

InductEV, Inc. (*Petitioner*)
v.
WiTricity Corporation (*Patent Owner*)

Case No.: IPR 2024-00140

U.S. Patent No.: 8,466,654

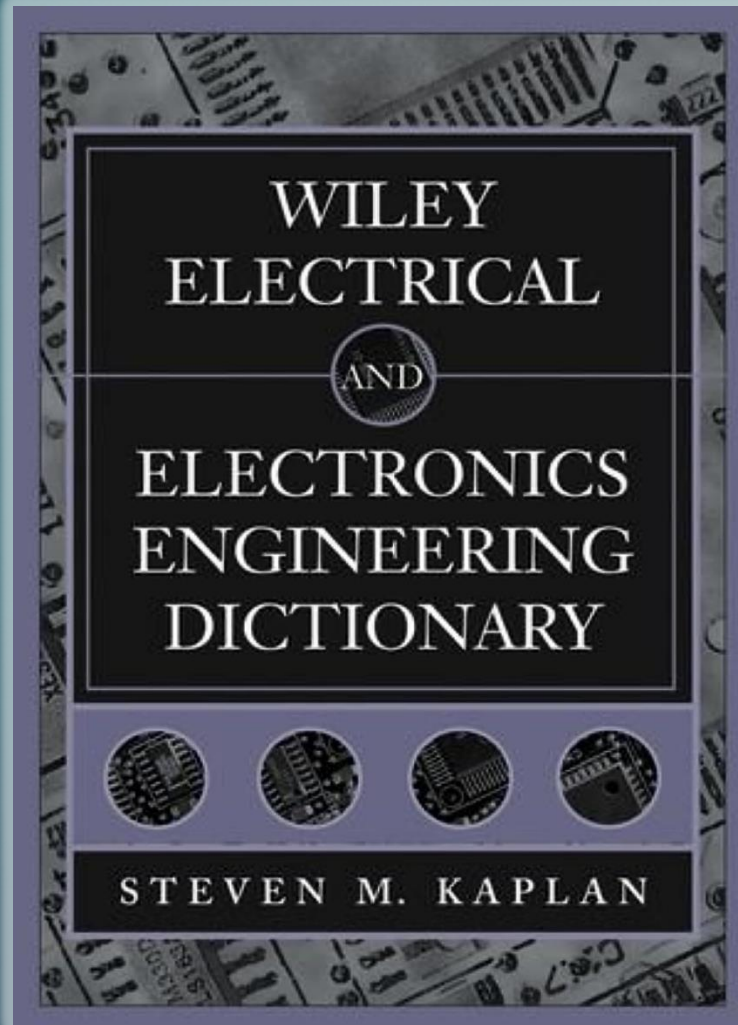
February 28, 2025

WiTricity Corporation
Exhibit _____
InductEV Inc. v.
WiTricity Corp.
IPR2024-00140

Definitions

Antenna | Transformer

Antenna Definition / Example



ANTENNA - A device that radiates and/or receives radio waves.
See Ex. 2006 at 2 (emphasis added).

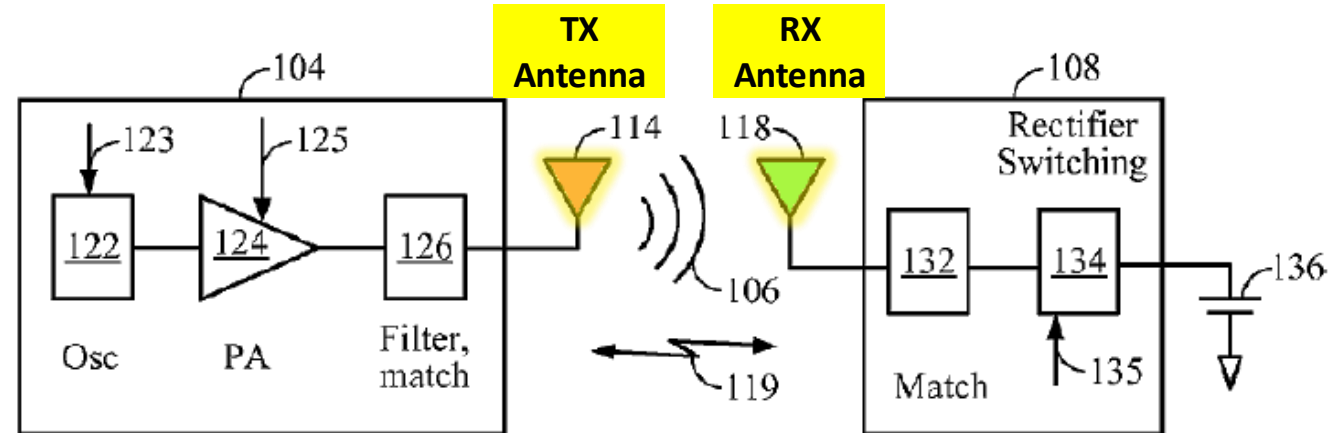


Figure 2 from the '654 patent illustrates a "wireless power transfer system" embodiment. ('654 patent, 2:41-42).

Antenna Definition / Example

- “Antenna” refers to a coil that produces/receives “a near-field component of flux in free space” to effect resonant inductive coupling (POR 8), but is not limited to devices that ONLY generate a near-field component.
- An “antenna” MUST be able to radiate energy in the near and far fields, but in the power transfer context of the '654 Patent, the near field component effects the inductive coupling. See *Horenstein Decl.* (Ex. 2001) ¶ 25; *Horenstein Supp.* (Ex. 2010) ¶¶ 37-39.
- Radiating energy in the NEAR and FAR fields necessarily radiates energy “into free space” (i.e., into the air), rather than containing flux within a core.

Figure 4 from the '654 patent

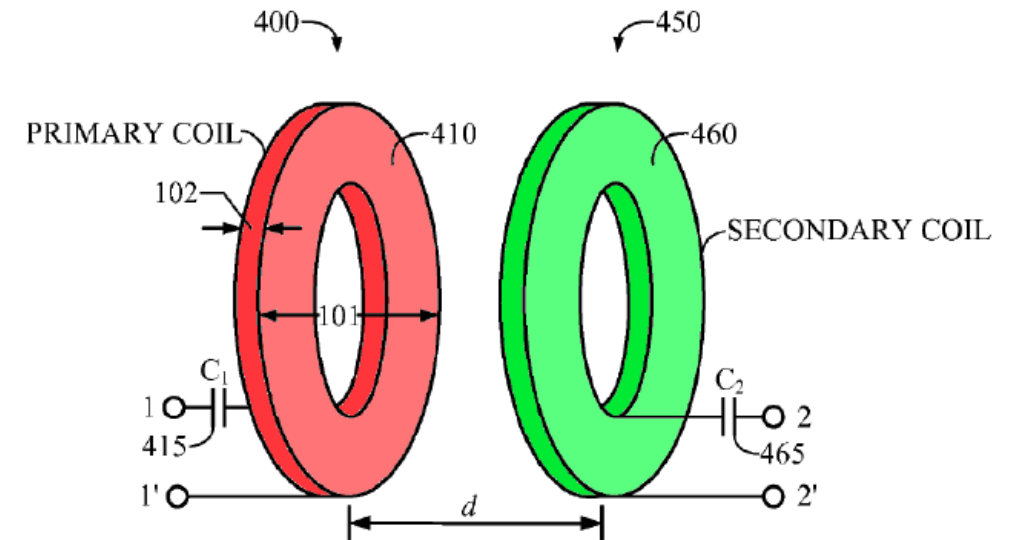
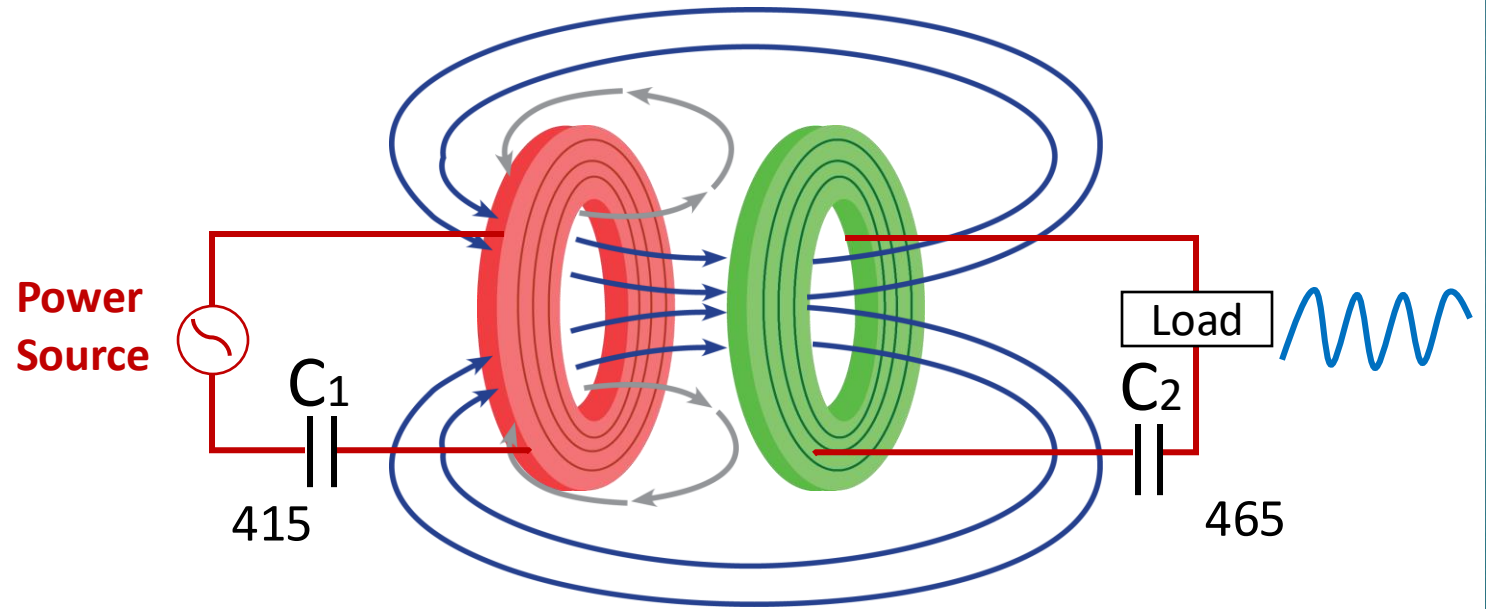


Figure 4 from the '654 patent illustrates an example embodiment of the two antennas. The TX-RX combination consists of two flat coils of wire separated only by air, without any intervening solid material.

