

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

INDUCTEV, INC.
Petitioner,

v.

WITRICITY CORPORATION,
Patent Owner.

Case IPR2024-00105
Patent 10,027,184

PATENT OWNER'S SUR-REPLY

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TABLE OF AUTHORITIES

<i>In re Mraz</i> , 868 F.3d 1342, 1346 (Fed. Cir. 2017)	20
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EXHIBIT LIST

Ex.	Description
2001	U.S. Patent No. 9,442,172
2002	File History of U.S. Patent No. 9,442,172
2003	U.S. Patent Application Publication No. 2008/0211320 (“Cook-320”)
2004	U.S. Provisional Patent Application No. 61/102,602 (“Fells-602 Provisional”)
2005	Declaration of Mark Horenstein, Ph.D. (“Horenstein Decl.”)
2006	Curriculum Vitae of Mark Horenstein, Ph.D.
2007	Excerpts from Carstens, ELECTRICAL SENSORS AND TRANSDUCERS (1993) (“Carstens”)
2008	Excerpts from Staugaard, 8-BIT MICROPROCESSOR INTERFACING AND APPLICATIONS (192) (“Staugaard”)
2009	Excerpts from Petruzella, PROGRAMMABLE LOGIC CONTROLLERS (4th ed. 2011) (“Petruzella”)
2010	Excerpts from Rabiee, PROGRAMMABLE LOGIC CONTROLLERS: HARDWARE AND PROGRAMMING (2nd ed. 2009) (“Rabiee”)
2011	Excerpts from Carr, SENSORS AND CIRCUITS (1993) (“Carr”)
2012	Excerpts from McGRAW-HILL DICTIONARY OF SCIENTIFIC AND TECHNICAL TERMS (6th ed. 2003) (“McGraw-Hill Dictionary-2”)
2013	Excerpts from Wiley, ELECTRICAL AND ELECTRONICS ENGINEERING DICTIONARY (2004) (“Wiley Dictionary-2”)
2014	Excerpts from MERRIAM-WEBSTER’S COLLEGIATE® DICTIONARY (10th ed. 2000) (“Merriam-Webster Dictionary”)

2015	Zoom Deposition of Mark Allen, Ph.D. (“Allen Depo.”)
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I. INTRODUCTION

The wireless charging system disclosed and claimed in the ‘184 Patent is fundamentally different than the prior art relied upon by Petitioner, and in particular Fells. The claims of the ‘184 Patent are directed to a wireless charging system with magnetic field sensors, including wire loop sensors, that are located in the magnetic field of the active (and energized) source resonator and detect FOD (Foreign Object Debris) by measuring perturbations in the magnetic field of the source resonator directly caused by the FOD.

Fells, on the other hand, has the primary purpose of conserving energy for a wireless charging system for, example, mobile phones. Fells discloses that it accomplishes this conservation of energy by keeping the source resonator inactive (idle) so that it is not producing a magnetic field during the low power mode (i.e., there is no power to the source resonator, so the source resonator *cannot* produce *any* magnetic field). The Fells system discloses using a separate “proximity detector” that has its own low power source that can detect FOD that approaches the vicinity of the source resonator. But Power is *not* delivered to the source resonator until *after* the proximity detector detects FOD in the vicinity of the source resonator. After detection of the mobile phone (or FOD), a switch is closed that allows power to be delivered to the source resonator. Only then can the source resonator generate a magnetic field and begin the wireless energy transfer.

Ground 1 (Fells alone) fails because Fells does not disclose “wherein the at least one magnetic field sensor is positioned within the magnetic field of the wireless energy transfer system.” The Petition alleges that Fells discloses a Hall Effect sensor and an inductive proximity sensor that each correspond to the recited magnetic field sensor. But an inductive proximity sensor is not a magnetic field sensor. Even assuming, *arguendo*, that an inductive proximity sensor is a magnetic field sensor, the inductive proximity sensor and Hall Effect sensor disclosed in Fells are neither positioned within nor responsive to the magnetic field of the wireless energy transfer system. PO Response at 24-35. As summarized above, Fells requires that the wireless energy transfer system (resonator) be in the off mode – i.e., *not* generating a magnetic field – until *after* the proximity detector (inductive proximity sensor or Hall Effect sensor) senses an object (like a mobile phone) approaching the vicinity of the source resonator. Because the resonator is not turned on and does not produce a magnetic field until *after* the proximity detector senses the mobile phone, the system disclosed in Fells achieves the stated goal of a wireless energy transfer system that conserves energy. *Id.*

