Electronic Patent Application Fee Transmittal

Application Number:	13789860
Filing Date:	08-Mar-2013
Title of Invention:	WIRELESS ENERGY TRANSFER
First Named Inventor/Applicant Name:	Aristeidis Karalis
Filer:	Marc M. Wefers/Cheryl Forrest
Attorney Docket Number:	01997-0358008

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
Submission- Information Disclosure Stmt	1806	1	180	180
		Total in USD ($)		**180**

Electronic Acknowledgement Receipt

EFS ID:	24566694
Application Number:	13789860
International Application Number:	
Confirmation Number:	4131
Title of Invention:	WIRELESS ENERGY TRANSFER
First Named Inventor/Applicant Name:	Aristeidis Karalis
Customer Number:	26161
Filer:	Marc M. Wefers/Cheryl Forrest
Filer Authorized By:	Marc M. Wefers
Attorney Docket Number:	01997-0358008
Receipt Date:	08-JAN-2016
Filing Date:	08-MAR-2013
Time Stamp:	11:04:45
Application Type:	Utility under 35 USC 111(a)

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Payment Type	Deposit Account
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RAM confirmation Number	8366
Deposit Account	061050
Authorized User	FISH & RICHARDSON P C
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		IDS.pdf	140672 45f5ae1ee59e59d403c5bf50063eeefbfa4d92bd	yes	2
	Multipart Description/PDF files in .zip description				
	Document Description		**Start**	**End**	
	Transmittal Letter		1	1	
	Information Disclosure Statement (IDS) Form (SB08)		2	2	
Warnings:					
Information:					
2	Foreign Reference	FA2.pdf	537410 fc2f37e8c7f64960853a6e291167fe1254f8de9f	no	9
Warnings:					
Information:					
3	Foreign Reference	FA3.pdf	607091 7bc4178ac2bacce01b692a9c65d6d2d227448dc0	no	11
Warnings:					
Information:					
4	Foreign Reference	FA4.pdf	2004125 112b61d1f8b8f5fc0c04d2bd88d180ba22608385	no	51
Warnings:					
Information:					
5	Non Patent Literature	NPL5.pdf	426559 51db3e6c9ceeba35b0314a36bc8e2d1b9ed0b385	no	8
Warnings:					
Information:					
6	Non Patent Literature	NPL6.pdf	624322 c30f2206ad9afd23e62bcde35715094d3b784e3a	no	6
Warnings:					
Information:					

7	Fee Worksheet (SB06)	fee-info.pdf	30418 12bf30abfd8c2892b8dff4ed9e6f91c897c54e31	no	2

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Total Files Size (in bytes):	4370597

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If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor	:	Aristeidis Karalis	Art Unit	:	2836
Serial No.	:	13/789,860	Examiner	:	Fritz M. Fleming
Filed	:	March 8, 2013	Conf. No.	:	4131
Title	:	WIRELESS ENERGY TRANSFER			

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P.O. Box 1450
Alexandria, VA 22313-1450

INFORMATION DISCLOSURE STATEMENT

Please consider the references listed on the enclosed PTO-SB-08 or Disclosure Form. Foreign patent documents and non-patent literature are enclosed; cited U.S. patents and patent application publications will be provided on request. Copies of communications from foreign patent offices in counterpart applications are also enclosed.

This statement is being filed after a final action or a notice of allowance, but before payment of the issue fee. Each item of information in this information disclosure statement was first cited in communications from foreign patent offices in counterpart foreign applications not more than three months prior to the filing of this information disclosure statement. See 37 CFR 1.97(e)(1). A late submission fee in the amount of $180, specified by 37 CFR §1.17(p) is being paid with this statement.

Apply any necessary charges or credits to deposit account 06-1050, referencing the above attorney docket number.

Please contact the undersigned if there are any questions regarding this Statement.

Respectfully submitted,

Date: January 8, 2016

/Marc M. Wefers Reg. No. 56,842/
Marc M. Wefers
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PTO/SB/30 (07-09)
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Request for Continued Examination (RCE) Transmittal

Address to:
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Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Application Number	13/789,860
Filing Date	March 8, 2013
First Named Inventor	Aristeidis Karalis
Art Unit	2836
Examiner Name	Fritz M. Fleming
Attorney Docket Number	01997-0358008

This is a Request for Continued Examination (RCE) under 37 CFR 1 .114 of the above-identified application.
Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, or to any design application. See Instruction Sheet for RCEs (not to be submitted to the USPTO) on page 2.

1. Submission required under 37 CFR 1.114 Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).

   a. ☐ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.

      i. ☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____

      ii. ☐ Other _____

   b. ☒ Enclosed

      i. ☒ Amendment/Reply

      ii. ☐ Affidavit(s)/ Declaration(s)

      iii. ☒ Information Disclosure Statement (IDS)

      iv. ☐ Other _____

2. Miscellaneous

   Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a

   a. ☐ period of _____ months. (Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)

   b. ☐ Other _____

3. Fees The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.
   The Director is hereby authorized to charge the following fees any underpayment of fees or credit any overpayments to

   a. ☒ Deposit Account No. 06-1050 .

      i. ☒ RCE fee required under 37 CFR 1.17(e)

      ii ☒ Extension of time fee (37 CFR 1.136 and 1.17)

      iii ☒ Other any deficiencies

   b. ☐ Check in the amount of $ _____ enclosed

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SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

Signature	/Marc M. Wefers Reg. No. 56,842/	Date	April 14, 2016
Name (Print/Type)	Marc M. Wefers	Registration No.	56,842

CERTIFICATE OF MAILING OR TRANSMISSION

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Name (Print/Type)		Date	

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TERMINAL DISCLAIMER TO OBVIATE A DOUBLE PATENTING REJECTION OVER A "PRIOR" PATENT	Docket Number (Optional) 01997-0358008

In re Application of: Massachusetts Institute of Technology

Application No.: 13/789,860

Filed: March 8, 2013

For: WIRELESS ENERGY TRANSFER

The applicant, Massachusetts Institute of Technology, owner of 100 percent interest in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of **prior patent** No. 8,760,007 as the term of said **prior patent** is presently shortened by any terminal disclaimer. The applicant hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and the **prior patent** are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

In making the above disclaimer, the applicant does not disclaim the terminal part of the term of any patent granted on the instant application that would extend to the expiration date of the full statutory term of the **prior patent**, "as the term of said **prior patent** is presently shortened by any terminal disclaimer," in the event that said **prior patent** later:

expires for failure to pay a maintenance fee;
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is found invalid by a court of competent jurisdiction;
is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321;
has all claims canceled by a reexamination certificate;
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is in any manner terminated prior to the expiration of its full statutory term as presently shortened by any terminal disclaimer.

Check either box 1 or 2 below, if appropriate.

1. ☐ The undersigned is the applicant. If the applicant is an assignee, the undersigned is authorized to act on behalf of the assignee.

I hereby acknowledge that any willful false statements made are punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

2. ☒ The undersigned is an attorney or agent of record. Reg. No. 56,842

/Marc M. Wefers Reg. No. 56,842/ — Signature
April 14, 2016 — Date

Marc M. Wefers — Typed or printed name

Attorney of Record — Title
(617) 542-5070 — Telephone Number

☐ Terminal disclaimer fee under 37 CFR 1.20(d) included.

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TERMINAL DISCLAIMER TO OBVIATE A PROVISIONAL DOUBLE PATENTING REJECTION OVER A PENDING "REFERENCE" APPLICATION	Docket Number (Optional) 01997-0358008

In re Application of: Massachusetts Institute of Technology

Application No.: 13/789,860

Filed: March 8, 2013

For: WIRELESS ENERGY TRANSFER

The applicant, Massachusetts Institute of Technology, owner of 100 percent interest in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of any patent granted on pending **reference** Application Number 13/477,459, filed, May 22, 2012, as the term of any patent granted on said **reference** application may be shortened by any terminal disclaimer filed prior to the grant of any patent on the pending **reference** application. The applicant hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and any patent granted on the **reference** application are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

In making the above disclaimer, the applicant does not disclaim the terminal part of any patent granted on the instant application that would extend to the expiration date of the full statutory term of any patent granted on said **reference** application, "as the term of any patent granted on said **reference** application may be shortened by any terminal disclaimer filed prior to the grant of any patent on the pending **reference** application," in the event that: any such patent granted on the pending **reference** application expires for failure to pay a maintenance fee, is held unenforceable, is found invalid by a court of competent jurisdiction, is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321, has all claims canceled by a reexamination certificate, is reissued, or is in any manner terminated prior to the expiration of its full statutory term as shortened by any terminal disclaimer filed prior to its grant.

Check either box 1 or 2 below, if appropriate.

1. ☐ The undersigned is the applicant. If the applicant is an assignee, the undersigned is authorized to act on behalf of the assignee.

I hereby acknowledge that any willful false statements made are punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

2. ☒ The undersigned is an attorney or agent of record. Reg. No. 56,842

/Marc M. Wefers Reg. No. 56,842/ — Signature
April 14, 2016 — Date

Marc M. Wefers — Typed or printed name

Attorney of Record — Title
(617) 542-5070 — Telephone Number

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor	:	Aristeidis Karalis	Art Unit	:	2836
Serial No.	:	13/789,860	Examiner	:	Fritz M. Fleming
Filed	:	March 8, 2013	Conf. No.	:	4131
Title	:	WIRELESS ENERGY TRANSFER			

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Apply any necessary charges or credits to deposit account 06-1050, referencing the above attorney docket number.

Please contact the undersigned if there are any questions regarding this Statement.

Respectfully submitted,

Date: April 14, 2016

/Marc M. Wefers Reg. No. 56,842/
Marc M. Wefers
Reg. No. 56,842

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Substitute Disclosure Form	U.S. Department of Commerce Patent and Trademark Office	Attorney Docket No. 01997-0358008	Application No. 13/789,860
Information Disclosure Statement by Applicant (Use several sheets if necessary) (37 CFR §1.98(b))		Applicant Aristeidis Karalis et al.	
		Filing Date March 8, 2013	Group Art Unit 2836

U.S. Patent Documents							
Examiner Initial	Desig. ID	Document Number	Publication Date	Patentee	Class	Subclass	Filing Date If Appropriate
	1.	6,028,429	2/22/2000	Green et al.			
	2.	8,077,485	12/13/2011	Lee			
	3.	2007/0008140	1/11/2007	Saarisalo et al.			

Foreign Patent Documents or Published Foreign Patent Applications								
Examiner Initial	Desig. ID	Document Number	Publication Date	Country or Patent Office	Class	Subclass	Translation	
							Yes	No
	4.	DE 30 43 441	6/3/1982	DE	H02J	17/00	Machine Translation	
	5.	WO 2007/075058	7/5/2007	WIPO	H02J	3/38		

Other Documents (include Author, Title, Date, and Place of Publication)		
Examiner Initial	Desig. ID	Document
	6.	Copy of Notice of Allowance from the U.S. Patent and Trademark Office for Application No. 13/477,459 by Examiner Fritz M. Fleming dated March 31, 2016 (13 pages)
	7.	Copy of Summons to Attend Oral Proceedings for Application No. 06 786 588.1 dated February 4, 2016 (31 pages)
	8.	Copy of Summons to Attend Oral Proceedings for Application No. 11 184 066.6 dated February 8, 2016 (17 pages)
	9.	Bladel, "Weakly Coupled Dielectric Resonators", IEEE Transactions on Microwave Theory and Techniques, Vol. 30, No. 11, pp. 1907-1914 (November 1982)
	10.	Fenn et al., "Linear Array Characteristics with One-Dimensional Reactive-Region Near-Field Scanning: Simulations and Measurements", IEEE Transactions on Antennas and Propagation, Vol. 39, No. 9, pp. 1305-1311 (September 1991)
	11.	Haus et al., "Coupled-Mode Theory", Proceedings of the IEEE, Vol. 79, No. 10, pp. 1505-1518 (October 1991)
	12.	Shamonina et al., "Magneto-inductive waveguide", Electronics Letters, Vol. 38, No. 8, pp 371-373 (April 11, 2002)
	13.	Syms et al., "Magneto-inductive waveguide devices", IEEE Proc.-Microw. Antennas Propag., Vol. 153, No. 2., pp. 111-121 (April 2006)

Examiner Signature	Date Considered
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(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(74) Agents: **KIM, Inhan** et al.; Room 901, Doorea Bldg, 24, Yeouido-dong, Yeongdeungpo-gu, Seoul 150-877 (KR).

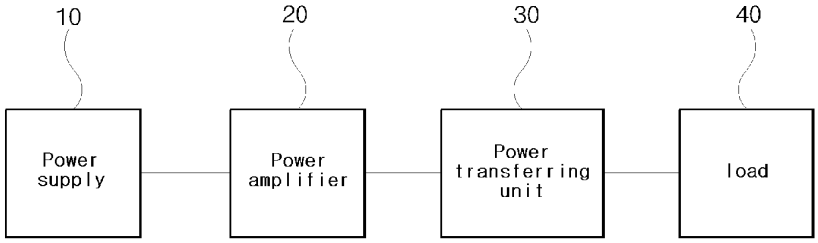
(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KZ, LA, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

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Published:
— *with international search report*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) **Title:** CIRCUIT FOR TRANSMITTING AN AMPLIFIED RESONANT POWER TO LOAD



(57) **Abstract:** A circuit for transferring amplified resonant power to a load is disclosed. The circuit transfers amplified resonant power, which is generated in an inductor of a conventional transformer when serial or parallel resonance of a conventional power supply is formed, to a load through the conventional transformer. The circuit comprises: a power supply for producing and supplying voltage or current; a power amplifier for generating amplified resonant power using the voltage or current; and a power transferring unit for transferring the amplified resonant power to the load using a transformer.

WO 2007/075058 A1

Description

CIRCUIT FOR TRANSMITTING AN AMPLIFIED RESONANT POWER TO LOAD

Technical Field

[1] The present invention relates to a power amplifier circuit and its power transferring. More particularly, this invention relates to a circuit that can transfer amplified resonant power, which is generated by an inductor of a conventional transformer when serial or parallel resonance of a conventional power supply is formed, to a load through the conventional transformer.

Background Art

[2] An electric-power supply produces electric-power and supplies the produced electric-power to a load directly connected thereto. An example of such an electric-power supply is an electric generator. When such an electric generator produces electric-power, a transformer transforms the electric-power into a voltage or current compliant with a load's resistance and supplies it to the load.

[3] According to a conventional electric-power supply method, an independent power supply used a primary power supply directly supplies electric-power to a load. That is, the consumption power of the load is directly provided by the independent power supply.

[4] As such, the conventional electric-power supply method has only used an independent power supply that directly supplies power to a load. That is, a method where electric-power provided from an independent power supply is amplified and then supplied to a load has not been known.

[5] Therefore, before supplying electric-power from an independent power supply to a load, if it is amplified and then supplied to the load, the electric-power consumption can be reduced. That is, such idea becomes a landmark in the industry.

Disclosure of Invention

Technical Problem

[6] Therefore, the present invention has been made in view of the above problems, and it is an object of the present invention to provide a circuit for transferring amplified resonant power to a load that is capable of transferring Q times amplified resonant power, which is generated at an inductor of a conventional transformer when serial or parallel resonance of a conventional power supply is formed, to a load through the conventional transformer, thereby proving a higher amount of power to the load than a conventional circuit can, including the conventional power supply apparatus having simple functions.

Technical Solution

[7] In accordance with an aspect of the present invention, the above and other objects can be accomplished by the provision of a circuit for transferring amplified resonant power to a load, comprising: a power supply for producing and supplying voltage or current; a power amplifier for generating amplified resonant power using the voltage or current; and a power transferring unit for transferring the amplified resonant power to the load using a transformer.

[8] Preferably, the power supply is one of AC voltage source, AC current source, DC voltage source, and DC current source.

[9] Preferably, the power amplifier includes: a primary inductor of the transformer; and a capacitor connected to the primary inductor in serial or in parallel. Here, the amplified resonant power is stored in the primary inductor.

[10] Preferably, reflective impedance at the primary side of the transformer has a relatively small value such that the power amplifier can maintain resonance.

Brief Description of the Drawings

[11] The above and other object, feature and other advantages of the present invention will be more clearly understood from the following detailed description taken in conjunction with the accompanying drawings, in which:

[12] FIG. 1 is a schematic circuit block diagram according to an embodiment of the present invention;

[13] FIG. 2 is a view illustrating a circuit that transfers amplified resonant power, generated in serial resonance, to a load, according to an embodiment of the present invention;

[14] FIG. 3 shows equivalent circuit diagrams of a three-phase synchronous electric generator according to an embodiment of the present invention;

[15] FIG. 4A and FIG. 4B are equivalent circuit diagrams of serial and parallel resonance circuits, respectively, according to an embodiment of the present invention;

[16] FIG. 5 is an equivalent circuit diagram of a transformer according to an embodiment of the present invention;

[17] FIGS. 6A and 6B are equivalent circuit diagrams when a transformer connected to a load is in serial resonance, according to an embodiment of the present invention;

[18] FIG. 7 is an exemplary view illustrating a transformer used in an embodiment of the present invention;

[19] FIG. 8 is an equivalent circuit diagram of an electric-power amplification/transfer experiment circuit, according to an embodiment of the present invention;

[20] FIG. 9 shows equivalent circuit diagrams of a circuit used in an experiment according to the present invention;

[21] FIG. 10 is a circuit diagram where a load is directly connected to a power supply according to an experiment of the present invention;

[22] FIG. 11 is an equivalent circuit diagram of a final transformer for electric-power transfer according to an experiment of the present invention

[23] FIG. 12 is an equivalent circuit diagram of an electric-power transfer resonant voltage source according to an experiment of the present invention;

[24] FIG. 13 is an equivalent circuit diagram of an electric-power transfer resonant current source according toan experiment of the present invention;

[25] FIG. 14 is an equivalent circuit diagram of an electric-power transfer transformer of a home electrical appliance, according to an experiment of the present invention; and

[26] FIG. 15 is an equivalent circuit diagram of an electric-power transfer resonant current source of a home electrical appliance, for reducing consumption power of a load, according to an experiment of the present invention.

Best Mode for Carrying Out the Invention

[27] Preferred embodiments of a circuit for transferring amplified resonant power, configured to include the above-described means, and their operations, will be described in detail with reference to the accompanying drawings.

[28] As shown in FIG. 1, the circuit according to the present invention is configured to include: a power supply 10 for producing and supplying electric-power a power amplifier 20 for resonating the electric-power provided from the power supply 10 to generate amplified resonant power, and storing it therein; and a power transferring unit 30 for transferring the amplified resonant power of the power amplifier 20 to a load 40.

[29] The power supply 10 means a general independent power source. Such a general independent power source is used in such a way that its output voltage is increased or decreased to a voltage necessary for a load by a transformer, etc., and then transferred to the load. However, in the present invention, the power supply 10 just functions as only an accessory circuit that supplies current or voltage to the power amplifier 20 such that the power amplifier 20 can amplify power based on the current or voltage. The power supply 10 does not directly produce or provide its electric-power to the load.

[30] The independent power supply source functioning as the power supply 10 may be implemented with an AC source and a DC source. The AC source includes an AC voltage source and an AC current source. The DC source includes a DC voltage source and a DC current source. When the independent power supply source is implemented with a DC source, the output of the DC source can be converted to AC power through an inverter.

[31] The power amplifier 20 produces amplified resonant power using voltage and

current outputted from the power supply 10. In an embodiment of the present invention, the amplified resonant power is transferred to a load through a transformer. More specifically, the power amplifier 20 produces the amplified resonant power using the primary inductor of the transformer, and is then stored in the primary inductor.

[32] Here, the power amplifier 20 is configured to include the primary inductor of the transformer and a capacitor connected to the primary inductor in serial or in parallel. Here, the power amplifier 20 resonates and amplifies the power provided from the power supply 10 and then stores it in the inductor.

[33] The power amplifier 20 affixes an inductor (L) and capacitor (C), which are electrical parts for storing energy, to the power supply 10, and enables the inductor (L) and capacitor (C) to be synchronous to the frequency of the source power and to form serial or parallel resonance. Therefore, the source power is amplified Q times and then stored in the inductor (L) and the capacitor (C).

[34] When serial resonance is formed at a source voltage of V_g, Q times source voltage, i.e., $Q * V_g$ [V], is applied to the inductor. Here, the serial resonant power P_s by resonant current I_0 flowing in the inductor is generated such as $P_s = Q V_g * I_0$ [W].

[35] On the other hand, when parallel resonance is formed, Q times input current of I_g, i.e., $Q*I_g$ [A], flows into the inductor. Here, parallel resonant power P_p by a voltage V_p between both leads of the inductor generates as $P_p = Q I_g * V_p$ [W].

[36] As such, in using serial or parallel resonance, the inductor for resonance stores Q times input power P therein. Here, the type of resonances can be chosen according to the object of the circuit design. And here, power generated in the inductor is reactive power, and, for convenience, denoted by power P.

[37] The amplified resonant power, generated by the power amplifier 20, is transferred to the load 40 by the power transferring unit 30 composed of a commonly used transformer.

[38] The power transferring unit 30 transfers the power, amplified Q times by the transformer in the power amplifier 20, to the load. In order to transfer power maximally, it is preferable that the coupling coefficient k be close to 1.

[39] When serial resonance is formed, voltage V_2 at the secondary side of the transformer, which is hereinafter referred to as secondary voltage V_2, can be calculated by the following equation, based on the transformer principle. Here, the current I_2 at the secondary side, which is hereinafter referred to as secondary current I_2, is assumed to be 0.

[40] $V_2 = k*V_1/n = k*Q*V_g/n = (Q/n)*k*V_g$

[41] Where, Q denotes a quality factor of the circuit n denotes the turns ratio of the trans former k denotes the coupling coefficient V_g denotes the source voltage and V_1 denotes a voltage between both leads of the inductor in serial resonance.

[42] When the transformer is operated, the secondary current I_2 flows in the secondary side of the transformer. Then, reflective impedance Z_{21} is reflected from the secondary side to the primary side, thereby suppressing resonance at the primary side.

[43] Therefore, the reflective impedance at the primary side, which is hereinafter referred to as primary reflective impedance, is designed to be relatively small to maintain resonance in the power amplifier 20. In the present invention, an equation for voltage transfer to the secondary side and an equation for adjusting reflective impedance Z_{21}, when resonance is formed, are derived and then applied to the circuit design. Therefore, the present invention allows the amplified resonant power to be transferred to the load without loss, based on the transformer principle.

[44] The load 40 is a circuit that is provided with the power amplified Q times at the primary inductor of the transformer. When the secondary current I_2 is not zero, resonance of the primary side of the transformer is broken by the reflective impedance of the transformer. To prevent this, the reflective impedance Z_{21} must be adjusted and resistance R_0 of the load must beoptimally chosen to maintain the resonance of the primary side.

[45] An embodiment of the circuit for transferring amplified resonant power to the load, as configured above, according to the present invention, is illustrated in FIG. 2. As shown in FIG. 2, the circuit includes: a power supply 10 having an AC voltage source (V_g) and an internal resister (R_g) a power amplifier 20 having a primary inductor (L_1) of a transformer and a capacitor (C_1) serially connected to the inductor (L_1) a power transferring unit 30 having the transformer and a load (R_0) inputting resonant power, amplified by the power transferring unit 30.

[46] FIG. 3 shows equivalent circuit diagrams of a three-phase synchronous electric generator according to an embodiment of the present invention. In such a circuit, jX_s denotes reactance of an electric generator and R_1 denotes resistance of the inductor. The present invention transfers electric-power to the load in such a way that: in order to apply an equivalent circuit for a single phase electric power generation to a circuit, a capacitor is added the circuit power is amplified by using resonance; and the amplified resonant power is directly provided to the load using the transformer principle. Therefore, the present invention transfers the amplified power to the load. On the other hand, the conventional power supply is directly connected to the load and transfers its power thereto.

[47] FIG. 4A and FIG. 4B are diagrams illustrating a single phase equivalent circuit of an electric generator to which serial or parallel resonance is applied to amplify electric-power. Such a circuit is configured to include a power supply 10 and a power amplifier 20.

[48] As shown in FIG. 4A, in the circuit to which serial resonant is applied, if resistance

R_1 of a coil is neglected, the quality factor Q_s is expressed as $Q_s = \omega L_1 / R_g$, where R_g denotes internal resistance of the power supply, and R_1 denotes loss resistance of the coil. Here, the factor Q_s of a circuit is generally greater than 10. Also, a voltage V_1 between both leads of an inductor (L_1) in serial resonance is expressed as $V_1 = Q_s * V_g$. Here, power P_1 stored in the inductor (L_1) is expressed as follows:

[49] $P_1 = V_1 * I_0 = Q_S * V_g * I_0 = Q_s * V_{g2} / R_g$

[50] where, $I_0 = V_g / R_g$ (I_0: resonance current)

[51] As well, the source power P_g in serial resonance is expressed as $P_g = V_g * I_0 = V_{g2} / R_g$. Therefore, $P_1 = Q_s * P_g$. The equation shows that the inductor (L_1) in serial resonance inputs Q_s times input power.

[52] As shown in FIG. 4B, in the circuit to which parallel resonant is applied, like the serial resonant circuit, Q times power is applied to both leads of the inductor. Since such power amplification in the parallel resonant circuit is similar to that of the serial resonant circuit, which has already been described above, its description will be omitted.

[53] FIG. 5 is an equivalent circuit diagram of a transformer used in the power transferring unit 30 according to an embodiment of the present invention.

[54] When the transformer of the power transferring unit 30 is assumed to be ideal, input power P_1 of the primary side can be transferred to the secondary side without loss. Therefore, the power P_2 at the secondary side becomes the input power P_1, i.e., $P_1 = P_2$. However, when considering the coupling coefficient k and turns ratio n, the secondary side can be expressed as follows. Here, coil resistance is neglected.

[55] $V_2 = k * V_1 / n$

[56] $I_2 = k * n * I_1$

[57] $P_2 = V_2 * I_2 = k^2 * P_1$

[58] On the other hand, when internal resistance R_g of the power supply exists and the secondary current I_2 is not zero as a load having resistance R_0 is connected to the secondary side, reflective impedance Z_{21} is coupled to the primary side. Here, the reflective impedance Z_{21} can be expresses as $Z_{21} = -(sM)^2 / Z_{22} = R_{21} + jX_{21}$ [Ω].

[59] FIGS. 6A and 6B are equivalent circuit diagrams of the primary and secondary sides of a transformer, respectively, when the resonant power amplified by the serial resonant circuit of FIG. 4A is transferred to the secondary side of the transformer, based on the transformer principle, as shown in FIG. 5.

[60] As shown in FIG. 6B, in the equivalent circuit diagram of the secondary side of the transformer, I_1 denotes primary current and Z_{12} denotes mutual inductance.

[61] As shown in FIG. 6A, when the power supply circuit at the primary side is configured to be a serial resonant circuit and a load is connected to the secondary side circuit, reflective impedance Z_{21} appears at the resonant circuit at the primary side.

When the circuit is designed such that the reflective impedance Z_{21} hardly affects the resonant circuit at the primary side, the resonant circuit continues its resonance. Then, the power amplified by such resonance is transferredto the secondary side, based on the transformer principle, such that the amplified power can be provided to the load.

[62] The following is a detailed description of exemplary experiments to prove the above-described embodiments according to the present invention.

[63] FIG. 7 is a view illustrating a transformer used in a practical experiment for an embodiment of the present invention. The transformer is designed in such a way that coils are wound around a ferrite core to form primary and secondary sides whose inductances are each 348 [mH] and whose turns ratio is n:1. As well, the transformer is operated in serial resonance. Here, DC resistance of the coil is 2.8 [Ω] and coupling coefficient k is 0.742.

[64] As well, for the experiment of the transformer of FIG. 7, a signal generator, Tektronix CFG 280 whose internal impedance is 50 [Ω], is used as an AC power source and a serial resonance frequency of 304 [KHz] is used. An oscilloscope, Tektronix TDS 220, is used as a voltmeter.

[65] FIG. 8 is an equivalent circuit diagram of an electric-power amplification/transfer experimental circuit according to an embodiment of the present invention. FIGS. 9A and 9B are equivalent circuit diagrams of the primary and secondary sides in the equivalent circuit of FIG. 8.

[66] In the equivalent circuit at the primary side shown in FIG. 9A, equivalent resistance R_T can be expressed as $R_T=R_g+R_1+R_{21}$. Here, when a load (R_0) is connected to the circuit, the quality factor Q_s can be expressed as $Q_s = XL_1/R_T$. Thus, the smaller the reflective impedance R_{21}, the better the power amplification.

[67] Therefore, if the reflective impedance Z_{21} is minimized at the primary side to maintain resonance when the circuit is designed, the amplified resonant power is transferred to the secondary side without loss, based on the transformer principle, such that the voltage and current corresponding to the transferred power can appear at the secondary side. Accordingly, the voltage at the primary side, amplified by serial resonance, becomes $Q_s * V_g$, and the voltage V_2 at the secondary side is expressed as $V_2=(Q_s/n)*k*V_g$. When the coupling coefficient k is 1 and the turns ratio n is 1, the secondary voltage V_2 is amplified as Q times the source power V_g and then applied to the load connected to the secondary side.

[68] Since the secondary current I_2 is $k*n*I_1$, when n=1 and k=1, then $I_2=I_1$. Here, I_1 is resonant current of the primary side and transferred to the secondary side without loss.

[69] Therefore, the power P_2 transferred to the secondary side is expressed as the following equation.

[70] $$P_2=V_2*I_2=(Q_s/n)*k*V_g*k*n*I_1=Q_s*k^2*V_g*I_1=Q_s*k^2*P_1$$

[71] The above equation, P_2, means that Q_s times input power is transferred to the secondary side when resonance is formed with k=1. The load does not input electric-power from the power supply but inputs the resonant power amplified by the power amplifier, which is regarded as a main power supply. Thus, the power supply functions as a trigger (an auxiliary circuit) allowing such a resonance to be maintained.

[72] In the experimental circuits shown in FIGS. 9A and 9B, when the load resistance R_0 is assumed to be 170 [kΩ], the reflective impedance Z_{21} is expressed as follows:

[73] $Z_{21}=-(sM)^2/Z_{22}=1.43-j5.6*(10)^{-3}$ [Ω]$=R_{21}+jX_{21}$ [Ω]

[74] Here, assuming that Rg= 50 [Ω], R_0=170 [kΩ], XL_1=665 [Ω], XL_2 = 665 [Ω], k=0.742, and n=1.

[75] As described in the equation, since the reflective resistance R_{21}, 1.43 [Ω], is relatively smaller than the internal resistance Rg, 50 [Ω], it hardly affects the factor of circuit Qs. As well, since the reflective capacitive reactance X_{21}, 5.6* $(10)^{-3}$ [Ω], is relatively smaller than the inductive reactance, 665 [Ω], at the primary side, such a resonance can be constantly maintained.

[76] The following Table 1 shows experimental measurement data of available power provided to a load (R_0) using a resonant circuit of the power supply whose internal resistance Rg is 50 [Ω] and whose voltage is 1 [V]. Here, the data is obtained when the coupling coefficient k is 0.742. However, when the coupling coefficient k is 1, then, $V_2 = V_1$ and the power provided to the load is as described in Table 1. Here, XL_2 is neglected, because $R_0 >> XL_2$ when the power provided to the load is calculated.

[77] Table 1

Experimental measurement data of power, according to load change, in the equivalent circuit of FIG. 8

Load Resistance, R_0 [Ω]	Quality factor, Q_s	Primary Voltage, V_1 [V]	Secondary Voltage, V_2 =0.742V_1 [V]	Available load power, $P_0=V_{22}/R_0$ [μW]	Reflective Resistance, R_{21} [Ω]
1M	8.97	8.97	6.65	42.9	0.24
170K	8.80	8.80	6.55	252.3	1.43
10K	6.56	6.56	4.92	2420.6	24.34
1.2K	2.40	2.40	1.72	2465.3	202.89
870	1.93	1.93	1.34	2063.9	279.85

[78] Where, V_g=1 [V], k=0.742, and n=1.

[79] In Table 1, since the source voltage V_g is 1 Volt, the value of the quality factor of the circuit Q_s is equal to the magnitude of the voltage V_1 applied to the inductor (L_1).

Therefore, the voltage V_2, transferred to the secondary side, is $k*V_1$.

[80] As well, when $I_2=0$, the quality factor Q_s at the primary side is expressed as $Q_s=XL_1/(R_g+R_1)=665\ [\Omega]/52.8\ [\Omega] = 12.59$. Provided that R_g denotes internal resistance of the power supply, 50 [Ω], and R_1 is DC resistance of the primary coil, 2.8 [Ω].

[81] Since the case where load resistance R_0 is 1 [MΩ] is similar to that where $I_2=0$, Q_s must be 12.59 like the theoretical value but, as described in Table 1, the experimental value is measured as 8.97. Such a result is estimated because the value of the factor Q_s is reduced by resistance caused by the high frequency of the coil as well as the DC resistance of the coil.

[82] Therefore, based on such a result, effective resistance R_{eff} of the primary circuit can be calculated as $R_{eff}=XL_1/Q_s=667\ [\Omega]/8.97 = 74.1\ [\Omega]$. Thus, the experiment circuit is estimated as being operated in a state where the effective resistance R_{eff} is $R_{eff}=74.1\ [\Omega]$ and the internal resistance R_g of the power source is 50 [Ω]. The Table 1 shows that the quality factor Q_s according to change of load resistance R_0 is $XL_1/(R_{eff}+R_{21})$, i.e., $Q_s=XL_1/(R_{eff}+R_{21})$.

[83] The Table 1 shows that, when the load resistance R_0 is 1.2 [kΩ], the reflective resistance R_{21} is 202.89 [Ω] and voltage amplification is approximately 2.4. Therefore, a circuit designed to have such conditions is operated in such a way that, when the load resistance R_0 is increased, the reflective resistance R_{21} and the reflective impedance Z_{21} are decreased but the quality factor Q_s is increased.

[84] The following Table 2 describes value calculated by an equation when the coupling coefficient k set to 1at the resonant equivalent circuit of FIG. 8.

[85] Table 2

Theoretical values, at k=1, in the equivalent circuit of FIG. 8

Load resistance, R_0 [Ω]	Quality factor, Q_s	Primary Voltage, V_1 [V]	Secondary Voltage, $V_2=0.742V_1$ [V]	Available power of Load, $P_0=V_{22}/R_0$ [μW]	Reflective Resistance, R_{21} [Ω]
1M	8.93	8.93	8.93	79.7	0.44
170K	8.67	8.67	8.80	442	2.6
10K	5.62	5.62	5.62	3158	44.21
1.2K	1.50	0.83	0.83	577	368.51
870	1.14	0.75	0.75	651	508.30

[86] Where, $V_g=1$[V], k=1, and n=1.

[87] In Table 2, since the reflective resistance R_{21} is changed according to a change in the load resistance R_0 at k = 1, when each R_0 in Tables 1 and 2 is 1.2 [kΩ] or 870 [Ω],

the available power provided to the load (R_0) is decreased more than that in the case of k=0.742. Such a result is because parameters used for the reflective impedance Z_{21}, such as, coupling coefficient k, load resistance R_0, turns ratio n, and reactance XL_1, are associated with the design of a circuit for resonant power transfer.

[88] The following Table 3 shows comparisons of magnitude of available power provided to a load (R_0) when the load (R_0) is directly connected to the source voltage with that of available power provided to a load (R_0) when the load is connected to an experimental circuit for power amplification with 1 [V] voltage source, as shown in FIG. 8.

[89] FIG. 10 is a circuit diagram where a power supply is directly connected to a load to supply its power to the load. Here, since $R_0 >> R_g$, the internal resistance R_g of the power supply is neglected.

[90] Table 3

Comparison of available load power between direct connection manner and source power amplification connection manner

Load resistance , R_0[Ω]	①Direct connection manner$P_0=V_g^2/R_0$[μW]	Source power amplification connection manner $P_0=V_g^2/R_0$[μW]		Ratio of available load power,②/①	Ratio of available load power,③/①
		② k=0.742	③ k=1		
1M	1.0	42.9	79.7	42.9	79.7
170K	5.9	252.3	442	42.76	74.91
10K	100.0	2420.6	3158	24.20	31.58
1.2K	833.3	2465.3	577	2.95	0.69
870	1149.4	2063.9	651	1.79	0.56

[91] As described in Table 1, in the circuit where Q_s is maintained at 6.56 in serial resonance, the available power provided to the load having load resistance R_0 of 10 [k], as described in Table 3, is 24.2 times power in the case of k=0.742 and 31.58 times power in the case of k=1 than that of the case where the load is directly connected to the power supply. This means that the load is provided with amplified power, Q_s^2 times greater than that of the conventional power providing method.

[92] The following is a detailed description of a circuit for amplifying and supplying source power using parallel resonance, based on the experiment results.

[93] Home electric-power is provided in such a way that 6.6 [kV] is transmitted to a transformer nearest a home and the transformer steps-down the voltage to a single phase 220 [V] to supply it to the home, so that home appliances can consume it.

[94] FIG. 11 is an equivalent circuit diagram for transferring electric-power to loads in a home. The circuit is designed in such a way that load resistance R_0 is 1 [Ω] and a factor Q_p of a desired circuit is 8.58. Here, the internal resistance of the power supply is neglected.

[95] Here, the primary voltage of the transformer is 6.6 [kV] and the secondary voltage is 220 [V]. In addition, when the coupling coefficient k of the transformer is assumed to be 1, the turns ratio n is 30 (= V_1/V_2 = 6.6 [kV]/220 [V]). As well, the resistance of a load at home is assumed to be 1 [Ω].

[96] Here, in order to apply 220 [V] to the load, the reactance at the secondary side of transformer shown in FIG. 11 must be chosen in such a way to be 1% of the load resistance, i.e., 0.0105 [Ω]. Since the reactance X_1 at the primary side and the reactance X_2 at the secondary side are each proportional to the square of the turns ratio, $XL_1=n^2 XL_2=30^2$ (0.0105) = 9.44 [Ω]. Here, since the reflective impedance Z_{21} is $-(sM)^2/Z_{22}$ =0.1-j0.01 [Ω], it hardly affects the circuit at the primary side.

[97] Therefore, a parallel resonance circuit of the primary side, for amplifying power, is applied to the power amplification circuit using parallel resonance, as shown in FIG. 12, thereby transferring the amplified resonant power to the secondary side.

[98] Here, when the resistance RL_1 of the coil at the primary side is assumed to be 1 [Ω], the factor of circuit Q_p is 8.58 (=XL_1/R_{eff}=9.44 [Ω]/1.1 [Ω]). Provided that $R_{eff}=RL_1+R_{21}$. As well, the resistance R_1 in the parallel resonance is 81 [Ω] (=$R_{eff}Q^2$=1.1 [Ω]*(8.58)^2). Here, the internal resistance of the power supply is neglected.

[99] FIG. 13 is an equivalent circuit diagram of a current source, which is modified from the circuit of FIG. 12 as the voltage source is replaced with the current source.

[100] As shown in FIG. 13, the resonant current I_0 is 0.0815 [kA] (= V_1/R_1=6.6 [kV]/81 [Ω]). The primary reactance X_1 allows a circulating current of 0.699 [kA], which corresponds to I_0 (0.0815 [kA]) times Q_p, to be flown therein. 6.6 [kV] is applied to both leads of the primary reactance. Therefore, under these conditions, the parallel resonant power P_{1R} is 4,613.4 [kW] (=$V_1*Q_p*I_0$=6.6 [kV]*0.699 [kA]).

[101] However, in the equivalent circuit of FIG. 11, when the coil resistance RL_1 is neglected, the current I1 flown in the primary reactance XL_1 is 0.699 [kA] (=V_1/XL_1 =6.6 [kV]/9.44 [Ω]. Therefore, the power P_1 applied to the primary reactance XL_1 is 4,613.4 [kW] (=V_1*I_1=6.6 [kV]*0.699 [kA]).

[102] Therefore, the parallel resonant power P_{1R} of 4,613.4 [kW] in parallel resonance is identical, in magnitude, to the power P_1 of 4,613.4 [kW], not in resonance, and transferred to the load through the transformer. From view of the power supply, it must produce power P_1 of 4,613.4 [kW], not in resonance. However, since the source power P_g in parallel resonance, as shown in the equivalent circuit of FIG. 13, is 0.54 [kW] (=V_1*I_0=6.6 [kV]*0.0815[A]), the power supply in resonance may produce P_1 times

$1/Q_s$. Therefore, from view of the electric generator, its output power seems to be increased. On the other hand, such an effect can be identically obtained from a circuit in serial resonance.

[103] The present invention can save more of a load's consumption power than the conventional method can.

[104] The following describes theoretical proposals for how the present invention can be applied to home appliances to save consumption power, based on the experiment results.

[105] A general home appliance steps down from 220 [V] to a certain voltage using a transformer and then converts the step-down voltage to AC or DC to provide it to loads, for example, when an apparatus has regular output of 6 V and output current of 0.3A.

[106] Here, equivalent resistance R_0 of the load is 20 [Ω] ($=V_2/I_2=6$ [V]/0.3 [A]). In order to apply 99% of the voltage to the load (R_0), XL_2 is chosen to be 0.2 [Ω]. Here, the turns ratio n is 36.7 ($=V_1/V_2=220$ [V]/6 [V]), and the primary reactance XL_1 is 269 [Ω] ($=n^2*XL_2=36.72*0.2$ [Ω]).

[107] Also, when the reflective impedance Z_{21} and the resistance RL_1 of the primary coil (L_1) are chosen so that $Z_{21}=-(sM)^2/Z_{22}=2.7-j0.027$ [Ω] and $RL_1=40$ [Ω], the reflective impedance Z_{21} hardly affects the primary circuit. Such an equivalent circuit of the transformer is illustrated in FIG. 14, in which the internal resistance of the power supply is neglected.

[108] In FIG. 14, in order to apply 6 [V] to the load (R_0) of 20 [Ω], the primary current I_1 needs approximately 818 [mA] (i.e., $I_1=V_1/XL_1=220$ [V]/269 [Ω] ≒ 818 [mA]), assuming that the primary coil resistance RL_1 is neglected.

[109] Therefore, the power actually consumed by the load (R_0) is determined by the primary voltage, 220 [V], and the current, 818 [mA], of the primary side of the transformer shown in FIG. 14.

[110] FIG. 15 shows an equivalent circuit diagram modified from the circuit of FIG. 14 as the voltage source is replaced with a current source. The circuit of FIG. 15 is configured to be operated in parallel resonance.

[111] In FIG. 15, the internal resistance of the power supply is neglected. In the equivalent circuit using parallel resonance, the factor Q_p is obtained as $Q_p=XL_1/(RL_1+R_{21})=269$ [Ω]/(40+27) [Ω]≒6.3. As well, the primary circuitresistance R_1 is obtained as $R_1=(RL_1+R_{21})*Q_p^2=42.7*6.3^2$≒1694.7 [Ω].

[112] Therefore, the primary current I_1 is identical to the resonant current I_0, and obtained as $I_0=V_1/R_1=220$[V]/1694.7 [Ω]≒129.8 [mA]. Thus, the current I_Q, flown in the primary reactance XL_1, is obtained as $I_Q=Q_p*I_0=6.3*129.8$ [mA]≒818 [mA].

[113] Therefore, under the condition that the coupling coefficient k is 1 and the turns ratio

InductEV, Inc.
Exhibit 1031
Page 1354

n is 36.7, the voltage V_2 and current I_2, obtained as $V_2=V_1/n=220$ [V]/36.7≒6 [V], and $I_2=n*I_Q=36.7*818$ [mA]≒30 [A], respectively, are transferred to the load at the secondary side of the transformer. Thus, the load can be operated by the voltage V_2 and current I_2, used as the regular voltage and current of the load.

[114] However, since the consumption power of the load is caused by the power induced at the primary side of the transformer, the load actually consumes power caused by voltage and current used at the primary side. Therefore, when the resonance shown in the equivalent circuit of FIG. 14 is not used, the primary current I_1 is approximately 818 [mA] and the current I_0, flown in the primary side in parallel resonance shown in FIG. 15, is approximately 129.8 [mA]. Since the circuit inputs the same 220 [V], it can reduce power, provided to the load in parallel resonance, smaller approximately 6.3 times than that, provided to the load not in resonance. That is, the circuit can reduce the consumption power in parallel resonance by Q_P times, compared to not in resonance.

Industrial Applicability

[115] As described above, the circuit according to the present invention can transfer amplified power to a load, compared to the conventional circuit where the electric-power is simply transferred to the load using an electric generator and a transformer. To this end, the circuit of the present invention is configured in such a way that: resonance (serial or parallel resonance) is formed at the side of the power supply; and the transformer circuit, used for transferring power to the load, is designed such that its reflective impedance can beset within a value to maintain the resonance. Therefore, the amplified resonant power is transferred to the load. That is, the circuit according to the present invention does not transfer the power, produced by an electric generator as a main power source, to the load, but transfers the amplified resonant power to the load.

[116] In the circuit according to the present invention, the power supply (an electric generator, etc.) is regarded as an auxiliary circuit to produce resonant power. Power to be substantially transferred to a load is amplified by a parallel or serial resonant circuit, thereby providing the amplified resonant power to the load, compared to the conventional circuit where power produced by an electric generator is directly provided to the load. Therefore, the circuit of the present invention can reduce the consumption power of the load, from view of a load.

[117] The present invention is operated to transfer resonant power to a load through a transformer, and may be analyzed as serial or parallel resonant circuit. Therefore, the present invention can be usefully applied to industrial power applications while satisfying energy conservation laws.

[118] Although the preferred embodiments of the present invention have been disclosed

for illustrative purposes, those skilled in the art will appreciate that various modifications, additions and substitutions are possible, without departing from the scope and spirit of the invention as disclosed in the accompanying claims.

Claims

[1] A circuit for transferring amplified resonant power to a load, comprising:
a power supply for producing and supplying voltage or current;
a power amplifier for generating amplified resonant power using the voltage or current; and
a power transferring unit for transferring the amplified resonant power to the load using a transformer.

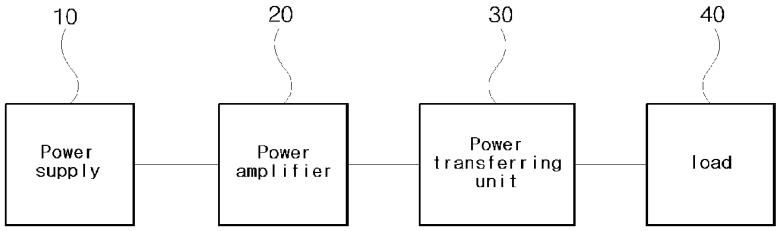
[2] The circuit according to claim 1, wherein the power supply is one of AC voltage source, AC current source, DC voltage source, and DC current source.

[3] The circuit according to claim 1, wherein the power amplifier includes:
a primary inductor of the transformer; and
a capacitor connected to the primary inductor in serial or in parallel,
wherein the amplified resonant power is stored in the primary inductor.

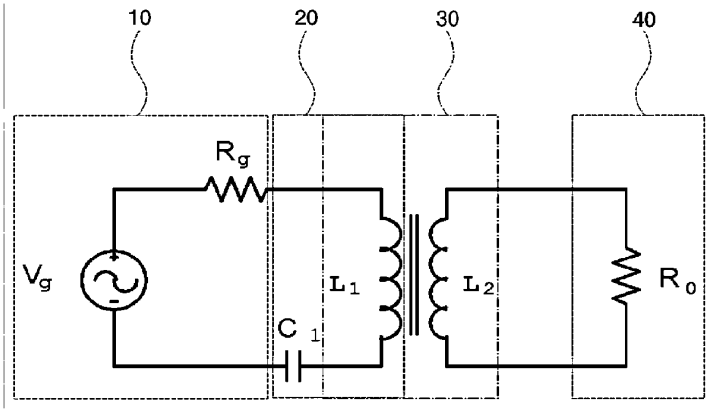
[4] The circuit according to claim 1, wherein reflective impedance at the primary side of the transformer has a relatively small value such that the power amplifier can maintain resonance,
wherein reflective resistance (R_{21})of the reflective impedance (Z_{21}) is less than equivalent inductive reactance (XL_1) of the primary side of the transformer transferring the resonant power, and reflective reactance (X_{21}) is less that 0.5 of the equivalent inductive reactance (XL_1) of the primary side of the transformer.

[5] The circuit according to claim 1, wherein the circuit amplifies power by using parallel resonance, and transfers the amplified resonant power to the load, such that consumption power of the load can be reduced.

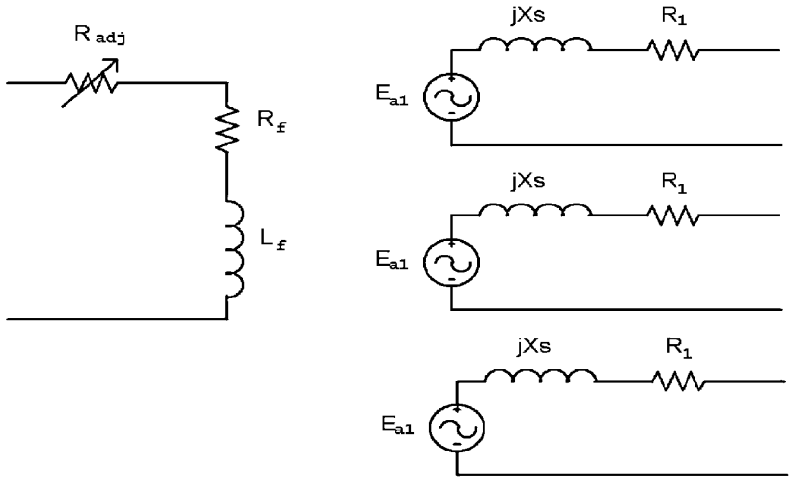
[Fig. 1]



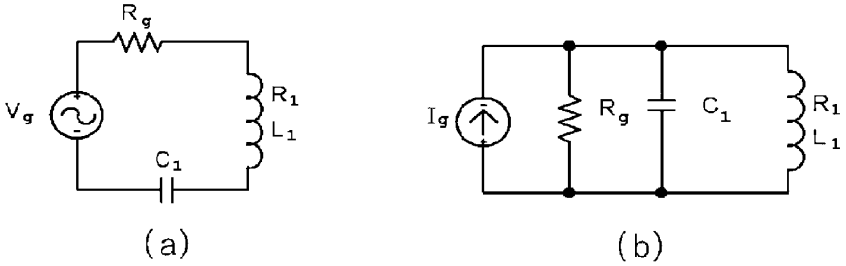
[Fig. 2]



[Fig. 3]

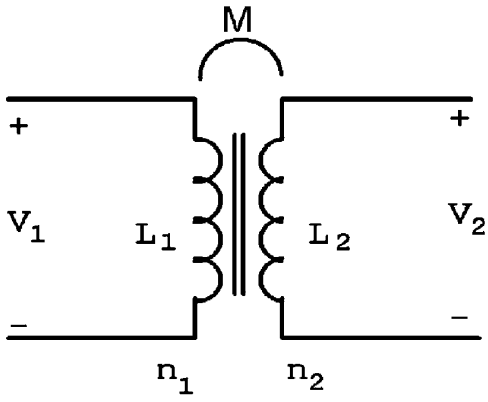


[Fig. 4]

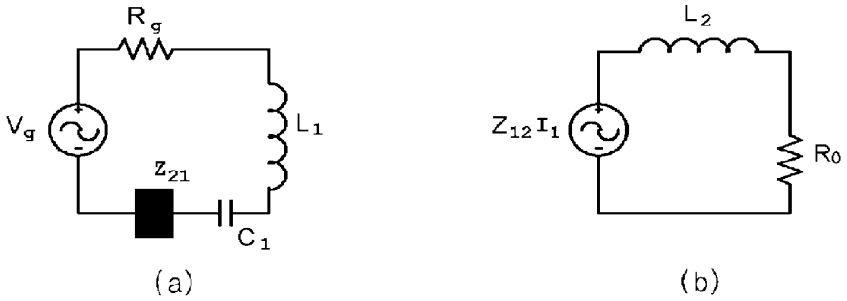


InductEV, Inc.
Exhibit 1031
Page 1358

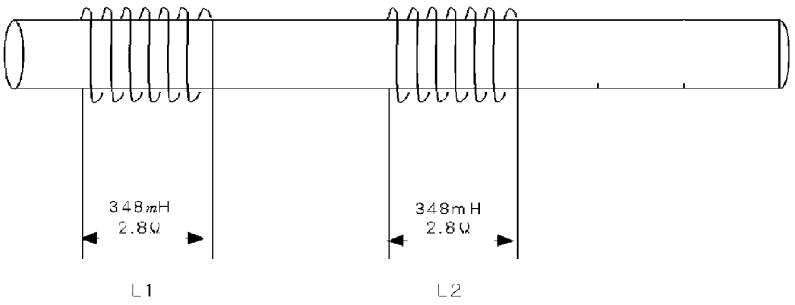
[Fig. 5]



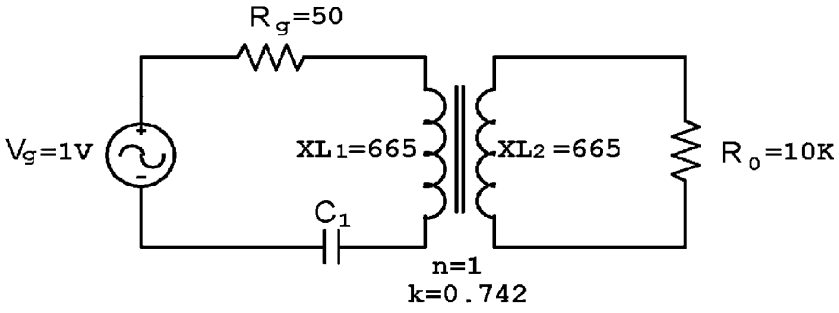
[Fig. 6]



[Fig. 7]

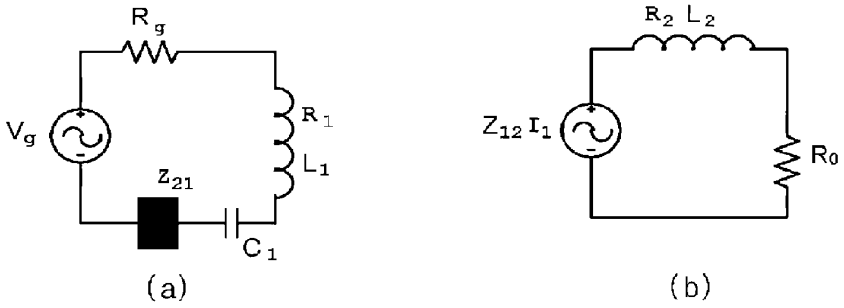


[Fig. 8]

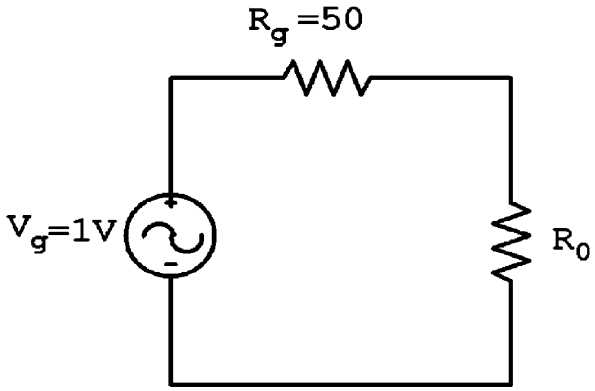


InductEV, Inc.
Exhibit 1031
Page 1359

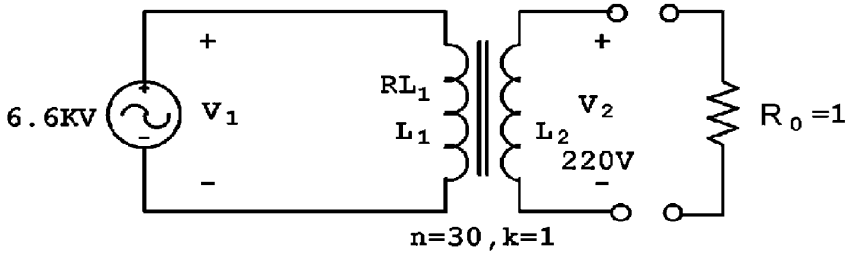
[Fig. 9]



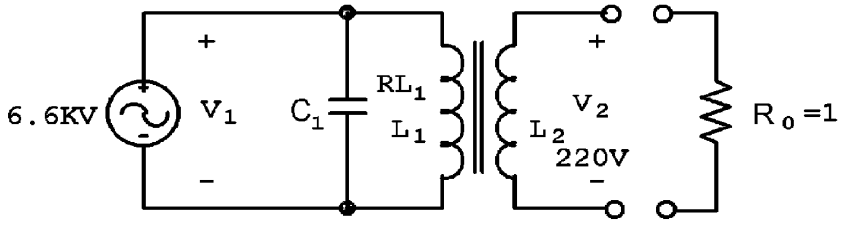
[Fig. 10]



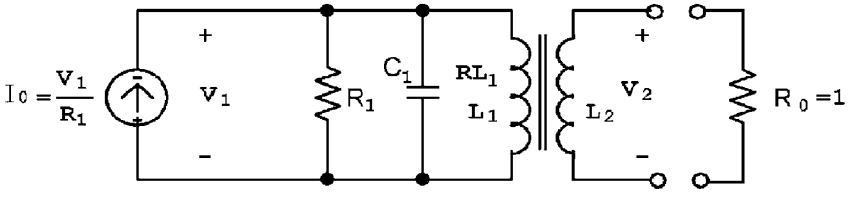
[Fig. 11]



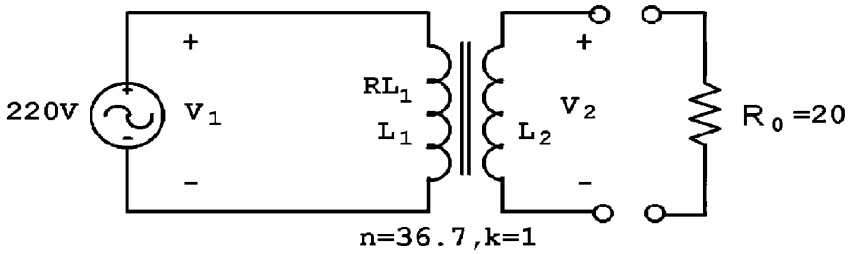
[Fig. 12]



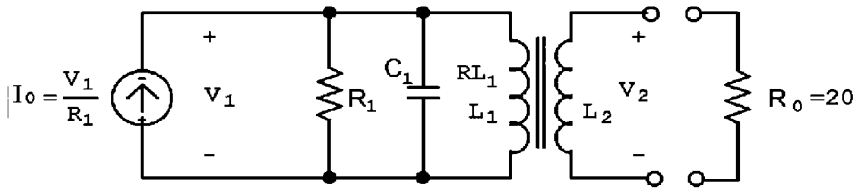
[Fig. 13]



[Fig. 14]


220V
V1
+
-
RL1
L1
L2
V2
+
-
R0=20
n=36.7,k=1

[Fig. 15]


I0 = V1/R1
V1
+
-
R1
C1
RL1
L1
L2
V2
+
-
R0=20

INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR2006/005801

A. CLASSIFICATION OF SUBJECT MATTER

H02J 3/38(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC8 : H02J 3/38

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean Utility models and applications for Utility Models since 1975
Japanese Utility models and applications for Utility Models since 1975

Electronic data base consulted during the intertnational search (name of data base and, where practicable, search terms used)

eKIPASS (KIPO internal) "circuit", "amplif*", "resonant"

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	JP 13-218456 A (DENSEI LAMBDA K.K.) 10 August 2001 See claims 1 - 6, See figure 1.	1-5
A	US 05646835 A (KATCHA, JASON STUART) 08 July 1997 See abstract, See figure 1.	1-5

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents,such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
09 APRIL 2007 (09.04.2007)	**09 APRIL 2007 (09.04.2007)**
Name and mailing address of the ISA/KR Korean Intellectual Property Office 920 Dunsan-dong, Seo-gu, Daejeon 302-701, Republic of Korea Facsimile No. 82-42-472-7140	Authorized officer JEONG, So Yeon Telephone No. 82-42-481-5656

Form PCT/ISA/210 (second sheet) (April 2007)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.
PCT/KR2006/005801

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
JP 13-218456 A	10.08.01	DE 60109504 C0	28.04.05
		DE 60109504 T2	16.03.06
		EP 01120896 A2	01.08.01
		EP 01120896 A3	23.01.02
		EP 01120896 B1	23.03.05
		EP 1120896 A2	01.08.01
		EP 1120896 A3	23.01.02
		EP 1120896 B1	23.03.05
		EP 1120896 A2	01.08.01
		JP 13218456	10.08.01
		JP 2001218456 A2	10.08.01
		US 06483721	19.11.02
		US 20010021114 A1	13.09.01
		US 2001021114 AA	13.09.01
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US 05646835 A	08.07.97	DE 19645740 A1	22.05.97
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		JP 3745848 B2	15.02.06
		JP 9224373 A2	26.08.97
		US 5646835 A	08.07.97

InductEV, Inc.
Exhibit 1031
Page 1363

Espacenet

Bibliographic data: DE3043441 (A1) — 1982-06-03

Power transfer system - has transformer allowing position data update inside SOS buoy on board ship

Inventor(s): GOEBEL WALTER DIPL PHYS DR [DE] ± (GOEBEL,WALTER,DIPL.-PHYS.DR)

Applicant(s): DEUTSCHE FORSCH LUFT RAUMFAHRT [DE] ± (DEUTSCHE FORSCHUNGS- UND VERSUCHSANSTALT FUER LUFT- UND RAUMFAHRT E.V)

Classification: **- international:** ***B63C9/22; H01F38/14;*** (IPC1-7): H02J17/00
- cooperative: **B63C9/22**; **H01F38/14**

Application number: DE19803043441 19801118

Priority number (s): DE19803043441 19801118

Abstract of DE3043441 (A1)

The system has a transformer whose two windings have a rectangular shape and different lengths. They are curved around imaginary cylindrical surfaces concentric with one another and one inside the other such that practically no change occurs in the transfer characteristics of the transformer when the windings rotate about the axis of the imaginary cylinders. The parameters (e.g. winding resistance, inductance etc.,) are related by a specified equation. The buoy is mounted on a ship and the transformer is used to transfer signals updating the position data of the ship stored in the buoy. (This data is transmitted automatically when the buoy is thrown overboard).

InductEV, Inc.
Exhibit 1031
Page 1364

(19) BUNDESREPUBLIK DEUTSCHLAND

DEUTSCHES PATENTAMT

(12) **Offenlegungsschrift**

(11) **DE 3043441 A1**

(51) Int. Cl. 3: H02J 17/00

(21) Aktenzeichen: P 30 43 441.4-32

(22) Anmeldetag: 18. 11. 80

(43) Offenlegungstag: 3. 6. 82

Behördeneigentum

(71) Anmelder:

Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt e.V., 5000 Köln, DE

(72) Erfinder:

Goebel, Walter, Dipl.-Phys. Dr., 8000 München, DE

Prüfungsantrag gem. § 44 PatG ist gestellt

(54) **Einrichtung zur drahtlosen Energieübertragung**

DE 3043441 A1

DE 3043441 A1

BUNDESDRUCKEREI BERLIN 04. 82 230 022/408 5/60

InductEV, Inc.
Exhibit 1031
Page 1365

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PATENTANWALT

DIPL.-PHYS. F. ENDLICH, POSTFACH, D-8034 GERMERING

GERMERING 6. Nov. 1980 E/m

3043441

TELEFON: MÜNCHEN 84 36 38
PHONE:

TELEGRAMMADRESSE: PATENDLICH MÜNCHEN
CABLE ADDRESS:

TELEX: 52 1730 pate d

Meine Akte: D-4813

Anmelderin: Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt e.V., Köln

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Patentansprüche

---

1. Einrichtung zur drahtlosen Energieübertragung mittels eines Lufttransformators, insbesondere für eine Seenotboje, d a d u r c h g e k e n n z e i c h n e t, daß die beiden Spulen eine rechteckige Form und eine unterschiedliche Länge aufweisen, und daß sie zylindrisch gekrümmt und konzentrisch derart ineinander angeordnet sind, daß durch eine Drehung der Spulen um die Zylinderachse praktisch keine Änderung der Übertragungseigenschaften verursachbar ist.

2. Einrichtung zur drahtlosen Energieübertragung nach Anspruch 1, d a d u r c h g e k e n n z e i c h n e t, daß die beiden Spulen in einer Serienresonanzschaltung vorgesehen sind, deren Schaltungsparameter derart ausgewählt sind, daß

$$R_{opt(\eta)} \approx \sqrt{\frac{r_2}{r_1}\omega^2 M^2 + r_2^2} \qquad R_{opt(N)} \approx r_2 + \frac{\omega^2 M^2}{r_1},$$

wobei R_{opt} = optimaler Lastwiderstand (Näherungslösung)
ω = $2\pi f$ = Kreisfrequenz
M = Gegeninduktivität
r_1 = ohmscher Verlustwiderstand der Primärspule
r_2 = ohmscher Verlustwiderstand der Sekundärspule
darstellt.

3. Einrichtung zur drahtlosen Energieübertragung nach Anspruch 2, d a d u r c h g e k e n n z e i c h n e t, daß zur Optimierung von Wirkungsgrad (η) und übertragener Leistung (N) zwischen den beiden Werten $R_{opt(\eta)}$ und $R_{opt(N)}$ gewählt ist.

ORIGINAL INSPECTED

InductEV, Inc.
Exhibit 1031
Page 1366

DIPL.-PHYS. F. ENDLICH
PATENTANWALT

DIPL.-PHYS. F. ENDLICH, POSTFACH, D-8034 GERMERING

3043441

GERMERING 6. Nov. 1980 E/m

TELEFON: PHONE: MÜNCHEN 84 36 38

TELEGRAMMADRESSE: CABLE ADDRESS: PATENDLICH MÜNCHEN

TELEX: 52 1730 pate d

Meine Akte: D-4813

-2-

Anmelderin: Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt e.V., Köln

Einrichtung zur drahtlosen Energieübertragung

Die Erfindung betrifft eine Einrichtung zur drahtlosen Energieübertragung mittels eines Lufttransformators, insbesondere für eine Seenotboje.

Beim Betrieb einer Seenotboje auf Schiffen, die sich beim Eintauchen ins Wasser selbständig einschaltet und über einen Satelliten die Seenotbotschaft abstrahlt, ist es wichtig, daß der Boje beim Lösen aus der Halterung keinerlei Widerstand entgegenwirkt. Einer Kabelverbindung, selbst wenn sie mit einer Sollbruchstelle versehen ist, ist deshalb eine drahtlose Verbindung vorzuziehen. Eine Verbindung ist notwending, um in regelmäßigen Zeitabständen die in der Boje gespeicherten Positionsdaten vom Schiff her zu erneuern und die bei dem Betrieb des Datenspeichers notwendige Stromversorgung sicherzustellen, welche die dabei verbrauchte Energie ersetzt. Darüberhinaus sollte die Energieübertragung auch ermöglichen, die gesamte Stromversorgung in der Boje einschließlich Senderteil, wenn sie aus wiederaufladbaren Zellen besteht, auf vollem Ladezustand zu halten. Im Falle einer Bestückung mit Nickel-Cadmium-Zellen vom Typ "D" (Monozelle) ist ein Dauerladestrom von ca. 0,1A erforderlich. Die notwendige Ladespannung ist von der Zahl der Zellen abhängig. Für die Speicherelektronik allein sind 10V ausreichend, für den Senderbetrieb 30 V.