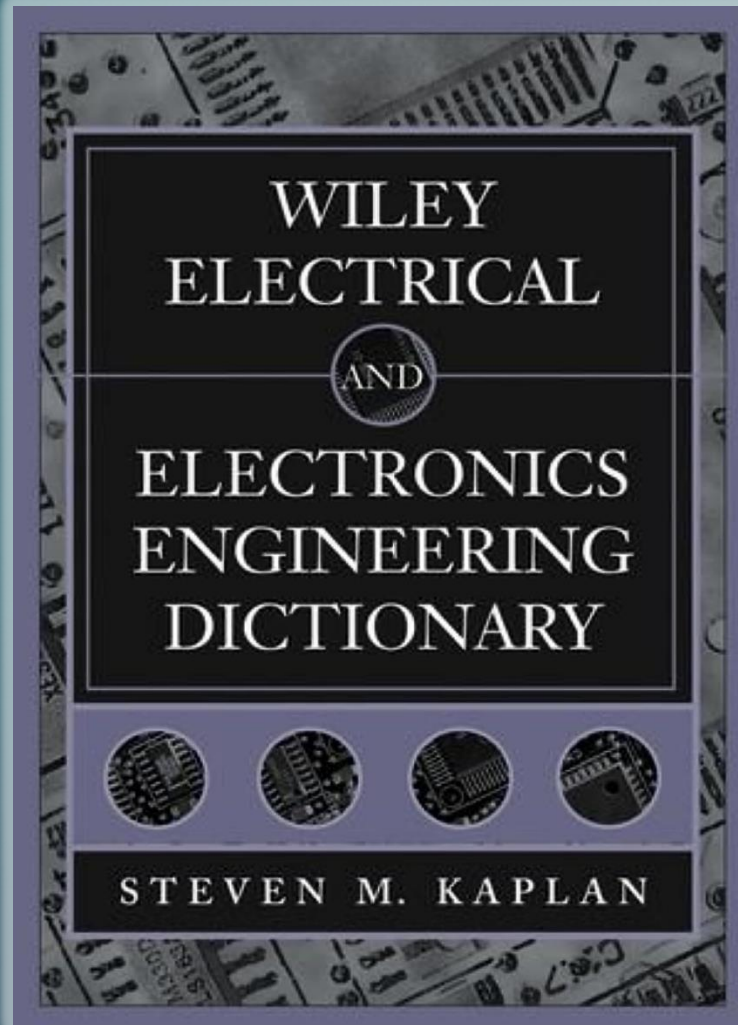
Antenna Definition / Example

- Magnetic flux lines (i.e., “a magnetic field”) are generated by the primary coil.
- These flux lines pass through the secondary antenna coil, inducing a voltage in the secondary coil.

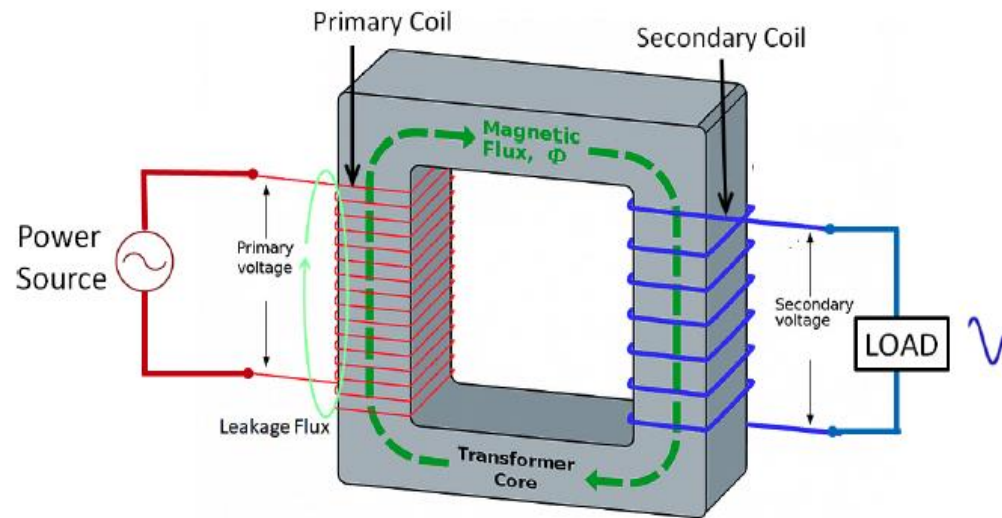
Figure 4 from the '654 patent



Transformer Definition / Example



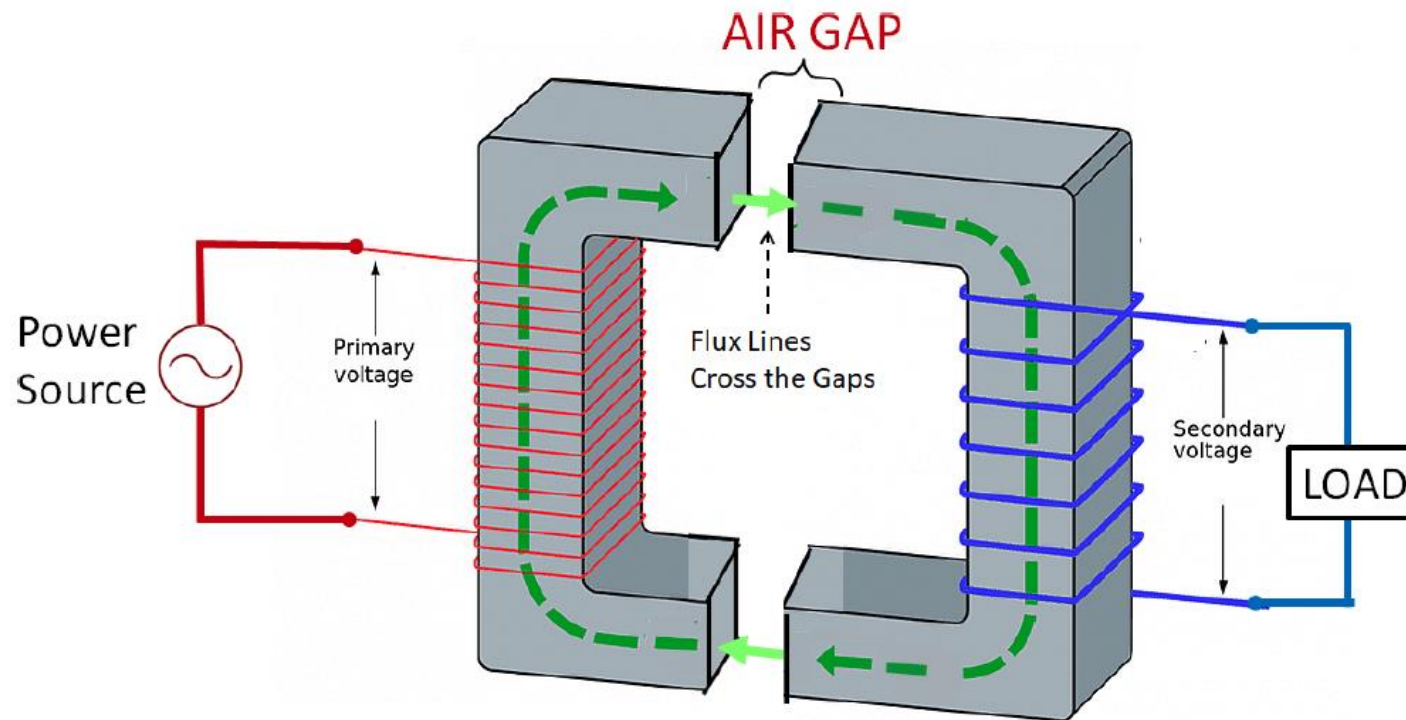
TRANSFORMER - Has no moving parts and consists of two or more coils of wire separately wrapped around a magnetic core. The coils are inductively linked by magnetic lines of force, and do not come into physical contact. *See Exhibit 2006 at 8 (emphasis added).*



Field lines are guided by a core common to both primary and secondary coils. *See Horenstein Supp. ¶ 41.*

Transformer Definition / Example

Transformer with Air Gap / Charging System



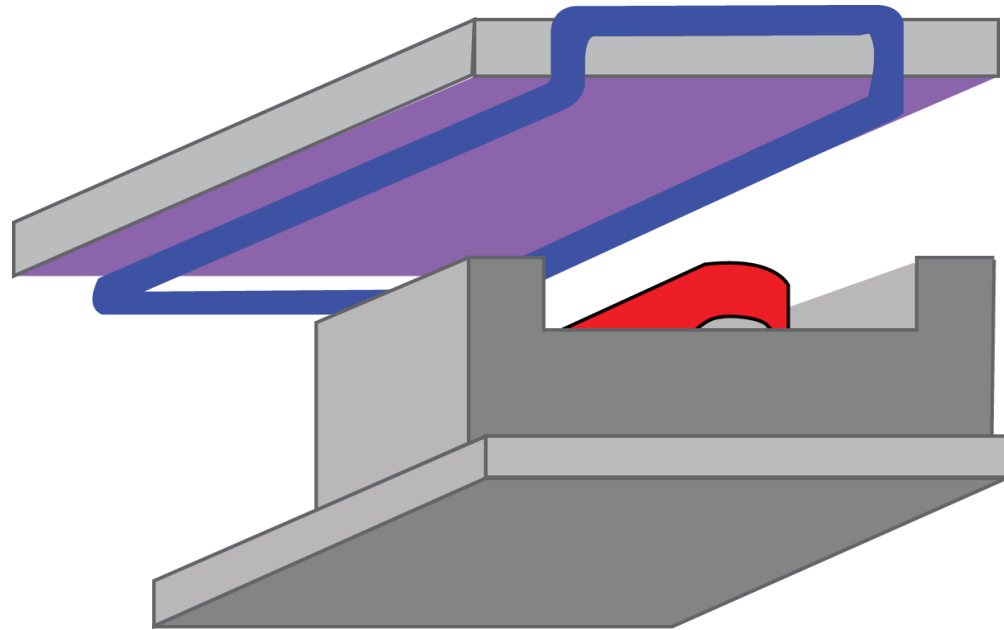
- Inductive coupling using a “Transformer” is **DIFFERENT** than ***Inductive coupling using Antennas.***
- The magnetic flux lines are **NOT radiated to the near or far fields.**

Odachi Does NOT Include
An Antenna

Odachi Does NOT Include An Antenna

- Discloses a traditional transformer structure in which a primary coil induces a current in a secondary coil by way of a common core.

