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(54) Title: A METHOD AND APPARATUS FOR POWER EXTRACTION IN A PRE-EXISTING AC WIRING INFRASTRUCTURE

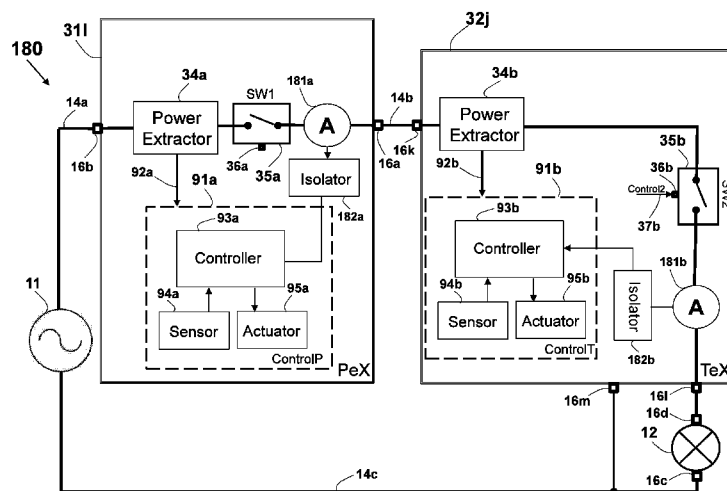


FIG. 18

(57) Abstract: A method and apparatus for extracting power in a switch location, and in a load location for use in a pre-existing infrastructure of switching AC power to a lamp (or other load) via a two terminal switch device. The switch is replaced with a module including a first controlled switch (such as a triac or relay) and a first impedance (such as a capacitor) connected in parallel, and another module including a second controlled switch (such as a triac or relay) and a second impedance (such as a capacitor) connected in parallel, is installed at the load location. In an 'off' state where the two controlled switches are in 'open' state, current is flowing via the impedances, but not through the load, so that power extractor circuits in the modules, connected in series to the impedances, extract low power for DC powering logic and other loads in the modules.

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## INTERNATIONAL SEARCH REPORT

International application No.

PCT/IL15/51172

<b>A. CLASSIFICATION OF SUBJECT MATTER</b> IPC(8) - G08C 19/12, 17/02; H05B 37/02 (2016.01) CPC - G08C 19/12, 17/02; H05B 37/02 According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b> Minimum documentation searched (classification system followed by classification symbols) IPC(8): G08C 17/02, 19/12; H05B 33/08, 37/02; H02M 5/25, 5/27; H03K 17/72 (2016.01) CPC Classifications: G08C 19/12, 17/02; H05B 33/08, 33/0848, 37/02; H02M 5/25, 5/27, 5/225, 5/2573; H03K 17/063, 17/284, 2017/066 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) PatSeer (US, EP, WO, JP, DE, GB, CN, FR, KR, ES, AU, IN, CA, RU, AT, CH, TH, BR, PH, CN, INPADO Data); EBSCO; IEEE; Google Scholar; Google Patents; Lens; Orbit KEYWORDS: power, load, alternating, current, converter, AC, DC, switch, control, dimmer, FET, MOSFET, transistor, light, LED, diode, SSL, circuit, current, relay, terminal, node, open, close, on, off, wire, wireless, remote impedance		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2005/0213273 A1 (WANG, G) September 29, 2005; figures 1-2; paragraphs [0025-0026, 0030]),	1-75
A	US 4,276,486 A (AHUJA, A et al.) June 30 1981; figure 2, abstract, column 3, lines 6-21, 26, 46; claim 1	1-75
A	US 2012/0286696 A1 (GHANEM, M) November 15, 2012; figure 3; paragraphs [0025-0026, 0028, 0034, 0039]	1-75
A	US 2011/0199061 A1 (SHIMADA, R) August 18, 2011; figure 1; abstract; paragraphs [0009, 0021, 0027]	1-75
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> 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 10 June 2016 (10.06.2016)		Date of mailing of the international search report <b>07 JUL 2016</b>
Name and mailing address of the ISA/ Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-8300		Authorized officer Shane Thomas PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/IL15/51172

**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.: 76-607  
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:

Regarding claims 76-607, see Form ISA/224 mailed on 07 April 2016. PCT Article 6 states that the claims shall be clear and concise. Claims 76-607 do not meet this requirement, even assuming for the sake of argument that the individual claims are clear and concise in themselves, because the lack of clarity of the claims as a whole arises from the lack of conciseness. No international search report will be established for claims 76-607.

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:

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.