the Petition fails to establish the presence of multiple claim limitations applicable to each of the Grounds in the Petition. *First*, the Petition fails to establish how to combine the several cited references to arrive at the claimed subject matter. Instead, in several instances as to each Ground, the Petition makes conclusory assertions and provides lengthy string cites making the Petition impossible to clearly follow. The Petition does not meet the statutory burden of establishing a reasonable likelihood of prevailing.

Second, Petitioner fails to demonstrate that Okada “periodically receive[s] information corresponding to one or more output voltages or currents of the one or more receiver rectifier circuits via the one or more primary coils and the one or more sense circuits; and regulate[s] in a closed loop feedback manner the one or more output voltages or currents of the one or more receiver rectifier circuits.” That is, Petitioner fails to demonstrate that Okada teaches closed-loop feedback control as claimed. Petitioner points to Okada’s power consumption information code which instructs the transmitter (the power transmitting module) *one time at the beginning* of the charging process to set the supplied power level to the device to “high, intermediate, or low” during the duration of the charging process. This is significantly different from the claimed periodic receipt by the transmitter of the

voltage/current value at the output of the receiver rectifier circuit for closed-loop regulation of these parameters by the transmitter. Furthermore, the Okada transmitter does not include any method for dynamically adjusting the power delivered to the primary coil to regulate in a feedback manner. Rather, the system only makes a one-time power output setting (low, intermediate or high).

Seemingly acknowledging these short comings in Okada, Petitioner makes a conclusory string citation to Berghegger and other sections of the Petition. Not only is this an inadequate showing of any modification of Okada, a POSITA would not have been motivated to modify Okada to add feedback regulation given that the objective of the Okada system is driving with one of three power levels (high, intermediate or low), and relying the receiver self-regulating its output power, rather than using closed-loop feedback control; that is, closed-loop feedback control is contrary to the teachings in Okada.

Third, Petitioner fails to demonstrate how the proposed Okada/Odendaal combination would provide the claimed “planar coil(s).” Okada does not disclose a planar coil that is parallel to the surface of the transmitter; rather, Okada shows a solenoid coil with multiple taps for power transfer and communications. Acknowledging this, Petitioner relies on Odendaal to try to show a planar coil. However, Odendaal by itself or in combination with Okada fails to teach a POSITA how to implement in a planar multi-tap coil parallel to the charger surface as required

by Okada's system for its "high, intermediate, and low" power levels. Moreover, not only is there no teaching to do this, Petitioner has failed to show that a POSITA would have had a reasonable expectation of success making a planar coil work in Okada's multi-tap system. The changes required to accomplish this are not at all obvious and there is no reasonable expectation of success. In fact there is ample evidence that Okada has purposely employed a multi-tap solenoid coil to achieve its goals of a compact efficient system for delivering multiple levels of power inductively to different portable devices.

Fourth, Petitioner fails to demonstrate that that it would have been obvious to combine Okada and Berghegger to arrive at the "a drive circuit [that operates] near a first resonant frequency." The claims require "one or more drive circuits including one or more FET drivers, FET switches, and capacitors . . . wherein the one or more communication and control circuits: operate the one or more drive circuits near a first resonant frequency." As the Petitioner admits, Okada does not include a capacitor and FET drive coupled to the one or more primary coils and does not operate near a resonance of a circuit as claimed. Petitioner contends that Berghegger teaches operation of a system near a resonant frequency.

However, the Petition fails to consider the complexities and implications of adding resonance frequency operation and control to Okada. Okada includes four coil sections at the transmitter, three of which are used for power transfer, with one

of the three chosen depending on whether low, intermediate, or high power is desired. Achieving resonance would have to address each of these coil sections in combination with their respective receiver units (receiver circuitry and receiver coil). A method of implementation of such a complex multi-resonant system is not at all obvious from the cited art and if such a system were to be designed and implemented, it would require substantially more electronics and control systems. The Petition fails to address these issues. The Petition has not established obviousness of this claim limitation, including failing to establish a reasonable motivation and expectation of success.

Fifth, Petitioner fails to show that any of the dependent claims in the Petition are invalid. Regarding claim 2, Petitioner attempts to add non-analogous reference (Masias) directed to wired charging systems in order to achieved the claimed voltage regulator. Not only is Masias not applicable to this analysis, but Petitioner fails to demonstrate that a POSITA would have been motivated to modify Okada in the ways it describes. Regarding claim 4, Petitioner add Calhoon to achieve the claimed communicated identification information. However, Okada only requires a single code to determine whether to charge a low, intermediate, or high. As such, a POSITA would not have been motivated to modify Okada to include more information than it required to operate. Regarding claim 18, Petitioner adds Kazutoshi to achieve the claimed proportional integral derivative control technique to regulate the ouptu of

the receiver rectifier circuit. However, Kazutoshi does not teach a system that regulates the output of the *receiver* rectifier circuit and a POSITA would not have been motivated to modify Okada in light of Kazutoshi's teachings.

For any one of the reasons, the Petition should be denied.

II. BACKGROUND

A. The '500 Patent

Each of the Grounds is directed to claim 1 or a claim dependent on claim 1. Claim 1 specifies a system for inductive power transfer to a portable device, *i.e.*, claim 1 specifies a wireless transmitter (the inductive charger) for use with a portable device (including the inductive receiver). Ex. 1001 at claim 1.

Among other things, as relevant to this Preliminary Response, claim 1 specifies that the transmitter is configured to perform closed-loop feedback control to regulate the voltage or current induced at the output of the receiver rectifier circuit during charging. *Id.* To do so, the transmitter is configured to periodically receive, as feedback from the receiver, information about the voltage or current at the output of the receiver rectifier circuit. With this periodic feedback information from the receiver, the transmitter is configured to adjust its drive frequency or duty cycle to maintain the desired voltage or current output at the receiver during charging. *Id.*

Claim 1 also specifies that the drive circuit(s) including FET(s), FET driver(s), and capacitor(s), operate near a resonant frequency, and adjust the frequency or duty

cycle during power transfer to regulate the voltage or current at the output of the receiver rectifier circuit during charging. *Id.*

Furthermore, claim 1 specifies that the primary coil(s) are planar and parallel to the charging surface and generate an electromagnetic field perpendicular to the charging surface. *Id.*

Additionally, the dependent claims also specify unique and novel features. For example, claim 2 specifies that the system of claim 1 can include voltage regulator circuits to accommodate different power levels required by different portable devices. *Id.* at claim 2. Claim 4 specifies different information that needs to be included in the identification information communicated from the portable device to the transmitter. *Id.* at claim 4. Finally, claim 18 specifies using a PID control technique to regulate the output of the receiver rectifier circuit. *Id.* at claim 18.

These summarized features of claims 1, 2, 4, and 18 addressed in this Preliminary Response are seen in the below emphasized text The Challenged Claims specify many more features, as seen in the claim, which would need to be addressed if there were institution.

1.A	A system for inductive powering or charging of portable devices, the system comprising:
1.B	<i>one or more primary coils</i> that are <i>substantially <u>planar</u> and <u>parallel</u> to a surface</i> of the system for powering or charging one or more compatible portable devices including batteries and receiver units, each receiver unit including a receiver coil and a receiver circuit including a receiver rectifier circuit;
1.C	<i>one or more <u>drive circuits</u> including one or more FET drivers, FET switches, and capacitors</i> coupled to the one or more primary coils that when operated apply an alternating electrical current to the one or more primary coils to generate a magnetic field in a direction substantially perpendicular to the plane of the one or more primary coils and the surface of the system to provide power to the one or more portable devices capable of being powered or charged by the system when present and near the one or more primary coils;
1.D	one or more sense circuits to monitor the current through the one or more primary coils to sense communications from the one or more receiver coils; and

1.E	one or more communication and control circuits including one or more microcontrollers coupled to the one or more drive circuits and the one or more sense circuits that detect communications through the one or more sense circuits via the one or more primary coils and control the one or more drive circuits to control the powering or charging of the one or more compatible portable devices;
1.F	wherein the one or more communication and control circuits: <i><u>operate the one or more drive circuits near a first resonant frequency</u></i> of a circuit formed by a primary coil and a drive circuit and a receiver coil and a receiver circuit of a compatible portable device when nearby;
1.G	switch the one or more primary coils at a frequency and power level sufficient to transfer power to one or more of the receiver units when near the one or more primary coils for a sufficiently long period of time to activate the one or more receiver circuits and to receive a response from the one or more receiver circuits via the one or more receiver coils which the one or more primary coils sense via the one

	or more sense circuits as a modulation of one or more primary coil currents;
1.H	detect, through the one or more sense circuits, communications from the one or more receiver units through the one or more receiver coils including information corresponding to one or more voltages at one or more outputs of the receiver rectifier circuits induced by the one or more primary coils and the one or more receiver coils and information associated with the one or more portable devices and/or receiver units to enable the one or more communication and control circuits to identify the one or more portable devices and/or receiver units and to determine any one or more appropriate charging or powering algorithm profiles therefor;
1.I	for each portable device, determine the primary coil electromagnetically most aligned with the receiver coil of the portable device;
1.J	drive the one or more FET switches associated with the most aligned one or more primary coils;

1.K	<i><u>periodically receive</u> information corresponding to one or more output voltages or currents of the one or more receiver rectifier circuits via the one or more primary coils and the one or more sense circuits; and</i>
1.L	<i><u>regulate in a closed loop feedback manner</u> the one or more output voltages or currents of the one or more receiver rectifier circuits by adjusting the frequency or duty cycle of the one or more drive circuits during the charging or powering of the one or more portable devices.</i>
2	The system of claim 1, further comprising one or more <u>voltage regulator circuits that can change input voltages</u> to the one or more drive circuits between two or more levels to accommodate different power required by the portable devices.
4	The system of claim 1, wherein the one or more communication and control circuits are designed to receive from a receiver unit of a portable device <u>identification information</u> including one or more codes identifying the manufacturer of the portable device and/or receiver unit, a unique portable device and/or

	receiver ID code, a charge algorithm profile, and a power requirement of the portable device and/or receiver unit.
18	The system of claim 1, further wherein the one or more communication and control circuits <u>use a Proportional-Integral-Derivative control technique to regulate one or more outputs of the one or more receiver rectifier circuits.</u>

B. Claim Construction

For the sake of this Response only, Patent Owner adopts Petitioner's position that no constructions are required. Pet. 5.

C. Person of Skill in the Art

For the purposes of this Preliminary Response, Patent Owner does not challenge Petitioner's definition of a POSITA (Pet. 4), but Patent Owner reserves the right to argue for a different definition should there be institution.

III. ARGUMENT

A. The Petition Should Be Denied Under *Fintiv* As The Issues Presented By This Petition And Petitioner's Seventeen Other Petitions Will Be Resolved First In The Underlying District Court Case And Institution Of This Petition And The Other Seventeen Petitions Would Greatly Multiply The Proceedings, Rather Than Simplify Matters

Petitioner has taken a single district court litigation and sought to turn it into eighteen proceedings before this Board, which would issue final written decisions

months after the scheduled trial in the single district court case. The Board should use its discretion to deny institution of Petitioner's eighteen IPR petitions.

As Director Vidal has pointed out, "Congress designed the America Invents Act (AIA) post-grant proceedings 'to establish a more efficient and streamlined patent system that will improve patent quality and limit unnecessary and counterproductive litigation costs.'" Ex. 1064 at 1 (citing H.R. Rep. No. 112- 98, pt. 1, at 40 (2011), 2011 U.S.C.C.A.N. 67, 69; *see* S. Rep. No. 110- 259, at 20 (2008)). Instituting Petitioner's eighteen IPR petitions is directly contrary to this goal. This is because "[p]arallel district court and AIA proceedings involving the same parties and invalidity challenges *can increase, rather than limit*, litigation costs." Ex. 1064 at 1 (emphasis added).

