

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. IPR2023-01096
Patent No. 11,316,371

PATENT OWNER'S PRELIMINARY RESPONSE

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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 20-23 and 30 of U.S. Patent No. 11,316,371 (the “371 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 district court case. By way of this and its seventeen other petitions, Petitioner is

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, (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 (this IPR), (18) IPR2023-01097.

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 America Invents Act, as it would multiply and complicate the proceedings, rather than simplify matters.

Substantively, the Petition fails to establish the obviousness of combining or modifying the *five to nine* asserted references per Ground to somehow arrive at the claimed subject matter. The Petition fails to show how *specifically* the several asserted references would be combined or modified to arrive at the claimed subject matter. Nor does the Petition show that it would have been obvious to a POSITA to do so, or that a POSITA would have had a reasonable expectation of success. Instead, in several instances on each Ground, the Petition makes conclusory assertions with merely lengthy string cites that make the Petition impossible to follow.

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 obviousness of the claimed portable device being configured to communicate its voltage/current levels to the transmitter (or base unit) to enable closed-loop feedback regulation by the transmitter during charging. That is, the

Petition fails to establish obviousness of the closed-loop feedback regulation specified in the claims. To try to establish this claimed subject matter, the Petition points to Okada as the base reference and then suggests modifying Okada somehow by way of Berghegger to add closed-loop feedback regulation. However, Okada is fundamentally an open-loop system during charging, setting the transmitter power level once before the start of charging (setting the power level to low, intermediate, or high), and then relying on the receiver to self-regulate the charging power, rather than using closed-loop feedback regulation by the transmitter during charging. That is, the claimed closed-loop feedback regulation is the antithesis of the open-loop Okada system. The Petition fails to explain why a POSITA would have been motivated to try to modify Okada to add closed-loop feedback regulation. Nor does the Petition explain how this would be done while keeping the Okada system intact. Thus, the Petition is deficient on the claimed closed-loop feedback regulation.

Second, the Petition fails to demonstrate how the proposed Okada/Odendaal combination would provide the claimed “planar coil(s)” in the context of the claimed invention. Okada does not disclose planar coils. Rather, Okada uses solenoid coils for both the transmitter and receiver with the transmitter solenoid coil having multiple taps for power transfer and communication. In particular, in addition to connections to the two ends of the solenoid coil, the Okada transmitter solenoid coil has three taps along its length to provide four different coil sections, three selectively

used for “high, intermediate, and low” power level transmissions, and the fourth smallest section separately used for communication. Given Okada’s use of solenoid coils, the Petition points to Odendaal to try to modify Okada to have the claimed planar coil. However, the Petition fails to show how a POSITA would use Odendaal to implement the Okada system with planar coils. Indeed, the Petition fails to make any showing of how a POSITA would or could do this to provide the four needed coil lengths for Okada’s separate “high, intermediate, and low” power levels and communication channel. The Petition fails to make any showing that a POSITA would have been motivated to attempt this or would have had a reasonable expectation of success. To the contrary, there are a host of reasons as discussed below that point against this. Thus, the Petition is also insufficient on the “planar coil” claim limitation.

Third, the Petition fails to demonstrate obviousness of the claimed portable device being configured to communicate with the base unit (the transmitter) by modulating the current induced in the receiver coil by the base unit (the power transfer current). In particular, the Petition fails to demonstrate obviousness of the “receiver communication and control circuit [configured] *to modulate the current [induced by the base unit] in the receiver coil to communicate with the base unit* while the receiver circuit is being powered by the inductive charging system” as claimed. The claims specify that “the current” that is modulated by the receiver for

communication with the base unit is the current that is generated in the receiver coil inductively by the base unit. The Petition points to Okada as allegedly showing “the communication and control circuit [configured] *to modulate the current*” as claimed. But the Petition ignores that in Okada the receiver communicates by way of a *separate signal injected by a separate circuit in the receiver*. Because Okada does not communicate by modulating the power transfer current generated in the receiver coil inductively by the base unit, the Petition fails to establish this claim element.

Fourth, as to Grounds 1–3, challenged independent Claim 20 (and hence also Challenged Claims 21–23 dependent thereon) further specifies that the portable device includes a battery charging circuit that begins drawing current only when the output of the receiver rectifier circuit reaches a set minimum voltage value. The ’371 Patent teaches that this ensures that the receiver coil is sufficiently aligned with the transmitter coil (to induce an adequate voltage at the portable device) before starting battery charging. Acknowledging that Okada does not disclose a circuit that “begins drawing current only when the output of the receiver rectifier circuit reaches a set minimum voltage value[.]” the Petition attempts to bring in Nguyen. But the Petition fails to demonstrate (1) that Nguyen is analogous art, (2) that Nguyen teaches the claim limitations missing in Okada, and (3) that a POSITA would have been motivated to modify Okada somehow per Nguyen, when in fact Nguyen is unrelated to Okada and Okada has no need for Nguyen’s technology. Nguyen does not teach

a battery charging circuit (let alone one for a wireless or even a wired charger), but instead just an under-voltage lockout mechanism for an entirely different type of circuit with no battery. Moreover, Okada has no need for Nguyen's under-voltage lockout mechanism, as Okada already has a process for ensuring adequate voltage at the portable device, as explained below.

Fifth, as to Ground 4, Challenged Claim 30 requires that the portable device additionally have an output disconnect switch (controlled by the communication and control unit) to interrupt the flow of current to the battery, so that current flow to the battery is interrupted during at least some of the communication with the base unit. The '371 Patent teaches that this provides more reliable communication. Acknowledging that Okada does not teach such an output disconnect switch, the Petition turns to an additional reference, Meadows, but the Petition fails to show obviousness thereby. The Petition fails to demonstrate that Meadows teaches an output disconnect switch *that is controlled by a communication and control unit* as specified by Claim 30. Rather, Meadows teaches a battery protection circuit *having nothing to do with communication*. Thus, even if Okada were somehow combined with Meadows, it would not result in the output disconnect switch of Claim 30. Moreover, the Petition fails to demonstrate that a POSITA would have been motivated to combine Meadows and Okada. To the contrary, Okada has no need for the battery protection circuit of Meadows, as Okada already has battery protection

circuitry and processes, as explained below. Moreover, Okada's portable device has entirely *separate* battery charging and communication circuits, so that the claimed output disconnect switch controlled by the communication and control unit (to improve the communication from the portable device as explained in the '371 Patent) has no place or need in Okada.

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

II. BACKGROUND

A. The '371 Patent

The Petition contains four Grounds. Grounds 1–3 are each directed to independent Claim 20 or a claim dependent thereon. Ground 4 is directed to independent Claim 30. Independent Claims 20 and 30 specify a similar portable device including a receiver unit (an inductive receiver) to receive power inductively from a wireless charger (an inductive transmitter or “base unit”). Ex. 1001 at Claims 20 and 30.

Among other things, as relevant to this Preliminary Response, Claims 20 and 30 specify that the receiver unit is configured to periodically communicate information corresponding to an output voltage / current of a receiver rectifier circuit to the inductive transmitter so that that the voltage / current can be regulated by the transmitter using closed-loop feedback. *Id.*

Claims 20 and 30 also specify that the receiver coil is planar and parallel to the charging surface, to receive an electromagnetic field perpendicular to the plane of the receiver coil. *Id.*

Furthermore, Claims 20 and 30 specify that the receiver unit uses the current induced in the receiver coil by the charging transmitter to power and activate its microcontroller and to charge the battery of the portable device, and the receiver unit modulates this current to communicate information to the transmitter. *Id.*

Moreover, Claim 20 specifies that the receiver unit includes a battery charging circuit that only begins to draw current when the output of the receiver rectifier circuit reaches a set voltage, and Claim 30 also specifies that the receiver unit includes an output disconnect switch. *Id.*

These summarized features of Claims 20 and 30 addressed in this Preliminary Response are seen in the below emphasized text in Claims 20 and 30. These claims specify many more features, as seen in the claims, which would need to be addressed if there were institution.

