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**Declaration under Rule 4.17:**

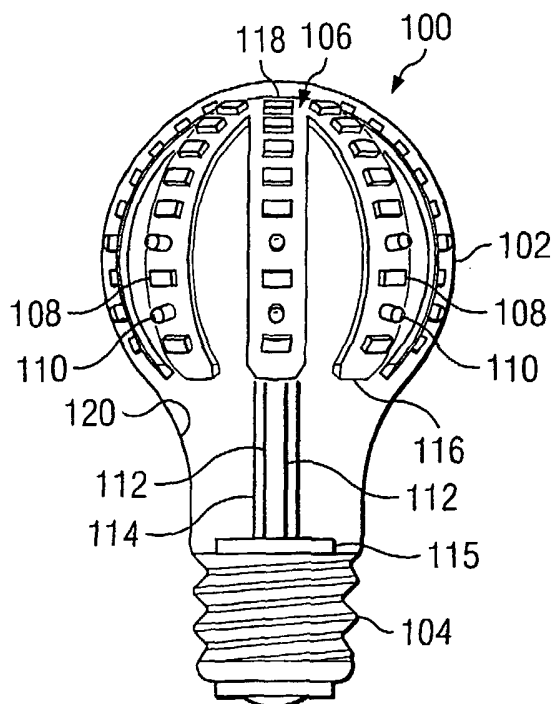
— of inventorship (Rule 4.17(iv)) for US only

**Published:**

— with international search report

[Continued on next page]

(54) Title: LED LIGHT BULB USING A FLEXIBLE SUBSTRATE



(57) Abstract: The present lighting element uses, as a source of light generation, electronically activated light emitting elements, such as light emitting diodes, organic crystals and the like to provide one or more functions and are surface mounted on a flexible substrate, such that the substrate can bend and conform to a pre-established structure. In addition, standoffs of varying lengths are used to provide adjustable distances between the flexible substrate and the housing of the LED light bulb to provide adjustable light dispersion patterns. In this case, the circuit board is adapted to extend about and fit within the interior surface of a light bulb with the light emitting elements carried on the circuit board. A center post can be used to extend electrical conductors to the circuit board from the base and, if required, a power supply can also be carried in the post. A portion of the circuit board itself could also effectively operate as the post. Methods for making same are also provided.



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

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

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## INTERNATIONAL SEARCH REPORT

 International Application No  
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 A. CLASSIFICATION OF SUBJECT MATTER  
 IPC 7 F21K7/00

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 F21K

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, 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 2003/090910 A1 (CHEN HSING) 15 May 2003 (2003-05-15)  the whole document	1-3, 5-11, 16, 26
X	US 2004/037080 A1 (LUK JOHN F ET AL) 26 February 2004 (2004-02-26)  the whole document	1-3, 5-11, 16, 26
X	US 6 621 222 B1 (HONG KUN-LIANG) 16 September 2003 (2003-09-16) the whole document	1-3, 16
X	US 2003/031015 A1 (ISHIBASHI KAZUO) 13 February 2003 (2003-02-13) cited in the application the whole document	1-3, 5, 7-13, 16, 26
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☒ Further documents are listed in the continuation of box C.☒ 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

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"&amp;" document member of the same patent family

Date of the actual completion of the international search

26 October 2005

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 nal Application No  
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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2003/117803 A1 (CHEN HSING) 26 June 2003 (2003-06-26)  the whole document	1-3,5, 16-19, 21,22
A	US 2003/072145 A1 (NOLAN STEVEN T ET AL) 17 April 2003 (2003-04-17) paragraph '0031!; figure 5a	1
A	US 6 220 722 B1 (BEGEMANN SIMON H. A) 24 April 2001 (2001-04-24) the whole document	1-31
A	US 5 162 696 A (GOODRICH ET AL) 10 November 1992 (1992-11-10) the whole document	1,16,26
A	DE 101 05 622 A1 (INSTA ELEKTRO GMBH) 14 August 2002 (2002-08-14) abstract; figures 3,4	1,16,26
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X	WO 03/034458 A (CHLIWNYJ, KATARINA, M) 24 April 2003 (2003-04-24) pages 10-11; figures 7-10	32-35
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X	US 5 707 132 A (OOKI ET AL) 13 January 1998 (1998-01-13) the whole document	32-35

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US2005/008941

### 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.:

#### 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: 1-31

lighting device comprising a flexible substrate and method  
of manufacturing  
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2. claims: 32-35

method for manufacturing a housing with a lens portion by  
molding  
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# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No  
PCT/US2005/008941

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