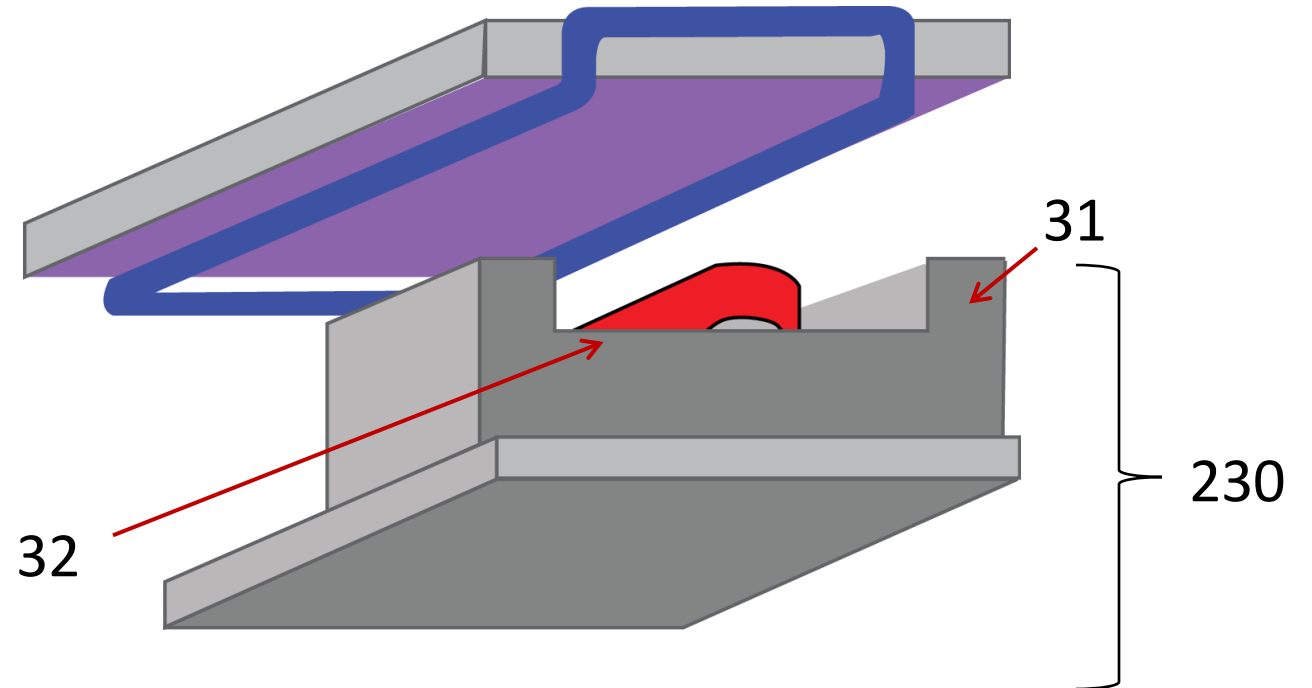
Odachi – Figure 12



Odachi Does NOT Include An Antenna

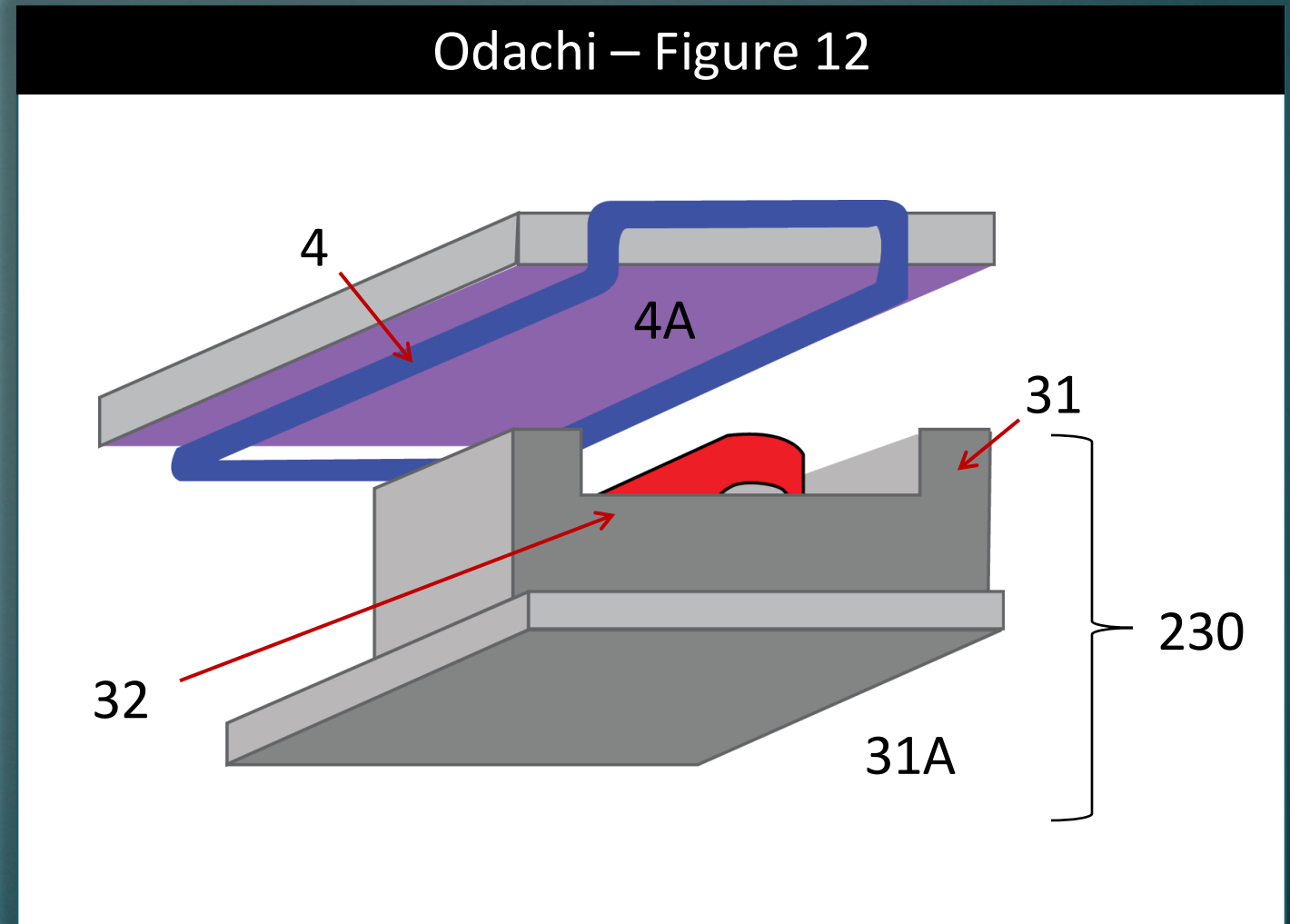
- Discloses a traditional transformer structure in which a primary coil induces a current in a secondary coil by way of a common core.
- Includes a primary inductive device 230, which includes a core 31 and a coil 32.**

