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(54) DIRECT-TYPE PANEL LIGHT

(57) The application belongs to the technical field of lighting equipment, and in particular to a direct-type panel light, which comprises a light-transmitting component, a frame, a bottom cover and at least one strip-shaped LED light bar. The light-transmitting component is connected to the frame, and the bottom cover includes a bottom plate and a curled edge which is connected to the frame in a close-coupled arrangement, the bottom plate and the light-transmitting component are arranged oppositely, the light-transmitting component, the frame and the bottom cover form an assembly space, and the strip-shaped LED light bar is located in the assembly space. The stamping ribs protrude in the direction away from the light-transmitting component to form rib grooves, the stamping depth of the rib groove is H, 0.1 mm≤H≤1.5 mm, and the strip-shaped LED light bar is installed in the rib groove. The application of the technical solution of the application solves the problem of insufficient rigidity of the bottom cover of the existing panel light.

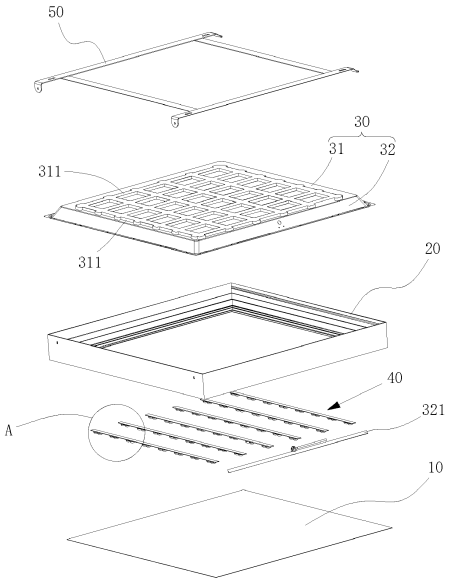

FIG. 1

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Description

TECHNICAL FIELD

[0001] The application relates to the technical field of lighting equipment, in particular to a direct-type panel light.

BACKGROUND

[0002] Currently, the bottom cover of the panel light for the direct-type panel light is reported to have an insufficient rigidity by users, and it is easy to deform during use, so that the internal light-emitting components will be crushed and damaged.

SUMMARY

[0003] The purpose of the application is to provide a direct-type panel light, which aims to solve the problem of insufficient rigidity of the bottom cover of the existing panel light.

[0004] In order to achieve the above purpose, the technical solution adopted by the application is: a direct-type panel light, which includes a light-transmitting component, a frame, a bottom cover and at least one strip-shaped LED light bar. The light-transmitting component is connected to the frame, and the bottom cover includes a bottom plate and a curled edge which is connected to the frame in a close-coupled arrangement. The bottom plate and the light-transmitting component are arranged oppositely. The light-transmitting component, the frame and the bottom cover form an assembly space. The strip-shaped LED light bar is located in the assembly space, and the bottom plate is provided with stamping ribs, and the stamping ribs protrude in a direction away from the light-transmitting component to form rib grooves, the stamping depth of the rib groove is H, 0.1 mm≤H≤1.5 mm, and the strip-shaped LED light bar is installed in the rib groove.

[0005] Further, the stamping ribs are arranged in a crisscross way, there are a plurality of strip-shaped LED light bars, and the strip-shaped LED light bars are arranged in parallel, and installed in the rib grooves one by one.

[0006] Further, the strip-shaped LED light bar includes a lamp plate and a plurality of LED lamp beads arranged on the lamp plate, the lamp plate is attached to the bottom of the rib groove, and the height of the top of the LED lamp bead protruding from the rib groove is greater than or equal to 0.1 mm, and less than or equal to 0.3 mm.

[0007] Further, the end of the lamp plate is provided with a connector electrically connected to the LED lamp beads, and an adapter plate is provided on the curled edge, and all the connectors are electrically connected to the adapter plate. The direct-type panel light also includes a driver, and the connecting wire of the adapter plate is electrically connected to the driver after passing through the curled edge.

[0008] Further, the two ends of each stamping rib respectively extend to the curled edge.

[0009] Further, the direct-type panel light further includes a mounting bracket, which is connected to a side of the bottom plate away from the light-transmitting component, and the mounting bracket is used for connecting and fixing to the ceiling.

