

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent of: Azancot et al.
U.S. Patent No.: 8,626,461 Attorney Docket No.: 46570-0023IP1
Issue Date: January 7, 2014
Appl. Serial No.: 13/306,379
Filing Date: November 29, 2011
Title: EFFICIENCY MONITOR FOR INDUCTIVE POWER
TRANSMISSION

Mail Stop Patent Board

Patent Trial and Appeal Board
U.S. Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450

**PETITION FOR *INTER PARTES* REVIEW OF UNITED STATES PATENT
NO. 8,626,461 PURSUANT TO 35 U.S.C. §§ 311–319, 37 C.F.R. § 42**

TABLE OF CONTENTS

I.	REQUIREMENTS FOR IPR—37 C.F.R. §42.104.....	1
A.	Grounds for Standing—37 C.F.R. §42.104(a)	1
B.	Challenge and Relief Requested—37 C.F.R. §42.104(b)	1
II.	SUMMARY OF THE '461 PATENT	2
A.	Brief Description	2
B.	Prosecution History of the '461 Patent	4
III.	LEVEL OF ORDINARY SKILL	8
IV.	CLAIM CONSTRUCTION	8
V.	DETAILED EXPLANATION OF GROUNDS.....	9
A.	GROUND 1A: Olson Anticipates Claims 13-16 and 18	9
1.	Olson	9
2.	Application to Challenged Claims	12
B.	GROUND 1B: The Predictable Combination of Olson in View of Stevens Renders Obvious Claim 17	26
1.	Stevens	26
2.	The Olson-Stevens Combination	29
3.	Application to Challenged Claims	33
C.	GROUND 2: The Predictable Combination of Stevens in View of Olson Renders Obvious Claims 13-18	37
1.	The Stevens-Olson Combination	37
2.	Application to Challenged Claims	39
D.	GROUND 3: The Predictable Combination of Stevens in View of Jin Renders Obvious Claims 13-18.....	55
1.	Jin	55
2.	The Stevens-Jin Combination	56
3.	Application to Challenged Claims	58
VI.	DISCRETIONARY DENIAL IS NOT JUSTIFIED.....	63

A.	The Petition’s New Prior Art and Errors Made During Prosecution Warrant Institution—35 U.S.C. § 325(d).....	63
B.	<i>Fintiv</i> Considerations Weigh in Favor of Institution—35 U.S.C. § 314(a).....	64
VII.	PAYMENT OF FEES—37 C.F.R. § 42.103.....	65
VIII.	CONCLUSION.....	65
IX.	MANDATORY NOTICES UNDER—37 C.F.R § 42.8(a)(1).....	65
A.	Real Party-In-Interest Under 37 C.F.R. § 42.8(b)(1)	65
B.	Related Matters Under 37 C.F.R. § 42.8(b)(2)	65
C.	Lead And Back-Up Counsel Under 37 C.F.R. § 42.8(b)(3)	66
D.	Service Information.....	67

LIST OF EXHIBITS

EX1001	U.S. Patent No. 8,626,461
EX1002	Prosecution History of U.S. Patent No. 8,626,461 (“the ‘461 application”)
EX1003	Expert Declaration of Gary Woods, Ph.D.
EX1004	U.S. Publication No. 2005/0075699 (“Olson”)
EX1005	PCT Publication No. WO2005/109597 (“Stevens”)
EX1006	US Publication No. 2002/0057164 (“Jin”)
EX1007	U.S. Provisional App. Serial No. 60/907,132 (March 22, 2007)
EX1008	U.S. Provisional App. Serial No. 60/935,847 (September 4, 2007)
EX1009	U.S. Provisional App. Serial No. 61/006,076 (December 18, 2007)
EX1010	U.S. Provisional App. Serial No. 61/006,448 (January 16, 2008)
EX1011	U.S. Provisional App. Serial No. 61/006,721 (January 29, 2008)
EX1012	<i>Powermat Technologies Ltd. v. Anker Innovations Ltd.</i> , Case No. 5-23-cv-00052 (E.D. Tex.), Document 1 (Complaint), June 5, 2023
EX1013	U.S. Patent No. 7,605,496 (“Stevens496”)
EX1014	U.S. Patent No. 7,791,312 (“Kook”)
EX1015	Petitioner’s <i>Sotera</i> Stipulation

EX1016 Waiver of Service, *Powermat Technologies Ltd. v. Anker
Innovations Ltd.*, Case No. 5-23-cv-00052 (E.D. Tex.),
September 27, 2023

LISTING OF CLAIMS

Claim Element	Language
[13.P]	An inductive power outlet comprising at least one primary coil, for inductively coupling with a secondary coil wired to an electric load, the inductive power outlet further comprising an efficiency monitor comprising:
[13.1]	at least one input power monitor configured to measure input power received by the primary coil from the power supply;
[13.2]	at least one signal detector configured to detect signals carrying data pertaining to output power received by the secondary coil;
[13.3]	at least one processor configured to receive data pertaining to the input power and the output power, the processor further configured to determine an index of power-loss indicative of the efficiency of an inductive coupling between the primary coil and the secondary coil;
[13.4]	wherein the index of power-loss comprises at least one of: an efficiency quotient Q , defined as the ratio of the output power to the input power; and an efficiency differential Δ , defined as the difference between the output power and the input power.
[14]	The inductive power outlet of claim 13 additionally comprising at least one circuit-breaker configured to disconnect the primary coil from the power supply.
[15.1]	An inductive power receiver comprising at least one secondary coil for inductively coupling to a primary coil and supplying power to an electric load,
[15.2]	the inductive power receiver further comprising at least one output power monitor for measuring output power received inductively by the secondary coil from the primary coil, and
[15.3]	at least one signal transmitter configured to transmit signals carrying data pertaining to the output power to the inductive power outlet of claim 13.
[16]	The inductive power receiver of claim 15 wherein the signal transmitter is selected from a group consisting of: light emitting diodes, radio transmitters, optocouplers, and transmitter circuits.

[17.1]	The inductive power receiver of claim 15 wherein the transmitter comprises: an ancillary load selectively connectable to the secondary inductive coil, a modulator for modulating a bit-rate signal with an input signal to create a modulated signal, and
[17.2]	a switch for intermittently connecting the ancillary load to the secondary inductive coil according to the modulated signal.
[18]	The inductive power receiver of claim 15 wherein the output power monitor is incorporated into an electric device.

Anker Innovations Ltd. (“Petitioner” or “Anker”) petitions for *Inter Partes* Review (“IPR”) of claims 13-18 (“the Challenged Claims”) of U.S. Patent No. 8,626,461 (“the ’461 patent”).

I. REQUIREMENTS FOR IPR—37 C.F.R. §42.104

A. Grounds for Standing—37 C.F.R. §42.104(a)

Petitioner certifies that the ’461 patent is available for IPR, and Petitioner is not barred or estopped from requesting IPR.

B. Challenge and Relief Requested—37 C.F.R. §42.104(b)

Petitioner requests IPR on Grounds 1A-3 listed below. An expert declaration from Gary Woods, Ph.D. supports Grounds 1A-3. *See* EX1003.

Ground	Claims	Basis for Rejection
1A	13-16, 18	§102 – Anticipated by Olson (EX1004)
1B	17	§103 – Obvious based on Olson in view of Stevens (EX1005)
2	13-18	§103 – Obvious based on Stevens in view of Olson
3	13-18	§103 – Obvious based on Stevens in view of Jin (EX1006)

All Grounds 1A-3 rely on publications that were published well before the March 22, 2007 filing date of the ’461 patent’s earliest provisional application and thereby qualify as prior art under at least the following provisions of pre-AIA 35 U.S.C. § 102:

Reference	Filed	Published	§102 Provision(s)
Olson	04/30/2004	04/07/2005	102(a) and (b)
Stevens	05/11/2005	11/17/2005	102(a) and (b)
Jin	07/03/1998	05/16/2002	102(a) and (b)

II. SUMMARY OF THE '461 PATENT

A. Brief Description

The '461 patent describes an “efficiency monitor” for an inductive power outlet, which can be used to wirelessly charge another device. EX1001, 12:60-15:60, FIGS. 5-7, Abstract; EX1003, ¶25. According to the patent, the “efficiency monitor 4300 consists of an input power monitor 4122 incorporated within the power outlet 4210 and an output power monitor 4124 incorporated within the electric device 4290, both in communication with a processor 4162.” EX1001, 13:10-14. As shown in FIG. 5 (below), the “input power monitor 4122” measures the input power provided by the “primary coil 4220” and the “output power monitor 4124” measures the output power received by the “secondary coil 4260”:

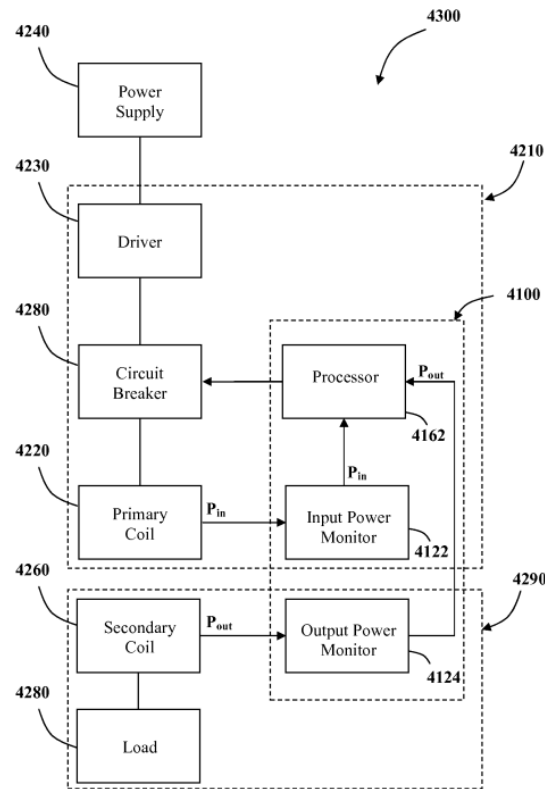


Fig. 5

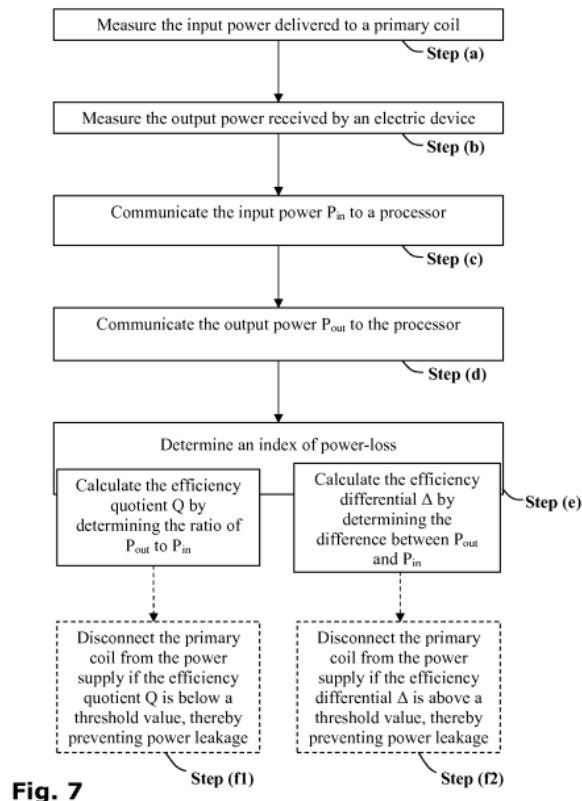
EX1001, FIG. 5, 13:4-20.

A processor 4162 of the power outlet 4210 is in communication with both the input power monitor 4122 and the output power monitor 4142 for purposes of receiving the values of “input power P_{in} ” and “output power P_{out} ,” which the processor uses to calculate “an index of power-loss.” EX1001, 13:21-37; FIGS. 5, 7. Pertinent to the independent claims of the ’461 patent, the specification explains that:

The index of power-loss may be the efficiency quotient Q which is the ratio between them, P_{out}/P_{in} , which is an indication of the efficiency of the inductive coupling. Alternatively the index of power loss may be

the efficiency differential Δ which is the difference between P_{out} and P_{in} .

EX 1001, 13:24-29. The example method in FIG. 7 likewise depicts these alternatives for the “index of power-loss”:



EX1001, FIG. 7, 15:34-39; *see also id.*, FIG. 6(a)-(d) and 13:38-15:33 (describing an embodiment that “then calculates the efficiency quotient Q”); EX1003, ¶26.

B. Prosecution History of the '461 Patent

The prosecution history demonstrates that the structural elements recited in claim 13—a primary coil for inductively coupling with a secondary coil, an efficiency monitor, an input power monitor, a signal detector, and a processor—

were often implemented in prior art inductive power outlets. EX1003, ¶¶27-30 (citing to EX1002, 197-202, 246-248). The examiner allowed claims only after an amendment that added the final “wherein” functional recitation, which limited the index of power-loss to a specific type: an “efficiency quotient Q ” or an “efficiency differential Δ .” EX1002, 218, 220, 246-248.

In more detail, application claim 14 (now issued claim 13 of the ’461 patent) was initially rejected in a first Office action dated August 29, 2012 as being anticipated by U.S. Pat. 7,605,496 (EX1013).¹ EX1002, 91-93. In response, the applicant responded without amending the independent claims and instead argued that the cited patent did not “describe any signal detector configured to detect signals carrying data pertaining to output power received by the secondary coil” and did not describe “any alternative way to determine an index of power loss.” EX1002, 180, 186-187. In a second (final) Office action dated March 21, 2013, the examiner explained that such arguments were “not persuasive” and then set forth why the cited patent did indeed teach all elements of the independent claim. EX1002, 200-203.

The applicant then interviewed the examiner twice. In the May 2013 interview, no agreement was reached. EX1002, 220. In the June 2013 interview,

¹ See *infra*, footnote 3.

the examiner suggested amending each independent claim to overcome the cited patent—including an amendment to add the “wherein” clause of then-dependent claim 10 into each independent claim. EX1002, 220. The applicant obliged, amending application claim 14 (now issued as claim 13) as follows:

14. An inductive power outlet comprising at least one primary coil, for inductively coupling with a secondary coil wired to an electric load, the inductive power outlet further comprising an efficiency monitor comprising:

at least one input power monitor configured to measure input power received by the primary coil from the power supply ~~delivered to the primary coil~~;

at least one signal detector configured to detect signals carrying data pertaining to output power received by the secondary coil;

at least one processor configured to receive data pertaining to the input power and the output power, the processor further configured to determine an index of power-loss indicative of the efficiency of an inductive coupling between the primary coil and the secondary coil;

wherein the index of power-loss comprises at least one of:

an efficiency quotient Q , defined as the ratio of the output power to the input power; and

an efficiency differential Δ , defined as the difference between the output power and the input power.

EX1002, 218. This response to the second Office action also included remarks in

which the applicant acknowledged the Examiner's conclusion. EX1002, 224 ("However, in order to expedite prosecution, and following the Examiner suggestions These amendments further clarify the failure of Stevens to anticipate the claimed invention.").

A notice of allowance was provided on August 30, 2013, which expressly identified the reasons for allowance. EX1002, 240-248. Namely, for application claim 14 (issued claim 13), the Examiner concluded that US7,605,496 was "the reference closest to the claimed invention" because it discloses all of the claim elements except the functional recitation of the processor element:

Stevens et al. do not teach the processor further configured to determine an index of power-loss indicative of the efficiency of an inductive coupling between the primary coil and the secondary coil; wherein the index of power-loss comprises at least one of: an efficiency quotient Q , defined as the ratio of the output power to the input power; and an efficiency differential A , defined as the difference between the output power and the input power.

