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(54) EXTRUSION-TYPE TRI-PROOF LAMP

(57) An extrusion-type tri-proof lamp comprises a lampshade (10), shell assemblies (20) disposed at two ends of the lampshade (10), and end cover assemblies (30) detachably mounted on the shell assemblies (20), wherein a slideway (40) and a heat sink (50) slidably connected to the slideway are disposed in the lampshade (10), a light source module (60) and a drive module (80) are disposed on the heat sink (50), the light source module (60) is connected to the drive module (80), the drive module (80) is connected to an external power source, a wiring board (100) and a mounting plate (90) are disposed on the back of the lampshade (10), the wiring board (100) is detachably connected to the mounting plate (90), a first water-proof ring (110) is disposed between the mounting plate (90) and the lampshade (10), the mounting plate (90) is provided with a wiring hole, and a second water-proof ring (120) is disposed in the wiring hole.

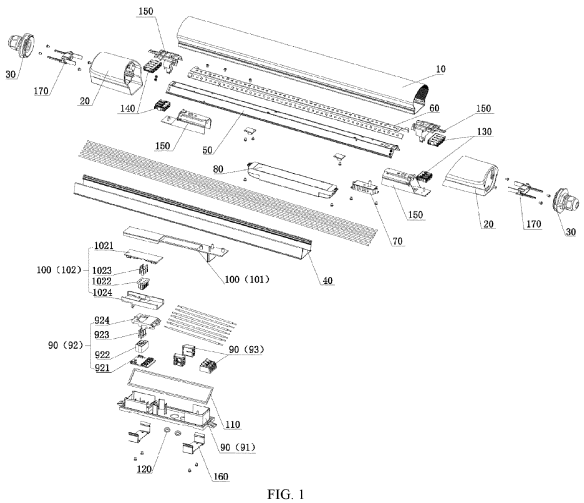

FIG. 1

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Description

BACKGROUND OF THE INVENTION

1. Technical Field

[0001] The invention relates to the field of tri-proof lamps, in particular to an extrusion-type tri-proof lamp.

2. Description of Related Art

[0002] Tri-proof lamps are illuminating lamps with a water-proof function, a dust-proof function and a corrosion-proof function, and have been widely used in factories, offices, metros, airports and other special occasions with water-proof, dust-proof and corrosion-proof requirements. Generally, the tri-proof lamps are produced by injection-molding or extrusion. Different molds are needed for injection-molding of tri-proof lamps with different sizes, which makes the investment cost high. Extrusion-type tri-proof lamps with any lengths can be fabricated without any mold. Most existing extrusion-type tri-proof lamps are of an integrated structure, and wiring holes are reserved only in two sides of the extrusion-type tri-proof lamps to allow electricians to assemble or disassemble wires; a small part of the tri-proof lamps are provided with a detachable battery, but the drive module, the light source module, and a microwave sensor are undetachable. The tri-proof lamp is expensive and will not be able to function normally once one part is broken, so the use effect is compromised, and even the whole lamp will be discarded, thus causing resource waste and increasing the use cost due to the replacement with a new lamp. In addition, wires are connected into the existing extrusion-type tri-proof lamps from two sides, so the overall wiring is disordered, and the use effect and overall appearance of the lamps are compromised.

BRIEF SUMMARY OF THE INVENTION

[0003] The objective of the invention is to provide an extrusion-type tri-proof lamp to solve the problems of resource waste and high use cost caused by difficult maintenance and disordered overall wiring of the existing tri-proof lamps.

[0004] To fulfill the objective of the invention, the following technical solution is adopted.

[0005] An extrusion-type tri-proof lamp comprises a lampshade, shell assemblies disposed at two ends of the lampshade, and end cover assemblies detachably mounted on the shell assemblies, wherein a slideway and a heat sink slidably connected to the slideway are disposed in the lampshade, a light source module and a drive module are disposed on the heat sink, the light source module is connected to the drive module, the drive module is connected to an external power source, a wiring board to be connected to the external power source and a mounting plate fixedly connected to a mounting face are disposed on the back of the lampshade, the wiring board is detachably connected to the mounting plate, a first water-proof ring is disposed between the mounting plate and the lampshade, the mounting plate is provided with a wiring hole allowing the power source to be connected thereinto, and a second water-proof ring is disposed in the wiring hole.

