

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SAMSUNG ELECTRONICS CO., LTD.,
Petitioner,

v.

MOJO MOBILITY INC.,
Patent Owner.

IPR2023-01097
Patent 11,316,371 B1

Before WILLIAM V. SAINDON, BRIAN J. MCNAMARA, and
KARA L. SZPONDOWSKI, *Administrative Patent Judges*.

Opinion for the Board filed by *Administrative Patent Judge* SAINDON.

Opinion concurring filed by *Administrative Patent Judge* McNAMARA.

SAINDON, *Administrative Patent Judge*.

DECISION
Denying Institution of *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

A. *Background and Summary*

Samsung Electronics Co., Ltd. (“Petitioner”) filed a Petition (Paper 1, “Pet.”) requesting *inter partes* review of claims 28 and 29 of U.S. Patent No. 11,316,371 B1 (Ex. 1001, “the ’371 patent”). Mojo Mobility Inc. (“Patent Owner”) filed a Preliminary Response. Paper 7 (“Prelim. Resp.”). Addressing only the issue of discretionary denial, Petitioner filed a Reply to the Preliminary Response (Paper 8), to which Patent Owner filed a Sur-Reply (Paper 10).

We have authority to enter this decision denying institution of *inter partes* review (“Decision”) under 35 U.S.C. § 314(b) and 37 C.F.R. § 42.4(a). The standard for instituting an *inter partes* review is set forth in 35 U.S.C. § 314(a), which provides that an *inter partes* review may not be instituted unless “there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” For the reasons provided below, we determine Petitioner has not satisfied the threshold requirement set forth in 35 U.S.C. § 314(a). Because Petitioner has not demonstrated a reasonable likelihood that at least one claim of the ’371 patent is unpatentable, we do not institute an *inter partes* review. 37 C.F.R. § 42.108(a).

B. *Real Parties in Interest*

Petitioner identifies itself (Samsung Electronics Co., Ltd.) and Samsung Electronics America, Inc. as real parties in interest. Pet. 1.

Patent Owner identifies itself (Mojo Mobility Inc.) as the real party in interest. Paper 4, 2 (Patent Owner’s Mandatory Notices).

C. Related Matters

Petitioner identifies *Mojo Mobility Inc. v. Samsung Electronics Co., Ltd.*, No. 1-22-cv-00398 (E.D. Tex.) as a matter in which the '371 patent and also U.S. Patent Nos. 7,948,208, 9,577,440, 11,292,349, 11,201,500, 11,342,777, and 11,462,942 have been asserted against Petitioner. Pet. 1. The parties indicate that Petitioner filed a petition for *inter partes* review (IPR2023-01094, -01095, and -01096) challenging some other claims of the '371 patent. Pet. 1; Paper 4, 2.

Patent Owner also identifies *Mojo Mobility Inc. v. Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc.*, No. 1:22-cv-00433-JRJ (E.D. Tex) as a related matter. Paper 4, 2.

D. Prior Art and Asserted Grounds

Petitioner's grounds rely on the following prior art references:

Name	Reference	Exhibit No.
Okada	Translation of Japanese Patent Application Publication No. 2006-141170A	1005
Odendaal	U.S. Patent No. 6,960,968	1008
Shima	U.S. Patent No. 5,808,587	1032
Hui-027	U.S. Patent Application Publication No. 2003/0095027	1068
Kook	U.S. Patent Application Publication No. 2009/0261778	1059
Kazutoshi	U.S. Patent Application Publication No. 2005/0135129A1	1034

Petitioner asserts that the challenged claims would have been unpatentable on the following grounds:

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
28	103	Okada, Odendaal, Shima, Hui-027, Kook

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
29	103	Okada, Odendaal, Shima, Hui-027, Kook, Kazutoshi

