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

(11) **EP 1 826 481 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
08.10.2008 Bulletin 2008/41

(51) Int Cl.:
F21V 29/00 *(2006.01)* ***F21V 31/00*** *(2006.01)*
F21K 7/00 *(2006.01)*

(21) Application number: **07102624.9**

(22) Date of filing: **19.02.2007**

(54) **Lamp**

Lampe

Lampe

(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 NL PL PT RO SE SI SK TR

(30) Priority: **24.02.2006 ES 200600439**

(43) Date of publication of application:
29.08.2007 Bulletin 2007/35

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Printed by Jouve, 75001 PARIS (FR)

Description

BACKGROUND OH THE INVENTION

[0001] Lamps provided with light-emitting diodes (LEDS) are known. The main advantages of these lamps are its long lifetime and its low energy consumption.

[0002] A generic lamp is known from EP-A-1 577 613.

[0003] It is known the use of this sort of lamps for the replacement of conventional incandescent lamps used in traffic lights.

[0004] Said prior art diode lamps have drawbacks in evacuating the heat produced by its inside electronic components, thus reducing its lifetime and usefulness. It has also been proved that said lamps do not show a good air or water tightness either.

[0005] In a few existing models, heat removal improvements have been tried by providing large diameter lamps. A drawback of these lamps is that this diameter enlargement obstructs the easy incandescent lamp replacement, since in many cases said replacement is carried out from behind the lamp support, through an opening which fits the incandescent lamp diameter. If there is not enough room for the diodes lamp to pass through said opening, the traffic-light frontal part has to be dismantled so as to install the lamp.

[0006] Moreover, lack of tightness in said diode lamps often leads to failures owing to water condensation. Some lamp models include rubber joints, but the pressures and depressions caused by the great thermal changes to which the traffic light lamps are subjected provoke, in the long term, the air entrance from the outside, whose humidity condensates inside the lamps.

DESCRIPTION OF THE INVENTION

[0007] The object of the present invention is to solve the known prior art devices drawbacks, providing a lamp comprising all the features of claim 1.

[0008] Thanks to this cooling wings it is possible to efficiently evacuate the heat from the inside of the lamp without enlarging its outer diameter. Therefore, thanks to its reduced dimensions, the lamp of the invention can be used for replacing the usual incandescent lamps used in traffic-lights in a simple and fast manner, as if they were replaced by another incandescent lamp. This avoids the need to dismantle the traffic-light front part.

[0009] Preferably, the cooling wings comprise at least part of the outer surface of at least one of the housings.

[0010] Advantageously, the housings and the cooling wings are made of a conducting material of the heat caused by said electronic components and diodes.

[0011] Preferably, the heat conducting material is a metallic material, more specifically, aluminium.

[0012] According to an embodiment of the present invention, the lamp comprises a sealing resin arranged inside the housings so as to prevent the water or air from entering into said housings and to increase the evacuation of the heat caused by the electronic components and the light-emitting diodes towards the outside of the lamp.

[0013] Preferably, the sealing resin is of the epoxy type.

[0014] This sealing resin keeps the housings tightness and, in combination with the wings, improves the heat transmission from the housings inside to the lamp outside. Thus, it is avoided the use of prior art rubber joints, which normally loose tightness due to sudden temperature changes to which they are subjected.

[0015] Preferably, the connection means to an electric power supply comprise a threaded metallic cap.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016] A drawing is attached to facilitate the description of what has been disclosed above, in which, diagrammatically and only as a non-limitative example, a practical case of embodiment of the invention is shown. This drawing shows a longitudinal cross-section of the lamp of the present invention.

DESCRIPTION OF A PREFERRED EMBODIMENT

[0017] As it can be seen in the drawing, the lamp 1 of the invention comprises a main body 2 which includes some cooling wings 3 in its outer surface extending perpendicularly with respect to the longitudinal axis of the lamp 1.

[0018] Said main body 2 defines a housing 4 in which the electronic components of the lamp 1 are located.

[0019] The lamp 1 comprises another frontal housing 6defined in one of the ends of the main body 2, in which a plurality of light-emitting diodes 7 are located. Said housing 6 is frontally closed by a transparent dome 8.

[0020] As it can be observed, the main body 2 wings 3 extends through a part of the outer surface of the lamp 1, more specifically through part of the outer surface of both housings 4, 6. These wings 3 are meant to evacuate to the maximum the heat produced by the operation of the electronic components and the diodes 7 arranged inside the housings 4, 6. In this way, the heat is transmitted from inside the housings 4, 6 through the its walls directly towards the wings 3.

[0021] The body 2 and the wings 3 will be total or partially made of any good heat conducting material or materials, preferably of aluminium.

