

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

INDUCTEV, INC.
Petitioner,

v.

WITRICITY CORPORATION,
Patent Owner.

Case IPR2024-00140
Patent 8,466,654

PATENT OWNER'S PRELIMINARY RESPONSE TO PETITION

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EXHIBIT LIST

Ex. 2001 Declaration of Dr. Mark N. Horenstein

Ex. 2002 CV of Dr. Mark N. Horenstein

Ex. 2003 Wiley Electrical and Electronics Engineering Dictionary Excerpts

Ex. 2004 McGraw-Hill Dictionary of Scientific and Technical Terms Excerpts

I. INTRODUCTION

The invalidity grounds raised by Petitioner fail because Petitioner (1) fundamentally mistakes the traditional transformer structure of the cited Odachi reference (Ex. 1005) for the transmitting and receiving “antennas” recited in the challenged claims, and (2) improperly cobbles together disparate teachings of the cited Ross reference (Ex. 1007) to manufacture an argument that the challenged claims are anticipated by Ross. Odachi utilizes primary and secondary windings wrapped around an E-shaped core to form a traditional transformer that generates a voltage at the secondary winding based on the magnetic flux contained in the core. By contrast, the challenged claims use antennas having a primary coil that produces a near-field component of flux into free space that is intercepted by a second coil to effect resonant inductive coupling. Because one skilled in the art would understand the fundamental difference between a transformer and an antenna, Petitioner has failed to show that Grounds 1a-1c present a reasonable likelihood that Petitioner will prevail with respect to at least one claim.

Ross, which shares an overlapping disclosure with prior art that was already considered by the Examiner, fails to disclose detecting a degree of coupling between a receiving antenna and a transmitting antenna at a first alignment position, and then moving the receiving antenna or transmitting antenna to a second alignment position to improve the degree of coupling in response to the

degree of coupling detected at the first alignment position, as recited in claims 8 and 13. The portion of Ross cited by Petitioner uses optical position sensors to auto-steer a vehicle into a first position in a loading/unloading zone, and uses conventional electronic positioning devices for finer alignment into a designed stop position. Ross discloses a separate embodiment that measures amplitude at the receiving antenna to maintain the receiving antenna in position while the vehicle is being driven down the road, but this embodiment has nothing to do with the parking embodiment that uses optical position sensors. Petitioner's improper attempt to combine embodiments does not establish reasonable likelihood that Petitioner will prevail with respect to at least one claim, so the institution should be denied.

II. OVERVIEW OF THE '654 PATENT

A. The '654 Patent

On June 18, 2013, the '654 Patent, titled "Wireless High Power Transfer Under Regulatory Constraints," was duly and lawfully issued by the United States Patent and Trademark Office. The '654 Patent claims priority to Provisional Application No. 61/078,812, filed on July 8, 2008. WiTricity is the owner of the '654 Patent by assignment. The '654 Patent discloses and claims resonant inductive coupling systems and methods for an improved battery charging system for electric vehicles by, among other things, using transmitting and receiving

antennas, a charging control system, and an alignment controller to further align the electric vehicle based on the degree of coupling between the transmitting and receiving antennas. Of the challenged claims, claims 1, 8, and 13 are independent. Independent claim 13 of the '654 Patent is reproduced below:

13. A method, comprising:

guiding a receiving antenna of a vehicle to a first alignment position relative to a transmitting antenna;

responsive to detecting a degree of coupling in the first alignment position between the receiving antenna and the transmitting antenna that is measured at the receiving antenna, moving one of the receiving antenna and the transmitting antenna from the first alignment position to a second alignment position to improve alignment of the receiving antenna with the transmitting antenna and improve the degree of coupling.