EX1002, 247-248. Applicant never commented on this reason for allowance for issued claim 13 of the '461 patent. *See* EX1002, 311-319.

As demonstrated by Grounds 1A-3 below, however, the application never should have been allowed in that form. *Infra*, Section V. Critically, more pertinent prior art was never presented to the Examiner during examination, but these

publications (such as Olson and Jin) amply demonstrate exactly what the Examiner mistakenly believed to be missing from the prior art. EX1003, ¶¶31, 123. The '461 patent is ripe for review.

III. LEVEL OF ORDINARY SKILL

For purposes of this IPR, Petitioner submits that a person of ordinary skill in the art at the time of the alleged invention (“POSITA”) would have had a bachelor’s degree or higher in electrical engineering, at least 3 years of experience designing or researching electronic circuits, and familiarity with power electronics and inductive power transfer circuits. EX1003, ¶20.

IV. CLAIM CONSTRUCTION

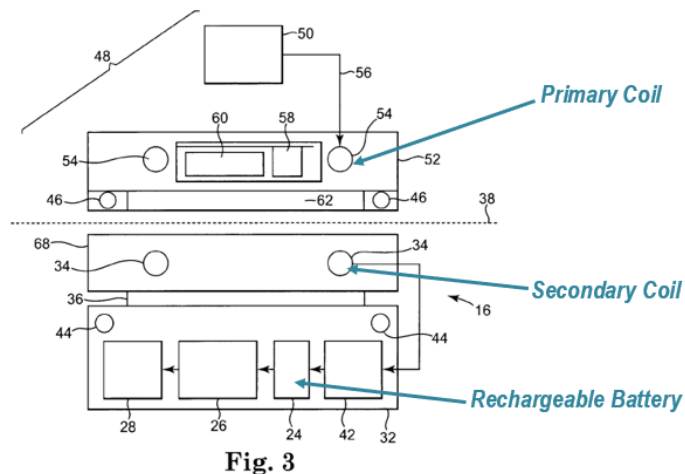
All claim terms should be construed according to the *Phillips* standard. *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005); 37 C.F.R. §42.100. Here, given the remarkable overlap between the preferred embodiment of the '461 patent and the prior art/predictable combinations articulated in Grounds 1A-3, Petitioners submit that no claim elements need a formal construction for purposes of resolving the controversy in this proceeding. *Wellman, Inc. v. Eastman Chem. Co.*, 642 F.3d 1355, 1361 (Fed. Cir. 2011); *Google Inc. v. Intellectual Ventures II LLC*, 701 Fed. Appx. 946, 956 (Fed. Cir. 2017) (“do not require construction” for purposes of “resolv[ing] the parties’ patentability arguments”). EX1003, ¶34.

V. DETAILED EXPLANATION OF GROUNDS

A. GROUND 1A: Olson Anticipates Claims 13-16 and 18

1. Olson

Similar to the '461 patent, Olson describes concepts related to a power outlet device (Olson uses the term “external charging device”) having a “primary coil” for inductively coupling with a “secondary coil” of a battery-powered electric device:



EX1004, [0019], [0046]-[0054], [0072]-0078], FIGS. 3 (annotated above) and 14; EX1003, ¶35. In Olson’s depicted embodiments, the power outlet device is implemented in the form of wireless charger for transmitting power to an implanted medical device. EX1004, [0046]-[0054], [0072]-[0078], [0111]-[0116]. Olson explains that “[f]or implanted medical devices, the efficiency at which energy is transcutaneously transferred is crucial” because a high efficiency beneficially reduces the heating of surrounding components and tissues as well as reduces the amount of time to recharge the wireless device. EX1004, [0017]. Accordingly,

Olson's charging device measures and calculates an efficiency of power transfer between the external charging device and the implantable medical device. EX1004, [0074], [0075], [0076], [0112]. This efficiency of power transfer is presented to a user to assist with repositioning/alignment for improved power transfer from the external charging device to the implantable medical device. EX1004, [0076]-[0078].

Specifically, Olson's charging device "contains the electronics necessary to drive primary coil 54 with an oscillating current in order to induce current in secondary coil 34" contained in the implantable device. EX1004, [0054]; EX1003, ¶36. The "[s]econdary charging coil 34 is operatively coupled through electronics 26 to rechargeable power source 24." EX1004, [0050].

As shown in FIG. 14, Olson monitors the efficiency of power transfer from the primary coil to the secondary coil using a microprocessor 212, a telemetry antenna 218, and a current measure block 226:

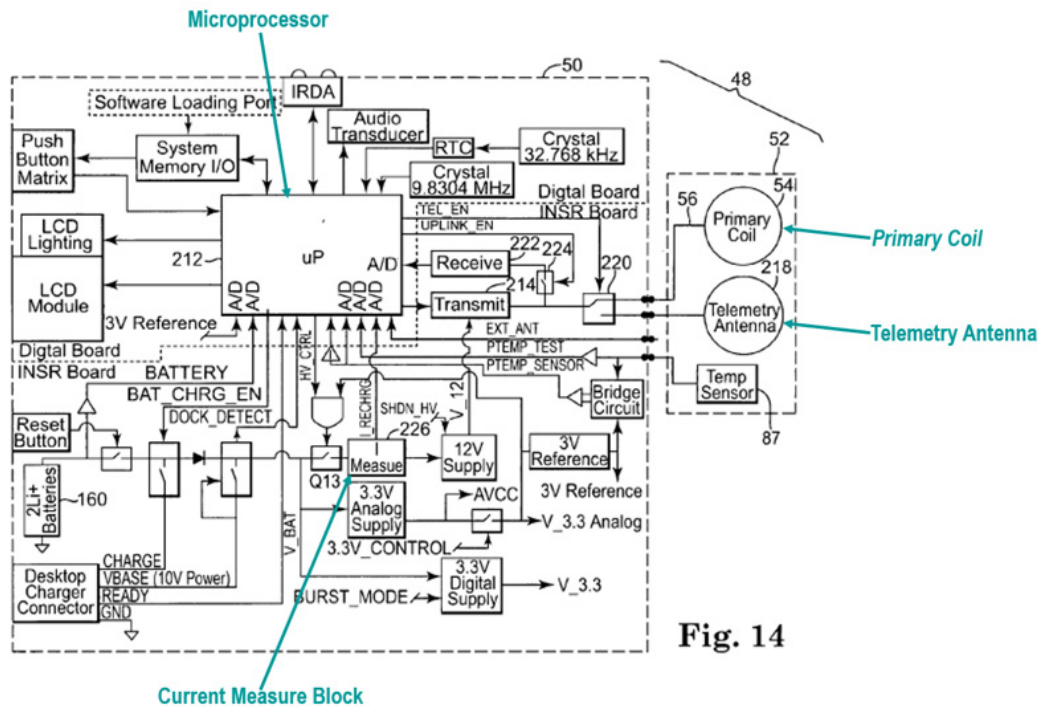


Fig. 14

EX1004, FIG. 14 (annotated), [0072], [0074]-[0078]; EX1003, ¶37. The “[c]urrent measured by current measure block 226 is used in the calculation of power,” which as depicted in FIG. 14, measures the “power in” provided to transmit block 214/primary coil 54 and communicates this “power in” measure to the microprocessor 212. EX1004, [0074]-[0075] (“by the current driving external antenna 52”), FIG. 14; EX1003, ¶37. From there, this **“power in” measure** is “used in the calculation of efficiency of power transfer and/or charging efficiency.” EX1004 [0074]. The charging device 48 also includes a “telemetry antenna 218.” *Id.*, [0072]. The charging device receives “by telemetry” (e.g., the telemetry antenna 218) the data pertaining to the “power induced in the implantable medical device 16”—a **“power out” measure** indicating the recharging power received by the

secondary coil. EX1004, [0075] (“by the charging current in the implantable medical device 16”), *see also* [0073]; EX1003, ¶¶36-37.

The microprocessor 212 receives data pertaining to the “power in” and “power out” measures and then calculates the efficiency of power transfer from the primary coil to the secondary coil. EX1004, [0073]-[0076], [0112] FIG. 14; EX1003, ¶38. Namely, Olson teaches the conventional option of using an index of power loss in the form of an *efficiency quotient*—which is described as a “calculation” where the “power out” measure is “divided by” the “power in” measure. EX1004, [0075]-[0076], [0112] (“efficiency is measured by dividing the power in, i.e., the power received by secondary coil 34, by the power out, i.e., the power transmitted by primary coil 54”); EX1003, ¶38. Simply put, Olson teaches that which the examiner believed to be missing from the prior art during examination of the ’461 patent.

2. Application to Challenged Claims

Element [13.P]: An inductive power outlet comprising at least one primary coil, for inductively coupling with a secondary coil wired to an electric load, the inductive power outlet further comprising an efficiency monitor comprising:

Even if the preamble is treated as a limitation, Olson discloses a “charging device 48” (e.g., the claimed *inductive power outlet*) comprising a “*primary coil 54.*” EX1004, [0072], [0075], FIG. 14, *see also* [0050]-[0054], FIGS. 2-3, 13; EX1003, ¶39. The charging device 48 “contains the electronics necessary to drive

primary coil 54 with an oscillating current in order to induce current in *secondary coil 34* when primary coil 54 is placed in the proximity of secondary coil 34.”

EX1004, [0054], *see also* [0072].

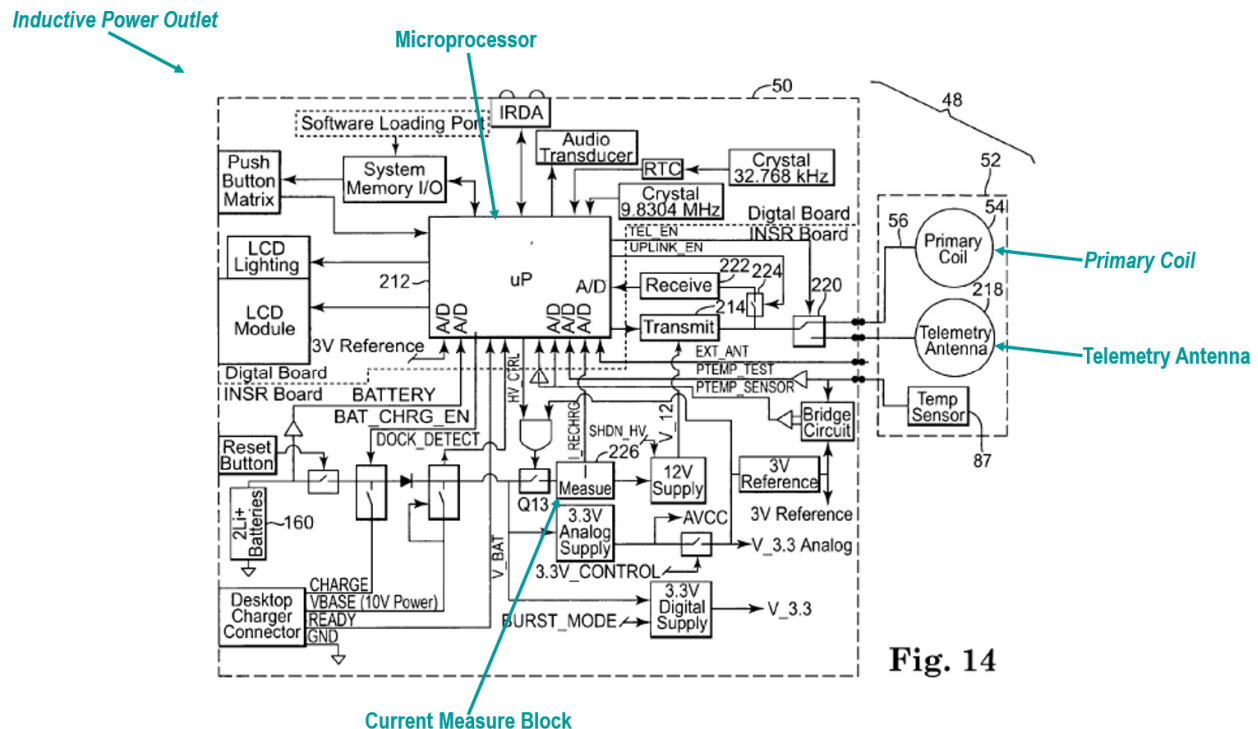
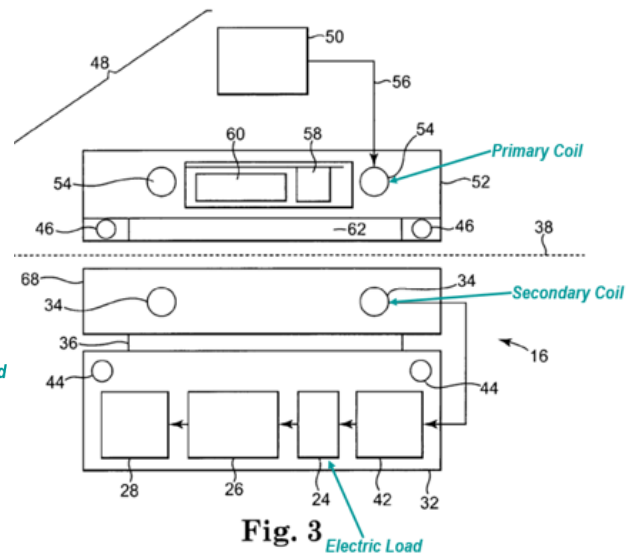
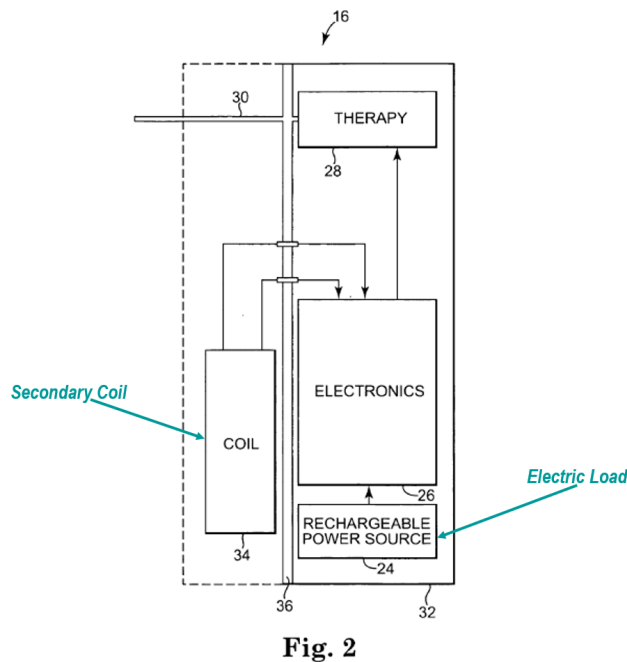


Fig. 14

EX1004, FIG. 14 (annotated).

Olson’s charging device 48 wirelessly recharges an electric device—an implanted medical device in Olson’s depicted embodiments—which includes a “rechargeable power source 24” (e.g., the claimed *electric load*) wired to the “secondary charging coil 34.” EX1004, [0050]-[0054], FIGS. 2-3. The “[s]econdary charging coil 34 is operatively coupled through electronics 26 to rechargeable power source 24.” EX1004, [0050], [0054], [0075], FIGS. 2-3.



