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(54) **Energy efficient high intensity reflector lamp**

Energieeffiziente Reflektorlampe mit hoher Intensität

Lampe à réflecteur à haute intensité et écoénergétique

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Description

Fields of the invention

[0001] The present invention relates to a light emitting diode (LED) lamp, especially to an energy efficient high intensity reflector lamp that features on reduced volume and enhanced heat dissipation property.

Descriptions of Related Art

[0002] Document US 2012/0002419 A1 discloses a reflector lamp.

[0003] Refer to Fig. 8, a conventional reflector lamp includes a light emitting diode (LED) 61 disposed on a light emitting diode (LED) unit 60. The LED unit 60 is also arranged with a driving electronic 62 and is connected to a heat conducting portion 63 for heat dissipation. The LED unit 60 is further connected to a LED driver 64 and the LED driver 64 is fastened on a driver's heat dissipation portion 65 so as to dissipate heat generated. All the components mentioned above are mounted and positioned in a clamp 70 and then is set into a housing 80. A lens unit 81 and a front cover 82 are covered over an opening of the housing 60. Thus light emitted from the LED 61 passes through the lens unit 81 to be projected lightly outward. However, the above structure has following disadvantages: (1) Both the LED unit 60 and the LED driver 64 are disc-like circuit boards being disposed with a lot of electronics. Thus they have larger volume and occupy more space. Therefore the space of the housing 80 needs to be increased in order to receive the LED unit 60 and the LED driver 64. The total volume of the device is too large. (2) The LED 61 and the driving electronic 62 are assembled on the same LED unit 60. While in use, the LED 61 generates a lot of heat that is directly conducted to the driving electronic 62. Thus the driving electronic 62 is easy to get damaged due to overheat. The LED unit 60 also has bad heat dissipation. Therefore the problem of poor heat dissipation occurs. (3) Both the LED unit 60 and the LED driver 64 are exposed to air. This not only cause structural instability but also sulfuration of the components that has negative effect on durability. (4) The LED unit 60 and the LED driver 64 are connected to the heat conducting portion 63 and the driver's heat dissipation portion 65. However, the heat dissipation structure is covered by the housing 80, the lens unit 81 and the front cover 82. Thus hot air therein is unable to transfer heat by convection and conduction. Moreover, the heat radiating area of the heat conducting portion 63 and the driver's heat dissipation portion 65 is insufficient. No effective barrier is formed between LED 61 and the LED driver 64. Thus the whole structure is under high temperature working environment. The LED driver 64 is overheated and damaged due to poor heat dissipation performance.

SUMMARY OF THE INVENTION

[0004] In order to overcome the above shortcomings of the techniques available now, there is a need to provide a novel energy efficient high intensity reflector lamp.

[0005] The reflector lamp includes an integrally formed aluminum shade disposed with a plurality of heat dissipation fins, a round plate, a reflector installed on top of the shade, a housing disposed with inclined locking blocks and stopping strips, and an electronic device. The shade includes a heat dissipation channel communicating an inner side and an outer side thereof, a circular groove disposed close to the bottom end thereof, at least one stopping slot arranged axially and a mounting portion close to the top end thereof. An outer edge of the round plate is tightly riveted onto the mounting portion of the shade and a LED light is disposed on a front surface of the round plate. The reflector is installed on top of the shade. A plurality of inclined locking blocks and a plurality of stopping strips are projected from a surface of the housing. The housing is mounted into and fixed on the shade by the stopping strip inserted into the stopping slot and the inclined locking blocks locked into the circular groove of the shade. And the shade is only in contact with the housing at the inclined locking blocks. The electronic device is formed by a main circuit board and at least one secondary circuit board while the secondary circuit board is disposed on the main circuit board perpendicularly. Thus the electronic device is able to be mounted in the housing and used to control the LED light.

[0006] Moreover, external threads are formed on the heat dissipation fins and are around a top end of the shade while the reflector is positioned by a fixing ring. The fixing ring is disposed with internal threads on an inner edge thereof. Thus the fixing ring is fastened on the heat dissipation fins by the internal threads engaged with the external threads.

[0007] An adhesive sealant is filled between the round plate and the LED light.

[0008] At least one slot is arranged at the main circuit board of the main circuit board.

[0009] A plurality of electric contacts is disposed projectingly on a surface of the housing while the electronic device is connected to the electric contacts.

[0010] An adhesive sealant is filled inside the housing.

[0011] The electronic device is connected to a protective capacitor. One end of the protective capacitor and the electronic device are conducted to each other while the other end of the protective capacitor is connected to a wire. The wire is clipped between the housing and the shade. While performing high voltage insulation test, the protective capacitor conducts the high voltage current to the shade to form a test loop, without passing the LED light. The protective capacitor prevents the high voltage current from flowing through the LED light, working as high voltage shielding.

[0012] The electronic device is connected to a magnetic reluctance that eliminates noises.

[0013] Therefore it is a primary object of the present invention to provide an energy efficient high intensity reflector lamp in which the secondary circuit board of the electronic device is disposed on the main circuit board perpendicularly for reducing volume of the electronic device and enabling the electronic device to be mounted into the housing smoothly. The volume of the whole reflector lamp is reduced.

[0014] It is another object of the present invention to provide an energy efficient high intensity reflector lamp that includes the housing for receiving an electronic device therein. The space in the housing is filled with the adhesive sealant for covering and positioning the electronic device. The heat dissipation of the electronic device is also improved by heat conduction of the adhesive sealant. Moreover, sulfuration of the electronic device is also eliminated due to vacuum state formed by the adhesive sealant.

[0015] It is a further object of the present invention to provide an energy efficient high intensity reflector lamp in which the housing is fixed on the shade by the inclined locking blocks of the housing locked into the circular groove of the shade. Moreover, the fixing ring is fastened on the shade by the internal threads of the fixing ring engaged with the external threads of the heat dissipation fins of the shade. The assembly is fast and non-contact. Thus the value added is increased.

[0016] It is a further object of the present invention to provide an energy efficient high intensity reflector lamp in which rotation of the housing and the shade is prevented by the stopping strips of the housing connected to the stopping slot of the shade. By local contact at the inclined locking blocks between the housing and the shade, the contact area between the housing and the shade is dramatically reduced and heat conduction is reduced. Thus the electronic device will not be affected by high temperature of the end with the LED light and having higher durability.

[0017] It is a further object of the present invention to provide an energy efficient high intensity reflector lamp in which the shade is integrally formed and made from aluminum. A plurality of heat dissipation fins is arranged circularly around the tubular shade. Thus Air flows through the space between the heat dissipation fins so as to dissipate heat more effectively. The heat dissipation of the shade is further improved by the heat dissipation channel that is communicating an inner side and an outer side of the shade.

[0018] It is a further object of the present invention to provide an energy efficient high intensity reflector lamp in which an adhesive sealant is arranged between the round plate and the LED light to fill pores therebetween for improving heat conduction and dissipation.

