



(12) **EUROPEAN PATENT APPLICATION**
published in accordance with Art. 153(4) EPC

(43) Date of publication:
26.08.2009 Bulletin 2009/35

(21) Application number: **07817128.7**

(22) Date of filing: **22.10.2007**

(51) Int Cl.:
F21S 4/00 ^(2006.01) **F21V 21/002** ^(2006.01)
H01R 4/24 ^(2006.01) **H01R 33/97** ^(2006.01)
F21W 121/00 ^(2006.01) **F21Y 101/02** ^(2006.01)

(86) International application number:
PCT/CN2007/070937

(87) International publication number:
WO 2008/058481 (22.05.2008 Gazette 2008/21)

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC MT NL PL PT RO SE SI SK TR

(30) Priority: **14.11.2006 CN 200610123567**

(71) Applicant: **Heshan Jianhao Lighting Ind. Co., Ltd.**
Hecheng Town
Heshan
Guangdong 529-727 (CN)

(72) Inventor: **HUANG, Guohao**
Taiwan 249 (CN)

(74) Representative: **Schlich, George William**
Schlich & Co
34 New Road
GB-Littlehampton, W Sussex BN17 5AT (GB)

(54) **A DECORATIVE LAMP STRING**

(57) A decorative lamp string comprises a lamp body (1) and a lamp base (2) connected by power lines (3). An electric raceway (21), in which the power lines are inserted, is set on the lamp base. Each end of the lead terminals (11) of the lamp body has a tip and penetrates

the power lines via the corresponding through-hole (22) on the lamp base and electrically connects to the conductor in the power lines. The decorative lamp string has the advantages of compact structure, simple technology, and reduced production cost.

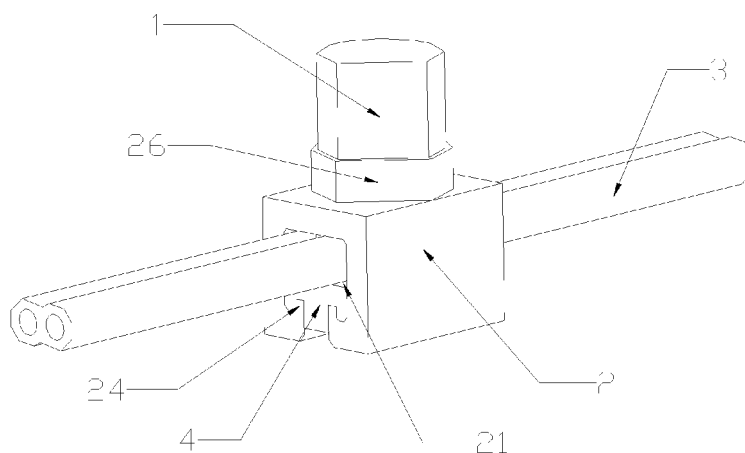


Fig.3

Description

[0001] Technical Field

[0002] The invention relates to a decorative lamp string.

[0003] Background of the invention

[0004] At present, the structural form of the connection between the lamp body and the lamp base refers to Fig. 1 in the accompanying drawings, in which the power line 3' employed to connect electrically lamps is inserted into the clasp-slot in the lamp base 2' which extends out of the bottom, and the lamp body 1' is inserted into the lamp holder. The end of the lead terminal of the lamp body 1' touches onto the conductor of the power line 3', which forms electric connection. When assembling, make each of said power line pass through said lamp base 2' and then position the conductors into the clasp-slot and fasten them so that the conductors cannot shift therein. This process has to be completed manually, instead of automatically, which directly leads to a lower efficiency and time- and labour- consuming; this increases the manufacturing cost extremely. For the purpose of simplifying these processes, an improved lamp base has been brought out, as shown in Fig 2 in the accompanying drawings. It comprises a removable lamp base 2" and a seal base 6". The power line 3" is positioned and fastened in the raceway between the lamp base 2" and said base 6". When assembling, insert the conductors of power line 3" into the lamp base 2" firstly, then mate said lamp base 2" with said seal base so that said power line 3" is enclosed therein, and in the end insert the lamp holder 5" assembled with a lamp body 1" into the lamp base 2". This makes processes of manufacturing simple and easy, and is suitable for arranging an automatic assembling, which decreases the operation by hand and increases the manufacturing efficiency. However, the improved lamp base 2" is more complicated in its structure, with a large volume, so the molding tools to be needed are accordingly complicated, and there is inconvenience yet when assembled, which leads to a higher manufacturing cost in accordance.