EX1004, FIGS. 2-3 (annotated); EX1003, ¶40.

Olson's charging device 48 includes "a microprocessor 212," "telemetry antenna 218," and "current measure block 226" that operates as part of the claimed *efficiency monitor*. EX1004, [0072]-[0076], FIG. 14; *see also* EX1004, [0112]; EX1003, ¶41. Specifically, the microprocessor 212 is configured to determine an efficiency index calculation by receiving (e.g., via the "current measure block 226") data pertaining to the "power in" at the primary coil 54 and by receiving (e.g., via the telemetry antenna 218) data pertaining to the "power out" for the amount of power induced at the secondary charging coil 34. EX1004, [0072], [0074]-[0076], EX1003, ¶41. The microprocessor 212 uses these measured values to determine an efficiency quotient indicative of power loss during the wireless power transfer. EX1004, [0074]-[0076] ("divided by"), [0112] ("by dividing"); EX1003, ¶41.

Element [13.1]: at least one input power monitor configured to measure input power received by the primary coil from the power supply;

Olson discloses a current measure block 26 that, in connection with microprocessor 212, provides the claimed ***input power monitor***. EX1003, ¶42. For example, Olson's "[c]urrent measure block 226" measures current to the "primary coil 54" from the ***power supply*** 216 EX1004, [0071]-[0078]. FIG. 13, FIG. 14; EX1003, ¶42; *supra*, Element [13.P]. In particular, "current measure block 226" measures current to "12 volt power supply 216," which is used in the calculation of the "power in" measure. EX1004, [0074]. As shown in FIG. 14, this is the current driving the external antenna 52, via the transmit block 214 and to the primary coil 54. EX1004, FIG. 14, [0074]-[0075] ("by the current driving external antenna 52"), *see also* [0112] ("efficiency is measured coil-to-coil, i.e., ***from primary coil 54*** to secondary coil 34."). According to Olson, the "power in" measure is advantageously "used in the calculation of efficiency of power transfer and/or charging efficiency to determine, in part, the best location of external antenna 52 and/or rotating core cup assembly 92." EX1004, [0074].

FIG. 14 also shows that the current measure block 226 produces a signal that is provided as input to an analogue-to-digital ("A/D") converter of the microprocessor 212 so that the microprocessor 212 receives a value for the measured current from the power supply to drive the primary coil 54 of the external antenna

52:

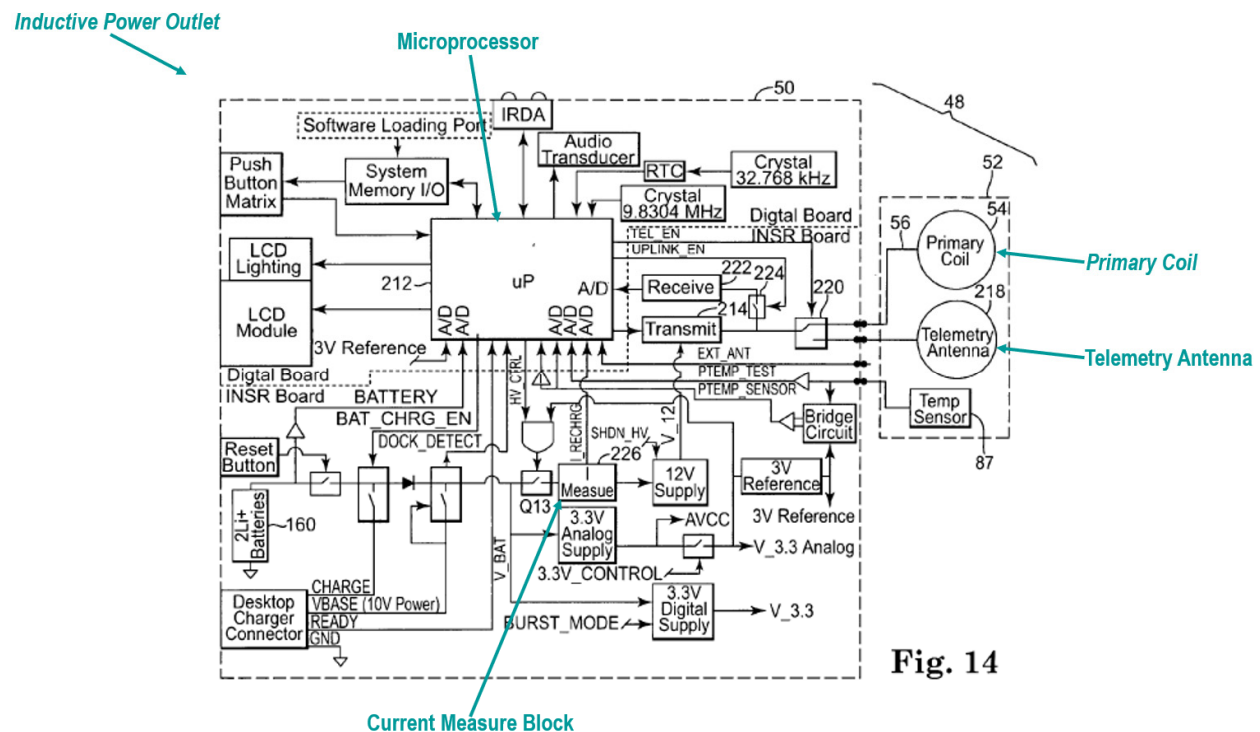


Fig. 14

EX1004, FIG. 14 (annotated), [0074]; EX1003, ¶43.

The microprocessor 212 also receives the input voltage of the charging device 48 (e.g., from the batteries 160 and/or the desktop charging device 162). EX1004, FIG. 14, EX1003, ¶44. Therefore, the microprocessor 212 calculates the “power in” by “multiplying the internal voltage of the charging unit 50 ... by the current driving the external antenna 52 [provided to the primary coil 54].” EX1004, [0075]; EX1003, ¶44; *see also* EX1004, [0071]-[0078], FIGS. 13-14, 17; and [0112] (“efficiency is measured by dividing the power in, i.e., the power received by secondary coil 34, by the power out, i.e., the power transmitted by primary coil 54. While energy efficiency can be measured at other locations in external antenna 52

and/or implantable medical device 16, for purposes of some embodiments of the present invention *it is preferred that efficiency is measured coil-to-coil, i.e., from primary coil 54 to secondary coil 34*) (emphasis added).

Element [13.2]: at least one signal detector configured to detect signals carrying data pertaining to output power received by the secondary coil;

Olson discloses the claimed signal detector. EX1003, ¶45. For example, Olson describes the “telemetry antenna 218” (e.g., a ***signal detector***) that is configured to detect data signals from the implantable medical device. EX1004, [0072]-[0075] (“by telemetry”), FIG. 14, *see also* [0052] (“to obtain information from implantable medical device 16”). Olson describes that microprocessor 212 receives “by telemetry” measurement data pertaining to “the power induced in implantable device 16” (e.g., via the telemetry antenna 218). EX1004, [0072], [0075], FIG. 14, *see also* EX1004 [0052]; 1003, ¶45.

Element [13.3]: at least one processor configured to receive data pertaining to the input power and the output power, the processor further configured to determine an index of power-loss indicative of the efficiency of an inductive coupling between the primary coil and the secondary coil;

Olson discloses the claimed processor and its recited functionality. EX1003, ¶46. For example, Olson describes the “microprocessor 212” (e.g., a ***processor***) that receives data pertaining to the input power and the output power. EX1004, [0071]-

[0078], [0112] . FIG. 14, EX1003, ¶46. As detailed above (*supra* Elements [13.P]-[13.1]), the microprocessor 212 is configured to determine an efficiency index calculation by receiving (e.g., via the “current measure block 226”) data pertaining to the “power in” at the primary coil 54 and by receiving (e.g., via the telemetry antenna 218) data pertaining to the “power out” for the amount of power induced at the secondary charging coil 34. EX1004, [0072], [0074]-[0076], EX1003, ¶46. Indeed, Olson’s FIG. 14 depicts the “I_RECHRG” output from current measure block 226, which is connected to an analog-digital input (“A/D”) of the microprocessor 212, thereby providing the microprocessor with data pertaining to the “power in” measure. EX1004, [0072]-[0075] (“the current driving the external antenna”), [0112] (“efficiency is measured coil-to-coil”), FIG. 14. Also, the microprocessor 212 receives “by telemetry” (e.g., the telemetry antenna 218 and the receive block 222) data pertaining to the “power out” measure indicative to the power induced in the implanted medical device. EX1004, [0072]-[0075] (“the charging current”), [0112] (“coil-to-coil”), FIG. 14.

Also, as detailed above (*supra* Elements [13.P]-[13.1]), the microprocessor 212 is configured to determine “a measure of the efficiency of external charging device 48,” which is an index of power-loss indicative of the efficiency of an inductive coupling between the primary coil and the secondary coil. EX1004, [0075] (“divided by”), [0112] (“by dividing”), *see also* EX1004, [0072] (explaining that the

external charging device 48 is “controlled by microprocessor 212”), FIG. 14; EX1003, ¶47.

Element [13.4]: wherein the index of power-loss comprises at least one of: an efficiency quotient Q , defined as the ratio of the output power to the input power; and an efficiency differential Δ , defined as the difference between the output power and the input power.

Olson discloses that the index of power-loss comprises an efficiency quotient, as recited in claim 13. EX1004, [0074], [0075], [0076], and [0112]; EX1003, ¶¶48-49. For example, Olson discloses calculating “a ratio of power out divided by power in” as the claimed ***efficiency quotient*** as the ***index of power-loss***. EX1004, [0076], *see also* [0074]-[0075] (“divided by”), [0112] (“efficiency is measured by dividing the power in, i.e., the power received by secondary coil 34, by the power out, i.e., the power transmitted by primary coil 54.”²), *see supra* Element [13.3]. Indeed,

² Olson’s paragraphs [0074]-[0076] consistently uses the terms “power in” and “power out,” but paragraph [0112] flips this terminology in one self-evident instance. Even then, paragraph [0112] is consistent with paragraphs [0074]-[0076] in that they describe the same dividend and divisor for the efficiency quotient—with [0112] clarifying that “the power *received by secondary coil 34*” (the “power out” measure according to paragraphs [0074]-[0076]) should be divided by “the

Olson explains that this efficiency quotient can be advantageously “displayed to patient 18, or a medical professional or other person adjusting rotatable core cup assembly 92 or positioning external antenna 52,” which is consistent with Olson’s explanation that this index value is useful “to determine, in part, the “best location of external antenna 52.” EX1004, [0076], [0074], *see also* [0112] (“measured coil-to-coil”).

Element [14]: The inductive power outlet of claim 13 additionally comprising at least one circuit-breaker configured to disconnect the primary coil from the power supply.

Olson discloses the claimed circuit breaker. EX1003, ¶50. In a first example, Olson teaches that an “electronically controllable switch 220” serves as a circuit-breaker configured to disconnect the primary coil 54 from the 12V power supply:

power *transmitted by primary coil 54*” (the “power in” measure according to paragraphs [0074]-[0076]). EX1003, ¶49. This conventional practice in Olson is also consistent with the preferred embodiment of the efficiency quotient Q in the ’461 patent. EX1003, ¶49.

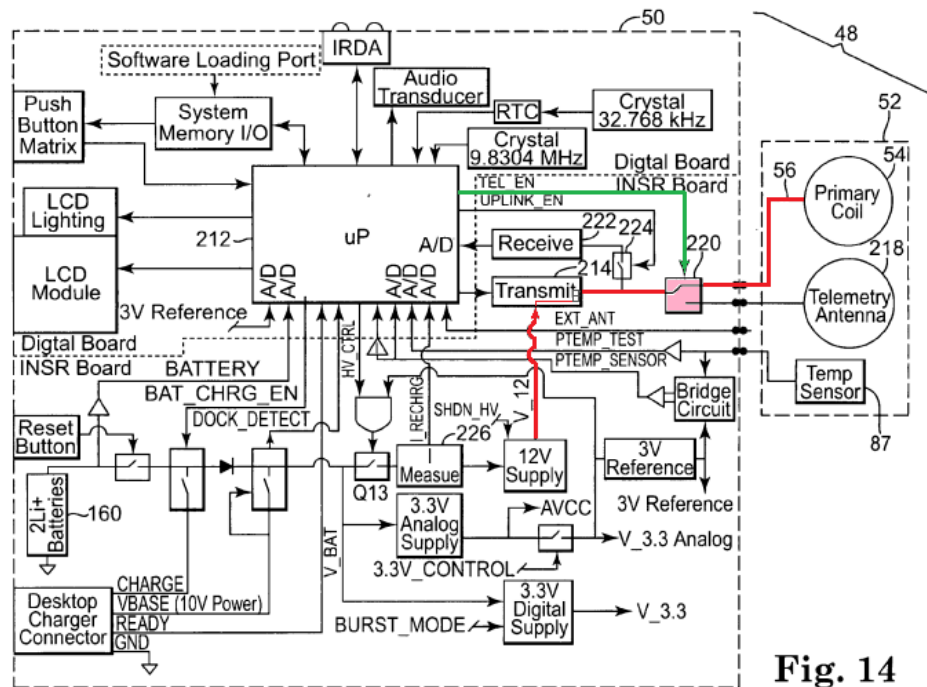


Fig. 14

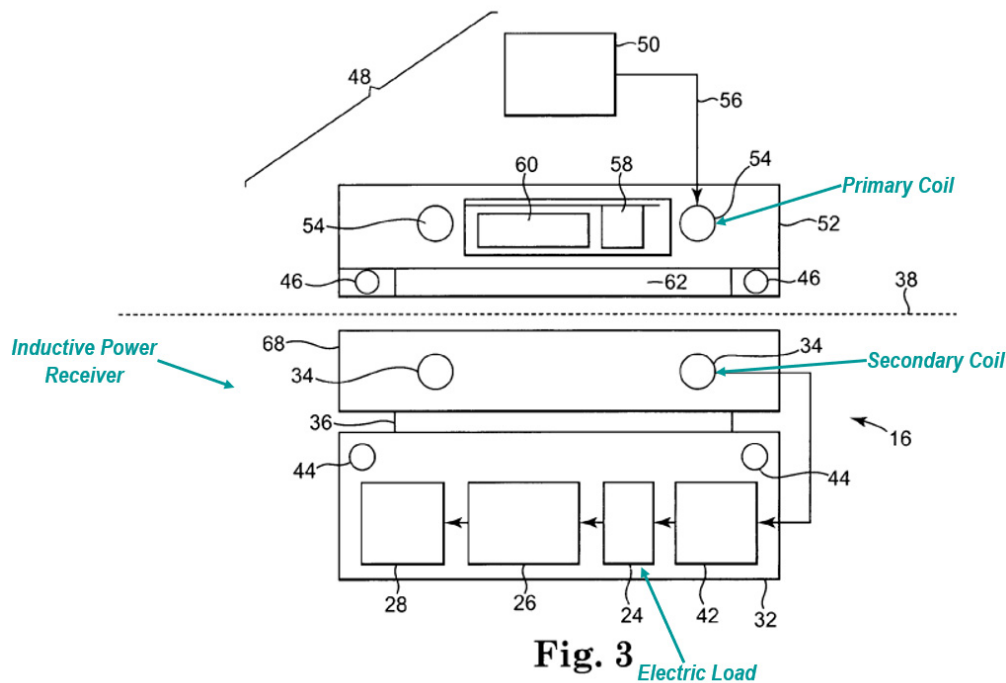
EX1004, FIG. 14 (color added), [0072] (“Drive selection is done by electronically controllable switch 220”); EX1003, ¶50. The microprocessor 212 provides a control signal to the switch 220, which can selectively disconnect the primary coil 54 and thereby break the connection between the power supply and the primary coil 54. EX1004, [0072]; EX1003, ¶51. In a second example, Olson discloses control circuitry/control logic that switches off energy transfer from the primary coil 54 in the event too much heat is generated (e.g., due to inefficient power transfer). EX1004, [0085], [0105], [0110]; EX1003, ¶51. Olson explains that “heat may be generated” as energy is transferred from primary coil 54 to secondary coil 34 and that a temperature sensor 87 (feeding back a sensor signal to the microprocessor 212, as shown in FIG. 14) can trigger control circuitry to “curtail energy transfer” from

the primary coil 54. EX1004, [0105], [0110] (“Control logic in charging unit 50 can then take appropriate action ... by ceasing ... further energy transfer”); EX1003, ¶51.