BRIEF DESCRIPTION OF THE DRAWINGS

[0019] The structure and the technical means adopted by the present invention to achieve the above and other

objects can be best understood by referring to the following detailed description of the preferred embodiments and the accompanying drawings, wherein

- 5 Fig. 1 is a perspective view of an embodiment according to the present invention;
- Fig. 2 is an explosive view of an embodiment according to the present invention;
- 10 Fig. 3 is a perspective view of an electronic device of an embodiment according to the present invention;
- Fig. 4 is an explosive view of a light emitting diode light of an embodiment according to the present invention;
- 15 Fig. 5 is a schematic drawing showing a shade and a housing being assembled of an embodiment according to the present invention;
- Fig. 6 is a longitudinal cross sectional view of an embodiment according to the present invention;
- 20 Fig. 7 is a cross sectional view of an embodiment according to the present invention;
- Fig. 8 is a cross sectional view of a conventional light emitting diode (LED) light according to the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

- [0020]** Refer from Fig. 1 to Fig. 7, an energy efficient high intensity reflector lamp of the present invention includes a shade 10, a round plate 20, a reflector 30, a housing 40, and an electronic device 50. The shade 10 is integrally formed and made from aluminum. A plurality of heat dissipation fins 11 is arranged circularly around the tubular shade 10 and a heat dissipation channel 12 communicating an inner side and an outer side of the shade 10 is disposed circularly around the tubular shade 10. The heat dissipation effect of the shade 10 is increased by the heat dissipation fins 11 and the heat dissipation channel 12. External threads 111 are formed on the heat dissipation fins 11 and are around a top end of the shade 10. A circular groove 13 is mounted inside the shade 10, close to the bottom end of the shade 10 while at least one stopping slot 14 is axially arranged in the shade 10. A mounting portion 15 is formed adjacent to the top end of the shade 10. An outer edge of the round plate 20 is tightly riveted onto the mounting portion 15 of the shade 10 and a LED light 21 is disposed on a front surface of the round plate 20. An adhesive sealant 22 is arranged between the round plate 20 and the LED light 21 to fill pores therebetween and enhance heat conduction and dissipation. The reflector 30 is installed on top of the shade 10 so that light from the LED light 21 is converged and emitted out. A fixing ring 31 is used to position the reflector 30 and is disposed with internal threads 311 on an inner edge thereof. The internal threads 311 of the fixing ring 31 are engaged with the external threads 111 of the heat dissipation fins 11. A

plurality of inclined locking blocks 41 and a plurality of stopping strips 42 are projected from a surface of the housing 40. After the housing 40 being mounted into the shade 10, the stopping strip 42 is inserted into the stopping slot 14 for preventing the shade 10 and the housing 40 from rotating. The inclined locking blocks 41 are pressed and locked into the circular groove 13 of the shade 10. Thus the shade 10 is only in contact with the housing 40 at the inclined locking blocks 41 so as to block heat conduction effectively. Moreover, a plurality of electric contacts 43 is disposed projectingly on the surface of the housing 40. The electronic device 50, having a main circuit board 51 and at least one secondary circuit board 52, is connected to the electric contacts 43. There is at least one slot 511 on the main circuit board 51 for providing electrical isolation. The secondary circuit board 52 is arranged at the main circuit board 51 perpendicularly so as to reduce the volume of the electronic device 50. Thus the electronic device 50 can be mounted in the housing 40 for control of the LED light 21. An inner space of the housing 40 is filled with an adhesive sealant 44 and the adhesive sealant 44 is used for positioning and improving heat dissipation of the electronic device 50. Furthermore, the electronic device 50 is in vacuum insulation due to the adhesive sealant 44. Thus capacitor electrolyte is unable to evaporate and sulfuration of the electronic device 50 will not occur. Therefore the service life is extended. The structure mentioned above not only reduces overall volume but also improves heat dissipation.

[0021] As shown in Fig. 2, the electronic device 50 is connected to the electric contacts 43 of the housing 40. Due to perpendicular design of the main circuit board 51 to the secondary circuit board 52, the volume of the electronic device 50 is reduced and is able to be mounted into the housing 40 easily. Then the electronic device 50 is vacuum sealed by the adhesive sealant 44 filled in the housing 40. Thus the electronic device 50 is not only fixed firmly, the heat dissipation thereof is effectively improved and the sulfuration is minimized. Next the housing is arranged into the shade 10. The rotation of both the housing 40 and the shade 10 is prevented by the stopping strips 42 of the housing 40 and the stopping slot 14 of the shade 10. By the inclined locking blocks 41 of the housing 40 being pressed and locked into the circular groove 13 of the shade 10, the housing 40 and the shade 10 are in a partial contact and are fixed. Moreover, the electronic device 50 is electrically connected to the LED light 21 of the round plate 20. Thereby the electrical contact 43 and the LED light 21 are electrically connected and the LED light 21 is controlled by the electronic device 50. Then the round plate 20 is fixed on the mounting portion 15 of the shade 10 by rivets. The reflector 30 is arranged in front of the LED light 21 in the shade 10 and is fixed by the internal threads 311 of the reflector 30 engaged with the external threads 111 of the heat dissipation fins 11. Thus light from the LED light 21 is concentrated and emitted. The structure mentioned above has following advantages:

(1) The secondary circuit board 52 of the electronic device 50 is disposed on the main circuit board 51 in the direction perpendicular to the main circuit board 51. Thus the volume of electronic device 50 is reduced and is able to be mounted into the housing smoothly. The overall volume of the reflector lamp is decreased. (2) After receiving the electronic device 50, the housing is filled with the adhesive sealant 44 so as to cover and position the electronic device 50. Moreover, the heat dissipation of the electronic device 50 is enhanced due to heat conduction of the adhesive sealant 44. The sulfuration of the electronic device 50 is also minimized due to the vacuum state formed by the adhesive sealant 44. (3) The housing 40 is assembled with the shade 10 by the inclined locking blocks 41 being pressed and locked into the circular groove 13. The round plate 20 is riveted and fixed on the mounting portion 15 of the shade 10. The internal threads 311 of the reflector 30 are engaged with the external threads 111 of the heat dissipation fins 11 of the shade 10. The assembly is fast and non-contact. The value added is increased. (4) The rotation of both the housing 40 and the shade 10 is prevented by the stopping strips 42 of the housing 40 connected to the stopping slot 14 of the shade 10. And the housing 40 and the shade 10 are in a partial contact by the inclined locking blocks 41 of the housing 40 being pressed and locked into the circular groove 13 of the shade 10. Thereby the contact area between the housing 40 and the shade 10 is significantly reduced and thermal conduction is reduced. Thus the electronic device 50 will not be affected by high temperature of the end with the LED light 21 and having higher durability. (5) The tubular shade 10 is integrally formed, made from aluminum and having a plurality of heat dissipation fins 11 therearound. Air flows through the space between the hollowed-out heat dissipation fins 11 so as to dissipate heat more effectively. Moreover, the heat dissipation of the shade 10 is further improved by the heat dissipation channel 12 that is communicating an inner side and an outer side of the shade 10. (6) The adhesive sealant 22 between the round plate 20 and the LED light 21 fills pores therebetween to improve heat conduction and dissipation therebetween.