Here, instituting the eighteen IPR petitions which will have the same outcome as the *single* district court case (upholding the validity or invalidating the patents) will dramatically increase the litigation costs of the parties. Notably, the district court case is considering the exact same references and will also consider more invalidity grounds. The single district court case will cover all the invalidity grounds raised across the *eighteen* IPR petitions as well as additional invalidity grounds. It is a fallacy to consider Petitioner's IPR petitions as streamlining the dispute between the parties. The Board should thus use its discretion to deny institution.

Under 35 U.S.C § 314(a), the Board has discretion to deny a petition based on the status of a related litigation. The Board considers six factors to determine whether efficiency, fairness, and the merits support denial:

Factor 1: whether the court granted a stay or evidence exists that one may be granted if a proceeding is instituted;

Factor 2: proximity of the court's trial date to the Board's projected statutory deadline for a final written decision;

Factor 3: investment in the parallel proceeding by the court and the parties;

Factor 4: overlap between issues raised in the petition and the parallel proceeding;

Factor 5: whether the petitioner and the defendant in the parallel proceeding are the same parties;

Factor 6: other circumstances that impact the Board's exercise of discretion, including the merits.

Apple v. Fintiv, IPR2020-00019, Paper 11 at 5-6 (PTAB March 20, 2020) (precedential). As discussed below, each of the six *Fintiv* factors supports the Board denying institution. The current advanced state of the parallel district court case, as well as the lack of a granted stay, favors denial of the Petition. By the time the Board would issue an institution decision across all eighteen IPR petitions (expected February 2024), claim construction will have been briefed and argued to the district court. Moreover, fact discovery has been underway and is set for completion in March 2024—weeks following the final institution decisions. Opening expert reports will be exchanged in that same month. The district court trial is scheduled

for August 2024, more than five months *before* the earliest of the Final Written Decisions for the eighteen IPR petitions would be issued and six months before all Final Written Decisions would be issued. *See* Ex. 1066 (EDTX Scheduling Order). As explained below, the district court is unlikely to stay a trial that is already scheduled to be complete well before a final written decision on any petition would be issued by the Board.

Petitioner's proposed stipulation does not meaningfully streamline the issues. Petitioner merely offers to drop from its invalidity assertions in district court only those grounds that are instituted by the Board. This would mean that *even if all eighteen IPRs were to be instituted*, Petitioner would still assert invalidity grounds based on §§ 102 and 103 in district court that would not and could not be addressed by the Board. And those invalidity grounds in district court would be tried before a jury months before any final written decision would issue. Not only does Petitioner's proposal not alleviate the duplicative efforts in assessing the invalidity of the patents, it increases the likelihood of inconsistent results across the proceedings. There is no argument that can be offered that supports instituting eighteen IPRs—that would issue narrow invalidity rulings on 35 U.S.C. §§ 102 and 103 months after the district courts trial—rather than letting the parties resolve all these issues in a single, quicker district court case that is already scheduled to be complete in less than a year. Accordingly, the Board should deny institution to maintain the goals of efficiency

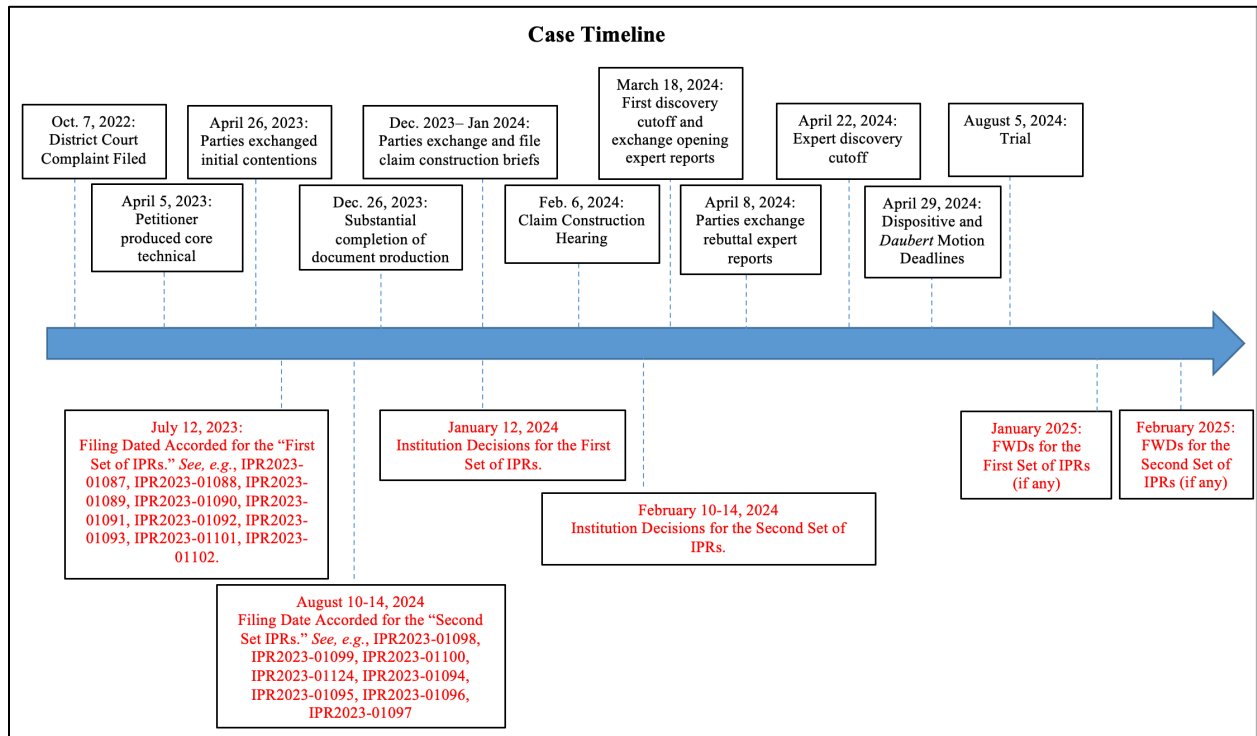
and efficacy. *See General Plastic Industrial Co., Ltd. v. Canon Kabushiki Kaisha*, IPR2016-01357, Paper 19 at 16-17 (PTAB Sept. 6, 2017).

Factor 1: the district court case has not been stayed nor is it likely to be stayed even were this petition instituted. Petitioner states that this factor is neutral. Pet. 86. However, Petitioner has failed to consider the totality of the evidence. This Board has previously held that “[i]n the absence of specific evidence, we will not attempt to predict how the district court in the related district court litigation will proceed because the court may determine whether or not to stay any individual case.” *See Sand Revolution II, LLC v. Continental Intermodal Group – Trucking LLC*, IPR2019-01393, Paper 24 at 7 (PTAB June 16, 2020) (informative) (emphasis added). Here, ***all*** the evidence points to a stay not being entered in the district court litigation pre or post institution.

Petitioner has filed a motion to stay the district court litigation which has not been ruled on, but will almost certainly be denied pre-institution. *See* Ex. 2002 at 1-2 (Patent Owner showing that the Eastern District of Texas ***universally*** denies a motion to stay pre-institution). Moreover, even if instituted, the timing and advanced stage of litigation indicates that Judge Gilstrap is highly likely to deny a motion to stay. *See e.g., MyPort, Inc. v. Samsung Elecs. Co., Ltd.*, Case No. 2:22-CV-00114-JRG, Dkt. 73 at 4-5 (E.D. Tex. June 13, 2023) (denying a motion to stay when trial was scheduled and “the PTAB [final written] decision is not due until over two

months after jury trial is set to begin.”); *Solas OLED Ltd. v. Samsung Display Co., Ltd.*, Case No. 2:19-CV-00152-JRG, Dkt. 133 at 3-4 (E.D. Tex. July 17, 2020) (denying a motion to stay despite the Board’s institution on the patents-in-suit largely because “discovery is complete[] and trial is only a few months away” when PTAB final written decisions would have been issued months after the scheduled trial); *Oyster Optics, LLC, v. Inferna Corp.*, Case No. 2:19-CV-00257-JRG, Dkt. 87 at 4-5 (E.D. Tex. July 17, 2020) (denying a motion to stay although the asserted claims were instituted because claim construction briefing was finished and “[f]act discovery is closing in about a month and trial is only six months away.”).

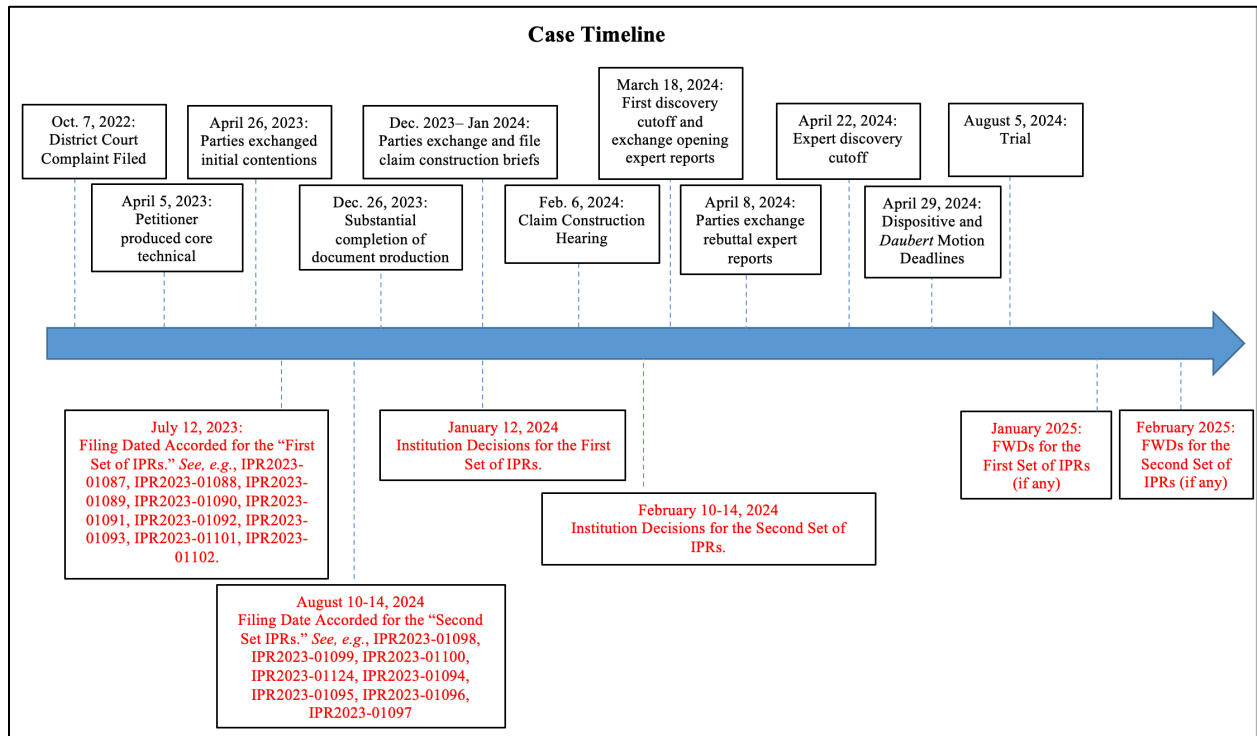
Here, the timing demonstrates that Judge Gilstrap is likely to deny a motion to stay. As shown in the case timeline below, the decision on institution across the *eighteen* IPRs is not expected until January and February 2024. By that time, the parties will have had the *Markman* hearing and substantial document production will have occurred. Ex. 1066 at 3. Fact discovery is set to be completed only a month later only March 18, 2024. *Id.* Notably, the scheduled trial date (August 5, 2024) is set only six months after the institution decision of the IPRs. *Id.* at 1. Finally, a Final Written Decision (if any) across the eighteen IPRs would be handed down roughly five to six months after the trial in the district court case—one single proceeding that will address all the issues in the eighteen IPRs. Thus, Factor 1 heavily favors denial.



