

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. IPR2023-01086
Patent No. 7,948,208

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 1 and 18 of U.S. Patent No. 7,948,208 (the “’208 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 (this IPR), (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, (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 address two critical issues with its obviousness theories. *First*, the Petition fails to demonstrate obviousness of the claimed “current modulation performed by the receiver coil or its circuitry.” The Petition first points to Nakamura as allegedly showing the claimed current modulation. But the Petition ignores that in Nakamura the receiver communicates by way of a *separate signal injected by a separate circuit in the receiver*. The Petition then argues without any evidence that current modulation would have been part of the common knowledge of a POSITA, but unless the technology were extremely simple (and the Petition provides no such evidence), common sense is not legally sufficient to render a missing claim limitation obvious. *Arendi S.A.R.L. v. Apple Inc.*, 832 F.3d 1355, 1361 (Fed. Cir. 2016). Because Nakamura does not communicate by modulating the power transfer current generated in the receiver coil

inductively by the base unit, and because the Petition's common knowledge argument fails, the Petition fails to establish this claim element.

Second, the Petition fails to demonstrate how the claimed “capacitive or other component that decreases harmonics” in an activated primary coil would be rendered obvious. The Petition mainly argues that a POSITA would have incorporated disclosures from the Berghegger and WangII references, but it falls short of showing that a POSITA would combine either Berghegger or WangII with Nakamura to render the claim obvious. For Berghegger, the strategy of adding a capacitor to create a resonance would require matching a capacitor to the inductance of the activated primary coil (i.e. the primary coil used for power transfer to a receiver). Such a strategy cannot be easily applied to Nakamura, because Nakamura has multi-tap and multi-coil architectures that select different activated primary coils, which would have different inductance values for power transfer for different types of receivers. The Petition provides no explanation of how a POSITA would address the problem of creating resonance for multiple activated primary coils with different inductance values and provides no evidence that the Berghegger modification would result in lower harmonics. It also fails to show a motivation to combine. The Petition further relies on WangII for this element in grounds 5 and 6, but WangII suffers from similar incompatibility with Nakamura as well as with Berghegger. The petition does not provide any clear explanation of how to combine WangII (which

includes a tuning capacitor and adjusts output power through tuning of this capacitor) with Nakamura (which adjusts amplitude by activating a particular coil) or with Berghegger (which adjusts amplitude by varying frequency or duty cycle). The Petition simply fails to show how these different, disparate approaches would be combined. Nor does the Petition properly show a motivation to combine such different approaches, where Nakamura, Berghegger and WangII try to adjust output power by three different methods and are therefore incompatible with each other.

II. BACKGROUND

A. Challenged Claims 1 and 18 of the '208 Patent

Each of the Grounds is directed to independent claim 1 and dependent claim 18, which depends from claim 1. The claims challenged in the Petition are listed below with language addressed below emphasized:

<u>Claim 1</u>
1(a): A charger system for use with a mobile, electronic, or other device and/or battery, battery door, or skin for use with the device, for charging and/or powering the device and/or battery inductively, comprising:
1(b): a base unit having a surface, and comprising a plurality of primary coils arranged behind and parallel to the surface, wherein each of the primary coils is positioned within the base unit, and
1(c): wherein each of the primary coils is associated with a switching circuit in the base unit, which switching circuit is capable of being selectively switched to activate its associated primary coil so that, when an electrical current is passed through that activated primary coil, a magnetic field is generated by that activated primary coil in a direction substantially perpendicular to the surface of the base unit, and
1(d): wherein the base unit and/or switching circuit includes a capacitive or other component that decreases harmonics in that activated primary coil;

Claim 1
1(e): a power supply for passing a current through the primary coils when activated, to generate the magnetic field in a direction substantially perpendicular to the plane of the primary coils;
1(f): a communications interface that the base unit, and the mobile, electronic, or other device and/or battery, battery door, or skin for use with the device, use to communicate with one another during powering or charging, to
1(g): poll each of the primary coils, or receive a signal from a sensor associated therewith, to verify the presence of the mobile, electronic, or other device and/or battery, battery door, or skin for use with the device placed upon or close to the surface of the base unit,
1(h): select, based on the polling or sensing, from within the plurality of primary coils, and selectively switch, using their associated switching circuits to activate, only those one or more primary coils which are determined to be most closely aligned with a receiver coil at the mobile, electronic, or other device and/or battery, battery door, or skin for use with the device, and
1(i): periodically thereafter exchange information to provide power transfer to the device and/or battery, including device and/or battery charging or power status or presence; and
1(j): wherein the substantially perpendicular magnetic field is used to inductively generate a current in the receiver coil within or on the mobile, electronic, or other device and/or battery, battery door, or skin for use with the device placed upon the activated primary coil of the base unit, to charge or power the device and/or battery , and
1(k): wherein the base unit, and receiver coil or circuitry associated therewith, use current modulation performed by the receiver coil or its circuitry, to provide an indication that is then used by the base unit to
1(l): determine and regulate one or more of output voltage, current, or power provided by the base unit to the device and/or battery to be within the range of one or more of a value of a required voltage, current, or other power parameter for the mobile, electronic, or other device and/or battery, battery door, or skin for use with the device, and/or
1(m): verify the continued presence of the receiver coil near the base unit.

Claim 18
18. The system of claim 1, wherein the charger system includes one or a plurality of LED's and/or audio signals that identify charging occurring or which of the plurality of primary coils are currently activated.

Ex. 1001, 26:32-27:27, 29:48-51.

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 or against claim constructions 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.

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. 1031 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. 1031 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 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. 1033 (EDTX Scheduling Order). As explained below, the district court is unlikely to stay a trial that is already scheduled to be complete well before a final written decision on any petition would be issued by the Board.

Petitioner's proposed stipulation does not meaningfully streamline the issues. Petitioner merely offers to drop from its invalidity assertions in district court only those grounds that are instituted by the Board. This would mean that *even if all eighteen IPRs were to be instituted*, Petitioner would still assert invalidity grounds based on §§ 102 and 103 in district court that would not and could not be addressed by the Board. And those invalidity grounds in district court would be tried before a jury months before any final written decision would issue. Not only does Petitioner's proposal not alleviate the duplicative efforts in assessing the invalidity of the patents, it increases the likelihood of inconsistent results across the proceedings. There is no argument that can be offered that supports instituting eighteen IPRs—that would issue narrow invalidity rulings on 35 U.S.C. §§ 102/103 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.