[0022] Thanks to said wings 3, the outer diameter of the lamp 1 is smaller than the diameter of this type of prior art lamps, since the contact surface with the outside is increased, thus making more easy the heat removal without the need of enlarging the outer diameter.

[0023] The housings 4, 6 could be filled with sealing resin 9, of the epoxy or another type, good heat transmitting, so as to improve the evacuation of the heat generated by the elements arranged inside both housings 4, 6 towards the outside of the lamp and to provide the needed tightness to prevent the water or air from entering said

housings 4, 6 in whatever condition. The resin 9 can be arranged nearby close to the internal wall of the housings 4, 6.

[0024] The lamp 1 includes also a standard threaded cap 10 for the electricity supplying of the lamp 1 components by connecting it to an electric network connected terminal.

[0025] Even though in the described embodiment the cooling wings 3 comprise many substantially parallel layers which extends in a plane perpendicular to the lamp longitudinal axis, the wings configuration and arrangement can vary depending on the lamp 1 design and specific needs.

Claims

1. Lamp (1) comprising connection means (10) to an electric power supply, a housing (4) comprising lamp (1) electronic components (5), and a housing (6) comprising a plurality of light-emitting diodes (7), and some cooling wings (3) in the outer lamp (1) surface for the evacuation of the heat caused by said electronic components (5) and by the diodes (7) towards the outside of the lamp (1) **characterized in that** said cooling wings (3) extend perpendicularly with respect to the longitudinal axis of the lamp.

2. Lamp (1), according to claim 1, **characterized in that** the cooling wings (3) comprise at least part of the outer surface of at least one of the housings (4, 6).

3. Lamp (1), according to any of the previous claims, **characterized in that** the housings (4, 6) and the cooling wings (3) are made of a conducting material.

4. Lamp (1), according to claim 3, **characterized in that** the heat conducting material is a metallic material.

5. Lamp (1), according to claim 4, **characterized in that** the heat conducting material is aluminium.

6. Lamp (1), according to any of the previous claims, **characterized in that** it comprises a sealing resin (9) arranged inside the housings (4, 6) so as to prevent water or air from entering said housings (4, 6) and to increase the evacuation of the heat caused by the electronic components (5) and the light-emitting diodes (7) towards the outside of the lamp (1).

7. Lamp (1), according to claim 6, **characterized in that** the sealing resin (9) is of the epoxy type.

8. Lamp (1), according to any of the previous claims, **characterized in that** the connection means to an electric power supply comprise a threaded metallic cap (10).

Patentansprüche

1. Lampe (1) mit einer Verbindungseinrichtung (10) zu einer elektrischen Energiequelle, einem Gehäuse (4), das elektronische Komponenten (5) der Lampe (1) aufweist, einem Gehäuse (6), das eine Mehrzahl von licht-emittierenden Dioden (7) und einige Kühlrippen (3) in der äußeren Oberfläche der Lampe (1) für das Ausbringen von Wärme aufweist, die von den elektronischen Komponenten (5) und den Dioden (7) hervorgerufen wird, zur Außenseite der Lampe (1), **dadurch gekennzeichnet, dass** sich die Kühlrippen (3) senkrecht bezüglich der Längsachse der Lampe erstrecken.

2. Lampe (1) nach Anspruch 1, **dadurch gekennzeichnet, dass** die Kühlrippen (3) wenigstens einen Teil der äußeren Oberfläche wenigstens eines der Gehäuse (4, 6) aufweise.

3. Lampe (1) nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die Gehäuse (4, 6) und die Kühlrippen (3) aus leitendem Material gebildet sind.

4. Lampe (1) nach Anspruch 3, **dadurch gekennzeichnet, dass** das wärmeleitende Material ein metallisches Material ist.

5. Lampe (1) nach Anspruch 4, **dadurch gekennzeichnet, dass** das wärmeleitende Material Aluminium ist.

6. Lampe (1) nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** sie ein Dichtharz (9) aufweist, das innerhalb der Gehäuse (4, 6) angeordnet ist um Wasser oder Luft am Eindringen in die Gehäuse (4, 6) zu hindern und das Ausbringen von Wärme, die von den elektronischen Komponenten (5) und den licht-emittierenden Dioden (7) erzeugt wird, zur Außenseite der Lampe (1) zu erhöhen.

7. Lampe (1) nach Anspruch 6, **dadurch gekennzeichnet, dass** das Dichtharz (9) vom Epoxyd-Typ ist.

8. Lampe (1) nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die Verbindungseinrichtung zu einer elektrischen Energiequelle eine metallische Gewindekappe (10) aufweist.