InductEV, Inc.
Exhibit 1031
Page 1367

Es ist deshalb Aufgabe der Erfindung, eine Einrichtung zur drahtlosen Energieübertragung mittels eines Lufttransformators anzugeben, die insbesondere in Verbindung mit einer Seenotboje verwendbar ist, welche trotz des geringen Kopplungsfaktors der Luftspulen eine möglichst große Leistungsübertragung bei möglichst großem Wirkungsgrad ermöglicht. Diese Aufgabe wird erfindungsgemäß durch den Gegenstand des Patentanspruchs 1 gelöst.

Zur Erzielung optimaler Verhältnisse findet vorzugsweise die Dimensionierungsvorschrift entsprechend Patentanspruch 2 Verwendung.

Anhand der Zeichnung soll die Erfindung beispielsweise näher erläutert werden. Es zeigen:

Fig. 1a eine Seitenansicht und Fig. 1b eine Schnittansicht durch eine Seenotboje und deren Halterung mit einer Einrichtung gemäß der Erfindung;

Fig. 2 Ausführungsbeispiele der beiden Spulen des Lufttransformators in Fig. 1; und

Fig. 3 ein Ersatzschaltbild des Lufttransformators in Fig. 1.

Bei dem in Fig. 1 dargestellten Ausführungsbeispiel ist eine Boje B vorgesehen, die in einer Bojenhalterung H angeordnet ist. Die Bojenhalterung H ist mit einer zu einem Schiff führenden Versorgungsleitung verbunden.

Fig. 2 zeigt eine in die Ebene ausgerollte Spule 1 mit einer rechteckigen Form sowie eine ebenfalls in die Ebene ausgerollte Splule 2 mit einer rechteckigen Form, deren Länge größer als diejenige der Spule 1 ist. Die Spule 2 ist entlang dem kugelförmigen Teil der Boje B angeordnet, und die Spule 1 entsprechend zylindrisch gekrümmt und konzentrisch dazu in der Bojenhalterung H. Beispielsweise kann die Spule 2 in die Boje B eingeschäumt sein und die Spule 1 kann in einer kleinen Vertiefung der Bojenhalterung H einlameniert sein.

Wie aus Fig. 1 ersichtlich ist, umschließt die Spule 2 die Boje entlang einer Kreislinie, während die Spule 1 entsprechend der Ausbildung der Bojenhalterung H nur entlang einem Halbkreis angeordnet ist. Die für die Kopplung maßgebende Fläche ist also diejenige der Spule 1, und eine an sich beliebige Drehung der Spulen um die Zylinderachse senkrecht zu der Zeichenebene in Fig. 1b verursacht deshalb praktisch keine Änderung der Übertragungseigen-

InductEV, Inc.
Exhibit 1031
Page 1368

schaften. Sollten zufällig die beiden Enden der Spule 2 über die Spule 1 zu liegen kommen, wird auch dadurch nahezu nichts an der Übertragungsleistung geändert, weil die Richtung der Induktionsspannung in beiden Spulenteilen übereinstimmt.

Fig. 3 zeigt ein Ersatzschaltbild des Lufttransformators, wobei die beiden Spulen L_1 und L_2 in einer Serienresonanzschaltung vorgesehen sind. Diese Ersatzschaltung läßt sich nach bekannten Methoden formelmäßig darstellen. Der Erfindung liegt die Erkenntnis zugrunde, daß ausgehend von diesen Formeln eine Optimierungsbeziehung zwischen dem vom Verwendungszweck her zu fordernden Lastwiderstand/und den Schaltungsparametern herleitbar ist, welche bei einem Verzicht auf eine umfangreiche streng mathematische Lösung zu einfachen, für die Anwendung praktikablen Näherungslösungen führt. Die Schaltungsparameter können sowohl im Hinblick auf einen maximalen Wirkungsgrad η, als auch auf eine maximal zu übertragende Leistung N optimiert und als Dimensionierungsvorschrift angegeben werden.

Diese Vorschriften lauten:

$$R_{opt(\eta)} \approx \sqrt{\frac{r_2}{r_1}\omega^2 M^2 + r_2^2} \qquad R_{opt(N)} \approx r_2 + \frac{\omega^2 M^2}{r_1}$$

wobei M = Gegeninduktivität
$\omega = 2\pi f$ = Kreisfrequenz
r_1 = Ohmscher Verlustwiderstand Primärspule
r_2 = Ohmscher Verlustwiderstand Sekundärspule .

Die Dimensionierung der Kapazitäten ergibt sich in bekannter Weise aus der Resonanzbedingung.

Nachdem die Bauelemente nach obiger Beziehung ausgewählt und deren Charakteristika vermessen sind, lassen sich sowohl Wirkungsgrad, als auch übertragene Leistung wie folgt errechnen:

$$\eta = \frac{1}{1 + \frac{r_2}{R} + \frac{r_1}{R}\left(\frac{R + r_2}{\omega M}\right)^2} \qquad N = \left(\frac{U_1 \omega M}{r_1 (R + r_2) + \omega^2 M^2}\right)^2 R$$

Die interessierenden Ströme und Spannungen errechnen sich für die betracntete Näherung ($R < 10\omega L_2$) und nach Herstellung von Resonanz in beiden Kreisen:

InductEV, Inc.
Exhibit 1031
Page 1369

$$J_1 = \frac{U_1}{r_1 + \frac{\omega^2 M^2}{R + r_2}}$$

$$J_2 = -j \frac{U_1 \omega M}{r_1 (R + r_2) + \omega^2 M^2}$$

$$U_2 = -j \frac{U_1 \omega M}{\left(r_1 + \frac{\omega^2 M^2}{R + r_2}\right)\left(1 + \frac{r_2}{R}\right)}$$

Dabei ist U_1 die an den Primärkreis angelegte Spannung.

Der an sich wünschenswerten Erhöhung der Frequenz sind im allgemeinen zwei Grenzen gesetzt: Die eine ist technisch begründet und fordert einen genügenden Abstand von der Spulen-Eigenresonanz. Die andere ist postalisch begründet: Ab 10 kHz beginnt die Genehmigungspflicht und gerade auf Schiffen könnte eine Störfrequenz den Funk- und Navigationsempfang behindern (z.B. OMEGA-Verfahren bei 10 kHz).

Daher wurde als Beispiel für folgenden Versuchsaufbau (Fig. 2) die Frequenz 9 kHz gewählt und folgende Parameter gemessen:

Spule 1: 50 Windungen mit 0,5 mm Cu, Abmessungen 15 x 70 cm
Spule 2: 85 Windungen mit 0,4 mm Cu, Abmessungen 15 x 175 cm

$r_1 = 7{,}7$	$L_1 = 3{,}3$ mH	$C_1 = 95$ nF
$r_2 = 45{,}4$	$L_2 = 19{,}6$ mH	$C_2 = 16$ nF
Spulenabstand ca. 2,5 cm;	$K = 0{,}2$	$M = K\sqrt{L_1 L_2} = 1{,}6$ mH

Die rechnerischen Ergebnisse sind in Tabelle 1 zusammengefaßt. Sie konnten im Versuchsaufbau für die Gegeninduktivität K = 0,2 meßtechnisch bestätigt werden.

InductEV, Inc.
Exhibit 1031
Page 1370

Tabelle 1

Ausrechnung von Leistungsdaten für drei verschiedene Werte des Kopplungsfaktors
(f = 9000 Hz, U_1 = 10V; Versuchsaufbau wie beschrieben)

	K = 0.1		K = 0.2		K = 0.3		
M	0.80		1.60		2.41		mH
ωM	45.2		90.5		136.3		Ω
$R_{opt(\eta)}$		118		224		334	Ω
$R_{opt(N)}$	311		1109		2458		Ω
I_1	744	494	676	262	661	176	mA
I_2	94	137	53	88	36	63	mA
U_2	29.4	16.1	58.8	19.7	88.5	21.2	V
η	37.2	44.7	46.1	66.3	48.2	76.1	%
N	2.77	2.21	3.11	1.74	3.19	1.34	W

Liegt das Interesse sowohl am Wirkungsgrad als auch an der übertragenen Leistung, können für R auch beliebige Werte zwischen den beiden genannten Optimierungswerten gewählt werden.

Das gesteckte Ziel der Zellennachladung, z.B. 100 mA/45 Volt (R=450Ω) konnte mit U_1 = 13 Volt bei einem Wirkungsgrad von 62% erreicht werden, trotz des verhältnismäßig geringen Kopplungsgrads von 0,2.

InductEV, Inc.
Exhibit 1031
Page 1371

Leerseite

Nummer: 3043441
Int. Cl.³: H02J 17/00
Anmeldetag: 18. November 1980
Offenlegungstag: 3. Juni 1982

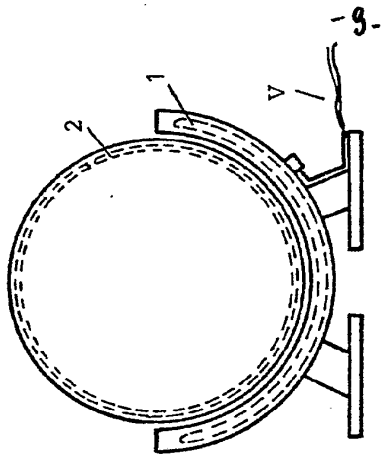


FIG. 1b

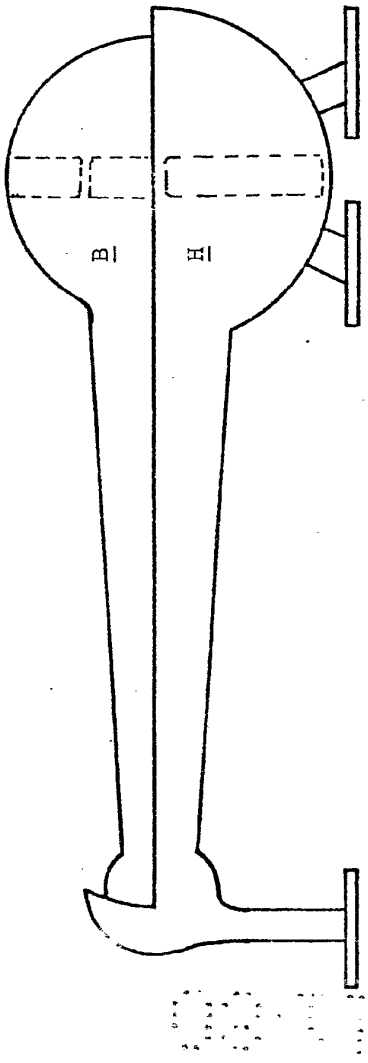
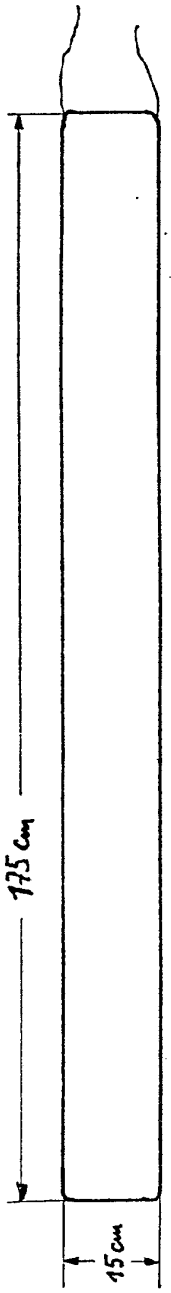


FIG. 1a



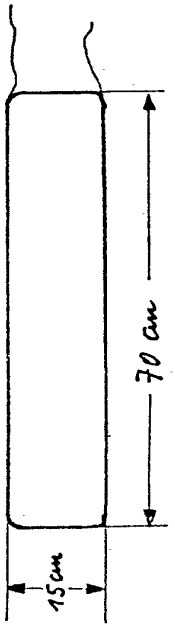


FIG. 2

D-4813

InductEV, Inc.
Exhibit 1031
Page 1373

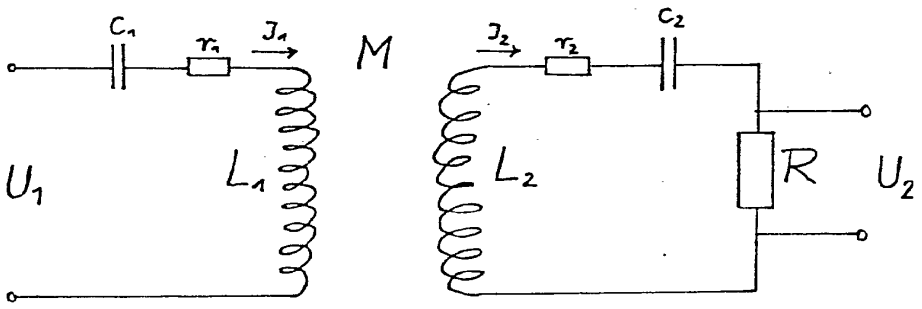


FIG. 3

InductEV, Inc.
Exhibit 1031
Page 1374

Espacenet

Bibliographic data: DE3043441 (A1) — 1982-06-03

Power transfer system - has transformer allowing position data update inside SOS buoy on board ship

Inventor(s): GOEBEL WALTER DIPL PHYS DR [DE] ± (GOEBEL,WALTER,DIPL.-PHYS.DR)

Applicant(s): DEUTSCHE FORSCH LUFT RAUMFAHRT [DE] ± (DEUTSCHE FORSCHUNGS- UND VERSUCHSANSTALT FUER LUFT- UND RAUMFAHRT E.V)

Classification: **- international:** ***B63C9/22; H01F38/14;*** (IPC1-7): H02J17/00
- cooperative: **B63C9/22**; **H01F38/14**

Application number: DE19803043441 19801118

Priority number (s): DE19803043441 19801118

Abstract of DE3043441 (A1)

The system has a transformer whose two windings have a rectangular shape and different lengths. They are curved around imaginary cylindrical surfaces concentric with one another and one inside the other such that practically no change occurs in the transfer characteristics of the transformer when the windings rotate about the axis of the imaginary cylinders. The parameters (e.g. winding resistance, inductance etc.,) are related by a specified equation. The buoy is mounted on a ship and the transformer is used to transfer signals updating the position data of the ship stored in the buoy. (This data is transmitted automatically when the buoy is thrown overboard).

InductEV, Inc.
Exhibit 1031
Page 1375

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CLAIMS DE3043441

Claims <RTI> Einrichtuny </ RTI> for wireless energy transfer by means of a Air transformer, in particular for a Seenotboje, d a d u r c h g e k e n n z e i c h n e t that the two Spu len have a rectangular shape and a different length, and that they are arranged cylindrically curved and concentric the art into each other that by a rotation of Coils around the cylinder axis does not change the <RTI> About practically - </ RTI> transmission properties is verursachbar.

2.

2. means for wireless transfer of energy according to claim 1, d a d u r c h g e k e n n z e i c h n e t, that the two Coils are provided in a series resonant circuit whose Circuit parameters are selected such that <Img class = "EMIRef" id = "022204709-00010001" />

wherein Ropt = optimum load resistance (approximation solution) # = 2 # f = angular frequency M = mutual inductance r1 = ohmic resistance of the primary coil loss is r2 = ohmic loss resistance of the secondary coil.

3. means for wireless nnergieübertragung according to claim 2, dadurchgekennzeichnet that for optimizing (#) tion of efficiency and transmitted power (R) between the two values Ropt (#) unc Ropt selected it. </ RTI>

InductEV, Inc.
Exhibit 1031
Page 1376

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DESCRIPTION DE3043441

Means for wireless transfer of energy

The invention relates to a device for wireless energy transfer means of an air transformer, in particular for a Seenotboj e. </ RTI>

When operating a Seenotboje on ships into the water independently switches on when immersed and emits the distress message via a satellite, it is important that the buoy when releasing from the holder opposes no resistance.

A cable connection, even if it is provided with a predetermined breaking point is, therefore, preferable a wireless connection.

A connection is notwending to renew at regular time intervals stored in the buoy position data from the ship here and ensure the necessary in the operation of the data memory power supply, which replaces the energy consumed. Moreover, the energy transfer should also allow to keep all power in the buoy including transmitter part, if it consists of rechargeable cells at full charge. In case of fitting with nickel-cadmium cells of type "D" (D-cell) is a continuous charging current of about 0.1A required. The required charging voltage is dependent on the number of cells. For the storage electronics alone are 10V sufficient for the transmitter operation 30 V.

It is therefore an object of the invention to provide a means for wireless transfer of energy by means of an air transformer which is particularly useful in conjunction with a Seenotboje which allows the greatest possible power transmission in the greatest possible efficiency despite the low coupling factor of air coil , This is on display in the present invention solved by the subject of claim 1.

For optimum conditions preferably takes the dimensioning rule according to claim 2 use.

Reference to the drawing, the invention will be described in greater detail, for example. FIG. <RTI> Ia </ RTI> is a side view and FIG. <RTI> ib </ RTI> is a sectional view through a Seenotboje and its holder with a device according to the invention; Fig. 2 embodiments of the two coils of the trans- former Lufttransfor in Fig. 1; and Fig. 3 is an equivalent circuit diagram of the air transformer in FIG. 1.

In the embodiment shown in FIG. 1, a buoy B is provided, which is arranged in a holder H buoys. The buoy bracket H connected to a moving ship to a supply line.

Fig. 2 shows a rolled-out in the plane coil 1 having a rectangular shape as well as an also unrolled into the plane Spiule 2 having a rectangular shape whose length is greater than that of the coil 1. The coil 2 is disposed along the spherical part of the buoy B and the coil 1 correspondingly curved cylindrically and concentrically thereto in the buoys holder H. For example, the coil may be two foamed into the buoy B and the coil 1 can in a small recess of the buoys support H a <RTI> lameniert </ RTI> be.

1 as is seen from Fig., Surrounds the coil 2, the buoy along a circular line, while the coil 1 is arranged according to the design of the buoy fixture H only along a half circle. The for <RTI> Ropp * 1 ng </ RTI> Prevailing surface so that the coil 1, and any per se rotation of the coil around the cylinder axis perpendicular to the plane in Fig. <RTI> ib </ RTI> therefore causes <RTI> pr '~ ish </ RTI> properties Keire change in transmission own. If by chance the two ends of the coil 2 come to lie on the coil 1, almost nothing is further changed at the transmission power, because the direction of the induction voltage matches in both coil parts.

InductEV, Inc.
Exhibit 1031
Page 1377

Fig. 3 shows an equivalent circuit of the air transformer, with the two coils L1 and L2 are provided in a series resonant circuit. This equivalent circuit can be represented formula moderately by known methods. The invention is based on the realization that the basis of these formulas to optimize relationship between the intended use even for demanding load <RTI> R resistance / and the circuit parameters derivable, which is </ RTI> a waiver of an extensive strictly mathematical solution to simple leads for use practical approximate solutions. The circuit parameters can also be optimized to a maximum power to be transmitted and reported as N dimensioning specification both in terms of a maximum <RTI> efficiency, as </ RTI>.

These rules are: <Img class = "EMIRef" id = "022204708-00040001" />

where M = mutual inductance z = 2q = = angular frequency r1 = ohmic loss resistance primary coil r2 = ohmic loss resistance secondary coil The dimensioning of capacity results in a known manner from the resonance condition.

After the Components selected according to the above relationship and their characteristics are measured, both efficiency and power transmitted as follows can be calculated: <Img class = "EMIRef" id = "022204708-00040002" />

The interest currents and voltages are calculated for betracntete approximation (R <1OGiL2) and by producing resonance in two circles: <Img class = "EMIRef" id = "022204708-00050001" />

Here U1 is the voltage applied to the primary circuit voltage.

The desirable in itself increase the frequency are in al1ge - my set two limits: one is justified on technical grounds and calls for a sufficient distance from the coil self-resonance. The other is post justified: From 10 kHz, the licenses and just ship starts could be an interference frequency the radio and navigation reception hinder (z. B. OMEGA process at 10 kHz).

(Fig. 2) Therefore, it was chosen as an example for the following <RTI> VersuchsaufbauZdie </ RTI> frequency 9 kHz and measured the following parameters: Coil 1: 50 turns of 0.5 mm Cu, dimensions 15 x 70 cm Coil 2: 65 turns of 0.4 mm Cu, dimensions 15 x 175 cm r1 = <RTI> 77 </ RTI> L1 = 3.3 mH C1 <RTI> 9 </ RTI> nF r2 = 45.4 L2 = 19.6 mH C2 = 16 nF coil spacing about 2.5 cm; K <RTI> - </ RTI> 0.2 M = <Img class = "EMIRef" id = "022204708-00050002" />

= 1.6 mH, the computational results are summarized in Table 1 below. They could be metrologically confirmed the experimental setup for the mutual inductance K = 0.2.

Table 1 For calculation of performance for three different values of the coupling factor (f = 9000 Hz, U1 = 10V; experimental setup as described) <Img class = "EMIRef" id = "022204708-00060001" />

<Tb> K = 0.1 K = 0.2 K = 0.3 <Tb> M 0.80 1.60 2:41 <RTI> inH </ RTI> <Tb> <RTI> 45.2 </ RTI> 90.5 136.3 <Tb> <RTI> Ropt (#) </ RTI> 118 224 334 <Tb> <RTI> Ropt (N) </ RTI> 331 1109 2458 <RTI> 1 </ RTI> <Tb> <RTI> Ii </ RTI> <RTI> I44 </ RTI> 494 676 262 661 176 mA <Tb> <RTI> I2 </ RTI> 94 137 53 88 36 63 mA <Tb> U2 29.4 16.1 58.8 19.7 88.5 21.2 V <Tb> <RTI> 37.2 </ RTI> 44.7 46.1 66.3 46.2 76.1 <Tb> N 2.77 21.2 11.3 1.74 19.3 1:34 W <Tb> If the interest both on efficiency and on the transmitted power, and any value between these two optimization values can be selected for R.

The stated goal of the Zellennachladung, z. B. 100 mA / 45 V <RTI> (R = 450 #) </ RTI> could be reached with U1 = 13 V at an efficiency of 62%, despite the relatively low degree of coupling of 0.2.

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InductEV, Inc.
Exhibit 1031
Page 1378

Electronic Patent Application Fee Transmittal

Application Number:	13789860
Filing Date:	08-Mar-2013
Title of Invention:	WIRELESS ENERGY TRANSFER
First Named Inventor/Applicant Name:	Aristeidis Karalis
Filer:	Marc M. Wefers/Cheryl Forrest
Attorney Docket Number:	01997-0358008

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Claims in Excess of 20	1202	3	80	240
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Extension - 2 months with $0 paid	1252	1	600	600
Miscellaneous:				
Request for Continued Examination	1801	1	1200	1200
Statutory or Terminal Disclaimer	1814	2	160	320
		Total in USD ($)		**2360**

Electronic Acknowledgement Receipt

EFS ID:	25500155
Application Number:	13789860
International Application Number:	
Confirmation Number:	4131
Title of Invention:	WIRELESS ENERGY TRANSFER
First Named Inventor/Applicant Name:	Aristeidis Karalis
Customer Number:	26161
Filer:	Marc M. Wefers/Cheryl Forrest
Filer Authorized By:	Marc M. Wefers
Attorney Docket Number:	01997-0358008
Receipt Date:	15-APR-2016
Filing Date:	08-MAR-2013
Time Stamp:	09:43:43
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$2360
RAM confirmation Number	7863
Deposit Account	061050
Authorized User	FISH & RICHARDSON P C
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		ReplytoFinalOA.pdf	149480 27309eae0ed99ab08343bc8b99603c2976bf489c	yes	13

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Response After Final Action	1	1
	Claims	2	5
	Applicant Arguments/Remarks Made in an Amendment	6	13

Warnings:

Information:

2	Request for Continued Examination (RCE)	RCE.pdf	109226 68632ab59bbf926f2ed51d2b6ceab4d7592d1383	no	1

Warnings:

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Information:

3	Terminal Disclaimer Filed	TermDisc1.pdf	83868 05c99d10bdeb359ece2cf84876f321b9d2146e95	no	1

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4	Terminal Disclaimer Filed	TermDisc2.pdf	84508 f6d227cfc29a3f8dbcc92787b840e67df8c42106	no	1

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5		IDS.pdf	143576 96bf2b203e015067ed10bf20fc3264dfed8a9b5e	yes	2

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**

	Transmittal Letter		1	1	
	Information Disclosure Statement (IDS) Form (SB08)		2	2	
Warnings:					
Information:					
6	Foreign Reference	FA1.pdf	937026 4bcd6dcb075d29de332d9be0e030e48af920dd44	no	22
Warnings:					
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7	Foreign Reference	FA2.pdf	377053 07dac4d3ae940200dc85971efc9a19f2031c94e0	no	11
Warnings:					
Information:					
8	Foreign Reference	FA3.pdf	253994 e9fb2b5cd2c75b613a697ec3a9a5fb094ae198cc	no	4
Warnings:					
Information:					
9	Non Patent Literature	NPL1.pdf	158117 eb89eb6e64b83dc853998303e2e78baa9128a3b6	no	13
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Information:					
10	Non Patent Literature	NPL2.pdf	1254192 d04688fa52a966ceacaf96de21d54cfb0358a521	no	31
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Information:					
11	Non Patent Literature	NPL3.pdf	672993 cab9322a1675485f962cd238187237370517741a5	no	17
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12	Non Patent Literature	NPL4.pdf	864596 2013e33d5fd7e0206cfda84fcfe6dcb46abdf624	no	8
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13	Non Patent Literature	NPL5.pdf	721333 eb91cb71b1c1db404bc0ac65e55166e3184c2d16	no	7

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14	Non Patent Literature	NPL6.pdf	1551336 05fc1baab06ab046a30ac79da9ecf002dd677b52	no	14
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15	Non Patent Literature	NPL7.pdf	755020 c07820525e4868630fd2cd6642dcd0a1d2a2fe20	no	3
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Warnings:					
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		Total Files Size (in bytes):	8464237		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

<u>New Applications Under 35 U.S.C. 111</u>
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

<u>National Stage of an International Application under 35 U.S.C. 371</u>
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

<u>New International Application Filed with the USPTO as a Receiving Office</u>
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor	:	Aristeidis Karalis	Art Unit	:	2836
Serial No.	:	13/789,860	Examiner	:	Fritz M. Fleming
Filed	:	March 8, 2013	Conf. No.	:	4131

Title : WIRELESS ENERGY TRANSFER

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Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

REPLY TO ACTION OF NOVEMBER 20, 2015

Please consider the following reply.

List of claims (replacing prior versions).

1. (Currently Amended) A power supply system comprising:

a power supply loop that is configured to be supplied with power from a power supply;

a power supply-side resonance coil that is configured to be supplied with power from the power supply loop in a non-contact manner, wherein the power supply-side resonance coil is part of a source resonator having a resonant frequency ω_1, an intrinsic loss rate Γ_1, and an intrinsic quality factor $Q_1 = \omega_1 / (2\Gamma_1)$;

a power receiving-side resonance coil that is configured to be supplied with power from the power supply-side resonance coil in a non-contact manner, wherein the power receiving-side resonance coil is part of a device resonator having a resonant frequency ω_2, an intrinsic loss rate Γ_2, and an intrinsic quality factor $Q_2 = \omega_2 / (2\Gamma_2)$;

a power receiving loop that is configured to be supplied with power from the power receiving-side resonance coil in a non-contact manner;

wherein the device resonator ~~module~~ is configured to be movable relative to the source resonator ~~module~~ over a range of distances D between the source resonator ~~module~~ and the device resonator ~~module~~, and

wherein the source resonator and the device resonator are configured to resonantly and wirelessly couple electromagnetic power from the source resonator to the device resonator using non-radiative electromagnetic induction having a coupling coefficient κ, ~~and~~ wherein the intrinsic loss rates satisfy $\kappa/\sqrt{\Gamma_1\Gamma_2} > 1$ over the range of distances D, and wherein the coupling coefficient κ can be expressed as $\kappa = \omega M / 2\sqrt{L_s L_d}$, wherein ω is the frequency of the resonant coupling, L_s is the inductance of the power supply-side resonance coil, L_d is the inductance of the power receiving-side resonance coil, and M is the mutual inductance between the power supply-side resonance coil and the power receiving side resonance coil.

2. (Original) The power supply system according to claim 1, wherein the at least one of the distance between the power supply loop and the power supply-side resonance coil and

the distance between the power receiving loop and the power receiving-side resonance coil is adjustable so as to increase a power supply efficiency.

3.-18. (Cancelled)

19. (Previously Presented) The power supply system of claim 1, wherein the power provided to the power receiving loop from the power receiving-side resonance coil defines a work drainage rate Γ_w, and wherein the work drainage rate Γ_w is configured to be set such that $\Gamma_w = \Gamma_2\sqrt{1+wp\cdot\left(\kappa^2/\Gamma_1\cdot\Gamma_2\right)}$ for some value of the coupling coefficient κ in the range of distances D, wherein *wp* is a parameter satisfying $wp > 0$.

20. (Previously Presented) The power supply system of claim 19, wherein the parameter *wp* satisfies $wp \geq 1$.

21. (Previously Presented) The power supply system of claim 20, wherein the parameter *wp* satisfies $1 \leq wp \leq 10$.

22. (Previously Presented) The power supply system of claim 21, wherein the parameter *wp* satisfies $1 < wp \leq 10$.

23. (Previously Presented) The power supply system of claim 19, wherein the parameter *wp* is set to optimize an efficiency of the non-contact power supply of the power supply-side resonance coil by the power receiving-side resonance coil.

24. (Previously Presented) The power supply system of claim 19, wherein the parameter wp is set to decrease energy stored in the device resonator to prevent breakdown of a capacitor material providing a capacitance for the device resonator.

25. (Previously Presented) The power supply system of claim 19, wherein the parameter *wp* is set to decrease energy stored in the device resonator.

26. (Previously Presented) The power supply system of claim 1, further comprising a portable electronic device comprising the power receiving loop, wherein the portable electronic device is a cell phone, a computer, or a robot, wherein $f_1 = \omega_1 / (2\pi)$ and $f_2 = \omega_2 / (2\pi)$, and f_1 and f_2, are between 1 MHz and 10 MHz, and wherein each intrinsic loss rate comprises a resistive component and a radiative component.

27. (Previously Presented) The power supply system of claim 1, wherein $Q_1 > 100$.

28. (Previously Presented) The power supply system of claim 27, wherein the intrinsic quality factors satisfy $\sqrt{Q_1 Q_2} > 100$.

29. (Previously Presented) The power supply system of claim 26, wherein power provided to the load from the device resonator is at least 1 Watt.

30. (Previously Presented) The power supply system of claim 1, further comprising a vehicle comprising the power receiving loop, wherein a load is coupled to the power receiving loop to receive power from the device resonator, wherein the power provided to the load from the device resonator is greater than 10 Watts, and wherein $f_1 = \omega_1 / (2\pi)$ and $f_2 = \omega_2 / (2\pi)$, and f_1 and f_2, are between 10 kHz and 1 MHz.

31. (Previously Presented) The power supply system of claim 30, wherein f_1 and f_2, are between 10 kHz and 100 kHz.

32. (Previously Presented) The power supply system of claim 30, wherein the intrinsic loss rates satisfy $\kappa / \sqrt{\Gamma_1 \Gamma_2} > 5$ over the range of distances D.

33. (Previously Presented) The power supply system of claim 30, wherein the power provided to the load from the device resonator is on the order of 1 kW.

34. (Previously Presented) The power supply system of claim 30, wherein $Q_1 > 100$ and $Q_2 > 100$.

35. (Previously Presented) The power supply system of claim 30, wherein the power provided to the load from the device resonator is on the order of 1 kW, wherein the intrinsic loss rates satisfy $\kappa/\sqrt{\Gamma_1\Gamma_2} > 5$ over the range of distances D, and wherein $Q_1 > 200$ and $Q_2 > 200$.

36. (New) The power supply system of claim 1, wherein the intrinsic loss rates satisfy $\kappa/\sqrt{\Gamma_1\Gamma_2} > 2$ over the range of distances D.

37. (New) The power supply system of claim 19, wherein the intrinsic loss rates satisfy $\kappa/\sqrt{\Gamma_1\Gamma_2} > 2$ over the range of distances D.

38. (New) The power supply system of claim 22, wherein the intrinsic loss rates satisfy $\kappa/\sqrt{\Gamma_1\Gamma_2} > 2$ over the range of distances D.

39. (New) The power supply system of claim 28, wherein the intrinsic loss rates satisfy $\kappa/\sqrt{\Gamma_1\Gamma_2} > 2$ over the range of distances D.

REMARKS

Claims 1, 2, and 19-39 are pending. Claim 1 is the only independent claim. Claims 36-39 are new.

This Reply is being filed together with a Request for Continued Examination, which is understood to address the Examiner's concerns regarding how the scope of the claims has changed since the application was filed.

Regarding the Action's statements regarding the scope of the "configured to be relatively movable" language in claim 1, we note that this limitation defines the relative movement with respect to "a range of distances D" and claim 1 *further* requires that the resonant coupling of wireless power between the resonators defined by κ and the intrinsic loss rates "satisfy $\kappa/\sqrt{\Gamma_1\Gamma_2} > 1$ over this range of distances D." Therefore a prior art system designed for wireless energy transfer between loops that are fixed in place relative to one another would not satisfy this limitation even if they were relatively movable during construction of the prior art system because the system would not have been configured for wireless energy transfer during such construction, let alone wireless energy transfer satisfying the relationship $\kappa/\sqrt{\Gamma_1\Gamma_2} > 1$ over the range of distances D.

Section 112 Rejections

The Action raises several issues under Section 112, which are addressed in turn below.

First the Action contends there are issues with regard to the claimed recitation of "a coupling coefficient k" because "[i]t would seem to be accepted in the art that the 'coupling coefficient k' only takes values between 0 and 1." We respectively submit that the Action is confusing the dimensionless parameter "k" (Roman character k), which is used in the art to relate a mutual inductance M between two inductors to the respective individual inductances of L_1 and L_2 of those inductors, with the coupling coefficient "κ" (Greek character kappa), which is consistently used in the present specification to describe the rate at which energy is coupled between two resonators.

For example, at page 16, lines 3-5, the application as filed states:

> "The energy transfer rate (κ) refers to the rate of energy transfer from one resonator to another. In the coupled mode description described below it is the coupling constant between the resonators."

Similarly, with regard to the coupled mode equations at Equation (1), at page 18, lines 19-24, the application as filed states:

> "...and κ is the coupling coefficient. Eqs.(1) show that at exact resonance ($\omega_1=\omega_2$ and $\Gamma_1=\Gamma_2$), the eigenmodes of the combined system are split by 2κ; the energy exchange between the two objects takes place in time $\sim\pi/2\kappa$ and is nearly perfect, apart for losses, which are minimal when the coupling rate is much faster than all loss rates ($\kappa\gg\Gamma_{1,2}$). The coupling to loss ratio $\kappa/\sqrt{\Gamma_1\Gamma_2}$ serves as a figure-of-merit in evaluating a system used for wireless energy-transfer, along with the distance over which this ratio can be achieved."

Moreover, for the specific example of inductive coupling between two loops, at page 49, line 19, the application explains that the coupling coefficient κ can be expressed as $\kappa = \omega M / 2\sqrt{L_s L_d}$, where L_s and L_d are the inductances of the two loops, and M is their mutual inductance.

In this regard, to avoid any possible confusion with the dimensionless parameter k, independent claim 1 was been amended to recite: "wherein the coupling coefficient κ can be expressed as $\kappa = \omega M / 2\sqrt{L_s L_d}$, wherein ω is the frequency of the resonant coupling, L_s is the inductance of the power supply-side resonance coil, L_d is the inductance of the power receiving-side resonance coil, and M is the mutual inductance between the power supply-side resonance coil and the power receiving side resonance coil." Comparison with the coupling coefficient k defined at 2:24-29 of Hochmair (US Patent No. 4,441,210), which was cited by the Examiner, shows that $\kappa = \omega k / 2$, thereby demonstrates that the claimed coupling coefficient κ is not bounded between dimensionless values of zero and one, as asserted in the Action.

Second, the Action sought clarification regarding the usage of the claimed term "intrinsic loss rate." Preliminarily, we note that the Examiner is correct that paragraph [0102] of the published application US2013/0181541 includes a printing error. Specifically, the "F" in the published application should be capital Gamma "Γ", just as it was in the full paragraph in the application as originally filed at page 19, lines 1-4, reproduced below:

> "In some embodiments, the energy-transfer application preferably uses resonant modes of high $Q=\omega/2\Gamma$, corresponding to low (i.e. slow) intrinsic-loss rates Γ.

> This condition may be satisfied where the coupling is implemented using, not the lossy radiative far-field, but the evanescent (non-lossy) stationary near-field."

Moreover, this paragraph immediately follows the paragraph at page 18, lines 9-26, which explains the coupled mode equations (Equation 1) and describes the "intrinsic-loss rates Γ" as "$\Gamma_{1,2}$ are the resonance widths due to the objects' intrinsic (absorption, radiation etc.) losses." Accordingly, the intrinsic-loss rate Γ for a resonator can equivalently and interchangeably be referred to as the resonance width Γ for the resonator due to the resonator's intrinsic losses. As is common in the art, the interchangeability between a resonance width and a loss rate follows from whether the dynamics are being described in the frequency domain or the time domain, respectively.

Additional portions of the specification as filed also make it clear that these expressions are interchangeable. For example, at page 15, lines 25-26, the application as filed states: "The resonant width (Γ) refers to the width of an object's resonance due to object's intrinsic losses (e.g. loss to absorption, radiation, etc.)." And, when further describing the same Γ_1 for the first resonant object as that in the coupled mode equations (Equation 1) in a later rate equation (Equation 11), the application as filed at page 42, lines 5-6, describes Γ_1 as "the intrinsic (absorption, radiation etc.) loss rate."

Finally, the Action properly notes that the prior version of claim 1 had no proper previous recitation of "module." Claim 1 has been amended to replace "module" with "resonator" to address this issue.

In view of the above, we ask the Examiner to withdraw the Section 112 rejection.

Priority

With regard to the *present* claims, Applicants confirm that they are not claiming benefit earlier filed applications 60/698,442 or 11/481,077.

Drawings

The Action objects to the drawings because the portable electronic device of claim 26 and the vehicle of claim 30 are not shown. We respectfully request that this objection be withdrawn.

It is well established that such a drawing is only required when necessary for the understanding of the subject matter being patented. (35 U.S.C. § 113 and 37 C.F.R. §1.81(a).) Here, based on the express text identifying applications of the disclosed wireless power system as including portable electronic devices and vehicles, one of skill in the art would readily understand that that the generic work load resistance R_w in Figure 10 could correspond to a load in a portable electronic device or vehicle, and similarly, that the specific light bulb load depicted in Figure 14 could be replaced with a load in a portable electronic device or vehicle. Accordingly, the existing figures are already sufficient for the understanding of the subject matter being patented.

Rejections under Section 103

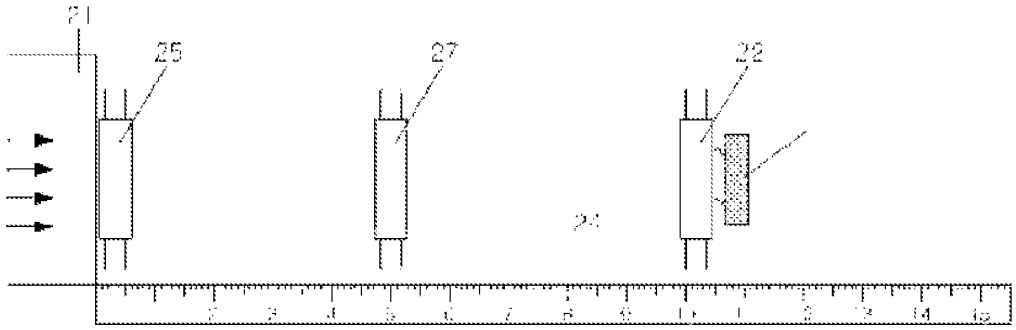
The Action rejects all claims as allegedly obvious over Lee (WO2006/011769A1) in view of Hochmair, Galbraith (US Patent No. 4,679,560), Phillips (US Patent No. 6,240,318), Gaul (US Patent No. 6,533,178), Fujimoto (US Patent No. 5,703,573) and Wuidart (US Patent No. 7,058,357). In making this multi-reference obviousness rejection, however, the Action at pages 8 and 9 state, respectively:

> "As has been noted above, the claims are vague and indefinite. The claims are being rejected based upon the application of art with the commonly accepted definitions and values for a coupling coefficient of k. For purposes of an art rejection the claimed "k" is being rejected on the combined teachings of the secondary references and what they disclose for "k", as it is unclear exactly what the claimed "k" is."
>
> ...
>
> "Turning to the cited secondary references, each describes different aspects of k. Since the claims are not clear, and in order to make the best possible rejection, all of the secondary references are being relied upon for teaching various aspects relevant to the claims."

Therefore the rejection should be withdrawn because, as explained above and clarified by amendment, the claims are in fact directed to kappa κ, not the dimensionless quantity k as was assumed when making the rejection. Nonetheless we provide yet further reasons for the Examiner to withdraw the rejections as set forth below.

With regard to Lee, for example, the Action points to Fig. 6 (reproduced below) and identifies amplifying repeaters 25 and 27 as the claimed power supply-side resonance coil and power receiving-side resonance coil, respectively, and receiver 22 as the claimed power receiving loop.

[Fig. 6]



With regard to the claimed "power supply loop that is configured to be supplied with power from a power supply," the Action points to Electromagnetic Wave Generating Source 21. (See, e.g., the Action at page 8, which states: "…Figure 6 [shows] … a power supply loop configured to be supplied with power from a power supply (not shown in detail at 21, but described at [54] as being the electromagnetic wave generating source).") But this mapping is clearly flawed because while electromagnetic wave generating source 21 in Lee can fairly correspond to the claimed power supply, the Action fails to point to any additional disclosure of the claimed "power supply loop" that is configured to receive power from source 21 because the Action instead maps amplifying repeater 25 onto the claimed power supply-side resonance coil. Indeed, Fig. 6 of Lee plainly shows only three components (25, 27, and 22) that can reasonably read on the two loops and two coils claimed in claim 1, and therefore any proposed mapping fails, in which case the rejection should be withdrawn.

In addition to this deficiency in Lee, there are also deficiencies in the secondary references cited by the Examiner. None the secondary references cited by the Examiner teach the limitation "wherein the intrinsic loss rates satisfy $\kappa/\sqrt{\Gamma_1\Gamma_2} > 1$ over the range of distances D," as recited in independent claim 1, let alone in conjunction with the additional limitations, for example, in dependent claims 19-23 (further specifying the work-drainage rate Γ_w and the

parameter wp), dependent claims 27, 28, 34, and 35 (further specifying high values for the claims intrinsic quality factors), and dependent claims 35-39 (further increasing the value $\kappa/\sqrt{\Gamma_1\Gamma_2}$).

For example, Hochmair emphasizes critical coupling (i.e., K = 1) with respect to "two coils being incorporated in tuned circuits of qualities Q_1 and Q_2, respectively, thus forming a bandpass filter as shown in FIG. 1." (See Hochmair at 2:24-45.) But Hochmair makes no attempt to characterize any *intrinsic* losses that contribute to the quality factor of the second circuit. Instead, FIG. 1 simply identifies "load resistor R2," which corresponds to the *load* in transcutaneous device receiving the wireless power. For example, by converting the claimed kappa into the "k" used in Hochmair, the claimed relationship can be rewritten as $k\sqrt{Q_1^{\text{int}}Q_2^{\text{int}}} > 1$, where the superscript "int" has been added to emphasize that the claimed quality factors are *intrinsic* quality factors, and thereby include resonator losses, but *exclude* the useful power provided to the load for doing work. On the other hand, the critical coupling taught by Hochmair leads to $k\sqrt{Q_1 Q_2} = 1$, where the Hochmair quality factor Q_2 can only refer to the load resistor R2. Therefore, even if one were to convert the "k" in Hochmair to the kappa "κ" being claimed, Hochmair does not describe the *intrinsic* quality factors and related loss rates being claimed in relationship to kappa κ.

Galbraith and Phillips have similar deficiencies. They do not separate loss-related contributions to the quality factor (i.e., *intrinsic* quality factors) from work related contributions to the quality factor (i.e., *loaded* quality factors) and thereby do not provide the teachings claimed. We also note that Actions' further reliance on Gaul, Fujimoto, and Wuidart is less than clear, especially in view of the incorrect assumptions regarding "k", and further that Gaul, Fujimoto, and Wuidart all relate to radio frequency identification tags, and therefore it is unclear how or why a person of skill in the art would combine their teachings with the transcutaneous energy transfer systems of any of Hochmair, Galbraith, and Phillips.

In view of the above, we ask that the obviousness rejection be withdrawn.

Double Patenting Rejection

Claims 1, 2, 19-35 are provisionally rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-28 of copending Application No. 13/477,459 in view of Lee (W02006/011769A1) in view of Hochmair, Galbraith, Phillips, Gaul, Fujimoto and Wuidart, as set forth in detail above.

Claims 1, 2, 19-35 are rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-44 of U.S. Patent No. 8,760,007 in view of Lee (W02006/011769A1) in view of Hochmair, Galbraith (US Patent No. 4,679,560), Phillips (US Patent No. 6,240,318), Gaul (US Patent No. 6,533,178), Fujimoto (US Patent No. 5,703,573) and Wuidart (US Patent No. 7,058,357).

To obviate these double patenting rejections, and without conceding the merits of the double patenting rejections, Applicants have filed a Terminal Disclaimer together with the submission of the present response.

In Conclusion

All of the dependent claims are patentable for at least similar reasons as those for the claims on which they depend are patentable.

Canceled claims, if any, have been canceled without prejudice or disclaimer.

Any circumstance in which the applicant has (a) addressed certain comments of the examiner does not mean that the applicant concedes other comments of the examiner, (b) made arguments for the patentability of some claims does not mean that there are not other good reasons for patentability of those claims and other claims, or (c) amended or canceled a claim does not mean that the applicant concedes any of the examiner's positions with respect to that claim or other claims.

The applicant respectfully requests consideration of all filed IDSs not previously considered, by initialing and returning each Form PTO-1449.

The fees for excess claims in the amount of $240.00 and the two month extension of time in the amount of $600.00 are being paid with this reply on the Electronic Filing System. Apply those fees and any other necessary charges or credits to Deposit Account 06-1050, referencing the above attorney docket number.

Respectfully submitted,

Date: April 14, 2016

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Substitute Disclosure Form	U.S. Department of Commerce Patent and Trademark Office	Attorney Docket No.	Application No.
Information Disclosure Statement by Applicant (Use several sheets if necessary) (37 CFR §1.98(b))		01997-0358008	13/789,860
		Applicant: Massachusetts Institute of Technology	
		Filing Date: March 8, 2013	Group Art Unit: 2836

U.S. Patent Documents							
Examiner Initial	Desig. ID	Document Number	Publication Date	Patentee	Class	Subclass	Filing Date If Appropriate
	1.						

Foreign Patent Documents or Published Foreign Patent Applications								
Examiner Initial	Desig. ID	Document Number	Publication Date	Country or Patent Office	Class	Subclass	Translation Yes	Translation No
	2.	DE 30 43 441	6/3/1982	DE	H02J	17/00	X	

Other Documents (include Author, Title, Date, and Place of Publication)		
Examiner Initial	Desig. ID	Document
	3.	

Examiner Signature	Date Considered

EXAMINER: Initials citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Substitute Disclosure Form

Tuesday, 3 May 2016

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By Leo Greene (name of signer) Leo Greene (signature of signer)

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Bibliographic data: DE3043441 (A1) – 1982-06-03

Power transfer system – has transformer allowing position data update inside SOS buoy onboard ship

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Classification: - international: **B63C9/22; H01F38/14;** (IPC1-7): H02J17/00
- cooperative: **B63C9/22; H01F38/14**

Application number: DE19803043441 19801118

Priority number(s): DE19803043441 19801118

Abstract of DE3043441 (A1)

The system has a transformer whose two windings have a rectangular shape and different lengths. They are curved around imaginary cylindrical surfaces concentric with one another and one inside the other such that practically no change occurs in the transfer characteristics of the transformer when the windings rotate about the axis of the imaginary cylinders. The parameters (e.g. winding resistance, inductance etc.,) are related by a specified equation. The buoy is mounted on a ship and the transformer is used to transfer signals updating the position data of the ship stored in the buoy. (This data is transmitted automatically when the buoy is thrown overboard).

InductEV, Inc.
Exhibit 1031
Page 1400

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Application for examination acc. Article 44 of the German Patent Law (PatG) has been submitted

(54) **System for wireless energy transfer**

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Patent Claims

[TN: Circled: 1.] System for wireless energy transfer using an air-core transformer, in particular for a maritime distress buoy, characterized by the two windings having a rectangular shape and different lengths, and by them being curved around imaginary cylindrical surfaces concentric with one another and one inside the other such that practically no change occurs in the transfer characteristics when the windings rotate about the axis of the imaginary cylinders.

2. System for wireless energy transfer pursuant to claim 1, characterized by the two windings being intended to be in a series resonance circuit, for which the circuit parameters are chosen such that

$$R_{opt(\eta)} \approx \sqrt{\frac{r_2}{r_1}\omega^2 M^2 + r_2^2} \qquad R_{opt(N)} \approx r_2 + \frac{\omega^2 M^2}{r_1},$$

where R_{opt} = optimal load resistance (approximation solution)
ω = $2\pi f$ = circuit frequency
M = mutual inductance
r_1 = ohmic loss resistance of the primary coil
r_2 = ohmic loss resistance of the secondary coil.

3. System for wireless energy transfer pursuant to claim 2, characterized by the selection between the two values $R_{opt\,(\eta)}$ and $R_{opt\,(N)}$ for optimizing the efficiency (η) and transferred power (R).

[Stamp: ORIGINAL INSPECTED]

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- 2 -

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Applicant: Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt e.V., (German Research and Test Institute for Aerospace), Cologne

System for wireless energy transfer

The invention concerns a system for wireless energy transfer using an air-core transformer, in particular for a maritime distress buoy.

When operating on ships a maritime distress buoy that automatically turns itself on when it is submerged in water and transmits the distress at sea signal via satellite, it is important that there is no resistance whatsoever countering the buoy when it is released from its mount. Therefore, a wireless connection is preferable to a cable connection even if it is fitted with a predetermined breakaway point. A connection is necessary in order to update the position data of the ship stored in the buoy at regular time intervals and to ensure the power supply required for operating the data storage, which replaces the energy used therein. Furthermore, the energy transfer should enable the entire supply of power in the buoy including the transmitter if it consists of rechargeable batteries to remain at full charge. In case of equipping with Nickle-Cadmium cells of type “D” (single cell) a permanent load current of approx. 0.1A is required. The required charging voltage depends on the number of cells. For the storage electronics alone 10V are sufficient; for operating the transmitter 30 V.

It is therefore the task of the invention to list a system for wireless energy transfer using an air-core transformer that can, in particular, be used in conjunction with a maritime distress buoy that despite the low coupling factor of the air coils allows a large power transfer with as great an efficiency as possible. This task is inventively solved by the object in patent claim 1.

To achieve optimal conditions the sizing specification according to patent claim 2 is used. Based on the drawing the invention shall for example be explained in greater detail. Depicted are on:

Fig. 1a a side view and Fig. 1b a cross section view of a maritime distress buoy and its mounting with a system according to the invention;
Fig. 2 design examples of both coils of the air-core transformer in Fig. 1; and
Fig. 3 an equivalent circuit diagram of the air-core transformer in Fig. 1.

For the design example illustrated in Fig. 1 a buoy B is planned that is aligned in a buoy mount H. The buoy mount H is connected to a supply line leading to a ship.

Fig. 2 shows a coil 1 that is rolled out into the plane with a rectangular shape as well as another coil 2 rolled out in the plane with a rectangular shape, the length of which is longer than the length of coil 1. Coil 2 is aligned along the spherical part of buoy B, and coil 1 is correspondingly curved cylindrically and mounted concentrically in buoy mount H. For example, coil 2 can be lathered into buoy B and coil 1 can be laminated into a small indentation in buoy mount H.

As can be seen in Fig. 1, coil 2 encloses the buoy along a circumference, while coil 1 consistent with the formation of the buoy mount H is only aligned along a semi-circle. The area decisive for the coupling is therefore the one for coil 1, and therefore an arbitrary rotation of the coils around the cylinder axis vertical to the drawing plane in Fig. 1b causes practically no change in the transfer characteristics.

InductEV, Inc.
Exhibit 1031
Page 1404

If, by chance, both ends of coil 2 happen to end up lying above coil 1, almost nothing is changed by this in the transfer power, because the direction of the induction voltage is equivalent in both coil parts.

Fig. 3 displays an equivalent circuit diagram of the air-core transformer, whereby both coils L_1 and L_2 are intended to be in a series resonance circuit. This equivalent circuit can be illustrated according to the formula based on known methods. The invention is based on the insight that starting from these formulas an optimization relationship between the load resistance R to be demanded based on the application purpose and the circuit parameters can be derived that while not using a comprehensive strictly mathematical solution, leads to simple, for the application practical approximation solutions. The circuit parameters can be optimized regarding a maximum degree of efficiency η, and a maximum power N to be transferred and listed as sizing specification.

These specifications are:

$$R_{opt(\eta)} \approx \sqrt{\frac{r_2}{r_1}\omega^2 M^2 + r_2^2} \qquad R_{opt(N)} \approx r_2 + \frac{\omega^2 M^2}{r_1}$$

where
- M = mutual inductance
- ω = 2 πf = circuit frequency
- r_1 = ohmic loss resistance of the primary coil
- r_2 = ohmic loss resistance of the secondary coil.

The sizing of the capacities is known to result from the resonance condition.

Since the building elements are selected based on the above relationship and their characteristics are measured, the effectivity, as well as the transferred power are calculated as follows:

$$\eta = \frac{1}{1 + \frac{r_2}{R} + \frac{r_1}{R}\left(\frac{R + r_2}{\omega M}\right)^2} \qquad N = \left(\frac{U_1 \omega M}{r_1 (R + r_2) + \omega^2 M^2}\right)^2 R$$

The interesting currents and voltages can be computed for the approximation viewed ($R < 10\omega D_2$) and according to the creation of resonance in both circles:

$$J_1 = \frac{U_1}{r_1 + \frac{\omega^2 M^2}{R + r_2}}$$

$$J_2 = -j \frac{U_1 \omega M}{r_1 (R + r_2) + \omega^2 M^2}$$

$$U_2 = -j \frac{U_1 \omega M}{\left(r_1 + \frac{\omega^2 M^2}{R + r_2}\right)\left(1 + \frac{r_2}{R}\right)}$$

Hereby U_1 is the voltage applied to the primary circuit.

There are generally two thresholds for the actually desired increase in frequency: One is technically based and requires a sufficient distance from the coil's self-resonance. The other is postally based: Starting with 10 kHz there is a permit requirement and especially for ships a parasitic frequency could hinder radio and navigation reception (e.g. OMEGA procedures at 10 kHz).
Therefore, as an example for the following trial set up (Fig. 2) the frequency 9 kHz was chosen and the following parameters were measured:

Coil 1: 50 windings with 0.5 mm Cu, measurements 15 x 70 cm
Coil 2: 85 windings with 0.4 mm Cu, measurements 15 x 175 cm

$r_1 = 7.7$	$L_1 = 3.3$ mH	$C_1 = 95$ nF
$r_2 = 45.4$	$L_2 = 19.6$ mH	$C_2 = 16$ nF

Coil distance approx. 2.5 cm; K = 0.2 $\quad M = K \sqrt{L_1 L_2} = 1.6$ mH

The calculated results are summarized in Table 1. They were confirmed by measurements in the trial set up for the mutual inductance K = 0.2.

Table 1

Calculation of power data for three different values of the coupling factor
(f = 9000 Hz, U_1 = 10V; trial set up as described)

	K = 0.1		K = 0.2		K = 0.3		
M	0.80		1.60		2.41		mH
ωM	45.2		90.5		136.3		Ω
$R_{opt\ (\eta)}$		118		224		334	Ω
$R_{opt\ (N)}$	311		1109		2458		Ω
I_1	744	494	676	262	661	176	mA
I_2	94	137	53	88	36	63	mA
U_2	29.4	16.1	58.8	19.7	88.5	21.2	V
η	37.2	44.7	46.1	66.3	48.2	76.1	%
N	2.77	2.21	3.11	1.74	3.19	1.34	W

If the interest is focused on efficiency as well as the transferred power, arbitrary values can also be chosen for R between the two mentioned optimization values.

The goal set for cell recharge, e.g. 100 mA/ 45 Volt (R = 450 Ω) was achieved with U_1 = 13 Volt with an efficiency of 62%, despite the relatively low coupling degree of 0.2.

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Number: **30 43 441**
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Filing Date: November 18, 1980
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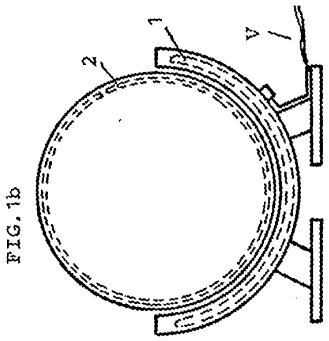


FIG. 1b

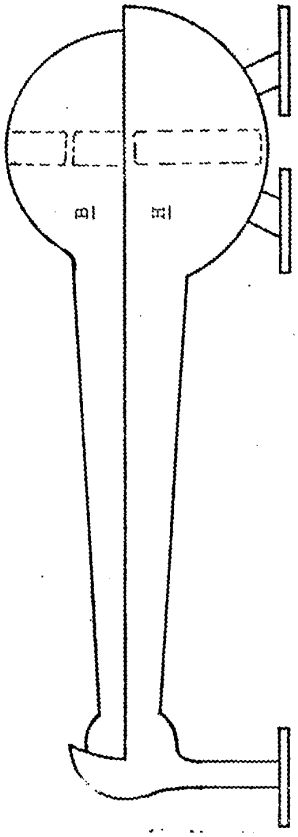


FIG. 1a

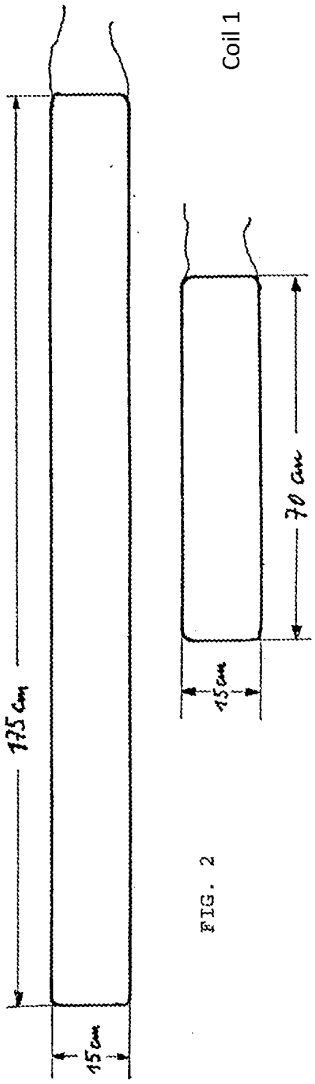


FIG. 2

D-4813

11/18/80

InductEV, Inc.
Exhibit 1031
Page 1409

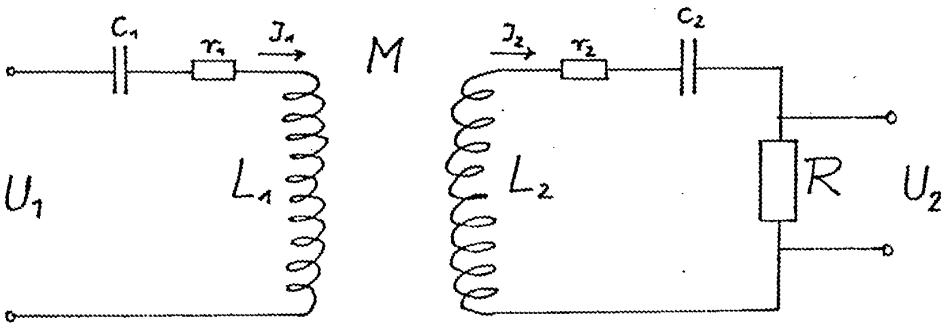


FIG. 3

Electronic Acknowledgement Receipt

EFS ID:	25682520
Application Number:	13789860
International Application Number:	
Confirmation Number:	4131
Title of Invention:	WIRELESS ENERGY TRANSFER
First Named Inventor/Applicant Name:	Aristeidis Karalis
Customer Number:	26161
Filer:	Marc M. Wefers/Cheryl Forrest
Filer Authorized By:	Marc M. Wefers
Attorney Docket Number:	01997-0358008
Receipt Date:	04-MAY-2016
Filing Date:	08-MAR-2013
Time Stamp:	14:18:35
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		358008IDS.pdf	135493 6e69e7191e80b7c6eee4bee8dad30cd7009255af	yes	2

	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Transmittal Letter		1	1	
	Information Disclosure Statement (IDS) Form (SB08)		2	2	
Warnings:					
Information:					
2	Foreign Reference	TranslationofDE3043441.pdf	681839 410e7899f227cd743882ac570b1b1ab3b031989d	no	12
Warnings:					
Information:					
		Total Files Size (in bytes):	817332		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor	:	Aristeidis Karalis	Art Unit	:	2836
Serial No.	:	13/789,860	Examiner	:	Fritz M. Fleming
Filed	:	March 8, 2013	Conf. No.	:	4131
Title	:	WIRELESS ENERGY TRANSFER			

MAIL STOP AMENDMENT
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

INFORMATION DISCLOSURE STATEMENT

Please consider the references listed on the enclosed PTO-SB-08 or Disclosure Form. Foreign patent documents and non-patent literature are enclosed; cited U.S. patents and patent application publications will be provided on request.

This statement is being filed after a request for continued examination and before the mailing of a first action.

Apply any necessary charges or credits to deposit account 06-1050, referencing the above attorney docket number.

Please contact the undersigned if there are any questions regarding this Statement.

Respectfully submitted,

Date: May 4, 2016

/Marc M. Wefers Reg. No. 56,842/
Marc M. Wefers
Reg. No. 56,842

Customer Number 26161
Fish & Richardson P.C.
Telephone: (617) 542-5070
Facsimile: (877) 769-7945

23520400.doc

Application Number	Application/Control No.	Applicant(s)/Patent under Reexamination	
	13/789,860	KARALIS ET AL.	

Document Code - DISQ	Internal Document – DO NOT MAIL

TERMINAL DISCLAIMER	☒ APPROVED	☐ DISAPPROVED
Date Filed : 04/15/2016	**This patent is subject to a Terminal Disclaimer**	

Approved/Disapproved by:
/MANUEL SALDANA/ TWO TERMINAL DISCLAIMERS

U.S. Patent and Trademark Office

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

26161 7590 06/02/2016
FISH & RICHARDSON P.C. (BO)
P.O. BOX 1022
MINNEAPOLIS, MN 55440-1022

EXAMINER	
FLEMING, FRITZ M	
ART UNIT	PAPER NUMBER
2836	

DATE MAILED: 06/02/2016

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/789,860	03/08/2013	Aristeidis Karalis	01997-0358008	4131

TITLE OF INVENTION: WIRELESS ENERGY TRANSFER

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$960	$0	$0	$960	09/02/2016

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

InductEV, Inc.
Exhibit 1031
Page 1415

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

26161 7590 06/02/2016
FISH & RICHARDSON P.C. (BO)
P.O. BOX 1022
MINNEAPOLIS, MN 55440-1022

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/789,860	03/08/2013	Aristeidis Karalis	01997-0358008	4131

TITLE OF INVENTION: WIRELESS ENERGY TRANSFER

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$960	$0	$0	$960	09/02/2016

EXAMINER	ART UNIT	CLASS-SUBCLASS
FLEMING, FRITZ M	2836	307-104000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
- ❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.
1 _____
2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. The following fee(s) are submitted:
- ❑ Issue Fee
- ❑ Publication Fee (No small entity discount permitted)
- ❑ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**
- ❑ A check is enclosed.
- ❑ Payment by credit card. Form PTO-2038 is attached.
- ❑ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
- ❑ Applicant certifying micro entity status. See 37 CFR 1.29 — NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
- ❑ Applicant asserting small entity status. See 37 CFR 1.27 — NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
- ❑ Applicant changing to regular undiscounted fee status. — NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

PTOL-85 Part B (10-13) Approved for use through 10/31/2013. OMB 0651-0033 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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Exhibit 1031
Page 1416

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/789,860	03/08/2013	Aristeidis Karalis	01997-0358008	4131

26161 7590 06/02/2016

FISH & RICHARDSON P.C. (BO)
P.O. BOX 1022
MINNEAPOLIS, MN 55440-1022

EXAMINER	
FLEMING, FRITZ M	

ART UNIT	PAPER NUMBER
2836	

DATE MAILED: 06/02/2016

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

InductEV, Inc.
Exhibit 1031
Page 1417

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No. 13/789,860	Applicant(s) KARALIS ET AL.	
	Examiner FRITZ M. FLEMING	Art Unit 2836	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *the RCE filed 4/15/16*.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on_____.
2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
3. ☒ The allowed claim(s) is/are *1,2 and 19-39*. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov .
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☐ All b) ☐ Some *c) ☐ None of the:
   1. ☐ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☒ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date 5/4/16,4/15/16,1/8/16,11/16/15
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
5. ☐ Examiner's Amendment/Comment
6. ☒ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/FRITZ M FLEMING/
Primary Examiner, Art Unit 2836

InductEV, Inc.
Exhibit 1031
Page 1419

1. The present application is being examined under the pre-AIA first to invent provisions.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 4/15/16 has been entered.

Terminal Disclaimer

3. The terminal disclaimer filed on 4/15/16 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of 13/477,459 and 8,760,007 has been reviewed and is accepted. The terminal disclaimer has been recorded.

Allowable Subject Matter

4. Claims 1,2,19-39 are allowed.

5. The following is an examiner's statement of reasons for allowance: Applicants' response combined with the amendment has overcome all outstanding rejections and objections. It is to be emphasized that the claims have been amended to clarify the "coupling coefficient" and that it satisfies the claimed loss rates which are losses (i.e.

resonance widths due to the objects' intrinsic losses) as opposed to R,L,C values. The response clarifies this as well.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to FRITZ M. FLEMING whose telephone number is (571)272-4145. The examiner can normally be reached on M-F, 0900-1730.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rexford N. Barnie can be reached on 571-272-7492. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

FRITZ M FLEMING
Primary Examiner
Art Unit 2836

/FRITZ M FLEMING/
Primary Examiner, Art Unit 2836

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13789860	KARALIS ET AL.
	Examiner	Art Unit
	FRITZ M FLEMING	3649

CPC- SEARCHED		
Symbol	Date	Examiner
H02J17/00	3/9/2015	FMF
H02J50/12	5/16/2016	FMF

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
307	104	3/9/2015	FMF
320	108	3/9/2015	FMF

SEARCH NOTES		
Search Notes	Date	Examiner
East search notes	3/9/2015	FMF
updated searches.	11/15/2015	FMF
updated searches.	5/16/2016	FMF

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner
	Interference search in USPAT and PGPUBs as indicated.	5/16/2016	FMF

	/FRITZ M FLEMING/ Primary Examiner.Art Unit 2836

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BIB DATA SHEET

CONFIRMATION NO. 4131

SERIAL NUMBER	FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
13/789,860	03/08/2013 RULE	307	2836	01997-0358008

APPLICANTS

MASSACHUSETTS INSTITUTE OF TECHNOLOGY, Cambridge, MA

INVENTORS

Aristeidis Karalis, Boston, MA;
Andre B. Kurs, Chestnut Hill, MA;
Robert Moffatt, Reston, VA;
John D. Joannopoulos, Belmont, MA;
Peter H. Fisher, Cambridge, MA;
Marin Soljacic, Belmont, MA;

**** CONTINUING DATA ***************************

This application is a CON of 13/477,459 05/22/2012
which is a CON of 13/036,177 02/28/2011 ABN
which is a CON of 12/437,641 05/08/2009 PAT 8097983 *
which is a CON of 12/055,963 03/26/2008 PAT 7825543 *
which is a CIP of 11/481,077 07/05/2006 PAT 7741734 *
which claims benefit of 60/698,442 07/12/2005
and said 12/055,963 03/26/2008
claims benefit of 60/908,383 03/27/2007
and claims benefit of 60/908,666 03/28/2007
and is a CIP of PCT/US2007/070892 06/11/2007
(*)Data provided by applicant is not consistent with PTO records.

