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(54) **LAMP SUITABLE FOR AUTOMATIC PRODUCTION**

(57) The invention discloses a lamp suitable for automatic production, which includes a lamp holder, a light source assembly and an end cover, wherein the lamp holder is provided with an installation cavity for installing the light source assembly, the installation cavity is provided with an installation opening, the end cover is used for packaging the installation opening, the lamp holder is provided with a fixing hole, and the end cover is provided with a convex which is in interference fit with the fixing hole to realize fixed connection. According to the lamp suitable for automatic production, the end cover and the lamp holder are fixedly connected in an inserted connection fit mode, automatic production can be achieved conveniently.

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Description

RELATED APPLICATION

[0001] This application claims priority to a Chinese Patent Application No. CN 202011171162.3, filed on October 26, 2020.

FIELD OF THE TECHNOLOGY

[0002] The invention relates to the technical field of lighting equipment, in particular to a lamp suitable for automated production.

BACKGROUND OF THE INVENTION

[0003] In the context of energy saving and environmental protection, LED lamps are increasingly used in the home and commercial lighting fields because of their high light-emitting efficiency and good light-gathering performance.

[0004] With the increase in demand and industrialization of LED lamps, how to improve production efficiency and processing costs has become a problem that needs to be solved at the moment, but currently it is mainly assembled by hand. LED lamps generally include lamp holders, circuit boards with LED chips, and other parts such as end caps and lampshades, they need to be glued or connected by fasteners to be fixed, making it difficult to realize automation.

BRIEF SUMMARY OF THE INVENTION

[0005] In view of this, the present invention provides a lamp suitable for automated production to solve the above technical problems.

[0006] A lamp suitable for automated production includes a lamp holder, a light source assembly and an end cover, the lamp holder is provided with an installation cavity for installing the light source assembly, the installation cavity is provided with an installation opening, and the end cover is used to encapsulate the installation opening, the lamp holder is provided with a fixing hole, and the end cover is provided with a convex which is interference fit with the fixing hole to realize a fixed connection.

advantageously, the middle section of the convex expands radially.

advantageously, the hardness of the fixing hole is greater than that of the convex and its hole is a cut.

advantageously, the radial dimension of the root of the convex is smaller than that of the fixing hole.

advantageously, the lamp holder is made of metal material.

advantageously, the end cover is made of plastic or nylon material.

advantageously, the end cover is provided with a guide block close to the convex, the length of the guide block is longer than the convex, and the lamp holder is provided with a guide groove fitting with the guide block.

advantageously, the lamp is a bar-shaped lamp, the lamp holder is a bar-shaped, and the end cover is used to encapsulate the installation opening at the end of the lamp holder.

advantageously, the lamp holder is a profile with a U-shaped cross section, including a bottom surface and two opposite side surfaces.

advantageously, the inner side of the side surface is provided with the fixing hole, and the depth direction of the fixing hole is consistent with the length direction of the lamp holder.

advantageously, the fixing hole extends to both ends of the side surface along the depth direction.

advantageously, both sides surfaces are provided with the fixing holes, and the end cover is provided with two convexes respectively matching the fixing holes.

advantageously, the light source assembly includes a strip-shaped circuit board, a light source arranged on the strip-shaped circuit board, and a strip-shaped optical element.

advantageously, the two side surfaces are provided with first grooves with openings arranged opposite to each other and extending to both ends along the length direction, and the circuit board penetrates into the first grooves from the installation opening.

advantageously, two side surfaces are provided with second grooves with openings arranged opposite to each other and extending along the length direction to both ends, and two sides of the strip-shaped optical element are provided with clamping edges, which penetrate the second groove from the installation opening.

[0007] Technical effects of the present invention:

In the lamp suitable for automatic production of the present invention, the end cover and the lamp holder adopt plug-in fitting to realize the fixed connection, which is convenient to realize automatic production, and the connected convex is set to swell at the middle. The swell part of the convex can be cut up from the orifice of the fixing hole and the protruding column enters into the fixing hole to achieve a firm connection of interference fit.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] The embodiments of the present invention are described below in conjunction with the drawings, in which:

FIG.1 is a schematic diagram of the structure of a lamp suitable for automated production in this embodiment.

FIG.2 is an exploded view of the lamp suitable for automated production in this embodiment.

FIG. 3 is an enlarged diagram of part A in FIG.2.

FIG.4 is an enlarged diagram of part B in FIG.2.

FIG.5 is a schematic cross-sectional view of the lamp suitable for automated production in this embodiment at the end cover installation place.

FIG.6 is a schematic longitudinal cross-sectional view of the lamp suitable for automated production in this embodiment at the end cover installation place (before installation).

FIG.7 is a schematic longitudinal cross-sectional view of the lamp suitable for automated production in this embodiment at the end cover installation place (after installation).

DETAILED DESCRIPTION OF THE INVENTION

[0009] Hereinafter, specific embodiments of the present invention will be described in further detail based on the drawings. It should be understood that the description of the embodiments of the present invention is not intended to limit the protection scope of the present invention.

