(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 0 806 817 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
12.11.1997 Bulletin 1997/46

(51) Int. Cl.[6]: **H01R 33/06**

(21) Application number: **96201277.9**

(22) Date of filing: **09.05.1996**

(84) Designated Contracting States:
CH DE ES FR GB IT LI

(71) Applicant: **REGGIANI S.p.A. ILLUMINAZIONE**
I-20057 Vedano Al Lambro Milano (IT)

(72) Inventor: **Reggiani, Fabio**
20121 Milano (IT)

(74) Representative:
Faraggiana, Vittorio, Dr. Ing.
Ingg. Guzzi & Ravizza S.r.l.
Via Vincenzo Monti 8
20123 Milano (IT)

(54) Universal lamp-holder

(57) A universal lamp-holder comprises a casing (11) defining chambers (13, 14) which house elastic contact elements (18, 19) for electrical connection with the pins of a light bulb. Each contact element (18, 19) has opposing surfaces (20, 21) defining a channel between them with its inlet end facing out from the lamp-holder through a coupling aperture (16, 17) to receive a light bulb pin. Screws (34, 35) are disposed at right angles to the extension of the contact surfaces and push the opposing surfaces towards each other to grip a pin inserted in the channel.

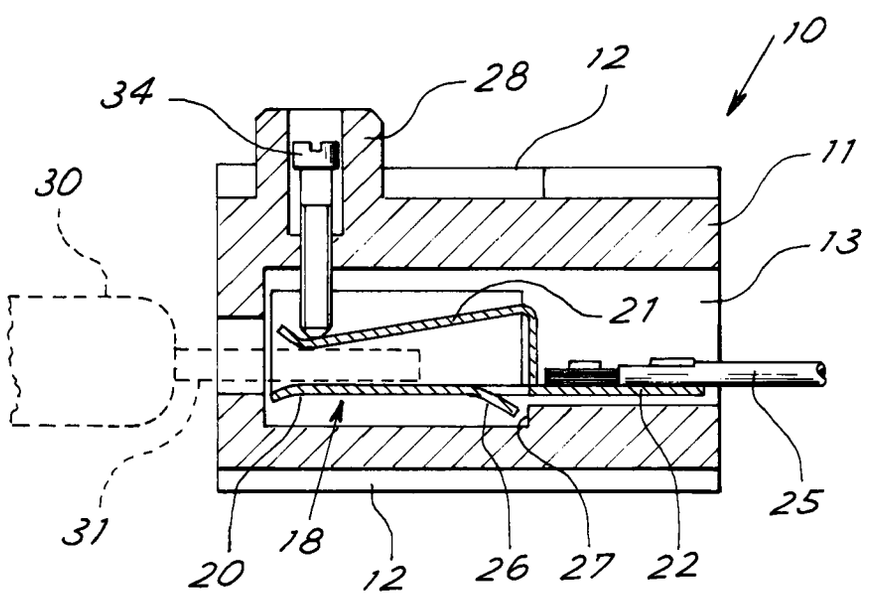

Fig. 1

EP 0 806 817 A1

Description

This invention refers to a lamp-holder of the type used with low-voltage halogen lamps.

Low-voltage halogen lamps are provided on their rear portion with a pair of parallel pins which are designed to fit into corresponding elastic contacts on the lamp-holder to make the electrical connection. The pitch between the pins varies according to the model of light bulb.

In substance there are light bulbs with a pitch ranging from 4 mm to 6.35 mm. Each of these models requires a specific lamp-holder, having contacts disposed to precisely receive the pins of a pre-established model of light bulb.

The shape of the pins implies the dedicated use of them for a single model of light bulb, and consequently whenever it is required to replace the light bulb with a different model it is necesssary to change the whole lamp-holder. Moreover, due to working tolerances, the pins do not always have an identical pitch in all the specimens of one particular model of light bulb. As a result, conventional lamp-holders sometimes receive the light bulb with some difficulty, giving rise to a rather unreliable electrical contact.