[0006] Preferably, the mounting plate comprises a first base plate, the first base plate is provided with a first wiring socket and a first wiring terminal to be connected to the power wire, the first wiring terminal is connected to the first wiring socket through a wire, the wiring board comprises a second base plate, the second base plate is provided with a second wiring socket matched with the first wiring socket, the first wiring socket is connected to the second wiring socket in a pluggable manner, and the drive module is connected to the second wiring socket through a wire.

[0007] Preferably, the first wiring socket comprises a PCB male pin connecting board fixed to a first board body, a male pin fixing base disposed on the PCB male pin connecting board, a male pin assembly disposed in the male pin fixing base, and a male pin fixing gland covering the PCB male pin connecting board; and the second wiring socket comprises a PCB female pin connecting board fixed to a second board body, a female pin fixing base disposed on the PCB female pin connecting board, a female pin assembly disposed in the female pin fixing base, and a female pin fixing gland covering the PCB female pin connecting board.

[0008] Preferably, a second wiring terminal and a third wiring terminal are disposed at two ends of the heat sink, and the drive module is connected to one of the first wiring terminal, the second wiring terminal and the third wiring terminal.

[0009] Preferably, mounting brackets for mounting the second wiring terminal and the third wiring terminal are disposed at the two ends of the heat sink, and are provided with handles for users to pull the heat sink out.

[0010] Preferably, the mounting plate is provided with fasteners, the lampshade is provided with fastening portions clamped on and matched with the fasteners, and after being connected to the wiring board, the mounting plate is clamped and fixed to the lampshade through the fasteners.

[0011] Preferably, each of the end cover assemblies comprises a cover and a water-proof connector, the covers are provided with first wire holes allowing the power wire to penetrate through, the water-proof connectors are provided with second wire holes allowing the power wire to penetrate through, rubber plugs are disposed in the first wire holes, the water-proof connectors are detachably mounted on the covers, internal threads are disposed on inner walls of the shell assemblies, external threads matched with the internal threads are disposed on the covers, and the end cover assemblies and the shell assemblies are fixed or disassembled by screwing.

[0012] Preferably, a pressing plate is disposed be-

tween each shell assembly and the corresponding end cover assembly, and is fixedly connected to the shell assembly.

[0013] Preferably, the heat sink is further provided with a microwave sensor connected to the drive module.

[0014] Preferably, the heat sink comprises a cooling substrate, a first side plate and a second side plate, the first side plate and the second side plate are obliquely disposed at two ends of the cooling substrate and are slidably connected to the slideway, the light source assembly comprises a first light strip disposed on the surface of the cooling substrate, a second light strip disposed on the surface of the first side plate, and a third light strip disposed on the second side plate, the microwave sensor and the drive module are disposed at the bottom of the cooling substrate, and the cooling substrate is provided with a via hole for detecting the microwave sensor.

[0015] The invention has the following beneficial effects:

1. The extrusion-type tri-proof lamp of the invention is provided with the slidable heat sink, and the light source module, and the microwave sensor and the drive module are disposed on the heat sink, such that internal components can be pulled out to be replaced or maintained; and the whole lamp does not need to be discarded, such that resource waste is effectively avoided, and the use cost is reduced for users.
2. Wiring on the back of the lampshade is added, so that more wiring methods are provided for customers; and the power wire will not be seen after the lamp is assembled, such that the whole lamp is more beautiful

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

[0016]

FIG. 1 is a disassembled structural view of the invention;
FIG. 2 is an overall structural view of the invention;
FIG. 3 is a structural view of the invention after a mounting plate is disassembled;
FIG. 4 is a structural view of top wiring of the invention;
FIG.5 is a structural view of the invention after end cover assemblies are disassembled;
FIG. 6 is a structural view of side wiring of the invention;
FIG. 7 is a structural view of the pulling condition of the internal structure of the invention;
FIG. 8 is a schematic diagram of the internal structure of the invention;
FIG. 9 is a disassembled structural view of the surface of the internal structure of the invention;
FIG. 10 is a disassembled structural view of the bottom surface of the internal structure of the invention;

[0017] In the figures: 10, lampshade; 20, shell assembly; 30, end cover assembly; 40, slideway; 50, heat sink; 51, cooling substrate; 52, first side plate; 53, second side plate; 60, light source module; 61, first light strip; 62, second light strip; 63, third light strip; 70, microwave sensor; 80 drive module; 90, mounting plate; 91, first base plate; 92, first wiring socket; 921, PCB male pin connecting board; 922, male pin fixing base; 923, male pin assembly; 924, male pin fixing gland; 93, first wiring terminal; 100, wiring board; 101, second base plate; 102, first wiring socket; 1021, PCB female pin connecting board; 1022, female pin fixing base; 1023, female pin assembly; 1024, female pin fixing gland; 110, first water-proof ring; 120, second water-proof ring; 130, second wiring terminal; 140, third wiring terminal; 150, mounting bracket; 151, handle; 160, fastener; 170, pressing plate.

