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(12) # EUROPEAN PATENT APPLICATION

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(54) ## High power led lamp

(57) This invention discloses a kind of high power LED lamp that consists of lampshade, high power LED light source and its driving circuit, heat sink, lamp holder and the bearing base. The LED light source is fixed on the heat sink, its two poles are electrically connected with the corresponding control terminals of the driving circuit board; the upper part of the bearing base supports the heat sink unit, the lower part connects with the lamp holder; the above mentioned LED light source consists of a high power LED which is integrated by a set of multi-chip modules. The LED light source is either hooded with the heat sink under the lampshade together or the LED light source hooded under the lampshade independently. The invention high power Led lamp is environment protective and energy-saving with long performance life. Adopting new type of structural design can increase the radiation brightness efficiently. The heat-sinking and anti-vibration capability is also greatly improved with even radiation and higher brightness.

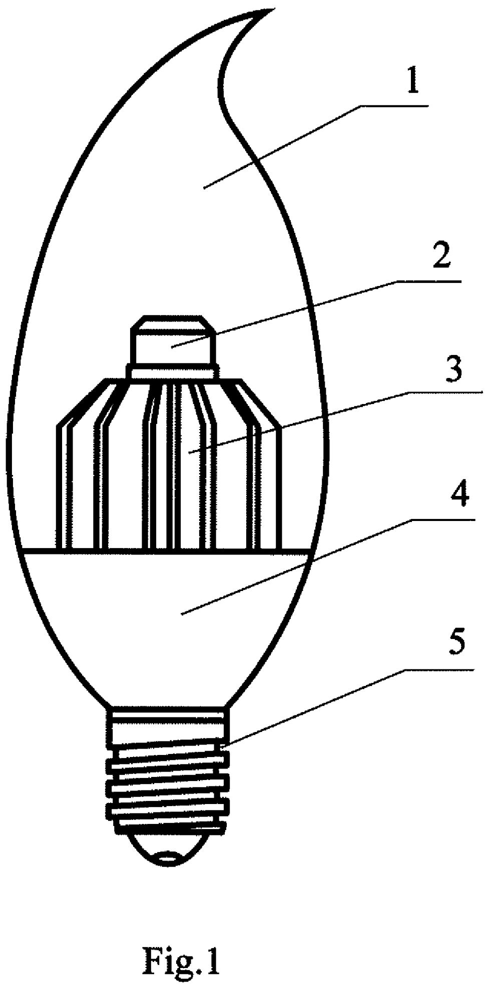

Fig.1

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Description

[0001] The invention relates to a lamp used for decoration and illumination, especially refers to a new type of high power LED lamp.

[0002] Traditional bulbs are normally regular incandescent lamps, which have the following disadvantages:

- the life of lamp is short due to high heat productivity;
- low photoelectric efficiency, high energy consumption, against energy-saving, against environmental protection.

[0003] Light Emitting diodes (hereafter LED) source is a kind of new lighting source on the rising featured for low voltage performance, small size, safe, easy control and high radiation rate. A more satisfactory and broad prospect will be ensured If high power LED source is used as the replacement source for the traditional decoration lamp: LED boasts long performance life reaching 30-50 thousand hours, low voltage and DC drive, safe, convenient control, high light-power output power reaching 80LM/W. Besides, the LED source is more environmental protective due to the environment-harmful Hg is not needed for LED. Because of the various advantages of LED source, people have started exploring the use of such type of light source as lighting lamp and decoration lamp, etc. It is prospective that LED source used as illumination light source and decoration source in future is positive and expectative.

[0004] However, high power LED light source needs to be improved in radiation brightness. The cost also needs to be reduced.

[0005] The purpose of this invention is to provide a high power LED lamp, which is environment protective and energy-saving with long performance life. The new designed utilized increases the radiation brightness efficiently. The heat-sinking and anti-vibration capability is also greatly improved with even radiation and higher brightness.

[0006] In order to realize the above purpose, this invention utilizes the following features.

