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(54) **EASY-TO-ASSEMBLE DETACHABLE DOWNLIGHT**

LEICHT ZU MONTIERENDER ABNEHMBARER DECKENSTRAHLER
PLAFONNIER AMOVIBLE FACILE À MONTER

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(56) References cited:
WO-A1-2011/145425 CN-U- 202 024 158
CN-U- 203 628 395 CN-U- 204 285 176
CN-U- 208 312 147 DE-T5-112015 002 678
US-A1- 2012 044 695

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Description

TECHNICAL FIELD

[0001] The present disclosure belongs to the technical field of lamps, and more specifically relates to an easy-to-assemble detachable downlight.

BACKGROUND

[0002] A downlight is a kind of lamp embedded in a ceiling or other external structures. The downlight can generate different types of light effects. With a corresponding decoration style, the downlight can well create a warm and soft atmosphere, which greatly enhances the user's spatial experience. On some occasions, an installation space for the downlight is relatively small. In order to adapt to the relatively small installation space, there are downlights with thinner light bodies in the prior art. However, the existing thin downlights are often composed of many parts, and the complexity of each procedure such as design, machining and assembling remains high, resulting in relatively high downlight cost.

CN 202024158 U discloses a downlight which includes light emitting diodes (LEDs), a base plate and a heat radiator. The LEDs are fixed on the end surface of the bottom end of the base plate. The LEDs are electrically connected with the base plate. The heat radiator is provided with an accommodating region with a downward opening. The base plate is placed in the accommodating region. The end surface of the top end of the base plate is tightly pasted and fixed on the end surface of the top end of the accommodating region. The opening of the accommodating region of the heat radiator is provided with a heat radiation surface frame made of heat radiation materials. The heat radiation surface frame is tightly pasted and fixed at the bottom of the heat radiator. Because the heat radiation surface frame made of the heat radiation materials also has a heat radiation effect, and in addition, the heat radiation surface frame is tightly pasted and fixed at the bottom of the heat radiator, so the whole downlight forms an integral heat radiation structure, the size of the heat radiator can be smaller, and the thickness can be thinner. Therefore, the downlight has the characteristics of small size, thin thickness and the like.

Document CN204285176U discloses another downlight according to the prior art.

SUMMARY

[0003] The present disclosure is directed to provide an easy-to-assemble detachable downlight, and aims to solve the technical problems that an existing downlight has a large number of parts for assembling and a complicated assembling process.

[0004] In order to achieve the above purpose, the technical solution used by the present disclosure is to provide an easy-to-assemble detachable downlight, including a

shell and a light source panel.

[0005] The shell is flat and includes a front hood and a back seat. The front hood and the back seat are of an integrated structure. The front hood and the back seat are detachably connected and encircle an accommodating cavity. The front hood has a light-transmitting part and a surface ring part.

[0006] The light source panel is located in the accommodating cavity and is detachably mounted on the back seat. The light source panel has a power interface used to be connected to an external power supply.

[0007] The back seat conducts and dissipates heat generated by the light source panel, and reflects light emitted by the light source panel to the light-transmitting part.

[0008] The light source panel is connected with the back seat through a first screw, and the front hood is connected with the back seat through a second screw.

[0009] The back seat includes a back plate, a conical ring plate, and a specially-shaped ring plate.

[0010] A first thread hole for allowing the first screw to be screwed in is formed in the back plate, and the light source panel is mounted on the back plate through the first screw.

[0011] The own axis of the conical ring plate is perpendicular to the back plate, and one end of the conical ring plate is seamlessly connected with the back plate; and an inner side surface of the conical ring plate is a light reflection surface and faces the light-transmitting part.

[0012] The specially-shaped ring plate is connected with the front hood and fixedly connected with the conical ring plate or the back plate.

[0013] The specially-shaped ring plate is conical and surrounds the back plate and the conical ring plate; one end of the specially-shaped ring plate is connected with the conical ring plate; the other end of the specially-shaped ring plate is provided with a flange; and the flange is provided with an open pore for allowing the second screw to pass through.

[0014] The front hood includes a panel; an edge of the panel is the surface ring part, and the surface ring part is circular; and a middle part of the panel is the light-transmitting part.

[0015] The front hood further includes a barrel-shaped connection plate; one end of the connection plate is fixedly connected with the panel, and the other end of the connection plate extends towards one side of the panel; a convex block is arranged on the connection plate; and the convex block is provided with a second thread hole that is aligned with the open pore and allows the second screw to be screwed in.

[0016] As another embodiment of the present application, the connection plate is provided with a hanger; the hanger is used to be connected with an external structure; and the hanger is also used to be aligned with a locating gap formed in the flange and in clamping fit with the locating gap.

[0017] As another embodiment of the present applica-

tion, the easy-to-assemble detachable downlight further includes a power line. One end of the power line is connected with the power interface, and the other end of the power line is used to be connected with the external power supply; and the flange is provided with a threading gap for allowing the power line to pass through.

[0018] As another embodiment of the present application, two sides of the threading gap are provided with bayonets, and the connection plate is provided with a fixture block that is in clamping fit with the bayonets.

[0019] As another embodiment of the present application, the power line is provided with a switch used to control switch on and switch off. The easy-to-assemble detachable downlight further includes an external driving module connected between the switch and the external power supply. The external driving module provides working current for light emitting diodes on the light source panel.

[0020] Compared with the prior art, the easy-to-assemble detachable downlight provided by the present disclosure has the beneficial effects that by the arrangement of the one-piece front hood and back seat, during production of the downlight, after the light source panel is mounted to the back seat, and the front hood and the back seat are fastened, the assembling of the product is completed with convenience and high efficiency. Compared with a downlight composed of a surface ring, a light-transmitting hood, a heat dissipation body and a light reflection cup, the easy-to-assemble detachable downlight provided by the present disclosure reduces the number of parts, simplifies the structures of the parts and greatly reduces the design and manufacturing cost. During assembling of the product, the steps of press fitting of the surface ring and the light-transmitting hood and clamping fitting of the heat dissipation body and the light reflection cup are canceled, which simplifies the assembling process and improves the assembling efficiency. Meanwhile, since the parts are detachably connected, the front hood and the back seat can be conveniently separated, and the shell is disassembled to replace different types of light source panels to fully meet the use need of customers. In addition, the shell is flat, so that the downlight is relatively thin and can be applicable to a narrow installation space. The back seat is also flat and has a relatively large heat dissipation area. When the light source panel is mounted on the back seat, a distance to the back seat is very small, so that the heat conduction distance is extremely small, and heat generated by the downlight in the use process can be dissipated in time, which is favorable for prolonging the service life of the downlight.

BRIEF DESCRIPTION OF THE DRAWINGS

[0021] To describe the technical solutions in the embodiments of the present disclosure more clearly, drawings required to be used in the embodiments or the illustration of the existing art will be briefly introduced below.

Obviously, the drawings in the illustration below are only some embodiments of the present disclosure. Those of ordinary skill in the art also can acquire other drawings according to the provided drawings without doing creative work.