**** FOREIGN APPLICATIONS ***************************

**** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ****

04/01/2013

Foreign Priority claimed ☐ Yes ☑ No 35 USC 119(a-d) conditions met ☐ Yes ☑ No Verified and Acknowledged /FRITZ M FLEMING/ Examiner's Signature	☐ Met after Allowance Initials	STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
		MA	14	18	10

ADDRESS

FISH & RICHARDSON P.C. (BO)
P.O. BOX 1022
MINNEAPOLIS, MN 55440-1022
UNITED STATES

TITLE

WIRELESS ENERGY TRANSFER

FILING FEE RECEIVED	FEES: Authority has been given in Paper No._____ to charge/credit DEPOSIT ACCOUNT	☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time)

BIB (Rev. 05/07).

Substitute Disclosure Form / U.S. Department of Commerce Patent and Trademark Office	Attorney Docket No.	Application No.
Information Disclosure Statement by Applicant (Use several sheets if necessary) (37 CFR §1.98(b))	01997-0358008	13/789,860
	Applicant: Aristeidis Karalis et al.	
	Filing Date: March 8, 2013	Group Art Unit: 2836

U.S. Patent Documents

Examiner Initial	Desig. ID	Document Number	Publication Date	Patentee	Class	Subclass	Filing Date If Appropriate
	1.						

Foreign Patent Documents or Published Foreign Patent Applications

Examiner Initial	Desig. ID	Document Number	Publication Date	Country or Patent Office	Class	Subclass	Translation Yes	Translation No
	2.	JP 10-84304	3/31/1998	Japan	H04B	5/00	English Abstract Only	
	3.	JP 11-155245	6/8/1999	Japan	H02J	17/00	English Abstract Only	
	4.	JP 2012-105537	5/31/2012	Japan	H02J	17/00	English Abstract Only	

Other Documents (include Author, Title, Date, and Place of Publication)

Examiner Initial	Desig. ID	Document
	5.	Copy of Japanese Office Action for Japanese Office Action No. 2013-223597 by Examiner I. Yoshimura dated November 17, 2015 (8 pages)
	6.	Copy of 3rd Chinese Office Action for Chinese Application No. 201310280724.1 by Examiner Zhang Wei dated December 15, 2015 (6 pages)

Examiner Signature	Date Considered
/FRITZ M FLEMING/	05/16/2016

EXAMINER: Initials citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Substitute Disclosure Form

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /F.M.F/

Sheet 1 of 1

Substitute Disclosure Form / U.S. Department of Commerce Patent and Trademark Office	Attorney Docket No.	Application No.
Information Disclosure Statement by Applicant (Use several sheets if necessary) (37 CFR §1.98(b))	01997-0358008	13/789,860
	Applicant: Aristeidis Karalis et al.	
	Filing Date: March 8, 2013	Group Art Unit: 2836

U.S. Patent Documents

Examiner Initial	Desig. ID	Document Number	Publication Date	Patentee	Class	Subclass	Filing Date If Appropriate
	1.	6,028,429	2/22/2000	Green et al.			
	2.	8,077,485	12/13/2011	Lee			
	3.	2007/0008140	1/11/2007	Saarisalo et al.			

Foreign Patent Documents or Published Foreign Patent Applications

Examiner Initial	Desig. ID	Document Number	Publication Date	Country or Patent Office	Class	Subclass	Translation Yes	Translation No
	4.	DE 30 43 441	6/3/1982	DE	H02J	17/00	Machine Translation	
	5.	WO 2007/075058	7/5/2007	WIPO	H02J	3/38		

Other Documents (include Author, Title, Date, and Place of Publication)

Examiner Initial	Desig. ID	Document
	6.	Copy of Notice of Allowance from the U.S. Patent and Trademark Office for Application No. 13/477,459 by Examiner Fritz M. Fleming dated March 31, 2016 (13 pages)
	7.	Copy of Summons to Attend Oral Proceedings for Application No. 06 786 588.1 dated February 4, 2016 (31 pages)
	8.	Copy of Summons to Attend Oral Proceedings for Application No. 11 184 066.6 dated February 8, 2016 (17 pages)
	9.	Bladel, "Weakly Coupled Dielectric Resonators", IEEE Transactions on Microwave Theory and Techniques, Vol. 30, No. 11, pp. 1907-1914 (November 1982)
	10.	Fenn et al., "Linear Array Characteristics with One-Dimensional Reactive-Region Near-Field Scanning: Simulations and Measurements", IEEE Transactions on Antennas and Propagation, Vol. 39, No. 9, pp. 1305-1311 (September 1991)
	11.	Haus et al., "Coupled-Mode Theory", Proceedings of the IEEE, Vol. 79, No. 10, pp. 1505-1518 (October 1991)
	12.	Shamonina et al., "Magneto-inductive waveguide", Electronics Letters, Vol. 38, No. 8, pp 371-373 (April 11, 2002)
	13.	Syms et al., "Magneto-inductive waveguide devices", IEEE Proc.-Microw. Antennas Propag., Vol. 153, No. 2., pp. 111-121 (April 2006)

Examiner Signature	Date Considered
/FRITZ M FLEMING/	05/16/2016

EXAMINER: Initials citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor	:	Aristeidis Karalis	Art Unit	:	2836
Serial No.	:	13/789,860	Examiner	:	Fritz M. Fleming
Filed	:	March 8, 2013	Conf. No.	:	4131

Title : WIRELESS ENERGY TRANSFER

MAIL STOP AF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

REPLY TO ACTION OF NOVEMBER 20, 2015

Please consider the following reply.

OK TO ENTER: /F.M.F/

05/27/2016

/FRITZ M FLEMING/

Sheet 1 of 1

Substitute Disclosure Form / U.S. Department of Commerce Patent and Trademark Office	Attorney Docket No.	Application No.
Information Disclosure Statement by Applicant (Use several sheets if necessary) (37 CFR §1.98(b))	01997-0358008	13/789,860
	Applicant: Massachusetts Institute of Technology	
	Filing Date: March 8, 2013	Group Art Unit: 2836

U.S. Patent Documents

Examiner Initial	Desig. ID	Document Number	Publication Date	Patentee	Class	Subclass	Filing Date If Appropriate
	1.						

Foreign Patent Documents or Published Foreign Patent Applications

Examiner Initial	Desig. ID	Document Number	Publication Date	Country or Patent Office	Class	Subclass	Translation Yes	Translation No
	2.	DE 30 43 441	6/3/1982	DE	H02J	17/00	X	

Other Documents (include Author, Title, Date, and Place of Publication)

Examiner Initial	Desig. ID	Document
	3.	

Examiner Signature	Date Considered
/FRITZ M FLEMING/	05/16/2016

EXAMINER: Initials citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Substitute Disclosure Form

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /F.M.F/

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13789860	KARALIS ET AL.
	Examiner	**Art Unit**
	FRITZ M FLEMING	2836

CPC						
Symbol					**Type**	**Version**
H02J		5	/	005	F	2013-01-01
B60L		11	/	182	I	2013-01-01
H01Q		7	/	00	I	2013-01-01
H01Q		9	/	04	I	2013-01-01
H02J		17	/	00	I	2013-01-01
H04B		5	/	0037	I	2013-01-01
Y10T		29	/	4902	A	2015-01-15
H02J		50	/	12	A	2016-02-01
B60L		2210	/	20	A	2013-01-01
Y02T		10	/	7005	A	2013-01-01
Y02T		10	/	725	A	2013-01-01
Y02T		90	/	122	A	2013-01-01
Y02T		90	/	127	A	2013-01-01
Y02T		90	/	14	A	2013-01-01
Y02T		10	/	7072	A	2013-01-01

CPC Combination Sets							
Symbol					**Type**	**Set**	**Ranking**	**Version**
			/					
			/					

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	23	
/FRITZ M FLEMING/ Primary Examiner.Art Unit 2836	05/16/2016	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	9C

InductEV, Inc.
Exhibit 1031
Page 1429

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13789860	KARALIS ET AL.
	Examiner	**Art Unit**
	FRITZ M FLEMING	2836

US ORIGINAL CLASSIFICATION		INTERNATIONAL CLASSIFICATION										
CLASS	SUBCLASS	CLAIMED					NON-CLAIMED					
307	104	H	0	2	J	17 / 00 (2006.01.01)						

CROSS REFERENCE(S)						
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)					

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	23	
/FRITZ M FLEMING/ Primary Examiner.Art Unit 2836	05/16/2016	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	9C

InductEV, Inc.
Exhibit 1031
Page 1430

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13789860	KARALIS ET AL.
	Examiner	**Art Unit**
	FRITZ M FLEMING	2836

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☒ T.D. ☐ R.1.47

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
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2	2	-	18	21	34										
-	3	3	19	22	35										
-	4	4	20	23	36										
-	5	5	21	11	37										
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-	15	18	31												
-	16	19	32												

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	23	
/FRITZ M FLEMING/ Primary Examiner.Art Unit 2836	05/16/2016	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	9C

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13789860	KARALIS ET AL.
	Examiner	**Art Unit**
	FRITZ M FLEMING	2836

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☒ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	03/09/2015	11/16/2015	05/16/2016						
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InductEV, Inc.
Exhibit 1031
Page 1432

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13789860	KARALIS ET AL.
	Examiner	**Art Unit**
	FRITZ M FLEMING	2836

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☒ T.D. ☐ R.1.47

CLAIM		DATE								
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11	37			=						
7	38			=						
16	39			=						

InductEV, Inc.
Exhibit 1031
Page 1433

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	4203	(307/104).CCLS.	US-PGPUB; USPAT	OR	OFF	2016/05/16 07:45
L2	2811	(320/108).CCLS.	US-PGPUB; USPAT	OR	OFF	2016/05/16 07:45
L3	6604	1 or 2	US-PGPUB; USPAT	OR	OFF	2016/05/16 07:45
L4	2979	h02j17/00.cpc.	US-PGPUB; USPAT	OR	OFF	2016/05/16 07:45
L5	10558	h02j17/00.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/05/16 07:45
L6	195	h02j50/12.cpc. or h02j50/12.ipc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/05/16 07:47
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S2	296	S1 same wireless	USPAT	OR	OFF	2012/03/20 16:45
S3	88674	("5876425" | "20040130916" | "6345203" | "20050151511" | "5455467" | "6597076" | "6307468" | "6047214" | "5517194" | "20030014091" | "7355150" | "20030114769" | "6442434" | "20040130915" | "6364735" | "20030069051")".PN"	US-PGPUB; USPAT	OR	OFF	2012/03/20 16:48
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S7	39	S6 and q	USPAT	OR	OFF	2012/03/20

						16:59
S8	306	S6 and q	US-PGPUB; USPAT	OR	OFF	2012/03/20 16:59
S9	362	(320/108).CCLS.	USPAT; USOCR	OR	OFF	2012/03/20 17:35
S10	893	(320/108).CCLS.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/03/20 17:36
S11	129	S10 and q	US-PGPUB; USPAT	OR	OFF	2012/03/20 17:36
S12	5432	(high adj q) same resonator	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2012/03/20 17:51
S13	480	(high adj q) same resonator same (contactless or (contact adj less) or inductive or inductively or wireless or wirelessly)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2012/03/20 17:52
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S18	550	transcutaneous adj energy adj transfer	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2012/03/20 22:34
S19	60	S18 and q	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2012/03/20 22:34
S20	1060	("near" adj field) same wireless same power	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2012/03/20 22:49
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			DERWENT; IBM_TDB			
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S27	893	(320/108).CCLS.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/03/20 23:54
S28	2316	S26 or S27	US-PGPUB; USPAT	OR	OFF	2012/03/20 23:54
S29	319	S28 and "near" adj field	US-PGPUB; USPAT	OR	ON	2012/03/20 23:54
S30	31	("3167168" | "4023753" | "4331225" | "4459438" | "4603640" | "4689530" | "4800328" | "4833337" | "4836344" | "4879522").PN. OR ("5519262").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/03/21 00:10
S31	4	("near" adj field) same implant$ same q	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2012/03/21 00:16
S32	186	("near" adj field) same high adj q	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2012/03/21 00:20
S33	34	("2401572" | "2426226" | "2805414" | "3546699" | "3713162" | "3771075" | "3786376" | "3810183" | "3914715" | "4150345" | "4157516" | "4163961" | "4233580" | "4253101" | "4258365" | "4288759" | "4358746" | "Re29296").PN. OR ("4516097").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/03/21 00:30
S34	1	("20100102639").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/03/21 11:50
S35	1	(("2010012355") or ("7741734")).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/03/21 12:29
S36	2	(("20100012355") or ("7741734")).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/03/21 12:29
S37	2	(("20100123355") or ("7741734")).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/03/21 12:30
S38	2	(("20100096934") or	US-PGPUB;	OR	OFF	2012/03/21

		("7741734")).PN.	USPAT; USOCR			12:52
S39	2	(("20100123355") or ("7741734")).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/03/21 20:45
S40	0	S39 and (tunable)	US-PGPUB; USPAT	OR	OFF	2012/03/21 20:45
S41	0	S39 and (tuning)	US-PGPUB; USPAT	OR	OFF	2012/03/21 20:46
S42	0	S39 and (tune)	US-PGPUB; USPAT	OR	OFF	2012/03/21 20:46
S43	1	("20100127574").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/03/26 06:11
S44	1	S43 and rate	US-PGPUB; USPAT	OR	OFF	2012/03/26 06:13
S45	1	S43 and "0.2"	US-PGPUB; USPAT	OR	OFF	2012/03/26 06:18
S46	1	S43 and (tunable or tuning or tuned or feedback)	US-PGPUB; USPAT	OR	ON	2012/03/26 06:20
S47	1	S43 and (tunable or tuning or tuned or feedback or detune or detuning)	US-PGPUB; USPAT	OR	ON	2012/03/26 06:21
S48	1	("20090085408").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/03/26 06:57
S49	1	("20110140544").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/04/09 13:11
S50	1	S49 and common	US-PGPUB; USPAT	OR	OFF	2012/04/09 13:11
S51	3	(("20110140544") or ("7825543") or ("7741734")).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/04/09 13:14
S52	3	S51 and common	US-PGPUB; USPAT	OR	OFF	2012/04/09 13:14
S53	1	S51 and (common adj inductance)	US-PGPUB; USPAT	OR	ON	2012/04/09 13:15
S54	4	(("20110140544") or ("20100117456") or ("7825543") or ("7741734")).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/04/09 13:19
S55	1	S52 and (common adj inductance)	US-PGPUB; USPAT	OR	ON	2012/04/09 13:19
S56	3	S52 and common	US-PGPUB; USPAT	OR	OFF	2012/04/09 13:20
S57	4	S54 and common	US-PGPUB; USPAT	OR	OFF	2012/04/09 13:20
S58	368	(high adj q) same resonant same (tune or tuning)	USPAT	OR	OFF	2012/04/09 13:54
S59	587	(high adj q) same resonant same (tune or tuning)	US-PGPUB; USPAT	OR	ON	2012/04/09 13:54
S60	1485	(307/104).CCLS.	USPAT; USOCR	OR	OFF	2012/05/07 04:48
S61	3	S60 and young and fleming	USPAT	OR	OFF	2012/05/07 04:48
S62	2	(("7825543") or ("7741734")).PN.	USPAT;	OR	OFF	2012/05/07

			USOCR			08:04
S63	5	"2006011769"	EPO; DERWENT	OR	OFF	2012/05/07 08:16
S64	4	"2004072581"	EPO; DERWENT	OR	OFF	2012/05/07 08:17
S65	2179	(307/104).CCLS.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/05/07 12:02
S66	921	(320/108).CCLS.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/05/07 12:02
S67	1199	S65 or S66	USPAT	OR	OFF	2012/05/07 12:02
S68	2381	S65 or S66	US-PGPUB; USPAT	OR	OFF	2012/05/07 12:02
S69	100	S68 and (nano or nanoscale)	US-PGPUB; USPAT	OR	ON	2012/05/07 12:02
S70	409	capacitor same inductor same(nano or nanoscale)	US-PGPUB; USPAT	OR	ON	2012/05/07 12:07
S71	5	capacitor same inductor same(nano or nanoscale) same transponder	US-PGPUB; USPAT	OR	ON	2012/05/07 12:13
S72	365	capacitor same inductor same powder	US-PGPUB; USPAT	OR	ON	2012/05/07 12:19
S73	87	q same (inductor or inductance) same (air adj core) same frequency	US-PGPUB; USPAT	OR	ON	2012/05/07 13:09
S74	5	q same (inductor or inductance) same (air adj core) same adjustable	US-PGPUB; USPAT	OR	ON	2012/05/07 13:13
S75	24	(inductor or inductance) same (air adj core) same adjustable	US-PGPUB; USPAT	OR	ON	2012/05/07 13:14
S76	79	(inductor or inductance) same (air adj core) same variable	US-PGPUB; USPAT	OR	ON	2012/05/07 13:15
S77	166	S68 and (air adj core)	US-PGPUB; USPAT	OR	ON	2012/05/07 13:24
S78	21	(inductor or inductance) same (air adj core) same variable	EPO; JPO; DERWENT	OR	ON	2012/05/07 13:38
S79	98	S68 and (variable or adjustable) near2 (inductor or inductance)	US-PGPUB; USPAT	OR	ON	2012/05/07 13:43
S80	53	("20020082059" | "20030006880" | "20030090239" | "3689885" | "3938018" | "3949268" | "4800328" | "4818855" | "5229652" | "5341280" | "5428659" | "5455466" | "5455467" | "5550452" | "5600225" | "5701657" | "5734254" | "5814900" | "5831348" | "5982764" | "6057668" | "6127799" | "6252380" | "6265791" | "6301128" | "6323775" | "6424124" | "6429622" | "6462432" | "6597076" | "6683438" | "6703920" | "6821670" | "6844702" | "6977479").PN. OR ("7518267").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/05/07 13:51
S81	1	("6436299").PN.	USPAT; USOCR	OR	OFF	2012/05/07 13:59
S82	2222	(307/104).CCLS.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/06/18 05:48

S83	962	(320/108).CCLS.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/06/18 05:48
S84	2222	(307/104).CCLS.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/06/18 05:49
S85	962	(320/108).CCLS.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/06/18 05:49
S86	2458	S84 or S85	US-PGPUB; USPAT	OR	OFF	2012/06/18 05:49
S87	511	(high adj q) same resonator same (contactless or (contact adj less) or inductive or inductively or wireless or wirelessly)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2012/06/18 05:50
S88	264	("near" adj field) same (wireless adj power)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2012/06/18 05:50
S89	163	("near" adj field) adj inductive	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2012/06/18 05:50
S90	2458	S84 or S85	US-PGPUB; USPAT	OR	OFF	2012/06/18 05:51
S91	350	S90 and "near" adj field	US-PGPUB; USPAT	OR	ON	2012/06/18 05:51
S92	11	("20040100338" | "20040233043" | "20060202665" | "20120068549" | "5053774" | "5287112" | "6772011" | "8076800" | "8076801" | "8084889" | "8097983").PN.	US-PGPUB; USPAT	OR	ON	2012/06/18 07:40
S93	4	("20030124050" | "20030126948" | "5455467" | "6772011").PN.	US-PGPUB; USPAT	OR	ON	2012/06/18 07:40
S94	2	(("7825543") or ("7741734")).PN.	USPAT; USOCR	OR	OFF	2012/06/18 08:05
S95	2	S94 and characteristic	USPAT	OR	OFF	2012/06/18 08:05
S96	1	("20030210106").PN.	US-PGPUB; USPAT	OR	OFF	2012/07/03 10:37
S97	1	("5959433").PN.	US-PGPUB; USPAT	OR	OFF	2012/07/03 10:39
S98	447	evanescent adj tail	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/07/03 10:40

S99	50	S98 and inductive	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/07/03 10:41
S100	97	S98 same power	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/07/03 10:42
S101	50	S98 same wireless$	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/07/03 10:43
S102	60	S98 and wireless$	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/07/03 10:44
S103	37316	computer same (wireless$ or inductive$) same power	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2012/07/03 11:05
S104	4230	computer same (wireless$ or inductive$) same power same (coupling or transfer)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2012/07/03 11:05
S105	56	("2967267" | "3549990" | "4038625" | "4654573" | "4697183" | "4755783" | "4914561" | "4924171" | "4996638" | "5122729" | "5157319" | "5166965").PN. OR ("5455467").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/07/03 11:06
S106	1358	computer same (wireless$ or inductive$) same power same (charging)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2012/07/03 11:09
S107	2	("2005/0151511").URPN.	USPAT	OR	OFF	2012/07/03 11:19
S108	971	(320/108).CCLS.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/07/03 11:20

S109	130	S108 and computer	USPAT	OR	OFF	2012/07/03 11:20
S110	364	S108 and computer	US-PGPUB; USPAT	OR	OFF	2012/07/03 11:21
S111	1	("20100277005").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/07/03 11:28
S112	2	(("20100277005") or ("20110049996")).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/07/03 11:29
S113	0	S112 and base	USPAT	OR	OFF	2012/07/03 11:30
S114	0	S112 and hold	USPAT	OR	OFF	2012/07/03 11:30
S115	0	S112 and portable	USPAT	OR	OFF	2012/07/03 11:31
S116	2	S112 and portable	US-PGPUB; USPAT	OR	OFF	2012/07/03 11:31
S117	2	S112 and base	US-PGPUB; USPAT	OR	OFF	2012/07/03 11:31
S118	135	S108 and contacts	USPAT	OR	OFF	2012/07/03 11:44
S119	1	("5367242").PN.	USPAT; USOCR	OR	OFF	2012/07/03 12:01
S120	0	S119 and phone	USPAT	OR	OFF	2012/07/03 12:01
S121	244	S108 and ferrite	US-PGPUB; USPAT	OR	OFF	2012/07/03 12:19
S122	1	S112 and desktop	US-PGPUB; USPAT	OR	OFF	2012/07/03 13:38
S123	2	S112 and "near"	US-PGPUB; USPAT	OR	OFF	2012/07/03 13:48
S124	2	S112 and evanescent	US-PGPUB; USPAT	OR	OFF	2012/07/03 14:44
S125	2	S112 and radiative	US-PGPUB; USPAT	OR	OFF	2012/07/03 14:46
S126	2	(("7825543") or ("7741734")).PN.	USPAT; USOCR	OR	OFF	2012/07/03 14:50
S127	1	("20100207458").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/08/13 02:46
S128	1	S127 and characteristic	US-PGPUB; USPAT	OR	OFF	2012/08/13 02:46
S129	1	("20100127575").PN.	US-PGPUB; USPAT	OR	OFF	2012/08/27 06:11
S130	1	S129 and second and third	US-PGPUB; USPAT	OR	OFF	2012/08/27 06:14
S131	0	("7687939").PN.	USPAT; USOCR	OR	OFF	2012/08/27 06:15
S132	0	("7687939").PN.	US-PGPUB; USPAT	OR	OFF	2012/08/27 06:16
S133	0	("7687939").PN.	US-PGPUB; USPAT	OR	OFF	2012/08/27 06:16
S134	1	("7741734").PN.	US-PGPUB;	OR	OFF	2012/08/27

			USPAT			06:21
S135	0	S134 and second and third	USPAT	OR	OFF	2012/08/27 06:22
S136	1	("20110074347").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/08/27 12:22
S137	3	(("20110074347") or ("7825543") or ("7741734")).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/08/27 12:23
S138	1	("20100237708").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/08/29 08:48
S139	1	S138 and housing	US-PGPUB; USPAT	OR	OFF	2012/08/29 08:49
S140	1	S138 and housing	US-PGPUB; USPAT	OR	ON	2012/08/29 09:17
S141	2	(("20101117456") or ("20080278264") or ("7825543")).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/09/04 11:41
S142	3	(("20100117456") or ("20080278264") or ("7825543")).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/09/04 11:42
S143	3	S142 and impedance	US-PGPUB; USPAT	OR	ON	2012/09/04 11:44
S144	0	S142 and (impedance same (match or matching))	US-PGPUB; USPAT	OR	ON	2012/09/04 11:45
S145	3	(("20100127573") or ("7741734") or ("7825543")).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/09/10 10:27
S146	3	S145 and characteristic	US-PGPUB; USPAT	OR	OFF	2012/09/10 10:28
S147	1706	(307/104).CCLS.	US-PGPUB; USPAT	OR	OFF	2012/09/10 12:09
S148	1095	(333/195).CCLS.	US-PGPUB; USPAT	OR	OFF	2012/09/10 12:09
S149	1017	(320/108).CCLS.	US-PGPUB; USPAT	OR	OFF	2012/09/10 12:09
S155	1	("20100096934").PN.	US-PGPUB; USPAT	OR	OFF	2012/09/10 13:29
S157	1	("20100102641").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/09/10 14:44
S159	1	("20110169339").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/09/11 07:05
S160	0	S159 and (voltage same capacitor)	USPAT	OR	OFF	2012/09/11 07:08
S161	1	S159 and (voltage same capacitor)	US-PGPUB; USPAT	OR	ON	2012/09/11 07:08
S162	1	S159 and (information same exchange)	US-PGPUB; USPAT	OR	ON	2012/09/11 07:09
S163	1	S159 and planar	US-PGPUB; USPAT	OR	ON	2012/09/11 07:18
S164	25	(high adj q) same feedback same (wireless$ or (non adj contact) or	US-PGPUB; USPAT;	OR	ON	2012/09/11 08:16

		contactless)	USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB			
S165	1110	q same feedback same (wireless$ or (non adj contact) or contactless or inductive$)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2012/09/11 08:18
S166	78	q same feedback same (wireless$ or (non adj contact) or contactless or inductive$) same power same transfer	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2012/09/11 08:18
S167	1019	(320/108).CCLS.	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2012/09/11 08:21
S168	1794	(307/104).CCLS.	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2012/09/11 08:21
S169	0	("032or33").PN.	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2012/09/11 08:22
S170	2717	S167 or S168	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/09/11 08:22
S171	485	S170 and feedback	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/09/11 08:22
S172	507	S170 and (secondary same current same voltage)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/09/11 09:33
S173	128	S170 and (secondary same current same voltage same resonant)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/09/11 09:33
S174	145	(implant$) and (secondary same	US-PGPUB;	OR	OFF	2012/09/11

		current same voltage same resonant)	USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB			10:29
S175	9	tet same (secondary same current same voltage same resonant)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/09/11 10:39
S176	45	tet and (secondary same current same voltage same resonant)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/09/11 10:40
S177	54	tet and (secondary same power same resonant)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/09/11 10:40
S178	316	tet and (power same feedback)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/09/11 10:45
S179	126	high same q same wireless same power same transfer	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2012/09/11 11:12
S180	1790	(307/104).CCLS.	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2012/09/21 20:55
S181	1013	(320/108).CCLS.	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2012/09/21 20:56
S183	0	20016655u1	EPO; DERWENT	OR	OFF	2012/09/30 18:52
S184	9	"20016655"	EPO; DERWENT	OR	OFF	2012/09/30 18:52
S185	3	"10221484"	EPO; DERWENT	OR	OFF	2012/09/30 18:53
S186	0	("200902677710").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/09/30 19:05
S187	1	("20090267710").PN.	US-PGPUB; USPAT;	OR	OFF	2012/09/30 19:05

			USOCR			
S188	0	S187 and radiative	USPAT	OR	OFF	2012/09/30 19:05
S189	0	S187 and nonradiative	USPAT	OR	OFF	2012/09/30 19:05
S190	0	S187 and nonradiative	US-PGPUB	OR	OFF	2012/09/30 19:05
S191	1	S187 and radiative	US-PGPUB; USPAT	OR	OFF	2012/09/30 19:06
S192	2	(("7825543") or ("7741734")).PN.	USPAT; USOCR	OR	OFF	2012/10/01 07:01
S193	1020	(320/108).CCLS.	US-PGPUB; USPAT	OR	OFF	2012/10/01 07:16
S194	746	(320/109).CCLS.	US-PGPUB; USPAT	OR	OFF	2012/10/01 07:16
S195	67	S193 and S194	US-PGPUB; USPAT	OR	OFF	2012/10/01 07:16
S196	1	("20110018361").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/10/01 08:01
S197	1	S196 and motorized	US-PGPUB; USPAT	OR	OFF	2012/10/01 08:01
S198	1	S196 and movement	US-PGPUB; USPAT	OR	OFF	2012/10/01 08:02
S199	1	S196 and position	US-PGPUB; USPAT	OR	OFF	2012/10/01 08:04
S200	1	("20100327660").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/10/01 09:41
S201	1	S200 and optimize	US-PGPUB; USPAT	OR	OFF	2012/10/01 09:41
S202	1	S200 and optimizing	US-PGPUB; USPAT	OR	OFF	2012/10/01 09:43
S203	1	S200 and optimiz$	US-PGPUB; USPAT	OR	OFF	2012/10/01 09:44
S204	1	("20110074218").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/10/01 17:14
S205	3	(("20100123354") or ("20100123353") or ("20090267710")).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/11/23 11:14
S206	3	S205 and resonator	US-PGPUB; USPAT	OR	OFF	2012/11/23 11:19
S207	60	"7741734"	US-PGPUB; USPAT	OR	OFF	2012/11/23 12:01
S208	1	("7741734").PN.	USPAT; USOCR	OR	OFF	2012/11/23 12:01
S209	1	("7741734").PN.	USPAT; USOCR	OR	OFF	2012/11/26 19:58
S210	0	S209 and storing	USPAT	OR	OFF	2012/11/26 19:58
S211	0	S209 and store	USPAT	OR	OFF	2012/11/26 19:58
S212	0	S209 and store	USPAT	OR	ON	2012/11/26

InductEV, Inc.
Exhibit 1031
Page 1447

						20:05
S213	1	S209 and energy	USPAT	OR	ON	2012/11/26 20:05
S214	1	S209 and stored	USPAT	OR	ON	2012/11/26 20:07
S215	1	S209 and intrinsic	USPAT	OR	ON	2012/11/26 20:12
S216	2	(("6960968") or ("7069064")).PN.	USPAT; USOCR	OR	OFF	2012/12/10 15:46
S217	1802	(307/104).CCLS.	US-PGPUB; USPAT	OR	OFF	2012/12/10 22:53
S219	4	(("20110140544") or ("20100117456") or ("7825543") or ("7741734")).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/12/17 08:16
S220	4	S219 and acoustic	US-PGPUB; USPAT	OR	OFF	2012/12/17 08:16
S221	233	acoustic near3 power near3 transmission	US-PGPUB; USPAT	OR	ON	2012/12/17 08:17
S222	34	S221 and resonant	US-PGPUB; USPAT	OR	ON	2012/12/17 08:17
S223	774	(self adj (resonant or resonating)) near5 (coil or loop)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/01/24 09:19
S224	593	(self adj (resonant or resonating)) near2 (coil or loop)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/01/24 09:20
S225	303	(self adj (resonant or resonating)) adj (coil or loop)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/01/24 09:20
S226	123	("3859624" | "4450431" | "4630044" | "4658263" | "4868915").PN. OR ("5084699").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/01/24 09:29
S227	23	S223 same ("near" adj field)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/01/24 09:38
S228	1	("5012236").PN.	USPAT; USOCR	OR	OFF	2013/01/24 09:40
S229	900	self near2 (resonant or resonate or resonance or resonating) near2 (coil or loop)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO;	OR	ON	2013/01/24 12:09

			DERWENT; IBM_TDB			
S230	2524	(307/104).CCLS.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/01/24 12:19
S231	209	S230 and (self near2 (resonant or resonate or resonance or resonating))	US-PGPUB; USPAT; USOCR	OR	ON	2013/01/24 12:19
S232	782	S229 or S231	US-PGPUB; USPAT; USOCR	OR	ON	2013/01/24 12:20
S233	209	S230 and (self near2 (resonant or resonate or resonance or resonating))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/01/24 12:20
S234	957	S233 or S229	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/01/24 12:20
S235	17	self same resonant same coil same transponder	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/02/07 10:50
S236	1	("20100231053").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/02/21 08:45
S237	2993	contactless same (energy or power)	EPO; JPO; DERWENT	OR	OFF	2013/02/28 01:50
S238	137	contactless same (energy or power) same (resonant or resonance or resonating)	EPO; JPO; DERWENT	OR	ON	2013/02/28 01:50
S239	934	wireless same (energy or power) same (resonant or resonance or resonating)	EPO; JPO; DERWENT	OR	ON	2013/02/28 02:15
S240	233	wireless same (energy or power) same (resonant or resonance or resonating) same coil	EPO; JPO; DERWENT	OR	ON	2013/02/28 02:15
S241	118	wireless same (energy or power) same q	EPO; JPO; DERWENT	OR	ON	2013/02/28 02:23
S242	29	wireless same (energy or power) same (resonant or resonance or resonating) same q	EPO; JPO; DERWENT	OR	ON	2013/02/28 02:29
S243	0	(h02j5/0005).IPCR.	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2013/02/28 08:48
S244	975	h02j5/005.cpc.	US-PGPUB; USPAT; EPO; JPO;	OR	OFF	2013/02/28 08:52

			DERWENT			
S245	0	h02j5/005.cpc.	EPO; JPO; DERWENT	OR	OFF	2013/02/28 08:55
S246	0	h02j5/005	EPO; JPO; DERWENT	OR	OFF	2013/02/28 08:55
S247	0	h02j5/005.cpc.	EPO; JPO; DERWENT	OR	OFF	2013/02/28 09:03
S248	0	h02j5.cpcl.	EPO; JPO; DERWENT	OR	OFF	2013/02/28 09:06
S249	0	h02j.cpcl.	EPO; JPO; DERWENT	OR	OFF	2013/02/28 09:07
S250	9041	h02j17/00	EPO; JPO; DERWENT	OR	OFF	2013/02/28 09:18
S251	0	h02j17/00	EPO	OR	OFF	2013/02/28 09:21
S252	7452	h02j17/00	DERWENT	OR	OFF	2013/02/28 09:21
S253	9041	h02j17/00	JPO; DERWENT	OR	OFF	2013/02/28 09:21
S254	1589	h02j17/00	JPO	OR	OFF	2013/02/28 09:21
S255	0	h02j17/00.ipc.	EPO	OR	OFF	2013/02/28 09:26
S256	0	h02j17/00.ipc.	DERWENT	OR	OFF	2013/02/28 09:26
S257	0	h02j17/00.epc.	EPO	OR	OFF	2013/02/28 09:27
S258	0	H02J17/00.epc.	EPO	OR	OFF	2013/02/28 09:27
S259	0	H02J17/00.ipc.	EPO	OR	OFF	2013/02/28 09:27
S260	1589	H02J17/00.ipc.	JPO	OR	OFF	2013/02/28 09:28
S261	1095	S252 and q	DERWENT	OR	OFF	2013/02/28 09:28
S262	25	S252 and (high adj q)	DERWENT	OR	OFF	2013/02/28 09:30
S263	1	schuerman and (high adj q)	USPAT	OR	OFF	2013/02/28 09:32
S264	1	("5053774").PN.	USPAT	OR	OFF	2013/02/28 09:32
S265	8	schuerman and q	USPAT	OR	OFF	2013/02/28 09:36
S266	1	("5374930").PN.	USPAT; USOCR	OR	OFF	2013/02/28 09:39
S267	97	("5287112").PN. OR ("5374930").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/02/28 09:39
S268	230	S252 and (resonator)	DERWENT	OR	OFF	2013/02/28 09:45
S269	242	S252 and (resonator)	DERWENT	OR	ON	2013/02/28 09:46
S270	554	S252 and (resonant)	DERWENT	OR	ON	2013/02/28 09:51

S271	61	transponder and (resonance or resonant or resonating) and q	JPO; DERWENT; IBM_TDB	OR	ON	2013/02/28 10:34
S272	1	("5095224").PN.	USPAT; USOCR	OR	OFF	2013/02/28 10:44
S273	43	("3166718" | "3360732" | "3391345" | "4345604" | "4489370" | "4584499" | "4654574" | "4675796" | "4694387" | "4743789" | "4829415").PN. OR ("5095224").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/02/28 10:44
S274	1069	S252 and resonance	DERWENT	OR	OFF	2013/02/28 10:47
S275	44	S274 and quality	DERWENT	OR	OFF	2013/02/28 10:47
S276	541	S252 and resonance and coil	DERWENT	OR	OFF	2013/02/28 10:48
S277	557	S252 and resonance and coil	DERWENT	OR	ON	2013/02/28 10:48
S278	71	(high adj q) and coil and resonance	DERWENT	OR	ON	2013/02/28 10:59
S279	453	(high adj q) same coil same resonance	US-PGPUB; USPAT	OR	ON	2013/02/28 11:03
S280	33	(high adj q) same transponder same power	US-PGPUB; USPAT	OR	ON	2013/02/28 11:22
S281	34	(high adj q) same wireless$ same power	EPO; JPO; DERWENT	OR	ON	2013/02/28 11:45
S282	786	(resonance or resonator or resonating) same wireless$ same power	EPO; JPO; DERWENT	OR	ON	2013/02/28 11:46
S283	521	(resonance or resonator or resonating) same inductive$ same power	EPO; JPO; DERWENT	OR	ON	2013/02/28 11:53
S284	41	S252 and meter	EPO; JPO; DERWENT	OR	ON	2013/02/28 12:04
S285	108	"10" and power and distance and resonant	EPO; JPO; DERWENT	OR	ON	2013/02/28 14:47
S286	7452	h02j17/00	DERWENT	OR	OFF	2013/02/28 14:51
S287	77	S286 and power and distance and resonant	EPO; JPO; DERWENT	OR	ON	2013/02/28 14:51
S288	477	magnetic and resonant and power and (transfer or transmission or coupling)	EPO; JPO; DERWENT	OR	ON	2013/02/28 14:52
S289	39	S286 and repeater	EPO; JPO; DERWENT	OR	ON	2013/02/28 15:02
S290	2569	(307/104).CCLS.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/02/28 15:04
S291	145	S290 and repeater	US-PGPUB; USPAT	OR	ON	2013/02/28 15:04
S292	67	implant same repeater	US-PGPUB; USPAT	OR	ON	2013/02/28 15:07
S293	9	"near field" and q and loop	EPO; JPO; DERWENT	OR	ON	2013/03/01 10:26
S294	193	"near field" and loop	EPO; JPO; DERWENT	OR	ON	2013/03/01 10:27
S295	201	"near field" and power and transmission	EPO; JPO; DERWENT	OR	ON	2013/03/01 10:31

S296	1374	"near field" same power same transmission	US-PGPUB; USPAT	OR	ON	2013/03/01 10:33
S297	130	"near field" same power same transmission same q	US-PGPUB; USPAT	OR	ON	2013/03/01 10:33
S298	160	"near field" same power same transmission same resonance	US-PGPUB; USPAT	OR	ON	2013/03/01 10:35
S299	256	"near field" same (wireless or contactless or inductive) same resonance	US-PGPUB; USPAT	OR	ON	2013/03/01 10:36
S300	101	("3036295" | "3137847" | "3182314" | "3182315" | "3218638" | "3299424" | "3363246" | "3467962" | "3518546" | "3522602" | "3737911" | "3739279").PN. OR ("4160971").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/03/01 10:39
S301	228	"wireless power transfer"	EPO; JPO; DERWENT	OR	OFF	2013/03/01 10:42
S302	807	"wireless power transfer"	US-PGPUB; USPAT	OR	OFF	2013/03/01 10:46
S303	110	"contactless power transfer"	US-PGPUB; USPAT	OR	OFF	2013/03/01 10:51
S304	3053	((contactless or wireless$ or inductive$) adj power)	EPO; JPO; DERWENT	OR	ON	2013/03/01 10:57
S305	7642	((contactless or wireless or inductive or inductively) adj3 power)	EPO; JPO; DERWENT	OR	ON	2013/03/01 10:58
S306	3011	((contactless or wireless or inductive or inductively) adj power)	EPO; JPO; DERWENT	OR	ON	2013/03/01 10:58
S307	56	((contactless or wireless or inductive or inductively) adj3 power) same q	EPO; JPO; DERWENT	OR	ON	2013/03/01 10:58
S308	115	((contactless or wireless or inductive or inductively) adj3 power) and ("near" adj field)	EPO; JPO; DERWENT	OR	ON	2013/03/01 11:00
S309	522	((contactless or wireless or inductive or inductively) adj3 power) same ("near" adj field)	US-PGPUB; USPAT	OR	ON	2013/03/01 11:01
S310	392	(self adj resonance) same q	US-PGPUB; USPAT	OR	ON	2013/03/01 11:04
S311	2569	(307/104).CCLS.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/03/01 11:10
S312	48	S311 and quality	USPAT	OR	OFF	2013/03/01 11:10
S313	331	S311 and quality	US-PGPUB; USPAT	OR	OFF	2013/03/01 11:10
S314	264	S311 and (q adj factor)	US-PGPUB; USPAT	OR	OFF	2013/03/01 11:11
S315	303	(self adj (resonance or resonating)) and (q adj factor)	US-PGPUB; USPAT	OR	OFF	2013/03/01 11:12
S316	102	(loop adj antenna) same q same resonance	US-PGPUB; USPAT	OR	ON	2013/03/01 11:15
S317	1	("7741734").PN.	USPAT; USOCR	OR	OFF	2013/03/01 11:26
S318	0	S317 and yates	USPAT	OR	OFF	2013/03/01 11:26
S319	1	S317 and optimal	USPAT	OR	OFF	2013/03/01

						11:26
S320	1	S317 and markoff	USPAT	OR	OFF	2013/03/01 11:26
S321	1	("7741734").PN.	USPAT; USOCR	OR	OFF	2013/03/01 23:46
S322	4	"3824972"	EPO; DERWENT	OR	OFF	2013/03/02 00:54
S323	235	magnetic adj antenna	EPO; JPO; DERWENT	OR	OFF	2013/03/02 01:48
S324	252	magnetic adj antenna	EPO; JPO; DERWENT	OR	ON	2013/03/02 01:48
S325	680	magnetic adj antenna	US-PGPUB; USPAT	OR	ON	2013/03/02 02:05
S326	28	S325 same q	US-PGPUB; USPAT	OR	ON	2013/03/02 02:06
S327	290	S325 and "near field"	US-PGPUB; USPAT	OR	ON	2013/03/02 02:08
S328	10	("20040046663" | "20050086264" | "20050178832" | "6236315" | "6259369" | "6839035" | "7005968").PN. OR ("7280045").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/03/02 02:17
S329	133	(quality adj factor) same (loss adj rate)	US-PGPUB; USPAT; USOCR	OR	ON	2013/03/02 02:51
S330	70	(quality adj factor) same (loop adj antenna)	US-PGPUB; USPAT; USOCR	OR	ON	2013/03/02 02:52
S331	11	(quality adj factor) and (loop adj antenna)	EPO; JPO; DERWENT	OR	ON	2013/03/02 02:59
S332	321	(quality adj factor) and (resonant adj frequency)	EPO; JPO; DERWENT	OR	ON	2013/03/02 03:08
S333	265	(quality adj factor) same (resonant adj frequency)	EPO; JPO; DERWENT	OR	ON	2013/03/02 03:08
S334	1587	(quality adj factor) same (resonant adj frequency)	USPAT	OR	ON	2013/03/02 03:12
S335	1	("20100207458").PN.	US-PGPUB; USPAT	OR	OFF	2013/06/02 08:29
S336	0	S335 and dynamically	USPAT	OR	OFF	2013/06/02 08:34
S337	0	S335 and dynamic$	USPAT	OR	OFF	2013/06/02 08:55
S338	0	S335 and intrinsic	USPAT	OR	OFF	2013/06/02 09:09
S339	0	S335 and dynamically	US-PGPUB; USPAT	OR	OFF	2013/06/02 09:11
S340	1	S335 and intrinsic	US-PGPUB; USPAT	OR	OFF	2013/06/02 09:11
S341	0	S335 and " high intrinsic"	US-PGPUB; USPAT	OR	OFF	2013/06/02 09:13
S342	1	S335 and high	US-PGPUB; USPAT	OR	OFF	2013/06/02 09:13
S343	1	S335 and rate	US-PGPUB; USPAT	OR	OFF	2013/06/02 09:16

S344	1	("20110089895").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/06/03 01:10
S345	1	S344 and repeater	US-PGPUB; USPAT	OR	OFF	2013/06/03 01:10
S346	1	S344 and enhances	US-PGPUB; USPAT	OR	OFF	2013/06/03 01:12
S347	1	S344 and "coupling mode region"	US-PGPUB; USPAT	OR	OFF	2013/06/03 01:13
S348	0	qualcom and "coupling mode region"	US-PGPUB; USPAT	OR	OFF	2013/06/03 01:14
S349	0	qualcom and (wireless same repeater same "near" same field)	US-PGPUB; USPAT	OR	OFF	2013/06/03 01:15
S350	16	qualcom and (wireless same repeater)	US-PGPUB; USPAT	OR	OFF	2013/06/03 01:15
S351	6	nigel and (wireless same repeater)	US-PGPUB; USPAT	OR	OFF	2013/06/03 01:16
S352	1	("20090284218").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/06/03 01:20
S353	1	("20090286470").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/06/03 01:23
S354	2	(("20100207458") or ("20110089895")).PN.	US-PGPUB; USPAT	OR	OFF	2013/06/03 15:30
S355	2	(("20090224856") or ("20110089895")).PN.	US-PGPUB; USPAT	OR	OFF	2013/06/03 15:32
S356	1	("20090286470").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/06/03 15:39
S357	1	S356 and (resonant or resonator)	US-PGPUB; USPAT	OR	ON	2013/06/03 15:39
S358	0	S356 and q	US-PGPUB; USPAT	OR	ON	2013/06/03 15:57
S359	66	("2274557" | "3694803" | "3723966" | "3798642" | "3806905" | "3911434" | "3990041" | "4067235" | "4074227" | "4174515" | "4303910").PN. OR ("4450431").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/06/03 17:03
S360	11	("20040046663" | "20050086264" | "20050178832" | "6236315" | "6259369" | "6839035" | "7005968").PN. OR ("7280045").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/06/03 17:20
S361	36228	(rfid or (rf adj2 id)) smae passive same repeater	EPO; JPO; DERWENT	OR	ON	2013/06/03 17:26
S362	6	(rfid or (rf adj2 id)) same passive same repeater	EPO; JPO; DERWENT	OR	ON	2013/06/03 17:26
S363	11	(rfid or (rf adj2 id)) near2 passive near2 repeater	US-PGPUB; USPAT	OR	ON	2013/06/03 19:50
S364	73	(rfid or (rf adj2 id)) near2 repeater	US-PGPUB; USPAT	OR	ON	2013/06/03 19:51
S365	3	(("8097983") or ("7825543") or ("7741734")).PN.	USPAT; USOCR	OR	OFF	2013/06/03 20:13
S366	3	(("8097983") or ("7825543") or ("7741734") or	US-PGPUB; USPAT	OR	OFF	2013/06/03 20:15

		("201100898985")).PN.				
S367	0	S366 and repeater	US-PGPUB; USPAT	OR	ON	2013/06/03 20:16
S368	4	(("8097983") or ("7825543") or ("7741734") or ("20110089895")).PN.	US-PGPUB; USPAT	OR	OFF	2013/06/03 20:17
S369	1	S368 and repeater	US-PGPUB; USPAT	OR	OFF	2013/06/03 20:17
S370	0	tranponder same resonator	EPO; JPO; DERWENT	OR	OFF	2013/06/05 09:37
S371	64	transponder same resonator	EPO; JPO; DERWENT	OR	ON	2013/06/05 09:37
S372	103	transponder near5 resonator	US-PGPUB; USPAT	OR	ON	2013/06/05 09:45
S373	36	transponder same resonator same q	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/06/05 09:50
S374	36	transponder same resonator same q and resonator	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/06/05 09:56
S375	7	("20030161511" | "20030200814" | "20070176773" | "5443987" | "5663072" | "6025725" | "6204764").PN. OR ("7714593").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/06/05 09:58
S376	32	rfid same resonator same q	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/06/05 09:59
S377	7	rfid and resonator and q	EPO; JPO; DERWENT	OR	ON	2013/06/05 10:01
S378	112	tire and pressure and resonator	EPO; JPO; DERWENT	OR	ON	2013/06/05 10:02
S379	1	("4450431").PN.	USPAT; USOCR	OR	OFF	2013/06/05 17:13
S380	0	S379 and resonator	USPAT	OR	OFF	2013/06/05 17:13
S381	1	S379 and resonant	USPAT	OR	OFF	2013/06/05 17:13
S382	4	(("8097983") or ("7825543") or ("7741734") or ("20110089895")).PN.	US-PGPUB; USPAT	OR	OFF	2013/06/11 08:29
S383	4	S382 and enhanc$	US-PGPUB; USPAT	OR	OFF	2013/06/11 08:29
S384	1	S382 and "loop inductor"	US-PGPUB; USPAT	OR	OFF	2013/06/11 09:05

S385	2	hochstein and tire and pressure and "267,261"	US-PGPUB; USPAT	OR	OFF	2013/06/11 10:28
S386	6	("3662335" | "3806905" | "3858174" | "4006449" | "4074227" | "4174515").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/06/11 10:43
S387	2	("2274557").PN.	USPAT; USOCR	OR	OFF	2013/06/11 10:49
S388	3	(("2274557") or ("3723966")).PN.	USPAT; USOCR	OR	OFF	2013/06/11 10:49
S389	4	(tire adj pressure) same resonant same repeat$	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2013/06/11 13:44
S390	39	(tire adj pressure) same resonant same passive	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2013/06/11 13:52
S391	2	contactless same resonant same repeater	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/06/11 13:54
S392	87	wireless$ same resonant same repeater	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/06/11 13:54
S393	1	wireless$ same resonant same extender	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/06/11 13:56
S394	2	rfid same resonant same extender	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/06/11 13:56
S395	5	rfid same resonant same repeater	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/06/11 13:57
S396	1	rfid and resonant and repeater	FPRS; EPO; JPO;	OR	ON	2013/06/11 13:58

			DERWENT; IBM_TDB			
S397	0	rfid and resonant and extender	FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/06/11 13:58
S398	6	rfid and extender	FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/06/11 13:58
S399	73	rfid and booster	FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/06/11 14:01
S400	14	rfid and booster and range	FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/06/11 14:01
S401	176	rfid and passive and range	FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/06/11 14:02
S402	1150	rfid same range same (boost$ or (extend or extender or extending))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/06/11 14:28
S403	814	rfid same range same (extend or extender or extending)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/06/11 14:29
S404	172	rfid same range same (extend or extender or extending) same passive$	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/06/11 14:29
S405	7	("5379455" | "5600333" | "6107910" | "6137403" | "6223990" | "6278413" | "6359444").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/06/11 14:34
S406	284	rfid same range same improved same antenna	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/06/11 14:37
S407	1	("8097983").PN.	USPAT; USOCR	OR	OFF	2013/06/12 00:16
S408	1	("5053774").PN.	USPAT; USOCR	OR	OFF	2013/06/12 00:40
S409	97	rfid same resonant same detun$	US-PGPUB; USPAT;	OR	OFF	2013/06/12 01:44

			USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB			
S410	97	rfid same resonant same detun$	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/06/12 01:44
S411	76	resonator same resonant same frequency same q same l same c	USPAT	OR	OFF	2013/06/12 16:27
S412	148	resonator same resonant same frequency same q same l same c	US-PGPUB	OR	OFF	2013/06/12 16:31
S413	0	rfid same resonant same frequency same q same l same c	US-PGPUB	OR	OFF	2013/06/12 16:33
S414	12	transponder same resonant same frequency same q same l same c	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/06/12 17:19
S415	112	transponder same resonant same frequency same q	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/06/12 17:44
S416	4206	l same c same resonant same frequency same q	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/06/12 17:52
S417	19	l same c same resonant same frequency same q	FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/06/12 17:52
S418	1	charger same resonant same frequency same q	FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/06/12 17:54
S419	47	charger same resonant same frequency same q	US-PGPUB; USPAT	OR	ON	2013/06/12 17:55
S420	429	(resonant adj circuit) near5 resonator	USPAT	OR	ON	2013/06/12 18:58
S421	51	(resonant adj circuit) near5 resonator same q	USPAT	OR	ON	2013/06/12 18:58
S422	74	("3440633" | "4429314" | "4712070" | "5084699").PN. OR ("5373303").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/06/12 19:03
S423	56	(resonant adj circuit) near5 resonator same LC	USPAT	OR	ON	2013/06/12 19:06

S424	2101	(307/104).CCLS.	US-PGPUB; USPAT	OR	OFF	2013/06/12 19:08
S425	1298	(320/108).CCLS.	US-PGPUB; USPAT	OR	OFF	2013/06/12 19:08
S426	1432	S424 or S425	USPAT	OR	OFF	2013/06/12 19:09
S427	62	S426 and resonator	USPAT	OR	OFF	2013/06/12 19:09
S428	1	("20100127575").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/06/12 23:35
S429	1	S428 and resonator	US-PGPUB; USPAT	OR	ON	2013/06/12 23:35
S430	35	mouse and pad and (cordless or noncontact$ or contactless$ or inductive$) and power	EPO; JPO; DERWENT	OR	ON	2013/09/30 13:26
S431	19	mouse same pad same (cordless or noncontact$ or contactless$ or inductive$) same power	EPO; JPO; DERWENT	OR	ON	2013/09/30 13:46
S432	72	mouse same pad same (cordless or noncontact$ or contactless$ or inductive$) same power	US-PGPUB; USPAT	OR	ON	2013/09/30 13:48
S433	20	("20070090790" | "7518267" | "20070090790" | "20100109445" | "20080278112" | "7741734" | "20100041332" | "7826873" | "8013568" | "20090284083" | "20100045114" | "7825543" | "20080278264" | "20100289449" | "20080278264" | "8339096" | "20050134213" | "8040103" | "20100148589" | "6008622" | "20090237029" | "20100127660").PN.	US-PGPUB; USPAT	OR	ON	2013/09/30 14:18
S434	8	q same (resonant or resonance or resonator) same charging same ("near" adj field)	US-PGPUB; USPAT	OR	ON	2013/09/30 14:24
S435	5	q and (resonant or resonance or resonator) and charging and ("near" adj field)	EPO; JPO; DERWENT	OR	ON	2013/09/30 14:26
S436	45	q and (resonant or resonance or resonator) and ("near" adj field)	EPO; JPO; DERWENT	OR	ON	2013/09/30 14:27
S437	503	q same (resonant or resonance or resonator) same ("near" adj field)	US-PGPUB; USPAT	OR	ON	2013/09/30 14:28
S438	296	q same (resonant or resonance or resonator) same ("near" adj field) same power	US-PGPUB; USPAT	OR	ON	2013/09/30 14:29
S439	854	(q same (resonant or resonance or resonator) same power) and ("near" adj field)	US-PGPUB; USPAT	OR	ON	2013/09/30 14:32
S440	120	q and (resonant or resonance or resonator) and transmitter and power	EPO; JPO; DERWENT	OR	ON	2013/09/30 15:07
S441	23	q same (resonant or resonance or resonator) same transmitter same power	EPO; JPO; DERWENT	OR	ON	2013/09/30 15:13
S442	418	q same (resonant or resonance or	US-PGPUB;	OR	ON	2013/09/30

		resonator) same transmitter same power	USPAT			15:13
S443	184	(US-20030114769-$ or US-20110281528-$ or US-20090153273-$ or US-20050206479-$ or US-20050174197-$ or US-20040037363-$ or US-20090010028-$ or US-20080197710-$ or US-20070276538-$ or US-20070267918-$ or US-20070145830-$ or US-20050288740-$ or US-20050085873-$ or US-20020105343-$ or US-20020032471-$ or US-20050288741-$ or US-20040233043-$ or US-20040032363-$ or US-20040030260-$ or US-20030130708-$ or US-20070142872-$ or US-20060025830-$ or US-20040199212-$ or US-20020097770-$ or US-20090051224-$ or US-20030135971-$).did. or (US-20030124050-$ or US-20030126948-$ or US-20040263307-$ or US-20050007067-$ or US-20030210106-$ or US-20050151511-$ or US-20040189246-$ or US-20020089305-$ or US-20110285214-$ or US-20110101790-$ or US-20100066176-$ or US-20100036773-$ or US-20100007307-$ or US-20090174263-$ or US-20060071632-$ or US-20100289449-$ or US-20080001572-$ or US-20060012371-$ or US-20050258966-$ or US-20040000974-$ or US-20040134985-$ or US-20080218314-$ or US-20070241762-$ or US-20030137446-$ or US-20020130778-$ or US-20050237198-$ or US-20050104790-$).did. or (US-20050275629-$ or US-20040196262-$ or US-20040145567-$ or US-20100127660-$ or US-20040130425-$).did. or (US-6047214-$ or US-6307468-$ or US-6483202-$ or US-7994880-$ or US-4654573-$ or US-5367242-$ or US-6430069-$ or US-6906495-$ or US-7521890-$ or US-7599743-$ or US-6009350-$ or US-5630835-$ or US-7622891-$ or US-5519262-$ or US-6561975-$ or US-4516097-$ or US-5455467-$ or US-7825543-$ or US-7741734-$ or US-6307440-$ or US-6217604-$ or US-5057809-$ or US-6170026-$ or US-7084605-$ or US-6844702-$ or US-6184651-$).did. or (US-5923544-$ or US-4082097-$ or US-7495414-$ or US-5654621-$ or US-5702431-$ or US-5498948-$ or US-5703461-$ or US-5084699-$ or US-4450431-$ or US-4630044-$ or US-5317330-$ or US-5703573-$ or US-8310108-$ or US-6424820-$ or US-4471343-$ or US-5374930-$ or US-5053774-$ or US-5250944-$ or US-5099227-$ or	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2013/09/30 15:22

		US-4560445-$ or US-5541604-$ or US-5420579-$ or US-5287112-$ or US-6489745-$ or US-4656472-$ or US-7541930-$ or US-7280045-$).did. or (US-6839035-$ or US-4588978-$ or US-2274557-$ or US-5373303-$ or US-5550536-$ or US-5864323-$ or US-5033295-$ or US-7075435-$ or US-6563425-$ or US-6650227-$ or US-7826873-$ or US-7518267-$ or US-6008622-$ or US-3949388-$ or US-6211799-$ or US-4059801-$).did. or (EP-1538558-$ or WO-2004015885-$ or EP-1434160-$ or EP-558316-$ or DE-3824972-$ or EP-549832-$ or DE-3941509-$ or EP-849700-$).did. or (JP-2002075736-$ or JP-2005026741-$ or JP-2004206383-$ or JP-2004206245-$ or JP-11075329-$ or JP-2008125127-$ or JP-02162222-$).did. or (JP-11144962-$ or JP-02097005-$ or DE-20016655-$ or DE-10221484-$ or EP-1408456-$ or EP-945829-$ or US-7147604-$ or KR-2004072581-$ or US-20040127248-$ or EP-1071038-$ or EP-1071039-$ or JP-2000270501-$ or JP-11305848-$ or DE-19651719-$ or US-5374930-$ or US-5287112-$ or US-4802080-$ or DE-10152863-$ or DE-10152858-$ or EP-473957-$ or JP-11075329-$ or JP-08126230-$ or US-20050063488-$ or US-5697076-$ or DD-225565-$ or US-20070145830-$).did. or (WO-2007034421-$ or WO-9811505-$ or WO-9811504-$ or US-4275377-$ or US-4180795-$ or FR-2896898-$ or SG-112842-$ or WO-2005055121-$ or WO-0215112-$ or US-20060061324-$ or US-20050275629-$ or US-20040189246-$ or US-20030103039-$ or JP-2001159948-$ or JP-10260781-$).did.				
S444	52841	S443 and q or ("near" adj field)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2013/09/30 15:23
S445	90	S443 and (q or ("near" adj field))	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2013/09/30 15:23
S446	2	(("20020070718") or ("20100164292")).PN.	US-PGPUB	OR	OFF	2013/09/30 15:43
S447	1	("7906871").PN.	US-PGPUB; USPAT	OR	OFF	2013/09/30 15:45
S448	1000	(307/104).CCLS.	USPAT	OR	OFF	2013/09/30 15:57
S449	13	S448 and fleming and young	USPAT	OR	OFF	2013/09/30 15:57
S450	12	("20040046663" | "20050086264" | "20050178832" | "6236315" | "6259369" | "6839035" |	US-PGPUB; USPAT; USOCR	OR	OFF	2013/09/30 16:22

		"7005968").PN. OR ("7280045").URPN.				
S451	28	("20020044058" | "20030043949" | "5168282" | "5285177" | "5420579" | "6069564" | "6118379" | "6147606" | "6278413" | "6281794" | "6396438" | "6400274" | "6480110" | "6516182").PN. OR ("6839035").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/09/30 16:23
S452	14	("20070080804" | "6016409" | "6259369" | "6351621" | "6377764" | "6839035").PN. OR ("7504951").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/09/30 16:25
S453	9	("20050162331" | "5270717" | "5580664" | "6480110" | "6839035" | "6924777" | "7119671" | "7126552" | "7439863").PN. OR ("7696884").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/09/30 16:26
S454	30	("4737789" | "5057844").PN. OR ("5270717").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/09/30 16:29
S455	95	wireless$ and powered and television	EPO; JPO; DERWENT	OR	ON	2013/09/30 18:03
S456	1577132	wireless$ said powered said television	US-PGPUB; USPAT	OR	ON	2013/09/30 18:06
S457	722	wireless$ same powered same television	US-PGPUB; USPAT	OR	ON	2013/09/30 18:07
S458	129	wireless$ and powered and appliance	EPO; JPO; DERWENT	OR	ON	2013/09/30 18:10
S459	20	inductive$ and powered and appliance	EPO; JPO; DERWENT	OR	ON	2013/09/30 18:12
S460	81	inductive$ same powered same appliance	US-PGPUB; USPAT	OR	ON	2013/09/30 18:13
S461	32	("2133494" | "2415688" | "3320512" | "3530499" | "3710062").PN. OR ("3761668").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/09/30 18:23
S462	47	("2133494").URPN.	USPAT	OR	OFF	2013/09/30 18:35
S463	11	inductive$ and energiz$ and appliance	EPO; JPO; DERWENT	OR	ON	2013/09/30 18:38
S464	676	(noncontact or (non adj contact) or contactless$) and appliance	EPO; JPO; DERWENT	OR	ON	2013/09/30 18:40
S465	4095392	(noncontact or (non adj contact) or contactless$) and appliance (power or energy)	EPO; JPO; DERWENT	OR	ON	2013/09/30 18:40
S466	213	(noncontact or (non adj contact) or contactless$) and appliance and (power or energy)	EPO; JPO; DERWENT	OR	ON	2013/09/30 18:40
S467	120	(noncontact or (non adj contact) or contactless$) and tv and (power or energy)	EPO; JPO; DERWENT	OR	ON	2013/09/30 19:11
S468	51	(noncontact or (non adj contact) or contactless$) same tv same (power or energy)	US-PGPUB; USPAT	OR	ON	2013/09/30 19:14
S469	14	(noncontact or (non adj contact) or contactless$) and desktop and (power or energy)	EPO; JPO; DERWENT	OR	ON	2013/09/30 19:17

S470	256	(noncontact or (non adj contact) or contactless$) and (desk or table) and (power or energy)	EPO; JPO; DERWENT	OR	ON	2013/09/30 19:18
S471	1297	(noncontact or (non adj contact) or contactless$) and distance and (power or energy)	EPO; JPO; DERWENT	OR	ON	2013/09/30 19:26
S472	2368531	(noncontact or (non adj contact) or contactless$) and distance and (power or energy) separat$	EPO; JPO; DERWENT	OR	ON	2013/09/30 19:26
S473	104	(noncontact or (non adj contact) or contactless$) and distance and (power or energy) and separat$	EPO; JPO; DERWENT	OR	ON	2013/09/30 19:26
S474	30	(noncontact or (non adj contact) or contactless$) same distance same (power or energy) same separat$	EPO; JPO; DERWENT	OR	ON	2013/09/30 19:36
S475	322	(noncontact or (non adj contact) or contactless$) same distance same (power or energy) same separat$	US-PGPUB; USPAT	OR	ON	2013/09/30 19:36
S476	844	(noncontact or (non adj contact) or contactless$) same (desk or table or shelf) same (power or energy)	US-PGPUB; USPAT	OR	ON	2013/09/30 19:41
S477	361	(noncontact or (non adj contact) or contactless$) and distance and (power or energy) and transmission	EPO; JPO; DERWENT	OR	ON	2013/09/30 19:49
S478	1735	(wireless$ or inductive$) and distance and (power or energy) and transmission	EPO; JPO; DERWENT	OR	ON	2013/09/30 19:57
S479	75	(wireless$ or inductive$) and distance and (power or energy) and transmission and meter	EPO; JPO; DERWENT	OR	ON	2013/09/30 19:57
S480	119	(wireless$ or inductive$) and distance and (power or energy) and transmission and separat$	EPO; JPO; DERWENT	OR	ON	2013/09/30 19:58
S481	1	("20120086867").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/12/15 15:56
S482	1	S481 and television	US-PGPUB; USPAT	OR	OFF	2013/12/15 15:57
S483	21	(wireless$ or contactless$ or noncontact or inductive$) same powered same television	EPO; JPO; DERWENT	OR	OFF	2013/12/15 15:58
S484	659	(wireless$ or contactless$ or noncontact or inductive$) same powered same television	US-PGPUB; USPAT	OR	OFF	2013/12/15 16:01
S485	537	(wireless$ or contactless$ or noncontact or inductive$) same powered same (computer or display or monitor)	EPO; JPO; DERWENT	OR	OFF	2013/12/15 16:04
S486	9	("20050162331" | "5270717" | "5580664" | "6480110" | "6839035" | "6924777" | "7119671" | "7126552" | "7439863").PN. OR ("7696884").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/12/15 16:42
S487	3623	q and (inductive or contactless or wireless) and (power adj supply)	EPO; JPO; DERWENT	OR	ON	2013/12/15 17:04
S488	45	q and (inductive or contactless or wireless) and (power adj supply) and	EPO; JPO; DERWENT	OR	ON	2013/12/15 17:05

		resonant				
S489	197	(US-20030114769-$ or US-20110281528-$ or US-20090153273-$ or US-20050206479-$ or US-20050174197-$ or US-20040037363-$ or US-20090010028-$ or US-20080197710-$ or US-20070276538-$ or US-20070267918-$ or US-20070145830-$ or US-20050288740-$ or US-20050085873-$ or US-20020105343-$ or US-20020032471-$ or US-20050288741-$ or US-20040233043-$ or US-20040032363-$ or US-20040030260-$ or US-20030130708-$ or US-20070142872-$ or US-20060025830-$ or US-20040199212-$ or US-20020097770-$ or US-20090051224-$ or US-20030135971-$).did. or (US-20030124050-$ or US-20030126948-$ or US-20040263307-$ or US-20050007067-$ or US-20030210106-$ or US-20050151511-$ or US-20040189246-$ or US-20020089305-$ or US-20110285214-$ or US-20110101790-$ or US-20100066176-$ or US-20100036773-$ or US-20100007307-$ or US-20090174263-$ or US-20060071632-$ or US-20100289449-$ or US-20080001572-$ or US-20060012371-$ or US-20050258966-$ or US-20040000974-$ or US-20040134985-$ or US-20080218314-$ or US-20070241762-$ or US-20030137446-$ or US-20020130778-$ or US-20050237198-$ or US-20050104790-$).did. or (US-20050275629-$ or US-20040196262-$ or US-20040145567-$ or US-20100127660-$ or US-20040130425-$ or US-20120086867-$).did. or (US-6047214-$ or US-6307468-$ or US-6483202-$ or US-7994880-$ or US-4654573-$ or US-5367242-$ or US-6430069-$ or US-6906495-$ or US-7521890-$ or US-7599743-$ or US-6009350-$ or US-5630835-$ or US-7622891-$ or US-5519262-$ or US-6561975-$ or US-4516097-$ or US-5455467-$ or US-7825543-$ or US-7741734-$ or US-6307440-$ or US-6217604-$ or US-5057809-$ or US-6170026-$ or US-7084605-$ or US-6844702-$ or US-6184651-$).did. or (US-5923544-$ or US-4082097-$ or US-7495414-$ or US-5654621-$ or US-5702431-$ or US-5498948-$ or US-5703461-$ or US-5084699-$ or US-4450431-$ or US-4630044-$ or US-5317330-$ or US-5703573-$ or US-8310108-$ or US-6424820-$ or US-4471343-$ or US-5374930-$ or US-5053774-$ or US-5250944-$ or US-5099227-$ or US-4560445-$ or	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2013/12/15 17:44

