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Remarks:
Amended claims in accordance with Rule 137(2) EPC.

(54) **LAMP**

(57) A lamp, comprising: a heat dissipation base (10), a light source assembly (20), and a lampshade (30); wherein the heat dissipation base (10) comprises: a heat dissipation column (12) arranged on a base (11); the light source assembly (20) comprises: lamp beads (22), and a power driven module (23) both arranged on a flexible substrate (21); the flexible substrate (21) comprises: a side plate (211) wrapping outside a sidewall of the heat

dissipation column (12), and a top plate (212) connected to the side plate (211) and covering a top of the heat dissipation column (12); the lamp beads (22) are arranged on the side plate (211) and the top plate (212), respectively; and connecting strips (213) extend from a periphery of the top plate (212), and the connecting strips (213) abut against an outer side of the heat dissipation column (12) and are wrapped inside the side plate (211).

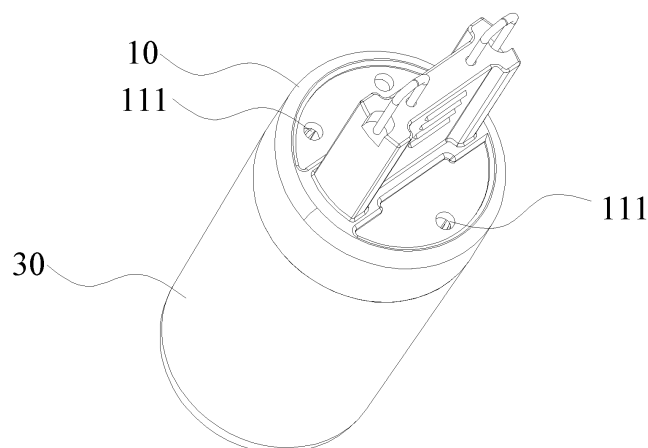


FIG. 1

Description

TECHNICAL FIELD

[0001] The present application relates to the technical field of lighting, and more particularly to a lamp.

BACKGROUND

[0002] Existing lamps, such as G9 or G4, usually include a heat dissipation base, a flexible circuit substrate surrounding the heat dissipation base, and a light source arranged on the flexible circuit substrate. In the process of actual use, the flexible circuit substrate is easily tilted up, which causes the temperature of the light source on the flexible circuit substrate to be too high, which affects the service life of the lamp.

SUMMARY

[0003] It is an object of embodiments of the present application to provide a lamp, so as to solve the technical problem that the lamp in the related art has a short service life.

[0004] To achieve the above purpose, the technical solution adopted by an embodiment of the present application is: a lamp, comprising: a heat dissipation base, a light source assembly, and a lampshade arranged outside the light source assembly. The heat dissipation base comprises: a base and a heat dissipation column arranged on the base. The light source assembly comprises: a flexible substrate, lamp beads, and a power driven module arranged on the flexible substrate. The flexible substrate comprises: a side plate wrapping outside a sidewall of the heat dissipation column, and a top plate connected to the side plate and covering a top of the heat dissipation column. The lamp beads are arranged on the side plate and the top plate, respectively. Connecting strips extend from a periphery of the top plate, and the connecting strips abut against an outer side of the heat dissipation column and are wrapped inside the side plate.

[0005] In an embodiment, the number of the connecting strips is plural, and a plurality of connecting strips are spacedly arranged along the periphery of the top plate.

[0006] In an embodiment, a back surface of the flexible layer is provided with an adhesive layer; and the adhesive layer is attached to the heat dissipation column for fixation.

[0007] In an embodiment, a contour shape of the top of the heat dissipation column is a polygon or a circle, and a contour shape of the top plate is as same as the contour shape of the top of the heat dissipation column.

[0008] In an embodiment, the light source assembly further comprises electrode conductive terminals electrically connected to the power driven module; and the lamp beads, the power driven module, and the electrode conductive terminals are integrated on the flexible substrate.

[0009] In an embodiment, the heat dissipation column

is provided with an accommodation cavity configured for accommodating a power driven module; the side plate and/or the top plate defines therein first heat dissipation holes communicating with the accommodation cavity, and the base defines therein second heat dissipation holes communicating with the first heat dissipation holes and the outside, respectively.

[0010] In an embodiment, the number of the first heat dissipation holes is plural, and/or the number of the second heat dissipation holes is plural.

[0011] In an embodiment, the sidewall of the heat dissipation column defines therein a slot, and the slot communicates with the accommodation cavity and is configured for allowing the side plate to pass through, such that the power driven module is accommodated in the accommodation cavity.

[0012] In an embodiment, the lamp further includes a thermal conductive sleeve sleeved outside the heat dissipation column; and the side plate is wrapped outside a sidewall of the thermal conductive sleeve, and the connecting strips abut against a sidewall of the thermal conductive sleeve.

[0013] In an embodiment, the thermal conductive sleeve is a thermal conductive silicone rubber piece.

[0014] The beneficial effect of the lamp according to embodiments of the present application are summarized as follows: compared with the prior art, the lamp provided by the present application has connecting strips extending from the periphery of the top plate, and the connecting strips abut against the outer side of the heat dissipation column and is wrapped inside the side plate, thereby preventing the flexible substrate from being tilted and avoiding the occurrence of high temperature of the lamp bead arranged on the flexible substrate as in prior art due to the tilting up of the flexible substrate, which affects the service life of the lamp.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] In order to explain technical solutions in embodiments of the present application more clearly, the drawings used in the embodiments or the exemplary technical description will be briefly introduced below. Obviously, the drawings in the following description are only some embodiments of the present application, for those of ordinary skill in the art, other drawings can be obtained based on these drawings without devoting creative work.

FIG. 1 is a perspective schematic view of a lamp according to an embodiment of the present application;

FIG. 2 is an exploded schematic view of a lamp according to an embodiment of the present application;

FIG. 3 is a sectional schematic view of a lamp according to an embodiment of the present application;

FIG.4 is a perspective schematic view of a light source assembly according to an embodiment of the present application;

FIG. 5 is a perspective schematic view of the light source assembly according to an embodiment of the present application from another angle;

FIG. 6 is a sectional schematic view of a light source assembly used in an embodiment of the present application;

FIG.7 is a partial schematic view of FIG. 6;

FIG.8 is a perspective schematic view of a heat dissipation base used in an embodiment of the present application;

FIG. 9 is a first assemblage schematic view showing a light source assembly assembled on a heat dissipation base according to an embodiment of the present application;

FIG. 10 is a second assemblage schematic view showing a light source assembly assembled on a heat dissipation base according to an embodiment of the present application;

FIG. 11 is a third assemblage schematic view showing a light source assembly assembled on a heat dissipation base according to the present application.

Reference numerals used in the drawings are as follows:

[0016] 10- Heat dissipation base; 11- Base; 111- Second heat dissipation hole; 12- Heat dissipation column; 121-Accommodation cavity; 122- Slot; 20- Light source assembly; 21- Flexible substrate; 211- Side plate; 212- Top plate; 2121-First heat dissipation hole; 213-Connecting strip; 214-Adhesive layer; 22-Lamp bead; 23-Power driven module; 24-Electrode conductive terminals; 30-Lampshade; 40- Thermal conductive sleeve.