[0010] According to another aspect of the application, there is provided a direct-type panel light, which includes a light-transmitting component, a frame, a bottom cover and at least one ring-shaped LED light bar. The light-transmitting component is connected to the frame, and the bottom cover includes a bottom plate and a curled edge which is connected to the frame in a close-coupled arrangement. The bottom plate and the light-transmitting component are arranged oppositely. The light-transmitting component, the frame and the bottom cover form an assembly space. The ring-shaped LED light bar is located in the assembly space. The bottom plate is provided with a plurality of ring-shaped stamping ribs which are concentric circles with unequal diameters, and the stamping ribs protrude in a direction away from the light-transmitting component to form rib grooves. The stamping depth of the rib groove is H, 0.1 mm≤H≤1.5 mm, and the ring-shaped LED light bar is installed in the rib groove.

[0011] Further, the ring-shaped LED light bar includes a lamp plate and a plurality of LED lamp beads arranged on the lamp plate, the lamp plate is attached to the bottom of the rib groove, and the height of the top of the LED lamp bead protruding from the rib groove is greater than or equal to 0.1 mm, and less than or equal to 0.3 mm.

[0012] Further, there are a plurality of ring-shaped LED light bars, and the plurality of ring-shaped LED light bars are installed in the rib grooves one by one.

[0013] Further, the direct-type panel light further includes a mounting bracket, which is connected to a side of the bottom plate away from the light-transmitting component, and the mounting bracket is used for connecting and fixing to the ceiling.

[0014] The application has at least the following beneficial effects:

In the direct-type panel light of the application, stamping ribs protruding away from the light irradiation direction are formed by stamping the bottom plate of the bottom cover, and the depth of the rib grooves of these stamping ribs is designed to be 0.1 mm to 1.5 mm, and the stamping ribs are used to fix the bottom plate, thereby enhancing the overall rigidity of the bottom cover, meeting users' requirements for strength and rigidity. In addition, an edge skeleton is formed between the bottom plate and the curled edge, which can further improve the overall strength of the bottom cover.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] In order to explain the technical solutions in the embodiments of the present application more clearly, the

following will briefly introduce the drawings that need to be used in the description of the embodiments or the prior art. Obviously, the drawings in the following description are merely some embodiments of the application, and those of ordinary skill in the art can obtain other drawings based on these drawings without creative labor.

FIG. 1 is an exploded view of the direct-type panel light according to the first embodiment of the application;
FIG. 2 is an enlarged view of A in FIG. 1;
FIG. 3 is a top view of FIG. 1 after the assembly is completed;
FIG. 4 is a left view of FIG. 3;
Fig. 5 is a schematic structural view of the bottom cover of the direct-type panel light according to the second embodiment of the application.

[0016] The reference numbers in the drawings are as follows:

10. Light-transmitting component;
20. Frame;
30. Bottom cover;
31. Bottom plate;
311. Stamping ribs;
32. Curled edge;
321. Adapter plate;
40. Strip-shaped LED light bar;
41. Lamp plate;
42. LED lamp beads;
50. Mounting bracket.

DETAILED DESCRIPTION OF THE EMBODIMENTS

[0017] The embodiments of the application will be described in detail below. Examples of the embodiments are shown in the accompanying drawings, in which the same or similar reference numbers indicate the same or similar elements or elements with the same or similar functions. The embodiments described below with reference to the drawings are exemplary, and are intended to explain the present application, but should not be understood as a limitation to the present application.

[0018] In the description of the application, it should be understood that the terms "length", "width", "upper", "lower", "front", "rear", "left", "right", "vertical", "horizontal", "top" , "bottom", "inner", "outer", etc. indicate the position or positional relationship based on the position or positional relationship shown in the drawings, and are only for the convenience of describing the application and simplifying the description, rather than indicating or implying that the device or element referred to should have a specific orientation, be constructed and operated in a specific orientation, and therefore cannot be construed as a limitation of the present application.

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

[0020] In this application, unless otherwise clearly specified and defined, the terms "installed", "connected to", "connected", "fixed" and other terms should be understood in a broad sense, for example, it can be connected fixedly or detachably, or integrated; it can be a mechanical connection or an electrical connection; it can be directly connected or indirectly connected through an intermediate medium, and it can be the internal communication of two components or the interaction relationship between two components. For those of ordinary skill in the art, the specific meanings of the above-mentioned terms in this application can be understood according to specific circumstances.