Further, a POSA would understand that a Hall Effect sensor positioned within the magnetic field of the wireless energy transfer system would itself become a foreign object, which Fells seeks to detect and avoid. PO Response at 35-

36; Horenstein ¶ 100. A POSA would instead position the Hall Effect sensor in Fells in the vicinity of the magnetic field, which would satisfy the energy conservation purposes of Fells. *Id.*

In addition, a POSA would understand that a Hall Effect sensor only senses *magnetized* objects like a portable device (mobile phone). Hence, using a Hall Effect sensor would defeat the purpose of the invention claimed in the ‘184 Patent because a Hall Effect sensor would not detect non-magnetized FOD debris. This non-magnetized FOD debris disclosed in the ‘184 Patent that would not be sensed by a Hall Effect sensor includes, for example, metal objects, steel wool, soda cans, metal-foil paper for gum wrappers and fast food, cigarette packs, etc. ‘184 Patent 5:25 to 6:42; 2:11-13. It is worth noting that a Hall Effect sensor is not mentioned in the ‘184 Patent.

Ground 2 (Fells and Cook) fails as to dependent claims 2-7, 9 and 10 because Cook does not cure the deficiencies of Fells with respect to claim 1. In its Reply, Petitioner does not argue that Cook cures the deficiencies in Fells. Similarly, Ground 3 (Fells and Ono) and Ground 4 (Fells in view of Cook and/or Wang) fail because Ono, Cook and/or Wang also do not cure the deficiencies of Fells. Again, in its Reply, Petitioner does not argue that the additional references (Ono, Cook, and/or Wang) cure the deficiencies in Fells.

Patent Owner notes here that in its Reply, Petitioner failed to address Patent Owner's arguments regarding Petitioner's Ground 4. *See* PO Response at 56-57.

Ground 2 also fails as to claims 4-6 and 16 because Petitioner fails to establish obviousness of "wherein the foreign object debris detection system is configured to perform a health and/or status check of the wireless energy transfer source before the vehicle is positioned over the source resonator." The Petition alleges that Fells, or Fells in combination with Cook, discloses a sense circuit calibration and energy storage element check that each correspond to the recited health and/or status check. But Fells does not disclose calibration of its sense circuit when implemented by a proximity detector (Hall Effect sensor), and a check of the energy level in the energy storage element does not relate to health and/or status of the source resonator.

Ground 2 fails as to claim 16 because the combination of Fells and Cook does not disclose "performing a health and/or status check of a source resonator of the wireless energy transfer system." Again, the Petition relies on Fells disclosing a sense circuit calibration and energy storage element check. But calibration of Fells' sense circuit does not indicate the health and/or status of a source resonator. Likewise, a check of the energy level in the energy storage element does not relate to health and/or status of the source resonator.

Ground 3 also fails because the combination of Fells and Ono does not disclose or render obvious “the foreign object debris detection system is integrated into the enclosure.” The Petition equates “integrated into” the enclosure with being “housed” in the enclosure, but in the context of the claim, “integrated into” requires more. In context, “integrated into” means that the foreign object debris detection system is unified with the enclosure to form a functioning or unified whole, which Fells and Ono do not disclose.

For at least these reasons, the Board should enter a final decision affirming the validity of the challenged claims.

II. Claims 1, 8 and 11 are Patentable Over Fells (Ground 1)

A. Fells Does Not Disclose “Wherein the At Least One Magnetic Field Sensor Is Positioned Within the Magnetic Field of the Wireless Energy Transfer System”

In its Reply, Petitioner continues to assert that claim 1 is unpatentable as being obvious over Fells. Reply 7-14. As explained in detail in PO’s Response and below, however, Fells does not disclose “wherein the at least one magnetic field sensor is positioned within the magnetic field of the wireless energy transfer

system,” as required by claim 1. PO Response at 24 to 37; Horenstein Decl. ¶¶ 76-102.