DETAILED DESCRIPTION OF THE INVENTION

[0018] The lampshade 10 of existing tri-proof lamps are fabricated typically by injection-molding and extrusion. Molds with different lengths are needed for injection-molding of lampshades 10 with different lengths, so the production cost is extremely high, and the range of selectable machines is narrow. Tubes with the same section and any lengths can be continuously fabricated by extruding, so that the mold cost is effectively reduced. The existing tri-proof lamps are difficult to maintain, thus causing resource waste and high use cost; and back wiring is not available yet at present. In view of this, the invention provides a new solution. For the sake of a clearer representation, the invention will be described in detail below in conjunction with the accompanying drawings.

[0019] As shown in FIG. 1-FIG. 10, an extrusion-type tri-proof lamp comprises a lampshade 10, shell assemblies 20 fixedly disposed at two ends of the lampshade 10, and end cover assemblies 30 detachably mounted on the shell assemblies 20. A slideway 40 and a heat sink 50 slidably connected to the slideway 40 are disposed in the lampshade 10. A light source module 60, a microwave sensor 70 and a drive module 80 are disposed on the heat sink 50. The microwave sensor 70 is used to detect whether a person approaches the tri-proof lamp, controls the tri-proof lamp to be turned on or increases the brightness of the tri-proof lamp when detecting that a person approaches the tri-proof lamp, and controls the tri-proof lamp to be turned off or decrease the brightness of the tri-proof lamp when detecting that the person moves away from the tri-proof lamp. The light source module 60 and the microwave sensor 70 are both connected to the drive module 80, and the drive module 80 is connected to an external power source. A wiring board 100 to be connected to the external power source and a mounting plate 90 fixedly connected to a mounting face are disposed on the back of the lampshade 10, the wiring board 100 is detachably connected to the mounting plate

90, a first water-proof ring 110 is disposed between the mounting plate 90 and the lampshade 10, the mounting plate 90 is provided with a wiring hole allowing a power wire to be connected thereinto, and a second water-proof ring 120 is disposed in the wiring hole, such that a water-proof effect over level 5 is effectively realized.

[0020] In other embodiments, only the light source module 60 and the drive module 80 are disposed on the heat sink 50 to meet requirements of different users.

[0021] The mounting plate 90 comprises a first base plate 91, connecting holes are formed in two ends of the first base pate 91, and expansion bolts penetrate through the connecting holes to fixedly connect the mounting plate 90 to the mounting face such as a ceiling. The first base plate 91 is provided with a first wiring socket 92 and a first wiring terminal 93 to be connected to the power wire, and the first wiring terminal 93 is connected to the first wiring socket 92 through a wire. In this embodiment, the first wiring terminal 93 comprises a three-position terminal and a two-position terminal, such that the requirements for connection to a power source in different usage scenarios are met.

[0022] A mounting hole is formed in the back of the lampshade 10, the wiring board 100 is disposed in the lampshade 10 and corresponds to the mounting hole in position. The wiring board 100 comprises a second base plate 101, the second base plate 101 is provided with a second wiring socket 102 matched with the first wiring socket 92, the first wiring socket 92 is connected to the second wiring socket 102 in a pluggable manner, and the drive module 80 is connected to the second wiring socket 102 through a wire.

[0023] The first wiring socket 92 comprises a PCB male pin connecting board 921 fixed to a first board body, a male pin fixing base 922 disposed on the PCB male pin connecting board 921, a male pin assembly 923 disposed in the male pin fixing base 922, and a male pin fixing gland 924 covering the PCB male pin connecting board 921; and the second wiring socket 102 comprises a PCB female pin connecting board 1021 fixed to a second board body, a female pin fixing base 1022 disposed on the PCB female pin connecting board 1021, a female pin assembly 1023 disposed in the female pin fixing base 1022, and a female pin fixing gland 1024 covering the PCB female pin connecting board 1021.