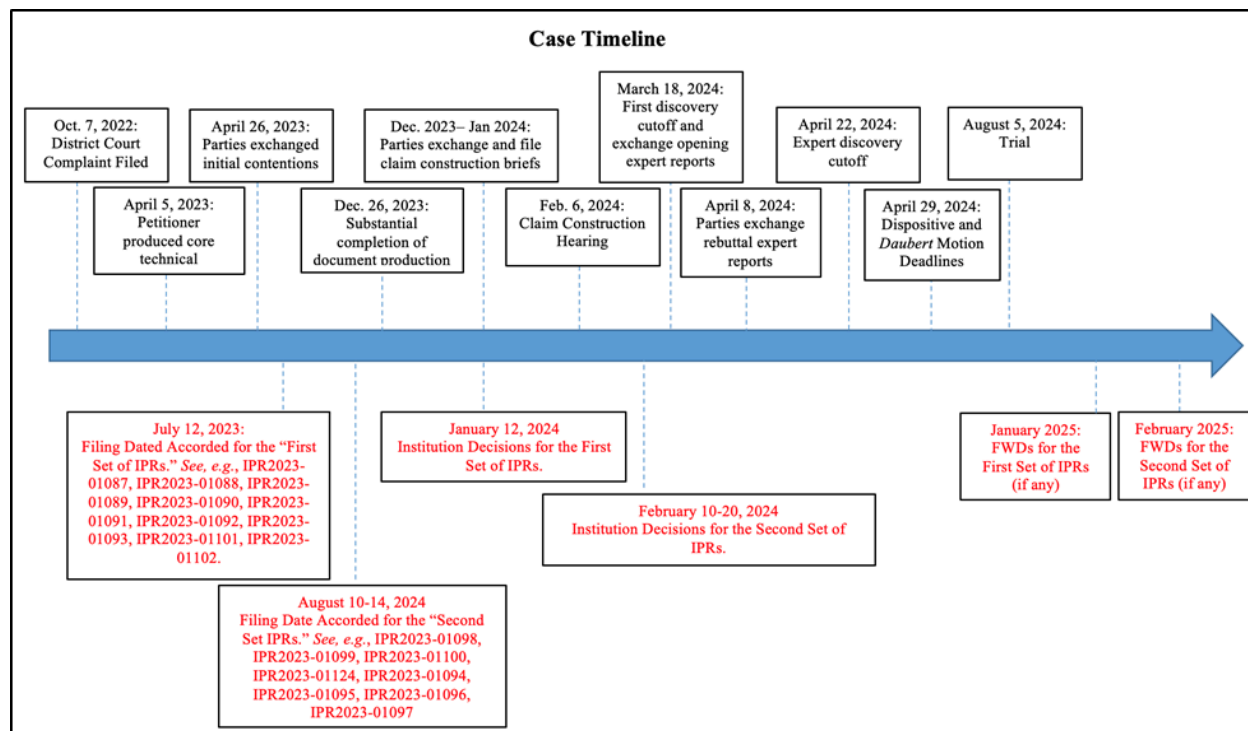
Accordingly, the Board should deny institution to maintain the goals of efficiency and efficacy. *See General Plastic Industrial Co., Ltd. v. Canon Kabushiki Kaisha*, IPR2016-01357, Paper 19 at 16-17 (P.T.A.B. Sept. 6, 2017).

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 83. 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 (P.T.A.B. 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. Infinera 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.”).

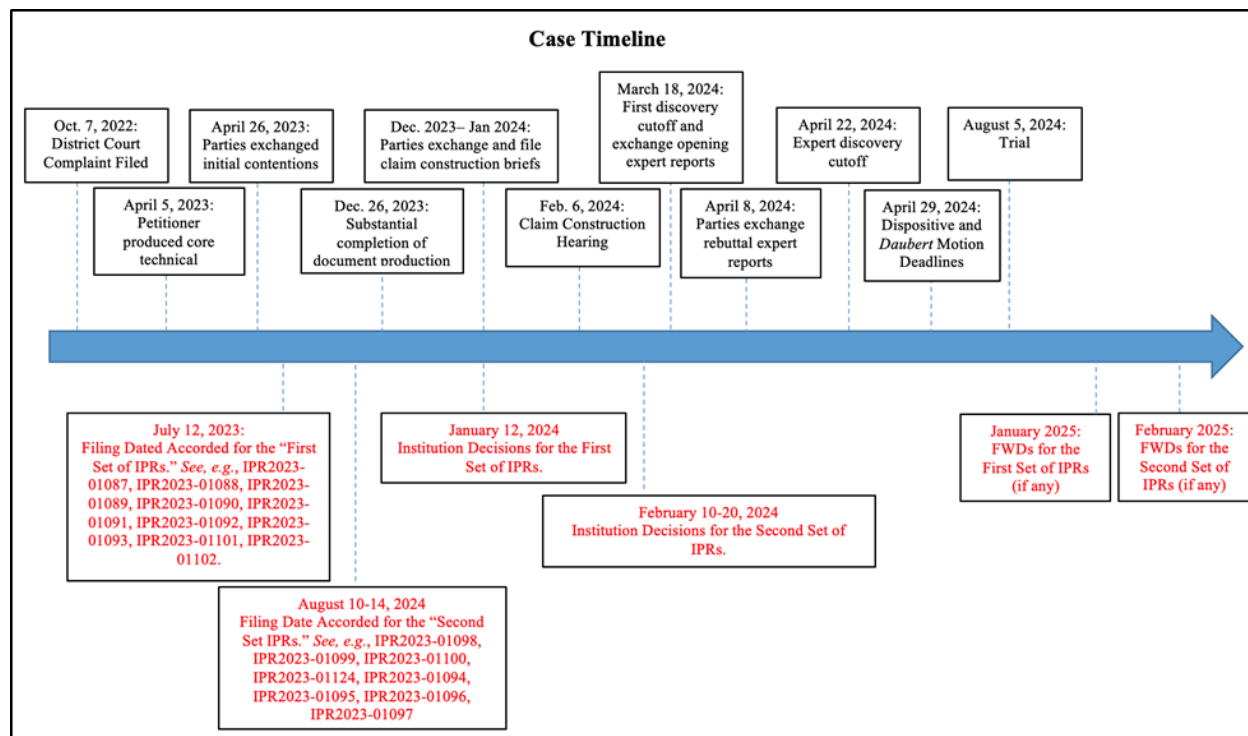
Here, the timing demonstrates that Judge Gilstrap is likely to deny a motion to stay. As shown in the case timeline below, the decision on institution across the *eighteen* IPRs is not expected until January and February 2024. By that time, the parties will have had the *Markman* hearing and substantial document production will have occurred. Ex. 1033 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 (P.T.A.B. Nov. 10, 2021) (five months); *Maxlite, Inc. v. Jiaxing Super Lighting Electric Appliance Co., Ltd.*, IPR2020-00208, Paper 32 at 5 (P.T.A.B. Oct. 12, 2021) (four months); *Stanley Black & Decker, Inc., et al. v. Zircon Corp.*, IPR2020-01572, Paper 10 at 12 (P.T.A.B. April 19, 2021) (three months); *Next Caller, Inc. v. TrustID, Inc.*, IPR2019-00961, Paper 10 at 14-15 (P.T.A.B. Oct. 16, 2019) (three months); *E-One, Inc. v. Oshkosh Corp.*, IPR2019-00161, Paper 16 at 6 (P.T.A.B. 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 (P.T.A.B. 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. The Petition Fails to Show Nakamura, Berghegger, or Any Other Cited References Render Obvious “Current Modulation Performed By The Receiver Coil or its Circuitry” in the Claimed Invention