1. ***The Fells wireless energy transfer system does not produce a magnetic field until after the magnetic field sensor detects an object; thus, when sensing for a mobile phone or object, the Fells magnetic field sensor is not within the magnetic field of the wireless energy transfer system.***

Even assuming, *arguendo*, the inductive proximity sensor or Hall Effect sensor in Fells constitutes a magnetic field sensor, Petitioner fails to establish that Fells discloses the inductive proximity sensor / Hall Effect sensor “is positioned within the magnetic field of the wireless energy transfer system,” as required by claim 1. *See* PO Response 25 – 37.

Claim 1 of the '184 Patent requires that the magnetic field sensor be “positioned within the magnetic field” of the resonator/(“wireless energy transfer system”) so that the sensor will measure perturbations in the magnetic field of the resonator/(wireless energy transfer system). '184 Patent 2:48-49; 5:25 to 6:42. The magnetic field of the resonator will pass thru the magnetic field sensors. '184 Patent 5:43-45.

In contrast to the inductive proximity detector and Hall Effect sensors discussed in Fells, which require power to operate, the loop sensors in the '184 patent

are passive, requiring no power because their signals are induced *by the resonator field*. ('184 patent, 6:52-56, 7:15-16).

The '184 patent explains that in order to detect FOD over the area of the resonator, an array of field sensors must be placed over the surface of the resonator. '184 patent 7:28-8:4.

As the '184 Patent further discloses, the array may comprise “single loop sensors and/or dipole gradiometers” '184 patent 8:4. A POSA schooled in the concept of magnetic induction would have understood that each loop in the array must be placed *within* the magnetic field *of the resonator*, such that the latter is perpendicular to the face of the former. Horenstein ¶ 38; Figure caption above ¶¶ 39, 40, 43. Figures 4a and 4b show examples of loop arrays disclosed in the '184 patent. A POSA would have understood that the loop sensors of the '184 patent are used to form an array that is *placed over the resonator*, and therefore *in the magnetic field of the resonator*. Such an array is necessary if full detection coverage is to be monitored over the entire face of the resonator, as stated in the patent. The '184

patent also discloses passive loop sensors that will detect FOD debris while having little effect on the resonator field itself.

Fig. 2

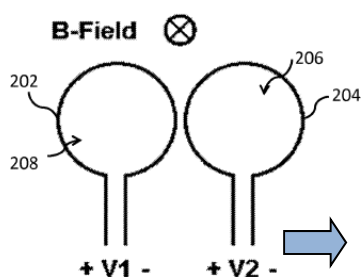


Fig. 4A

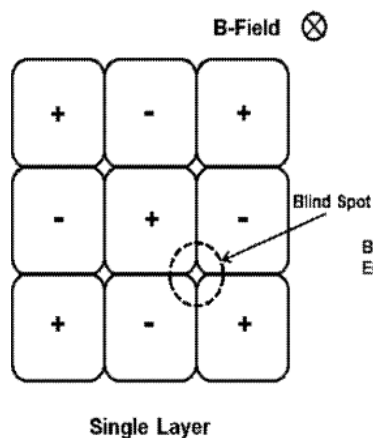
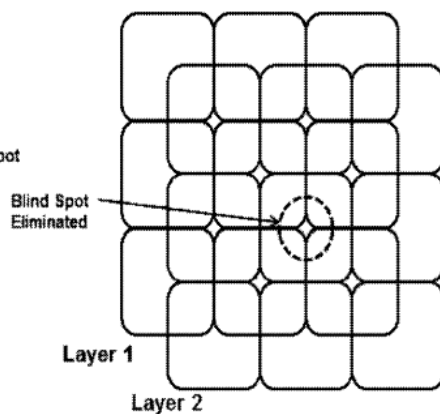


Fig. 4B



The magnetic field sensors disclosed in Fells cannot be “within the magnetic field of the wireless energy transfer system”/resonator at least because the resonator is *not* producing a magnetic field (i.e., no power to resonator) until *after* the magnetic field sensor senses an object and then SW1 closes. PO Response 29-35; Horenstein ¶¶ 110, 113. Fells discloses the Proximity Detector 4002 must

receive power to operate, i.e., the proximity detector is powered by its own energy source that is separate from the primary coil/resonator. Fells [0191], [0246]). This is evident in Fells Fig. 40, which shows no connection between the proximity detector and the primary coil and, again, is “completely separate” from the primary coil. Fells [0288]. Rather, each of the sensor types disclosed in Fells [0289] is powered by its own, separate Energy Storage 204. Fig. 40. A POSA would have known, for example, that a Hall Effect sensor requires external power to operate because it produces its output voltage via a current made to flow through along the plane of the device. Lenz pg. 979, Horenstein ¶ 96 (figure and caption below).

