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(54) **LAMP HOUSING ASSEMBLY CONFIGURED FOR PAR LAMPS AND PAR LAMPS**

(57) Embodiments of the present disclosure provide a lamp housing assembly configured for a PAR lamp and a PAR lamp, wherein the lamp housing assembly comprises a housing and at least two lamp feet mounted on the housing, one side of the housing close to the lamp feet is provided with guide through holes respectively abutting with each of the lamp feet, and each of lamp feet has one end embedded in each corresponding guide through hole inside the housing. Therefore, the light source board is grasped by an automated mechanical arm, the light source board is provided with the leads, the light source board is moved directly above the lamp housing assembly without precise positioning, and put down to a set placement plane, then the leads are led into the lamp feet through the guide through holes, thus completing the automated assembling of the PAR lamp, greatly improving the production efficiency and the production yield, facilitating the production control, and reducing the production cost.

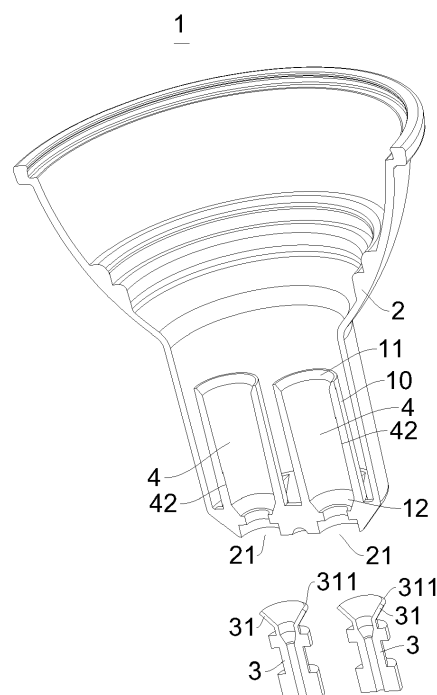


FIG. 4

Description

Technical Field

[0001] The present disclosure relates to the photoelectric field, in particular to a lamp housing assembly configured for a PAR lamp and a PAR lamp.

Background Art

[0002] As the PAR lamp can emit relatively fixed light beams, the light beams have a wide variety of angles, and the light spots cannot be adjusted in size, the PAR lamp is widely applied to application scenarios such as household lighting, clothing stores, restaurants and various places for large performances. Conventionally, a metal halide lamp is packaged into a reflective cup to form a PAR lamp. With the revolution of technologies, most PAR lamps now use LED lamp beads with excellent quality and high light efficiency as a lamp source. Such LED PAR lamps not only have good brightness and low energy consumption, but also have a high color rendering index Ra, and emit light close to natural light, so that human eyes are well protected, therefore, the LED PAR lamps are popularized and applied very well.

[0003] At the present stage, manual assembling is still needed in most of the PAR lamp production processes, thus resulting in a high labor cost, a high time cost, and a relatively complicated assembling process.

[0004] In view of this, to design a PAR lamp that can be automatically produced and has a low manufacturing cost is one of the problems to be solved urgently.

Summary

[0005] The present disclosure provides a lamp housing assembly configured for a PAR lamp and a PAR lamp, which can enable automation of production of the PAR lamp, and have a low manufacturing cost.

[0006] Embodiments of the present disclosure may be implemented as follows:

an embodiment of the present disclosure provides a lamp housing assembly configured for a PAR lamp, including a housing and at least two lamp feet mounted on the housing, one side of the housing close to the lamp feet is provided with guide through holes respectively abutting with each of the lamp feet, and each of the lamp feet has one end embedded in each corresponding guide through hole inside the housing.

[0007] Optionally, an inner diameter of the guide through hole is kept unchanged; and preferably, the shape of the guide through hole is cylindrical.

[0008] Optionally, the guide through hole has an inner diameter gradually decreasing towards a direction of the respective lamp foot, and

preferably, the shape of the guide through hole is tapered.

[0009] Optionally, the respective guide through holes

are arranged at intervals inside the housing;

preferably, each of the guide through holes is independently provided inside the housing;

preferably, a plurality of the guide through holes are separated by a separating plate; and

preferably, the separating plate is integrally formed with or detachably cooperates with the housing.

[0010] Optionally, the lamp housing assembly further includes a guide bushing, the guide bushing is provided inside the housing, and the guide through holes are defined inside the guide bushing;

preferably, a plurality of the guide through holes are defined inside the same guide bushing;

preferably, the guide bushing is integrally formed with or detachably cooperates with the housing; and

preferably, the guide bushing is provided with an abutment post, and the abutment post is configured to be positioned against one side of a light source board.

[0011] Optionally, the housing is provided with a mounting hole, the guide bushing defines an inlet end and an outlet end communicating with each other, and the outlet end detachably cooperates with the mounting hole; and the lamp feet communicate with the outlet end through the mounting hole; and

preferably, the outlet end is accommodated in one end of the lamp foot.

[0012] Optionally, a guide groove is provided inside the housing, a guide strip is provided outside the guide bushing, and the guide strip slidably cooperates with the guide groove.

[0013] Optionally, an end surface of one end of the lamp foot abuts against or is close to an inner wall of the guide through hole.

[0014] Optionally, one end of the lamp foot is fixed in the guide through hole in a manner of spinning.

[0015] Optionally, one end of the lamp foot is in a horn mouth shape; and

preferably, the horn mouth shape of the one end of the lamp foot is next to or close to the inner wall of the guide through hole.

[0016] Optionally, the housing is provided with a mounting hole in communication with the guide through hole, one end of each of the lamp feet is embedded in each corresponding guide through hole inside the housing through the mounting hole; and

preferably, the lamp foot adopts a GU10 copper pin, and the shape of the mounting hole is adapted to the shape of the GU10 copper pin.

[0017] Optionally, a mounting post and a positioning post are provided in the housing, and the positioning post is configured to cooperate with the positioning hole on the light source board, so as to realize guided mounting of the light source board; and a top end of the mounting post is configured to be fixedly assembled with the light source board via a screw.

[0018] An embodiment of the present disclosure further provides a PAR lamp, including the above lamp housing assembly configured for a PAR lamp and at least

two leads, each of the leads passes through one of the guide through holes and extends to enter the corresponding lamp foot.

[0019] Optionally, each lead of the at least two leads separately passes through the corresponding guide through hole.

[0020] Optionally, the PAR lamp further includes a driving assembly and a light source board, the driving assembly is fixed on the light source board, the light source board is fixed on the lamp housing assembly, and the leads are connected to the driving assembly.

[0021] Compared with the prior art, beneficial effects of the embodiments of the present disclosure include, for example:

the embodiments of the present disclosure provide a lamp housing assembly configured for a PAR lamp and a PAR lamp, wherein the lamp housing assembly includes a housing and at least two lamp feet mounted on the housing, one side of the housing close to the lamp feet is provided with guide through holes respectively abutting with each of the lamp feet, and each of lamp feet has one end embedded in each corresponding guide through hole inside the housing. Therefore, the light source board is grasped by an automated mechanical arm, the light source board is provided with the leads, the light source board is moved directly above the lamp housing assembly without precise positioning, and put down to a set placement plane, then the leads are led into the lamp feet through the guide through holes, thereby completing the automated assembling of the PAR lamp, greatly improving the production efficiency and the production yield, facilitating the production control, and reducing the production cost.

Brief Description of Drawings

[0022] The accompanying drawings are included so as to provide further understanding to the embodiments and the accompanying drawings are incorporated into the present specification and constitute a part of the present specification. The accompanying drawings illustrate the embodiments and are used to explain the principle of the present disclosure together with the description. Other embodiments and many expected advantages of the embodiments will be readily recognized, because they become better understood with reference to the following detailed description. Elements in the accompanying drawings are not necessarily scaled to each other. Like reference signs indicate corresponding similar components. It should be understood that a person ordinarily skilled in the art still could obtain other relevant accompanying drawings according to these accompanying drawings, without using inventive effort.

FIG. 1 is a schematic view of a first lamp housing assembly provided in the present embodiment;

FIG. 2 is a schematic view of a second lamp housing

assembly provided in the present embodiment;

FIG. 3 is a schematic view of a third lamp housing assembly provided in an embodiment of the present disclosure;

FIG. 4 is a schematic view of the third lamp housing assembly in FIG. 3, from another perspective;

FIG. 5 is a schematic view of a fourth lamp housing assembly provided in an embodiment of the present disclosure;

FIG. 6 is a schematic view of the fourth lamp housing assembly in FIG. 5, from another perspective;

FIG. 7 is a schematic view of a fifth lamp housing assembly provided in an embodiment of the present disclosure;

FIG. 8 is a schematic view of the fifth lamp housing assembly in FIG. 7, from another perspective;

FIG. 9 is an explosive view of a PAR lamp in an embodiment of the present disclosure;

FIG. 10 is a schematic view of the PAR lamp in FIG. 9, from another perspective;

FIG. 11 is a schematic view of the PAR lamp, corresponding to the third lamp housing assembly, provided in an embodiment of the present disclosure;

FIG. 12 is a schematic view of the PAR lamp in FIG. 11, from another perspective;

FIG. 13 is a schematic view of the PAR lamp, corresponding to the fourth lamp housing assembly, provided in an embodiment of the present disclosure;

FIG. 14 is a schematic view of the PAR lamp in FIG. 13, from another perspective;

FIG. 15 is a schematic view of the PAR lamp, corresponding to the fifth lamp housing assembly, provided in an embodiment of the present disclosure; and

FIG. 16 is a schematic view of the PAR lamp in FIG. 15, from another perspective.

[0023] Reference signs: 100-PAR lamp; 1-lamp housing assembly; 2-housing; 21-mounting hole; 22-mounting post; 23-positioning post; 24-guide groove; 3-lamp foot; 31-one end; 311-end surface; 4-guide through hole; 41-separating plate; 42-inner wall; 5-lead; 6-driving assembly; 7-light source board; 71-positioning hole; 72-fixing portion; 8-lens assembly; 9-screw; 10-guide bushing; 11-inlet end; 12-outlet end; 13-abutment post; 14-guide

strip; 15-light source.