1. The Petition Does Not Show That Nakamura Discloses “Current Modulation”

The Challenged Claims require “current modulation performed by the receiver coil or its circuitry.” Ex. 1001 at Claim 1. The claim describes first that an activated primary coil generates a magnetic field (Element 1(c), Ex. 1001 at 26:44-

48), which in turn generates a current in the receiver coil to charge or power the device or battery (Element 1(j), Ex. 1001 at 27:9-14). This current drawn by the receiver coil to charge or power the device is modulated by the receiver coil or a receiver coil circuitry to provide an indication to the base unit. (Element 1(k), Ex. 1001 at 27:15-18) Thus the **current that is modulated in the receiver** for communication with the base unit **is a current generated inductively** in the receiver coil by a magnetic field **from an activated primary coil** and the same current is **used for charging or powering the device or the battery**. One example of “current modulation” provided by the ’208 specification is that the charger provides power (i.e. current) to a nearby receiver that includes a chip in the receiver circuit that “can be programmed so that on power-up, it draws current in a pre-programmed manner.” Ex. 1001 at 18:48-50. And the chip or a microcontroller in the receiver in this manner “upon power-up modulates the current in the secondary that can then be detected as current modulation in the primary.” *Id.* at 18:53-55.

The Petition points to Nakamura’s modulated “signals (which have current)” in an attempt to show this element is met. Pet. 51. But this falls short of showing the required “current modulation.” The Petition ignores that in Nakamura, communication is in the form of a separate information signal injected by a separate circuit (45) in the receiver and applied to the secondary side (receiver) coil (12). Ex. 1005 (Nakamura) at [0077-0078]. Nakamura explains that “the modulated wave

supplied to the secondary side coil 12 from the modulation circuit 45 is transmitted to the primary side (base unit) coil 11 magnetically coupled thereto.” Ex. 1005 at [0078]. “The demodulation circuit 36 connected to the tap c of the primary side coil 11 receives and demodulates the transmitted modulated wave.” *Id.* Because Nakamura does not communicate by modulating *the current induced in the receiver coil by the activated primary coil in the base unit* (the power transfer current used for charging or powering the battery or the device), the Petition fails to establish this claim element.

The '208 Patent illustrates the claimed modulation of the power transfer current by way of varying the current draw at the receiver (the secondary side) to inductively create a current modulation in a primary coil for communication with the transmitter. *See* Ex. 1001 at 18:50-55. In this manner, the receiver communicates by way of modulating the *power transfer current* in the receiver coil rather than with some separate communication signal injected to the secondary side coil (as in Nakamura). The transmitter primary side coil detects this receiver current variation by way of the inductive coupling between the secondary side coil and the primary side coil. For example, the '208 Patent shows Figures 11 and 17 as example embodiments where the chip shown as “MCU2” modulates the current in the receiver coil (L2) in order to communicate information to the base unit:

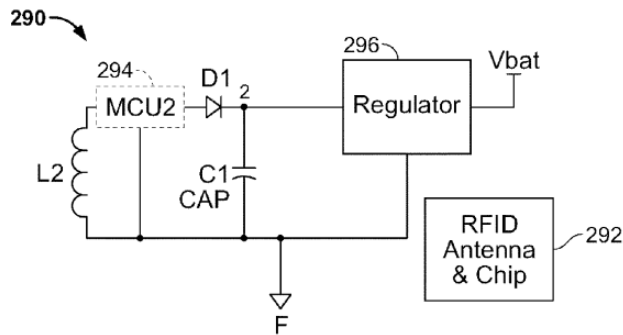


FIG. 11

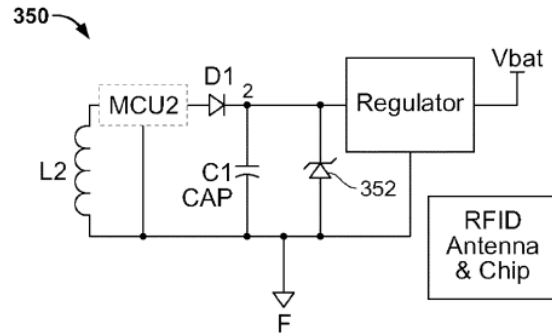
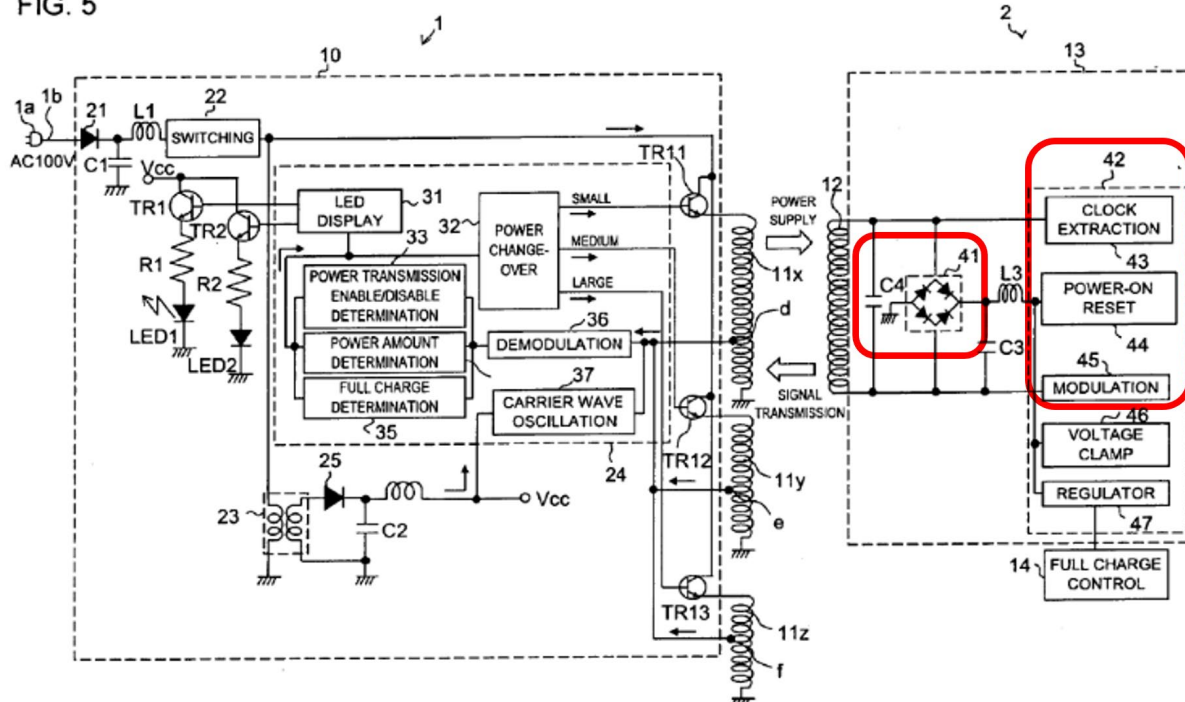


FIG. 17

Ex. 1001 at Figs. 11, 17; *see* Ex. 1001 at 18:44-55 (describing MCU2 as modulating the current).

In contrast to the claimed modulation of the AC power transfer current, Nakamura promotes the use of signal-generating communication circuitry on the receiver side (43 and 45), located after a “smoothing capacitor” (C4) and a rectifier 41:

FIG. 5



Ex. 1005 (Nakamura) at Fig. 5; *see also* Figs. 3, 6, 22; [0074] (describing “smoothing capacitor” C4 and “rectification circuit” 41).

This communication circuitry (43 and 45) generates a new phase-modulated wave (separate from the power transfer current) applied to the secondary side coil 12 and sent to the power transmitting module 10. Ex. 1005 (Nakamura) at [0077] (“the modulation circuit 45 . . . supplies the modulated wave to the secondary side coil 12”) & [0078] (“The modulated wave supplied to the secondary side coil 12 from the modulation circuit 45 is transmitted to the primary side coil 11 magnetically coupled thereto.”). This communication circuitry (43 and 45) does not modulate the power transfer current inductively generated in the receiver coil by the primary coil.

Rather, this communication circuitry (43 and 45) generates and applies a separate signal on the secondary side coil 12 that is magnetically coupled to the transmitter. Importantly, the Petition does not consider this and does not establish that Nakamura teaches modulation of the power transfer current induced by the base unit.

2. The Petition’s Arguments Regarding Knowledge of a POSITA Cannot Satisfy the “Current Modulation” Limitation

Apparently realizing the deficiencies in its analysis of Nakamura, the Petition next argues that “it would have been obvious to configure the *Nakamura-Berghegger* system to use ‘current modulation.’” Pet. 49. To begin with, the *Nakamura-Berghegger* system could not simply be “configured” to use current modulation, because as explained above, Nakamura’s system is specifically designed to inject a separate, phase-modulated signal into the secondary side coil. Different circuitry in the receiver (and in the transmitter for detecting the communication from the receiver) would be required to attempt to create a current modulation-based communication system, and the Petition identifies no disclosure of such circuitry.

But the most critical flaw in this obviousness argument is that it is not based on a disclosure of current modulation in any of the references in the combination. Instead of pointing to disclosure of current modulation in any of the five references listed in the Petition’s six grounds, the Petition instead simply argues that current

modulation features “were known by a POSITA at the time.” Pet. 50. In other words, the Petition relies on the proposition that current modulation in a wireless power system was common knowledge.

Courts set a high bar to use “common knowledge” as part of an obviousness case. While courts do “consider common sense, common wisdom, and common knowledge in analyzing obviousness,” common sense “is typically invoked to provide a known motivation to combine, not to supply a missing claim limitation.” *Arendi S.A.R.L. v. Apple Inc.*, 832 F.3d 1355, 1361 (Fed. Cir. 2016). Knowledge of a POSITA is only used to supply a missing claim limitation when that limitation is “unusually simple and the technology particularly straightforward.” *Id.* Yet even though the Petition attempts to argue that common knowledge of a POSITA supplies the missing “current modulation” claim limitation, the Petition does not allege that the use of current modulation in wireless charging is unusually simple or particularly straightforward.

Further, the Petition lacks credible factual support for current modulation supposedly being part of “a POSITA’s knowledge.” *See* Pet. 51. First, the Petition attempts to rely on three patent publications that allegedly disclose current modulation, Exhibits 1044-1046. Pet. 50. None of the three references is part of any of the Petition’s six alleged obviousness grounds. Pet. 2-3. The Petition provides no basis to conclude that these background references themselves were well

known to people of skill in the art: to the contrary, each is an obscure patent or patent application publication that most people in the wireless charging industry have likely never read. And while each of the three background references uses the terms “current” and “modulation” in some way, none of the references says that “current modulation” was well known, common wisdom, or common knowledge to those of ordinary skill in the field of wireless charging systems, nor do any of the references describe the claimed invention. *See generally* Exs. 1044-1046.