[0024] A second wiring terminal 130 and a third wiring terminal 140 are disposed at two ends of the heat sink 50, and the drive module 80 is connected to one of the first wiring terminal 93, the second wiring terminal 130 and the third wiring terminal 140. Any one of the first wiring terminal 93, the second wiring terminal 130 and the third wiring terminal 140 is connected to the power wire, such that power supply to the whole lamp is realized.

[0025] Mounting brackets 150 for mounting the second wiring terminal 130 and the third wiring terminal 140 are disposed at the two ends of the heat sink 50, and the mounting bracket 150 are provided with handles 151 for users to pull the heat sink 50 out.

[0026] In this embodiment, each of the second wiring terminal 130 and the third wiring terminal 140 comprises a three-position terminal and a four-position terminal, such that the requirements for connection to a power source in different usage scenarios are met. Correspondingly, each of the mounting brackets 150 comprises a three-position terminal bracket and a four-position terminal bracket, the three-position terminals are fixed to the three-position terminal brackets, the four-position terminals are fixed to the four-position terminal brackets, the four-position terminal brackets are fixedly connected to the three-position terminal brackets, the three-position terminal brackets are fixedly disposed at the two ends of the heat sink 50, and the handle 151 are disposed at one end of the four-position terminal brackets.

[0027] The mounting plate 90 is provided with fasteners 160 locked at the bottom of the mounting plate 90 with screws, the lampshade 10 is provided with fastening portions fastened on and matched with the fasteners 160, and after being connected to the wiring board 100, the mounting plate 90 is clamped and fixed to the lampshade 10 through the fasteners 160. In this embodiment, the fasteners 160 are metal fasteners 160, and one to three fasteners 160 may be arranged to guarantee the fixing stability.

[0028] Each of the end cover assemblies 30 comprises a cover and a water-proof connector, the covers are provided with first wire holes allowing the power wire to penetrate through, the water-proof connectors are provided with second wire holes allowing the power wire to penetrate through, rubber plugs are disposed in the first wire holes, and the water-proof connectors are detachably mounted on the covers.

[0029] Internal threads are disposed on inner walls of the shell assemblies 20, external threads matched with the internal threads are disposed on the covers, and the end cover assemblies 30 and the shell assemblies 20 are fixed or disassembled by screwing.

[0030] A pressing plate 170 is disposed between each shell assembly 20 and the corresponding end cover assembly 30, and is fixedly connected to the shell assembly 20 through a screw. The pressing plates 170 can protect the internal structure from being opened with bare hands, thus guaranteeing the safety.

[0031] The heat sink 50 comprises a cooling substrate 51, a first side plate 52 and a second side plate 53, wherein the first side plate 52 and the second side plate 53 are obliquely disposed at two ends of the cooling substrate 51, the first side plate and the second side plate are slidably connected to the slideway, the cooling substrate 51 is provided with an aluminum part, and internal elements are cooled by means of the heat conductivity of aluminum.

[0032] In this embodiment, the light source module 60 comprises a first light strip 61 disposed on the surface of the cooling substrate 51, a second light strip 62 disposed on the surface of the first side plate 52, and a third light strip 63 disposed on the second side plate 53, and the

first light strip 61, the second light strip 62 and the third light strip 63 are all locked on the surface of the heat sink with screws.

[0033] In other embodiments, the light source module 60 can be arranged as actually needed, and may comprise one or more light strips to meet requirements of different users.

[0034] In this embodiment, the microwave sensor 70 and the drive module 80 are disposed at the bottom of the cooling substrate 51, the microwave sensor 70 is locked in the three-position terminal bracket at one end with screws, and the three-position terminal bracket and the cooling substrate 51 are provided with via holes for detecting the microwave sensor 70. Drive brackets are disposed at two ends of the drive module 80 and are locked at the bottom of the cooling substrate 51 with screws, and the drive module 80 is locked on the drive brackets with screws.

[0035] The invention is used as follows:

Referring to FIG. 3-FIG. 4, top wiring: the fasteners 160 are pulled outwards, the mounting plate 90 is disassembled, the power wire penetrates through the second water-proof ring 120, and the mounting plate 90 is fixed to a ceiling with expansion bolts; then, the power wire is connected to the first wiring terminal 93; and finally, the mounting plate 90 is inserted in the wiring plate 100, and the fasteners 160 are further fixed to the lampshade 10, such that power supply is realized.