[0007] A high power LED lamp consists of lampshade, LED light source and its driving circuit, heat sink, lamp holder and the bearing base. The LED light source is fixed on the heat sink, its two poles are electrically connected with the corresponding control terminals of the driving circuit board; the upper part of the bearing base supports the heat sink unit, the lower part connects with the lamp holder; the above Said LED light source consists of a high power LED which is integrated by a set of multichip modules.

[0008] The said LED Light Source is either hooded with the heat sink under the lampshade together or the LED light source hooded under the lampshade independently.

[0009] Heat abstraction of the invention high power LED lamp is designed to be achieved through metal heat sink, which ensures the LED lamp serves under constant temperature.

[0010] 80~240VAC circuit input and constant current output driven high power LED make the light radiation stable without stroboflash.

[0011] The bearing base can be manufactured by using America UL certified plastic materials or other applicable inflaming retarding materials to ensure fire prevention and safety.

[0012] The high power LED lamp of this invention provides a kind of decoration light source featured for environment protective, energy saving, long performance life and quick response.

[0013] Advantages of this invention product:

- adopting this invention high power LED as the light source, so as to avoid of damaging the object under radiation of the light;
- Being the cold light source, LED boasts long performance life. Accordingly, the high power LED lamp boasts low malfunction rate, which greatly reduces the cost of maintenance and repair.
- low power consumption, energy saving;
- the diversity of LED light source color enables the invention high power LED lamp to display the color as required, which broadens the scope of applicable color compare with traditional incandescent decoration lamp.
- the connecting fitting can choose universal holder, which is convenient and suitable for the decoration light source in hotel and restaurant, etc.
- american UL certified materials are used for the manufacturing of fittings, which provides more reliable safety.

[0014] According to the invention, the high power LED is mounted on an heat sink (3) which is supported by bearing base, which lower part is connected to a lamp holder and comprising a lampshade, and a driving circuit board. The lamp holder being a traditional holder used for regular incandescent lamps

[0015] According to another characteristic, the high power LED is integrated by a set of multi-chip modules.

[0016] According to a complementary characteristic the high power LED heat sink is made with metal materials, and for example is made into blossom shape heat delivery structure.

[0017] According to another characteristic the LED light source is hooded with the heat sink under the lampshade together, and is hooded under the lampshade independently.

[0018] It is to note that, the multi-chip integrated high power LED applies LED with butterfly-shaped radiation angle of 360/275°.

[0019] Other characteristics and advantages of the invention will emerge from the description which will follow as well as annexed drawings which are given as nonrestrictive examples

[0020] Figure. 1 is an illustration of the High Power LED lamp.

[0021] Figures 2a, 2b, 2c, 2d, 2e, 2f are illustrations of the structure of the heat s, figure 2a being an external view, figure 2b being a top plan view, figure 2c is the upward view, figure 2d is an erect pictorial view, figure 2e being a pictorial view, figure 2f being a sectional view.

[0022] Figures. 3a, 3b, 3c are illustrations of the structure of the bearing base, figure 3a being an external view, figure 3b being a sectional view, figure 3c a top plan view.

[0023] Figure. 4 is a representation of the structure of the lamp holder

[0024] Figure 5 is an electronic schematic diagram of LED light source driving circuit.

[0025] As shown in Fiure.1, the major components of the high power LED lamp include: one lampshade (1), one LED light source (2), one heat sink (3), one bearing base (, one lamp holder (5) and the circuit board (not shown in Figure 1, can be placed between bearing base (4) and lamp holder (5) that drives the LED Light Source.

[0026] Traditional LED light source encapsulates LED inside pattern assembly, whose brightness is inadequate to meet the requirement of illumination. The LED light source used in this invention is a kind of new type of light source that is uniquely designed to realize high brightness without the consequent high heat generation. It consists of high power LED integrated by a set of multi-chip module.

[0027] The lampshade (1) of the high power LED lamp of invention can be made of transparent or semitransparent materials with better light transmittance.

[0028] As it represented on Figure.2, the application of heat sinking structure is also one bright spot of this invention. LED light source connection unit can be provided on the upper end of heat sink (3), in the sample application, LED light source connection unit is equipped with screw thread 301 inside of LED light source; heat sink uses metal materials and is made into blossom shape (with blossom body 302) heat delivery structure for better heat emission.