Even if the ideas in these three background references were somehow well known to a POSITA, the references fail to show that a POSITA would have configured a receiver to use current modulation to transmit data in the context of wireless charging.

Delatorre is a patent regarding communication and power transfer between a surface location or station and a well tool in a well bore. Delatorre discusses the challenges of communicating in such a system with a very long cable going down the well, noting that high-frequency signals do not work well given the inductance of that cable. Ex. 1044 at 3:30-43. This is a very different environment and field from wireless charging: Berghegger, for example, discloses a 100 kHz power signal, while Delatorre sends a 4.8 Hz power signal—20,000 times slower. *Compare* Ex. 1006 at 2:3-5 *with* Ex. 1044 at 3:47-50. That “current modulation” might have been used for some purpose in a system that sends signals in a long wire down a well says

little about whether it would be applicable at all in wireless charging for consumer electronics, and says nothing at all about whether a POSITA in the field of wireless charging would know how to implement it in a wireless charging system as common knowledge. Further, Delatorre explains that the high frequencies such as those used by wireless charging would not work with its system. Delatorre is non-analogous art and not directed to wireless charging at close range of any device remotely similar to the device in the '208 patent. Even if Delatorre's well-bore communication system were somehow common knowledge to a POSITA in the completely different field of wireless charging, the POSITA would have had little motivation to combine it with a wireless charging system similar to the '208 patent. *See* Ex. 1044 at 3:30-43.

Clark relates to embodiments for “an automated pick system for a warehouse; another is for billboards or travellers' destination signs.” Ex. 1045 at Abstract. The Clark system consists of a power supply (transmitter) and several pickups (receivers). Clark shows how the *transmitter* may modulate the current it sends, but does not describe any communication in the opposite direction at all and especially not a *receiver* that performs current modulation to transmit information in the opposite direction. Ex. 1045 at col. 15:16-21 (“Each power supply can be provided with a signal transceiver . . . to send data This will also be transferred inductively across the gap to reach the ferrite-cored pickups at the receivers”), col. 20:1-10 (showing that the power supply signal is modulated and sent to the signal

modules, and then “demodulated by the signal diode 1N4148” at the receiver), Fig. 10 (showing signal diode 1N4148 is on the receiver side). Similar to Delatorre, Clark is non analogous art. It also only describes a power transmitter to power receiver communication system—the opposite of the claimed current modulation.

Due-Hansen is a patent for passive measurement of intracranial pressure in hydrocephalus patients [P.1 lines 1-7]. Due-Hansen only mentions current modulation once. It states “As mentioned earlier, the pressure data signal transmission will be implemented by a current modulation. This will now be explained more fully by means of figures 3 and 4.” (Ex. 1046 at 10:22-24), Due-Hansen cuts against the notion that implementing current modulation in a wireless power system would be “unusually simple” or “particularly straightforward” as required by *Arendi*: Following the above sentence regarding current modulation, Due-Hansen launches into pages of complicated mathematics to describe the operation of the complicated circuits it discloses in figures 3 and 4. Ex. 1046 at 10:25-12:17. Figures 3 and 4 show various transmitter and receiver topologies for power transfer and the discussion following the above statement is focused on operation of these systems that lack any communication circuits or capabilities. Notably, while these pages discuss determining the gain (output voltage / input voltage) of the system as derived in equation (4). [Bottom of page 11] and finding “the greatest possible energy transmission,” Ex. 1046 at 12:3, they do not explain at

all how data would actually be transmitted. *Id.* at 10:25-12:17. Nor do the actual circuit diagrams of figures 3A, 3B or 4 show any input for data to modulate or any output for demodulated data or any means for ‘current modulation’. *Id.* at 27-28.

Finally, the Petition cites the Atmel e5530 microcontroller, which the ’208 patent uses as part of the circuit in one of its embodiments that performs current modulation. Pet. 50-51; Ex. 1001 at 18:50-52 (indicating that the Atmel e5530 “or another inexpensive microcontroller” can be integrated in a way that performs current modulation as shown in the Figure 11 embodiment of the ’208 patent). The Petition characterizes the 208 patent’s discussion of this microcontroller as a discussion of “conventional technologies”—yet the cited portion of the patent is about the new Figure 11 embodiment, not a “background of the invention” section. Pet. 50 (citing Ex. 1001 at 18:44-57). Furthermore, the ’208 patent merely identifies the cited Atmel IC as an example of a component that could be used to implement a part of the ideas of the invention. The Atmel e5530 is not a specific IC for receiver to transmitter communication in a wireless charger system. The ’208 invention is not about the use of this *particular IC* but about *the communication between the receiver and the transmitter using modulation of the current inductively generated in the receiver coil by the primary coil during power transmission*—something not specified at all by the Atmel e5530 datasheet.

The Atmel datasheet’s discussion of modulation never uses the terms “current modulation” or “wireless charging,” and there is no evidence that the component had ever been used at the time of the invention for receiver to transmitter communication by current modulation in an inductive charging system. Ex. 1043 at 3. And critically, the Petition offers no evidence that the Atmel e5530 microcontroller, which is not discussed by any of the references cited in any of the grounds, constitutes common knowledge that a POSITA would be familiar with the chip. To the contrary, a POSITA—who according to the Petition might have only two years of industry experience—would not likely be familiar with every obscure part available from every vendor. *See* Pet. at 3-4.

In summary, the background references cited by the Petition do not show that using current modulation to communicate from a receiver to a transmitter as part of wireless charging would have been part of the common knowledge of a POSITA. The Petition has not established obviousness of the claimed “current modulation.”

C. The Petition Fails to Show a “Capacitive or Other Component that Decreases Harmonics” is Rendered Obvious in the Claimed Invention by Nakamura, Berghegger, or Other References

The Challenged Claims require “wherein the base unit and/or switching circuit includes a capacitive or other component that decreases harmonics in that activated primary coil.” Ex. 1001 at 26:49-51 (claim 1), 29:48:51 (depending from claim 1). 21-24, 30:20-23. The Petition admits that Nakamura does not expressly

include a capacitor or other component that decreases harmonics in a primary coil. Pet. 16. Instead, the Petition relies primarily on the Berghegger reference, as well as “a POSITA’s state-of-art knowledge” and various background references, to argue that this limitation is met. Pet. 16-27.