[0022] Refer to FIG. 2 and Fig. 6, the electronic device 50 is connected to a magnetic reluctance 53 that eliminates noises. By the magnetic reluctance 53, noises of the current flowing from the electric contact 43 and the electronic device 50 are filtered and eliminated so as to improve the stability in use. Moreover, the LED light 21 is fixed on the round plate 20 with high thermal conductivity so that the working temperature of the LED light 21 is significantly decreased. Once the insulation strength is not enough, high voltage current easily enables a spark jumps from the LED light 21 to the shade 10 and this lead to damages of the LED light 21 while performing high voltage insulation test. The lamp is also unable to pass the high voltage test. In order to solve the problem, the electronic device 50 is connected to a protective capacitor 54. One end of the protective capacitor 54 and the

electronic device 50 are conducted to each other while the other end of the protective capacitor 54 is connected to a wire 541. The wire 541 is clipped between the housing 40 and the shade 10. The capacitance of the protective capacitor 54 is at least five times than larger the total capacitance of the electronic device 50. Under normal use of the electronic device 50, the capacitor 54 is an open circuit and has no effect on use and control of the LED light 21. While performing high voltage insulation test between the electric contact 43 and the shade 10, the high voltage current flows through the electric contact 43, the electronic device 50 and the wire 541 to reach the protective capacitor 54. Then the protective capacitor 54 conducts the high voltage current to the shade 10 to form a test loop, without passing the LED light 21. The protective capacitor 54 prevents the high voltage current from flowing through the LED light 21, working as high voltage shielding. Thus the LED light 21 is protected by the protective capacitor 54 and the safety requirements are met.

Claims

1. An energy efficient high intensity reflector lamp comprising :

a shade (10) that is tubular, integrally formed and made from aluminum; the shade is disposed with a plurality of heat dissipation fins (11) there-around and having a heat dissipation channel (12) communicating an inner side and an outer side thereof, a circular groove (13) disposed close to a bottom end thereof, at least one stopping slot (14) arranged axially and a mounting portion (15) arranged close to a top end thereof; a round plate (20) whose is tightly riveted onto the mounting portion (15) of the shade and a LED light (21) is disposed on a front surface of the round plate (20); a reflector (30) that is installed on top of the shade (10) so that light from the LED light is converged and emitted out; a housing (40) that includes a plurality of inclined locking blocks (41) and a plurality of stopping strips (42) projecting from a surface thereof; the housing (20) is mounted into the shade (10) and the stopping strip (42) is inserted into the stopping slot (14) for preventing the shade and the housing from rotating; and the inclined locking blocks (42) are locked into the circular groove (13) of the shade so that the shade is only in contact with the housing at the inclined locking blocks for effectively blocking heat conduction; and

an electronic device (50) that includes a main circuit board (51) and at least one secondary circuit board (52); the secondary circuit board is disposed on the main circuit board perpendicu-

larly so as to reduce volume of the electronic device; thus the electronic device (50) is mounted in the housing (40) and used to control the LED light (21); the electronic device not only has reduced volume but also provides enhanced heat dissipation.

2. The device as claimed in claim 1, wherein external threads are (111) formed on the heat dissipation fins and are around a top end of the shade (10) while the reflector is positioned by a fixing ring (31); he fixing ring is disposed with internal threads (311) on an inner edge thereof; thus the fixing ring is fastened on the heat dissipation fins by the internal threads engaged with the external threads.
3. The device as claimed in claim 1, wherein an adhesive sealant (22) is arranged between the round plate (20) and the LED light (21) to fill pores therebetween for improving heat conduction and dissipation.
4. The device as claimed in claim 1, wherein least one slot (511) is arranged at the main circuit board of the main circuit board (51) and the slot provides electrical isolation.
5. The device as claimed in claim 1, wherein a plurality of electric contacts (43) is projecting from a surface of the housing while the electronic (50) device is connected to the electric contacts.
6. The device as claimed in claim 1, wherein an adhesive sealant (44) is filled in the housing and the adhesive sealant is used for positioning the electronic device (50) and dissipating heat of the electronic device.
7. The device as claimed in claim 1, wherein the electronic device (50) is connected to a protective capacitor (54); one end of the protective capacitor and the electronic device are conducted to each other while the other end of the protective capacitor is connected to a wire (541); the wire is clipped between the housing and the shade; the protective capacitor conducts high voltage current to the shade (10) to form a test loop, without passing the LED light (21); the protective capacitor works as high voltage shielding for preventing the high voltage current from flowing through the LED light.
8. The device as claimed in claim 1, wherein the electronic device is connected to a magnetic reluctance (53) that eliminates noises.

Patentansprüche

1. Energieeffiziente Hochintensitäts-Reflektorlampe

umfassend:

einen Lampenschirm (10), der röhrenförmig, integral geformt und aus Aluminium gefertigt ist, wobei der Lampenschirm mit einer Vielzahl von Wärmedissipationsrippen (11) um diesen herum ausgebildet ist und einen Wärmedissipationskanal (12), über den eine Innenseite und eine Außenseite des Schirms miteinander kommunizieren, eine ringförmige Nut (13), die nahe seinem Boden angeordnet ist, mindestens einen Stoppschlitz (14), der axial angeordnet ist, und ein Montageteil (15) aufweist, das nahe seinem oberen Ende ausgebildet ist, eine runde Platte (20), die fest auf das Montageteil (15) des Lampenschirms genietet ist, wobei eine LED-Leuchte (21) an einer Vorderfläche der runden Platte (20) angeordnet ist, einen Reflektor (30), der an der Oberseite des Lampenschirms (10) installiert ist, sodass Licht von der LED-Leuchte konvergiert und emittiert wird, ein Gehäuse (40), das eine Vielzahl von geneigten Verriegelungsblöcken (41) und eine Vielzahl von Stopfstreifen (42) umfasst, die von einer Fläche desselben abstehen, wobei das Gehäuse (20) in den Lampenschirm (10) montiert ist und der Stopfstreifen (42) in den Stoppschlitz (14) eingeführt ist, um den Lampenschirm und das Gehäuse am Rotieren zu hindern, wobei die geneigten Verriegelungsblöcke (42) in der kreisförmigen Nut (13) des Lampenschirms verriegelt sind, sodass zur effektiven Vermeidung von Wärmeleistung der Lampenschirm nur an den geneigten Verriegelungsblöcken mit dem Gehäuse in Kontakt steht, und eine elektronische Vorrichtung (50), die eine Hauptleiterplatte (51) und mindestens eine Sekundärleiterplatte (52) aufweist, wobei die Sekundärleiterplatte auf der Hauptleiterplatte senkrecht angeordnet ist, um das Volumen der elektronischen Vorrichtung zu verringern, wobei somit die elektronische Vorrichtung (50) in dem Gehäuse (40) montiert ist und dazu verwendet wird, die LED-Leuchte (21) zu kontrollieren, und wobei die elektronische Vorrichtung nicht nur ein reduziertes Volumen aufweist, sondern ebenfalls eine verbesserte Wärmedissipation bereitstellt.

2. Vorrichtung nach Anspruch 1, bei der Außengewinde (111) an den Wärmedissipationsrippen und um ein oberes Ende des Lampenschirms (10) herum ausgebildet sind, während der Reflektor durch einen Fixierung (31) positioniert ist, wobei der Fixiering mit Innengewinden (311) an seinem inneren Rand ausgebildet ist, wobei somit der Fixiering durch das Verzahnungen der Innengewinde mit den Außengewin-

de auf den Wärmedissipationsrippen befestigt wird.