Figure 1 is a schematic diagram of an exploded structure of an easy-to-assemble detachable downlight provided by the embodiments of the present disclosure;

Figure 2 is a schematic bottom-view structural diagram of an easy-to-assemble detachable downlight provided by the embodiments of the present disclosure;

Figure 3 is a schematic diagram of assembling of a light source panel and a back seat in an easy-to-assemble detachable downlight provided by the embodiments of the present disclosure;

Figure 4 is a schematic diagram of assembling of a front hood and a back seat in an easy-to-assemble detachable downlight provided by the embodiments of the present disclosure;

Figure 5 is a schematic diagram of a three-dimensional structure of a back seat in an easy-to-assemble detachable downlight provided by the embodiments of the present disclosure;

Figure 6 is a schematic diagram of a sectional structure of a back seat in an easy-to-assemble detachable downlight provided by the embodiments of the present disclosure;

Figure 7 is a schematic diagram of a three-dimensional structure of a front hood in an easy-to-assemble detachable downlight provided by the embodiments of the present disclosure;

Figure 8 is a schematic diagram of a revolved sectional structure of an easy-to-assemble detachable downlight provided by the embodiments of the present disclosure;

Figure 9 is a schematic top-view structural diagram of an easy-to-assemble detachable downlight provided by the embodiments of the present disclosure; and

Figure 10 is a schematic diagram of a structural composition of an easy-to-assemble detachable downlight including a power line and an external driving module provided by the embodiments of the present disclosure.

[0022] In the drawings: 1, shell; 2, light source panel;

3, front hood; 31, light-transmitting part; 32, surface ring part; 33, panel; 34, connection plate; 341, convex block; 3411, second thread hole; 342, hanger; 343, fixture block; 4, back seat; 41, back plate; 411, first thread hole; 42, conical ring plate; 43, specially-shaped ring plate; 44, flange; 441, open pore; 442, locating gap; 443, threading gap; 444, bayonet; 51, first screw; 52, second screw; 6, power line; 61, switch; and 7, external driving module.

DETAILED DESCRIPTION OF ILLUSTRATIVE EMBODIMENTS

[0023] In order to make the technical problems, technical solutions and beneficial effects of the present disclosure clearer, the present disclosure is further described below in detail with reference to accompanying drawings and embodiments. It should be understood that the specific embodiments described here are merely to explain the present disclosure, and not intended to limit the present disclosure.

[0024] Referring to Figure 1 and Figure 2, an easy-to-assemble detachable downlight provided by the present disclosure is now described. The easy-to-assemble detachable downlight includes a shell 1 and a light source panel 2. The shell 1 is flat and includes a front hood 3 and a back seat 4. The front hood 3 and the back seat 4 are of a one-piece structure. The front hood 3 and the back seat 4 are detachably connected and encircle an accommodating cavity. The front hood 3 has a light-transmitting part 31 and a surface ring part 32. The light source panel 2 is located in the accommodating cavity and is detachably mounted on the back seat 4. The light source panel 2 is provided with a power interface used to be connected to an external power supply. The back seat 4 conducts and dissipates heat generated by the light source panel 2, and reflects light emitted by the light source panel 2 to the light-transmitting part 31.

[0025] Compared with the prior art, the easy-to-assemble detachable downlight provided by the present disclosure has the beneficial effects that by the arrangement of the one-piece front hood 3 and back seat 4, during production of the downlight, after the light source panel 2 is mounted to the back seat 4, and the front hood 3 and the back seat 4 are fastened, the assembling of the product is completed with convenience and high efficiency. Compared with a downlight composed of a surface ring, a light-transmitting hood, a heat dissipation body and a light reflection cup, the easy-to-assemble detachable downlight provided by the present disclosure reduces the number of parts, simplifies the structures of the parts and greatly reduces the design and manufacturing cost. During assembling of the product, the steps of press fitting of the surface ring and the light-transmitting hood and clamping fitting of the heat dissipation body and the light reflection cup are canceled, which simplifies the assembling process and improves the assembling efficiency. Meanwhile, since the parts are detachably connected, the front hood 3 and the back seat 4 can be conveniently

separated, and the shell 1 is disassembled to replace different types of light source panels 2 to fully meet the use need of customers. In addition, the shell 1 is flat, so that the downlight is relatively thin and can be applicable to a narrow installation space. The back seat 4 is also flat and has a relatively large heat dissipation area. When the light source panel 2 is mounted on the back seat 4, a distance to the back seat 4 is very small, so that the heat conduction distance is extremely small, and heat generated by the downlight in the use process can be dissipated in time, which is favorable for prolonging the service life of the downlight.

[0026] It should be noted that the light source panel 2 usually uses the prior art. The power interface is an existing structure on the light source panel 2. The light source panel 2 may use light emitting diodes (LEDs) as a light emitting element. Most of the heat generated by the light source panel 2 is generated by the light emitting element, and light emitted by the light source panel 2 is all emitted by the light emitting element.

[0027] There are various ways to realize detachable connection between the light source panel 2 and the back seat 4 as well as between the front hood 3 and the back seat 4, such as clamping after plugging or threaded connection. A detachable structure is obtained in a method which is well known to the person skilled in the art, and application of the detachable structure to the technical solution formed in the present embodiment shall be deemed to fall within the protection scope of the present disclosure.

[0028] The front hood 3 may be formed by one-piece injection molding and is equivalent to two parts, i.e., a surface ring and a light-transmitting hood, in the prior art. During production of the downlight, there is no longer need to assemble the surface ring and the light-transmitting hood, so that the production efficiency is improved. The back seat 4 may be formed by performing one-piece stamping on an aluminum material to achieve an extremely good heat dissipation effect. The back seat 4 is equivalent to two parts, i.e., a heat dissipation body and a light reflection cup, in the prior art. During production of the downlight, there is no need to assemble the heat dissipation body and the light reflection cup, so that the production efficiency is improved. The back seat 4 enhances the heat dissipation effect, and a fastener for the light reflection cup does not need to be additionally designed, so that the design and manufacturing cost is reduced.

[0029] Specifically, the shell 1 may be circular, and at this time, the front hood 3 and the back seat 4 are also circular.

[0030] In the present disclosure, referring to Figure 3 and Figure 4, the light source panel 2 is connected with the back seat 4 through a first screw 51, and the front hood 3 is connected with the back seat 4 through a second screw 52. Screw connection realizes the detachable connection between the light source panel 2 and the back seat 4 as well as between the front hood 3 and the back

seat 4. A screw connection structure is simple and convenient to assemble and disassemble. Furthermore, screws are easy to obtain and relatively low in cost.

[0031] In the present disclosure, referring to Figure 5 and Figure 6, the back seat 4 includes a back plate 41, a conical ring plate 42, and a specially-shaped ring plate 43. A first thread hole 411 for allowing the first screw 51 to be screwed in is formed in the back plate 41, and the light source panel 2 is mounted on the back plate 41 through the first screw 51. The own axis of the conical ring plate 42 is perpendicular to the back plate 41, and one end of the conical ring plate 42 is seamlessly connected with the back plate 41; and an inner side surface of the conical ring plate 42 is a light reflection surface and faces the light-transmitting part 31. The specially-shaped ring plate 43 is connected with the front hood 3 and fixedly connected with the conical ring plate 42 or the back plate 41.