		US-5541604-$ or US-5420579-$ or US-5287112-$ or US-6489745-$ or US-4656472-$ or US-7541930-$ or US-7280045-$).did. or (US-6839035-$ or US-4588978-$ or US-2274557-$ or US-5373303-$ or US-5550536-$ or US-5864323-$ or US-5033295-$ or US-7075435-$ or US-6563425-$ or US-6650227-$ or US-7826873-$ or US-7518267-$ or US-6008622-$ or US-3949388-$ or US-6211799-$ or US-4059801-$ or US-7696884-$ or US-7504951-$ or US-5270717-$ or US-2133494-$).did. or (EP-1538558-$ or WO-2004015885-$ or EP-1434160-$ or EP-558316-$ or DE-3824972-$ or EP-549832-$ or DE-3941509-$ or EP-849700-$ or WO-9827561-$).did. or (JP-2002075736-$ or JP-2005026741-$ or JP-2004206383-$ or JP-2004206245-$ or JP-11075329-$ or JP-2008125127-$ or JP-02162222-$ or JP-2004275417-$ or JP-2002345104-$).did. or (JP-11144962-$ or JP-02097005-$ or DE-20016655-$ or DE-10221484-$ or EP-1408456-$ or EP-945829-$ or US-7147604-$ or KR-2004072581-$ or US-20040127248-$ or EP-1071038-$ or EP-1071039-$ or JP-2000270501-$ or JP-11305848-$ or DE-19651719-$ or US-5374930-$ or US-5287112-$ or US-4802080-$ or DE-10152863-$ or DE-10152858-$ or EP-473957-$ or JP-11075329-$ or JP-08126230-$ or US-20050063488-$ or US-5697076-$ or DD-225565-$ or US-20070145830-$).did. or (WO-2007034421-$ or WO-9811505-$ or WO-9811504-$ or US-4275377-$ or US-4180795-$ or FR-2896898-$ or SG-112842-$ or WO-2005055121-$ or WO-0215112-$ or US-20060061324-$ or US-20050275629-$ or US-20040189246-$ or US-20030103039-$ or JP-2001159948-$ or JP-10260781-$ or US-6331744-$ or JP-09182323-$ or DE-102011101478-$ or US-20060176239-$ or US-6803744-$).did.				
S490	76	S489 and q	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2013/12/15 17:45
S491	21	S489 and falls	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2013/12/15 18:03
S492	1	("6047214").PN.	USPAT; USOCR	OR	OFF	2013/12/15 19:14
S493	1	("20120086867").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/12/15 20:31

S494	197	(US-20030114769-$ or US-20110281528-$ or US-20090153273-$ or US-20050206479-$ or US-20050174197-$ or US-20040037363-$ or US-20090010028-$ or US-20080197710-$ or US-20070276538-$ or US-20070267918-$ or US-20070145830-$ or US-20050288740-$ or US-20050085873-$ or US-20020105343-$ or US-20020032471-$ or US-20050288741-$ or US-20040233043-$ or US-20040032363-$ or US-20040030260-$ or US-20030130708-$ or US-20070142872-$ or US-20060025830-$ or US-20040199212-$ or US-20020097770-$ or US-20090051224-$ or US-20030135971-$).did. or (US-20030124050-$ or US-20030126948-$ or US-20040263307-$ or US-20050007067-$ or US-20030210106-$ or US-20050151511-$ or US-20040189246-$ or US-20020089305-$ or US-20110285214-$ or US-20110101790-$ or US-20100066176-$ or US-20100036773-$ or US-20100007307-$ or US-20090174263-$ or US-20060071632-$ or US-20100289449-$ or US-20080001572-$ or US-20060012371-$ or US-20050258966-$ or US-20040000974-$ or US-20040134985-$ or US-20080218314-$ or US-20070241762-$ or US-20030137446-$ or US-20020130778-$ or US-20050237198-$ or US-20050104790-$).did. or (US-20050275629-$ or US-20040196262-$ or US-20040145567-$ or US-20100127660-$ or US-20040130425-$ or US-20120086867-$).did. or (US-6047214-$ or US-6307468-$ or US-6483202-$ or US-7994880-$ or US-4654573-$ or US-5367242-$ or US-6430069-$ or US-6906495-$ or US-7521890-$ or US-7599743-$ or US-6009350-$ or US-5630835-$ or US-7622891-$ or US-5519262-$ or US-6561975-$ or US-4516097-$ or US-5455467-$ or US-7825543-$ or US-7741734-$ or US-6307440-$ or US-6217604-$ or US-5057809-$ or US-6170026-$ or US-7084605-$ or US-6844702-$ or US-6184651-$).did. or (US-5923544-$ or US-4082097-$ or US-7495414-$ or US-5654621-$ or US-5702431-$ or US-5498948-$ or US-5703461-$ or US-5084699-$ or US-4450431-$ or US-4630044-$ or US-5317330-$ or US-5703573-$ or US-8310108-$ or US-6424820-$ or US-4471343-$ or US-5374930-$ or US-5053774-$ or US-5250944-$ or US-5099227-$ or US-4560445-$ or US-5541604-$ or US-5420579-$ or	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2014/02/24 21:45

		US-5287112-$ or US-6489745-$ or US-4656472-$ or US-7541930-$ or US-7280045-$).did. or (US-6839035-$ or US-4588978-$ or US-2274557-$ or US-5373303-$ or US-5550536-$ or US-5864323-$ or US-5033295-$ or US-7075435-$ or US-6563425-$ or US-6650227-$ or US-7826873-$ or US-7518267-$ or US-6008622-$ or US-3949388-$ or US-6211799-$ or US-4059801-$ or US-7696884-$ or US-7504951-$ or US-5270717-$ or US-2133494-$).did. or (EP-1538558-$ or WO-2004015885-$ or EP-1434160-$ or EP-558316-$ or DE-3824972-$ or EP-549832-$ or DE-3941509-$ or EP-849700-$ or WO-9827561-$).did. or (JP-2002075736-$ or JP-2005026741-$ or JP-2004206383-$ or JP-2004206245-$ or JP-11075329-$ or JP-2008125127-$ or JP-02162222-$ or JP-2004275417-$ or JP-2002345104-$).did. or (JP-11144962-$ or JP-02097005-$ or DE-20016655-$ or DE-10221484-$ or EP-1408456-$ or EP-945829-$ or US-7147604-$ or KR-2004072581-$ or US-20040127248-$ or EP-1071038-$ or EP-1071039-$ or JP-2000270501-$ or JP-11305848-$ or DE-19651719-$ or US-5374930-$ or US-5287112-$ or US-4802080-$ or DE-10152863-$ or DE-10152858-$ or EP-473957-$ or JP-11075329-$ or JP-08126230-$ or US-20050063488-$ or US-5697076-$ or DD-225565-$ or US-20070145830-$).did. or (WO-2007034421-$ or WO-9811505-$ or WO-9811504-$ or US-4275377-$ or US-4180795-$ or FR-2896898-$ or SG-112842-$ or WO-2005055121-$ or WO-0215112-$ or US-20060061324-$ or US-20050275629-$ or US-20040189246-$ or US-20030103039-$ or JP-2001159948-$ or JP-10260781-$ or US-6331744-$ or JP-09182323-$ or DE-102011101478-$ or US-20060176239-$ or US-6803744-$).did.				
S495	9	S494 and litz	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2014/02/24 21:45
S496	197	(US-20030114769-$ or US-20110281528-$ or US-20090153273-$ or US-20050206479-$ or US-20050174197-$ or US-20040037363-$ or US-20090010028-$ or US-20080197710-$ or US-20070276538-$ or US-20070267918-$ or US-20070145830-$ or US-20050288740-$ or US-20050085873-$ or US-20020105343-$ or US-20020032471-$ or US-20050288741-$ or US-	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2014/02/25 16:53

		20040233043-$ or US-20040032363-$ or US-20040030260-$ or US-20030130708-$ or US-20070142872-$ or US-20060025830-$ or US-20040199212-$ or US-20020097770-$ or US-20090051224-$ or US-20030135971-$).did. or (US-20030124050-$ or US-20030126948-$ or US-20040263307-$ or US-20050007067-$ or US-20030210106-$ or US-20050151511-$ or US-20040189246-$ or US-20020089305-$ or US-20110285214-$ or US-20110101790-$ or US-20100066176-$ or US-20100036773-$ or US-20100007307-$ or US-20090174263-$ or US-20060071632-$ or US-20100289449-$ or US-20080001572-$ or US-20060012371-$ or US-20050258966-$ or US-20040000974-$ or US-20040134985-$ or US-20080218314-$ or US-20070241762-$ or US-20030137446-$ or US-20020130778-$ or US-20050237198-$ or US-20050104790-$).did. or (US-20050275629-$ or US-20040196262-$ or US-20040145567-$ or US-20100127660-$ or US-20040130425-$ or US-20120086867-$).did. or (US-6047214-$ or US-6307468-$ or US-6483202-$ or US-7994880-$ or US-4654573-$ or US-5367242-$ or US-6430069-$ or US-6906495-$ or US-7521890-$ or US-7599743-$ or US-6009350-$ or US-5630835-$ or US-7622891-$ or US-5519262-$ or US-6561975-$ or US-4516097-$ or US-5455467-$ or US-7825543-$ or US-7741734-$ or US-6307440-$ or US-6217604-$ or US-5057809-$ or US-6170026-$ or US-7084605-$ or US-6844702-$ or US-6184651-$).did. or (US-5923544-$ or US-4082097-$ or US-7495414-$ or US-5654621-$ or US-5702431-$ or US-5498948-$ or US-5703461-$ or US-5084699-$ or US-4450431-$ or US-4630044-$ or US-5317330-$ or US-5703573-$ or US-8310108-$ or US-6424820-$ or US-4471343-$ or US-5374930-$ or US-5053774-$ or US-5250944-$ or US-5099227-$ or US-4560445-$ or US-5541604-$ or US-5420579-$ or US-5287112-$ or US-6489745-$ or US-4656472-$ or US-7541930-$ or US-7280045-$).did. or (US-6839035-$ or US-4588978-$ or US-2274557-$ or US-5373303-$ or US-5550536-$ or US-5864323-$ or US-5033295-$ or US-7075435-$ or US-6563425-$ or US-6650227-$ or US-7826873-$ or US-7518267-$ or US-6008622-$ or US-3949388-$ or US-6211799-$ or US-4059801-$ or US-7696884-$ or				

		US-7504951-$ or US-5270717-$ or US-2133494-$).did. or (EP-1538558-$ or WO-2004015885-$ or EP-1434160-$ or EP-558316-$ or DE-3824972-$ or EP-549832-$ or DE-3941509-$ or EP-849700-$ or WO-9827561-$).did. or (JP-2002075736-$ or JP-2005026741-$ or JP-2004206383-$ or JP-2004206245-$ or JP-11075329-$ or JP-2008125127-$ or JP-02162222-$ or JP-2004275417-$ or JP-2002345104-$).did. or (JP-11144962-$ or JP-02097005-$ or DE-20016655-$ or DE-10221484-$ or EP-1408456-$ or EP-945829-$ or US-7147604-$ or KR-2004072581-$ or US-20040127248-$ or EP-1071038-$ or EP-1071039-$ or JP-2000270501-$ or JP-11305848-$ or DE-19651719-$ or US-5374930-$ or US-5287112-$ or US-4802080-$ or DE-10152863-$ or DE-10152858-$ or EP-473957-$ or JP-11075329-$ or JP-08126230-$ or US-20050063488-$ or US-5697076-$ or DD-225565-$ or US-20070145830-$).did. or (WO-2007034421-$ or WO-9811505-$ or WO-9811504-$ or US-4275377-$ or US-4180795-$ or FR-2896898-$ or SG-112842-$ or WO-2005055121-$ or WO-0215112-$ or US-20060061324-$ or US-20050275629-$ or US-20040189246-$ or US-20030103039-$ or JP-2001159948-$ or JP-10260781-$ or US-6331744-$ or JP-09182323-$ or DE-102011101478-$ or US-20060176239-$ or US-6803744-$).did.				
S497	9	S496 and litz	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2014/02/25 16:53
S498	0	S497 and tire	USPAT	OR	OFF	2014/02/25 16:53
S499	197	(US-20030114769-$ or US-20110281528-$ or US-20090153273-$ or US-20050206479-$ or US-20050174197-$ or US-20040037363-$ or US-20090010028-$ or US-20080197710-$ or US-20070276538-$ or US-20070267918-$ or US-20070145830-$ or US-20050288740-$ or US-20050085873-$ or US-20020105343-$ or US-20020032471-$ or US-20050288741-$ or US-20040233043-$ or US-20040032363-$ or US-20040030260-$ or US-20030130708-$ or US-20070142872-$ or US-20060025830-$ or US-20040199212-$ or US-20020097770-$ or US-20090051224-$ or US-20030135971-$).did. or (US-20030124050-$ or US-20030126948-$	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2014/02/25 16:53

		or US-20040263307-$ or US-20050007067-$ or US-20030210106-$ or US-20050151511-$ or US-20040189246-$ or US-20020089305-$ or US-20110285214-$ or US-20110101790-$ or US-20100066176-$ or US-20100036773-$ or US-20100007307-$ or US-20090174263-$ or US-20060071632-$ or US-20100289449-$ or US-20080001572-$ or US-20060012371-$ or US-20050258966-$ or US-20040000974-$ or US-20040134985-$ or US-20080218314-$ or US-20070241762-$ or US-20030137446-$ or US-20020130778-$ or US-20050237198-$ or US-20050104790-$).did. or (US-20050275629-$ or US-20040196262-$ or US-20040145567-$ or US-20100127660-$ or US-20040130425-$ or US-20120086867-$).did. or (US-6047214-$ or US-6307468-$ or US-6483202-$ or US-7994880-$ or US-4654573-$ or US-5367242-$ or US-6430069-$ or US-6906495-$ or US-7521890-$ or US-7599743-$ or US-6009350-$ or US-5630835-$ or US-7622891-$ or US-5519262-$ or US-6561975-$ or US-4516097-$ or US-5455467-$ or US-7825543-$ or US-7741734-$ or US-6307440-$ or US-6217604-$ or US-5057809-$ or US-6170026-$ or US-7084605-$ or US-6844702-$ or US-6184651-$).did. or (US-5923544-$ or US-4082097-$ or US-7495414-$ or US-5654621-$ or US-5702431-$ or US-5498948-$ or US-5703461-$ or US-5084699-$ or US-4450431-$ or US-4630044-$ or US-5317330-$ or US-5703573-$ or US-8310108-$ or US-6424820-$ or US-4471343-$ or US-5374930-$ or US-5053774-$ or US-5250944-$ or US-5099227-$ or US-4560445-$ or US-5541604-$ or US-5420579-$ or US-5287112-$ or US-6489745-$ or US-4656472-$ or US-7541930-$ or US-7280045-$).did. or (US-6839035-$ or US-4588978-$ or US-2274557-$ or US-5373303-$ or US-5550536-$ or US-5864323-$ or US-5033295-$ or US-7075435-$ or US-6563425-$ or US-6650227-$ or US-7826873-$ or US-7518267-$ or US-6008622-$ or US-3949388-$ or US-6211799-$ or US-4059801-$ or US-7696884-$ or US-7504951-$ or US-5270717-$ or US-2133494-$).did. or (EP-1538558-$ or WO-2004015885-$ or EP-1434160-$ or EP-558316-$ or DE-3824972-$ or EP-549832-$ or DE-3941509-$ or EP-849700-$ or WO-9827561-$).did. or (JP-2002075736-$ or JP-2005026741-$ or JP-2004206383-$ or JP-					

		2004206245-$ or JP-11075329-$ or JP-2008125127-$ or JP-02162222-$ or JP-2004275417-$ or JP-2002345104-$).did. or (JP-11144962-$ or JP-02097005-$ or DE-20016655-$ or DE-10221484-$ or EP-1408456-$ or EP-945829-$ or US-7147604-$ or KR-2004072581-$ or US-20040127248-$ or EP-1071038-$ or EP-1071039-$ or JP-2000270501-$ or JP-11305848-$ or DE-19651719-$ or US-5374930-$ or US-5287112-$ or US-4802080-$ or DE-10152863-$ or DE-10152858-$ or EP-473957-$ or JP-11075329-$ or JP-08126230-$ or US-20050063488-$ or US-5697076-$ or DD-225565-$ or US-20070145830-$).did. or (WO-2007034421-$ or WO-9811505-$ or WO-9811504-$ or US-4275377-$ or US-4180795-$ or FR-2896898-$ or SG-112842-$ or WO-2005055121-$ or WO-0215112-$ or US-20060061324-$ or US-20050275629-$ or US-20040189246-$ or US-20030103039-$ or JP-2001159948-$ or JP-10260781-$ or US-6331744-$ or JP-09182323-$ or DE-102011101478-$ or US-20060176239-$ or US-6803744-$).did.				
S500	4	S499 and tire	USPAT	OR	OFF	2014/02/25 16:53
S501	2634	(307/104).CCLS.	US-PGPUB; USPAT	OR	OFF	2014/05/05 06:31
S502	94	("20020130642" | "20020167294" | "20030071034" | "20030160590" | "20040026998" | "20040130425" | "20040142733" | "20040189246" | "20040227057" | "20050021135" | "20050033382" | "20050104453" | "20050116683" | "20050140482" | "20050189945" | "20050194926" | "20050253152" | "20050288742" | "20060001509" | "20060053296" | "20060066443" | "20060164866" | "20060184209" | "20060184210" | "20060199620" | "20060214626" | "20060219448" | "20060238365" | "20060281435" | "20070010295" | "20070013483" | "20070016089" | "20070024246" | "20070069687" | "20070096875" | "20070105429" | "20070117596" | "20070126650" | "20070176840" | "20070208263" | "3780425" | "3871176" | "4095998" | "4280129" | "5229652" | "5408209" | "5522856" | "5541604" | "5565763" | "5630835" | "5697956" | "5703461" | "5710413" | "5742471" | "5821728" | "5821731" | "5903134" | "5923544" | "5940509" | "5957956" | "5959245" | "5993996" | "6012659" | "6047214" | "6066163" | "6067473" | "6108579" |	US-PGPUB; USPAT	OR	OFF	2014/05/05 06:32

		"6127799" | "6207887" | "6232841" | "6238387" | "6252762" | "6473028" | "6483202" | "6535133" | "6561975" | "6609023" | "6631072" | "6683256" | "6696647" | "6703921" | "6803744" | "6858970" | "6961619" | "6967462" | "6988026" | "7027311" | "7035076" | "7084605" | "7127293" | "7193418" | "7233137" | "7251527" | "7288918").PN.				
S503	106440	("20050027192" | "20050135122" | "4588978" | "5033295" | "5864323" | "6176433" | "6563425" | "6839035" | "7443135" | "7545337" | "7863859" | "8131378")".PN"	US-PGPUB; USPAT	OR	OFF	2014/05/05 06:33
S504	12	("20050027192" | "20050135122" | "4588978" | "5033295" | "5864323" | "6176433" | "6563425" | "6839035" | "7443135" | "7545337" | "7863859" | "8131378").PN.	US-PGPUB; USPAT	OR	OFF	2014/05/05 06:34
S505	106	S502 or S504	US-PGPUB; USPAT	OR	OFF	2014/05/05 06:34
S507	94	("20020130642" | "20020167294" | "20030071034" | "20030160590" | "20040026998" | "20040130425" | "20040142733" | "20040189246" | "20040227057" | "20050021134" | "20050033382" | "20050104453" | "20050116683" | "20050140482" | "20050189945" | "20050194926" | "20050253152" | "20050288742" | "20060001509" | "20060053296" | "20060066443" | "20060164866" | "20060184209" | "20060184210" | "20060199620" | "20060214626" | "20060219448" | "20060238365" | "20060281435" | "20070010295" | "20070013483" | "20070016089" | "20070024246" | "20070069687" | "20070096875" | "20070105429" | "20070117596" | "20070126650" | "20070176840" | "20070208563" | "3780425" | "3871176" | "4095998" | "4280129" | "5229652" | "5408209" | "5522856" | "5541604" | "5565763" | "5630835" | "5697956" | "5703461" | "5710413" | "5742471" | "5821728" | "5821731" | "5903134" | "5923544" | "5940509" | "5959245" | "5959956" | "5993996" | "6012659" | "6047214" | "6066163" | "6067473" | "6108579" | "6127799" | "6207887" | "6232841" | "6238387" | "6252762" | "6473028" | "6483202" | "6535133" | "6561975" | "6609023" | "6631072" | "6683256" | "6696647" | "6703921" | "6803744" | "6858970" | "6961619" | "6967462" | "6988026" | "7027311" | "7035076" | "7084605" | "7127293" | "7193418" | "7233137" | "7251527" | "7288918").PN.	US-PGPUB; USPAT	OR	OFF	2014/06/02 07:53
S508	0	fleming and writricity and repeater	USPAT	OR	OFF	2014/07/13

						21:22
S509	0	fleming and fish and richardson and repeater	USPAT	OR	OFF	2014/07/13 21:23
S510	347	fleming and fish and richardson	USPAT	OR	OFF	2014/07/13 21:23
S511	14	fleming and fish and richardson and karalis	USPAT	OR	OFF	2014/07/13 21:23
S512	2922	(307/104).CCLS.	US-PGPUB; USPAT	OR	OFF	2014/09/26 18:49
S513	38	S512 and animal	USPAT	OR	OFF	2014/09/26 18:49
S514	154	S512 and animal	US-PGPUB; USPAT	OR	OFF	2014/09/26 18:50
S515	1	("20070296393").PN.	US-PGPUB; USPAT	OR	OFF	2014/09/26 18:52
S516	1	("20050125093").PN.	US-PGPUB; USPAT	OR	OFF	2015/03/07 23:35
S517	1	("8760007").PN.	USPAT; USOCR	OR	OFF	2015/03/08 23:37
S518	1	("8097983").PN.	USPAT; USOCR	OR	OFF	2015/03/08 23:55
S519	2224	(320/108).CCLS.	US-PGPUB; USPAT	OR	OFF	2015/03/09 04:38
S520	3318	(307/104).CCLS.	US-PGPUB; USPAT	OR	OFF	2015/03/09 04:38
S521	6390	h02j17/00.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/03/09 04:39
S522	1921	(307/104).CCLS.	USPAT; USOCR	OR	OFF	2015/04/03 09:29
S523	40	S522 and fritz	USPAT	OR	OFF	2015/04/03 09:29
S524	0	S522 and palladini	USPAT	OR	OFF	2015/04/03 09:31
S525	0	S522 and pallidini	USPAT	OR	OFF	2015/04/03 09:31
S526	32	S522 and albert	USPAT	OR	OFF	2015/04/03 09:31
S527	2015	paladini near2 albert	USPAT	OR	OFF	2015/04/03 09:32
S528	33	S527 and (impedance adj matching)	USPAT	OR	OFF	2015/04/03 09:32
S529	2275	(320/108).CCLS.	US-PGPUB; USPAT	OR	OFF	2015/04/08 19:47
S530	3360	(307/104).CCLS.	US-PGPUB; USPAT	OR	OFF	2015/04/08 19:50
S531	6547	h02j17/00.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO;	OR	OFF	2015/04/08 19:53

			DERWENT; IBM_TDB			
S535	1	("20150048676").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2015/04/08 22:18
S536	13	(("6262639") or ("0876008") or ("8766485") or ("8772971") or ("8772972") or ("8791599") or ("8836172") or ("20060044188") or ("20060164868") or ("20060284708") or ("20120228960") or ("20130181541") or ("20140354071")).PN.	US-PGPUB; USPAT	OR	OFF	2015/04/08 22:39
S537	13	(("6262639") or ("8760008") or ("8766485") or ("8772971") or ("8772972") or ("8791599") or ("8836172") or ("20060044188") or ("20060164868") or ("20060284708") or ("20120228960") or ("20130181541") or ("20140354071")).PN.	US-PGPUB; USPAT	OR	OFF	2015/04/08 22:40
S538	2	(("9065286") or ("8760007")).PN.	USPAT; USOCR	OR	OFF	2015/08/10 08:51
S539	1948	(307/104).CCLS.	USPAT; USOCR	OR	OFF	2015/08/10 08:57
S540	3571	(307/104).CCLS.	US-PGPUB; USPAT	OR	OFF	2015/08/10 08:58
S541	2443	(320/108).CCLS.	US-PGPUB; USPAT	OR	OFF	2015/08/10 08:58
S542	7808	h02j17/00.cpc.	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/08/10 08:59
S543	3309	h02j17/00.cpc.	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/08/10 08:59
S544	4499	h02j17/00.cpc.	FPRS	OR	OFF	2015/08/10 08:59
S545	962	S540 and vehicle	US-PGPUB; USPAT	OR	OFF	2015/08/10 09:13
S546	199	(US-20030114769-$ or US-20110281528-$ or US-20090153273-$ or US-20050206479-$ or US-20050174197-$ or US-20040037363-$ or US-20090010028-$ or US-20080197710-$ or US-20070276538-$ or US-20070267918-$ or US-20070145830-$ or US-20050288740-$ or US-20050085873-$ or US-20020105343-$ or US-20020032471-$ or US-20050288741-$ or US-20040233043-$ or US-20040032363-$ or US-20040030260-$ or US-20030130708-$ or US-20070142872-$ or US-20060025830-$ or US-20040199212-$ or US-20020097770-$	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2015/08/10 12:21

		or US-20090051224-$ or US-20030135971-$).did. or (US-20030124050-$ or US-20030126948-$ or US-20040263307-$ or US-20050007067-$ or US-20030210106-$ or US-20050151511-$ or US-20040189246-$ or US-20020089305-$ or US-20110285214-$ or US-20110101790-$ or US-20100066176-$ or US-20100036773-$ or US-20100007307-$ or US-20090174263-$ or US-20060071632-$ or US-20100289449-$ or US-20080001572-$ or US-20060012371-$ or US-20050258966-$ or US-20040000974-$ or US-20040134985-$ or US-20080218314-$ or US-20070241762-$ or US-20030137446-$ or US-20020130778-$ or US-20050237198-$ or US-20050104790-$).did. or (US-20050275629-$ or US-20040196262-$ or US-20040145567-$ or US-20100127660-$ or US-20040130425-$ or US-20120086867-$ or US-20050125093-$ or US-20150048676-$).did. or (US-6047214-$ or US-6307468-$ or US-6483202-$ or US-7994880-$ or US-4654573-$ or US-5367242-$ or US-6430069-$ or US-6906495-$ or US-7521890-$ or US-7599743-$ or US-6009350-$ or US-5630835-$ or US-7622891-$ or US-5519262-$ or US-6561975-$ or US-4516097-$ or US-5455467-$ or US-7825543-$ or US-7741734-$ or US-6307440-$ or US-6217604-$ or US-5057809-$ or US-6170026-$ or US-7084605-$ or US-6844702-$ or US-6184651-$).did. or (US-5923544-$ or US-4082097-$ or US-7495414-$ or US-5654621-$ or US-5702431-$ or US-5498948-$ or US-5703461-$ or US-5084699-$ or US-4450431-$ or US-4630044-$ or US-5317330-$ or US-5703573-$ or US-8310108-$ or US-6424820-$ or US-4471343-$ or US-5374930-$ or US-5053774-$ or US-5250944-$ or US-5099227-$ or US-4560445-$ or US-5541604-$ or US-5420579-$ or US-5287112-$ or US-6489745-$ or US-4656472-$ or US-7541930-$ or US-7280045-$).did. or (US-6839035-$ or US-4588978-$ or US-2274557-$ or US-5373303-$ or US-5550536-$ or US-5864323-$ or US-5033295-$ or US-7075435-$ or US-6563425-$ or US-6650227-$ or US-7826873-$ or US-7518267-$ or US-6008622-$ or US-3949388-$ or US-6211799-$ or US-4059801-$ or US-7696884-$ or US-7504951-$ or US-5270717-$ or US-2133494-$ or US-8097983-$).did. or (EP-1538558-$ or WO-2004015885-$ or EP-1434160-					

		$ or EP-558316-$ or DE-3824972-$ or EP-549832-$ or DE-3941509-$ or EP-849700-$ or WO-9827561-$).did. or (JP-2002075736-$ or JP-2005026741-$ or JP-2004206383-$ or JP-2004206245-$ or JP-11075329-$ or JP-2008125127-$ or JP-02162222-$ or JP-2004275417-$ or JP-2002345104-$).did. or (JP-11144962-$ or JP-02097005-$ or DE-20016655-$ or DE-10221484-$ or EP-1408456-$ or EP-945829-$ or US-7147604-$ or KR-2004072581-$ or US-20040127248-$ or EP-1071038-$ or EP-1071039-$ or JP-2000270501-$ or JP-11305848-$ or DE-19651719-$ or US-5374930-$ or US-5287112-$ or US-4802080-$ or DE-10152863-$ or DE-10152858-$ or EP-473957-$ or JP-11075329-$ or JP-08126230-$ or US-20050063488-$ or US-5697076-$ or DD-225565-$ or US-20070145830-$).did. or (WO-2007034421-$ or WO-9811505-$ or WO-9811504-$ or US-4275377-$ or US-4180795-$ or FR-2896898-$ or SG-112842-$ or WO-2005055121-$ or WO-0215112-$ or US-20060061324-$ or US-20050275629-$ or US-20040189246-$ or US-20030103039-$ or JP-2001159948-$ or JP-10260781-$ or US-6331744-$ or JP-09182323-$ or DE-102011101478-$ or US-20060176239-$ or US-6803744-$).did.				
S547	0	S546 and characteristic adj length	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/08/10 12:21
S548	87	S546 and characteristic	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/08/10 12:21
S549	16	S546 and characteristic.clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/08/10 12:21
S550	1	("9065286").PN.	USPAT; USOCR	OR	OFF	2015/08/10 12:36
S551	1	("20150194818").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2015/08/10 12:47
S552	1	S551 and breakdown	US-PGPUB;	OR	OFF	2015/08/10

			USPAT			12:48
S553	2	(("20150194818") or ("20130181541")).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2015/08/10 12:49
S554	3	(("20150194818") or ("20130181541") or ("8097983")).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2015/08/10 12:52
S555	3	S554 and breakdown	US-PGPUB; USPAT	OR	OFF	2015/08/10 12:54
S556	3	S554 and wp	US-PGPUB; USPAT	OR	OFF	2015/08/10 12:54
S557	199	(US-20030114769-$ or US-20110281528-$ or US-20090153273-$ or US-20050206479-$ or US-20050174197-$ or US-20040037363-$ or US-20090010028-$ or US-20080197710-$ or US-20070276538-$ or US-20070267918-$ or US-20070145830-$ or US-20050288740-$ or US-20050085873-$ or US-20020105343-$ or US-20020032471-$ or US-20050288741-$ or US-20040233043-$ or US-20040032363-$ or US-20040030260-$ or US-20030130708-$ or US-20070142872-$ or US-20060025830-$ or US-20040199212-$ or US-20020097770-$ or US-20090051224-$ or US-20030135971-$).did. or (US-20030124050-$ or US-20030126948-$ or US-20040263307-$ or US-20050007067-$ or US-20030210106-$ or US-20050151511-$ or US-20040189246-$ or US-20020089305-$ or US-20110285214-$ or US-20110101790-$ or US-20100066176-$ or US-20100036773-$ or US-20100007307-$ or US-20090174263-$ or US-20060071632-$ or US-20100289449-$ or US-20080001572-$ or US-20060012371-$ or US-20050258966-$ or US-20040000974-$ or US-20040134985-$ or US-20080218314-$ or US-20070241762-$ or US-20030137446-$ or US-20020130778-$ or US-20050237198-$ or US-20050104790-$).did. or (US-20050275629-$ or US-20040196262-$ or US-20040145567-$ or US-20100127660-$ or US-20040130425-$ or US-20120086867-$ or US-20050125093-$ or US-20150048676-$).did. or (US-6047214-$ or US-6307468-$ or US-6483202-$ or US-7994880-$ or US-4654573-$ or US-5367242-$ or US-6430069-$ or US-6906495-$ or US-7521890-$ or US-7599743-$ or US-6009350-$ or US-5630835-$ or US-7622891-$ or US-5519262-$ or US-6561975-$ or US-4516097-$ or US-5455467-$ or US-7825543-$ or US-7741734-$ or US-	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2015/09/15 23:02

		6307440-$ or US-6217604-$ or US-5057809-$ or US-6170026-$ or US-7084605-$ or US-6844702-$ or US-6184651-$).did. or (US-5923544-$ or US-4082097-$ or US-7495414-$ or US-5654621-$ or US-5702431-$ or US-5498948-$ or US-5703461-$ or US-5084699-$ or US-4450431-$ or US-4630044-$ or US-5317330-$ or US-5703573-$ or US-8310108-$ or US-6424820-$ or US-4471343-$ or US-5374930-$ or US-5053774-$ or US-5250944-$ or US-5099227-$ or US-4560445-$ or US-5541604-$ or US-5420579-$ or US-5287112-$ or US-6489745-$ or US-4656472-$ or US-7541930-$ or US-7280045-$).did. or (US-6839035-$ or US-4588978-$ or US-2274557-$ or US-5373303-$ or US-5550536-$ or US-5864323-$ or US-5033295-$ or US-7075435-$ or US-6563425-$ or US-6650227-$ or US-7826873-$ or US-7518267-$ or US-6008622-$ or US-3949388-$ or US-6211799-$ or US-4059801-$ or US-7696884-$ or US-7504951-$ or US-5270717-$ or US-2133494-$ or US-8097983-$).did. or (EP-1538558-$ or WO-2004015885-$ or EP-1434160-$ or EP-558316-$ or DE-3824972-$ or EP-549832-$ or DE-3941509-$ or EP-849700-$ or WO-9827561-$).did. or (JP-2002075736-$ or JP-2005026741-$ or JP-2004206383-$ or JP-2004206245-$ or JP-11075329-$ or JP-2008125127-$ or JP-02162222-$ or JP-2004275417-$ or JP-2002345104-$).did. or (JP-11144962-$ or JP-02097005-$ or DE-20016655-$ or DE-10221484-$ or EP-1408456-$ or EP-945829-$ or US-7147604-$ or KR-2004072581-$ or US-20040127248-$ or EP-1071038-$ or EP-1071039-$ or JP-2000270501-$ or JP-11305848-$ or DE-19651719-$ or US-5374930-$ or US-5287112-$ or US-4802080-$ or DE-10152863-$ or DE-10152858-$ or EP-473957-$ or JP-11075329-$ or JP-08126230-$ or US-20050063488-$ or US-5697076-$ or DD-225565-$ or US-20070145830-$).did. or (WO-2007034421-$ or WO-9811505-$ or WO-9811504-$ or US-4275377-$ or US-4180795-$ or FR-2896898-$ or SG-112842-$ or WO-2005055121-$ or WO-0215112-$ or US-20060061324-$ or US-20050275629-$ or US-20040189246-$ or US-20030103039-$ or JP-2001159948-$ or JP-10260781-$ or US-6331744-$ or JP-09182323-$ or DE-102011101478-$ or US-20060176239-$ or US-6803744-$).did.				

S558	2	S557 and kikuchi	US-PGPUB; USPAT	OR	OFF	2015/09/15 23:05
S559	1	("8760007").PN.	USPAT; USOCR	OR	OFF	2015/09/16 13:32
S560	18	("20070080804" | "6016409" | "6259369" | "6351621" | "6377764" | "6839035").PN. OR ("7504951").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2015/10/02 16:12
S561	68	("20020044058" | "20030043949" | "5168282" | "5285177" | "5420579" | "6069564" | "6118379" | "6147606" | "6278413" | "6281794" | "6396438" | "6400274" | "6480110" | "6516182").PN. OR ("6839035").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2015/10/02 16:13
S562	1	("5367242").PN.	USPAT; USOCR	OR	OFF	2015/10/02 17:18
S563	199	(US-20030114769-$ or US-20110281528-$ or US-20090153273-$ or US-20050206479-$ or US-20050174197-$ or US-20040037363-$ or US-20090010028-$ or US-20080197710-$ or US-20070276538-$ or US-20070267918-$ or US-20070145830-$ or US-20050288740-$ or US-20050085873-$ or US-20020105343-$ or US-20020032471-$ or US-20050288741-$ or US-20040233043-$ or US-20040032363-$ or US-20040030260-$ or US-20030130708-$ or US-20070142872-$ or US-20060025830-$ or US-20040199212-$ or US-20020097770-$ or US-20090051224-$ or US-20030135971-$).did. or (US-20030124050-$ or US-20030126948-$ or US-20040263307-$ or US-20050007067-$ or US-20030210106-$ or US-20050151511-$ or US-20040189246-$ or US-20020089305-$ or US-20110285214-$ or US-20110101790-$ or US-20100066176-$ or US-20100036773-$ or US-20100007307-$ or US-20090174263-$ or US-20060071632-$ or US-20100289449-$ or US-20080001572-$ or US-20060012371-$ or US-20050258966-$ or US-20040000974-$ or US-20040134985-$ or US-20080218314-$ or US-20070241762-$ or US-20030137446-$ or US-20020130778-$ or US-20050237198-$ or US-20050104790-$).did. or (US-20050275629-$ or US-20040196262-$ or US-20040145567-$ or US-20100127660-$ or US-20040130425-$ or US-20120086867-$ or US-20050125093-$ or US-20150048676-$).did. or (US-6047214-$ or US-6307468-$ or US-6483202-$ or US-7994880-$ or US-4654573-$ or US-5367242-$ or US-6430069-$ or US-	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2015/10/02 22:10

		6906495-$ or US-7521890-$ or US-7599743-$ or US-6009350-$ or US-5630835-$ or US-7622891-$ or US-5519262-$ or US-6561975-$ or US-4516097-$ or US-5455467-$ or US-7825543-$ or US-7741734-$ or US-6307440-$ or US-6217604-$ or US-5057809-$ or US-6170026-$ or US-7084605-$ or US-6844702-$ or US-6184651-$).did. or (US-5923544-$ or US-4082097-$ or US-7495414-$ or US-5654621-$ or US-5702431-$ or US-5498948-$ or US-5703461-$ or US-5084699-$ or US-4450431-$ or US-4630044-$ or US-5317330-$ or US-5703573-$ or US-8310108-$ or US-6424820-$ or US-4471343-$ or US-5374930-$ or US-5053774-$ or US-5250944-$ or US-5099227-$ or US-4560445-$ or US-5541604-$ or US-5420579-$ or US-5287112-$ or US-6489745-$ or US-4656472-$ or US-7541930-$ or US-7280045-$).did. or (US-6839035-$ or US-4588978-$ or US-2274557-$ or US-5373303-$ or US-5550536-$ or US-5864323-$ or US-5033295-$ or US-7075435-$ or US-6563425-$ or US-6650227-$ or US-7826873-$ or US-7518267-$ or US-6008622-$ or US-3949388-$ or US-6211799-$ or US-4059801-$ or US-7696884-$ or US-7504951-$ or US-5270717-$ or US-2133494-$ or US-8097983-$).did. or (EP-1538558-$ or WO-2004015885-$ or EP-1434160-$ or EP-558316-$ or DE-3824972-$ or EP-549832-$ or DE-3941509-$ or EP-849700-$ or WO-9827561-$).did. or (JP-2002075736-$ or JP-2005026741-$ or JP-2004206383-$ or JP-2004206245-$ or JP-11075329-$ or JP-2008125127-$ or JP-02162222-$ or JP-2004275417-$ or JP-2002345104-$).did. or (JP-11144962-$ or JP-02097005-$ or DE-20016655-$ or DE-10221484-$ or EP-1408456-$ or EP-945829-$ or US-7147604-$ or KR-2004072581-$ or US-20040127248-$ or EP-1071038-$ or EP-1071039-$ or JP-2000270501-$ or JP-11305848-$ or DE-19651719-$ or US-5374930-$ or US-5287112-$ or US-4802080-$ or DE-10152863-$ or DE-10152858-$ or EP-473957-$ or JP-11075329-$ or JP-08126230-$ or US-20050063488-$ or US-5697076-$ or DD-225565-$ or US-20070145830-$).did. or (WO-2007034421-$ or WO-9811505-$ or WO-9811504-$ or US-4275377-$ or US-4180795-$ or FR-2896898-$ or SG-112842-$ or WO-2005055121-$ or WO-0215112-$ or US-20060061324-$ or US-20050275629-$ or US-20040189246-$					

		or US-20030103039-$ or JP-2001159948-$ or JP-10260781-$ or US-6331744-$ or JP-09182323-$ or DE-102011101478-$ or US-20060176239-$ or US-6803744-$).did.				
S564	48	S563 and (coil same capacitance)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/10/02 22:10
S565	1	("6533178").PN.	USPAT; USOCR	OR	OFF	2015/10/09 16:34
S566	12	("20060044188" | "20060164868" | "20060284708" | "20120228960" | "20140354071" | "6262639" | "8361272" | "8760008" | "8766485" | "8772971" | "8772972" | "8791599").PN.	US-PGPUB; USPAT	OR	OFF	2015/10/09 16:43
S567	2	("6407470" | "9065286").PN.	US-PGPUB; USPAT	OR	OFF	2015/10/09 16:43
S568	14	S566 or S567	US-PGPUB; USPAT	OR	OFF	2015/10/09 16:43
S569	2	(intrinsic same loss same rate same quality same coupling).clm.	US-PGPUB; USPAT	OR	OFF	2015/10/09 18:34
S570	2	(intrinsic same loss same rate same quality same coupling).clm.	US-PGPUB; USPAT	OR	ON	2015/10/09 18:34
S571	2	(intrinsic same loss same rate same quality same coefficient).clm.	US-PGPUB; USPAT	OR	ON	2015/10/09 18:35
S572	13	(intrinsic same loss same rate same quality).clm.	US-PGPUB; USPAT	OR	ON	2015/10/09 18:36
S573	5	(work adj drainage adj rate).clm.	US-PGPUB; USPAT	OR	ON	2015/10/09 19:01
S574	123	(work adj drainage adj rate)	US-PGPUB; USPAT	OR	ON	2015/10/09 19:02
S575	202	(US-20030114769-$ or US-20110281528-$ or US-20090153273-$ or US-20050206479-$ or US-20050174197-$ or US-20040037363-$ or US-20090010028-$ or US-20080197710-$ or US-20070276538-$ or US-20070267918-$ or US-20070145830-$ or US-20050288740-$ or US-20050085873-$ or US-20020105343-$ or US-20020032471-$ or US-20050288741-$ or US-20040233043-$ or US-20040032363-$ or US-20040030260-$ or US-20030130708-$ or US-20070142872-$ or US-20060025830-$ or US-20040199212-$ or US-20020097770-$ or US-20090051224-$ or US-20030135971-$).did. or (US-20030124050-$ or US-20030126948-$ or US-20040263307-$ or US-20050007067-$ or US-20030210106-$ or US-20050151511-$ or US-20040189246-$ or US-20020089305-$	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2015/10/09 19:49

		or US-20110285214-$ or US-20110101790-$ or US-20100066176-$ or US-20100036773-$ or US-20100007307-$ or US-20090174263-$ or US-20060071632-$ or US-20100289449-$ or US-20080001572-$ or US-20060012371-$ or US-20050258966-$ or US-20040000974-$ or US-20040134985-$ or US-20080218314-$ or US-20070241762-$ or US-20030137446-$ or US-20020130778-$ or US-20050237198-$ or US-20050104790-$).did. or (US-20050275629-$ or US-20040196262-$ or US-20040145567-$ or US-20100127660-$ or US-20040130425-$ or US-20120086867-$ or US-20050125093-$ or US-20150048676-$ or US-20150188321-$).did. or (US-6047214-$ or US-6307468-$ or US-6483202-$ or US-7994880-$ or US-4654573-$ or US-5367242-$ or US-6430069-$ or US-6906495-$ or US-7521890-$ or US-7599743-$ or US-6009350-$ or US-5630835-$ or US-7622891-$ or US-5519262-$ or US-6561975-$ or US-4516097-$ or US-5455467-$ or US-7825543-$ or US-7741734-$ or US-6307440-$ or US-6217604-$ or US-5057809-$ or US-6170026-$ or US-7084605-$ or US-6844702-$ or US-6184651-$).did. or (US-5923544-$ or US-4082097-$ or US-7495414-$ or US-5654621-$ or US-5702431-$ or US-5498948-$ or US-5703461-$ or US-5084699-$ or US-4450431-$ or US-4630044-$ or US-5317330-$ or US-5703573-$ or US-8310108-$ or US-6424820-$ or US-4471343-$ or US-5374930-$ or US-5053774-$ or US-5250944-$ or US-5099227-$ or US-4560445-$ or US-5541604-$ or US-5420579-$ or US-5287112-$ or US-6489745-$ or US-4656472-$ or US-7541930-$ or US-7280045-$).did. or (US-6839035-$ or US-4588978-$ or US-2274557-$ or US-5373303-$ or US-5550536-$ or US-5864323-$ or US-5033295-$ or US-7075435-$ or US-6563425-$ or US-6650227-$ or US-7826873-$ or US-7518267-$ or US-6008622-$ or US-3949388-$ or US-6211799-$ or US-4059801-$ or US-7696884-$ or US-7504951-$ or US-5270717-$ or US-2133494-$ or US-8097983-$ or US-6533178-$ or US-9065286-$).did. or (EP-1538558-$ or WO-2004015885-$ or EP-1434160-$ or EP-558316-$ or DE-3824972-$ or EP-549832-$ or DE-3941509-$ or EP-849700-$ or WO-9827561-$).did. or (JP-2002075736-$ or JP-2005026741-$ or JP-2004206383-$ or JP-					

		2004206245-$ or JP-11075329-$ or JP-2008125127-$ or JP-02162222-$ or JP-2004275417-$ or JP-2002345104-$).did. or (JP-11144962-$ or JP-02097005-$ or DE-20016655-$ or DE-10221484-$ or EP-1408456-$ or EP-945829-$ or US-7147604-$ or KR-2004072581-$ or US-20040127248-$ or EP-1071038-$ or EP-1071039-$ or JP-2000270501-$ or JP-11305848-$ or DE-19651719-$ or US-5374930-$ or US-5287112-$ or US-4802080-$ or DE-10152863-$ or DE-10152858-$ or EP-473957-$ or JP-11075329-$ or JP-08126230-$ or US-20050063488-$ or US-5697076-$ or DD-225565-$ or US-20070145830-$).did. or (WO-2007034421-$ or WO-9811505-$ or WO-9811504-$ or US-4275377-$ or US-4180795-$ or FR-2896898-$ or SG-112842-$ or WO-2005055121-$ or WO-0215112-$ or US-20060061324-$ or US-20050275629-$ or US-20040189246-$ or US-20030103039-$ or JP-2001159948-$ or JP-10260781-$ or US-6331744-$ or JP-09182323-$ or DE-102011101478-$ or US-20060176239-$ or US-6803744-$).did.				
S576	21	S575 and (coupling adj coefficient)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/10/09 19:50
S577	1	("20130181541").PN.	US-PGPUB; USPAT	OR	OFF	2015/10/10 13:46
S578	202	(US-20030114769-$ or US-20110281528-$ or US-20090153273-$ or US-20050206479-$ or US-20050174197-$ or US-20040037363-$ or US-20090010028-$ or US-20080197710-$ or US-20070276538-$ or US-20070267918-$ or US-20070145830-$ or US-20050288740-$ or US-20050085873-$ or US-20020105343-$ or US-20020032471-$ or US-20050288741-$ or US-20040233043-$ or US-20040032363-$ or US-20040030260-$ or US-20030130708-$ or US-20070142872-$ or US-20060025830-$ or US-20040199212-$ or US-20020097770-$ or US-20090051224-$ or US-20030135971-$).did. or (US-20030124050-$ or US-20030126948-$ or US-20040263307-$ or US-20050007067-$ or US-20030210106-$ or US-20050151511-$ or US-20040189246-$ or US-20020089305-$ or US-20110285214-$ or US-	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2015/10/10 14:22

		20110101790-$ or US-20100066176-$ or US-20100036773-$ or US-20100007307-$ or US-20090174263-$ or US-20060071632-$ or US-20100289449-$ or US-20080001572-$ or US-20060012371-$ or US-20050258966-$ or US-20040000974-$ or US-20040134985-$ or US-20080218314-$ or US-20070241762-$ or US-20030137446-$ or US-20020130778-$ or US-20050237198-$ or US-20050104790-$).did. or (US-20050275629-$ or US-20040196262-$ or US-20040145567-$ or US-20100127660-$ or US-20040130425-$ or US-20120086867-$ or US-20050125093-$ or US-20150048676-$ or US-20150188321-$).did. or (US-6047214-$ or US-6307468-$ or US-6483202-$ or US-7994880-$ or US-4654573-$ or US-5367242-$ or US-6430069-$ or US-6906495-$ or US-7521890-$ or US-7599743-$ or US-6009350-$ or US-5630835-$ or US-7622891-$ or US-5519262-$ or US-6561975-$ or US-4516097-$ or US-5455467-$ or US-7825543-$ or US-7741734-$ or US-6307440-$ or US-6217604-$ or US-5057809-$ or US-6170026-$ or US-7084605-$ or US-6844702-$ or US-6184651-$).did. or (US-5923544-$ or US-4082097-$ or US-7495414-$ or US-5654621-$ or US-5702431-$ or US-5498948-$ or US-5703461-$ or US-5084699-$ or US-4450431-$ or US-4630044-$ or US-5317330-$ or US-5703573-$ or US-8310108-$ or US-6424820-$ or US-4471343-$ or US-5374930-$ or US-5053774-$ or US-5250944-$ or US-5099227-$ or US-4560445-$ or US-5541604-$ or US-5420579-$ or US-5287112-$ or US-6489745-$ or US-4656472-$ or US-7541930-$ or US-7280045-$).did. or (US-6839035-$ or US-4588978-$ or US-2274557-$ or US-5373303-$ or US-5550536-$ or US-5864323-$ or US-5033295-$ or US-7075435-$ or US-6563425-$ or US-6650227-$ or US-7826873-$ or US-7518267-$ or US-6008622-$ or US-3949388-$ or US-6211799-$ or US-4059801-$ or US-7696884-$ or US-7504951-$ or US-5270717-$ or US-2133494-$ or US-8097983-$ or US-6533178-$ or US-9065286-$).did. or (EP-1538558-$ or WO-2004015885-$ or EP-1434160-$ or EP-558316-$ or DE-3824972-$ or EP-549832-$ or DE-3941509-$ or EP-849700-$ or WO-9827561-$).did. or (JP-2002075736-$ or JP-2005026741-$ or JP-2004206383-$ or JP-2004206245-$ or JP-11075329-$ or				

		JP-2008125127-$ or JP-02162222-$ or JP-2004275417-$ or JP-2002345104-$).did. or (JP-11144962-$ or JP-02097005-$ or DE-20016655-$ or DE-10221484-$ or EP-1408456-$ or EP-945829-$ or US-7147604-$ or KR-2004072581-$ or US-20040127248-$ or EP-1071038-$ or EP-1071039-$ or JP-2000270501-$ or JP-11305848-$ or DE-19651719-$ or US-5374930-$ or US-5287112-$ or US-4802080-$ or DE-10152863-$ or DE-10152858-$ or EP-473957-$ or JP-11075329-$ or JP-08126230-$ or US-20050063488-$ or US-5697076-$ or DD-225565-$ or US-20070145830-$).did. or (WO-2007034421-$ or WO-9811505-$ or WO-9811504-$ or US-4275377-$ or US-4180795-$ or FR-2896898-$ or SG-112842-$ or WO-2005055121-$ or WO-0215112-$ or US-20060061324-$ or US-20050275629-$ or US-20040189246-$ or US-20030103039-$ or JP-2001159948-$ or JP-10260781-$ or US-6331744-$ or JP-09182323-$ or DE-102011101478-$ or US-20060176239-$ or US-6803744-$).did.				
S579	21	S578 and Coupling adj coefficient	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/10/10 14:22
S580	1	("20130181541").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2015/10/14 11:34
S581	1	S580 and "coupling coefficient"	US-PGPUB; USPAT	OR	OFF	2015/10/14 11:34
S582	1	S580 and "energy transfer rate"	US-PGPUB; USPAT	OR	OFF	2015/10/14 12:21
S583	1	S580 and "intrinsic loss"	US-PGPUB; USPAT	OR	OFF	2015/10/14 12:31
S584	1	S580 and (intrinsic or loss)	US-PGPUB; USPAT	OR	ON	2015/10/14 12:34
S585	1	("20130181541").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2015/10/14 21:34
S586	1	S585 and (intrinsic)	US-PGPUB; USPAT	OR	ON	2015/10/14 21:34
S587	2	"200611769"	FPRS; DERWENT	OR	OFF	2015/10/14 22:15
S588	19	"2006011769"	FPRS; DERWENT	OR	OFF	2015/10/14 22:16
S589	12	"10295043"	FPRS; JPO; DERWENT	OR	OFF	2015/10/14 22:41
S590	2	nigelpower and repeater	US-PGPUB; USPAT	OR	OFF	2015/10/15 15:45

S591	2	(("8447234") or ("9130602")).PN.	USPAT; USOCR	OR	OFF	2015/10/15 16:03
S592	710	antenna same energy same transfer same rate	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/10/15 16:20
S593	355	quality same factor same loop same antenna	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/10/15 17:50
S594	768	quality same factor same coil same inductive	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/10/15 21:39
S595	4168	(resonance or resonant) same coil same inductive same coupling	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/10/15 22:11
S596	2330	(resonance or resonant) same coil same inductive same coupling same (power or energy)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/10/15 22:11
S597	1434	(resonance or resonant) same coil same inductive same coupling same (power or energy)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/10/15 22:12
S598	1018	(resonance or resonant) same coil same contactless	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/10/15 23:04
S599	0	"1020040072581"	DERWENT	OR	OFF	2015/11/16 06:13
S600	0	lee adj hyungjoo	DERWENT	OR	OFF	2015/11/16 06:15
S601	0	lee near1 hyungjoo	DERWENT	OR	OFF	2015/11/16 06:15
S602	7	lee near1 hyung	DERWENT	OR	OFF	2015/11/16 06:15
S603	1	"20040072581"	DERWENT	OR	OFF	2015/11/16 06:17

S604	3	"2013099583"	DERWENT	OR	OFF	2015/11/16 06:22
S605	0	"201300099583"	DERWENT	OR	OFF	2015/11/16 06:22
S606	1	"20130099583"	DERWENT	OR	OFF	2015/11/16 06:22
S607	1	("20130181541").PN.	US-PGPUB	OR	OFF	2015/11/16 07:17
S608	1	S607 and "coupling coefficient"	US-PGPUB; USPAT	OR	OFF	2015/11/16 07:17
S609	1	("8760007").PN.	USPAT; USOCR	OR	OFF	2015/11/16 10:34
S610	10126	h02j17/00.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/02/27 21:08
S611	2691	(320/108).CCLS.	US-PGPUB; USPAT	OR	OFF	2016/02/27 21:18
S612	4011	(307/104).CCLS.	US-PGPUB; USPAT	OR	OFF	2016/02/27 21:18
S613	6310	S611 or S612	US-PGPUB; USPAT	OR	OFF	2016/02/27 21:18
S614	5	((("6028429") or ("20070008140") or ("4441210") or ("4679560") or ("6240318") or ("7058357")).PN.	USPAT; USOCR	OR	OFF	2016/02/27 21:50
S615	6	((("6028429") or ("20070008140") or ("4441210") or ("4679560") or ("6240318") or ("7058357")).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/02/27 21:50
S617	1	("8077485").PN.	USPAT; USOCR	OR	OFF	2016/03/20 20:53
S618	209	(US-20030114769-$ or US-20110281528-$ or US-20090153273-$ or US-20050206479-$ or US-20050174197-$ or US-20040037363-$ or US-20090010028-$ or US-20080197710-$ or US-20070276538-$ or US-20070267918-$ or US-20070145830-$ or US-20050288740-$ or US-20050085873-$ or US-20020105343-$ or US-20020032471-$ or US-20050288741-$ or US-20040233043-$ or US-20040032363-$ or US-20040030260-$ or US-20030130708-$ or US-20070142872-$ or US-20060025830-$ or US-20040199212-$ or US-20020097770-$ or US-20090051224-$ or US-20030135971-$).did. or (US-20030124050-$ or US-20030126948-$ or US-20040263307-$ or US-20050007067-$ or US-20030210106-$ or US-20050151511-$ or US-20040189246-$ or US-20020089305-$ or US-20110285214-$ or US-20110101790-$ or US-20100066176-$ or US-20100036773-$ or US-	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2016/04/01 13:09

		20100007307-$ or US-20090174263-$ or US-20060071632-$ or US-20100289449-$ or US-20080001572-$ or US-20060012371-$ or US-20050258966-$ or US-20040000974-$ or US-20040134985-$ or US-20080218314-$ or US-20070241762-$ or US-20030137446-$ or US-20020130778-$ or US-20050237198-$ or US-20050104790-$).did. or (US-20050275629-$ or US-20040196262-$ or US-20040145567-$ or US-20100127660-$ or US-20040130425-$ or US-20120086867-$ or US-20050125093-$ or US-20150048676-$ or US-20150188321-$ or US-20130181541-$ or US-20080211320-$ or US-20090058189-$ or US-20050245996-$).did. or (US-6047214-$ or US-6307468-$ or US-6483202-$ or US-7994880-$ or US-4654573-$ or US-5367242-$ or US-6430069-$ or US-6906495-$ or US-7521890-$ or US-7599743-$ or US-6009350-$ or US-5630835-$ or US-7622891-$ or US-5519262-$ or US-6561975-$ or US-4516097-$ or US-5455467-$ or US-7825543-$ or US-7741734-$ or US-6307440-$ or US-6217604-$ or US-5057809-$ or US-6170026-$ or US-7084605-$ or US-6844702-$ or US-6184651-$).did. or (US-5923544-$ or US-4082097-$ or US-7495414-$ or US-5654621-$ or US-5702431-$ or US-5498948-$ or US-5703461-$ or US-5084699-$ or US-4450431-$ or US-4630044-$ or US-5317330-$ or US-5703573-$ or US-8310108-$ or US-6424820-$ or US-4471343-$ or US-5374930-$ or US-5053774-$ or US-5250944-$ or US-5099227-$ or US-4560445-$ or US-5541604-$ or US-5420579-$ or US-5287112-$ or US-6489745-$ or US-4656472-$ or US-7541930-$ or US-7280045-$).did. or (US-6839035-$ or US-4588978-$ or US-2274557-$ or US-5373303-$ or US-5550536-$ or US-5864323-$ or US-5033295-$ or US-7075435-$ or US-6563425-$ or US-6650227-$ or US-7826873-$ or US-7518267-$ or US-6008622-$ or US-3949388-$ or US-6211799-$ or US-4059801-$ or US-7696884-$ or US-7504951-$ or US-5270717-$ or US-2133494-$ or US-8097983-$ or US-6533178-$ or US-9065286-$ or US-6240318-$).did. or (US-2724091-$).did. or (WO-2006011769-$).did. or (EP-1538558-$ or WO-2004015885-$ or EP-1434160-$ or EP-558316-$ or DE-3824972-$ or EP-549832-$ or DE-3941509-$ or EP-849700-$ or WO-9827561-$).did. or (JP-2002075736-$ or JP-2005026741-				

		$ or JP-2004206383-$ or JP-2004206245-$ or JP-11075329-$ or JP-2008125127-$ or JP-02162222-$ or JP-2004275417-$ or JP-2002345104-$).did. or (JP-11144962-$ or JP-02097005-$ or DE-20016655-$ or DE-10221484-$ or EP-1408456-$ or EP-945829-$ or US-7147604-$ or KR-2004072581-$ or US-20040127248-$ or EP-1071038-$ or EP-1071039-$ or JP-2000270501-$ or JP-11305848-$ or DE-19651719-$ or US-5374930-$ or US-5287112-$ or US-4802080-$ or DE-10152863-$ or DE-10152858-$ or EP-473957-$ or JP-11075329-$ or JP-08126230-$ or US-20050063488-$ or US-5697076-$ or DD-225565-$ or US-20070145830-$).did. or (WO-2007034421-$ or WO-9811505-$ or WO-9811504-$ or US-4275377-$ or US-4180795-$ or FR-2896898-$ or SG-112842-$ or WO-2005055121-$ or WO-0215112-$ or US-20060061324-$ or US-20050275629-$ or US-20040189246-$ or US-20030103039-$ or JP-2001159948-$ or JP-10260781-$ or US-6331744-$ or JP-09182323-$ or DE-102011101478-$ or US-20060176239-$ or US-6803744-$).did.				
S619	22	S618 and (repeater or repeating or extender)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/04/01 13:10

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L7	37	(resonator same (resonance or resonant) same frequency same intrinsic same loss same transfer same rate).clm.	US-PGPUB; USPAT	OR	ON	2016/05/16 08:24
S150	0	((resonator or resonant or resonance) same intrinsic same loss same characterstic same size).clm.	US-PGPUB; USPAT	OR	ON	2012/09/10 11:55
S151	0	((resonator or resonant or resonance) and intrinsic and loss and characterstic and size).clm.	US-PGPUB; USPAT	OR	ON	2012/09/10 11:56
S152	15	((resonator or resonant or resonance) and intrinsic and loss and characterstic and size)	US-PGPUB; USPAT	OR	ON	2012/09/10 11:57
S153	0	((resonator or resonant or resonance) same characterstic same size).clm.	US-PGPUB; USPAT	OR	ON	2012/09/10 11:59
S154	147	((resonator or resonant or resonance) same characteristic same size).clm.	US-PGPUB; USPAT	OR	ON	2012/09/10 12:03

S156	10	(resonator same (resonance or resonant) same frequency same intrinsic same loss same transfer same rate).clm.	US-PGPUB; USPAT	OR	ON	2012/09/10 13:42
S158	1	(resonator same (resonance or resonant) same frequency same intrinsic same loss same "near" same field same q same factor).clm.	US-PGPUB; USPAT	OR	ON	2012/09/10 14:50
S182	10	(resonator same (resonance or resonant) same frequency same intrinsic same loss same transfer same rate).clm.	US-PGPUB; USPAT	OR	ON	2012/09/21 20:55
S218	1	(resonator same (resonance or resonant) same frequency same intrinsic same loss same high same (q or quality)).clm.	US-PGPUB; USPAT	OR	ON	2012/12/10 23:01
S506	4	(resonator same (resonance or resonant) same frequency same intrinsic same loss same high same (q or quality)).clm.	US-PGPUB; USPAT	OR	ON	2014/05/05 06:27
S532	9	(resonator same (resonance or resonant) same frequency same intrinsic same loss same high same (q or quality)).clm.	US-PGPUB; USPAT	OR	ON	2015/04/08 19:46
S533	0	(307/104).CCLS.		OR	OFF	2015/04/08 19:46
S534	1	(320/108).CCLS.		OR	OFF	2015/04/08 19:46
S616	37	(resonator same (resonance or resonant) same frequency same intrinsic same loss same transfer same rate).clm.	US-PGPUB; USPAT	OR	ON	2016/02/27 21:07

5/ 16/ 2016 8:26:01 AM
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Sheet 1 of 1

Substitute Disclosure Form (37 CFR §1.98(b))	U.S. Department of Commerce Patent and Trademark Office	Attorney Docket No. 01997-0358008	Application No. 13/789,860
Information Disclosure Statement by Applicant (Use several sheets if necessary)		Applicant Aristeidis Karalis et al.	
		Filing Date March 8, 2013	Group Art Unit 3649

U.S. Patent Documents

Examiner Initial	Desig. ID	Document Number	Publication Date	Patentee	Class	Subclass	Filing Date If Appropriate
	1.						

Foreign Patent Documents or Published Foreign Patent Applications

Examiner Initial	Desig. ID	Document Number	Publication Date	Country or Patent Office	Class	Subclass	Translation Yes	Translation No
	2.							

Other Documents (include Author, Title, Date, and Place of Publication)

Examiner Initial	Desig. ID	Document
	3.	Copy of Final Office Action for US Application Serial No. 13/477,459 by Examiner Fritz M. Fleming dated 9/22/2015 (18 pages)
	4.	John T. Boys et al., "The Inductive Power Transfer Story at the University of Auckland", IEEE Circuits and Systems Magazine, Second Quarter 2015, pp. 6 – 27 (May 21, 2015)
	5.	Xun Liu, "Qi Standard Wireless Power Transfer Technology Development Toward Spatial Freedom", IEEE Circuits and Systems Magazine, Second Quarter 2015, pp. 32-39 (May 21, 2015)
	6.	John M. Miller et al., "Elements of Wireless Power Transfer Essential to High Power Charging of Heavy Duty Vehicles", IEEE Transactions on Transportation Electrification, Vol. 1, No. 1, pp. 26-39 (June 2015)
	7.	Phil Schewe et al., "Berkeley Symposium Celebrates Laser Pioneer", Physics News Update, No. 749 #1, October 13, 2005 (3 pages)
	8.	Marin Soljacic, "Wireless Non-Radiative Energy Transfer - PowerPoint Presentation", Amazing Light: Visions for Discovery, An International Symposium, October 6-8, 2005, University of California, Berkeley (2005)

Examiner Signature	Date Considered
/FRITZ M FLEMING/	05/16/2016

EXAMINER: Initials citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Substitute Disclosure Form

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /F.M.F/

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor	:	Aristeidis Karalis	Art Unit	:	2836
Serial No.	:	13/789,860	Examiner	:	Fritz M. Fleming
Filed	:	March 8, 2013	Confirmation No.	:	4131
			Notice of Allowance Date: June 2, 2016		
Title	:	WIRELESS ENERGY TRANSFER			

MAIL STOP ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

REPLY TO NOTICE OF ALLOWANCE

In response to the Notice of Allowance dated June 2, 2016, enclosed is a completed Part B - Fee(s) Transmittal.

The issue fee in the amount of $960 is being paid with this reply on the Electronic Filing System. Apply those fees and any other necessary charges or credits to Deposit Account 06 1050, referencing the above attorney docket number.

COMMENTS ON EXAMINER'S REASONS FOR ALLOWANCE

It is recognized that in accordance with M.P.E.P. § 1302.14, the Examiner's reasons for allowance need not set forth all of the details as to why the claims are allowed. In the above-referenced application, it is not conceded that the Examiner's stated reasons for allowance are correct or the only reasons for which the claims are allowable. For example, the Examiner's reasons for allowance indicate that particular claim elements are not disclosed or suggested by the prior art of record, yet the claims may be patentable for other reasons, including the inventive combination of all of the recited claim elements. It is not conceded that the specific limitations identified by the Examiner are necessary to distinguish the art of record or to satisfy the requirements of 35 U.S.C. § 112. Moreover, the Examiner does not assert, and it would not be conceded, that the Examiner's reasons have any bearing on the patentability of claims in any other applications directed to the disclosed subject matter.