B. Relevant Prosecution History

During prosecution of the '654 Patent, the Examiner considered and cited prior art containing the same disclosure that Petitioner now relies on in Ground 2 of the Petition. More specifically, in a March 16, 2012 Office Action, the Examiner cited U.S. Patent No. 5,573,090 to Ross (Ex. 1011; "Ross-090") for allegedly disclosing "a guidance control, which automatically provides guidance information for guiding a vehicle to a location where said receiving antenna is better aligned with a transmitting primary antenna," which was recited in original dependent claims 17 and 23. Ex. 1002 at 124. Ross-090 names the same inventor as, and contains overlapping disclosures with, U.S. Patent No. 5,669,470 (Ex.

1007; “Ross”) that Petitioner now relies on to allege that claims 8-10, 12-14, 16, and 19 are invalid.

In response to the March 16, 2012 Office Action, Applicant amended independent claims 1, 15, and 27 to recite adjusting the positioning of the transmitting antenna (claim 1), receiving antenna (claim 15), or either the transmitting or receiver antenna (claim 27) based on a measurement indicative of the coupling between the transmitting and antennas, as measured at the receiving antenna. Ex. 1002 at 139-142. Applicant specifically argued that Ross does *not* teach or suggest detecting coupling of the receiving antenna to the transmitting antenna “based on a measurement indicative of the coupling that is measured at the receiving antenna” and adjusting the position “from the first alignment position to a second alignment position having a finer alignment.” Ex. 1002 at 144-145.

In the next Office Action, the Examiner agreed that Ross-090 does not disclose this feature, but relied on a different reference (U.S. Patent No. 5,821,731 to Kuki et al.) for allegedly disclosing this feature. Ex. 1002 at 155-156.

Applicant was able to overcome the rejection by arguing that none of the cited references (including Ross-090) disclose or suggest detecting the degree of coupling in the first alignment position, and adjusting the x-y alignment of the transmitting antenna (or receiving antenna, as recited in issued claim 13) to a

second position based on the degree of coupling in order to improve the coupling.
Ex. 1002 at 177-180, 212.

In the Petition, Petitioner relies on a portion of Ross disclosing that “the vehicle coil can be ‘laterally moved in one direction or the other’ while ‘monitoring the change in the amplitude of the inductively receiving power signal’ at the vehicle coil.” Pet. at 49 (quoting Ex. 1007 at 13:15-32). But the relied upon portion of Ross is also included in Ross-090, which the Examiner found did not disclose this feature. *Compare* Ex. 1011 at 14:49-65 *with* Ex. 1007 at 13:15-31. As discussed further below, the Examiner correctly determined that the portion of Ross relied upon by Petitioner does not disclose or suggest the claimed feature of “responsive to detecting a degree of coupling in the first alignment position between the receiving antenna and the transmitting antenna that is measured at the receiving antenna, moving one of the receiving antenna and the transmitting antenna from the first alignment position to a second alignment position to improve alignment of the receiving antenna with the transmitting antenna and improve the degree of coupling,” as recited in claim 13.

III. STANDARD FOR GRANTING INTER PARTES REVIEW

The Board may grant a petition for inter partes review only where “the information presented in the petition ... shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least one of the claims

challenged in the petition.” 35 U.S.C. §314(a); 37 C.F.R. §42.108(c). The petitioner must show with particularity why each challenged claim is unpatentable. *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016); 35 U.S.C. § 312(a)(3); 37 C.F.R. § 42.104(b). The petitioner bears the burden of showing that this statutory threshold has been met. *See* Office Patent Trial Practice Guide, 77 Fed. Reg. 48,756, 48,756 (Aug. 14, 2012). Critically, Petitioners must fulfill this burden based on “information presented in the petition” (35 U.S.C. §314(a)), and the law forbids Petitioners from subsequently adding theories/arguments that should have been part of their initial Petition. *Intelligent Bio-Systems, Inc. v. Illumina Cambridge, Ltd.*, 821 F.3d 1359, 1369 (Fed. Cir. 2016) (citing to 35 U.S.C. § 312) (“It is of the utmost importance that petitioners in the IPR proceedings adhere to the requirement that the initial petition identify ‘with particularity’ the ‘evidence that supports the grounds for the challenge to each claim.’”); *see also* *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2154 (2016) (Alito, J. concurring in part and dissenting in part) (“Thus, if a petition fails to state its challenge with particularity—or if the Patent Office institutes review on claims or grounds not raised in the petition—the patent owner is forced to shoot into the dark. The potential for unfairness is obvious.”). Moreover, as part of the petitioner’s burden, the petition must state how a challenged claim is to be construed and how each element of the construed claim is found in prior art patents

or printed publications. 37 C.F.R. §§ 42.104(b)(3)–(4). The burden of persuasion never shifts to the patent owner. *Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015).