[0029] As represented by Figures.3a, 3b, 3c, the bearing base (4), which can be made of plastic, connects upper part and joints lower part. In the sample application, the plastic bearing base (4) is like a cup at upper part with supporting table (401) on the edge of upper internal open equipped with a group of supporting block (402) used to support heat sink component, the lower part is clamp (403) that connects to standard lamp holder. Plastic bearing base can preferably use America UL certified UL flaming retarding component, which is safe and fire proof. Other flaming retarding materials can also be used.

[0030] As shown on Figure. 4, the said lamp holder (5) can choose the one of the current universal standard or adopt non-standard lamp holder as needed to fasten it on the clamp (403) of the plastic base (4) directly. The said high power LED light source is fastened on heat sink with its two poles connected to the corresponding control terminals of driving circuit board; clamp the integral body into the cup-shape plastic bearing base (4) through the lampshade (1).

[0031] The LED light source radiation angle is chosen at 360/275° butterfly-shaped light shape or full-shaped 360°, because the LED radiation angle is big, the radiation effect is even. The heat emission of metal heat sink ensures the LED serve under a constant temperature.

[0032] The driving circuit sample application of the invention LED light source is represented by figure 5

[0033] The circuit is 110VAC input, after rectifier commutation and filtered by capacitance and inductance, it enters into a chip and then output 320MA constant current. Circuit applies the high bright LED driving chip U1 HV9910. HV9910 is a high efficient PWM LED driver control integrated circuit that can drive LED with constant current and high efficiency. It is applicable to drive from une to several hundreds of LED groups, therefore, it is suitable to drive the LED light source of this invention product, and it will make the performance of the circuit of this invention as mentioned above

- stable output: 320mA constant current output is provided when the input voltage is 110V AC, the high power LED lamp can provide stable light radiation without stroboflash.
- high reliability: the circuit performance is stable after high temperature and high humidity test, etc.

[0034] The driving circuit is small in size to meet the requirement of installation in a confined area. Other model LED driving chip can be used on equivalent principle, which will not be detailed here.

[0035] The invention high power LED lamp is a kind of decoration and illumination light source featured for environment protective, energy saving, long performance life and quick response.

[0036] In the manufacturing process of the high power LED lamp: first fasten the high power LED on the heat sink, weld the constant current drive electron plate of the LED light source, after the welding is completed, install the plastic base and fasten the heat sink and plastic base with screws, place the circuit board inside the plastic base, assemble lamp holder and then weld, after that, assemble the glass shell with glue.

[0037] Various LED light sources with different effects can be made according to the parameters of angle, color and brightness, etc of the high power LED to meet the requirements of various environments and customers. Special design can be made according to special requirements of customers, such as the LED color zone, brightness change, alternation of installation method, change of input voltage, etc.

[0038] The above sample application can be altered in several ways within the protection scope of the invention, therefore, the structures in the above descriptions and the illustration figures are for examples only, and will not limit the applied patent scope of this invention.

Claims

1. High power LED lamp wherein the LED (2) is mounted on an heat sink (3) which is supported by bearing base (4) which lower part is connected to a lamp holder (5) and wherein the high power LED comprising a lampshade (1) and a driving circuit board.

2. High power LED light according to claim 1, wherein the high power LED is integrated by a set of multichip modules.

3. High power LED according to one of preceding claims, wherein the heat sink (3) is made with metal materials.

4. High power LED according to claim 3, wherein the heat sink (3) is made into blossom shape heat delivery structure.

5. High power LED lamp according to one of preceding claims, wherein, wherein the said LED light source is hooded with the heat sink under the lampshade together.

6. High power LED according to one of claims 1 to 5, wherein or the LED light source is hooded under the lampshade independently.

7. High power LED according to one of claims 2 to 6, wherein the multi-chip integrated high power LED applies LED with butterfly-shaped radiation angle of 360/275°.