In addition, each dependent claim stands on its own and may be allowable on its own merits. In particular, each dependent claim may be allowable on the basis of a combination of some of the features recited in the dependent claim and its base claim(s), which combination of features may not include all of the limitations identified in the Examiner's reasons for allowance.

Respectfully submitted,

Date: June 2, 2016

/Marc M. Wefers Reg. No. 56,842/
Marc M. Wefers
Reg. No. 56,842

Customer Number 26161
Fish & Richardson P.C.
Telephone: (617) 542-5070
Facsimile: (877) 769-7945

23530465.doc

InductEV, Inc.
Exhibit 1031
Page 1493

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

26161 7590 06/02/2016

FISH & RICHARDSON P.C.
P.O. BOX 1022
MINNEAPOLIS, MN 55440-1022

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/789,860	03/08/2013	Aristeidis Karalis	01997-0358008	4131

TITLE OF INVENTION: WIRELESS ENERGY TRANSFER

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	LARGE	$960	$0	$0	$960	09/02/2016

EXAMINER	ART UNIT	CLASS-SUBCLASS
FLEMING, FRITZ M.	2836	307-104000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

[ ] Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

[ ] "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) the names of up to 3 registered patent attorneys or agents OR, alternatively,

(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 Fish & Richardson P.C.
2
3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE: Massachusetts Institute of Technology

(B) RESIDENCE: (CITY and STATE OR COUNTRY): Cambridge, MA

Please check the appropriate assignee category or categories (will not be printed on the patent): **[**] Individual [X] Corporation or other private group entity [ ] Government

4a. The following fee(s) are submitted:

[X] Issue Fee

[ ] Publication Fee (No small entity discount permitted)

[ ] Advance Order - # of Copies _____

4b. Payment of Fee(s): (**Please first reapply any previously paid issue fee shown above**)

[ ] A check in the amount of the fee(s) is enclosed.

[ ] Payment by credit card. Form PTO-2038 is attached.

[X] The Director is hereby authorized to charge the required fee(s), or credit any overpayment, to Deposit Account Number 06-1050

5. **Change in Entity Status** (from status indicated above)

[ ] Applicant certifying micro entity status. See 37 CFR 1.29 — **NOTE**: Absent a valid certification of Micro Entity Status (see form PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

[ ] Applicant asserting small entity status. See 37 CFR 1.27. — **NOTE**: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

[ ] Applicant changing to regular undiscounted fee status. — **NOTE**: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

The Director of the USPTO is requested to apply the Issue Fee and Publication Fee (if any) or to re-apply any previously paid issue fee to the application identified above.
NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature /Marc M. Wefers Reg. No. 56,842/ Date June 2, 2016

Typed or printed name Marc M. Wefers Registration No. 56,842

23530468.doc

Electronic Patent Application Fee Transmittal

Application Number:	13789860
Filing Date:	08-Mar-2013
Title of Invention:	WIRELESS ENERGY TRANSFER
First Named Inventor/Applicant Name:	Aristeidis Karalis
Filer:	Marc M. Wefers/Cheryl Forrest
Attorney Docket Number:	01997-0358008

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Utility Appl Issue Fee	1501	1	960	960

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		**960**

Electronic Acknowledgement Receipt

EFS ID:	25947782
Application Number:	13789860
International Application Number:	
Confirmation Number:	4131
Title of Invention:	WIRELESS ENERGY TRANSFER
First Named Inventor/Applicant Name:	Aristeidis Karalis
Customer Number:	26161
Filer:	Marc M. Wefers/Denise Siede
Filer Authorized By:	Marc M. Wefers
Attorney Docket Number:	01997-0358008
Receipt Date:	02-JUN-2016
Filing Date:	08-MAR-2013
Time Stamp:	12:23:13
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$960
RAM confirmation Number	12228
Deposit Account	061050
Authorized User	FISH & RICHARDSON P C
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	ReplytoNOA.pdf	149550 a5a0052a0f314ca1bfc3a7cd7aac8f6575ff71e2	no	3
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30365 ba3df3bee11e59943a2fb540ab7a9eebbca2c310	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	179915		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor	:	Aristeidis Karalis	Art Unit	:	2836
Serial No.	:	13/789,860	Examiner	:	Fritz M. Fleming
Filed	:	March 8, 2013	Conf. No.	:	4131
Title	:	WIRELESS ENERGY TRANSFER			

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

PETITION TO WITHDRAW APPLICATION FROM ISSUANCE TO PERMIT CONSIDERATION OF IDS

Please withdraw this application from issuance, under 37 CFR § 1.313(c)(2), to permit consideration of an information disclosure statement submitted in a request for continued examination filed with this petition

Please charge any fees that need to be paid and apply credits to Deposit Account 06-1050.

Respectfully submitted,

Date: June 24, 2016

/Marc M. Wefers Reg. No. 56,842/
Marc M. Wefers
Reg. No. 56,842

Customer Number 26161
Fish & Richardson P.C.
Telephone: (617) 542-5070
Facsimile: (877) 769-7945

23537821.doc

PTO/SB/30 (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Request for Continued Examination (RCE) Transmittal

Address to:
Mail Stop RCE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Application Number	13/789,860
Filing Date	March 8, 2013
First Named Inventor	Aristeidis Karalis
Art Unit	2836
Examiner Name	Fritz M. Fleming
Attorney Docket Number	01997-0358008

This is a Request for Continued Examination (RCE) under 37 CFR 1 .114 of the above-identified application.
Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, or to any design application. See Instruction Sheet for RCEs (not to be submitted to the USPTO) on page 2.

1. Submission required under 37 CFR 1.114 Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).

   a. ☐ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.

      i. ☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____

      ii. ☐ Other _____

   b. ☒ Enclosed

      i. ☐ Amendment/Reply

      ii. ☐ Affidavit(s)/ Declaration(s)

      iii. ☒ Information Disclosure Statement (IDS)

      iv. ☐ Other _____

2. Miscellaneous

   Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a

   a. ☐ period of _____ months. (Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)

   b. ☐ Other _____

3. Fees The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.
   The Director is hereby authorized to charge the following fees any underpayment of fees or credit any overpayments to

   a. ☒ Deposit Account No. 06-1050 .

      i. ☒ RCE fee required under 37 CFR 1.17(e)

      ii ☐ Extension of time fee (37 CFR 1.136 and 1.17)

      iii ☒ Other any deficiencies

   b. ☐ Check in the amount of $ _____ enclosed

   c. ☐ Payment by credit card (Form PTO-2038 enclosed)

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

Signature	/Marc M. Wefers Reg. No. 56,842/	Date	June 24, 2016
Name (Print/Type)	Marc M. Wefers	Registration No.	56,842

CERTIFICATE OF MAILING OR TRANSMISSION

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Mail Stop RCE, Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450 or facsimile transmitted to the U.S. Patent and Trademark Office on the date shown below.

Signature			
Name (Print/Type)		Date	

This collection of information is required by 37 CFR 1.114. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Mail Stop RCE, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

American LegalNet, Inc.
www.FormsWorkFlow.com

Electronic Patent Application Fee Transmittal

Application Number:	13789860
Filing Date:	08-Mar-2013
Title of Invention:	WIRELESS ENERGY TRANSFER
First Named Inventor/Applicant Name:	Aristeidis Karalis
Filer:	Marc M. Wefers/Cheryl Forrest
Attorney Docket Number:	01997-0358008

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
RCE- 2nd and Subsequent Request	1820	1	1700	1700
		Total in USD ($)		**1700**

Electronic Acknowledgement Receipt

EFS ID:	26164088
Application Number:	13789860
International Application Number:	
Confirmation Number:	4131
Title of Invention:	WIRELESS ENERGY TRANSFER
First Named Inventor/Applicant Name:	Aristeidis Karalis
Customer Number:	26161
Filer:	Marc M. Wefers/Lisa Peterson
Filer Authorized By:	Marc M. Wefers
Attorney Docket Number:	01997-0358008
Receipt Date:	24-JUN-2016
Filing Date:	08-MAR-2013
Time Stamp:	12:10:27
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$1700
RAM confirmation Number	10655
Deposit Account	061050
Authorized User	FISH & RICHARDSON P C
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	IDS.pdf	57173 f24018a71b35f8393dee7a9745d48edc523313be	no	4
Warnings:					
Information:					
2	Information Disclosure Statement (IDS) Form (SB08)	1449.pdf	96979 c371cd818896d81f446b5fc6e9cd21706de053d3	no	2
Warnings:					
Information:					
This is not an USPTO supplied IDS fillable form					
3	Foreign Reference	FA.pdf	311417 76c0bc2135d47a36253c9027da0dd2bd124547e0	no	31
Warnings:					
Information:					
4	Non Patent Literature	NPL1.pdf	25747 f1b5273082fbfd533cebbe192b65e652886ce15e	no	3
Warnings:					
Information:					
5	Non Patent Literature	NPL2.pdf	629263 4a26623b7375e953df10ecddb98b9b16077c603e	no	7
Warnings:					
Information:					
6	Non Patent Literature	NPL3.pdf	873363 793302c0a049d045837bf8bfa8c7c1da0c0a6a29	no	13
Warnings:					
Information:					
7	Non Patent Literature	NPL4.pdf	595671 4a7df7c69df2f6ce7a97d38402caa0e2acd8a1bd	no	8
Warnings:					
Information:					

8	Non Patent Literature	NPL5.pdf	372014 03abd480af0bb4b972c0a9cbb65b7936cffdd781	no	4
Warnings:					
Information:					
9	Non Patent Literature	NPL6.pdf	2895365 acd1ce666b7a8a9116eaa9d994aa17d86208dfb8	no	235
Warnings:					
Information:					
10	Non Patent Literature	NPL7.pdf	1594976 e44dd7123ad8831c0ac0cbbfeed62c18c7887022	no	7
Warnings:					
Information:					
11	Non Patent Literature	NPL8.pdf	693709 863c7be16ca725df443587e7c94090071c9f3be2	no	10
Warnings:					
Information:					
12	Non Patent Literature	NPL9.pdf	318928 062db66cea0fdcef99201c7f395a82ff1f0e31bd	no	10
Warnings:					
Information:					
13	Non Patent Literature	NPL10.pdf	369939 6a99a7aa0f9b0520ea07b210d13629b6e123841a	no	7
Warnings:					
Information:					
14	Non Patent Literature	NPL11.pdf	291670 d0dc43e55ca0cf49a7e03e6003368e6a5485bbd2	no	5
Warnings:					
Information:					
15	Non Patent Literature	NPL12.pdf	794041 c77bd153a6f272c31b4cab33cb9863114c4646ad	no	8
Warnings:					
Information:					
16	Non Patent Literature	NPL13.pdf	298838 b865d6d547efcbf7bd9abe211cd40b1f32bde011	no	7
Warnings:					
Information:					

17	Petition to Withdraw from Issue	PettoWithdraw.pdf	46871 042cd7ed6b6c81aceaf17d10fdc5039f753b67b4	no	1
Warnings:					
Information:					
18	Request for Continued Examination (RCE)	RCE.pdf	109187 862f08941e11ec3393f80b26fffbdc25c9a0d797	no	1
Warnings:					
This is not a USPTO supplied RCE SB30 form.					
Information:					
19	Fee Worksheet (SB06)	fee-info.pdf	30221 c67f914b82cffdb6d7f5cecb2ca1bc9bc1c65a16	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	10405372		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

<u>New Applications Under 35 U.S.C. 111</u>
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

<u>National Stage of an International Application under 35 U.S.C. 371</u>
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

<u>New International Application Filed with the USPTO as a Receiving Office</u>
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor	:	Aristeidis Karalis	Art Unit	:	2836
Serial No.	:	13/789,860	Examiner	:	Fritz M. Fleming
Filed	:	March 8, 2013	Conf. No.	:	4131
Title	:	WIRELESS ENERGY TRANSFER			

MAIL STOP RCE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

INFORMATION DISCLOSURE STATEMENT

Please consider the references listed on the enclosed PTO-SB-08 or Disclosure Form. Foreign patent documents and non-patent literature are enclosed; cited U.S. patents and patent application publications will be provided on request.

This filing is being made with the filing of a Request for Continued Examination. No fee is required.

The applicant invites the examiner to consider the position of the examiner and replies by the applicant that have been set forth in the prosecution of the following U.S. patent applications. These applications are related to the present application under Section 120 and/or contain at least some material that is similar to the material set forth in the specification of this application. The applicant assumes that the examiner has direct access to these files, but will be happy to provide copies to the examiner upon request.

Application No.	Filing Date	Status
11/481,077	July 5, 2006	Issued
12/055,963	March 26, 2008	Issued
12/415,650	March 31, 2009	Issued
12/415,616	March 31, 2009	Issued
12/415,655	March 31, 2009	Issued
12/415,667	March 31, 2009	Issued
12/437,641	May 9, 2009	Issued
12/466,065	May 14, 2009	Issued
12/553,957	September 3, 2009	Abandoned
12/571,949	October 1, 2009	Issued
12/639,958	December 16, 2009	Abandoned
12/639,961	December 16, 2009	Issued
12/639,962	December 16, 2009	Issued
12/639,963	December 16, 2009	Issued
12/639,966	December 16, 2009	Issued
12/639,967	December 16, 2009	Issued
12/639,972	December 16, 2009	Issued
12/646,442	December 23, 2009	Issued
12/646,524	December 23, 2009	Issued
12/649,635	December 30, 2009	Issued
12/649,777	December 30, 2009	Issued
12/649,813	December 30, 2009	Issued
12/649,852	December 30, 2009	Issued
12/649,904	December 30, 2009	Issued
12/649,973	December 30, 2009	Issued
12/688,305	January 15, 2010	Abandoned
12/688,339	January 15, 2010	Abandoned
12/708,850	February 19, 2010	Abandoned

Application No.	Filing Date	Status
12/713,556	February 26, 2010	Abandoned
12/717,559	March 4, 2010	Abandoned
12/726,742	March 18, 2010	Abandoned
12/726,913	March 18, 2010	Abandoned
12/726,953	March 18, 2010	Abandoned
12/732,399	March 26, 2010	Abandoned
12/949,504	November 18, 2010	Abandoned
12/949,544	November 18, 2010	Abandoned
12/949,580	November 18, 2010	Abandoned
13/036,177	February 28, 2011	Abandoned
13/288,308	November 3, 2011	Abandoned
13/477,459	May 22, 2012	Pending
13/677,407	November 15, 2012	Issued
14/302,662	June 12, 2014	Issued
14/629,709	February 24, 2015	Pending
14/666,683	March 24, 2015	Pending
15/083,726	March 29, 2016	Pending
15/186,969	June 20, 2016	Pending

Apply any necessary charges or credits to deposit account 06-1050, referencing the above attorney docket number.

Please contact the undersigned if there are any questions regarding this Statement.

Respectfully submitted,

Date: June 24, 2016

/Marc M. Wefers Reg. No. 56,842/
Marc M. Wefers
Reg. No. 56,842

Customer Number 26161
Fish & Richardson P.C.
Telephone: (617) 542-5070
Facsimile: (877) 769-7945

23537826.doc

Substitute Disclosure Form	U.S. Department of Commerce Patent and Trademark Office	Attorney Docket No. 01997-0358008	Application No. 13/789,860
Information Disclosure Statement by Applicant (Use several sheets if necessary) (37 CFR §1.98(b))		Applicant Massachusetts Institute of Technology	
		Filing Date March 8, 2013	Group Art Unit 2836

U.S. Patent Documents							
Examiner Initial	Desig. ID	Document Number	Publication Date	Patentee	Class	Subclass	Filing Date If Appropriate
	1.						

Foreign Patent Documents or Published Foreign Patent Applications								
Examiner Initial	Desig. ID	Document Number	Publication Date	Country or Patent Office	Class	Subclass	Translation Yes	Translation No
	2.	WO 2005/124962	12/29/2005	WIPO	H02J	3/00		

Other Documents (include Author, Title, Date, and Place of Publication)		
Examiner Initial	Desig. ID	Document
	3.	Copy of European Patent Office Communication for European Patent Application No. 06786588.1 dated June 17, 2016 (3 pages)
	4.	J.T. Boys et al., "Stability and control of inductively coupled power transfer systems", IEE Proc. Electr. Power Appl., Vol. 147, No. 1, pp. 37-43 (January 2000)
	5.	Mickel Budhia et al., "Design and Optimization of Circular Magnetic Structures for Lumped Inductive Power Transfer Systems", IEEE Transactions on Power Electronics, Vol. 26, No. 11, pp. 3096-3108 (November 2011)
	6.	Mickel Budhia et al., "Development and evaluation of single sided flux couplers for contactless electric vehicle charging", IEEE, pp. 614-621 (2011)
	7.	M. Chaoui et al, "Electrical Modeling of Inductive Links for High-Efficiency Energy Transmission", Electronics, Circuits and Systems, 2005. ICECS 2005. 12th IEEE International Conference, (December 2005)
	8.	Aiguo Patrick Hu, "Selected Resonant Converters for IPT Power Supplies", Thesis submitted to the Department of Electrical and Electronic Engineering for The University of Auckland, New Zealand (October 2001)
	9.	Arthur W. Kelley et al., "Connectorless Power Supply for an Aircraft-Passenger Entertainment System", IEEE Transactions on Power Electronics, Vol. 4, No. 3, pp. 348-354 (July 1989)
	10.	Seung-Hwan Lee et al., "Development and Validation of Model for 95%-Efficiency 220-W Wireless Power Transfer Over a 30-cm Air Gap", IEEE Transactions on Industry Applications, Vol. 47, No. 6, pp. 2495-2504 (November/December 2011)
	11.	Rudolf Mecke et al., "Analysis of inductive energy transmission systems with large air gap at high frequencies", European Conference on Power Electronics and Applications, Toulouse 2003, (January 2003)
	12.	R. Mecke et al., "High frequency resonant inverter for contactless energy transmission over large air gap", 2004 35th Annual IEEE Power Electronics Specialists Conference, Aachen, Germany, pp. 1737-1743 (2004)
	13.	Fumiaki Nakao et al., "Ferrite Core Couplers for Inductive Chargers", IEEE, PCC-Osaka 2002, pp. 850-854 (2002)

Examiner Signature	Date Considered

EXAMINER: Initials citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Substitute Disclosure Form

Substitute Disclosure Form U.S. Department of Commerce Patent and Trademark Office **Information Disclosure Statement by Applicant** (Use several sheets if necessary) (37 CFR §1.98(b))	Attorney Docket No. 01997-0358008	Application No. 13/789,860
	Applicant Massachusetts Institute of Technology	
	Filing Date March 8, 2013	Group Art Unit 2836

Other Documents (include Author, Title, Date, and Place of Publication)		
Examiner Initial	Desig. ID	Document
	14.	Takahashi Ohira, "What in the World is Q?", IEEE Microwave Magazine, pp. 42-49 (June 2016)
	15.	Juan C. Olivares-Galvan et al., "Wireless Power Transfer: Literature Survey", Power, Electronics and Computing (ROPEC), 2013 IEEE International Autumn Meeting on 13-15 Nov. 2013, Mexico City, (2013) (7 pages)

Examiner Signature	Date Considered
EXAMINER: Initials citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.	

Substitute Disclosure Form

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
29 December 2005 (29.12.2005)

PCT

(10) International Publication Number
WO 2005/124962 A1

(51) International Patent Classification[7]: H02J 3/00, 17/00, H01F 38/14

(21) International Application Number: PCT/NZ2004/000123

(22) International Filing Date: 17 June 2004 (17.06.2004)

(25) Filing Language: English

(26) Publication Language: English

(71) Applicant *(for all designated States except US)*: **HARDING ELECTRONIC SYSTEMS LIMITED** [NZ/NZ]; 69b Portage Road, Otahuhu, Auckland, 1006 (NZ).

(72) Inventor; and

(75) Inventor/Applicant *(for US only)*: **TETLOW, Steven, Douglas** [NZ/NZ]; 104 Upper Fitzherbert Road, Wainuiomata, Wellington, 6008 (NZ).

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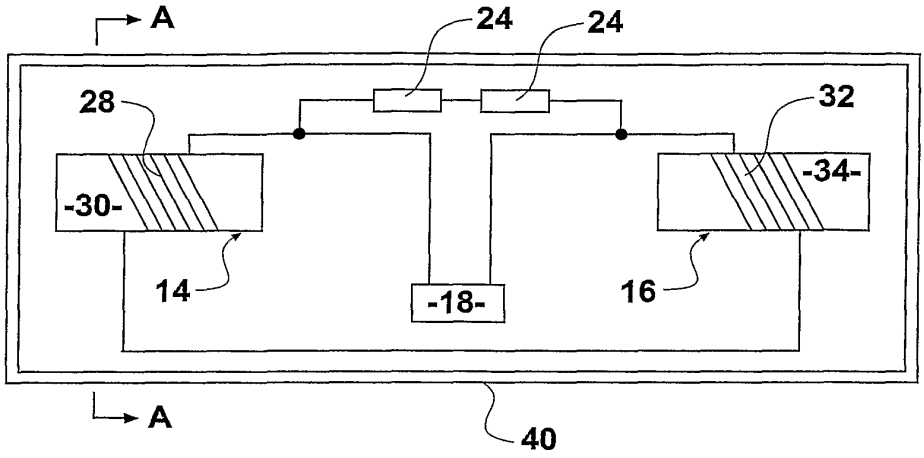
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(54) Title: APPARATUS AND METHOD FOR INDUCTIVE POWER TRANSFER



(57) Abstract: Apparatus is disclosed for allowing an inductive power distribution system pick-up to be located at an extended distance from the system primary conductive path. The apparatus has an elongate housing (40) which has a first coil (14) at one end to receive energy from a magnetic field associated with the primary conductive path. A second coil (16) is provided at the other end of the housing and is electrically connected to the first coil to produce a magnetic field for the supply of electrical energy to the pick-up. The circuit formed by the two coils is tuned to have a desired resonant frequency.

WO 2005/124962 A1

APPARATUS AND METHOD FOR INDUCTIVE POWER TRANSFER

Field Of Invention

This invention relates to inductive power distribution systems commonly known as inductive power transfer (IPT) systems.

Background

Inductive power transfer systems for use in distributing electrical energy are now well known. These systems typically comprise an elongate primary conductor which is energised at a desired frequency so that a number of tuned "pick-up" or secondary power distribution units which are positioned closely adjacent to the primary conductor may be energised by the magnetic field associated with the primary conductor. Therefore, IPT systems have the advantage that a contactless power distribution system is achieved.

These systems have significant benefits in a number of applications such as lighting for roadways, tunnels, swimming pools and aircraft. In particular these systems are particularly advantageous for use in situations where an unfavourable environment for power distribution may exist. For example, roadways are subject to considerable physical stresses due to large fast moving vehicles. Illuminated road studs that are powered by fixed wiring are difficult to wire in to the roadway and are prone to failure due to stresses from vehicles that can physically move the stud or the adjacent road surface and allow foreign matter such as water or dirt to interfere with the wired connection.

An issue with illuminated road stud IPT systems, where the primary conductor is required to be buried in the road substrate, is that it can be necessary to transfer power over an extended distance or gap from the primary conductor. Although the primary conductor may be buried at a suitable level to enable adequate power transfer when such a system is first installed, roadways often need to be resealed which can extend the distance between the primary conductor and the pick-up. As distance from the primary conductor increases, less may power may be transferred, until such time as the light supplied by the pick-up becomes weak or does not function at all.

A solution to this problem has been proposed in United States Patent Specification 6,317,338 which suggests use of an intermediate resonant circuit. This is a resonant circuit which may be placed between the primary conductor and one or more of the secondary pick-ups. In the context of lighting systems, the specification discloses an intermediate resonant circuit which comprises an inductive element and a capacitive element, the values of which are selected to provide resonance at a desired frequency. Therefore, the intermediate resonant circuit is energised by energy derived from the magnetic field associated with the primary conductor. As a result of energisation of the intermediate resonant circuit, a magnetic field is established which in effect extends the field associated with the primary conductor. This allows power to be transferred over an extended distance or gap from the primary conductor.

United States Patent Specification 6,317,338 discloses intermediate resonant circuit constructions of conductors that have inductive and capacitive properties that lie parallel to the primary conductor. This is undesirable in many practical applications, for example in a road stud installation a significant section of roadway needs to be cut or excavated to install such a system. This form of circuit presents installation difficulties if primary cables need to be run through an existing cable duct in a structure such as a bridge. Also, the physical construction of such a circuit is difficult to manufacture and is prone to failure. If a road including this known design needs surface reconstruction, then there is a substantial risk that the intermediate resonant circuit will be destroyed. Finally, the known arrangement has the disadvantage that is effectively only intercepts the field from one of the conductors in the primary conductive path.

Object

It is an object of the present invention to provide an IPT system or a component for such a system that allows pick-ups to be located at an extended distance from a primary conductor that will at least partially obviate one or more problems or disadvantages mentioned above, or which will at least provide a useful alternative.

Brief Summary of the Invention

In one aspect the invention provides an IPT system field extension device including:

a first coil adapted to receive energy from a magnetic field associated with a primary conductive path of an IPT system;

a second coil electrically connected to the first coil and provided remote from the first coil, and being adapted to produce a magnetic field for supply of electrical energy to a pick-up of an IPT system; and

a tuning capacitance provided in series or parallel with the first and second coils to enable the circuit so formed to have a desired resonant frequency.

In a preferred embodiment the first coil is retained within a first housing and the second coil is retained within a second housing.

One of the first or second housings may be at last partly received within the other of the first or second housings.

A filler material may be provided between each coil and its respective housing part.

The filler material preferably comprises an electrically non-conductive material.

In a preferred embodiment the filler material comprises a material having property of elasticity or resilience. The filler material may comprise an epoxy resin or a particulate material such as silicone sand.

Each housing part may be constructed from a cylindrical plastics material such as PVC conduit. Alternatively the housing may be constructed from a ceramic material.

The housing and filler material may both be constructed from flexible material.

In a preferred embodiment the first coil is provided at or adjacent to the first end of an elongate housing and the second coil is provided at or adjacent to the second end of the housing.

The first or second coil may be formed about a ferrite core such as an E core, a toroid, or a pot core.

In a further aspect the invention provides an IPT system including:

a primary conductor;

at least one pick-up coil capable of generating a voltage by magnetic induction from the primary conductor;

an intermediate resonant circuit provided between the primary conductor and a pick-up coil, the intermediate resonant circuit including a first coil adapted to receive energy from a magnetic field associated with a primary conductive path of an IPT system, a second coil electrically connected to the first coil and being adapted to produce a magnetic field for supply of electrical energy to a pick-up of an IPT system, the first coil being provided adjacent to the primary conductive path, the second coil being provided adjacent to the at least one pick-up coil, and a tuning capacitance provided in series or parallel with the first and second coils to enable the circuit so formed to have a desired resonant frequency.

The invention also provides one or more of:
a pathway such as a roadway, footpath, aisle or sidewalk;
a tunnel;
a handrail;
a pool installation;
including an IPT system set forth above.

In yet a further aspect the invention provides a method of producing an IPT system field extension device, the method including steps of:

providing a first coil;
providing an elongate housing having an interior space;
placing the first coil in the interior space to locate the first coil at or adjacent to one end of the housing;
providing a second coil;
placing the second coil in the interior space to locate the second coil at or adjacent to another end of the housing;
filling the space between the housing and the coils with a filler material.

In a still further aspect the invention provides a method of installing an IPT system including the steps of laying a primary conductive path in a channel such that the primary conductive path is substantially surrounded by stationary material, drilling at least one hole in the stationary material, providing an IPT system field extension device as set forth above in the at least one hole, and locating an IPT pick-up adjacent to the entrance to the hole remote from the primary conductive path.

Further aspects of the invention will become apparent from the following description which is given by way of example.

Drawing Description

One or more embodiments of the invention will now be described by way of example with reference to the accompanying drawings in which:

Figure 1: is a diagram of a known IPT system topology;

Figure 2: is a diagram of an IPT system including field extension apparatus to enable a field associated with the primary conductor to power one or more pick-ups, which in this example are shown as road studs;

Figure 3: is a diagrammatic view of field extension apparatus located adjacent to a primary conductor (which is shown in cross-section) to supply electrical energy to a road stud;

Figure 4a: is a diagram of the apparatus of Figure 3 used to power two road studs;

Figure 4b: is a diagram of the apparatus of Figures 3 and 4 having one coil which is used to power two road studs;

Figure 5: is a diagram of the apparatus of Figure 3 but further including a detuned capacitor and zener diodes;

Figure 6a: is an elevation in partial cross section of field extension apparatus;

Figure 6b: is an elevation and partial cross section of field extension apparatus;

Figure 7: is an elevation in partial cross section through an altenative embodiment of field extension apparatus.

Figure 8a is a partial elevation in cross section of an alternative form of inductive element to that shown in Figures 6a and 6b;

Figure 8b: is a cross section through line BB of Figure 8a;

Figure 9a: is a partial elevation and cross section of an alternative inductor arrangement to that shown in the preceding Figures;

Figure 9b: is a cross section through line CC of Figure 9a;

Figure 10a: is a partial elevation and cross section of an alternative inductor arrangement to that shown in the preceding Figures;

Figure 10b: is a cross section through line DD of Figure 10a;

Figure 11a: is a partial elevation in cross section of an alternative inductor arrangement to that shown in the preceding Figures;

Figure 11b: is a cross section through another alternative form of inductive element;

Figures 12 to 16: are diagrammatic elevations of arrangements of IPT field extension apparatus according to the invention;

Figure 17: is a diagrammatic elevation in cross section through part of a roadway illustrating the use of a field extension device according to the invention;

Figure 18: is a diagrammatic elevation in cross section through a pool installation illustrating use of a field extension device according to the invention; and

Figure 19: is an elevation in cross section of a handrail assembly including a field extension device.

Detailed Description

Referring to Figure 1, the basic structure of an IPT power supply (also sometimes referred to as an inductively coupled power transfer (ICPT) power supply system or a contactless power supply system) is shown generally referenced 1. The system generally comprises two electrically isolated parts. The first part consists of a power supply 2 which may comprise a resonant converter for example. The power supply supplies electrical energy to a primary conductive path 4 so that an alternating current is provided in the primary conductive path. The primary conductive path is usually provided in the form of an elongated cable or track from which one or more of the second parts (commonly referred to as "pick-ups") 5 are located. The primary conductive path may be provided with or beneath a roadway for example, and secondary pick-ups 5 which may comprise lighting elements such as illuminated road studs are adhered to the surface of the roadway.

Each of the pick-ups 5 includes a pick-up element such as a coil 8 which is located sufficiently close to the conductive path 4 (but not within electrical contact with the conductive path) to enable voltage to be induced in the pick-up coil 8 by mutual induction. Reference to coils includes multiple turns of conductive material as well as a single turn or partial turn. The pick-up coils 8 are tuned with the tuning capacitor 10 to augment the power transfer capability from the primary conductive path to each pick-up. The tuning,

although shown in Figure 1 as being achieved with a parallel connected capacitor, may also be achieved with a series connected capacitor.

The output from the tuned pick-up circuit comprising elements 8 and 10 is then typically rectified and fed to a controller. Discussion of one example of an appropriate controller, and a description which provides more information about the function and construction of IPT systems generally may be found with reference to the United States Patent No. 5,239,308. That document describes partial decoupling of the pick-up coil to control the power flow to match the power taken from the primary conductive path to that required by a load supplied by each pick-up 6.

In order for effective power transfer to occur, the coils 8 of each of the pick-ups 6 must be within a certain distance from a primary conductive path 4. This distance will vary depending upon the system design, but may typically be only a few centimetres. In United States Patent No. 6,317,338 an intermediate resonant circuit has been suggested, which comprises an inductive element and a capacitive element (although a separate capacitor as such may not necessarily be required) that may be physically located between the primary conductive path 4 and one or more pick-up coils 8. A resonant current is induced in the intermediate resonant circuit by the magnetic field associated with the primary conductive path 4. The current in the intermediate resonant circuit further produces a field which allows a secondary pick-up coil 8 to be located at a further distance from the primary conductive path 4 to achieve a given power transfer to the coil 8.

Turning to Figure 2, a general diagram of an IPT system according to the present invention is shown generally referenced 10. In this system, the secondary pick-ups 6 comprise road studs. Although not shown, each road stud includes an appropriate control circuit and also includes one or more lighting devices such as light emitting diodes (LED's). Intermediate resonant circuits generally referenced 12 are provided, each circuit having a first lumped inductance 14 which is located substantially adjacent to the primary conductor 4, and a second lumped inductance 16 which is located adjacent to the pick-up coils 8 of the pick-ups 6. The coils 14 and 16 are directly or indirectly electrically connected to each other. In the examples shown in Figure 2, tuning capacitances 18 are connected in series with the coils 14 and 16. However, the capacitances 18 may be provided in parallel with coils 14 and 16. The tuning capacitance 18 is chosen so that the circuit 12 as a whole will resonate at a desired resonant frequency to enhance the field

generated by coil 16 and therefore augment the power transfer capability of the circuit 12 to pick-up 6.

A circuit 12 according to one embodiment of the invention is shown diagrammatically adjacent to a primary conductive path in Figure 3. Typically the primary conductive path 4 comprises a cable in the form of an elongate loop which begins and ends at the power supply 2. The cable conductors will typically be provided closely adjacent to each other. However, at locations along the conductors where pick-ups 6 will be located (which may be referred to as "nodes"), the cable conductors may be separated apart a predetermined distance in order to provide an adequate magnetic flux path which may be intercepted by a pick-up, or a coil of an intermediate resonant circuit. For example, in a typical road stud application, the cable may be nearly any form of conductive cable, but we have found multi-strand copper cable preferable. The two conductors that form the overall loop of conductive material are typically separated by a distance of approximately 25mm to 50mm in the intended vicinity of a road stud or other pick-up. The preferred operating frequency for current in the primary conductive path is 38.4 kHz, but systems could be constructed from 100 Hz to some MHz depending on local radio regulations.

Therefore in Figure 3 the primary conductive path 4 is shown in the form of a distribution cable the two separate conductors of which have been separated in the vicinity of first coil 14 to assist power transfer.

Figure 4a diagrammatically shows a further coil 20 which is located adjacent to a second road stud 6 so that two road studs may be powered from the single intermediate resonant circuit. The overall circuit inductance and capacitance is chosen to maintain the desired resonant frequency. In figure 4b a construction is diagrammatically shown whereby the second coil 16 is used to power two road studs 6.

In Figure 5, the general construction described with reference to Figures 3 to 4b is shown, but further includes a detuning capacitor 22 which is connected in parallel with the circuit tuning capacitor 18. The detuning capacitor 22 may also be connected in series with two back to back zener diodes 24. If desired, the back to back zener diodes may simply be connected across the tuning capacitor without the detuning capacitor 22, as we have found that a detuning capacitor is not necessary when using inductors that are formed about a bar or rod of ferrite or similar material. The diode construction limits the peak voltage in either direction and therefore provides a way of limiting circulating current. This

is important because in practice if a load is not being supplied (for example if the road stud is not functioning or is required to be turned off) then high circulating resonant currents may be induced in the intermediate resonant circuit. Such currents are undesirable for two reasons. Firstly, component ratings in the intermediate resonant circuit may be exceeded leading to failure of the device. Secondly, due to the mutual inductance between the inductor 14 of the intermediate circuit and primary conductor path 4, any high circulating currents will have an affect on the power supply for the primary conductive path which can lead to destabilisation of the supply and have a negative impact on overall system performance.

Turning now to Figures 6a and 6b, a practical embodiment of an intermediate resonant circuit in accordance with the invention is illustrated.

Referring to Figure 6a, coil 14 is formed by winding a conductive material such as copper wire 28 about a ferrite core 30. Similarly, coil 16 may be formed by winding copper wire 32 about a ferrite core 34. Cores may not be necessary in some applications, or alternative core materials with similar electrical characteristics may be used such as FINEMET or GLASSMET, but we have found ferrite to be the most preferred material. The windings are electrically connected to each other as shown by wire 36 which may be a separate piece of conductive material which is connected to one end of each coil, or alternatively both coils may be constructed from the same length of material. The other end of each coil is connected to capacitor 18. The coil 14 is in use located within about 30mm of the primary conductor.

The two back to back zener diodes 24 are connected in parallel with capacitor 18 to limit resonant currents in the circuit when no load is being supplied in use.

In the embodiment shown in figures 6A and 6B the typical zener voltage is 48 V. Typical tuned circuit current is 0.5 A with the road stud in position and 0.7 A when the road stud is removed. Without the zener diodes 24, unloaded circulating current can rise above 4 A which may destroy the tuning capacitor and affect system efficiency.

In the embodiment shown in Figures 6a and 6b, the winding assemblies, capacitor 18 (which may typically be 100nF) and zener diodes 24 may be mounted on a rigid substrate, such as a printed circuit board (PCB) 36. This has the advantage that the components are more easily electrically connected together while still being maintained in an

appropriate physical relationship. Therefore, the ferrite coils 30 and 34 may be glued or otherwise affixed to the circuit board for example, and each end of the windings wound about the coils may be electrically connected (for example by soldering) to conductive tracks on the board. In this way, there are no loose wires within the assembly. Similarly, the capacitor 18 and zener diodes 24 may be soldered to electrically conductive tracks on the board so that the desired electric circuit is established.

As can be seen more clearly in 6b, the PCB 36 together with the components mounted on the PCB is provided within a housing 40. In the preferred embodiment housing 40 takes the form of an elongate sleeve which is cylindrical in form. Those skilled in the art will appreciate that a variety of different cross sectional shapes may be used rather than the circular shape shown in the drawing figures. The housing 40 is preferably constructed from a flexible material, but one which has sufficient rigidity to house the required components so that the assembled unit may be handled and installed in the field. For example, the housing is preferably sufficiently robust to allow the construction 12 to be pushed into a hole formed in a roadway which may be formed from loose aggregate, or concrete or steel materials. The most preferred material for constructing the housing is 25 millimetre PVC conduit having a wall thickness of 2mm, for example standard electrical high impact grade conduit.

In the most preferred form, the space between the components within the housing and the housing itself is filled with a filler material that provides a matrix within which the required components are encased or surrounded so that they are securely held within the housing. It is preferable that the filler material is also flexible or allows movement (such as flexing) of the housing, as this has advantages in various installations as will be described further below. Furthermore, we have found that a substantially resilient or elastic compound (which therefore provides properties of flexibility in use) has a number of practical advantages. In particular the physical unit when installed in a number of practical situations can be subject to physical movement such as vibration which has potential to be extremely damaging to electronic components or their physical assembly. One example is use of IPT systems in roadways where frequent use of heavy vehicles which travel at speed can cause significant vibration or similar movement. A filler material which is resilient or elastic insulates the components of the circuit against this movement. Furthermore, the filler material may have the advantage of assisting with electrical insulation, and has the further advantage that it assists with maintaining a desired position

of the components within the housing so that a "unitary" robust product is provided which would resist ingress of any foreign matter such as water, dirt etc.

A number of different materials may be used to construct the housing and provide the filler. In some embodiments, any electrically nonconductive material may be used for the housing and the filler. In some applications are may be desirable to use materials which have a specified fire ratings. For example, it may be desirable to construct the other housing from a surrounded material such as a glass ceramic and to provide a particular material for the filler, for example silicon sand. These materials have a high fire rating, so they may be used for installation of IPT systems in tunnels, bridges, buildings or other structures where the primary conductive path may be disposed in a cable duct or maintenance duct. The extended devices 12 may be placed in holes drilled into a wall adjacent to the duct. Providing the devices 12 with an appropriate fire rating can be important to reduce fire risk.

We have found that epoxy resin, particularly electrical grade epoxy resin provides a suitable filler material compound. However, other materials which provide electrical insulation and have a property of elasticity or resilience may also be provided, such as polyurethanes for example.

Turning now to Figure 7, it will be seen that the housing may be separated into two parts 40a and 40b with housing 40a including a first PCB 36a and housing 40b containing a second PCB 36b. The first winding 14 is provided in the first part 40a and the second winding 16 is provided in part 40d together with capacitor 18 and zener diodes 24. Alternatively, the capacitor and zener diodes may be provided in housing part 40a, or in a separate housing, or in material intermediate of the two housing parts 40a and 40b. The desired circuit is completed by two core cable 42 (e.g. 1.5mm two core cable) which is connected for example by soldering or by using appropriate electrical plugs, sockets or similar connectors to terminals provided on each circuit board so that the required circuit is made as described above with reference to the preceding figures.

In the most preferred form, the electrical connection between the two circuit paths is made, and then each housing is filled with epoxy resin, so that the electrical connections are sealed against any ingress of water or dirt or other foreign matter which may affect circuit performance. The advantage with having the housing effectively split into two separate parts which are joined by flexible conductive material is that the intermediate

resonant circuit can be used to supply electrical energy to a pick-up which is quite remote from the primary conductive path. One example is diagrammatically illustrated in Figure 16 where it can be seen that the first coil is provided adjacent to a conductive primary path 4 and second coil 16 is provided a considerable distance away (and possibly via a tortuous path through a floor, wall or various other structural components) to power an illuminated exit sign 44. Therefore, the overall construction has the advantage that an elongate primary conductor may be provided during construction of a building, for example through the floor of a building, and then lights or other electrical apparatus within the building may be supplied with electrical energy without contacts needing to be hardwired into the building structure. This also had the advantage that electrical connections do not need to be broken if the building is reconfigured, for example if an office is being repartitioned. We have found that the coils 14 and 16 may be separated by a distance up to two metres using standard cable to interconnect them, and longer distances are possible if litz wire is used.

Referring now to Figures 8a and 8b a first alternative form of coil configuration is shown. Further alternative coil configurations are also shown in Figures 9a through 10b and these will each be discussed with reference to coil 14 i.e. the coil which intercepts the field associated with the primary conductors. However, these arrangements could also be applied to second coil 16.

In Figure 8a, the elongate ferrite core 30 has been substituted for a ferrite E core 50. One each of the separated primary conductors is placed within the gaps 52 and 54 between the legs of the E core. The wire 28 is wound about the base of the core. A cross section through a part of the core (indicated by lines BB in Figure 8A) is shown in Figure 8b.

Turning to Figure 9a, the first coil 14 may alternatively be formed the using a ferrite toroidal core 60 which has an opening 62 to allow one of the separated primary conductors 4 to be placed in a central position within the toroid. The winding 28 is made about the body of the toroid as shown. For further clarity, Figure 9b shows a cross section taken through lines CC of Figure 9a.

In Figure 10a a ferrite pot core 64 is shown within an end of housing 40, with the winding 28 disposed about the central leg 66 of the core. Figure 10b shows a cross section through line DD of Figure 10a. Such a pot core may be used to form winding 14, and we

have found that this arrangement allows the apparatus to function effectively even when closely adjacent to steel materials.

In Figure 11a, another ferrite pot core 68 is shown having gaps 70 through which primary conductors 4 may be introduced into the pot core. Therefore core 68 remains in association with the primary conductor, and a pot core 64, as described with reference to Figures 10a and 10b, can be placed in contact with or adjacent to core 68 to facilitate magnetic coupling.

Similarly, referring to Figure 11b, the primary conductors 4 may be placed between the legs of a ferrite E core 72 against which ferrite E core 50 (refer Figure 8a and 8b) may be placed to facilitate good magnetic coupling.

Cable ties (not shown) may be used in practice to ensure that the apparatus 12 is located within a desired physical proximity of the primary conductor. In the embodiments where the ferrite cores extend beyond the housing, additional physical support such as a conduit box may be provided. Alternatively the environment or position of the primary conductor and the apparatus 12 may be such that no additional support is required.

Referring now to Figures 12 to 15, the constructions described above are shown in various practical implementations in diagrammatic form. For convenience and ease of illustration, only the housing 40 of each isolated tuned intermediate circuit assembly 12 is shown. In Figure 12, it can be seen that the construction can be provided horizontally. In Figure 13, the advantageous ability of the apparatus to flex is illustrated. To enable this construction to be possible, a construction similar to that described with reference to Figure 7 may be used whereby the housing is provided in one part, but the circuit board is provided in two parts. An appropriate flexible conductor provides the electrical connection between the circuit boards which are held in their positions at either end of the housing 40. Depending on the nature of the conductors and the filler material within the housing, the filler may be provided in portions of the housing adjacent each end so as to substantially enclose or encase the circuit boards, or alternatively the compound may be provided throughout the length of the housing.

In Figure 14, it will be seen that more than one pick-up can be supplied by the single field extension. As illustrated in Figure 4b, a single second core 16 may provide a field sufficient to power two pick-ups. Alternatively, depending on the power requirements of

the pick-ups and their physical location or proximity to each other, a separate coil 20, as shown in Figure 4a, may be required. In a practical embodiment of the invention, further coil 20 may be replicated in the same way as coil 16. Therefore, a separate ferrite core may be provided for attachment to the circuit board, and coil 20 may be formed on this separate ferrite core. The further coil 20 may also be provided on a separate piece of PCB to allow flexible construction to be achieved.

Turning to Figure 15, the isolated tuned circuit construction 12 is shown in a vertical orientation in which it may be disposed within a roadway for example with the upper surface 74 of the roadway comprising a sealed surface, a cobblestone surface, bricks or a driveway surface which may be a loose particulate material. Use of the circuit construction 12 for these high movement applications is highly desirable since fixed hard wired systems in these applications will frequently fail due to movement. We have also found that the circuit construction 12 will still operate effectively with a roadway (such as the bridge) with a steel upper surface or layer 74.

Turning now to Figure 17, a further embodiment is shown diagrammatically in use in a roadway system. In some applications, the roadway may comprise a structure such as bridge deck 76 over which the roadway surface 78 is disposed. Due to variations in the depth of the bridge deck throughout the structure (and/or to allow for physical expansion and contraction of the bridge structure) it is desirable to have a field extension circuit which may expand or contract. We have found that we may make provision for extension contraction by effectively telescoping the housing 40 so that a first housing part 40c is of a sufficient diameter to receive a second housing path 40d. Housing part 40c contains first coil 14 and part 40d contains the second coil 16 which may be sealed within the respective parts as described above. One of the housing parts includes any other necessary components such as capacitor 18 and zener diodes 24 (although these components may be distributed between the housing parts if desired). The circuit is completed by using flexible cable 42 as described above with reference to the embodiments shown in Figure 7. Therefore, in use the two housing parts may move relative to each other while the cable between sections is securely housed within the housing assembly. This telescoping construction also has the advantage that the housing sections are maintained in physical contact.

In Figure 18, example of use of the invention in a pool environment is shown diagrammatically. The pool structure 80 may be made of an appropriate structural

material such as structural concrete or steel. This will typically have an internal coating 82 that may include a water proof seal which is covered with plaster, paint or other suitable internal materials to provide a barrier between the liquid (not shown) within space 84 of the pool and the pool structure. The pool lights are frequently a desirable feature for users of swimming pools, but lights pose a problem in terms of electrical connection, so the installation of lights usually also means installing costly seals within the pool structure to allow fixed wiring to be installed to reach the light connections without exposing the connections to any water. This problem is overcome by the present invention. As can be seen from Figure 18, a hole can be drilled into the pool structural material 80 without penetrating the internal coating 82, and circuits 12 can be placed in each hole. A primary conductive loop can then be placed about the outside of the pool structure. Sealed light units can then simply be affixed to the internal pool wall in the appropriate places adjacent to coils 16 of the intermediate circuits 12.

In Figure 19 application of the invention to a handrail installation is also shown diagrammatically. A handrail 86 is affixed at a number of places to a concrete wall 88 by mounting brackets 90. Within handrail 86 a reflective light pipe 92 is provided which has one end 94 open to the light source such as LED's 96. Primary conductors 4 are encased within concrete wall 88, and a hole 98 has been drilled within the wall within which circuit 40 is disposed so that coil 14 (not shown) is adjacent to conductors, and coil 16 (not shown) is adjacent to a ferrite pick-up assembly 100 which is tuned by a capacitor 102 at an appropriate frequency to optimise or at least augment power transfer to the pick-up. A control circuit 104 (which may be similar to the circuit disclosed in US Patent No. 6,317,338) controls the transfer of power to the pick-up to supply the LED's which illuminate the reflective light pipe 92. The invention has the advantage that it allows the primary conductor to be buried in the concrete wall rather than having to be contained within the handrail which is something that may well be damaged as a result of fire, for example, or traffic accidents or through general wear and tear.

The invention has a number of practical applications and significant advantages over known systems. In particular the isolated tuned circuit allows physical as well as electrical isolation. Therefore, it enables primary cables to be run though cable ducts in bridges for example which are often some distance from the point at which power is required to be supplied. Also, primary cables may be protected from fire or other damage by being located deep in a structural material such as concrete, and still provide a functional IPT

system. Finally, the invention is easily manufactured and installed. Installation only requires a hole to be made, and this can be achieved by drilling, with minimal disruption.

Various changes and modifications to the presently preferred embodiments of the invention described herein will be apparent to those skilled in the art. Such changes and modifications may be made without departing from the spirit and scope of the present invention and without diminishing its attendant advantages. It is therefore intended that such changes and modifications be included within the scope of the invention as defined in the appended claims.

The preferred features of the invention are applicable to all aspects of the invention and may be used in any possible combination.

Where the words "comprise" "have" or "contain" are used in this document, or variations of these word such as comprises and comprising, these are intended to be interpreted in an inclusive sense i.e. to mean "including but not limited to" unless the context clearly dictates the contrary.

CLAIMS:

1. An IPT system field extension device including:
a first coil adapted to receive energy from a magnetic field associated with a primary conductive path of an IPT system;
a second coil electrically connected to the first coil and provided remote from the first coil, and being adapted to produce a magnetic field for supply of electrical energy to a pick-up of an IPT system; and
a tuning capacitance provided in series or parallel with the first and second coils to enable the circuit so formed to have a desired resonant frequency.

2. A field extension device as claimed in claim 1 wherein the first coil is retained within a first housing and the second coil is retained within a second housing.

3. A field extension device as claimed in claim 2 wherein one of the first or second housings is at last partly received within the other of the first or second housings.

4. A field extension device as claimed in claim 2 or claim 3 wherein a filler material is provided between each coil and its respective housing part.

5. A field extension device as claimed in claim 4 wherein the filler material comprises an electrically non-conductive material.

6. A field extension device as claimed in claim 4 or claim 5 wherein the filler material comprises a material having property of elasticity or resilience.

7. A field extension device as claimed in any one of claims 4 to 6 wherein the filler material comprises an epoxy resin.

8. A field extension device as claimed in claim 4 or claim 5 wherein the filler material comprises a particulate material.

9. A field extension device as claimed in claim 8 wherein the particulate material comprises silicone sand.

10. A field extension device as claimed in any one of claims 2 to 9 wherein each housing part is constructed from a cylindrical plastics material.

11. A field extension device as claimed in claim 10 wherein the housing is constructed from PVC conduit.

12. A field extension device as claimed in claim 10 wherein the housing is constructed from a ceramic material.

13. A field extension device as claimed in any one of claims 2 to 12 wherein the housing and filler material are constructed from flexible material.

14. A field extension device as claimed in claim 1 further including an elongate housing having a first end and a second end, the first coil being provided at or adjacent to the first end of the housing and the second coil being provided at or adjacent to the second end of the housing.

15. A field extension device as claimed in any one of the preceding claims wherein the first or second coil is formed about a ferrite core.

16. A field extension device as claimed in claim 15 were in the ferrite core comprises one of an E core, a toroid, or a pot core.

17. An IPT system including:
a primary conductor;
at least one pick-up coil capable of generating a voltage by magnetic induction form the primary conductor;
an intermediate resonant circuit provided between the primary conductor and a pick-up coil, the intermediate resonant circuit including a first coil adapted to receive energy from a magnetic field associated with a primary conductive path of an IPT system, a second coil electrically connected to the first coil and being adapted to produce a magnetic field for supply of electrical energy to a pick-up of an IPT system, the first coil being provided adjacent to the primary conductive path, the second coil being provided adjacent to the at least one pick-up coil, and a tuning capacitance provided in series or parallel with the first and second coils to enable the circuit so formed to have a desired resonant frequency.

18. An IPT system as claimed in claim 17 wherein the first coil is retained within a first housing and the second coil is retained within a second housing.

19. An IPT system as claimed in claim 18 wherein one of the first or second housings is at last partly received within the other of the first or second housings.

20. An IPT system as claimed in claim 18 or claim 19 wherein a filler material is provided between each coil and its respective housing part.

21. An IPT system as claimed in claim 20 wherein the filler material comprises an electrically non-conductive material.

22. An IPT system as claimed in claim 20 or claim 21 wherein the filler material comprises a material having property of elasticity or resilience.

23. An IPT system as claimed in any one of claims 20 to 22 wherein the filler material comprises an expoxy resin.

24. An IPT system device as claimed in claim 20 or claim 21 wherein the filler material comprises a particulate material.

25. An IPT system as claimed in claim 24 wherein the particulate material comprises silicone sand.

26. An IPT system as claimed in any one of claims 19 to 25 wherein each housing part is constructed from a cylindrical plastics material.

27. An IPT system as claimed in claim 26 wherein the housing is constructed from PVC conduit.

28. An IPT system as claimed in any one of claims 18 to 21 wherein the housing is constructed from a ceramic material.

29. An IPT system as claimed in any one of claims 18 to 21 wherein the housing and filler material are constructed from flexible material.

30. An IPT system as claimed in claim 17 wherein the intermediate resonant circuit includes an elongate housing having a first end and a second end, the first coil being provided at or adjacent to the first end of the housing and the second coil being provided at or adjacent to the second end of the housing.

31. An IPT system as claimed in any one of claims 17 to 30 wherein the first or second coil is formed about a ferrite core.

32. An IPT system as claimed in claim 31 wherein the ferrite core comprises one of an E core, a toroid, or a pot core.

33. A pathway including an IPT system according to claim 17.

34. A tunnel including an IPT system according to claim 17.

35. A handrail assembly including an IPT system according to claim 17.

36. A pool installation including an IPT system according to claim 17.

37. A method of producing an IPT system field extension device, a method including steps of:
providing a first coil;
providing an elongate housing having an interior space;
placing the first coil in the interior space to locate the first coil at or adjacent to one end of the housing;
providing a second coil;
placing the second coil in the interior space to locate the second coil at or adjacent to another end of the housing;
filling the space between the housing and the coils with a filler material.

38. A method of installing an IPT system including the steps of laying a primary conductive path in a channel such that the primary conductive path is substantially surrounded by stationary material, drilling at least one hole in the stationary material, providing an IPT system field extension device as claimed in

any one of claims 1 to 16 in the at least one hole, and locating an IPT pick-up adjacent to the entrance to the hole remote from the primary conductive path.

39. An IPT field extension device substantially as herein described with reference to any one of the embodiments shown in the accompanying drawings.

40. An IPT system substantially as herein described with reference to any one of the embodiments shown in the accompanying drawings.

41. A method of producing an IPT system field extension device substantially as herein described with reference to any one of the embodiments shown in the accompanying drawings.

42. A method of installing an IPT system substantially as herein described with reference to any one of the embodiments shown in the accompanying drawings.

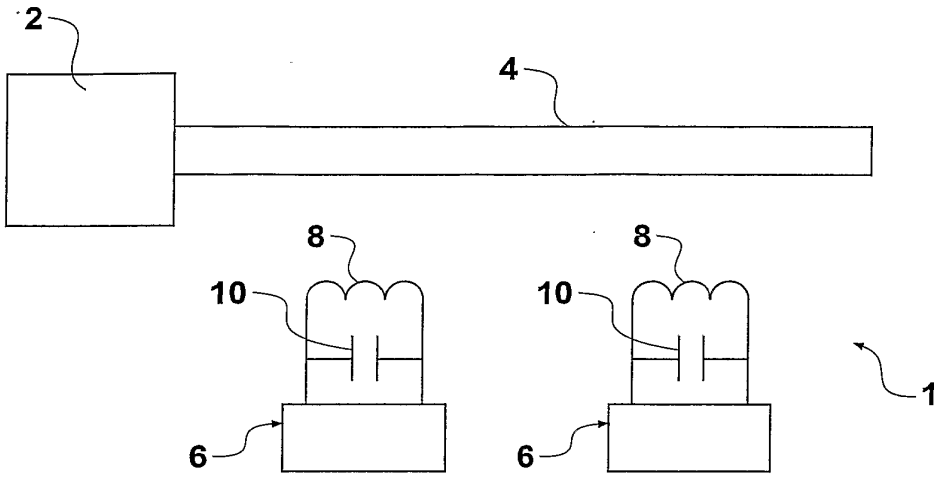


Fig. 1

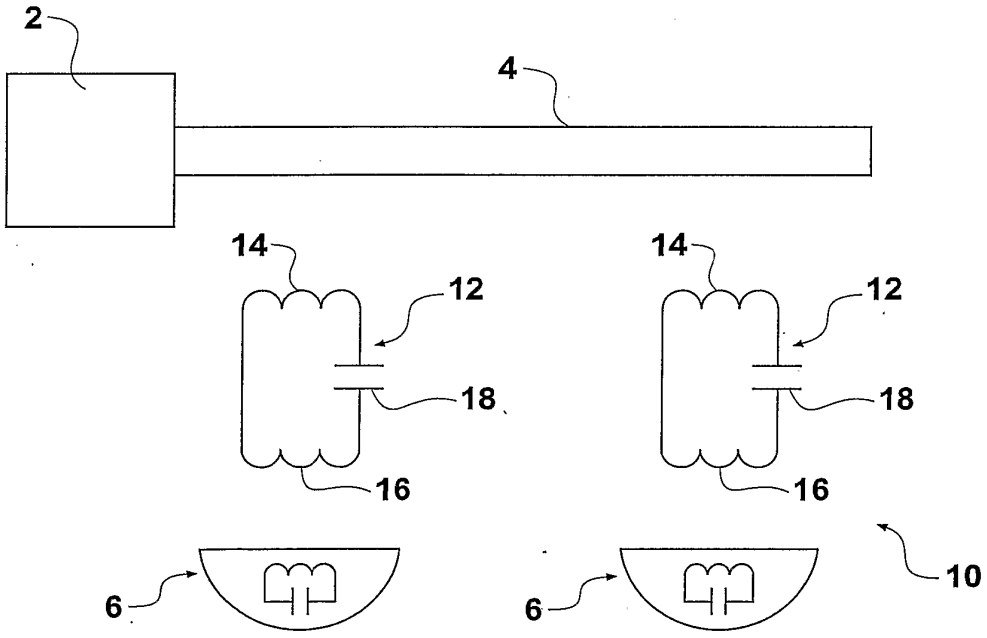


Fig. 2

InductEV, Inc.
Exhibit 1031
Page 1535

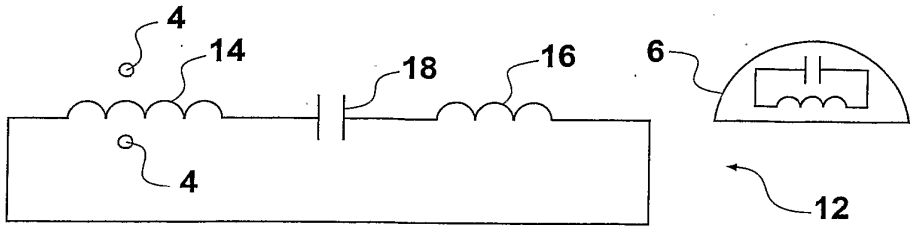


Fig. 3

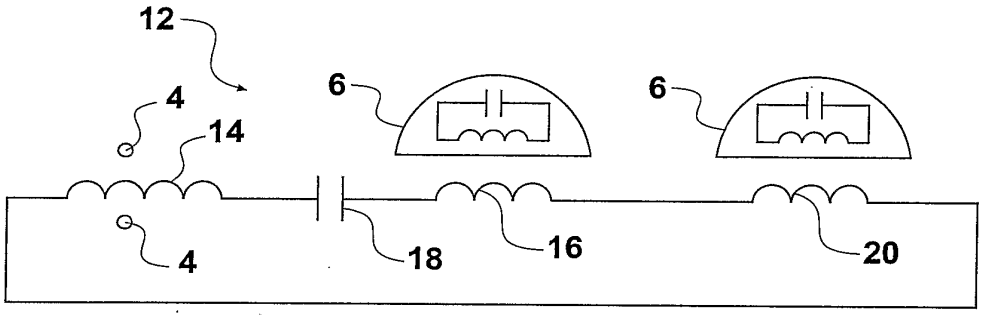


Fig. 4a

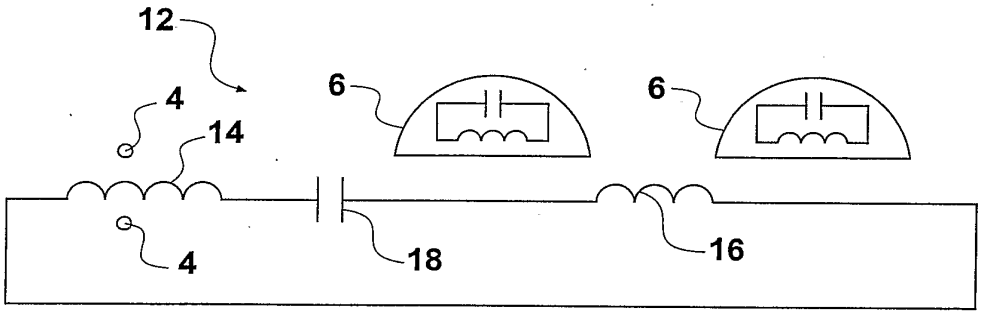


Fig. 4b

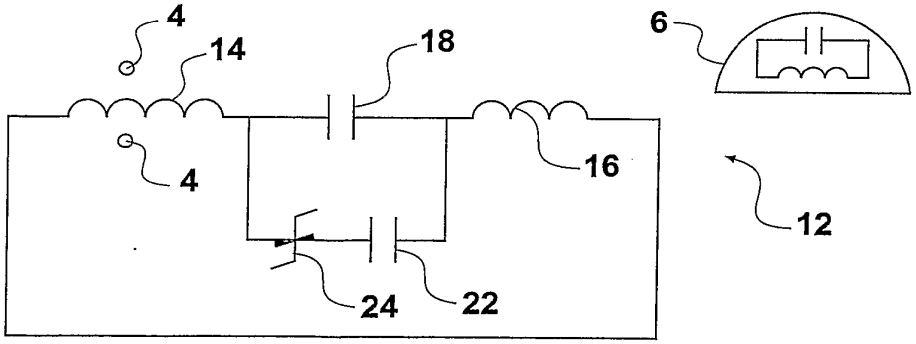


Fig. 5

InductEV, Inc.
Exhibit 1031
Page 1536

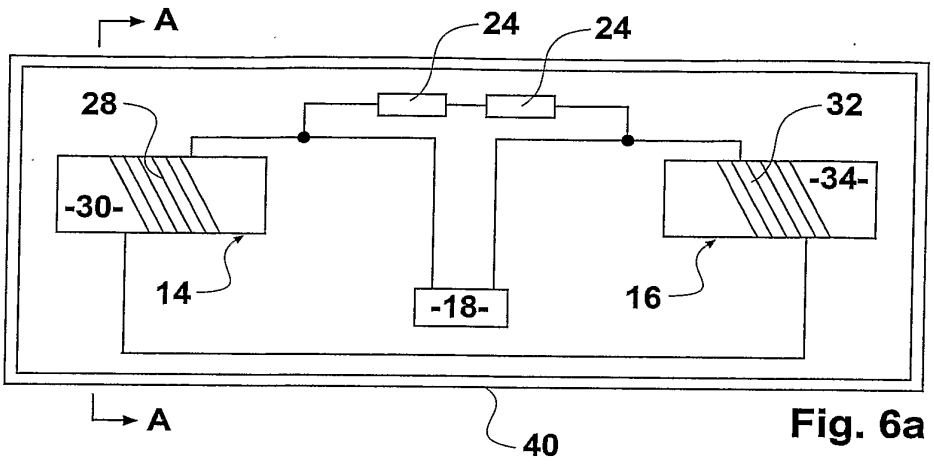


Fig. 6a

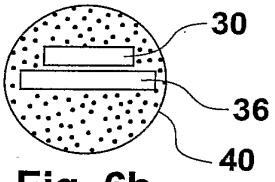


Fig. 6b

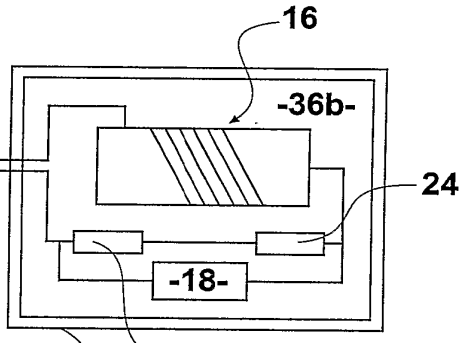
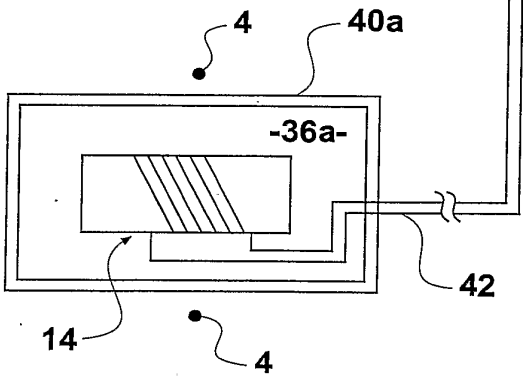