1. Berghegger

The Petition overlooks several critical issues in arguing that a POSITA would combine Nakamura with Berghegger to arrive at a “capacitive or other component that decreases harmonics in that activated primary coil.”

First, a POSITA would not know how to combine Berghegger’s resonant circuit with Nakamura’s coil selection system, because Nakamura’s three primary side coils do not have the same inductance values. Nakamura uses a single switching circuit 22 to provide an AC power transfer signal to the primary side coils. Nakamura does not teach any means of changing any properties (amplitude, duty cycle, frequency, wave shape, etc.) of the resulting signal from the switching circuit. The Nakamura system therefore operates using a fixed type of signal from such a switching circuit. According to Petitioner’s expert, “*Berghegger*’s resonant circuit (including a capacitor C_p) has a resonant frequency at the operating frequency of the power being transferred.” Ex. 1002 at ¶¶ 87, 137; *see also* Ex. 1006 at 2:61-64 (touting match between resonant frequency and oscillator frequency as an advantage of the system). And Petitioner’s expert also states that it is the fact that the resonant

frequency is “near or at the operating frequency of a signal” that “would decrease the harmonics of that signal and would improve transmission efficiency.” *See* Ex. 1002 at ¶ 137.

But the resonant frequency in a combined Nakamura-Berghegger system would vary greatly depending on the coil selected (Fig. 5) or the tap of the coil that is selected (Figs. 3, 6), frustrating any attempt to decrease the harmonics in the way Petitioner’s expert described. The resonant frequency of a series LC circuit is determined by multiplying the capacitance of the capacitor by the inductance of the inductor:

The value of ω that satisfies this condition is called the *resonant frequency* ω_0 . Thus, the resonance condition is

$$\omega_0 L = \frac{1}{\omega_0 C} \quad (14.25)$$

$$\omega_0 = \frac{1}{\sqrt{LC}} \text{ rad/s} \quad (14.26)$$

Since $\omega_0 = 2\pi f_0$,

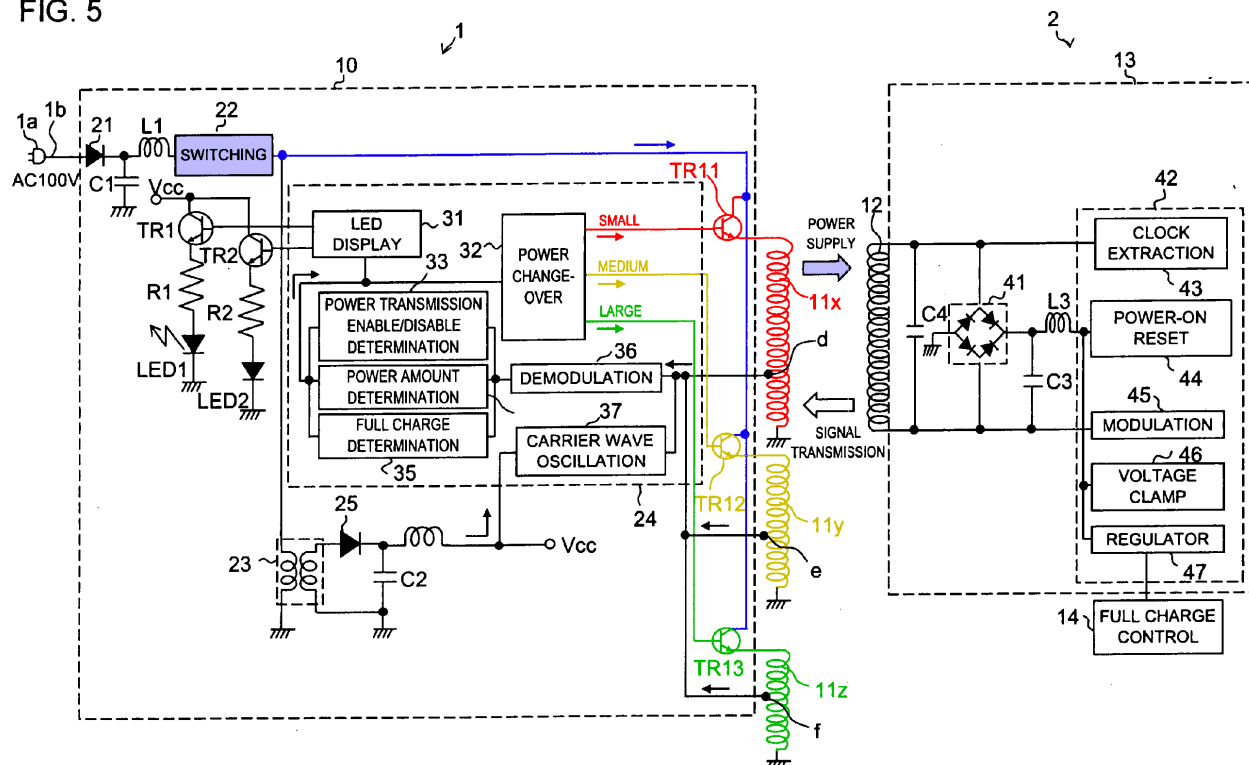
$$f_0 = \frac{1}{2\pi\sqrt{LC}} \text{ Hz} \quad (14.27)$$

Ex. 1016 at 631.

But Nakamura describes a system where the power switching circuit 22 applies the same power signal to differing lengths (i.e. inductance values) of the

primary side coil 11 (see 11x, 11y and 11z coils in Fig. 5 below) at the transmitter 1 (left side), based on the power requirement (small, medium, and large) of the electronic equipment at receiver 2 (right side), and each of those lengths would have a different inductance.

FIG. 5



Ex. 1005 at Fig. 5 (color added); *see also* Figs. 3, 6 (using multiple taps in the same coil instead of multiple coils, resulting in a different effective inductance based on which tap is selected).

In Nakamura, the inductance of primary coil 11 will be different based on which coil (or tap) is selected. Ex. 1029 at 10 (showing that inductance of a coil varies based on the number of turns). The Petition fails to explain how a POSITA

could select a capacitor to match the fixed operating frequency of the switching circuit where each of the three primary side coils would have a different inductance. The Petition does not even explain the details of how a combination of Nakamura and Berghegger could or would be implemented given this issue, much less show that such an implementation would have been obvious to a POSITA. The fact that Berghegger's operation would have to be fundamentally changed to work with Nakamura's multiple-coil system confirms that such a combination would be non-obvious. *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) ("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").