Odachi – Figure 12



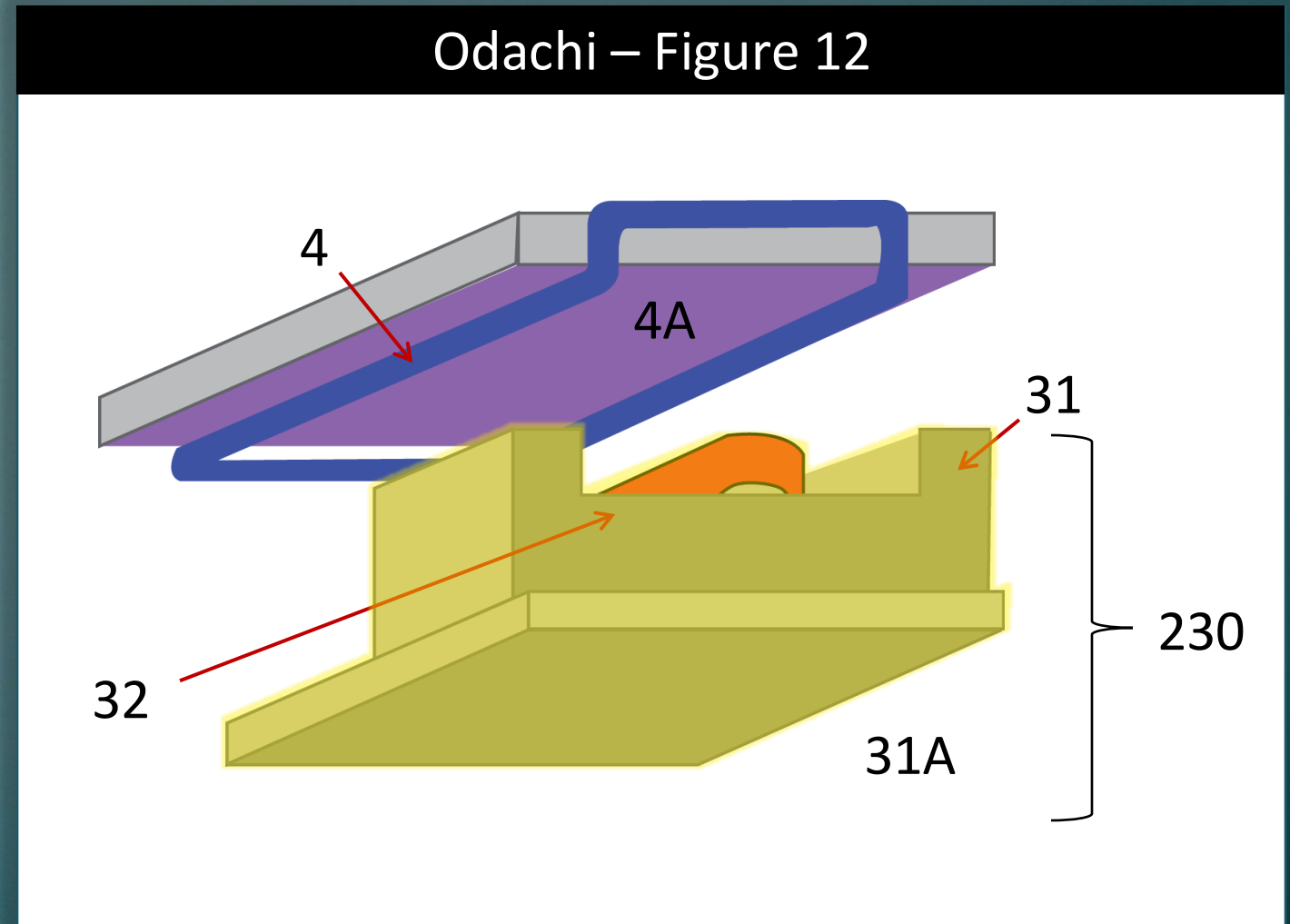
Odachi Does NOT Include An Antenna

- Discloses a traditional transformer structure in which a primary coil induces a current in a secondary coil by way of a common core.
- Includes a primary inductive device 230, which includes a core 31 and a coil 32.
- A secondary coil 4 is located on the vehicle, and has a cavity 4a to receive the primary coil 32 and the center projection 31a of the primary core 31.



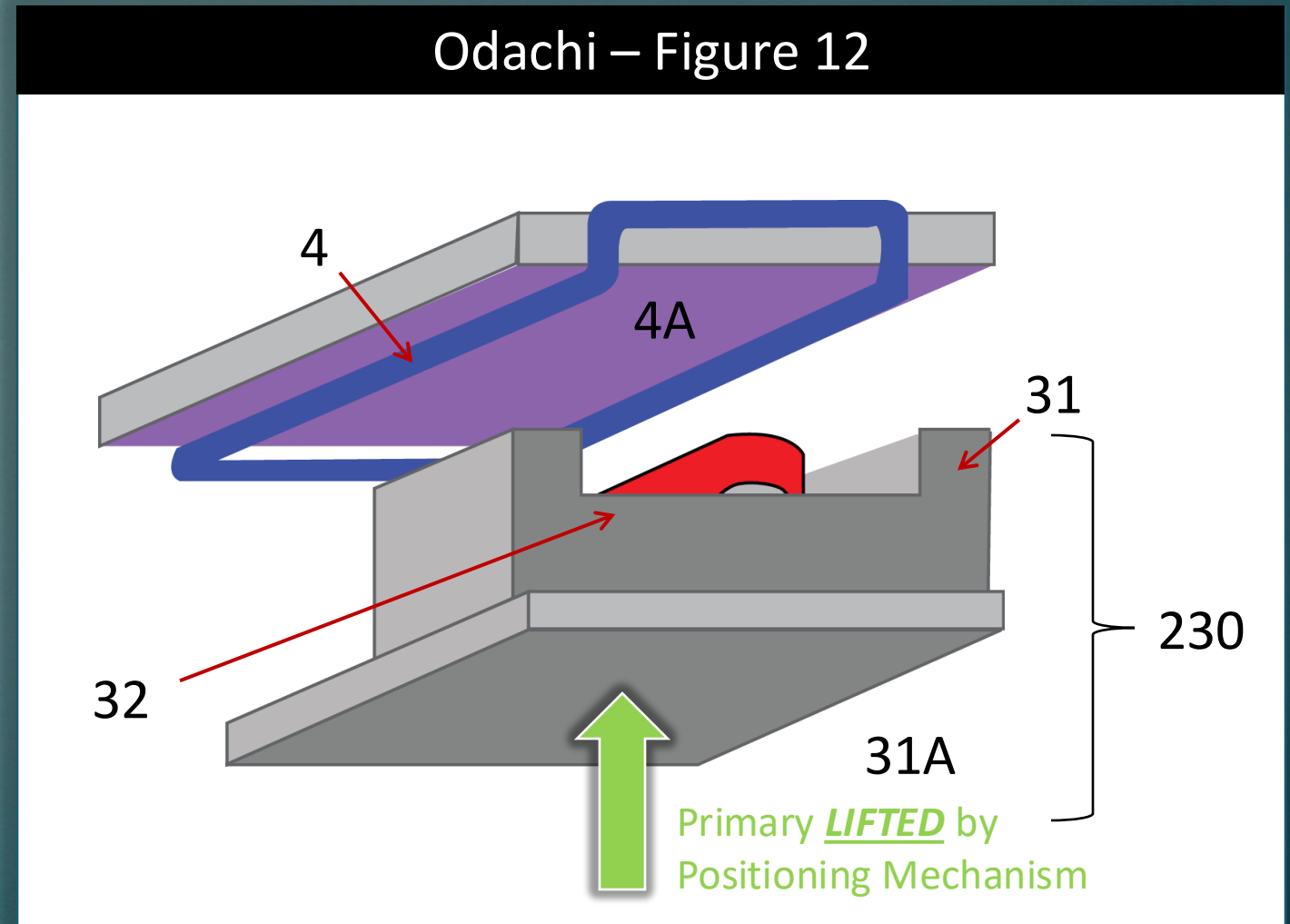
Odachi Does NOT Include An Antenna

- Discloses a traditional transformer structure in which a primary coil induces a current in a secondary coil by way of a common core.
- Includes a primary inductive device 230, which includes a core 31 and a coil 32.
- A secondary coil 4 is located on the vehicle, and has a cavity 4a that allows the primary coil 32 and the center projection 31a of the primary core 31.
- **The primary inductive device 230 is affixed to the support arm.**



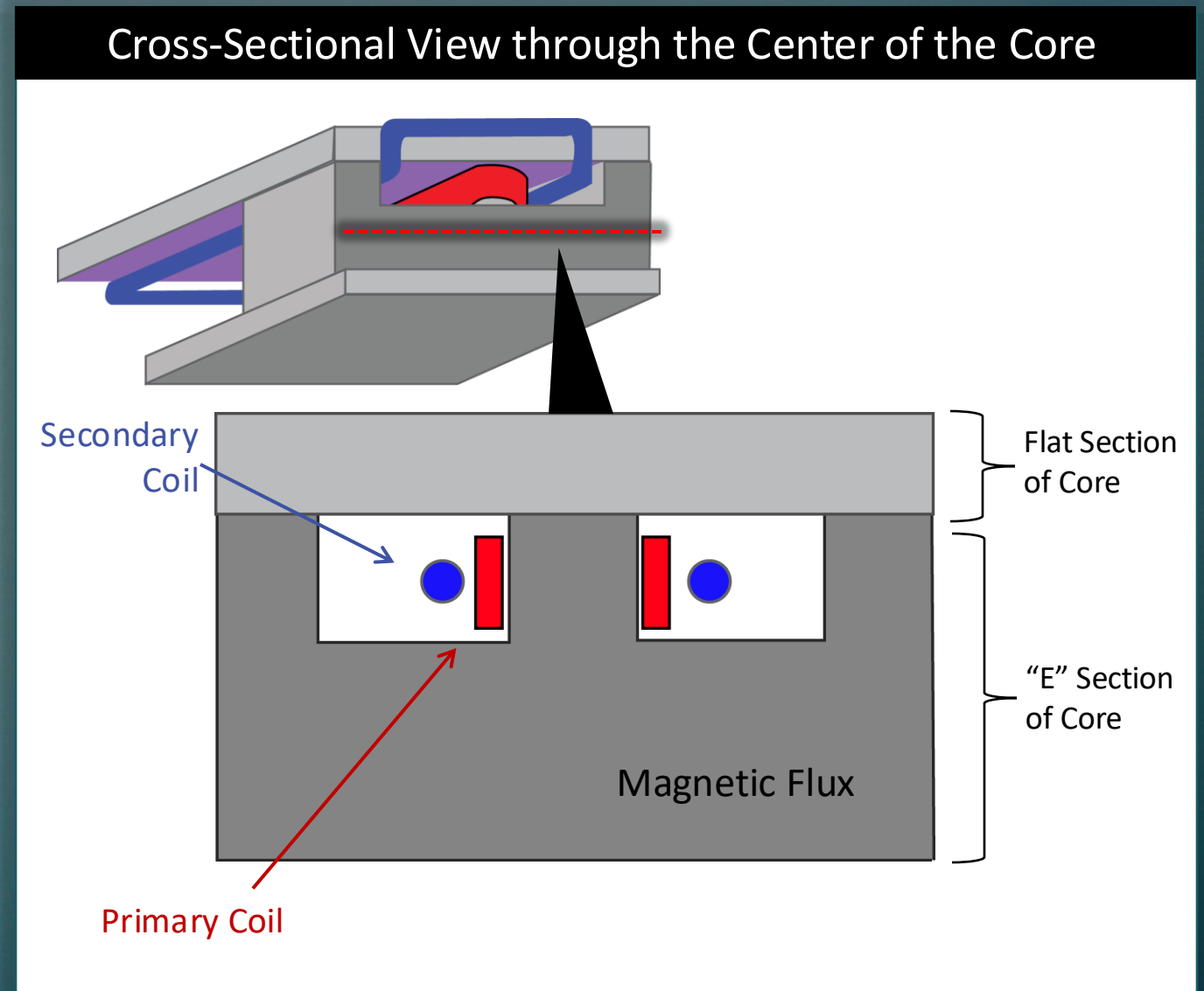
Odachi Does NOT Include An Antenna

- Discloses a traditional transformer structure in which a primary coil induces a current in a secondary coil by way of a common core.
- Includes a primary inductive device 230, which includes a core 31 and a coil 32.
- A secondary coil 4 is located on the vehicle, and has a cavity 4a that allows the primary coil 32 and the center projection 31a of the primary core 31.
- *The primary inductive device 230 is affixed to the support arm.*
- **The entire structure forms a transformer with a completed core that has no air gap.**