It should also be considered that when in operation halogen lamps generate considerable heat. The lamp-holders must consequently be made of materials which are highly resistant to heat, such as for example steatite or porcelain with similar heat-resistant properties. The heat and thermal shocks that the electrical contact elements are subject to may cause deformation of the contacts resulting in difficulty in coupling and uncoupling the light bulb. Furthermore, an unsteady contact gives rise to an increase in electrical resistance which further increases the heat that the contact elements are subject to, thereby further deteriorating their electrical characteristics.

The scope of this invention is to obviate the aforementioned problems by providing a lamp-holder for halogen lamps, which is capable of receiving pins with a widely variable pitch and at the same time ensuring an excellent electrical contact even at the high operating temperatures of the light bulb. The lamp-holder according to the invention also offers excellent heat resistance, thereby limiting impairment of the mechanical and electrical characteristics deriving both from the high operating temperatures and from the frequent thermal shocks that it is subjected to as a result of frequent switching on and off.

With a lamp-holder according to the invention, the light bulb is constantly and safely blocked under any conditions of use, even in the presence of stresses capable of leading to inefficient operation in the case of lamp-holders of known technique.

These scopes are achieved, according to the invention, by providing a universal lamp-holder comprising a casing defining chambers which house elastic contact elements for electrical connection with pins of a light bulb,
characterized by the fact that each contact element has opposing surfaces defining a channel between them with its inlet end facing out from the lamp-holder through a coupling aperture to receive a light bulb pin, screws are disposed at right angles to the extension of the contact surfaces and push the opposing surfaces towards each other to grip a pin inserted in the channel.

The innovative principles of this invention and its advantages with respect to the known technique will be more clearly evident from the following description of a possible exemplificative and non-restrictive embodiment applying such principles, with reference to the accompanying drawings, in which:

- figure 1 shows a longitudinal cutaway view along the line I-I of figure 2, of a lamp-holder according to the invention;
- figure 2 shows a front elevational view of the lamp-holder of figure 1;
- figure 3 shows a schematic view of an electrical contact contained in the lamp-holder of figure 1;
- figure 4 shows a perspective view of the lamp-holder of figure 1.

With reference to the figures, a lamp-holder, generically indicated by reference 10, used in particular for halogen lamps designed for illuminating environments, comprises a casing 11, advantageously made of polyphenylene sulphide (PPS), preferably with a regular prismatic shape with a quadrangular cross-section. As can be clearly seen in figure 4, the casing is externallly provided with a plurality of parallel ribs 12 forming a set of cooling fins.

Inside the casing 11 are formed two chambers 13, 14, substantially identical to each other and parallelepipedon in shape, disposed longitudinally and separated by a wall or diaphragm 15 made in one piece with the casing. The chambers are open at both the anterior and posterior end.

The apertures 16, 17 at the anterior end are slightly smaller in dimension than the crosswise dimensions of the chamber thus forming stop surfaces for electrical contact elements 18, 19 housed in the chambers.

As can be clearly seen in figures 1 and 3, the contacts 18, 19, identical to each other, can be made by cutting and shaping from galvanized metal. Each contact element 18, 19 comprises a casing 20 with arms extending towards the leading end of the contact element to define an elastic contact channel delimited by the opposing surfaces of the arms. One arm forms part of a basic element with a U-shaped cross section inside which is bent a contact spring or tab 21 which forms the other arm. The tab 21 is bent towards the base of the U, is slightly shorter in length than the other arm and has its leading end folded away from the bottom of the U.

A shank 22 is formed protruding posteriorly from the casing 20 and has two pairs of tabs folded over themselves to clamp an insulated conductor 25 with a

stripped end. In particular, the tabs 23, 24 enclose the cable 25 respectively on its stripped conducting portion and on its portion covered with insulating material.

As can be clearly seen in figures 1 and 2, the contacts 18, 19 are inserted in their respective chambers so as to have their front ends facing onto the front apertures 16 and 17 of the chambers. Each contact has an arrow-shaped coupling tab 26 blanked outward from the bottom of the U.