IV. SUMMARY OF ALLEGED GROUNDS OF UNPATENTABILITY

Petitioner does not challenge claims 2, 3, 11, and 17 of the ’654 Patent.

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

Claims Challenged	Statutory Basis	Cited References
13 and 15 (Ground 1a)	§102	Odachi ¹
1, 7, and 18 (Ground 1b)	§103	Odachi and Wang ²
4-6 (Ground 1c)	§103	Odachi, Wang, and Partovi ³
8-10, 12-14, 16, and 19 (Ground 2)	§103	Ross ⁴ , alone or with Wang

Petitioner also supports its challenge with a Declaration of Professor Allen. Ex. 1003.

¹ Ex. 1005.

² Ex. 1008.

³ Ex. 1006.

⁴ Ex. 1007.

V. CLAIM CONSTRUCTION

All claim terms in this proceeding are to be construed according to the *Phillips* standard. *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005); 37 C.F.R. §42.100. Petitioner failed to propose any claim construction for any claim terms in the '654 Patent. As will be shown below, there are numerous defects in the Petition, including Petitioner's failure to construe the terms "transmitting antenna" and "receiving antenna."⁵ For purposes of this Preliminary Response, Patent Owner discusses the proper construction of "transmitting antenna" and "receiving antenna" only, but reserves the right to propose constructions for additional claim terms.

Independent claims 1, 8, and 13 all recite a transmitting and/or receiving "antennas." The term is a well-known technical term that is defined by many technical dictionaries. For example, the authoritative IEEE Wiley Electrical and Electronics Engineering dictionary defines an antenna as, "a device that radiates and/or receives radio waves." *See* Ex. 2001 (Declaration of Dr. Mark Horenstein ("Horenstein Decl.)) at ¶25; Ex. 2003 at 29. The '654 patent specification discusses a certain type of antenna, called a loop antenna. *See e.g.*, Ex. 1001 at Figs. 3-4, 2:59-3:13. Loop antennas are typically formed by a coil of wire. *See id.*; Horenstein

⁵ Patent Owner reserves the right to make claim construction arguments regarding additional terms in this and other proceedings.

Decl. at ¶21. A transmitting antenna may be formed by one coil of wire (i.e., a primary coil), and a receiving antenna may be formed by another coil of wire (i.e., a secondary coil), with the coils separated by air, without any intervening solid material. Horenstein Decl. at ¶22. The '654 patent specification similarly describes antennas that may be “capacitively loaded wire loops or multi-turn coils.” Ex. 1001 at 1:15-17.

When an AC power source is applied to the primary coil, a magnetic field is generated by the primary coil. The magnetic field lines circulate around the primary coil, and also pass through the secondary coil of the receiving antenna. According to Faraday’s law, the magnetic field passing through the secondary coil induces a voltage in the secondary coil, which may drive a load coupled to the secondary coil. In this way, power is transferred from the primary coil to the secondary coil by inductive coupling. *See* Horenstein Decl. at ¶22.

The magnetic flux lines produced by the primary coil include “near-field” radio waves, which stay close to the primary coil, and “far-field” radio waves that propagate long distances from the primary coil. *See* Ex. 1001 at 3:43-48; Horenstein Decl. at ¶¶23-24. As the '654 patent explains, localized wireless power transfer systems couple “a large portion of the energy in the near-field of the transmitting antenna to a receiving antenna rather than propagating most of the energy in an electromagnetic wave to the far field.” Ex. 1001 at 2:31-35; *see also id.* at 3:19-23.

