

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. IPR2023-01087
Patent No. 9,577,440

PATENT OWNER'S PRELIMINARY RESPONSE

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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 and 27 of U.S. Patent No. 9,577,440 (the “’440 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. Samsung 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.* Samsung has asserted all these invalidity grounds (and more) in the district court case. By way of this and its seventeen other petitions, Samsung is

¹ See, e.g., (1) IPR2023-01086, (2) IPR2023-01087 (this IPR), (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, (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.

The Petition should also be denied because it is part of a set of multiple petitions challenging the '440 patent. With only four challenged claims and one prior art combination, the petitions could easily have been presented as one, yet Petitioner chose to file multiple petitions against the guidance of the PTAB's Trial Practice Guide.

Substantively, the Petition fails to address several critical issues with its obviousness theories. *First*, Petitioner fails to demonstrate how the proposed Nakamura/Odendaal combination would provide the claimed “planar coil(s).” Nakamura does not disclose a planar coil, instead using a solenoid coil with multiple taps for power transfer and communications. Acknowledging this, Petitioner relies on Odendaal to try to show a planar coil. But Odendaal does not disclose the use of multiple taps in the planar coil, as required by Nakamura's embodiments for its small, medium, and large power levels and for its communication system. 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 where Nakamura's system relied on the fact that its coil was wound around a ferrite core. The Petition does not provide any explanation for how or whether the planar coil in its alleged combination could be used with a ferrite core. Indeed, the changes required to integrate planar coils with Nakamura's system are not at all obvious and there is no reasonable expectation of success. The Petition fails to establish otherwise—the Petition fails to show how to implement Nakamura's system with planar coils (with or without taps), let alone that it would have been obvious to do so.

Second, the Petition fails to demonstrate that the combination of Nakamura and Calhoon render obvious an “identification component.” The Petition fails to address the fact that Nakamura is focused on an interoperable system that charges and powers across a broad range of devices, while Calhoon is designed to only charge or power a particular set of authorized, authenticated devices. This forces the conclusion that there would have been no motivation to combine Nakamura with Calhoon. In addition, the combination of Nakamura and Calhoon would not work because Calhoon requires bidirectional communication for its identification functionality to work, yet the embodiments of Nakamura that the Petition relies on

lack any capability for bidirectional communication. There would be no reasonable expectation of success for such a combination.

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

II. BACKGROUND

A. Challenged Independent Claims 1 and 27 of the '440 Patent

The claims challenged in the Petition are listed below with language addressed below emphasized:

<u>Claim 1</u>	<u>Claim 27</u>
1(a): A mobile device capable of inductive powering or charging by a universal base unit for charging of different mobile devices and/or batteries of different charging characteristics associated therewith, comprising:	27(a): A system capable of inductive powering or charging by a universal base unit for charging of different mobile devices and/or batteries of different charging characteristics associated therewith, comprising:
1(b): a battery, wherein one or both of a mobile device and the battery have particular charging characteristics associated therewith;	27(b): a battery, wherein one or both of a device and the battery have particular charging characteristics associated therewith;
1(c): a receiver and receiver coil, for one of inductively powering the device or charging the battery in the mobile device, wherein the receiver is one of attached to or incorporated into the battery or the mobile device, and wherein <i>the receiver coil has a generally planar shape so that a magnetic field received in a direction substantially perpendicular to the plane of the receiver coil is used to inductively generate a current in the receiver coil;</i>	27(c): a receiver and receiver coil, for one of inductively powering the device or charging the battery in the device, wherein the receiver is one of attached to or incorporated into the battery or the [mobile] device, and wherein <i>the receiver coil has a <u>generally planar shape</u> so that a magnetic field received in a direction substantially perpendicular to the plane of the receiver coil is used to inductively generate a current in the receiver coil;</i>

<u>Claim 1</u>	<u>Claim 27</u>
1(d): <i>an <u>identification component</u> associated with the mobile device or battery, which is configured to provide wireless identification of the receiver to the universal base unit;</i>	27(d): <i>an <u>identification component</u> associated with the device or battery, which is configured to provide wireless identification of the receiver to the universal base unit;</i>
1(e): a means for avoiding overcharging one or both of the mobile device and battery inductively; and	27(e): a means for avoiding overcharging one or both of the mobile device and battery inductively; and
1(f): a regulator, coupled to the output of the receiver or to the battery, that regulates an output voltage or output current provided by the receiver, to the mobile device or battery, to be within a range of parameters for the mobile device or the battery;	27(f): a regulator, coupled to the output of the receiver or to the battery, that regulates an output voltage or output current provided by the receiver, to the device or battery, to be within a range of parameters for the [mobile] device or the battery;
1(g): wherein different mobile devices and batteries can have different charging characteristics associated therewith; and	27(g): wherein different devices and batteries can have different charging characteristics associated therewith; and
1(h): wherein the receiver communicates with the base unit to	27(h): wherein the receiver communicates with the base unit to
1(i): detect, identify and authenticate the receiver with the base unit, as provided by the identification component,	27(i): detect, identify and authenticate the receiver with the base unit, as provided by the identification component,
1(j): determine and then activate one or more primary coils of the base unit which are aligned with the receiver coil,	27(j): determine and then activate one or more primary coils of the base unit which are aligned with the receiver coil,
1(k): verify the continued presence of the receiver near the base unit, and	27(k): verify the continued presence of the receiver near the base unit, and
1(l): communicate information describing the characteristics of the mobile device or the battery, for use by the base unit to provide power transfer to the receiver and to the mobile device and the battery according to their particular charging characteristics.	27(l): communicate information describing the characteristics of the device or the battery, for use by the base unit to provide power transfer to the receiver and to the [mobile] device and the battery according to their particular charging characteristics.

Ex. 1001, 27:5-48, 30:5-45.

B. Claim Construction

Patent Owner does not dispute Petitioner's statement on claim construction for purposes of this preliminary response, but reserves the right to argue for a different definition in district court or other proceedings, as well as later in this proceeding should this Petition be instituted.

C. Person of Skill in the Art

Patent Owner will apply the Petitioner's definition of a POSITA for the purposes of this preliminary response, but reserves the right to argue for a different definition in district court or other proceedings, as well as later in this proceeding should this Petition be instituted.

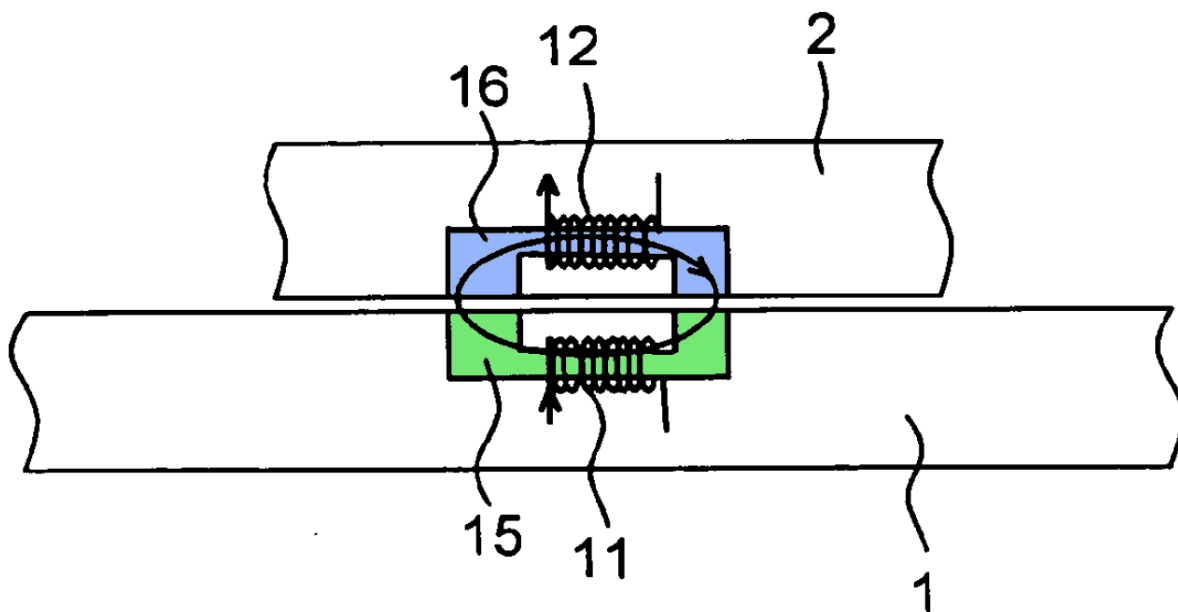
D. Alleged Prior Art

1. Nakamura – U.S. Patent App. Pub. No. 2005/0068019

Nakamura “relates to a power supply system that supplies power to electronic equipment.” Ex. 1005 at [0003]. Nakamura explains that “since there is no compatibility among AC adapters, a problem has arisen that a house is flooded with many AC adapters.” Ex. 1005 at [0010]. To solve this problem, Nakamura attempts “to provide a power supply system capable of not only supplying power to different types of electronic equipment by using a single power transmission apparatus, but

also saving space and performing payment for public service and charges.” Ex. 1005 at [0016].