DETAILED DESCRIPTION OF THE EMBODIMENTS

[0017] In order to make the technical problems, technical solution and beneficial effects of the present application to be more clearly understood, the present application will be further described in detail below with reference to the accompanying drawings and embodiments. It should be understood that the specific embodiments described herein are only used to explain the present application and are not intended to limit the present application.

[0018] It should be noted that when an element is called "fixed to" or "arranged on" another element, it may be directly on another element or indirectly on the other el-

ement. When an element is referred to as being "connected to" another element, it can be directly connected to the other element or indirectly connected to the other element.

[0019] In addition, the terms of "first" and "second" are used for descriptive purposes only, and cannot be understood as indicating or implying relative importance or implicitly indicating the number of technical features indicated. Therefore, the features defined as "first" and "second" may explicitly or implicitly include one or more features. In the description of the present application, the meaning of "a plurality of" is two or more, unless specifically defined otherwise. The meaning of "several" is one or more, unless specifically defined otherwise.

[0020] In the description of the present application, it should be understood that the orientations or position relationship indicated by the terms of "center", "length", "width", "thickness", "upper", "lower", "front", "rear", "left", "right", "vertical", "horizontal", "top", "bottom", "inside", "outside" are based on the orientations or position relationship as shown in the drawings, only for easing of describing the present application and simplifying the description, rather than indicating or implying that the device or element referred to must have a specific orientation or construct and operate in a specific orientation, and therefore which cannot be understood as a limitation on the present application.

[0021] In the description of the present application, it should be noted that the terms of "install", "link", and "connect" should be understood in a broad sense unless otherwise specified and limited. For example, the terms of "install", "link", and "connect" may be a fixed connection or a disassembly connection, or integral connection; it can be mechanical or electrical connection; it can be directly connected or indirectly connected through an intermediate medium, it can be the internal connection of two elements or the interaction between two elements. For those of ordinary skill in the art, the specific meanings of the above terms in the present application can be understood according to specific situations.

[0022] Reference to "an embodiment" or "some embodiments" throughout the specification means that a particular feature, structure, or characteristic described in connection with the embodiment is included in at least one embodiment of the present application. Thus, not all the phrases of "in an embodiment" or "in some embodiments" in various places throughout the specification refer to the same embodiment. Furthermore, the particular features, structures, or characteristics may be combined in any suitable manner in one or more embodiments.

[0023] For the convenience of description, the three coordinate axes that are mutually orthogonal in space are defined as X axis, Y axis, and Z axis, meanwhile, the direction along X axis is longitudinal, the direction along Y axis is lateral, and the direction along Z axis is vertical; X axis and Y axis are two coordinate axes perpendicular to each other on the same horizontal plane, and Z axis is a vertical coordinate axis; X axis, Y axis, and Z axis

are located in space perpendicular to each other. Three planes are XY plane and YZ plane and XZ plane, where XY plane is a horizontal plane, XZ plane and YZ plane are vertical planes, and XZ plane is perpendicular to YZ plane. The three axes in space are X axis, Y axis, and Z axis. Moving along the three axes in space refers to moving along the three axes that are perpendicular to each other in space, especially moving along the X, Y, and Z axes in space; and plane movement refers to moving on the XY plane.

[0024] Please refer to FIG. 1 to FIG. 3, the lamp provided by the present application will be described. The present application provides a lamp, including: a heat dissipation base 10, a light source assembly 20, and a lampshade 30 which is arranged outside the light source assembly 20. As shown in FIG. 8, the heat dissipation base 10 includes a base 11 and a heat dissipation column 12 arranged on the base 11. Specifically, in this embodiment, the base 11 and the heat dissipation column 12 are integrally formed and connected. As shown in FIG. 4 to FIG. 5, the light source assembly 20 includes: a flexible substrate 21, lamp beads 22, and a power driven module 23 arranged on the flexible substrate 21. The lamp beads 22 can be LED lamp beads. The flexible substrate 21 includes: a side plate 211 wrapping outside a sidewall of the heat dissipation column 12, and a top plate 212 connected to the side plate 211 and covering a top of the heat dissipation column 12. The lamp beads 22 are arranged on the side plate 211 and the top plate 212, respectively. By arranging the lamp beads 22 on the side plate 211 and the top plate 212, the light emitting angle and the irradiation range can be further improved. As shown in FIGS. 6, 7 and 9, connecting strips 213 extend from a periphery of the top plate 212, and the connecting strips 213 abut against an outer side of the heat dissipation column 12 and are wrapped inside the side plate 211. When assembling, as shown in FIG. 9, firstly, the side plate 211 are aligned with the sidewall of the heat dissipation column 12, the top plate 212 is aligned with the top of the heat dissipation column 12, and one end of the side plate 211 is enabled to wrap outside the sidewall of the heat dissipation column 12; then, as shown in FIG. 10, the top plate 212 is flipped over so that the top plate 212 contacts with the top of the heat dissipation column 12, and the connecting strip 213 is flipped over to abut against the outer side of the heat dissipation column 12; finally, as shown in FIG. 11, the other end of the side plate 211 is wrapped outside the connecting strip 213 and the heat dissipation column 12, so as to achieve the installation of light source assembly 20. Due to the arrangement of the connecting strip 213, the flexible substrate 21 can be prevented from being tilted up, and avoiding the occurrence of excessive high temperature of the lamp beads 22 arranged on the flexible substrate 21 due to the tilting up of the flexible substrate 21 in the prior art, which thereby affects the service life of the lamp.

[0025] Compared with the prior art, in the lamp provided by the present application, the connecting strips 213

extend from the periphery of the top plate 212, abut against the outer side of the heat dissipation column 12 and are wrapped inside the side plate 211, thereby preventing the flexible substrate 21 from being tilted up and avoiding the occurrence of excessive high temperature of the lamp beads 22 arranged on the flexible substrate 21 due to the tilting up of the flexible substrate 21 in the prior art, which thereby affects the service life of the lamp.

[0026] Optionally, as a specific embodiment of the lamp provided by the present application, the side plate 211, the top plate 212, and the connecting strip 213 are integrally formed and connected, and only need to be manually bent in use, which is not only small in size, simple in structure, but also very easy and convenient to assemble.

[0027] Optionally, referring to FIG. 4 and FIG. 9, as a specific embodiment of the lamp provided by the present application, the number of the connecting strips 213 is plural, and a plurality of connecting strips 213 are spacedly arranged along the periphery of the top plate 212. By providing a plurality of connecting strips 213, the connection strength between the connecting strips 213 and the side plate 211 can be strengthened, and the flexible substrate 21 can be effectively prevented from being tilted up. Specifically, the number of the connecting strips 213 can be arranged according to actual needs, for example, it can be one, two, four, or more.

[0028] Optionally, please refer to FIG. 9, as a specific embodiment of the lamp provided by the present application, a back surface of the flexible layer 21 is provided with an adhesive layer 214. The adhesive layer 214 is attached to the heat dissipation column 12 for fixation. The fixation connection between the adhesive layer and the heat dissipation column 12 are achieved in an attachment manner, which is very simple and cost saving.