Detailed Description of Embodiments

[0024] In order to make objectives, technical solutions and advantages of the present disclosure clearer, the present disclosure will be further described in detail below in conjunction with the accompanying drawings, and apparently, some but not all embodiments of the present disclosure are described.

[0025] In the following detailed description, reference is made to the accompanying drawings, which form a part of the detailed description and are shown through illustrative specific embodiments in which the present disclosure can be practiced. In this regard, directional terms such as "top", "bottom", "left", "right", "upper", "lower", etc. are used with reference to the orientation of the drawings described. As components of the embodiments may be positioned in several different orientations, directional terms are used for illustration purposes and directional terms are by no means limiting.

[0026] It should be noted that similar reference signs and letters represent similar items in the following accompanying drawings, therefore, once a certain item is defined in one accompanying drawing, it is not needed to be further defined or explained in subsequent accompanying drawings. Besides, terms such as "first", "second", and "third", if appear, are merely for distinctive description, but should not be construed as indicating or implying relative importance.

[0027] In the description of the present disclosure, it also should be indicated that unless expressly otherwise specified and defined, terms such as "provide", "mount", "join", and "connect", if appear, should be understood in a broad sense, for example, connection may be fixed connection, detachable connection, or integrated connection; it may be mechanical connection or electrical connection; it may be direct connection or indirect connection through an intermediary, and it also may be inner communication between two elements. For a person ordinarily skilled in the art, specific meanings of the above-mentioned terms in the present disclosure could be understood according to specific circumstances.

[0028] It should be noted that the features in the embodiments of the present disclosure may be combined with each other if there is no conflict.

[0029] At the present stage, manual assembling is still needed in most of the PAR lamp production processes, thus resulting in a high labor cost, a high time cost, and a relatively complicated assembling process. For example, in the existing lighting product PAR lamp type, a GU10 copper pin of the input end thereof is fixed by means of direct riveting interference. The diameter of the copper pin hole is 0.8 mm, the diameter of the lead is 0.5 mm, and the lead is a flexible wire, therefore, an automated mechanical arm cannot realize precise positioning or insert the lead for assembling, but only manual assembling and production can be employed, then this

mode has low production efficiency, and a high production cost.

[0030] FIG. 1 and FIG. 2 respectively show a first lamp housing assembly and a second lamp housing assembly configured for a PAR lamp provided in the present embodiment, and correspondingly, two assembling solutions are provided. As shown in FIG. 1, in the first solution, although a separating plate is provided inside the housing to separate two leads, the leads are not guided to be inserted into lamp feet, but the leads are directly inserted into the lamp feet. In this case, the leads are not definitely guided, and cannot be precisely positioned, resulting in low efficiency and a low yield. As shown in FIG. 2, in the other solution, a driving adapter board is added inside the housing, and a conductive path is realized by the driving adapter board and wiring terminals, but the cost of the product is increased by adding the driving adapter board and the wiring terminals.

[0031] The present embodiment further provides a third lamp housing assembly, a fourth lamp housing assembly and a fifth lamp housing assembly, configured for a PAR lamp, and a PAR lamp, which, compared with the PAR lamps in the prior art, or compared with the first lamp housing assembly and the second lamp housing assembly configured for a PAR lamp in the above, can realize high-efficient automated production. The third lamp housing assembly, the fourth lamp housing assembly and the fifth lamp housing assembly, configured for a PAR lamp, and the PAR lamp provided in the present embodiment will be introduced in detail below.

[0032] Referring to FIG. 3 and FIG. 4, FIG. 3 and FIG. 4 show a third lamp housing assembly 1 configured for a PAR lamp 100 (shown in FIGS. 9-16) provided in an embodiment of the present disclosure, which includes a housing 2 and at least two lamp feet 3 mounted on the housing 2, one side of the housing 2 close to the lamp feet 3 is provided with guide through holes 4 respectively abutting with respective lamp foot 3, and each lamp foot 3 correspondingly matches one guide through hole 4. Each lamp foot 3 has one end 31 embedded in respective corresponding guide through hole 4 inside the housing 2.

[0033] In this way, when the PAR lamp 100 (shown in FIGS. 9-16) is assembled, a light source board 7 (shown in FIGS. 9-16) with leads 5 (shown in FIGS. 9-16) may be grasped by an automated mechanical arm (not shown), and when the light source board 7 is mounted onto the lamp housing assembly 1, the leads 5 may be guided into the lamp feet 3 through the guiding through holes 4, thus completing the automated assembling of the PAR lamp 100, greatly improving the production efficiency and the production yield, facilitating the production control, and reducing the production cost.

[0034] It should be noted that "each lamp foot 3 has one end 31 embedded in respective corresponding guide through hole 4 in the housing 2" mentioned herein may be understood as that one end 31 of each lamp foot 3 communicates with respective guide through hole 4, in this way, the leads 5 may be smoothly led into the lamp

feet 3 after being guided through the guide through holes 4. Broadly understood, one end 31 of each lamp foot 3 may be accommodated in respective guide through hole 4, and it is also may be the case that a guide bushing 10 (shown in FIGS. 7 and 8) defining respective guide through hole 4 is accommodated in the one end 31 of the lamp foot 3.

[0035] Specifically, in conjunction with FIG. 3 and FIG. 4, the number of lamp feet 3 is two, the number of guide through holes 4 is also two, the number of leads 5 is also two, and the three are distributed in one-to-one correspondence. Certainly, in other embodiments, the number of the three is not limited, and may be three or four and so on. In the present embodiment, a bottom end of the housing 2 is provided with two mounting holes 21, and the two mounting holes 21 are in communication with the two guide through holes 4, respectively, and correspondingly, one ends 31 of the two lamp feet 3 is correspondingly mounted in the two guide through holes 4 through the mounting holes 21.

[0036] In the present embodiment, the guide through holes 4 are arranged at intervals inside the housing 2. In this way, the guide through holes 4 are isolated from each other, which can avoid short circuit of zero and live wires. Specifically, each guide through hole 4 includes a inlet end 11 and a corresponding outlet end 12, the inlet ends 11 of the two guide through holes 4 are arranged at intervals, and the outlet ends 12 of the two guide through holes 4 are arranged at intervals. Specifically, the outlet ends 12 of the two guide through holes 4 correspondingly communicate with the two mounting holes 21, in this way, the leads 5 can enter from the inlet ends 11 of the guide through holes 4 and extend out from the outlet ends 12, so as to extend into the corresponding lamp feet 3. Certainly, in other embodiments, the two guide through holes 4 may also be in communication with each other as long as the leads 5 can be guided.

[0037] In the present embodiment, each guide through hole 4 is independently provided inside the housing 2, and as shown in FIG. 3 and FIG. 4, the two guide through holes 4 are separated by a gap. It can be understood that, in conjunction with FIG. 3 and FIG. 4, the bottom end of the housing 2 is provided with two guide bushings 10, each guide bushing 10 internally defines one guide through hole 4, and the guide bushings 10 may be integrally formed with the housing 2. In other embodiments, the guide bushings 10 may also be detachably fitted with the housing 2.

[0038] In a specific embodiment, as shown in FIG. 3 and FIG. 4, an end surface 311 of one end 31 of each lamp foot 3 abuts against an inner wall 42 of the guide through hole 4, and is fixed in the guide through hole 4 in the manner of spinning (rotary pressing). The lamp feet 3 are generally fixed in the housing 2 by riveting, and spinning is also one of the ways of riveting. In other embodiments, the end surface 311 of one end 31 of each lamp foot 3 may also be close to the inner wall 42 of the guide through hole 4, in other words, does not completely

abut against the inner wall 42 of the guide through hole 4, but allows a certain interval. Possibly, when the lamp feet 3 are formed into a horn mouth shape by a jig, a riveting pressure may have an error, and one end 31 of the lamp foot 3 may be riveted broken, so that it will not necessarily abut against the inner wall 42 of the guide through hole 4. Here, "close to" may be understood as being in proximity. Meanwhile, in other embodiments, the lamp feet 3 may also be fixed with the housing 2 by means of integral injection molding.

[0039] In the present embodiment, after being subjected to spinning, the one end 31 of each lamp foot 3 is in a horn mouth shape. The one end 31 of the lamp foot 3 is embedded in the respective guide through hole 4 and abuts against the inner wall 42, which facilitates the lead 5 passing through the guide through hole 4 and extending into the hole inside the lamp foot 3. Furthermore, in the manner of spinning, the lamp feet 3 are prevented from cracking, burrs or like problems, which thereby influence the insertion of the leads 5. The horn mouth shape of the lamp feet 3 may also facilitate the leads 5 being successfully inserted into the respective lamp feet 3 after passing through the guide through holes 4. It can be understood that, in an implementation, one end 31 of each lamp foot 3 is first extended to a predetermined position in the guide through hole 4 through the mounting hole 21 of the housing 2, and then fixed in the manner of spinning. In the present embodiment, the guide through holes 4 are circular holes, and the horn mouth shape of one end 31 of each lamp foot 3 after the spinning is also in a circular shape, in this way, the one end 31 can be next to or close to the inner wall 42 of the guide through hole 4 to facilitate the penetration of the leads 5. Here, "close to" may be understood as being in proximity. That is, the horn mouth shape of one end 31 of the lamp foot 3 is proximate to the inner wall 42 of the guide through hole 4.

[0040] Certainly, in other alternative embodiments, one end 31 of each lamp foot 3 may also be embedded in respective guide through hole 4 in other manners, as long as the lamp foot 3 can be fixedly engaged on the inner wall 42 of the guide through hole 4, and the guide through hole 4 functions to guide the lead 5 to be precisely inserted into the lamp foot 3. Furthermore, after being processed, one end of the lamp foot 3 may also be formed into other shapes, for example, a stepped shape.