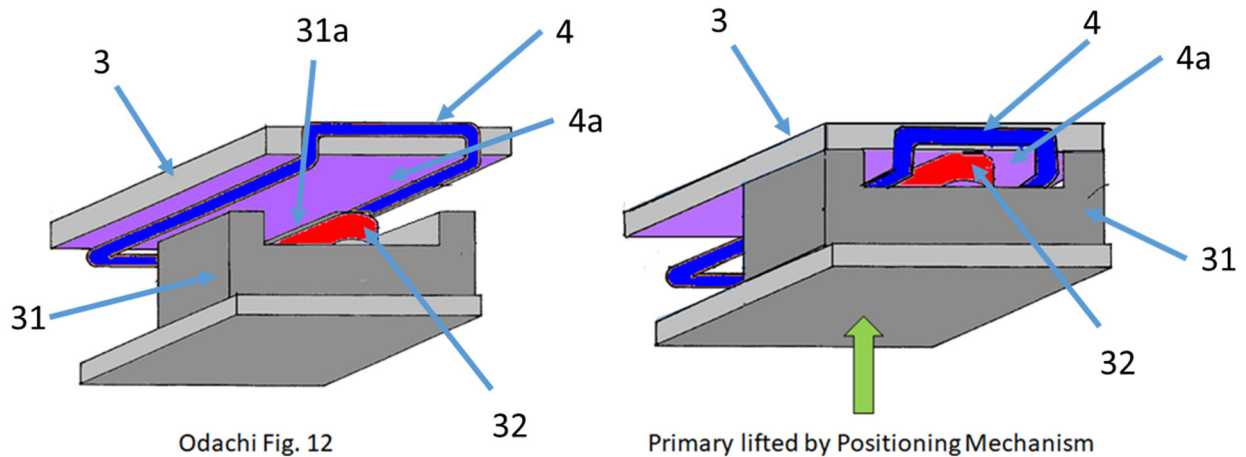
Based on the '654 patent specification and the well understood definition of “antenna,” one skilled in the art would understand a “transmitting antenna” as used in the wireless power transfer context of the '654 patent to mean “a primary coil that produces a near-field component of flux into free space that is intercepted by a secondary coil to effect resonant inductive coupling.” Horenstein Decl. at ¶26. One skilled in the art would similarly understand a “receiving antenna” as used in the wireless power transfer context of the '654 patent means “a secondary coil that intercepts and receives a near-field component of flux in free space that is generated by a primary coil to effect resonant inductive coupling.” *Id.*

**VI. THE PETITION FAILS TO DEMONSTRATE A REASONABLE
LIKELIHOOD THAT ANY CLAIM OF THE '654 PATENT IS
UNPATENTABLE**

**A. Ground 1a: Odachi Does Not Anticipate Claims 13 (independent)
or 15 (dependent on Claim 13) At Least Because Odachi Does Not
Disclose a “Transmitting Antenna” or “Receiving Antenna”**

Odachi discloses an inductive electric vehicle battery charging system that includes a device for positioning a primary core-coil device relative to a secondary core-coil device. *See* Ex. 1005 at 1:7-13. Odachi discloses a ground battery charger 210 that includes a primary inductive device 230 that includes a core 31 and a coil 32. *See id.* at 8:16-19. The core 31 of the primary inductive device 230 has an E-shaped cross section, and the coil 32 is wound around the center

projection 31a (shown in FIG. 7, and annotated FIG. 12 below) of the E-shaped core 31. *See id.* at 8:40-43.