[0036] Referring to FIG. 5-FIG. 6, side wiring: the end cover assembly 30 at the wiring end is unscrewed first, then the water-proof connector of the end cover assembly 30 is unscrewed, the rubber plug in the water-proof connector is taken out, and after that, the power wire penetrates through the water-proof connector and the cover and is connected to the wiring terminal at the corresponding end; after wiring is completed, the cover and the shell assembly 20 are screwed to be fixed; and finally, the water-proof connector is screwed to realize power supply.

[0037] Similarly, an adjacent tri-proof lamp can obtain power through the second wiring terminal 130 or the third wiring terminal 140 (that is, power is supplied from one terminal and comes out from the other terminal, and the next tri-proof lamp obtains power from the former tri-proof lamp), and the two adjacent tri-proof lamps are connected in parallel in this way.

[0038] One of the top wiring and the side wiring may be selected to effectively meet the requirements of different users.

[0039] Referring to FIG. 7-FIG. 10, replacement of internal components: the end cover assembly 30 at any one end is unscrewed first, then the corresponding pressing plate 170 is disassembled, the corresponding handle 151 is pulled outwards to pull the whole internal structure out, and the light source module 60, the microwave sensor 70 or the drive module 80 may be separately disassembled to be maintained or replaced.

[0040] The extrusion-type tri-proof lamp of the invention is provided with the slidable heat sink 50, and the light source module and the drive module are disposed on the heat sink 50, such that internal components can be pulled out to be replaced or maintained, and the whole lamp does not need to be discarded, thus effectively avoiding resource waste and reducing use cost for users; in addition, wiring on the back of the lampshade 10 is added, so that more wiring methods are provided for customers; and the power wire will not be seen after the lamp is assembled, such that the whole lamp is more beautiful.

[0041] The above embodiments are merely used to explain and describe the technical solution of the invention, and are not intended to limit the technical solution of the invention. Although the invention has been specifically described with reference to the above embodiments, those skilled in the art should appreciate that amendments or equivalent substitutions can still be made to the specific implementations of the invention, and any amendments and equivalent substitutions made without departing from the spirit and scope of the invention should fall within the scope of the claims of the invention.

Claims

1. An extrusion-type tri-proof lamp, comprising a lampshade, shell assemblies disposed at two ends of the lampshade, and end cover assemblies detachably mounted on the shell assemblies, wherein a slideway and a heat sink slidably connected to the slideway are disposed in the lampshade, a light source module and a drive module are disposed on the heat sink, the light source module is connected to the drive module, the drive module is connected to an external power source, a wiring board to be connected to the external power source and a mounting plate fixedly connected to a mounting face are disposed on a back of the lampshade, the wiring board is detachably connected to the mounting plate, a first water-proof ring is disposed between the mounting plate and the lampshade, the mounting plate is provided with a wiring hole allowing a power wire to be connected thereinto, and a second water-proof ring is disposed in the wiring hole.

2. The extrusion-type tri-proof lamp according to Claim 1, wherein the mounting plate comprises a first base plate, the first base plate is provided with a first wiring socket and a first wiring terminal to be connected to the power wire, the first wiring terminal is connected to the first wiring socket through a wire, the wiring board comprises a second base plate, the second base plate is provided with a second wiring socket matched with the first wiring socket, the first wiring socket is connected to the second wiring socket in a pluggable manner, and the drive module is connected to the second wiring socket through a wire.

3. The extrusion-type tri-proof lamp according to Claim 2, wherein the first wiring socket comprises a PCB male pin connecting board fixed to a first board body, a male pin fixing base disposed on the PCB male pin connecting board, a male pin assembly disposed in the male pin fixing base, and a male pin fixing gland covering the PCB male pin connecting board; and the second wiring socket comprises a PCB female pin connecting board fixed to a second board body, a female pin fixing base disposed on the PCB female pin connecting board, a female pin assembly disposed in the female pin fixing base, and a female pin fixing gland covering the PCB female pin connecting board.

4. The extrusion-type tri-proof lamp according to Claim 2, wherein a second wiring terminal and a third wiring terminal are disposed at two ends of the heat sink, and the drive module is connected to one of the first wiring terminal, the second wiring terminal and the third wiring terminal.