Fig. 7



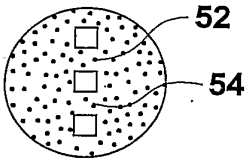


Fig. 8b

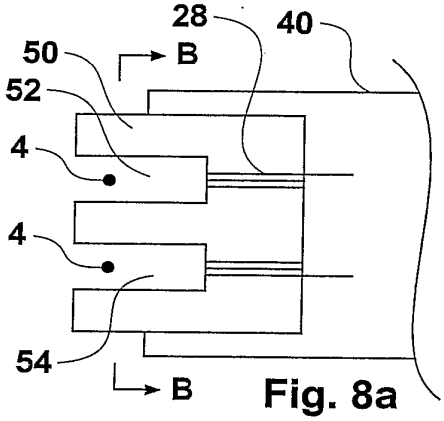


Fig. 8a

InductEV, Inc.
Exhibit 1031
Page 1537

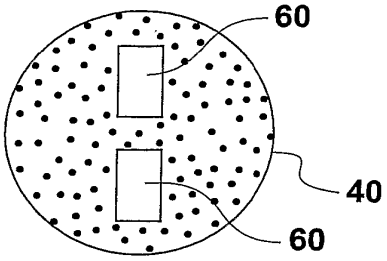


Fig. 9b

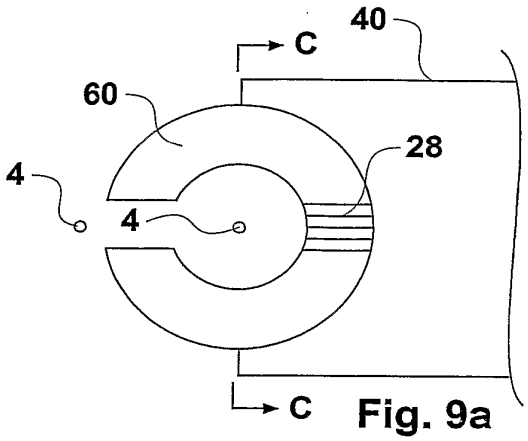


Fig. 9a

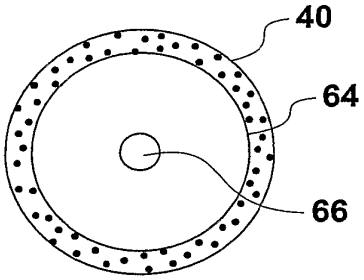


Fig. 10b

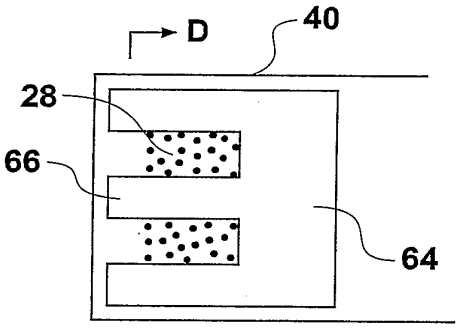


Fig. 10a

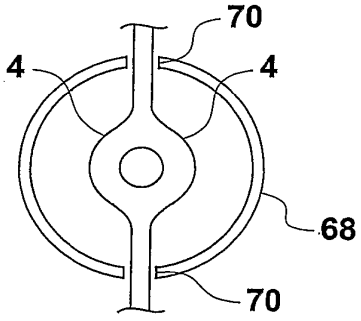


Fig. 11a

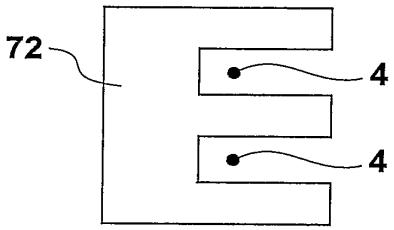


Fig. 11b

InductEV, Inc.
Exhibit 1031
Page 1538

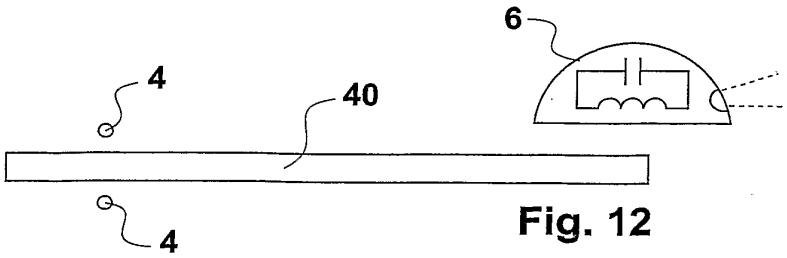


Fig. 12

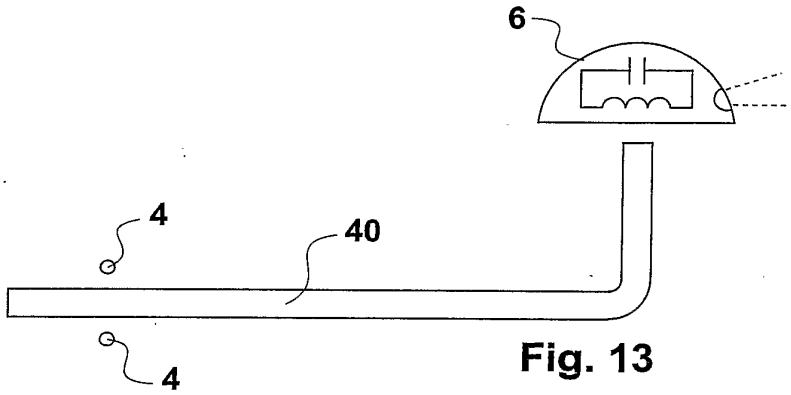


Fig. 13

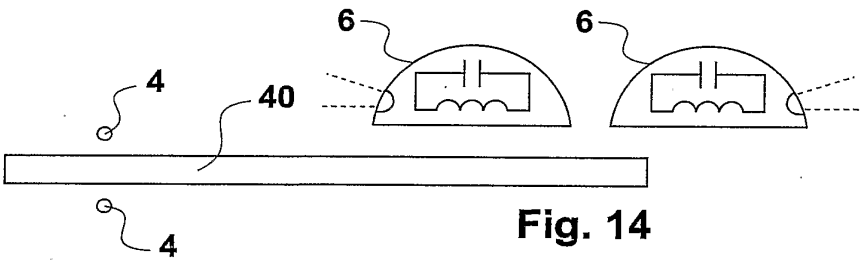


Fig. 14

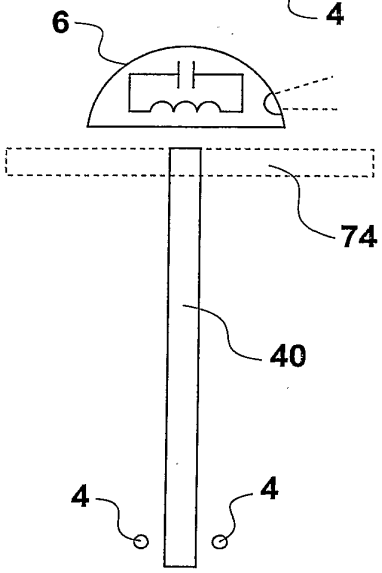


Fig. 15

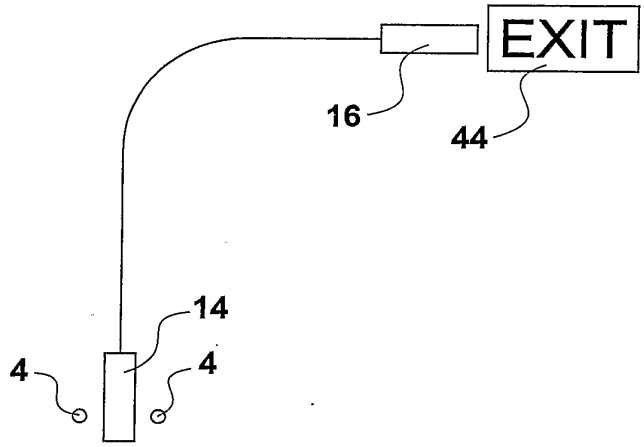


Fig. 16

InductEV, Inc.
Exhibit 1031
Page 1539

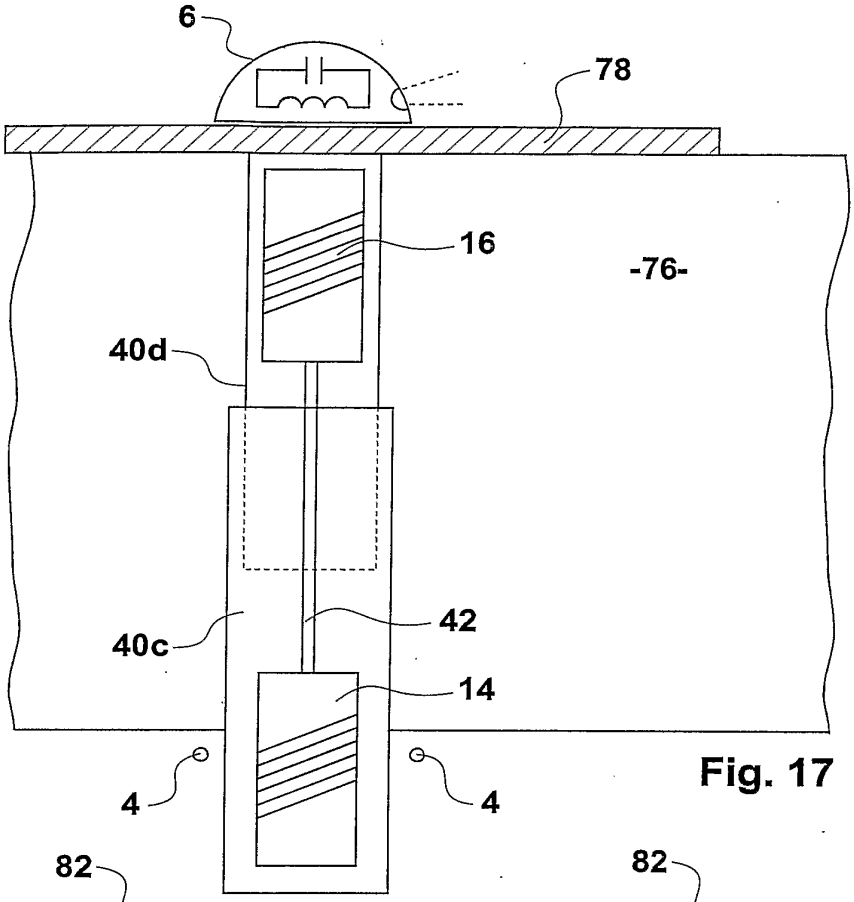


Fig. 17

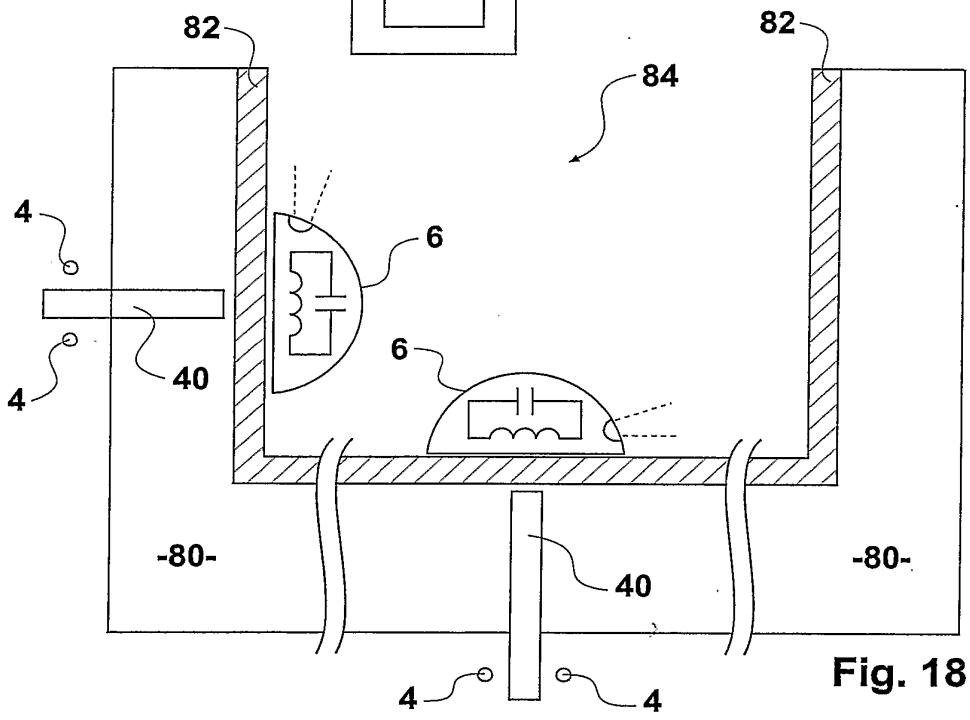


Fig. 18

InductEV, Inc.
Exhibit 1031
Page 1540

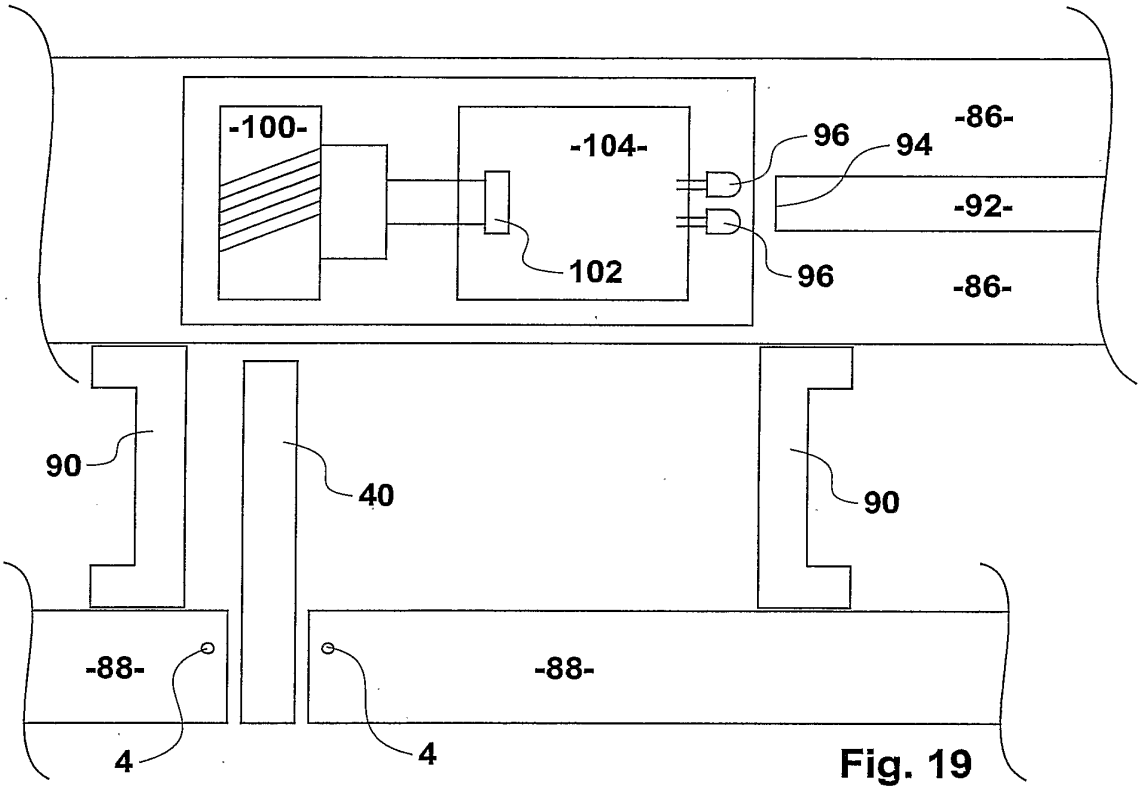


Fig. 19

InductEV, Inc.
Exhibit 1031
Page 1541

INTERNATIONAL SEARCH REPORT

International application No.
PCT/NZ2004/000123

A. CLASSIFICATION OF SUBJECT MATTER

Int. Cl. [7]: H02J 3/00, H02J 17/00, H01F 38/14

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
DWPI IPC: H02M, H01F, H02J, B60L & keywords: inductive, power, transfer, resonant and similar terms.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 6,317,338 B1 (BOYS) 13 November 2001 Abstract	

☐ Further documents are listed in the continuation of Box C ☒ See patent family annex

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
6 August 2004	11 AUG 2004
Name and mailing address of the ISA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaustralia.gov.au Facsimile No. (02) 6285 3929	Authorized officer **SUE THOMAS** Telephone No : (02) 6283 2454

Form PCT/ISA/210 (second sheet) (January 2004)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/NZ2004/000123

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report		Patent Family Member					
US	6317338	AU	75564/98	CA	2288877	EP	1010229
		NZ	500773	US	2001012208	WO	9850993

Due to data integration issues this family listing may not include 10 digit Australian applications filed since May 2001.

END OF ANNEX

InductEV, Inc.
Exhibit 1031
Page 1543

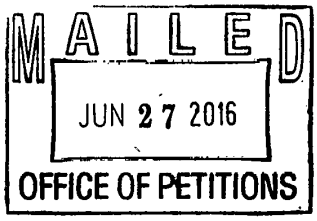
Document code: WFEE

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FISH & RICHARDSON P.C. (BO)
P.O. BOX 1022
MINNEAPOLIS MN 55440-1022

In re Application of	:	
Aristedis Karalis et al	:	
Application No. 13/789,860	:	DECISION ON PETITION
Filed: March 8, 2013	:	UNDER 37 CFR 1.313(c)
Attorney Docket No. 01997-0358008	:	

This is a decision on the petition under 37 CFR 1.313(c), filed June 24, 2016, to withdraw the above-identified application from issue after payment of the issue fee.

The petition is **GRANTED**.

The above-identified application is withdrawn from issue for consideration of a submission under 37 CFR 1.114 (request for continued examination). *See* 37 CFR 1.313(c)(2).

Petitioner is advised that the issue fee paid on June 2, 2016, cannot be refunded. If, however, this application is again allowed, petitioner may request that it be applied towards the issue fee required by the new Notice of Allowance.[1]

Telephone inquiries should be directed to the undersigned at (571) 272-3208.

This application is being referred to Technology Center AU 2836 for processing of the request for continued examination under 37 CFR 1.114 and for consideration of the concurrently filed IDS.

/Karen Creasy/
Karen Creasy
Paralegal Specialist
Office of Petitions

[1] *The request to apply the issue fee to the new Notice may be satisfied by completing and returning the new Part B – Fee(s) Transmittal Form (along with any balance due at the time of submission). Petitioner is advised that the Issue Fee Transmittal Form must be completed and timely submitted to avoid abandonment of the application.*

Substitute Disclosure Form	U.S. Department of Commerce Patent and Trademark Office	Attorney Docket No. 01997-0358008	Application No. 13/789,860
Information Disclosure Statement by Applicant (Use several sheets if necessary) (37 CFR §1.98(b))		Applicant Massachusetts Institute of Technology	
		Filing Date March 8, 2013	Group Art Unit 2836

U.S. Patent Documents							
Examiner Initial	Desig. ID	Document Number	Publication Date	Patentee	Class	Subclass	Filing Date If Appropriate
	1.	6,101,300	8/8/2000	Fan et al.			

Foreign Patent Documents or Published Foreign Patent Applications								
Examiner Initial	Desig. ID	Document Number	Publication Date	Country or Patent Office	Class	Subclass	Translation	
							Yes	No
	2.							

Other Documents (include Author, Title, Date, and Place of Publication)		
Examiner Initial	Desig. ID	Document
	3.	Benjamin L. Cannon, et al., "Magnetic Resonant Coupling As a Potential Means for Wireless Power Transfer to Multiple Small Receivers", IEEE Transactions on Power Electronics, Vol. 24, No. 7, pp. 1819-1825 (July 2009)
	4.	Takehiro Imura, et al., "Maximizing Air Gap and Efficiency of Magnetic Resonant Coupling for Wireless Power Transfer Using Equivalent Circuit and Neumann Formula", IEEE Transactions on Industrial Electronics, Vol. 58, No. 10, pp. 4746-4752 (October 2011)
	5.	B. E. Little, et al., "Microring Resonator Channel Dropping Filters", Journal of Lightwave Technology, Vol. 15, No. 6, pp. 998-1005 (June 1997)
	6.	J. Meins, "Inductive Power Transfer Basics, Design Optimizations, Applications", Conference on Electric Roads & Vehicles, Institute for Electrical Machines, Traction and Drives, Technical University of Braunschweig, Park City, Utah (February 4-5, 2013) (42 pages)
	7.	Joyce K. S. Poon, et al., "Designing coupled-resonator optical waveguide delay lines", J. Opt. Soc. Am. B, Vol. 21, No. 9, pp. 1665-1673 (September 2004)
	8.	GuoMin Zhang, et al., "Wireless Power Transfer Using High Temperature Superconducting Pancake Coils", IEEE Transactions on Applied Superconductivity, Vol. 24, No. 3 (June 2014) (5 pages)

Examiner Signature	Date Considered
EXAMINER: Initials citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.	

Substitute Disclosure Form

Electronic Acknowledgement Receipt

EFS ID:	26265915
Application Number:	13789860
International Application Number:	
Confirmation Number:	4131
Title of Invention:	WIRELESS ENERGY TRANSFER
First Named Inventor/Applicant Name:	Aristeidis Karalis
Customer Number:	26161
Filer:	Marc M. Wefers/Cheryl Forrest
Filer Authorized By:	Marc M. Wefers
Attorney Docket Number:	01997-0358008
Receipt Date:	06-JUL-2016
Filing Date:	08-MAR-2013
Time Stamp:	12:26:37
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		358008-IDS.pdf	144354 64ea75dcd67bd11a1d001d54ba88551e39e1c670	yes	2

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Transmittal Letter	1	1
	Information Disclosure Statement (IDS) Form (SB08)	2	2

Warnings:					
Information:					
2	Non Patent Literature	NPL3.pdf	926240 d6cf1802b38cee2c520e1bad714b05fb71da672e	no	7
Warnings:					
Information:					
3	Non Patent Literature	NPL4.pdf	1572540 75e36a0b4763b78bb9f26571b9b3e1bbd5ba05ff	no	7
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4	Non Patent Literature	NPL5.pdf	587656 37068ee6b223f75df43f3e2d359792775fa11459	no	8
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5	Non Patent Literature	NPL6.pdf	18850807 ef5c4ed940d9e1e502d5f17c6ff1a3983b844dc3	no	42
Warnings:					
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6	Non Patent Literature	NPL7.pdf	664315 bac79b81cde93415b7bf19e0e24657e366c4f10f	no	9
Warnings:					
Information:					
7	Non Patent Literature	NPL8.pdf	947089 b1191917440af7b0b984cf7524204feb98efd8a8	no	5
Warnings:					

Information:	
Total Files Size (in bytes):	23693001

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor	:	Aristeidis Karalis	Art Unit	:	2836
Serial No.	:	13/789,860	Examiner	:	Fritz M. Fleming
Filed	:	March 8, 2013	Conf. No.	:	4131
Title	:	WIRELESS ENERGY TRANSFER			

MAIL STOP AMENDMENT
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

INFORMATION DISCLOSURE STATEMENT

Please consider the references listed on the enclosed PTO-SB-08 or Disclosure Form. Foreign patent documents and non-patent literature are enclosed; cited U.S. patents and patent application publications will be provided on request.

This statement is being filed after a request for continued examination and before the mailing of a first action.

Apply any necessary charges or credits to deposit account 06-1050, referencing the above attorney docket number.

Please contact the undersigned if there are any questions regarding this Statement.

Respectfully submitted,

Date: July 6, 2016

/Marc M. Wefers Reg. No. 56,842/
Marc M. Wefers
Reg. No. 56,842

Customer Number 26161
Fish & Richardson P.C.
Telephone: (617) 542-5070
Facsimile: (877) 769-7945

23541950.doc

PLUS Search Results for S/N 13789860, Searched Wed Aug 10 09:09:40 EDT 2016

The Patent Linguistics Utility System (PLUS) is a USPTO automated search system for U.S. Patents from 1971 to the present PLUS is a query-by-example search system which produces a list of patents that are most closely related linguistically to the application searched. This search was prepared by the staff of the Scientific and Technical Information Center, SIRA.

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UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

26161 7590 08/26/2016
FISH & RICHARDSON P.C. (BO)
P.O. BOX 1022
MINNEAPOLIS, MN 55440-1022

EXAMINER	
FLEMING, FRITZ M	
ART UNIT	PAPER NUMBER
2836	

DATE MAILED: 08/26/2016

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/789,860	03/08/2013	Aristeidis Karalis	01997-0358008	4131

TITLE OF INVENTION: WIRELESS ENERGY TRANSFER

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$960	$0	$960	$960	11/28/2016

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

InductEV, Inc.
Exhibit 1031
Page 1553

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

26161 7590 08/26/2016
FISH & RICHARDSON P.C. (BO)
P.O. BOX 1022
MINNEAPOLIS, MN 55440-1022

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/789,860	03/08/2013	Aristeidis Karalis	01997-0358008	4131

TITLE OF INVENTION: WIRELESS ENERGY TRANSFER

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$960	$0	$960	$960	11/28/2016

EXAMINER	ART UNIT	CLASS-SUBCLASS
FLEMING, FRITZ M	2836	307-104000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
- ❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.
1 _____
2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. The following fee(s) are submitted:
- ❑ Issue Fee
- ❑ Publication Fee (No small entity discount permitted)
- ❑ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**
- ❑ A check is enclosed.
- ❑ Payment by credit card. Form PTO-2038 is attached.
- ❑ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
- ❑ Applicant certifying micro entity status. See 37 CFR 1.29 — NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
- ❑ Applicant asserting small entity status. See 37 CFR 1.27 — NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
- ❑ Applicant changing to regular undiscounted fee status. — NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

PTOL-85 Part B (10-13) Approved for use through 10/31/2013. OMB 0651-0033 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

InductEV, Inc.
Exhibit 1031
Page 1554

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/789,860	03/08/2013	Aristeidis Karalis	01997-0358008	4131

26161 7590 08/26/2016

FISH & RICHARDSON P.C. (BO)
P.O. BOX 1022
MINNEAPOLIS, MN 55440-1022

EXAMINER	
FLEMING, FRITZ M	

ART UNIT	PAPER NUMBER
2836	

DATE MAILED: 08/26/2016

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

InductEV, Inc.
Exhibit 1031
Page 1555

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No. 13/789,860	Applicant(s) KARALIS ET AL.	
	Examiner FRITZ M. FLEMING	Art Unit 2836	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *the RCE filed 6/24/16*.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on_____.
2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
3. ☒ The allowed claim(s) is/are *1,2,19-39*. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☐ All b) ☐ Some *c) ☐ None of the:
   1. ☐ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☒ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date See Continuation Sheet
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
5. ☐ Examiner's Amendment/Comment
6. ☒ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/FRITZ M FLEMING/
Primary Examiner, Art Unit 2836

InductEV, Inc.
Exhibit 1031
Page 1557

Continuation of Attachment(s) 2. Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date: 6/24/16,6/24/16,7/6/16.

InductEV, Inc.
Exhibit 1031
Page 1558

1. The present application is being examined under the pre-AIA first to invent provisions.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after allowance or after an Office action under *Ex Parte Quayle*, 25 USPQ 74, 453 O.G. 213 (Comm'r Pat. 1935). Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, prosecution in this application has been reopened pursuant to 37 CFR 1.114. Applicant's submission filed on 6/24/16 has been entered.

Allowable Subject Matter

3. Claims 1,2,19-39 are allowed.

4. The following is an examiner's statement of reasons for allowance: The reasons previously presented are still valid. Applicants have submitted 3 (three) IDSs for consideration with the RCE. No reference was noted as being any more relevant than any other.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to FRITZ M. FLEMING whose telephone number is (571)272-4145. The examiner can normally be reached on M-F, 0900-1730.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rexford N. Barnie can be reached on 571-272-7492. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

FRITZ M FLEMING
Primary Examiner
Art Unit 2836

/FRITZ M FLEMING/
Primary Examiner, Art Unit 2836

Sheet 1 of 1

Substitute Disclosure Form / U.S. Department of Commerce Patent and Trademark Office	Attorney Docket No.	Application No.
Information Disclosure Statement by Applicant (Use several sheets if necessary) (37 CFR §1.98(b))	01997-0358008	13/789,860
	Applicant: Massachusetts Institute of Technology	
	Filing Date: March 8, 2013	Group Art Unit: 2836

U.S. Patent Documents

Examiner Initial	Desig. ID	Document Number	Publication Date	Patentee	Class	Subclass	Filing Date If Appropriate
	1.	6,101,300	8/8/2000	Fan et al.			

Foreign Patent Documents or Published Foreign Patent Applications

Examiner Initial	Desig. ID	Document Number	Publication Date	Country or Patent Office	Class	Subclass	Translation Yes	Translation No
	2.							

Other Documents (include Author, Title, Date, and Place of Publication)

Examiner Initial	Desig. ID	Document
	3.	Benjamin L. Cannon, et al., "Magnetic Resonant Coupling As a Potential Means for Wireless Power Transfer to Multiple Small Receivers", IEEE Transactions on Power Electronics, Vol. 24, No. 7, pp. 1819-1825 (July 2009)
	4.	Takehiro Imura, et al., "Maximizing Air Gap and Efficiency of Magnetic Resonant Coupling for Wireless Power Transfer Using Equivalent Circuit and Neumann Formula", IEEE Transactions on Industrial Electronics, Vol. 58, No. 10, pp. 4746-4752 (October 2011)
	5.	B. E. Little, et al., "Microring Resonator Channel Dropping Filters", Journal of Lightwave Technology, Vol. 15, No. 6, pp. 998-1005 (June 1997)
	6.	J. Meins, "Inductive Power Transfer Basics, Design Optimizations, Applications", Conference on Electric Roads & Vehicles, Institute for Electrical Machines, Traction and Drives, Technical University of Braunschweig, Park City, Utah (February 4-5, 2013) (42 pages)
	7.	Joyce K. S. Poon, et al., "Designing coupled-resonator optical waveguide delay lines", J. Opt. Soc. Am. B, Vol. 21, No. 9, pp. 1665-1673 (September 2004)
	8.	GuoMin Zhang, et al., "Wireless Power Transfer Using High Temperature Superconducting Pancake Coils", IEEE Transactions on Applied Superconductivity, Vol. 24, No. 3 (June 2014) (5 pages)

Examiner Signature	Date Considered
/FRITZ M FLEMING/	08/21/2016

EXAMINER: Initials citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Substitute Disclosure Form

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /F.M.F/

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor	:	Aristeidis Karalis	Art Unit	:	2836
Serial No.	:	13/789,860	Examiner	:	Fritz M. Fleming
Filed	:	March 8, 2013	Conf. No.	:	4131
Title	:	WIRELESS ENERGY TRANSFER			

MAIL STOP RCE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

INFORMATION DISCLOSURE STATEMENT

Please consider the references listed on the enclosed PTO-SB-08 or Disclosure Form. Foreign patent documents and non-patent literature are enclosed; cited U.S. patents and patent application publications will be provided on request.

This filing is being made with the filing of a Request for Continued Examination. No fee is required.

The applicant invites the examiner to consider the position of the examiner and replies by the applicant that have been set forth in the prosecution of the following U.S. patent applications. These applications are related to the present application under Section 120 and/or contain at least some material that is similar to the material set forth in the specification of this application. The applicant assumes that the examiner has direct access to these files, but will be happy to provide copies to the examiner upon request.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /F.M.F/

Application No.	Filing Date	Status
11/481,077	July 5, 2006	Issued
12/055,963	March 26, 2008	Issued
12/415,650	March 31, 2009	Issued
12/415,616	March 31, 2009	Issued
12/415,655	March 31, 2009	Issued
12/415,667	March 31, 2009	Issued
12/437,641	May 9, 2009	Issued
12/466,065	May 14, 2009	Issued
12/553,957	September 3, 2009	Abandoned
12/571,949	October 1, 2009	Issued
12/639,958	December 16, 2009	Abandoned
12/639,961	December 16, 2009	Issued
12/639,962	December 16, 2009	Issued
12/639,963	December 16, 2009	Issued
12/639,966	December 16, 2009	Issued
12/639,967	December 16, 2009	Issued
12/639,972	December 16, 2009	Issued
12/646,442	December 23, 2009	Issued
12/646,524	December 23, 2009	Issued
12/649,635	December 30, 2009	Issued
12/649,777	December 30, 2009	Issued
12/649,813	December 30, 2009	Issued
12/649,852	December 30, 2009	Issued
12/649,904	December 30, 2009	Issued
12/649,973	December 30, 2009	Issued
12/688,305	January 15, 2010	Abandoned
12/688,339	January 15, 2010	Abandoned
12/708,850	February 19, 2010	Abandoned

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /F.M.F/

Application No.	Filing Date	Status
12/713,556	February 26, 2010	Abandoned
12/717,559	March 4, 2010	Abandoned
12/726,742	March 18, 2010	Abandoned
12/726,913	March 18, 2010	Abandoned
12/726,953	March 18, 2010	Abandoned
12/732,399	March 26, 2010	Abandoned
12/949,504	November 18, 2010	Abandoned
12/949,544	November 18, 2010	Abandoned
12/949,580	November 18, 2010	Abandoned
13/036,177	February 28, 2011	Abandoned
13/288,308	November 3, 2011	Abandoned
13/477,459	May 22, 2012	Pending
13/677,407	November 15, 2012	Issued
14/302,662	June 12, 2014	Issued
14/629,709	February 24, 2015	Pending
14/666,683	March 24, 2015	Pending
15/083,726	March 29, 2016	Pending
15/186,969	June 20, 2016	Pending

Apply any necessary charges or credits to deposit account 06-1050, referencing the above attorney docket number.

Please contact the undersigned if there are any questions regarding this Statement.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /F.M.F/

Respectfully submitted,

Date: June 24, 2016

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23537826.doc

08/21/2016

/FRITZ M FLEMING/

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /F.M.F/

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13789860	KARALIS ET AL.
	Examiner	**Art Unit**
	FRITZ M FLEMING	2836

CPC						
Symbol					**Type**	**Version**
H02J		5	/	005	F	2013-01-01
Y10T		29	/	4902	A	2015-01-15
H02J		50	/	12	A	2016-02-01
B60L		11	/	182	I	2013-01-01
B60L		2210	/	20	A	2013-01-01
H01Q		7	/	00	I	2013-01-01
H01Q		9	/	04	I	2013-01-01
H02J		17	/	00	I	2013-01-01
Y02T		10	/	7005	A	2013-01-01
Y02T		10	/	725	A	2013-01-01
Y02T		90	/	122	A	2013-01-01
Y02T		90	/	127	A	2013-01-01
Y02T		90	/	14	A	2013-01-01
H04B		5	/	0037	I	2013-01-01
Y02T		10	/	7072	A	2013-01-01

CPC Combination Sets							
Symbol					**Type**	**Set**	**Ranking**	**Version**
			/					
			/					

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	23	
/FRITZ M FLEMING/ Primary Examiner.Art Unit 2836	08/21/2016	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	9C

InductEV, Inc.
Exhibit 1031
Page 1566

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13789860	KARALIS ET AL.
	Examiner	**Art Unit**
	FRITZ M FLEMING	2836

US ORIGINAL CLASSIFICATION		INTERNATIONAL CLASSIFICATION										
CLASS	SUBCLASS	CLAIMED					NON-CLAIMED					
307	104	H	0	2	J	17 / 00 (2006.01.01)						

CROSS REFERENCE(S)						
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)					

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	23	
/FRITZ M FLEMING/ Primary Examiner.Art Unit 2836	08/21/2016	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	9C

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13789860	KARALIS ET AL.
	Examiner	**Art Unit**
	FRITZ M FLEMING	2836

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☒ T.D. ☐ R.1.47

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
1	1	-	17	20	33										
2	2	-	18	21	34										
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-	15	18	31												
-	16	19	32												

NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 23	
/FRITZ M FLEMING/ Primary Examiner.Art Unit 2836 (Primary Examiner)	08/21/2016 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 9C

InductEV, Inc.
Exhibit 1031
Page 1568

Substitute Disclosure Form / U.S. Department of Commerce Patent and Trademark Office	Attorney Docket No.	Application No.
Information Disclosure Statement by Applicant (Use several sheets if necessary) (37 CFR §1.98(b))	01997-0358008	13/789,860
	Applicant: Massachusetts Institute of Technology	
	Filing Date: March 8, 2013	Group Art Unit: 2836

U.S. Patent Documents

Examiner Initial	Desig. ID	Document Number	Publication Date	Patentee	Class	Subclass	Filing Date If Appropriate
	1.						

Foreign Patent Documents or Published Foreign Patent Applications

Examiner Initial	Desig. ID	Document Number	Publication Date	Country or Patent Office	Class	Subclass	Translation Yes	Translation No
	2.	WO 2005/124962	12/29/2005	WIPO	H02J	3/00		

Other Documents (include Author, Title, Date, and Place of Publication)

Examiner Initial	Desig. ID	Document
	3.	Copy of European Patent Office Communication for European Patent Application No. 06786588.1 dated June 17, 2016 (3 pages)
	4.	J.T. Boys et al., "Stability and control of inductively coupled power transfer systems", IEE Proc. Electr. Power Appl., Vol. 147, No. 1, pp. 37-43 (January 2000)
	5.	Mickel Budhia et al., "Design and Optimization of Circular Magnetic Structures for Lumped Inductive Power Transfer Systems", IEEE Transactions on Power Electronics, Vol. 26, No. 11, pp. 3096-3108 (November 2011)
	6.	Mickel Budhia et al., "Development and evaluation of single sided flux couplers for contactless electric vehicle charging", IEEE, pp. 614-621 (2011)
	7.	M. Chaoui et al, "Electrical Modeling of Inductive Links for High-Efficiency Energy Transmission", Electronics, Circuits and Systems, 2005. ICECS 2005. 12th IEEE International Conference, (December 2005)
	8.	Aiguo Patrick Hu, "Selected Resonant Converters for IPT Power Supplies", Thesis submitted to the Department of Electrical and Electronic Engineering for The University of Auckland, New Zealand (October 2001)
	9.	Arthur W. Kelley et al., "Connectorless Power Supply for an Aircraft-Passenger Entertainment System", IEEE Transactions on Power Electronics, Vol. 4, No. 3, pp. 348-354 (July 1989)
	10.	Seung-Hwan Lee et al., "Development and Validation of Model for 95%-Efficiency 220-W Wireless Power Transfer Over a 30-cm Air Gap", IEEE Transactions on Industry Applications, Vol. 47, No. 6, pp. 2495-2504 (November/December 2011)
	11.	Rudolf Mecke et al., "Analysis of inductive energy transmission systems with large air gap at high frequencies", European Conference on Power Electronics and Applications, Toulouse 2003, (January 2003)
	12.	R. Mecke et al., "High frequency resonant inverter for contactless energy transmission over large air gap", 2004 35th Annual IEEE Power Electronics Specialists Conference, Aachen, Germany, pp. 1737-1743 (2004)
	13.	Fumiaki Nakao et al., "Ferrite Core Couplers for Inductive Chargers", IEEE, PCC-Osaka 2002, pp. 850-854 (2002)

Examiner Signature	Date Considered
/FRITZ M FLEMING/	08/21/2016

EXAMINER: Initials citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Substitute Disclosure Form

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /F.M.F/

Substitute Disclosure Form / U.S. Department of Commerce Patent and Trademark Office	Attorney Docket No.	Application No.
Information Disclosure Statement by Applicant (Use several sheets if necessary) (37 CFR §1.98(b))	01997-0358008	13/789,860
	Applicant: Massachusetts Institute of Technology	
	Filing Date: March 8, 2013	Group Art Unit: 2836

Other Documents (include Author, Title, Date, and Place of Publication)		
Examiner Initial	Desig. ID	Document
	14.	Takahashi Ohira, "What in the World is Q?", IEEE Microwave Magazine, pp. 42-49 (June 2016)
	15.	Juan C. Olivares-Galvan et al., "Wireless Power Transfer: Literature Survey", Power, Electronics and Computing (ROPEC), 2013 IEEE International Autumn Meeting on 13-15 Nov. 2013, Mexico City, (2013) (7 pages)

Examiner Signature	Date Considered
/FRITZ M FLEMING/	08/21/2016

EXAMINER: Initials citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Substitute Disclosure Form

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /F.M.F/

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	4331	(307/104).CCLS.	US-PGPUB; USPAT	OR	OFF	2016/08/21 22:38
L2	2900	(320/108).CCLS.	US-PGPUB; USPAT	OR	OFF	2016/08/21 22:40
L3	10109	H02J17/00.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/08/21 22:42
L4	864	H02J50/12.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/08/21 22:47
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S2	296	S1 same wireless	USPAT	OR	OFF	2012/03/20 16:45
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S7	39	S6 and q	USPAT	OR	OFF	2012/03/20 16:59
S8	306	S6 and q	US-PGPUB; USPAT	OR	OFF	2012/03/20 16:59
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			USOCR			17:35
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S13	480	(high adj q) same resonator same (contactless or (contact adj less) or inductive or inductively or wireless or wirelessly)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2012/03/20 17:52
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S15	10488	tet same q	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2012/03/20 22:31
S16	4	tet same q same implant	US-PGPUB; USPAT; USOCR; FPRS;	OR	ON	2012/03/20 22:32

			EPO; JPO; DERWENT; IBM_TDB			
S17	2	trancutaneous adj energy adj transfer	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2012/03/20 22:34
S18	550	transcutaneous adj energy adj transfer	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2012/03/20 22:34
S19	60	S18 and q	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2012/03/20 22:34
S20	1060	("near" adj field) same wireless same power	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2012/03/20 22:49
S21	76	("near" adj field) same wireless same power same q	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2012/03/20 22:49
S22	233	("near" adj field) same (wireless adj power)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2012/03/20 22:52
S23	156	("near" adj field) adj inductive	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2012/03/20 23:01
S24	178	("near" adj field) same implant$ same power	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2012/03/20 23:19
S25	192	("near" adj field) same power same q	US-PGPUB; USPAT;	OR	ON	2012/03/20 23:40

			USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB			
S26	2141	(307/104).CCLS.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/03/20 23:54
S27	893	(320/108).CCLS.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/03/20 23:54
S28	2316	S26 or S27	US-PGPUB; USPAT	OR	OFF	2012/03/20 23:54
S29	319	S28 and "near" adj field	US-PGPUB; USPAT	OR	ON	2012/03/20 23:54
S30	31	("3167168" | "4023753" | "4331225" | "4459438" | "4603640" | "4689530" | "4800328" | "4833337" | "4836344" | "4879522").PN. OR ("5519262").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/03/21 00:10
S31	4	("near" adj field) same implant$ same q	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2012/03/21 00:16
S32	186	("near" adj field) same high adj q	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2012/03/21 00:20
S33	34	("2401572" | "2426226" | "2805414" | "3546699" | "3713162" | "3771075" | "3786376" | "3810183" | "3914715" | "4150345" | "4157516" | "4163961" | "4233580" | "4253101" | "4258365" | "4288759" | "4358746" | "Re29296").PN. OR ("4516097").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/03/21 00:30
S34	1	("20100102639").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/03/21 11:50
S35	1	(("2010012355") or ("7741734")).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/03/21 12:29
S36	2	(("20100012355") or ("7741734")).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/03/21 12:29
S37	2	(("20100123355") or ("7741734")).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/03/21 12:30
S38	2	(("20100096934") or ("7741734")).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/03/21 12:52
S39	2	(("20100123355") or ("7741734")).PN.	US-PGPUB; USPAT;	OR	OFF	2012/03/21 20:45

			USOCR			
S40	0	S39 and (tunable)	US-PGPUB; USPAT	OR	OFF	2012/03/21 20:45
S41	0	S39 and (tuning)	US-PGPUB; USPAT	OR	OFF	2012/03/21 20:46
S42	0	S39 and (tune)	US-PGPUB; USPAT	OR	OFF	2012/03/21 20:46
S43	1	("20100127574").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/03/26 06:11
S44	1	S43 and rate	US-PGPUB; USPAT	OR	OFF	2012/03/26 06:13
S45	1	S43 and "0.2"	US-PGPUB; USPAT	OR	OFF	2012/03/26 06:18
S46	1	S43 and (tunable or tuning or tuned or feedback)	US-PGPUB; USPAT	OR	ON	2012/03/26 06:20
S47	1	S43 and (tunable or tuning or tuned or feedback or detune or detuning)	US-PGPUB; USPAT	OR	ON	2012/03/26 06:21
S48	1	("20090085408").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/03/26 06:57
S49	1	("20110140544").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/04/09 13:11
S50	1	S49 and common	US-PGPUB; USPAT	OR	OFF	2012/04/09 13:11
S51	3	(("20110140544") or ("7825543") or ("7741734")).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/04/09 13:14
S52	3	S51 and common	US-PGPUB; USPAT	OR	OFF	2012/04/09 13:14
S53	1	S51 and (common adj inductance)	US-PGPUB; USPAT	OR	ON	2012/04/09 13:15
S54	4	(("20110140544") or ("20100117456") or ("7825543") or ("7741734")).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/04/09 13:19
S55	1	S52 and (common adj inductance)	US-PGPUB; USPAT	OR	ON	2012/04/09 13:19
S56	3	S52 and common	US-PGPUB; USPAT	OR	OFF	2012/04/09 13:20
S57	4	S54 and common	US-PGPUB; USPAT	OR	OFF	2012/04/09 13:20
S58	368	(high adj q) same resonant same (tune or tuning)	USPAT	OR	OFF	2012/04/09 13:54
S59	587	(high adj q) same resonant same (tune or tuning)	US-PGPUB; USPAT	OR	ON	2012/04/09 13:54
S60	1485	(307/104).CCLS.	USPAT; USOCR	OR	OFF	2012/05/07 04:48
S61	3	S60 and young and fleming	USPAT	OR	OFF	2012/05/07 04:48
S62	2	(("7825543") or ("7741734")).PN.	USPAT; USOCR	OR	OFF	2012/05/07 08:04
S63	5	"2006011769"	EPO; DERWENT	OR	OFF	2012/05/07 08:16

S64	4	"2004072581"	EPO; DERWENT	OR	OFF	2012/05/07 08:17
S65	2179	(307/104).CCLS.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/05/07 12:02
S66	921	(320/108).CCLS.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/05/07 12:02
S67	1199	S65 or S66	USPAT	OR	OFF	2012/05/07 12:02
S68	2381	S65 or S66	US-PGPUB; USPAT	OR	OFF	2012/05/07 12:02
S69	100	S68 and (nano or nanoscale)	US-PGPUB; USPAT	OR	ON	2012/05/07 12:02
S70	409	capacitor same inductor same(nano or nanoscale)	US-PGPUB; USPAT	OR	ON	2012/05/07 12:07
S71	5	capacitor same inductor same(nano or nanoscale) same transponder	US-PGPUB; USPAT	OR	ON	2012/05/07 12:13
S72	365	capacitor same inductor same powder	US-PGPUB; USPAT	OR	ON	2012/05/07 12:19
S73	87	q same (inductor or inductance) same (air adj core) same frequency	US-PGPUB; USPAT	OR	ON	2012/05/07 13:09
S74	5	q same (inductor or inductance) same (air adj core) same adjustable	US-PGPUB; USPAT	OR	ON	2012/05/07 13:13
S75	24	(inductor or inductance) same (air adj core) same adjustable	US-PGPUB; USPAT	OR	ON	2012/05/07 13:14
S76	79	(inductor or inductance) same (air adj core) same variable	US-PGPUB; USPAT	OR	ON	2012/05/07 13:15
S77	166	S68 and (air adj core)	US-PGPUB; USPAT	OR	ON	2012/05/07 13:24
S78	21	(inductor or inductance) same (air adj core) same variable	EPO; JPO; DERWENT	OR	ON	2012/05/07 13:38
S79	98	S68 and (variable or adjustable) near2 (inductor or inductance)	US-PGPUB; USPAT	OR	ON	2012/05/07 13:43
S80	53	("20020082059" | "20030006880" | "20030090239" | "3689885" | "3938018" | "3949268" | "4800328" | "4818855" | "5229652" | "5341280" | "5428659" | "5455466" | "5455467" | "5550452" | "5600225" | "5701657" | "5734254" | "5814900" | "5831348" | "5982764" | "6057668" | "6127799" | "6252380" | "6265791" | "6301128" | "6323775" | "6424124" | "6429622" | "6462432" | "6597076" | "6683438" | "6703920" | "6821670" | "6844702" | "6977479").PN. OR ("7518267").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/05/07 13:51
S81	1	("6436299").PN.	USPAT; USOCR	OR	OFF	2012/05/07 13:59
S82	2222	(307/104).CCLS.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/06/18 05:48
S83	962	(320/108).CCLS.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/06/18 05:48

S84	2222	(307/104).CCLS.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/06/18 05:49
S85	962	(320/108).CCLS.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/06/18 05:49
S86	2458	S84 or S85	US-PGPUB; USPAT	OR	OFF	2012/06/18 05:49
S87	511	(high adj q) same resonator same (contactless or (contact adj less) or inductive or inductively or wireless or wirelessly)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2012/06/18 05:50
S88	264	("near" adj field) same (wireless adj power)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2012/06/18 05:50
S89	163	("near" adj field) adj inductive	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2012/06/18 05:50
S90	2458	S84 or S85	US-PGPUB; USPAT	OR	OFF	2012/06/18 05:51
S91	350	S90 and "near" adj field	US-PGPUB; USPAT	OR	ON	2012/06/18 05:51
S92	11	("20040100338" | "20040233043" | "20060202665" | "20120068549" | "5053774" | "5287112" | "6772011" | "8076800" | "8076801" | "8084889" | "8097983").PN.	US-PGPUB; USPAT	OR	ON	2012/06/18 07:40
S93	4	("20030124050" | "20030126948" | "5455467" | "6772011").PN.	US-PGPUB; USPAT	OR	ON	2012/06/18 07:40
S94	2	(("7825543") or ("7741734")).PN.	USPAT; USOCR	OR	OFF	2012/06/18 08:05
S95	2	S94 and characteristic	USPAT	OR	OFF	2012/06/18 08:05
S96	1	("20030210106").PN.	US-PGPUB; USPAT	OR	OFF	2012/07/03 10:37
S97	1	("5959433").PN.	US-PGPUB; USPAT	OR	OFF	2012/07/03 10:39
S98	447	evanescent adj tail	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/07/03 10:40
S99	50	S98 and inductive	US-PGPUB; USPAT; USOCR;	OR	OFF	2012/07/03 10:41

			FPRS; EPO; JPO; DERWENT; IBM_TDB			
S100	97	S98 same power	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/07/03 10:42
S101	50	S98 same wireless$	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/07/03 10:43
S102	60	S98 and wireless$	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/07/03 10:44
S103	37316	computer same (wireless$ or inductive$) same power	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2012/07/03 11:05
S104	4230	computer same (wireless$ or inductive$) same power same (coupling or transfer)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2012/07/03 11:05
S105	56	("2967267" | "3549990" | "4038625" | "4654573" | "4697183" | "4755783" | "4914561" | "4924171" | "4996638" | "5122729" | "5157319" | "5166965").PN. OR ("5455467").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/07/03 11:06
S106	1358	computer same (wireless$ or inductive$) same power same (charging)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2012/07/03 11:09
S107	2	("2005/0151511").URPN.	USPAT	OR	OFF	2012/07/03 11:19
S108	971	(320/108).CCLS.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/07/03 11:20
S109	130	S108 and computer	USPAT	OR	OFF	2012/07/03 11:20
S110	364	S108 and computer	US-PGPUB;	OR	OFF	2012/07/03

			USPAT			11:21
S111	1	("20100277005").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/07/03 11:28
S112	2	(("20100277005") or ("20110049996")).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/07/03 11:29
S113	0	S112 and base	USPAT	OR	OFF	2012/07/03 11:30
S114	0	S112 and hold	USPAT	OR	OFF	2012/07/03 11:30
S115	0	S112 and portable	USPAT	OR	OFF	2012/07/03 11:31
S116	2	S112 and portable	US-PGPUB; USPAT	OR	OFF	2012/07/03 11:31
S117	2	S112 and base	US-PGPUB; USPAT	OR	OFF	2012/07/03 11:31
S118	135	S108 and contacts	USPAT	OR	OFF	2012/07/03 11:44
S119	1	("5367242").PN.	USPAT; USOCR	OR	OFF	2012/07/03 12:01
S120	0	S119 and phone	USPAT	OR	OFF	2012/07/03 12:01
S121	244	S108 and ferrite	US-PGPUB; USPAT	OR	OFF	2012/07/03 12:19
S122	1	S112 and desktop	US-PGPUB; USPAT	OR	OFF	2012/07/03 13:38
S123	2	S112 and "near"	US-PGPUB; USPAT	OR	OFF	2012/07/03 13:48
S124	2	S112 and evanescent	US-PGPUB; USPAT	OR	OFF	2012/07/03 14:44
S125	2	S112 and radiative	US-PGPUB; USPAT	OR	OFF	2012/07/03 14:46
S126	2	(("7825543") or ("7741734")).PN.	USPAT; USOCR	OR	OFF	2012/07/03 14:50
S127	1	("20100207458").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/08/13 02:46
S128	1	S127 and characteristic	US-PGPUB; USPAT	OR	OFF	2012/08/13 02:46
S129	1	("20100127575").PN.	US-PGPUB; USPAT	OR	OFF	2012/08/27 06:11
S130	1	S129 and second and third	US-PGPUB; USPAT	OR	OFF	2012/08/27 06:14
S131	0	("7687939").PN.	USPAT; USOCR	OR	OFF	2012/08/27 06:15
S132	0	("7687939").PN.	US-PGPUB; USPAT	OR	OFF	2012/08/27 06:16
S133	0	("7687939").PN.	US-PGPUB; USPAT	OR	OFF	2012/08/27 06:16
S134	1	("7741734").PN.	US-PGPUB; USPAT	OR	OFF	2012/08/27 06:21
S135	0	S134 and second and third	USPAT	OR	OFF	2012/08/27 06:22

InductEV, Inc.
Exhibit 1031
Page 1580

S136	1	("20110074347").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/08/27 12:22
S137	3	(("20110074347") or ("7825543") or ("7741734")).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/08/27 12:23
S138	1	("20100237708").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/08/29 08:48
S139	1	S138 and housing	US-PGPUB; USPAT	OR	OFF	2012/08/29 08:49
S140	1	S138 and housing	US-PGPUB; USPAT	OR	ON	2012/08/29 09:17
S141	2	(("20101117456") or ("20080278264") or ("7825543")).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/09/04 11:41
S142	3	(("20100117456") or ("20080278264") or ("7825543")).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/09/04 11:42
S143	3	S142 and impedance	US-PGPUB; USPAT	OR	ON	2012/09/04 11:44
S144	0	S142 and (impedance same (match or matching))	US-PGPUB; USPAT	OR	ON	2012/09/04 11:45
S145	3	(("20100127573") or ("7741734") or ("7825543")).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/09/10 10:27
S146	3	S145 and characteristic	US-PGPUB; USPAT	OR	OFF	2012/09/10 10:28
S147	1706	(307/104).CCLS.	US-PGPUB; USPAT	OR	OFF	2012/09/10 12:09
S148	1095	(333/195).CCLS.	US-PGPUB; USPAT	OR	OFF	2012/09/10 12:09
S149	1017	(320/108).CCLS.	US-PGPUB; USPAT	OR	OFF	2012/09/10 12:09
S155	1	("20100096934").PN.	US-PGPUB; USPAT	OR	OFF	2012/09/10 13:29
S157	1	("20100102641").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/09/10 14:44
S159	1	("20110169339").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/09/11 07:05
S160	0	S159 and (voltage same capacitor)	USPAT	OR	OFF	2012/09/11 07:08
S161	1	S159 and (voltage same capacitor)	US-PGPUB; USPAT	OR	ON	2012/09/11 07:08
S162	1	S159 and (information same exchange)	US-PGPUB; USPAT	OR	ON	2012/09/11 07:09
S163	1	S159 and planar	US-PGPUB; USPAT	OR	ON	2012/09/11 07:18
S164	25	(high adj q) same feedback same (wireless$ or (non adj contact) or contactless)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	OR	ON	2012/09/11 08:16

			IBM_TDB			
S165	1110	q same feedback same (wireless$ or (non adj contact) or contactless or inductive$)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2012/09/11 08:18
S166	78	q same feedback same (wireless$ or (non adj contact) or contactless or inductive$) same power same transfer	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2012/09/11 08:18
S167	1019	(320/108).CCLS.	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2012/09/11 08:21
S168	1794	(307/104).CCLS.	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2012/09/11 08:21
S169	0	("032or33").PN.	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2012/09/11 08:22
S170	2717	S167 or S168	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/09/11 08:22
S171	485	S170 and feedback	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/09/11 08:22
S172	507	S170 and (secondary same current same voltage)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/09/11 09:33
S173	128	S170 and (secondary same current same voltage same resonant)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/09/11 09:33
S174	145	(implant$) and (secondary same current same voltage same resonant)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO;	OR	OFF	2012/09/11 10:29

			DERWENT; IBM_TDB			
S175	9	tet same (secondary same current same voltage same resonant)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/09/11 10:39
S176	45	tet and (secondary same current same voltage same resonant)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/09/11 10:40
S177	54	tet and (secondary same power same resonant)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/09/11 10:40
S178	316	tet and (power same feedback)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/09/11 10:45
S179	126	high same q same wireless same power same transfer	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2012/09/11 11:12
S180	1790	(307/104).CCLS.	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2012/09/21 20:55
S181	1013	(320/108).CCLS.	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2012/09/21 20:56
S183	0	20016655u1	EPO; DERWENT	OR	OFF	2012/09/30 18:52
S184	9	"20016655"	EPO; DERWENT	OR	OFF	2012/09/30 18:52
S185	3	"10221484"	EPO; DERWENT	OR	OFF	2012/09/30 18:53
S186	0	("200902677710").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/09/30 19:05
S187	1	("20090267710").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/09/30 19:05
S188	0	S187 and radiative	USPAT	OR	OFF	2012/09/30 19:05

S189	0	S187 and nonradiative	USPAT	OR	OFF	2012/09/30 19:05
S190	0	S187 and nonradiative	US-PGPUB	OR	OFF	2012/09/30 19:05
S191	1	S187 and radiative	US-PGPUB; USPAT	OR	OFF	2012/09/30 19:06
S192	2	(("7825543") or ("7741734")).PN.	USPAT; USOCR	OR	OFF	2012/10/01 07:01
S193	1020	(320/108).CCLS.	US-PGPUB; USPAT	OR	OFF	2012/10/01 07:16
S194	746	(320/109).CCLS.	US-PGPUB; USPAT	OR	OFF	2012/10/01 07:16
S195	67	S193 and S194	US-PGPUB; USPAT	OR	OFF	2012/10/01 07:16
S196	1	("20110018361").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/10/01 08:01
S197	1	S196 and motorized	US-PGPUB; USPAT	OR	OFF	2012/10/01 08:01
S198	1	S196 and movement	US-PGPUB; USPAT	OR	OFF	2012/10/01 08:02
S199	1	S196 and position	US-PGPUB; USPAT	OR	OFF	2012/10/01 08:04
S200	1	("20100327660").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/10/01 09:41
S201	1	S200 and optimize	US-PGPUB; USPAT	OR	OFF	2012/10/01 09:41
S202	1	S200 and optimizing	US-PGPUB; USPAT	OR	OFF	2012/10/01 09:43
S203	1	S200 and optimiz$	US-PGPUB; USPAT	OR	OFF	2012/10/01 09:44
S204	1	("20110074218").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/10/01 17:14
S205	3	(("20100123354") or ("20100123353") or ("20090267710")).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/11/23 11:14
S206	3	S205 and resonator	US-PGPUB; USPAT	OR	OFF	2012/11/23 11:19
S207	60	"7741734"	US-PGPUB; USPAT	OR	OFF	2012/11/23 12:01
S208	1	("7741734").PN.	USPAT; USOCR	OR	OFF	2012/11/23 12:01
S209	1	("7741734").PN.	USPAT; USOCR	OR	OFF	2012/11/26 19:58
S210	0	S209 and storing	USPAT	OR	OFF	2012/11/26 19:58
S211	0	S209 and store	USPAT	OR	OFF	2012/11/26 19:58
S212	0	S209 and store	USPAT	OR	ON	2012/11/26 20:05
S213	1	S209 and energy	USPAT	OR	ON	2012/11/26 20:05

S214	1	S209 and stored	USPAT	OR	ON	2012/11/26 20:07
S215	1	S209 and intrinsic	USPAT	OR	ON	2012/11/26 20:12
S216	2	(("6960968") or ("7069064")).PN.	USPAT; USOCR	OR	OFF	2012/12/10 15:46
S217	1802	(307/104).CCLS.	US-PGPUB; USPAT	OR	OFF	2012/12/10 22:53
S219	4	(("20110140544") or ("20100117456") or ("7825543") or ("7741734")).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/12/17 08:16
S220	4	S219 and acoustic	US-PGPUB; USPAT	OR	OFF	2012/12/17 08:16
S221	233	acoustic near3 power near3 transmission	US-PGPUB; USPAT	OR	ON	2012/12/17 08:17
S222	34	S221 and resonant	US-PGPUB; USPAT	OR	ON	2012/12/17 08:17
S223	774	(self adj (resonant or resonating)) near5 (coil or loop)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/01/24 09:19
S224	593	(self adj (resonant or resonating)) near2 (coil or loop)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/01/24 09:20
S225	303	(self adj (resonant or resonating)) adj (coil or loop)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/01/24 09:20
S226	123	("3859624" | "4450431" | "4630044" | "4658263" | "4868915").PN. OR ("5084699").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/01/24 09:29
S227	23	S223 same ("near" adj field)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/01/24 09:38
S228	1	("5012236").PN.	USPAT; USOCR	OR	OFF	2013/01/24 09:40
S229	900	self near2 (resonant or resonate or resonance or resonating) near2 (coil or loop)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/01/24 12:09
S230	2524	(307/104).CCLS.	US-PGPUB;	OR	OFF	2013/01/24

			USPAT; USOCR			12:19
S231	209	S230 and (self near2 (resonant or resonate or resonance or resonating))	US-PGPUB; USPAT; USOCR	OR	ON	2013/01/24 12:19
S232	782	S229 or S231	US-PGPUB; USPAT; USOCR	OR	ON	2013/01/24 12:20
S233	209	S230 and (self near2 (resonant or resonate or resonance or resonating))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/01/24 12:20
S234	957	S233 or S229	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/01/24 12:20
S235	17	self same resonant same coil same transponder	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/02/07 10:50
S236	1	("20100231053").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/02/21 08:45
S237	2993	contactless same (energy or power)	EPO; JPO; DERWENT	OR	OFF	2013/02/28 01:50
S238	137	contactless same (energy or power) same (resonant or resonance or resonating)	EPO; JPO; DERWENT	OR	ON	2013/02/28 01:50
S239	934	wireless same (energy or power) same (resonant or resonance or resonating)	EPO; JPO; DERWENT	OR	ON	2013/02/28 02:15
S240	233	wireless same (energy or power) same (resonant or resonance or resonating) same coil	EPO; JPO; DERWENT	OR	ON	2013/02/28 02:15
S241	118	wireless same (energy or power) same q	EPO; JPO; DERWENT	OR	ON	2013/02/28 02:23
S242	29	wireless same (energy or power) same (resonant or resonance or resonating) same q	EPO; JPO; DERWENT	OR	ON	2013/02/28 02:29
S243	0	(h02j5/0005).IPCR.	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2013/02/28 08:48
S244	975	h02j5/005.cpc.	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2013/02/28 08:52
S245	0	h02j5/005.cpc.	EPO; JPO; DERWENT	OR	OFF	2013/02/28 08:55
S246	0	h02j5/005	EPO; JPO;	OR	OFF	2013/02/28

			DERWENT			08:55
S247	0	h02j5/005.cpc.	EPO; JPO; DERWENT	OR	OFF	2013/02/28 09:03
S248	0	h02j5.cpcl.	EPO; JPO; DERWENT	OR	OFF	2013/02/28 09:06
S249	0	h02j.cpcl.	EPO; JPO; DERWENT	OR	OFF	2013/02/28 09:07
S250	9041	h02j17/00	EPO; JPO; DERWENT	OR	OFF	2013/02/28 09:18
S251	0	h02j17/00	EPO	OR	OFF	2013/02/28 09:21
S252	7452	h02j17/00	DERWENT	OR	OFF	2013/02/28 09:21
S253	9041	h02j17/00	JPO; DERWENT	OR	OFF	2013/02/28 09:21
S254	1589	h02j17/00	JPO	OR	OFF	2013/02/28 09:21
S255	0	h02j17/00.ipc.	EPO	OR	OFF	2013/02/28 09:26
S256	0	h02j17/00.ipc.	DERWENT	OR	OFF	2013/02/28 09:26
S257	0	h02j17/00.epc.	EPO	OR	OFF	2013/02/28 09:27
S258	0	H02J17/00.epc.	EPO	OR	OFF	2013/02/28 09:27
S259	0	H02J17/00.ipc.	EPO	OR	OFF	2013/02/28 09:27
S260	1589	H02J17/00.ipc.	JPO	OR	OFF	2013/02/28 09:28
S261	1095	S252 and q	DERWENT	OR	OFF	2013/02/28 09:28
S262	25	S252 and (high adj q)	DERWENT	OR	OFF	2013/02/28 09:30
S263	1	schuerman and (high adj q)	USPAT	OR	OFF	2013/02/28 09:32
S264	1	("5053774").PN.	USPAT	OR	OFF	2013/02/28 09:32
S265	8	schuerman and q	USPAT	OR	OFF	2013/02/28 09:36
S266	1	("5374930").PN.	USPAT; USOCR	OR	OFF	2013/02/28 09:39
S267	97	("5287112").PN. OR ("5374930").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/02/28 09:39
S268	230	S252 and (resonator)	DERWENT	OR	OFF	2013/02/28 09:45
S269	242	S252 and (resonator)	DERWENT	OR	ON	2013/02/28 09:46
S270	554	S252 and (resonant)	DERWENT	OR	ON	2013/02/28 09:51
S271	61	transponder and (resonance or resonant or resonating) and q	JPO; DERWENT; IBM_TDB	OR	ON	2013/02/28 10:34
S272	1	("5095224").PN.	USPAT;	OR	OFF	2013/02/28

InductEV, Inc.
Exhibit 1031
Page 1587

			USOCR			10:44
S273	43	("3166718" | "3360732" | "3391345" | "4345604" | "4489370" | "4584499" | "4654574" | "4675796" | "4694387" | "4743789" | "4829415").PN. OR ("5095224").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/02/28 10:44
S274	1069	S252 and resonance	DERWENT	OR	OFF	2013/02/28 10:47
S275	44	S274 and quality	DERWENT	OR	OFF	2013/02/28 10:47
S276	541	S252 and resonance and coil	DERWENT	OR	OFF	2013/02/28 10:48
S277	557	S252 and resonance and coil	DERWENT	OR	ON	2013/02/28 10:48
S278	71	(high adj q) and coil and resonance	DERWENT	OR	ON	2013/02/28 10:59
S279	453	(high adj q) same coil same resonance	US-PGPUB; USPAT	OR	ON	2013/02/28 11:03
S280	33	(high adj q) same transponder same power	US-PGPUB; USPAT	OR	ON	2013/02/28 11:22
S281	34	(high adj q) same wireless$ same power	EPO; JPO; DERWENT	OR	ON	2013/02/28 11:45
S282	786	(resonance or resonator or resonating) same wireless$ same power	EPO; JPO; DERWENT	OR	ON	2013/02/28 11:46
S283	521	(resonance or resonator or resonating) same inductive$ same power	EPO; JPO; DERWENT	OR	ON	2013/02/28 11:53
S284	41	S252 and meter	EPO; JPO; DERWENT	OR	ON	2013/02/28 12:04
S285	108	"10" and power and distance and resonant	EPO; JPO; DERWENT	OR	ON	2013/02/28 14:47
S286	7452	h02j17/00	DERWENT	OR	OFF	2013/02/28 14:51
S287	77	S286 and power and distance and resonant	EPO; JPO; DERWENT	OR	ON	2013/02/28 14:51
S288	477	magnetic and resonant and power and (transfer or transmission or coupling)	EPO; JPO; DERWENT	OR	ON	2013/02/28 14:52
S289	39	S286 and repeater	EPO; JPO; DERWENT	OR	ON	2013/02/28 15:02
S290	2569	(307/104).CCLS.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/02/28 15:04
S291	145	S290 and repeater	US-PGPUB; USPAT	OR	ON	2013/02/28 15:04
S292	67	implant same repeater	US-PGPUB; USPAT	OR	ON	2013/02/28 15:07
S293	9	"near field" and q and loop	EPO; JPO; DERWENT	OR	ON	2013/03/01 10:26
S294	193	"near field" and loop	EPO; JPO; DERWENT	OR	ON	2013/03/01 10:27
S295	201	"near field" and power and transmission	EPO; JPO; DERWENT	OR	ON	2013/03/01 10:31
S296	1374	"near field" same power same transmission	US-PGPUB; USPAT	OR	ON	2013/03/01 10:33
S297	130	"near field" same power same	US-PGPUB;	OR	ON	2013/03/01

		transmission same q	USPAT			10:33
S298	160	"near field" same power same transmission same resonance	US-PGPUB; USPAT	OR	ON	2013/03/01 10:35
S299	256	"near field" same (wireless or contactless or inductive) same resonance	US-PGPUB; USPAT	OR	ON	2013/03/01 10:36
S300	101	("3036295" | "3137847" | "3182314" | "3182315" | "3218638" | "3299424" | "3363246" | "3467962" | "3518546" | "3522602" | "3737911" | "3739279").PN. OR ("4160971").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/03/01 10:39
S301	228	"wireless power transfer"	EPO; JPO; DERWENT	OR	OFF	2013/03/01 10:42
S302	807	"wireless power transfer"	US-PGPUB; USPAT	OR	OFF	2013/03/01 10:46
S303	110	"contactless power transfer"	US-PGPUB; USPAT	OR	OFF	2013/03/01 10:51
S304	3053	((contactless or wireless$ or inductive$) adj power)	EPO; JPO; DERWENT	OR	ON	2013/03/01 10:57
S305	7642	((contactless or wireless or inductive or inductively) adj3 power)	EPO; JPO; DERWENT	OR	ON	2013/03/01 10:58
S306	3011	((contactless or wireless or inductive or inductively) adj power)	EPO; JPO; DERWENT	OR	ON	2013/03/01 10:58
S307	56	((contactless or wireless or inductive or inductively) adj3 power) same q	EPO; JPO; DERWENT	OR	ON	2013/03/01 10:58
S308	115	((contactless or wireless or inductive or inductively) adj3 power) and ("near" adj field)	EPO; JPO; DERWENT	OR	ON	2013/03/01 11:00
S309	522	((contactless or wireless or inductive or inductively) adj3 power) same ("near" adj field)	US-PGPUB; USPAT	OR	ON	2013/03/01 11:01
S310	392	(self adj resonance) same q	US-PGPUB; USPAT	OR	ON	2013/03/01 11:04
S311	2569	(307/104).CCLS.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/03/01 11:10
S312	48	S311 and quality	USPAT	OR	OFF	2013/03/01 11:10
S313	331	S311 and quality	US-PGPUB; USPAT	OR	OFF	2013/03/01 11:10
S314	264	S311 and (q adj factor)	US-PGPUB; USPAT	OR	OFF	2013/03/01 11:11
S315	303	(self adj (resonance or resonating)) and (q adj factor)	US-PGPUB; USPAT	OR	OFF	2013/03/01 11:12
S316	102	(loop adj antenna) same q same resonance	US-PGPUB; USPAT	OR	ON	2013/03/01 11:15
S317	1	("7741734").PN.	USPAT; USOCR	OR	OFF	2013/03/01 11:26
S318	0	S317 and yates	USPAT	OR	OFF	2013/03/01 11:26
S319	1	S317 and optimal	USPAT	OR	OFF	2013/03/01 11:26
S320	1	S317 and markoff	USPAT	OR	OFF	2013/03/01 11:26