Factor 2: the single district court case will resolve all of the issues presented in the eighteen petitions (and more) months before any final written decision. The Board generally denies institution when the trial date is months before the projected statutory deadline of the PTAB’s final written decision (FWD). *Fintiv*, IPR2020-00019, Paper 11 at 9) (“If the court’s trial date is earlier than the projected statutory deadline, the Board generally has weighed this fact in favor of exercising authority to deny institution.”). Trial is set for August 5, 2024, which would be **five to six months** before the earliest expected date of a FWD (January and February 2025). This factor weighs heavily in favor of denial. The Board regularly finds a period of time less than seven months between the expected date of the FWD and trial supports denial. See e.g., *id.* (5-6 months based on the time-to-trial evidence); *Satco Products*,

Inc. v. The Regents of the University of California, IPR2021-00794, Paper 14 at 19 (PTAB Nov. 10, 2021) (five months); *Maxlite, Inc. v. Jiaying Super Lighting Electric Appliance Co., Ltd.*, IPR2020-00208, Paper 32 at 5 (PTAB Oct. 12, 2021) (four months); *Stanley Black & Decker, Inc., et al. v. Zircon Corp.*, IPR2020-01572, Paper 10 at 12 (PTAB April 19, 2021) (three months); *Next Caller, Inc. v. TrustID, Inc.*, IPR2019-00961, Paper 10 at 14-15 (PTAB Oct. 16, 2019) (three months); *E-One, Inc. v. Oshkosh Corp.*, IPR2019-00161, Paper 16 at 6 (PTAB May 15, 2019) (one month).

Factor 3: there has and continues to be significant investment by the parties in the district court litigation. The Board has used its discretion to deny institution when, as here, there is significant investment in the parallel district court proceeding. As shown in the case timeline below, the district court proceeding has been pending since October of 2022. The Parties have prepared and exchanged infringement and invalidity contentions, presented initial disclosures, and are in the midst of substantial fact discovery. In fact, by the time the Board would even issue an institution decision, claim construction will have been briefed and argued.



Additionally, Petitioner did not file its Petitions expeditiously. Petitioner waited many months after the district court complaint was filed to submit its Petitions. *Compare Verizon Business Network Services, Inc. v. Huawei Techs. Co.*, IPR2020-01141, Paper 12 at 12 (PTAB Jan. 14, 2021) (“We credit Petitioner’s diligence in filing the Petition in this case within a short time (less than three months) after being served infringement contentions in the parallel case.”), *with* Ex. 2003 (the district court complaint was filed in October and Petitioner filed its first petition almost nine months later in June). Accordingly, the parties have expended a significant amount of time and resources related to the district court proceeding, which greatly weighs in favor of denying institution.

Factor 4: there is significant overlap between issues raised in the petition and in the parallel proceeding. “[I]f the petition includes the same or substantially the same claims, grounds, arguments, and evidence as presented in the parallel proceeding, th[at] fact has favored denial.” *Fintiv*, IPR2020-00019, Paper 11 at 12. Petitioner challenges the same claims in its petition—and across the 18 Petitions—that it does in its invalidity contentions at the district court. *See* Ex. 2001. In fact, Petitioner relies on the same principal references in the Petition as it does in the parallel litigation. *See* generally Ex. 2001 at 13-18. Thus, the Petition includes substantial overlap with the claims and evidence asserted in the parallel litigation.

In addition, Petitioner’s narrow stipulation will not mitigate the overlap between the district court and the Board. Petitioner could have included a broader stipulation that might better address the duplicative efforts, and adhere to the purpose of *inter partes* review as an alternative to district court litigation. *See, e.g., Sand Revolution II*, Paper 24 at 12 n.5 (“Petitioner stipulates only that it will not pursue, in district court, the ‘same grounds’ presented in the Petition . . . Petitioner could have stipulated that it would not pursue any ground raised or that *could have been reasonably raised in an IPR.*”) (emphasis added); *Sotera Wireless, Inc. v. Masimo Corp.*, IPR2020-01019, Paper 12 at 19 (PTAB Dec. 1, 2020) (precedential) (“Importantly, Petitioner broadly stipulates to not pursue ‘any ground raised or that could have been reasonably raised.’”).

Here, Petitioner’s stipulation “that, if the IPR is instituted, Petitioner will not pursue the IPR grounds in the district court litigation” falls short of a *Sotera* stipulation. In fact, Petitioner’s stipulation is superficial as it does not even meet the IPR estoppel that would arise after an IPR is instituted and a final written decision is issued. *See* 35 U.S.C. § 315 (e) (2) (“The petitioner in an *inter partes* review of a claim in a patent under this chapter that results in a final written decision under section . . . may not assert either in a civil action . . . that the claim is invalid on any ground that the petitioner raised ***or reasonably could have raised*** during that *inter partes* review.”) (emphasis added).

Petitioners’ weak stipulation actually allows it to circumvent estoppel and get two bites at the invalidity apple. It would permit Petitioner to maintain in district court those invalidity arguments that are not presented in the eighteen IPR petitions. Those invalidity arguments would then be raised during trial in August 2024. If Petitioner were to fail at trial, it would still have, as backup, the Final Written Decision to be issued by the Board, in early 2025. Petitioner’s stipulation is antithetical to a *Sotera* stipulation. Thus, this factor weighs in favor of denying the Petition.

Factor 5: the petitioner and the defendant in the parallel proceeding are the same party. Factor 5 weighs in favor of denial because both Parties to this proceeding are the same parties in the related district court litigation. *Fintiv*,

IPR2020-00019, Paper 11 at 15 (“Because the petitioner and the defendant in the parallel proceeding are the same party, this factor weighs in favor of discretionary denial.”). Petitioner does not contest this.

Factor 6: the merits of the Petition are weak. The final factor weighs in favor of denial because there is no “compelling challenge” of invalidity on the merits of the Petition. Interim Procedure, 4 (only “compelling, meritorious challenges will be allowed to proceed at the PTAB even where district court litigation is proceeding in parallel”). As shown in the following sections, Petitioner’s arguments on the merits do not meet the high standard required of an invalidity challenge. *Id.* (“Compelling, meritorious challenges are those in which the evidence, if unrebutted in trial, would plainly lead to a conclusion that one or more claims are unpatentable by a preponderance of the evidence.”); *see also Vector Flow, Inc. v. HID Glob. Corp.*, IPR2023-00353, Paper 8 at 23-24 (PTAB July 27, 2023)(same).

B. The Petition Fails To Establish That It Would Have Been Obvious To Combine The Five Cited References In Grounds 1 – 3.

1. The petition fails to provide the required showing for obviousness

“To satisfy its burden of proving obviousness, a petitioner cannot employ merely conclusory statements. The petitioner must instead articulate specific reasoning, based on evidence of record, to support the legal conclusion of obviousness.” *In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1380–81 (Fed. Cir.

2016). The “factual inquiry” into the reasons for “combin[ing] references must be thorough and searching, and the need for specificity pervades.” *In re NuVasive, Inc.*, 842 F.3d 1376, 1381–82 (Fed. Cir. 2016) (internal quotations and citations omitted). “An obviousness determination requires finding that a person of ordinary skill in the art would have been motivated to combine or modify the teachings in the prior art and would have had a reasonable expectation of success in doing so.” *Regents of University of California v. Broad Institute, Inc.*, 903 F.3d 1286, 1291 (Fed. Cir. 2018). It is Petitioners’ burden to prove that a POSITA would be motivated to combine and “to demonstrate that the skilled artisan would have had a reasonable expectation of success in combining references.” *KEYnetik, Inc. v. Samsung Electronics Co., Ltd.*, 841 Fed.App’x. 219, 227-228 (Fed. Cir. 2021) (internal citations omitted). Petitioner does not meet its burden.

First, Petitioner has failed to show why a POSITA would have been motivated to modify the four or five prior art references and that they would have had a reasonable expectation of success making the changes.

Second, the petition fails to include the required particularity for making the claimed modifications and in many instances the Petition includes mere conclusory lengthy string cites.

2. The Petition fails to address the multiple reasons as to why it would not have been obvious to combine the four or five references in each Ground

In each Ground, the Petition proposes combining at least *four* references Okada, Odendaal, Berghegger, and Black. There are multiple reasons that teach away from this combination, make it not obvious to a POSITA to combine, and that a POSITA would not have had a reasonable expectation of success.

For example, the claims require closed-loop feedback control during charging to provide a tightly controlled power transfer / charging operation from the transmitter to the output of the receiver rectifier circuit. But, Okada, the main reference relied upon by the Petitioner in each ground, teaches away from closed-loop feedback control. As explained further below, Okada uses a transmitter with three simple power output levels (low, intermediate, and high) set at the start of the charging process through a process of selection and switching of a section of the primary side coil for power transfer during the entire duration of the subsequent charging process. *See*, Section III.C.2.a, *infra*. Moreover, Okada uses a receiver that has an internal regulator, a voltage clamp, and a battery charger circuit at the output of its receiver rectifier circuit to allow the receiver unit to control charging of the battery of the portable device by itself. Thus, Okada has designed a complete system that provides one of three set receiver rectifier circuit output power levels based on the requested power level by the receiver before start of charging, and then during

charging, the receiver circuitry self-regulates the power charging the battery of the portable device for the duration of the charging process. Okada is thus intentionally uses a transmitter to receiver open-loop system and therefore, teaches away from using closed-loop feedback control of the power transfer process from the transmitter to the receiver during the charging process.

As another example, the claims require one or more planar coils parallel to the surface of the charger generating a magnetic field in a direction substantially perpendicular to the charger surface. But Okada teaches away from using planar coils and the Okada multi-tapped solenoid coils create a magnetic field substantially parallel to the charger surface. Acknowledging that Okada does not use planar coils, Petitioner suggests using planar coils as shown in Odendaal as an obvious replacement. But Petitioner fails to consider that Okada selected multi-tapped solenoid coils for multiple reasons, such as the ability to set the power level by selecting the taps as discussed above, uniform magnetic flux path between any selected primary side coil segment and the receiver coil, optimal power transfer efficiency, and determination of the proper alignment. As discussed in Section III.C.2.b, *infra*, exchanging Okada's solenoid geometry with planar coils is not a trivial task learned from a simple spiral coil shown in Odendaal. As such a POSITA would not be motivated to use or reasonably expect success with planar coils as in Odendaal with Okada's system.

Moreover, the claims require operating near a resonance frequency. But, as discussed in Section III.C.2.c, *infra*, Okada teaches away from this with its multi-tap primary side coil structures which would make it very difficult and costly to operate near resonance with each of the tapped sections.

Regarding the dependent claims, the Petition continues to fail to demonstrate why a POSITA would have been motivated to make the required modifications to Okada in light of what Okada teaches. *See* Section III.D-F, *infra*.

The Petition fails to address these issues and thus is inadequate for institution.