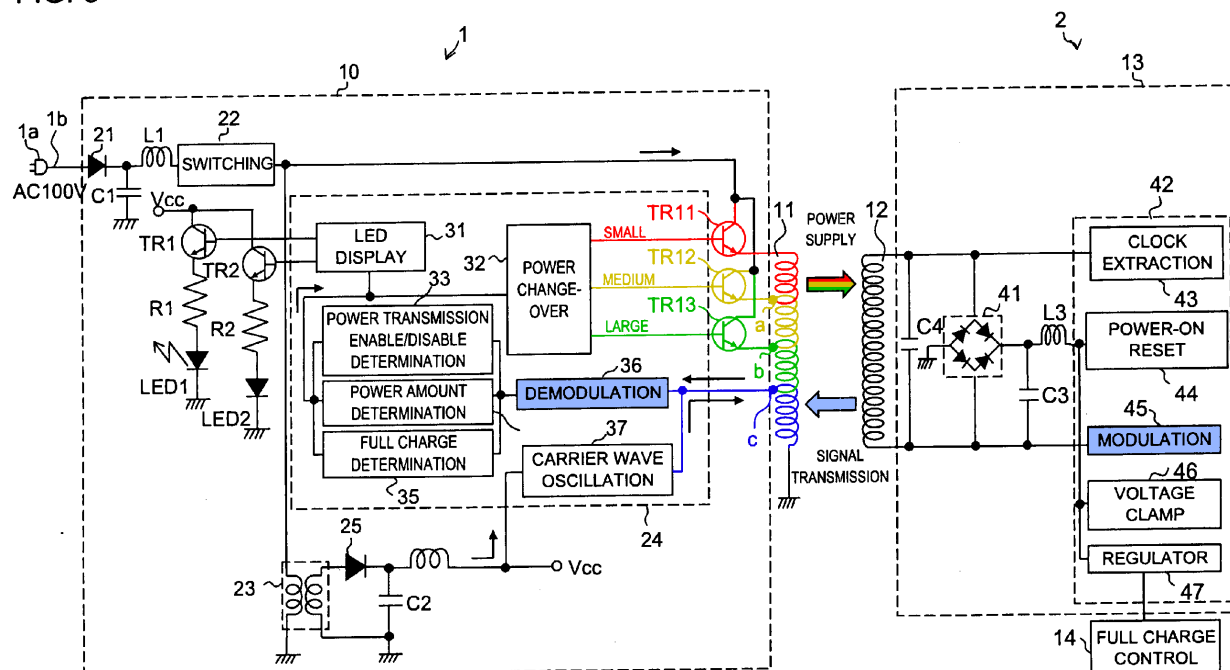
Nakamura describes a system where each device 2 contains a U-shaped ferrite core 16 that can interface with similar ferrite cores 15 on the power transmission apparatus 1 (i.e. transmitter), shown in blue and green below:



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

Further, in Figures 3 and 5, Nakamura shows how the power switching circuit 22 applies an AC power signal to differing lengths of the primary side coil 11 at the transmitter 1 (left side) to create a system that can supply power to receivers like receiver 2 (right side) for electronic equipment with different (small, medium and large) power requirements.

FIG. 3



Ex. 1005 at Fig. 3 (color added).

Nakamura also provides for signal transmission whereby the *power receiver* (right side of figure) sends an information signal (modulation 45, in blue) that is then received by the *power transmitter* (demodulation 36, on the left). Ex. 1005 at [0078]. The information signal communicates the power requirement of the electronic equipment's receiver with a code corresponding to small, medium or large power ("information on consumed power"). *Id.* Based on this code, a different tap on the coil is selected by the power transmitter as shown in Fig. 3 above (Ex. 1005 at [0083]-[0085]) for subsequent power delivery to the electronic equipment.

Key to Nakamura's Figure 3 system is its ability to use taps to adjust the characteristics of the primary side coil to provide different power levels (small,

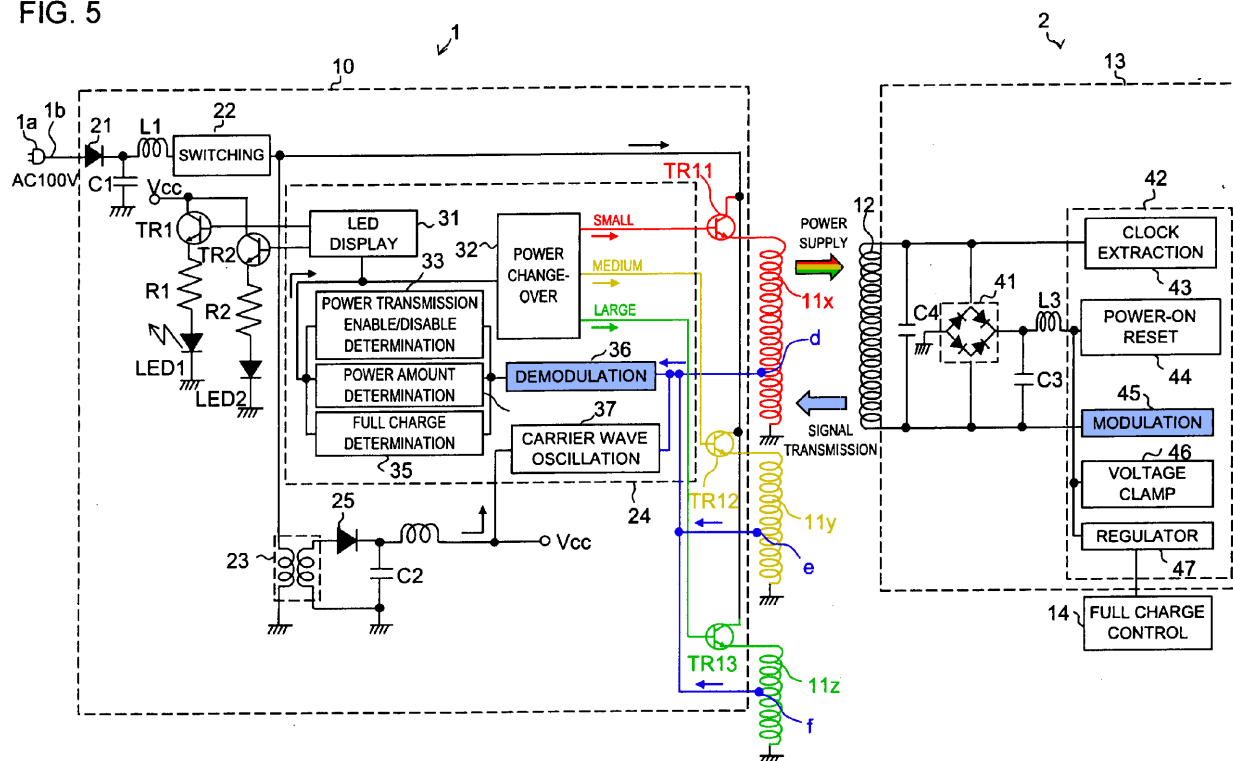
medium, or large) to the receiver as requested, and also to provide a section of the coil (shown in blue) for communication. Ex. 1005 at [0085]. For example, according to the teaching in Nakamura, when the “small” power option is selected (shown above in red and continuing the through full length to ground, i.e., through red, gold, green, and blue), the entire length of the primary side coil is used, effectively increasing the number of turns on the left side and reducing the power produced on the right (power receiver) side of the coil. *See id.* at [0084]. When the “large” power option is selected (green), the primary side coil on the left is powered at tap “b,” resulting in the pulse being applied across only a smaller portion of the coil (starting at green and continuing to ground, i.e., through green and blue). *See id.* at [0084]-[0085]. The use of fewer turns on the primary side coil increases the voltage produced on the receiver-side coil and allows higher powered devices to be charged. *See id.* at [0085], [0091]. This configurable power level technology, implemented by Nakamura’s coil-switching system, is key to Nakamura’s stated goals of providing a “power supply system capable of not only supplying power to different types of electronic equipment by using a single power transmission apparatus, but also saving space” through use of a system that works with “small”, “medium” and “large” power electronic equipment. Ex. 1005 at [0016], [0019]-[0020], [0085].

Since the primary side coil 11 is wrapped around a primary side ferrite core 15 (as seen in Fig. 2B above), any one of these three selected sections of the primary side coil (active primary side coil) would create a magnetic flux that travels along the same path shown in Fig. 2B above to the secondary side ferrite core 16 and coil 12. In addition, a separate carrier wave being applied to tap c (the blue length of the primary side coil 11 seen above in Fig. 3) during initial setup and later during power transfer for communication purposes by the separate carrier wave oscillation circuit 24 also generates a magnetic flux that travels through the same path created by the core 15 shown in Fig. 2B. Therefore, any of the possible active primary side coils (full length, from tap a, or from tap b) and the communication coil (from tap c) would couple to a “correctly placed” power reception equipment (Ex. 1005 at [0078]) and its nearby secondary side coil 12 with a core 16 as shown above in Fig. 2B efficiently with a high degree of magnetic coupling. *See* Ex. 1005 at [0079] (“a high coupling degree in magnetic coupling is established between the primary side **core** 15 of the power transmission apparatus 1 and the secondary side **core** 16 of the portable telephone 2”) (emphasis added). Similarly, the magnetic flux from the information signal from the receiver shown in blue in Fig. 3 also travels through the same magnetic flux path as the four magnetic fluxes from the transmitter mentioned above. *See* Ex. 1005 at [0078]. Nakamura uses this overlap of all of the magnetic flux paths to establish a method for determination of alignment of the magnetic cores

as discussed later below. This is an essential characteristic of the solenoid structure used in Nakamura.