[0005] Summary of the invention

[0006] For overcoming the above said shortcomings in the prior art, it is one objective of the invention to provide a decorative lamp string which has a simple structure and can make manufacturing processes simple and efficient, for the purpose of an automatic production. Furthermore, this can decrease material-consuming and lower the production cost.

[0007] The invention achieves its objective as follows:

[0008] A decorative lamp string, comprising a lamp body and a lamp base which are electrically connected together by a power line, a raceway being arranged in said lamp base, in the raceway said power line is clasped, wherein each end of the lead terminal of the lamp body has a tip and penetrates, through the corresponding through-hole on the lamp base, into said power line, and electrically connects to the conductors of said power line.

[0009] Further, a jam block is assembled into the raceway, under said power line.

[0010] Advantages of the invention comprise: The lamp assembly is very compact in its structure, saving materials used for production, and lowering the production cost. When assembling, position the power line in the raceway, then press a jam block, abutting against under said power line, into said raceway to fasten the power line, and at last allow the lead terminal of the lamp body to penetrate into said power line to form a current circuit. The process is simple, and apt to assemble automatically, decreasing manual operation by operator. It increases manufacturing efficiency greatly and saves materials used for lamp base, power line, etc, which lower the manufacturing cost.

[0011] Description of drawings

Fig.1 is a typical scheme showing a decorative lamp string in prior art;

Fig.2 is a typical scheme showing a second decorative lamp string in prior art;

Fig.3 is a perspective view of a decorative lamp string of the invention;

Fig.4 is a side view of the lamp base according to the invention;

Fig.5 is an exploded view showing assembly status of the decorative lamp string of the invention.

[0012] Preferred embodiments

[0013] Referring to Fig. 3 to Fig. 5, a decorative lamp string comprises a lamp body 1 and a lamp base 2 which are electrically connected together by a power line 3, a raceway 21 being arranged in said lamp base 2, in said raceway 21 said power line 3 is clasped. Each end of the lead terminal 11 of the lamp body 1 has a tip and penetrates, through the corresponding through-hole 22 on the lamp base 2, into said power line 3, and electrically connects to the conductors of said power line 3. This string is very compact in its structure, saving materials used for production and lowering the production cost. When assembling, position the power line 3 in the raceway, then allow the lead terminal of the lamp body 1 to penetrate into said power line 3 to form a current circuit. The process is simple, and apt to assemble automatically, decreasing manual operation by operator. It increases manufacturing efficiency greatly.

[0014] In order to keep the power line 3 in said raceway 21 fastened, a jam block 4, abutting against under said power line 3, is arranged in raceway 21. This can prevent the lead terminal from loosening or breaking away from the power line 3 when drawing or pulling this lamp string of the invention. A slot 23 is arranged on the bottom of lamp base 2, in the inside of raceway 21 two railways 24 are arranged on each side of said slot; two grooves 41 matching said railways are arranged on the jam block. The lamp base and the jam block are made of plastic materials and molded, so they are of some elasticity, this can improve the affection of fastening which the jam block

forces to said power line. Further, two holes 42, corresponding to said through-hole 22, for holding the lead terminals, are arranged on that jam block 4, and the lead terminals can penetrate into the power line 3 and extending out into said two holes 42. This makes the power line 3, lamp body, lamp base and jam block fastened tightly together, so the power line 3 and the jam block will not break away from the lamp base in case of being drawn or pulled. This greatly increases the reliability of connection between parts.