Limitation	Claim Language
20(a)	A portable device comprising:
20(b)	a battery; and a receiver unit, coupled to the battery, configured to receive inductive power from an inductive charging system

Limitation	Claim Language
	including a base unit with a primary coil and associated circuit, the receiver unit comprising:
20(c)	<i>a receiver coil which has a substantially planar shape and is located parallel to a surface of the portable device</i> so that an alternating magnetic field, when received through the surface of the portable device from the primary coil in the base unit in a direction substantially perpendicular to the plane of the receiver coil, inductively generates <i>a current in the receiver coil to provide power inductively to the portable device when the portable device is placed on the base unit for charging the battery of the portable device;</i>
20(d)	a ferromagnetic layer placed under the receiver coil on a side of the receiver coil away from the surface of the portable device; and
20(e)	a receiver circuit powered by the inductive charging system, wherein the receiver circuit comprises:
20(f)	a receiver rectifier circuit including a rectifier and a capacitor;

Limitation	Claim Language
20(g)	<i>a receiver communication and control circuit including a microcontroller to modulate the current in the receiver coil to communicate with the base unit while the receiver circuit is being powered by the inductive charging system;</i>
20(h)	a voltage regulator coupled to an output of the receiver rectifier circuit and coupled to the microcontroller to provide a regulated voltage to power the microcontroller from the received inductive power; and
20(i)	<i>a battery charging circuit to charge the battery, wherein the battery charging circuit is coupled to the output of the receiver rectifier circuit and coupled to the battery and begins drawing current only when the output of the receiver rectifier circuit reaches a set minimum voltage value;</i>
20(j)	wherein when a current is generated in the receiver coil inductively by the primary coil in the base unit, the current is rectified and smoothed by the receiver rectifier circuit and is used by the voltage regulator to power and activate the

Limitation	Claim Language
	microcontroller and used by the battery charging circuit to charge the battery of the portable device; and
20(k)	wherein upon powering and activation of the receiver circuit by the primary coil in the base unit, the receiver circuit is configured to:
20(l)	communicate to the base unit information corresponding to a voltage or current value at the output of the receiver rectifier circuit induced by the primary coil, a unique identifier code, a manufacturer code, a charge algorithm profile, and a power requirement; and
20(m)	<i>periodically communicate to the base unit additional information corresponding to a presently induced output voltage or current of the receiver rectifier circuit to enable the base unit to regulate in a closed loop manner the output voltage or current of the receiver rectifier circuit during the charging of the portable device.</i>

Limitation	Claim Language
30(a)	A portable device comprising:
30(b)	a battery; and a receiver unit, coupled to the battery, configured to receive inductive power from an inductive charging system including a base unit with a primary coil and associated circuit, the receiver unit comprising:
30(c)	<i>a receiver coil having a substantially planar shape and located parallel to a surface of the portable device</i> so that an alternating magnetic field, when received through the surface of the portable device from the primary coil in the base unit in a direction substantially perpendicular to the plane of the receiver coil, <i>inductively generates a current in the receiver coil to provide power inductively to the portable device when the portable device is placed on the base unit for charging the battery of the portable device;</i>
30(d)	a ferrite material layer placed under the receiver coil on a side of the receiver coil opposite to the surface of the portable device;

Limitation	Claim Language
30(e)	a receiver circuit powered by the inductive charging system, wherein the receiver circuit comprises:
30(f)	a receiver rectifier circuit including a rectifier and a capacitor; and
30(g)	<i>a receiver communication and control circuit including a microcontroller to modulate the current in the receiver coil to communicate with the base unit while the receiver circuit is being powered by the inductive charging system; and</i>
30(h)	<i>an output disconnect switch to interrupt a flow of current from an output of the receiver unit to the battery;</i>
30(i)	wherein when a current is generated in the receiver coil inductively by the primary coil in the base unit, the current is rectified and smoothed by the rectifier circuit and is used to power and activate the microcontroller and to charge the battery of the portable device;
30(j)	wherein upon powering and activation of the microcontroller by the primary coil in the base unit, the receiver circuit is configured to:

Limitation	Claim Language
30(k)	communicate to the base unit a power parameter and a voltage or current value at an output of the receiver rectifier circuit induced by the primary coil; and
30(l)	<i>periodically communicate to the base unit information corresponding to a presently induced output voltage or current of the receiver rectifier circuit to enable the base unit to regulate in a closed loop manner the output voltage or current of the receiver rectifier circuit during the charging of the battery of the portable device; and</i>
30(m)	<i>wherein the communication and control unit is configured to control the disconnect switch to disconnect the flow of current from the output of the receiver unit to the battery during at least some of the communication with the base unit.</i>

B. Claim Construction

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

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, 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. 1051 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. 1051 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. 1053 (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*

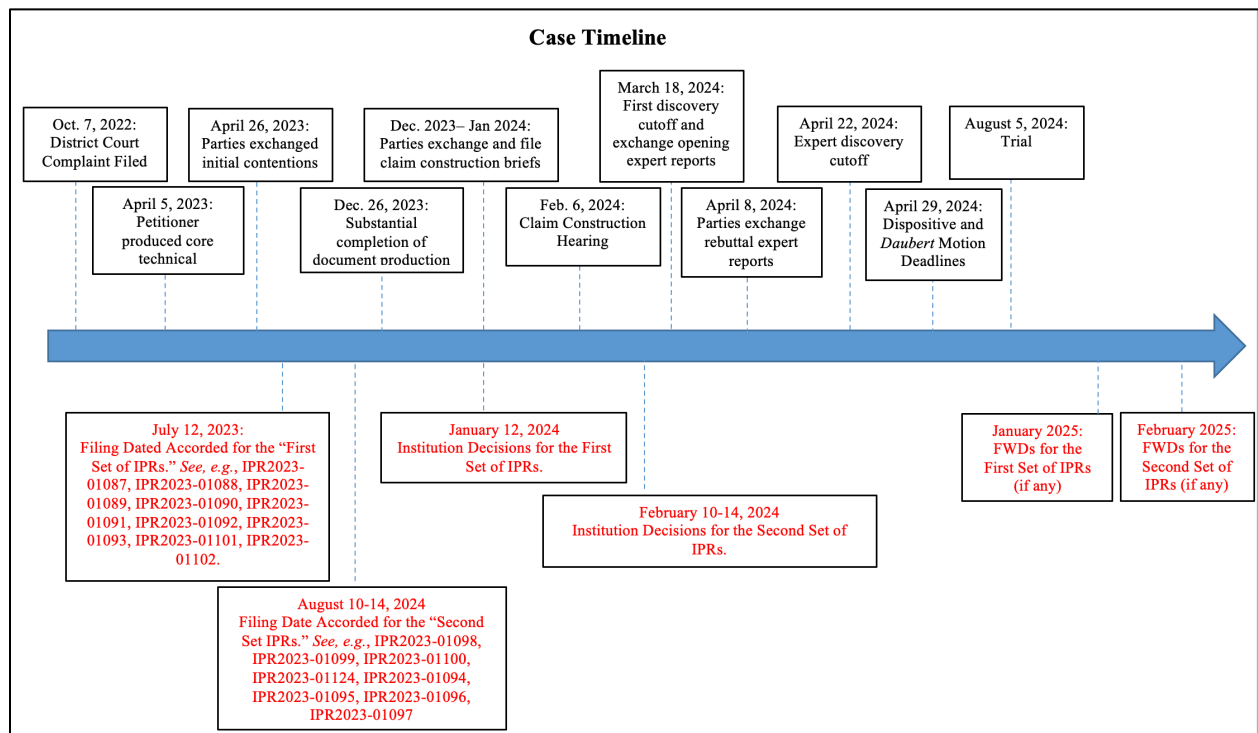
eighteen IPRs were to be instituted, Petitioner would still assert invalidity grounds based on §§ 102 and 103 in district court that would not and could not be addressed by the Board. And those invalidity grounds in district court would be tried before a jury months before any final written decision 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 under 35 U.S.C. §§ 102 and 103 months after the district court 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. However, Petitioner has failed to consider the totality of the evidence. This Board has previously held that “***in 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.” *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.

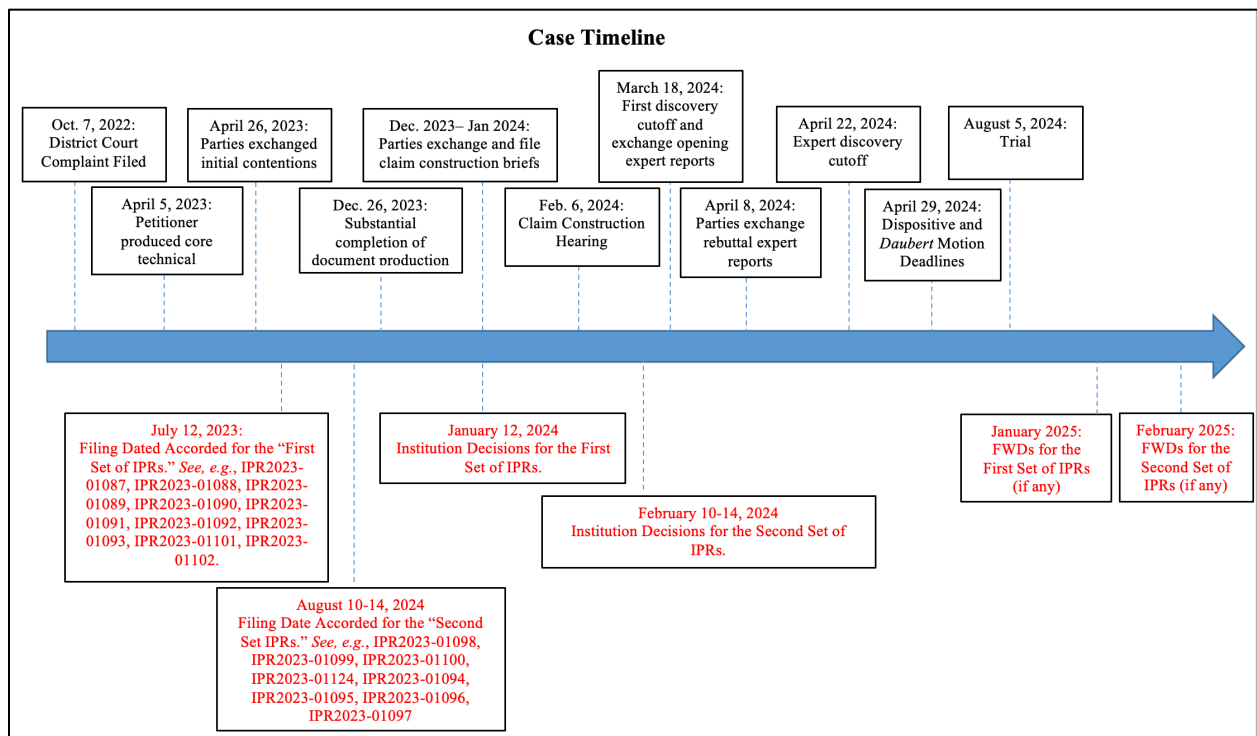
Petitioner has filed a motion to stay the district court litigation which has not been ruled on, but will almost certainly be denied pre-institution. *See* Ex. 2002 at 1-2 (Patent Owner showing that the Eastern District of Texas ***universally*** denies a motion to stay pre-institution). Moreover, even 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. Infierna 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. 1053 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. Jiaxing 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. *Compare 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), *with 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).