Nakamura also discloses in Figure 5 an embodiment that uses multiple, separate coils for different power levels rather than taps on the same coil:

FIG. 5



Ex. 1005 at Fig. 5 (color added). Here, the small, medium, and large power levels use separate coils, shown in red, yellow, and green. But like Nakamura's Figure 3 embodiment, the Figure 5 power transmitter relies on taps d, e, f (blue) to supply the carrier wave to a segment of each of the primary side coils 11x, 11y and 11z and to receive the communication signal from the portable equipment 2 being charged. Ex. 1005 at [0090]. Other than the fact that the individual windings are separately wound

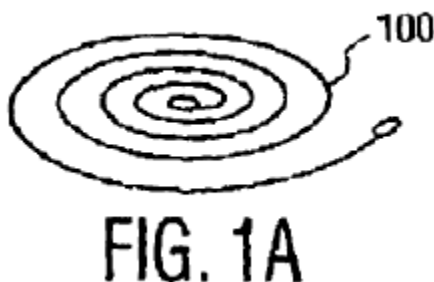
around Nakamura's primary side ferrite core 15, rather than having separate taps on the same winding, Figure 5 works largely in the same way as Figure 3. Because the coils are next to each other, around the same ferrite core, they will be aligned similarly with the secondary side coil and its ferrite core 16 generating fluxes that travel the same path. *See* Ex. 1005 at [0079] (equipment "are arranged at positions where a high degree of magnetic coupling is established between the primary side core 15 of the power transmission apparatus 1 and the secondary side core 16 of the portable telephone 2").

In the Figure 3 and Figure 5 embodiments of Nakamura, data communication is unidirectional, from the power receiver 2 (e.g. electronic equipment) to power transmitter 1 to initially provide information about presence of the electronic equipment, its degree of alignment, and its power requirement.

2. Odendaal – U.S. Patent No. 6,960,968

Odendaal describes a planar resonator for use with power transfer. Ex. 1008. Odendaal explains that an "interface of energy transfer (IOET) has a first spiral-shared conductor arranged on the top surface of said IOET; a second spiral-shaped conductor arranged on the bottom surface of said IOET; has a vertical axis aligned with the first spiral-shaped conductor." Ex. 1008, Abstract. "The IOET and the first and second spiral-shaped conductors have a predetermined self-resonant frequency." *Id.*

Odendaal demonstrates a spiral coil as shown below, with an inner terminating port and an outer terminating port.



Ex. 1008, Fig. 1A. Odendaal’s coils are two port devices. Odendaal does not disclose any embodiments with additional ports or “taps” along the winding. Odendaal does not discuss a “tap” anywhere in its specification. Nor does Odendaal teach selection between multiple transmit coils or multiple receive coils.

3. Calhoon – U.S. Patent App. Pub. No. 2005/0127868

Calhoon discloses an “inductive battery charger.” Figure 3, for example, shows how legacy battery packs, such as nickel-metal hydride, lithium-ion, or nickel-cadmium packs, may be inserted into the battery charger, which is inductively powered. Ex. 1006 at [0029]. The charger may have “slots, stand or dock-type charger configurations” to allow the insertion of batteries. *Id.* Calhoon explains that this system works with battery packs from legacy devices, which need not be aware of the fact of inductive charging. *Id.*

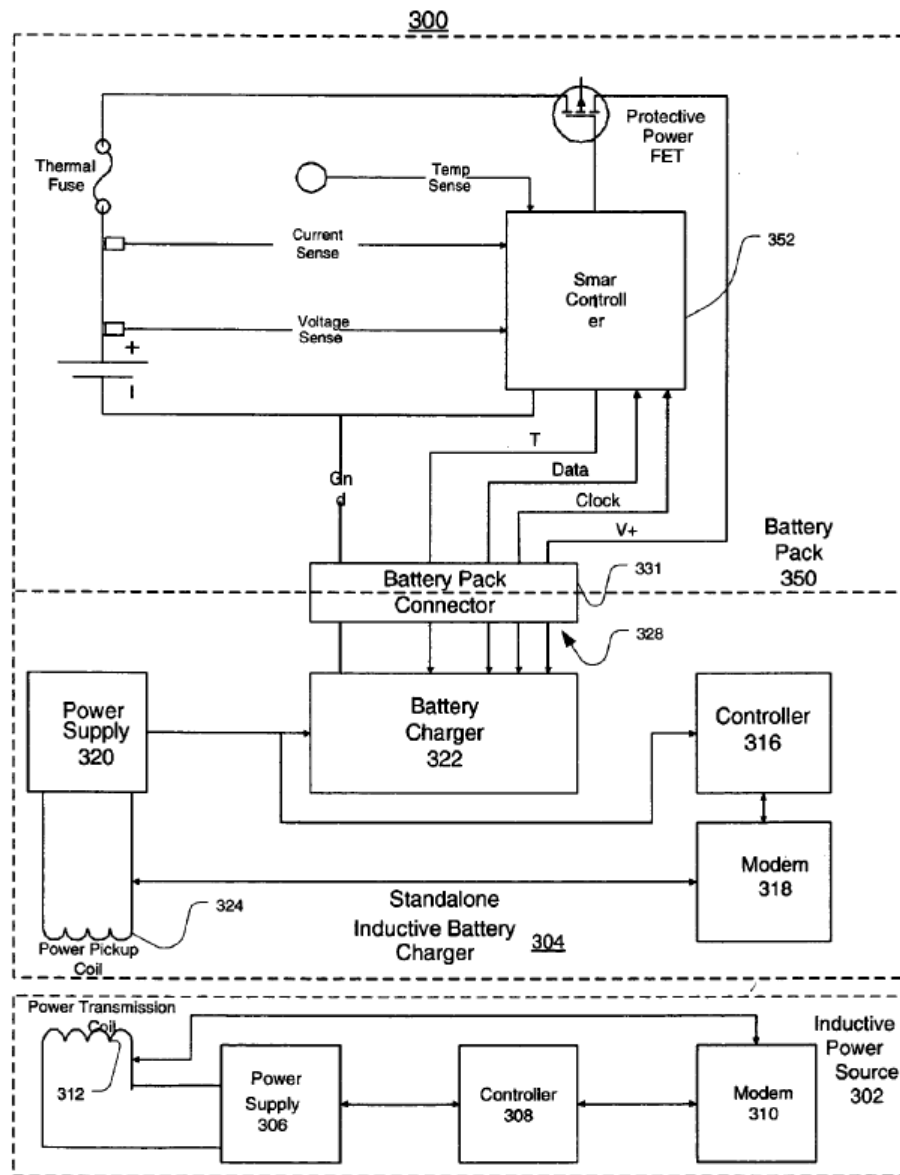


FIGURE 3

In some embodiments, Calhoon describes a system to “provide for authentication of devices that are allowed by the source to be powered or otherwise charged.” Ex. 1006, Abstract. Calhoon explains that “the inductive charging source 302 may request for a security certificate or digital signature from the battery charger assembly 304 to authenticate it.” Ex. 1006 at [0052]. Other types of information

may also be requested, for “security, data integrity, or other purposes,” including “a battery charger identification (ID) number, battery type chemistry of the battery pack, or serial number of the battery charger or the serial number of the battery pack.” Ex. 1006 at [0047]. The battery charger provides this information only on request. *Id.*

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 (AJA) 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. 1034 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. 1034 at 1 (emphasis added).

Here, instituting the eighteen IPR petitions, or even a subset, which will have the same outcome—upholding the validity or invalidating the patents—as the *single* district court case will dramatically increase the litigation costs of the parties. Notably, in district court, Petitioner asserts the exact same references (*see* Ex. 2001 (Petitioner’s district court invalidity contentions) at 13) as it does in this petition, in the other IPR petition against the ’440 Patent, and in other related petitions. Further, in district court, Petitioner asserts other references and invalidity grounds that are not included in the related IPR petitions. In short, the single district court case will cover all of 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.

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 should exercise that discretion here and deny institution. 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 (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. 1036 (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 USC §§ 102/103 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).

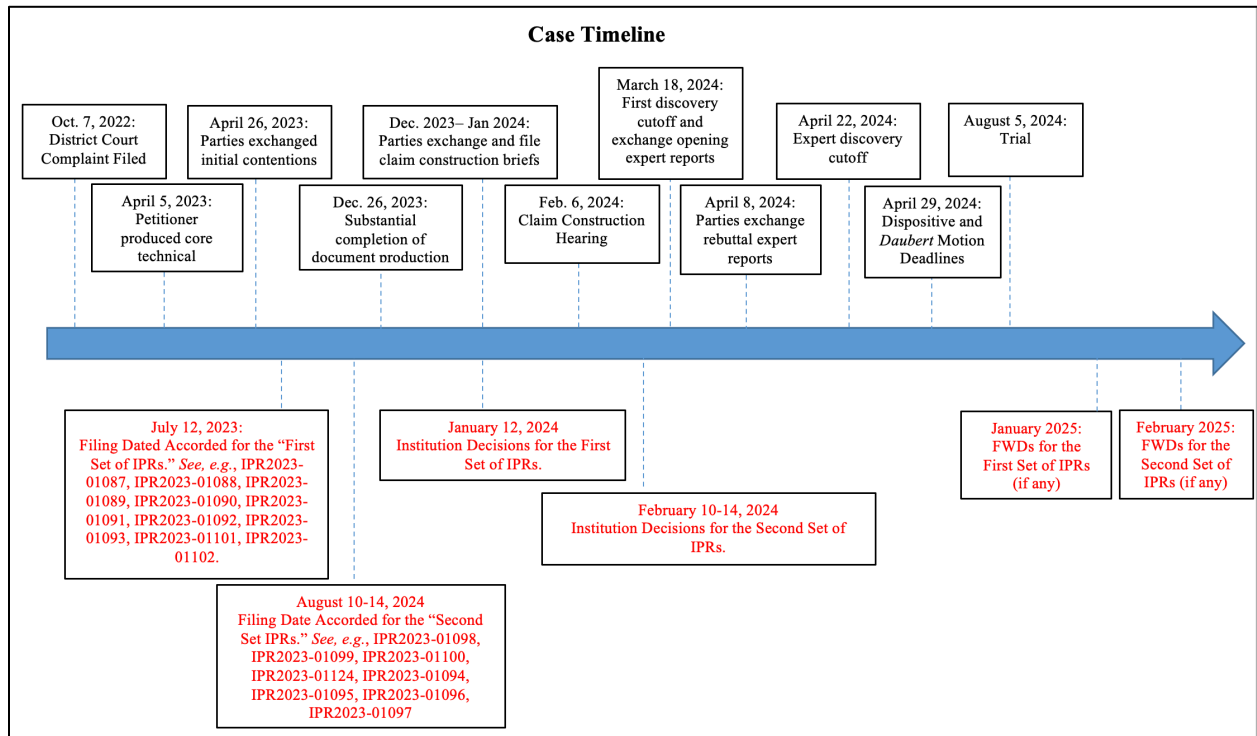
Factor 1: the district court case has not been stayed nor is it likely to be stayed even were this petition instituted. Petitioner states that this factor is neutral.