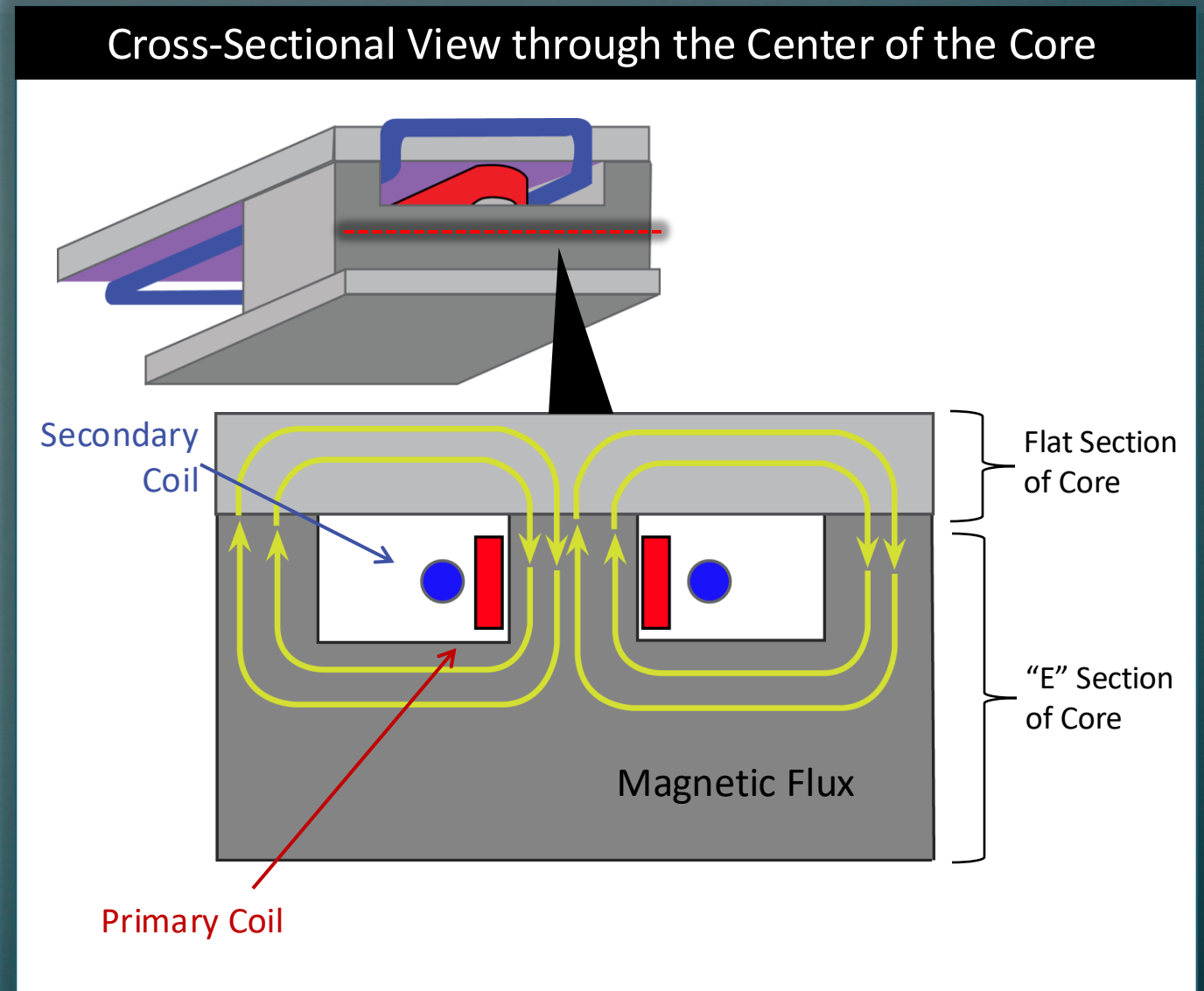
Odachi Does NOT Include An Antenna

- Odachi forms a complete transformer, and the flux lines circulate around the E-core structure.
(Ex. 2010 Par 42, 53, and 69)



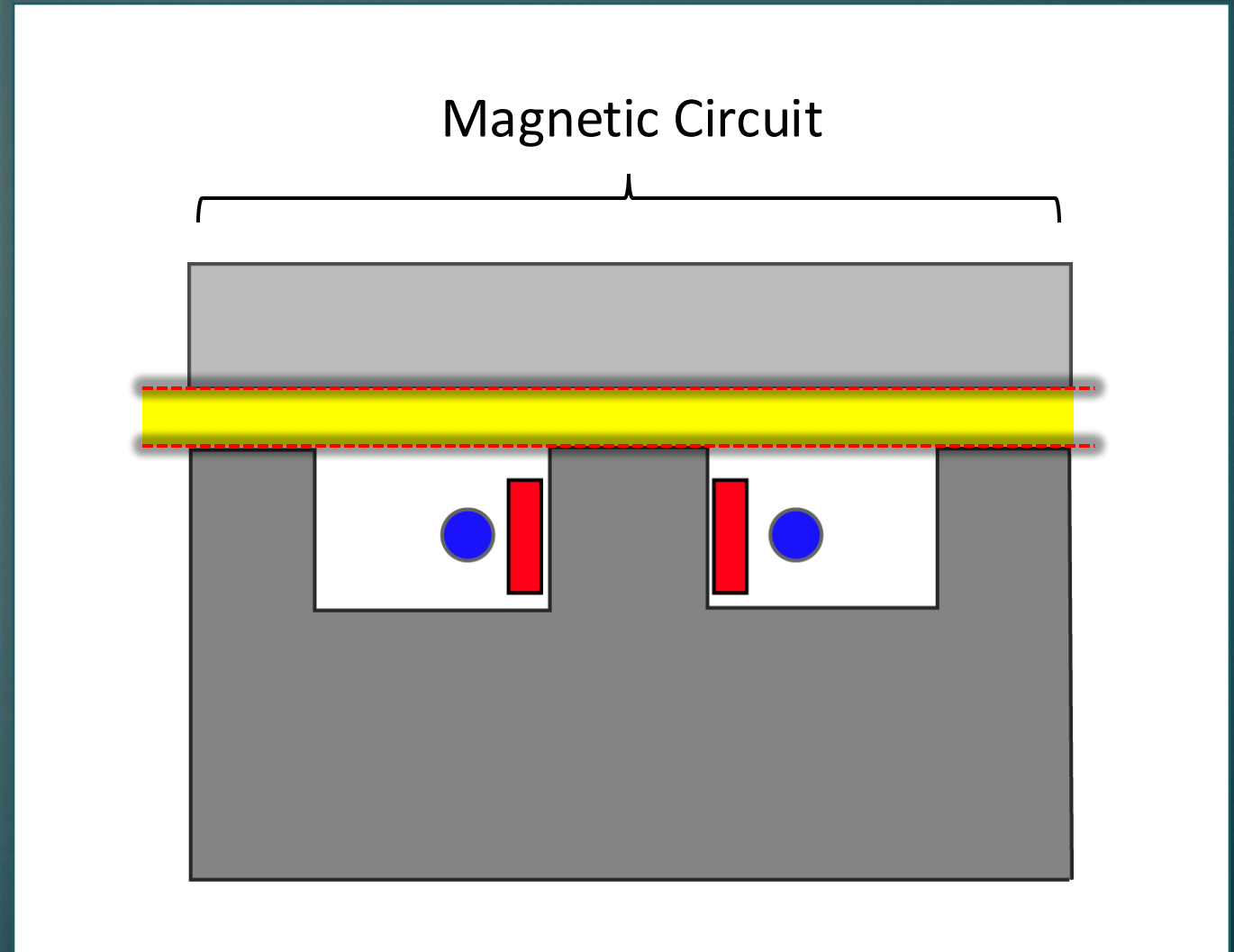
Odachi Does NOT Include An Antenna

- Odachi forms a complete transformer, and the flux lines circulate around the E-core structure.
(Ex. 2010 Par 42, 53, and 69)
- The magnetic flux lines are contained within the core. There is NO radiation to the near or far fields.
(Ex. 2010 Par 42, 53, and 69)