Petitioner’s 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 (“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 Obviousness To Combine Or Modify The Five To Nine Asserted References Per Ground To Arrive At The Claimed Subject Matter

“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). Thus, the Petition must show that a POSITA would have been motivated to combine the asserted references and “demonstrate that the skilled artisan would have had a reasonable expectation of success.” *KEYnetik, Inc. v. Samsung Electronics Co., Ltd.*, 841 Fed. Appx. 219, 227-228 (Fed. Cir. 2021) (internal citations omitted). As illustrated below, the Petition here has not made these required showings.

The Petition fails to show that a POSITA would have been motivated to combine and modify the many asserted prior art references to arrive at the claimed

subject matter. Any discussion on using combinations is limited to discrete claim elements, and not a motivation regarding the references themselves. Moreover, the Petition fails to show that a POSITA would have had a reasonable expectation of success in making the alleged combinations and changes. To the contrary, for example, in several instances the Petition fails to consider multiple reasons teaching away from the alleged combinations and changes, making it nonobvious to combine or modify, and going against a reasonable expectation of success, as illustrated below in Section III.C.

Additionally, the Petition fails to provide the required particularity for making the alleged combinations and modifications. Instead, in many instances the Petition merely presents conclusory assertions with lengthy string cites. For example:

- Pet. at 5: “However, those features, and others, recited in the challenged claims relate to a compilation of conventional components/features that were disclosed/suggested by the prior art combinations herein. *See In re Gorman*, 933 F.2d 982, 986 (Fed. Cir. 1991). (Infra §IX; Ex. 1002, ¶¶22-65, 69-237; Exs. 1005-1017, 1019-1020, 1023-1030, 1036-1037, 1039, 1041, 1044, 1047-1050, 1056-1067, 1075-1078.)”

- Pet. at 18-19: “Planar coils placed in parallel to a power transfer system’s surface were known. (Ex. 1002, ¶130; Ex. 1027, 1-3 (planar spiral inductor); 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 (flat coils); Ex. 1009, Abstract, FIGS. 1-3, 1:4-51, 1:54-2:26, 2:47-3:8, 3:9-39 (thin flat coil), 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 (planar, spiral coils); 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, 5:22, 11:18, 23:20-24:8, 24:19-22.)”
- Pet. at 59: “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. 1002, ¶198; 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.)”

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

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 illustrated 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 *roughly 50* of evidence 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

² The institution of an IPR remains discretionary even if a petition presents a reasonable likelihood of success as to one claim (which Patent Owner submits the Petition 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).

C. The Petition Is Deficient As To Several Claim Limitations Common To All Challenged Claims And All The Grounds

As explained below, the Petition fails to show sufficiently for institution obviousness of several limitations found in each of the Challenged Claims and each of the Grounds. Each of the Grounds presents the same alleged combination of art and argument as to these claim limitations, so that each Ground is commonly deficient as to these claim limitations. Any one or all of these insufficiencies of the Petition warrants denial of institution of the Petition.

1. The Petition fails to establish obviousness of the claimed invention including closed-loop feedback regulation (Limitations [20(m)] and [30(l)])

The Petition fails to demonstrate that a POSITA would have been motivated to change Okada's open-loop system into the claimed closed-loop feedback regulation system to enable the base unit to regulate in a closed-loop manner the output voltage or current of the receiver rectifier circuit (Limitations [20(m)] and [30(l)]).

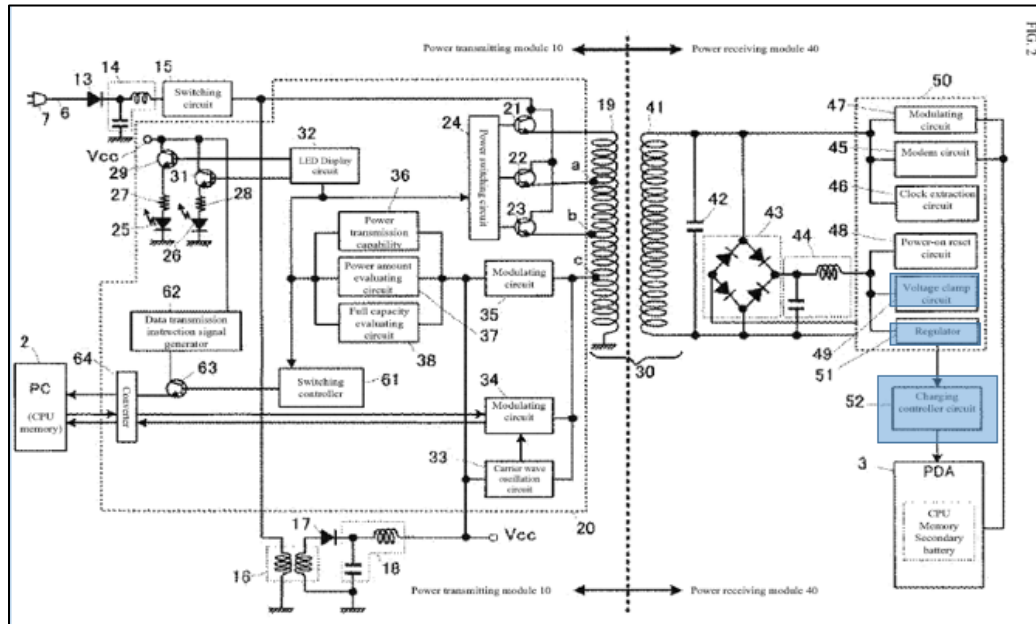
The claims require a portable device including a receiver circuit configured to “periodically communicate to the base unit additional information corresponding to a presently induced output voltage or current of the receiver rectifier circuit to enable the base unit to regulate in a closed loop manner the output voltage or current of the

receiver rectifier circuit during the charging of the portable device.”³ Okada, the primary reference relied upon in the Petition, teaches away from the claimed closed-loop feedback regulation because it establishes the power level as one of three open-loop power levels (low, intermediate, and high) set during an initial setup phase. During the subsequent power transfer for charging phase, Okada keeps the transmitter power level at that established power level. Moreover, in Okada’s open-loop system, the receiver self-regulates its output charging power during the charging process with its own circuitry, as explained below.

Figure 2 (below) from Okada shows the main components of the transmitter (10) and receiver (40) system. Okada teaches an open-loop charging system wherein the receiver 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. Ex. 1005 (Okada) at [0047]. This is unlike the claimed closed-loop feedback architecture in which the receiver communicates an output voltage / current level and the transmitter regulates the voltage / current of the receiver. Because the Okada system is an open-loop architecture, Okada’s receiver does not periodically

³ Limitation 20(m) in Ground 1 is reproduced in the body of the argument. For the purposes of this response, Limitation 30(l) in Ground 4 is very similar and the same analysis applies.

communicate information to the transmitter during charging for use by the transmitter to regulate the receiver circuit current/voltage.



Ex. 1005 (Okada) at [0047].

The open-loop nature of Okada is seen further in Figure 3 (below) of Okada.