[0032] Specifically, the light source panel 2 is parallel to the back plate 41. After the assembling is completed, a surface of the light source panel 2 is opposite to the light-transmitting part 31 and can emit light to the light-transmitting part 31. Lateral light emitted by the light source panel 2 is reflected to the light-transmitting part 31 by virtue of an inner side surface of the conical ring plate 42, thereby increasing the utilization rate of the light. The conical ring plate 42 may use its surface to reflect the light, or may reflect the light by means of setting a light reflection layer on a light reflection surface. Moreover, the light source panel 2 is completely or basically fitted to the back plate 41, so that in a working process of the downlight, the heat generated by the light source panel 2 may be immediately conducted to the back plate 41 to be quickly dissipated to an external space to prolong the life of the downlight.

[0033] In the present disclosure, referring to Figure 6, the specially-shaped ring plate 43 is conical and surrounds the back plate 41 and the conical ring plate 42; one end of the specially-shaped ring plate 43 is connected with the conical ring plate 42; the other end of the specially-shaped ring plate 43 is provided with a flange 44; and the flange 44 is provided with an open pore 441 for allowing the second screw 52 to pass through. That is, the specially-shaped ring plate 43 is of the same shape as the conical ring plate 42, but they are provided in different directions. From Figure 6, the conical ring plate 42 tilts to the inner side, and the specially-shaped ring plate 43 tilts to the outer side.

[0034] A size of a whole composed of the back plate 41 and the conical ring plate 42 in an axial direction of the downlight is less than a size of the specially-shaped ring plate 43 in the axial direction of the downlight, so that the back plate 41 and the conical ring plate 42 may be completely enclosed in a conical space encircled by the specially-shaped ring plate 43. With a relatively small overall thickness, the downlight can well adapt to a narrow installation space.

[0035] Specifically, as shown in Figure 6, an edge of

the lower end of the specially-shaped ring plate 43 is seamlessly connected with an edge of the lower end of the conical ring plate 42; an edge of the upper end of the specially-shaped ring plate 43 is seamlessly connected with an edge of the inner side of the circular flange 44; an edge of the upper end of the conical ring plate 42 is seamlessly connected with an edge of the back plate 41; and there are a plurality of open pores 441 uniformly distributed in a circumferential direction. The number of the open pores 441 is consistent with the number of the second screws 52, and the open pores 441 are in one-to-one correspondence to the second screws 52. That is, there are also a plurality of second screws 52 uniformly distributed in the circumferential direction. A tight locking force can be generated to firmly mount the front hood 3 and the back seat 4 together.

[0036] In the present disclosure, referring to Figure 2 and Figure 7, the front hood 3 includes a panel 33; an edge of the panel 33 is the surface ring part 32, and the surface ring part 32 is circular; and the middle part of the panel 33 is the light-transmitting part 31. Specifically, a step is arranged between the light-transmitting part 31 and the surface ring part 32.

[0037] In the present disclosure, referring to Figure 7, the front hood 3 further includes a barrel-shaped connection plate 34; one end of the connection plate 34 is fixedly connected with the panel 33, and the other end of the connection plate 34 extends towards one side of the panel 33; a convex block 341 is arranged on the connection plate 34; the convex block 341 is provided with a second thread hole 3411 that is aligned with the open pore 441 and allows the second screw 52 to be screwed in. Specifically, the connection plate 34 is perpendicular to the panel 33 and extends to the upper side of the panel 33.

[0038] Figure 8 is a schematic diagram of a revolved sectional schematic diagram after the front hood 3, the back seat 4 and the light source panel 2 are assembled. The first screw 51 and the second screw 52 are not shown in the figures. During assembling, the first screw 51 is used to fix the light source plate 2 to the inner surface of the back plate 41 at first, and then the second screw 52 is used to assemble the front hood 3 and the back seat 4. After the assembling is completed, the thickness of the downlight is basically equal to the height of the connection plate 34, so that the entire downlight is relatively thin and has a relatively large surface area to facilitate heat dissipation.

[0039] As a specific implementation mode of the easy-to-assemble detachable downlight provided by the present disclosure, referring to Figure 5, Figure 7, and Figure 9, the connection plate 34 is provided with a hanger 342; the hanger 342 is used to be connected with an external structure; and the hanger 342 is also used to be aligned with a locating gap 442 formed in the flange 44 and in clamping fit with the locating gap 442. Specifically, the top end of the hanger 342 is of a hook-type hanging structure and may be connected to an external structure such as a ceiling. After the hanger 342 is in clamping fit

with the locating gap 442, the open pore 441 formed in the flange 44 may be aligned with the second thread hole 3411 formed in the connection plate 34 to improve the assembling efficiency.

[0040] As a specific implementation mode of the easy-to-assemble detachable downlight provided by the present disclosure, referring to Figure 5, Figure 9, and Figure 10, the easy-to-assemble detachable downlight further includes a power line 6. One end of the power line 6 is connected with the power interface, and the other end of the power line 6 is used to be connected with the external power supply; and the flange 44 is provided with a threading gap 443 for allowing the power line 6 to pass through.

[0041] One end of the power line 6 is provided with a connector adapting to the power interface on the light source panel 2. Before assembling of the front hood 3 and the back seat 4, the power line 6 and the light source panel 2 are connected through the connector, and the power line 6 is arranged in the threading gap 443. During assembling of the front hood 3 and the back seat 4, the power line 6 is located in the threading gap 443, so that fastening between the front hood 3 and the back seat 4 cannot be obstructed to enable the front hood 3 and the back seat 4 to be successfully assembled.

[0042] As a specific implementation mode of the easy-to-assemble detachable downlight provided by the present disclosure, referring to Figure 5, Figure 7, and Figure 9, two sides of the threading gap 443 are provided with bayonets 444, and the connection plate 34 is provided with a fixture block 343 that is in clamping fit with the bayonets 444. On the basis of clamping fit between the hanger 342 and the locating gap 442, the clamping fit between the fixture block 343 and the bayonets 444 further ensures that assembled angles of the front hood 3 and the back seat 4 are correct, and the open pore 441 may be just aligned with the second thread hole 3411 to screw in the second screw 52 to complete the assembling.

[0043] As a specific implementation mode of the easy-to-assemble detachable downlight provided by the present disclosure, referring to Figure 10, the power line 6 is provided with a switch 61 used to control switch on and switch off. The easy-to-assemble detachable downlight further includes an external driving module 7 connected between the switch 61 and the external power supply. The external driving module 7 is used to provide working current for light emitting diodes on the light source panel 2. In the present embodiment, the downlight takes LEDs as a light source, and thus has many advantages of safety, energy conservation, long service life, and the like. Specifically, two ends of the power line 6 are provided with plugs, so that the light source panel 2 and the external driving module 7 may be conveniently connected by means of plugging. The plugs, connection structures for the plugs and the light source panel 2, and connection structures for the plugs and the external driving module 7 are all the prior art. The external driving

module 7 is the prior art. Using the external driving module 7 is favorable for reducing the volume of a downlight main body. The switch 61 is also the prior art, which may control whether to feed the working current to the light emitting diodes, thereby controlling the light emitting diodes to be turned on or turned off.