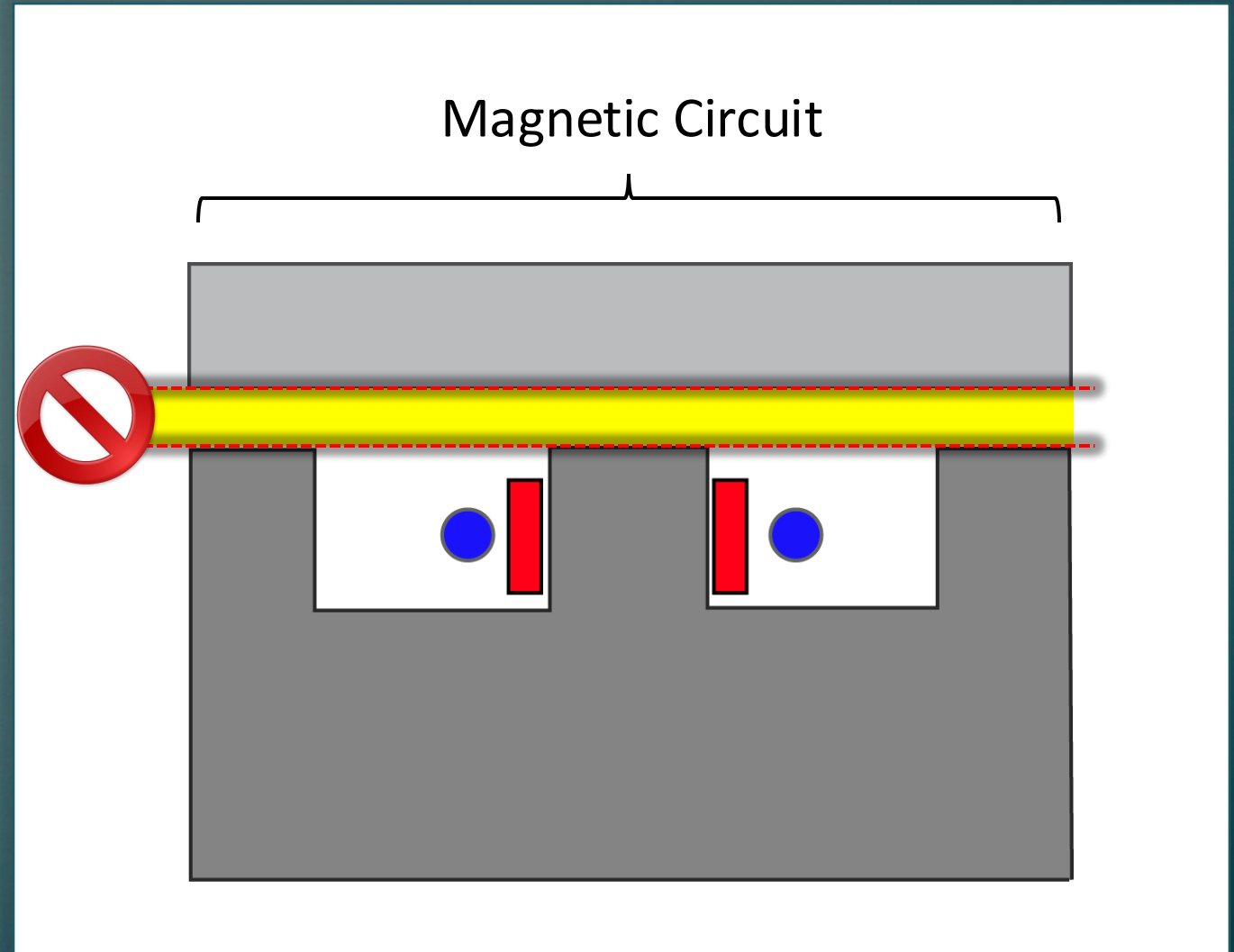
Odachi – Core(s) Form a Transformer / Magnetic Circuit

- A modified version of the diagram provided illustrating the magnetic flux lines of Odachi when the primary core is close to, but not yet in contact with, the secondary core.



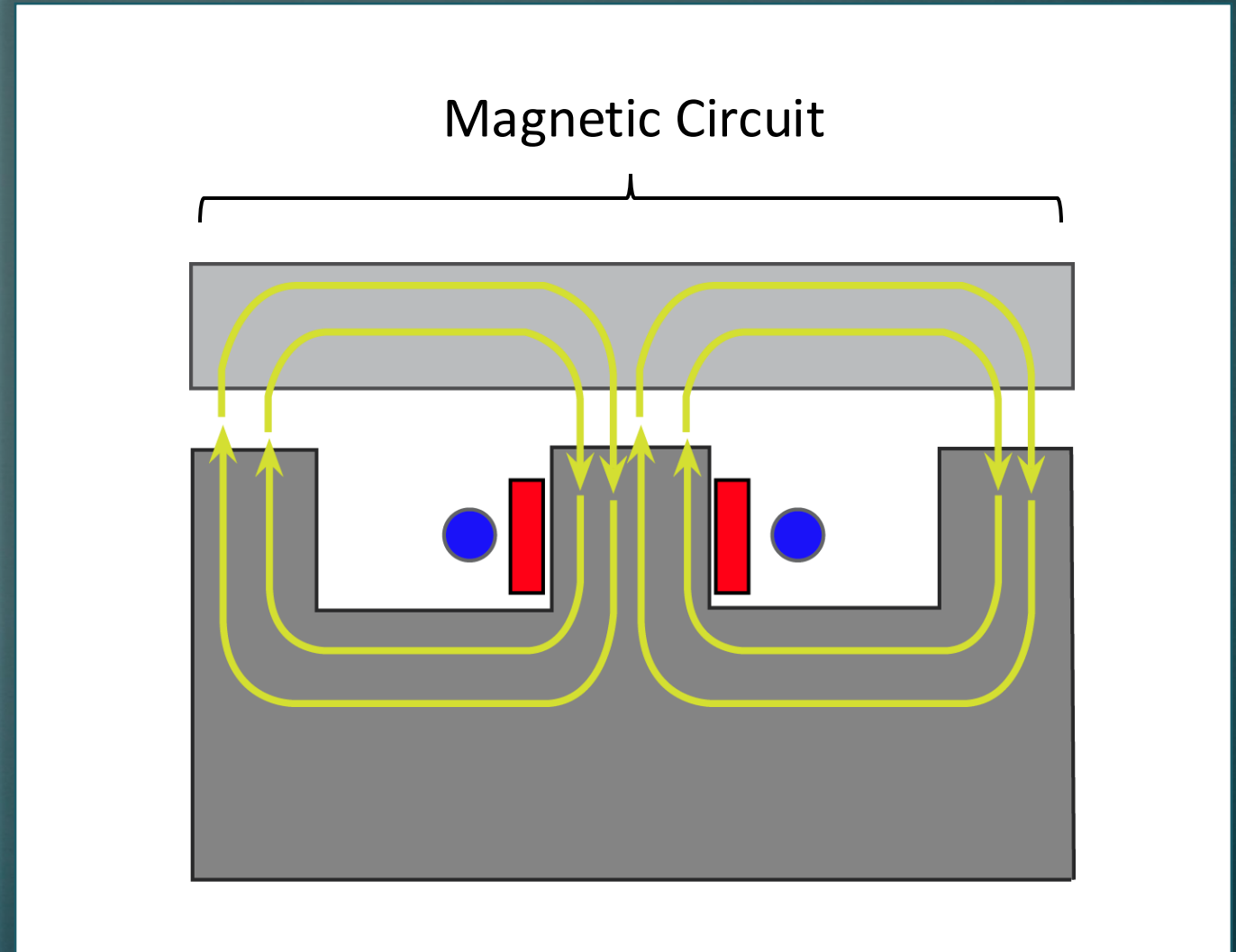
Odachi – Core(s) Form a Transformer / Magnetic Circuit

- A modified version of the diagram provided illustrating the magnetic flux lines of Odachi when the primary core is close to, but not yet in contact with, the secondary core.
- A small gap between the cores in Odachi during one portion of the alignment process does not convert the transformer into an antenna.



Odachi – Core(s) Form a Transformer / Magnetic Circuit

- A modified version of the diagram provided illustrating the magnetic flux lines of Odachi when the primary core is close to, but not yet in contact with, the secondary core.
- A small gap between the cores in Odachi during one portion of the alignment process DOES NOT convert the transformer into an antenna.
- The primary core of Odachi DOES NOT “radiate radio waves,” but instead functions as a traditional transformer in combination with the secondary core.



Claims 13 and 15 (*Ground 1a*) Are Not Unpatentable Over Odachi



Odachi describes a traditional transformer,
NOT an antenna.



Odachi does **NOT radiate energy in to near and far fields.**

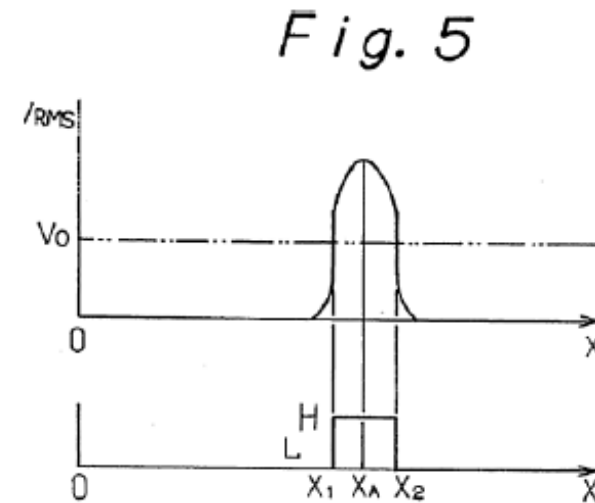
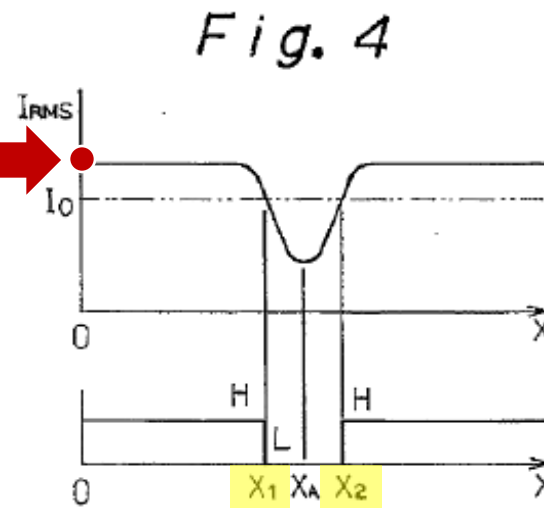
Odachi Does NOT Move the
Transmitting Antenna Based On
Degree of Coupling In First Position

“Responsive To Degree of Coupling In First Alignment Position”