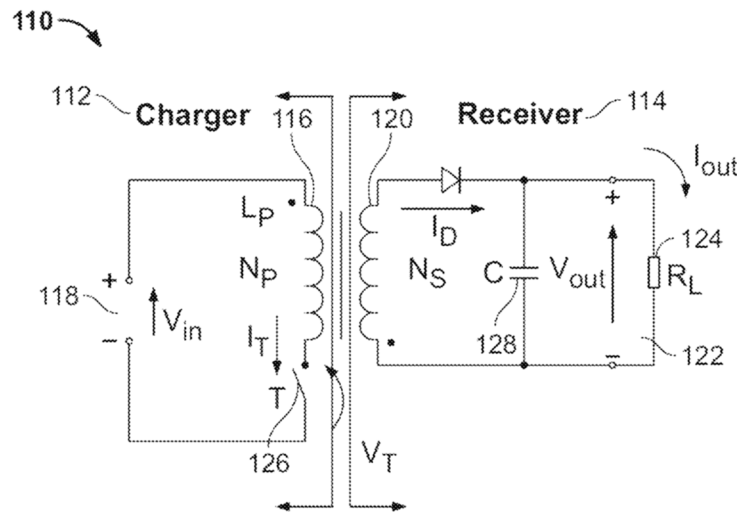
E. Technical Background and Overview of the '371 patent

The '371 patent is a continuation-in-part of U.S. application 11/669,113, filed January 30, 2007, and claims a benefit of priority directly and indirectly (via 11/669,113) to ten U.S. provisional applications filed through 2006 to 2008. Ex. 1001, 1:7–34. The '371 patent is directed to an inductive charging system for portable devices. *Id.* at code (57). Generally, the charging system includes a primary coil, drive circuit, sense circuit, and communication/control circuit. *Id.* Each portable device includes a receiver unit coupled to a battery, receiver coil inductively powered by the primary coil of the charging system, and communication/control circuit. *Id.* During charging, the inductive powering is modulated per communications from the portable device to the charging system. *Id.*

The “background” section (*id.* at 1:58) of the '371 patent discloses that inductive charging entails a voltage transformer whereby a first winding inductively powers a proximate but physically separated second winding, first electronics drive the first winding at an “appropriate” frequency, and second electronics rectify a DC voltage from the second winding. *Id.* at 3:2–10. The background section further discloses that a typical portable charging device cannot reliably align the included first winding with the respective second windings of different portable devices and cannot adapt to the respective power requirements of different portable devices. *Id.* at 3:13–51.

The “summary” section (*id.* at 3:53) of the ’371 patent discloses that the invention’s charging accordingly provides portable inductive charging whereby: a first winding of a charging device is powered by an alternating current; a proximate second winding of a rechargeable device inductively receives that power; DC power is rectified from the second winding by the rechargeable device; and logic of the rechargeable device communicates information to the charging device for improved charging. *Id.* at 3:55–4:36. For example, based on a “communication of information” via “current modulation” induced in the first winding by the second winding, an embodiment adjusts “the provision of power inductively to the portable device.” *Id.* at 4:45–5:10.

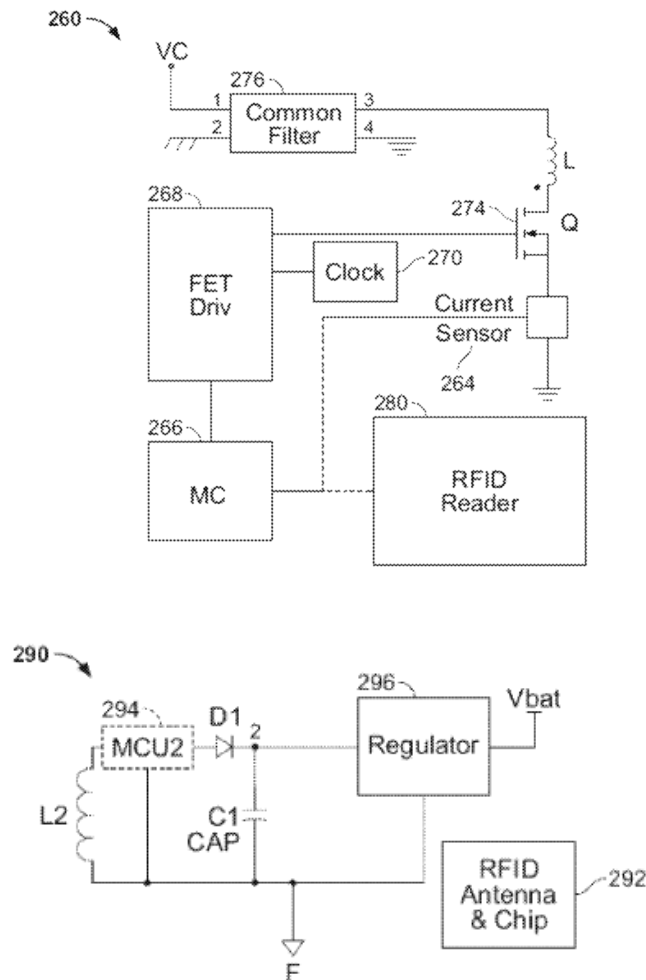
Figure 2, reproduced below, shows “main components of a typical inductive power transfer system 110.” *Id.* at 12:46–47.