Additionally, a POSITA would have understood the “SHDN_HV” signal shown in FIG. 14, as teaching a mechanism to shut down the “12V supply” when it is beneficial to prevent power transfer to the primary coil. EX1003, ¶52; EX1004, FIG. 14.

Element [15.1]: An inductive power receiver comprising at least one secondary coil for inductively coupling to a primary coil and supplying power to an electric load,

Olson discloses the claimed inductive power receiver, as recited in claim 15, including the signal transmitter to transmit signals to the inductive power outlet of claim 13. EX1003, ¶53. Regarding the structure recited in Element [15.1], as detailed above (*supra*, Element [13.P]-[13.2]), Olson teaches an inductive power receiver (the implantable medical device 16 in the depicted embodiments) that includes a “rechargeable power source 24” and a “secondary charging coil 34”:



EX1004, FIG. 3 (annotated), [0050], FIG. 2. The “[s]econdary charging coil 34 is operatively coupled through electronics 26 to rechargeable power source 24.” EX1004, [0050]-[0054], [0075], FIG. 2.

Element [15.2]: the inductive power receiver further comprising: at least one output power monitor for measuring output power received inductively by the secondary coil from the primary coil, and

Olson discloses the claimed output power monitor. EX1003, ¶54. For example, as detailed above (*supra* Elements [13.P] and [13.4]), Olson teaches that “efficiency is measured coil-to-coil, i.e., from the primary coil 54 to the secondary coil 34”—and in particular “by dividing the power in, i.e., ***the power received by secondary coil 34***, by the power out, i.e., the power transmitted by primary coil 54.” EX1004, [0112]. In doing so, Olson describes that an output power monitor

at implantable medical device 16 measures both “the charging current” induced at the secondary coil and “the voltage of the rechargeable power source 24,” which are multiplied to provide a measurement of power at the secondary coil. EX1004, [0075] (“by multiplying the voltage of rechargeable power source 24 by the charging current in implantable medical device 16”), *see also* [0112]; EX1003, ¶54. Furthermore, the evidence here confirms that such measurement information would be provided at the “powering electronics 26,” for purposes of controlling “the charging rate of the rechargeable power source 24” (or, optionally, a separate “charging regulation module 42” of FIG. 3), and then a “telemetry coil 44” would communicate this “information from implantable medical device 16.” EX1003, ¶54 (citing to EX1004, [0050]-[0054], FIGS. 2-3). Olson explains that the power information is communicated to the power outlet device (charging device 48) “by telemetry” so that Olson’s microprocessor can measure the efficiency “coil-to-coil, i.e., from the primary coil 54 to the secondary coil 34.” EX1004, [0075], [0112], EX1003, ¶54.

Element [15.3]: at least one signal transmitter configured to transmit signals carrying data pertaining to the output power to the inductive power outlet of claim 13.

Olson discloses the claimed signal transmitter. EX1003, ¶55. For example, Olson discloses an inductive power receiver implemented within the “implantable

medical device 16” that includes an “internal telemetry coil 44 configured in conventional manner to communicate [with]... charging unit 50.” EX1004, [0052], FIG. 3. EX1003, ¶55; *supra*, Element [15.2]. Olson disclosed the implantable medical device as providing the measured power information to the charging device “by telemetry.” EX1004, [0075], EX1003, ¶55.

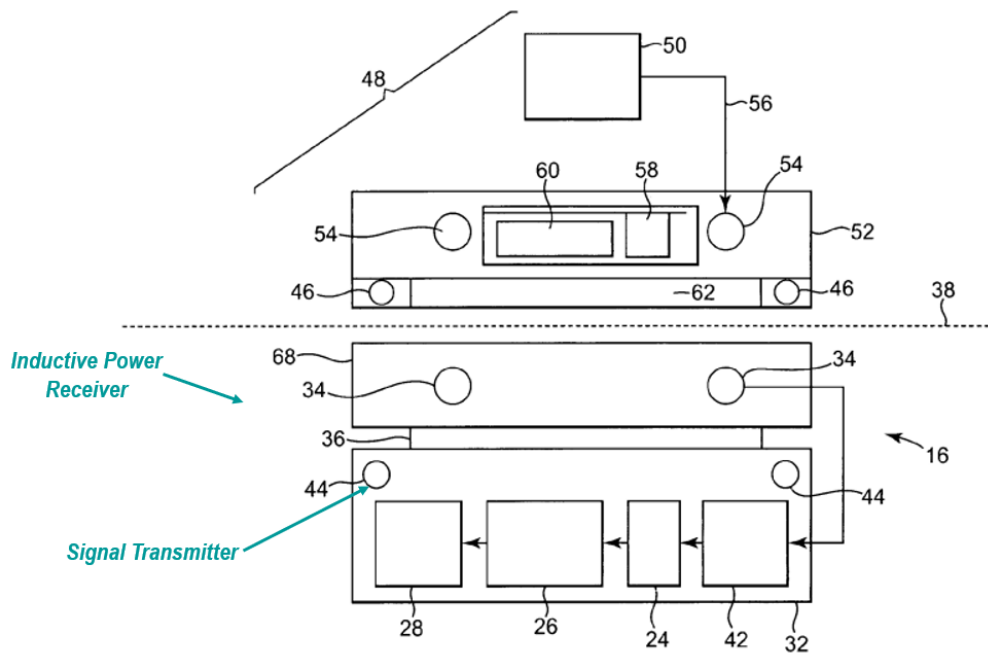


Fig. 3

EX1004, FIG. 3 (annotated).

Element [16]: The inductive power receiver of claim 15 wherein the signal transmitter is selected from a group consisting of: light emitting diodes, radio transmitters, optocouplers, and transmitter circuits.

Olson discloses the claimed signal transmitter as recited in claim 16.

EX1003, ¶56. For example, in Olson, the implantable medical device includes an “internal telemetry coil 44 configured in conventional manner to communicate

through external telemetry coil 46 to ... charging unit 50.” EX1004, [0052], [0075]. The evidence here confirms that a POSITA would have understood Olson’s internal telemetry coil 44 to be both a radio transmitter and a component of a transmitter circuit. EX1003, ¶56.

Element [18]: The inductive power receiver of claim 15 wherein the output power monitor is incorporated into an electric device.

Olson discloses the electric device of claim 18. EX1003, ¶57. As detailed above (*supra* Elements [13.P] and [15.1]-[15.2]), Olson’s implantable medical device 16 is an “electronic device” that incorporates the output power monitor. EX1004, [0052], [0075], FIGS. 2-3; EX1003, ¶57; *supra*, Elements [13.P] and [15.1]-[15.2].

B. GROUND 1B: The Predictable Combination of Olson in View of Stevens Renders Obvious Claim 17

1. Stevens

Like Olson and the ’461 patent, Stevens is directed to an inductive power transfer system. EX1005, 1:3-4, 17:7-15; 38:5-39:35- FIGS. 1, 4, 12; EX1003, ¶58-63. The system includes “a primary unit 10” that has a “primary coil 12” and a “secondary device 30” that has a “secondary coil 30” wired to an “actual load”:

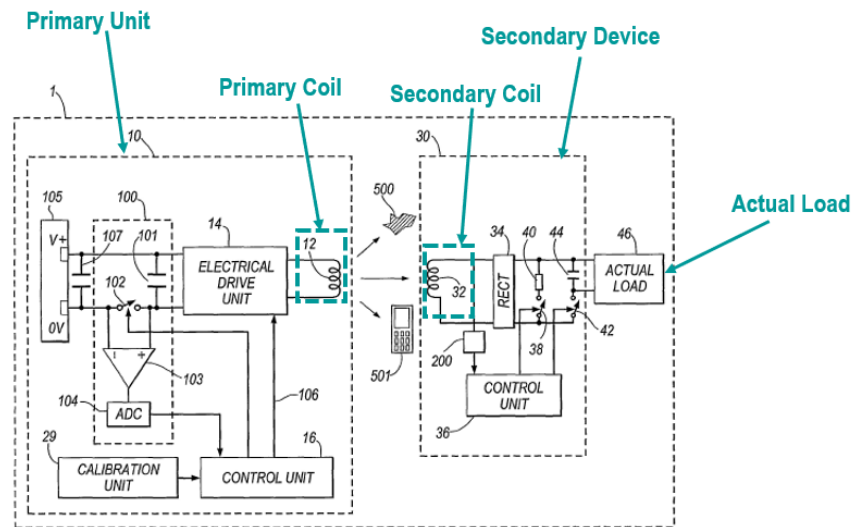


Fig.4

EX1005, FIG. 4 (annotated), 17:7-26, 21:17-35; 23:31-33; 38:5-23; EX1003, ¶58.

The primary unit 10 includes an “electrical drive unit 14” that is connected to a “power supply 105,” via a “power measurement unit 100.” EX1005, 21:16-27.

The electrical drive unit “takes the AC voltage signal 106 and converts it to an AC current signal in the primary coil 12, so as to generate an induced electromagnetic field in the proximity of the 15 primary coil 12.” EX1005, 17:7-15. The “secondary coil 30” is configured to couple with “the electromagnetic field generated by the primary unit 10 when the secondary device 30 is in proximity to the primary unit 10” to inductively transfer power from the primary unit 10 to the secondary device 30. EX1005, 17:22-26; EX1003, ¶59.

The primary unit further comprises the control unit 16/720 and a power measurement unit 100/730. EX1005, 21:22-23, FIG. 1, FIG. 12; EX1003, ¶60.

The power measurement unit “provides an output representative of the electrical

power drawn by the electrical drive unit 14 to the control unit 16.” EX1005, 18:7-9. “The power drawn by the electrical drive unit 14 is representative of the power drawn by the primary coil 12.” EX1005, 18:9-10.

Stevens suggests using “any suitable communication link” to permit the secondary device to communicate its power requirement information to the primary unit. *See* EX1005, 38:25-26 and 39:24-35, FIG. 12 and FIG. 4 (reference numbers 40 and 38); EX1003, ¶61. For example, the secondary device “may transmit its power requirement information to the primary unit by varying a load imposed by the secondary device on the primary unit.” EX1005, 5:23-28.

The control unit receives the power drawn by the driving circuit and the power requirement information of the secondary device. EX1005, 18:7-9, FIG. 4, FIG. 12; EX1003, ¶62. The control unit determines, “if the measured power from the power measurement unit 730 exceeds the sum of the load measures from the secondary devices by more than a shutdown threshold then the control unit 720 concludes that a substantial parasitic load must be present and places the primary unit in the shutdown mode.” EX1005, 38:34-39:6. According to this plain teaching, Stevens suggests that the control unit 720 should determine *an index of power-loss* (an efficiency differential in this example) for purposes of comparing to Stevens’ shutdown threshold value. EX1005, 38:34-39:6, EX1003, ¶62. For example, in the implementation in which there is one secondary device (600₁),

Stevens would determine a difference between the power received by the secondary device 600₁ and the power transmitted by the primary unit 700 (an efficiency differential Δ), which is then compared to Stevens' threshold value to identify when the primary unit 700 should be shut down. EX1005, 38:34-39:6, EX1003, ¶62.³

2. The Olson-Stevens Combination

As previously described in Ground 1A, Olson discloses all elements of independent claim 13. To the extent Olson does not expressly disclose the elements

³ The Stevens reference cited in this Petition (EX1005) is an earlier PCT counterpart to U.S. Pat. 7,605,496 (EX1013) cited during prosecution of the '461 patent. *Supra*, Section II.B. Notably, this pertinent portion of Stevens (pp. 38-39, suggesting the use of an efficiency differential) was never acknowledged by the examiner nor the applicant at the time. *See, e.g.*, EX1002, 202 and 223 (referring to columns 12-13 of US7,605,496 rather than columns 25-26). Regardless, the Stevens reference here is employed differently. Not only is the EX1005 an earlier §102(b) publication, this Petition relies upon the teachings of EX1005 in a manner never contemplated in any office action during prosecution—namely, Stevens *in combination with Olson* (Ground 2) and Stevens *in combination with Jin* (Ground 3). *Infra*, Section VI.A; EX1003, ¶63.

of dependent claim 17, such features were commonly implemented in similar wireless charging systems to provide known benefits—as demonstrated by the Stevens reference. EX1003, ¶64.

Stevens and Olson are similar to one another in several ways. For example, both describe concepts related to power outlet devices having a “primary coil” for inductively coupling with a “secondary coil” of a wireless electric device for recharging a battery. EX1005, 17:7-18:28, 21:13-24:16, 38:5-39:35, 33:1934:15, FIGS. 1, 4, 9 and 12; EX1004, [0050]-[0054], [0072]-[0078], FIGS. 2-3 and 14; EX1003, ¶65. Stevens also provides additional details regarding a number of conventional options used in such wireless charging devices. For example, pertinent to claim 17, Stevens provides detail regarding such a conventional transmitter for an inductive power receiver, and also discloses that “each secondary device could vary the load it imposes on the primary unit to communicate the power requirement information.” EX1005, 39:27-35. Stevens suggests the conventional practice of the secondary device using “a dummy load” (e.g., an ancillary load) representing the amount of power required by its actual load, and Stevens suggests dynamically altering the load to provide information of the secondary device to the primary unit including using a number of “bits.” EX1005, 30:34-31:6.

Multiple reasons would have prompted a POSITA to implement Olson’s charging unit (e.g., charging unit 50) according to Stevens’ suggestion for

communicating power information to the primary unit by varying the imposed load using a dummy load, thereby modulating a bit-rate signal, to achieve known benefits.⁴ EX1003, ¶66.

First, a POSITA would have been motivated to implement communication according to Stevens' suggested load modulation scheme to reduce the size and complexity of Olson's charging devices. EX1003, ¶67. Olson's original communication technique relies on an "[i]nternal telemetry coil 44" that has "a larger diameter than secondary coil 34" so as not to be "completely covered by magnetic shield 36." EX1004, [0053], FIG. 3. With Stevens' load-modulation scheme, by contrast, the secondary coil 34 itself would be predictably used to signal load variations to the charger device 48 via primary coil 54. EX1003, ¶67. This is plainly beneficial in eliminating the need for the large internal telemetry coil 44 separate from the secondary coil 34 itself. *Id.* Indeed, implementing Stevens' suggestion in Olson's system would advantageously permit Olson's implanted device to use Olson's existing secondary coil to transmit power information back to the charging device (without requiring the separate telemetry

⁴ It would have been clear to a POSITA that Stevens' load-modulation scheme could be used in lieu of Olson's telemetry-based communication to achieve known benefits as described above. EX1003, ¶66.

coil), thereby advantageously providing a more compact device with fewer communication coils. EX1003, ¶67.