[0041] In the present embodiment, as shown in FIG. 3 and FIG. 4, the inner diameter of each guide through hole 4 is kept unchanged. In this case, the guide through hole 4 forms a hollow columnar structure inside the housing 2. The columnar structure extends downwards at the same inner diameter starting from the middle part of the housing 2 until the lamp foot 3 is embedded. In other words, the two guide bushings 10 are both tubular in shape, and the guide through holes 4 are cylindrical in shape, so that the inner diameters of the guide through holes 4 defined in the guide bushings 10 are equal everywhere.

[0042] In the present embodiment, one end 31 of each

lamp foot 3 is embedded in the guide through hole 4, and then formed into a horn mouth shape, in the manner of spinning or in other manners, to be fixedly engaged on the inner wall 42 of the guide through hole 4, such that the lead 5 can pass through the guide through hole 4 and extend into the lamp foot 3. Optionally, the guide through hole 4 is below the end surface 311 of one end 31 of the lamp foot 3, that is, a part of the mounting hole 21 is also in a horn mouth shape, which is consistent with the horn mouth shape of the one end 31 of the lamp foot 3, therefore, the lamp foot 3 can be effectively fixed on the housing 2. Optionally, the lamp foot 3 generally adopts a GU10 copper pin, in other words, the shape of the mounting hole 21 may be adapted to the shape of the GU10 copper pin, so as to facilitate mounting and fixing.

[0043] In the present embodiment, the inner diameter of the guide through hole 4 in the upper part is larger than the outer diameter of the lamp foot 3, and the two guide through holes 4 may be separated from each other by a gap, so as to avoid appearance of short circuit between the two leads 5.

[0044] Referring to FIG. 5 and FIG. 6, FIG. 5 and FIG. 6 show a fourth lamp housing assembly 1 configured for a PAR lamp 100 provided in an embodiment of the present disclosure, which has mostly the same structure as the third lamp housing assembly 1 for a PAR lamp 100 shown in FIG. 3 and FIG. 4, and the differences lie in that:

in FIG. 5 and FIG. 6, the guide through holes 4 are defined by the inner wall of the housing 2, and are separated by the separating plate 41 provided in the housing 2, in other words, the two guide through holes 4 are separated from each other by the separating plate 41. Optionally, the two guide through holes 4 may also be separated from each other by other partition structures or edges. In conjunction with FIG. 6, the inlet ends 11 of the two guide through holes 4 are separated by an upper edge of the separating plate 41, and the outlet ends 12 of the two guide through holes 4 are separated by a lower edge of the separating plate 41. Such provision of the separating plate 41 also may isolate a plurality of guide through holes 4 from each other, so that short circuit of zero and live wires may be avoided. The separating plate 41 may be integrally formed with the housing 2, or also may be detachably fixed inside the housing 2.

[0045] In the present embodiment, in combination with FIG. 5 and FIG. 6, each guide through hole 4 has an inner diameter gradually decreasing towards the direction of corresponding lamp foot 3. It can be understood that the guide through holes 4 extend downwards starting from the inner wall of the housing 2 until the lamp feet 3 are embedded. After the lamp feet 3 are embedded into respective guide through holes 4, the lamp feet are formed into a horn mouth shape, in the manner of spinning or in other manners, to abut against the inner walls 42 of the guide through holes 4. At this time, each guide through hole 4 may be formed into a hollow tapered shape, and the guide through hole 4 has an upper end (inlet end 11)

with a large inner diameter, and a lower end (outlet end 12) with a small inner diameter, therefore, the lead 5 can be guided to quickly pass through the guide through hole 4 to enter the lamp foot 3. At this time, the two guide through holes 4 may be separated by the separating plate 41, or also may be separated by an edge between the two guide through holes 4, so as to prevent appearance of short circuit of the leads 5 in the process of passing through the guide through holes 4.

[0046] Referring to FIG. 7 and FIG. 8, FIG. 7 and FIG. 8 show a fifth lamp housing assembly 1 configured for a PAR lamp 100 provided in an embodiment of the present disclosure, which has mostly the same structure as the fourth lamp housing assembly 1 configured for a PAR lamp 100 shown in FIG. 5 and FIG. 6, and the differences lie in that:

the lamp housing assembly 1 further includes a guide bushing 10, the guide bushing 10 is provided inside the housing 2, and the guide bushing 10 internally defines a guide through hole 4. Specifically, the guide bushing 10 is detachably fitted with the housing 2.

[0047] Optionally, a plurality of guide through holes 4 are defined in the same guide bushing 10, for example, in the present embodiment, two guide through holes 4 are defined inside one guide bushing 10. In this way, one housing 2 may be mounted therein with only one guide bushing 10. Certainly, in other embodiments, it also may be feasible that one guide through hole 4 is defined inside the same guide bushing 10. In this way, when the number of lamp feet 3 is two, one housing 2 needs to be mounted therein with two guide bushings 10. Meanwhile, in the present embodiment, the two guide through holes 4 are separated by the separating plate 41.

[0048] Specifically, the housing 2 is provided with mounting holes 21, the guide bushing 10 defines an inlet end 11 and an outlet end 12 communicating with each other, and the outlet end 12 is detachably fitted with the mounting hole 21. The lamp foot 3 communicates with the outlet end 12 through the mounting hole 21. Optionally, the outlet end 12 is accommodated in one end 31 of the lamp foot 3, which facilitates guiding the lead 5.

[0049] In combination with FIG. 8, in the present embodiment, a guide groove 24 is provided inside the housing 2, a guide strip 14 is provided outside the guide bushing 10, and the guide strip 14 slidably cooperates with the guide groove 24. Specifically, the guide groove 24 is provided along an extending direction of the housing 2, that is, provided along a vertical direction in FIG. 8, in this way, when the guide bushing 10 is mounted, the guide bushing 10 can be quickly mounted in position through the sliding cooperation between the guide strip 14 and the guide groove 24.

[0050] In conjunction with FIG. 7 and FIG. 8, the guide bushing is provided with an abutment post 13, which is configured to be positioned against one side of the light source board 7 (shown in FIG. 15 and FIG. 16).

[0051] Meanwhile, for the guide bushing 10 provided in the present embodiment, the inlet end 11 is a large-

diameter opening, the outlet end 12 is a small-diameter opening, and the upper opening transitions evenly and smoothly to the lower opening, then leads 5 at different angles and in different directions may be vertically led out from the lower outlet ends 12 through the guide through holes 4 in the guide bushing 10. By means of an automated mechanical hand or suction nozzle, the guide bushing 10 may be vertically placed in the housing 2, positioned through the cooperation between the guide strip 14 and the guide groove 24 inside the housing 2, and fixed by being pressed against the bottom of the inner wall of the housing 2 and the bottom of the light source board 7, so as to avoid shaking of the guide bushing 10.

[0052] In combination with FIG. 7 and FIG. 8, a mounting post 22 and a positioning post 23 are provided inside the housing 2, and the positioning post 23 is configured to cooperate with the positioning hole 71 on the light source board 7, so as to realize guided mounting of the light source board 7. The mounting post 22 is formed with a threaded hole at a top end, which is configured to be fixedly assembled with the light source board 7 via a screw 9.

[0053] Referring to FIG. 9 and FIG. 10, FIG. 9 and FIG. 10 show a PAR lamp 100 provided in an embodiment of the present disclosure, which includes a lamp housing assembly 1, at least two leads 5, a driving assembly 6, a light source board 7 and a lens assembly 8.

[0054] For the specific structure of the lamp housing assembly 1, reference may be made to the detailed description of the lamp housing assembly 1 in the above, and details are not repeated herein. Generally, when the housing 2 is assembled together with the lamp feet 3 to form the lamp housing assembly 1, the lamp housing assembly is then assembled with other components. In the present embodiment, the driving assembly 6 is fixed on the light source board 7 in the form of DOB, the leads 5 are fixedly connected to the light source board 7 through fixing portions 72 provided on the light source board 7 (for example, by means of riveting), and the leads 5 are connected to the driving assembly 6 to realize energization. The light source board 7 is fixedly assembled with the housing 2 via the screw 9. The lens assembly 8 is fixed on the housing 2 by means of snap-fit or gluing, and light emitted from the light source 15 on the light source board 7 can pass through the lens assembly 8 and emit light beams with a specific light beam angle. This lens assembly 8 has its own heat dissipation structure, which can be understood as an integration of a lens and a radiator.

[0055] In the present embodiment, the light source board 7 may adopt a COB light source. The COB light source is a high-light-efficiency integrated surface light source technology for directly attaching an LED chip on a mirror metal substrate with high reflectivity. This technology removes the stent concept, and has no electroplating, reflow soldering, and patching procedures, therefore, the procedures are reduced by nearly one third, and

the cost is also saved by one third.

[0056] In combination with FIG. 3 - FIG. 8, each lead 5 passes through one of the guide through holes 4 and extends into the corresponding lamp foot 3, to be connected respectively with the zero wire and the live wire through the lamp foot 3, thus realizing the connection of the conductive path. Each lead 5 of the at least two leads 5 separately passes through the corresponding guide through hole 4, and the leads 5 do not contact each other, thereby avoiding short circuit caused by aging of the leads 5 or other reasons. In this way, the assembling process is simple, fully automated production can be realized in the whole process from the materials to the final product, greatly improving the production efficiency of the PAR lamp 100 and the controllability of production yield, and reducing the production cost.

[0057] In combination with FIG. 9 and FIG. 10, in the present embodiment, one of the two leads 5 is a common power line, and the other is a power line for protective resistor (which has its own protective resistor).

[0058] Referring to FIG. 11 and FIG. 12, the PAR lamp 100 shown in FIG. 11 and FIG. 12 employs the lamp housing assembly 1 shown in FIG. 3 and FIG. 4.

[0059] Referring to FIG. 13 and FIG. 14, the PAR lamp 100 shown in FIG. 13 and FIG. 14 employs the lamp housing assembly 1 shown in FIG. 5 and FIG. 6.

[0060] Referring to FIG. 15 and FIG. 16, the PAR lamp 100 shown in FIG. 15 and FIG. 16 employs the lamp housing assembly 1 shown in FIG. 7 and FIG. 8.