[0044] The above descriptions are only the preferred embodiments of the present disclosure, and is not intended to limit the present disclosure.

Claims

1. An easy-to-assemble detachable downlight, comprising:

a shell (1), which is flat and comprises a front hood (3) and a back seat (4), wherein the front hood (3) and the back seat (4) are of an integrated structure; the front hood (3) and the back seat (4) are detachably connected and encircle an accommodating cavity; the front hood (3) has a light-transmitting part (31) and a surface ring part (32); and

a light source panel (2), which is located in the accommodating cavity and is detachably mounted on the back seat (4), wherein the light source panel (2) has a power interface used to be connected to an external power supply;

the back seat (4) conducts and dissipates heat generated by the light source panel (2), and reflects light emitted by the light source panel (2) to the light-transmitting part (31);

wherein the light source panel (2) is connected with the back seat (4) through a first screw (51), wherein the back seat (4) comprises:

a back plate (41), wherein a first thread hole (411) for allowing the first screw (51) to be screwed in is formed in the back plate (41), and the light source panel (2) is mounted on the back plate (41) through the first screw (51);

a conical ring plate (42), which has an own axis perpendicular to the back plate (41), wherein one end of the conical ring plate (42) is seamlessly connected with the back plate (41); an inner side surface of the conical ring plate (42) is a light reflection surface and faces the light-transmitting part (31); and

a specially-shaped ring plate (43), which is connected with the front hood (3) and fixedly connected with the conical ring plate (42) or the back plate (41);

wherein one end of the specially-shaped ring plate (43) is connected with the conical ring plate (42), wherein the front hood (3)

comprises a panel (33); an edge of the panel (33) is the surface ring part (32), and the surface ring part (32) is circular; and a middle part of the panel (33) is the light-transmitting part (31);

wherein the front hood (3) further comprises a barrel-shaped connection plate (34); one end of the connection plate (34) is fixedly connected with the panel (33), and the other end of the connection plate (34) extends towards one side of the panel (33);

characterized in that:

the specially-shaped ring plate (43) is conical and surrounds the back plate (41) and the conical ring plate (42);

the front hood (10a) is connected with the back seat (4) through a second screw (52); the other end of the specially-shaped ring plate (43) is provided with a flange (44); and the flange (44) is provided with an open pore (441) for allowing the second screw (52) to pass through;

and in that a convex block (341) is arranged on the connection plate (34); and the convex block (341) is provided with a second thread hole (3411) that is aligned with the open pore (441) and allows the second screw (52) to be screwed in.

2. The easy-to-assemble detachable downlight according to claim 1, wherein the connection plate (34) is provided with a hanger (342); the hanger (342) is used to be connected with an external structure; and the hanger (342) is also used to be aligned with a locating gap (442) formed in the flange (44) and in clamping fit with the locating gap (442).
3. The easy-to-assemble detachable downlight according to claim 2, wherein the easy-to-assemble detachable downlight further comprises a power line (6); one end of the power line (6) is connected with the power interface, and the other end of the power line (6) is used to be connected with the external power supply; and the flange (44) is provided with a threading gap (443) for allowing the power line (6) to pass through.
4. The easy-to-assemble detachable downlight according to claim 3, wherein two sides of the threading gap (443) are provided with bayonets (444), and the connection plate (34) is provided with a fixture block that is in clamping fit with the bayonets (444).
5. The easy-to-assemble detachable downlight according to claim 4, wherein the power line (6) is provided with a switch (61) used to control switch on and switch off; the easy-to-assemble detachable downlight further comprises an external driving mod-

ule (7) connected between the switch (61) and the external power supply; and the external driving module (7) provides working current for light emitting diodes on the light source panel (2).

Patentansprüche

1. Leicht zu montierender abnehmbarer Deckenstrahler, umfassend:

eine Gehäuse (1), das flach ist und eine vorderseitige Haube (3) und eine rückseitige Anlegefläche (4) umfasst, wobei die vorderseitige Haube (3) und die rückseitige Anlegefläche (4) eine integrierte Struktur aufweisen; die vorderseitige Haube (3) und die rückseitige Anlegefläche (4) lösbar verbunden sind und einen Aufnahmehohlraum umschließen; die vorderseitige Haube (3) einen lichtdurchlässigen Teil (31) und einen Oberflächenringteil (32) aufweist; und ein Lichtquellenpaneel (2), das sich in dem Aufnahmehohlraum befindet und abnehmbar an der rückseitigen Anlegefläche (4) montiert ist, wobei das Lichtquellenpaneel (2) eine Stromversorgungsschnittstelle aufweist, die dafür verwendet wird, mit einer externen Stromversorgung verbunden zu werden; wobei die rückseitige Anlegefläche (4) die durch das Lichtquellenpaneel (2) erzeugte Wärme leitet und dissipiert und das durch das Lichtquellenpaneel (2) ausgestrahlte Licht auf den lichtdurchlässigen Teil (31) reflektiert; wobei das Lichtquellenpaneel (2) durch eine erste Schraube (51) mit der rückseitigen Anlegefläche (4) verbunden ist, wobei die rückseitige Anlegefläche (4) umfasst:

eine rückseitige Platte (41), wobei ein erstes Gewindeloch (411), in das die erste Schraube (51) eingeschraubt werden kann, in der rückseitigen Platte (41) ausgebildet ist und das Lichtquellenpaneel (2) durch die erste Schraube (51) an der rückseitigen Platte (41) montiert wird; eine konische Ringplatte (42), die eine eigene Achse senkrecht zu der rückseitigen Platte (41) aufweist, wobei ein Ende der konischen Ringplatte (42) nahtlos mit der rückseitigen Platte (41) verbunden ist; eine Innenseitenfläche der konischen Ringplatte (42) eine Lichtreflexionsfläche ist und dem lichtdurchlässigen Teil (31) zugewandt ist; und eine speziell geformte Ringplatte (43), die mit der vorderseitigen Haube (3) verbunden ist und fest mit der konischen Ringplatte (42) oder der rückseitigen Platte (41) ver-

bunden ist;
wobei ein Ende der speziell geformten Ringplatte (43) mit der konischen Ringplatte (42) verbunden ist, wobei die vorderseitige Haube (3) ein Paneel (33) umfasst; ein Rand des Paneels (33) der Oberflächenringteil (32) ist und der Oberflächenringteil (32) kreisförmig ist; und ein mittlerer Teil des Paneels (33) der lichtdurchlässige Teil (31) ist; wobei die vorderseitige Haube (3) des Weiteren eine tonnenförmige Verbindungsplatte (34) umfasst;
ein Ende der Verbindungsplatte (34) fest mit dem Paneel (33) verbunden ist und das andere Ende der Verbindungsplatte (34) sich in Richtung einer Seite des Paneels (33) erstreckt;

dadurch gekennzeichnet, dass:

die speziell geformte Ringplatte (43) konisch ist und die rückseitige Platte (41) und die konische Ringplatte (42) umgibt;

die vorderseitige Haube (10a) durch eine zweite Schraube (52) mit der rückseitigen Anliegefläche (4) verbunden ist; das andere Ende der speziell geformten Ringplatte (43) mit einem Flansch (44) versehen ist; und der Flansch (44) mit einer offenen Pore (441) versehen ist, durch die die zweite Schraube (52) hindurchgeführt werden kann;

und dadurch, dass ein konvexer Block (341) an der Verbindungsplatte (34) angeordnet ist; und der konvexe Block (341) mit einem zweiten Gewindeloch (3411) versehen ist, das auf die offene Pore (441) ausgerichtet ist und das Hineinschrauben der zweiten Schraube (52) erlaubt.