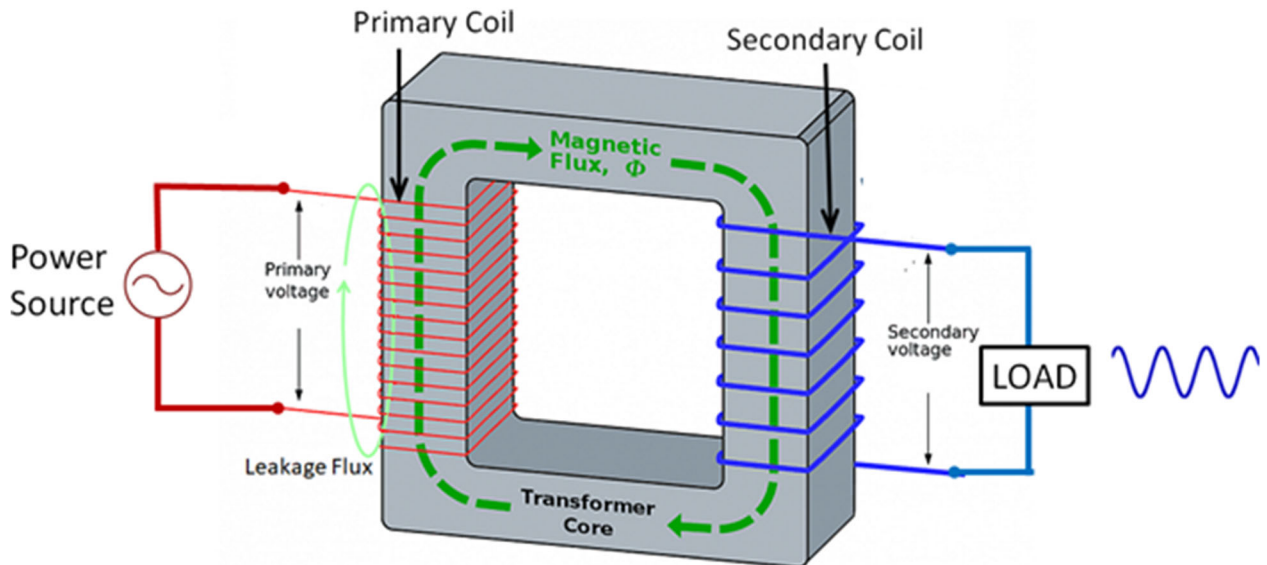
A secondary coil 4 may be located on the vehicle to be charged. The secondary coil has a cavity 4a that is sized so that the primary coil 32 can fit within the cavity 4a when the primary coil 32 engages the secondary core-coil device to “form a magnetic circuit.” *Id.* at 8:43-48. More specifically, once the primary inductive coupler is aligned with the secondary inductive coupler, the primary inductive coupler “is moved upward until the primary core 31 is *brought into contact* with the secondary core 3 and the primary coil 32 [is] placed within the cavity 4a defined by the secondary coil 4.” *Id.* at 9:49-51; *see also id.* at 11:60-12:7. Once the primary core 31 is in contact with the secondary core 3, a charging current is supplied to the primary coil 32, which induces a current in the secondary coil 42. *See id.* at 12:8-19; 7:29-35.

The receiving or secondary coil of Odachi is not a “receiving antenna,” as recited in claim 13 of the ’654 patent. As an initial matter, Odachi does not use the word “antenna” even once. But as a substantive matter, Odachi describes a traditional transformer, not an antenna. As Dr. Horenstein explains, a person of skill in the art would understand that a “transformer” is a device that is utilized to transfer electrical energy from one circuit to another via magnetic or electromagnetic induction. A transformer consists of two or more coils of wire **separately wrapped around a magnetic core**, and it has no moving parts. *See* Horenstein Decl. at ¶27.⁶ Thus, in contrast to inductive coupling via antennas, a transformer achieves wireless inductive coupling by relying on a magnetic core structure, usually made from ferrite composite. The core directs and contains the magnetic flux lines, thus ensuring that nearly all of them reach the secondary winding except for a small amount of leakage flux. *See Id.*