3. Vorrichtung nach Anspruch 1, bei der ein Klebedichtungsmittel (22) zwischen der runden Platte (20) und der LED-Leuchte (21) angeordnet ist, um dazwischen befindliche Poren zu füllen und so die Wärmeleitung und Wärmedissipation zu verbessern.
4. Vorrichtung nach Anspruch 1, bei der mindestens ein Schlitz (511) an der Hauptleiterplatte (51) angeordnet ist und wobei der Schlitz elektrische Isolation bereitstellt.
5. Vorrichtung nach Anspruch 1, bei der eine Vielzahl von elektrischen Kontakten (43) von einer Oberfläche des Gehäuses hervor steht, während die elektronische Vorrichtung (50) mit den elektrischen Kontakten verbunden ist.
6. Vorrichtung nach Anspruch 1, bei der ein Klebedichtungsmittel (44) in das Gehäuse gefüllt ist und wobei das Klebedichtungsmittel dazu verwendet wird, die elektronische Vorrichtung (50) zu positionieren und Wärme der elektronischen Vorrichtung abzuleiten.
7. Vorrichtung nach Anspruch 1, bei der die elektronische Vorrichtung (50) mit einem Schutzkondensator (54) verbunden ist, wobei ein Anschluss des Schutzkondensators und die elektrische Vorrichtung miteinander verbunden sind, während der andere Anschluss des Schutzkondensators mit einem Draht (541) verbunden ist, wobei der Draht zwischen dem Gehäuse und dem Lampenschirm verklebt ist, wobei der Schutzkondensator einen Hochspannungsstrom an den Lampenschirm (10) leitet, um eine Testschleife zu bilden ohne an der LED-Leuchte (21) vorbeizukommen, und wobei der Schutzkondensator als ein Hochspannungsschutz wirkt, um zu vermeiden, dass der Hochspannungsstrom durch die LED-Leuchte fließt.
8. Vorrichtung nach Anspruch 1, bei der die elektronische Vorrichtung mit einem magnetischen Widerstand (53) verbunden ist, der Geräusche eliminiert.

Revendications

1. Lampe à réflecteur haute intensité écoénergétique comprenant :

un abat-jour (10) qui est tubulaire, formé intégralement et fait en aluminium, l'abat-jour étant disposé avec une pluralité d'ailettes de dissipation thermique (11) tout autour et ayant un canal de dissipation thermique (12) qui fait communiquer un côté intérieur et un côté extérieur de celui-ci, une rainure circulaire (13) disposée

- près d'une extrémité inférieure de celui-ci, au moins une fente d'arrêt (14) arrangée axialement et une portion de montage (15) arrangée près d'une extrémité supérieure de celui-ci ; une plaque ronde (20) qui est rivetée de manière serrée sur la portion de montage (15) de l'abat-jour et une lumière LED (21) est disposée sur une surface frontale de la plaque ronde (20) ; un réflecteur (30) qui est installé sur le dessus de l'abat-jour (10) si bien que de la lumière de la lumière LED est convergée et émise ; un boîtier (40) qui comprend une pluralité de blocs de verrouillage inclinés (41) et une pluralité de bandes d'arrêt (42) qui font saillie d'une surface de celui-ci, le boîtier étant monté dans l'abat-jour (10) et la bande d'arrêt (42) étant insérée dans la fente d'arrêt (14) pour empêcher l'abat-jour et le boîtier de tourner et les blocs de verrouillage inclinés (42) étant verrouillés dans la rainure circulaire (13) de l'abat-jour si bien que l'abat-jour est seulement en contact avec le boîtier sur les blocs de verrouillage inclinés pour bloquer la conduction thermique de manière efficace et un dispositif électronique (50) qui comprend un circuit imprimé principal (51) et au moins un circuit imprimé secondaire (52), le circuit imprimé secondaire étant disposé sur le circuit imprimé principal perpendiculairement de manière à réduire le volume du dispositif électronique, le dispositif électronique (50) étant donc monté dans le boîtier (40) et utilisé pour contrôler la lumière LED (21), le dispositif électronique n'ayant pas seulement un volume réduit mais augmentant aussi la dissipation de chaleur.
2. Dispositif selon la revendication 1, des filets extérieurs (111) étant formés sur les ailettes de dissipation thermique et étant autour d'une extrémité supérieure de l'abat-jour (10) tandis que le réflecteur est positionné par une bague de fixation (31), la bague de fixation étant disposée avec des filets intérieurs (311) sur un bord intérieur de celle-ci, la bague de fixation étant ainsi fixée sur les ailettes de dissipation thermique par les filets intérieurs en prise avec les filets extérieurs.
3. Dispositif selon la revendication 1, un mastic collant (22) étant arrangé entre la plaque ronde (20) et la lumière (21) pour remplir les pores placés entre pour améliorer la conduction thermique et la dissipation de chaleur.
4. Dispositif selon la revendication 1, la fente qui existe au moins (511) étant arrangée sur le circuit imprimé principal du circuit imprimé principal (51) et la fente procurant une isolation électrique.
5. Dispositif selon la revendication 1, une pluralité de contacts électriques (43) faisant saillie d'une surface du boîtier pendant que le dispositif électronique (50) est relié aux contacts électriques
6. Dispositif selon la revendication 1, un mastic collant (44) étant rempli dans le boîtier et le mastic collant étant utilisé pour positionner le dispositif électronique (50) et dissiper la chaleur du dispositif électronique.
7. Dispositif selon la revendication 1, le dispositif électronique (50) étant relié à un condensateur de protection (54), une extrémité du condensateur de protection et le dispositif électronique étant conduits l'un vers l'autre tandis que l'autre extrémité du condensateur de protection est reliée à un fit (541), le fil est sectionné entre le boîtier et l'abat-jour, le condensateur de protection conduit du courant haute tension à l'abat-jour (10) pour former une boucle d'essai sans faire passer la lumière LED (21), le condensateur de protection fonctionne comme blindage haute tension pour empêcher le courant haute tension de s'écouler à travers la lumière LED.
8. Dispositif selon la revendication 1, le dispositif électronique (50) étant relié à une réluctance magnétique (53) qui élimine les bruits.