Odachi – Figure 4 and 5

First
Alignment
Position

1st
position is
irrelevant



Odachi Figs. 4 and 5

Odachi Uses X_1 and
 X_2 to determine
position of X_A

POSA Would NOT Have
Combined Wang with Odachi

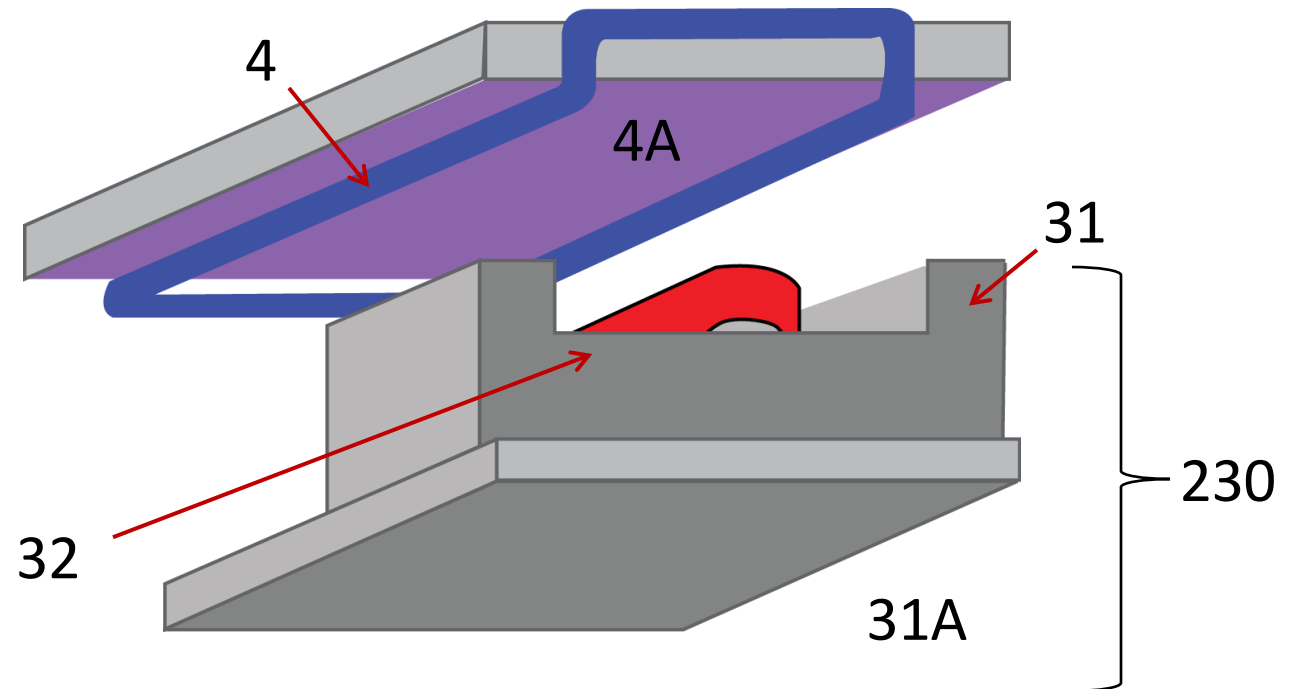
POSA Would NOT Have Combined Wang with Odachi

- Wang “utilizes electromagnetic fields to transfer electric power from a stationary primary source to one or more movable loads without contact.” Wang at 1.
- “It is desired to enable increasing air gaps as well as increasing track length and number of pickups, while achieving greater power and better efficiency.” Wang at 4.
- Wang increases frequency to improve coupling, but adds capacitors to compensate for increased reactance. Wang at 38.

POSA Would NOT Have Combined Wang with Odachi

Adding a Capacitor From Wang to Odachi Does NOT Convert the Transformers of Odachi into Antennas.

Odachi – Figure 12



POSA Would NOT Have Combined Wang with Odachi

A POSA would NOT have been motivated to combine Wang with Odachi:

- Odachi does not need higher frequency to improve coupling because the primary and secondary couplers are “in abutment” when charging.
Odachi 4: 34-31.
- *“The primary coupler 6 is brought into contact with the secondary receptacle.”*
Odachi 7: 19-26.
- *“Elevator 42D is moved upward until the primary 31 is brought into contact with the secondary core 3.”* *Odachi 9: 47-51.*

Benefits of Compensating Capacitors In Wang Does Not Apply to Odachi

Claims 1,7 and 18 (*Ground 1b*)

Odachi and Wang **DO NOT Disclose** Transmitting Power to a “Remote Receiving Antenna,” as Recited in Claim 7.

- **Odachi DOES NOT disclose** a receiving “*antenna*,” but also does not disclose a receiving antenna that is “*remote*.”
- The primary and secondary couplers in Odachi are in contact for charging, and are **NOT “REMOTE.”** *Horenstein Decl. ¶ 84.*

Claims 1,7 and 18 (*Ground 1b*)

Odachi and Wang **DO NOT Disclose** “the Coupling Test Comprises a Measurement of the Amount of Power That is Transferred to the Receiving Antenna,” as Recited in Claim 18.

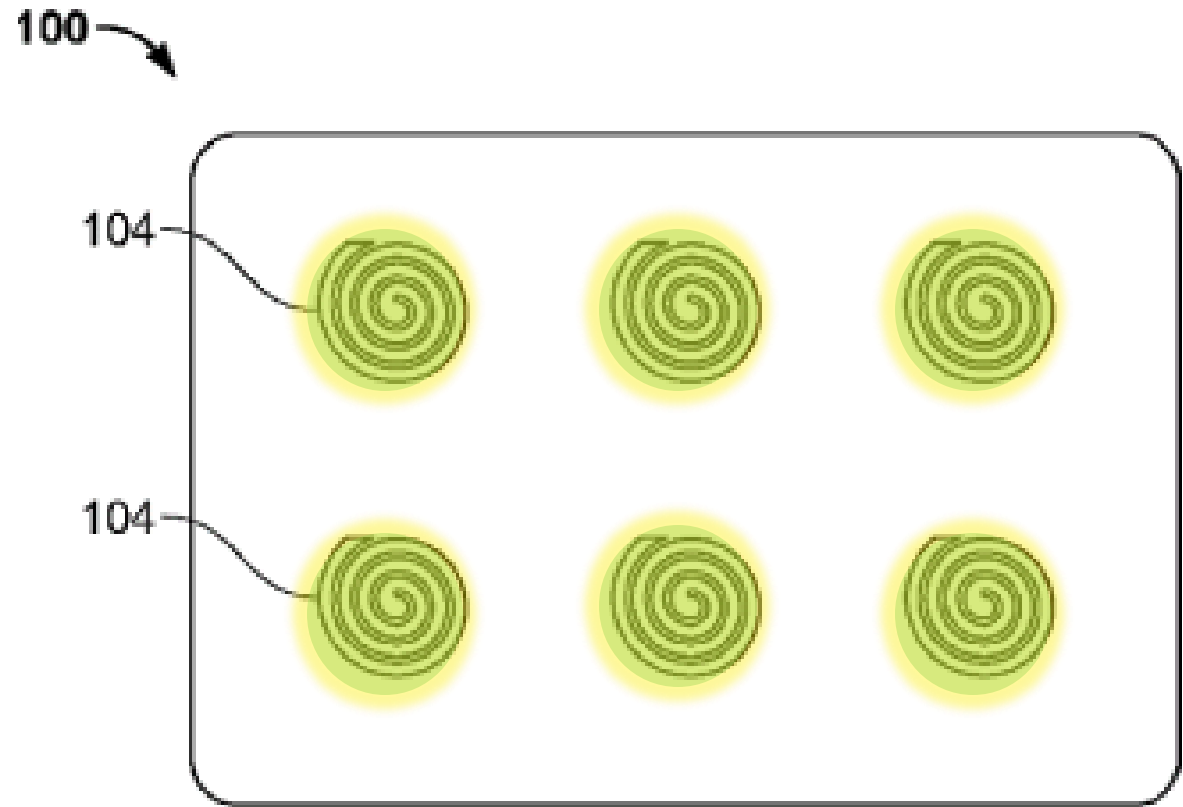
- Odachi probes the primary coil with a **“check current” only, i.e. a test current.**
- A test current is only a fraction of the current that flows during actual power transfer. *See Horenstein Supp. ¶¶ 86-87.*
- **Odachi DOES NOT disclose** measuring “the amount of power that is transferred to the receiving antenna” as part of the coupling test.

POSA Would NOT
Have Combined Partovi with
Odachi and Wang

POSA Would NOT Have Combined Partovi with Odachi and Wang

- Partovi is directed to a portable inductive power source, such as a pad, for powering or charging electrical devices.
- By including multiple coils within the pad, multiple devices may be charged, or charging can occur anywhere on the pad.
- Pancake coil - A coil that is in the form of a disk. **Its winding is FLAT, as opposed to cylindrical.** Also called pancake winding, or disk coil. (Ex. 2012 at 4).
- NOT feasible to use the pancake coils of Partovi to couple to the 3-D core-based secondary coils of Odachi. See Horenstein Supp. ¶ 96.