The bottoms of the chambers are made on two levels to define a low shoulder 27 in the central area of their extension. When the contact is inserted into its respective chamber the tab 26 engages elastically with the shoulder 27, preventing the contact from slipping out again.

Above and close to its anterior end the casing 11 has two perforated cylindrical extensions 28, 29 directed crosswise to the extension of the chambers, which each communicate with the inside of a chamber in the direction of the free leading end of the tab 21 of the contact in the chamber.

As can be clearly seen in figures 1 and 2, the cylindrical extensions 28, 29 each receive a screw 34, 35 tightened so as to have its end protruding into the chamber and resting on the tab 21 of the contact inside it to push it towards the bottom of the U.

The chambers and the contacts in the chambers have an elongated crosswise extension so that the lamp-holder can be fitted with a light bulb 30 (shown by the broken line in figure 1) having pins 31 with a pitch variable from a maximum pitch (figure 2, indicated by reference 32), established by the distance of the furthermost sides of the contacts 18, 19) to a minimum pitch (figure 2, indicated by reference 33), established by the distance of the nearest sides of the contacts 18, 19. Advantageously, the minimum and maximum pitches are chosen at least equivalent to the minimum and maximum pitches of the normal models of halogen lamps.

Plugging the light bulb into the lamp-holder is quick and easy. The two pins 31 engage, one into chamber 13 and the other into chamber 14, penetrating into the contact channel between the tab 21 and the bottom of the U of the corresponding contact. The upward folded portion of the free end of the tab constitutes a precise invitation to insert the terminals of the light bulb.

After their elastic insertion into the contact channel, the tightening of the screws 28, 29 ensures a reliable and stable contact, both electrical and mechanical, between the contact elements and pins of the light bulb, thereby offering an additional means of blocking the light bulb.

The specific conformation of the chambers 13, 14, anteriorly for the light bulb and posteriorly for the contact element, creates a channel in which the air circulates with a "chimney effect". The anterior portion, which is hot due to the presence of the light bulb, forms a continuous stream of air that creates a circulation of air through the chambers, helping to substantially reduce the temperature. The ribs 12 on the outer surface of the casing 11 help to decrease the temperature still further.

The advantages attained by a lamp-holder according to the invention are evident. In fact, the halogen lamps are received in the lamp-holder regardless of the pitch between the terminals of the lamp. Whatever the case, the screws ensure that it is firmly secured in place. The structure of the lamp-holder is simple and easy to assemble, the contacts snap fitting into the chambers thanks to the tab 26 and shoulder 27. Adequate ventilation is ensured which lowers the temperature and prevents deterioration of the unit.

The foregoing description of an embodiment applying the innovative principles of this invention is obviously given by way of example in order to illustrate such innovative principles and should not therefore be understood as a limitation to the sphere of the invention claimed herein.

For example, the casing of the lamp-holder may differ in shape or size from the one shown, both inside and outside the chambers. A larger number of paired chambers may also be provided.

Moreover, the lamp-holder may present appendices or areas pre-arranged and if necessary perforated for securing the lamp-holder (with screws or other means) to generic supports. A housing or fastening means for a protective strip surrounding the light bulb may also be provided.

Claims

1. Universal lamp-holder comprising a casing (11) defining chambers (13, 14) which house elastic contact elements (18, 19) for electrical connection with pins of a light bulb, characterized by the fact that each contact element (18, 19) has opposing surfaces (20, 21) defining a channel between them with its inlet end facing out from the lamp-holder through a coupling aperture (16, 17) to receive a light bulb pin, screws (34, 35) are disposed substantially at right angles to the extension of the contact surfaces and push the opposing surfaces towards each other to grip a pin inserted in the channel.

2. Lamp-holder as claimed in claim 1, characterized by the fact that the contact channels extend crosswise to the direction of insertion of a pin into the channel to receive light bulbs with a pitch between the pins variable from a maximum to a minimum.

3. Lamp-holder as claimed in claim 1, characterized by the fact that the contact element (18, 19) is fork-shaped with two opposing arms (20, 21) and with free ends directed towards the inlet end of the channel, the two arms each constituting one of said opposing surfaces.