Second, a POSITA would have been motivated to implement communication according to Stevens’ suggested load modulation scheme to reduce component costs. Windings and coils are ordinarily relatively expensive electronic circuit components, but Stevens’ suggested use of the secondary coil itself for load modulation and communication of power information would yield cost savings by not requiring a separate telemetry coils. EX1003, ¶68.

Third, Stevens expressly suggests a known technique to address a conventional problem—namely, communicating information (e.g., power information)—from a secondary unit to a primary unit of a wireless charging system similar to Olson’s. EX1003, ¶69. Here, the combination thus merely entails a known technique (e.g., Stevens’ suggested load-modulation scheme) to address this known problem using the prior art elements of Olson and Stevens according to their established functions. *Id.* In these circumstances, “there is a motivation to combine.” *Intel Corp. v. PACT XPP Schweiz AG*, 61 F.4th 1373, 1380 (Fed. Cir. 2023).

Finally, both Olson and Stevens are directed to wireless charging systems whose designs were concerned with power transfer efficiency and the communication of power information from a secondary unit to a primary unit.

Supra, Sections V.A.1, V.B.1. A POSITA would have been sufficiently skilled and would have had a reasonable expectation of success implementing the combination as described above, especially in view of the similar wireless charging systems described in both Olson and Stevens and the conventional solutions described in each. EX1003, ¶70.

3. Application to Challenged Claims

Element [17.1]: The inductive power receiver of claim 15 wherein the transmitter comprises: an ancillary load selectively connectable to the secondary inductive coil, a modulator for modulating a bit-rate signal with an input signal to create a modulated signal, and

The predictable Olson-Stevens combination would provide Element [17.1]. EX1003, ¶¶71-72. Stevens teaches an inductive power receiver (the secondary device 30) that includes a “secondary coil 32, a dummy load switch 38”, and “a dummy load 40” (e.g., *ancillary load*):

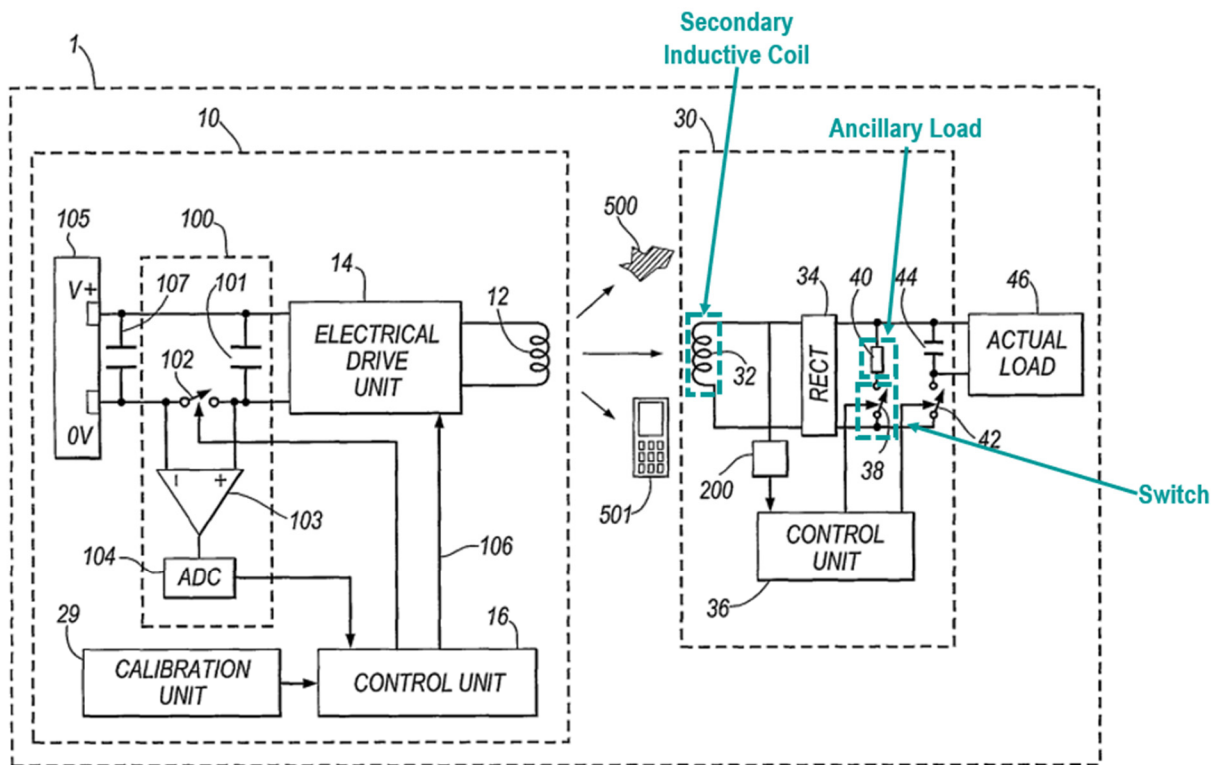


Fig.4

EX1005, FIG. 4 (annotated), 23:31-24:2. The dummy load 40 is selectively connectable to the secondary coil 32 via the dummy load switch 38. EX1003, ¶71; EX1005, FIG. 4, 23:31-24:2, 30:13-22.

Stevens describes that a “way of dynamically changing the load is to modulate switch [38]”⁵ to provide “information about the load requirements and parasitic information of the secondary device 30.” EX1005, 30:13-31:6. This

⁵ Stevens includes a typo at 39:20 labeling the switch “40” instead of “38.” See EX1005, 30:13-31:6, FIG. 4; EX1003, ¶99.

information can include “information about the serial number, model number, power requirements or other information stored in the secondary device” by dynamically altering either “synchronously or asynchronously” and “a number of ‘bits’ ... may be used.” EX1005, 31:1-6. Stevens also discloses that “each secondary device could vary the load it imposes on the primary unit to communicate the power requirement information.” EX1005, 39:27-35; *see also* 5:23-28, 6:1-18, 19:13-20, 30:13-22, 30:34-31:6, 32:1-10, 33:10-17. For each of the reasons discussed above in the overview of the Olson-Stevens combination, it would have been obvious to implement in Olson’s electric device a load modulation transmitter that includes a modulator for modulating a bit-rate signal with an input signal to create a modulated signal in order to communicate power requirement information to the primary device using “bits” as suggested by Stevens. EX1003, ¶72 (citing EX1005, FIG. 4, 5:23-28, 6:1-18, 19:13-20, 23:31-24:2, 30:13-31:6, 32:1-10, 39:27-35).

Element [17.2]: a switch for intermittently connecting the ancillary load to the secondary inductive coil according to the modulated signal.

The predictable Olson-Stevens combination would provide Element [17.2]. EX1003, ¶¶73-74. Stevens teaches a dummy load switch 38 provided to selectively connect the dummy load 40 to the secondary coil 32:

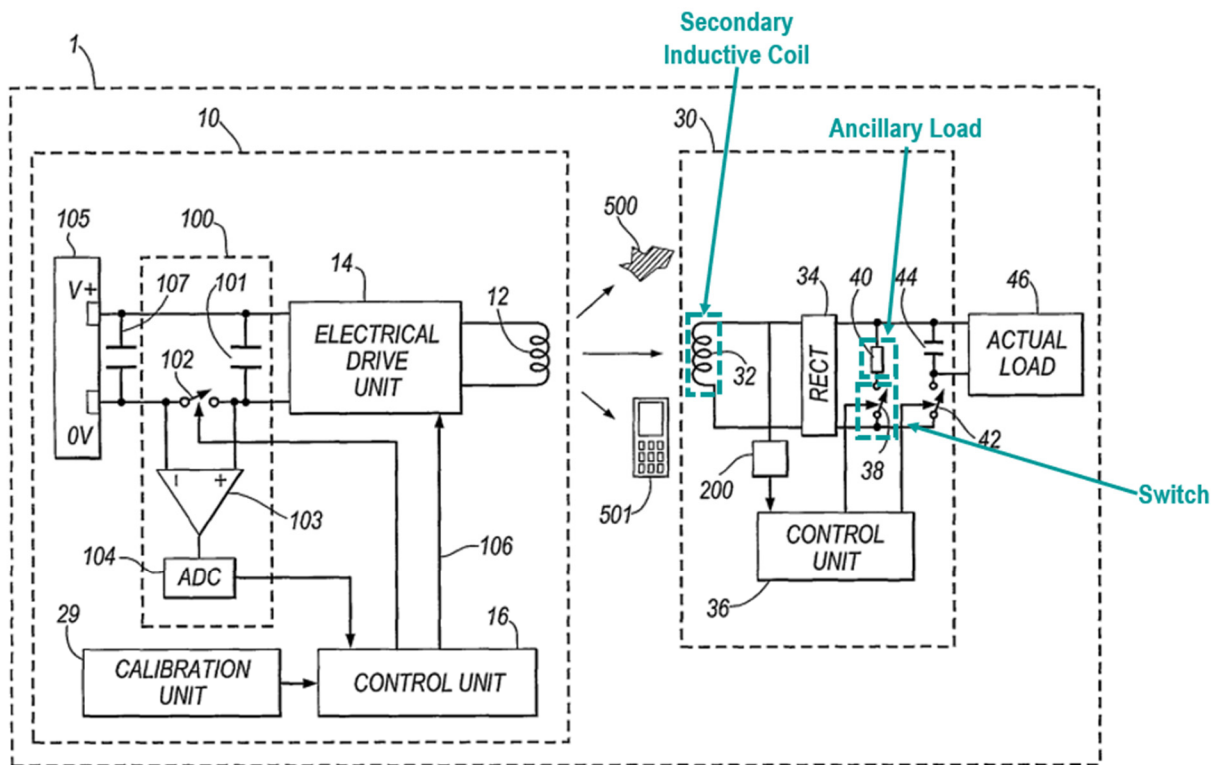


Fig.4

EX1005, FIG. 4, 23:31-24:2, 30:13–22; EX1003, ¶73, *supra* Element [17.1].

As discussed in element [17.1] Stevens describes a “way of dynamically changing the load is to modulate switch [38]”⁶ to provide “information about the load requirements and parasitic information of the secondary device 30.” EX1005, 30:13-31:6, *supra* Element [17.1]. For each of the reasons discussed above in the overview of the Olson-Stevens combination, it would have been obvious to implement in Olson’s electric device a dummy load switch to intermittently

⁶ See *supra*, Footnote 5.

connect a dummy load to the secondary coil according to the modulated signal to transmit information to the primary device using load modulation as suggested by Stevens. EX1003, ¶74 (citing EX1005, FIG. 4, 5:23-28, 6:1-18, 19:13-20, 23:31-24:2, 30:13-31:6, 32:1-10, 39:27-35).

C. GROUND 2: The Predictable Combination of Stevens in View of Olson Renders Obvious Claims 13-18

1. The Stevens-Olson Combination

While Stevens suggests an index of power-loss (*see supra*, Section V.B.1 and EX1005, 38:34-39:6), Olson expressly discloses more details for the conventional practice of calculating *an index of power-loss* according to an advantageous efficiency quotient. EX1004, [0072]-[0078], [0112]; EX1003, ¶75. Olson was already detailed above. *Supra*, Section V.A.1. Specifically here, Olson discloses calculating “a ratio of power out divided by power in,” which is similar to the claimed *efficiency quotient* as the *index of power-loss*. EX1004, [0074], [0075], [0076], and [0112] (“efficiency is measured coil-to-coil”), EX1003, ¶75. Multiple reasons would have prompted a POSITA to implement Olson’s suggestion (calculating a power transfer efficiency ratio) in Stevens’ system to achieve known benefits. EX1003, ¶76.

First, a POSITA would have been motivated to do so because Olson plainly suggests that using this efficiency measure (“[t]he ratio of power out divided by power in”) advantageously “works not only at high charging or power transfer

levels but also at reduced charging levels, as for example, when charging at reduced levels toward the end or beginning of a charging cycle.” EX1004 [0076]-[0077]; EX1003, ¶77. Such a known benefit would have been readily recognized as a similar benefit to Stevens’ system, which would also seek to monitor the efficiency even when charging at reduced levels toward the end or beginning of a cycle. EX1003, ¶77.

Second, a POSITA would have been motivated to implement Olson’s suggestion (determining the index of power-loss using an efficiency quotient, as described above) in Stevens’ system because Olson expressly suggests it was “an important measure of effectiveness,” especially where the efficiency is measured “coil-to-coil.” EX1004, [0111]-[0112]; EX1003, ¶78. Here, a POSITA would have recognized practical, real life benefits from Olson’s suggestion to maximize energy transfer efficiency in this manner, including advantageously improving charging times and reducing overall heat generation. EX1004 [0017]; EX1003, ¶78.

Third, a POSITA would have been motivated to modify Stevens’ system to include Olson’s suggestion (determining an index of power loss between a primary and secondary coil that includes a ratio of the output power and input power) for purposes of improved detection of a parasitic load by comparing this quotient value with a threshold value. EX1005, 2:8-20, 38:34-39:6; EX1003, ¶79.

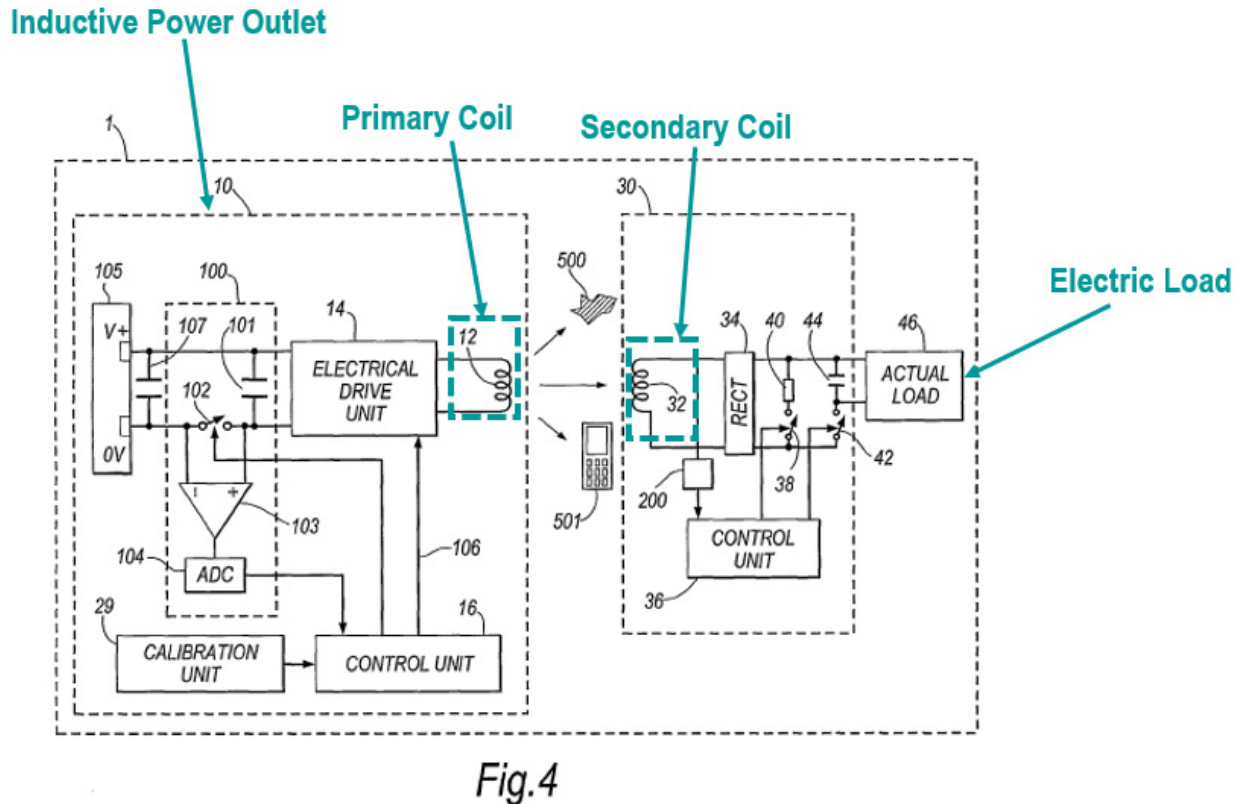
Finally, both Stevens and Olson are directed to wireless charging systems whose designs were specifically concerned with power transfer efficiency. *Supra*, Sections V.A.1, V.B.1. A POSITA would have been sufficiently skilled and would have had a reasonable expectation of success implementing the combination as described above, especially in view of the similar wireless charging systems described in both Stevens and Olson and their related desires to use conventional indices of power loss to improve power transfer efficiency according to conventional techniques. EX1003, ¶80.

