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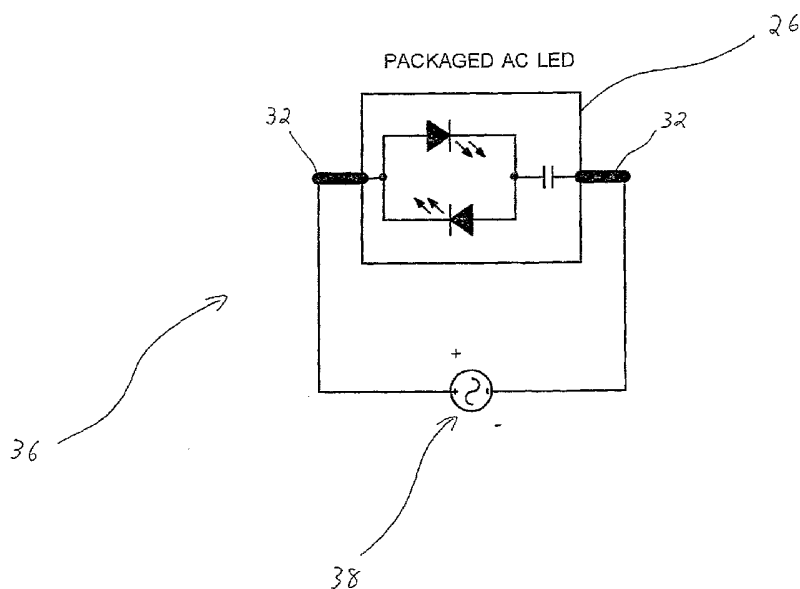
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[Continued on next page]

(54) Title: AC LIGHT EMITTING DIODE AND AC LED DRIVE METHODS AND APPARATUS



(57) Abstract: An AC LED package and circuits are disclosed along with an AC LED driver. The AC LED circuit may include as few as one LED or an array of anti-parallel LEDs driven with AC power sources and AC LED drivers at various voltages and frequencies. The AC LEDs are pre-packaged in various forms and materials and designed for mains or high frequency coupling in various forms to AC power sources, inverter type drivers or packages. The AC LED driver is a fixed frequency driver that provides a relatively constant voltage output to different size loads within the wattage limitation of the driver and in some cases is a direct mains power source.

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INTERNATIONAL SEARCH REPORT

International Application No
PCT/US2005/006146

| A. CLASSIFICATION OF SUBJECT MATTER IPC 7 H05B33/08 | | |
|---|--|---|
| 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) IPC 7 H05B | | |
| 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, PAJ | | |
| C. DOCUMENTS CONSIDERED TO BE RELEVANT | | |
| Category ° | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
| X | US 2003/122502 A1 (CLAUBERG BERND ET AL) 3 July 2003 (2003-07-03) page 1 - page 3; figure 4 | 1-16, 40-42 |
| X | PATENT ABSTRACTS OF JAPAN vol. 2000, no. 02, 29 February 2000 (2000-02-29) & JP 11 330561 A (OKI ELECTRIC IND CO LTD), 30 November 1999 (1999-11-30) abstract; figures 5,7 | 1-16, 40-42 |
| A | EP 1 215 944 A (GENERAL ELECTRIC COMPANY) 19 June 2002 (2002-06-19) column 1 - column 7; figure 1 | 1-16, 40-42 |
| <input type="checkbox"/> Further documents are listed in the continuation of box C. <input checked="" type="checkbox"/> Patent family members are listed in 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 13 June 2005 | | Date of mailing of the international search report 26. 08. 2005 |
| Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016 | | Authorized officer Morrish, I |

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2005/006146

Box 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 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 fee, this Authority did not invite payment of any additional fee.

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.:

see annex

Remark on Protest

- The additional search fees were accompanied by the applicant's protest.
- 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: 1-16,40-42

A lighting system

2. claims: 17-39

An LED device

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US2005/006146

| Patent document cited in search report | Publication date | Patent family member(s) | Publication date |
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