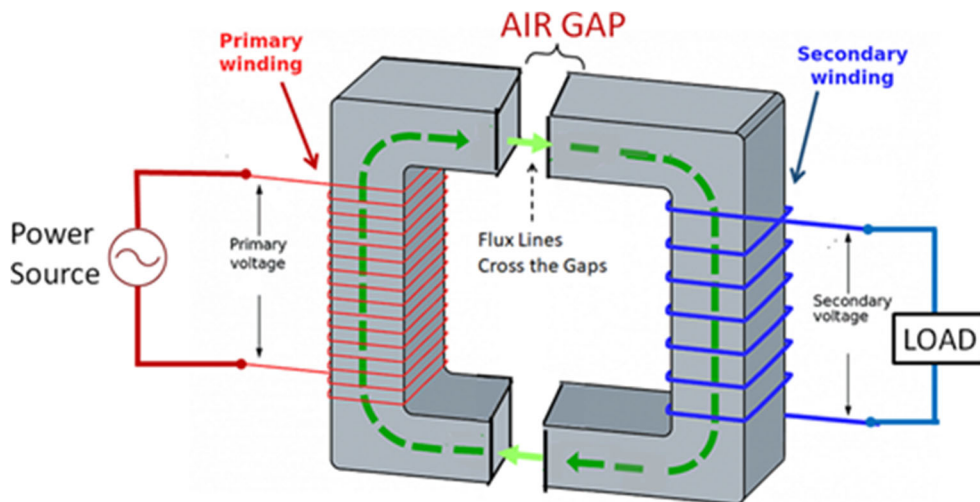
For example, consider the depiction of transformer below. When energized, the primary coil (red) produces magnetic flux lines that pass through the secondary coil (blue) via the core, to induce a voltage across the secondary coil. *See Id.* In a

⁶ The Wiley IEEE dictionary defines “transformer” as: “A component or device which is utilized to transfer electrical energy from one circuit to another via magnetic or electromagnetic induction. A transformer has no moving parts and consists of two or more coils of wire separately wrapped around a magnetic core.” Ex. 2003 at 798.

practical transformer, a small amount of leakage flux (light green) may be produced by the primary but not be contained in the core.



As shown below in a second example, the transformer core may be made from two sections separated by an air gap:



For this latter case, the flux lines will still be contained within the core and will simply bridge the air gap but otherwise remain within the core. *See Id.* at ¶28.

Thus, in contrast to inductive coupling via antennas, wherein flux lines are not contained within a core, a transformer achieves wireless inductive coupling by relying on a magnetic core structure, usually made from ferrite composite. The core directs and contains the magnetic flux lines, thus ensuring that nearly all of them reach the secondary except possibly for a small amount of leakage flux. *See Id.* at ¶¶27-28.

Referring again to Odachi, the primary core 31 and the secondary core 3 are brought into contact to create a “magnetic circuit” (i.e., transformer) that induces a current in the secondary coil. Ex. 1005 at 9:49-51, 11:60-12:7, 8:43-48. As one skilled in the art would understand, the secondary coil and the core in Odachi do not comprise a “receiving antenna,” because the current induced in the secondary coil is not “generated by a near-field component of flux in free space,” but is instead induced by flux contained with the shared magnetic core formed by bringing the primary core 31 and secondary core 3 into contact. *See Horenstein Decl.* at ¶¶29-33. Likewise, one skilled in the art would understand that the primary coil and core of Odachi is not a “transmitting antenna” because it does not “produce a near-field component of flux into free space that is intercepted by a secondary coil to effect resonant inductive coupling.” *See id.*

Therefore, because Odachi does not disclose a “receiving antenna” or “transmitting antenna,” as recited in claim 13, Odachi does not anticipate claim 13.

B. Ground 1b: Odachi and Wang Do Not Disclose the Transmitting and Receiving Antennas of Claim 1, or dependent Claims 7 and 18.

For Ground 1b, the Petitioner relies solely on Odachi for allegedly disclosing the “transmitting antenna” of claim 1. Pet. at 25-26. Therefore, Ground 1b of the Petition fails for the same reasons that Ground 1a fails, as discussed above. Moreover, Petitioner’s reliance on Wang for allegedly disclosing coupling a capacitor to a primary winding to form a resonant circuit does not cure the deficient teachings of Odachi.