Fells also discloses that the primary coil/resonator is not activated (i.e., does not have any power) until *after* the proximity detector detects a mobile phone (or object) and closes Switch 1 (SW 1). Fells [0191], [0206], [0246]; Horenstein ¶ 95. With switch SW1 open (no current can flow), the primary coil L_p , which produces the resonator’s magnetic field, is not activated. Hence the primary coil/resonator is *not* producing a magnetic field. Consequently, when the proximity detector in Fells is charged and searching/sensing for a mobile phone or object, the proximity detector can neither reside within, nor can it monitor, the magnetic field of the primary coil/resonator, *because there is no magnetic field to monitor*. (Horenstein at 95).

2. *The Hall Effect sensor disclosed in Fells measures changes in the magnetic field caused by the approaching mobile phone or object.*

It is well known that a mobile phone capable of wireless charging contains a receiving coil. *See, e.g.*, Kurs [0364]; Fells [0303] (discussing NFC embedded into phones; Horenstein ¶ 61. It also was known that both primary and secondary coils can be wound on ferrite cores. Stevens 17:28-30; Horenstein ¶ 96.

“The primary coil 12 and the secondary coils 32 can have any suitable forms, but may for example be copper wire wound around a high-permeability former such as ferrite or 30 amorphous metal.” Stevens at 17:28-30.

Fells also discusses ferrites in the context of the disclosed proximity sensor

“The presence of a ferrite core or other material with similar properties within the portable device may result in altering the magnetic field.” (Fells [0289]).

The aforementioned ferrite core “within a portable device” refers to the fact that in a mobile phone, the circuitry around the ferrite core and other parts of the mobile phone can be magnetized, thus producing a magnetic field. Horenstein ¶ 96. Thus for a magnetized mobile phone approaching the primary coil in Fells, a ferrite core inside the phone would “result in altering the magnetic field” *seen by the Hall Effect device*. Thus, the change in magnetic field contemplated by Fells is not the magnetic field of the primary coil/resonator. Horenstein ¶ 93.

It is thus clear that by “magnetic field”, Fells is referring to the magnetic field produced by an approaching object, such as a mobile phone. Horenstein ¶ 60, generally at ¶ 72. As shown above, it was well known that a mobile phone set up for wireless charging contains a ferrite disk behind its secondary receiving coil (Horenstein ¶ 96), as well as one or more permanent magnets, e.g., in the core of the phone’s loudspeaker or another permanent magnet placed inside the phone. Fells [0290].

This is disclosed in Fells [0289] which refers to Fells Fig. 40. Figure 40 shows a proximity detector 4002 that “is used to initially detect that a device [e.g. a mobile phone] or foreign object has been placed in the vicinity of the wireless power supply 200. It also detects if a device or foreign object is removed from the wireless power supply 200.” (*Id.* [0287]. Fells notes that “...Proximity Detector 4002 is *completely separate* from the primary coil 212 and therefore not connected to it.” *Id.*; emphasis added; Horenstein ¶ 79.

Fells then provides a list of possible Proximity Detectors, including an “inductive proximity sensor”, a “capacitive proximity detector”, or a “Hall Effect sensor” in which, for the latter, there is a change in its output voltage in response to a change in magnetic field.” Fells [0289). Given that all of the preceding are

examples of Proximity Detector 4002, Fells thus teaches that each of the disclosed sensors is completely separate from the primary coil.

Fells notes that a ferrite core “may result in altering the magnetic field”. (Fells [0289]). Fells further teaches that a portable device may contain a permanent magnet to aid in its detection by the proximity sensor, which can be a Hall-effect sensor:

It is possible to have an element in the portable device which facilitates its detection. For instance the device may contain a **permanent magnet**. When this magnet is in proximity to the wireless power supply 200 it activates a switch within the wireless power supply 200 by magnetic attraction. Additional sense circuits that act as proximity detectors could include a hall sensor...” Fells [0290] (emphasis added).