[0061] A specific mounting manner of the PAR lamp 100 provided in the present embodiment is as follows: the lamp foot 3 is fixed inside the mounting hole 21 of the housing 2 in a manner of riveting or spinning, and the light source board 7 equipped with the driving assembly 6 is grasped by an automated mechanical arm. There are already two leads 5 on the driving assembly 6. The light source board 7 can be moved directly above the housing 2 without precise positioning, and put down to a set placement plane, at this time, the leads 5 extend downwards along the guide through holes 4 and penetrate into the lamp feet 3 along the horn mouths of the lamp feet 3, so as to realize the circuit connection.

[0062] An embodiment of the present disclosure discloses a lamp housing assembly 1 configured for a PAR lamp 100 and a PAR lamp 100, wherein the lamp housing assembly 1 includes a housing 2 and at least two lamp feet 3 mounted on the housing 2, one side of the housing 2 close to the lamp feet 3 is provided with guide through holes 4 respectively abutting with respective lamp feet 3, and each lamp foot 3 has one end embedded in respective corresponding guide through hole 4 inside the housing 2. Therefore, the light source board 7 is grasped by the automated mechanical arm, the light source board 7 is provided with the leads 5, the leads 5 can be guided into the lamp feet 3 through the guide through holes 4 without precise positioning, then automated assembling of the PAR lamp 100 is realized, greatly improving the production efficiency and the production yield, facilitating

the production control, and reducing the production cost.

In some embodiments:

[0063] Referring to FIG. 1 and FIG. 2: in the first lamp housing assembly and the second lamp housing assembly shown in FIG. 1 and FIG. 2, two assembling solutions are provided. In FIG. 1, two lamp feet are assembled at the bottom of the housing, the housing is provided therein with the separating plate to separate an inner space of the housing into two chambers, and the two leads may be connected to corresponding lamp feet through the two chambers, respectively. In FIG. 2, the housing is provided therein with a driving adapter plate, through which connection with the lamp feet is realized, thus leads may not be used.

[0064] Referring to FIG. 3 and FIG. 4: the third lamp housing assembly 1 shown in FIG. 3 and FIG. 4 includes a housing 2 and two lamp feet 3, a top end of the housing 2 is in a shape of open horn mouth, a bottom end of the housing 2 is provided with two mounting holes 21, two mounting holes 21 are provided corresponding to two lamp feet 3, and one end 31 of each lamp foot 3 is mounted in respective mounting hole 21. Two guide bushings 10 arranged at intervals are distributed inside the housing 2. Each guide bushing 10 is vertically arranged, with one end being formed as an inlet end 11, and the other end being formed as an outlet end 12. The guide bushing 10 defines a guide through hole 4 therein. The inlet end 11 communicates with the outlet end 12 through the guide through hole 4, the outlet end 12 is integrally formed with the bottom end of the housing 2, and the outlet end 12 communicates with the mounting hole 21. One end 31 of each lamp foot 3 extends into the guide through hole 4 through the mounting hole 21, and is fixed into the guide through hole 4 after being formed into a horn mouth shape in a manner of spinning, moreover, a lower end part of the guide through hole 4 is also in a horn mouth shape, and the end surface 311 of one end 31 of the lamp foot 3 is closely fitted with the inner wall 42 in a horn mouth shape of the lower end of the guide through hole 4. Meanwhile, each guide bushing 10 is of a tubular structure, and the inner diameter of each of the guide through holes 4 defined therein are equal everywhere.

[0065] Referring to FIG. 5 and FIG. 6: the fourth lamp housing assembly 1 shown in FIG. 5 and FIG. 6 includes a housing 2 and two lamp feet 3, a top end of the housing 2 is in a shape of open horn mouth, a bottom end of the housing 2 is provided with two mounting holes 21, two mounting holes 21 are provided corresponding to two lamp feet 3, and one end 31 of each lamp foot 3 is mounted in respective mounting hole 21. The housing 2 is provided therein with a separating plate 41, and the separating plate 41 separates a bottom end portion of the housing 2 into two guide through holes 4. Each guide through hole has one end being formed as an inlet end 11, and the other end being formed as an outlet end 12. Moreover, the outlet end 12 communicates with respec-

tive mounting hole 21. One end 31 of each lamp foot 3 extends into the guide through hole 4 through the mounting hole 21, and is fixed into the guide through hole 4 after being formed into a horn mouth shape in a manner of spinning, moreover, a lower end portion of the guide through hole 4 is also in a horn mouth shape, and an end surface 311 of one end 31 of the lamp foot 3 is closely fitted with the inner wall 42 in a horn mouth shape of the lower end of the guide through hole 4. Meanwhile, each guide through hole 4 is in a tapered shape, the inlet end 11 of the guide through hole 4 has a large-diameter opening, and the outlet end 12 has a small-diameter opening.

[0066] Referring to FIG. 7 and FIG. 8: the fifth lamp housing assembly 1 shown in FIG. 7 and FIG. 8 includes a housing 2, a guide bushing 10 and two lamp feet 3, a top end of the housing 2 is in a shape of open horn mouth, a bottom end of the housing 2 is provided with two mounting holes 21, two mounting holes 21 are provided corresponding to two lamp feet 3, and one end 31 of each lamp foot 3 is mounted in respective mounting hole 21. The lamp foot 3 adopts a GU10 copper pin, and the shape of the mounting hole 21 is adapted to the shape of the GU10 copper pin. One end 31 of each lamp foot 3, after being formed into the horn mouth shape in a manner of spinning, is accommodated in the mounting hole 21. Each guide bushing 10 is provided with two guide through holes 4, and the two guide through holes 4 are separated by a separating plate 41. Each guide through 4 has an inlet end 11 and an outlet end 12. Each guide through hole 4 is in a tapered shape. The inlet end 11 of the guide through hole 4 has a large-diameter opening, and the outlet end 12 has a small-diameter opening. The inner wall of the housing 2 is provided with a guide groove 24, and an outer wall of the guide bushing 10 is provided with a guide strip 14. The guide strip 14 slidably cooperates with the guide groove 24, so as to achieve the effect of guided positioning. When the guide strip 14 is engaged in the guide groove 24, the outlet ends 12 of the two guide through holes 4 are respectively embedded in one ends 31 of the two lamp feet 3. The housing 2 is further provided with two mounting posts 22 and two positioning posts 23, and the two positioning posts 23 are configured to cooperate with two positioning holes 71 on a light source board 7, so as to realize guided mounting. The two mounting posts 22 are configured to be mounted fixedly with the light source plate 7 via screws 9. The guide bushing 10 is provided with an abutment post 13, of which a top end is configured to be positioned against one side of the light source board 7.

[0067] Referring to FIG. 9 and FIG. 10: the PAR lamp 100 shown in FIG. 9 and FIG. 10 includes a lamp housing assembly 1, two leads 5, a driving assembly 6, a light source board 7, a lens assembly 8, screws 9 and light sources 15, wherein the lamp housing assembly 1 includes a housing 2 and two lamp feet 3 mounted at the bottom end of the housing 2. The driving assembly 6 and the light sources 15 are both fixed on the light source board 7. The light source board 7 is provided thereon

with two fixing portions 72, and the two fixing portions 72 make two leads 5 fixed, respectively, and the screws 9 fix the light source board 7 into the housing 2, so that the leads 5 extend into the lamp feet 3. The top end of the housing 2 is in a shape of open horn mouth, and the lens assembly 8 is mounted to the top end of the housing 2, so that the two leads 5, the driving assembly 6, the light source board 7, the screws 9 and the light sources 15 are all accommodated between the lens assembly 8 and the housing 2. The lens assembly 8 may be fixed on the housing 2 in a snap-fit or bonding manner.

[0068] Referring to FIG. 11 and FIG. 12: the PAR lamp 100 shown in FIG. 11 and FIG. 12 employs the third lamp housing assembly 1 mentioned in the above. When mounted in the housing 2, the light source board 7 is stopped by a raised structure on the housing 2. In the mounting process, that is, in the process of moving the light source board 7 from top to bottom, bottom ends of the two leads 5 enter the inlet ends 11 of the two guide bushings 10, respectively, and move downwards along the inner wall 42 of the guide through holes 4, and finally, after extending out from the outlet ends 12 of the guide through holes 4, extend into the lamp feet 3 along one end 31 of each lamp foot 3. Meanwhile, a clip structure may be chosen for the fixing portions 72 for fixing the leads 5.

[0069] Referring to FIG. 13 and FIG. 14: the PAR lamp 100 shown in FIG. 13 and FIG. 14 employs the fourth lamp housing assembly 1 mentioned in the above. When mounted in the housing 2, the light source board 7 is stopped by a raised structure on the housing 2. In the mounting process, that is, in the process of moving the light source board 7 from top to bottom, bottom ends of the two leads 5 enter the two guide through holes 4 separated by the separating plate 41, respectively. Each lead first enters the inlet end 11, and moves downwards along the inner wall 42 of the guide through hole 4, and finally, after extending out from the outlet end 12 of the guide through hole 4, extends into the lamp foot 3 along one end 31 of the lamp foot 3. Meanwhile, a clip structure may be chosen for the fixing portions 72 for fixing the leads 5.

[0070] Referring to FIG. 15 and FIG. 16: the PAR lamp 100 shown in FIG. 15 and FIG. 16 employs the fifth lamp housing assembly 1 mentioned in the above. In the mounting process, the guide bushing 10 is mounted first, the guide strip 14 on the guide bushing 10 slidingly cooperates with the guide groove 24 inside the housing 2, and after the guide bushing is mounted in position, the two outlet ends 12 of the guide bushing 10 are engaged into one ends 31 of the two lamp feet 3. Then, the light source board 7 is mounted, and in the process of mounting the light source board 7 downwards, the two positioning holes 71 on the light source board 7 are guided by the two positioning posts 23 on the housing 2 to realize guided mounting. When the light source board 7 is moved to the mounting position, the top end of the abutment post 13 on the guide bushing 10 is positioned against

one side surface of the light source board 7. At this time, the top end of the positioning post 23 passes through the positioning hole 71, and two screws 9 may be fitted with the two mounting posts 22 on the housing 2 after passing through the holes on the light source board 7, thus realizing fastening. In the mounting process of the light source board 7, the two leads 5 fixed on the light source board 7 enter the guide through holes 4 defined therein through the inlet ends 11 of the guide bushing 10, and enter the lamp feet 3 after passing through the outlet ends 12 along the inner walls 42 of the guide through holes 4. Finally, the lens assembly 8 is mounted. The lens assembly 8 is fastened to the top end in the horn mouth shape of the housing 2, and is further fixed by gluing. Meanwhile, the fixing portions 72 provided on the light source board 7 and configured to fix the leads 5 are in a hollow columnar structure.