As explained above, the primary inductive device or coupler 230 of Odachi is the primary coil of a transformer—not an antenna—because the primary coil of Odachi is wrapped around a magnetic core and generates magnetic flux lines that are contained within the core, rather than emitted into free space. *See* Horenstein Decl. at ¶¶29-33. Adding a compensation capacitor of Wang to the transformer coil of Odachi, as proposed by Petitioner, does not convert the transformer of Odachi into an antenna because the magnetic flux lines generated by the primary coil of Odachi are still contained within the magnetic core. *See Id.* at ¶¶35-36. As Dr. Horenstein explains, adding the compensation capacitor to the primary coil of Odachi sets a unity power factor at the driving frequency, but does not affect the containment of the magnetic flux lines within the magnetic core. *See Id.* Because Petitioner’s proposed combination of Odachi and Wang results in a resonant

circuit—but not an antenna as properly construed "that produces a near-field component of flux into free space that is intercepted by a secondary coil to effect resonant inductive coupling"—the prior art references cited in Ground 1b of the Petition fail to disclose each and every element of claim 1 of the '654 Patent. Because claims 7 and 18 dependent from claim 1, Ground 1b fails to render claims 7 and 18 invalid for the same reasons set forth above for claim 1.

C. Ground 1c: Odachi, Wang, and Partovi Do Not Disclose the Transmitting and Receiving Antennas of Claim 1, or dependent Claims 4 to 6.

For Ground 1c, the Petitioner relies on Odachi for allegedly disclosing the “transmitting antenna” of independent claim 1, and relies on U.S. Patent No. 7, 952,322 to Partovi (“Partovi”) for allegedly disclosing the features of claims 4-6, which depend from claim 1. Pet. at 40-47. For example, regarding claim 4, Petitioner proposes adding multiple coils to the primary inductive device of Odachi. Pet. at 40. But adding more coils to the traditional transformer structure of Odachi does not change the transformer of Odachi into an antenna. Accordingly, Ground 1c fails for the same reasons that Ground 1a fails, as discussed above.

D. Ground 2: Ross alone or Ross and Wang Do Not Disclose Moving the Receiving/Transmitting Antenna from a First Alignment Position to a Second Alignment Position Based on a Degree of Coupling Detected at the Receiving Antenna, as Recited in Independent Claims 8 and 13.⁷

As discussed above in connection with the prosecution history of the '654 Patent, Ross names the same inventor and shares a very similar disclosure with Ross-090, over which the Examiner allowed the challenged claims. Ross is generally directed to a roadway-powered electric vehicle system that uses a transmitting coil 40 of a roadway power module 24 to transfer energy to a receiving coil 42 located on a vehicle. *See* Ex. 1007 (“Ross”) at Abstract, 9:11-29. Ross discloses a system that uses lateral and vertical positioning of the assembly 44 on which the coil 42 is mounted. *See id.* at 12:37-40. As the driver approaches a loading/unloading zone, an auto-positioning feature is engaged that uses vehicle sensors 60 to sense the position of the vehicle relative to the roadway power transmitting module 24. *See id.* at 12:40-47. The vehicle is laterally steered within a rough tolerance (5-10 cm) of the optimum lateral position when the vehicle comes to its designed stopped location. Ross describes vehicle sensors 60 include a variety of sensors to sense, for example, temperature, lane position, distance from

⁷ In Ground 2, the Petition addresses Claims 8 (independent), 9-10, 12, and 19 (each dep. on Cl. 8); Claim 13 (independent), 14 and 16 (each dependent on Claim 13).

nearest vehicle, etc. *See id.* at 13:5-9. For purposes of laterally positioning the assembly 44, “such sensors are typically optical sensors that look for markers placed on the roadway power transmitting module 24 embedded in the roadway. Other types of sensors may also be used for this purpose, including acoustic, mechanical, and electromagnetic sensors.” *See id.* at 13:9-15.