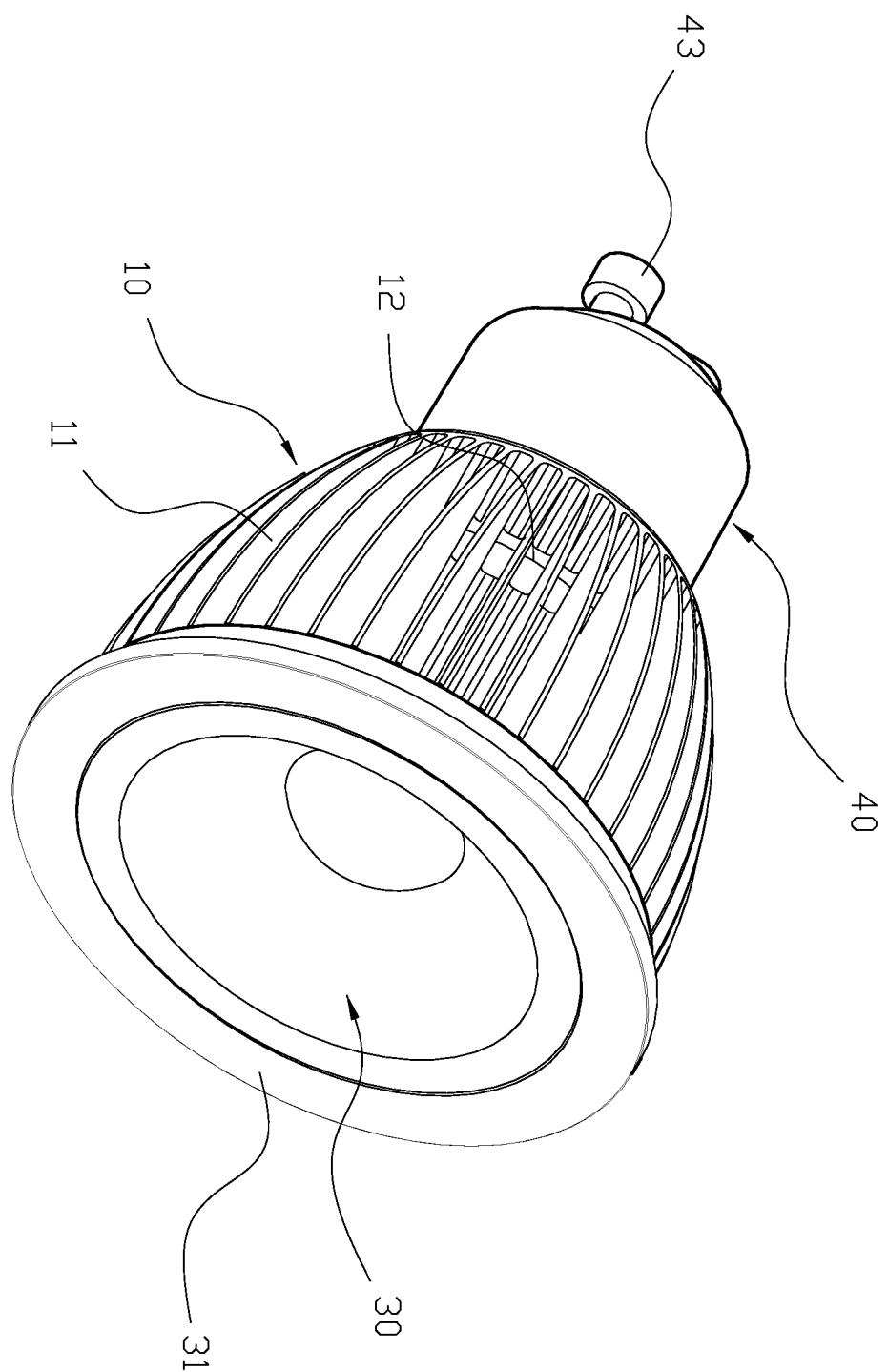


FIG. 1

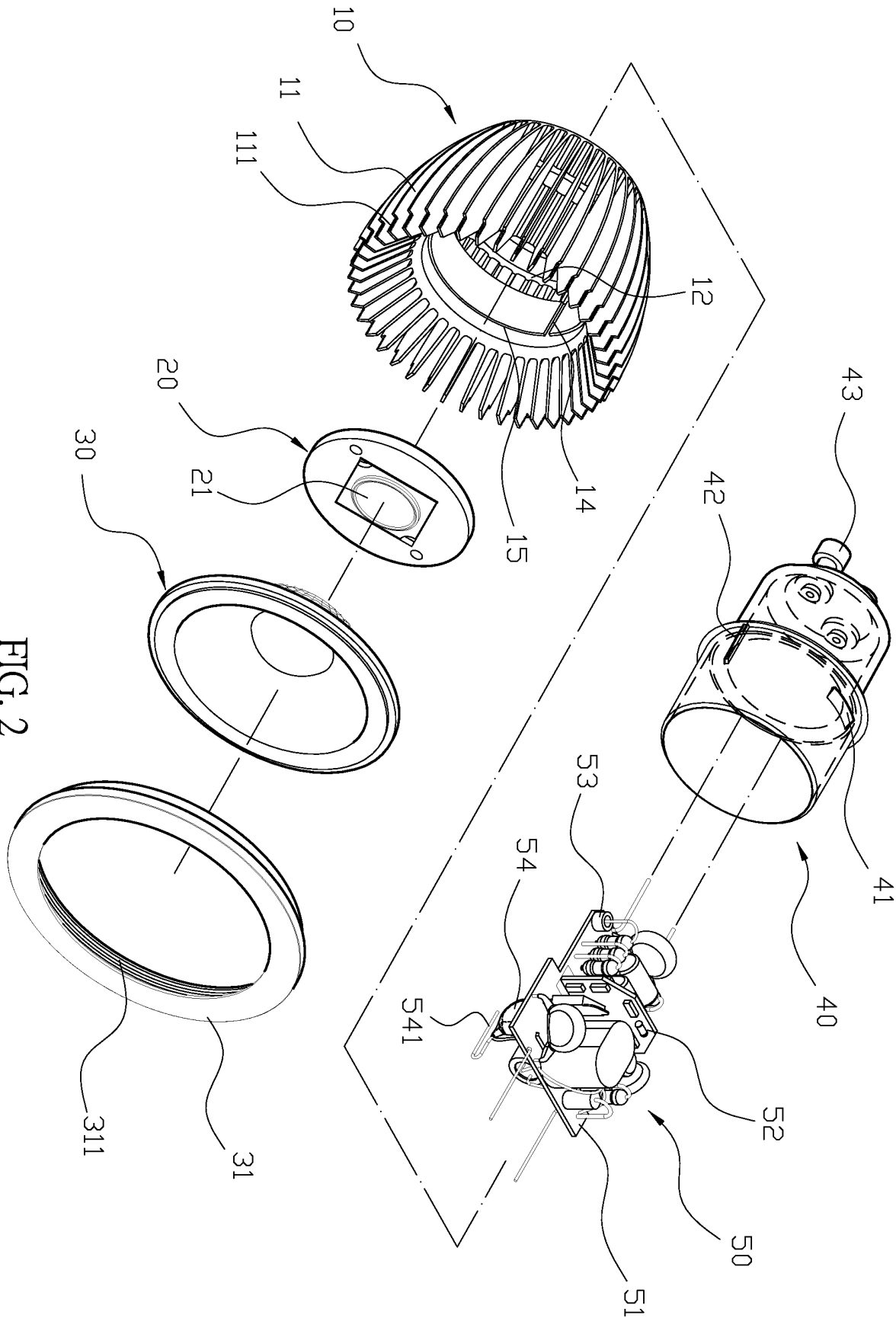