3. The Petition fails to show with the required particularity that a POSITA would have been motivated to combine the alleged prior art

The Petition groups the prior art references into four Grounds consisting of a total of seven prior art references covering eight claims—with each Ground seeking to combine at least four references. As previously discussed, the Petition fails to show the required motivation to combine all these references. In fact, any discussion on using combinations is limited to discrete claim elements (and not the motivation regarding the actual references themselves), resulting in a hunt through string cites and multiple paragraphs in the Petition and Declarations in an attempt to identify the possible motivation to combine the references. Many of the Petition’s assertions lack adequate explanation, instead only providing lengthy string cites. For example:

- Pet. at 4-5: “However, as demonstrated below, those features, and the others, are a compilation of technologies/techniques known in the art. *See In re Gorman*, 933 F.2d 982, 986 (Fed. Cir. 1991). (§(Infra §IX; Ex. 1002, ¶¶22- 67, 69-249; Exs. 1005-1017, 1019-1021, 1023-1031, 1034, 1036-1037, 1039, 1041, 1044, 1046-1050, 1056-1063.)”
- Pet at 18-19: “Planar coils placed in parallel to a power transfer system’s surface were known. (Ex. 1002, ¶¶50-53, 128-132; Ex. 1027, 1-3; Ex. 1015, FIGS. 1-2, 3-4, 7-12, Abstract, 1:5-2:29, 2:64-3:27, 3:39-51, 5:5-47, 5:48-9:5; Ex. 1047, FIGS. 1-3, 6, 8A-9, ¶¶0002, 0006-0007, 0018-0025-0034; Ex. 1025, FIGS. 1, 3, 8-9, 13, 1:10-2:3, 2:5-12 (reasons for thin coil designs), 2:14-3:2, 4:19-32, 7:25-9:28, 12:27-32, 14:4-17; Ex. 1026, FIGS. 1-2, 5, 9A-9C, Abstract, 1:3-4:4, 4:6-9:4, 11:4-15; Ex. 1009, Abstract, FIGS. 1-3, 1:4-51, 1:54-2:26, 2:47-3:8, 3:9-39, 4:18-60); 1024, FIGS. 3, 8-9, 1:12-15, 1:39-2:29, 9:41-53, 10:45-57, 11:60-13:4; Ex. 1028, Abstract, FIGS. 2-7, ¶¶0001, 0004-0007, 0025-0032, 0041; Ex. 1029, 1-4, 9-19; Ex. 1030, FIGS. 3-7B, 1:5-9, 1:59-61, 3:19-56, 4:62-567, 5:25-44); Ex. 1036, Abstract, 2:22-3:6 (“primary winding...*substantially parallel* to [] planar charging surface” and formed on planar PCB”), 5:22, 11:18, 23:20-24:8, 24:19-22.)”

- Pet. at 38: “Thus, a POSITA would have been motivated to configure the modified Okada system to provide current modulation/demodulation-type techniques/technologies (including current sense circuit(s)) to facilitate (and sense) the communication of information from the secondary side, consistent with that known in the art. (Ex. 1002, ¶¶176-178; Ex. 1056, Abstract, 2:7-9, 2:38-44, 4:21-34, 5:12-14, 6:12-33; Ex. 1057, 9:20-24, 15:16-21, 21:21-22:3, FIGS. 1-3, 11-13; Ex. 1058, Abstract, FIGS. 1, 3A-8, 3:25-4:35, 5:27-7:23, 10:22-24, 10:25-12:17; *infra* §IX.A.1(g).) (See also Ex. 1001, 23:38-45) (discussing “current modulation” in context of conventional technologies, which supports that such features were known); Ex. 1063; Ex. 1002, ¶¶176-178.)”
- Pet. at 57: “A POSITA would have had reasons to consider and implement such features given it was known different types of batteries/portable devices have different power/charge characteristics/algorithm-profiles. (Ex. 1007, ¶0003; Ex. 1037, 1:56-2:6, 2:18-19, 6:51-7:2, 7:36-53, FIGS. 4A-4C; Ex. 1039, Abstract, 3:23-35, FIG. 1, 5:20-34; Ex. 1002, ¶206.)”

And these are but a handful of the voluminous string citations, citations to other parts of the Petition, or citations to one of the sixty pieces of evidence submitted with the

Petition. As a final example, Petitioner has taken this to an extreme for its analysis of the closed loop feedback element (reproduced below).

l) regulate in a closed loop feedback manner the one or more output voltages or currents of the one or more receiver rectifier circuits by adjusting the frequency or duty cycle of the one or more drive circuits during the charging or powering of the one or more portable devices.

The *Okada-Odendaal-Berghegger-Black* combination discloses/suggests this limitation. (Ex. 1002, ¶¶218-219.)

The analysis above demonstrates how/why a POSITA would have configured the *Okada-Odendaal-Berghegger* system to implement a closed-loop feedback control process where the “**one or more communication and control circuits**” (§§IX.A.1(e)-(f)) use device information received from **PRM40** to control the disclosed “**drive circuit(s)**” during charging/powering by adjusting the frequency and/or duty cycle of the waveform applied to primary coil(s) 19 based on load variation information. (§§IX.A.1(c), 1(e), (g).) Also, for reasons explained for limitations 1(h) and 1(k), in the *Okada-Odendaal-Berghegger-Black* system, the load variation would have been measured as a voltage at the output of the receiver rectifier in **PRM40**, which is fed back to **PTM10** with the power demand information for adjusting the frequency and/or duty cycle of the “drive circuit(s)” during charging/powering of the portable device. (*Id.*; §§IX.A.1(h), IX.A.1(k); Ex. 1006, 4:58-59, 5:65-6:29.) Accordingly, for the reasons explained (*see also* §§IX.A.1(a)-(b), IX.A.1(d)-(g), IX.A.1(i)-(j)), the *Okada-Odendaal-Berghegger-Black* combination discloses/suggests limitation 1(l). (Ex. 1002, ¶219.)

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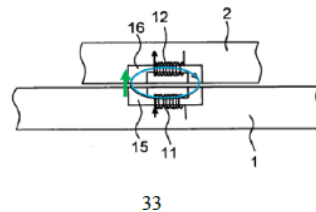
The entirety of the Petition’s analysis of this claim is *a single paragraph* that cites to numerous other sections of the Petition and other exhibits without any specificity.

Those sections of the Petition also cite to other sections of the Petition and to other pieces of evidence. It is nearly impossible to fully follow what is being argued. This is not the required level of particularity this Board requires.

Finally, consider Petitioners argument regarding the “substantially perpendicular” “magnetic field.” Pet 33. Petitioner is discussing a combination of Okada, Odendaal, and Berghegger, yet includes a figure from a fourth reference not in the Ground—Nakamura (Ex. 1019)—in addition to another voluminous string citation to at least eight other pieces of evidence. It is unclear how this image is applicable to the system that Samsung has put forward as Nakamura discusses solenoid coils wrapped around a ferrite core which is a different coil geometry than any of the art Petitioner references.

Consistent with such teachings, a POSITA would have also understood that the ac signal applied to the primary coils in the modified *Okada* system would have generated a “substantially perpendicular” “magnetic field” as claimed, given such a field would have been the natural result of activating the primary coil to inductively transfer power as described by *Okada*, *Odendaal*, and *Berghegger*. (Ex. 1002, ¶¶165-168; Ex. 1005, ¶¶0035, 0051, 0056, 0063, 0066, 0121, ¶¶0127-0132, FIGS. 11(b) and 13(b); Ex. 1006, 4:25-27 (“charge mode” where LP is “magnetically coupled with” LS), 6:5-9; Ex. 1008, 1:17-20, 2:1-29); §IX.A.1(b); Ex. 1011, 557-562, 593-594, 601; Ex. 1009, 2:62-3:8 (“current is inducted into” receiving device “when magnetic field lines are approximately 90 degrees to the first part of the transformer”), 1:54-2:18, 3:20-4:11, FIGS. 1-3; Ex. 1010, FIGS. 1-5B, 8:55-9:52, FIGS. 6A-10, 7:21-8:54, 9:53-10:22, 11:27-14:67; Ex. 1029, 3-4, 27-50); Ex. 1019, FIG. 2B (showing magnetic field (blue below) perpendicular (green) to charger surface 1), ¶¶0027, 0064.)

FIG. 2B



The PTAB’s Trial Practice Guide advises petitioners to “avoid submitting a repository of all the information that a judge could possibly consider, and instead focus on concise, well-organized, easy-to-follow arguments supported by readily identifiable evidence of record.” 77 Fed. Reg. 48,756, 48,763 (Aug. 14, 2012). As set forth above, the Petition is a “repository of all information” with voluminous string cites that require both the Board and Patent Owner to sort through the over *sixty* pieces of evidence that Petitioner filed with the Petition. The Board should accordingly exercise its discretion to deny the Petition. *See* 35 U.S.C. § 312(a)(3)

(requiring that an IPR petition to identify “with particularity, each claim challenged, the grounds on which the challenge to each claim is based, and the evidence that supports the grounds for the challenge to each claim.”).²

C. The Petition Fails To Demonstrate The Independent Challenged Claim Is Invalid.

Petitioner has failed to show Grounds 1-3, taken in combination, teach or render obvious every limitation of claim 1, 2, 4, and 18 of the '500 Patent. Regarding claim 1, the Petition fails for the reasons discussed below, which are also made in Patent Owner's response to IPR2023-01091.

² The institution of an IPR remains discretionary even if a petitioner demonstrates a reasonable likelihood of success as to at least one claim (which Patent Owner submits Petitioner has *not* done), as the Board must make “a binary choice—either institute review or don't.” *SAS Institute Inc. v. Iancu*, 138 S. Ct. 1348, 1355 (2018).

1. **The Petition’s suggested combination of four references fails to establish obviousness of the claim requirements of “periodically receive[ing] information corresponding to one or more output voltages or currents of the one or more receiver rectifier circuits . . .” and “regulate[ing] . . . the one or more output voltages or current of the one or more receiver rectifier circuits by adjusting the frequency or duty cycle of the one or more drive circuits during the charging or powering of the one or more portable devices” (Limitations [1.K-L])**

The Petition is conclusory as to limitations 1.K and 1.L, failing to make the required showing for institution. The Petition is inadequate and incorrect as to limitation K (Pet. 61-63), and for limitation L, the Petition is merely one paragraph with many unclear cites (Pet. 63-64). This is inadequate for institution.

As to the suggested combination of four references, the Petition points to Okada’s “power consumption information” supposedly as “information corresponding to one or more output voltages or currents of the one or more receiver rectifier circuits.” Pet. 62. But Okada is clear as to what the “power consumption information” is; it is not an output voltage or a current of the receiver rectifier circuit. Rather, the “power consumption information” is a code indicating one of three levels of power—high, intermediate, or low—that the receiver communicates once at the beginning of the charging process to the transmitter and indicates the power level the portable device is capable of being charged at (e.g. 5 W, 10 W, etc.). Further, the “power consumption information” is only transmitted by the receiver at the

beginning of the charging process once, before any power delivery / charging of the portable device, and thus is not periodically received by the transmitter during the charging of the portable device. Moreover, this level of power is a static number (“stored in advance”) in the receiver and is not information corresponding to a dynamic receiver rectifier circuit output voltage or current measured and communicated by the receiver that can be received by the transmitter and used for regulation of this value dynamically during charging of the portable device.

Petitioner’s ambiguous citations to Berghegger and other sections of the Petition are inadequate. The Petition does not demonstrate why a POSITA would have been motivated to change Okada’s simple three power level system to incorporate regulation of the output of the receiver rectifier circuit.

Limitation 1.K requires the “one or more communication and control circuits . . . *periodically* receive information corresponding to *one or more output voltages or currents* of the one or more receiver rectifier circuits via the one or more primary coils and the one or more sense circuits.” Ex. 1001 at claim 1 (emphasis added). Limitation 1.L requires “*regulate* in a closed loop feedback manner *the one or more output voltages or currents* of *the one or more receiver rectifier circuits by adjusting the frequency or duty cycle of the one or more drive circuits* during the charging or powering of the one or more portable devices.” Ex. 1001 at claim 1 (emphasis added).

Figure 2 (below) from Okada shows the main components of the transmitter (10) and receiver (40) system.