[0021] As shown in FIGS. 1 to 4, the first embodiment of the application provides a direct-type panel light. The direct-type panel light is mounted on the ceiling. After lighting, the light is irradiated to the floor and the side light is minimized. Specifically, the direct-type panel light includes a light-transmitting component 10, a frame 20, a bottom cover 30, and at least one strip-shaped LED light bar 40. The light-transmitting component 10 is connected to the frame 20, and the light emitted by the strip-shaped LED light bar 40 is irradiated to the light-transmitting component 10 for optical adjustment and subsequent illumination. The bottom cover 30 includes a bottom plate 31 and a curled edge 32 which is connected to the frame 20 in a close-coupled arrangement. The ridge at the connection between the bottom plate 31 and the curled edge 32 form an edge skeleton, which can improve the overall strength of the bottom cover 30. The bottom plate 31 is arranged oppositely to the light-transmitting component 10, wherein the bottom plate 31 is provided with cross-arranged stamping ribs 311, the stamping ribs 311 protrude in a direction away from the light-transmitting component 10 to form rib grooves, and the stamping depth of the rib groove is H, 0.1 mm≤H≤1.5 mm. The light-transmitting component 10, the frame 20 and the bottom cover 30 form an assembly space, and the strip-shaped LED light bar 40 is located in the assembling space, and the strip-shaped LED light bar 40 is installed in the rib groove formed by the corresponding stamping rib 311.

[0022] In the direct-type panel light of this embodiment, the cross-arranged stamping ribs 311 are formed by stamping the bottom plate 31 of the bottom cover 30, and the depth of the rib grooves of these stamping ribs 311 is designed to be 0.1 mm to 1.5 mm, more preferably 0.8 mm to 1.3 mm, thereby enhancing the overall rigidity of the bottom cover 30 and meeting the user's needs for strength and rigidity. In addition, the ridge formed at the connection between the bottom plate 31 and the curled

edge 32 form an edge frame which can improve the overall strength of the bottom cover 30.

[0023] In this embodiment, the stamping ribs 311 are arranged in a crisscross way (i.e., the stamping ribs 311 extending in the longitudinal direction are perpendicular to the stamping ribs 311 extending in the transverse direction, and at least one stamping rib 311 extends in the longitudinal direction, and at least one stamping rib 311 extends in the transverse direction). There are a plurality of strip-shaped LED light bars 40, and each strip-shaped LED light bar 40 is arranged in parallel, and installed in the rib grooves one by one, that is, all the strip-shaped LED light bars 40 are installed in the rib grooves formed by the longitudinally extending stamping ribs 311 one by one, or all the strip-shaped LED light bars 40 are installed in the rib grooves formed by the laterally extending stamping ribs 311 one by one.

[0024] As shown in FIG. 2, each strip-shaped LED light bar 40 includes a lamp plate 41 and a plurality of LED lamp beads 42 arranged on the lamp plate 41 (the plurality of LED lamp beads 42 may be connected in series or mutually connected or connected in parallel), the lamp plate 41 is attached to the bottom of the rib groove, so that the light emitted by the LED lamp bead 42 will not be blocked. Therefore, the height of the top of the LED lamp bead 42 protruding from the rib groove is greater than or equal to 0.1 mm. Further, the height of the top of the LED lamp bead 42 protruding from the rib groove is less than or equal to 0.3 mm.

[0025] In the direct-type panel light of the first embodiment, the end of the lamp plate 41 is provided with a connector (not shown) electrically connected to the LED lamp beads 42, wherein: when a plurality of LED lamp beads 42 on each lamp plate 41 are connected in series, any one of the LED lamp beads 42 can be electrically connected to the connector; when the plurality of LED lamp beads 42 on each lamp plate 41 are connected in parallel with each other, all the LED lamp beads 42 need to be electrically connected to the connector. The connecting wire is drawn from the connector, and the connecting wire is electrically connected to the driver, and the driver supplies power to the LED lamp beads 42 to light up the panel light. As shown in FIGS. 1 and 4, one side of the curled edge 32 is provided with an adapter plate 321, and all connectors are electrically connected to the adapter plate 321. The direct-type panel light also includes a driver, and the connecting wire of the adapter plate is electrically connected to the driver after passing through the curled edge 32.