4. Lamp-holder as claimed in claim 3, characterized by the fact that one (20) of the two arms is made

substantially rigid with a U-shaped cross-section, the other arm (21) constituting an elastic arm received between side walls of the U.

5. Lamp-holder as claimed in claim 4, characterized by the fact that the screw (34, 35) acts against said other arm (21).

6. Lamp-holder as claimed in claim 5, characterized by the fact that said other arm (21) has a free end bent in the direction of the fastening screw.

7. Lamp-holder as claimed in claim 3, characterized by the fact that to the rear of the fork the terminal has a clamping end (22) for clamping a conductor.

8. Lamp-holder as claimed in claim 7, characterized by the fact that the chamber is open also at the end opposite said coupling aperture (16, 17).

9. Lamp-holder as claimed in claim 8, characterized by the fact that the contact element (18, 19) has an arrow-shaped protruding tab (26) to engage the contact against a shoulder (27) inside the chamber.

10. Lamp-holder as claimed in claim 1, characterized by the fact that the contact element (18, 19) is made from a cut and shaped metal sheet.

11. Lamp-holder as claimed in claim 1, characterized by the fact that the casing (11) has cooling ribs (12) made in one piece on its outer surface.

12. Lamp-holder as claimed in claim 1, characterized by the fact that the casing (11) has a regular prismatic shape with a quadrangular cross-section, with perforated cylindrical protrusions (28, 29), each communicating with the inside of a chamber (13, 14) and receiving a fastening screw (34, 35).