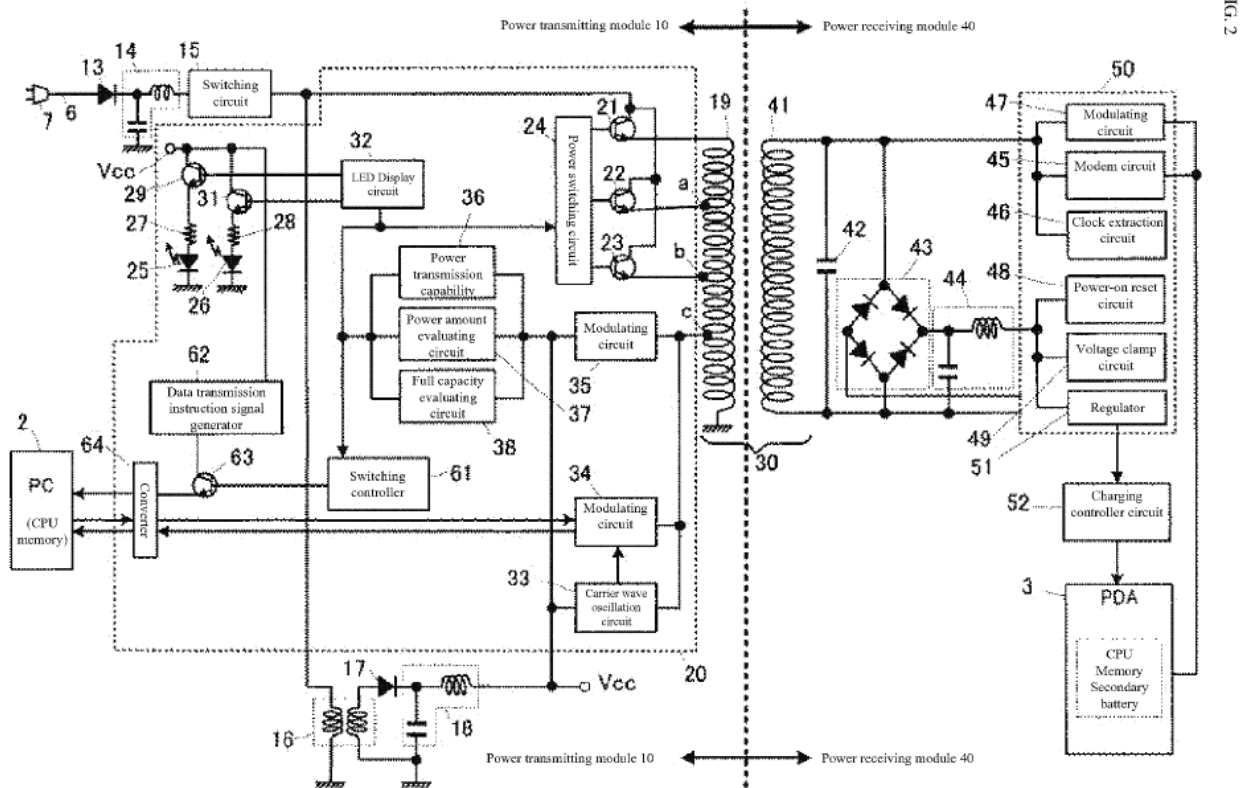


Figure 3 (below) from Okada is a “flowchart illustrating the flow of power supply operations carried out between the power transmitting module 10 and the power receiving module 40.” Ex. 1005 at [0059]. A proper understanding of this chart demonstrates “power consumption information” does not meet the claim. Okada describes the operation of its system as follows (unrelated steps omitted):

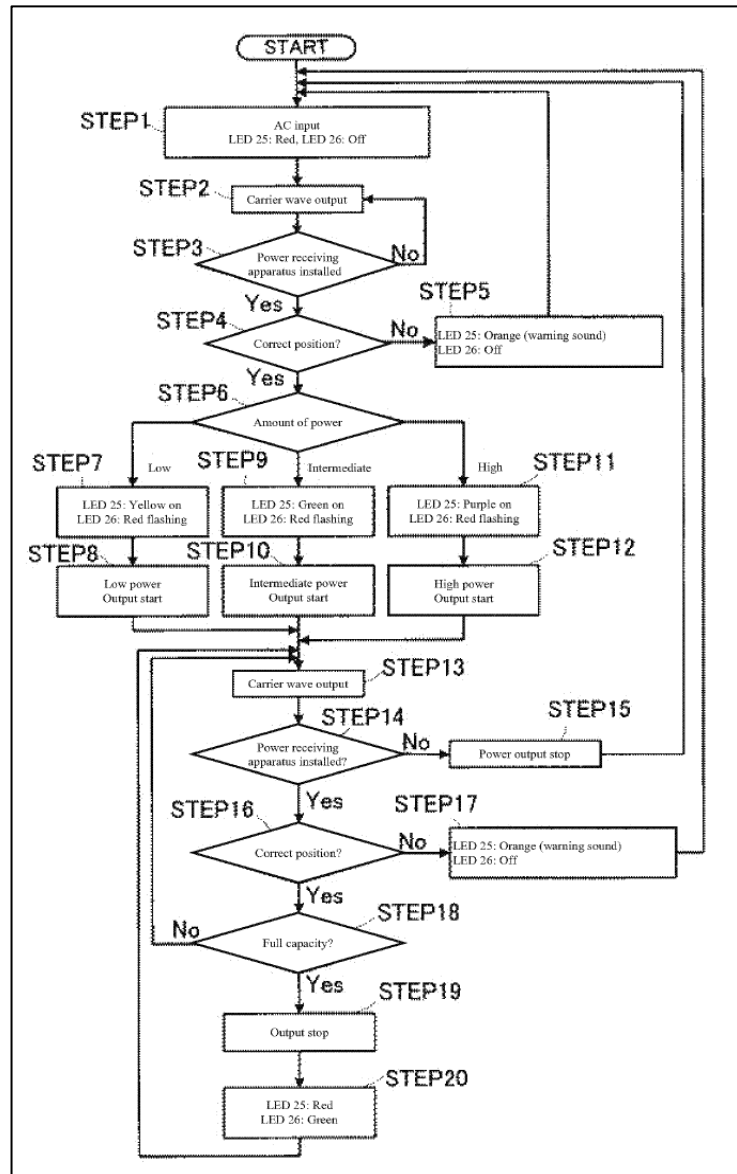
Step 2. The “Oscillating circuit 33 outputs [the] carrier wave.” *Id.* at [0062].

Step 3. “This carrier wave is used to determine whether a device capable of receiving power . . . is mounted on the common cradle.” *Id.* at [0062].

Step 6. If a device capable of receiving power is detected and mounted correctly (Steps 3-4), the receiver transmits and the transmitter receives “**power consumption information**” code (Step 6) included in the information signal demodulated by the power

amount evaluating circuit 37. **The transmitter then adjusts power transmission output to one of three levels: high, intermediate, and low, by a one-time primary side coil winding section selection by parts 21, 22, 23 and 24 switching operation for the duration of the charging. *Id.* at [0069] (emphasis added).**

Steps 7-12. The Power amount evaluating circuit



determines what level (high, intermediate, or low) to supply to the receiver based on

the received “Power Consumption Information” code and based on this determination, sets the transistor switches 21, 22, and 23 to states to apply the Power Transmission Signal to the full primary side coil 19 or taps a or b to set the turns ratio between the transmitter and receiver coils for the duration of the subsequent charging power transfer to the portable device, and then the power transmission for charging starts (steps 8, 10, or 12). *Id.* at [0070-73]

Step 13-17. After transmission has begun, the carrier wave is “periodically” applied to determine if “the device capable of receiving power has been removed from the common cradle.” *Id.* at [0074].

Notably, the determination of the power level for the receiver (low, intermediate, or high) (Step 6) **only occurs once**, and hence **there is no periodic receipt of power information of any type, let alone information corresponding to the output voltage or current of the receiver rectifier circuit**, and there is also **no closed-loop feedback control** performed by the transmitter in Okada during the entire charging of the portable device.

Steps 18-20: Finally, the “full capacity information” is merely a single terminating condition that Okada’s receiver communicates with the transmitter to indicate full charging of the battery—at which points the transmitter stops the charging process. *Id.* at [0076].

What this detour through Okada demonstrates is that the three types of received information by the transmitter via the carrier wave in Okada are wholly unrelated to any type of dynamic output voltage/current at the receiver. *See* Ex. 1005 at [0063] (noting that the “the ‘code indicating that a device is capable of receiving power,’ ‘power consumption information,’ and ‘full capacity information’ are stored in advance” in memory of the portable device) (emphasis added).

Petitioner admits as much. Pet. 61 (“the carrier wave is ‘periodically transmitted’ from PTM10 to PRM40 to determine whether PDA 3 is ***properly positioned*** and whether it is ***fully charged***”). The processes described by Okada are anything but “periodically receiv[ing] information corresponding to one or more output voltages or currents of the one or more receiver rectifier circuits” and “regulat[ing] in a closed loop feedback manner the one or more output voltages or currents of the one or more receiver rectifier circuits by adjusting the frequency or duty cycle of the one or more drive circuits during the charging or powering of the one or more portable devices.” Petitioner does not argue the contrary. Pet. 61-62.

Notably, while Okada may change the power level via changing the tap used in response to the ‘Power Consumption Information’ message received by the transmitter, that is only done at the start of the entrie process during a communication only phase (step S6 - with no charging of the electroinic device) and it does not change the duty cycle or frequency of the drive circuit as required by claim 1. During

this phase, the switching circuit 15 is not even active and is only activated later in steps 8, 10 or 12.

Acknowledging that the “periodic information” checked in steps 13-17 would not include the receiver voltage/current information, Petitioner attempts to pivot to the “power consumption information” in Okada. Pet. 62. But the “power consumption information” is not a dynamic “*one or more output voltages or currents* of the one or more receiver rectifier circuits” that is capable of being regulated by changing the duty cycle or frequency. Rather, “power consumption information” (low, intermediate, or high) is stored once in advance of charging. *See supra* Ex. 1005 at [0063].

Petitioner’s one sentence reference to the “power consumption information” is insufficient to meet its burden. Pet. 62; *See* 35 U.S.C. § 312(a)(3) (“particularity”); *see Wasica Fin. GmbH v. Cont’l Auto. Sys., Inc.*, 853 F.3d 1272, 1286 (Fed. Cir. 2017) (“It is of the utmost importance that petitioners in the IPR proceedings adhere to the requirement that the initial petition identify with particularity the evidence that supports the grounds for the challenge to each claim.” (quoting *Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1369 (Fed. Cir. 2016))); *In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1381 (Fed. Cir. 2016) (“[W]e find no support for the PTO’s position that the Board is free to adopt arguments on behalf of petitioners that could have been, but were not, raised by the petitioner during an

IPR.”); *DeSilva v. DiLeonardi*, 181 F.3d 865, 866–67 (7th Cir. 1999) (“A brief must make all arguments accessible to the judges, rather than ask them to play archeologist with the record.”).

Seemingly acknowledging that Okada fails to meet the limitation, Petitioner makes an ambiguous attempt to add in Berghegger. *See* Pet. at 62-63. But the Petition fails to establish that it would be obvious to modify Okada to incorporate closed-loop feedback as claimed. Okada teaches away from closed-loop feedback control because it uses three simple power levels (low, intermediate, and high) established at the beginning of the process by receiver to transmitter communication. Okada also teaches an open-loop receiver that has three components (a regulator (51), a voltage clamp (49), and a charging controller (52)) for the receiver to self-regulate the battery charging process.

Any closed-loop feedback system as required by the claim would require the transmitter to regulate “by adjusting the frequency or duty cycle of the one or more drive circuits during the charging or powering of the one or more portable devices.” *See* Claim 1. The Okada drive circuit (switching circuit 15) as described is not designed for any adjustment of its frequency or duty cycle. Okada teaches choosing one of three power levels through the use of a multi-tapped primary side coil. The Petition makes no attempt to show that Okada teaches or suggests frequency or duty cycle control. The Petitioner fails to address or discuss how the Okada system would

be modified to implement these controls. Such changes to the receiver and transmitter to add additional circuitry and control mechanism would add complexity and cost to the system that run counter to an assertion of obviousness.

Accordingly, the petitioner has failed to demonstrate that a POSITA would undertake to complicate Okada's functioning system by adding extra cost and complexity to the receiver and transmitter to combine with Berghegger to achieve the claim elements. Furthermore, the Petition has failed to demonstrate that Okada (whether by itself or somehow modified in combination with Berghegger) "periodically receives information corresponding to one or more output voltages or currents of the one or more receiver rectifier circuits . . ." and "regulate[s] . . . the one or more output voltages or current of the one or more receiver rectifier circuits by adjusting the frequency or duty cycle of the one or more drive circuits during the charging or powering of the one or more portable devices." (Limitations [1.K-L]).