As Fells explained, the alteration to the magnetic field by a ferrite core, as disclosed in [0289], thus refers to the alteration of the magnetic field produced by the mobile device. Horenstein, generally, at ¶ 96. A POSA would have known, for example, that every mobile phone contains a loudspeaker, and that loudspeakers always contain a permanent magnet. This is consistent with Fells’ disclosure of a permanent magnet inside a portable device.

3. A POSA would not place a Hall Effect sensor on or in the magnetic field of the source resonator.

A POSA would have known it to be difficult if not impossible to achieve the sensing capability of the loop sensors of the ’184 patent using Hall sensors. In order to attain full debris detection coverage with Hall Effect sensors, one would have to

use large numbers of Hall Effect sensors and spread them over the face of the resonator. A Hall device is not small, however, such that each sensor would obstruct the resonator. Horenstein ¶ 100 (showing how the resonator field will induce eddy currents in the silicon chip of a Hall Effect sensor, thereby incapacitating the ability of the Hall device to measure anything).

In addition, Hall Effect sensors placed on top of the resonator would themselves become foreign object debris. Because the resonator field is so strong, the sensors would heat up, just like the gum wrappers mentioned frequently in the '184 patent. Horenstein ¶ 100.

It is also true that a Hall Effect sensor can measure only magnetic fields from an external source. In other words, it can only sense *magnetized* objects. (Horenstein ¶ 96 and figure caption below). Accordingly, a Hall Effect sensor cannot sense the non-magnetized foreign object debris (FOD), which are meant to be detected as a primary purpose of the invention of the '184 Patent (e.g., detecting metal-foil paper gum wrapper and food wrappers, metal objects, cat, etc.). '184 Patent 5:25 to 6:42; 2:11-13.

Likewise, the Hall Effect sensor in Fells [0289] can by itself sense a magnetic field if the device is powered. (Lenz 979). However, as disclosed in Fells, with the

source resonator off, the Hall Effect sensor will see zero magnetic field, and its output voltage will not reflect the presence of such a field. Fells at [0289].

4. *The inductive proximity sensor in Fells is not a magnetic field sensor.*

Petitioner continues to allege that Fells discloses that its proximity detector may be “an inductive proximity sensor,” and that it constitutes “at least one magnetic field sensor” as in claim 1. Reply 3-7. For the reasons explained in detail in PO’s Response, an inductive proximity detector is not a magnetic field sensor as disclosed and claimed in the ‘184 Patent. PO Response 25-29.

Nothing in Petitioner’s Reply changes the fact that a POSA would not consider an inductive proximity sensor to be a magnetic field sensor. Horenstein Decl. ¶ 82. A magnetic field sensor detects the presence or strength of external magnetic fields, which may be from permanent magnets or electromagnet. In contrast, an inductive proximity sensor creates its own magnetic field and then detects the presence of metallic objects regardless of whether those objects are magnetic. PO Response 25-29; Horenstein Decl. ¶¶ 89-92. Indeed, Petitioner’s declarant, Dr. Allen, admits that “an Eddy-current sensor, I suppose, could be something loosely like [an inductive proximity sensor that does not constitute a magnetic field sensor].” Allen Depo. (Ex. 2015) 33:13-18; see also id. 34:9 – 35:6. Petitioner’s Dr. Allen further explains, “instead of directly sensing a magnetic

field, [an inductive proximity sensor that does not constitute a magnetic field sensor] generates a magnetic field in the presence of a conductor that is then sensed.” *Id.* 33:18-21. In this regard, the magnetic field created by an inductive proximity sensor is sensitive to metallic objects but does not directly respond to external magnetic fields. PO Response 27; Horenstein Decl. ¶¶ 89-90.