Pet. at 78. 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 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., *Solas OLED LTD., v. Samsung Display Co., LTD., et. al.*, 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.”); *Oyster Optics, LLC, v. Inferna Corp., et. al.*, Case No. 2:19CV-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.”).

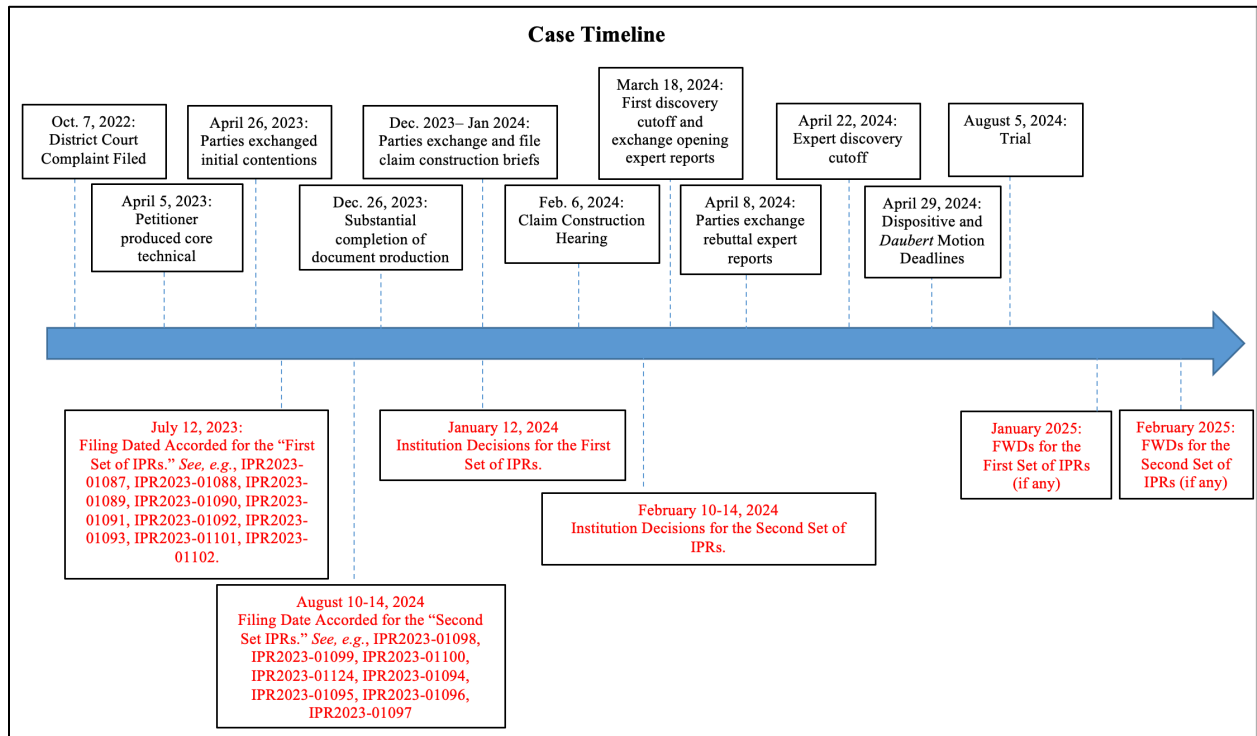
Here, the timing demonstrates that Judge Gilstrap is likely to deny a motion to stay. As shown in the case timeline below, the decision on institution across the *eighteen* IPRs is not expected until January and February 2024. By that time, the parties will have had the *Markman* hearing and substantial document production will have occurred. Ex. 1036 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 (P.T.A.B. 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).

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 (P.T.A.B. July 27, 2023) (same).

B. Petitioner Could Easily Have Combined Its Arguments Into One Petition: Institution Should Be Denied for Improper Parallel Petitioning.

This Petition is one of two nearly identical challenges to the ’440 patent (IPR2023-01087 and IPR2023-01088). Both Petitions on the ’440 patent provide exactly the same grounds for invalidity, and large swaths of the Petitions are word-for-word identical. Where the Petitioner “has not demonstrated a need for multiple petitions to challenge the patentability of claims,” the Board has discretion to deny

institution under 35 U.S.C. § 314(a). *Fantasia Trading LLC v. Cognipower, LLC*, No. IPR2021-00073, Paper 21, at 14 (P.T.A.B. May 12, 2021) (denying institution where multiple petitions were brought on the same patent). The Board should exercise that discretion here.

The Board’s Trial Practice Guide explains that “two petitions by a petitioner may be needed” only in “rare” cases, such as where “a large number of claims” are asserted in litigation “or when there is a dispute about priority date requiring arguments under multiple prior art references.” TPG,² 59. Neither situation applies here. Patent Owner has asserted *just four* claims of the ’440 patent in district court. Ex. 1032 at 2. And the Petitions allege *only one ground* for invalidity, with no apparent dispute regarding priority dates. Pet. at 2-3.

Petitioner argues that “there was no practicable way to fit the challenges in a single petition.” Paper 3 at 2. But this cannot be true, given that *both petitions make nearly identical arguments*. See *Fantasia Trading LLC v. Cognipower, LLC*, No. IPR2021-00073, Paper 21, at 13 (P.T.A.B. May 12, 2021) (denying institution where petitions “contain significant overlap due to the repetition of arguments”). Each petition combines the same art, in the same way, to argue that extremely similar claim elements are met. Numerous passages are essentially word-for-word identical.

² <https://www.uspto.gov/sites/default/files/documents/tpgnov.pdf>

Even a cursory comparison of each section of the document shows the extreme similarities between Petitioner’s two petitions of the ’440 patent:

Topic	IPR2023-01087	IPR2023-01088
Introductory material	Pages 1-7	Pages 1-6
Preamble	Pages 9-13	Pages 8-12
Battery/charging characteristics	Pages 14-15	Pages 33-34
Planar coil/perpendicular field	Pages 15-30	Pages 13-29
Identification component	Pages 31-40	Pages 34-44
Means for avoiding overcharging	Pages 40-54	Pages 44-57
Regulator	Pages 54-62	Pages 57-64
Wherein clause	Pages 62-63	Pages 64-65
Receiver comm. with base unit	Pages 63-76	Pages 65-77
Discretionary denial	Pages 77-80	Pages 82-85

A comparison of any of the pages cited above would show that the arguments for each are nearly identical. Petitioner’s invalidity arguments are almost exactly the same for each of the challenged claims, and could easily have been made in a single petition.

Petitioner’s arguments in support of multiple petitions are mistaken. First, Petitioner argues that the length of the Challenged Claims, “approximately two-thirds of a column,” precluded addressing them in a single petition. Not so. To begin with, most of the claim language is nearly identical across the challenged claims. *Compare* Ex. 1001 at 27:21-48 (claim 1) *with* Ex. 1001 at 28:3-31 (claim 3); *see also* Ex. 1001 at 30:20-45 (claim 27). Because only four claims are at issue here—and because they share much of the same language—the number of

limitations would not make it difficult for Petitioner to address them all in one petition.

Petitioner cites two cases in support of the idea that Patent Owner's supposedly lengthy claims warrant multiple petitions, but the cases in fact show the opposite. *See* Paper 3 at 3. The first case, *Hardin*, dealt with “**forty-nine** claims in district court”—ten times the number of claims asserted for the '440 patent—spanning more than eight printed pages. *Samsung Elecs. Co. v. Hardin*, IPR2022-01335, Paper No. 13 at 22 (P.T.A.B. Feb. 8, 2023) (emphasis added); U.S. Pat. No. 10,984,447 at 14:16-30:22 (claims). Here, in contrast, the **four** asserted claims for the '440 patent would fit on just one page. And the Board in *Hardin* based its decision on the presence of a “lengthy and detailed” priority argument in the petition, which incurred the use of additional space. *Hardin*, Paper No. 13 at 22. No such priority argument is present here.