2. Leicht zu montierender abnehmbarer Deckenstrahler nach Anspruch 1, wobei die Verbindungsplatte (34) mit einem Aufhänger (342) versehen ist; der Aufhänger (342) dafür verwendet wird, mit einer externen Struktur verbunden zu werden; und der Aufhänger (342) ebenfalls dafür verwendet wird, auf eine in dem Flansch (44) ausgebildeten Positionierungsaussparung (442) ausgerichtet und in einen Klemmsitz mit der Positionierungsaussparung (442) gebracht zu werden.
3. Leicht zu montierender abnehmbarer Deckenstrahler nach Anspruch 2, wobei der leicht zu montierende abnehmbare Deckenstrahler des Weiteren ein Stromkabel (6) umfasst; ein Ende des Stromkabels (6) mit der Stromschnittstelle verbunden ist und das

andere Ende des Stromkabels (6) verwendet wird, um mit der externen Stromversorgung verbunden zu werden; und der Flansch (44) mit einem Einfädelspalt (443) versehen ist, durch den das Stromkabel (6) hindurchgeführt werden kann.

4. Leicht zu montierender abnehmbarer Deckenstrahler nach Anspruch 3, wobei zwei Seiten des Einfädelspalts (443) mit Bajonetten (444) versehen sind und die Verbindungsplatte (34) mit einem Befestigungsblock versehen ist, der mit den Bajonetten (444) einen Klemmsitz bildet.
5. Leicht zu montierender abnehmbarer Deckenstrahler nach Anspruch 4, wobei das Stromkabel (6) mit einem Schalter (61) versehen ist, der zum Steuern des Einschaltens und des Ausschaltens verwendet wird; der leicht zu montierende abnehmbare Deckenstrahler des Weiteren ein externes Treibermodul (7) umfasst, das zwischen dem Schalter (61) und der externen Stromversorgung verbunden ist; und das externe Treibermodul (7) Arbeitsstrom für Leuchtdioden an dem Lichtquellenpaneel (2) bereitstellt.

Revendications

1. Plafonnier détachable facile à monter, comprenant :

une enveloppe (1), qui est plate et comprend un couvercle avant (3) et un socle arrière (4), dans lequel le couvercle avant (3) et le socle arrière (4) ont une structure intégrée ; le couvercle avant (3) et le socle arrière (4) sont assemblés de manière détachable et encerclent une cavité de réception ; le couvercle avant (3) a une partie de transmission de lumière (31) et une partie annulaire de surface (32) ; et

un panneau source de lumière (2), qui est situé dans la cavité de réception et est monté sur le socle arrière (4) de manière détachable, dans lequel le panneau source de lumière (2) a une interface d'alimentation utilisée pour être raccordée à une alimentation externe ;

le socle arrière (4) conduit et dissipe de la chaleur générée par le panneau source de lumière (2), et réfléchit la lumière émise par le panneau source de lumière (2) vers la partie de transmission de lumière (31) ;

dans lequel le panneau source de lumière (2) est assemblé avec le socle arrière (4) par une première vis (51), dans lequel le socle arrière (4) comprend :

une plaque arrière (41), dans laquelle un premier trou fileté (411) pour permettre d'y visser la première vis (51) est formé dans

la plaque arrière (41), et le panneau source de lumière (2) est monté sur la plaque arrière (41) par l'intermédiaire de la première vis (51) ;

une plaque annulaire conique (42), qui a son axe propre perpendiculaire à la plaque arrière (41), dans lequel une extrémité de la plaque annulaire conique (42) est assemblée de manière sans soudure avec la plaque arrière (41) ; une surface latérale intérieure de la plaque annulaire conique (42) est une surface de réflexion de lumière et fait face à la partie de transmission de lumière (31) ; et

une plaque annulaire spécialement formée (43), qui est assemblée avec le couvercle avant (3) et fixement assemblée avec la plaque annulaire conique (42) ou la plaque arrière (41) ;

dans lequel une extrémité de la plaque annulaire spécialement formée (43) est assemblée avec la plaque annulaire conique (42),

dans lequel le couvercle avant (3) comprend un panneau (33) ; un bord du panneau (33) est la partie annulaire de surface (32) et la partie annulaire de surface (32) est circulaire ; et une partie centrale du panneau (33) est la partie de transmission de lumière (31) ;

dans lequel le couvercle avant (3) comprend en outre une plaque d'assemblage en forme de cylindre (34) ;

une extrémité de la plaque d'assemblage (34) est fixement assemblée avec le panneau (33), et l'autre extrémité de la plaque d'assemblage (34) s'étend vers un côté du panneau (33) ;

caractérisé en ce que :

la plaque annulaire spécialement formée (43) est conique et entoure la plaque arrière (41) et la plaque annulaire conique (42) ;

le couvercle avant (10a) est assemblé avec le socle arrière (4) par une seconde vis (52) ;

l'autre extrémité de la plaque annulaire spécialement formée (43) est pourvue d'un rebord (44), et le rebord (44) est pourvu d'un orifice ouvert (441) pour permettre à la seconde vis (52) de passer à travers ;

et **en ce qu'**un bloc convexe (341) est agencé sur la plaque d'assemblage (34) ; et le bloc convexe (341) est pourvu d'un second trou fileté (3411) qui est aligné avec l'orifice ouvert (441) et per-

met d'y visser la seconde vis (52).

2. Plafonnier détachable facile à monter selon la revendication 1, dans lequel la plaque d'assemblage (34) est pourvue d'un élément d'accrochage (342) ; l'élément d'accrochage (342) est utilisé pour être assemblé avec une structure externe ; et l'élément d'accrochage (342) est également utilisé pour être aligné avec un espace de positionnement (442) formé dans le rebord (44) et par ajustement serré avec l'espace de positionnement (442).

3. Plafonnier détachable facile à monter selon la revendication 2, dans lequel le plafonnier détachable facile à monter comprend en outre une ligne d'alimentation (6) ; une extrémité de la ligne d'alimentation (6) est raccordée à l'interface d'alimentation, et l'autre extrémité de la ligne d'alimentation (6) est utilisée pour être raccordée à l'alimentation externe ; et le rebord (44) est pourvu d'un espace de filetage (443) pour permettre à la ligne d'alimentation (6) de passer à travers.