In the charger 112, a MOSFET switch 126 is operated so as to power a coil 116 with AC voltage at an “appropriate operating frequency.” *Id.* at 12:50–54. In the receiver 114, a consequent voltage is generated in a

coil 120 and rectified (by a connected capacitor 128) to power a load 124.
Id. at 12:54–57.

Figures 10 and 11, reproduced below (seriatim), show circuit diagrams for detecting a rechargeable device and responsively activating a charging device. *Id.* at 23:44–49.



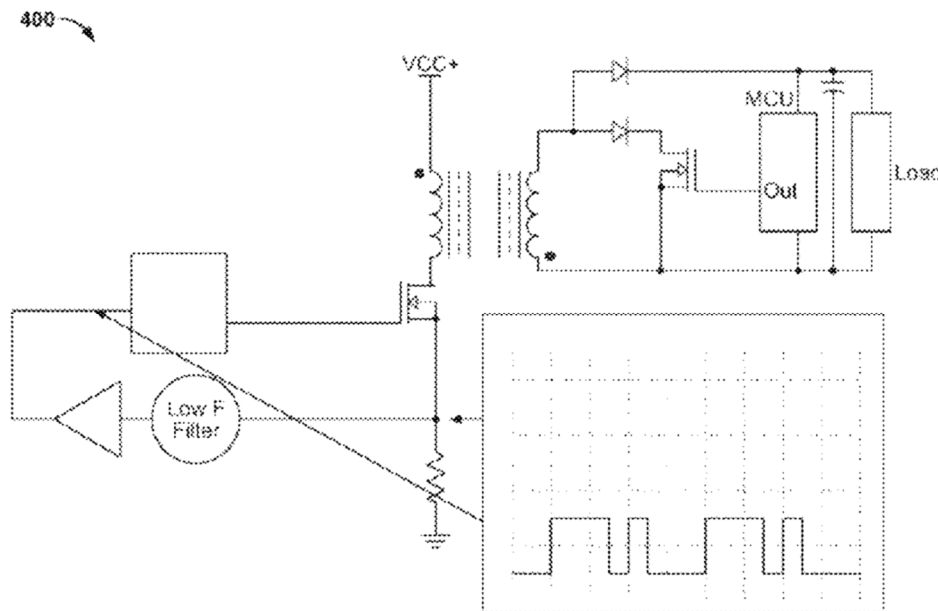
In the charging device (circuit 260) shown by Figure 10, a microcontroller MCU1 266 controls activation (enables or disables) of a FET driver 268, 274 that drives the charging coil L of the pad. *Id.* at 23:50–52, 24:2–4. The MCU1 266 activates the FET driver 268 based on

information received from an RFID reader 280, which reads corresponding information from an RFID tag of a nearby rechargeable device.

Id. at 23:53–56. The MCU1 266 monitors the current through the FET driver 268, 274 via a current sensor 264. *Id.* at 24:6–7.

In the rechargeable device (circuit 290) shown by Figure 11, and during activation of the charging device (i.e., of the FET driver 268 by the MCU1 266), a microcontroller MCU2 294 powers up and modulates current into the receiver (circuit 290). *Id.* at 24:32–43. A regulator 296 for charging the rechargeable battery draws the current in a pre-programmed manner. *Id.* at 24:36–38.

Figure 19, reproduced below, shows a circuit diagram for “identification verification” that ensures a rechargeable device is “valid” for charging by the charging device. *Id.* at 30:33–37.