[0010] As shown in FIG.1~7, the lamp suitable for automated production in this embodiment includes a lamp holder 100, a light source assembly 200, and an end cover 300. The lamp holder 100 is provided with an installation cavity 101 for installing the light source assembly 200, and the installation cavity 101 is provided with an installation opening 102, and the end cover 300 is used to encapsulate the installation opening 102. In addition to the light source assembly, electrical components are also installed in the installation cavity 101. In some cases, the electrical components and the light source assembly 200 are coupled with each other. In this embodiment it focuses on the structure and installation method of the end cover 300. The specific forms of other parts are only shown as example in this embodiment. Of course, they can also be applied to other types of lamps, such as strip lamp, shot lamp, downlamp, etc.

[0011] The cross-sectional shape of the convex 301 may be round-like or other shapes, such as polygonal, triangular, and the like.

[0012] In this embodiment, the lamp holder 100 is provided with a fixing hole 103, and the end cover 300 is provided with a convex 301 that is interference-fitted with the fixing hole 103 to achieve a fixed connection. The fixed connection is realized by inserting the convex 301 into the fixing hole 103, the assembly action is less, the direction is single, and automation can be conveniently realized.

[0013] In this embodiment, the middle section of the convex 301 expands radially, so that it can take the shape of an elliptical sphere with small ends and a large middle, that is, a structure with large middle and small ends which gradual change from the middle to both ends, which is not only easier to align with the fixing hole 103, but also easier to insert and assemble.

[0014] In order to make the assembly of the fixing hole 103 and the convex 301 more firm, in this embodiment, the hardness of the fixing hole 103 is greater than that of the convex 301 and its orifice is a cut. In this embodiment, when assembling, the orifice is used as a cut, and the outer wall of the convex 301 is cut. After cutting, the assembly can be tighter and stronger. The orifice as a cut is generally not chamfered, so that the outer wall of the convex 301 can be cut by making the orifice sharp.

[0015] In order to prevent the cut chips from accumulating at the root of the convex 301, in this embodiment, the radial dimension of the root of the convex 301 is smaller than the fixing hole 103. As a result, a gap 400 is formed between the root of the convex 301 and the inner wall of the fixing hole 103, and the gap 400 is used to accommodate the cut chips, prevent the cut chips from accumulating outside the fixing hole 103, and improve the fixing effect.

[0016] In order to facilitate manufacturing, the lamp holder 100 is made of metal material, generally aluminum alloy. Further, the end cover 300 is made of plastic or nylon material, which has certain elasticity and strength and has hardness less than that of most metals, for that the aforementioned cutting process can be completed.

[0017] In order to make the assembly more reliable and prevent the convex 301 from being broken due to misalignment, the end cover 300 is provided with a guide block 302 close to the convex 301, and the length of the guide block 302 is longer than the convex 301. The lamp holder 100 is provided with a guide groove 108 that is matched with the guide block 302. When assembling, the guide block 302 and the guide groove 108 are first matched to align the assembly, and then the convex 301 and the fixing hole 103 are connected.

[0018] The structure and assembly of the end cover 300 of this embodiment can be applied to various types of lamps. The lamp of this embodiment is a bar-shaped lamp, the lamp holder 100 is a bar, and the end cover 300 is used to encapsulate installation opening 102 at the end of the lamp holder 100. Both ends of the lamp holder 100 of this embodiment need to be encapsulated, and the encapsulated method is the same, and one end is described below as example.

[0019] The lamp holder 100 of this embodiment is a profile and its cross-section is U-shaped, and it includes a bottom surface 104 and two opposite side surfaces 105. The profile has a simple shape and low manufacturing cost. The inner side of the side surface 105 is provided with the fixing hole 103, and the depth direction of the fixing hole 103 is the same as the length direction of the lamp holder 100. With this arrangement, the insertion direction of the fixing hole 103 and the convex 301 can

be the same as the length direction of the lamp holder 100.

[0020] To facilitate manufacturing, the fixing hole 103 extends to both ends of the side surface 105 along the depth direction. Further, both side surfaces 105 are provided with the fixing holes 103, and the end cover 300 is provided with two convexes 301 respectively matched with the fixing holes 103. The number of the convexes 301 on the end cover 300 can be set according to the size and shape of the installation opening 102. In this embodiment, there are two convexes 301.

[0021] In addition, if the depth of the closed hole on the circumference is too large, it is difficult to process. For this reason, the fixing hole 103 in this embodiment is provided with a slit 1031 on the circumference, and the side wall of the convex 301 is provided with a reinforcing rib 3011, the reinforcing rib 3011 is inserted into the slit 1031 during assembly.

[0022] The light source assembly 200 includes a strip-shaped circuit board 201, a light source 202 arranged on the strip-shaped circuit board 201 and a strip-shaped optical element 203. The strip-shaped optical element 203 may be a light distribution lens or a simple lampshade.