FIG. 2

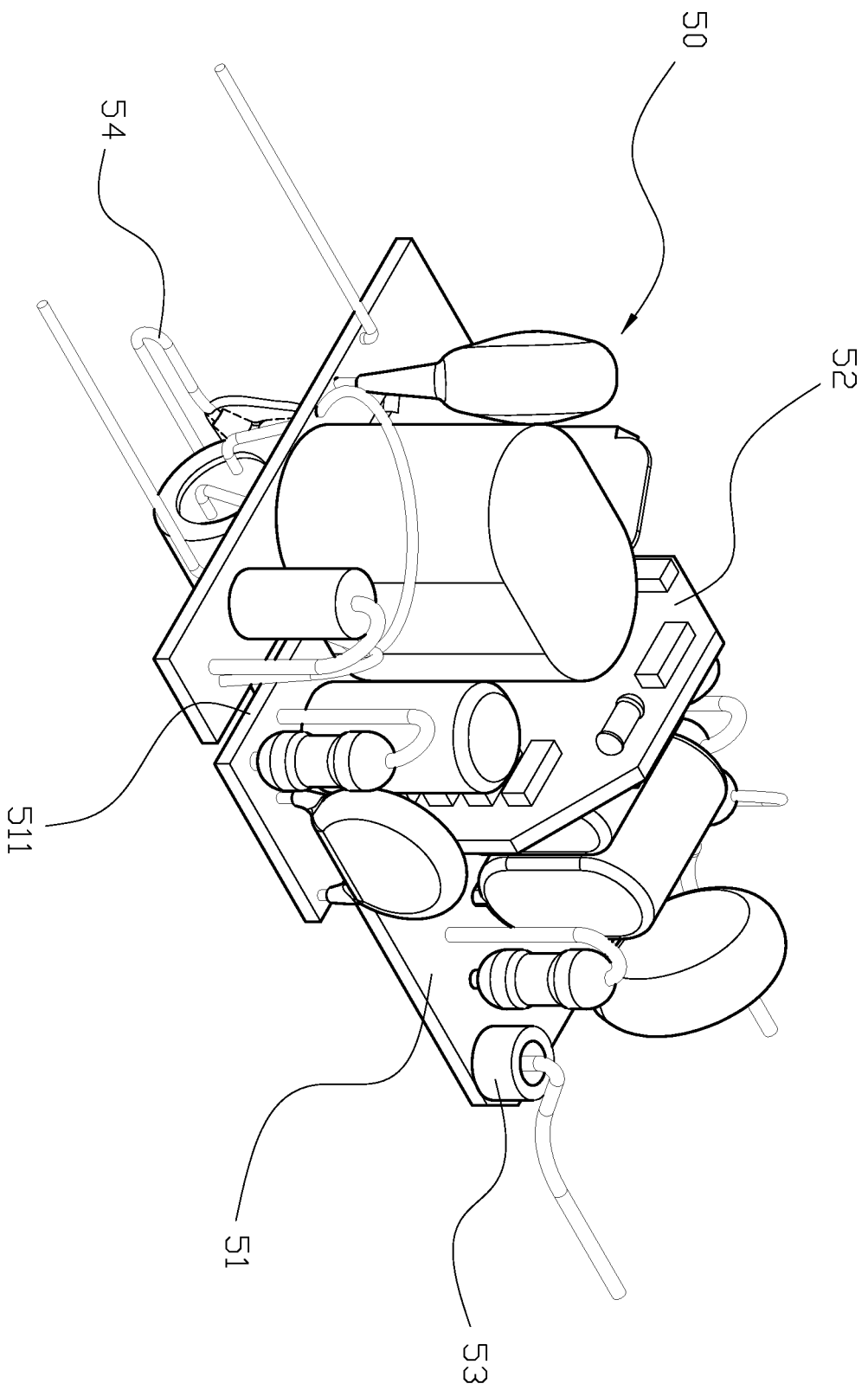


FIG. 3

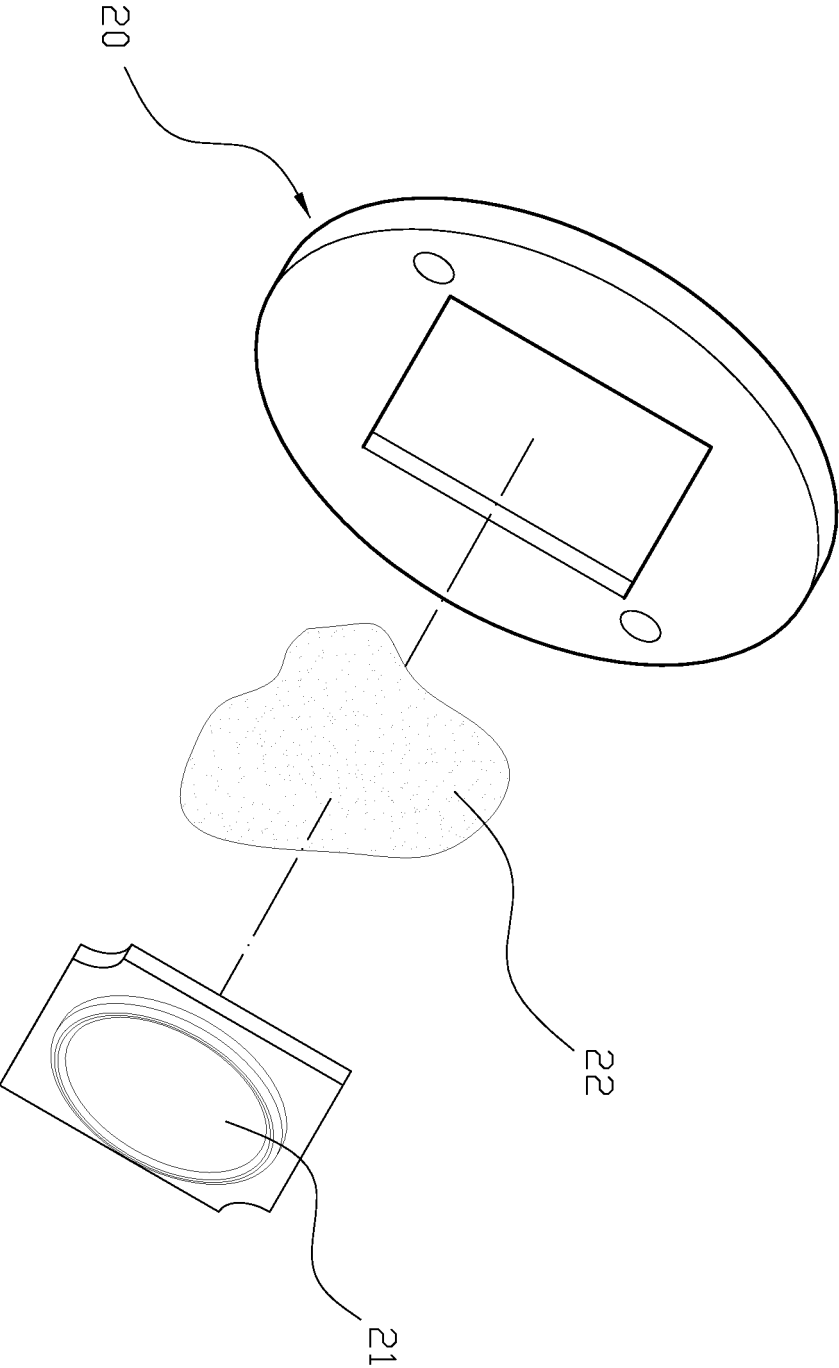