Second, there are a number of issues relating to motivation to combine that the Petition simply fails to address. To begin with, while the Petition argues that a POSITA's motivation to combine would have come from a desire to reduce harmonics (Pet. 12), neither Nakamura nor Berghegger uses the term "harmonic" even once. *See generally* Exs. 1005, 1006. Since the Berghegger system does not explain how to reduce harmonics, even a POSITA who was somehow motivated to reduce harmonics in Nakamura would not have looked to Berghegger. In contrast to the 208 patent's extensive discussions of harmonics, which explains in detail

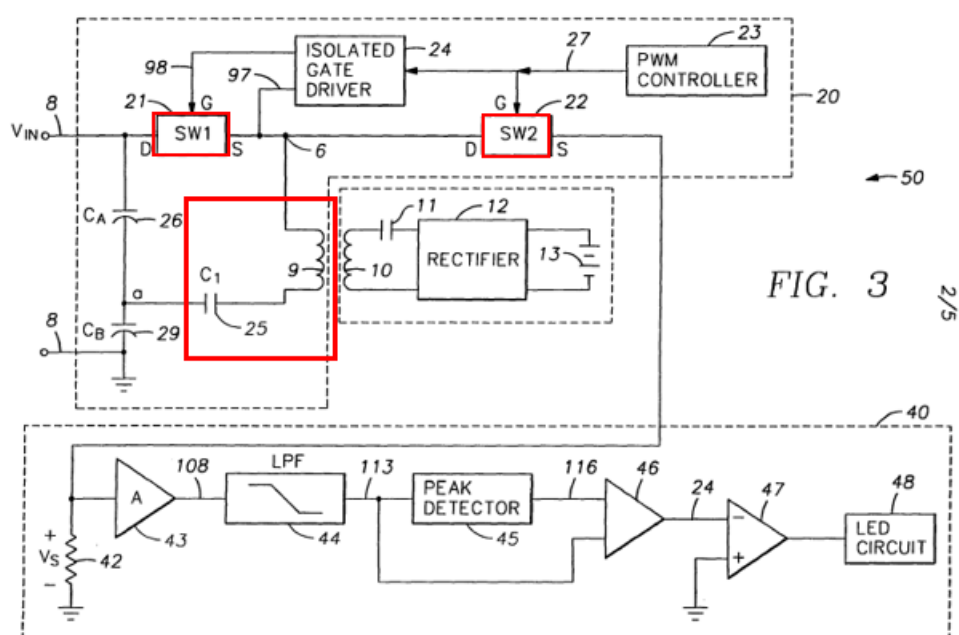
particular situations where harmonics can present problems and how a capacitor can alleviate those problems, and the advantages of such a combination, Berghegger is simply silent on the issue of harmonics, and neither Nakamura nor Berghegger would motivate a POSITA to address any issues relating to harmonics. *Compare* Ex. 1001 (208 patent) at 16:41-17:53 *with* Ex. 1005 (Nakamura), Ex. 1006 (Berghegger) at 3:58-4:40.

Third, the Petition’s reliance on infringement contentions from other litigation is misplaced. *See* Pet. 21-23. The Petition argues that Patent Owner has pointed to “random capacitors” as satisfying the element, but fails to provide any analysis of the actual function of the capacitors in Petitioner’s product. Pet. 23. Similarly, the Petition cites claim charts showing a standards document that “resembles configurations taught by Berghegger,” but such a citation does not speak at all to the question of whether Berghegger could or would be combined with Nakamura, nor is it dispositive of whether Berghegger in fact meets the claim language. *See* Pet. 21-22.

2. WangII

The Petition’s reliance on WangII—both as background art and as a reference in Grounds 5 and 6—to show a “capacitive or other component that decreases harmonics” fails.

First, like Berghegger, WangII does not account for the fact that Nakamura uses multiple different coils with different inductances. The Petition appears to point to capacitor 25 in WangII, in series with the inductor, as the component that reduces harmonics:



Pet. 20, 23; Ex. 1013 at Fig. 3 (red boxes as shown in Petition)..

WangII, like Berghegger, explains that the capacitance value for capacitor 25 must be chosen to create a particular resonant frequency: “Through proper selection of the value of capacitor 25, the natural resonant frequency of the primary coil 9 and capacitor 25 resonant circuit can be controlled to be below the operational frequency in order to achieve the zero-voltage turn-on of both switches 21 and 22.” Ex. 1013

at 8:19-22. Yet in Nakamura, where any of several primary side coils may be selected to be connected to the switching circuit 22, selecting a capacitor would lead to three different resonant frequencies for the three primary side coils (low, medium and high power coils). Given that Nakamura does not disclose any method for adjusting the signal generated by the switching circuit 22, the resonant frequency of the circuit would not reliably match the generated switching circuit signal. Similar to Berghegger above, this presents a serious problem with any attempt by a POSITA to add WangII's capacitor to Nakamura, and the Petition fails to address how that problem would or could be solved by a POSITA. *See 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) (“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”).

Second, WangII takes a fundamentally different approach than Nakamura in adjusting the amplitude of the output power. While Nakamura switches between different primary side coils (or segments of a primary side coil) to vary the amplitude of the output power of the receiver, WangII states that “Furthermore, by varying the value of capacitor 25, the amplitude of the current through primary coil 9 can be

modified to provide a wide-range voltage conversion ratio.” Ex. 1013 at 7:35. WangII thus uses this method to adjust the voltage at the output of the receiver.

These are different approaches, and the Petition fails to address whether or how a POSITA would combine Nakamura’s coil-switching approach with WangII’s capacitor-tuning approach. This defeats Petitioner’s obviousness theory.

Third, and relatedly, Nakamura already includes circuitry and methods to provide output power at different levels, so Nakamura would not need to adopt WangII’s tunable capacitor for varying the output power. WangII describes varying the value of the capacitor 25 to vary the current in the primary coil and the output voltage / power. Ex. 1013 at 7:36-38. But Nakamura already has the ability to select power levels through its multiple-coil selection. *E.g.* Ex. 1005 at [0084]-[0085], [0090], [0099]. Nakamura also has a regulator on its output that adjusts the level of output power. *Id.* at [0136]. A POSITA would have had little motivation to add WangII’s tuning capacitor 25 to Nakamura when the disclosed function of the capacitor—generating the desired current amplitude and output voltage / power—was already performed by other components in Nakamura’s system. In short, Nakamura’s system had no need for WangII’s capacitor.