As a POSA would understand, magnetic field sensors are sensors, such as the loop(s) of wire disclosed in the ’184 patent, that are designed to sense and respond to *external* magnetic fields. PO Response 25-26 (citing ’184 Patent 2:20-31, 5:29-34, 39-49; Horenstein Decl. ¶¶ 90-92; Carstens 119, 130-131; Staugaard 8-26). In contrast to a magnetic field sensor, an inductive proximity sensor as referenced in Fells is a sensor designed to detect the presence of a metallic object by generating and monitoring changes in an electromagnetic field produced by the inductive proximity sensor itself. PO Response (citing Horenstein Decl. ¶¶ 83-89; *see also* Carstens 250; Staugaard 8-25; Petruzella 102; Rabiee 75; Carr 191).

B. Dependent Claims 8 and 11

Because dependent claims 8 and 11 depend from claim 1, Patent Owner respectfully submits that the Petition has failed to establish that the challenged dependent claims are unpatentable at least by virtue of their respective dependencies.

For at least the foregoing reasons, Petitioner therefore fails to establish that claims 1, 8 and 11 are unpatentable as being obvious over Fells. Accordingly, Ground 1 fails.

III. Claims 2-7, 9, 10, and 16 Are Patentable Over Fells and Cook (Ground 2)

A. Dependent Claims 2-7, 9 and 10

1. Cook does not cure the deficiencies of Fells.

Petitioner asserts that claims 2-7, 9, 10 and 16 are unpatentable as being obvious over Fells and Cook. As explained above, Petitioner fails to establish that claims 1, 8 and 11 are unpatentable as being obvious over Fells. Cook does not cure the aforementioned deficiencies of Fells, including at least positioning of the at least one magnetic field sensor, as required by claim 1, and by dependency claims 2-7, 9 and 10. Horenstein Decl. ¶ 104. Petitioner does not in fact cite Cook for teaching placement of the at least one magnetic field sensor.

For at least the same reasons given above and in PO's Response, Petitioner fails to establish that claims 2-7, 9 and 10 are unpatentable as being obvious over Fells and Cook. Ground 2 as to claims 2-7, 9, and 10 therefore fails.

2. Petitioner fails to establish obviousness of “wherein the foreign object debris detection system is configured to perform a health and/or status check of the wireless energy transfer source before the vehicle is positioned over the source resonator.”

Ground 2 as to claims 4-6 also fails for additional reasons. In this regard, dependent claim 4 (and by further dependency claims 5 and 6) requires that the foreign object debris detection system is configured to perform a health and/or status check of the wireless energy transfer source before the vehicle is positioned over the source resonator. Petitioner alleges that Fells teaches two health and/or status checks, namely, a “sense circuit calibration” and a check of the energy level in the energy storage element. Pet. 40-42, 52-53; Allen Decl. ¶¶ 184-196, 225-227. Petitioner is incorrect. Horenstein Decl. ¶ 105.

(a) Sense Circuit Calibration

Petitioner’s Reply failed to address that, as understood by a POSA, a status check of a source resonator is a test to verify the functioning status of that source resonator. PO Response 45-46; Horenstein Decl. ¶ 106. Petitioner relies on Fells’ sense circuit calibration, but it does not verify the functioning status of the source resonator itself. *Id.* Horenstein Decl. ¶¶ 106-107. Likewise, establishing a baseline induction measurement also does not verify the functioning status of the source resonator. *Id.*

(b) Check of the Energy Level in the Energy Storage Element

Petitioner again argues that checking that the energy storage element is not fully depleted provides the health and/or status of the resonator, as the resonator is incapable of being turned on by the sense circuit if the energy storage element is depleted. Reply 16-18; Pet. 42. Simply put, a check of the energy storage element's energy level only determines whether the sense circuit can potentially be triggered; it does not provide a health or status check of the resonator itself. PO Response 48-49.

For at least this additional reason, Petitioner fails to establish that claim 4, and by further dependency claims 5 and 6, are unpatentable as being obvious over Fells and Cook.

B. Independent Claim 16

Independent claim 16 requires performing a health and/or status check of a source resonator of the wireless energy transfer system. As explained immediately above, with respect to claims 4-6 (Ground 2), Petitioner alleges that Fells teaches two health and/or status checks, namely, a “sense circuit calibration” and a check of the energy level in the energy storage element. For the same reasons noted

above, Fells disclosure of a sense circuit calibration and status check of the energy storage element is not a health or status check of the source resonator. As both Figures 2 and 40 show, the source resonator is a separate component part from the sense circuit and the energy storage element that only provides energy to the sense circuit (and does not provide energy to the source resonator).