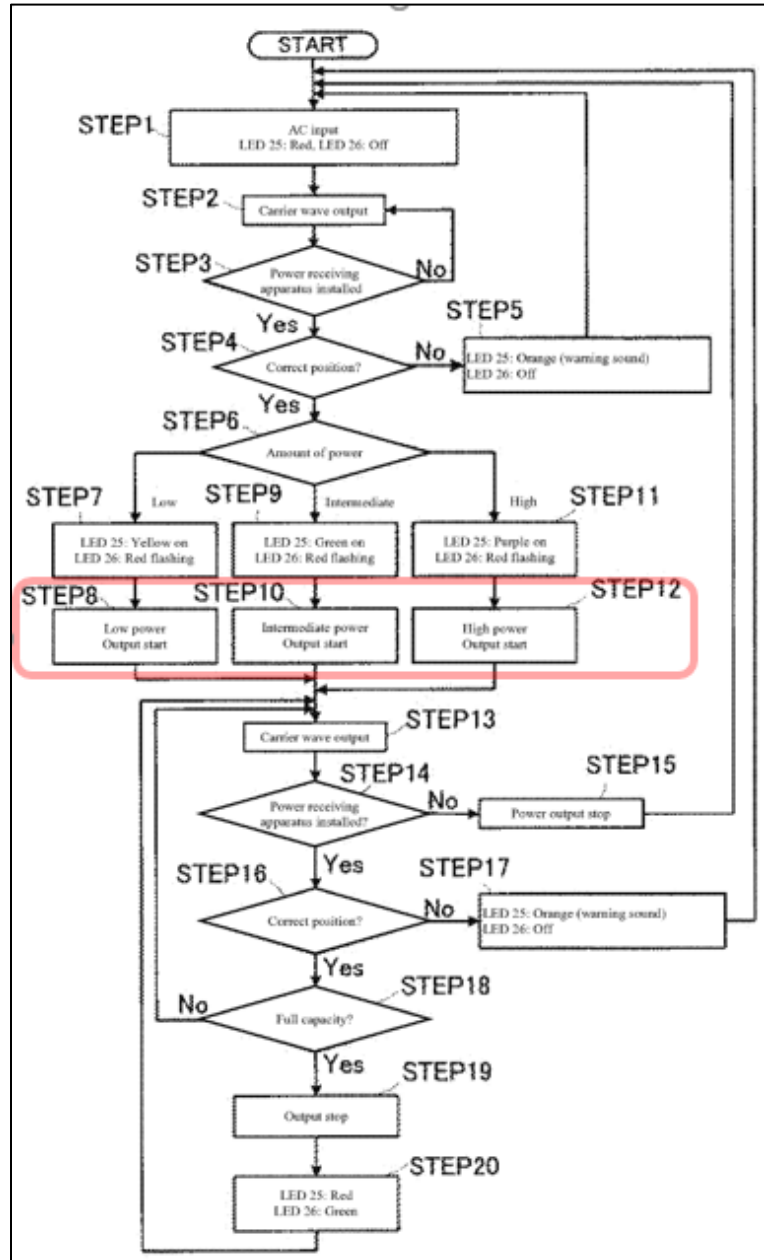
Okada Figure 3 is a “flowchart illustrating the flow of power supply operations carried out between the power transmitting module 10 and the power receiving module 40.” Ex. 1005 (Okada) at [0059]. Okada describes the operation of its system as follows (unrelated steps omitted):

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 6–12. If a device capable of receiving power is detected and positioned correctly (Steps 3-4), the receiver transmits to the transmitter a “power consumption



information” code (Step 6). The transmitter then sets the power transmission output to one of three levels (low, intermediate, or high), by a *one-time selection* of one of the primary-side coil winding sections, used for the duration of the charging. *Id.* at [0069–73].

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

Notably, the setting of the transmitter power level (low, intermediate, or high) (Step 6) *only occurs once*. Hence, during charging there is no closed-loop feedback regulation of the receiver voltage/current performed by the transmitter.

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

What this tour through Okada demonstrates is that the information from the receiver to the transmitter in Okada is unrelated to any type of dynamic output regulation of voltage/current at the receiver for closed-loop feedback regulation as specified by the Challenged Claims. Okada does not teach a transmitter that dynamically adjusts the power it is transmitting based on the receiver output voltage/current to regulate such output. Okada does not teach a receiver that

periodically feeds back its output voltage/current level to the transmitter for such a purpose.

Rather, Okada is designed specifically as an open-loop system. In particular, instead of the transmitter regulating the voltage/current at the receiver, as noted above, the Okada receiver has three components for the receiver to self-regulate / control the battery charging process. Specifically, at the receiver-side (i.e., the power receiving module 40), the Okada receiver includes a regulator (51), voltage clamp (49), and charging controller (52), as seen in Fig. 2 above.

Despite this, the Petition makes a conclusory argument that a POSITA would modify Okada per Berghegger. *See* Pet. at 47. Critically, the Petition fails to establish that it would be obvious to modify Okada somehow per Berghegger to incorporate closed-loop feedback regulation as claimed. To the contrary, Okada teaches away from the claimed closed-loop feedback regulation because it uses three simple power levels (low, intermediate, and high) established once during the initial setup phase. Moreover, Okada teaches an open-loop receiver that *self-regulates* the battery charging process through its regulator (51), voltage clamp (49), and charging controller (52).

The Petition fails to address any of this. Moreover, the Petition fails to address how a POSITA would add closed-loop feedback regulation to Okada's three-power level system, or why a POSITA would be motivated to do so, with the associated

complexity and cost of seeking to do so, particularly when the Okada receiver has circuitry for self-regulation. The Petition fails to address or discuss how specifically a POSITA would modify the Okada system in light of Berghegger to have closed-loop feedback regulation as claimed, let alone explaining that a POSITA would have had an expectation of success in doing so.

Accordingly, the Petition has failed to demonstrate obviousness of the closed-loop feedback regulation aspects of the Challenged Claims.

2. The Petition fails to show obviousness of the claimed invention including a planar coil (Limitations [20(c)] and [30(c)])

The Challenged Claims require a portable device that includes “a receiver coil which has a substantially planar shape and is located parallel to a surface of the portable device.” The Petition admits that Okada does not disclose this claim element. The Petition instead asserts that in view of Odendaal, a POSITA could or would somehow replace Okada’s solenoid coils (transmitter *and* receiver sides) with planar coils. Pet. at 18, 21 & 22 (the Petition repeatedly suggesting replacing *both* the transmitter *and* receiver side solenoid coils in Okada with planar coils). Yet, neither Odendaal nor the Petition explains how this would or could be done in Okada. In reality, such a replacement would present a number of issues for a

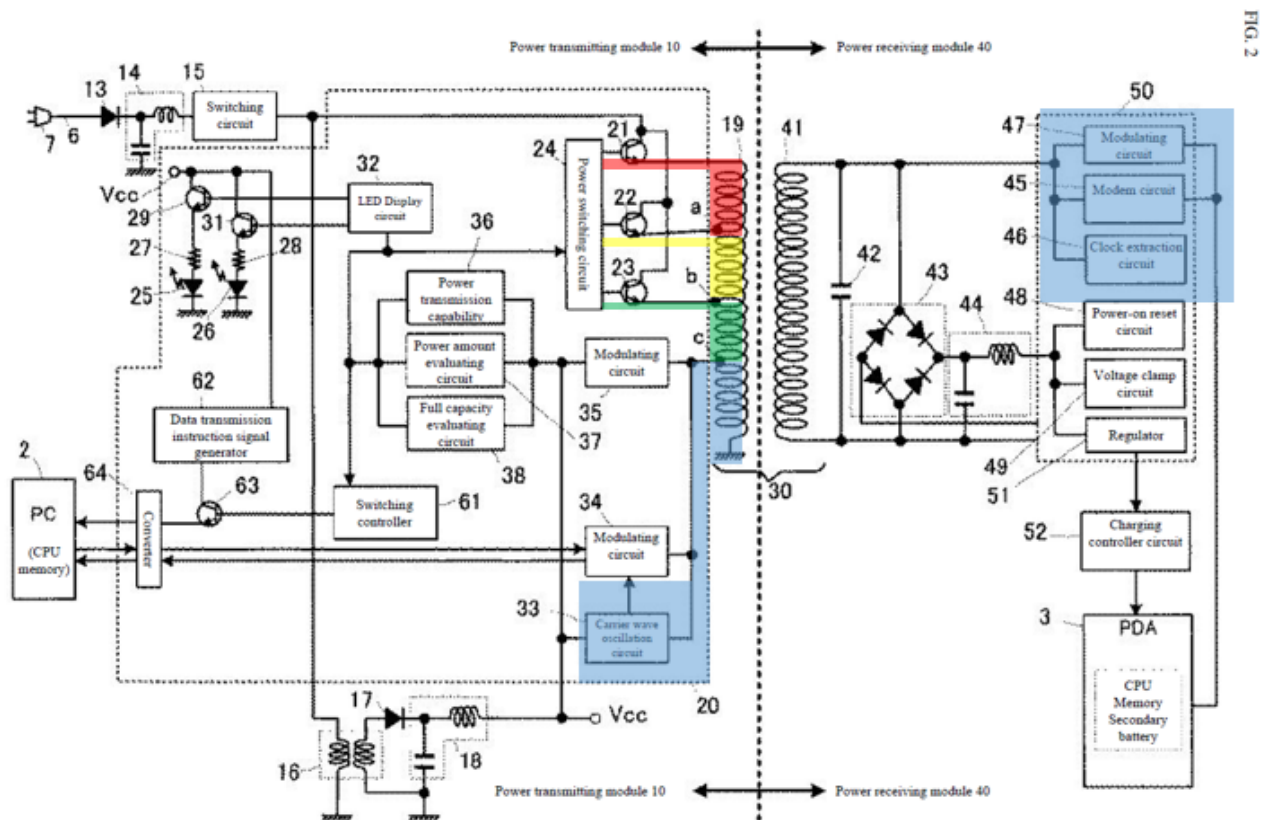
POSITA to solve to maintain Okada's operability.⁴ This is significant because "[c]ombinations of references that render a prior art device inoperable, or that fundamentally change the manner of operation of the device, often will not support a finding of obviousness." *Plas-Pak Indus., Inc. v. Sulzer Mixpac AG*, No. 13-7786, 2014 WL 203101, at *2 (PTAB. Jan. 17, 2014) (citing *In re Ratti*, 270 F.2d 810, 813 (CCPA 1959)), *aff'd*, 600 Fed. Appx. 755 (Fed. Cir. 2015).