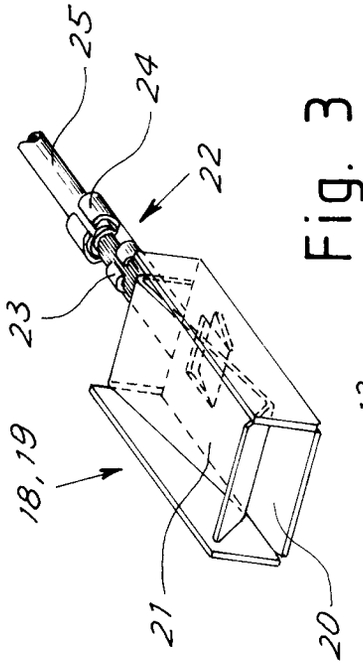

Fig. 3

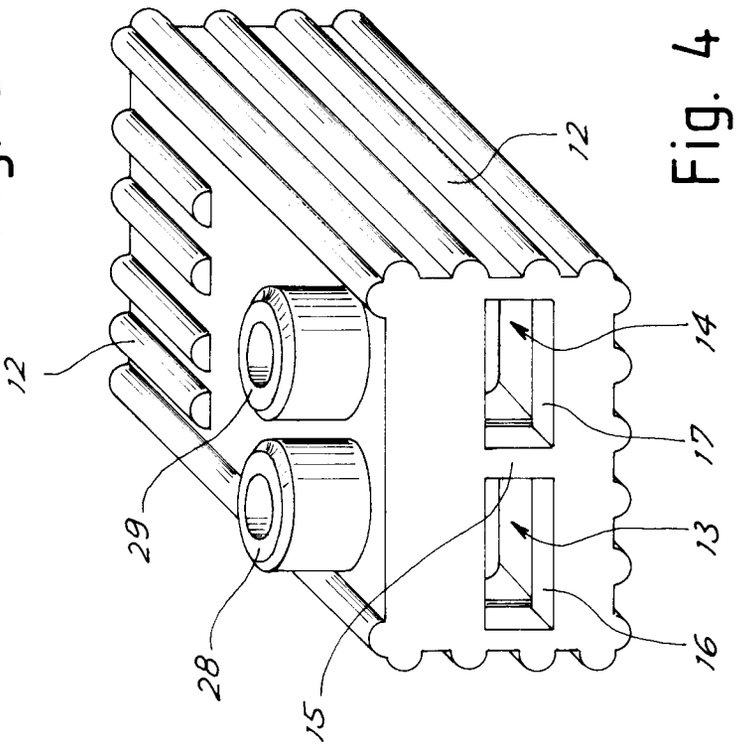

Fig. 4

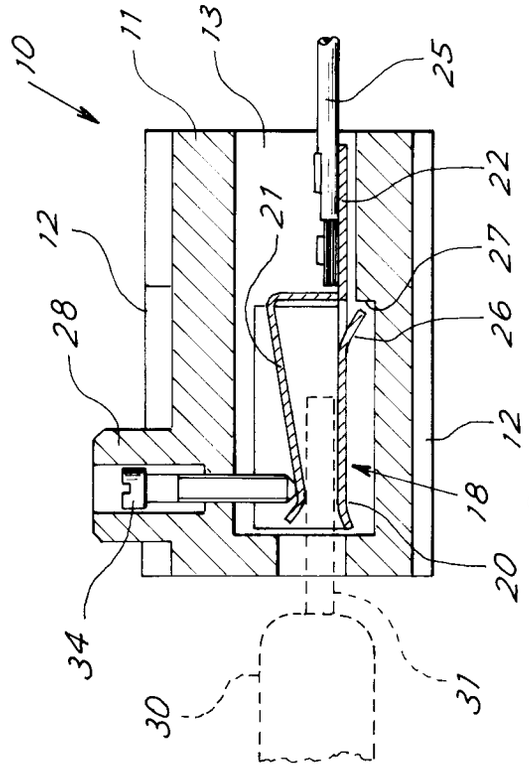

Fig. 1

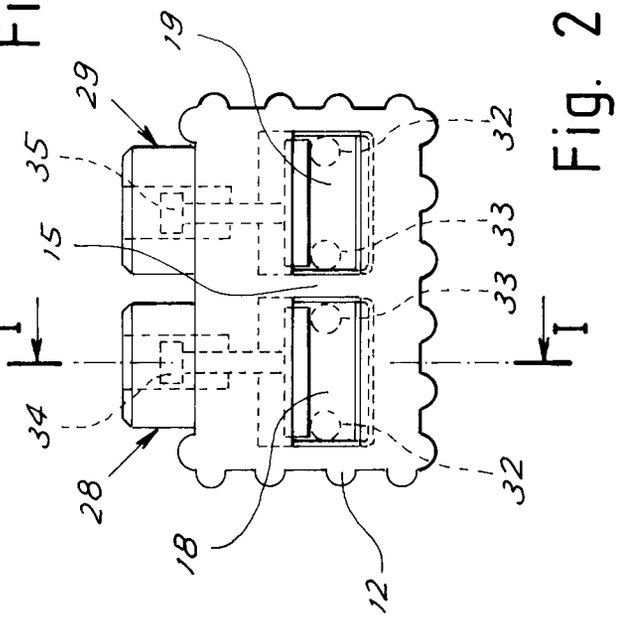

Fig. 2

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 96 20 1277

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X Y A	US-A-5 310 355 (DANNATT IRMGARD) 10 May 1994 * column 4, line 26 - column 5, line 9; figure 2A * ---	1,2,10 3,4,7,8 12	H01R33/06
Y A	DE-U-82 11 251 (ERNST HERMAN) 19 August 1982 * the whole document * ---	3,4,7,8 1,2,10	
A	US-A-5 263 874 (MILLER JACK V) 23 November 1993 * column 2, line 27 - line 66; figure 1 * ---	1,11,12	
A	US-A-4 596 433 (OESTERHELD KLAUS ET AL) 24 June 1986 * column 2, line 31 - line 53; figures 2,4,5A,5B * ---	1,8-11	
A	EP-A-0 389 659 (SIEMENS AG) 3 October 1990 * page 4, column 5, line 2 - line 24; figure 8 * -----	11	

TECHNICAL FIELDS SEARCHED (Int.Cl.6)

H01R
F21V

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	28 August 1996	Criqui, J-J

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)