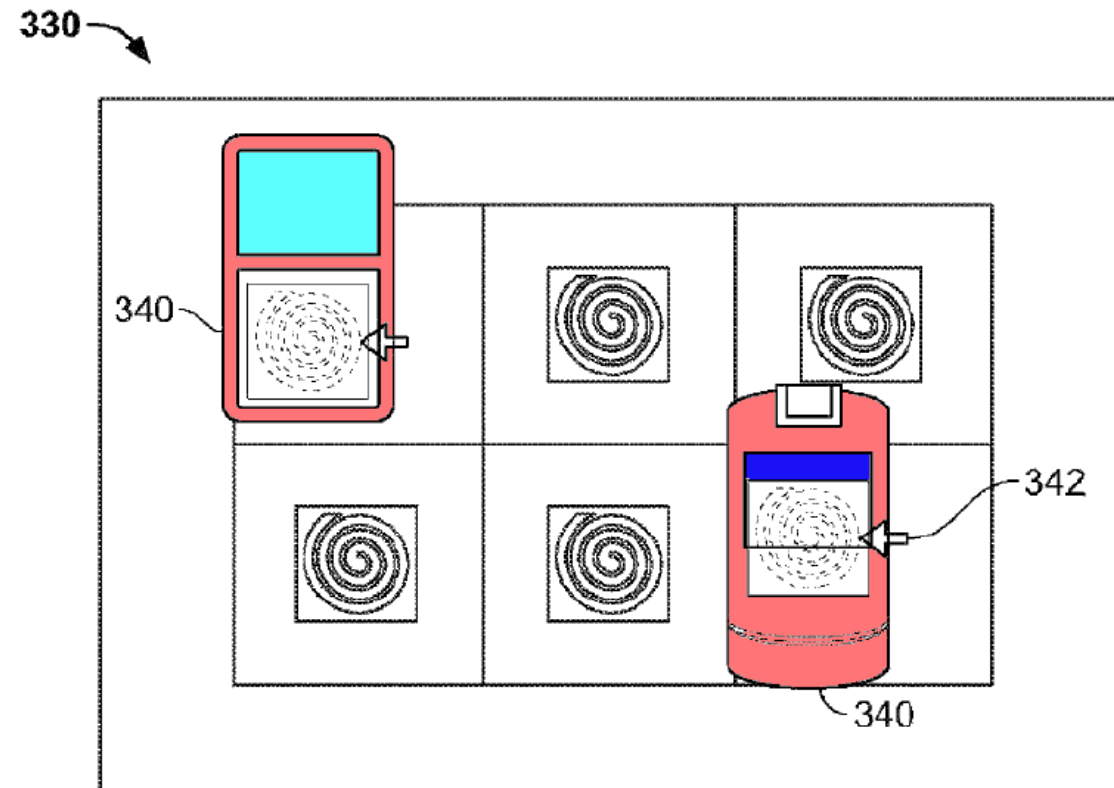
Partovi – Figure 1



Claims 4-6 (*Ground 1c*) Are Not Unpatentable Over Odachi, Wang and Partovi

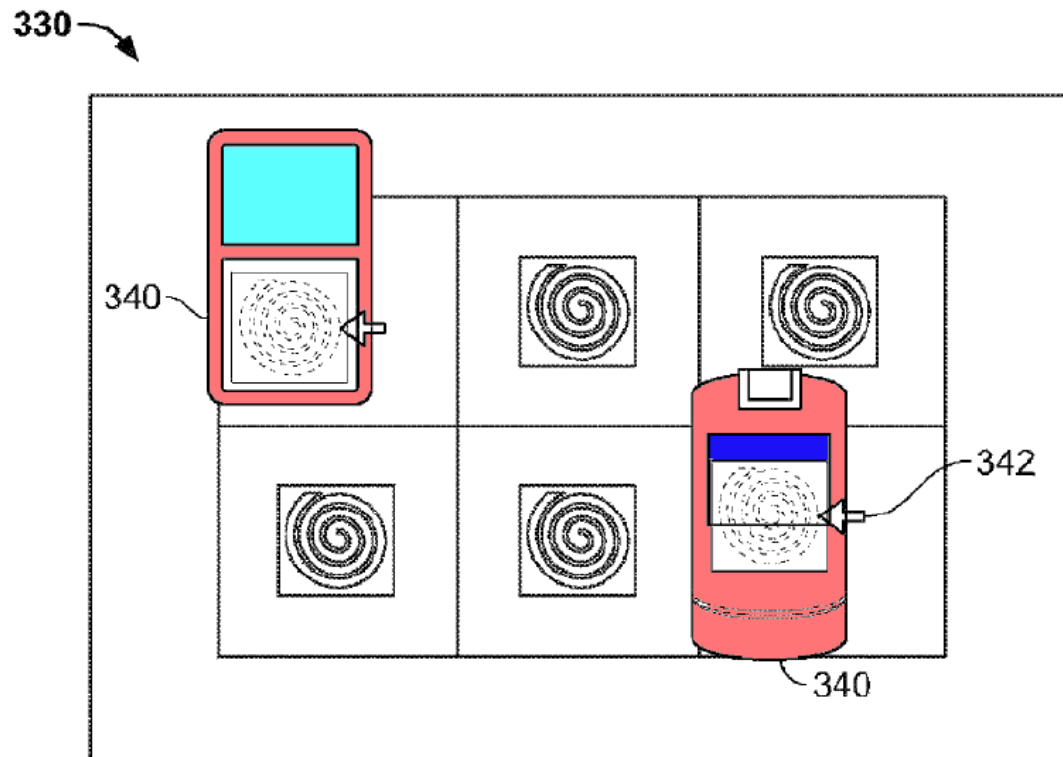
- “The pad should be able to **charge a number of device[s] with various power requirements efficiently**. A typical number would be 1-6 devices, and probably up to 4 low power (**up to 5 W**) devices simultaneously. (*Partovi, 5:41-44; emphasis added*)
- Odachi only charges **ONE vehicle at a time**.
- **No need** for extra coils to increase range: Odachi **already** includes a positioning system.

Partovi – Figure 16



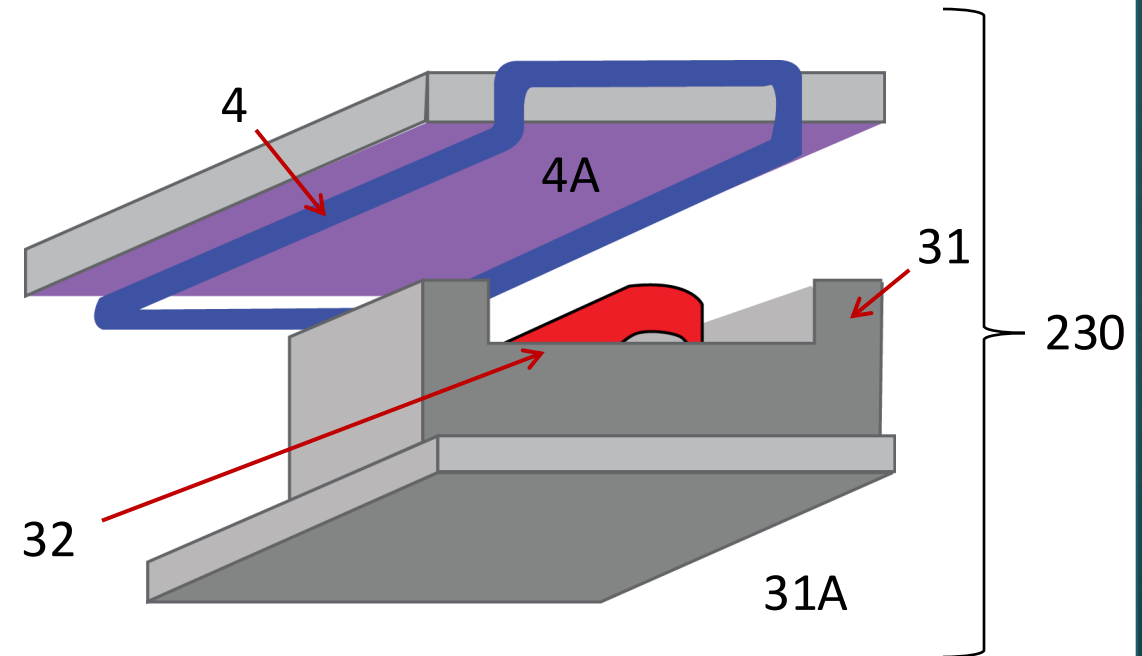
Claims 4-6 (*Ground 1c*) Are Not Unpatentable Over Odachi, Wang and Partovi

Partovi – Figure 16



Partovi is about charging cell phones with a charging pad.

Odachi – Figure 12



Odachi is about Charging CARS

POSA Would NOT
Have Combined Wang with Ross

Overview of Prior Art – *Ross*

- Ross is 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.
- As a driver approaches a loading/unloading zone, an auto-positioning feature takes over to automatically steer the vehicle into a position within a rough tolerance of an optimal lateral position.
See id. at col. 12:40-52.
- The auto-positioning feature uses vehicle sensors 60 to sense the position of the vehicle relative to the roadway power transmitting module. *See id. at col. 12:40-52, 13:5-15.*
- From rough tolerance position, coil 42 is more closely aligned with the optimal lateral position.
See id. at col. 12:52-57.
- Once in the optimal lateral optimal position, a vertical positioning unit 48 lowers the coil 42 toward the coil 40. *See id. at col. 12:57- 62.*

Claims 8-10, 12-14, 16, and 19 (*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.

- **Ross does not add capacitors** to turn its coils into resonant circuits, and the word “*resonant*” does not appear anywhere in Ross.
- **Ross does NOT suffer from increased reactance** that the capacitors in Wang compensate for.
- Ross teaches away from using high frequencies that would necessitate compensating capacitors. *Ross 5: 53-60.*

Ross Does NOT Move the
Transmitting Antenna Based On
Degree of Coupling In First Position

Claims 8-10, 12-14, 16, and 19 (*Ground 2*)

Claims 13, 14, and 16 Are Not Invalid Because Ross Fails to Disclose Moving the Receiving or Transmitting Antenna to a Second Alignment Position “Responsive to Detecting a Degree of Coupling in the First Alignment Position”

- Ross discloses using sensors 60, such as optical sensors, so an auto positioning control positions the vehicle within a “*rough tolerance*” of an optimal position. Ross 12:37-52.
- Vehicle is moved to designated optimal position, but NOT based on degree of coupling at the “rough tolerance” position. Ross 10:60-61, 12:37-52.
- Petitioner relies on a different “driving” embodiment (13:15-31) that maintains coil 42 within a rough tolerance of coil 40.
- No “first alignment position” in the driving embodiment. Horenstein Supp. Par 120.

Conclusion

Conclusion



Petition **DOES NOT** show that any claim of the '654 Patent is unpatentable.