S321	1	("7741734").PN.	USPAT; USOCR	OR	OFF	2013/03/01 23:46
S322	4	"3824972"	EPO; DERWENT	OR	OFF	2013/03/02 00:54
S323	235	magnetic adj antenna	EPO; JPO; DERWENT	OR	OFF	2013/03/02 01:48
S324	252	magnetic adj antenna	EPO; JPO; DERWENT	OR	ON	2013/03/02 01:48
S325	680	magnetic adj antenna	US-PGPUB; USPAT	OR	ON	2013/03/02 02:05
S326	28	S325 same q	US-PGPUB; USPAT	OR	ON	2013/03/02 02:06
S327	290	S325 and "near field"	US-PGPUB; USPAT	OR	ON	2013/03/02 02:08
S328	10	("20040046663" | "20050086264" | "20050178832" | "6236315" | "6259369" | "6839035" | "7005968").PN. OR ("7280045").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/03/02 02:17
S329	133	(quality adj factor) same (loss adj rate)	US-PGPUB; USPAT; USOCR	OR	ON	2013/03/02 02:51
S330	70	(quality adj factor) same (loop adj antenna)	US-PGPUB; USPAT; USOCR	OR	ON	2013/03/02 02:52
S331	11	(quality adj factor) and (loop adj antenna)	EPO; JPO; DERWENT	OR	ON	2013/03/02 02:59
S332	321	(quality adj factor) and (resonant adj frequency)	EPO; JPO; DERWENT	OR	ON	2013/03/02 03:08
S333	265	(quality adj factor) same (resonant adj frequency)	EPO; JPO; DERWENT	OR	ON	2013/03/02 03:08
S334	1587	(quality adj factor) same (resonant adj frequency)	USPAT	OR	ON	2013/03/02 03:12
S335	1	("20100207458").PN.	US-PGPUB; USPAT	OR	OFF	2013/06/02 08:29
S336	0	S335 and dynamically	USPAT	OR	OFF	2013/06/02 08:34
S337	0	S335 and dynamic$	USPAT	OR	OFF	2013/06/02 08:55
S338	0	S335 and intrinsic	USPAT	OR	OFF	2013/06/02 09:09
S339	0	S335 and dynamically	US-PGPUB; USPAT	OR	OFF	2013/06/02 09:11
S340	1	S335 and intrinsic	US-PGPUB; USPAT	OR	OFF	2013/06/02 09:11
S341	0	S335 and " high intrinsic"	US-PGPUB; USPAT	OR	OFF	2013/06/02 09:13
S342	1	S335 and high	US-PGPUB; USPAT	OR	OFF	2013/06/02 09:13
S343	1	S335 and rate	US-PGPUB; USPAT	OR	OFF	2013/06/02 09:16
S344	1	("20110089895").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/06/03 01:10
S345	1	S344 and repeater	US-PGPUB;	OR	OFF	2013/06/03

			USPAT			01:10
S346	1	S344 and enhances	US-PGPUB; USPAT	OR	OFF	2013/06/03 01:12
S347	1	S344 and "coupling mode region"	US-PGPUB; USPAT	OR	OFF	2013/06/03 01:13
S348	0	qualcom and "coupling mode region"	US-PGPUB; USPAT	OR	OFF	2013/06/03 01:14
S349	0	qualcom and (wireless same repeater same "near" same field)	US-PGPUB; USPAT	OR	OFF	2013/06/03 01:15
S350	16	qualcom and (wireless same repeater)	US-PGPUB; USPAT	OR	OFF	2013/06/03 01:15
S351	6	nigel and (wireless same repeater)	US-PGPUB; USPAT	OR	OFF	2013/06/03 01:16
S352	1	("20090284218").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/06/03 01:20
S353	1	("20090286470").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/06/03 01:23
S354	2	(("20100207458") or ("20110089895")).PN.	US-PGPUB; USPAT	OR	OFF	2013/06/03 15:30
S355	2	(("20090224856") or ("20110089895")).PN.	US-PGPUB; USPAT	OR	OFF	2013/06/03 15:32
S356	1	("20090286470").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/06/03 15:39
S357	1	S356 and (resonant or resonator)	US-PGPUB; USPAT	OR	ON	2013/06/03 15:39
S358	0	S356 and q	US-PGPUB; USPAT	OR	ON	2013/06/03 15:57
S359	66	("2274557" | "3694803" | "3723966" | "3798642" | "3806905" | "3911434" | "3990041" | "4067235" | "4074227" | "4174515" | "4303910").PN. OR ("4450431").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/06/03 17:03
S360	11	("20040046663" | "20050086264" | "20050178832" | "6236315" | "6259369" | "6839035" | "7005968").PN. OR ("7280045").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/06/03 17:20
S361	36228	(rfid or (rf adj2 id)) smae passive same repeater	EPO; JPO; DERWENT	OR	ON	2013/06/03 17:26
S362	6	(rfid or (rf adj2 id)) same passive same repeater	EPO; JPO; DERWENT	OR	ON	2013/06/03 17:26
S363	11	(rfid or (rf adj2 id)) near2 passive near2 repeater	US-PGPUB; USPAT	OR	ON	2013/06/03 19:50
S364	73	(rfid or (rf adj2 id)) near2 repeater	US-PGPUB; USPAT	OR	ON	2013/06/03 19:51
S365	3	(("8097983") or ("7825543") or ("7741734")).PN.	USPAT; USOCR	OR	OFF	2013/06/03 20:13
S366	3	(("8097983") or ("7825543") or ("7741734") or ("201100898985")).PN.	US-PGPUB; USPAT	OR	OFF	2013/06/03 20:15
S367	0	S366 and repeater	US-PGPUB; USPAT	OR	ON	2013/06/03 20:16

S368	4	((("8097983") or ("7825543") or ("7741734") or ("20110089895")).PN.	US-PGPUB; USPAT	OR	OFF	2013/06/03 20:17
S369	1	S368 and repeater	US-PGPUB; USPAT	OR	OFF	2013/06/03 20:17
S370	0	tranponder same resonator	EPO; JPO; DERWENT	OR	OFF	2013/06/05 09:37
S371	64	transponder same resonator	EPO; JPO; DERWENT	OR	ON	2013/06/05 09:37
S372	103	transponder near5 resonator	US-PGPUB; USPAT	OR	ON	2013/06/05 09:45
S373	36	transponder same resonator same q	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/06/05 09:50
S374	36	transponder same resonator same q and resonator	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/06/05 09:56
S375	7	("20030161511" | "20030200814" | "20070176773" | "5443987" | "5663072" | "6025725" | "6204764").PN. OR ("7714593").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/06/05 09:58
S376	32	rfid same resonator same q	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/06/05 09:59
S377	7	rfid and resonator and q	EPO; JPO; DERWENT	OR	ON	2013/06/05 10:01
S378	112	tire and pressure and resonator	EPO; JPO; DERWENT	OR	ON	2013/06/05 10:02
S379	1	("4450431").PN.	USPAT; USOCR	OR	OFF	2013/06/05 17:13
S380	0	S379 and resonator	USPAT	OR	OFF	2013/06/05 17:13
S381	1	S379 and resonant	USPAT	OR	OFF	2013/06/05 17:13
S382	4	((("8097983") or ("7825543") or ("7741734") or ("20110089895")).PN.	US-PGPUB; USPAT	OR	OFF	2013/06/11 08:29
S383	4	S382 and enhanc$	US-PGPUB; USPAT	OR	OFF	2013/06/11 08:29
S384	1	S382 and "loop inductor"	US-PGPUB; USPAT	OR	OFF	2013/06/11 09:05
S385	2	hochstein and tire and pressure and "267,261"	US-PGPUB; USPAT	OR	OFF	2013/06/11 10:28
S386	6	("3662335" | "3806905" | "3858174" | "4006449" | "4074227" | "4174515").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/06/11 10:43

S387	2	("2274557").PN.	USPAT; USOCR	OR	OFF	2013/06/11 10:49
S388	3	(("2274557") or ("3723966")).PN.	USPAT; USOCR	OR	OFF	2013/06/11 10:49
S389	4	(tire adj pressure) same resonant same repeat$	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2013/06/11 13:44
S390	39	(tire adj pressure) same resonant same passive	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2013/06/11 13:52
S391	2	contactless same resonant same repeater	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/06/11 13:54
S392	87	wireless$ same resonant same repeater	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/06/11 13:54
S393	1	wireless$ same resonant same extender	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/06/11 13:56
S394	2	rfid same resonant same extender	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/06/11 13:56
S395	5	rfid same resonant same repeater	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/06/11 13:57
S396	1	rfid and resonant and repeater	FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/06/11 13:58
S397	0	rfid and resonant and extender	FPRS; EPO; JPO; DERWENT;	OR	ON	2013/06/11 13:58

			IBM_TDB			
S398	6	rfid and extender	FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/06/11 13:58
S399	73	rfid and booster	FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/06/11 14:01
S400	14	rfid and booster and range	FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/06/11 14:01
S401	176	rfid and passive and range	FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/06/11 14:02
S402	1150	rfid same range same (boost$ or (extend or extender or extending))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/06/11 14:28
S403	814	rfid same range same (extend or extender or extending)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/06/11 14:29
S404	172	rfid same range same (extend or extender or extending) same passive$	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/06/11 14:29
S405	7	("5379455" | "5600333" | "6107910" | "6137403" | "6223990" | "6278413" | "6359444").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/06/11 14:34
S406	284	rfid same range same improved same antenna	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/06/11 14:37
S407	1	("8097983").PN.	USPAT; USOCR	OR	OFF	2013/06/12 00:16
S408	1	("5053774").PN.	USPAT; USOCR	OR	OFF	2013/06/12 00:40
S409	97	rfid same resonant same detun$	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2013/06/12 01:44

S410	97	rfid same resonant same detun$	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/06/12 01:44
S411	76	resonator same resonant same frequency same q same l same c	USPAT	OR	OFF	2013/06/12 16:27
S412	148	resonator same resonant same frequency same q same l same c	US-PGPUB	OR	OFF	2013/06/12 16:31
S413	0	rfid same resonant same frequency same q same l same c	US-PGPUB	OR	OFF	2013/06/12 16:33
S414	12	transponder same resonant same frequency same q same l same c	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/06/12 17:19
S415	112	transponder same resonant same frequency same q	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/06/12 17:44
S416	4206	l same c same resonant same frequency same q	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/06/12 17:52
S417	19	l same c same resonant same frequency same q	FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/06/12 17:52
S418	1	charger same resonant same frequency same q	FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/06/12 17:54
S419	47	charger same resonant same frequency same q	US-PGPUB; USPAT	OR	ON	2013/06/12 17:55
S420	429	(resonant adj circuit) near5 resonator	USPAT	OR	ON	2013/06/12 18:58
S421	51	(resonant adj circuit) near5 resonator same q	USPAT	OR	ON	2013/06/12 18:58
S422	74	("3440633" | "4429314" | "4712070" | "5084699").PN. OR ("5373303").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/06/12 19:03
S423	56	(resonant adj circuit) near5 resonator same LC	USPAT	OR	ON	2013/06/12 19:06
S424	2101	(307/104).CCLS.	US-PGPUB; USPAT	OR	OFF	2013/06/12 19:08
S425	1298	(320/108).CCLS.	US-PGPUB; USPAT	OR	OFF	2013/06/12 19:08
S426	1432	S424 or S425	USPAT	OR	OFF	2013/06/12

						19:09
S427	62	S426 and resonator	USPAT	OR	OFF	2013/06/12 19:09
S428	1	("20100127575").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/06/12 23:35
S429	1	S428 and resonator	US-PGPUB; USPAT	OR	ON	2013/06/12 23:35
S430	35	mouse and pad and (cordless or noncontact$ or contactless$ or inductive$) and power	EPO; JPO; DERWENT	OR	ON	2013/09/30 13:26
S431	19	mouse same pad same (cordless or noncontact$ or contactless$ or inductive$) same power	EPO; JPO; DERWENT	OR	ON	2013/09/30 13:46
S432	72	mouse same pad same (cordless or noncontact$ or contactless$ or inductive$) same power	US-PGPUB; USPAT	OR	ON	2013/09/30 13:48
S433	20	("20070090790" | "7518267" | "20070090790" | "20100109445" | "20080278112" | "7741734" | "20100041332" | "7826873" | "8013568" | "20090284083" | "20100045114" | "7825543" | "20080278264" | "20100289449" | "20080278264" | "8339096" | "20050134213" | "8040103" | "20100148589" | "6008622" | "20090237029" | "20100127660").PN.	US-PGPUB; USPAT	OR	ON	2013/09/30 14:18
S434	8	q same (resonant or resonance or resonator) same charging same ("near" adj field)	US-PGPUB; USPAT	OR	ON	2013/09/30 14:24
S435	5	q and (resonant or resonance or resonator) and charging and ("near" adj field)	EPO; JPO; DERWENT	OR	ON	2013/09/30 14:26
S436	45	q and (resonant or resonance or resonator) and ("near" adj field)	EPO; JPO; DERWENT	OR	ON	2013/09/30 14:27
S437	503	q same (resonant or resonance or resonator) same ("near" adj field)	US-PGPUB; USPAT	OR	ON	2013/09/30 14:28
S438	296	q same (resonant or resonance or resonator) same ("near" adj field) same power	US-PGPUB; USPAT	OR	ON	2013/09/30 14:29
S439	854	(q same (resonant or resonance or resonator) same power) and ("near" adj field)	US-PGPUB; USPAT	OR	ON	2013/09/30 14:32
S440	120	q and (resonant or resonance or resonator) and transmitter and power	EPO; JPO; DERWENT	OR	ON	2013/09/30 15:07
S441	23	q same (resonant or resonance or resonator) same transmitter same power	EPO; JPO; DERWENT	OR	ON	2013/09/30 15:13
S442	418	q same (resonant or resonance or resonator) same transmitter same power	US-PGPUB; USPAT	OR	ON	2013/09/30 15:13
S443	184	(US-20030114769-$ or US-20110281528-$ or US-20090153273-$ or US-20050206479-$ or US-20050174197-$ or US-20040037363-$ or US-20090010028-$ or US-20080197710-$ or US-20070276538-$	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2013/09/30 15:22

		or US-20070267918-$ or US-20070145830-$ or US-20050288740-$ or US-20050085873-$ or US-20020105343-$ or US-20020032471-$ or US-20050288741-$ or US-20040233043-$ or US-20040032363-$ or US-20040030260-$ or US-20030130708-$ or US-20070142872-$ or US-20060025830-$ or US-20040199212-$ or US-20020097770-$ or US-20090051224-$ or US-20030135971-$).did. or (US-20030124050-$ or US-20030126948-$ or US-20040263307-$ or US-20050007067-$ or US-20030210106-$ or US-20050151511-$ or US-20040189246-$ or US-20020089305-$ or US-20110285214-$ or US-20110101790-$ or US-20100066176-$ or US-20100036773-$ or US-20100007307-$ or US-20090174263-$ or US-20060071632-$ or US-20100289449-$ or US-20080001572-$ or US-20060012371-$ or US-20050258966-$ or US-20040000974-$ or US-20040134985-$ or US-20080218314-$ or US-20070241762-$ or US-20030137446-$ or US-20020130778-$ or US-20050237198-$ or US-20050104790-$).did. or (US-20050275629-$ or US-20040196262-$ or US-20040145567-$ or US-20100127660-$ or US-20040130425-$).did. or (US-6047214-$ or US-6307468-$ or US-6483202-$ or US-7994880-$ or US-4654573-$ or US-5367242-$ or US-6430069-$ or US-6906495-$ or US-7521890-$ or US-7599743-$ or US-6009350-$ or US-5630835-$ or US-7622891-$ or US-5519262-$ or US-6561975-$ or US-4516097-$ or US-5455467-$ or US-7825543-$ or US-7741734-$ or US-6307440-$ or US-6217604-$ or US-5057809-$ or US-6170026-$ or US-7084605-$ or US-6844702-$ or US-6184651-$).did. or (US-5923544-$ or US-4082097-$ or US-7495414-$ or US-5654621-$ or US-5702431-$ or US-5498948-$ or US-5703461-$ or US-5084699-$ or US-4450431-$ or US-4630044-$ or US-5317330-$ or US-5703573-$ or US-8310108-$ or US-6424820-$ or US-4471343-$ or US-5374930-$ or US-5053774-$ or US-5250944-$ or US-5099227-$ or US-4560445-$ or US-5541604-$ or US-5420579-$ or US-5287112-$ or US-6489745-$ or US-4656472-$ or US-7541930-$ or US-7280045-$).did. or (US-6839035-$ or US-4588978-$ or US-2274557-$ or US-5373303-$ or US-5550536-$ or US-5864323-$ or US-5033295-$ or US-7075435-$ or					

		US-6563425-$ or US-6650227-$ or US-7826873-$ or US-7518267-$ or US-6008622-$ or US-3949388-$ or US-6211799-$ or US-4059801-$).did. or (EP-1538558-$ or WO-2004015885-$ or EP-1434160-$ or EP-558316-$ or DE-3824972-$ or EP-549832-$ or DE-3941509-$ or EP-849700-$).did. or (JP-2002075736-$ or JP-2005026741-$ or JP-2004206383-$ or JP-2004206245-$ or JP-11075329-$ or JP-2008125127-$ or JP-02162222-$).did. or (JP-11144962-$ or JP-02097005-$ or DE-20016655-$ or DE-10221484-$ or EP-1408456-$ or EP-945829-$ or US-7147604-$ or KR-2004072581-$ or US-20040127248-$ or EP-1071038-$ or EP-1071039-$ or JP-2000270501-$ or JP-11305848-$ or DE-19651719-$ or US-5374930-$ or US-5287112-$ or US-4802080-$ or DE-10152863-$ or DE-10152858-$ or EP-473957-$ or JP-11075329-$ or JP-08126230-$ or US-20050063488-$ or US-5697076-$ or DD-225565-$ or US-20070145830-$).did. or (WO-2007034421-$ or WO-9811505-$ or WO-9811504-$ or US-4275377-$ or US-4180795-$ or FR-2896898-$ or SG-112842-$ or WO-2005055121-$ or WO-0215112-$ or US-20060061324-$ or US-20050275629-$ or US-20040189246-$ or US-20030103039-$ or JP-2001159948-$ or JP-10260781-$).did.				
S444	52841	S443 and q or ("near" adj field)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2013/09/30 15:23
S445	90	S443 and (q or ("near" adj field))	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2013/09/30 15:23
S446	2	(("20020070718") or ("20100164292")).PN.	US-PGPUB	OR	OFF	2013/09/30 15:43
S447	1	("7906871").PN.	US-PGPUB; USPAT	OR	OFF	2013/09/30 15:45
S448	1000	(307/104).CCLS.	USPAT	OR	OFF	2013/09/30 15:57
S449	13	S448 and fleming and young	USPAT	OR	OFF	2013/09/30 15:57
S450	12	("20040046663" | "20050086264" | "20050178832" | "6236315" | "6259369" | "6839035" | "7005968").PN. OR ("7280045").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/09/30 16:22
S451	28	("20020044058" | "20030043949" | "5168282" | "5285177" | "5420579" | "6069564" | "6118379" | "6147606" | "6278413" | "6281794" | "6396438" | "6400274" | "6480110" |	US-PGPUB; USPAT; USOCR	OR	OFF	2013/09/30 16:23

		"6516182").PN. OR ("6839035").URPN.				
S452	14	("20070080804" | "6016409" | "6259369" | "6351621" | "6377764" | "6839035").PN. OR ("7504951").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/09/30 16:25
S453	9	("20050162331" | "5270717" | "5580664" | "6480110" | "6839035" | "6924777" | "7119671" | "7126552" | "7439863").PN. OR ("7696884").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/09/30 16:26
S454	30	("4737789" | "5057844").PN. OR ("5270717").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/09/30 16:29
S455	95	wireless$ and powered and television	EPO; JPO; DERWENT	OR	ON	2013/09/30 18:03
S456	1577132	wireless$ said powered said television	US-PGPUB; USPAT	OR	ON	2013/09/30 18:06
S457	722	wireless$ same powered same television	US-PGPUB; USPAT	OR	ON	2013/09/30 18:07
S458	129	wireless$ and powered and appliance	EPO; JPO; DERWENT	OR	ON	2013/09/30 18:10
S459	20	inductive$ and powered and appliance	EPO; JPO; DERWENT	OR	ON	2013/09/30 18:12
S460	81	inductive$ same powered same appliance	US-PGPUB; USPAT	OR	ON	2013/09/30 18:13
S461	32	("2133494" | "2415688" | "3320512" | "3530499" | "3710062").PN. OR ("3761668").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/09/30 18:23
S462	47	("2133494").URPN.	USPAT	OR	OFF	2013/09/30 18:35
S463	11	inductive$ and energiz$ and appliance	EPO; JPO; DERWENT	OR	ON	2013/09/30 18:38
S464	676	(noncontact or (non adj contact) or contactless$) and appliance	EPO; JPO; DERWENT	OR	ON	2013/09/30 18:40
S465	4095392	(noncontact or (non adj contact) or contactless$) and appliance (power or energy)	EPO; JPO; DERWENT	OR	ON	2013/09/30 18:40
S466	213	(noncontact or (non adj contact) or contactless$) and appliance and (power or energy)	EPO; JPO; DERWENT	OR	ON	2013/09/30 18:40
S467	120	(noncontact or (non adj contact) or contactless$) and tv and (power or energy)	EPO; JPO; DERWENT	OR	ON	2013/09/30 19:11
S468	51	(noncontact or (non adj contact) or contactless$) same tv same (power or energy)	US-PGPUB; USPAT	OR	ON	2013/09/30 19:14
S469	14	(noncontact or (non adj contact) or contactless$) and desktop and (power or energy)	EPO; JPO; DERWENT	OR	ON	2013/09/30 19:17
S470	256	(noncontact or (non adj contact) or contactless$) and (desk or table) and (power or energy)	EPO; JPO; DERWENT	OR	ON	2013/09/30 19:18
S471	1297	(noncontact or (non adj contact) or contactless$) and distance and (power or energy)	EPO; JPO; DERWENT	OR	ON	2013/09/30 19:26

S472	2368531	(noncontact or (non adj contact) or contactless$) and distance and (power or energy) separat$	EPO; JPO; DERWENT	OR	ON	2013/09/30 19:26
S473	104	(noncontact or (non adj contact) or contactless$) and distance and (power or energy) and separat$	EPO; JPO; DERWENT	OR	ON	2013/09/30 19:26
S474	30	(noncontact or (non adj contact) or contactless$) same distance same (power or energy) same separat$	EPO; JPO; DERWENT	OR	ON	2013/09/30 19:36
S475	322	(noncontact or (non adj contact) or contactless$) same distance same (power or energy) same separat$	US-PGPUB; USPAT	OR	ON	2013/09/30 19:36
S476	844	(noncontact or (non adj contact) or contactless$) same (desk or table or shelf) same (power or energy)	US-PGPUB; USPAT	OR	ON	2013/09/30 19:41
S477	361	(noncontact or (non adj contact) or contactless$) and distance and (power or energy) and transmission	EPO; JPO; DERWENT	OR	ON	2013/09/30 19:49
S478	1735	(wireless$ or inductive$) and distance and (power or energy) and transmission	EPO; JPO; DERWENT	OR	ON	2013/09/30 19:57
S479	75	(wireless$ or inductive$) and distance and (power or energy) and transmission and meter	EPO; JPO; DERWENT	OR	ON	2013/09/30 19:57
S480	119	(wireless$ or inductive$) and distance and (power or energy) and transmission and separat$	EPO; JPO; DERWENT	OR	ON	2013/09/30 19:58
S481	1	("20120086867").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/12/15 15:56
S482	1	S481 and television	US-PGPUB; USPAT	OR	OFF	2013/12/15 15:57
S483	21	(wireless$ or contactless$ or noncontact or inductive$) same powered same television	EPO; JPO; DERWENT	OR	OFF	2013/12/15 15:58
S484	659	(wireless$ or contactless$ or noncontact or inductive$) same powered same television	US-PGPUB; USPAT	OR	OFF	2013/12/15 16:01
S485	537	(wireless$ or contactless$ or noncontact or inductive$) same powered same (computer or display or monitor)	EPO; JPO; DERWENT	OR	OFF	2013/12/15 16:04
S486	9	("20050162331" | "5270717" | "5580664" | "6480110" | "6839035" | "6924777" | "7119671" | "7126552" | "7439863").PN. OR ("7696884").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/12/15 16:42
S487	3623	q and (inductive or contactless or wireless) and (power adj supply)	EPO; JPO; DERWENT	OR	ON	2013/12/15 17:04
S488	45	q and (inductive or contactless or wireless) and (power adj supply) and resonant	EPO; JPO; DERWENT	OR	ON	2013/12/15 17:05
S489	197	(US-20030114769-$ or US-20110281528-$ or US-20090153273-$ or US-20050206479-$ or US-20050174197-$ or US-20040037363-$ or US-20090010028-$ or US-20080197710-$ or US-20070276538-$	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2013/12/15 17:44

		or US-20070267918-$ or US-20070145830-$ or US-20050288740-$ or US-20050085873-$ or US-20020105343-$ or US-20020032471-$ or US-20050288741-$ or US-20040233043-$ or US-20040032363-$ or US-20040030260-$ or US-20030130708-$ or US-20070142872-$ or US-20060025830-$ or US-20040199212-$ or US-20020097770-$ or US-20090051224-$ or US-20030135971-$).did. or (US-20030124050-$ or US-20030126948-$ or US-20040263307-$ or US-20050007067-$ or US-20030210106-$ or US-20050151511-$ or US-20040189246-$ or US-20020089305-$ or US-20110285214-$ or US-20110101790-$ or US-20100066176-$ or US-20100036773-$ or US-20100007307-$ or US-20090174263-$ or US-20060071632-$ or US-20100289449-$ or US-20080001572-$ or US-20060012371-$ or US-20050258966-$ or US-20040000974-$ or US-20040134985-$ or US-20080218314-$ or US-20070241762-$ or US-20030137446-$ or US-20020130778-$ or US-20050237198-$ or US-20050104790-$).did. or (US-20050275629-$ or US-20040196262-$ or US-20040145567-$ or US-20100127660-$ or US-20040130425-$ or US-20120086867-$).did. or (US-6047214-$ or US-6307468-$ or US-6483202-$ or US-7994880-$ or US-4654573-$ or US-5367242-$ or US-6430069-$ or US-6906495-$ or US-7521890-$ or US-7599743-$ or US-6009350-$ or US-5630835-$ or US-7622891-$ or US-5519262-$ or US-6561975-$ or US-4516097-$ or US-5455467-$ or US-7825543-$ or US-7741734-$ or US-6307440-$ or US-6217604-$ or US-5057809-$ or US-6170026-$ or US-7084605-$ or US-6844702-$ or US-6184651-$).did. or (US-5923544-$ or US-4082097-$ or US-7495414-$ or US-5654621-$ or US-5702431-$ or US-5498948-$ or US-5703461-$ or US-5084699-$ or US-4450431-$ or US-4630044-$ or US-5317330-$ or US-5703573-$ or US-8310108-$ or US-6424820-$ or US-4471343-$ or US-5374930-$ or US-5053774-$ or US-5250944-$ or US-5099227-$ or US-4560445-$ or US-5541604-$ or US-5420579-$ or US-5287112-$ or US-6489745-$ or US-4656472-$ or US-7541930-$ or US-7280045-$).did. or (US-6839035-$ or US-4588978-$ or US-2274557-$ or US-5373303-$ or US-5550536-$ or US-5864323-$ or US-5033295-$ or					

		US-7075435-$ or US-6563425-$ or US-6650227-$ or US-7826873-$ or US-7518267-$ or US-6008622-$ or US-3949388-$ or US-6211799-$ or US-4059801-$ or US-7696884-$ or US-7504951-$ or US-5270717-$ or US-2133494-$).did. or (EP-1538558-$ or WO-2004015885-$ or EP-1434160-$ or EP-558316-$ or DE-3824972-$ or EP-549832-$ or DE-3941509-$ or EP-849700-$ or WO-9827561-$).did. or (JP-2002075736-$ or JP-2005026741-$ or JP-2004206383-$ or JP-2004206245-$ or JP-11075329-$ or JP-2008125127-$ or JP-02162222-$ or JP-2004275417-$ or JP-2002345104-$).did. or (JP-11144962-$ or JP-02097005-$ or DE-20016655-$ or DE-10221484-$ or EP-1408456-$ or EP-945829-$ or US-7147604-$ or KR-2004072581-$ or US-20040127248-$ or EP-1071038-$ or EP-1071039-$ or JP-2000270501-$ or JP-11305848-$ or DE-19651719-$ or US-5374930-$ or US-5287112-$ or US-4802080-$ or DE-10152863-$ or DE-10152858-$ or EP-473957-$ or JP-11075329-$ or JP-08126230-$ or US-20050063488-$ or US-5697076-$ or DD-225565-$ or US-20070145830-$).did. or (WO-2007034421-$ or WO-9811505-$ or WO-9811504-$ or US-4275377-$ or US-4180795-$ or FR-2896898-$ or SG-112842-$ or WO-2005055121-$ or WO-0215112-$ or US-20060061324-$ or US-20050275629-$ or US-20040189246-$ or US-20030103039-$ or JP-2001159948-$ or JP-10260781-$ or US-6331744-$ or JP-09182323-$ or DE-102011101478-$ or US-20060176239-$ or US-6803744-$).did.				
S490	76	S489 and q	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2013/12/15 17:45
S491	21	S489 and falls	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2013/12/15 18:03
S492	1	("6047214").PN.	USPAT; USOCR	OR	OFF	2013/12/15 19:14
S493	1	("20120086867").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/12/15 20:31
S494	197	(US-20030114769-$ or US-20110281528-$ or US-20090153273-$ or US-20050206479-$ or US-20050174197-$ or US-20040037363-$ or US-20090010028-$ or US-20080197710-$ or US-20070276538-$ or US-20070267918-$ or US-	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2014/02/24 21:45

		20070145830-$ or US-20050288740-$ or US-20050085873-$ or US-20020105343-$ or US-20020032471-$ or US-20050288741-$ or US-20040233043-$ or US-20040032363-$ or US-20040030260-$ or US-20030130708-$ or US-20070142872-$ or US-20060025830-$ or US-20040199212-$ or US-20020097770-$ or US-20090051224-$ or US-20030135971-$).did. or (US-20030124050-$ or US-20030126948-$ or US-20040263307-$ or US-20050007067-$ or US-20030210106-$ or US-20050151511-$ or US-20040189246-$ or US-20020089305-$ or US-20110285214-$ or US-20110101790-$ or US-20100066176-$ or US-20100036773-$ or US-20100007307-$ or US-20090174263-$ or US-20060071632-$ or US-20100289449-$ or US-20080001572-$ or US-20060012371-$ or US-20050258966-$ or US-20040000974-$ or US-20040134985-$ or US-20080218314-$ or US-20070241762-$ or US-20030137446-$ or US-20020130778-$ or US-20050237198-$ or US-20050104790-$).did. or (US-20050275629-$ or US-20040196262-$ or US-20040145567-$ or US-20100127660-$ or US-20040130425-$ or US-20120086867-$).did. or (US-6047214-$ or US-6307468-$ or US-6483202-$ or US-7994880-$ or US-4654573-$ or US-5367242-$ or US-6430069-$ or US-6906495-$ or US-7521890-$ or US-7599743-$ or US-6009350-$ or US-5630835-$ or US-7622891-$ or US-5519262-$ or US-6561975-$ or US-4516097-$ or US-5455467-$ or US-7825543-$ or US-7741734-$ or US-6307440-$ or US-6217604-$ or US-5057809-$ or US-6170026-$ or US-7084605-$ or US-6844702-$ or US-6184651-$).did. or (US-5923544-$ or US-4082097-$ or US-7495414-$ or US-5654621-$ or US-5702431-$ or US-5498948-$ or US-5703461-$ or US-5084699-$ or US-4450431-$ or US-4630044-$ or US-5317330-$ or US-5703573-$ or US-8310108-$ or US-6424820-$ or US-4471343-$ or US-5374930-$ or US-5053774-$ or US-5250944-$ or US-5099227-$ or US-4560445-$ or US-5541604-$ or US-5420579-$ or US-5287112-$ or US-6489745-$ or US-4656472-$ or US-7541930-$ or US-7280045-$).did. or (US-6839035-$ or US-4588978-$ or US-2274557-$ or US-5373303-$ or US-5550536-$ or US-5864323-$ or US-5033295-$ or US-7075435-$ or US-6563425-$ or					

		US-6650227-$ or US-7826873-$ or US-7518267-$ or US-6008622-$ or US-3949388-$ or US-6211799-$ or US-4059801-$ or US-7696884-$ or US-7504951-$ or US-5270717-$ or US-2133494-$).did. or (EP-1538558-$ or WO-2004015885-$ or EP-1434160-$ or EP-558316-$ or DE-3824972-$ or EP-549832-$ or DE-3941509-$ or EP-849700-$ or WO-9827561-$).did. or (JP-2002075736-$ or JP-2005026741-$ or JP-2004206383-$ or JP-2004206245-$ or JP-11075329-$ or JP-2008125127-$ or JP-02162222-$ or JP-2004275417-$ or JP-2002345104-$).did. or (JP-11144962-$ or JP-02097005-$ or DE-20016655-$ or DE-10221484-$ or EP-1408456-$ or EP-945829-$ or US-7147604-$ or KR-2004072581-$ or US-20040127248-$ or EP-1071038-$ or EP-1071039-$ or JP-2000270501-$ or JP-11305848-$ or DE-19651719-$ or US-5374930-$ or US-5287112-$ or US-4802080-$ or DE-10152863-$ or DE-10152858-$ or EP-473957-$ or JP-11075329-$ or JP-08126230-$ or US-20050063488-$ or US-5697076-$ or DD-225565-$ or US-20070145830-$).did. or (WO-2007034421-$ or WO-9811505-$ or WO-9811504-$ or US-4275377-$ or US-4180795-$ or FR-2896898-$ or SG-112842-$ or WO-2005055121-$ or WO-0215112-$ or US-20060061324-$ or US-20050275629-$ or US-20040189246-$ or US-20030103039-$ or JP-2001159948-$ or JP-10260781-$ or US-6331744-$ or JP-09182323-$ or DE-102011101478-$ or US-20060176239-$ or US-6803744-$).did.				
S495	9	S494 and litz	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2014/02/24 21:45
S496	197	(US-20030114769-$ or US-20110281528-$ or US-20090153273-$ or US-20050206479-$ or US-20050174197-$ or US-20040037363-$ or US-20090010028-$ or US-20080197710-$ or US-20070276538-$ or US-20070267918-$ or US-20070145830-$ or US-20050288740-$ or US-20050085873-$ or US-20020105343-$ or US-20020032471-$ or US-20050288741-$ or US-20040233043-$ or US-20040032363-$ or US-20040030260-$ or US-20030130708-$ or US-20070142872-$ or US-20060025830-$ or US-20040199212-$ or US-20020097770-$ or US-20090051224-$ or US-20030135971-$).did. or (US-20030124050-$ or US-20030126948-$	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2014/02/25 16:53

		or US-20040263307-$ or US-20050007067-$ or US-20030210106-$ or US-20050151511-$ or US-20040189246-$ or US-20020089305-$ or US-20110285214-$ or US-20110101790-$ or US-20100066176-$ or US-20100036773-$ or US-20100007307-$ or US-20090174263-$ or US-20060071632-$ or US-20100289449-$ or US-20080001572-$ or US-20060012371-$ or US-20050258966-$ or US-20040000974-$ or US-20040134985-$ or US-20080218314-$ or US-20070241762-$ or US-20030137446-$ or US-20020130778-$ or US-20050237198-$ or US-20050104790-$).did. or (US-20050275629-$ or US-20040196262-$ or US-20040145567-$ or US-20100127660-$ or US-20040130425-$ or US-20120086867-$).did. or (US-6047214-$ or US-6307468-$ or US-6483202-$ or US-7994880-$ or US-4654573-$ or US-5367242-$ or US-6430069-$ or US-6906495-$ or US-7521890-$ or US-7599743-$ or US-6009350-$ or US-5630835-$ or US-7622891-$ or US-5519262-$ or US-6561975-$ or US-4516097-$ or US-5455467-$ or US-7825543-$ or US-7741734-$ or US-6307440-$ or US-6217604-$ or US-5057809-$ or US-6170026-$ or US-7084605-$ or US-6844702-$ or US-6184651-$).did. or (US-5923544-$ or US-4082097-$ or US-7495414-$ or US-5654621-$ or US-5702431-$ or US-5498948-$ or US-5703461-$ or US-5084699-$ or US-4450431-$ or US-4630044-$ or US-5317330-$ or US-5703573-$ or US-8310108-$ or US-6424820-$ or US-4471343-$ or US-5374930-$ or US-5053774-$ or US-5250944-$ or US-5099227-$ or US-4560445-$ or US-5541604-$ or US-5420579-$ or US-5287112-$ or US-6489745-$ or US-4656472-$ or US-7541930-$ or US-7280045-$).did. or (US-6839035-$ or US-4588978-$ or US-2274557-$ or US-5373303-$ or US-5550536-$ or US-5864323-$ or US-5033295-$ or US-7075435-$ or US-6563425-$ or US-6650227-$ or US-7826873-$ or US-7518267-$ or US-6008622-$ or US-3949388-$ or US-6211799-$ or US-4059801-$ or US-7696884-$ or US-7504951-$ or US-5270717-$ or US-2133494-$).did. or (EP-1538558-$ or WO-2004015885-$ or EP-1434160-$ or EP-558316-$ or DE-3824972-$ or EP-549832-$ or DE-3941509-$ or EP-849700-$ or WO-9827561-$).did. or (JP-2002075736-$ or JP-2005026741-$ or JP-2004206383-$ or JP-				

		2004206245-$ or JP-11075329-$ or JP-2008125127-$ or JP-02162222-$ or JP-2004275417-$ or JP-2002345104-$).did. or (JP-11144962-$ or JP-02097005-$ or DE-20016655-$ or DE-10221484-$ or EP-1408456-$ or EP-945829-$ or US-7147604-$ or KR-2004072581-$ or US-20040127248-$ or EP-1071038-$ or EP-1071039-$ or JP-2000270501-$ or JP-11305848-$ or DE-19651719-$ or US-5374930-$ or US-5287112-$ or US-4802080-$ or DE-10152863-$ or DE-10152858-$ or EP-473957-$ or JP-11075329-$ or JP-08126230-$ or US-20050063488-$ or US-5697076-$ or DD-225565-$ or US-20070145830-$).did. or (WO-2007034421-$ or WO-9811505-$ or WO-9811504-$ or US-4275377-$ or US-4180795-$ or FR-2896898-$ or SG-112842-$ or WO-2005055121-$ or WO-0215112-$ or US-20060061324-$ or US-20050275629-$ or US-20040189246-$ or US-20030103039-$ or JP-2001159948-$ or JP-10260781-$ or US-6331744-$ or JP-09182323-$ or DE-102011101478-$ or US-20060176239-$ or US-6803744-$).did.				
S497	9	S496 and litz	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2014/02/25 16:53
S498	0	S497 and tire	USPAT	OR	OFF	2014/02/25 16:53
S499	197	(US-20030114769-$ or US-20110281528-$ or US-20090153273-$ or US-20050206479-$ or US-20050174197-$ or US-20040037363-$ or US-20090010028-$ or US-20080197710-$ or US-20070276538-$ or US-20070267918-$ or US-20070145830-$ or US-20050288740-$ or US-20050085873-$ or US-20020105343-$ or US-20020032471-$ or US-20050288741-$ or US-20040233043-$ or US-20040032363-$ or US-20040030260-$ or US-20030130708-$ or US-20070142872-$ or US-20060025830-$ or US-20040199212-$ or US-20020097770-$ or US-20090051224-$ or US-20030135971-$).did. or (US-20030124050-$ or US-20030126948-$ or US-20040263307-$ or US-20050007067-$ or US-20030210106-$ or US-20050151511-$ or US-20040189246-$ or US-20020089305-$ or US-20110285214-$ or US-20110101790-$ or US-20100066176-$ or US-20100036773-$ or US-20100007307-$ or US-20090174263-$ or US-20060071632-$ or US-	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2014/02/25 16:53

		20100289449-$ or US-20080001572-$ or US-20060012371-$ or US-20050258966-$ or US-20040000974-$ or US-20040134985-$ or US-20080218314-$ or US-20070241762-$ or US-20030137446-$ or US-20020130778-$ or US-20050237198-$ or US-20050104790-$).did. or (US-20050275629-$ or US-20040196262-$ or US-20040145567-$ or US-20100127660-$ or US-20040130425-$ or US-20120086867-$).did. or (US-6047214-$ or US-6307468-$ or US-6483202-$ or US-7994880-$ or US-4654573-$ or US-5367242-$ or US-6430069-$ or US-6906495-$ or US-7521890-$ or US-7599743-$ or US-6009350-$ or US-5630835-$ or US-7622891-$ or US-5519262-$ or US-6561975-$ or US-4516097-$ or US-5455467-$ or US-7825543-$ or US-7741734-$ or US-6307440-$ or US-6217604-$ or US-5057809-$ or US-6170026-$ or US-7084605-$ or US-6844702-$ or US-6184651-$).did. or (US-5923544-$ or US-4082097-$ or US-7495414-$ or US-5654621-$ or US-5702431-$ or US-5498948-$ or US-5703461-$ or US-5084699-$ or US-4450431-$ or US-4630044-$ or US-5317330-$ or US-5703573-$ or US-8310108-$ or US-6424820-$ or US-4471343-$ or US-5374930-$ or US-5053774-$ or US-5250944-$ or US-5099227-$ or US-4560445-$ or US-5541604-$ or US-5420579-$ or US-5287112-$ or US-6489745-$ or US-4656472-$ or US-7541930-$ or US-7280045-$).did. or (US-6839035-$ or US-4588978-$ or US-2274557-$ or US-5373303-$ or US-5550536-$ or US-5864323-$ or US-5033295-$ or US-7075435-$ or US-6563425-$ or US-6650227-$ or US-7826873-$ or US-7518267-$ or US-6008622-$ or US-3949388-$ or US-6211799-$ or US-4059801-$ or US-7696884-$ or US-7504951-$ or US-5270717-$ or US-2133494-$).did. or (EP-1538558-$ or WO-2004015885-$ or EP-1434160-$ or EP-558316-$ or DE-3824972-$ or EP-549832-$ or DE-3941509-$ or EP-849700-$ or WO-9827561-$).did. or (JP-2002075736-$ or JP-2005026741-$ or JP-2004206383-$ or JP-2004206245-$ or JP-11075329-$ or JP-2008125127-$ or JP-02162222-$ or JP-2004275417-$ or JP-2002345104-$).did. or (JP-11144962-$ or JP-02097005-$ or DE-20016655-$ or DE-10221484-$ or EP-1408456-$ or EP-945829-$ or US-7147604-$ or KR-2004072581-$ or US-20040127248-$ or EP-1071038-$ or EP-1071039-$ or				

		JP-2000270501-$ or JP-11305848-$ or DE-19651719-$ or US-5374930-$ or US-5287112-$ or US-4802080-$ or DE-10152863-$ or DE-10152858-$ or EP-473957-$ or JP-11075329-$ or JP-08126230-$ or US-20050063488-$ or US-5697076-$ or DD-225565-$ or US-20070145830-$).did. or (WO-2007034421-$ or WO-9811505-$ or WO-9811504-$ or US-4275377-$ or US-4180795-$ or FR-2896898-$ or SG-112842-$ or WO-2005055121-$ or WO-0215112-$ or US-20060061324-$ or US-20050275629-$ or US-20040189246-$ or US-20030103039-$ or JP-2001159948-$ or JP-10260781-$ or US-6331744-$ or JP-09182323-$ or DE-102011101478-$ or US-20060176239-$ or US-6803744-$).did.				
S500	4	S499 and tire	USPAT	OR	OFF	2014/02/25 16:53
S501	2634	(307/104).CCLS.	US-PGPUB; USPAT	OR	OFF	2014/05/05 06:31
S502	94	("20020130642" | "20020167294" | "20030071034" | "20030160590" | "20040026998" | "20040130425" | "20040142733" | "20040189246" | "20040227057" | "20050021135" | "20050033382" | "20050104453" | "20050116683" | "20050140482" | "20050189945" | "20050194926" | "20050253152" | "20050288742" | "20060001509" | "20060053296" | "20060066443" | "20060164866" | "20060184209" | "20060184210" | "20060199620" | "20060214626" | "20060219448" | "20060238365" | "20060281435" | "20070010295" | "20070013483" | "20070016089" | "20070024246" | "20070069687" | "20070096875" | "20070105429" | "20070117596" | "20070126650" | "20070176840" | "20070208263" | "3780425" | "3871176" | "4095998" | "4280129" | "5229652" | "5408209" | "5522856" | "5541604" | "5565763" | "5630835" | "5697956" | "5703461" | "5710413" | "5742471" | "5821728" | "5821731" | "5903134" | "5923544" | "5940509" | "5957956" | "5959245" | "5993996" | "6012659" | "6047214" | "6066163" | "6067473" | "6108579" | "6127799" | "6207887" | "6232841" | "6238387" | "6252762" | "6473028" | "6483202" | "6535133" | "6561975" | "6609023" | "6631072" | "6683256" | "6696647" | "6703921" | "6803744" | "6858970" | "6961619" | "6967462" | "6988026" | "7027311" | "7035076" | "7084605" | "7127293" | "7193418" | "7233137" | "7251527" | "7288918").PN.	US-PGPUB; USPAT	OR	OFF	2014/05/05 06:32

S503	106440	("20050027192" | "20050135122" | "4588978" | "5033295" | "5864323" | "6176433" | "6563425" | "6839035" | "7443135" | "7545337" | "7863859" | "8131378")".PN"	US-PGPUB; USPAT	OR	OFF	2014/05/05 06:33
S504	12	("20050027192" | "20050135122" | "4588978" | "5033295" | "5864323" | "6176433" | "6563425" | "6839035" | "7443135" | "7545337" | "7863859" | "8131378").PN.	US-PGPUB; USPAT	OR	OFF	2014/05/05 06:34
S505	106	S502 or S504	US-PGPUB; USPAT	OR	OFF	2014/05/05 06:34
S507	94	("20020130642" | "20020167294" | "20030071034" | "20030160590" | "20040026998" | "20040130425" | "20040142733" | "20040189246" | "20040227057" | "20050021134" | "20050033382" | "20050104453" | "20050116683" | "20050140482" | "20050189945" | "20050194926" | "20050253152" | "20050288742" | "20060001509" | "20060053296" | "20060066443" | "20060164866" | "20060184209" | "20060184210" | "20060199620" | "20060214626" | "20060219448" | "20060238365" | "20060281435" | "20070010295" | "20070013483" | "20070016089" | "20070024246" | "20070069687" | "20070096875" | "20070105429" | "20070117596" | "20070126650" | "20070176840" | "20070208563" | "3780425" | "3871176" | "4095998" | "4280129" | "5229652" | "5408209" | "5522856" | "5541604" | "5565763" | "5630835" | "5697956" | "5703461" | "5710413" | "5742471" | "5821728" | "5821731" | "5903134" | "5923544" | "5940509" | "5959245" | "5959956" | "5993996" | "6012659" | "6047214" | "6066163" | "6067473" | "6108579" | "6127799" | "6207887" | "6232841" | "6238387" | "6252762" | "6473028" | "6483202" | "6535133" | "6561975" | "6609023" | "6631072" | "6683256" | "6696647" | "6703921" | "6803744" | "6858970" | "6961619" | "6967462" | "6988026" | "7027311" | "7035076" | "7084605" | "7127293" | "7193418" | "7233137" | "7251527" | "7288918").PN.	US-PGPUB; USPAT	OR	OFF	2014/06/02 07:53
S508	0	fleming and writricity and repeater	USPAT	OR	OFF	2014/07/13 21:22
S509	0	fleming and fish and richardson and repeater	USPAT	OR	OFF	2014/07/13 21:23
S510	347	fleming and fish and richardson	USPAT	OR	OFF	2014/07/13 21:23
S511	14	fleming and fish and richardson and karalis	USPAT	OR	OFF	2014/07/13 21:23
S512	2922	(307/104).CCLS.	US-PGPUB; USPAT	OR	OFF	2014/09/26 18:49

S513	38	S512 and animal	USPAT	OR	OFF	2014/09/26 18:49
S514	154	S512 and animal	US-PGPUB; USPAT	OR	OFF	2014/09/26 18:50
S515	1	("20070296393").PN.	US-PGPUB; USPAT	OR	OFF	2014/09/26 18:52
S516	1	("20050125093").PN.	US-PGPUB; USPAT	OR	OFF	2015/03/07 23:35
S517	1	("8760007").PN.	USPAT; USOCR	OR	OFF	2015/03/08 23:37
S518	1	("8097983").PN.	USPAT; USOCR	OR	OFF	2015/03/08 23:55
S519	2224	(320/108).CCLS.	US-PGPUB; USPAT	OR	OFF	2015/03/09 04:38
S520	3318	(307/104).CCLS.	US-PGPUB; USPAT	OR	OFF	2015/03/09 04:38
S521	6390	h02j17/00.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/03/09 04:39
S522	1921	(307/104).CCLS.	USPAT; USOCR	OR	OFF	2015/04/03 09:29
S523	40	S522 and fritz	USPAT	OR	OFF	2015/04/03 09:29
S524	0	S522 and palladini	USPAT	OR	OFF	2015/04/03 09:31
S525	0	S522 and pallidini	USPAT	OR	OFF	2015/04/03 09:31
S526	32	S522 and albert	USPAT	OR	OFF	2015/04/03 09:31
S527	2015	paladini near2 albert	USPAT	OR	OFF	2015/04/03 09:32
S528	33	S527 and (impedance adj matching)	USPAT	OR	OFF	2015/04/03 09:32
S529	2275	(320/108).CCLS.	US-PGPUB; USPAT	OR	OFF	2015/04/08 19:47
S530	3360	(307/104).CCLS.	US-PGPUB; USPAT	OR	OFF	2015/04/08 19:50
S531	6547	h02j17/00.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/04/08 19:53
S535	1	("20150048676").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2015/04/08 22:18
S536	13	(("6262639") or ("0876008") or ("8766485") or ("8772971") or ("8772972") or ("8791599") or ("8836172") or ("20060044188") or ("20060164868") or ("20060284708")	US-PGPUB; USPAT	OR	OFF	2015/04/08 22:39

		or ("20120228960") or ("20130181541") or ("20140354071")).PN.				
S537	13	(("6262639") or ("8760008") or ("8766485") or ("8772971") or ("8772972") or ("8791599") or ("8836172") or ("20060044188") or ("20060164868") or ("20060284708") or ("20120228960") or ("20130181541") or ("20140354071")).PN.	US-PGPUB; USPAT	OR	OFF	2015/04/08 22:40
S538	2	(("9065286") or ("8760007")).PN.	USPAT; USOCR	OR	OFF	2015/08/10 08:51
S539	1948	(307/104).CCLS.	USPAT; USOCR	OR	OFF	2015/08/10 08:57
S540	3571	(307/104).CCLS.	US-PGPUB; USPAT	OR	OFF	2015/08/10 08:58
S541	2443	(320/108).CCLS.	US-PGPUB; USPAT	OR	OFF	2015/08/10 08:58
S542	7808	h02j17/00.cpc.	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/08/10 08:59
S543	3309	h02j17/00.cpc.	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/08/10 08:59
S544	4499	h02j17/00.cpc.	FPRS	OR	OFF	2015/08/10 08:59
S545	962	S540 and vehicle	US-PGPUB; USPAT	OR	OFF	2015/08/10 09:13
S546	199	(US-20030114769-$ or US-20110281528-$ or US-20090153273-$ or US-20050206479-$ or US-20050174197-$ or US-20040037363-$ or US-20090010028-$ or US-20080197710-$ or US-20070276538-$ or US-20070267918-$ or US-20070145830-$ or US-20050288740-$ or US-20050085873-$ or US-20020105343-$ or US-20020032471-$ or US-20050288741-$ or US-20040233043-$ or US-20040032363-$ or US-20040030260-$ or US-20030130708-$ or US-20070142872-$ or US-20060025830-$ or US-20040199212-$ or US-20020097770-$ or US-20090051224-$ or US-20030135971-$).did. or (US-20030124050-$ or US-20030126948-$ or US-20040263307-$ or US-20050007067-$ or US-20030210106-$ or US-20050151511-$ or US-20040189246-$ or US-20020089305-$ or US-20110285214-$ or US-20110101790-$ or US-20100066176-$ or US-20100036773-$ or US-	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2015/08/10 12:21

		20100007307-$ or US-20090174263-$ or US-20060071632-$ or US-20100289449-$ or US-20080001572-$ or US-20060012371-$ or US-20050258966-$ or US-20040000974-$ or US-20040134985-$ or US-20080218314-$ or US-20070241762-$ or US-20030137446-$ or US-20020130778-$ or US-20050237198-$ or US-20050104790-$).did. or (US-20050275629-$ or US-20040196262-$ or US-20040145567-$ or US-20100127660-$ or US-20040130425-$ or US-20120086867-$ or US-20050125093-$ or US-20150048676-$).did. or (US-6047214-$ or US-6307468-$ or US-6483202-$ or US-7994880-$ or US-4654573-$ or US-5367242-$ or US-6430069-$ or US-6906495-$ or US-7521890-$ or US-7599743-$ or US-6009350-$ or US-5630835-$ or US-7622891-$ or US-5519262-$ or US-6561975-$ or US-4516097-$ or US-5455467-$ or US-7825543-$ or US-7741734-$ or US-6307440-$ or US-6217604-$ or US-5057809-$ or US-6170026-$ or US-7084605-$ or US-6844702-$ or US-6184651-$).did. or (US-5923544-$ or US-4082097-$ or US-7495414-$ or US-5654621-$ or US-5702431-$ or US-5498948-$ or US-5703461-$ or US-5084699-$ or US-4450431-$ or US-4630044-$ or US-5317330-$ or US-5703573-$ or US-8310108-$ or US-6424820-$ or US-4471343-$ or US-5374930-$ or US-5053774-$ or US-5250944-$ or US-5099227-$ or US-4560445-$ or US-5541604-$ or US-5420579-$ or US-5287112-$ or US-6489745-$ or US-4656472-$ or US-7541930-$ or US-7280045-$).did. or (US-6839035-$ or US-4588978-$ or US-2274557-$ or US-5373303-$ or US-5550536-$ or US-5864323-$ or US-5033295-$ or US-7075435-$ or US-6563425-$ or US-6650227-$ or US-7826873-$ or US-7518267-$ or US-6008622-$ or US-3949388-$ or US-6211799-$ or US-4059801-$ or US-7696884-$ or US-7504951-$ or US-5270717-$ or US-2133494-$ or US-8097983-$).did. or (EP-1538558-$ or WO-2004015885-$ or EP-1434160-$ or EP-558316-$ or DE-3824972-$ or EP-549832-$ or DE-3941509-$ or EP-849700-$ or WO-9827561-$).did. or (JP-2002075736-$ or JP-2005026741-$ or JP-2004206383-$ or JP-2004206245-$ or JP-11075329-$ or JP-2008125127-$ or JP-02162222-$ or JP-2004275417-$ or JP-2002345104-$).did. or (JP-11144962-$ or JP-02097005-$ or DE-20016655-$ or DE-				

		10221484-$ or EP-1408456-$ or EP-945829-$ or US-7147604-$ or KR-2004072581-$ or US-20040127248-$ or EP-1071038-$ or EP-1071039-$ or JP-2000270501-$ or JP-11305848-$ or DE-19651719-$ or US-5374930-$ or US-5287112-$ or US-4802080-$ or DE-10152863-$ or DE-10152858-$ or EP-473957-$ or JP-11075329-$ or JP-08126230-$ or US-20050063488-$ or US-5697076-$ or DD-225565-$ or US-20070145830-$).did. or (WO-2007034421-$ or WO-9811505-$ or WO-9811504-$ or US-4275377-$ or US-4180795-$ or FR-2896898-$ or SG-112842-$ or WO-2005055121-$ or WO-0215112-$ or US-20060061324-$ or US-20050275629-$ or US-20040189246-$ or US-20030103039-$ or JP-2001159948-$ or JP-10260781-$ or US-6331744-$ or JP-09182323-$ or DE-102011101478-$ or US-20060176239-$ or US-6803744-$).did.				
S547	0	S546 and characteristic adj length	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/08/10 12:21
S548	87	S546 and characteristic	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/08/10 12:21
S549	16	S546 and characteristic.clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/08/10 12:21
S550	1	("9065286").PN.	USPAT; USOCR	OR	OFF	2015/08/10 12:36
S551	1	("20150194818").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2015/08/10 12:47
S552	1	S551 and breakdown	US-PGPUB; USPAT	OR	OFF	2015/08/10 12:48
S553	2	(("20150194818") or ("20130181541")).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2015/08/10 12:49
S554	3	(("20150194818") or ("20130181541") or ("8097983")).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2015/08/10 12:52
S555	3	S554 and breakdown	US-PGPUB; USPAT	OR	OFF	2015/08/10 12:54

S556	3	S554 and wp	US-PGPUB; USPAT	OR	OFF	2015/08/10 12:54
S557	199	(US-20030114769-$ or US-20110281528-$ or US-20090153273-$ or US-20050206479-$ or US-20050174197-$ or US-20040037363-$ or US-20090010028-$ or US-20080197710-$ or US-20070276538-$ or US-20070267918-$ or US-20070145830-$ or US-20050288740-$ or US-20050085873-$ or US-20020105343-$ or US-20020032471-$ or US-20050288741-$ or US-20040233043-$ or US-20040032363-$ or US-20040030260-$ or US-20030130708-$ or US-20070142872-$ or US-20060025830-$ or US-20040199212-$ or US-20020097770-$ or US-20090051224-$ or US-20030135971-$).did. or (US-20030124050-$ or US-20030126948-$ or US-20040263307-$ or US-20050007067-$ or US-20030210106-$ or US-20050151511-$ or US-20040189246-$ or US-20020089305-$ or US-20110285214-$ or US-20110101790-$ or US-20100066176-$ or US-20100036773-$ or US-20100007307-$ or US-20090174263-$ or US-20060071632-$ or US-20100289449-$ or US-20080001572-$ or US-20060012371-$ or US-20050258966-$ or US-20040000974-$ or US-20040134985-$ or US-20080218314-$ or US-20070241762-$ or US-20030137446-$ or US-20020130778-$ or US-20050237198-$ or US-20050104790-$).did. or (US-20050275629-$ or US-20040196262-$ or US-20040145567-$ or US-20100127660-$ or US-20040130425-$ or US-20120086867-$ or US-20050125093-$ or US-20150048676-$).did. or (US-6047214-$ or US-6307468-$ or US-6483202-$ or US-7994880-$ or US-4654573-$ or US-5367242-$ or US-6430069-$ or US-6906495-$ or US-7521890-$ or US-7599743-$ or US-6009350-$ or US-5630835-$ or US-7622891-$ or US-5519262-$ or US-6561975-$ or US-4516097-$ or US-5455467-$ or US-7825543-$ or US-7741734-$ or US-6307440-$ or US-6217604-$ or US-5057809-$ or US-6170026-$ or US-7084605-$ or US-6844702-$ or US-6184651-$).did. or (US-5923544-$ or US-4082097-$ or US-7495414-$ or US-5654621-$ or US-5702431-$ or US-5498948-$ or US-5703461-$ or US-5084699-$ or US-4450431-$ or US-4630044-$ or US-5317330-$ or US-5703573-$ or US-8310108-$ or US-6424820-$ or US-4471343-$ or	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2015/09/15 23:02

		US-5374930-$ or US-5053774-$ or US-5250944-$ or US-5099227-$ or US-4560445-$ or US-5541604-$ or US-5420579-$ or US-5287112-$ or US-6489745-$ or US-4656472-$ or US-7541930-$ or US-7280045-$).did. or (US-6839035-$ or US-4588978-$ or US-2274557-$ or US-5373303-$ or US-5550536-$ or US-5864323-$ or US-5033295-$ or US-7075435-$ or US-6563425-$ or US-6650227-$ or US-7826873-$ or US-7518267-$ or US-6008622-$ or US-3949388-$ or US-6211799-$ or US-4059801-$ or US-7696884-$ or US-7504951-$ or US-5270717-$ or US-2133494-$ or US-8097983-$).did. or (EP-1538558-$ or WO-2004015885-$ or EP-1434160-$ or EP-558316-$ or DE-3824972-$ or EP-549832-$ or DE-3941509-$ or EP-849700-$ or WO-9827561-$).did. or (JP-2002075736-$ or JP-2005026741-$ or JP-2004206383-$ or JP-2004206245-$ or JP-11075329-$ or JP-2008125127-$ or JP-02162222-$ or JP-2004275417-$ or JP-2002345104-$).did. or (JP-11144962-$ or JP-02097005-$ or DE-20016655-$ or DE-10221484-$ or EP-1408456-$ or EP-945829-$ or US-7147604-$ or KR-2004072581-$ or US-20040127248-$ or EP-1071038-$ or EP-1071039-$ or JP-2000270501-$ or JP-11305848-$ or DE-19651719-$ or US-5374930-$ or US-5287112-$ or US-4802080-$ or DE-10152863-$ or DE-10152858-$ or EP-473957-$ or JP-11075329-$ or JP-08126230-$ or US-20050063488-$ or US-5697076-$ or DD-225565-$ or US-20070145830-$).did. or (WO-2007034421-$ or WO-9811505-$ or WO-9811504-$ or US-4275377-$ or US-4180795-$ or FR-2896898-$ or SG-112842-$ or WO-2005055121-$ or WO-0215112-$ or US-20060061324-$ or US-20050275629-$ or US-20040189246-$ or US-20030103039-$ or JP-2001159948-$ or JP-10260781-$ or US-6331744-$ or JP-09182323-$ or DE-102011101478-$ or US-20060176239-$ or US-6803744-$).did.				
S558	2	S557 and kikuchi	US-PGPUB; USPAT	OR	OFF	2015/09/15 23:05
S559	1	("8760007").PN.	USPAT; USOCR	OR	OFF	2015/09/16 13:32
S560	18	("20070080804" | "6016409" | "6259369" | "6351621" | "6377764" | "6839035").PN. OR ("7504951").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2015/10/02 16:12
S561	68	("20020044058" | "20030043949" | "5168282" | "5285177" | "5420579" | "6069564" | "6118379" | "6147606" |	US-PGPUB; USPAT; USOCR	OR	OFF	2015/10/02 16:13

		"6278413" | "6281794" | "6396438" | "6400274" | "6480110" | "6516182").PN. OR ("6839035").URPN.				
S562	1	("5367242").PN.	USPAT; USOCR	OR	OFF	2015/10/02 17:18
S563	199	(US-20030114769-$ or US-20110281528-$ or US-20090153273-$ or US-20050206479-$ or US-20050174197-$ or US-20040037363-$ or US-20090010028-$ or US-20080197710-$ or US-20070276538-$ or US-20070267918-$ or US-20070145830-$ or US-20050288740-$ or US-20050085873-$ or US-20020105343-$ or US-20020032471-$ or US-20050288741-$ or US-20040233043-$ or US-20040032363-$ or US-20040030260-$ or US-20030130708-$ or US-20070142872-$ or US-20060025830-$ or US-20040199212-$ or US-20020097770-$ or US-20090051224-$ or US-20030135971-$).did. or (US-20030124050-$ or US-20030126948-$ or US-20040263307-$ or US-20050007067-$ or US-20030210106-$ or US-20050151511-$ or US-20040189246-$ or US-20020089305-$ or US-20110285214-$ or US-20110101790-$ or US-20100066176-$ or US-20100036773-$ or US-20100007307-$ or US-20090174263-$ or US-20060071632-$ or US-20100289449-$ or US-20080001572-$ or US-20060012371-$ or US-20050258966-$ or US-20040000974-$ or US-20040134985-$ or US-20080218314-$ or US-20070241762-$ or US-20030137446-$ or US-20020130778-$ or US-20050237198-$ or US-20050104790-$).did. or (US-20050275629-$ or US-20040196262-$ or US-20040145567-$ or US-20100127660-$ or US-20040130425-$ or US-20120086867-$ or US-20050125093-$ or US-20150048676-$).did. or (US-6047214-$ or US-6307468-$ or US-6483202-$ or US-7994880-$ or US-4654573-$ or US-5367242-$ or US-6430069-$ or US-6906495-$ or US-7521890-$ or US-7599743-$ or US-6009350-$ or US-5630835-$ or US-7622891-$ or US-5519262-$ or US-6561975-$ or US-4516097-$ or US-5455467-$ or US-7825543-$ or US-7741734-$ or US-6307440-$ or US-6217604-$ or US-5057809-$ or US-6170026-$ or US-7084605-$ or US-6844702-$ or US-6184651-$).did. or (US-5923544-$ or US-4082097-$ or US-7495414-$ or US-5654621-$ or US-5702431-$ or US-5498948-$ or US-5703461-$ or	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2015/10/02 22:10