Fourth, even though all the grounds with WangII also cite Berghegger as a reference, the Petition fails to address a number of other differences and incompatibilities between WangII and Berghegger or explain how a POSITA would

reconcile the references. For example, the Petition does not explain whether the combined WangII / Nakamura / Berghegger system would use a fixed capacitor (as in Berghegger) or a tunable capacitor (as in WangII), despite this choice being key to the operation of a combined system. *See* Ex. 1006 at 4:6-32; Ex. 1013 at 8:19-20. The Petition also fails to address whether the combined system would adopt Berghegger's approach of adjusting frequency or duty cycle to change the output power level or WangII's approach of tuning a capacitor. *See* Ex. 1006 at 4:62-5:30; Ex. 1013 at 8:15-23. The two references take approaches that are not only significantly different from Nakamura but also significantly different from each other. Because the Petition does not address these incompatibilities between Nakamura, WangII and Berghegger with respect to varying output power and fails to show how exactly a POSITA would supposedly combine these references and whether such a combined system would work, the Petition fails to show that the combinations with WangII render the Challenged Claims obvious.

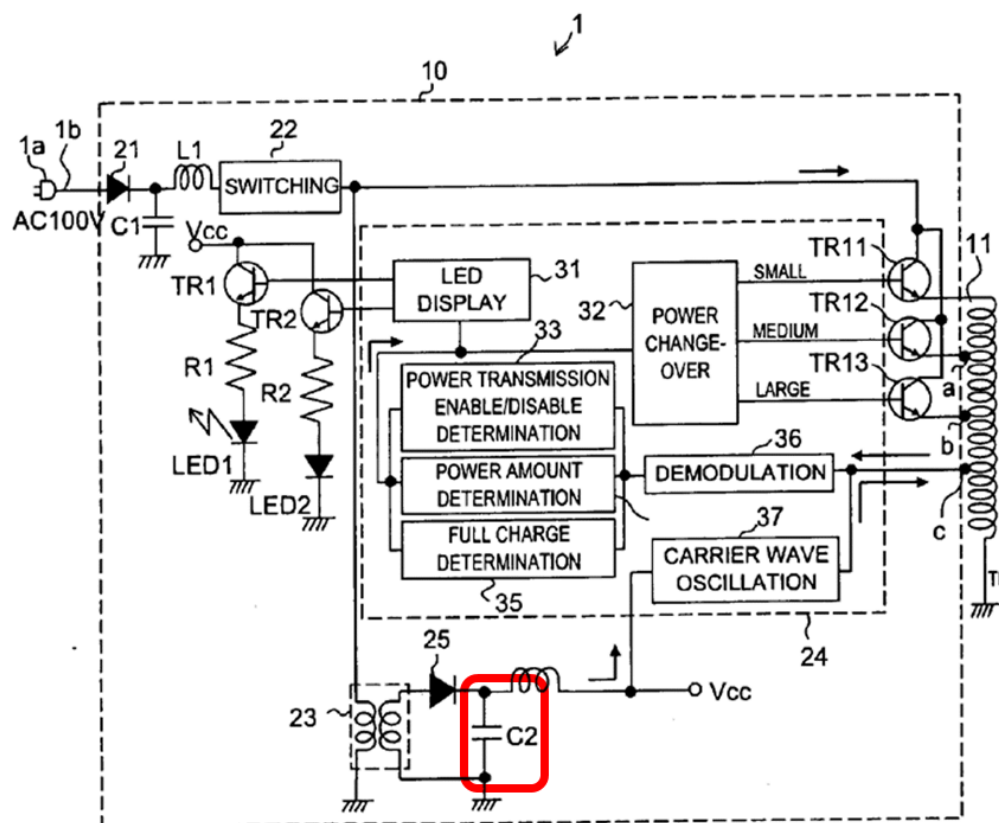
3. POSITA's State-of-Art Knowledge

The Petition also cites a number of other background references. Pet. at 19-21. These references are not part of the claimed combination and do not show that a POSITA would combine the actual references in the Grounds in a manner that would render obvious the claimed "capacitive or other component that decreases harmonics."

4. Nakamura's Capacitor Circuit

The Petition briefly notes Nakamura's "capacitor-circuit C2." That circuit, however, is part of a DC front-end power supply and smooths the DC supply voltage, rather than decreasing harmonics in an activated primary coil. See Ex. 1005 at [0071] ("the pulse voltage is . . . smoothed by a smoothing circuit constituted of . . . capacitor C2 so as to be converted to a DC voltage"). This circuit does not decrease harmonics across any activated primary coil, but rather produces a DC voltage (V_{cc}) to power other components in the base unit.

FIG. 3



Nakamura Fig. 3.

Because Nakamura's C2 is not a "capacitive or other component that decreases harmonics in that activated primary coil," it does not render the Challenged Claims obvious.

D. Grounds 2-6 Fail for the Same Reasons as Ground 1

The arguments above focus on deficiencies in the Petition's analysis of Nakamura and Berghegger, the references for Ground 1 of the Petition. While Grounds 2-6 of the petition add a variety of additional obviousness references—WangII, Odendaal, and Hsu—each ground fails for the same reasons identified above. The Petition does not allege that any of these three references disclose or render obvious current modulation. *See* Pet. 58-81. With respect to a "capacitive or other component that decreases harmonics," the Petition provides no arguments that Odendaal or Hsu render the element obvious, and the Petition's WangII arguments fail for the reasons stated above. *See* Pet. 58-81. For each ground, the Petition fails to show that the cited references, taken in combination, teach or render obvious every limitation of Claim 1 or Claim 18.

IV. CONCLUSION

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

Dated: November 20, 2023

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CERTIFICATE OF WORD COUNT

The undersigned hereby certifies that the portions of the above-captioned **PATENT OWNER'S PRELIMINARY RESPONSE** specified in 37 C.F.R. § 42.24 have 8,466 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: November 20, 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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