⁴ The Petition expressly proposes replacing *both* the transmitter *and* receiver side solenoid coils in Okada with planar coils. Pet. at 18, 21 & 22. Thus, while the Challenged Claims specify that the "receiver coil [] has a substantially planar shape and is located parallel to a surface of the portable device," there is no basis to consider replacing just the receiver side solenoid coil in Okada with a planar coil and not the transmitter side solenoid coil. Indeed, not only does the Petition not suggest this, there is no basis to assume such a mismatch of coils types / shapes would work, let alone that it would be obvious to accomplish. Thus, because the Petition is premised on replacing both the transmitter and receiver side solenoid coils in Okada with planar coils, the problems and challenges with replacing the transmitter side solenoid coil (which is a four-section coil as discussed below) is relevant to the Petition. Accordingly, these problems are discussed below.

Critically, as discussed below, the Petition fails to address any of these issues. Rather, the Petition presents merely a conclusory assertion that Okada could be implemented with planar coils. Pet. 21. Such a conclusory suggestion is inadequate for institution. *See In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d at 1380–81 (“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.”).

a. The Petition ignores that Okada’s power transfer system is premised on multi-tapped solenoid coils, not planar coils

Even though the Petition contends planar coils were well known (Pet. 18), Okada did not mention the possible use of planar coils. Instead, for specific reasons of common magnetic coupling and alignment (fundamental to the Okada system design and operation), Okada teaches a system with non-planar, solenoid wire-wound coils 19 and 41, illustrated in Fig. 2 shown below.



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

Okada Fig. 2 shows how in the power transmitting module 10 (left side) a switching circuit 15 applies an AC power signal to differing primary-side coil 19 sections (by way of taps) 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. Moreover, Okada Fig. 2 shows how carrier wave oscillation circuit 33 applies a carrier wave to a smallest section of the solenoid primary-side coil 19 (by way of tap c), and how, on that same smallest section of solenoid primary-side coil 19, the power transmitting module 10 senses and decodes (via circuits 35-

38) a phase-modulated communication signal from the power receiving module 40 generated by the communication circuit 45–47. Ex. 1005 (Okada) at Fig. 2 & [0042].

Specifically, rather than using the same primary side coil for all power transfer and communication (as specified by the Challenged Claims), Okada uses only the blue portion of the coil 19—from tap “c” to ground—to send a communication carrier wave, receive an information signal from the secondary side coil, and determine whether the secondary side coil is correctly aligned with the primary side coil. Ex. 1005 (Okada) at Fig. 2 (above), [0050], [0063]-[0066]. Then, when the system has determined there is correct 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 19 is enabled using one of three different starting points (starting at red, yellow, or green connected to the switching circuit 15 and continuing to ground) to provide power to charge the receiver-side portable device. Ex. 1005 (Okada) at Fig. 2 (above), [0050], [0063]-[0066].

In this manner, Okada relies only on the blue portion of the primary side coil to determine whether the portable device is “correctly placed,” but then uses one of three larger portions of the primary side coil 19 for charging (from red, yellow, or green to ground). Ex. 1005 (Okada) at Fig. 2. This system purportedly works because of Okada’s specific choice of solenoid coils. Namely, in Okada’s tapped solenoid

coil structure 19, different sections of the same winding purportedly achieve similar magnetic coupling with the receiver / solenoid secondary side coil 41.

With this consistent magnetic coupling relationship, the Okada system is able to use the magnitude of the information signal applied 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 sections and the secondary side coil. Ex. 1005 (Okada) at [0067] (“[B]y 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.”). That is, by utilizing multi-tap solenoid coils, Okada can rely on detection of the degree of coupling / alignment between the blue-highlighted *communication section* of the primary side coil and a nearby secondary side coil to determine whether there is correct alignment for the *power delivery sections* of the primary side coil and the same secondary side coil. This alignment process is foundational for the operation of the Okada system. Without this detection and verification, the process will not go forward to the next step. Ex. 1005 (Okada) at Fig. 3 (Step S4 – lack of correct alignment position leading to non-charging and standby status).

After ensuring correct magnetic alignment between the primary side coil and the secondary side coil and receiving the required power level information (Ex. 1005 (Okada) at Fig. 3, Steps 4 and 6), Okada begins power output start for charging the

battery in one of Fig. 3 steps S8, S10 and S12 (for low, intermediate, or high power). 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 low, intermediate or high levels) according to the requirement of the power receiver. Ex. 1005 (Okada) at [0073].

Importantly, Okada’s tapped solenoid design allows the system to select a *different* section of the primary side coil 19 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 three power transfer windings / sections and the communication winding / section are equally well aligned and coupled to the solenoid secondary side coil.

Despite the fact that Okada’s tapped solenoid coils are fundamental to the Okada system, the Petition does not address this when proposing that its solenoid coils be replaced with planar coils. Critically, the Petition contains no analysis of the property of common magnetic coupling with Okada’s tapped solenoid coils (upon which the Okada system is premised), nor any analysis of whether such common magnetic coupling could be obtained with planar coils, and if so, how. Without this, the Petition does not and cannot show motivation to combine Okada with a planar coil from Odendaal, nor a reasonable expectation of success in doing

so. Further deficiencies in the Petition regarding the suggested replacement of Okada's solenoid coils with planar coils are discussed in the following two subsections.

b. The Petition does not identify any multi-tap planar coil shown by any reference—yet such a coil would be required to replace Okada's solenoid coils with planar coils, as Okada's system relies on multi-tapped coils

While the Challenged Claims do not require taps, the Okada system relies on multiple taps along its transmitter side coil length to select a section (i.e. a sub-length) of the coil for specific uses. Ex. 1005 (Okada) at Figs. 2, 8 and 17. 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 for selecting a sub-length of the planar coil. Moreover, the Petition does not even attempt to show how Okada could be implemented with planar coils—with or without taps (i.e. by some other structure or method)—let alone that it would have been obvious to do so.

Odendaal only describes simple two-port spiral coils, without any taps along the length of the coil, as seen below. Ex. 1008 (Odendaal) at Fig. 1A.



The Petition fails to acknowledge this. Instead, the Petition ignores that Okada's system relies on complex solenoid coils tapped in multiple sections (to create four coil sections as seen in Fig. 2, shown above. Ex. 1005 (Okada). More generally, the Petition fails to identify any multi-tap planar coils in the prior art, and it also fails to provide any evidence or argument that a POSITA would somehow be motivated or able to modify Odendaal's planar coil to add taps to it. Rather, the Petition ignores these details in arguing that exchanging the solenoids in Okada's system 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 multi-tapped solenoid coil, 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. 18. The Petition assumes (with no showing) that Odendaal's planar coil is a simple drop-in replacement for Okada's tapped solenoid. But it is not a simple drop-in replacement, given Okada's complex system, e.g., relying on a common coupling with a secondary-side coil across its four primary-side coil sections. The Petition fails to show even a single embodiment or explanation of how multi-tap planar coils would allegedly be obvious to implement in Okada's system, thus rendering the Petition insufficient—i.e., the Petition fails to

show how it would have been obvious to combine Okada with Odendaal to arrive at the claimed invention, as further pointed out in the next subsection.