2. The Petition fails to show that Okada and Odendaal render the planar coil limitations obvious (Limitation 1.B).

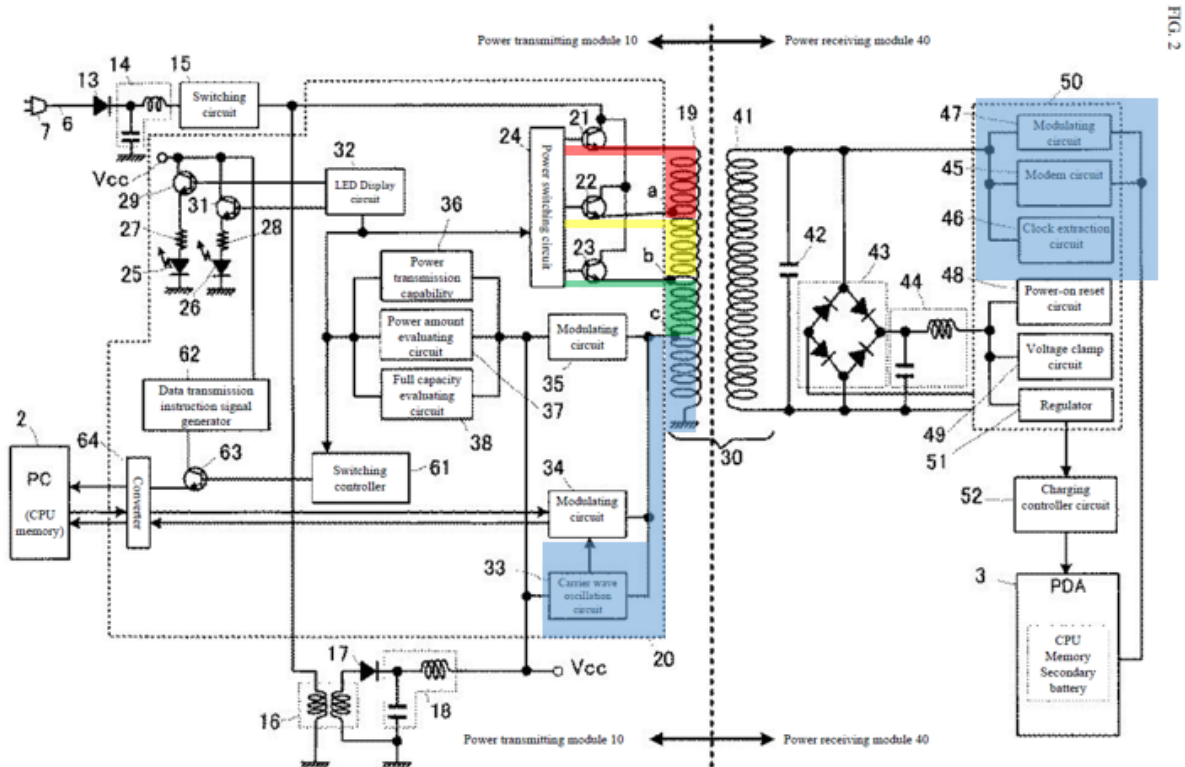
"Combinations of references that render a prior art device inoperable, or that fundamentally change the manner of operation of the device, often will not support a finding of obviousness." *Plas-Pak Indus., Inc. v. Sulzer Mixpac AG*, No. 13-7786, 2014 WL 203101, at *2 (P.T.A.B. Jan. 17, 2014) (citing *In re Ratti*, 270 F.2d 810, 813 (CCPA 1959)), *aff'd*, 600 Fed. Appx. 755 (Fed. Cir. 2015). The Challenged

Claims require that “one or more primary coils that are substantially planar and parallel to a surface of the system for powering or charging one or more compatible portable devices.” The Petition admits that Okada does not disclose this claim element, and instead argues in light of teachings from Odendaal, a POSITA would replace Okada’s multi-tap solenoid coil with a planar coil, fundamentally changing the technology used for power transfer in Okada. Yet neither Odendaal nor the Petition provides any disclosure of a multi-tap planar coil. Such a replacement would create a number of issues that would be difficult or impossible for a POSITA to solve, rendering Okada’s system inoperable. The Petition fails to address these issues entirely.

a. Okada’s power transfer system is deliberately based on multi-tapped solenoid coils, not planar coils.

Even though the Petition contends that a wide variety of planar coils were well known in the art in the approximate time frame of Okada (Pet. 18), and even though the Petition admits that Okada discussed use in low-profile systems for which a planar coil would allegedly be beneficial, Okada did not disclose the use of a planar coil. Instead, Okada chose a system with non-planar, solenoid wire-wound coils 19 and 41 (illustrated in Fig. 2 seen below). Okada shows how the switching circuit 15 applies an AC power signal to differing primary side coil lengths at the power transmitting module 10 (left side) to create a system that can supply power to

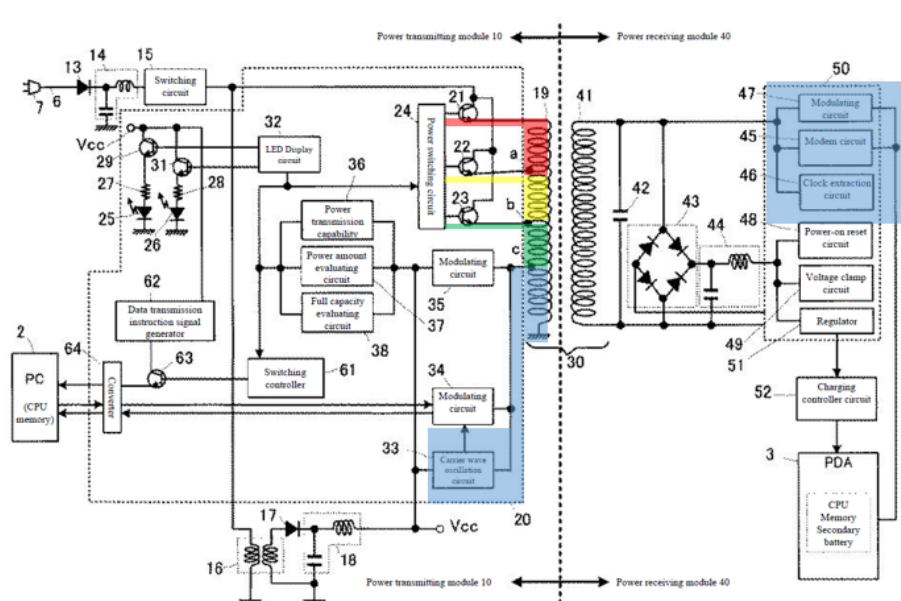
receivers like power receiving module 40 (right side) with different (low, intermediate, and high) power requirements.



Ex. 1005 at Fig. 2 (color added).

Okada has deliberately taken advantage of the benefits of solenoid coils for a number of reasons discussed below. The Okada primary side coil consists of multiple wire winding sections for transmitter power transfer to the PDA 3 or its battery, and a communication section on the same winding. In Okada's tapped solenoid coil structure, different windings—or different segments of the same winding—purportedly achieve similar magnetic coupling with the receiver / secondary side solenoid coil.

The Okada system is intentionally designed with this feature of the tapped solenoid coils. Rather than using the same segment of the primary side coil for all power transfer and communication, Okada's Figure 2 (below) embodiment uses only the blue portion of the coil—from tap “c”—to send a communication carrier wave, receive an information signal from the secondary side coil, and detect whether the secondary side coil is properly aligned with the primary side coil. *Id.* at Fig. 2. Then, when the system has determined a degree of alignment between the primary side coil and the secondary side coil and determined the receiver's required power level (low, intermediate, or high), one of three different sections of the primary side coil is enabled using different taps (starting at red, yellow, or green and continuing to ground) and connected to the switching circuit 15 to provide power to charge the portable device:



Id. at Fig. 2 (color added). Accordingly, Okada relies only on the blue portion of the coil to determine whether the device is “correctly placed,” but then uses a larger portion of the primary side coil for charging (from red, yellow, or green to ground). Ex. 1005 at Fig. 2. Okada uses the magnitude of the information signal supplied by the receiver circuit to the secondary side coil and inductively coupled to the primary side coil as a proxy for the degree of magnetic coupling between any of the primary side coil segments and the secondary side coil *Id.* at [0067] (“so even when the common cradle 4 is in a state where power is not being transmitted, by measuring a signal intensity of the information signal, the amount of positional offset of the common cradle 4 and the PDA 3 can be recognized.”).

Thus, by utilizing solenoid coils, Okada can rely on detection of the degree of coupling / alignment between the *blue portion* of the primary side coil and a nearby secondary side coil to determine whether there will be good alignment for the *power delivery sections* of the primary side coil and the same secondary side coil. This alignment process is crucial for the operation of the Okada system, and without this detection and verification, the process will not go forward to the next step. *Id.* at Fig. 3 (Step S4 – lack of alignment leading to non-charging and standby status).

Okada begins power output start after these initial steps in steps S8, S10 and S12 after ensuring adequate magnetic alignment between the primary side coil and the secondary side coil and receiving the required power level information from the

receiver. Okada's tapped solenoid design allows the system to then select a *different* section of the primary side coil with a different number of turns to transfer power at the desired power level (steps S8, S10 or S12 in Fig. 3), secure in the knowledge that each of the 3 power transfer windings and the communication winding is equally well aligned and coupled to the secondary side solenoid coil. By switching between taps of the primary side coil, the "effective number of actual turns of the primary-side coil 19 changes," causing the turns ratio of the two coils to change, thus allowing the power transmission level to change (to 'small', 'intermediate' or 'large' levels) according to the requirement of the power receiver. *Id.* at [0073].

While Okada's tapped solenoid coils are an important part of the Okada system, the Petition does not suggest that taps would or could be used with planar coils. Indeed, from the cited references it is difficult to understand how a tapped planar coil would be implemented, and there is no such disclosure in any of the cited references (as discussed in the following section). The petition does not address this issue even though it is a crucial element of the Okada design.

The Petition contains no analysis of why Okada's tapped solenoid coils were selected when planar coils were already known. It does not describe any technology for achieving the same magnetic coupling and power transfer efficiency and alignment benefits with planar coils, much less any evidence that it would be obvious for a POSITA to achieve or even implement the same results. Without this evidence,

Petitioner cannot show motivation to combine Okada with a planar coil from Odendaal, nor a reasonable expectation of success.

- b. The Petition does not identify any multi-tap planar coil, shown by any reference in the combination—yet such a coil would be required to replace Okada’s solenoid coils with planar coils as Okada’s embodiments rely on tapped coils.**

While the Challenged Claims do not require taps, all of the coils in Okada’s transmitter embodiments use one or more taps along the coil length to select only a portion of the coil for certain uses. Thus, the Okada system requires taps. But the Petition does not identify any prior art that shows the use of a planar coil with a tap in the planar coil. Moreover, the Petition does not even attempt to show how Okada would be implemented with planar coils—with or without taps—let alone that it would have been obvious to do so.

Odendaal describes simple two port spiral coils, without *any* taps in the coil:



Ex. 1008 (Odendaal) at Fig. 1A. The Petition fails to recognize that Okada’s embodiments use complex arrangements with tapped coils in multiple sections (**four sections** in Fig. 2). Not only does the Petition fail to identify multi-tap coils in the

prior art, but it also fails to provide any evidence or argument that a POSITA would somehow be motivated or able to modify Odendaal's coil to add any taps in the planar coil. Rather, the Petition ignores this detail in arguing that exchanging solenoids for planar coils would be obvious. The Petition makes the conclusory assumption that a POSITA could simply drop in Odendaal's planar coil as a replacement for Okada's tapped solenoid coils without any explanation of how the POSITA would figure out how to add multiple taps and access multiple sections of a planar coil or implement the Okada system using planar coils in any other manner. Pet. 19-20. Odendaal's planar coil is not a drop-in replacement for Okada's tapped solenoid, and even if a multi-tap version of Odendaal's coil were somehow available, substantial unaddressed questions would remain. The Petition fails to show even a single embodiment or explanation of how multi-tap planar coils would allegedly be obvious.