[0029] Optionally, please refer to FIG. 2 and FIG. 9, as a specific embodiment of the lamp provided by the present application, a contour shape of the top of the heat dissipation column 12 is a polygon or a circle, and a contour shape of the top plate 212 is as same as the contour shape of the top of the heat dissipation column 12 in order to fit the top of the heat dissipation column 12. In an embodiment of the present application, the contour shape of the top of the heat dissipation column 12 may be a pentagon, a hexagon, or the like.

[0030] Optionally, referring to FIGS. 4 to 5, as a specific embodiment of the lamp provided by the present application, the light source assembly 20 further includes electrode conductive terminals 24 electrically connected to the power driven module 23. Specifically, the electrode conductive terminals 24 are positive electrodes and negative conductive terminals, which are used for electrical connection with an external power source. The lamp beads 22, the power driven module 23, and the electrode conductive terminals 24 are integrated on the flexible substrate 21. The conventional lamp beads 22, power driven module 23, and electrode conductive terminals 24 are usually assembled separately, and the welding and

assembly are required during assembly process, making the procedures extremely complicated. The present application integrates the lamp beads 22, the power driven module 23, and the electrode conductive terminals 24 on the flexible substrate 21, which can greatly simplify the assembly process and improve the assembly efficiency.

[0031] Optionally, referring to FIG. 4 and FIG. 8, as a specific embodiment of the lamp provided by the present application, the heat dissipation column 12 is provided with an accommodation cavity 121 configured for accommodating a power driven module 23, and the top plate 212 defines therein first heat dissipation holes 2121 communicating with the accommodation cavity 121, and the base 11 defines therein second heat dissipation holes 111 communicating with the first heat dissipation holes 2121 and the outside, respectively. By the arrangement of the first heat dissipation holes 2121 and the second heat dissipation holes 111, the air convection from inside to outside of the accommodation cavity 121 is achieved, so that the heat emitted by the lamp beads 22 is quickly discharged out of the lamp, thereby improving the heat dissipation effect, preventing the light source from fading, and being applicable to high power lamps. It should be noted that the way of arrangement the first heat dissipation holes 2121 is not limited to this. For example, in other preferred embodiments of the present application, the first heat dissipation holes 2121 may be separately arranged on the side plate 211; or in order to improve the heat dissipation effect, the first heat dissipation holes 2121 can be arranged on the top plate 212 and the side plate 211, respectively.

[0032] Optionally, referring to FIG. 4 and FIG. 8, as a specific embodiment of the lamp provided by the present application, the number of the first heat dissipation holes 2121 is plural, for example, it can be two, three, or even up to ten, and the number of the second heat dissipation holes 111 is plural, for example, it can be two, three, or even up to ten. By providing a plurality of first heat dissipation holes 2121 and second heat dissipation holes 111, the heat can be dissipated quickly and the heat dissipation effect can be improved.

[0033] Optionally, referring to FIG. 8 and FIG. 9, as a specific embodiment of the lamp provided by the present application, the sidewall of the heat dissipation column 12 defines therein a slot 122, and the slot 122 communicates with the accommodation cavity 121 and is configured for allowing the side plate 211 to pass through, such that the power driven module 23 is accommodated in the accommodation cavity 121, thereby saving space and volume.

[0034] Optionally, referring to FIG. 2 and FIG. 3, as a specific embodiment of the lamp provided by the present application, the lamp further includes a thermal conductive sleeve 40 sleeved outside the heat dissipation column 12. Specifically, in this embodiment, the side plate 211 is wrapped outside a sidewall of the thermal conductive sleeve 40, and the connecting strips 213 abut against a sidewall of the thermal conductive sleeve 40. By ar-

ranging the thermal conductive sleeve 40, heat dissipation can be accelerated, the heat dissipation effect can be improved, and the service life of the lamp can be extended.

[0035] Optionally, referring to FIG. 2 and FIG. 3, as a specific embodiment of the lamp provided by the present application, the thermal conductive sleeve 40 is a thermal conductive silicone rubber piece. The use of high thermal conductivity silicone rubber material can effectively improve the heat dissipation effect. Specifically, the shape of the thermal conductive sleeve 40 matches with the shape of the heat dissipation column 12.

[0036] Optionally, as a specific embodiment of the lamp provided by the present application, the heat dissipation base 10 is a ceramic heat dissipation mechanism. By using a highly thermal conductive ceramic material, the heat generated by the lamp beads 22 can be quickly discharged out of the lamp, which effectively improves heat dissipation efficiency and extends lamp life.

[0037] The above description is only an optional embodiment of the present application and is not intended to limit the present application. Any modification, equivalent replacement, and improvement made within the spirit and principles of the present application should be included in the scope of the present application.

Claims

1. A lamp, comprising: a heat dissipation base (10), a light source assembly (20), and a lampshade (30) arranged outside the light source assembly (20); **characterized in that**

the heat dissipation base (10) comprises: a base (11) and a heat dissipation column (12) arranged on the base (11);
the light source assembly (20) comprises: a flexible substrate (21), lamp beads (22), and a power driven module (23) arranged on the flexible substrate (21);
the flexible substrate (21) comprises: a side plate (211) wrapping outside a sidewall of the heat dissipation column (12), and a top plate (212) connected to the side plate (211) and covering a top of the heat dissipation column (12);
the lamp beads (22) are arranged on the side plate (211) and the top plate (212), respectively; and
connecting strips (213) extend from a periphery of the top plate (212), and the connecting strips (213) abut against an outer side of the heat dissipation column (12) and are wrapped inside the side plate (211).

2. The lamp according to claim (1), **characterized in that** the number of the connecting strips (213) is plural, and a plurality of connecting strips (213) are

spacedly arranged along the periphery of the top plate (212).

3. The lamp according to any of the previous claims, **characterized in that** a back surface of the flexible layer (21) is provided with an adhesive layer (214); and the adhesive layer (214) is attached to the heat dissipation column (12) for fixation. 5
4. The lamp according to any of the previous claims, **characterized in that** a contour shape of the top of the heat dissipation column (12) is a polygon or a circle, and a contour shape of the top plate (212) is as same as the contour shape of the top of the heat dissipation column (12). 10
5. The lamp according to any of the previous claims, **characterized in that** the light source assembly (20) further comprises electrode conductive terminals (24) electrically connected to the power driven module (23); and the lamp beads (22), the power driven module (23), and the electrode conductive terminals (24) are integrated on the flexible substrate (21). 15
6. The lamp according to any of the previous claims, **characterized in that** the heat dissipation column (12) is provided with an accommodation cavity (121) configured for accommodating a power driven module (23); the side plate (211) and/or the top plate (212) defines therein first heat dissipation holes (2121) communicating with the accommodation cavity (121), and the base (11) defines therein second heat dissipation holes (111) communicating with the first heat dissipation holes (2121) and the outside, respectively. 20
7. The lamp according to any of the previous claims, **characterized in that** the number of the first heat dissipation holes (2121) is plural, and/or the number of the second heat dissipation holes (111) is plural. 25
8. The lamp according to any of the previous claims, **characterized in that** the sidewall of the heat dissipation column (12) defines therein a slot (122), and the slot (122) communicates with the accommodation cavity (121) and is configured for allowing the side plate (211) to pass through, such that the power driven module (23) is accommodated in the accommodation cavity (121). 30
9. The lamp according to any of the previous claims, **characterized in that** the lamp further includes a thermal conductive sleeve (40) sleeved outside the heat dissipation column (12); and the side plate (211) is wrapped outside a sidewall of the thermal conductive sleeve (40), and the connecting strips (213) abut against a sidewall of the thermal conductive sleeve (40). 35

10. The lamp according to any of the previous claims, **characterized in that** the thermal conductive sleeve (40) is a thermal conductive silicone rubber piece. 40

Amended claims in accordance with Rule 137(2) EPC.