FIG. 4

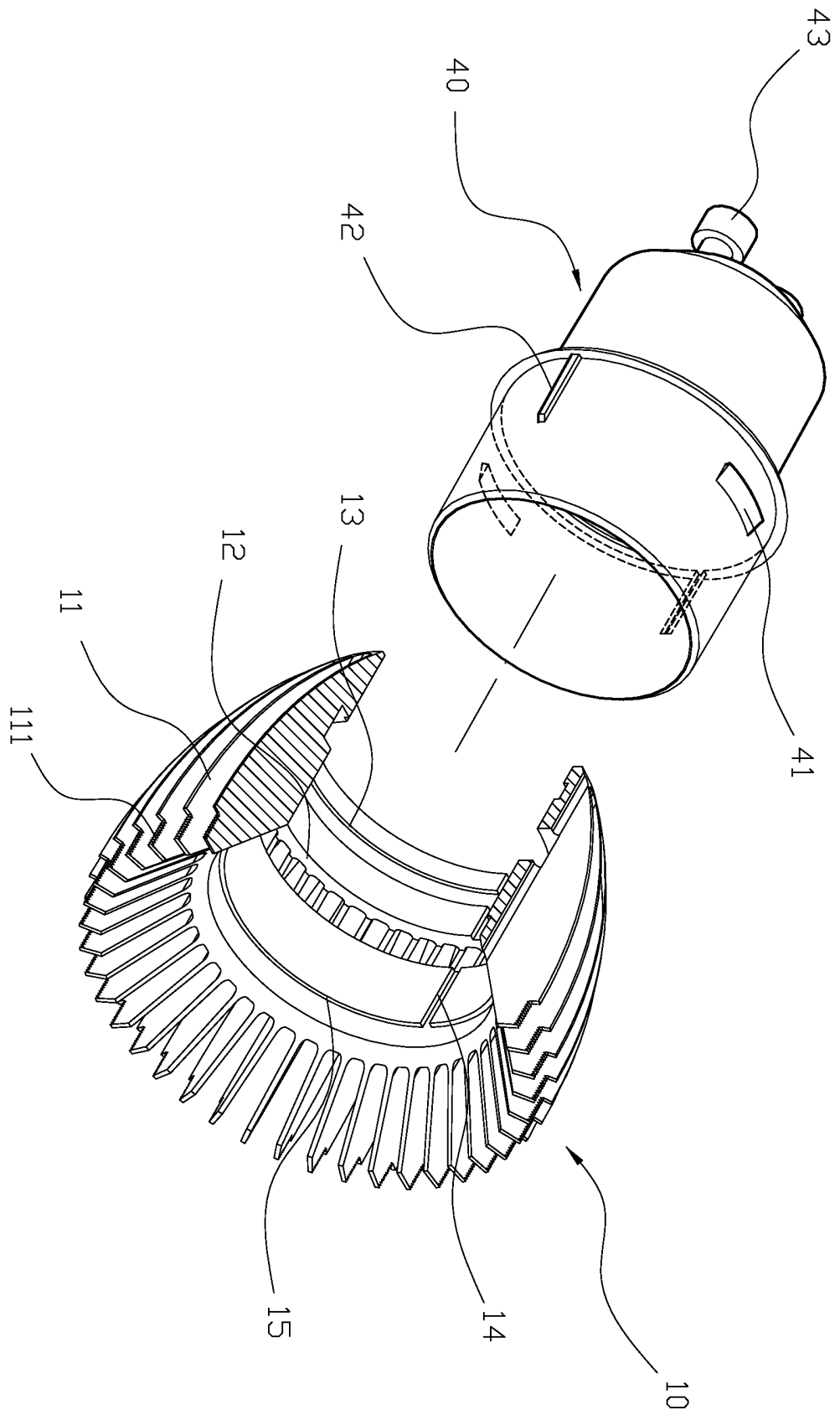
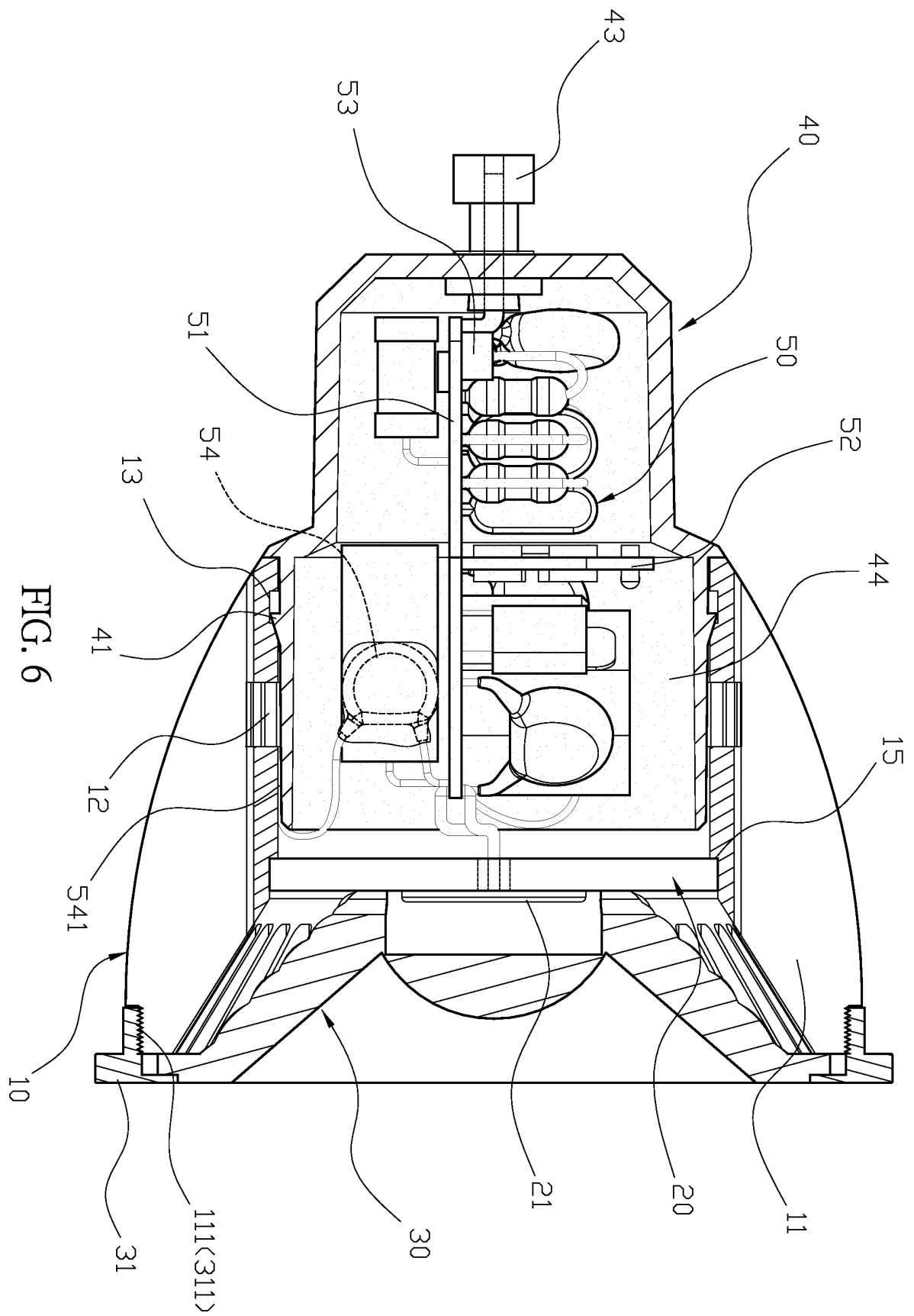