4. Plafonnier détachable facile à monter selon la revendication 3, dans lequel deux côtés de l'espace de filetage (443) sont pourvus de baïonnettes (444), et la plaque d'assemblage (34) est pourvue d'un bloc de fixation qui est ajusté par serrage avec les baïonnettes (444).

5. Plafonnier détachable facile à monter selon la revendication 4, dans lequel la ligne d'alimentation (6) est pourvue d'un interrupteur (61) utilisé pour commander une mise sous tension et une mise hors tension ; le plafonnier détachable facile à monter comprend en outre un module de pilotage externe (7) raccordé entre le commutateur (61) et l'alimentation externe ; et le module de pilotage externe (7) fournit du courant de travail pour des diodes électroluminescentes sur le panneau source de lumière (2).

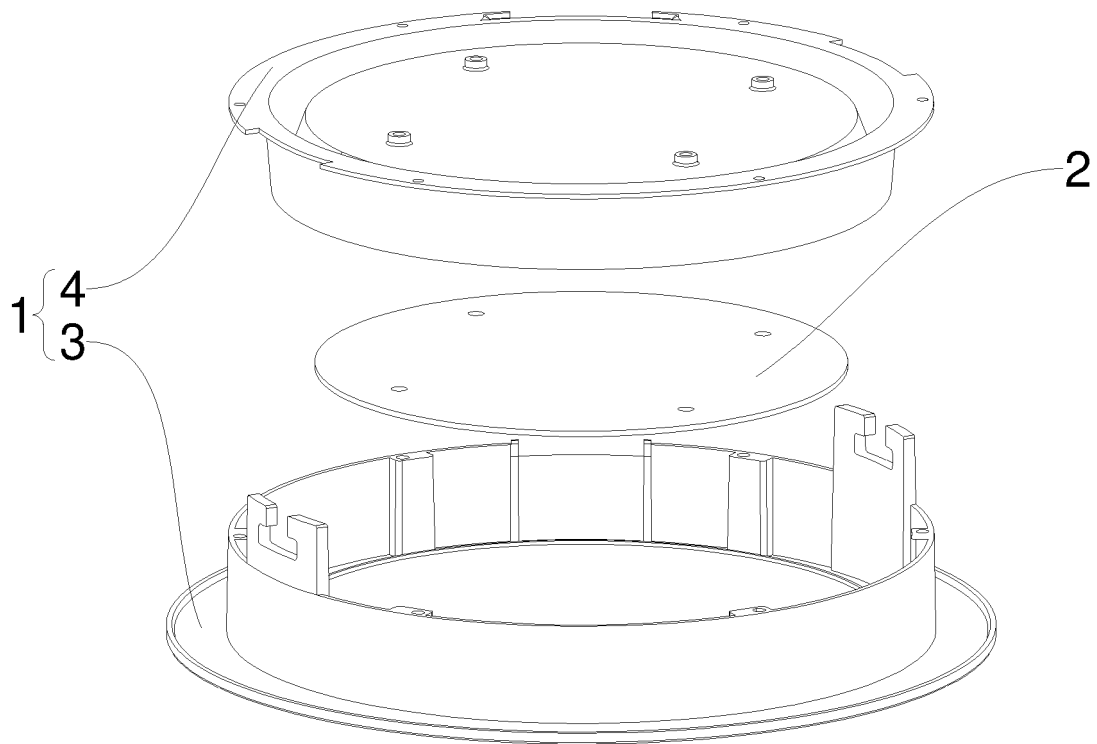


Figure 1

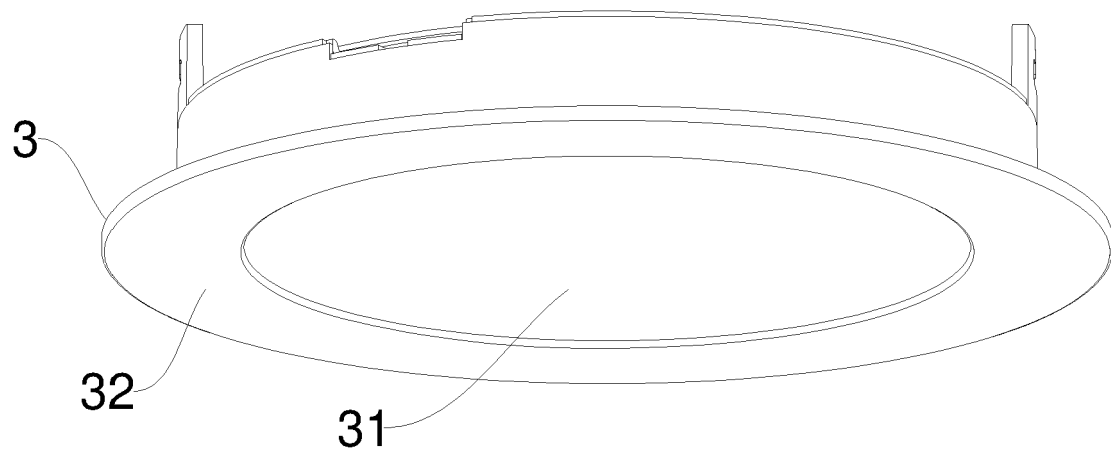


Figure 2

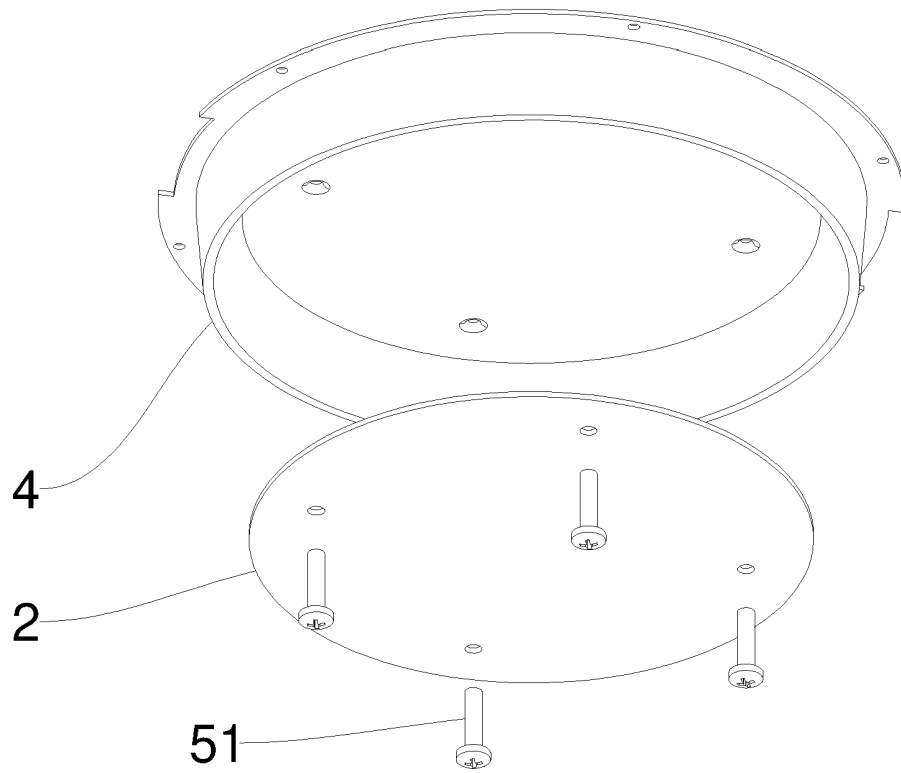


Figure 3