1. A lamp, comprising: a heat dissipation base (10), a light source assembly (20), a thermal conductive sleeve (40) and a lampshade (30) arranged outside the light source assembly (20); the heat dissipation base (10) comprises: a base (11) and a heat dissipation column (12) arranged on the base (11); the light source assembly (20) comprises: a flexible substrate (21), lamp beads (22), and a power driven module (23) arranged on the flexible substrate (21); the flexible substrate (21) comprises: a side plate (211) wrapping outside a sidewall of the heat dissipation column (12), and a top plate (212) connected to the side plate (211) and covering a top of the heat dissipation column (12); the lamp beads (22) are arranged on the side plate (211) and the top plate (212), respectively; 45

characterized in that

connecting strips (213) extend from a periphery of the top plate (212), and the connecting strips (213) abut against an outer side of the heat dissipation column (12) and are wrapped inside the side plate (211); the thermal conductive sleeve (40) sleeved outside the heat dissipation column (12); and the side plate (211) is wrapped outside a sidewall of the thermal conductive sleeve (40), and the connecting strips (213) abut against a sidewall of the thermal conductive sleeve (40). 50

2. The lamp according to claim (1), **characterized in that** the number of the connecting strips (213) is plural, and a plurality of connecting strips (213) are spacedly arranged along the periphery of the top plate (212). 55
3. The lamp according to any of the previous claims, **characterized in that** a back surface of the flexible layer (21) is provided with an adhesive layer (214); and the adhesive layer (214) is attached to the heat dissipation column (12) for fixation.
4. The lamp according to any of the previous claims, **characterized in that** a contour shape of the top of the heat dissipation column (12) is a polygon or a circle, and a contour shape of the top plate (212) is as same as the contour shape of the top of the heat dissipation column (12).
5. The lamp according to any of the previous claims,

characterized in that the light source assembly (20) further comprises electrode conductive terminals (24) electrically connected to the power driven module (23); and the lamp beads (22), the power driven module (23), and the electrode conductive terminals (24) are integrated on the flexible substrate (21). 5

6. The lamp according to any of the previous claims, **characterized in that** the heat dissipation column (12) is provided with an accommodation cavity (121) configured for accommodating a power driven module (23); the side plate (211) and/or the top plate (212) defines therein first heat dissipation holes (2121) communicating with the accommodation cavity (121), and the base (11) defines therein second heat dissipation holes (111) communicating with the first heat dissipation holes (2121) and the outside, respectively. 10 15

7. The lamp according to claim 6, **characterized in that** the number of the first heat dissipation holes (2121) is plural, and/or the number of the second heat dissipation holes (111) is plural. 20

8. The lamp according to any one of the previous claims 6 or 7, **characterized in that** the sidewall of the heat dissipation column (12) defines therein a slot (122), and the slot (122) communicates with the accommodation cavity (121) and is configured for allowing the side plate (211) to pass through, such that the power driven module (23) is accommodated in the accommodation cavity (121). 25 30

9. The lamp according to claim 1, **characterized in that** the thermal conductive sleeve (40) is a thermal conductive silicone rubber piece. 35

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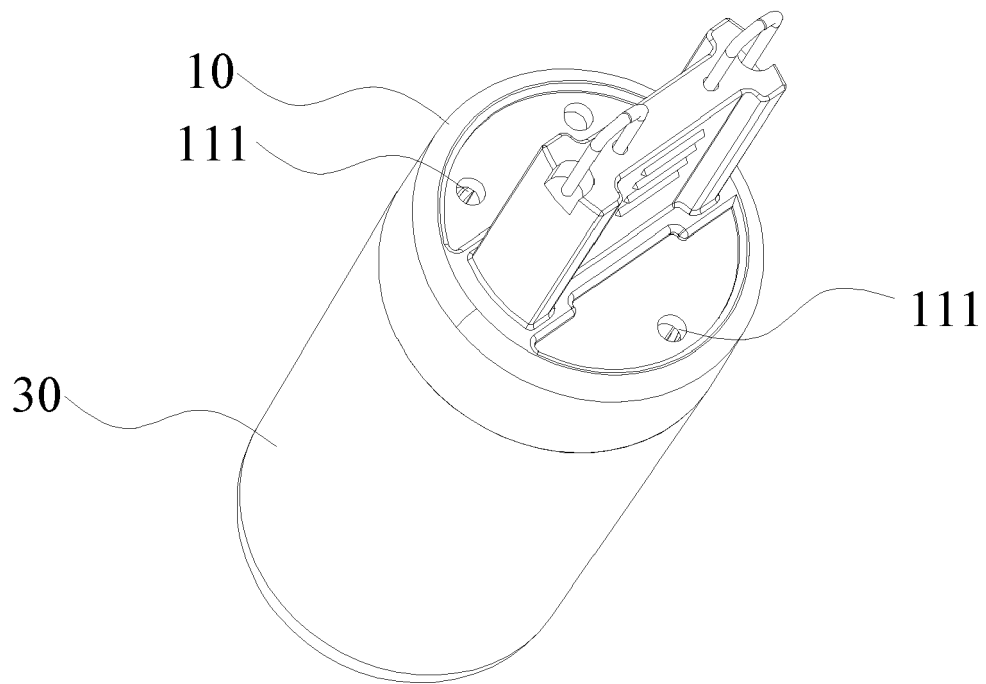