Industrial Applicability

[0071] To sum up, the present disclosure provides a lamp housing assembly configured for a PAR lamp and a PAR lamp, which can automate the production of the PAR lamp, and have a low manufacturing cost.

Claims

1. A lamp housing assembly (1) applicable to a PAR lamp (100), the lamp housing assembly comprising a housing (2) and at least two lamp feet (3) mounted on the housing (2), **characterized in that** one side of the housing (2) close to the lamp feet (3) is provided with guide through holes (4) respectively corresponding to one of the lamp feet (3), and each of the lamp feet (3) has one end (31) embedded in one corresponding guide through hole (4) inside the housing (2).
2. The lamp housing assembly (1) applicable to a PAR lamp (100) according to claim 1, wherein an inner diameter of each of the guide through holes (4) is kept unchanged; preferably, each of the guide through holes (4) is in cylindrical shape.
3. The lamp housing assembly (1) applicable to a PAR lamp (100) according to claim 1, wherein each of the guide through holes (4) has an inner diameter gradually decreasing towards a direction of one corresponding lamp foot (3), preferably, each of the guide through holes (4) is in tapered shape.
4. The lamp housing assembly (1) applicable to a PAR lamp (100) according to any one of claims 1-3, wherein the guide through holes (4) are arranged at intervals inside the housing (2); preferably, each of the guide through holes (4) is

- independently provided inside the housing (2); preferably, a plurality of the guide through holes (4) are separated by a separating plate (41); and preferably, the separating plate (41) is integrally formed with or detachably cooperates with the housing (2).
5. The lamp housing assembly (1) applicable to a PAR lamp (100) according to any one of claims 1-4, wherein the lamp housing assembly (1) further comprises at least one guide bushing (10), wherein the at least one guide bushing (10) is provided in the housing (2), and at least one guide through hole (4) is defined inside the at least one guide bushing (10); preferably, a plurality of the guide through holes (4) are defined in the same guide bushing (10); preferably, the at least one guide bushing (10) is integrally formed with or detachably cooperates with the housing (2); and preferably, the at least one guide bushing (10) is provided with an abutment post (13), wherein the abutment post (13) is configured to be positioned against one side of a light source board (7).
 6. The lamp housing assembly (1) applicable to a PAR lamp (100) according to claim 5, wherein the housing (2) is provided with at least one mounting hole (21), the at least one guide bushing (10) defines at least one inlet end (11) and at least one outlet end (12) communicating with each other, wherein the at least one outlet end (12) detachably cooperates with the at least one mounting hole (21); and each of the lamp feet (3) communicates with the at least one outlet end (12) through the at least one mounting hole (21); and preferably, the at least one outlet end (12) is accommodated in one end (31) of one corresponding lamp foot (3).
 7. The lamp housing assembly (1) applicable to a PAR lamp (100) according to claim 5 or 6, wherein at least one guide groove (24) is provided inside the housing (2), at least one guide strip (14) is provided outside the at least one guide bushing (10), and the at least one guide strip (14) slidably cooperates with the at least one guide groove (24).
 8. The lamp housing assembly (1) applicable to a PAR lamp (100) according to any one of claims 1-7, wherein an end surface (311) of the one end (31) of each of the lamp feet (3) abuts against or is close to an inner wall (42) of the one corresponding guide through hole (4).
 9. The lamp housing assembly (1) applicable to a PAR lamp (100) according to any one of claims 1-8, wherein the one end (31) of each of the lamp feet (3) is fixed in the one corresponding guide through hole (4) in a manner of spinning.
 10. The lamp housing assembly (1) applicable to a PAR lamp (100) according to any one of claims 1-9, wherein the one end (31) of each of the lamp feet (3) is in a horn mouth shape; preferably, the horn mouth shape of the one end (31) of each of the lamp feet (3) is next to or close to the inner wall (42) of the one corresponding guide through hole (4).
 11. The lamp housing assembly (1) applicable to a PAR lamp (100) according to any one of claims 1-10, wherein the housing (2) is provided with mounting holes (21) each in communication with one corresponding guide through hole (4), the one end (31) of each of the lamp feet (3) is embedded in one corresponding guide through hole (4) inside the housing (2) through one corresponding mounting hole (21); and preferably, each of the lamp feet (3) adopts a GU10 copper pin, and each of the mounting holes (21) is adapted to the GU10 copper pin in shape.
 12. The lamp housing assembly (1) applicable to a PAR lamp (100) according to any one of claims 1-11, wherein mounting posts (22) and positioning posts (23) are provided in the housing (2), and each of the positioning posts (23) is configured to cooperate with one corresponding positioning hole (71) on a light source board (7), so as to realize guided mounting of the light source board (7); and a top end of each of the mounting posts (22) is configured to be fixedly assembled with the light source board (7) via a screw (9).
 13. A PAR lamp (100), **characterized by** comprising the lamp housing assembly (1) applicable to a PAR lamp (100) according to any one of claims 1-12 and at least two leads (5), each of the leads (5) passes through one of the guide through holes (4) and extends to enter inside of one corresponding lamp foot (3).
 14. The PAR lamp (100) according to claim 13, wherein each lead (5) of the at least two leads (5) separately passes through one corresponding guide through hole (4).
 15. The PAR lamp (100) according to claim 13 or 14, wherein the PAR lamp (100) further comprises a driving assembly (6) and a light source board (7), wherein the driving assembly (6) is fixed on the light source board (7), the light source board (7) is fixed on the lamp housing assembly (1), and the leads (5) are connected to the driving assembly (6).

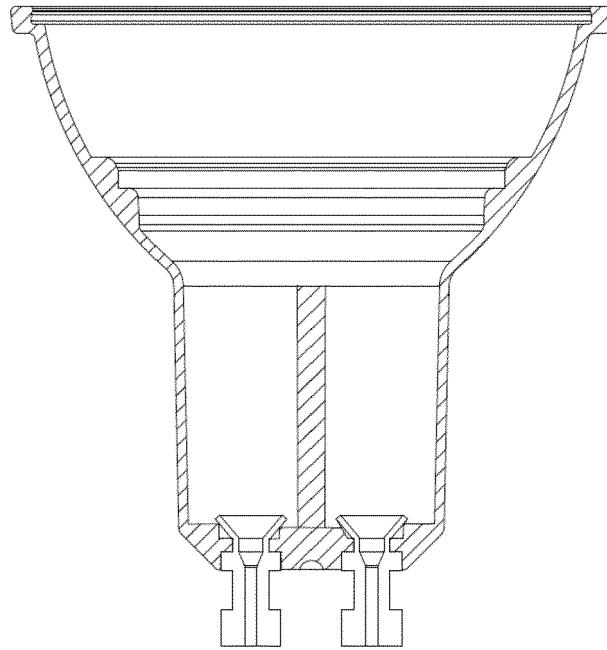


FIG. 1

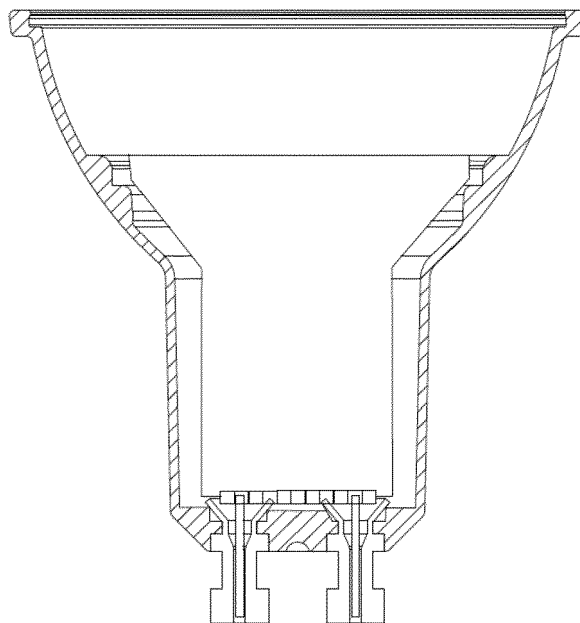


FIG. 2

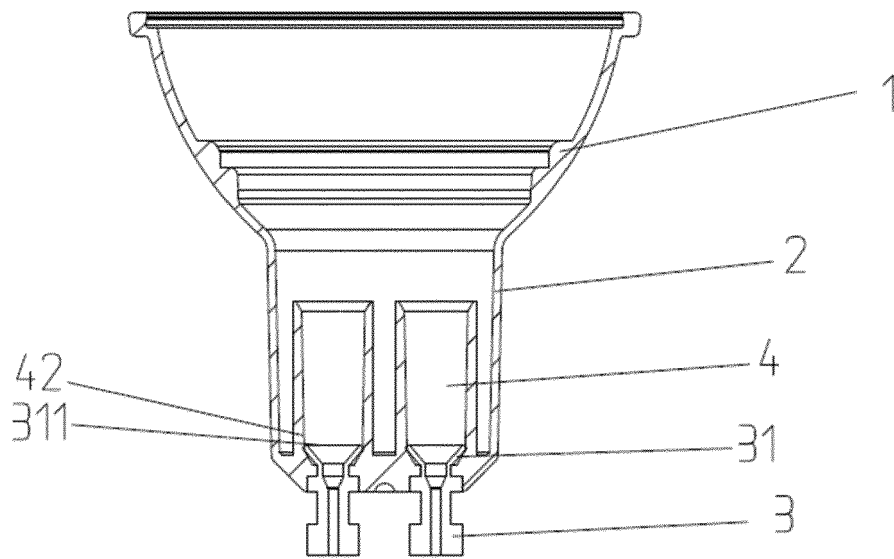


FIG. 3

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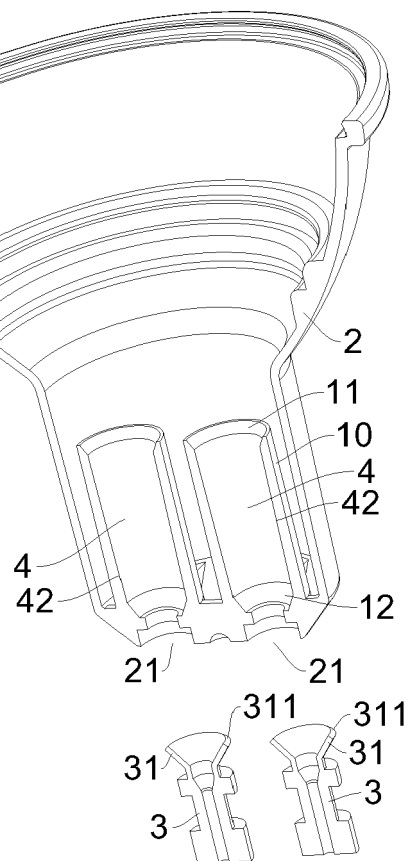