Petitioner's cited *ASSA ABLOY* case is inapposite as well. *See* Paper 3 at 3 (citing *ASSA ABLOY AB v. CPC Patent Technologies Pty Ltd.*, IPR2022-01089, Paper 21 at 3-5 (P.T.A.B. Jan. 3, 2023)). In *ASSA ABLOY*, the patent owner failed to raise any argument about whether the petitioner's use of multiple petitions was proper. *ASSA ABLOY*, IPR2022-01089, Paper 21 at 4, n.6 (“Here, Patent Owner did *not* respond to Petitioner's ranking and explanation.”). The petitions in that case challenged 13 different claims—more than three times as many as challenged for the

'440 patent—and the Board accepted the petitioner's un rebutted argument that the "large number of challenged claims" warranted multiple petitions. *See id.* at 4-5. That argument cannot apply here, where only four claims are at issue.

Petitioner next argues that the differences between the challenged claims—the fact that claims 1 and 27 are receiver-side claims, whereas claim 3 is a transmitter-side claim—warrant separate petitions. Paper 3 at 3-4. But the Petitions' analysis of the actual claim limitations are nearly identical for the transmitter and receiver sides. Further, the prior art on which Petitioner relies discloses systems with *both* the transmitter and receiver side, so Petitioner did not use different art or different obviousness combinations for the two Petitions.

Petitioner finally argues that the space taken by its four-page *Fintiv* discussion and the fact that "different claims are challenged in each respective petition" warrant multiple petitions. Paper 3 at 5. But in *Fantasia*, the Board found multiple petitions impermissible even though they were directed to different claims. *Fantasia Trading LLC v. Cognipower, LLC*, No. IPR2021-00073, Paper 21, at 12 (P.T.A.B. May 12, 2021) ("Although Petitioner correctly argues that each of its three petitions challenge different claims, Petitioner has not shown that it was necessary to distribute its challenges across three petitions in order to present one ground of unpatentability for each challenged claim."). Further, in *Fantasia*, the Board denied institution despite a *Fintiv* discussion that also spanned four pages. *See Fantasia Trading LLC*

v. Cognipower, LLC, No. IPR2021-00073, Paper 3 (P.T.A.B. Oct 16, 2020) (petition with *Fintiv* discussion).

In summary, Petitioner used only one combination of prior art references to challenge just four similar claims. It is difficult to imagine a scenario where fitting the arguments into a single petition would have been easier. Yet Petitioner nonetheless filed multiple petitions, against the clear guidance of the Board's Trial Practice Guide, adding to the burden on both Patent Owner and the Board. The Board should therefore use its discretion to deny institution of at least one of the petitions.

C. The Petition Fails to Provide Competent Evidence that Nakamura and Odendaal Render the Planar Coil Limitations Obvious.

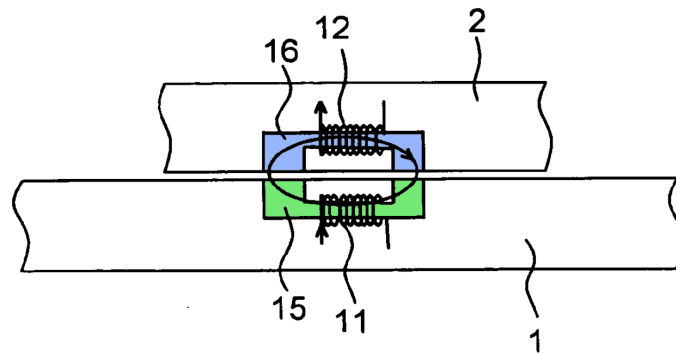
“Combinations of references that render a prior art device inoperable, or that fundamentally change the manner of operation of the device, often will not support a finding of obviousness.” *Plas-Pak Indus., Inc. v. Sulzer Mixpac AG*, No. 13-7786, 2014 WL 203101, at *2 (P.T.A.B. Jan. 17, 2014) (citing *In re Ratti*, 270 F.2d 810, 813 (CCPA 1959)), *aff'd*, 600 Fed. Appx. 755 (Fed. Cir. 2015). The Challenged Claims both require that “the receiver coil has a generally planar shape so that a magnetic field received in a direction substantially perpendicular to the plane of the receiver coil is used to inductively generate a current in the receiver coil.” Ex. 1001 at 27:16-20, 30:15-19. The Petition admits that Nakamura does not disclose this

claim element, and instead argues in light of teachings from Odendaal, a POSITA would replace Nakamura's multi-tap solenoid coil around a ferrite core with a planar coil, fundamentally changing the technology used for power transfer in Nakamura. Pet. at 21.³ Yet neither Odendaal nor the Petition provides any disclosure of a multi-tap planar coil, or one that uses a ferrite core. Such a replacement would create a number of issues that would be difficult or impossible for a POSITA to solve, rendering Nakamura's system inoperable. The Petition fails to address these issues entirely. In fact, the Petition fails to show how planar coils would be implemented in Nakamura's system, let alone that it would have been obvious to do so.

³ The Petition appears to argue that both sides of the Nakamura's transformer—receiver and transmitter—would be replaced with planar coils. To the extent that the Petition is somehow arguing that only *one* side would be replaced, the Petition provides no analysis whatsoever to indicate that a POSITA would find the magnetic fields of a U-shaped ferrite core would be compatible with a planar coil. To the contrary, a POSITA would not in fact assume that the combination of a U-shaped ferrite core with a differently-shaped planar coil would provide an acceptable level of power transfer or efficiency, as significant flux from a planar coil is generally in the center of the planar coil and the flux for the U-shaped ferrite is at the two ends of the U-shaped core. Because the Petition provides no indication that only one side is replaced with planar coils, this Preliminary Response focuses on the Petition's proposed combination where both sides of Nakamura's transformer are replaced with planar coils. The fact that the Petition does not discuss this issue further reflects the insufficiency of the petition.

1. The Petition ignores that Nakamura's power transfer system is deliberately based on solenoid wire-wound coils wrapped around ferrite cores, 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 Nakamura (Pet. at 22), and even though the Petition admits that Nakamura discussed use in low-profile systems for which a planar coil would allegedly be beneficial, Nakamura did not disclose the use of a planar coil. Instead, Nakamura chose a system where non-planar, solenoid wire-wound coils 11, 12 (illustrated in Fig. 2B seen below) were wrapped around a primary side ferrite core 15 and a receiver side ferrite core 16, which could be aligned by the user by placement of the electronic equipment 2 on the transmitter 1 for power transfer:



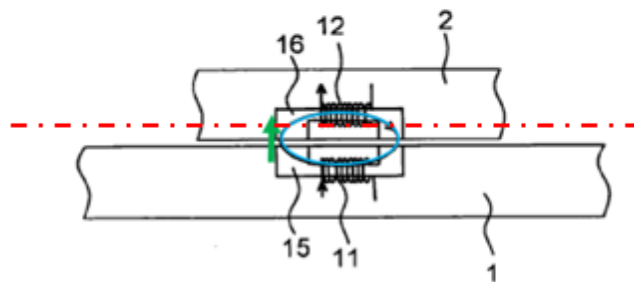
Ex. 1005, Fig. 2B (color added).

Nakamura has deliberately chosen solenoid coils around a ferrite core for a number of reasons discussed below. As illustrated in Figures 3 and 5 above, the Nakamura transmitter coil consists of multiple wire winding sections for transmitter

power transfer to the electronic equipment and its battery, and a communication section on the same winding. In each of the configurations shown, the three power delivery windings and the communication winding are wrapped around the same primary side core 15 and any flux generated by a current applied to any of the four windings (three for power and one for communication) travels the same path as shown in Fig. 2B above to the secondary side core 16 and the secondary side coil 12 for power transfer and communication.

In Nakamura’s configuration and solenoid coil structure, different windings—or different segments of the same winding—wound around the same primary ferrite core achieve similar magnetic coupling with the receiver / secondary solenoid coil through its ferrite core. Nakamura explains that the coils “constitute a transformer through magnetic coupling between a primary side core (ferrite) 15 and a secondary side core (ferrite) 16.” Ex. 1005 at [0065]. Petitioner’s expert admits that such a coupling results in a magnetic field that follows the U shape of the cores:

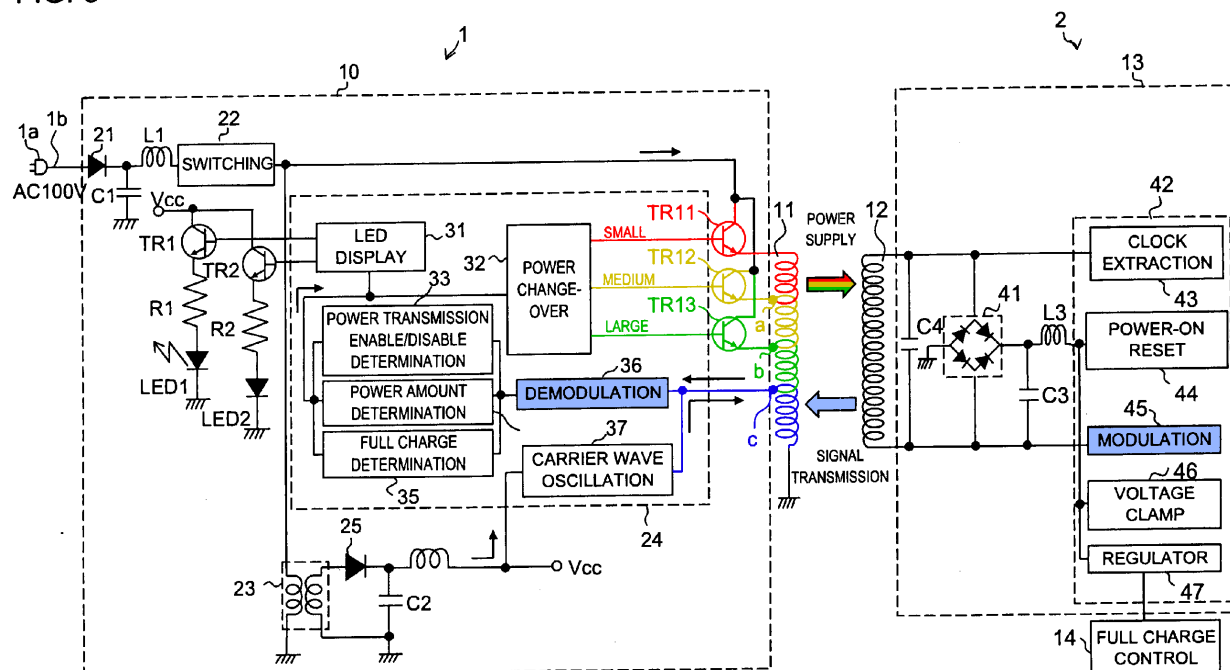
FIG. 2B



Ex. 1002 at ¶ 120.