2. Application to Challenged Claims

Element [13.P]: An inductive power outlet comprising at least one primary coil, for inductively coupling with a secondary coil wired to an electric load, the inductive power outlet further comprising an efficiency monitor comprising:

Even if the preamble is treated as a limitation (which Petitioners do not concede), Stevens discloses Element [13.P]. EX1003, ¶¶81-84. For example,

Stevens discloses a system with “a primary unit 10 and a secondary device 30”:



EX1005, FIG. 4 (annotated), 21:13-15, FIG. 4, *see also* EX1005, FIG. 1, *Abstract*, 1:10-18, 18:7-15; EX1003, ¶81. “[T]he primary unit 10 comprises a primary coil 12, an electrical drive unit 14, a control unit 16 and a power measurement unit 100.” EX1005, 21:22-23, FIG. 4. The secondary device includes a secondary coil. EX1005, 1:16-19, FIG. 1, *see also* EX1005, 17:7-15, FIG. 4. The primary unit drives an alternating current through the primary coil to create a time-varying magnetic flux and “[w]hen the secondary coil is placed in proximity to the time-varying flux created by the primary coil, the varying flux induces an alternating current in the secondary coil, and thus power may be transferred inductively from

the primary unit to the secondary device.” EX1005, 1:10-18, 4:27-5:3, 10:22-11:9, 17:9-26, 21:22-30, FIG. 1, FIG. 4; EX1003, ¶82. The secondary device comprises the “secondary coil 32” of the secondary device 30 is wired to an “actual load 46” (e.g., the claimed *electric load*) *Id.*, 23:31-33, FIG. 1, FIG. 4; EX1003, ¶82.

The primary unit further comprises the control unit 16/720 and a power measurement unit 100/730 (e.g., collectively the claimed *efficiency monitor*)⁷. EX1005, 18:5-11, 19:10-28, 21:22-35, 38:5-39:35 (“The control unit 720 corresponds generally to the control unit 16 described previously with reference to Fig. 1 , and the power measurement unit 730 corresponds generally to the power measurement unit 100 described in reference to Fig. 1”), FIG. 4, FIG. 12, *see also*

⁷ Stevens explains that the operation of the primary unit 700 (having the control unit 720 and power measurement unit 730) corresponds to the earlier embodiment “in reference to Fig. 1.” EX1005, 38:9-14. Similarly, Stevens explains that the features of the secondary device 600 are the same as those of the secondary device 30 “in Figure 4.” EX1005, 38:16-23. Accordingly, a person of ordinary skill in the art would have understood the primary unit 700 and the components therein to include the features described in reference to the primary device 10 as shown in FIGs. 1 and 4. EX1003, ¶84.

EX1005 4:27-5:3, 10:22-11:9, 11:29-12:4; EX1003, ¶83. The power measurement unit “provides an output representative of the electrical power drawn by the electrical drive unit 14 to the control unit 16.” EX1005, 18:4-11. “The power drawn by the electrical drive unit 14 is representative of the power drawn by the primary coil 12.” EX1005, 18:9-10; EX1003, ¶83.

Element [13.1]: at least one input power monitor configured to measure input power received by the primary coil from the power supply;

Stevens discloses Element [13.1]. EX1003, ¶85. Stevens discloses a power measurement unit 100/730. EX1005, 21:22-23, 38:34-39:6, FIG. 4, FIG. 12. The power measurement unit “provides an output representative of the electrical power drawn by the electrical drive unit 14 to the control unit 16.” EX1005, 18:7-9, *see also* EX1005, *Abstract*, 4:27-5:3. “The power drawn by the electrical drive unit 14 is representative of the power drawn by the primary coil 12.” EX1005, 18:4-11; EX1003, ¶85, *see also* EX1005, 22:15-23, 32:32-33:8, 38:9-14.

Element [13.2]: at least one signal detector configured to detect signals carrying data pertaining to output power received by the secondary coil;

Stevens discloses Element [13.2]. EX1003, ¶86. Stevens discloses the “primary unit 700” as having “an RFID unit 710.” 38:9-14. Stevens discloses using RFID or “any suitable communication link” to permit the secondary device to communicate its power requirement information to the primary unit. *See*

EX1005, 38:25-32, 39:24-35, FIGs. 4 (*see* reference numbers 40 and 38), 12. “The load measure produced by the load measuring unit 610 in each secondary device is supplied to the RFID unit 620 in the device and then transmitted via the relevant RFID link 630 to the RFID unit 710 in the primary unit”:

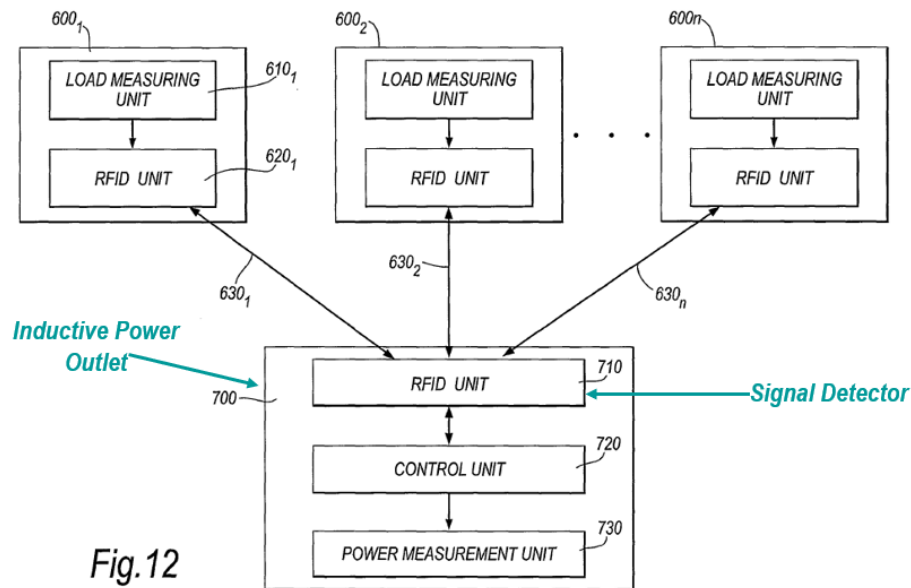


Fig.12

EX1005, FIG. 12 (annotated), 38:26-32.

Element [13.3]: at least one processor configured to receive data pertaining to the input power and the output power, the processor further configured to determine an index of power-loss indicative of the efficiency of an inductive coupling between the primary coil and the secondary coil;

Stevens discloses a processor as recited Element [13.3]. EX1003, ¶87-89.

As discussed above Element [13.2], Stevens discloses using RFID or “any suitable communication link” to permit the secondary device to communicate its power requirement information to the primary unit. *See* EX1005, 38:25-26, 39:24-35,

FIG. 12, FIG. 4 (*see* reference numbers 40 and 38). Accordingly, the control unit (16 in FIG. 4 or 720 in FIG. 12) receives the power drawn by the driving circuit) and the power requirement information of the secondary device. EX1005, 18:7-9, 38:25-26, 39:24-35, FIG. 12, FIG. 4; EX1003, ¶87.

The control unit determines, “if the measured power from the power measurement unit 730 exceeds the sum of the load measures from the secondary devices by more than a shutdown threshold then the control unit 720 concludes that a substantial parasitic load must be present and places the primary unit in the shutdown mode.” EX1005, 38:34-39:6. Thus, Stevens suggests that the control unit 720 should determine *an index of power-loss* for purposes of comparing to Stevens’ shutdown threshold value. EX1005, 38:34-39:6, EX1003, ¶88. For example, in the implementation in which there is one secondary device (600₁), Stevens would determine the difference between the power received by the secondary device 600₁ and the power transmitted by the primary unit 700 (an efficiency differential Δ), which is then compared to Stevens’ threshold value to identify when the primary unit 700 should be shut down. EX1005, 38:34-39:6, EX1003, ¶88.

Even if Stevens does not *explicitly* disclose the control unit being configured to determine the claimed type of “index of power-loss” as recited in Elements [13.3]-[13.4], such a feature was commonly implemented in similar prior art systems.

EX1003, ¶89. For example, Olson describes a similar system in which the “microprocessor 212” (e.g., a *processor*) that receives data pertaining to the input power and the output power. EX1004, [0071]-[0078], [0112] . FIG. 14, EX1003, ¶89. The microprocessor 212 is configured to determine an efficiency index calculation by receiving (e.g., via the “current measure block 226”) data pertaining to the “power in” at the primary coil 54 and by receiving (e.g., via the telemetry antenna 218) data pertaining to the “power out” for the amount of power induced at the secondary charging coil 34. EX1004, [0072], [0074]-[0076], EX1003, ¶89. Indeed, Olson’s FIG. 14 depicts the “I_RECHRG” output from current measure block 226, which is connected to an analog-digital input (“A/D”) of the microprocessor 212, thereby providing the microprocessor with data pertaining to the “power in” measure. EX1004, [0072]-[0075] (“the current driving the external antenna”), [0112] (“efficiency is measured coil-to-coil”), FIG. 14. Also, the microprocessor 212 receives “by telemetry” (e.g., the telemetry antenna 218 and the receive block 222) data pertaining to the “power out” measure indicative to the power induced in the implanted medical device. EX1004, [0072]-[0075] (“the charging current”), [0112] (“coil-to-coil”), FIG. 14. Olson also explains that the microprocessor should be configured to determine “a measure of the efficiency of external charging device 48,” which is the claimed type of *index of power-loss* indicative of the efficiency of an inductive coupling between the primary coil and

the secondary coil. EX1004, [0075] (“divided by”), [0112] (“by dividing”), *see also* EX1004, [0072] (“controlled by microprocessor 212”), FIG. 14.

Element [13.4]: wherein the index of power-loss comprises at least one of: an efficiency quotient Q , defined as the ratio of the output power to the input power; and an efficiency differential Δ , defined as the difference between the output power and the input power.

The predictable Stevens-Olson combination would provide Element [13.4] and achieve the known benefits articulated above. EX1003, ¶90; *supra*, Section V.C.1. For example, Olson teaches calculating “a ratio of power out divided by power in” as the claimed *efficiency quotient* as the *index of power-loss*. EX1004, [0076], *see also* [0074]-[0075] (“divided by”), [0112] (“efficiency is measured by dividing the power in, i.e., the power received by secondary coil 34, by the power out, i.e., the power transmitted by primary coil 54.”⁸), *see supra*, Element [13.3]. Indeed, Olson teaches that this efficiency quotient advantageously “works not only at high charging or power transfer levels but also at reduced charging levels, as for example, when charging at reduced levels toward the end or beginning of a charging cycle.” EX1004 [0076]-[0077]; EX1003, ¶90. Also, Olson suggests the efficiency quotient can be advantageously “scale displayed” to a user, which can be useful for

⁸ *See supra*, Footnote 2.

repositioning the relative location of the primary/secondary devices. EX1004, [0076], [0074], *see also* [0112] (“measured coil-to-coil”).

Element [14]: The inductive power outlet of claim 13 additionally comprising at least one circuit-breaker configured to disconnect the primary coil from the power supply.

Stevens discloses Element [14]. EX1003, ¶91. For example, Stevens teaches restricting or stopping the inductive power transfer from the primary unit. EX1005, 38:34-39:6. Stevens also shows in FIG. 9, an electrical drive unit 114 with a first switch 120 connected between a first power supply line of the primary unit (a positive DC voltage) and an output node of the electrical drive unit and a second switch 121 connected between the output node and a return power supply line (i.e., ground) of the primary unit (e.g., a ***circuit breaker***). EX1005, 33:23-28, *see also* EX1005, 2:18-20, 18:16-19 (describing “a shutdown mode in which the drive to the primary coil 12 is reduced or stopped, preventing heating of the parasitic load.”), 19:11-13, 19:30-32, 37:24-26, FIGs. 2-3, 8, 11; EX1003, ¶91 (“In normal operation of the primary unit 110, switches 120 and 121 are operated to generate an oscillating voltage to drive the primary inductor 112. However, under software control, switches 120 and 121 can also act as a ***circuit breaker***.”).

Element [15.1]: An inductive power receiver comprising at least one secondary coil for inductively coupling to a primary coil and supplying power to an electric load,

Stevens discloses Element [15.1]. EX1003, ¶92. For example, Stevens discloses a secondary device comprising “a secondary coil 32” for supplying power to “a storage unit 44” (e.g., an *electric load*):

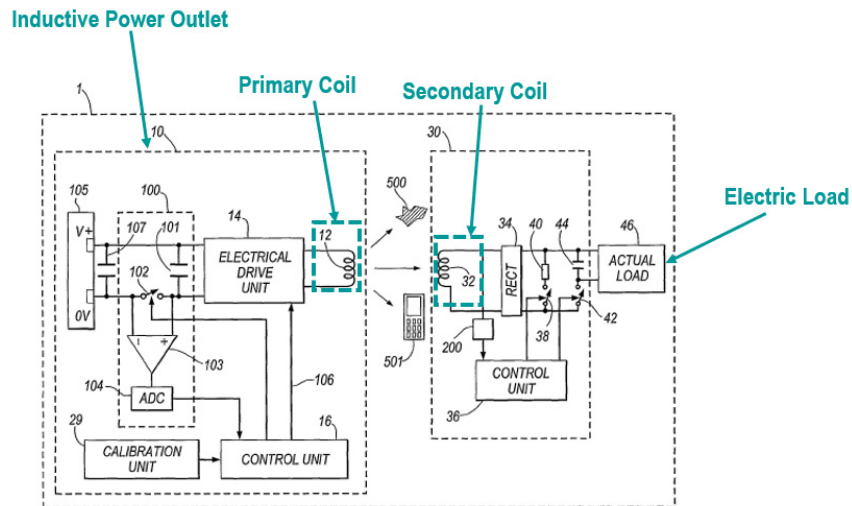


Fig.4

EX1005, FIG. 4, 23:31-33, 17:22-26, 23:31-24:2, FIG. 4; EX1003, ¶92.