FIG. 5



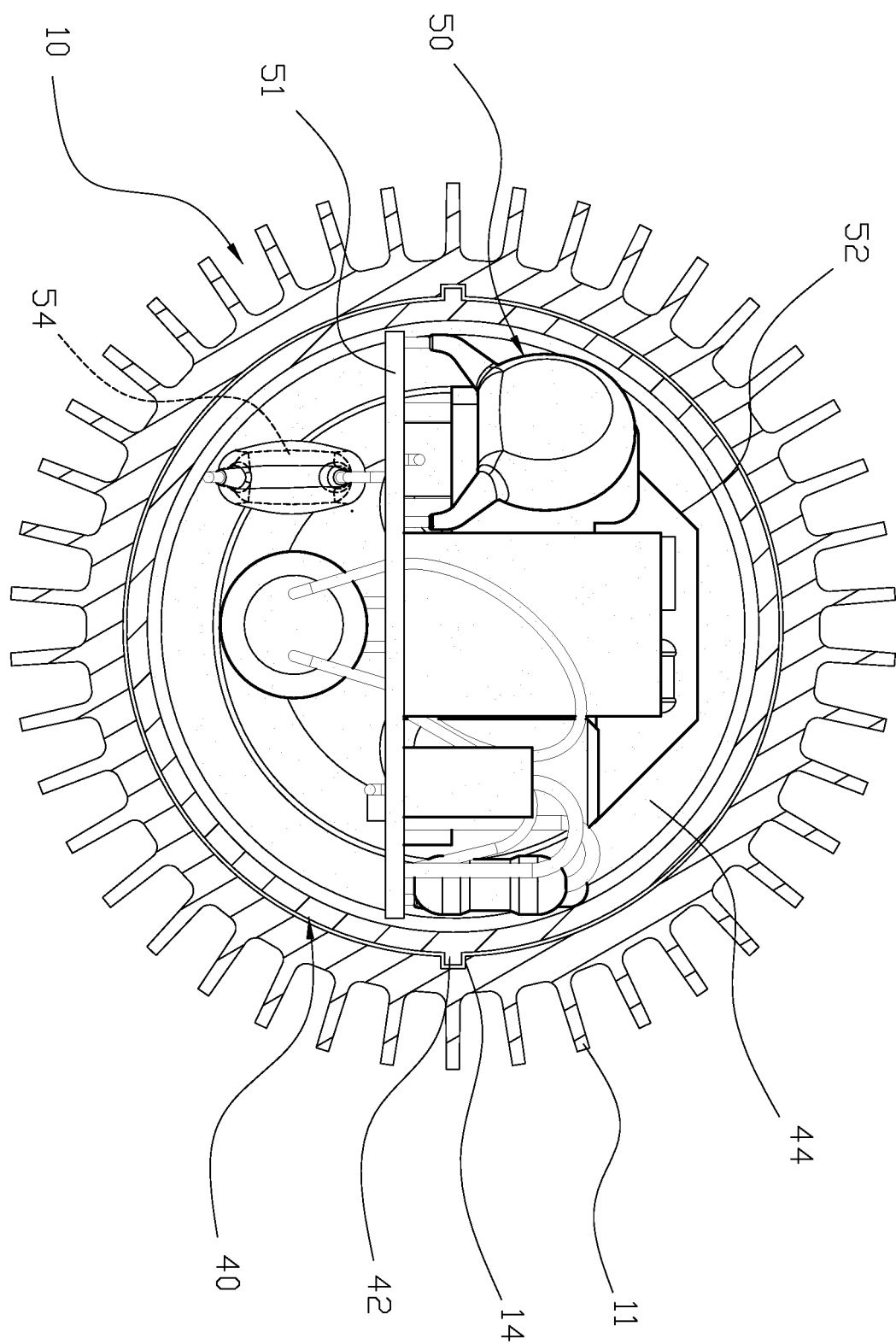


FIG. 7

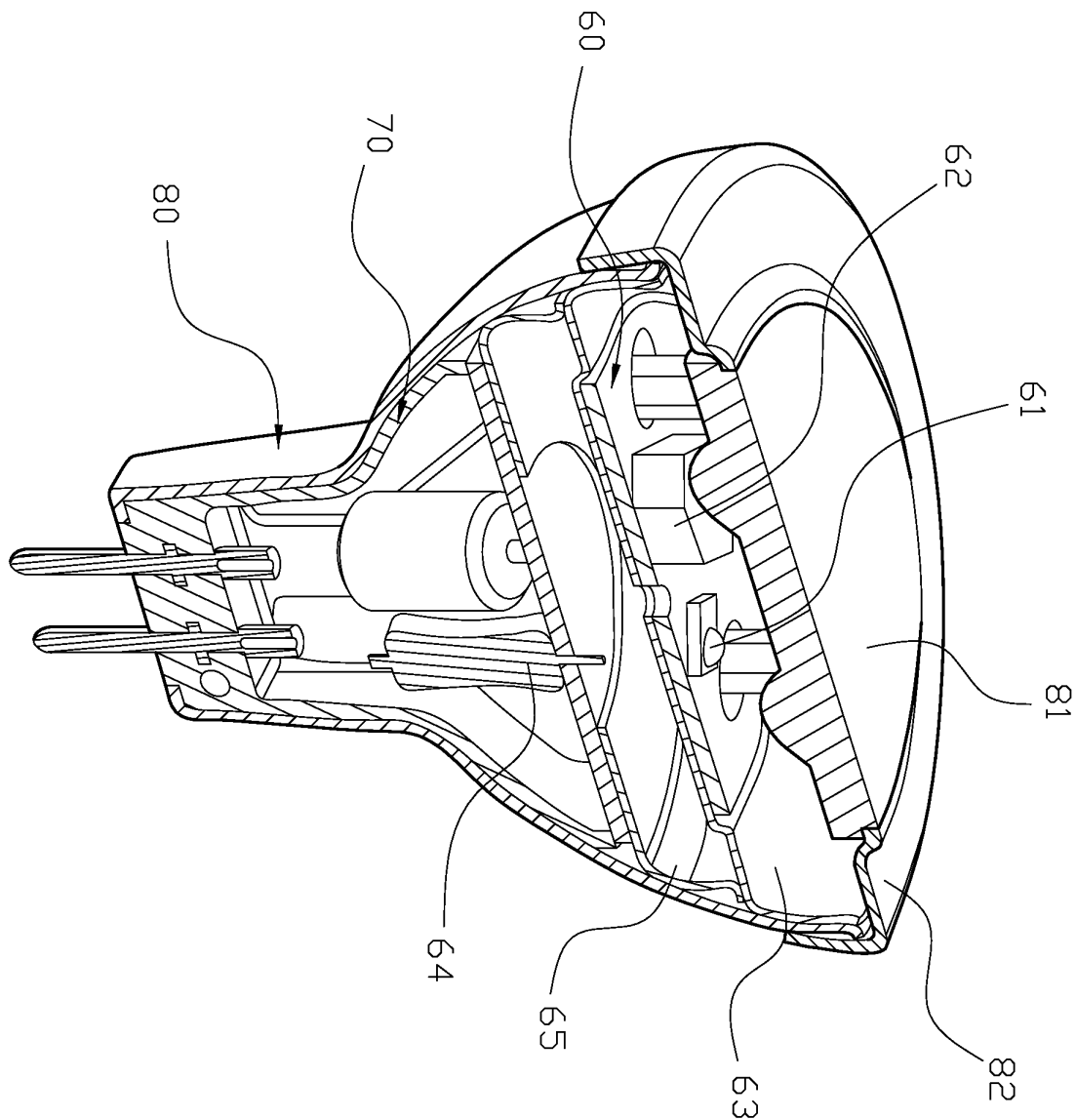


FIG. 8
PRIOR ART

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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