FIG. 4

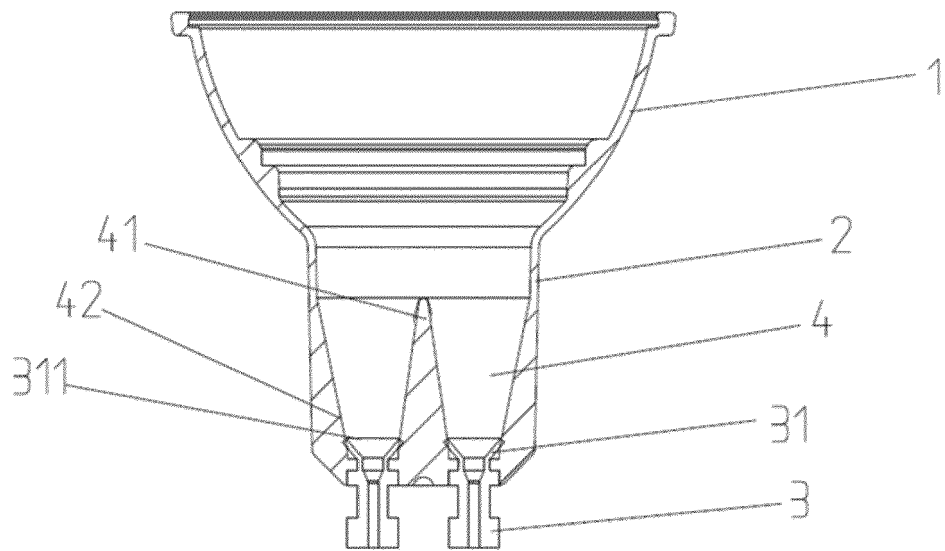


FIG. 5

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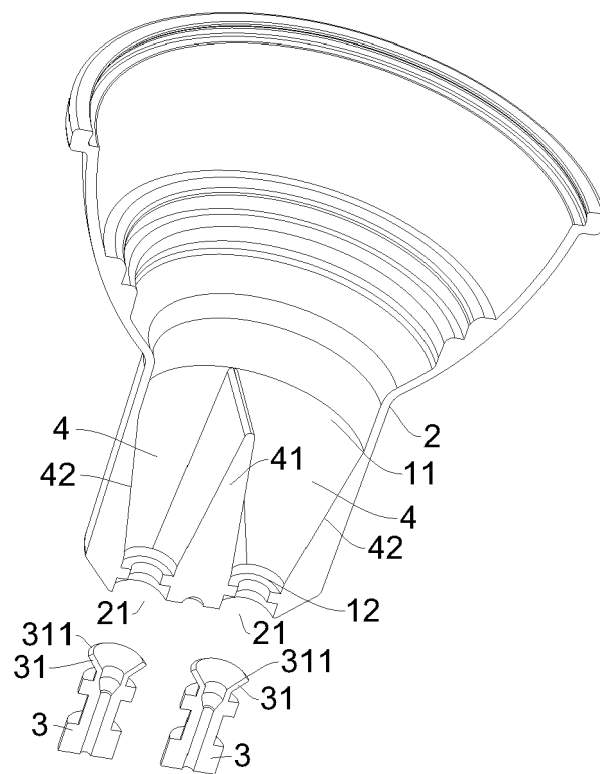