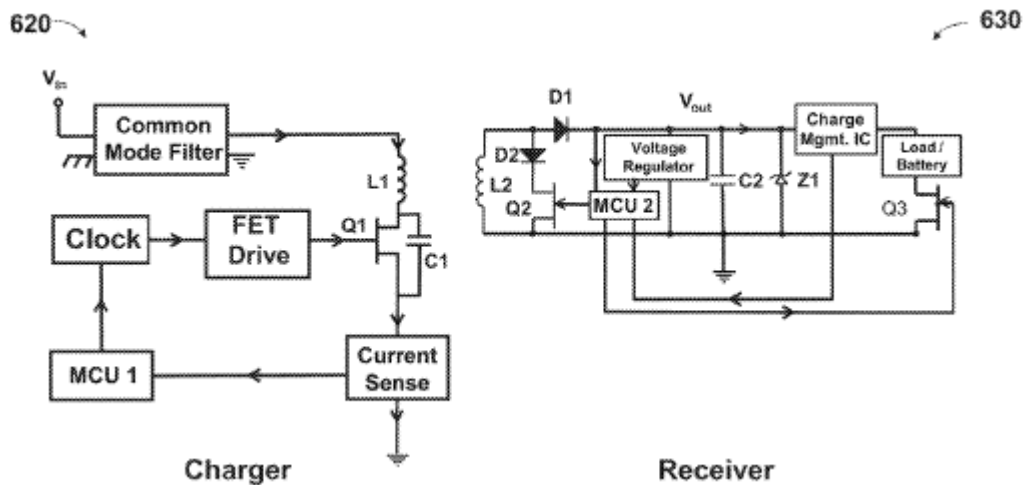
When the charging device is activated (“primary circuit is turned on”), an “initial signal” is generated in the charging device by the induction of the power into the rechargeable device (“signal is generated . . . as the circuit

induces power in the receiver”). *Id.* at 30:39–41. The initial signal is compared to information stored within the charging device (e.g., by the MCU1) to determine whether the rechargeable device “is valid for operation” with the charging device and to set the charging voltage. *Id.* at 30:41–48.

The ’371 patent describes the invention’s above “feedback designs” as entailing “actual communication between the receiver [(rechargeable device)] and the primary [(charging device)] as to voltage requirements” and as being either an “open loop design” or a “closed loop design.”

Id. at 30:19–22. “In an open loop design, the charging device, pad or power source provides the power to the primary, which is then inductively transferred to the receiver and the mobile device or battery other device to be charged[; t]he primary itself determines how much power should be received at the receiver.” *Id.* at 30:22–25. “In a closed loop design, . . . , the device/receiver communicates information back to the primary[] and then the primary determines how much power should be sent to the receiver.” *Id.* at 30:27–31.

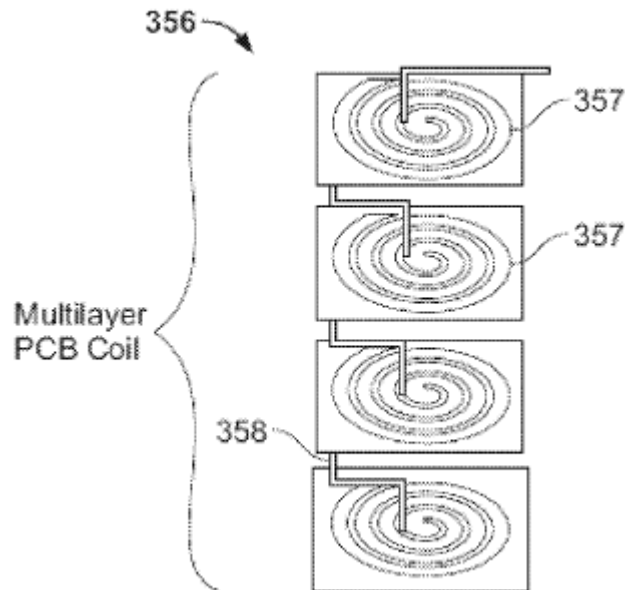
Figure 28, reproduced below, shows a “more sophisticated charger” whereby a “primary” stage (charging device) and “secondary” stage (rechargeable “receiver” device) wireless communicate via the same coil that inductively transfers to power. *Id.* at 33:39–48.



In the receiver 630, a microcontroller MCU2 controls a switch Q2 to modulate power inductively received by the secondary stage 630 from the primary stage 620. *Id.* at 33:49–56. The received power is rectified, filtered, and then passed to a charge management controller for output to a chargeable battery. *Id.* at 33:57–58, 33:64–66. The microcontroller MCU2 monitors the voltage output V_{out} to the charge management controller and accordingly modulates the voltage output V_{out} (by controlling a switch Q2) so as to stay within a pre-programmed range. *Id.* at 34:10–15.