- c. **The Petition ignores that use of only part of a planar coil would substantially impact the transmission coupling / efficiency between the primary-side coil and secondary-side coil, and hence would require an unknown alignment determination process**

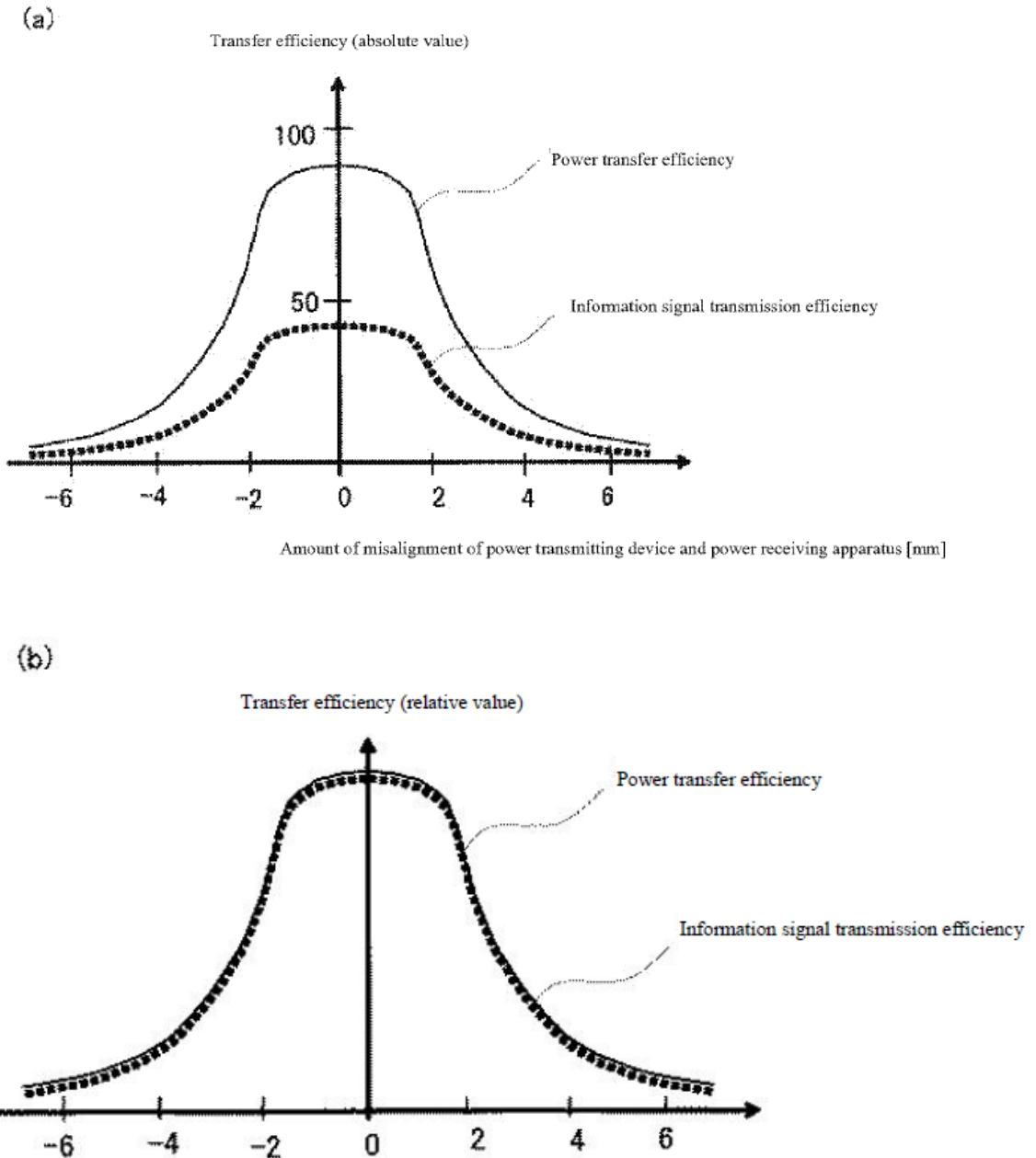
Odendaal explains that the behavior of a planar coil depends on the “geometric configuration of the spirals and interfaces.” Ex. 1008 (Odendaal) at 3:52-57. For example, the magnetic field and thus the magnetic coupling / power transfer efficiency between a multi-tap planar primary-side coil and a planar secondary-side coil would differ depending on which portion / segment of the planar primary side coil is selected for use—e.g., the outer rings of a planar spiral would behave differently than the inner rings. In addition, the needed alignment position between a planar primary side spiral coil and a planar secondary side coil may vary based on which portion of the planar primary side coil is used.

In contrast, Okada relies on a consistent common coupling and alignment position regardless of which of its four sections of its multi-tap solenoid primary side coil is used. As a result, as explained above, Okada is able to use its shortest section of the solenoid primary side coil (from tap c to ground) to determine alignment, and then apply power to one of three different sections of the primary side coil for power delivery, with the knowledge that having used solenoid primary side and secondary

side coils, each of its four primary side coil sections couples similarly to the secondary side coil (i.e., with a common magnetic coupling / efficiency). This foundational property of the Okada system comes from its solenoid coil geometry. This solenoid geometry provides Okada's alignment characteristics such that when the information signal is transmitted by the secondary side coil and received by the primary side coil using tap c, it is strongly correlated to the alignment and coupling characteristics when power is transmitted to the secondary side coil using any of the other three primary side coil sections for power delivery.

The charts in Figures 4A and 4B of Okada below show this consistent relationship for the multi-tap solenoid coil of Okada as a function of misalignment (x-axis), i.e., the maximum coupling / efficiency is at the same alignment position for the information signal and power transfer (namely, at the "0" position on the x-axis).

FIG. 4



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

In contrast, in a hypothetical planar spiral 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 tap (and hence which section

of the spiral) is selected. Thus, with such a multi-tap planar spiral coil embodiment, there would be no common coupling across the different coil sections and a secondary side coil. That is, the foundational property of Okada's system (i.e., common coupling across coil sections) would not exist with planar coils. The Petition fails to address or consider this.

In a hypothetical multi-tap planar spiral primary coil, the shapes and dimensions of different sections of the planar primary side coil will vary widely, and the magnetic coupling with the secondary side coil would involve different overlap and alignment deviations depending on which section of the planar primary side coil is selected by the taps. For this and other reasons stated above, the Petition contains no analysis of how to implement Okada's alignment process in a combined system using planar coils and 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 would be.

Furthermore, in a hypothetical multi-tap planar primary 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 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 variation of power transfer efficiency in a combined system would be in contrast to Okada's system that

provides uniform coupling and power transfer efficiency. Further changes to Okada's system would be required to counteract this non-uniformity and would require unknown changes to Okada's circuits and operational logic.

The Petition, however, provides no analysis to explain how this would be done or how this would work, and without such analysis, the proposed combination is merely conclusory and speculative. The Petition does not show that a POSITA with the simple knowledge of Odendaal's planar coils would be prepared to address any of these complex issues. Critically, the Petition provides no specific showing as to how Odendaal's planar coils would be implemented in Okada's system. Furthermore, the Petition does not show why a POSITA would be motivated or have any expectation of success given the host of unresolved issues related to using planar coils with Okada's system.

Thus, for any of these multiple reasons the Petition should also be denied on the basis of the claimed planar coil requirement.

3. The Petition fails to establish obviousness of the claimed invention including a “receiver communication and control circuit” configured to modulate the power transfer current to communicate with the base unit (Limitations [20(g)] and [30(g)])

The Challenged Claims require that the claimed portable device include a “receiver communication and control circuit” configured to communicate with the base unit by modulating the current induced by the base unit (the power transfer

current). In particular, the claims require that the “receiver communication and control circuit [is configured] *to modulate the current [induced by the base unit] in the receiver coil to communicate with the base unit* while the receiver circuit is being powered by the inductive charging system” that includes the base unit. Ex. 1001 at Claim [20(g)] and [30(g)]. That the claims specify that “the current” that is modulated by the receiver for communication with the base unit is the current that is generated inductively by the base unit is seen in the antecedent basis for “the current.” Namely, the claims earlier on specify “an alternating magnetic field, when received ... from *the primary coil in the base unit* ..., *inductively generates a current in the receiver coil to provide power inductively to the portable device.*” Ex. 1001 at claim [20(c)] and [30(c)].

The Petition points to Okada as allegedly showing “the communication and control circuit [configured] *to modulate the current*” as claimed. Pet. 28-31, 75. But the Petition ignores that in Okada communication is in the form of a separate information signal injected by a separate circuit (47) in the receiver and applied to the secondary side (receiver) coil (41). Ex. 1005 (Okada) at [0057]-[0058]. Because Okada does not communicate by modulating the current induced in the receiver coil by the base unit (the power transfer current), the Petition fails to establish this claim element.

The '371 Patent illustrates the claimed modulation of the power transfer current by way of varying the load/impedance at the receiver (the secondary side) as seen by the transmitter (the base unit), i.e., the receiver communicating with the transmitter by the receiver varying the power transfer current by the receiver varying its load/impedance seen by the transmitter. In this manner, the receiver communicates by way of the power transfer current rather than with some separate communication signal. The transmitter primary coil sees / detects this secondary load/impedance variation by way of the inductive coupling between the primary-side coil and the secondary side coil. For example, the '371 Patent shows Figure 28 as one example embodiment of this (described in the specification at column 33, line 39 and thereafter), which uses a Field Effect Transistor (FET) in the receiver to vary the input load/impedance of the receiver circuit (as seen by the primary circuit and coil) to create a modulation in the primary-side coil current that is detected by a sense circuit in the base unit for communication purposes.