Nakamura took particular advantage of this feature of U-shaped ferrite transformers with solenoid coils when designing his system. Rather than using the same segment of the primary side coil for all power transfer and detection, Nakamura's Figure 3 embodiment uses only the blue portion of the coil—from tap “c” to ground to apply the communication carrier wave, receive an information signal from the receiver coil, and detect whether the secondary side coil is properly aligned with the primary side coil before providing any inductive charging power to the battery of the electronic equipment. Ex. 1005 at [0077]-[0078]. Then, when the system has determined a degree of alignment between the primary side coil and the secondary side coil and determined the electronic equipment's receiver's required power level, different sections of the primary side coil are enabled or disabled from different taps (starting at red, yellow, or green and continuing to ground) to provide power to charge the electronic equipment:

FIG. 3



Ex. 1005 at Fig. 3 (color added). Because the solenoid coil is wrapped around a ferrite core that provides magnetic coupling (Fig. 2B above), any flux generated by activating any of the three power transfer sections or the carrier wave section of the primary side coil travels through the same path and couples equally well to a well aligned and nearby secondary side coil solenoid providing needed magnetic coupling and high power transfer efficiency.

Nakamura relies on this common magnetic coupling path, using only the blue portion of the primary side coil to determine whether the electronic equipment (i.e. the secondary side coil and its ferrite core) is “correctly placed,” before any power transmission for charging, but then uses a larger portion of the primary side coil for charging. Ex. 1005 at Fig. 4 (S4), [0078], [0083]-[0084]. Nakamura uses the

magnitude of the information signal supplied by the receiver to the secondary side coil and inductively coupled to the primary side coil (traveling through the same magnetic flux path as the power transfer and carrier wave flux path) as a proxy for the degree of magnetic coupling between any of the primary side coil segments (or individual primary side coils in the case of Fig. 5 configuration) and the secondary side coil. Ex. 1005 at [0081] (“a deviation of the portable telephone 2 from the power transmission apparatus 1 can be recognized by measuring a signal intensity of the information signal even in a state where the power transmission apparatus 1 transmits no power”).

This is illustrated in Figs. 11A and 11B and the description of the process in paragraphs [0079]-[0081].

FIG. 11A

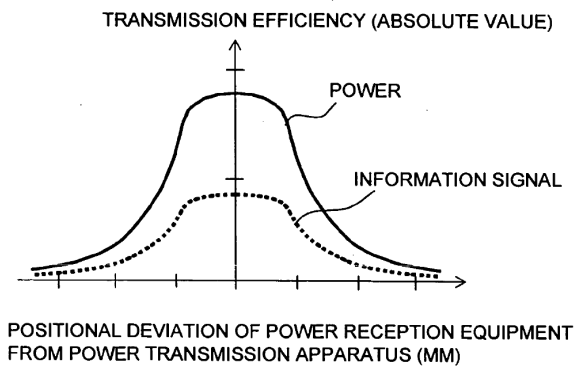
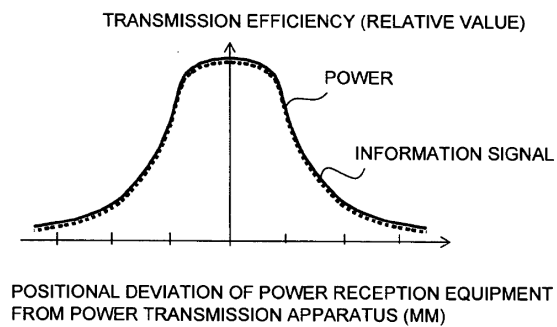


FIG. 11B



Ex. 1005, Figs 11A, 11B.

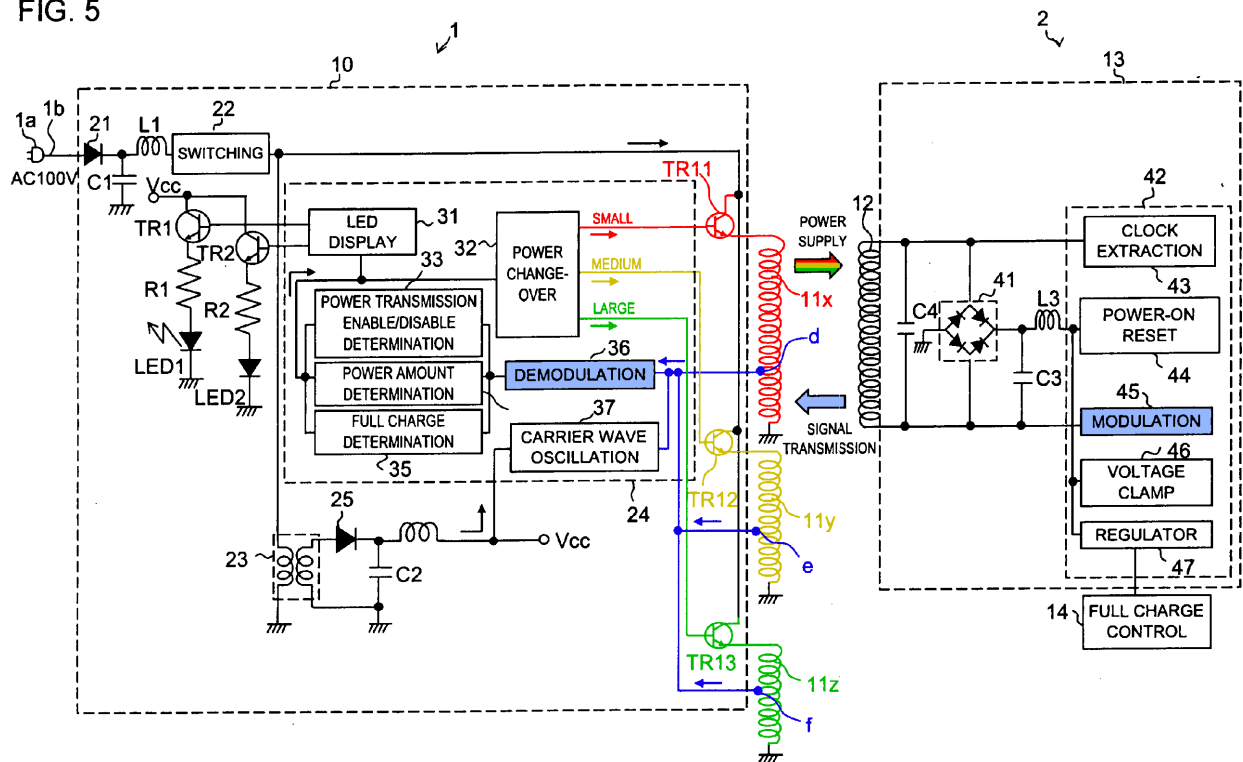
Thus, Nakamura can rely on detection of the degree of coupling / alignment between the *blue portion* of the primary side coil and a nearby secondary side coil

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 Nakamura system, and without this detection and verification, the process will not go forward to the next step. Ex. 1005 at Fig. 4 (see Step S5 – Lack of alignment leading to non-charging and standby status).

Nakamura begins power output start (power transmission for charging) after these initial steps in steps S8, S10 and S12 in Fig. 4 after a good degree of magnetic alignment between the primary side coil and secondary side coil and the required power level by the receiver have been determined using only the small communication portion of the primary side windings. Nakamura's 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 different power levels to a receiver (steps S8, S10 or S12 in Fig. 4), secure in the knowledge that each of the three 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 “actual effective number of turns of the primary side coil changes,” causing the turns ratio of the two coils to change, thus allowing the power transmission level to change (to small, medium or large levels) according to the requirements of the power receiver. Ex. 1005 at [0085].

The same operating procedure and flow chart is implemented in Nakamura's Figure 5 embodiment. While Figure 5 has three separate windings for the primary side coil, each has its own tap for a communication signal and the operation follows the same procedure. Thus, the operation of the Fig. 5 embodiment also relies on the same flux path being used by a magnetic flux generated by any of the three primary side power delivery windings and each winding's respective communication signal section for determination of alignment with a secondary side coil.

FIG. 5



Ex. 1005 at Fig. 5 (color added).