In the charger 620, a microcontroller MCU1 receives feedback of the voltage output V_{out} within the secondary stage. *Id.* at 33:43–46. The feedback chain entails: modulating of the voltage output V_{out} by the secondary stage; the consequent change to the impedance of the secondary stage; the consequent change to the current through the coil $L1$ of the primary stage; and the consequent change to a “current sense” connecting the MCU1 and the charging coil $L1$. *Id.* at 34:18–21.

Figure 18, reproduced below, shows a “stacking [of] coils . . . to achieve higher flux densities.” *Id.* at 27:37–39.



Multiple coils are formed in respective, separate layers and interconnected 358 to form a multi-layer PCB coil 356 containing many turns of the coil 356 to increase inductive transfer of power. *Id.* at 27:66–28:5. “By altering the dimensions of the coil in each layer (including the thickness, width, and number of turns) and by stacking multiple layers, the resistance, inductance flux density, and coupling efficiency for the coils can be adjusted so as to be optimized for a particular application.” *Id.* at 27:43–47.

F. Challenged Claims

Claims 28 and 29 are challenged. Claim 28 is independent. Claim 29 depends from claim 28. Claim 28 is reproduced below.¹

¹ To further differentiate the claim limitations, we have minimally reformatted the claim and included Patent Owner’s alphanumeric identifiers of limitations (Prelim. Resp. 8–11).

28(a) A system for providing power inductively to a portable device comprising a battery and an inductive receiver unit including a receiver coil and a receiver circuit, the system comprising:

28(b) a primary coil that is substantially planar and parallel to a surface of the system for providing power inductively to the portable device, wherein the primary coil comprises a flexible Printed Circuit Board (PCB), multi-turn coil having multiple layers of substantially similar patterns of substantially spiral-shaped conductors of 1 to 4 ounce copper thickness for each layer and having coil patterns electrically connected with vias between the layers;

28(c)(1) a drive circuit, including a FET driver, a capacitor and a FET switch, coupled to a DC voltage input and coupled to the primary coil,

28(c)(2) wherein during operation the drive circuit is configured to apply an alternating electrical current to the primary coil at an operating frequency within a range of 100 kHz to 1 MHz and duty cycle to generate an alternating magnetic field in a direction substantially perpendicular to the surface of the primary coil to provide power inductively to the portable device;

28(d) a sense circuit to monitor current flow through the primary coil during operation of the drive circuit to sense a current modulation in the primary coil from a modulation of a current in the receiver coil; and

28(e) a communication and control circuit, including a microcontroller coupled to the drive circuit and the sense circuit, configured to:

28(f) detect, through the sense circuit, a received communication of information in the current modulation in the primary coil;

28(g) operate the drive circuit to inductively transfer sufficient power to the inductive receiver unit to activate and power the receiver circuit to enable the

receiver circuit to communicate the information in the current modulation in the primary coil;

28(h) from the information communicated by the receiver circuit, determine a power parameter; and

28(i) operate the drive circuit according to the power parameter to provide power inductively from the primary coil to the receiver coil to power the microcontroller and to charge the battery of the portable device,

28(j) wherein the communication and control circuit is further configured to:

receive additional information in the current modulation in the primary coil from modulation of the current in the receiver coil corresponding to a voltage or current at an output of the receiver circuit while charging the battery of the portable device; and

28(k) regulate in a closed loop feedback manner, the voltage or current at the output of the receiver circuit in accordance with the received additional information corresponding to the voltage or current at the output of the receiver circuit by adjusting at least one of the operating frequency, the duty cycle, and the DC voltage input to the drive circuit during charging of the battery of the portable device.

Ex. 1001, 78:59–79:3.

II. ANALYSIS

A. Burdens of Proof

“In an IPR, the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.” *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C.

§ 312(a)(3) (requiring *inter partes* review petitions to identify “with particularity . . . the evidence that supports the grounds for the challenge to each claim”)); *Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015) (discussing the burden of proof in *inter partes* review). At the institution phase of an *inter partes* review, Petitioner’s burden is to show that “there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” 35 U.S.C. § 314(a).