In contrast to the claimed modulation of the power transfer current, Okada promotes the use of signal-generating communication circuitry on the receiver side (45, 46, and 47), located after a “smoothing capacitor” 42. This communication circuitry (45, 46, and 47) generates a new phase-modulated wave (separate from the power transfer current) applied to the secondary-side coil 41, sent to the power transmitting module 10. Ex. 1005 (Okada) at [0057] (“A modulated wave generated

by this modulation is applied to the secondary-side coil 41.”) & [0064] (“The modulated wave provided to the secondary-side coil 41 from the modulating circuit 47 is transmitted to the magnetically coupled primary-side coil 19.”). This communication circuitry (45, 46, and 47) does not modulate the power transfer current. Rather, this communication circuitry (45, 46, and 47) generates and applies a separate signal on the secondary-side coil 41 that is magnetically coupled to the transmitter. Importantly, the Petition does not consider this and does not establish that Okada teaches modulation of the power transfer current induced by the base unit.

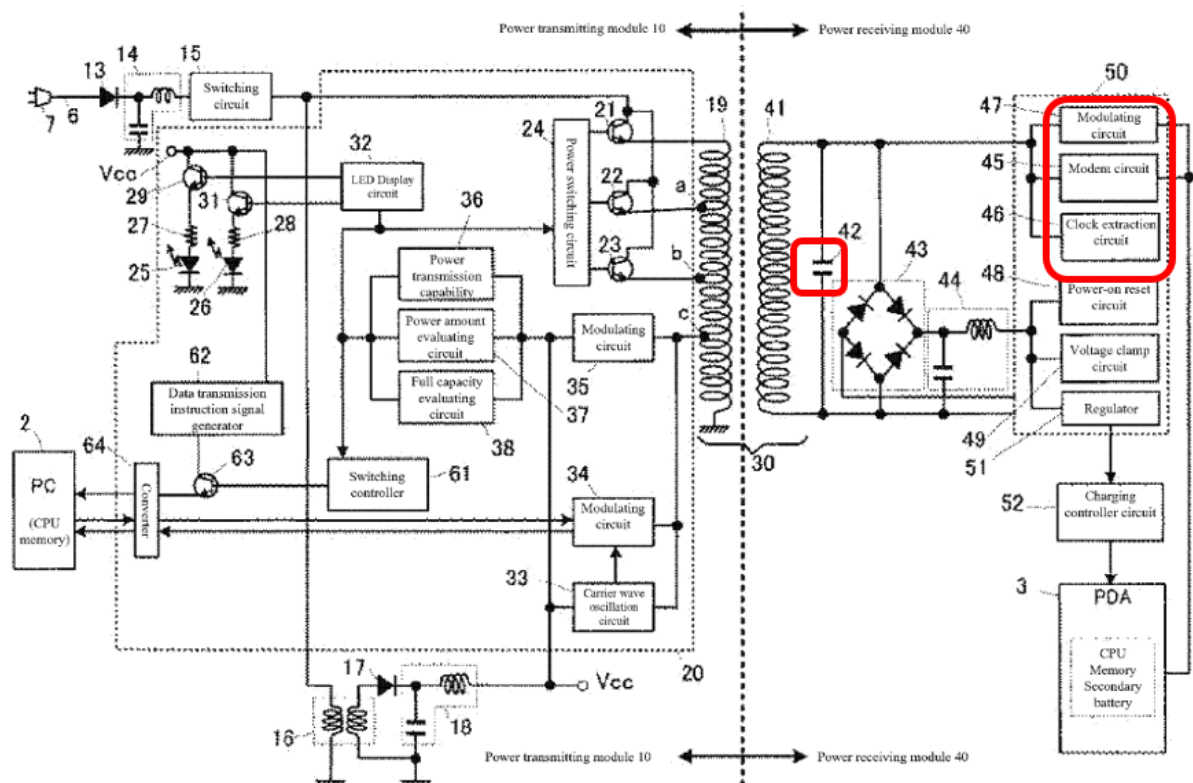


FIG. 2

Ex. 1005 (Okada) at Fig. 2.

Thus, the Petition has not established obviousness of a portable device with the claimed “receiver communication and control circuit” configured to communicate with the base unit by modulating the power transfer current induced by the base unit. This is another independent basis for denying institution.

D. The Petition Is Additionally Deficient As To Grounds 1–3 Because Of Its Insufficiency To Show Obviousness Of The Claimed Invention Including A “Battery Charging Circuit” As Found In Challenged Claims 20–23 To Which Grounds 1–3 Are Directed (Limitation [20(i)])

As explained below, the Petition additionally fails to show sufficiently for institution obviousness of the “battery charging circuit” as found in Challenged Claims 20–23 to which Grounds 1–3 are directed, for which the Petition alleges the same art combination and argument as to this claim element. This additional insufficiency of the Petition is another independent reason warranting denial of institution of Grounds 1–3, above and beyond the other reasons set forth above.

Challenged Claims 20–23 (through independent claim 20) require a portable device including a battery charging circuit to charge the battery, wherein the battery charging circuit is coupled to the output of the receiver rectifier circuit and coupled to the battery and begins drawing current only when the output of the receiver rectifier circuit reaches a set minimum voltage value. Ex. 1001 at claim 20.

Acknowledging that the Petition's base reference Okada does not disclose a battery charging circuit that "begins drawing current only when the output of the receiver rectifier circuit reaches a set minimum voltage value[,]" the Petition attempts to bring in Nguyen. Pet. 39. But the Petition fails to demonstrate (1) that Nguyen is analogous art, (2) that Nguyen teaches the claim limitations missing in Okada, and (3) that a POSITA would have been motivated to modify Okada somehow per Nguyen.

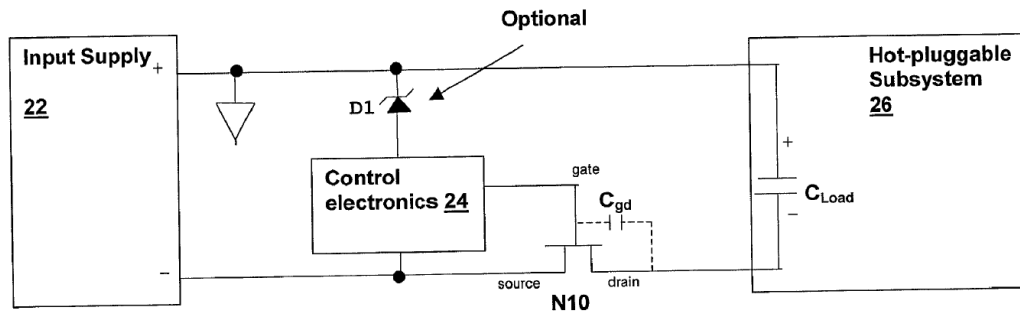
The Petition fails to show that Nguyen is analogous art. "Analogous art is merely a threshold inquiry as to whether a reference can be considered in an obviousness analysis." *Johns Manville Corp. v. Knauf Insulation, Inc.*, IPR2018-00827, Paper 9 at 13-14 (PTAB Oct. 16, 2018). There are two criteria 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).

In conclusory fashion, the Petition states that "Nguyen is in the same technical field as the '371 Patent and discloses features reasonable [sic] pertinent to the particular problem(s) the '371 patent inventor and a POSITA was [sic] trying to solve." Pet. 39-40. However, the Petition does not consider or even state what

Nguyen is actually teaching. In fact, Nguyen is not at all related to wireless charging or even wired charging. Rather, Nguyen teaches a “hot-pluggable subsystem” that allows users to replace parts in a computer or other electronic system without shutting off the power to the total system. *See* Ex. 1066 (Nguyen) at [0004] (“Computers and other electronic systems such as telecom systems require replacement and/or addition of subsystems without removing power from a host system. Known as ‘hot-pluggable’ subsystems, these electrical devices must operate properly after connection and disconnection, while not disrupting the operation of other electronic circuits.”). Further, while the Petition alleges that Nguyen discloses features reasonably pertinent to particular problems the ’371 patent inventor and a POSITA were trying to solve, it does not state which problems and solutions those are. Pet. 39-40. Accordingly, the Petition has failed to show, with its one sentence explanation, that Nguyen is pertinent to the claimed invention. This alone is an independent reason to reject the proposed modification of Okada in some manner per Nguyen.

Regardless, the Petition fails to demonstrate that Nguyen teaches the claim limitations missing in Okada. As previously discussed, Nguyen teaches a “hot-pluggable subsystem” that allows users to replace parts in a computer or other electronic system without shutting off the power to the total system. *See* Ex. 1066

(Nguyen) at [0004]. Figure 2 from Nguyen (below) shows the components of the system.



Ex. 1066 (Nguyen) at Fig. 2. This Nguyen system is not at all relevant to a battery charging circuit, wireless charging, or even wired charging—e.g., it does not comprise any charging circuits, batteries or receiver rectifier circuits as claimed. The Petition points to the switch N10 controlled by control electronics 24 as purportedly satisfying the claimed element. Pet. 40. However, as described by Nguyen, switch N10 is used merely to control the current of a hot pluggable wired system when initially plugged in. It is not part of any battery charging circuit coupled to a receiver rectifier circuit and a battery as required by the claimed element. See Ex. 1066 (Nguyen) at [0004]. Thus, even if one were to attempt to modify Okada by looking to Nguyen, the claimed invention with the specified “battery charging circuit” would not be achieved. The Petition has not established otherwise.