5. The extrusion-type tri-proof lamp according to Claim 4, wherein mounting brackets for mounting the second wiring terminal and the third wiring terminal are disposed at the two ends of the heat sink, and are provided with handles for users to pull the heat sink out.

6. The extrusion-type tri-proof lamp according to Claim 1, wherein the mounting plate is provided with fasteners, the lampshade is provided with fastening portions clamped on and matched with the fasteners, and after being connected to the wiring board, the mounting plate is clamped and fixed to the lampshade through the fasteners.

7. The extrusion-type tri-proof lamp according to Claim 1, wherein each of the end cover assemblies comprises a cover and a water-proof connector, the covers are provided with first wire holes allowing the power wire to penetrate through, the water-proof connectors are provided with second wire holes allowing the power wire to penetrate through, rubber plugs are disposed in the first wire holes, the water-proof connectors are detachably mounted on the covers, internal threads are disposed on inner walls of the shell assemblies, external threads matched with the internal threads are disposed on the covers, and the end cover assemblies and the shell assemblies are fixed or disassembled by screwing.

8. The extrusion-type tri-proof lamp according to Claim 1, wherein a pressing plate is disposed between each said shell assembly and the corresponding end cover assembly, and is fixedly connected to the shell assembly.

9. The extrusion-type tri-proof lamp according to Claim 1, wherein the heat sink is further provided with a microwave sensor connected to the drive module.

10. The extrusion-type tri-proof lamp according to Claim 9, wherein the heat sink comprises a cooling substrate, a first side plate and a second side plate, the first side plate and the second side plate are obliquely disposed at two ends of the cooling substrate and are slidably connected to the slideway, the light source assembly comprises a first light strip disposed on a surface of the cooling substrate, a second light strip disposed on a surface of the first side plate, and a third light strip disposed on the second side plate, the microwave sensor and the drive module are disposed at a bottom of the cooling substrate, and the cooling substrate is provided with a via hole for detecting the microwave sensor.

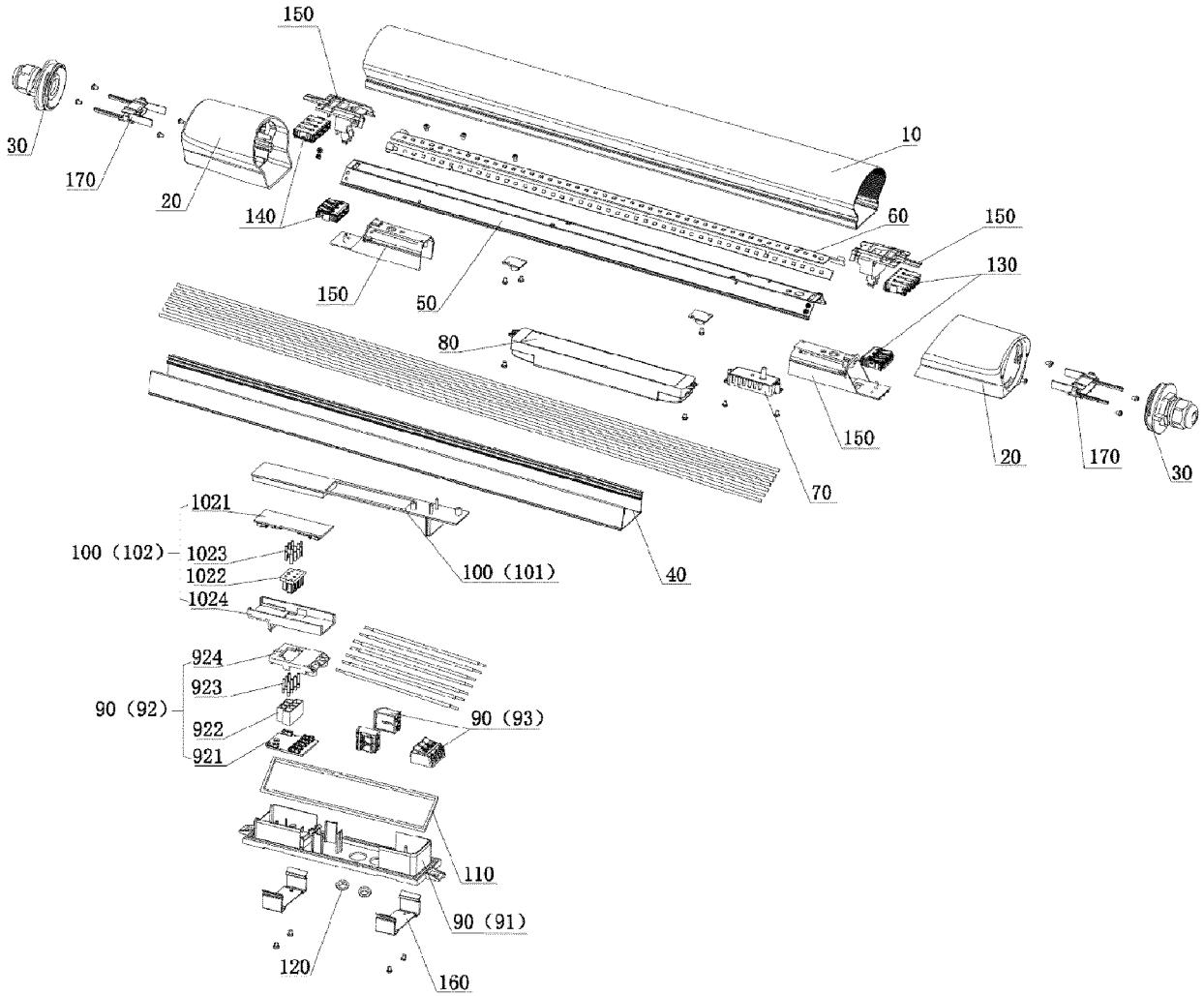
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FIG. 1