FIG. 6

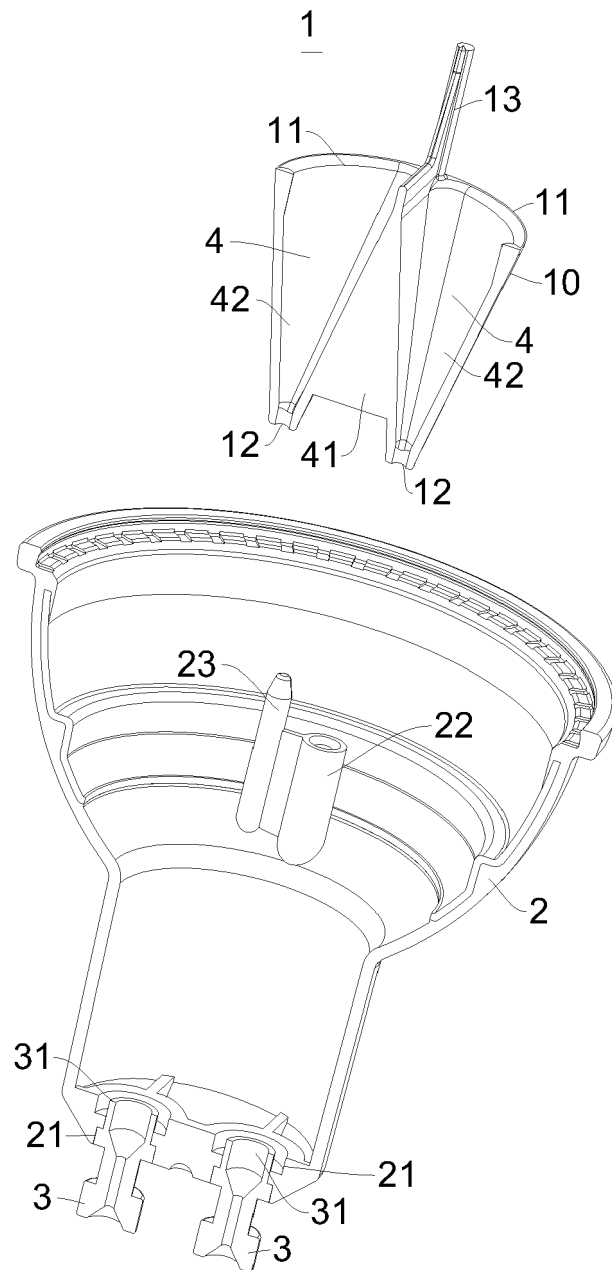


FIG. 7

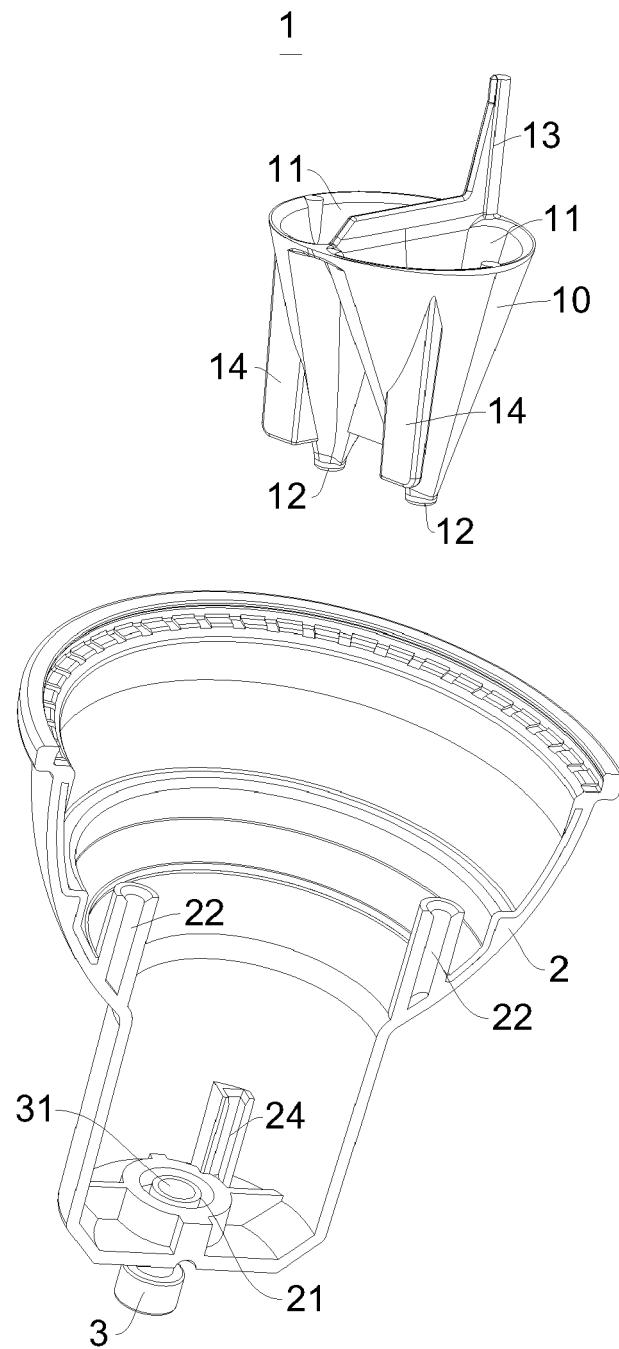


FIG. 8

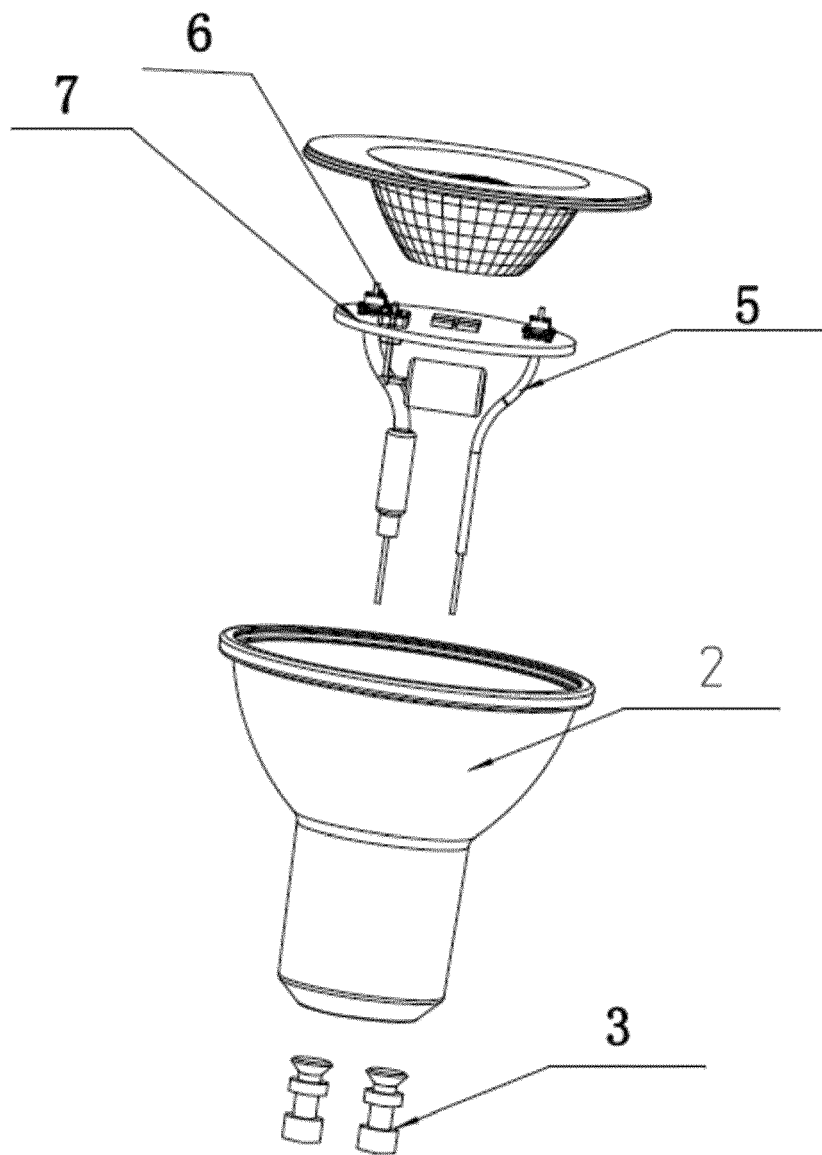


FIG. 9

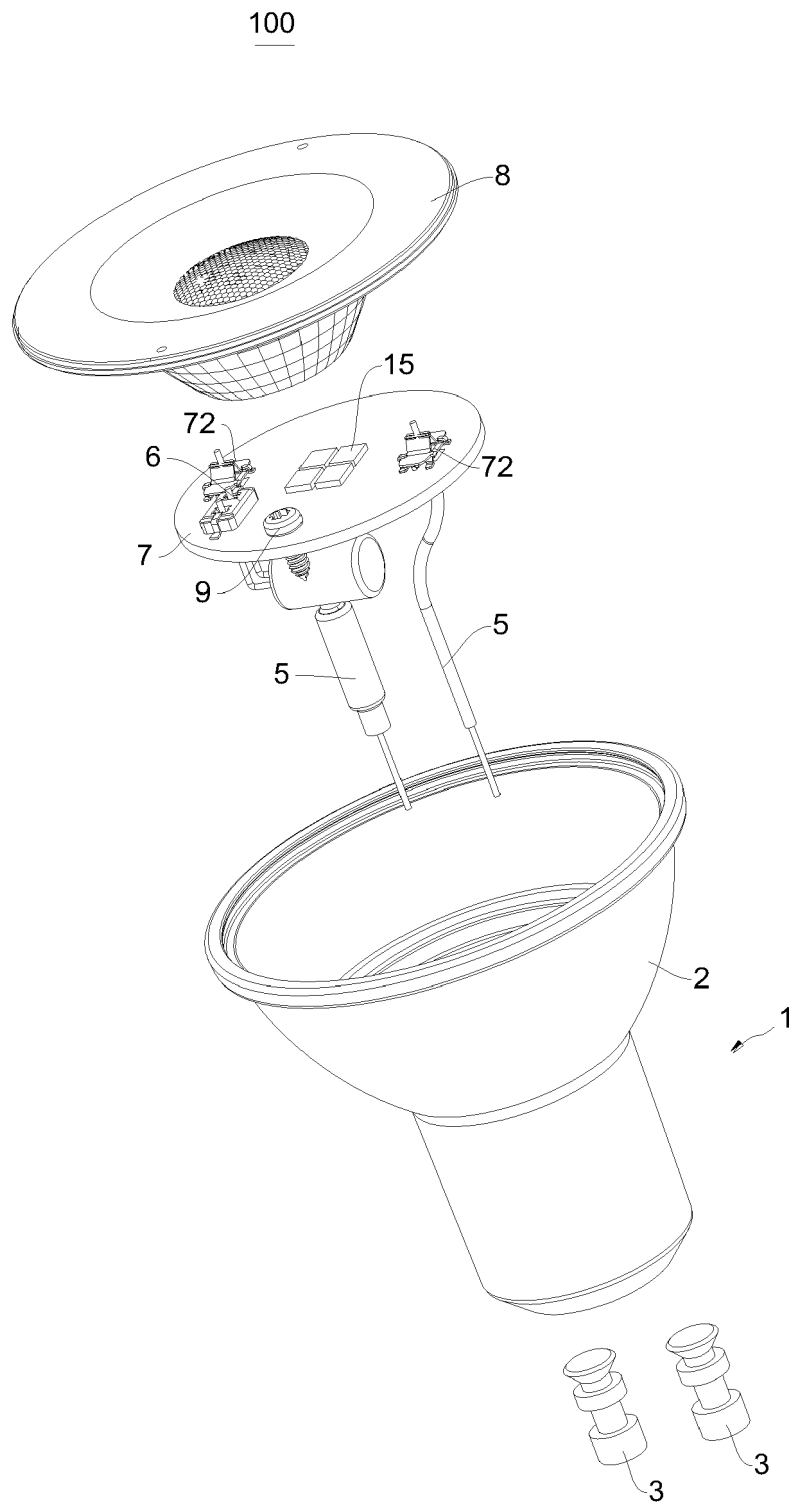


FIG. 10

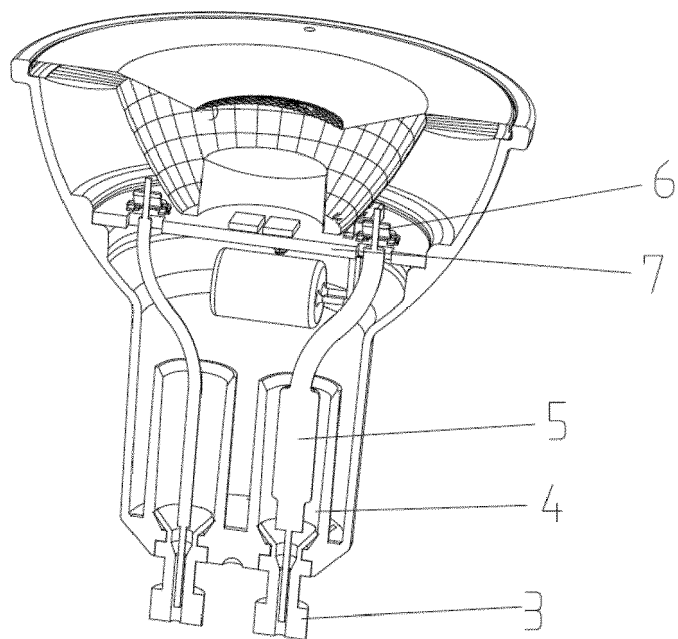


FIG. 11

100

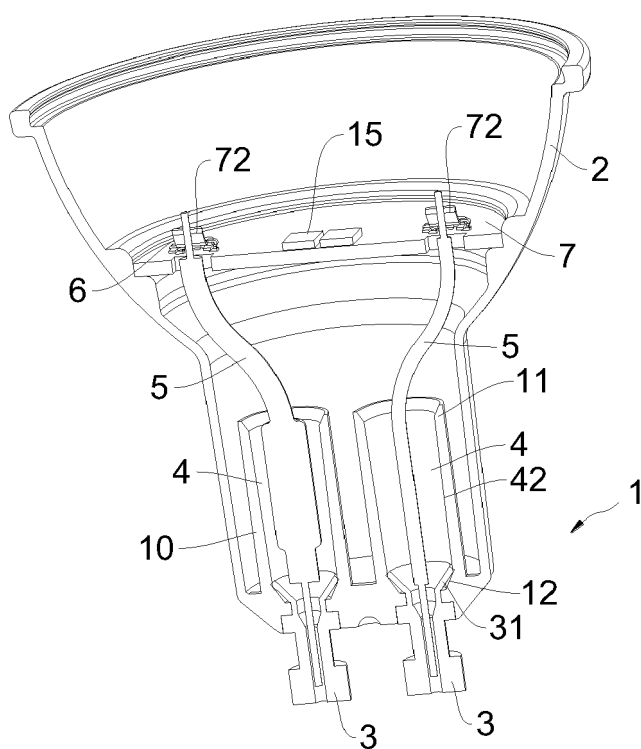


FIG. 12

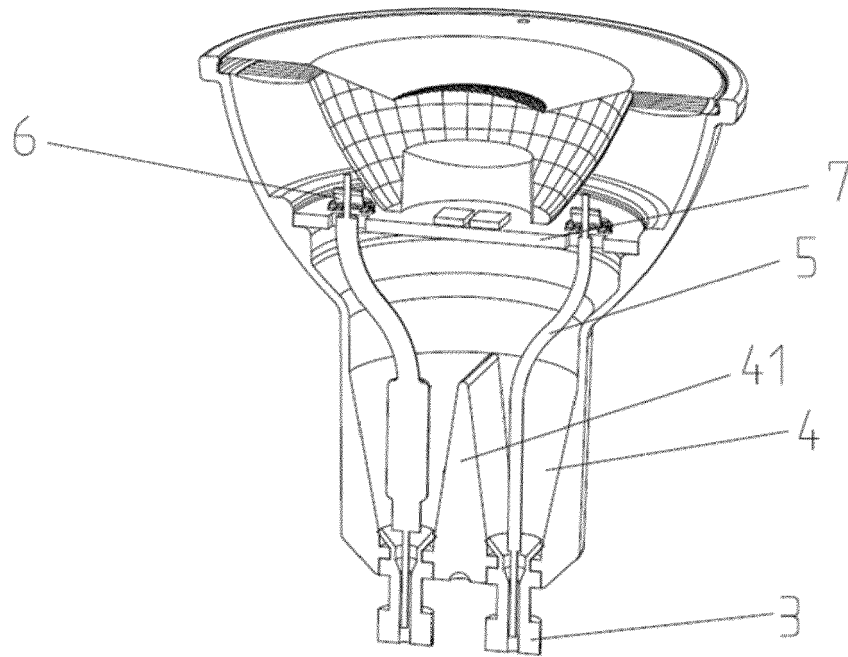


FIG. 13

100

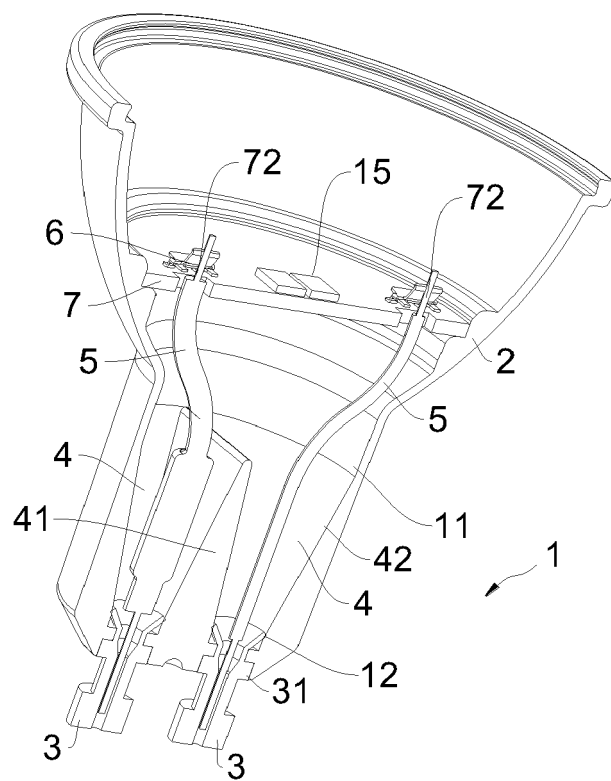


FIG. 14