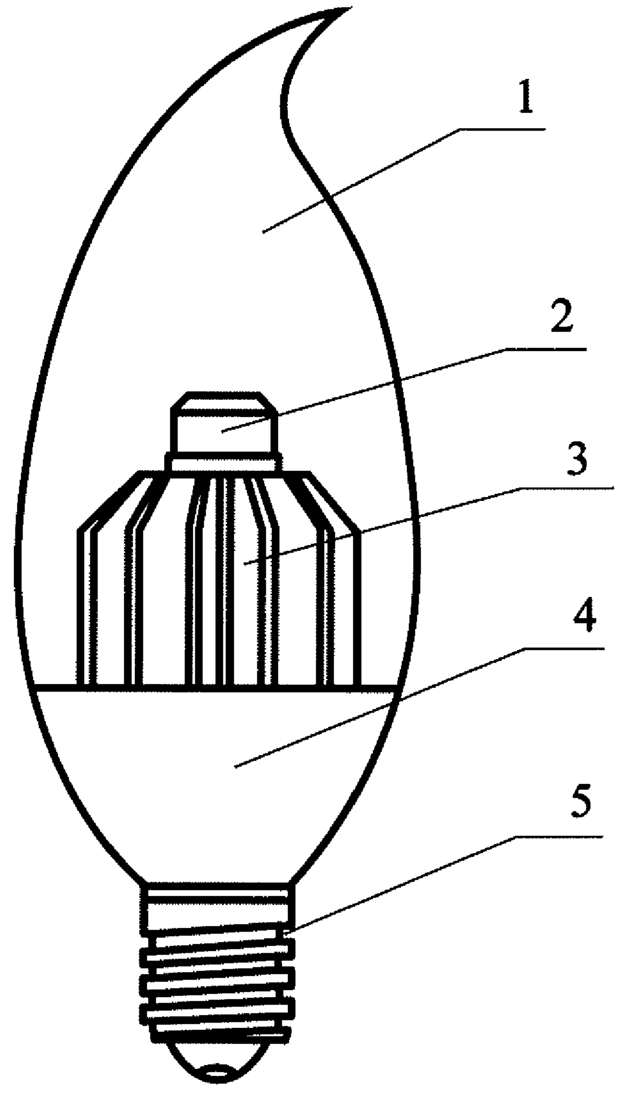

Fig.1

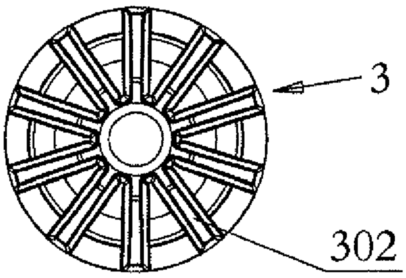

Fig. 2b

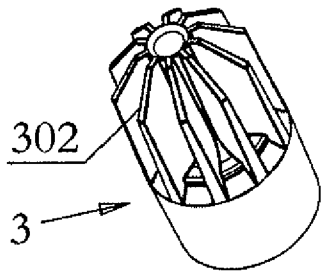

Fig. 2d

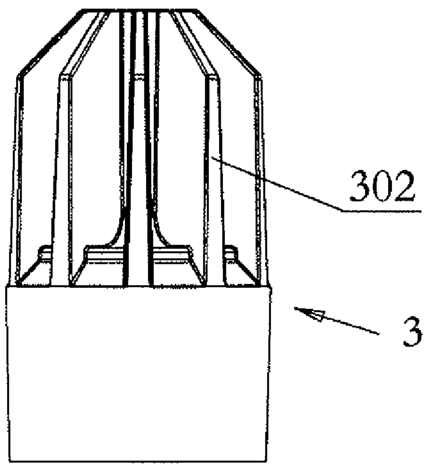

Fig. 2a

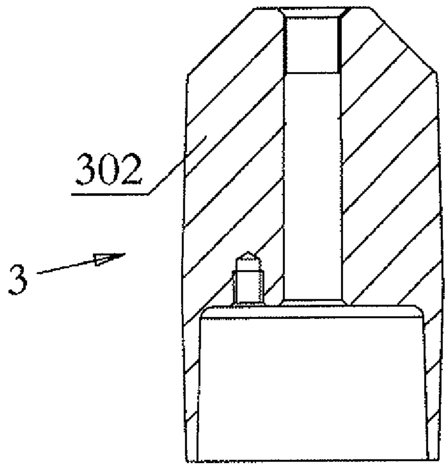

Fig. 2f

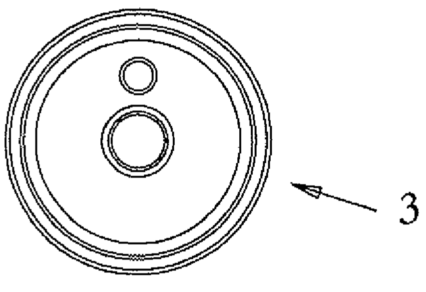

Fig. 2c

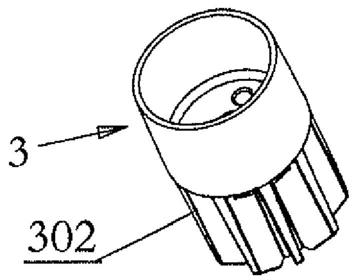