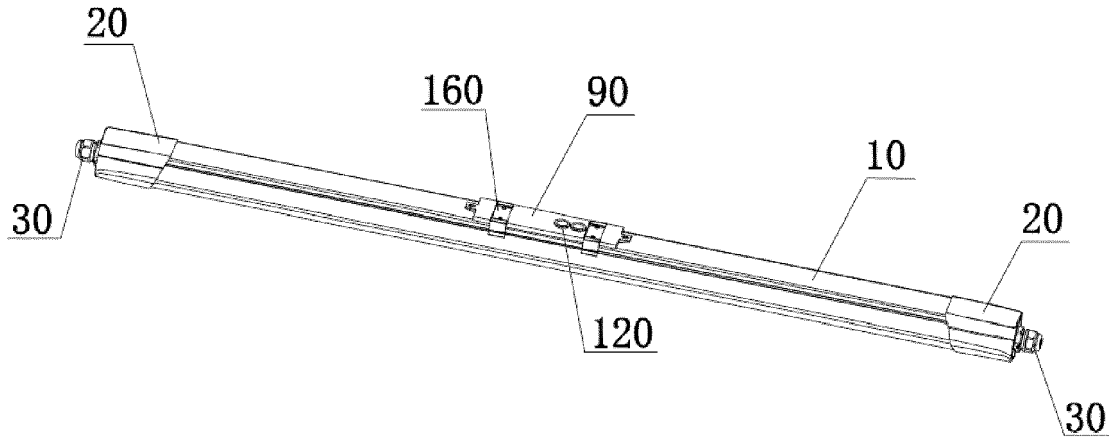

FIG. 2

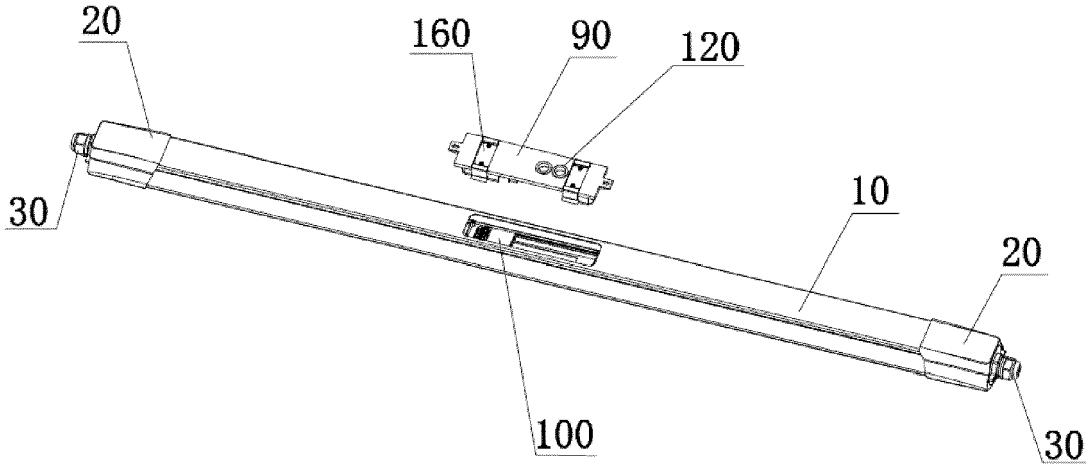