For at least the foregoing reasons, Petitioner therefore fails to establish that claims 2-7, 9, 10 and 16 are unpatentable as being obvious over Fells and Cook. Accordingly, Ground 2 fails.

IV. Claim 12 Is Patentable Over Fells and Ono (Ground 3)

A. Ono Does Not Cure the Deficiencies of Fells

Petitioner asserts that claim 12 is unpatentable as being obvious over Fells and Ono. As explained above, Petitioner fails to establish that claims 1, 8 and 11 are unpatentable as being obvious over Fells. Ono does not cure the aforementioned deficiencies of Fells, including at least positioning of the at least one magnetic field sensor, as required by claim 1, and by dependency claim 12. Horenstein Decl. ¶ 121. Petitioner does not in fact rely on Ono for teaching placement of the at least one magnetic field sensor.

For at least the same reasons given above, Petitioner fails to establish that claims 12 is unpatentable as being obvious over Fells and Ono. Ground 3 therefore fails.

1. Fells and Ono do not disclose “the foreign object debris detection system is integrated into the enclosure”

a) Fells Does Not Disclose “The Foreign Object Debris Detection System Is Integrated into the Enclosure”

Petitioner argues that Fells discloses the foreign object debris detection system is integrated into the enclosure, relying predominately on dotted lines shown in FIG. 40 of Fells. Pet. 61-62; Allen Decl. ¶ 246. According to Petitioner, “[a] POSA would have understood that the dotted lines in Fells’ diagrams indicate an ‘integrated’ enclosure encompassing all components within the dotted lines.” Pet. 62; Allen Decl. ¶ 246. Again, Petitioner is incorrect. Horenstein Decl. ¶¶ 123-125.

Petitioner is simply wrong. *See* PO Response at 50-55. Also, labeled, dotted lines in patents are used to identify parts, not indicate an enclosure. And they typically indicate parts grouped on a circuit board. Again, features shown in a drawing may be sufficient to establish anticipation, those features must be “shown clearly.” *In re Mraz*, 455 F.2d at 1072. As shown below, FIG. 40 is a block

diagram that shows various components and their interconnections within the wireless power supply. Horenstein Decl. ¶ 123.