[0023] The two side surfaces 105 are provided with first grooves 106 which are arranged opposite to each other and extend to both ends along the length direction. The circuit board 201 penetrates into the first groove 106 from the installation opening 102. The two side surfaces 105 are provided with second grooves 107 which are arranged opposite to each other and extend to both ends along the length direction. The two sides of the strip-shaped optical element 203 are provided with clamping edges, which penetrate the second grooves 107 from the installation opening 102. With the above structure it is easy to install the circuit board 201 and the strip-shaped optical element 203, and then install the end cover 300 to complete the entire lamp installation.

[0024] In this embodiment, the fixing hole 103 is arranged below the first groove 106, and the guide groove 108 is located below the fixing hole 103.

[0025] In this embodiment, a socket 2011 is provided at the end of the circuit board 201, and the socket 2011 is arranged on the back of the circuit board 201, and the end cover 300 is provided with a plug-in groove aligned with the jack of the socket 2011, and the two convexes 301 distributed on both sides of the plug-in groove 303.

[0026] The above disclosure has been described by way of example and in terms of exemplary embodiment, and it is to be understood that the disclosure is not limited thereto. Rather, any modifications, equivalent alternatives or improvement etc. within the spirit of the invention are encompassed within the scope of the invention as set forth in the appended claims.

Claims

1. A lamp suitable for automated production, comprising a lamp holder (100), a light source assembly (200) and an end cover (300), the lamp holder (100) is provided with an installation cavity (200) for installing the light source assembly (200) 101), and the installation cavity (101) is provided with a installation opening (102), and the end cover (300) is used to encapsulate the installation opening (102), **characterized in that**, the lamp holder (100) is provided with a fixing hole (103),and the end cover (300) is provided with a convex (301) that is interference fit with the fixing hole (103) to achieve a fixed connection.

2. The lamp suitable for automated production as claimed in claim 1, wherein the middle section of the convex (301) expands radially.

3. The lamp suitable for automated production as claimed in claim 2, wherein the hardness of the fixing hole (103) is greater than that of the convex (301) and its hole is a cut.

4. The lamp suitable for automated production as claimed in claim 3, wherein the radial dimension of the root of the convex (301) is smaller than that of the fixing hole (103).

5. The lamp suitable for automated production as claimed in claim 1, wherein the lamp holder (100) is made of metal material.

6. The lamp suitable for automated production as claimed in claim 1, wherein the end cover (300) is made of plastic or nylon.

7. The lamp suitable for automated production as claimed in claim 1, wherein the end cover (300) is provided with a guide block (302) close to the convex (301), and the length of the guide block (302) is longer than the convex (301), and the lamp holder (100) is provided with a guide groove (108) that is matched with the guide block (302).

8. The lamp suitable for automated production as claimed in any one of claims 1-7, wherein the lamp is a bar-shaped lamp, the lamp holder (100) is a bar-shaped, and the end cover (300)) is used to encapsulate the installation opening (102) at the end of the lamp holder (100).

9. The lamp suitable for automated production as claimed in claim 8, wherein the lamp holder (100) is a profile with a U-shaped cross section, including a bottom surface (104) and two opposite side surfaces (105).

10. The lamp suitable for automated production as claimed in claim 9, wherein the inner side of the side

surface (105) is provided with the fixing hole (103), and the depth direction of the fixing hole (103) is consistent with the length direction of the lamp holder (100).

11. The lamp suitable for automated production as claimed in claim 10, wherein the fixing hole (103) extends to both ends of the side surface (105) along the depth direction.

12. The lamp suitable for automated production as claimed in claim 10, wherein both side surfaces (105) are provided with the fixing holes (103), and the end cover (300) is provided with two convexes (301) respectively matched with the fixing hole (103).

13. The lamp suitable for automated production as claimed in any one of claims 9-12, wherein the light source assembly (200) comprises a strip-shaped circuit board (201), a the light source (202) arranged on the strip-shaped circuit board (201) and a strip-shaped optical element (203).

14. The lamp suitable for automated production as claimed in claim 13, wherein the two side surfaces (105) are provided with first grooves (106) which are arranged opposite to each other and extend to both ends along the length direction, and the circuit board (201) penetrates into the first groove (106) from the installation opening (102).

15. The lamp suitable for automated production as claimed in claim 14, wherein the two side surfaces (105) are provided with second grooves (107) which are arranged opposite to each other and extend to both ends along the length direction, and the two sides of the strip-shaped optical element (203) are provided with clamping edges, which penetrate the second groove (107) from the installation opening (102).