FIG. 1

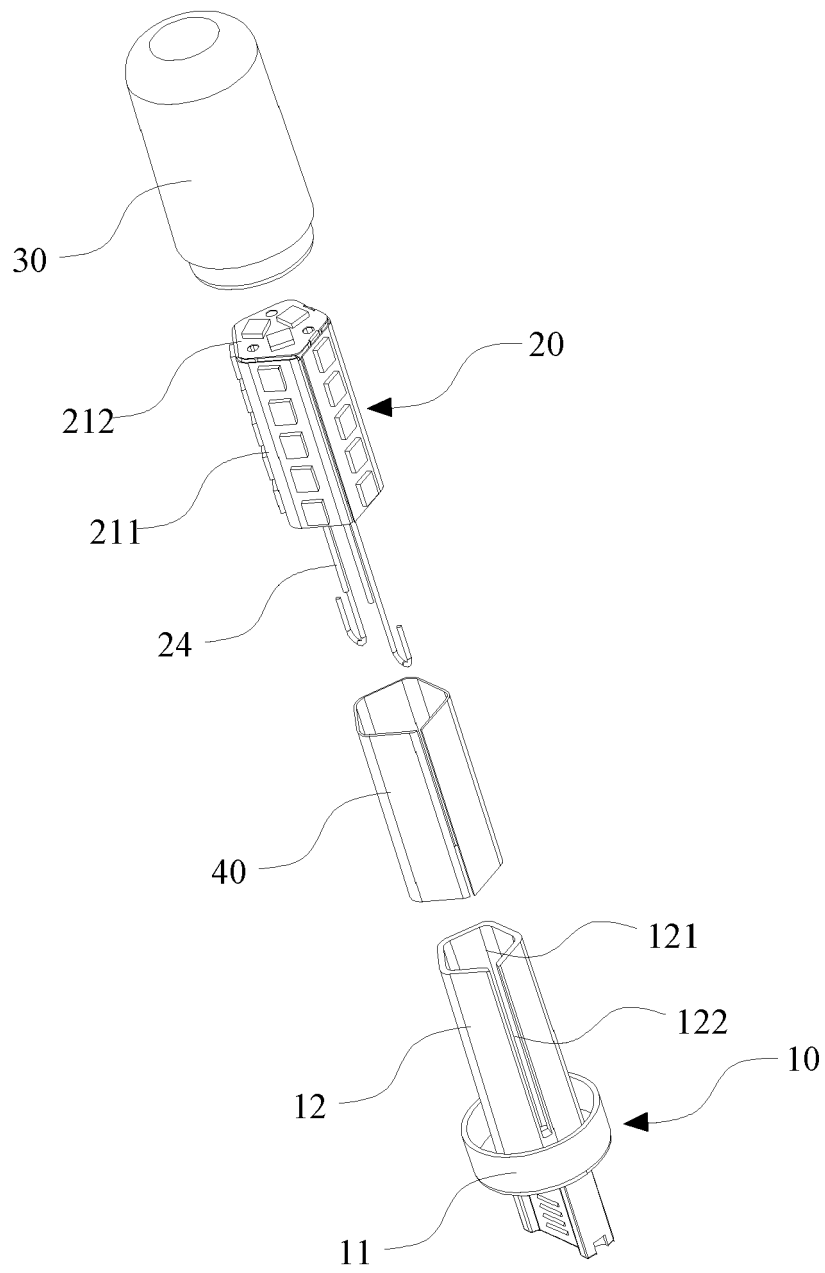


FIG.2

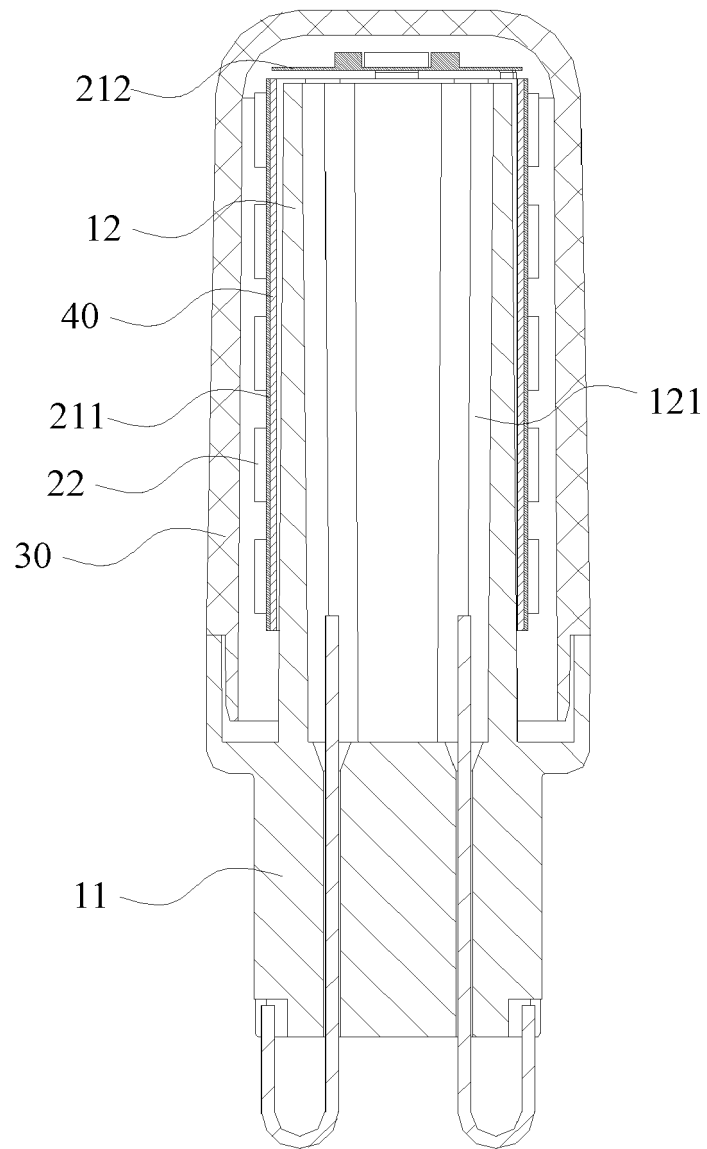


FIG.3

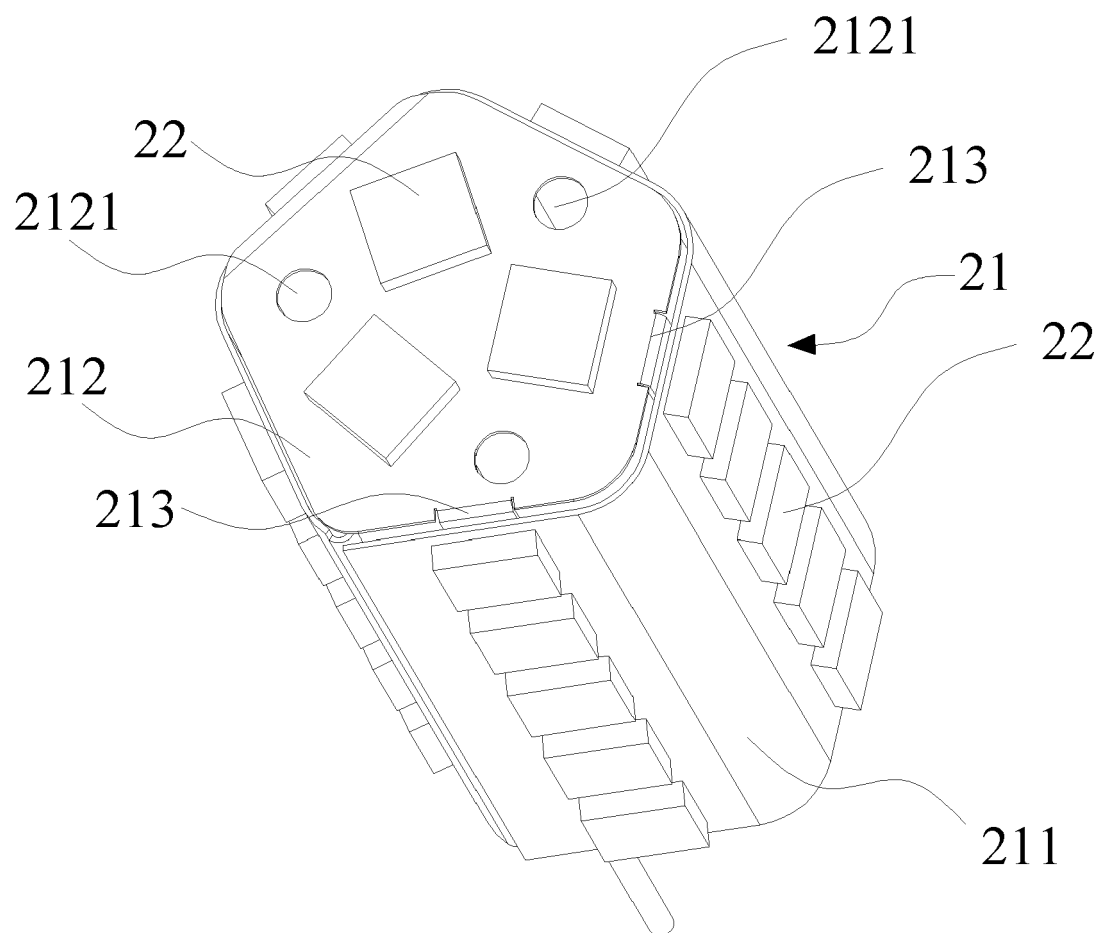


FIG. 4