While Nakamura's ferrite cores 15 and 16 are an important part of the Nakamura system, the Petition does not discuss their use or lack of use in a combined

system at all. The petition does not suggest that ferrite cores would or could be used with planar coils, much less in what form. Nor is there any such disclosure in any of the cited references. The petition does not address this issue, even though the ferrite core is a crucial element of the Nakamura design and operation.

The Petition contains no analysis of why Nakamura's solenoid coils around ferrite cores 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 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 Nakamura with a planar coil from another embodiment, nor a reasonable expectation of success.

2. 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 Nakamura's solenoid coils with planar coils as Nakamura's embodiments rely on multi-tap coils.

While the Challenged Claims do not require taps, all of the coils in Nakamura's transmitter embodiments—including the coils in Nakamura's multi-coil Figure 5 embodiment—use one or more taps along the length of the coil to select only a portion of the coil for certain uses. Thus, the Nakamura 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 Nakamura 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 Nakamura’s embodiments use complex arrangements with coils in multiple sections (**four sections** in Fig. 3 and **six sections** in Figure 5). 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 whatsoever 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 solenoid 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 Nakamura’s multi-tap 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 simply by knowledge of Odendaal’s simple Fig. 1A spiral coil. Pet. at 21-22. Odendaal’s two-port planar coil is not a drop-in replacement for Nakamura’s multi-tap solenoid and ferrite core,

and even if a multi-tap version of Odendaal's coil were somehow available, substantial unaddressed questions about its design and effect on the rest of operation of Nakamura's system would remain. The Petition fails to show even a single embodiment or explanation of how any potential multi-tap planar coils would allegedly be obvious, or that a POSITA would have had a high likelihood of success with the references provided.

3. The Petition fails to address that use of a planar coil would substantially impact the transmission efficiency of the coils.

In Nakamura, because the entire primary side winding (Fig. 3) or windings (Fig. 5) is wound around the same ferrite core, any of the possible active primary side coils would couple to the magnetic core and the receiver coil of a "correctly placed" power reception equipment with the needed magnetic coupling. See Ex. 1005 at [0078]-[0079]. Yet the Petition does not consider whether such needed magnetic coupling will remain when a ferrite core is not present. The Petition also fails to consider whether the needed magnetic coupling will exist when only portions of a coil—based on taps—are used.

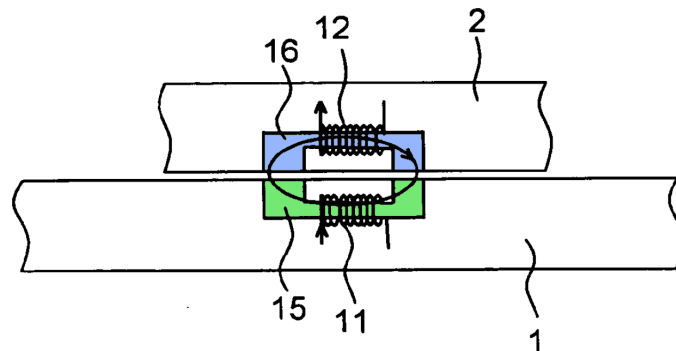
Odendaal explains that the behavior of a planar coil depends on the "geometric configuration of the spirals and interfaces." Ex. 1008 at 3:52-57. The magnetic field, and thus the magnetic coupling between a primary side coil and a secondary side coil may differ based on which portion of the planar primary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

selected for use—a donut shape formed by the outer rings of a spiral would couple to a secondary side coil differently than the circle shape of the coils at the inner rings leading to differences in power transfer efficiency depending on the requested power level (i.e. selected primary side coil section) by the receiver. This would be in contrast to the uniform coupling and power transfer efficiency of Nakamura’s solenoid coils and would have to be addressed by a POSITA combining such technologies.

The Petition does not introduce any reference with a multi-tapped planar spiral coil, nor do they show how it would be obvious to a POSITA to implement one. For example, neither the Petition nor the references explain what a multi-tap spiral would look like, nor do the Petition or references explain where taps should be placed, how the taps are formed, what parasitics are introduced by adding the taps, or how such parasitics would be considered and mitigated. The Petition and references also fail to address how the flux would couple between different sections of a multi-tap spiral and a planar power equipment planar secondary side coil. There is therefore no evidence that the combination would produce the “high power transmission efficiency” that Nakamura relies on. Ex. 1005 at [0079].

4. The Petition fails to address that use of different parts of a planar coil impacts the alignment determination process.

As explained above in Section III.B.1, Nakamura 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 all the used segments of the primary side coil will be similarly aligned with the secondary side coil. This is uniquely implemented by the tightly coupled Fig. 2B geometry of Nakamura wherein all generated magnetic fluxes from the transmitter are routed and coupled to the secondary side coil through the same flux path:



Ex. 1005, Fig. 2B (color added).

As explained above in Section III.C.1, Nakamura makes a critical assumption (reflected in Figs. 11A and 11B repeated below), based on the solenoid geometry of its coils, that when the *information signal* is transmitted using one tap, its alignment will be strongly correlated to the alignment characteristics when *power* is transmitted using any of the other three taps or power delivery coils.

FIG. 11A

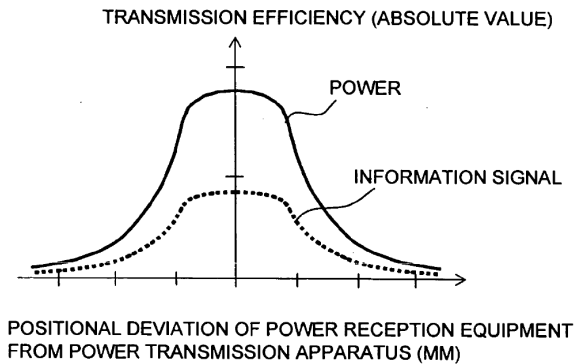
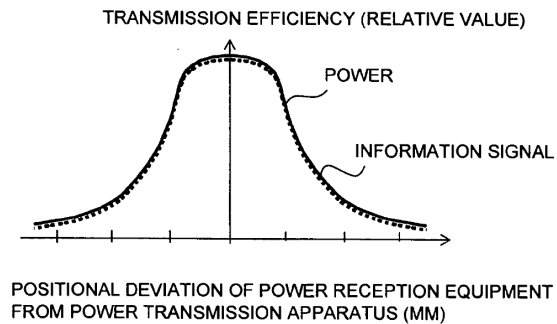


FIG. 11B



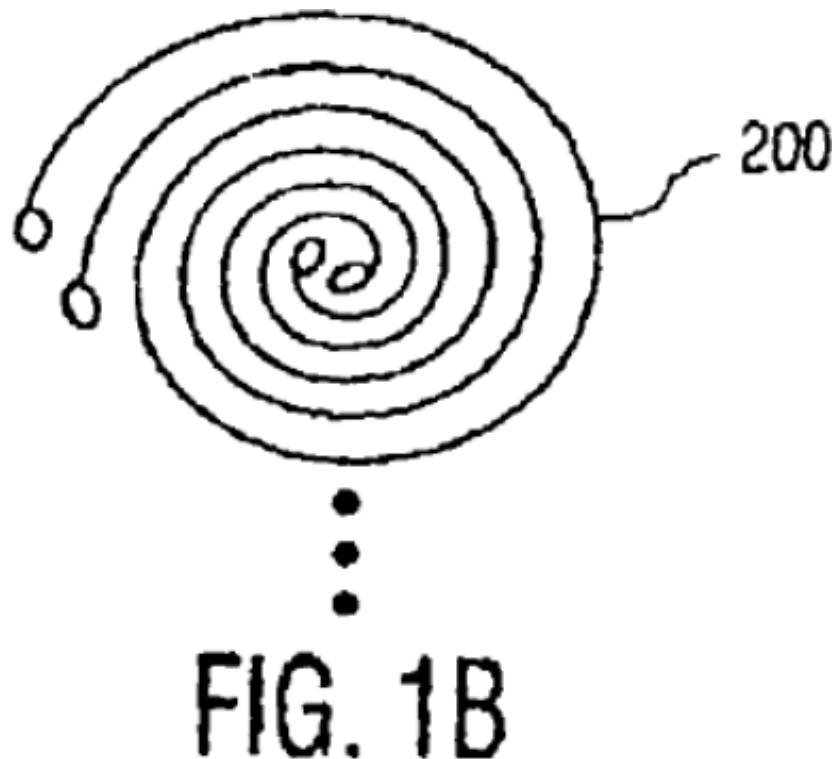
Ex. 1005, Figs 11A, 1B.

That is a reasonable assumption for taps in a solenoid coil like the one Nakamura discloses. But 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 may differ, since the information signal is received through one tap and power is delivered through a different tap and thus different segments of a planar spiral coil are used. As Odendaal admits, the “geometric configuration of the spirals and interfaces” strongly affects the behavior of a planar coil, and different tapped portion of a coil with different configurations might behave differently. Ex. 1008 at 3:52-57. The Petition, and the cited references, simply fail to address how the alignment of one section of a *planar* coil is usable as a proxy in the same way that Nakamura uses sections as a proxy for its *solenoid* coil, or to provide any alternative means for determining the primary side coil to secondary side coil alignment.