		US-5084699-$ or US-4450431-$ or US-4630044-$ or US-5317330-$ or US-5703573-$ or US-8310108-$ or US-6424820-$ or US-4471343-$ or US-5374930-$ or US-5053774-$ or US-5250944-$ or US-5099227-$ or US-4560445-$ or US-5541604-$ or US-5420579-$ or US-5287112-$ or US-6489745-$ or US-4656472-$ or US-7541930-$ or US-7280045-$).did. or (US-6839035-$ or US-4588978-$ or US-2274557-$ or US-5373303-$ or US-5550536-$ or US-5864323-$ or US-5033295-$ or US-7075435-$ or US-6563425-$ or US-6650227-$ or US-7826873-$ or US-7518267-$ or US-6008622-$ or US-3949388-$ or US-6211799-$ or US-4059801-$ or US-7696884-$ or US-7504951-$ or US-5270717-$ or US-2133494-$ or US-8097983-$).did. or (EP-1538558-$ or WO-2004015885-$ or EP-1434160-$ or EP-558316-$ or DE-3824972-$ or EP-549832-$ or DE-3941509-$ or EP-849700-$ or WO-9827561-$).did. or (JP-2002075736-$ or JP-2005026741-$ or JP-2004206383-$ or JP-2004206245-$ or JP-11075329-$ or JP-2008125127-$ or JP-02162222-$ or JP-2004275417-$ or JP-2002345104-$).did. or (JP-11144962-$ or JP-02097005-$ or DE-20016655-$ or DE-10221484-$ or EP-1408456-$ or EP-945829-$ or US-7147604-$ or KR-2004072581-$ or US-20040127248-$ or EP-1071038-$ or EP-1071039-$ or JP-2000270501-$ or JP-11305848-$ or DE-19651719-$ or US-5374930-$ or US-5287112-$ or US-4802080-$ or DE-10152863-$ or DE-10152858-$ or EP-473957-$ or JP-11075329-$ or JP-08126230-$ or US-20050063488-$ or US-5697076-$ or DD-225565-$ or US-20070145830-$).did. or (WO-2007034421-$ or WO-9811505-$ or WO-9811504-$ or US-4275377-$ or US-4180795-$ or FR-2896898-$ or SG-112842-$ or WO-2005055121-$ or WO-0215112-$ or US-20060061324-$ or US-20050275629-$ or US-20040189246-$ or US-20030103039-$ or JP-2001159948-$ or JP-10260781-$ or US-6331744-$ or JP-09182323-$ or DE-102011101478-$ or US-20060176239-$ or US-6803744-$).did.				
S564	48	S563 and (coil same capacitance)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/10/02 22:10
S565	1	("6533178").PN.	USPAT;	OR	OFF	2015/10/09

			USOCR			16:34
S566	12	("20060044188" | "20060164868" | "20060284708" | "20120228960" | "20140354071" | "6262639" | "8361272" | "8760008" | "8766485" | "8772971" | "8772972" | "8791599").PN.	US-PGPUB; USPAT	OR	OFF	2015/10/09 16:43
S567	2	("6407470" | "9065286").PN.	US-PGPUB; USPAT	OR	OFF	2015/10/09 16:43
S568	14	S566 or S567	US-PGPUB; USPAT	OR	OFF	2015/10/09 16:43
S569	2	(intrinsic same loss same rate same quality same coupling).clm.	US-PGPUB; USPAT	OR	OFF	2015/10/09 18:34
S570	2	(intrinsic same loss same rate same quality same coupling).clm.	US-PGPUB; USPAT	OR	ON	2015/10/09 18:34
S571	2	(intrinsic same loss same rate same quality same coefficient).clm.	US-PGPUB; USPAT	OR	ON	2015/10/09 18:35
S572	13	(intrinsic same loss same rate same quality).clm.	US-PGPUB; USPAT	OR	ON	2015/10/09 18:36
S573	5	(work adj drainage adj rate).clm.	US-PGPUB; USPAT	OR	ON	2015/10/09 19:01
S574	123	(work adj drainage adj rate)	US-PGPUB; USPAT	OR	ON	2015/10/09 19:02
S575	202	(US-20030114769-$ or US-20110281528-$ or US-20090153273-$ or US-20050206479-$ or US-20050174197-$ or US-20040037363-$ or US-20090010028-$ or US-20080197710-$ or US-20070276538-$ or US-20070267918-$ or US-20070145830-$ or US-20050288740-$ or US-20050085873-$ or US-20020105343-$ or US-20020032471-$ or US-20050288741-$ or US-20040233043-$ or US-20040032363-$ or US-20040030260-$ or US-20030130708-$ or US-20070142872-$ or US-20060025830-$ or US-20040199212-$ or US-20020097770-$ or US-20090051224-$ or US-20030135971-$).did. or (US-20030124050-$ or US-20030126948-$ or US-20040263307-$ or US-20050007067-$ or US-20030210106-$ or US-20050151511-$ or US-20040189246-$ or US-20020089305-$ or US-20110285214-$ or US-20110101790-$ or US-20100066176-$ or US-20100036773-$ or US-20100007307-$ or US-20090174263-$ or US-20060071632-$ or US-20100289449-$ or US-20080001572-$ or US-20060012371-$ or US-20050258966-$ or US-20040000974-$ or US-20040134985-$ or US-20080218314-$ or US-20070241762-$ or US-20030137446-$ or US-20020130778-$ or US-20050237198-$ or US-20050104790-$).did. or (US-20050275629-$ or US-20040196262-$	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2015/10/09 19:49

		or US-20040145567-$ or US-20100127660-$ or US-20040130425-$ or US-20120086867-$ or US-20050125093-$ or US-20150048676-$ or US-20150188321-$).did. or (US-6047214-$ or US-6307468-$ or US-6483202-$ or US-7994880-$ or US-4654573-$ or US-5367242-$ or US-6430069-$ or US-6906495-$ or US-7521890-$ or US-7599743-$ or US-6009350-$ or US-5630835-$ or US-7622891-$ or US-5519262-$ or US-6561975-$ or US-4516097-$ or US-5455467-$ or US-7825543-$ or US-7741734-$ or US-6307440-$ or US-6217604-$ or US-5057809-$ or US-6170026-$ or US-7084605-$ or US-6844702-$ or US-6184651-$).did. or (US-5923544-$ or US-4082097-$ or US-7495414-$ or US-5654621-$ or US-5702431-$ or US-5498948-$ or US-5703461-$ or US-5084699-$ or US-4450431-$ or US-4630044-$ or US-5317330-$ or US-5703573-$ or US-8310108-$ or US-6424820-$ or US-4471343-$ or US-5374930-$ or US-5053774-$ or US-5250944-$ or US-5099227-$ or US-4560445-$ or US-5541604-$ or US-5420579-$ or US-5287112-$ or US-6489745-$ or US-4656472-$ or US-7541930-$ or US-7280045-$).did. or (US-6839035-$ or US-4588978-$ or US-2274557-$ or US-5373303-$ or US-5550536-$ or US-5864323-$ or US-5033295-$ or US-7075435-$ or US-6563425-$ or US-6650227-$ or US-7826873-$ or US-7518267-$ or US-6008622-$ or US-3949388-$ or US-6211799-$ or US-4059801-$ or US-7696884-$ or US-7504951-$ or US-5270717-$ or US-2133494-$ or US-8097983-$ or US-6533178-$ or US-9065286-$).did. or (EP-1538558-$ or WO-2004015885-$ or EP-1434160-$ or EP-558316-$ or DE-3824972-$ or EP-549832-$ or DE-3941509-$ or EP-849700-$ or WO-9827561-$).did. or (JP-2002075736-$ or JP-2005026741-$ or JP-2004206383-$ or JP-2004206245-$ or JP-11075329-$ or JP-2008125127-$ or JP-02162222-$ or JP-2004275417-$ or JP-2002345104-$).did. or (JP-11144962-$ or JP-02097005-$ or DE-20016655-$ or DE-10221484-$ or EP-1408456-$ or EP-945829-$ or US-7147604-$ or KR-2004072581-$ or US-20040127248-$ or EP-1071038-$ or EP-1071039-$ or JP-2000270501-$ or JP-11305848-$ or DE-19651719-$ or US-5374930-$ or US-5287112-$ or US-4802080-$ or DE-10152863-$ or DE-10152858-$ or EP-473957-$ or JP-11075329-$ or JP-08126230-$ or US-					

		20050063488-$ or US-5697076-$ or DD-225565-$ or US-20070145830-$).did. or (WO-2007034421-$ or WO-9811505-$ or WO-9811504-$ or US-4275377-$ or US-4180795-$ or FR-2896898-$ or SG-112842-$ or WO-2005055121-$ or WO-0215112-$ or US-20060061324-$ or US-20050275629-$ or US-20040189246-$ or US-20030103039-$ or JP-2001159948-$ or JP-10260781-$ or US-6331744-$ or JP-09182323-$ or DE-102011101478-$ or US-20060176239-$ or US-6803744-$).did.				
S576	21	S575 and (coupling adj coefficient)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/10/09 19:50
S577	1	("20130181541").PN.	US-PGPUB; USPAT	OR	OFF	2015/10/10 13:46
S578	202	(US-20030114769-$ or US-20110281528-$ or US-20090153273-$ or US-20050206479-$ or US-20050174197-$ or US-20040037363-$ or US-20090010028-$ or US-20080197710-$ or US-20070276538-$ or US-20070267918-$ or US-20070145830-$ or US-20050288740-$ or US-20050085873-$ or US-20020105343-$ or US-20020032471-$ or US-20050288741-$ or US-20040233043-$ or US-20040032363-$ or US-20040030260-$ or US-20030130708-$ or US-20070142872-$ or US-20060025830-$ or US-20040199212-$ or US-20020097770-$ or US-20090051224-$ or US-20030135971-$).did. or (US-20030124050-$ or US-20030126948-$ or US-20040263307-$ or US-20050007067-$ or US-20030210106-$ or US-20050151511-$ or US-20040189246-$ or US-20020089305-$ or US-20110285214-$ or US-20110101790-$ or US-20100066176-$ or US-20100036773-$ or US-20100007307-$ or US-20090174263-$ or US-20060071632-$ or US-20100289449-$ or US-20080001572-$ or US-20060012371-$ or US-20050258966-$ or US-20040000974-$ or US-20040134985-$ or US-20080218314-$ or US-20070241762-$ or US-20030137446-$ or US-20020130778-$ or US-20050237198-$ or US-20050104790-$).did. or (US-20050275629-$ or US-20040196262-$ or US-20040145567-$ or US-20100127660-$ or US-20040130425-$	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2015/10/10 14:22

		or US-20120086867-$ or US-20050125093-$ or US-20150048676-$ or US-20150188321-$).did. or (US-6047214-$ or US-6307468-$ or US-6483202-$ or US-7994880-$ or US-4654573-$ or US-5367242-$ or US-6430069-$ or US-6906495-$ or US-7521890-$ or US-7599743-$ or US-6009350-$ or US-5630835-$ or US-7622891-$ or US-5519262-$ or US-6561975-$ or US-4516097-$ or US-5455467-$ or US-7825543-$ or US-7741734-$ or US-6307440-$ or US-6217604-$ or US-5057809-$ or US-6170026-$ or US-7084605-$ or US-6844702-$ or US-6184651-$).did. or (US-5923544-$ or US-4082097-$ or US-7495414-$ or US-5654621-$ or US-5702431-$ or US-5498948-$ or US-5703461-$ or US-5084699-$ or US-4450431-$ or US-4630044-$ or US-5317330-$ or US-5703573-$ or US-8310108-$ or US-6424820-$ or US-4471343-$ or US-5374930-$ or US-5053774-$ or US-5250944-$ or US-5099227-$ or US-4560445-$ or US-5541604-$ or US-5420579-$ or US-5287112-$ or US-6489745-$ or US-4656472-$ or US-7541930-$ or US-7280045-$).did. or (US-6839035-$ or US-4588978-$ or US-2274557-$ or US-5373303-$ or US-5550536-$ or US-5864323-$ or US-5033295-$ or US-7075435-$ or US-6563425-$ or US-6650227-$ or US-7826873-$ or US-7518267-$ or US-6008622-$ or US-3949388-$ or US-6211799-$ or US-4059801-$ or US-7696884-$ or US-7504951-$ or US-5270717-$ or US-2133494-$ or US-8097983-$ or US-6533178-$ or US-9065286-$).did. or (EP-1538558-$ or WO-2004015885-$ or EP-1434160-$ or EP-558316-$ or DE-3824972-$ or EP-549832-$ or DE-3941509-$ or EP-849700-$ or WO-9827561-$).did. or (JP-2002075736-$ or JP-2005026741-$ or JP-2004206383-$ or JP-2004206245-$ or JP-11075329-$ or JP-2008125127-$ or JP-02162222-$ or JP-2004275417-$ or JP-2002345104-$).did. or (JP-11144962-$ or JP-02097005-$ or DE-20016655-$ or DE-10221484-$ or EP-1408456-$ or EP-945829-$ or US-7147604-$ or KR-2004072581-$ or US-20040127248-$ or EP-1071038-$ or EP-1071039-$ or JP-2000270501-$ or JP-11305848-$ or DE-19651719-$ or US-5374930-$ or US-5287112-$ or US-4802080-$ or DE-10152863-$ or DE-10152858-$ or EP-473957-$ or JP-11075329-$ or JP-08126230-$ or US-20050063488-$ or US-5697076-$ or DD-225565-$ or US-20070145830-				

		$).did. or (WO-2007034421-$ or WO-9811505-$ or WO-9811504-$ or US-4275377-$ or US-4180795-$ or FR-2896898-$ or SG-112842-$ or WO-2005055121-$ or WO-0215112-$ or US-20060061324-$ or US-20050275629-$ or US-20040189246-$ or US-20030103039-$ or JP-2001159948-$ or JP-10260781-$ or US-6331744-$ or JP-09182323-$ or DE-102011101478-$ or US-20060176239-$ or US-6803744-$).did.				
S579	21	S578 and Coupling adj coefficient	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/10/10 14:22
S580	1	("20130181541").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2015/10/14 11:34
S581	1	S580 and "coupling coefficient"	US-PGPUB; USPAT	OR	OFF	2015/10/14 11:34
S582	1	S580 and "energy transfer rate"	US-PGPUB; USPAT	OR	OFF	2015/10/14 12:21
S583	1	S580 and "intrinsic loss"	US-PGPUB; USPAT	OR	OFF	2015/10/14 12:31
S584	1	S580 and (intrinsic or loss)	US-PGPUB; USPAT	OR	ON	2015/10/14 12:34
S585	1	("20130181541").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2015/10/14 21:34
S586	1	S585 and (intrinsic)	US-PGPUB; USPAT	OR	ON	2015/10/14 21:34
S587	2	"200611769"	FPRS; DERWENT	OR	OFF	2015/10/14 22:15
S588	19	"2006011769"	FPRS; DERWENT	OR	OFF	2015/10/14 22:16
S589	12	"10295043"	FPRS; JPO; DERWENT	OR	OFF	2015/10/14 22:41
S590	2	nigelpower and repeater	US-PGPUB; USPAT	OR	OFF	2015/10/15 15:45
S591	2	(("8447234") or ("9130602")).PN.	USPAT; USOCR	OR	OFF	2015/10/15 16:03
S592	710	antenna same energy same transfer same rate	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/10/15 16:20
S593	355	quality same factor same loop same antenna	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO;	OR	ON	2015/10/15 17:50

			DERWENT; IBM_TDB			
S594	768	quality same factor same coil same inductive	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/10/15 21:39
S595	4168	(resonance or resonant) same coil same inductive same coupling	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/10/15 22:11
S596	2330	(resonance or resonant) same coil same inductive same coupling same (power or energy)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/10/15 22:11
S597	1434	(resonance or resonant) same coil same inductive same coupling same (power or energy)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/10/15 22:12
S598	1018	(resonance or resonant) same coil same contactless	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/10/15 23:04
S599	0	"1020040072581"	DERWENT	OR	OFF	2015/11/16 06:13
S600	0	lee adj hyungjoo	DERWENT	OR	OFF	2015/11/16 06:15
S601	0	lee near1 hyungjoo	DERWENT	OR	OFF	2015/11/16 06:15
S602	7	lee near1 hyung	DERWENT	OR	OFF	2015/11/16 06:15
S603	1	"20040072581"	DERWENT	OR	OFF	2015/11/16 06:17
S604	3	"2013099583"	DERWENT	OR	OFF	2015/11/16 06:22
S605	0	"201300099583"	DERWENT	OR	OFF	2015/11/16 06:22
S606	1	"20130099583"	DERWENT	OR	OFF	2015/11/16 06:22
S607	1	("20130181541").PN.	US-PGPUB	OR	OFF	2015/11/16 07:17
S608	1	S607 and "coupling coefficient"	US-PGPUB; USPAT	OR	OFF	2015/11/16 07:17
S609	1	("8760007").PN.	USPAT; USOCR	OR	OFF	2015/11/16 10:34
S610	10126	h02j17/00.cpc.	US-PGPUB;	OR	ON	2016/02/27

			USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB			21:08
S611	2691	(320/108).CCLS.	US-PGPUB; USPAT	OR	OFF	2016/02/27 21:18
S612	4011	(307/104).CCLS.	US-PGPUB; USPAT	OR	OFF	2016/02/27 21:18
S613	6310	S611 or S612	US-PGPUB; USPAT	OR	OFF	2016/02/27 21:18
S614	5	(("6028429") or ("20070008140") or ("4441210") or ("4679560") or ("6240318") or ("7058357")).PN.	USPAT; USOCR	OR	OFF	2016/02/27 21:50
S615	6	(("6028429") or ("20070008140") or ("4441210") or ("4679560") or ("6240318") or ("7058357")).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/02/27 21:50
S617	1	("8077485").PN.	USPAT; USOCR	OR	OFF	2016/03/20 20:53
S618	209	(US-20030114769-$ or US-20110281528-$ or US-20090153273-$ or US-20050206479-$ or US-20050174197-$ or US-20040037363-$ or US-20090010028-$ or US-20080197710-$ or US-20070276538-$ or US-20070267918-$ or US-20070145830-$ or US-20050288740-$ or US-20050085873-$ or US-20020105343-$ or US-20020032471-$ or US-20050288741-$ or US-20040233043-$ or US-20040032363-$ or US-20040030260-$ or US-20030130708-$ or US-20070142872-$ or US-20060025830-$ or US-20040199212-$ or US-20020097770-$ or US-20090051224-$ or US-20030135971-$).did. or (US-20030124050-$ or US-20030126948-$ or US-20040263307-$ or US-20050007067-$ or US-20030210106-$ or US-20050151511-$ or US-20040189246-$ or US-20020089305-$ or US-20110285214-$ or US-20110101790-$ or US-20100066176-$ or US-20100036773-$ or US-20100007307-$ or US-20090174263-$ or US-20060071632-$ or US-20100289449-$ or US-20080001572-$ or US-20060012371-$ or US-20050258966-$ or US-20040000974-$ or US-20040134985-$ or US-20080218314-$ or US-20070241762-$ or US-20030137446-$ or US-20020130778-$ or US-20050237198-$ or US-20050104790-$).did. or (US-20050275629-$ or US-20040196262-$ or US-20040145567-$ or US-20100127660-$ or US-20040130425-$ or US-20120086867-$ or US-20050125093-$ or US-20150048676-$ or US-20150188321-$ or US-	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2016/04/01 13:09

		20130181541-$ or US-20080211320-$ or US-20090058189-$ or US-20050245996-$).did. or (US-6047214-$ or US-6307468-$ or US-6483202-$ or US-7994880-$ or US-4654573-$ or US-5367242-$ or US-6430069-$ or US-6906495-$ or US-7521890-$ or US-7599743-$ or US-6009350-$ or US-5630835-$ or US-7622891-$ or US-5519262-$ or US-6561975-$ or US-4516097-$ or US-5455467-$ or US-7825543-$ or US-7741734-$ or US-6307440-$ or US-6217604-$ or US-5057809-$ or US-6170026-$ or US-7084605-$ or US-6844702-$ or US-6184651-$).did. or (US-5923544-$ or US-4082097-$ or US-7495414-$ or US-5654621-$ or US-5702431-$ or US-5498948-$ or US-5703461-$ or US-5084699-$ or US-4450431-$ or US-4630044-$ or US-5317330-$ or US-5703573-$ or US-8310108-$ or US-6424820-$ or US-4471343-$ or US-5374930-$ or US-5053774-$ or US-5250944-$ or US-5099227-$ or US-4560445-$ or US-5541604-$ or US-5420579-$ or US-5287112-$ or US-6489745-$ or US-4656472-$ or US-7541930-$ or US-7280045-$).did. or (US-6839035-$ or US-4588978-$ or US-2274557-$ or US-5373303-$ or US-5550536-$ or US-5864323-$ or US-5033295-$ or US-7075435-$ or US-6563425-$ or US-6650227-$ or US-7826873-$ or US-7518267-$ or US-6008622-$ or US-3949388-$ or US-6211799-$ or US-4059801-$ or US-7696884-$ or US-7504951-$ or US-5270717-$ or US-2133494-$ or US-8097983-$ or US-6533178-$ or US-9065286-$ or US-6240318-$).did. or (US-2724091-$).did. or (WO-2006011769-$).did. or (EP-1538558-$ or WO-2004015885-$ or EP-1434160-$ or EP-558316-$ or DE-3824972-$ or EP-549832-$ or DE-3941509-$ or EP-849700-$ or WO-9827561-$).did. or (JP-2002075736-$ or JP-2005026741-$ or JP-2004206383-$ or JP-2004206245-$ or JP-11075329-$ or JP-2008125127-$ or JP-02162222-$ or JP-2004275417-$ or JP-2002345104-$).did. or (JP-11144962-$ or JP-02097005-$ or DE-20016655-$ or DE-10221484-$ or EP-1408456-$ or EP-945829-$ or US-7147604-$ or KR-2004072581-$ or US-20040127248-$ or EP-1071038-$ or EP-1071039-$ or JP-2000270501-$ or JP-11305848-$ or DE-19651719-$ or US-5374930-$ or US-5287112-$ or US-4802080-$ or DE-10152863-$ or DE-10152858-$ or EP-473957-$ or JP-11075329-$ or JP-08126230-$ or US-20050063488-$ or				

		US-5697076-$ or DD-225565-$ or US-20070145830-$).did. or (WO-2007034421-$ or WO-9811505-$ or WO-9811504-$ or US-4275377-$ or US-4180795-$ or FR-2896898-$ or SG-112842-$ or WO-2005055121-$ or WO-0215112-$ or US-20060061324-$ or US-20050275629-$ or US-20040189246-$ or US-20030103039-$ or JP-2001159948-$ or JP-10260781-$ or US-6331744-$ or JP-09182323-$ or DE-102011101478-$ or US-20060176239-$ or US-6803744-$).did.				
S619	22	S618 and (repeater or repeating or extender)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/04/01 13:10
S620	980	h02j50/00-90.cpc.	US-PGPUB; USPAT	OR	OFF	2016/07/25 05:19
S621	2502	h02j50/00-90.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/07/25 05:19
S622	10920	h02j17/00.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/07/25 05:19
S623	11984	S621 or S622	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/07/25 05:20
S624	1064	S621 not S622	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/07/25 05:20
S625	4967	(307/104).CCLS.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/07/25 05:25
S626	2914	(320/108).CCLS.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/07/25 05:25
S627	4336	(307/104).CCLS.	US-PGPUB; USPAT	OR	OFF	2016/07/25 05:25
S628	2907	(320/108).CCLS.	US-PGPUB;	OR	OFF	2016/07/25

			USPAT			05:25
S629	1	("6101300").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/07/25 05:58
S631	1	("9065286").PN.	USPAT; USOCR	OR	OFF	2016/07/28 09:30
S632	80	(intrinsic adj loss adj rate)	USPAT	OR	ON	2016/07/28 09:32
S633	29	(intrinsic adj loss adj rate).clm.	USPAT	OR	ON	2016/07/28 09:32
S634	1	S631 and intrinsic	USPAT	OR	OFF	2016/07/28 10:09
S635	1	("20150188321").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/07/28 13:35
S636	1	S635 and vehicle	US-PGPUB; USPAT	OR	OFF	2016/07/28 14:35
S637	1	S635 and vehicle	US-PGPUB; USPAT	OR	ON	2016/07/28 15:01
S638	1	S635 and intrinsic	US-PGPUB; USPAT	OR	ON	2016/07/28 15:46
S639	10	"102006027824"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/08/11 13:18

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L5	0	((resonator or resonant or resonance) same intrinsic same loss same characterstic same distance).clm.	US-PGPUB; USPAT	OR	ON	2016/08/21 22:49
L6	7	((resonator or resonant or resonance) same intrinsic same loss same characteristic same distance).clm.	US-PGPUB; USPAT	OR	ON	2016/08/21 22:50
S150	0	((resonator or resonant or resonance) same intrinsic same loss same characterstic same size).clm.	US-PGPUB; USPAT	OR	ON	2012/09/10 11:55
S151	0	((resonator or resonant or resonance) and intrinsic and loss and characterstic and size).clm.	US-PGPUB; USPAT	OR	ON	2012/09/10 11:56
S152	15	((resonator or resonant or resonance) and intrinsic and loss and characterstic and size)	US-PGPUB; USPAT	OR	ON	2012/09/10 11:57
S153	0	((resonator or resonant or resonance) same characterstic same size).clm.	US-PGPUB; USPAT	OR	ON	2012/09/10 11:59
S154	147	((resonator or resonant or resonance) same characteristic same size).clm.	US-PGPUB; USPAT	OR	ON	2012/09/10 12:03
S156	10	(resonator same (resonance or resonant) same frequency same intrinsic same loss same transfer same rate).clm.	US-PGPUB; USPAT	OR	ON	2012/09/10 13:42

S158	1	(resonator same (resonance or resonant) same frequency same intrinsic same loss same "near" same field same q same factor).clm.	US-PGPUB; USPAT	OR	ON	2012/09/10 14:50
S182	10	(resonator same (resonance or resonant) same frequency same intrinsic same loss same transfer same rate).clm.	US-PGPUB; USPAT	OR	ON	2012/09/21 20:55
S218	1	(resonator same (resonance or resonant) same frequency same intrinsic same loss same high same (q or quality)).clm.	US-PGPUB; USPAT	OR	ON	2012/12/10 23:01
S506	4	(resonator same (resonance or resonant) same frequency same intrinsic same loss same high same (q or quality)).clm.	US-PGPUB; USPAT	OR	ON	2014/05/05 06:27
S532	9	(resonator same (resonance or resonant) same frequency same intrinsic same loss same high same (q or quality)).clm.	US-PGPUB; USPAT	OR	ON	2015/04/08 19:46
S533	0	(307/104).CCLS.		OR	OFF	2015/04/08 19:46
S534	1	(320/108).CCLS.		OR	OFF	2015/04/08 19:46
S616	37	(resonator same (resonance or resonant) same frequency same intrinsic same loss same transfer same rate).clm.	US-PGPUB; USPAT	OR	ON	2016/02/27 21:07
S630	37	(resonator same (resonance or resonant) same frequency same intrinsic same loss same transfer same rate).clm.	US-PGPUB; USPAT	OR	ON	2016/07/25 05:24

8/21/2016 10:51:15 PM
C:\Users\ffleming\Documents\EAST\Workspaces\2836\FY2012\mit wireless power.wsp

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
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BIB DATA SHEET

CONFIRMATION NO. 4131

SERIAL NUMBER	FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
13/789,860	03/08/2013 RULE	307	2836	01997-0358008

APPLICANTS

MASSACHUSETTS INSTITUTE OF TECHNOLOGY, Cambridge, MA

INVENTORS

Aristeidis Karalis, Boston, MA;
Andre B. Kurs, Chestnut Hill, MA;
Robert Moffatt, Reston, VA;
John D. Joannopoulos, Belmont, MA;
Peter H. Fisher, Cambridge, MA;
Marin Soljacic, Belmont, MA;

**** CONTINUING DATA ***************************

This application is a CON of 13/477,459 05/22/2012
which is a CON of 13/036,177 02/28/2011 ABN
which is a CON of 12/437,641 05/08/2009 PAT 8097983 *
which is a CON of 12/055,963 03/26/2008 PAT 7825543 *
which is a CIP of 11/481,077 07/05/2006 PAT 7741734 *
which claims benefit of 60/698,442 07/12/2005
and said 12/055,963 03/26/2008
claims benefit of 60/908,383 03/27/2007
and claims benefit of 60/908,666 03/28/2007
and is a CIP of PCT/US2007/070892 06/11/2007
(*)Data provided by applicant is not consistent with PTO records.

**** FOREIGN APPLICATIONS ***************************

**** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ****

04/01/2013

Foreign Priority claimed ☐ Yes ☑ No 35 USC 119(a-d) conditions met ☐ Yes ☑ No Verified and Acknowledged /FRITZ M FLEMING/ Examiner's Signature	☐ Met after Allowance Initials	STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
		MA	14	18	10

ADDRESS

FISH & RICHARDSON P.C. (BO)
P.O. BOX 1022
MINNEAPOLIS, MN 55440-1022
UNITED STATES

TITLE

WIRELESS ENERGY TRANSFER

FILING FEE RECEIVED	FEES: Authority has been given in Paper No._____ to charge/credit DEPOSIT ACCOUNT	☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time)

BIB (Rev. 05/07).

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13789860	KARALIS ET AL.
	Examiner	Art Unit
	FRITZ M FLEMING	2836

CPC- SEARCHED		
Symbol	Date	Examiner
H02J17/00	3/9/2015	FMF
H02J50/12	5/16/2016	FMF

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
307	104	3/9/2015	FMF
320	108	3/9/2015	FMF

SEARCH NOTES		
Search Notes	Date	Examiner
East search notes	3/9/2015	FMF
updated searches.	11/15/2015	FMF
updated searches.	5/16/2016	FMF
updated searches.	8/21/2016	FMF

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner
	Interference search in USPAT and PGPUBs as indicated.	5/16/2016	FMF
	updated search.	8/21/2016	FMF

	/FRITZ M FLEMING/ Primary Examiner.Art Unit 2836

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13789860	KARALIS ET AL.
	Examiner	Art Unit
	FRITZ M FLEMING	2836

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☒ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	03/09/2015	11/16/2015	08/21/2016						
1	1	✓	✓	=						
2	2	✓	✓	=						
-	3	✓	-	-						
-	4	✓	-	-						
-	5	✓	-	-						
-	6	✓	-	-						
-	7	✓	-	-						
-	8	✓	-	-						
-	9	✓	-	-						
-	10	✓	-	-						
-	11	✓	-	-						
-	12	✓	-	-						
-	13	✓	-	-						
-	14	✓	-	-						
-	15	✓	-	-						
-	16	✓	-	-						
-	17	✓	-	-						
-	18	✓	-	-						
3	19		✓	=						
4	20		✓	=						
5	21		✓	=						
6	22		✓	=						
8	23		✓	=						
9	24		✓	=						
10	25		✓	=						
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15	28		✓	=						
13	29		✓	=						
17	30		✓	=						
18	31		✓	=						
19	32		✓	=						
20	33		✓	=						
21	34		✓	=						
22	35		✓	=						
23	36			=						

InductEV, Inc.
Exhibit 1031
Page 1631

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13789860	KARALIS ET AL.
	Examiner	**Art Unit**
	FRITZ M FLEMING	2836

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☒ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	03/09/2015	11/16/2015	08/21/2016						
11	37			=						
7	38			=						
16	39			=						

InductEV, Inc.
Exhibit 1031
Page 1632

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor	:	Aristeidis Karalis	Art Unit	:	2836
Serial No.	:	13/789,860	Examiner	:	Fritz M. Fleming
Filed	:	March 8, 2013	Confirmation No.	:	4131
			Notice of Allowance Date: August 26, 2016		
Title	:	WIRELESS ENERGY TRANSFER			

MAIL STOP ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

REPLY TO NOTICE OF ALLOWANCE

In response to the Notice of Allowance dated August 26, 2016, enclosed is a completed Part B - Fee(s) Transmittal.

No fees are believed to be due at this time. The issue fee in the amount of $960 was previously paid on June 2, 2016. Please apply any other necessary charges or credits to Deposit Account 06 1050, referencing the above attorney docket number.

COMMENTS ON EXAMINER'S REASONS FOR ALLOWANCE

It is recognized that in accordance with M.P.E.P. § 1302.14, the Examiner's reasons for allowance need not set forth all of the details as to why the claims are allowed. In the above-referenced application, it is not conceded that the Examiner's stated reasons for allowance are correct or the only reasons for which the claims are allowable. For example, the Examiner's reasons for allowance indicate that particular claim elements are not disclosed or suggested by the prior art of record, yet the claims may be patentable for other reasons as well, including the inventive combination of all of the recited claim elements. It is not conceded that the specific limitations identified by the Examiner are necessary to distinguish the art of record or to satisfy the requirements of 35 U.S.C. § 112. Moreover, the Examiner does not assert, and it would not be conceded, that the Examiner's reasons have any bearing on the patentability of claims in any other applications directed to the disclosed subject matter.

In addition, each dependent claim stands on its own and may be allowable on its own merits. In particular, each dependent claim may be allowable on the basis of a combination of some of the features recited in the dependent claim and its base claim(s), which combination of features may not include all of the limitations identified in the Examiner's reasons for allowance.

Respectfully submitted,

Date: August 26, 2016

/Marc M. Wefers Reg. No. 56,842/

Marc M Wefers
Reg. No. 56,842

Customer Number 26161
Fish & Richardson P.C.
Telephone: (617) 542-5070
Facsimile: (877) 769-7945

23560267.doc

InductEV, Inc.
Exhibit 1031
Page 1634

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

26161 7590 08/26/2016

FISH & RICHARDSON P.C.
P.O. BOX 1022
MINNEAPOLIS, MN 55440-1022

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/789,860	03/08/2013	Aristeidis Karalis	01997-0358008	4131

TITLE OF INVENTION: WIRELESS ENERGY TRANSFER

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	LARGE	$960	$0	$960	$960	11/26/2016

EXAMINER	ART UNIT	CLASS-SUBCLASS
FLEMING, FRITZ M.	2836	307-104000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

[ ] Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

[ ] "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) the names of up to 3 registered patent attorneys or agents OR, alternatively,

(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 Fish & Richardson P.C.
2
3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE: Massachusetts Institute of Technology

(B) RESIDENCE: (CITY and STATE OR COUNTRY): Cambridge, MA

Please check the appropriate assignee category or categories (will not be printed on the patent): **[**] Individual [X] Corporation or other private group entity [ ] Government

4a. The following fee(s) are submitted:

[X] Issue Fee

[ ] Publication Fee (No small entity discount permitted)

[ ] Advance Order - # of Copies _____

4b. Payment of Fee(s): (**Please first reapply any previously paid issue fee shown above**)

[ ] A check in the amount of the fee(s) is enclosed.

[ ] Payment by credit card. Form PTO-2038 is attached.

[X] The Director is hereby authorized to charge the required fee(s), or credit any overpayment, to Deposit Account Number 06-1050

5. **Change in Entity Status** (from status indicated above)

[ ] Applicant certifying micro entity status. See 37 CFR 1.29 — **NOTE**: Absent a valid certification of Micro Entity Status (see form PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

[ ] Applicant asserting small entity status. See 37 CFR 1.27. — **NOTE**: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

[ ] Applicant changing to regular undiscounted fee status. — **NOTE**: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

The Director of the USPTO is requested to apply the Issue Fee and Publication Fee (if any) or to re-apply any previously paid issue fee to the application identified above.
NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature /Marc M. Wefers Reg. No. 56,842/ Date August 26, 2016

Typed or printed name Marc M. Wefers Registration No. 56,842

23560276.doc

Electronic Acknowledgement Receipt

EFS ID:	26758354
Application Number:	13789860
International Application Number:	
Confirmation Number:	4131
Title of Invention:	WIRELESS ENERGY TRANSFER
First Named Inventor/Applicant Name:	Aristeidis Karalis
Customer Number:	26161
Filer:	Marc M. Wefers/doreen curseaden
Filer Authorized By:	Marc M. Wefers
Attorney Docket Number:	01997-0358008
Receipt Date:	26-AUG-2016
Filing Date:	08-MAR-2013
Time Stamp:	12:56:55
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	ReplytoNOA.pdf	158086 082126fd2113d732385216f9a70abdff8e7a59a9	no	3

Warnings:

Information:	
Total Files Size (in bytes):	158086

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IFW

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

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26161 7590 08/26/2016

FISH & RICHARDSON P.C.
P.O. BOX 1022
MINNEAPOLIS, MN 55440-1022

08/29/2016 CCHAU2 00012228 061050 13789860

01 FC:1501 960.00 DA

OPAP AUG 26 2016 PATENT & TRADEMARK OFFICE

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Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)

(Signature)

(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/789,860	03/08/2013	Aristeidis Karalis	01997-0358008	4131

TITLE OF INVENTION: WIRELESS ENERGY TRANSFER

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	LARGE	$960	$0	$960	$960	11/26/2016

EXAMINER	ART UNIT	CLASS-SUBCLASS
FLEMING, FRITZ M.	2836	307-104000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

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1 Fish & Richardson P.C.
2
3

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(B) RESIDENCE: (CITY and STATE OR COUNTRY): Cambridge, MA

Please check the appropriate assignee category or categories (will not be printed on the patent): [ ] Individual [X] Corporation or other private group entity [ ] Government

4a. The following fee(s) are submitted:

[X] Issue Fee

[ ] Publication Fee (No small entity discount permitted)

[ ] Advance Order - # of Copies _____

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[ ] Payment by credit card. Form PTO-2038 is attached.

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[ ] Applicant certifying micro entity status. See 37 CFR 1.29 — **NOTE**: Absent a valid certification of Micro Entity Status (see form PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

[ ] Applicant asserting small entity status. See 37 CFR 1.27. — **NOTE**: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

[ ] Applicant changing to regular undiscounted fee status. — **NOTE**: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

The Director of the USPTO is requested to apply the Issue Fee and Publication Fee (if any) or to re-apply any previously paid issue fee to the application identified above.
NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature /Marc M. Wefers Reg. No. 56,842/ Date August 26, 2016

Typed or printed name Marc M. Wefers Registration No. 56,842

23560276.doc

Adjustment date: 08/29/2016 CCHAU2
06/02/2016 INTEFSW 00012228 061050 13789860
01 FC:1501 960.00 CR

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/789,860	03/08/2013	Aristeidis Karalis	01997-0358008	4131

26161 7590 09/14/2016
FISH & RICHARDSON P.C. (BO)
P.O. BOX 1022
MINNEAPOLIS, MN 55440-1022

EXAMINER	
FLEMING, FRITZ M	

ART UNIT	PAPER NUMBER
2836	

NOTIFICATION DATE	DELIVERY MODE
09/14/2016	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PATDOCTC@fr.com

UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

Application No. : 13789860
Applicant : Karalis
Filing Date : 03/08/2013
Date Mailed : 9-14-16

NOTICE TO FILE CORRECTED APPLICATION PAPERS

Notice of Allowance Mailed

This application has been accorded an Allowance Date and is being prepared for issuance. The application, however, is incomplete for the reason below.

Applicant is given two (2) months from the mail date of this Notice within which to respond. This time period for reply is extendable under 37 CFR 1.136(a) for only TWO additional MONTHS.

The application is not in compliance with 37 CFR 1.46(c), as indicated in the attachment. The request under § 1.46(c)(1) to correct or update the name of the applicant or the request under § 1.46(c)(2) to change the applicant was improper and was mistakenly accepted by the Office.

If applicant fails to respond within the above-identified time period and in accordance with the attachment, the Office record will be changed to show the applicant information that was established prior to the filing of the request under § 1.46(c), a corrected application filing receipt showing the previously established applicant information will be sent to the applicant, and the previously established applicant information will be printed on the patent.

A copy of this notice MUST be returned with the reply. Please address response to "Mail Stop Issue Fee, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450".

/Patricia Pacenski/
Publication Branch
Office of Data Management
(571) 272-4200

Application No. 13789860

APPLICATION FILED ON OR AFTER SEPTEMBER 16, 2012, NOT IN COMPLIANCE WITH 37 CFR 1.46(c)

The § 1.46(c) request identified below was improper for the reason(s) indicated below and was mistakenly accepted by the Office. The corrected/updated applicant name or the change of applicant was mistakenly printed on the application filing receipt dated 04/30/2013.

The request filed 04/11/2013 under § 1.46(c)(1) to **correct or update the name of the applicant** or under § 1.46(c)(2) to **change the applicant** was improper for the reason(s) indicated below:

☐ No application data sheet under § 1.76 specifying the correct or updated name of the applicant in the applicant information section in accordance with § 1.76(c)(2) was filed.

☒ An application data sheet was filed but it did not comply with § 1.76(c)(2) in that underlining was not used for insertions and/or strike-through or brackets was not used for text removed.

☐ An application data sheet was filed but it was not signed.

☐ An application data sheet was filed and signed but it was not signed in accordance with §1.76(e) and §1.33(b).

☐ Other: _____

The request filed _____ under § 1.46(c)(2) to **change the applicant** was improper for the reason(s) indicated below:

☐ No statement under §3.73(c) was filed.

☐ A statement under § 3.73(c) was filed but it did not identify the assignee as required by § 3.73(c)(1).

☐ A statement under § 3.73(c) was filed but it neither provided documentary evidence of chain of title in accordance with § 3.73(c)(1)(i) nor provided a statement specifying the location (reel and frame number) in the Office's assignment records of such documentary evidence of chain of title.

☐ A statement under § 3.73(c) was filed but it did not include the statement as required by § 3.73(d)(1).

☐ A statement under § 3.73(c) was filed but it was not signed.

☐ A statement under § 3.73(c) was filed and signed but it was not signed in accordance with § 3.73(d)(2) or (d)(3)

☐ Other: _____

A timely response to this notice must include a compliant application data sheet and/or a compliant § 3.73(c) statement, and should also include a transmittal letter requesting that the Office continue to recognize the applicant information as printed on the above-identified application filing receipt and that the Office print the patent accordingly.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor	:	Aristeidis Karalis	Art Unit	:	2836
Serial No.	:	13/789,860	Examiner	:	Fritz M. Fleming
Filed	:	March 8, 2013	Conf. No.	:	4131
Title	:	WIRELESS ENERGY TRANSFER			

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

REQUEST TO CHANGE APPLICANT UNDER 37 CFR § 1.46(c)

Please change the applicant for the above-referenced application. Enclosed are an Application Data Sheet in accordance with 37 CFR § 1.76 that specifies the name(s) of the new applicant in the applicant information section and a Statement under 37 CFR § 3.73(c).

Please apply any charges or credits to Deposit Account No. 06-1050, referencing the above attorney docket number.

Respectfully submitted,

Date: September 29, 2016

/Marc M. Wefers Reg. No. 56,842/
Marc M. Wefers
Reg. No. 56,842

Customer Number 26161
Fish & Richardson P.C.
Telephone: (617) 542-5070
Facsimile: (877) 769-7945

23571290.doc

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	01997-0358008
	Application Number	13/789,860
Title of Invention	WIRELESS ENERGY TRANSFER	

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.

Secrecy Order 37 CFR 5.2

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Applicant 1

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

☒ Assignee	☐ Legal Representative under 35 U.S.C. 117	☐ Joint Inventor
☐ Person to whom the inventor is obligated to assign.	☐ Person who shows sufficient proprietary interest	

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor :

If the Applicant is an Organization check here. ☒

Organization Name Massachusetts Institute of Technology

Prefix	Given Name	Middle Name	Family Name	Suffix

Mailing Address Information:

Address 1	77 Massachusetts Avenue		
Address 2			
City	Cambridge	State/Province	MA
Country	United States	Postal Code	02142
Phone Number		Fax Number	
Email Address			

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	01997-0358008
	Application Number	13/789,860
Title of Invention	WIRELESS ENERGY TRANSFER	

Signature:

A signature of the applicant or representative is required in accordance with 37 CFR 1.33 and 10.18. Please see 37 CFR 1.4(d) for the form of the signature.					
Signature	/Marc M. Wefers Reg. No. 56,842/			Date (**MM/DD/YYYY**)	9/28/2016
First Name	Marc	Last Name	Wefers	Registration Number	56,842

23571251.doc

PTO/AIA/96 (08-12)
Approved for use through 01/31/2013. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

STATEMENT UNDER 37 CFR 3.73(c)

Applicant/Patent Owner: Massachusetts Institute of Technology

Application No./Patent No.: 13/789,860 Filed/Issue Date: March 8, 2013

Titled: WIRELESS ENERGY TRANSFER

Massachusetts Institute of Technology, a university
(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that, for the patent application/patent identified above, it is (choose **one** of the option 1, 2, 3 or 4 below):

1. ☒ The assignee of the entire right, title, and interest.

2. ☐ An assignee of less than the entire right, title and interest (check applicable box):

☐ The extent (by percentage) of its ownership interest is _____. Additional Statement(s) by the owners holding the balance of the interest must be submitted to account for 100% of the ownership interest.

☐ There are unspecified percentages of ownership. The other parties, including inventors, who together own the entire right, title and interest are:

Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

3. ☐ The assignee of an undivided interest in the entirety (a complete assignment from one of the joint inventors was made). The other parties, including inventors, who together own the entire right, title, and interest are:

Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

4. ☐ The recipient, via a court proceeding or the like (e.g., bankruptcy, probate), of an undivided interest in the entirety (a complete transfer of ownership interest was made). The certified document(s) showing the transfer is attached.

The interest identified in option 1, 2 or 3 above (not option 4) is evidenced by either (choose **one** of the options A or B below):

A. ☒ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel 029949, Frame 0562, or for which a copy thereof is attached.

B. ☐ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: _____ To: _____
The document was recorded in the United States Patent and Trademark Office at
Reel _____, Frame _____, or for which a copy thereof is attached.

2. From: _____ To: _____
The document was recorded in the United States Patent and Trademark Office at
Reel _____, Frame _____, or for which a copy thereof is attached.

This collection of information is required by 37 CFR 3.73(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

American LegalNet, Inc.
www.FormsWorkFlow.com

Approved for use through 01/31/2013. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

STATEMENT UNDER 37 CFR 3.73(c)

3. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

4. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

5. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

6. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

☐ Additional documents in the chain of title are listed on a supplemental sheet(s).

☒ As required by 37 CFR 3.73(c)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy *(i.e.,* a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

/Marc M. Wefers Reg. No. 56,842/	September 29, 2016
Signature	Date
Marc M. Wefers	56,842
Printed or Typed Name	Title or Registration Number

American LegalNet, Inc.
www.FormsWorkFlow.com

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor	:	Aristeidis Karalis	Art Unit	:	2836
Serial No.	:	13/789,860	Examiner	:	Fritz M. Fleming
Filed	:	March 8, 2013	Conf. No.	:	4131
Title	:	WIRELESS ENERGY TRANSFER			

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

REPLY TO NOTICE TO FILE CORRECTED APPLICATION PAPERS DATED SEPTEMBER 14, 2016

The applicant as a large entity submits:

☒ Supplemental Application Data Sheet

The applicant understands that this perfects the application and no additional papers or filing fees are required.

Please apply any necessary charges or credits to Deposit Account 06-1050, referencing the above attorney docket number.

Respectfully submitted,

Date: September 29, 2016

/Marc M. Wefers Reg. No. 56,842/
Marc M. Wefers
Reg. No. 56,842

Customer Number 26161
Fish & Richardson P.C.
Telephone: (617) 542-5070
Facsimile: (877) 769-7945

23571293.doc

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/789,860	03/08/2013	Aristeidis Karalis	01997-0358008	4131

26161 7590 09/14/2016
FISH & RICHARDSON P.C. (BO)
P.O. BOX 1022
MINNEAPOLIS, MN 55440-1022

EXAMINER	
FLEMING, FRITZ M	

ART UNIT	PAPER NUMBER
2836	

NOTIFICATION DATE	DELIVERY MODE
09/14/2016	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PATDOCTC@fr.com

UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

Application No. : 13789860
Applicant : Karalis
Filing Date : 03/08/2013
Date Mailed : 9-14-16

NOTICE TO FILE CORRECTED APPLICATION PAPERS

Notice of Allowance Mailed

This application has been accorded an Allowance Date and is being prepared for issuance. The application, however, is incomplete for the reason below.

Applicant is given two (2) months from the mail date of this Notice within which to respond. This time period for reply is extendable under 37 CFR 1.136(a) for only TWO additional MONTHS.

The application is not in compliance with 37 CFR 1.46(c), as indicated in the attachment. The request under § 1.46(c)(1) to correct or update the name of the applicant or the request under § 1.46(c)(2) to change the applicant was improper and was mistakenly accepted by the Office.

If applicant fails to respond within the above-identified time period and in accordance with the attachment, the Office record will be changed to show the applicant information that was established prior to the filing of the request under § 1.46(c), a corrected application filing receipt showing the previously established applicant information will be sent to the applicant, and the previously established applicant information will be printed on the patent.

A copy of this notice MUST be returned with the reply. Please address response to "Mail Stop Issue Fee, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450".

/Patricia Pacenski/
Publication Branch
Office of Data Management
(571) 272-4200

Application No. 13789860

APPLICATION FILED ON OR AFTER SEPTEMBER 16, 2012, NOT IN COMPLIANCE WITH 37 CFR 1.46(c)

The § 1.46(c) request identified below was improper for the reason(s) indicated below and was mistakenly accepted by the Office. The corrected/updated applicant name or the change of applicant was mistakenly printed on the application filing receipt dated 04/30/2013.

The request filed 04/11/2013 under § 1.46(c)(1) to **correct or update the name of the applicant** or under § 1.46(c)(2) to **change the applicant** was improper for the reason(s) indicated below:

☐ No application data sheet under § 1.76 specifying the correct or updated name of the applicant in the applicant information section in accordance with § 1.76(c)(2) was filed.

☒ An application data sheet was filed but it did not comply with § 1.76(c)(2) in that underlining was not used for insertions and/or strike-through or brackets was not used for text removed.

☐ An application data sheet was filed but it was not signed.

☐ An application data sheet was filed and signed but it was not signed in accordance with §1.76(e) and §1.33(b).

☐ Other: _____

The request filed _____ under § 1.46(c)(2) to **change the applicant** was improper for the reason(s) indicated below:

☐ No statement under §3.73(c) was filed.

☐ A statement under § 3.73(c) was filed but it did not identify the assignee as required by § 3.73(c)(1).

☐ A statement under § 3.73(c) was filed but it neither provided documentary evidence of chain of title in accordance with § 3.73(c)(1)(i) nor provided a statement specifying the location (reel and frame number) in the Office's assignment records of such documentary evidence of chain of title.

☐ A statement under § 3.73(c) was filed but it did not include the statement as required by § 3.73(d)(1).

☐ A statement under § 3.73(c) was filed but it was not signed.

☐ A statement under § 3.73(c) was filed and signed but it was not signed in accordance with § 3.73(d)(2) or (d)(3)

☐ Other: _____

A timely response to this notice must include a compliant application data sheet and/or a compliant § 3.73(c) statement, and should also include a transmittal letter requesting that the Office continue to recognize the applicant information as printed on the above-identified application filing receipt and that the Office print the patent accordingly.

Electronic Acknowledgement Receipt

EFS ID:	27068809
Application Number:	13789860
International Application Number:	
Confirmation Number:	4131
Title of Invention:	WIRELESS ENERGY TRANSFER
First Named Inventor/Applicant Name:	Aristeidis Karalis
Customer Number:	26161
Filer:	Marc M. Wefers/Cheryl Forrest
Filer Authorized By:	Marc M. Wefers
Attorney Docket Number:	01997-0358008
Receipt Date:	29-SEP-2016
Filing Date:	08-MAR-2013
Time Stamp:	10:59:26
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Post Allowance Communication - Incoming	RequesttoChangeApp.pdf	43571 49963767660516c2a2e24dea4f0a5239dafa83fc	no	1

Warnings:

Information:					
2	Application Data Sheet	SuppADS.pdf	73201 e11d6f3b9c3ed84c2f5dcaf2a3163dc956b86803	no	2
Warnings:					
Information:					
This is not an USPTO supplied ADS fillable form					
3	Assignee showing of ownership per 37 CFR 3.73	373c.pdf	109097 853f3e344fed972504f8a779c7246d2a09b9f217	no	2
Warnings:					
Information:					
4	Post Allowance Communication - Incoming	Response.pdf	155120 901f5f03a37104d58024b61192e6ceec5d1d1dbb	no	4
Warnings:					
Information:					
		Total Files Size (in bytes):	380989		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/789,860	11/01/2016	9484750	01997-0358008	4131

26161 7590 10/12/2016

FISH & RICHARDSON P.C. (BO)
P.O. BOX 1022
MINNEAPOLIS, MN 55440-1022

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment is 140 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site http://pair.uspto.gov for additional applicants):

Aristeidis Karalis, Boston, MA;
Andre B. Kurs, Chestnut Hill, MA;
Robert Moffatt, Reston, VA;
John D. Joannopoulos, Belmont, MA;
Peter H. Fisher, Cambridge, MA;
Marin Soljacic, Belmont, MA;
MASSACHUSETTS INSTITUTE OF TECHNOLOGY, Cambridge, MA

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The USA offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to encourage and facilitate business investment. To learn more about why the USA is the best country in the world to develop technology, manufacture products, and grow your business, visit SelectUSA.gov.

Substitute Disclosure Form (37 CFR §1.98(b))	U.S. Department of Commerce Patent and Trademark Office	Attorney Docket No. 01997-0358008	Application No. 13/789,860
Information Disclosure Statement by Applicant (Use several sheets if necessary)		Applicant Massachusetts Institute of Technology	
		Filing Date March 8, 2013	Group Art Unit 2836

U.S. Patent Documents							
Examiner Initial	Desig. ID	Document Number	Publication Date	Patentee	Class	Subclass	Filing Date If Appropriate
	1.						

Foreign Patent Documents or Published Foreign Patent Applications								
Examiner Initial	Desig. ID	Document Number	Publication Date	Country or Patent Office	Class	Subclass	Translation	
							Yes	No
	2.							

Other Documents (include Author, Title, Date, and Place of Publication)		
Examiner Initial	Desig. ID	Document
	3.	Copy of Decision to Refuse a European Patent Application for European Application No. EP 11 184 066.6 by Chairman Alan Davis dated September 30, 2016 (38 pags)
	4.	Copy of Decision to Refuse a European Patent Application for European Application No. EP 06 786 588.1 by Chairman Alan Davis dated September 30, 2016 (71 pages)

Examiner Signature	Date Considered

EXAMINER: Initials citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Substitute Disclosure Form

PTO/SB/30 (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Request for Continued Examination (RCE) Transmittal

Address to:
Mail Stop RCE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Application Number	13/789,860
Filing Date	March 8, 2013
First Named Inventor	Aristeidis Karalis
Art Unit	2836
Examiner Name	Fritz M. Fleming
Attorney Docket Number	01997-0358008

This is a Request for Continued Examination (RCE) under 37 CFR 1 .114 of the above-identified application.
Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, or to any design application. See Instruction Sheet for RCEs (not to be submitted to the USPTO) on page 2.

1. Submission required under 37 CFR 1.114 Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).

   a. ☐ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.

      i. ☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____

      ii. ☐ Other _____

   b. ☒ Enclosed

      i. ☐ Amendment/Reply

      ii. ☐ Affidavit(s)/ Declaration(s)

      iii. ☒ Information Disclosure Statement (IDS)

      iv. ☐ Other _____

2. Miscellaneous

   Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a

   a. ☐ period of _____ months. (Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)

   b. ☐ Other _____

3. Fees The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.
   The Director is hereby authorized to charge the following fees any underpayment of fees or credit any overpayments to

   a. ☒ Deposit Account No. 06-1050 .

      i. ☒ RCE fee required under 37 CFR 1.17(e)

      ii ☐ Extension of time fee (37 CFR 1.136 and 1.17)

      iii ☒ Other any deficiencies

   b. ☐ Check in the amount of $ _____ enclosed

   c. ☐ Payment by credit card (Form PTO-2038 enclosed)

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

Signature	/Marc M. Wefers Reg. No. 56,842/	Date	October 21, 2016
Name (Print/Type)	Marc M. Wefers	Registration No.	56,842

CERTIFICATE OF MAILING OR TRANSMISSION

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Mail Stop RCE, Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450 or facsimile transmitted to the U.S. Patent and Trademark Office on the date shown below.

Signature			
Name (Print/Type)		Date	

This collection of information is required by 37 CFR 1.114. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Mail Stop RCE, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

American LegalNet, Inc.
www.FormsWorkFlow.com

Electronic Patent Application Fee Transmittal

Application Number:	13789860
Filing Date:	08-Mar-2013
Title of Invention:	WIRELESS ENERGY TRANSFER
First Named Inventor/Applicant Name:	Aristeidis Karalis
Filer:	Marc M. Wefers
Attorney Docket Number:	01997-0358008

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
PETITION FEE- 37 CFR 1.17(H) (GROUP III)	1464	1	140	140
RCE- 2ND AND SUBSEQUENT REQUEST	1820	1	1700	1700
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		**1840**

UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

Decision Date : October 21, 2016

In re Application of :

Aristeidis Karalis

DECISION ON PETITION

UNDER CFR 1.313(c)(2)

Application No : 13789860

Filed : 08-Mar-2013

Attorney Docket No : 01997-0358008

This is an electronic decision on the petition under 37 CFR 1.313(c)(2), filed October 21, 2016 , to withdraw the above-identified application from issue after payment of the issue fee.

The petition is **GRANTED.**

The above-identified application is withdrawn from issue for consideration of a submission under 37 CFR 1.114 (request for continued examination). See 37 CFR 1.313(c)(2).

Petitioner is advised that the issue fee paid in this application cannot be refunded. If, however, this application is again allowed, petitioner may request that it be applied towards the issue fee required by the new Notice of Allowance.

Telephone inquiries concerning this decision should be directed to the Patent Electronic Business Center (EBC) at 866-217-9197.

This application file is being referred to Technology Center AU 2836 for processing of the request for continuing examination under 37 CFR 1.114 .

Office of Petitions

Electronic Acknowledgement Receipt

EFS ID:	27284558
Application Number:	13789860
International Application Number:	
Confirmation Number:	4131
Title of Invention:	WIRELESS ENERGY TRANSFER
First Named Inventor/Applicant Name:	Aristeidis Karalis
Customer Number:	26161
Filer:	Marc M. Wefers
Filer Authorized By:	
Attorney Docket Number:	01997-0358008
Receipt Date:	21-OCT-2016
Filing Date:	08-MAR-2013
Time Stamp:	12:54:40
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	$1840
RAM confirmation Number	102116INTEFSW00009631061050
Deposit Account	
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The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Petition automatically granted by EFS	petition-request.pdf	31560 06baf40d06a98f1de8ee0b664f83f730286cb096	no	2
Warnings:					
Information:					
2	Quick Path Information Disclosure Statement	QPIDS.pdf	106818 c0c05ad2ee55c26ea42f96251caaa143a0b8b3c1	no	1
Warnings:					
Information:					
3	Information Disclosure Statement (IDS) Form (SB08)	1449.pdf	88276 f4c2ecf31c9951f502654883d509eb969d2ec246	no	1
Warnings:					
Information:					
This is not an USPTO supplied IDS fillable form					
4	Request for Continued Examination (RCE)	RCE.pdf	118889 1fdad321b7824aef457b45cf0b29197f61ef3663	no	1
Warnings:					
This is not a USPTO supplied RCE SB30 form.					
Information:					
5	Other Reference-Patent/App/Search documents	Other1.pdf	1495170 af517ca3c7c16b793710a852ee7ce58401ff19e0	no	38
Warnings:					
Information:					
6	Other Reference-Patent/App/Search documents	Other2.pdf	2935476 28df88a195a402033c7741def41d99dc6e1ee773	no	71

Warnings:					
Information:					
7	Fee Worksheet (SB06)	fee-info.pdf	32155 f474304a74f5cc66911a84bf2bd27204f10f3d69	no	2
Warnings:					
Information:					
			Total Files Size (in bytes):	4808344	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Doc Code: PET.AUTO Document Description: Petition automatically granted by EFS-Web	PTO/SB/140 U.S. Patent and Trademark Office Department of Commerce

Electronic Petition Request	**PETITION TO WITHDRAW AN APPLICATION FROM ISSUE AFTER PAYMENT OF THE ISSUE FEE UNDER 37 CFR 1.313(c)**
Application Number	13789860
Filing Date	08-Mar-2013
First Named Inventor	Aristeidis Karalis
Art Unit	2836
Examiner Name	FRITZ FLEMING
Attorney Docket Number	01997-0358008
Title	WIRELESS ENERGY TRANSFER

An application may be withdrawn from issue for further action upon petition by the applicant. To request that the Office withdraw an application from issue, applicant must file a petition under this section including the fee set forth in § 1.17(h) and a showing of good and sufficient reasons why withdrawal of the application from issue is necessary.

APPLICANT HEREBY PETITIONS TO WITHDRAW THIS APPLICATION FROM ISSUE UNDER 37 CFR 1.313(c).

A grantable petition requires the following items:
(1) Petition fee; and
(2) One of the following reasons:
(a) Unpatentability of one or more claims, which must be accompanied by an unequivocal statement that one or more claims are unpatentable, an amendment to such claim or claims, and an explanation as to how the amendment causes such claim or claims to be patentable;
(b) Consideration of a request for continued examination in compliance with § 1.114 (for a utility or plant application only); or
(c) Express abandonment of the application. Such express abandonment may be in favor of a continuing application, but not a CPA under 37 CFR 1.53(d).

Petition Fee

- ○ Small Entity
- ○ Micro Entity
- ◉ Regular Undiscounted

Reason for withdrawal from issue

◯ One or more claims are unpatentable ◉ Consideration of a request for continued examination (RCE) (List of Required Documents and Fees) ◯ Applicant hereby expressly abandons the instant application (any attorney/agent signing for this reason must have power of attorney pursuant to 37 CFR 1.32(b)).
RCE request,submission, and fee. ☐ I certify, in accordance with 37 CFR 1.4(d)(4) that : The RCE request ,submission, and fee have already been filed in the above-identified application on ☒ Are attached.
THIS PORTION MUST BE COMPLETED BY THE SIGNATORY OR SIGNATORIES I certify, in accordance with 37 CFR 1.4(d)(4) that I am: ◉ An attorney or agent registered to practice before the Patent and Trademark Office who has been given power of attorney in this application. ◯ An attorney or agent registered to practice before the Patent and Trademark Office, acting in a representative capacity. ◯ A sole inventor ◯ A joint inventor; I certify that I am authorized to sign this submission on behalf of all of the inventors as evidenced by the power of attorney in the application ◯ A joint inventor; all of whom are signing this e-petition

Signature	/Marc M. Wefers Reg. No. 56,842/
Name	Marc M. Wefers
Registration Number	56842

Document code: WFEE

United States Patent and Trademark Office
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/789,860	03/08/2013	Aristeidis Karalis	01997-0358008	4131

26161 7590 11/01/2016

FISH & RICHARDSON P.C. (BO)
P.O. BOX 1022
MINNEAPOLIS, MN 55440-1022

EXAMINER	
FLEMING, FRITZ M	

ART UNIT	PAPER NUMBER
2836	

NOTIFICATION DATE	DELIVERY MODE
11/01/2016	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PATDOCTC@fr.com

Supplemental Notice of Allowability	Application No. 13/789,860	Applicant(s) KARALIS ET AL.	
	Examiner FRITZ M. FLEMING	Art Unit 2836	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *the QPIDS filed 10/21/16*.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on_____.
2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
3. ☒ The allowed claim(s) is/are *1,2 and 19-39*. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☐ All b) ☐ Some *c) ☐ None of the:
   1. ☐ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☒ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date 10/21/16
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
5. ☐ Examiner's Amendment/Comment
6. ☒ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/FRITZ M FLEMING/
Primary Examiner, Art Unit 2836

1. The present application is being examined under the pre-AIA first to invent provisions.

DETAILED ACTION

Allowable Subject Matter

2. Claims 1,2,19-39 are still allowed.

3. The following is an examiner's statement of reasons for allowance: The QPIDS filed 10/21/16 included two EPO refusals and no citations of references. While the refusals and the minutes offer some insight into the EPO process, attention is brought to the refusal and minutes for 06 786 588.1, sheets 12 and 7 respectively, in which it is mentioned that "the parameter ranges chosen are a matter of intentional and conscious optimization of the design" and "would hint the person skilled in the art to consider Q as the other possible parameter to improve energy transfer." and "would hint the person skilled in the art to experiment with higher Q values", respectively. This seems tantamount to using impermissible hindsight to attribute the invention to "design choice" and an invitation to experimentation, instead of clear findings of obviousness. Therefore, the claims are still allowable for the reasons set forth in the Notice of Allowance dated 6/2/16.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to FRITZ M. FLEMING whose telephone number is (571)272-4145. The examiner can normally be reached on M-F, 0900-1730.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rexford N. Barnie can be reached on 571-272-7492. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

FRITZ M FLEMING
Primary Examiner
Art Unit 2836

/FRITZ M FLEMING/
Primary Examiner, Art Unit 2836

Sheet 1 of 1

Substitute Disclosure Form / U.S. Department of Commerce Patent and Trademark Office	Attorney Docket No.	Application No.
Information Disclosure Statement by Applicant (Use several sheets if necessary) (37 CFR §1.98(b))	01997-0358008	13/789,860
	Applicant: Massachusetts Institute of Technology	
	Filing Date: March 8, 2013	Group Art Unit: 2836

U.S. Patent Documents							
Examiner Initial	Desig. ID	Document Number	Publication Date	Patentee	Class	Subclass	Filing Date If Appropriate
	1.						

Foreign Patent Documents or Published Foreign Patent Applications								
Examiner Initial	Desig. ID	Document Number	Publication Date	Country or Patent Office	Class	Subclass	Translation Yes	Translation No
	2.							

Other Documents (include Author, Title, Date, and Place of Publication)		
Examiner Initial	Desig. ID	Document
	3.	Copy of Decision to Refuse a European Patent Application for European Application No. EP 11 184 066.6 by Chairman Alan Davis dated September 30, 2016 (38 pags)
	4.	Copy of Decision to Refuse a European Patent Application for European Application No. EP 06 786 588.1 by Chairman Alan Davis dated September 30, 2016 (71 pages)

Examiner Signature	Date Considered
/FRITZ M FLEMING/	10/27/2016

EXAMINER: Initials citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Substitute Disclosure Form

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /F.M.F/

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/789,860	11/29/2016	9509147	01997-0358008	4131

26161 7590 11/09/2016

FISH & RICHARDSON P.C. (BO)
P.O. BOX 1022
MINNEAPOLIS, MN 55440-1022

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment is 168 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site http://pair.uspto.gov for additional applicants):

Aristeidis Karalis, Boston, MA;
Andre B. Kurs, Chestnut Hill, MA;
Robert Moffatt, Reston, VA;
John D. Joannopoulos, Belmont, MA;
Peter H. Fisher, Cambridge, MA;
Marin Soljacic, Belmont, MA;
MASSACHUSETTS INSTITUTE OF TECHNOLOGY, Cambridge, MA

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Electronic Acknowledgement Receipt

EFS ID:	27284558
Application Number:	13789860
International Application Number:	
Confirmation Number:	4131
Title of Invention:	WIRELESS ENERGY TRANSFER
First Named Inventor/Applicant Name:	Aristeidis Karalis
Customer Number:	26161
Filer:	Marc M. Wefers
Filer Authorized By:	
Attorney Docket Number:	01997-0358008
Receipt Date:	21-OCT-2016
Filing Date:	08-MAR-2013
Time Stamp:	12:54:40
Application Type:	Utility under 35 USC 111(a)

Payment information;

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	$1840
RAM confirmation Number	102116INTEFSW00009631061050
Deposit Account	
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	

Electronic Patent Application Fee Transmittal

Application Number:	13789860
Filing Date:	08-Mar-2013
Title of Invention:	WIRELESS ENERGY TRANSFER
First Named Inventor/Applicant Name:	Aristeidis Karalis
Filer:	Marc M. Wefers
Attorney Docket Number:	01997-0358008

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
PETITION FEE- 37 CFR 1.17(H) (GROUP III)	1464	1	140	140
RCE- 2ND AND SUBSEQUENT REQUEST	1820	1	1700	1700
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				

Adjustment date: 03/15/2017 SDIRETA1 13789860
01 FC:1464 140.00 CR
02 FC:1820 1700.00 CR