Fig. 2e

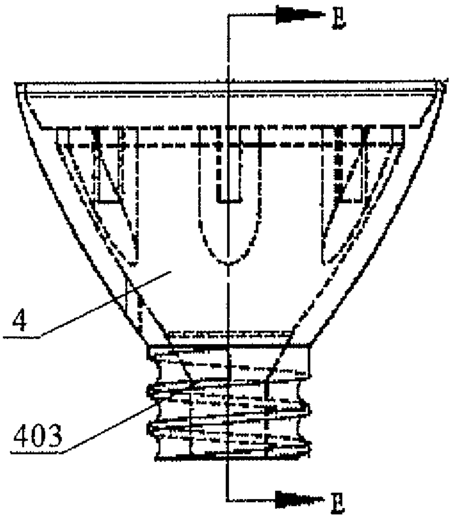

Fig.3a

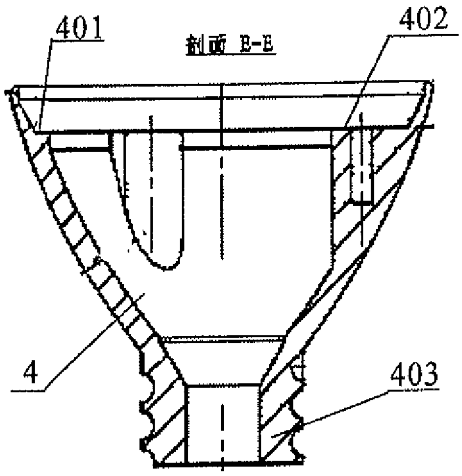

Fig.3b

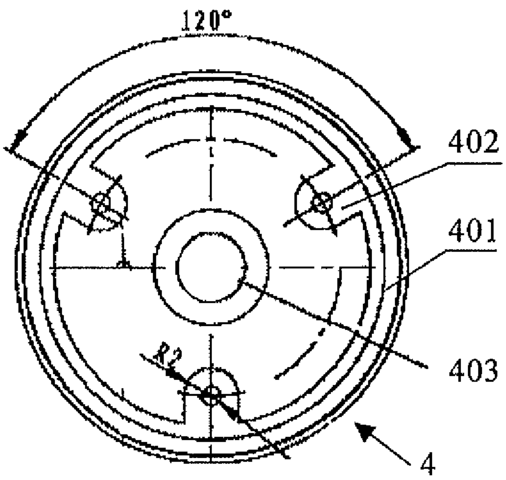

Fig.3c

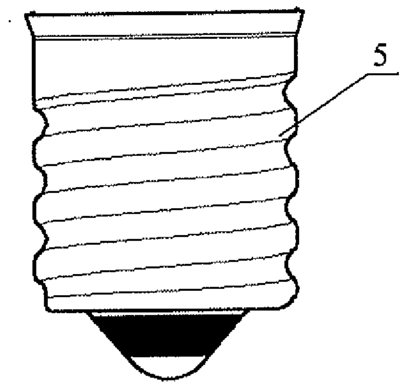

Fig.4

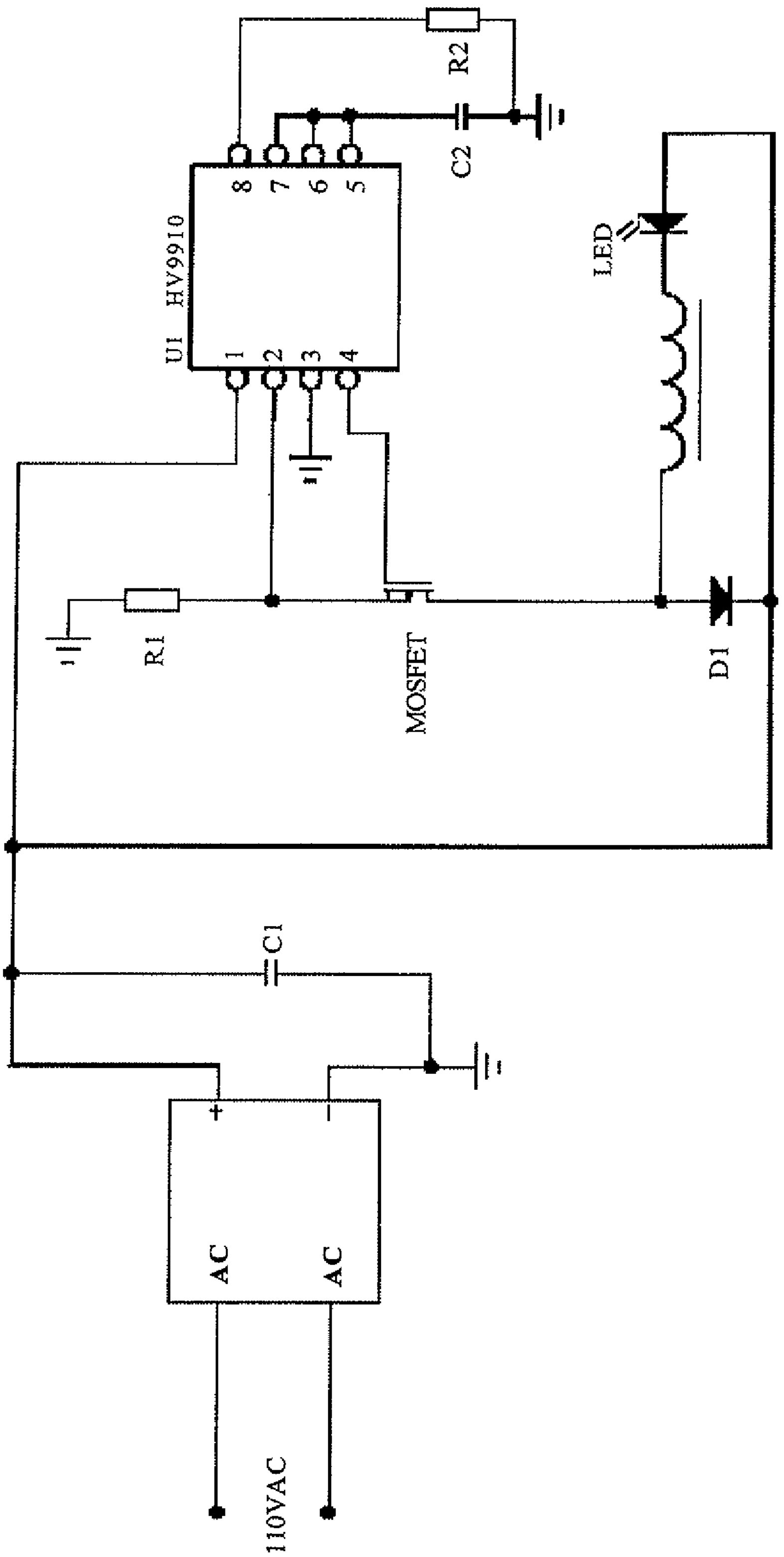

Fig. 5

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EUROPEAN SEARCH REPORT

Application Number
EP 09 16 3795

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The present search report has been drawn up for all claims

1

Place of search	Date of completion of the search	Examiner
Munich	11 December 2009	Schmid, Klaus

CATEGORY OF CITED DOCUMENTS

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