[0015] Usually, said power line includes two conductors insulated from each other, and is integrated into one cord, with a split mark between conductors. Ribs 25 and 43 are arranged on the centre of the surfaces touching the power line, on top surface of the raceway 21 and top surface of the jam block 4, respectively. When assembling the power line, the ribs will mate that split mark on the power line and prevent the power line from twisting, helpful for positioning the power line.

[0016] In view of saving electric energy, the decorative lamp string of this invention employs LEDs as its lamp body. As it is known, a LED has a positive and a negative terminal; it must be correctly connected with the supply circuit so that it can work normally. A positioning means 26 is arranged on the top of lamp base 2, which can makes a LED assembled to the lamp base correctly. The positioning means 26 is corresponding to said through-hole 22 and matches the LED uniquely and properly. To achieve this objective better, the lamp body is designed in an asymmetrical shape such as a shape like a column removed a part along its axis, referring to Fig. 3 and 5. This can avoid assembling LEDs incorrectly, helpful for arranging an automatic production.

two holes, corresponding to said through-hole, for holding the lead terminals, are arranged on said jam block, and the lead terminals can penetrate into the power line and extending out into said two holes.

- 5 5. A decorative lamp string in claims 1 or 2, wherein ribs are arranged on the centre of the surfaces touching the power line, on top surface of the raceway and top surface of the jam block, respectively.
- 10 6. A decorative lamp string in claims 1, wherein said lamp body is a LED.
- 15 7. A decorative lamp string in claims 6, wherein the lamp body is of a column, which is removed a part along its axis.
- 20 8. A decorative lamp string in claims 6 or 7, wherein a positioning means is arranged on the top of lamp base, said positioning means is corresponding to said through-hole and matches the LED uniquely and properly.
- 25
- 30
- 35

Claims

1. A decorative lamp string comprise a lamp body and a lamp base which are electrically connected together by a power line, a raceway being arranged in said lamp base, in said raceway said power line is claped; wherein each end of the lead terminal of the lamp body has a tip and penetrates, through the corresponding through-hole on the lamp base, into said power line, and electrically connects to the conductors of said power line.
- 40 2. A decorative lamp string in claim 1, wherein a jam block, abutting against under said power line, is arranged in raceway.
- 50 3. A decorative lamp string in claims 1 or 2, wherein a slot is arranged on the bottom of lamp base, in the inside of raceway two railways are arranged on each side of said slot; two grooves, matching said railways, are arranged on the jam block.
- 55 4. A decorative lamp string in claims 1 or 2, wherein