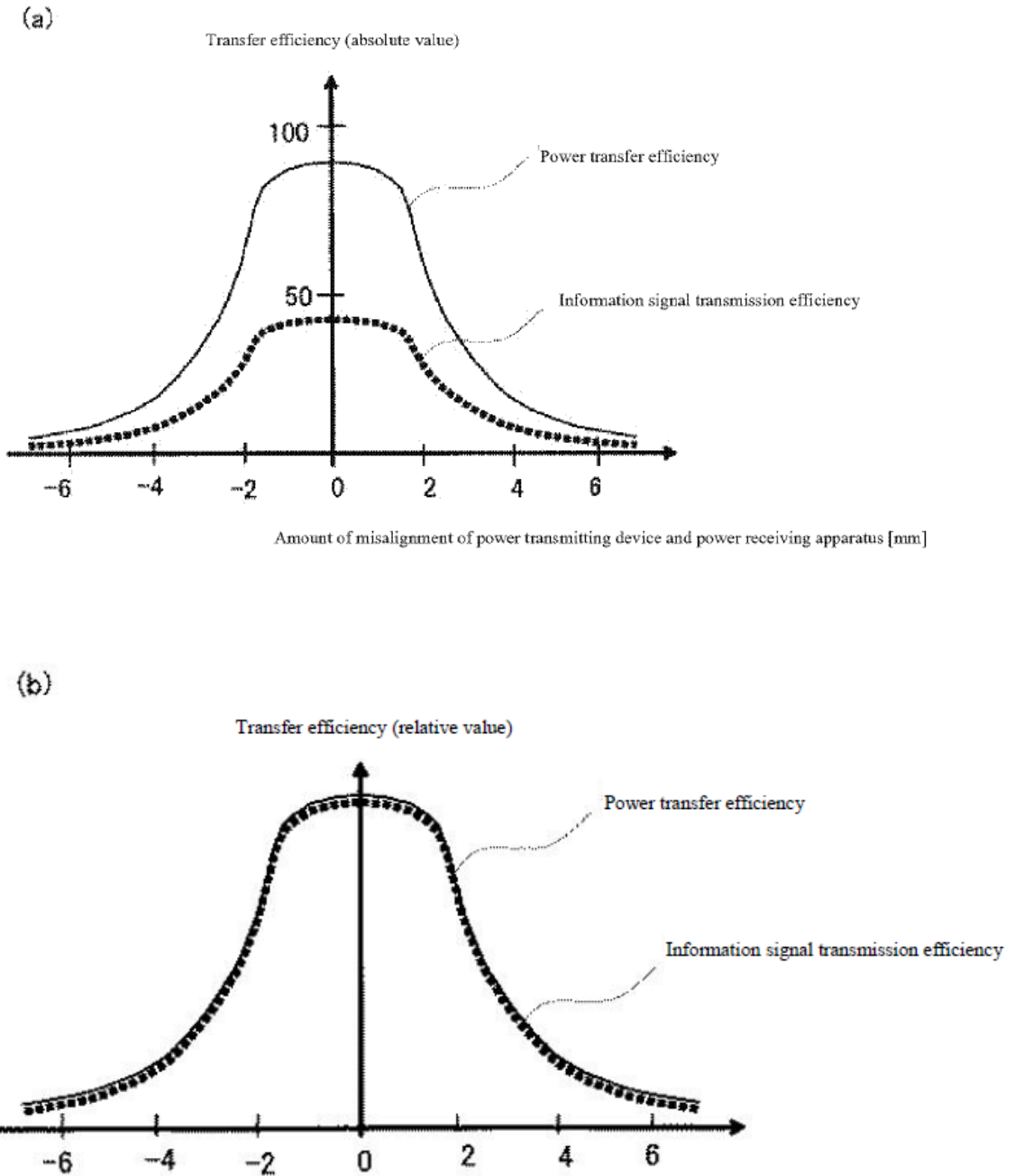
- c. Use of only part of a planar coil would substantially impact the transmission efficiency of the coil, and would require an unknown alignment determination process.**

Odendaal explains that the behavior of a planar coil depends on the “geometric configuration of the spirals and interfaces.” Ex. 1008 at 3:52-57. The magnetic field, and thus the magnetic coupling between a multi-tap primary side coil and a secondary side coil would differ based on which portion of the planar primary side

coil is being selected for use—a donut shape formed by the outer rings of a spiral would behave differently than the circle shape of the coils at the inner rings. In addition, the alignment between the selected primary side coil and a secondary side coil may vary based on which portions of the primary side planar coil are used.

As explained above, Okada relies on using a section of the primary side solenoid coil to determine alignment, and then powers a different section of the same primary side coil for power delivery, with the knowledge that having used solenoid primary side and secondary side coils, all the used segments of the primary side coil will be similarly magnetically aligned with the secondary side coil and would couple to the secondary side coil with similar magnetic coupling / efficiency. Okada's critical assumption is based on the solenoid geometry used that uniquely enables the alignment characteristics that when the *information signal* is transmitted by the secondary side coil and received by the primary side coil using tap c, it will be strongly correlated to the alignment characteristics when *power* is transmitted using any of the other three taps for power delivery from primary side coils to the secondary side coil. The charts in Figures 4A and 4B of Okada show this consistent relationship for the multi-tap solenoid coil of Okada as a function of misalignment (x-axis):

FIG. 4



Ex. 1005 (Okada) at Fig. 4B; [0066]-[0068].

In contrast, in a hypothetical planar coil embodiment with multiple taps, the coupling and alignment between different sections of the primary side coil and the

secondary side coil would vary depending on which taps are selected, so the same relation as in Okada's system would not hold. The Petition fails to address how this crucial alignment process would be enabled or modified in such a hypothetical system.

In the hypothetical multi-tap planar coil discussed above, the shapes and dimensions of different sections of the planar coil will vary widely, and the magnetic coupling with the secondary side coil would involve different overlap and alignment deviations depending on which sections of the planar primary side coil is selected by the taps. Yet the Petition contains no analysis of whether the alignment of one section of a planar coil is usable as a proxy for alignment of another section of the planar coil or what the effects on the alignment determination process are.

Furthermore, in a hypothetical multi-tap planar coil geometry, different sections of a spiral primary side coil would magnetically couple differently with a secondary side coil. Such a multi-tap coil would have lower and non-uniform magnetic coupling / power transfer efficiencies between different power delivery sections and also the carrier wave section and the secondary side coil. Such a change would require further changes to the system circuit and cause non-uniform power transfer efficiency between the transmitter and different type of receivers ('low', 'intermediate and 'high' power levels).

The Petition, however, provides no analysis to explain how this would work, and without such analysis, the proposed combination is based merely on hindsight bias. The Petition does not show that a POSITA with knowledge of Odendaal's planar coils would be prepared to address any of the issues such a change requires. Critically, the Petition provides no specific showing as to how Odendaal's planar coils would be implemented in Okada's system. For this reason alone the Petition should be denied.

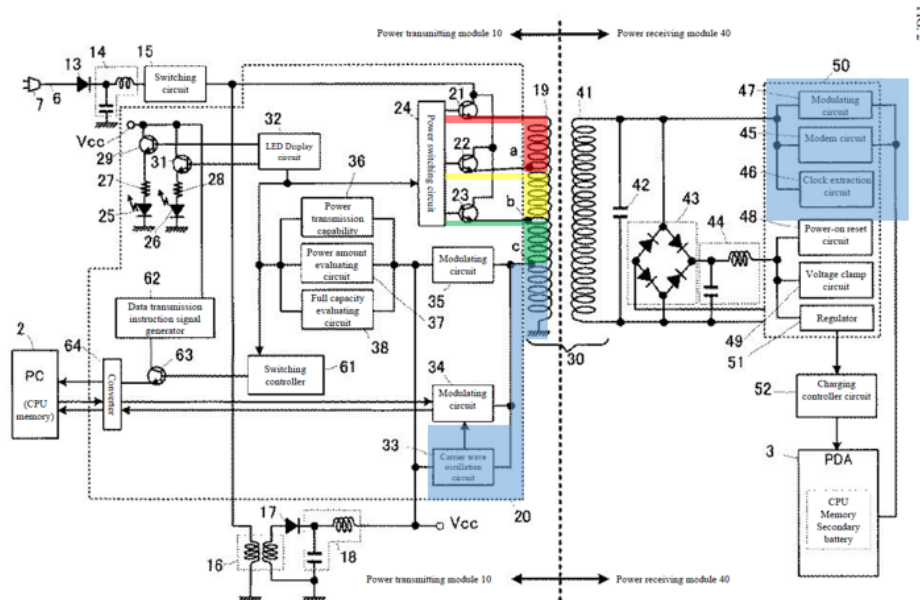
3. **The Petition fails to show that it would have been obvious to combine Okada and Berghegger to arrive at the “a drive circuit [that operates] near a first resonant frequency” (Limitation 1.F)**

The claims require “one or more drive circuits including one or more **FET drivers, FET switches, and capacitors** coupled to the one or more primary coils that when operated apply an alternating electrical current to the one or more primary coils . . . wherein the one or more communication and control circuits: **operate the one or more drive circuits near a first resonant frequency** of a circuit formed by a **primary coil and a drive circuit** and a **receiver coil and a receiver circuit** of a compatible portable device when nearby” (emphasis added). As the Petitioner admits, Okada does not include a capacitor and FET driver coupled to the one or more primary coils and does not operate near a resonance of a circuit as described in the claim element. Pet. 24-25. To try to remedy this, the Petition points to

Berghegger. Pet. at 25-26. However, the Petition fails to consider the complexities and implications of adding resonance frequency control to Okada. The Petition fails to show that there would be a motivation to combine Okada and Berghegger to arrive at this claimed limitation. As previously discussed, Okada includes four primary side coil sections at the transmitter, three of which are used for power transfer / charging of the portable device, with one chosen depending on whether ‘low’, ‘intermediate’ or ‘high’ power is desired by the receiver. Achieving resonance would have to address each of these coil sections (each with different inductance values), which would be very complex and costly. The Petition fails to address this. The Petition has not established obviousness of this claim limitation.

Consider Fig. 2 of Okada (reproduced below). Okada’s system can apply three different power levels to three different types of receivers (‘low’, ‘intermediate and ‘high’ power) based on a “Power Consumption Information” information message sent from the receiver to the transmitter. Ex. 1005 at [0069]-[0072]; *see also* Section III.C.2.a, *supra*. Upon receiving this message, the transmitter selects one of the three switches 21, 22 or 23 to apply the switching circuit 15 output to a section of the primary side coil 19 selected by the switches. Ex. 1005 at [0069]-[0072]; *see also* Section III.C.2.a, *supra*. These correspond to total length of the coil 19 for provision of power at one power level, from tap point a to ground for another power level, or b to ground for a third power level, representing three (3) different

inductance values. Ex. 1005 at [0050], In addition, the Okada system includes a communication channel using a carrier wave applied to tap c that is used to communicate with the receiver. Ex. 1005 at [0050]. The tap c to ground primary side coil length represents a fourth inductance value.



In contrast, Berghegger is a single transmitter coil / single receiver coil geometry. Because of this single geometry, Berghegger is able to incorporate circuitry for operating near a resonant frequency, as seen in Figure 1a and 1b below from Berghegger.