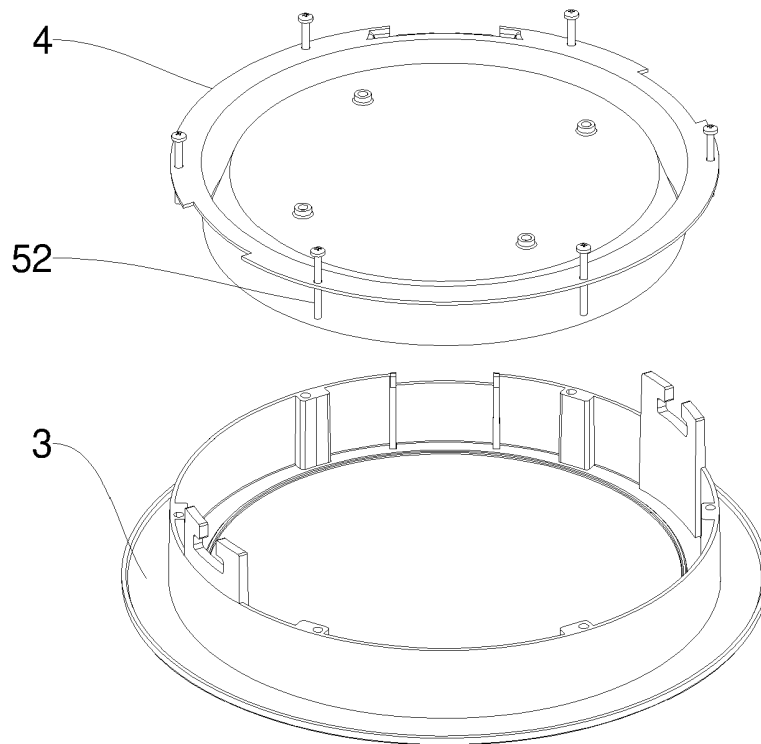


Figure 4

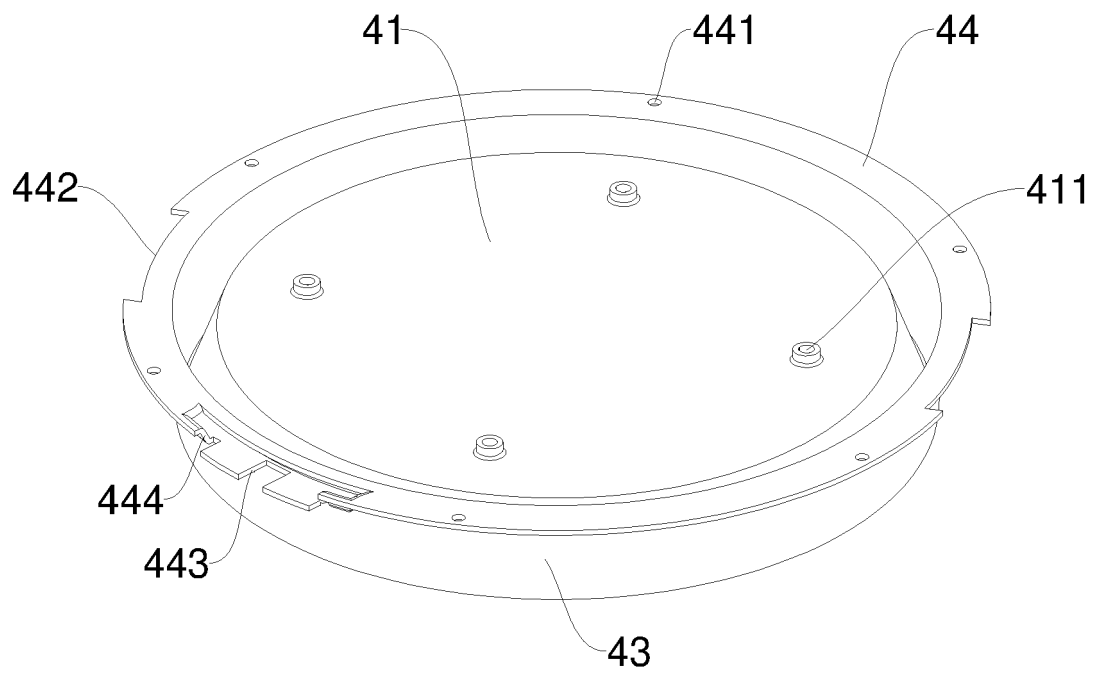


Figure 5

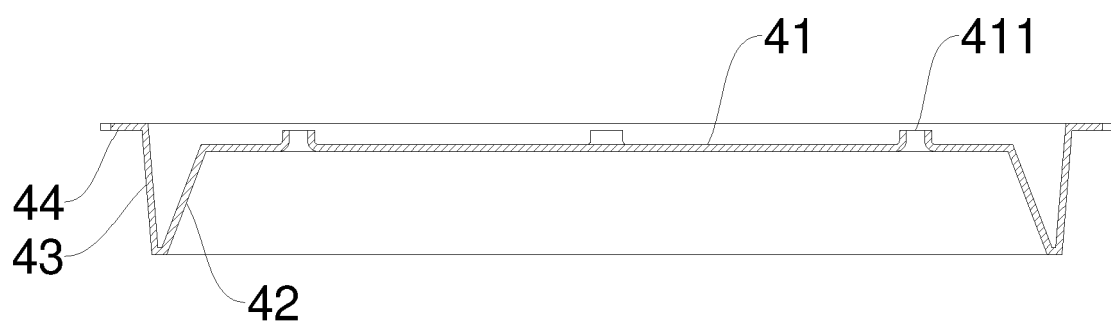


Figure 6

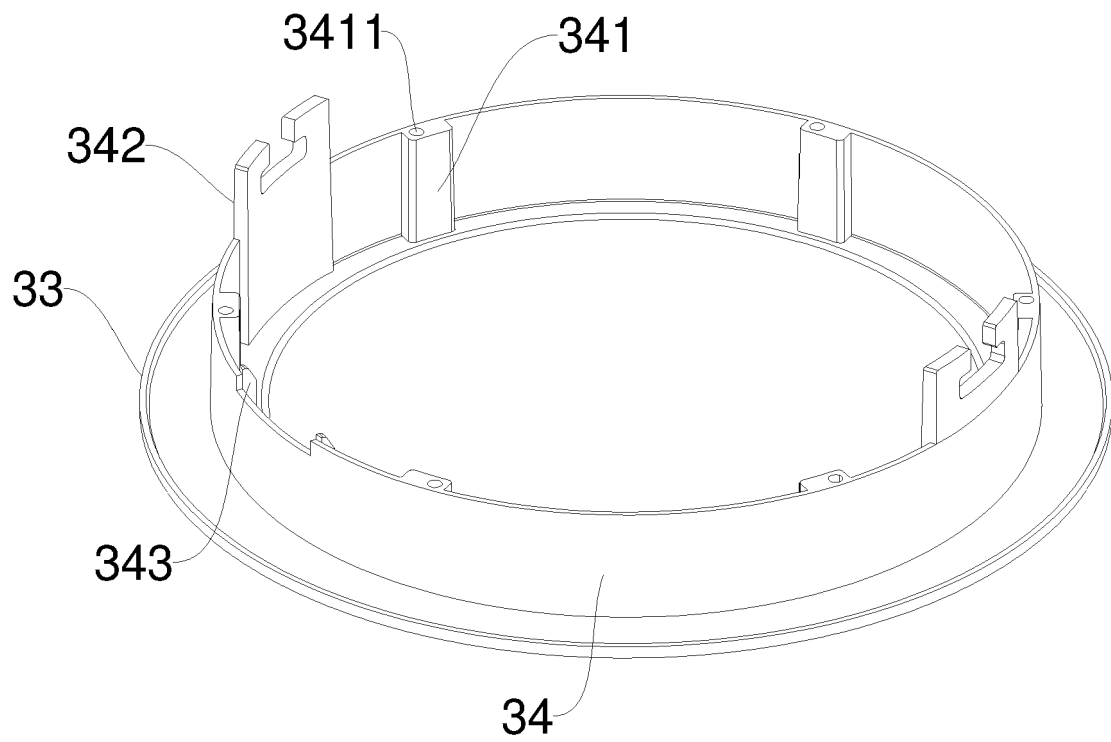


Figure 7

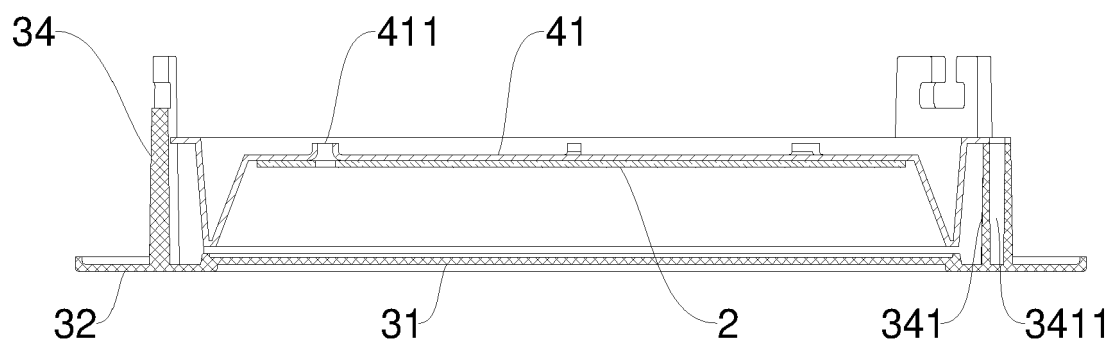


Figure 8

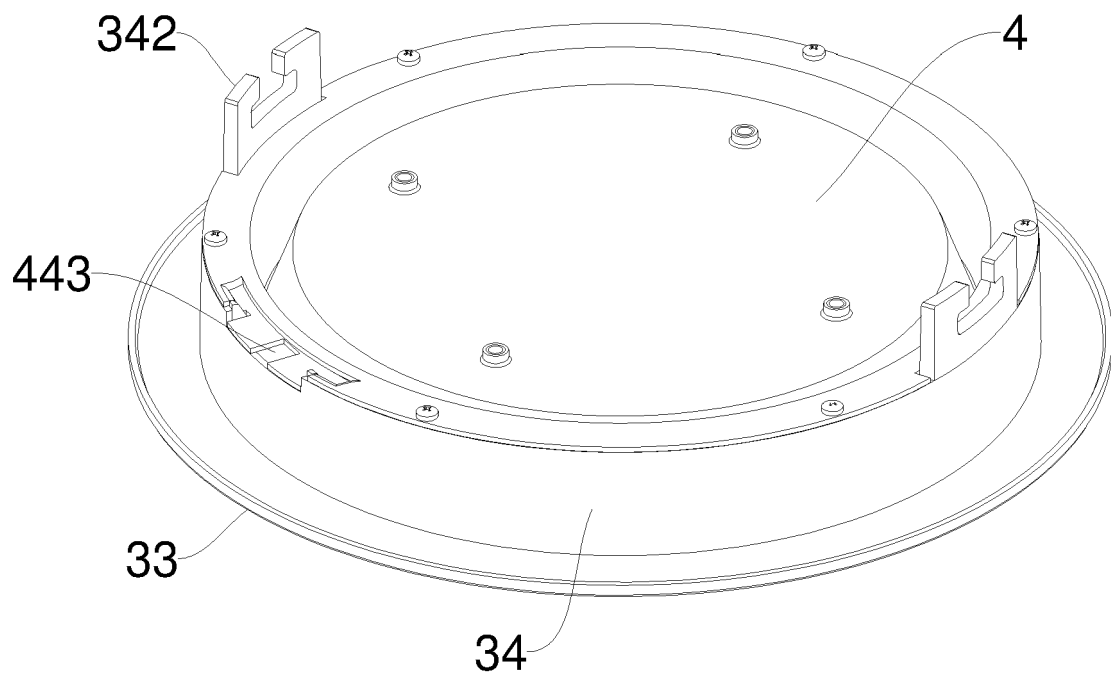


Figure 9

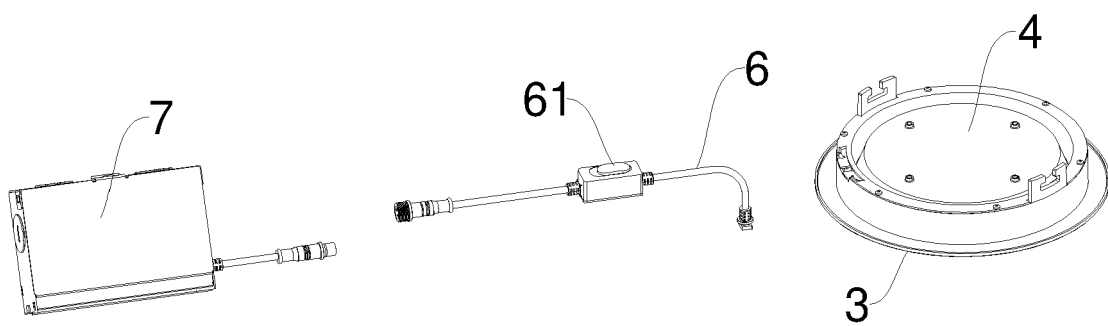


Figure 10

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- CN 202024158 U [0002]
- CN 204285176 U [0002]