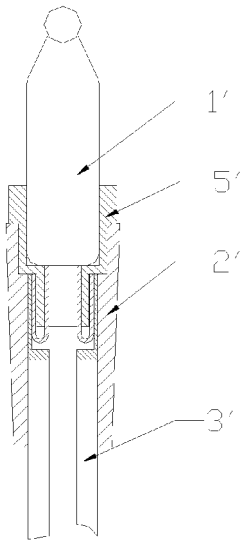


Fig.1

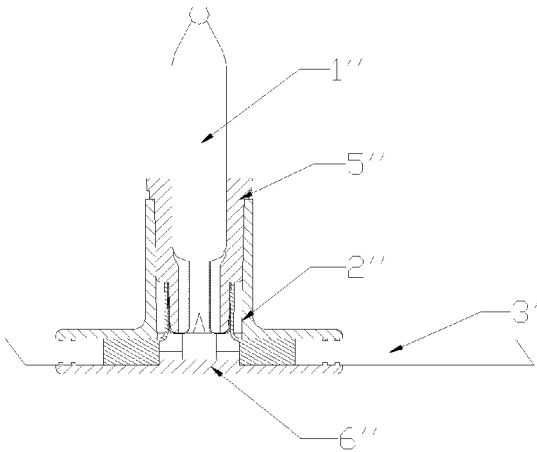


Fig.2

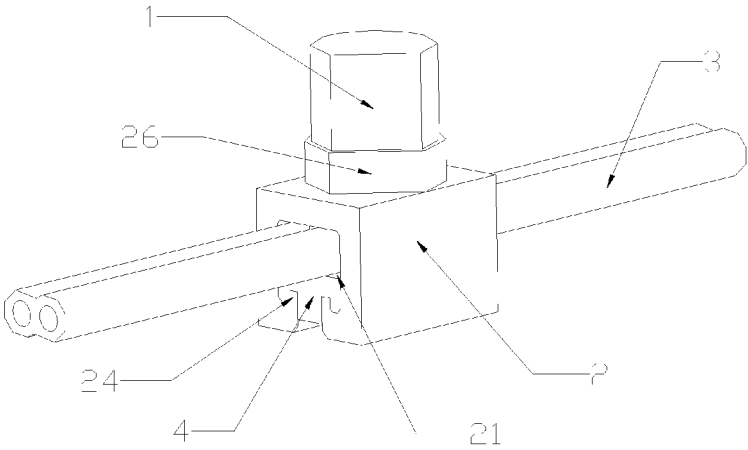


Fig.3

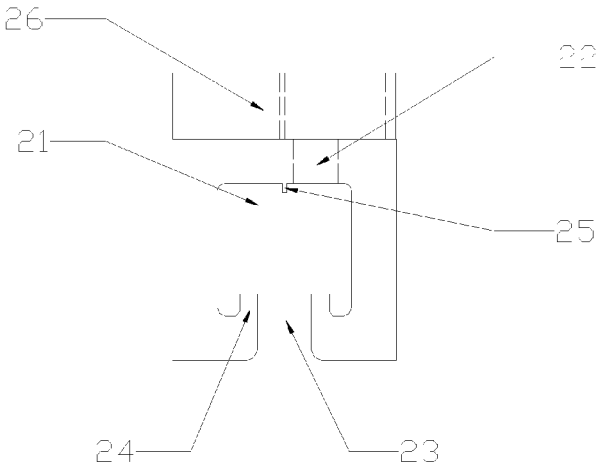


Fig.4

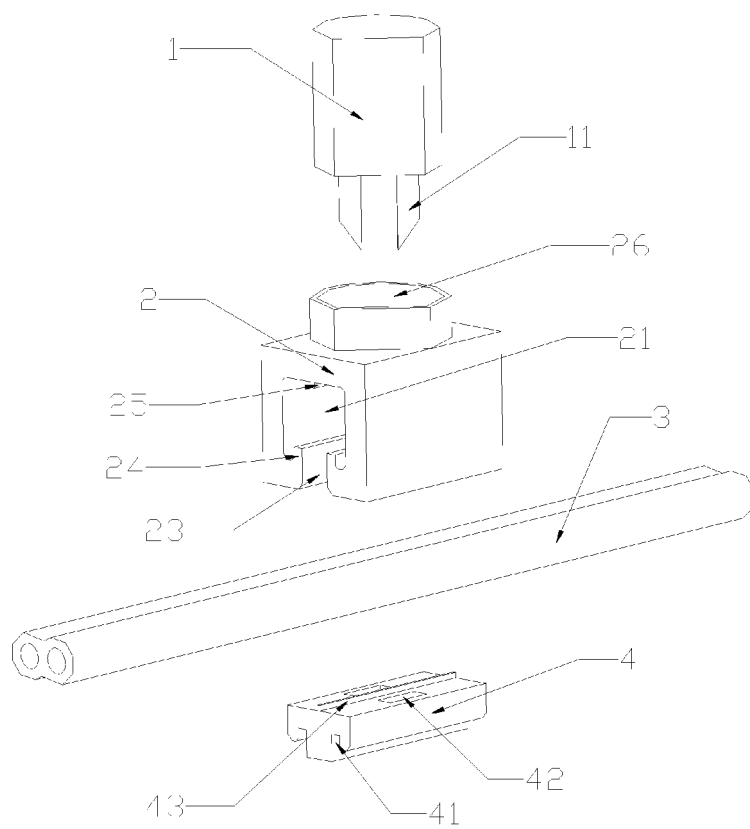


Fig.5

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2007/070937

A. CLASSIFICATION OF SUBJECT MATTER

See the extra 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)

