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(54) Title: WIRELESS POWER FROM RENEWABLE ENERGY

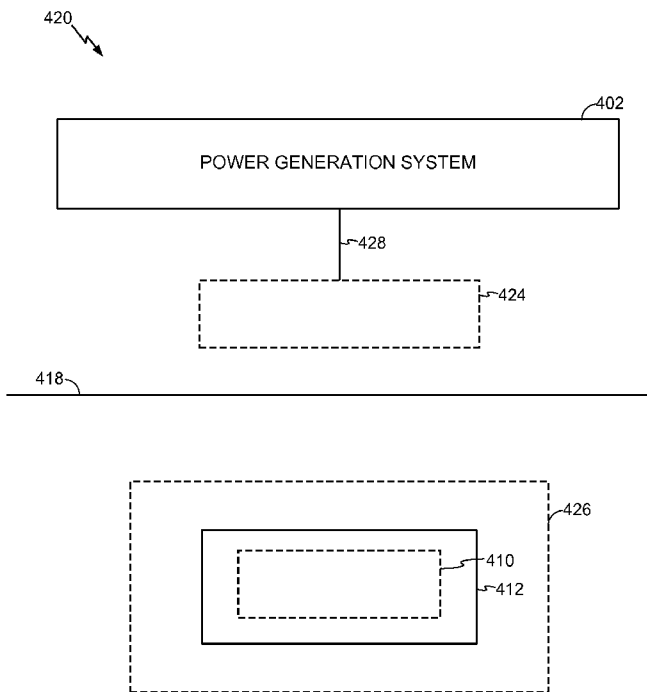


FIG. 25

(57) Abstract: Exemplary embodiments are directed to wireless charging. A charging system (420) may comprise at least one power generation system (402) configured to convert renewable energy to another form of energy and convey the another form of energy. The charging system may further include at least one transmit antenna (426) coupled to the at least one power generation system and configured to receive the another form of energy from the at least one power generation system. Further, the at least one transmit antenna is configured to wirelessly transmit energy to at least one other antenna positioned within an associated coupling-mode region.

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- *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*
- *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

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INTERNATIONAL SEARCH REPORT

International application No
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A. CLASSIFICATION OF SUBJECT MATTER
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B. FIELDS SEARCHED
 Minimum documentation searched (classification system followed by classification symbols)
 H02J H04B
 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 practical, search terms used)
 EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2008/109691 A2 (RANDALL MITCH [US]) 12 September 2008 (2008-09-12) paragraphs [0091] - [0099]; figures 1, 2b, 5 paragraph [0154]	1-7,14, 16,22-27
X	----- US 2008/054638 A1 (GREENE CHARLES E [US] ET AL) 6 March 2008 (2008-03-06) * abstract paragraphs [0002] - [0004], [0 11], [0 15] paragraphs [0039], [0058], [0059], [0072] - [0075]; figures ----- -/--	1-4,6,7, 16,17, 22,23, 26,27

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	"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
"E" earlier document but published on or after the international filing date	"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
"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)	"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.
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search 22 March 2011	Date of mailing of the international search report 29/03/2011
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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2010/024149

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.
3. As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No

PCT/US2010/024149

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	KANAI Y ET AL: "A non-contact power-supply card powered by solar cells for mobile communications", APPLIED POWER ELECTRONICS CONFERENCE AND EXPOSITION, 2000.APEC 2000.FIFTEENTH ANNUAL IEEE,, vol. 2, 6 February 2000 (2000-02-06), pages 1157-1162, XP010371642, DOI: DOI:10.1109/APEC.2000.822833 ISBN: 978-0-7803-5864-5 page 1157 - page 1158, paragraphs A,B; figures 1,2,3	1-3,5, 22,23, 25,27
E	----- WO 2011/019088 A2 (PANASONIC CORP [JP]; KANNO HIROSHI) 17 February 2011 (2011-02-17) paragraphs [0052], [0053], [0128]; figure 4 page 35, lines 2-6	1-7,14, 16,17, 22-27
X	----- WO 2009/009559 A1 (NIGELPOWER LLC [US]) 15 January 2009 (2009-01-15) pages 6,7; figure 1 figure 2	1-13, 18-21
X	----- US 2007/021140 A1 (KEYES MARION A IV [US] ET AL) 25 January 2007 (2007-01-25) paragraphs [0047] - [0067]; figures 2-6	8,18
X	----- WO 2007/095267 A2 (POWERCAST LLC [US]; GREENE CHARLES E [US]; HARRIST DANIEL W [US]; SHEA) 23 August 2007 (2007-08-23) sentences 51-53,99,101; figure 14	8
A	----- US 2007/236174 A1 (KAYE EVAN JOHN [US]) 11 October 2007 (2007-10-11) paragraph [0021]; figure 3	1,8-13, 18-21
A	----- EP 1 047 179 A1 (SANYO ELECTRIC CO [JP]) 25 October 2000 (2000-10-25) paragraph [0022]; figure 6	17
A	----- WO 2004/045044 A1 (CASSANI WALTER [IT]; SCARIONI ALESSANDRO [IT]) 27 May 2004 (2004-05-27) * abstract; figure 1	17
A	----- DE 44 37 650 A1 (KRECH HANS DR [DE]) 11 May 1995 (1995-05-11) figure 1	15,17
A	----- US 5 233 227 A (KAJIMOTO SHINSHI [JP] ET AL) 3 August 1993 (1993-08-03) figures 1, 2,7	15,17
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INTERNATIONAL SEARCH REPORT

International application No
PCT/US2010/024149

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 2007/059493 A2 (ROMANA JAGJIT S [US]; ROMANA RAJWINDER K [US]) 24 May 2007 (2007-05-24) figures 1,2 -----	17
A	US 2003/038610 A1 (MUNSHI M ZAFAR A [US] ET AL MUNSHI M ZAFAR A [US] ET AL) 27 February 2003 (2003-02-27) figure 17b -----	17

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2010/024149

Patent document cited in search report	Publication date	Patent family member(s)	Publication date	
WO 2008109691	A2	12-09-2008	AU 2008222801 A1 CN 101790828 A EP 2127062 A2 JP 2010520741 T KR 20090128450 A	12-09-2008 28-07-2010 02-12-2009 10-06-2010 15-12-2009
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US 2003038610	A1	27-02-2003	NONE	

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-7, 14, 16, 22-27

Charging system, comprising: at least one transmit antenna coupled to a power generation system and configured to receive another form of energy conveyed from the power generation system configured to convert renewable energy to another form of energy and convey the another form of energy; and wherein the at least one transmit antenna is configured to wirelessly transmit energy to at least one other antenna positioned within an associated coupling-mode region.

2. claims: 8-13, 15, 18-21

Charging system, comprising one transmit antenna receiving converted renewable energy and configured to wirelessly transmit energy to at least one other antenna positioned within an associated coupling-mode region, wherein the at least one other antenna comprises a repeater antenna configured to receive energy wirelessly transmitted from that at least one transmit antenna.

3. claim: 17

Charging system, comprising one transmit antenna receiving converted renewable energy and configured to wirelessly transmit energy to at least one other antenna positioned within an associated coupling-mode region, wherein the power generation is secured to a top outer surface of one bus, building, and a train