B. Level of Ordinary Skill in the Art

Petitioner asserts a person of ordinary skill in the art (“POSA” or “POSITA”) would have had “at least a master’s degree in electrical engineering, or a similar discipline, and two or more years of experience with wireless charging systems, including, for example, inductive power transfer systems” and that “[m]ore education can supplement practical experience and vice versa.” Pet. 4 (citing Ex. 1002 ¶¶ 20–21).

Patent Owner does not challenge Petitioner’s proposed level of skill. Prelim. Resp. 11. We adopt Petitioner’s definition for purposes of this Decision.

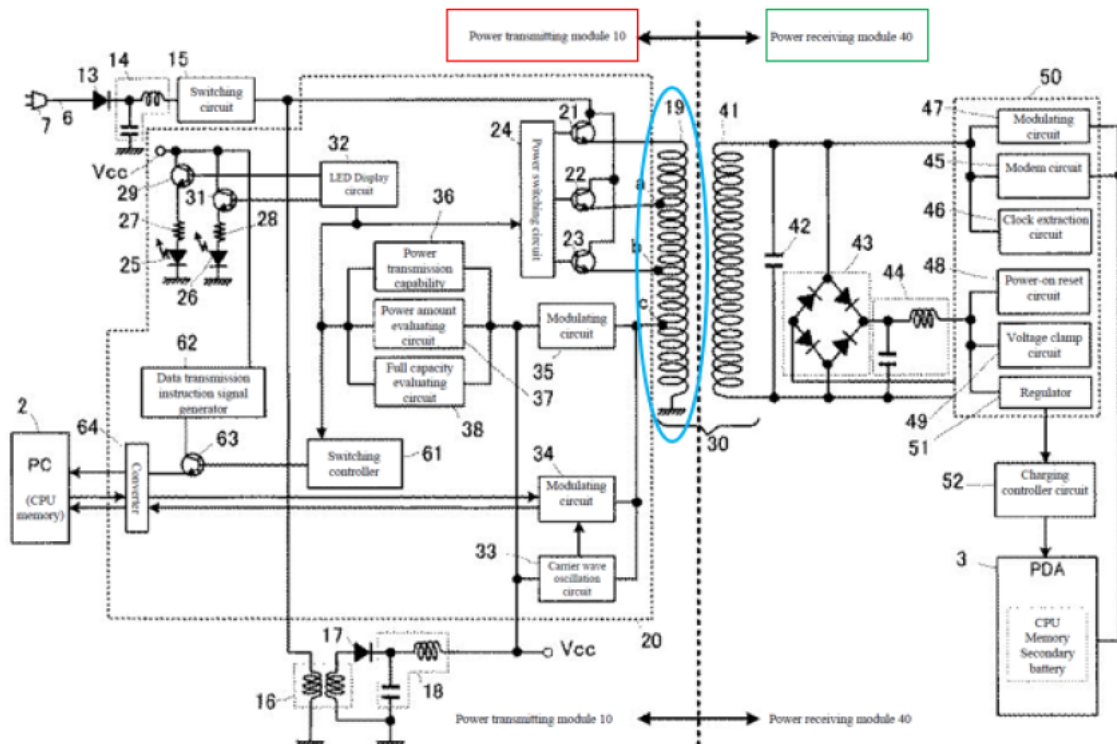
C. Claim Construction

The parties assert that no claims require construction. Pet. 5; Prelim. Resp. 10. We do not construe any terms at this time.

D. Asserted Obviousness in View of Okada, Odendaal, Shima, Hui-027, and Kook (Claim 29)

1. The Parties' Positions on Combining Okada and Odendaal

Petitioner asserts that Okada, Odendaal, Shima, and Hui-027 disclose the claimed primary coil that is substantially planar and has multiple layers of substantially similar patterns of spiral-shaped conductors electrically connected with vias. Pet. 14–28. Petitioner first points out that Okada's system includes primary coil 19 that uses switches 21, 22, and 23 to provide selected power levels to the portable device through induction. *Id.* at 15. Figure 2 of Okada, depicting this arrangement, is reproduced below with Petitioner's added annotations:



Pet. 15. Figure 2 of Okada shows power transmitting module 10 on the left side of a vertical dashed line and power receiving module 40 on the right.

