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[Continued on next page]

(54) Title: SPECIFICATION IMPROVED LED MODULE

(57) Abstract: An improved LED module that is thermally self-stabilizing, and that is able to be retrofitted into an existing flashlight is provided. In one embodiment, the LED module includes a light emitting diode, an amplifying circuit and a microchip. The amplifying circuit includes a temperature sensing device to sense heat from the light emitting diode. The output of the amplifying circuit is input to the microchip which output to a switching device that regulates energy that is delivered to the light emitting diode. The switching device may be part of a boosting circuit, a bucking circuit or an inverting circuit.

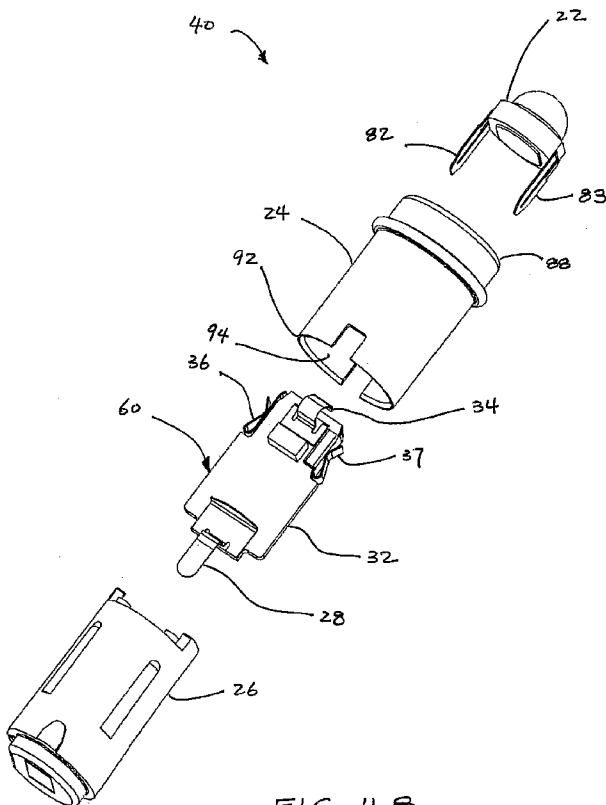


FIG. 4B

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European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

**Published:**

— *with international search report*

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25 September 2008

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US06/35764

**A. CLASSIFICATION OF SUBJECT MATTER**  
 IPC: **F21V 7/04( 2006.01);H05B 37/02( 2006.01)**  
  
 USPC: Please See Continuation Sheet  
 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)  
 U.S. : 362/555,583,582,580,544,545,546,547,631,632,612,202,203,204,205,206,207,208; 315/149,158,55,56,57,58,59  
  
 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)

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 6,086,218 ( ROBERTSON) 11 July 2000 (11.07.2000), Figures 3-7	17-20 and 25-35
Y	US 6,376,994 B1 (OCHI et al) 23 April 2002 (12.04.2002), Figures 5, 12 and 14	17-20, 25-35
Y	US 6,411,046 B1 (MUTHU) 25 June 2002 (25.06.2002), Figures 1.	17-21 and 25-35

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 application or patent 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	
"P" document published prior to the international filing date but later than the priority date claimed	"&" document member of the same patent family

Date of the actual completion of the international search 27 May 2008 (27.05.2008)	Date of mailing of the international search report <b>30 JUL 2008</b>
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (703) 305 3230	Authorized officer <b>TUYET VO</b> <i>Tuyet Vo</i> Telephone No. 571 272 1830

**INTERNATIONAL SEARCH REPORT**

International application No.

PCT/US06/35764

**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.: 1-16  
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:

- 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 any 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.: 17-38
- 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/US06/35764

Continuation of USPC:  
362/555,583,582,580,544,545,546,547,631,632,612,202,203,204,205,206,207,208;315/149,158,55,56,57,58,59