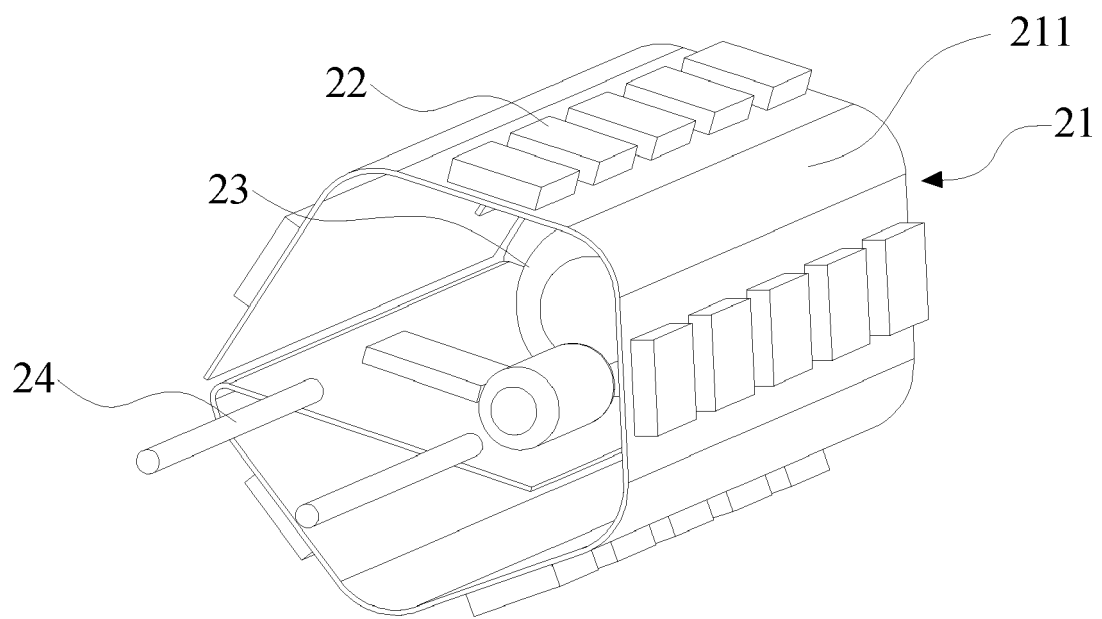


FIG.5

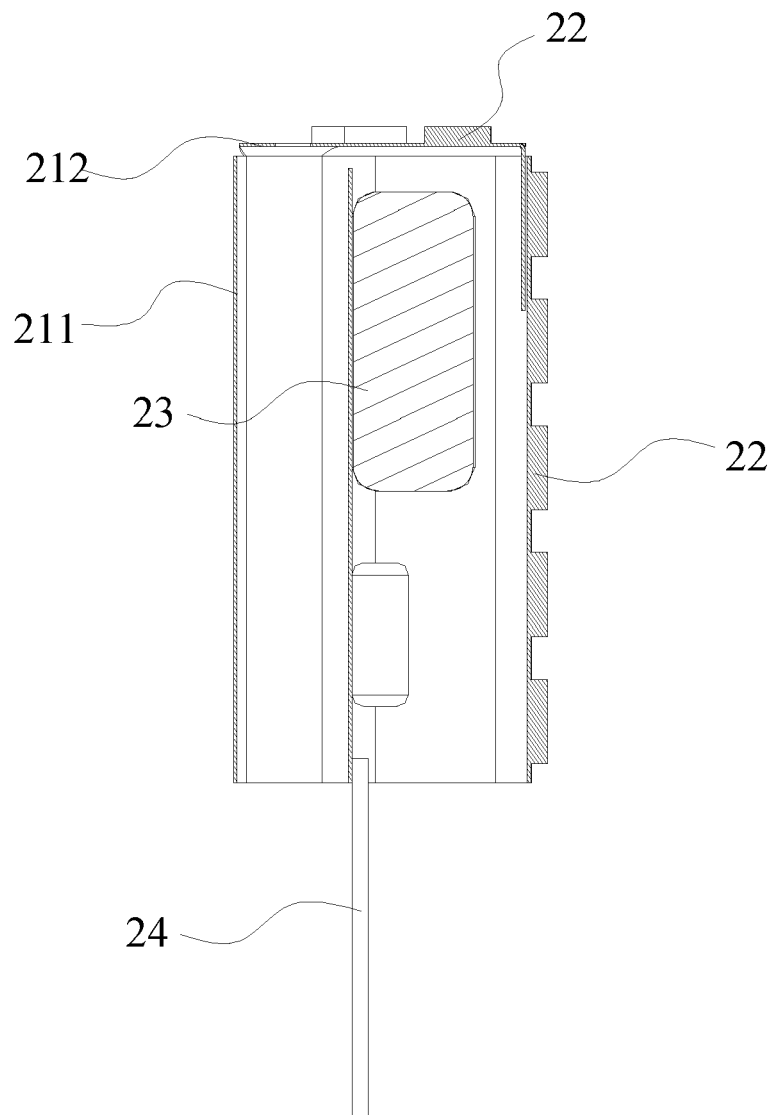


FIG.6

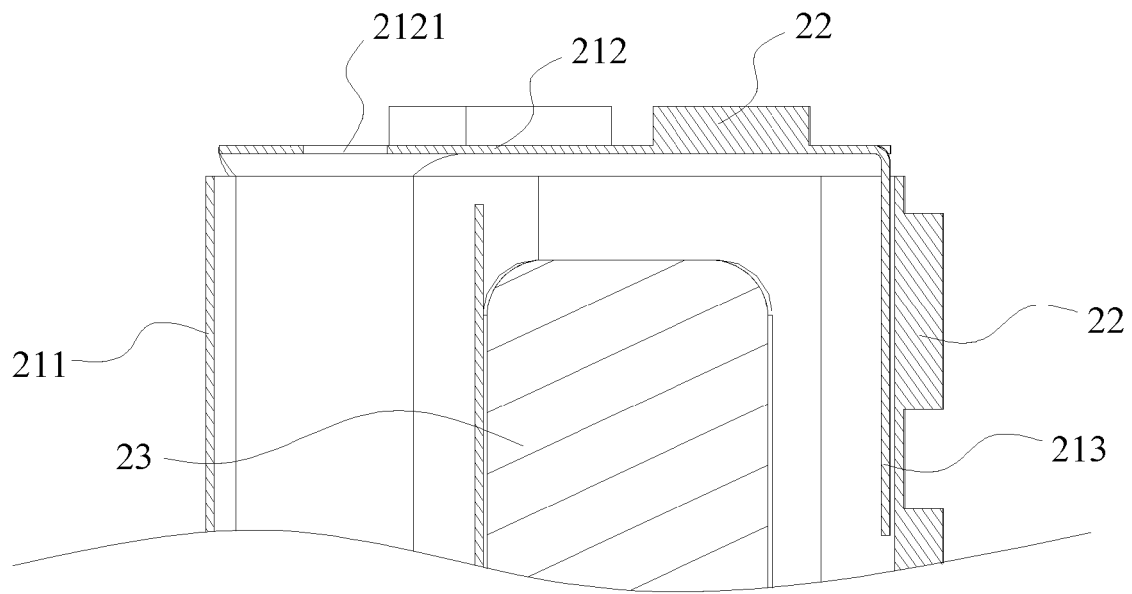


FIG. 7

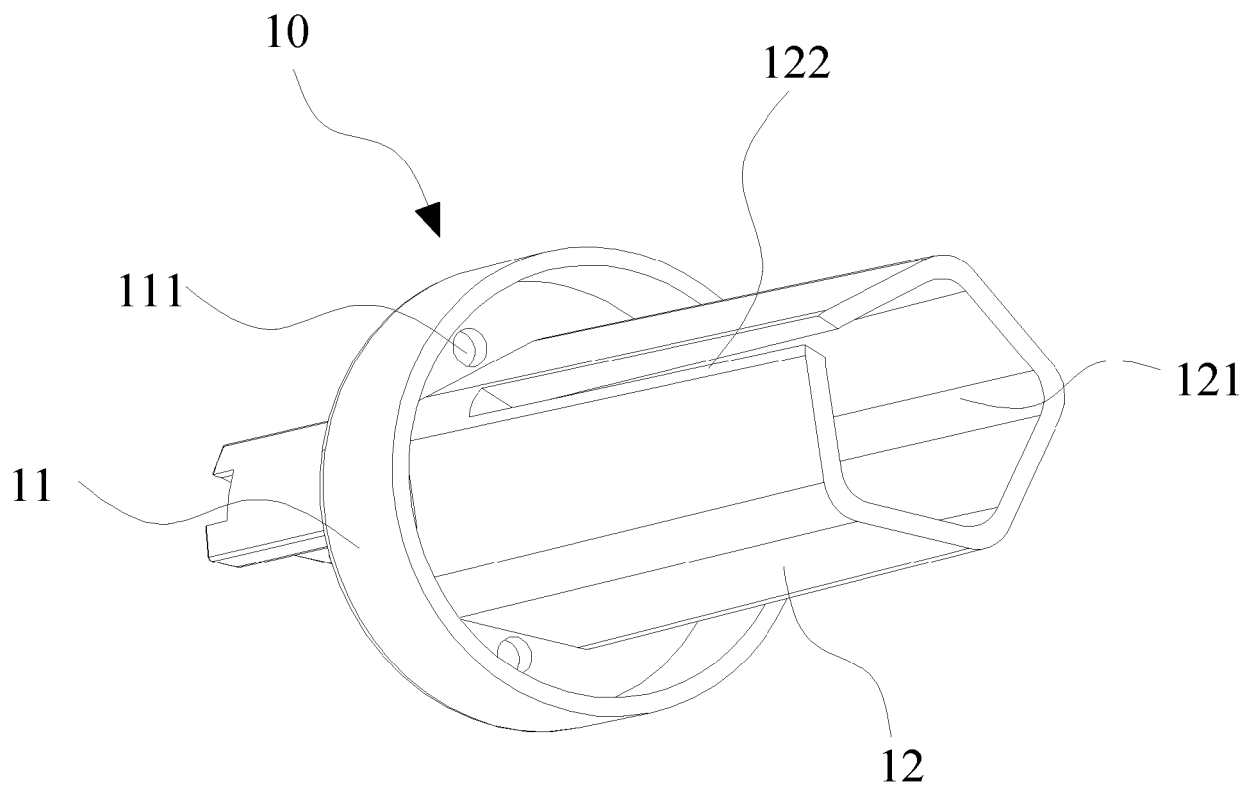