Ex. 1005 ¶ 40. Power is transmitted inductively between coil 19 of transmitting module 10 and coil 41 of receiving module 40. *Id.* The power transmitting module 10 is able to transmit different levels of power by turning on or off FET switches 21, 22, and 23, which activate different portions of coil 19. *Id.*

Petitioner asserts that Okada does not expressly state that the primary coil 10 is substantially planar. Pet. 16. Petitioner asserts, however, that planar coils were known in the art. *Id.* at 16–17. In particular, Petitioner directs our attention to Odendaal to teach planar-type inductor coils in an inductive power transfer system. *Id.* at 17–19. Petitioner asserts that it would have been obvious to modify Okada’s coils to be planar, as taught in Odendaal, to reduce the size of the coils, save weight, expand the usefulness of Okada, and for promoting efficient energy transmission. *Id.* at 19. Petitioner asserts that “such a modification would have involved known technologies/techniques” “to yield [a] predictable result.” *Id.* at 20.

Petitioner next asserts it would have been obvious to use multiple layers of planar coils based on the teachings of Odendaal and Shima (*see generally id.* at 20–24), and specifically to electrically connect those layers using vias (*id.* at 21–22).

On the topic of combining Okada and Odendaal, Patent Owner argues that the proposed combination would present a number of issues for a person of ordinary skill in the art to solve in order to maintain operability of the device. Prelim. Resp. 33. Patent Owner asserts that Okada uses different portions of the coil to perform different functions, such as communications, alignment, and power transfer. *Id.* at 35–38. Patent Owner argues that it is the multi-tapped configuration of Okada that provides these features. *Id.*

Patent Owner argues that none of the prior art references teach multi-tapped coils compatible with Okada. *Id.* at 39–45.

2. *Our Analysis for Claim 28*

Having reviewed the arguments and evidence before us, we determine that a dispositive issue is whether Petitioner has shown a reason to combine Okada and Odendaal in the manner proposed. Accordingly, our analysis focuses only on Petitioner’s combination.

As explained in further detail above, Okada uses a multi-tapped coil in order to vary the amount of power delivered. In particular, the various taps to the coil are activated by FET switches 21, 22, and 23. Ex. 1005 ¶¶ 40, 51. Petitioner proposes to modify the coils of Okada to be planar, as taught in Odendaal (and Shima). Pet. 14–24. Although Petitioner characterizes this as using “known technologies/techniques” which “yield [a] predictable result” (*id.* at 20), Petitioner has not shown this to be the case. Notably, Petitioner does not assert that Odendaal and/or Shima use multi-tapped planar coils. Adding the teachings of these references to create a multi-tapped planar coil results in a new arrangement not shown in the art presented in this record. Petitioner’s proposed combination does not “unite[] old elements with no change in their respective functions” or “simply arrange[] old elements with each performing the same function it had been known to perform.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 416–417 (2007) (quoting *Great Atlantic & Pacific Tea Co. v. Supermarket Equipment Corp.*, 340 U.S. 147, 152–153 (1950) and *Sakraida v. Ag Pro, Inc.*, 425 U.S. 273, 282 (1976)). Petitioner’s unsupported assertion that the combination

uses “known technologies/techniques,” therefore, is insufficiently persuasive for purposes of institution.

To the extent Petitioner is implying that this new arrangement is nevertheless predictable or has a reasonable likelihood of success (*see, e.g.*, Pet. 20), Petitioner provides insufficient evidence to support that assertion. Petitioner’s expert discusses the proposed combination in his declaration, but does not address the fact that Okada uses a multi-tapped coil. *See generally* Ex. 1002 ¶¶ 115–120. Petitioner (and its expert) cannot persuasively assert predictability for an arrangement they have not discussed.