Once stopped, the horizontal coil positioning unit 46, further controls the lateral positioning of the coil 42 so that it is more closely aligned (within ± 1 -2 cm) of the optimum position. *See id.* at 12:52-57. Once the assembly 44 has been laterally aligned the vertical positioning unit 48 lowers the assembly 44 to reduce the air gap to near zero. *See id.* at 12:57-62.

Petitioner contends that the position within a “rough tolerance” of the optimum lateral position corresponds to the claimed “first position,” Pet. at 53-54 and that the second, more closely aligned position, corresponds to the claimed “second position.” Pet. at 54-55. But the assembly 44/coil 42 in Ross are not moved from the first position to the second position “responsive to detecting a degree of coupling in the first alignment position between the receiving antenna and the transmitting antenna that is measured at the receiving antenna,” as recited in claim 13. *See Horenstein Decl.* at ¶39. Nor does Ross “sense a degree of coupling of said receiving antenna and the transmitting antenna based on a

detection of the coupling that is measured at the receiving antenna” at the first position, as recited in claim 8.

As described above, Ross uses vehicle sensors 60 to detect the position of the vehicle relative to the roadway power transmitting module 24. The vehicle sensors detect the position of the vehicle using, for example, optical sensors. Ross fails to disclose or suggest that the degree of coupling is measured at the first position, and that the receiver/transmitter antenna is moved into a first position responsive to the detected degree of coupling.

Apparently realizing this deficiency, Petitioner cites to a different portion of Ross that explains how the coil 42 is laterally positioned as the vehicle is driven down the road. Pet. at 56 (citing Ross at 13:20-32). In this embodiment of Ross, the relative lateral location of the coil 42 to coil 40 “may be determined by monitoring the change in the amplitude of the inductively received power signal as the coil 42 is laterally moved in one direction or the other.” Ex. 1007 at 13:23-27. But Ross does not disclose monitoring the change in the amplitude of the inductively received power when the vehicle is in the “first alignment position,” (i.e., when the auto-driving feature steers the vehicle to within a “rough tolerance” of the optimum position”), and then moving the transmitting/receiving antenna based on the detected change in amplitude to the “second alignment position” (i.e., the optimum lateral position “when the vehicle comes to its designed stopped

location.”). *Id.* at 12:48-52. Once again, here Ross discloses alignment to the first rough position using vehicle sensors 60, not a signal based on any detected degree of coupling. Petitioner cannot combine embodiments of Ross in an attempt to argue that Ross teaches moving the transmitting/receiving antenna from the first alignment position to the second alignment position in response to the degree of coupling detected at the receiving antenna. Petitioner, by way of its reliance on Ross, “treats the various features of [the reference’s] different embodiments as if they are interchangeable with one another” and “fails to provide a sufficient rationale to combine the teachings of [the reference’s] different embodiments.” *Abiomed, Inc. v. Maquet Cardiovascular, LLC*, IPR2017-01204, Paper 9 at 9-11 (denying institution); *see also BlephEx, LLC v. Myco Indus.*, 24 F.4th 1391, 1400 (Fed. Cir. 2022) (“[I]t is not enough that the prior art reference . . . includes multiple, distinct teachings that the artisan might somehow combine to achieve the claimed invention to show anticipation”).

V. CONCLUSION

For the reasons explained above, Patent Owner respectfully submits that the Petition does not show that there is a reasonable likelihood that any claim of the '654 Patent is unpatentable. Thus, the Board should deny the Petition and an IPR should be instituted.

Dated: February 22, 2024

Respectfully submitted,

/Lance A. Lawson/

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CERTIFICATION UNDER 37 CFR § 42.24

Under the provisions of 37 CFR § 42.24(d), the undersigned hereby certifies that the word count for the foregoing Patent Owner's Preliminary Response to Petition totals 4,431, which is less than the 14,000 allowed under 37 CFR § 42.24(b)(1).

Dated: February 22, 2024

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CERTIFICATE OF SERVICE

It is certified that a copy of the *Patent Owner's Preliminary Response to Petition* has been served on Petitioner as provided in 37 C.F.R. § 42.6(e) via electronic mail transmission addressed to the persons at the address of record as follows:

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