[0026] In addition, as shown in the bottom cover 30 shown in FIGS. 1 and 3, the two ends of the crisscrossed stamping ribs 311 respectively extend to the curled edge 32, so that the connecting wire drawn from the connector can be more directly drawn to the connecting plate 321 for electrical connection, thereby eliminating the defect that the shadow is formed because of the light-shielding of the connecting after wiring.

[0027] As shown in FIGS. 1 and 3, the direct-type panel light also includes a mounting bracket 50, which is connected to the side of the bottom plate 31 away from the light-transmitting component 10, and the direct-type panel light is connected and fixed on the ceiling by the mounting bracket 50 for lighting, so it is very convenient, fast and stable for the installation.

[0028] According to the second embodiment of the application, as shown in FIG. 5, another direct-type panel light is provided. Compared with the first embodiment, the direct-type panel light of the second embodiment has the following differences. In the second embodiment, the direct-type panel light includes at least one ring-shaped LED light bar (not shown), and the bottom plate 31 is provided with a plurality of ring-shaped stamping ribs 311 which are concentric circles with unequal diameters, and the ring-shaped LED light bar is installed in the rib groove formed by the corresponding stamping rib 311. In the second embodiment, stamping ribs 311 are also used to fix the bottom plate 31 to enhance the rigidity of the bottom cover 30, and an edge skeleton is formed between the bottom plate 31 and the curled edge 32 to further improve the overall strength of the bottom cover 30.

[0029] The LED lamp beads 42 on each ring-shaped LED light bar are connected in series (or in parallel), and a connecting wire is drawn as a connector from each ring-shaped LED light bar, which is electrically connected to the LED lamp bead 42 (connected in series or in parallel), and then the connecting wire (i.e., the connector) of each ring-shaped LED light bar bypasses all the LED lamp beads 42 and is arranged to be electrically connected to the driver.

[0030] Compared with the first embodiment, the second embodiment has the same structure except for the above structure.

[0031] The above are only the preferred embodiments of the present application, and are not intended to limit the present application. Any modification, equivalent replacement and improvement made within the spirit and principle of the application shall be included in the protection scope of this application.

Claims

1. A direct-type panel light, comprising: a light-transmitting component (10), a frame (20), a bottom cover (30), and at least one strip-shaped LED light bar (40), wherein
   the light-transmitting component (10) is connected to the frame (20);
   the bottom cover (30) comprises: a bottom plate (31), and a curled edge (32) which is connected to the frame (20) in a close-coupled arrangement, and the bottom plate (31) is arranged oppositely to the light-transmitting component (10);
   the light-transmitting component (10), the frame (20), and the bottom cover (30) form an assembly space, and the at least one strip-shaped LED light

bar (40) is located in the assembly space;
the bottom plate (31) is provided with cross-arranged stamping ribs (311), and the stamping ribs (311) protrude in a direction away from the light-transmitting component (10) to form rib grooves;
a stamping depth of each of the rib grooves is defined as H, wherein 0.1 mm≤H≤1.5 mm; and the at least one strip-shaped LED light bar (40) is installed in the rib grooves.

2. The direct-type panel light according to claim 1, wherein the stamping ribs (311) are arranged in a crisscross way, the number of the at least one strip-shaped LED light strip (40) is plural, and all the strip-shaped LED light bars (40) are arranged in parallel, and the strip-shaped LED light bars (40) are installed in the rib grooves in a manner of one-to-one correspondence.

3. The direct-type panel light according to any of the previous claims, wherein each strip-shaped LED light bar (40) comprises: a lamp plate (41), and a plurality of LED light beads (42) arranged at the lamp plate (41); the lamp plate (41) is attached to a bottom of a corresponding rib groove, a height of the top of the LED lamp bead (42) protruding from the rib groove is greater than or equal to 0.1 mm, and less than or equal to 0.3 mm.

4. The direct-type panel light according to claim 3, wherein an end of the lamp plate (41) is provided with a connector electrically connected to the plurality of LED lamp beads (42), and an adapter plate (321) is provided on the curled edge (32), all the connectors are electrically connected to the adapter plate (321), the direct-type panel light further comprises a driver, and the connecting wire of the adapter plate passes through the curled edge (32) and is electrically connected to the driver.

5. The direct-type panel light according to any of the previous claims, wherein both ends of each of the stamping ribs (311) extend to the curled edge (32) respectively.

