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[Continued on next page]

(54) Title: SIGNALING CHARGING IN WIRELESS POWER ENVIRONMENT

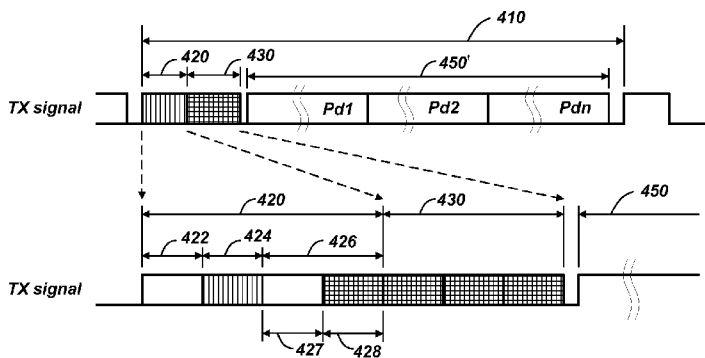


FIG. 15C

(57) Abstract: Exemplary embodiments are directed to wireless power transfer including generating an electromagnetic field at a resonant frequency of a transmitter to create a coupling-mode region within a near field of the transmitter during a synchronization portion of a time-multiplexed recurring period. During a power transmission portion of the recurring period, the electromagnetic field will continue to be generated when there is a receiver within the coupling-mode region, or the electromagnetic field will be disabled when there are no receivers within the coupling-mode region. Different segments of the power transmission portion are allocated to different receivers. The transmitter issues serial commands to the receivers by on/off keying the electromagnetic field. The receivers issue serial replies by changing the amount of power consumed from the electromagnetic field between two different states. The serial commands and serial replies are used to determine the number of receivers, their power requirements, and the allocation of segments.

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Declarations under Rule 4.17:

- *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))*

- *with international search report (Art. 21(3))*
- *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

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INTERNATIONAL SEARCH REPORT

International application No

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A. CLASSIFICATION OF SUBJECT MATTER
 INV. H04B5/02 G06K7/00 G06K19/07 H04B1/16

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)

H04B G06K H04W

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, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|-----------|--|------------------------|
| X | WO 2004/032349 A (BATTELLE MEMORIAL INSTITUTE [US]; PRATT RICHARD [US]; HUGHES MICHAEL A) 15 April 2004 (2004-04-15) the whole document | 1-3, 8-10, 18-23 |
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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 document 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

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Date of mailing of the international search report

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Name and mailing address of the ISA/

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INTERNATIONAL SEARCH REPORT

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| C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT | | |
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| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
| X | US 5 539 394 A (CATO ROBERT T [US] ET AL) 23 July 1996 (1996-07-23) | 4,5,11, 12,15-17 |
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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2009/043509

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.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

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

1. claims: 1-3,8-10,18-20

Generating an electromagnetic field if there is at least one receiver designated to accept power from said field or otherwise disable the generation of the electromagnetic field.

2. claims: 4,5,11,12,15,16,17

Segment allocation for power transfer to each of a plurality of receivers designated to accept power.

3. claims: 6,7,13,14

Device identification and power segment allocation when a new receiver enters a coupling-mode region.

4. claims: 21-23

Switching from a first to a second power reception state and configuring a receiver device accordingly.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2009/043509

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