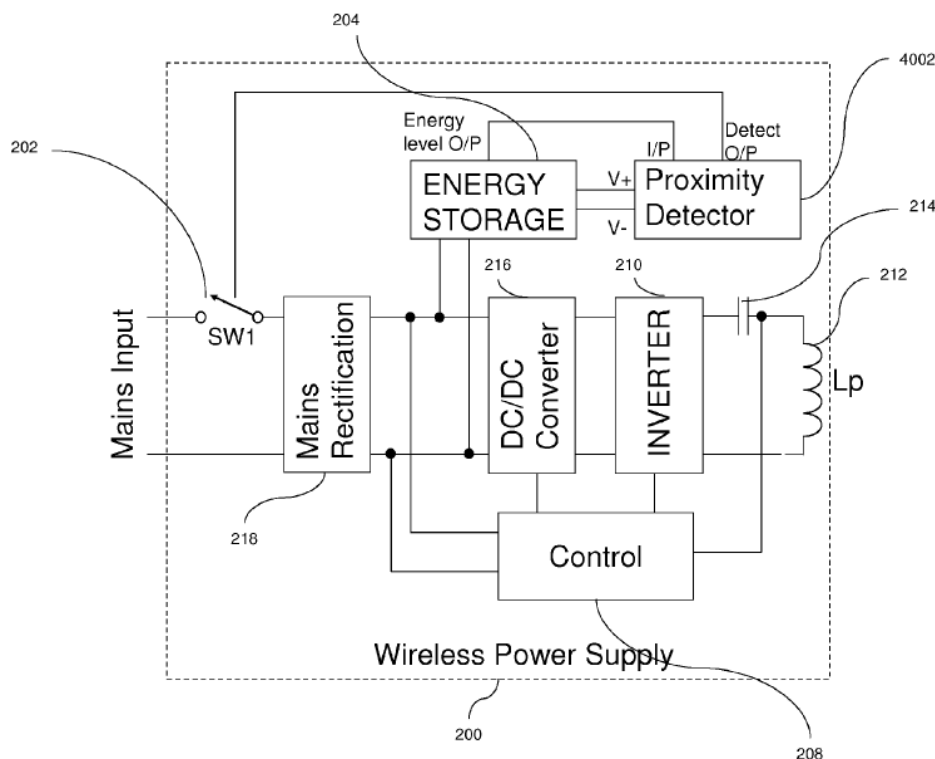


FIG. 40 includes reference numerals identified in the corresponding description of Fells. The dotted line boundary is identified by reference number 200, which Fells refers to as a wireless power supply, primary unit or wireless power unit. Fells ¶¶ 191, 203. But nowhere does Fells describe the wireless power supply, primary unit, or wireless power unit as an enclosure, or as including an enclosure. Horenstein Decl. ¶ 123. Petitioner instead simply relies on its declarant, Dr. Allen, and strained inferences to figures and passages in Fells referring to

“integration” of the wireless power supply with another piece of electronic equipment.

b) Fells and Ono do not disclose “the foreign object Debris detection system is integrated into the enclosure.”

In the alternative, Petitioner argues that “a POSA implementing Fells would have considered it obvious to place Fells’ wireless power supply, including the proximity detector, control unit, and tank circuit, within a primary enclosure as taught by Ono. Pet. 63; Allen Decl. ¶ 247. According to Petitioner, “a housing would protect the coil of Fells’ wireless power supply from environmental contaminants ..., while also shielding the coil and related circuitry from damage that could cause electrical shorts” Pet. 63; Allen Decl. ¶ 249. Even assuming, *arguendo*, a POSA would have considered it obvious to place Fells’ wireless power supply within a primary enclosure as taught by Ono, Petitioner still fails to establish that the combination of Fells and Ono discloses that the foreign object debris detection system is *integrated* into the enclosure, as required by claim 12. Horenstein Decl. ¶¶ 126-128.

In particular, Petitioner appears to believe that claim 12 merely requires an enclosure housing the wireless energy transfer source and the foreign object debris detection system. Once again, Petitioner is incorrect. The claim does require “an enclosure *housing* at least a portion of the wireless energy transfer source.” But the

claim also requires that the foreign object debris detection system is *integrated into* the enclosure,” which is different from the enclosure merely housing the foreign object debris detection system. PO Response 54-55.

For at least the foregoing reasons, Petitioner therefore fails to establish that claim 12 is unpatentable as being obvious over Fells alone or with Cook.

Accordingly, Ground 3 fails.

V. Claim 13 Is Patentable Over Fells and Cook and/or Wang Thesis (Ground 4)

As noted above, Petitioner did not address Ground 4 in its Reply.

Accordingly, PO relies on its argument in PO’s Response at 56-57. As explained above in Sections I and II, Petitioner fails to establish that claims 1, 8 and 11 are unpatentable as being obvious over Fells. Cook and/or Wang Thesis does not cure the aforementioned deficiencies of Fells, including at least positioning of the at least one magnetic field sensor, as required by claim 1, and by dependency claim 13. *Id.* Accordingly, Petitioner fails to establish that claims 13 is unpatentable as being obvious over Fells and Cook and/or Wang Thesis. Ground 4 therefore fails.

VI. CONCLUSION

For the foregoing reasons, Petitioner fails to meet its burden of establishing that the challenged claims are unpatentable as being obvious over the prior art.

Dated: February 13, 2025.

Respectfully submitted,

/Lance A. Lawson/

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CERTIFICATE OF COMPLIANCE UNDER 37 C.F.R. § 42.24(d)

Pursuant to 37 C.F.R. § 42.24(d), the undersigned hereby certifies that the foregoing paper complies with the type-volume limits of C.F.R. § 42.24(c)(4). The foregoing paper contains about 4,825 words, as calculated by Microsoft Word, excluding the parts of the paper exempted by 37 C.F.R. § 42.24(a)(1).

Dated: February 13, 2025

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CERTIFICATE OF SERVICE

It is certified that a copy of the *Patent Owner's Sur-Reply* 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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