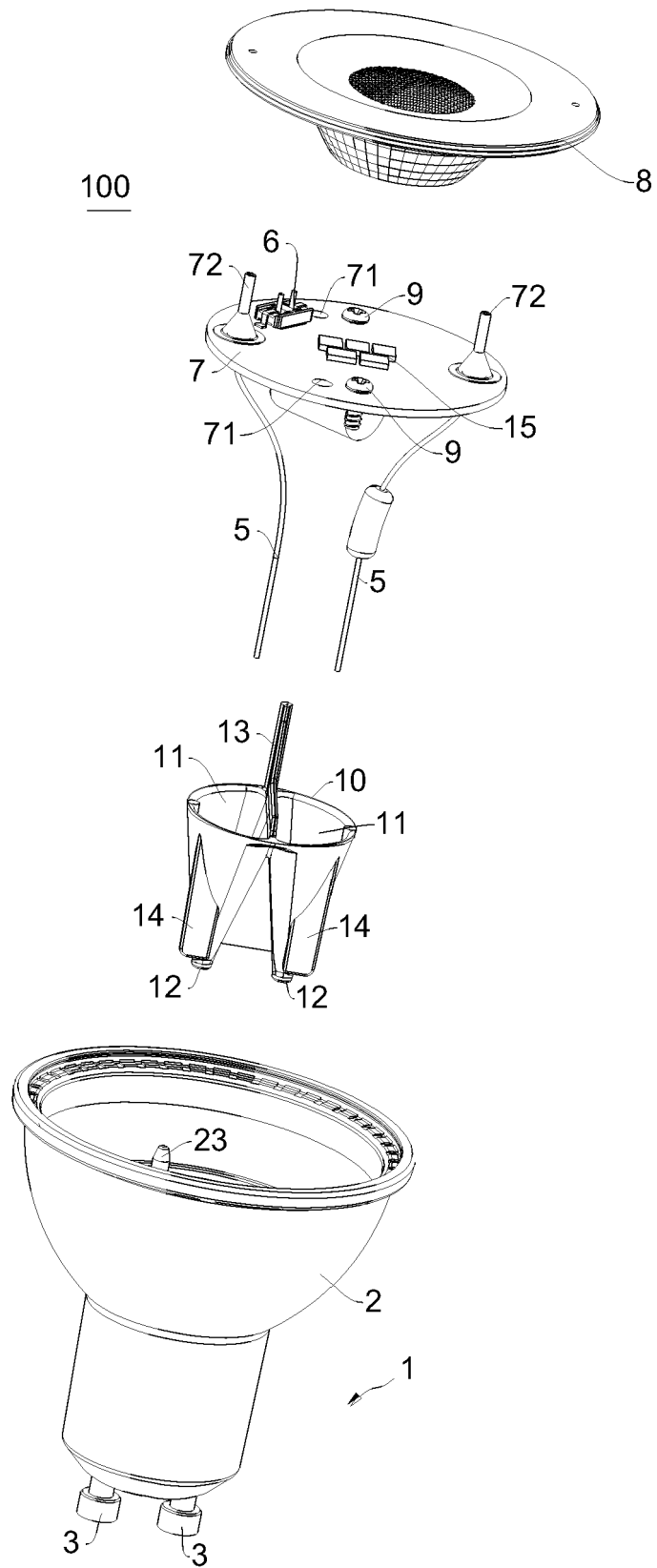
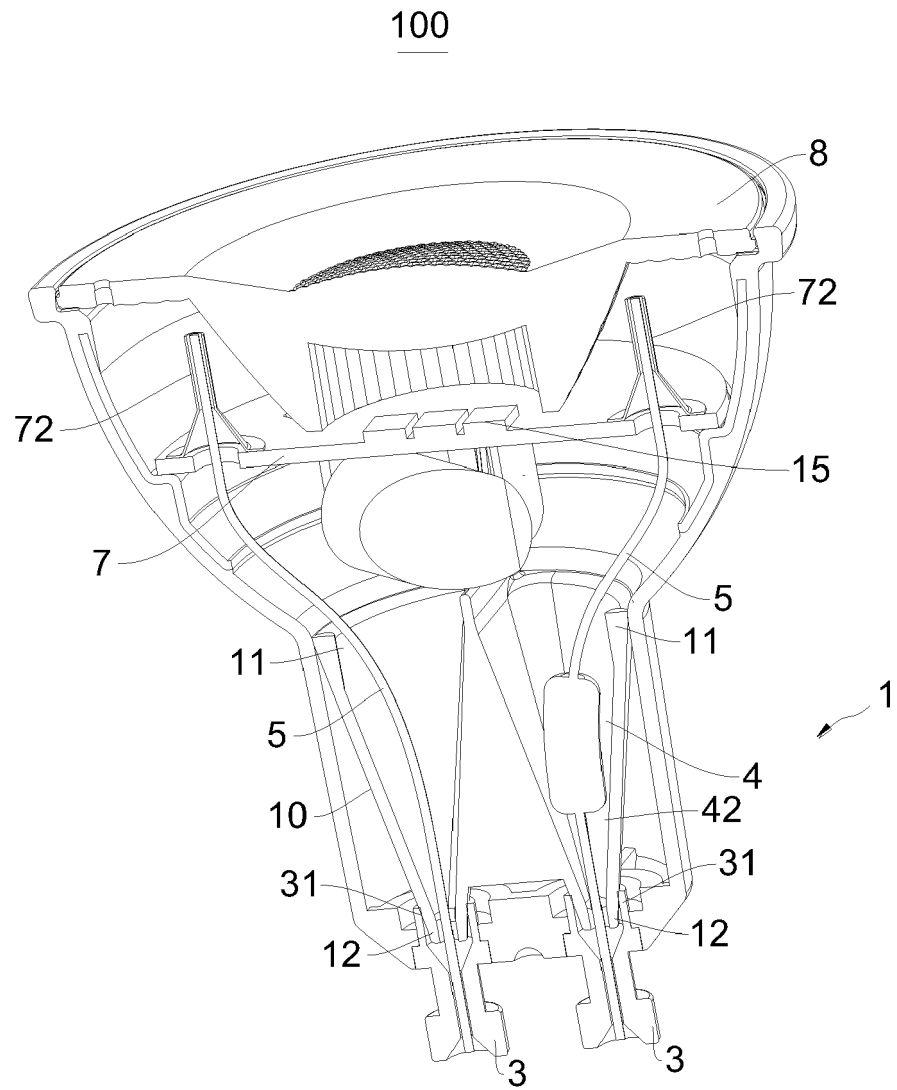


FIG. 15





EUROPEAN SEARCH REPORT

Application Number
EP 20 19 5486

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			F21K F21Y F21V
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 25 January 2021	Examiner Demirel, Mehmet
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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