FIG. 8

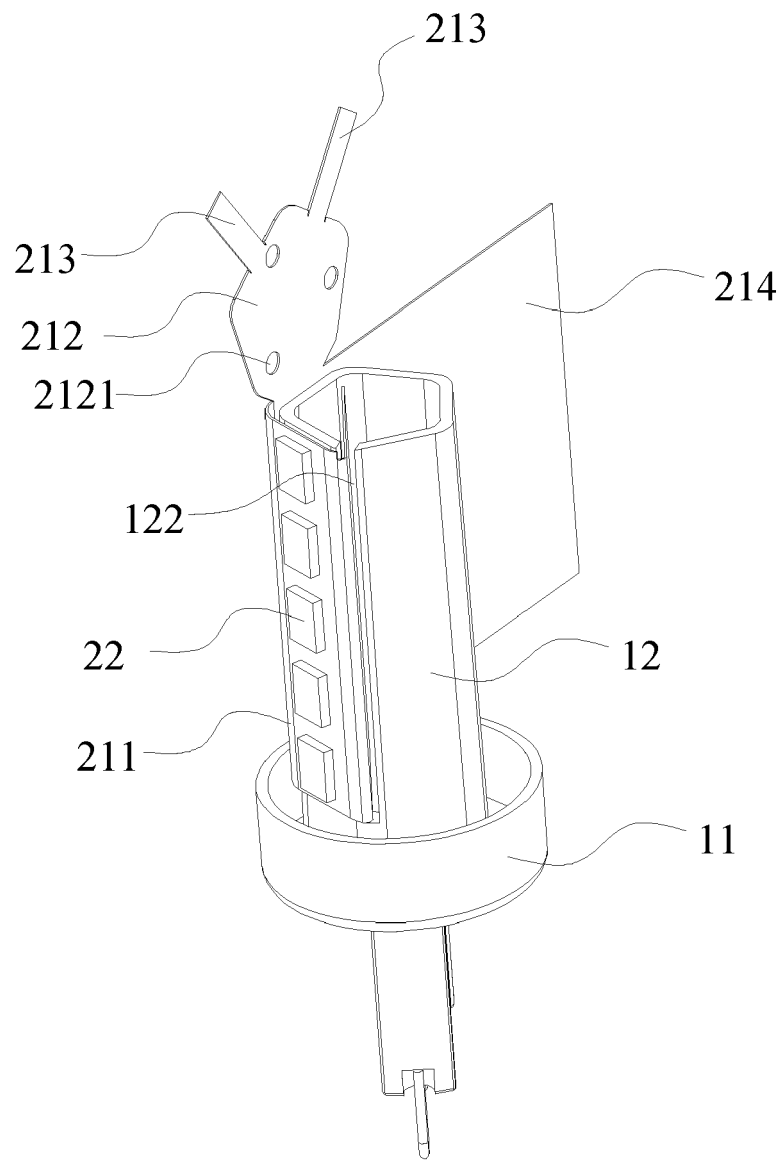


FIG.9

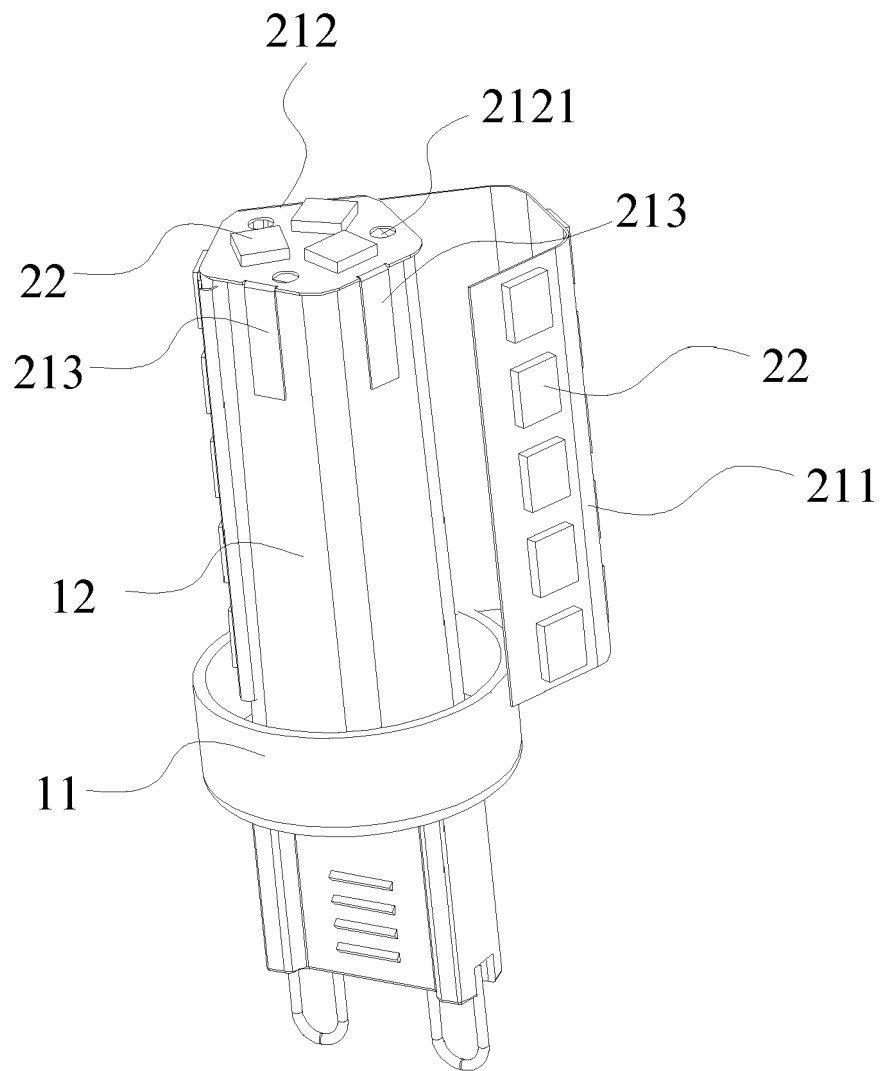


FIG.10

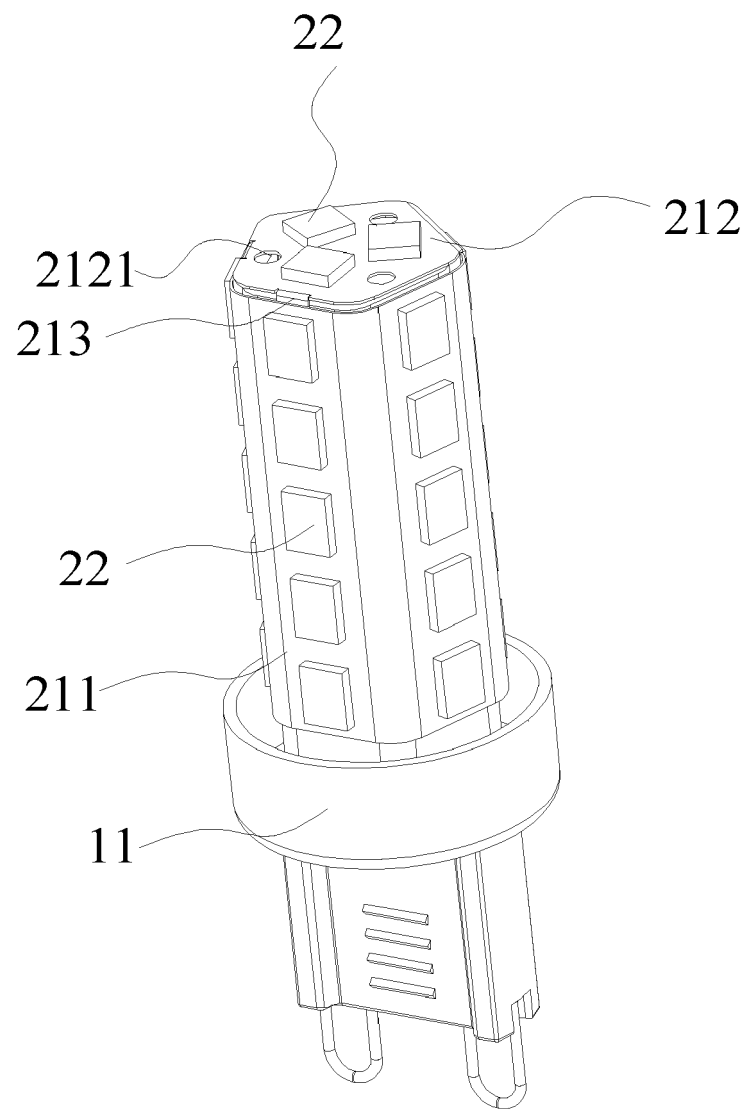


FIG.11



EUROPEAN SEARCH REPORT

Application Number
EP 20 16 3568

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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