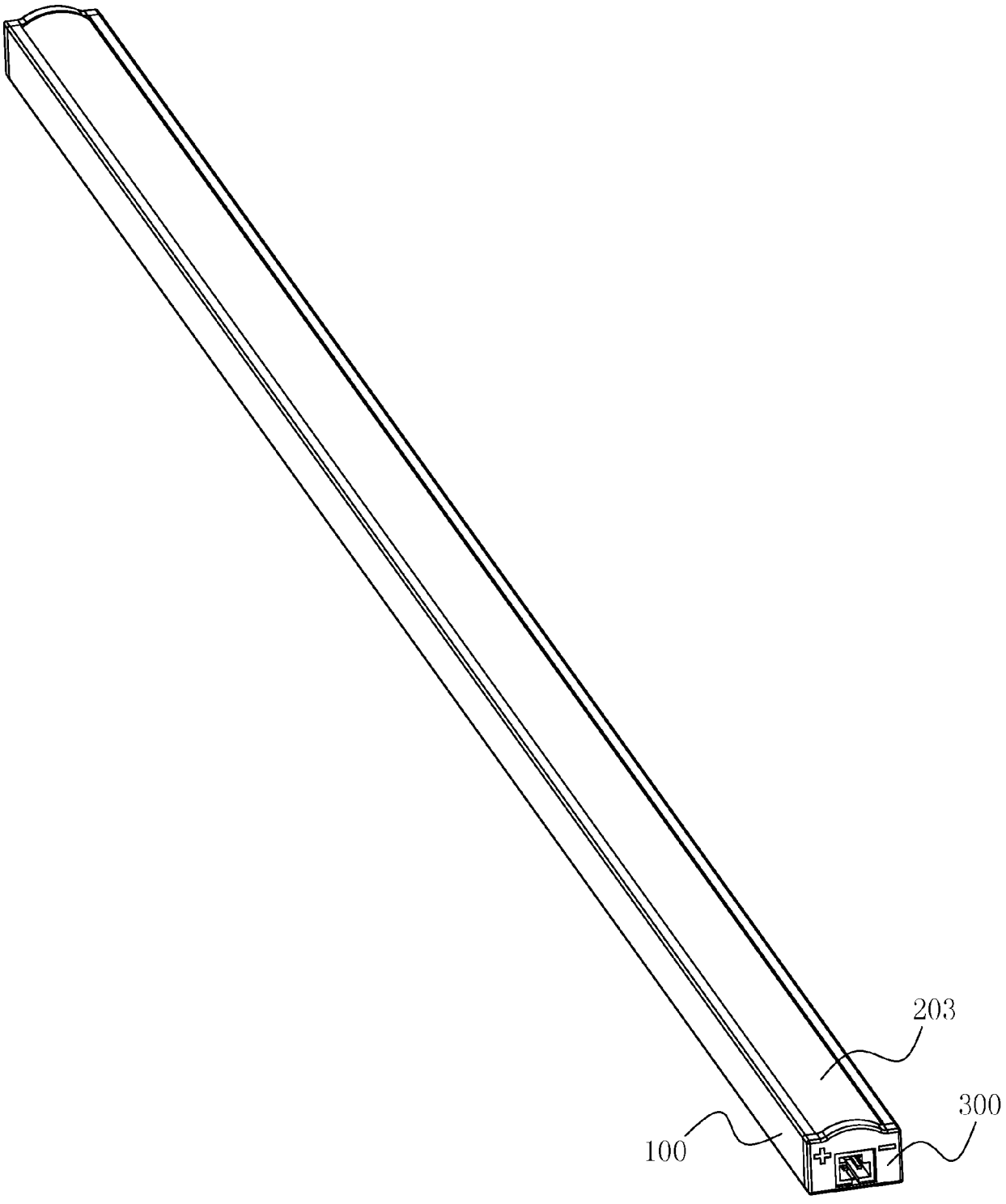

FIG. 1

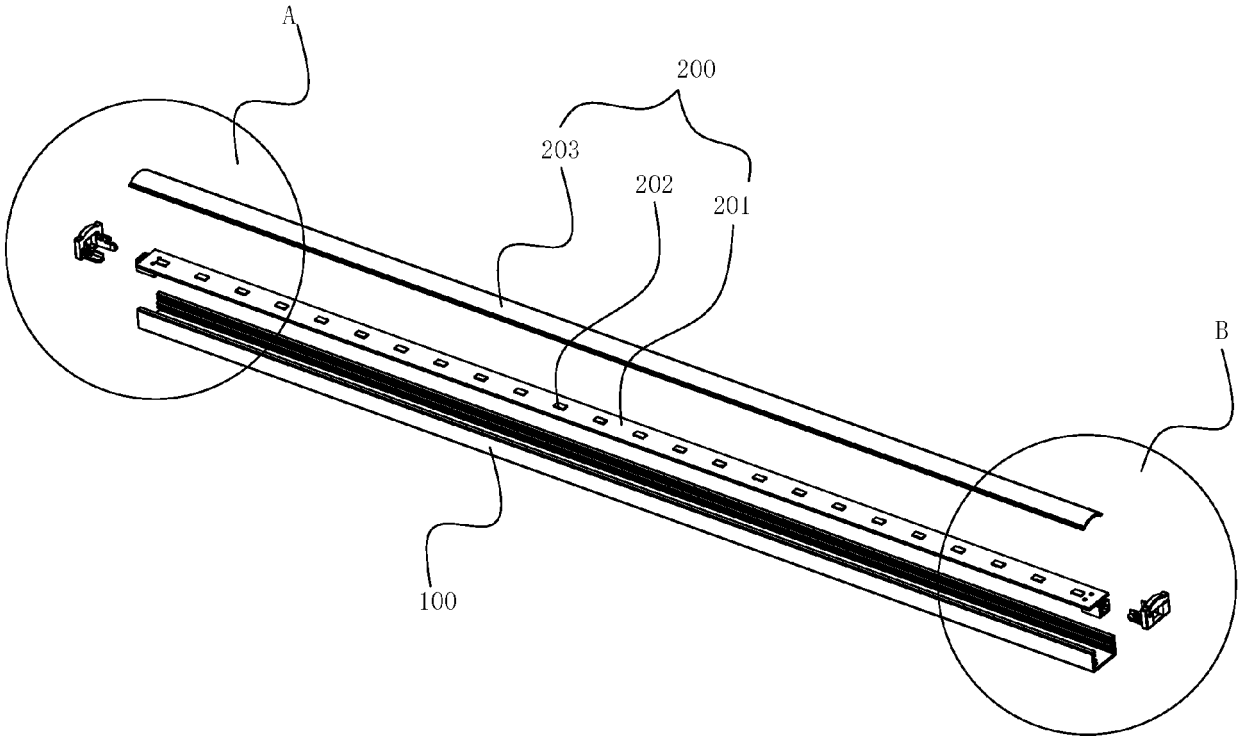

FIG. 2

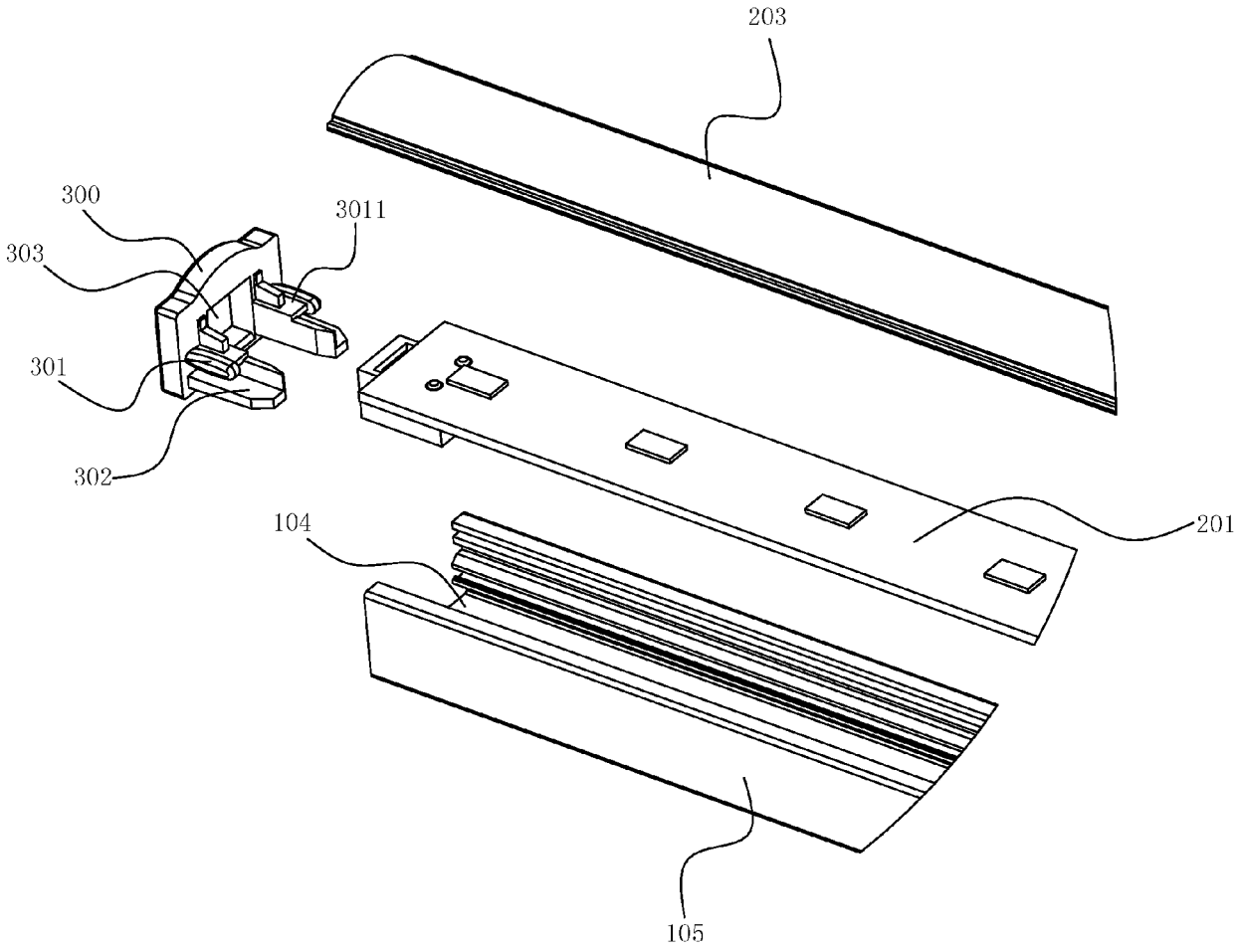

FIG. 3

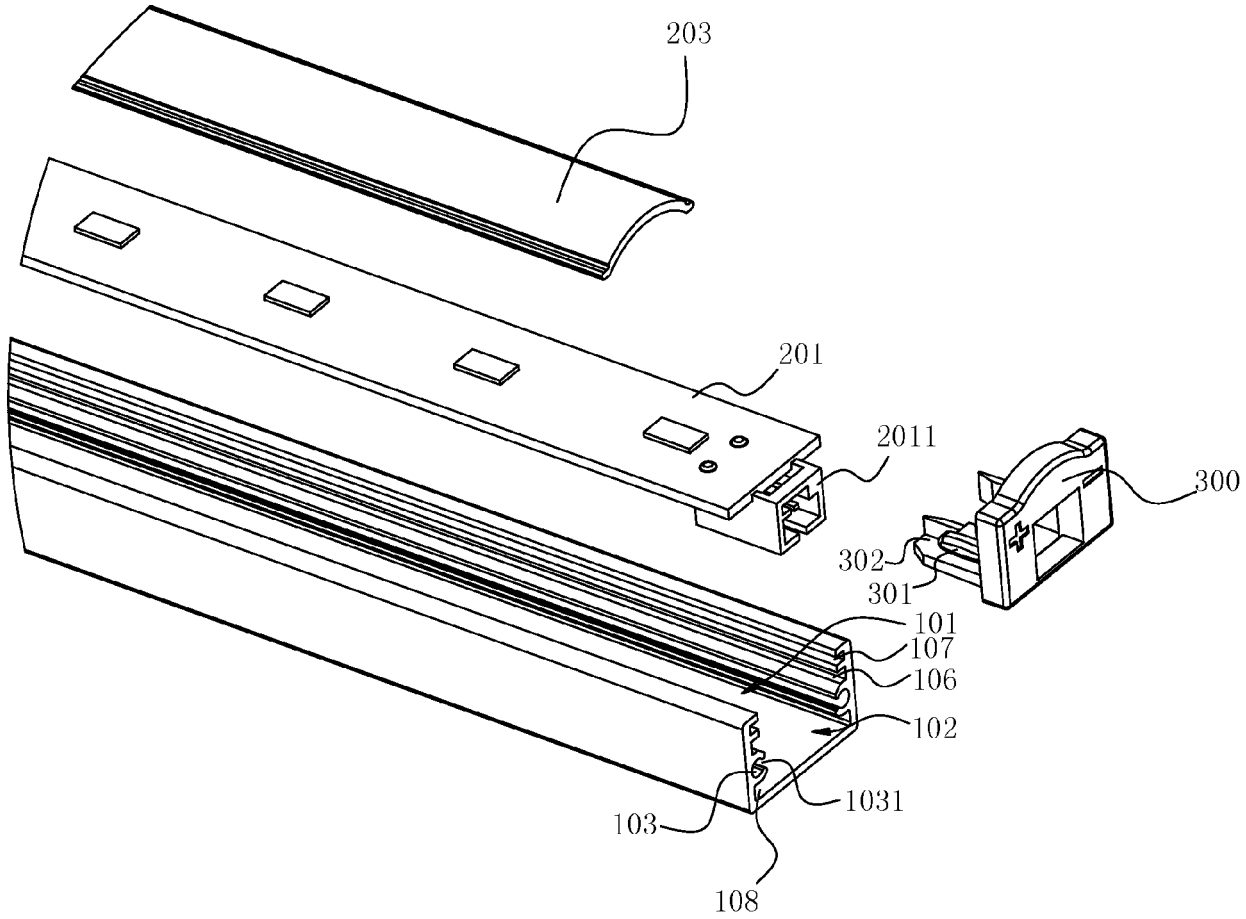

FIG. 4