5. The Petition does not analyze the impact of using multiple tapped planar coils to implement Nakamura's embodiments.

In addition to the use of taps, some embodiments of Nakamura (such as Figure 5) provide for switching between multiple coils based on the requested power level. The Petition fails to discuss how such multiple individual coils with different number of turns (each also tapped along the winding of the coil for communication signal) would be implemented in a planar coil geometry. With Nakamura's tightly wound solenoid coils all coupling their flux into a common ferrite core, nearby primary side windings can be used without significantly impacting the characteristics of others. However, the Petition does not address whether multiple planar coils might interact with each other or have different alignment or power transfer characteristics due to different geometries. The Petition does not explain how multiple coils would be arranged geometrically, nor does it provide any explanation about how a POSITA could avoid interactions between the multiple coils or arrange them in a way such that they would be similarly aligned and have similar power transfer characteristics. Furthermore, each planar coil would also need to be tapped for the communication signal therefore necessitating multiple tapped planar coils. As discussed earlier, such tapped coils are not discussed by Odendaal or any of the cited art. Given these potential problems, a POSITA would not have a reasonable expectation of success combining planar coils with Nakamura's multi-coil embodiments.

Odendaal does not contain any discussion of a system that *switches* between multiple planar coils, so a POSITA would not have any such system to base a combination on. Odendaal does, however, describe a “bi-filar” arrangement and other similar arrangements where two separate coils are placed in the same location. Ex. 1008 at 32-48. For example, it may appear as follows:



Ex. 1008 at Fig. 1B.

Odendaal does not, however, describe these as independent coils. Rather, the two coils on top of each other, separated by dielectric film, form a *capacitor*. The film between them “stores electric energy and forms the capacitive part of the resonator, where the inductive part is obtained from the self-coupling of the set of

spirals either side of the dielectric film.” Ex. 1008, 3:36-40. In other words, multiple coils, rather than being alternative options that Nakamura’s circuit could choose among, would potentially act in unison because of the capacitance between them.

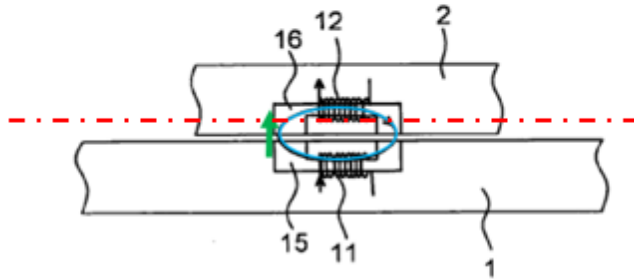
The Petition, however, has no analysis to explain how this would work. In reality, a POSITA would avoid multiple planar coils due to these uncertainties and risks. Because of the complicated issues presented by overlapping or multi-layer planar coils, it would not have been obvious to replace Nakamura’s solenoid coils and ferrite cores with Odendaal’s planar coils.

Critically, the Petition provides no specific showing as to how Odendaal’s planar coils would be implemented in Nakamura’s system. For this reason alone the Petition should be denied.

6. The Petition’s analysis of “substantially perpendicular” is based on the coil and ferrite core configuration that would be removed in Petitioner’s proposed configuration.

The Challenged Claims of the ’440 Patent require a magnetic field “in a direction substantially perpendicular to the plane of the receiver coil.” The Petition explains that the combination allegedly rendering the ’440 Patent obvious has planar coils instead of the solenoid coils originally in Nakamura. Pet. at 21. Yet the Petition’s analysis of the “substantially perpendicular” magnetic field is based on analysis of the solenoid coils and ferrite core that the Petition proposes *removing* from Nakamura:

FIG. 2B



Pet. at 20.

This analysis is not proper. Rather, to render the Challenged Claims obvious, the prior art references must have all the claimed elements *as combined*. Because the Petition does not demonstrate that the “substantially perpendicular” limitation is met by the combination with a *planar coil*, institution should be denied.

In summary, substitution of Nakamura’s solenoid coils with planar coils would raise several questions and challenges that render the proposed combination not obvious. None of these issues are addressed by the petition, nor does the Petition establish an expected likelihood of success. The Petition fails to establish obviousness as to the planar coil limitation.

D. The Petition Fails to Show An “Identification Component” is Rendered Obvious by Nakamura, Odendaal, and Calhoon

The Challenged Claims both require “an identification component associated with the [mobile] device or battery, which is configured to provide wireless

identification of the receiver to the universal base unit.” Ex. 1001 at 27:21-24, 30:20-23. The Petition admits that Nakamura does not expressly disclose this claim element, instead relying on a third reference, Calhoon, to show an identification component. Pet. at 32.

Nakamura states that “[t]he present invention relates to...a power supply system that supplies power to mobile electronic equipment such as portable telephones, notebook personal computers, a digital cameras, and an electronic toys. Ex. 1005 at [0003]. There would have been no motivation to combine Calhoon with Nakamura. Nakamura already had its own communication system, capable of receiving information necessary for charging. Nakamura’s base unit receives the “code indicating being power reception equipment’, ‘information on consumed power’, and ‘information on full charge’, which are included in the demodulated information signal.” Ex. 1005 at [0078].

This information is enough to power an electronic equipment, and a POSITA would not have seen identification information as necessary or related to charging. Significantly, the Petition does not establish otherwise, as it must to warrant institution.

The Petition argues that a POSITA would have added identification functionality from Calhoon for “identification/verification/authentication/security, etc. purposes.” Pet. 37. The Petition argues that the combined system would refuse

to charge a device unless it is properly authorized and authenticated. Pet. 37-38. But Nakamura teaches away from such a combination. Nakamura explains that it is trying to make an *interoperable* charging system—the opposite of a system that is limited only to a few authorized devices. Nakamura explains:

This means that there is no compatibility among AC adapters. Especially, in the case of the portable telephone, dedicated AC adapters are used for respective portable telephones which are different in model or make, thereby providing no compatibility among these AC adapters, only being resulted in inconvenience.

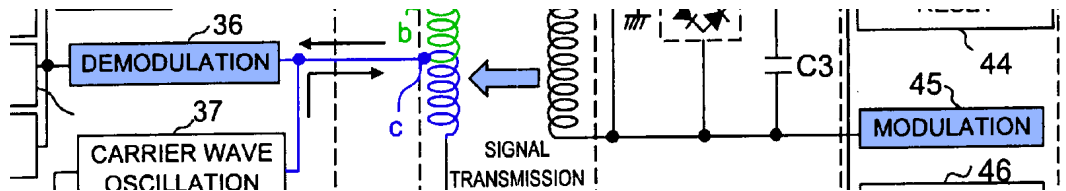
Since there is no compatibility among AC adapters, a problem has arisen that a house is flooded with many AC adapters.

Ex. 1005 at [0009]-[0010].

If only select, authorized devices worked with a wireless charging system, then it would not solve the problem of too many power adapters being necessary for different devices. A POSITA would not be motivated to add Calhoon's authentication system, which uses "a security certificate or digital signature from the battery charger assembly 304 to authenticate it." Ex. 1006 at [0052].

Another problem with adding Calhoon's authentication system to Nakamura is Calhoon's need for bidirectional communications between the battery charger and inductive charging source. Nakamura touts as one of the advantages of its power transmission system that "it is not necessary to transmit an information signal

between the power transmission apparatus 1 and the portable telephone 2, thereby enabling a power supply system to be simplified.” Ex. 1005 at [0101]. Indeed, the Figure 3 and 5 embodiments of Nakamura, relied on by the Petition, only show information transfer in a single direction—from the receiver to the base unit:⁴



Ex. 1005 at Fig. 3 (color added).

In contrast, Calhoon’s identification system does not *automatically* transfer its “battery charger identification (ID) number” from the receiver to the transmitter—it only does so *upon request* by the transmitter, thereby requiring transmitter to receiver communication. Indeed, the Petition points to a variety of information that “the source 302 (i.e. transmitter) may request” as part of a bidirectional communication system. Pet. at 34 (quoting Ex. 1006 at [0047]). Because of this, Calhoon’s system (which provides identification numbers only in response to a request for specific data) would not work with the Figure 3 and 5 embodiments of Nakamura that the Petition relies on, which only provide for

⁴ While the carrier wave is sent in the opposite direction (by box 37 in Figure 3), Figures 3 and 5 contain no hardware to modulate or demodulate the carrier wave, so this does not allow for information transmission. Nakamura need only “power up” the receiver and is not capable of sending any particular request to the receiver related to charging. See Ex. 1005 at [0076].

unidirectional communication from the electronic equipment to the power transmitter and does not incorporate the hardware, software and protocols necessary for bi-directional communication.

The Petition's proposed system would also require Calhoon's authentication—and thus bidirectional communication—for charging. Pet. 37-38. This would mean that *all* devices in Nakamura's system—every power transmitter, and every electronic equipment that receives power—would need to have hardware, software and protocols to support bidirectional communication, further adding to the cost of the system.⁵

A POSITA would not be motivated to add bidirectional communication to the power functionality of Nakamura. It would eliminate Nakamura's touted benefits of simplification. Ex. 1005 at [0101]. By requiring bulky, costly hardware for bidirectional communication in each system, the charging functionality would take up more space in the system and be less likely to receive widespread adoption. Nakamura's goal of "saving space" would be frustrated. Ex. 1005 at [0016]. Petitioner provides no credible reason that a POSITA would be motivated to use an identification as part of the charging process, particularly where Nakamura is aimed

⁵ Nakamura's Figure 22 shows communication from receiver to transmitter, but this is only used for a "payment information signal" as part of a separate payment system, and is not used for powering the device. Ex. 1005 at [0139].

at broad interoperability rather than restriction only to a few authorized devices, and where Nakamura already discloses transmission of the power information needed to charge a wide range of electronic equipment.

IV. CONCLUSION

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

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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 11,137 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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