6. The direct-type panel light according to any of the previous claims, wherein the direct-type panel light further comprises a mounting bracket (50) which is connected to one side of the bottom plate (31) away from the light-transmitting component (10), and the mounting bracket (50) is used for connecting and fixing to the ceiling.

7. A direct-type panel light, comprising: a light-transmitting component (10), a frame (20), a bottom cover (30), and at least one ring-shaped LED light bar;
wherein
the light-transmitting component (10) is connected to the frame (20);
the bottom cover (30) comprises a bottom plate (31) and curled edge (32) which is connected to the frame (20) in a close-coupled arrangement;
the bottom plate (31) is arranged oppositely to the light-transmitting component (10);
the light-transmitting component (10), the frame (20), and the bottom cover (30) form an assembly space, and the at least one ring-shaped LED light bar is located in the assembly space;
the bottom plate (31) is provided with a plurality of ring-shaped stamping ribs (311) which are concentric circles with unequal diameters;
the stamping ribs (311) protrude in a direction away from the light-transmitting component (10) to form rib grooves, a stamping depth of each of the rib grooves is H, wherein 0.1 mm≤H≤1.5 mm; and
the at least one ring-shaped LED light bar is installed in the rib grooves .

8. The direct-type panel light according to claim 7, wherein the ring-shaped LED light bar comprises a lamp plate (41) and a plurality of LED lamp beads (42) arranged at the lamp plate (41), the lamp plate (41) is attached to a bottom of the rib groove, a height of the top of the LED lamp bead (42) protruding from the rib groove is greater than or equal to 0.1 mm, and less than or equal to 0.3 mm.

9. The direct-type panel light according to claim 7 or 8, wherein the number of the at least one ring-shaped LED light bar is plural, and the plurality of ring-shaped LED light bars are installed in the rib groove in a manner of one-to-one correspondence.

10. The direct-type panel light according to any one of claims 7 to 9, wherein the direct-type panel light further comprises a mounting bracket (50) which is connected to one side of the bottom plate (31) away from the light-transmitting component (10), and the mounting bracket (50) is used for connecting and fixing to the ceiling.