Further, the proposed combination, on this record, raises a concern over the operability of the proposed combination. *In re Urbanski*, 809 F.3d 1237 (Fed. Cir. 2016) (“if references taken in combination would produce a seemingly inoperative device such references teach away from the combination and thus cannot serve as predicates for a *prima facie* case of obviousness.”) (cleaned up); *Plas-Pak Industries, Inc. v. Sulzer Mixpac AG*, 600 F. App’x. 755, 758 (Fed. Cir. 2015) (“combinations that change the basic principles under which the prior art was designed to operate, or that render the prior art inoperable for its intended purpose, may fail to support a conclusion of obviousness.”) (cleaned up). As we discussed above, Okada uses a multi-tapped coil, but Petitioner has not established that using planar coils works in this multi-tapped arrangement. Moreover, when considering the fact that Petitioner asserts that the planar coils are connected using vias (Pet. 21–24), it appears Petitioner’s combination creates coils that are electrically joined, in contraposition to a coil having multiple taps energizing different sections of the coil. It is unclear to us that such a device would

function, because it suggests major changes to, or removal of, the multi-tapped coil that underpins the functionality in Okada. *Cook Grp. Inc. v. Bos. Sci. Scimed, Inc.*, 809 F. App'x 990, 1001 (Fed. Cir. 2020) (“the Board properly weighed the loss of key functions as a relevant factor in the motivation to combine analysis”). Petitioner has not discussed these changes in its analysis. As a whole, the combination raises questions about its operability, further lending to the view that Petitioner has not established a reasonable likelihood of success.

Finally, we also note that the generic rationales that Petitioner has offered (*see, e.g.*, Pet. 19, alleging advantages in device size/weight, expanded/enhanced applications, and efficient energy transmission) have no connection to, nor do they explain, the change in operation of Okada resulting from replacing a multi-tapped coil with the planar coils that are shown in Odendaal and Shima.

We are cognizant of the Federal Circuit’s instruction that “the inquiry is not whether a relevant artisan would combine a first reference’s feature with a second reference’s feature to meet requirements of the first reference that are not requirements of the claims at issue.” *Axonics, Inc. v. Medtronic, Inc.*, 73 F.4th 950, 957 (Fed. Cir. 2023). First, we note that our Decision here, unlike in *Axonics*, is not a determination on patentability, but rather a determination of whether we institute an *inter partes* review. Thus, we consider here the likelihood of success for a position that lacks explanation and evidence. Second, our analysis properly focuses on whether a person of ordinary skill in the art would have combined elements from specific references to arrive at the claimed invention (which has planar coils). We determine that it does not because, for the reasons explained above,

Petitioner provides no reason (beyond hindsight) explaining why a person of ordinary skill in the art would have made a combination to include planar coils that appears unworkable and mixes incompatible features of the two different coil arrangements without sufficient explanation to justify their combination.

For the reasons expressed above, we determine that Petitioner has not demonstrated a reasonable likelihood of success in showing that the subject matter of claim 28 would have been obvious to a person of ordinary skill in the art. Claim 29 depends from claim 28, and Petitioner relies on the same combination of Okada and Odendaal. *See generally* Pet. 65–72. Accordingly, the same reasons as claim 28, Petitioner has not demonstrated a reasonable likelihood of success for claim 29.

III. CONCLUSION

For the reasons given above, we find that Petitioner has not established a reasonable likelihood of success in showing that any challenged claim is obvious in view of the grounds presented in the Petition.² Accordingly, we do not institute *inter partes* review. 35 U.S.C. § 314(a).

IV. ORDER

In consideration of the foregoing, it is hereby ordered that the Petition is *denied*, and that no trial is instituted.

² Because Petitioner has not established a reasonable likelihood of success, we do not reach the issue of discretionary denial.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SAMSUNG ELECTRONICS CO., LTD.,
Petitioner,

v.

MOJO MOBILITY INC.,
Patent Owner.

IPR2023-01094
Patent 11,316,371 B1

McNAMARA, *Administrative Patent Judge*, concurring.

I write separately to state that, consistent with the decision in *Samsung Electronics Co., Ltd. v. Mojo Mobility Inc.*, IPR2023-01094, I would decide this case exercising discretion to deny institution under 35 U.S.C. § 314(a). Consistent with the decision in IPR2023-01094, I am not persuaded that Petitioner has put forth compelling evidence of unpatentability of the challenged claims.

Therefore, I concur in the result that denies institution.

IPR2023-01097
Patent 11,316,371 B1

FOR PETITIONER:

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

FOR PATENT OWNER:

Steven J. Pollinger
Ryan McBeth
George Fishback
Christopher P. McNett
MCKOOL SMITH, P.C.
spollinger@mckoolsmith.com
rmcbeth@mckoolsmith.com
gfishback@mckoolsmith.com
cmcnett@mckoolsmith.com