Revendications

1. Lampe (1) comprenant des moyens de connexion (10) à une alimentation électrique, un boîtier (4) comprenant des composants électroniques (5) de lampe

(1), un boîtier (6) comprenant une pluralité de diodes électroluminescentes (7) et quelques ailettes de refroidissement (3) sur la surface externe de la lampe (1) pour l'évacuation de la chaleur provoquée par lesdits composants électroniques (5) et par les diodes (7) vers l'extérieur de la lampe (1), **caractérisée en ce que** lesdites ailettes de refroidissement (3) s'étendent perpendiculairement par rapport à l'axe longitudinal de la lampe.

2. Lampe (1) selon la revendication 1, **caractérisée en ce que** les ailettes de refroidissement (3) comprennent au moins une partie de la surface externe d'au moins un des boîtiers (4, 6).

3. Lampe (1) selon l'une quelconque des revendications précédentes, **caractérisée en ce que** les boîtiers (4, 6) et les ailettes de refroidissement sont faits d'un matériau conducteur de chaleur.

4. Lampe (1) selon la revendication 3, **caractérisée en ce que** le matériau conducteur de chaleur est un matériau métallique.

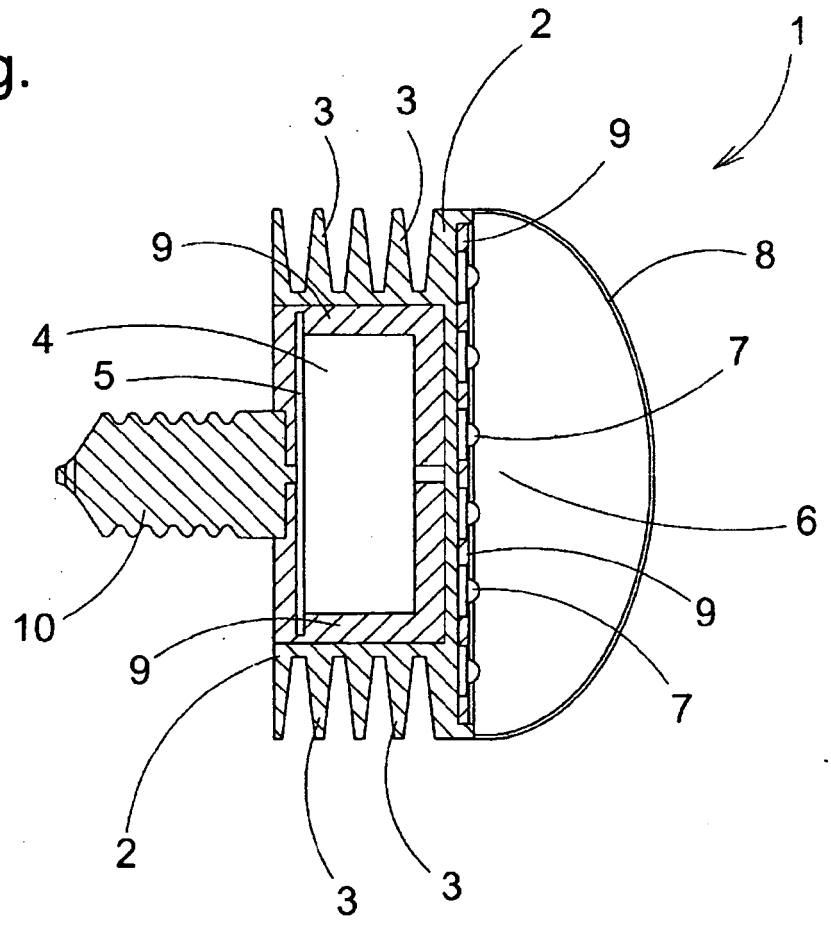
5. Lampe (1) selon la revendication 4, **caractérisée en ce que** le matériau conducteur de chaleur est de l'aluminium.

6. Lampe (1) selon l'une quelconque des revendications précédentes, **caractérisée en ce qu'**elle comprend une résine d'étanchéité (9) agencée à l'intérieur des boîtiers (4, 6) de sorte à empêcher l'air ou l'eau de pénétrer dans lesdits boîtiers (4, 6) et à accroître l'évacuation de la chaleur provoquée par les composants électroniques (5) et les diodes électroluminescentes (7) vers l'extérieur de la lampe (1).

7. Lampe (1) selon la revendication 6, **caractérisée en ce que** la résine d'étanchéité (9) est du type époxy.

8. Lampe (1) selon l'une quelconque des revendications précédentes, **caractérisée en ce que** les moyens de connexion à une alimentation électrique comprennent un capuchon métallique fileté (10).

Fig.



REFERENCES CITED IN THE DESCRIPTION

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