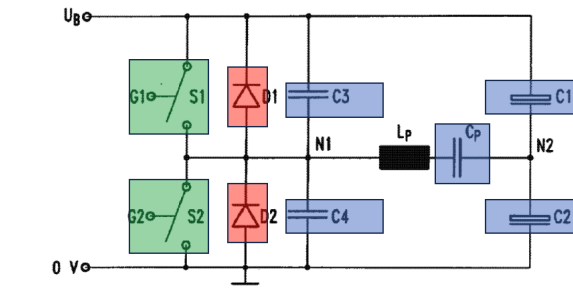


Fig.1a

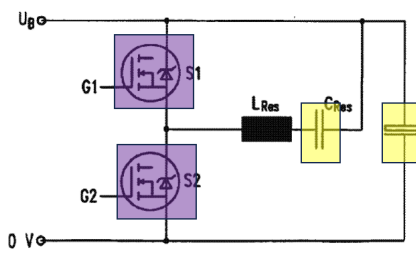


Fig.1b

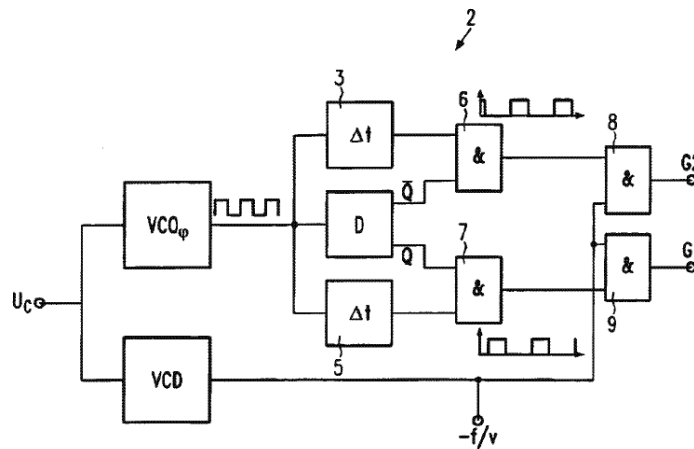


Fig.2

Ex. 1006 at Figs. 1a-b, 2. In Figure 1A, Berghegger's system contains five capacitors, two reverse current diodes, and two switches. In Figure 1b, a simplified version is shown including two FETs and two capacitors with some consequences on the high voltage present on the capacitors (Par. 4, line 19). The figure relied upon

by the Petitioner (Fig. 5 below) contains an element 40 that contains all the elements in Fig. 1. Pet. 32; Ex. 1006 at 5-15 (“Circuit 40 substantially contains the drive circuit 2 shown in FIG. 2 and the basic circuit 1 shown in FIG. 1 and used for driving the inductor L, and the resonant capacitor C, on the primary side.”).

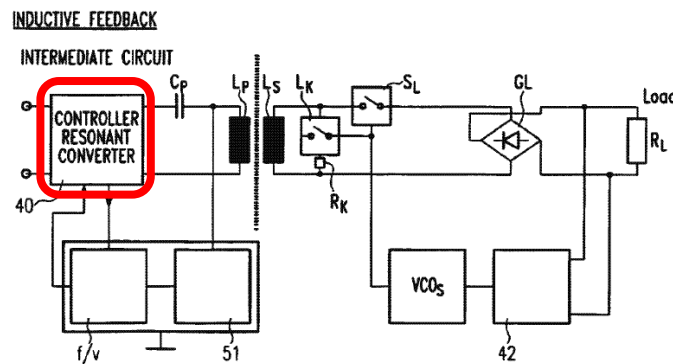


Fig.5

The resonant frequency of an LC circuit is related to the value of the inductor used. Given that Okada primary side coil uses three different inductor values to provide power to different types of receivers and their coils and another communication inductor value for coupling to any of the three receiver coils (to allow communication with any type of receiver), it is not at all obvious how resonance between the four sections of the primary side coil and all three receivers and their coils would be achieved. Implementation of any system would require multiple resonant capacitors and capacitor switching circuitry and complex control. Given the complexity and additional cost of such a potential combined system a POSITA would not be motivated to try to implement the complex and costly

circuitry of Berghegger into Okada to make a drive circuit that operates near resonance for the multi-tap coil system in Okada. The Petitioner does not provide an analysis for how to combine the complex Berghegger system with Okada's multi-tap primary coils to achieve this and any possible benefits gained from such a combination.

The Petition does not show with any degree of detail how the Berghegger system supposedly would be combined with Okada's system or whether a POSITA would want to undertake such a combination in light of all the complexity, additional cost and issues involved and whether a POSITA would consider the chances of success or improvement of the Okada system high for such a combined system. The Petition fails to establish obviousness of this claim limitation.

D. Ground 1 Fails To Establish That The Additional Limitation In Dependent Claim 2 Was Obvious.

Claim 2 adds “[t]he system of claim 1 further comprising one or more **voltage regulator circuits that can change input voltages to the one or more drive circuits between two or more levels to accommodate different powers required by the portable devices.**” Acknowledging that Okada does not disclose the claimed voltage regulator and changing the input voltage level, Petitioner suggests adding Masias as a *fifth* reference, but the Petition is inadequate for at least two reasons.

First, Masias is not analogous art and the Petition fails to establish that a POSITA would be motivated to use Masias and modify the suggested combination of four references with Masias as a fifth reference. “Analogous art is merely a threshold inquiry as to whether a reference can be considered in an obviousness analysis.” *Johns Manville Corp. v. Knauf Insulation, Inc.*, IPR2018-00827, Paper 9 at 13-14 (PTAB Oct. 16, 2018). There are two criteria for determining whether prior art is analogous: “(1) whether the art is from the same field of endeavor, regardless of the problem addressed, and (2) if the reference is not within the field of the inventor’s endeavor, whether the reference still is reasonably pertinent to the problem with which the inventor is involved.” *In re Clay*, 966 F.2d 656, 658–59 (Fed. Cir. 1992).

Macias does not come from the field of *wireless* charging, and is not pertinent to the problems addressed by the ’500 patent. Masias is directed to “[a] power source system including a power distribution apparatus has an energy management system for managing the provision of power from multiple power sources to multiple electrical devices.” Ex. 1031 at Abstract. Macias describes a *wired* system powered by AC or DC power supplies that can provide DC power to a number of devices or batteries simultaneously. *See generally* Ex. 1031. Masias is not pertinent to wireless charging.

The Petition merely provides a non-specific long string cite to try to support use of Masias. Pet. 65 (“Masias is in a related technical field as the ’500 patent and Okada and discloses features reasonably pertinent to particular problem(s) the inventor for the ’500 patent (and POSITA) was trying to solve. (Ex. 1001, Abstract, 2:15-4:29; Ex. 1031, 6:5-37; §§IX.A.1(a)-(c); Ex. 1005, ¶¶0037-0058, 0094-0109, 0116-0126; Ex. 1002, ¶¶101-103, 222-223.)”). This is inadequate to establish that a POSITA would have looked to Masias and modified the other four references relied upon to arrive at claim 2.

Second, even considering Masias, the Petition does not establish obviousness of claim 2. As discussed above regarding claim 1, Okada teaches a system that provides three different power levels by way of selecting one of three different coil sections in response to communication during an initial setup session to provide a different primary coil / secondary coil turns ratio to subsequently provide different levels of power to different receivers. *See* Section III.C.1, *supra*. The Petition fails to establish that a POSITA would be motivated to somehow add transmitter input voltage adjustments to this, or that it would be obvious to do so with a reasonable expectation of success by combining an input voltage regulator and selecting different input voltages to the drive circuit on top of the selection of the coil section in Okada.

E. Ground 2 Fails to Establish That The Additional Limitation In Dependent Claim 4 Was Obvious.

Claim 4 adds “the system of claim 1, wherein the one or more communication and control circuits are designed to receive from a receiver unit of a portable device identification information including one or more codes identifying the manufacturer of the portable device and/or receiver unit, a unique portable device and/or receiver ID code, a charge algorithm profile, and a power requirement of the portable device and/or receiver unit.”

Acknowledging that the *Okada-Odendaal-Berghegger-Black* system does not teach this specific information, Petitioner turns to *Calhoon*. However, Petitioner’s argument because the Petition fails to establish that a POSITA would seek to combine Calhoon with Okada. Okada’s system does not require all of the information recited by this claim limitation. Beyond what power level to assign and the battery capacity, which are provided via other methods (*see* Section III.C.1-2, *supra*), Okada does not need any of the other recited information. The Petition ignores this. Thus, the Petition fails to establish that a POSITA would be motivated to modify Okada per Calhoon.

F. Ground 3 Fails To Establish That The Additional Limitation In Dependent Claim 18 Was Obvious.

Claim 18 adds “[t]he system of claim 1, further wherein the one or more communication and control circuits use a Proportional-Integral-Derivative control

technique to regulate one or more *outputs of the one or more receiver rectifier circuits.*” Acknowledging that the *Okada-Odendaal-Berghegger-Black* system does not teach this specific claimed control technique, Petitioner turns to *Kazutoshi*. Pet. 77. But Petitioner’s reliance on Kazutoshi is misplaced.

Kazutoshi does not teach a system that regulates the output of the *receiver* rectifier circuit. Kazutoshi is an inductive system consisting of a long transmitter wire (embedded in a floor or ceiling for example) and a mobile device (such as a mobile cart) traveling along the length of the inductive wire that receives inductive power from this long wire to prevent current surges. *See generally* Ex. 1034. Kazutoshi is concerned with controlling the current in the inductive wire of the transmitter. *Id.* at Summary (“An object of an embodiment of the present invention is to provide a contactless power supply system, that can *impose continuous control on current in inductive wires*, even when circuit load varies.”) (emphasis added). To do this, the system uses a current detection circuit 63 and power detection circuit 62 that measure power and voltage of the transmitter inductive wire 19 *and controls those values*. *See* Ex. 1034 at Fig. 3, 0029. Notably, when Kazutoshi discusses “output power,” it is referring to the value measured by the power detection circuit 62 in the inductive wire 19 of the transmitter. *Id.* at 0043 (“The detected output power of the inductive wires 19.”). It has nothing to do with the output of the *receiver* rectifier circuit as required by the claim.

The Petition does not address this, and thus fails to establish it would have been obvious to consider the art as relevant since (1) Kazutoshi relates to control of the charger coil current and not the receiver rectifier circuit output and (2) Kazutoshi relates to providing continuous power to a moving cart along a wire and not to charging the battery of a stationary mobile device inductively. *See, e.g.*, Ex. 1034 at [0025]-[0026], [0028], [0031]. [0034], [0041]. Furthermore, the claim relates to use of a Proportional-Integral-Derivative control technique for the transmitter to regulate a voltage or current output of a *receiver* rectifier circuit. Moreover, Proportional-Integral-Derivative control is a form of closed-loop feedback control, and as explained above, a POSITA would not have been motivated to configure/modify Okada to have closed-loop feedback control *See* Section III.C.1, *supra*. Further, a POSITA combining a regulation system would face the issue raised in claim 1 for regulation and adding a PID control method would not alleviate the challenges raised in claim 1 for combining art to achieve regulation with little chance of success. *See* Section III.C.1, *supra*.

IV. CONCLUSION

For any or all of the above-described reasons, Patent Owner respectfully requests that the Board deny institution.

Dated: October 12, 2023

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CERTIFICATE OF WORD COUNT

The undersigned hereby certifies that the portions of the above-captioned **PATENT OWNER'S PRELIMINARY RESPONSE** specified in 37 C.F.R. § 42.24 have 13,085 words, in compliance with the 14,000 word limit set forth in 37 C.F.R. § 42.24(b)(1). This word count was prepared using Microsoft Word 2016.

Date: October 12, 2023

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CERTIFICATE OF SERVICE

The undersigned hereby certifies that the foregoing **PATENT OWNER'S PRELIMINARY RESPONSE** is being served via electronic mail, in its entirety on the following counsel of record for Petitioner:

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