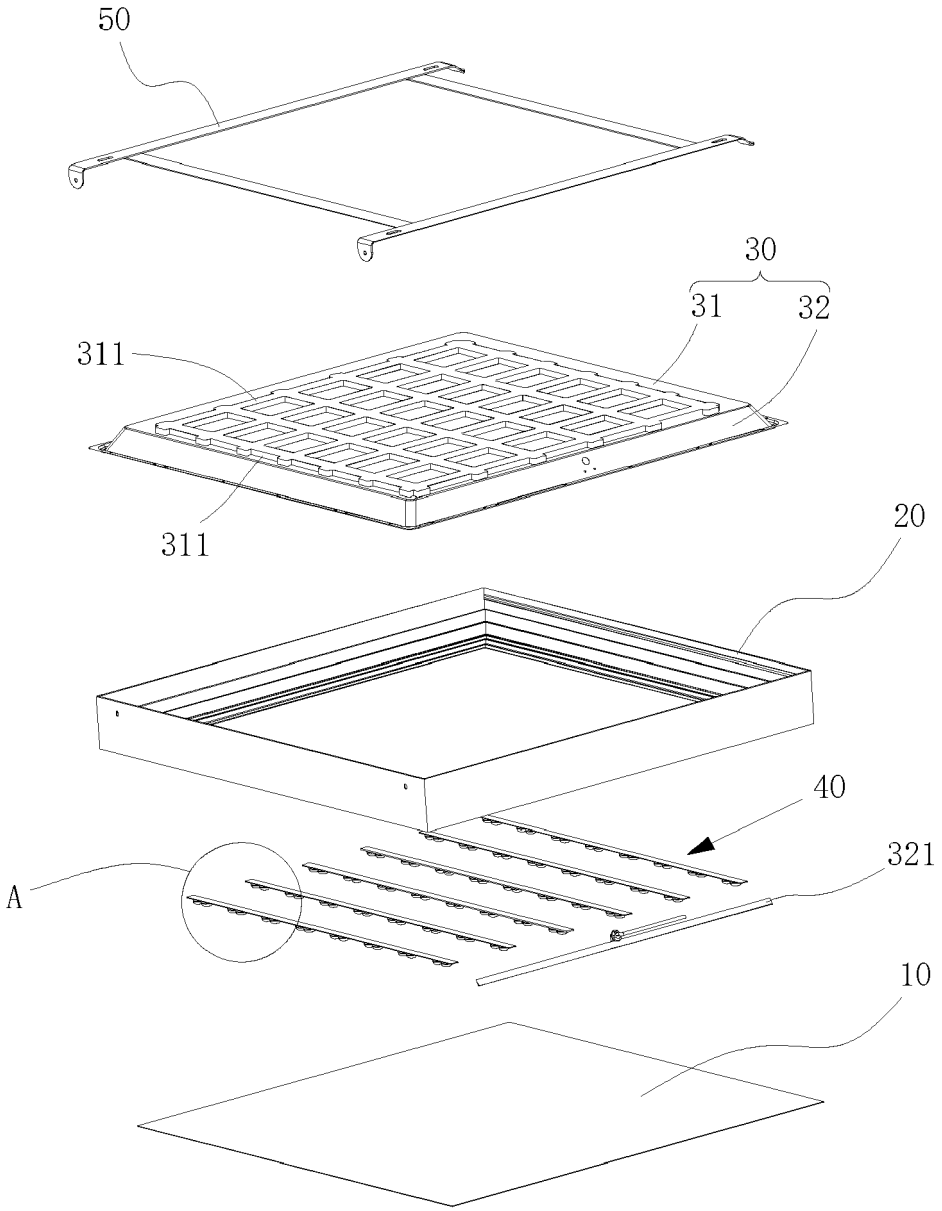

FIG. 1

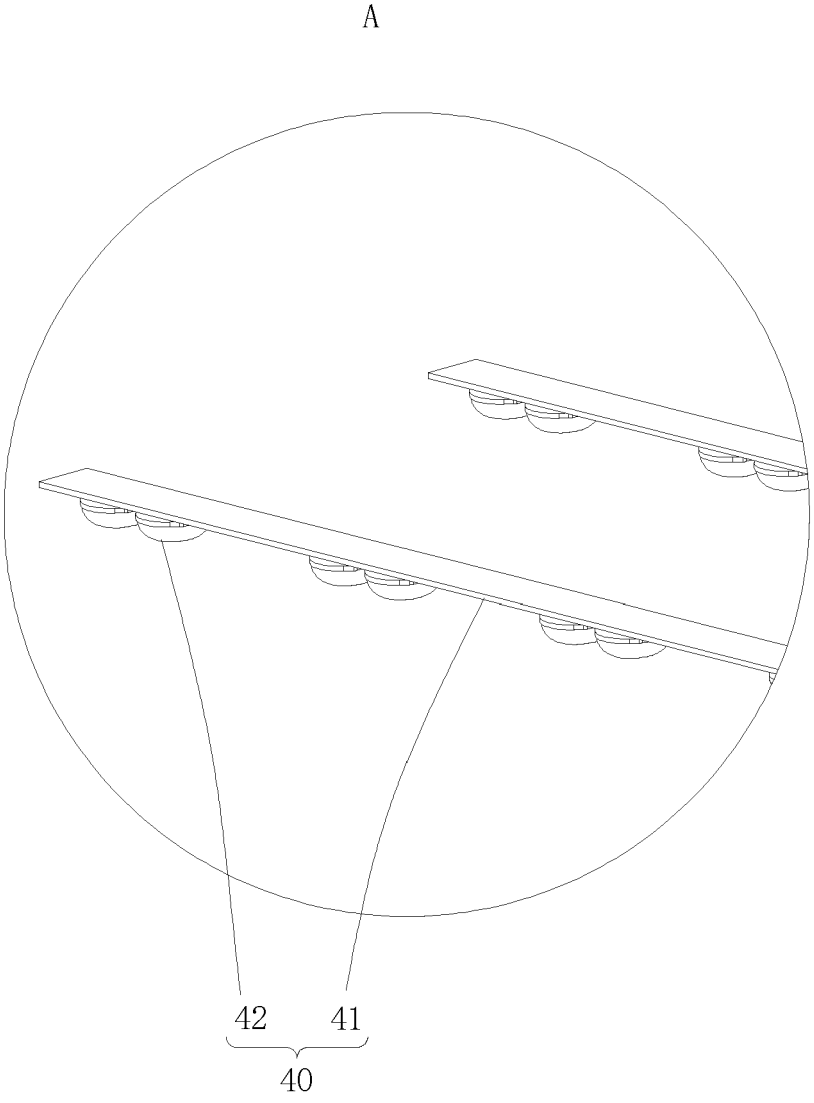

FIG. 2

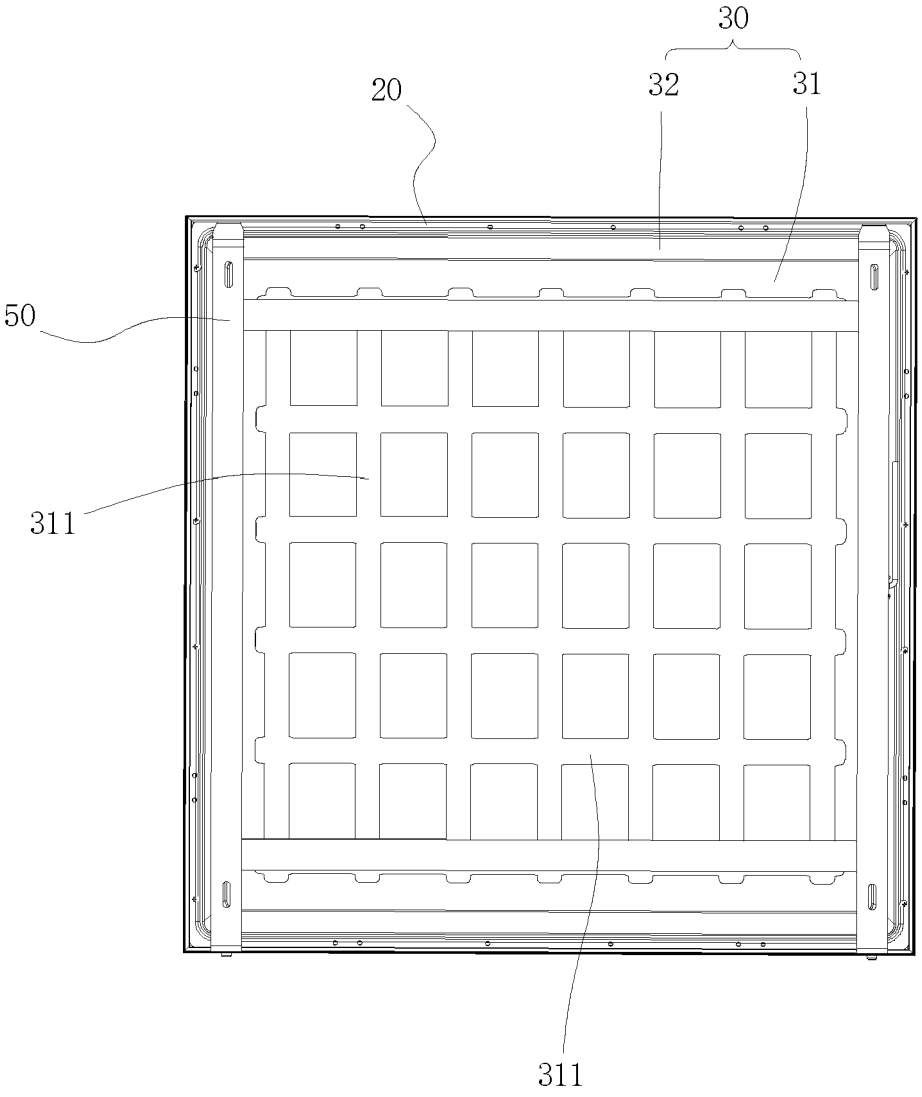

FIG. 3

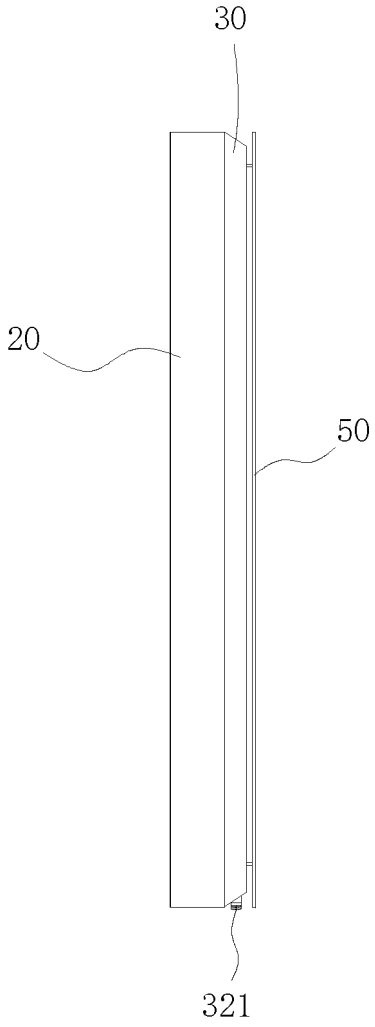

FIG. 4

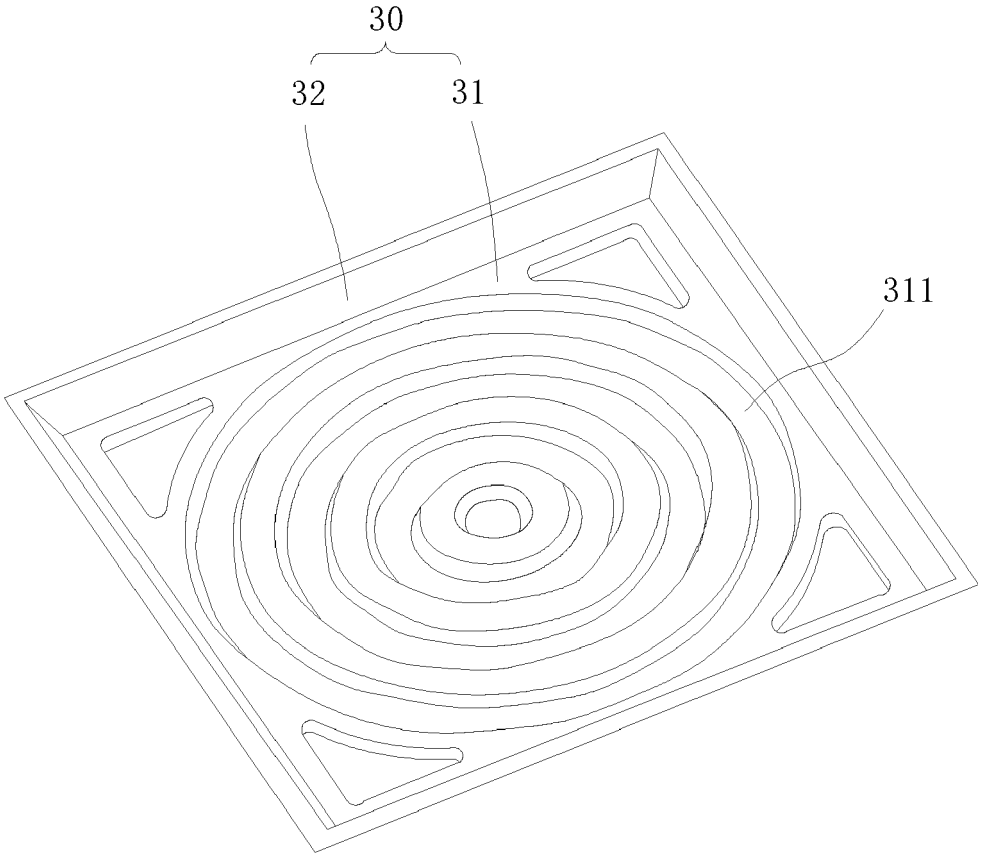

FIG. 5

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EUROPEAN SEARCH REPORT

Application Number
EP 21 16 8808

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	CN 207 162 263 U (GUANGZHOU ZHONGHAO DECORATION MAT CO LTD) 30 March 2018 (2018-03-30) * figures 1,2 * * paragraphs [0016], [0029], [0030], [0033] *	1-10	INV. F21V15/01 F21V19/00 F21S8/04 ADD. F21Y103/10 F21Y103/33 F21Y105/16 F21Y105/18 F21Y115/10
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TECHNICAL FIELDS SEARCHED (IPC)

F21V
F21S
F21Y

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	24 September 2021	Dinkla, Remko

CATEGORY OF CITED DOCUMENTS

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