Moreover, the Petition fails to demonstrate that a POSITA would have been motivated to modify Okada somehow per Nguyen to arrive at the claimed battery

circuit. As discussed above, Nguyen teaches a hot-pluggable subsystem for replacing electrical components in a computer system without turning off the power. It does not teach a battery charging circuit in a wireless charging system. The Petition fails to establish that a POSITA would have been motivated to modify a wireless charging system (let alone the Okada wireless charging system) in light of a hot-pluggable system.

Moreover, Okada has no need for the alleged modification from Nguyen. The Petition suggests that a POSITA might be inclined to add under-voltage lockout (“UVLO”) from Nguyen to Okada to avoid system damage by unwanted power draw. Pet. 41-42. This argument in the Petition is insufficient and incorrect. The ’371 patent teaches that the particular claimed “battery charging circuit” (that only begins drawing power when the voltage is above a set minimum) is used to ensure that the secondary side receiver coil is sufficiently aligned with the primary side transmitter coil for inductive charging. Ex. 1001 at 26:60-27:35. But Okada already teaches its own circuit and sequence for ensuring correct alignment of the portable device with the charger. Namely, Okada teaches that, *before any power transfer to a battery*, the transmitter determines if the receiving device is correctly positioned to receive power. *See* Ex. 1005 (Okada) at Fig. 3 (Steps 3 & 4). Thus, in Okada there is no need to worry about misalignment when charging starts, because the transmitter first

determines that the receiving device is correctly positioned on the charger to receive inductive power.

Thus, for any of these multiple reasons the Petition should also be denied on the basis of the “battery charging circuit” as found in Challenged Claims 20–23 to which Grounds 1–3 are directed.

E. The Petition Is Additionally Deficient As To Ground 4 Because Of Its Insufficiency To Show Obviousness Of The Claimed Invention Including An “Output Disconnect Switch” As Found In Challenged Claim 30 To Which Ground 4 Is Directed (Limitation [30(m)])

In addition to the common missing claim limitations discussed in Section III-C above, the Petition also fails to establish the obviousness of Challenged Claim 30 because of the “output disconnect switch” controlled by the receiver communication and control circuit as additionally specified in Claim 30. In particular, Claim 30, to which Ground 4 is directed, requires a portable device comprising:

- ***a receiver communication and control circuit*** including a microcontroller to modulate the current in the receiver coil to communicate with the base unit while the receiver circuit is being powered by the inductive charging system; and
- ***an output disconnect switch*** to interrupt a flow of current from an output of the receiver unit to the battery;

- wherein *the communication and control unit is configured to control the disconnect switch to disconnect the flow of current from the output of the receiver unit to the battery during at least some of the communication with the base unit.*

See Ex. 1001 at claim 30. Thus, claim 30 specifies that the communication and control unit of the portable device is configured to control an output disconnect switch to interrupt a flow of current from an output of the receiver unit to the battery during at least some of the communication with the base unit. The '371 Patent teaches that this is done to improve the communication from the portable device to the base unit (by improving the communication signal to noise ratio). Ex. 1001 at 39:48-51.

Acknowledging that Okada does not teach this claim limitation, the Petition attempts to turn to Meadows, pointing to a battery protection circuit of Meadows. Pet. 75, 70. This attempt in the Petition is insufficient and incorrect for multiple reasons.

First, the Petition fails to show that Meadows teaches a communication and control circuit as specified in claim 30 that communicates with a base unit and controls an output disconnect switch to disconnect the charging current from the portable battery during at least some of the communication with the base unit. Instead, as the Petition states, “Meadows discloses a battery protection IC 686

controlling a FET switch 688 ('disconnect switch') *to ensure that battery 180 is not overcharged.*" Pet. 70 (emphasis added). That is, Meadows simply teaches a "battery protection IC 686 [that] controls a FET switch 688 to make sure the battery 180 is always maintained within safe operating limits. A fuse 689 also protects the battery 180 from being charged with too much current. The fuse 689 also protects from an excessive discharge in the event of an external short circuit." Ex. 1060 (Meadows) at [0086]; *see also id.* at [0088]-[0089] (similar). Thus, battery protection IC 686 is in an independent circuit that is in no way controlled by anything that could be understood as a communication and control circuit; it is therefore also not operated to disconnect the charging current from the battery during at least some of the communication. The Petition has not demonstrated otherwise.

Indeed, as seen below in Fig. 7A of Meadows, the battery protection circuit 686 of Meadows operates independently from the rest of the receiver, making decisions on disconnecting the battery in case of overvoltage, under-voltage, or short circuit conditions on its own. The Petition has not demonstrated (and cannot demonstrate) in any way that the battery protection IC 686 in Meadows is controlled by a communication and control circuit or acts to disconnect the switch to interrupt a flow of current to the battery during at least some of the communication with the base unit as specified by claim 30.

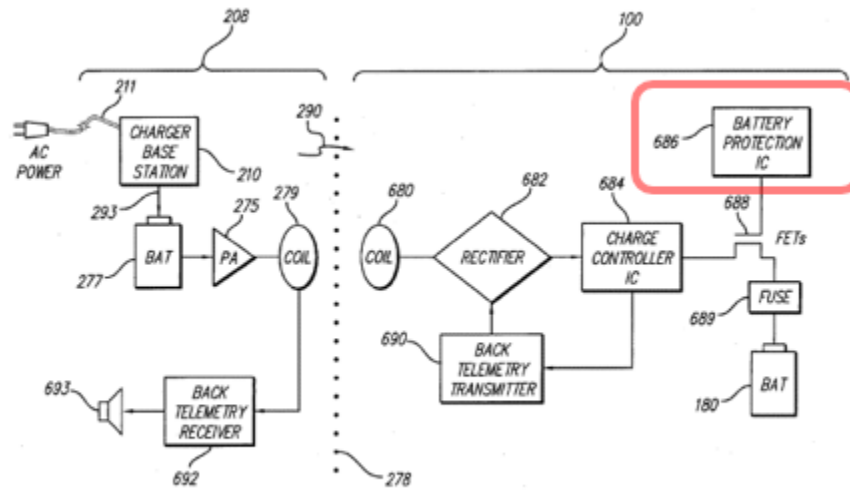


FIG. 7A

Ex. 1060 (Meadows) at Fig. 7A (annotation added).

Moreover, the Petition fails to demonstrate that a POSITA would have been motivated to modify Okada to incorporate the teachings of Meadows in this regard. To the contrary, the Petition fails to consider that Okada has no need for the battery protection circuit of Meadows, as Okada already has battery protection circuitry including, e.g., a voltage clamp circuit 49 and a regulator 51. Ex. 1005 (Okada) at Fig. 2. Additionally, Okada also teaches a method of making sure the battery is not over charged, namely, with its “full capacity information” and “evaluation circuits 36-38” which, according to Petitioner, “determine[] ... whether the charging of PDA3 is complete.” Pet. 29; *See* Ex. 1005 (Okada) at Fig. 2 (describing for starting and stopping the power transfer process).

Moreover, Okada’s portable device has entirely *separate* battery charging and communication circuits, so that the claimed output disconnect switch for

disconnecting the supply of charging power to the battery and controlled by the communication and control unit (to improve the communication from the portable device to the transmitter as explained in the '371 Patent) would not affect the Okada communication quality and has no place or need in Okada.

For these multiple reasons, the Petition has not established obviousness of a portable device with the claimed “output disconnect switch” controlled by the receiver communication and control circuit as specified by Claim 30. This is an additional basis for denying the Petition as to Ground 4.

IV. CONCLUSION

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

Dated: November 13, 2023

Respectfully submitted,

/s/Steven J. Pollinger

Steven J. Pollinger
Reg. No. 35,326
spollinger@mckoolsmith.com
George Fishback
Reg. No. 76,345
gfishback@mckoolsmith.com
McKool Smith, P.C.
303 Colorado Street, Suite 2100
Austin, Texas 78701
Telephone: (512) 692-8700
Facsimile: (512) 692-8744

Ryan McBeth
Reg. No. 69,817
rmcbeth@mckoolsmith.com
McKool Smith, P.C.
600 Travis St., Suite 7000
Houston, Texas 77002
Telephone: (713) 485-7300
Facsimile: (713) 485-7344

Christopher P. McNett
Reg. No. 64,489
cmcnett@mckoolsmith.com
McKool Smith, P.C.
1999 K Street NW, Suite 600
Washington, D.C. 20006
Telephone: (202) 370-8300
Facsimile: (202) 370-8344

*Counsel for Patent Owner, Mojo Mobility
Inc.*

CERTIFICATION 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 12,676 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 2010.

Date: November 13, 2023

Respectfully submitted,

/s/ Steven J. Pollinger

Steven J. Pollinger

Reg. No. 35,326

CERTIFICATION OF SERVICE

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

Joseph E. Palys
Naveen Modi
Howard Herr
PH-Samsung-MojoMobility-IPR@paulhastings.com

Date: November 13, 2023

Respectfully submitted,

/s/ Steven J. Pollinger
Steven J. Pollinger