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(54) Title: METHODS, SYSTEMS, AND APPARATUS FOR WIRELESS RECHARGING OF BATTERY-POWERED DEVICES

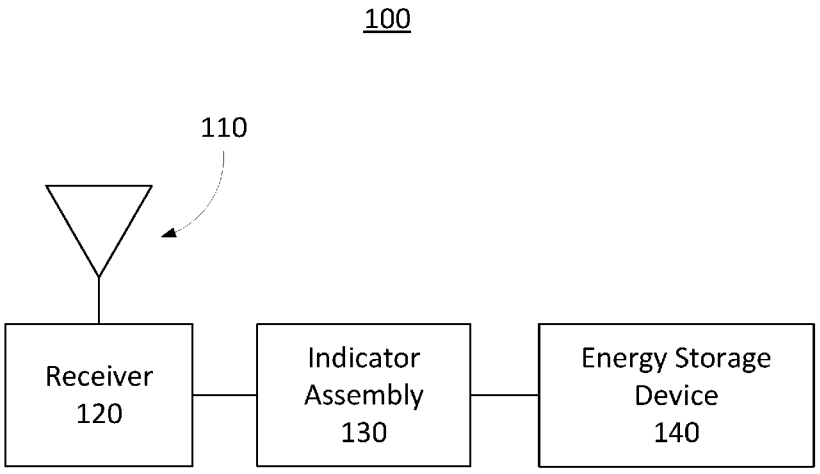


FIG. 1

(57) Abstract: In some embodiments, an apparatus includes an antenna, an energy storage device, a receiver, and an indicator assembly. The receiver may be coupled to the antenna and the energy storage device. The receiver may be configured to receive wireless energy via the antenna such that an energy storage level of the energy storage device is increased. The indicator assembly may be coupled to the receiver and may be configured, in response to the receiver receiving the wireless energy, to provide an indication based, at least in part, on a characteristic of the wireless energy.

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[Continued on next page]

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 18/63933

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - H02J 50/10 (2019.01)
CPC - H02J 50/00; H02J 50/12; H02J 50/10; H02J 50/40; H01Q 1/24; 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)
See Search History Document

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

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
See Search History Document

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X --- Y --- A	US 2016/0013677 A1 (ENERGOUS CORPORATION) 14 January 2016 (14.01.2016), entire document, especially; para [0035]-[0041], [0044], [0052], [0053]	1-4, 6, 7, 9, 13 ---- 8, 10, 11-12, 14 ---- 5
Y	US 2017/0279295 A1 (OTTER PRODUCTS, LLC) 28 September 2017 (28.09.2017), entire document, especially; para [0007], [0039]-[0041], [0056]	8, 10, 11, 14
Y	US 2015/0128733 A1 (QUALCOMM INCORPORATED) 14 May 2015 (14.05.2015), entire document, especially; para [0047]-[0054]	12
A	US 2010/0127660 A1 (COOK et al.) 27 May 2010 (27.05.2010), entire document	1-14
A	US 2006/0113955 A1 (NUNALLY) 01 June 2006 (01.06.2006), entire document	1-14

☐ 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
31 May 2019	18 JUL 2019

Name and mailing address of the ISA/US	Authorized officer:
Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-8300	Lee W. Young PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 18/63933

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:
This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be searched, the appropriate additional search fees must be paid.

Group I: claims 1-14: drawn to an apparatus including an indicator assembly.

Group II: claims 15-17: drawn to an apparatus including a second energy storage device.

Group III: claims 18-23: drawn to an apparatus including an RF-to-DC converter.

Group IV: claims 24-32: drawn to an apparatus including a reflector.

--See Extra 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 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.