Element [15.2]: the inductive power receiver further comprising: at least one output power monitor for measuring output power received inductively by the secondary coil from the primary coil, and

Stevens discloses Element [15.2]. EX1003, ¶¶93-94. For example, Stevens discloses the secondary device including a “load measuring unit 610”:

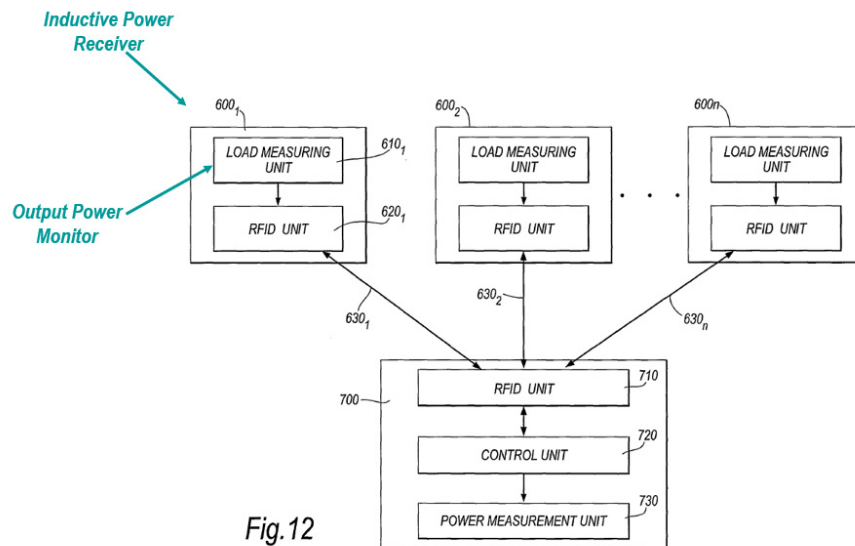


Fig.12

EX1005, FIG. 12 (annotated), 38:16-19 (“generally the same as those of the secondary device 30 in Figure 4”); ¶93. The load measuring unit 610 measures power being supplied to the actual load of the secondary device. EX1005, 38:19-20, FIG. 12; EX1003, ¶94. Based upon Stevens’ teachings, a POSITA would have recognized that the power being supplied to the actual load corresponded to the power received by the secondary coil. EX1003, ¶94 (citing to 38:18-20, FIG. 4).

Element [15.3]: at least one signal transmitter configured to transmit signals carrying data pertaining to the output power to the inductive power outlet of claim 13.

Stevens discloses Element [15.3]. EX1003, ¶¶95-96. Stevens discloses the secondary device including an “RFID unit 620”:

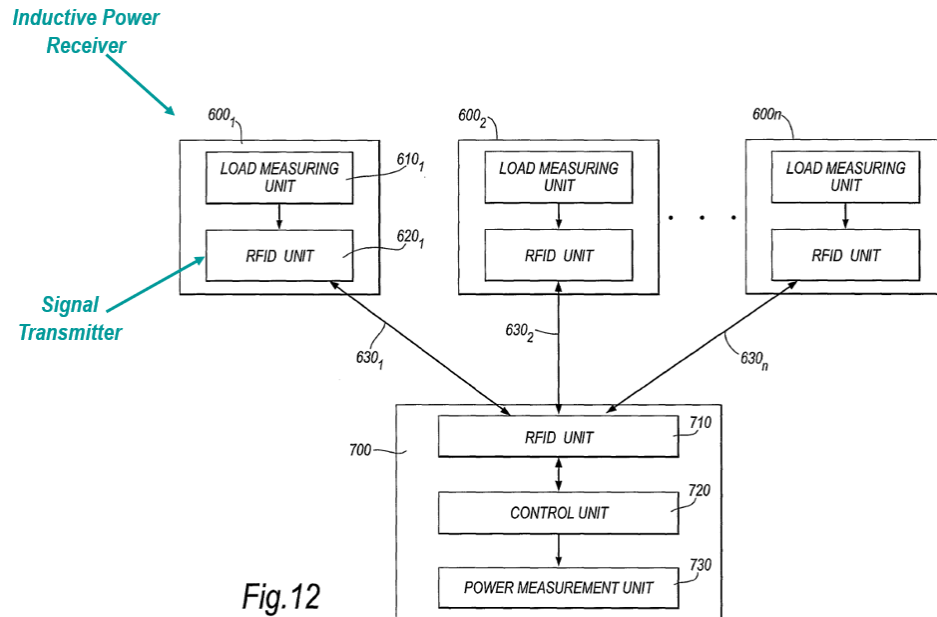


Fig.12

EX1005, 38:18-19, FIG. 12; EX1003, ¶95. “The load measure produced by the load measuring unit 610 in each secondary device is supplied to the RFID unit 620 in the device and then transmitted via the relevant RFID link 630 to the RFID unit 710 in the primary unit.” EX1005, 38:26-29; EX1003, ¶96. Stevens discloses using “any suitable communication link” to permit the secondary device to communicate its power requirement information to the primary unit as an alternative to using an RFID link. See EX1005, 38:25-26, 39:24-35. For example, the secondary device “may transmit its power requirement information to the primary unit by varying a load imposed by the secondary device on the primary unit.” EX1005, 5:23-28, 38:25-26, 39:24-35, FIG. 12, FIG. 4.

Element [16]: The inductive power receiver of claim 15 wherein the signal transmitter is selected from a group consisting of: light emitting diodes, radio transmitters, optocouplers, and transmitter circuits.

Stevens discloses Element [16]. EX1003, ¶97. For example, Stevens discloses “an RFID unit 620” as a ***radio transmitter***. EX1005, 38:25-26; 5:25-26, 12:2-4, 38:5-32, FIG. 12, EX1003, ¶97. Stevens also discloses other examples of transmitter circuits. EX1005, 5:23-28 (“Alternatively, the ... secondary device may transmit its power requirement information to the primary unit by varying a load imposed by the secondary device on the primary unit.”), 15:1-3 (“Any communication method can be used, and the method is not limited to load variation. For example, infrared or ultrasonic communication can be used. RFID can also be used.”), 39:24-35; EX 1003, ¶97.

Element [17.1]: The inductive power receiver of claim 15 wherein the transmitter comprises: an ancillary load selectively connectable to the secondary inductive coil, a modulator for modulating a bit-rate signal with an input signal to create a modulated signal, and

Stevens discloses Element [17.1]. EX1003, ¶¶98-99. Stevens teaches an inductive power receiver (the secondary device 30) that includes a “secondary coil 32, a dummy load switch 38”, and “a dummy load 40” (e.g., ***ancillary load***):

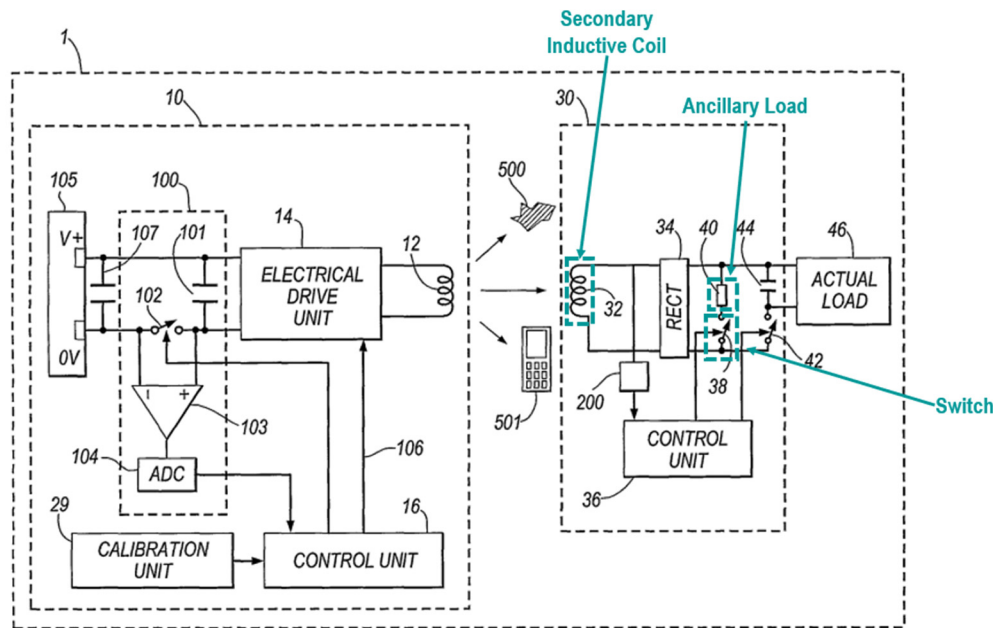


Fig.4

EX1005, FIG. 4 (annotated), 23:31-24:2. The dummy load 40 is selectively connectable to the secondary coil 32 via the dummy load switch 38. EX1003, ¶98; EX1005, FIG. 4, 23:31-24:2, 30:13–22.

Stevens describes a “way of dynamically changing the load is to modulate switch [38]”⁹ to provide “information about the load requirements and parasitic information of the secondary device 30.” EX1005, 30:13-31:6; *see also* 39:24-35 (“any suitable communication link”). This information can include “information about the serial number, model number, power requirements or other information stored in the secondary device” by dynamically altering either “synchronously or

⁹ *See supra*, Footnote 5.

asynchronously” and “a number of ‘bits’ ... may be used.” EX1005, 31:1-6.

Stevens also discloses that “each secondary device could vary the load it imposes on the primary unit to communicate the power requirement information.” EX1005, 39:27-35; *see also* 5:23-28, 6:1-18, 19:13-20, 30:13-22, 30:34-31:6, 32:1-10, 33:10-17. The evidence confirms Stevens’ load modulation transmitter would include a modulator for modulating a bit-rate signal with an input signal to create a modulated signal in order to communicate power requirement information to the primary device using “bits.” EX1003, ¶ 99 (citing EX1005, FIG. 4, 5:23-28, 6:1-18, 19:13-20, 23:31-24:2, 30:13-31:6, 32:1-10, 39:27-35).

Element [17.2]: a switch for intermittently connecting the ancillary load to the secondary inductive coil according to the modulated signal.

Stevens discloses Element [17.2]. EX1003, ¶¶100-101. Stevens teaches a dummy load switch 38 provided to selectively connect the dummy load 40 to the secondary coil 32:

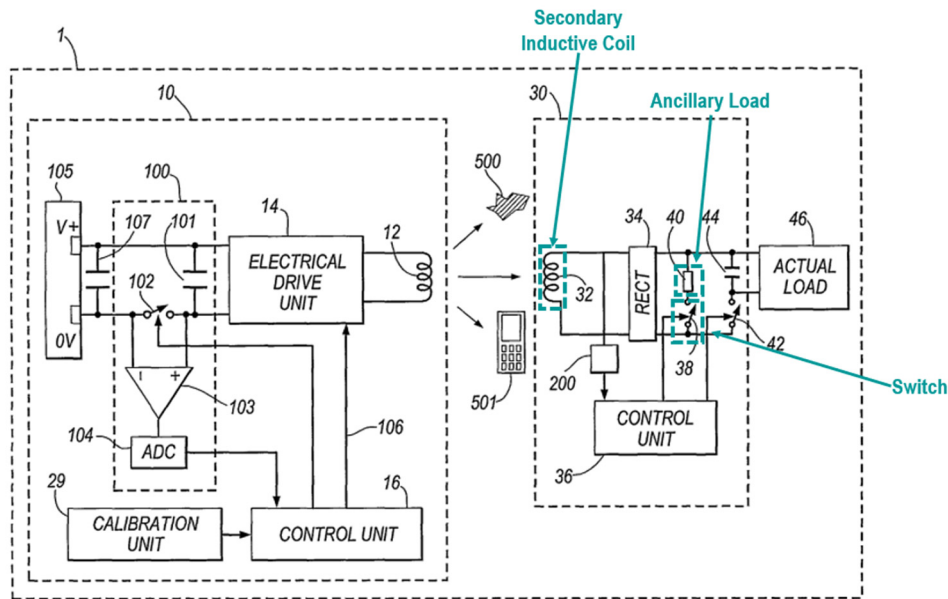


Fig.4

EX1005, FIG. 4, 23:31-24:2, 30:13-22; EX1003, ¶100, *supra* Element [17.1].

As discussed in element [17.1] Stevens describes a “way of dynamically changing the load is to modulate switch [38]”¹⁰ to provide “information about the load requirements and parasitic information of the secondary device 30.” EX1005, 30:13-31:6, *supra* Element [17.1]. The evidence the dummy load switch 38 is used to intermittently connect the dummy load to the secondary coil according to the modulated signal to transmit information to the primary device using load modulation. EX1003, ¶101 (citing EX1005, FIG. 4, 5:23-28, 6:1-18, 19:13-20, 23:31-24:2, 30:13-31:6, 32:1-10, 39:27-35).

¹⁰ See *supra*, Footnote 5.

Element [18]: The inductive power receiver of claim 15 wherein the output power monitor is incorporated into an electric device.

Stevens discloses Element [18]. EX1003, ¶102. For example, Stevens discloses “the secondary device may be carried in or by a host object which includes the load” where “the host object may be a portable electrical or electronic device having a rechargeable battery or cell.” EX1005, 1:20-26, 21:16-18, *see also* EX1005, 17:32-2 (“The secondary device 30 may be carried in or by an object requiring power such as a portable electrical or electronic device or a rechargeable battery or cell”), 30:34-31:6.

D. GROUND 3: The Predictable Combination of Stevens in View of Jin Renders Obvious Claims 13-18

1. Jin

Like Stevens and the '461 patent, Jin describes transmitting energy between inductively coupled coils. EX1006, [0184], FIG. 22, EX1003, ¶103. And like Olson, Jin also demonstrates that it was common to measure *an index of power loss* by calculating a transmission efficiency ratio. EX1006, [0093]-[0094]; EX1003, ¶103. Specifically, Jin describes assessing a coupling condition between coils “using a transmission efficiency as a parameter.” EX1006, [0093]; EX1003, ¶103. The transmission efficiency is defined as “Transmission efficiency = (effective current value of secondary side × effective voltage) / (effective current

value of primary side x effective voltage).” EX1006, [0094]. A POSITA would have recognized that this transmission efficiency parameter is exactly the power delivered to the secondary side divided by the power input on the primary side. EX1003, ¶103. Jin further explains, improving the transmission efficiency improves the coupling condition between coils and the reliability of signal transmission between the coils. EX1006, [0112]; EX1003, ¶103.

2. The Stevens-Jin Combination

While Stevens suggests *an index of power-loss* (*supra*, Section V.B.1), Jin expressly discloses determining *an index of power-loss* in a manner that achieves helpful benefits. EX1003, ¶104. Specifically, Jin describes determining “transmission efficiency” as a quotient calculation—the claimed *efficiency quotient* as the *index of power-loss*. EX1006 [0093]-[0094], EX1003, ¶104. Multiple reasons would have prompted a POSITA to implement Jin’s suggestion (e.g., for determining a “transmission efficiency” ratio) in Stevens’s system to achieve known benefits. EX1003, ¶¶105-108.