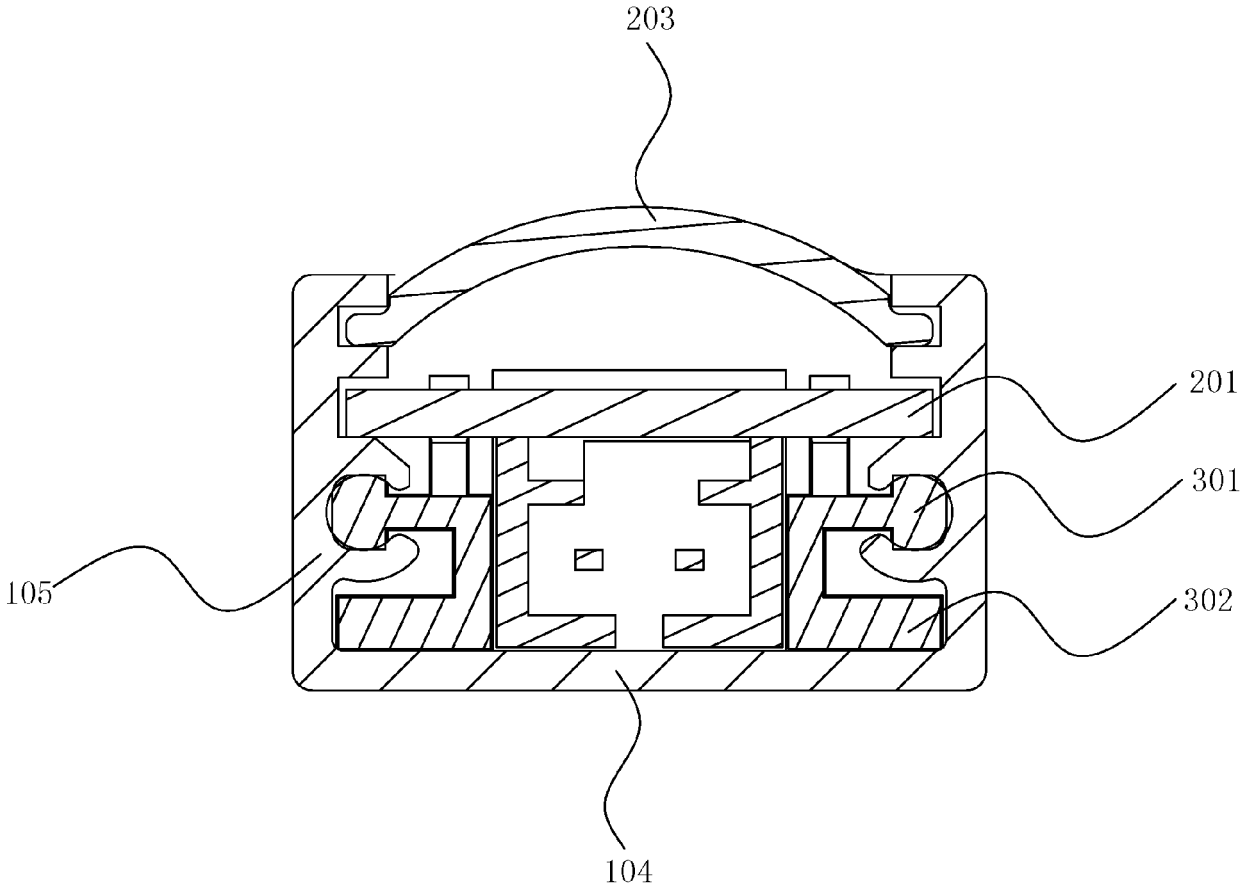

FIG. 5

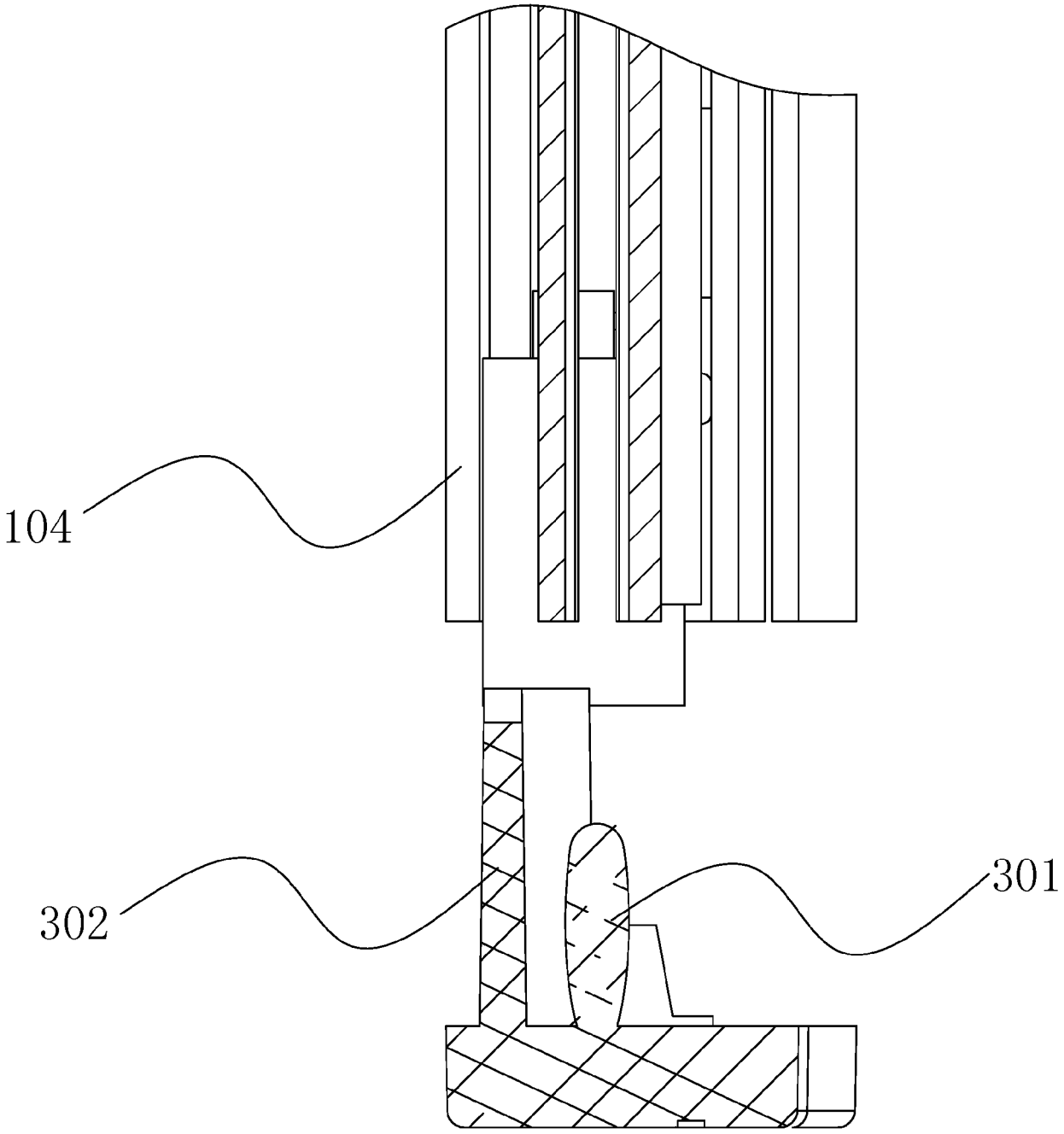

FIG. 6

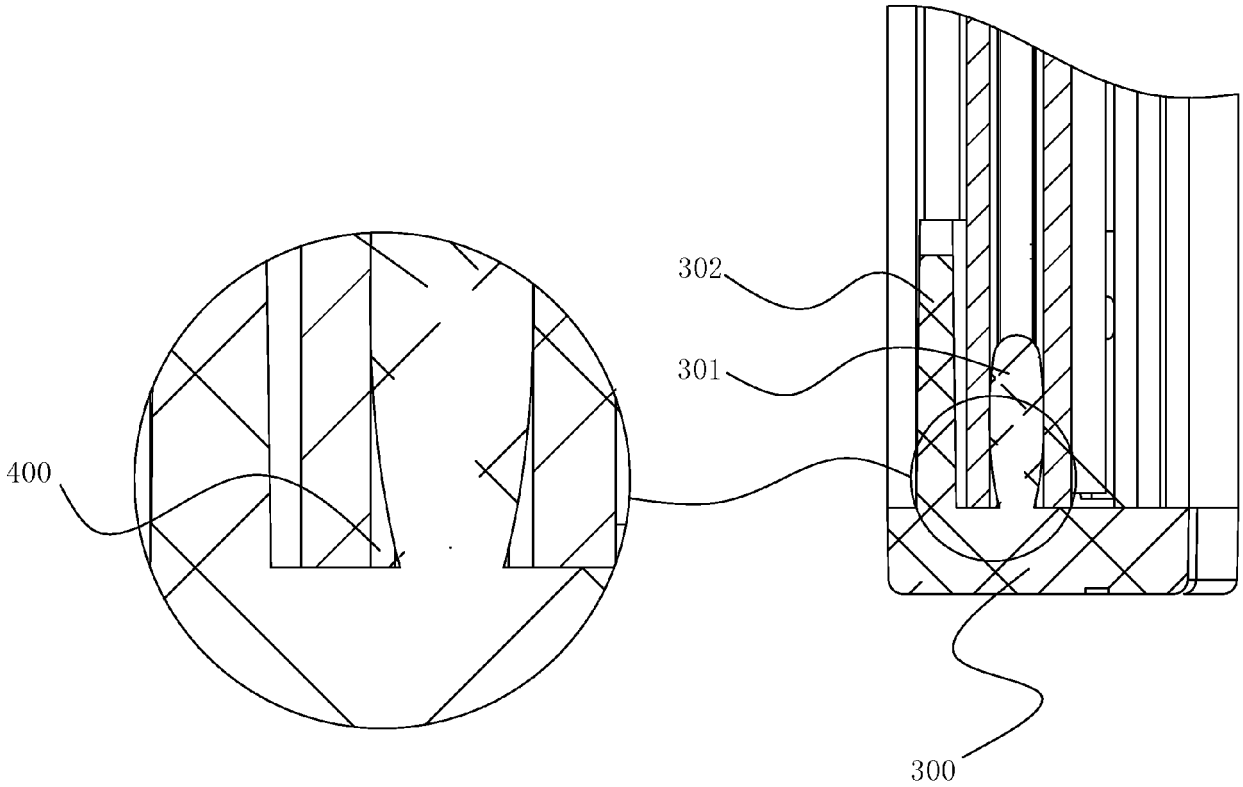

FIG. 7

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EUROPEAN SEARCH REPORT

Application Number
EP 21 19 1537

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 207 005 910 U (ZHONGSHAN CANDOR ELECTRIC APPLIANCE CO LTD) 13 February 2018 (2018-02-13) * paragraphs [0024] - [0029]; figures 3-6 * -----	1-3,5,6, 8-13,15	INV. F21S4/28 F21V15/015 F21V17/10 ADD.
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TECHNICAL FIELDS SEARCHED (IPC)
F21S F21V F21Y

1 The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	20 January 2022	Thibaut, Arthur

CATEGORY OF CITED DOCUMENTS

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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