IPC:F21,H01R4,H01R33

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)

WPI,EPODOC,PAJ,CNPAT

pin? or terminal? or lampress?? or leg? or lead???, pierc??? or penetrat+ or prick??? or stab???? or pok???, (strip? or string?) s (lamp? or light???), conductor? or conduit+ or ((wire? or line?) and (power or electr+)), acut+ or sharp+ or tip or cusp or keen+

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO2005/114753A1 (SHODEN CO LTD), 01 Dec.2005 (01.12.2005), pages 1,7, page 10, line 8 – page 13, line 17, figs.3,6-7,10	1–3, 5–6
Y		4, 7, 8
X	WO2006/085097A1 (ORTON S et al.), 17 Aug.2006 (17.08.2006), pages 7, para.4 – page 10, figs.1-6	1–3, 5–6
Y		4
X	US6027952A (Ming-Hsun Liu), 22 Feb.2000 (22.02.2000), col.3, line 18 – col.4, line 28, figs.2-5	1–3, 5–6
Y		4

☒ 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

15 Jan.2008 (15.01.2008)

Date of mailing of the international search report

31 Jan. 2008 (31.01.2008)

Name and mailing address of the ISA/CN
The State Intellectual Property Office, the P.R.China
6 Xitucheng Rd., Jimen Bridge, Haidian District, Beijing, China
100088
Facsimile No. 86-10-62019451

Authorized officer

WANG,Zhihua

Telephone No. (86-10)62085782

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2007/070937

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	CN2388709Y (LIN, Zhengzhong) , 19 Jul.2000 (19.07.2000) , page 2, fig.1	7, 8
X	CN1516862A (GELCORE LLC) , 28 Jul.2004 (28.07.2004) , page 7, para.1 – page 11, para.1, figs.1-2	1, 6
X	US4984999A (Sam S. Leake) , 15 Jan.1991 (15.01.1991) , col.2, line 51 – col.4, line 47, figs.1-4	1, 6
PX	CN1952474A (HESHAN JIANHAO LIGHTING IND. CO., LTD.) , 25 Apr.2007 (25.04.2007) , the whole	1–8
A	CN2366994Y (LIN, Meiru) , 01 Mar.2000 (01.03.2000) , the whole	1–8
A	CN2297800Y (JIAOJIANG HOLIDAY LAMP JOINT O) , 18 Nov.1998 (18.11.1998) , the whole	1–8

Form PCT/ISA/210 (continuation of second sheet) (April 2007)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2007/070937

Patent Documents referred in the Report	Publication Date	Patent Family	Publication Date
WO2005/114753A1	01.12.2005	JP2005333092A	02.12.2005
WO2006/085097A1	17.08.2006	GB2423196A	16.08.2006
US6027952A	22.02.2000	none	
CN2388709Y	19.07.2000	none	
CN1516862A	28.07.2004	US2002174995A	28.11.2002
		WO02097770A	05.12.2002
		EP1402504A	31.03.2004
		US2005030765A	10.02.2005
		JP2005515481T	26.05.2005
		US2007285933A	13.12.2007
US4984999A	15.01.1991	none	
CN1952474A	25.04.2007	DE202007009906U	13.09.2007
CN2366994Y	01.03.2000	none	
CN2297800Y	18.11.1998	none	

Form PCT/ISA/210 (patent family annex) (April 2007)

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2007/070937

CLASSIFICATION OF SUBJECT MATTER:

F21S4/00(2006.01) i
F21V21/002(2006.01) i
H01R4/24(2006.01) i
H01R33/97(2006.01) i
F21W121/00(2006.01)n
F21Y101/02(2006.01)n