First, a POSITA would have been motivated to do so because Jin expressly notes that using this efficiency measure (a ratio of the output power to the input power) advantageously provides a “strong correlation between the transmission efficiency and coupling coefficient.” [0093]-[0094], EX1003, ¶106. Here,

achieving this benefit in Stevens's would have been increased the likelihood of monitoring for the maximum energy transfer efficiency, which would promote improved charging times and reduced heat generation. EX1003, ¶106.

Second, a POSITA would have been motivated to implement Jin's suggestion (e.g., for determining a "transmission efficiency" ratio) in Stevens's system in order to improve the reliability of signal transmission between the coils. EX1006, [0112]; EX1003, ¶107.

Finally, both Stevens and Jin are directed to wireless charging systems whose designs were specifically concerned with power transfer efficiency. *Supra*, Sections V.B.1, V.D.1. A POSITA would have been sufficiently skilled and would have had a reasonable expectation of success implementing the combination as described above, especially in view of the similar wireless charging systems described in both Stevens and Jin and their related desires to use conventional indices of power loss to improve power transfer efficiency according to conventional techniques. EX1003, ¶108.

3. Application to Challenged Claims

Element [13.P]: An inductive power outlet comprising at least one primary coil, for inductively coupling with a secondary coil wired to an electric load, the inductive power outlet further comprising an efficiency monitor comprising:

Even if the preamble is treated as a limitation (which Petitioners do not concede), Stevens discloses it. *Supra*, Section V.C.2, Element [13.p]. EX1005, 1:10-19, 17:9-26, 18:4-11, 19:10-28, 21:13-35, 23:31-33, 38:9-23, 38:34-39:6, FIGs. 1, 4, 12; EX1003, ¶109.

Element [13.1]: at least one input power monitor configured to measure input power received by the primary coil from the power supply;

Stevens discloses this element. *Supra*, Section V.C.2, Element [13.1]. EX1005, 18:7-10, 21:15-23, 32:32-33:8, 38:9-14, 38:34-39:6, FIG. 4, FIG. 12.; EX1003, ¶110.

Element [13.2]: at least one signal detector configured to detect signals carrying data pertaining to output power received by the secondary coil;

Stevens discloses this element. *Supra*, Section V.C.2, Element [13.2]. EX1005, 38:9-14, 38:25-32, 39:24-35, FIGs. 4 (*see* reference numbers 40 and 38), 12; EX 1003, ¶111.

Element [13.3]: at least one processor configured to receive data pertaining to the input power and the output power, the processor further configured to determine an index of power-loss indicative of the efficiency of an inductive coupling between the primary coil and the secondary coil;

Stevens discloses a processor as recited Element [13.3]. *Supra*, Section V.C.2, Element [13.3]. EX1005, 18:7-9, 38:25-26, 38:34-39:6, 39:24-35, FIG. 12, FIG. 4 (*see* reference numbers 40 and 38); EX1003, ¶¶112-113. As detailed above, Stevens also teaches that the control unit determines that “if the measured power from the power measurement unit 730 exceeds the sum of the load measures from the secondary devices by more than a shutdown threshold then the control unit 720 concludes that a substantial parasitic load must be present and places the primary unit in the shutdown mode.” EX1005, 38:34-39:6. Thus, Stevens suggests that the control unit 720 should determine ***an index of power-loss*** for purposes of comparing to Stevens’ shutdown threshold value. EX1005, 38:34-39:6, EX1003, ¶112. For example, in the implementation in which there is one secondary device (600₁), Stevens would determine the difference between the power received by the secondary device 600₁ and the power transmitted by the primary unit 700 (an efficiency differential Δ), which is then compared to Stevens’ threshold value to identify when the primary unit 700 should be shut down. EX1005, 38:34-39:6, EX1003, ¶112.

Even if Stevens does not *explicitly* disclose the control unit being configured to determine the claimed type of “index of power-loss” as recited in Elements [13.3]-[13.4], such a feature was commonly implemented in similar prior art systems. EX1003, ¶113. For example, Jin describes the conventional practice of assessing an inductive coupling condition between coils “using a transmission efficiency as a parameter.” EX1006, [0093]; EX1003, ¶113. In particular, Jin explains that the transmission efficiency should be determined according to a ratio of the output power to the input power: “Transmission efficiency =(effective current value of secondary side × effective voltage)/(effective current value of primary side x effective voltage).” EX1006, [0093]-[0094]. In doing so, this efficiency measure advantageously provides a “strong correlation between the transmission efficiency and coupling coefficient.” [0093]-[0094], EX1003, ¶113.

Element [13.4]: wherein the index of power-loss comprises at least one of: an efficiency quotient Q , defined as the ratio of the output power to the input power; and an efficiency differential Δ , defined as the difference between the output power and the input power.

The predictable Stevens-Jin combination would provide Element [13.4] and achieve the known benefits articulated above. EX1003, ¶114; *supra*, Section V.D.2. As previously articulated, Jin demonstrates that it was a conventional practice to determine ***an index of power loss*** by calculating a transmission

efficiency ratio—one that calculates a ratio of the output power to the input power.

EX1006, [0093]-[0094]; EX1003, ¶114. In this suggested technique, the transmission efficiency is defined as “Transmission efficiency =(effective current value of secondary side × effective voltage)/(effective current value of primary side x effective voltage),” which provides the claimed *efficiency quotient Q*.

EX1006, [0094]; EX1003, ¶114. As detailed above, the resulting combination would have predictably achieved a number of known benefits. *Supra*, Section

V.D.2

Element [14]: The inductive power outlet of claim 13 additionally comprising at least one circuit-breaker configured to disconnect the primary coil from the power supply.

Stevens discloses this element. *Supra*, Section V.C.2, Element [14].

EX1005, 2:18-20, 18:16-19, 19:11-13, 19:30-32, 33:23-28, 37:24-26, 38:16-17, 38:34-39:6, FIGs. 2-3, 8, 11; EX1003, ¶115.

Element [15.1]: An inductive power receiver comprising at least one secondary coil for inductively coupling to a primary coil and supplying power to an electric load,

Stevens discloses this element. *Supra*, Section V.C.2, Element [15.1].

EX1005, 23:31-33, 17:22-26, 23:31-24:2, 38:16-17, FIG. 4; EX1003, ¶116.

Element [15.2]: the inductive power receiver further comprising: at least one output power monitor for measuring output power received inductively by the secondary coil from the primary coil, and

Stevens discloses this element. *Supra*, Section V.C.2, Element [15.2].

EX1005, 38:16-20, FIG. 12; EX1003, ¶117.

Element [15.3]: at least one signal transmitter configured to transmit signals carrying data pertaining to the output power to the inductive power outlet of claim 13.

Stevens discloses this element. *Supra*, Section V.C.2, Element [15.3].

EX1005, 38:18-19, 38:26-29, FIG. 12; ; EX1003, ¶118.

Element [16]: The inductive power receiver of claim 15 wherein the signal transmitter is selected from a group consisting of: light emitting diodes, radio transmitters, optocouplers, and transmitter circuits.

Stevens discloses this element. *Supra*, Section V.C.2, Element [16].

EX1005, 5:25-28, 12:2-4, 15:1-3, 38:5-32, 39:24-35, FIG. 12, EX1003, ¶119.

Element [17.1]: The inductive power receiver of claim 15 wherein the transmitter comprises: an ancillary load selectively connectable to the secondary inductive coil, a modulator for modulating a bit-rate signal with an input signal to create a modulated signal, and

Stevens discloses this element. *Supra*, Section V.C.2, Element [17.1].

EX1005, 5:23-28, 6:1-18, 19:13-20, 23:31-24:2, 30:13-31:6, 32:1-10, 39:27-35, FIG. 4; EX1003, ¶120.

Element [17.2]: a switch for intermittently connecting the ancillary load to the secondary inductive coil according to the modulated signal.

Stevens discloses this element. *Supra*, Section V.C.2, Element [17.2].

EX1005, 5:23-28, 6:1-18, 19:13-20, 23:31-24:2, 30:13-31:6, 32:1-10, 39:27-35, FIG. 4; EX1003, ¶121.

Element [18]: The inductive power receiver of claim 15 wherein the output power monitor is incorporated into an electric device.

Stevens discloses this element. *Supra*, Section V.C.2, Element [18].

EX1005, 1:20-26, 17:32-2, 21:16-18, 30:34-31:6; 1003, ¶122.

VI. DISCRETIONARY DENIAL IS NOT JUSTIFIED

A. The Petition's New Prior Art and Errors Made During Prosecution Warrant Institution—35 U.S.C. § 325(d)

This Petition does not present a situation where “the same or substantially the same prior art or arguments” were previously presented. 35 U.S.C. § 325(d); *Advanced Bionics, LLC v. MED-EL Elektromedizinische Geräte GmbH*, IPR2019-01469, Paper 6, 7-8 (Feb. 13, 2020). Regarding part 1 of the *Advanced Bionics* framework, all Grounds 1A-3 include at least one prior art publication that was absent during prosecution of the ‘461 patent. The file history contains no indication that Olson or Jin were presented to the Examiner during examination—and those publications were certainly never addressed in any claim rejection or office action. *Supra*, Section II.B; EX1001, face.

The Board need not reach part 2 of the *Advanced Bionics* framework because part 1 is not satisfied. But even if the Board evaluates part 2, institution is still warranted in view of material errors during prosecution. *Supra*, Section II.B. For example, the Examiner was led to the erroneous conclusion that the prior art did not disclose or suggest “wherein the index of power-loss comprises at least one of: an efficiency quotient Q , defined as the ratio of the output power to the input power; and an efficiency differential Δ , defined as the difference between the output power and the input power.” *Supra*, Section II.B. But here, Grounds 1A-3 plainly demonstrate why this conclusion was flawed—including that at least Olson and Jin plainly disclose prior art examples of these conventional options. The ’461 patent is ripe for review.

B. *Fintiv* Considerations Weigh in Favor of Institution—35 U.S.C. § 314(a)

The USPTO issued updated discretionary denial guidance in view of the *Fintiv* factors and confirmed that “the PTAB will not discretionarily deny institution in view of parallel district court litigation where a petitioner presents a stipulation not to pursue in a parallel proceeding the same grounds or any grounds that could have reasonably been raised before the PTAB.” *See* June 21, 2022 Memorandum to Members of the PTAB, 3 (available at https://www.uspto.gov/sites/default/files/documents/interim_proc_discretionary_denials_aia_parallel_district_court_litigation_memo_20220621_.pdf). Here,

Petitioner has eliminated any risk of duplicated effort by voluntarily presenting a *Sotera* stipulation to Patent Owner. EX1015; *Sotera Wireless, Inc. v. Masimo Corp.*, IPR2020-01019, Paper 12 (PTAB Dec. 1, 2020). For at least this reason, and considering the compelling merits of the above-detailed Grounds, discretionarily denial is unwarranted and would be unjust.

VII. PAYMENT OF FEES—37 C.F.R. § 42.103

Petitioner authorizes the Patent and Trademark Office to charge Deposit Account No. 06-1050 for the fee set in 37 C.F.R. § 42.15(a) for this Petition and further authorizes payment for any additional required fees to be charged to this Deposit Account.

VIII. CONCLUSION

IPR should be instituted here and the Challenged Claims determined unpatentable based on Grounds 1A-3.

IX. MANDATORY NOTICES UNDER—37 C.F.R § 42.8(a)(1)

A. Real Party-In-Interest Under 37 C.F.R. § 42.8(b)(1)

Petitioner, Anker Innovations Ltd. is the real party-in-interest.

B. Related Matters Under 37 C.F.R. § 42.8(b)(2)

The '461 patent is the subject of a civil action against Petitioner in *Powermat Technologies Ltd. v. Anker Innovations Ltd.*, 5-23-cv-00052 (E.D. Tex.), filed June

5, 2023 (EX1012). The waiver of service was not executed and filed at the district court until September 27, 2023 (EX1016), so “[t]his is the date that Petitioner is deemed to have been served.” *Brinkmann Corp. v. A&J Manufacturing, LLC*, IPR2015-00056, Paper 10, 6-7 (citing FED. R. CIV. P. 4(d)(4)).

Petitioner is not aware of any other disclaimers, reexamination certificates or petitions for inter partes review for the ’461 Patent.

Petitioner previously filed on June 5, 2024, a petition for *Inter Partes* Review of U.S. Patent No. 9,048,696 (IPR2024-00994), which Patent Owner has also asserted against Petitioner in the E.D. Texas litigation. Petitioner is additionally filing a petition for *Inter Partes* Review of U.S. Patent No. 9,083,204 on the same day as the present Petition. The ’204 Patent is also asserted in the E.D. Texas litigation.

C. Lead And Back-Up Counsel Under 37 C.F.R. § 42.8(b)(3)

Petitioner provides the following designation of counsel:

Lead Counsel	Backup Counsel
Michael T. Hawkins, Reg. No. 57,867 Fish & Richardson P.C. 60 South Sixth Street, Suite 3200 Minneapolis, MN 55402 Tel: 202-783-5070 Fax: 877-769-7945 Email: IPR46570-0023IP1@fr.com	Nicholas W. Stephens, Reg. No. 74,320 Joseph W. Bauer, Reg. No. 81,218 Thomas H. Reger II, Reg. No. 47,892 Fish & Richardson P.C. 60 South Sixth Street, Suite 3200 Minneapolis, MN 55402 Tel: 202-783-5070 Fax: 877-769-7945 PTABInbound@fr.com

D. Service Information

Please address all correspondence and service to the address listed above.

Petitioners consent to electronic service by email at IPR46570-0023IP1@fr.com
(referencing No. 46570-0023IP1 and cc'ing PTABInbound@fr.com,
hawkins@fr.com, nstephens@fr.com, jbauer@fr.com, and reger@fr.com).

Respectfully submitted,

Dated 08/14/2024

/Nicholas W. Stephens/

Michael T. Hawkins, Reg. No. 57,867
Nicholas W. Stephens, Reg. No. 74,320
Joseph W. Bauer, Reg. No. 81,218
Thomas H. Reger II, Reg. No. 47,892
Fish & Richardson P.C.
60 South Sixth Street, Suite 3200
Minneapolis, MN 55402
T: 202-783-5070
F: 877-769-7945

(Case No. IPR2024-00996)

Attorneys for Petitioner

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 Petition for *Inter partes* Review totals 11,307 words, which is less than the 14,000 allowed under 37 CFR § 42.24.

Dated: 08/14/2024

/Nicholas W. Stephens/
Michael T. Hawkins, Reg. No. 57,867
Nicholas W. Stephens, Reg. No. 74,320
Joseph W. Bauer, Reg. No. 81,218
Thomas H. Reger II, Reg. No. 47,892
Fish & Richardson P.C.
60 South Sixth Street, Suite 3200
Minneapolis, MN 55402
T: 202-783-5070
F: 877-769-7945

Attorneys for Petitioner

CERTIFICATE OF SERVICE

Pursuant to 37 CFR §§ 42.6(e)(4)(i) et seq. and 42.105(b), the undersigned certifies that on August 14, 2024, a complete and entire copy of this Petition for *Inter partes* Review, Power of Attorney, and all supporting exhibits were provided by Federal Express, to the Patent Owner by serving the correspondence address of record as follows::

Volpe Koenig - Powermat
30 South 17th Street, Suite 1800
Philadelphia, PA 19103

/Diana Bradley/
Diana Bradley
Fish & Richardson P.C.
60 South Sixth Street,
Suite 3200
Minneapolis, MN 55402
(858) 678-5667