FIG. 3

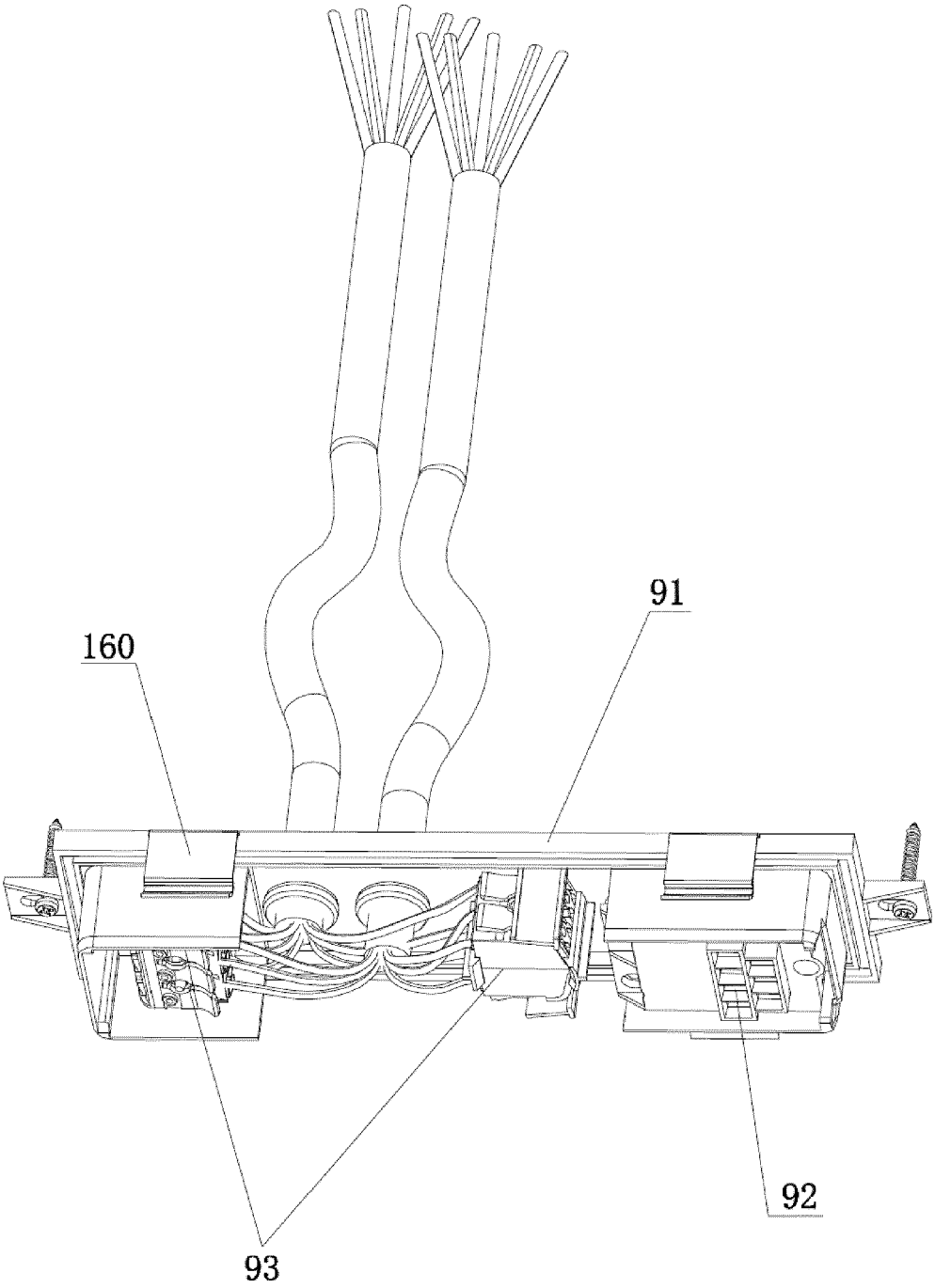

FIG. 4

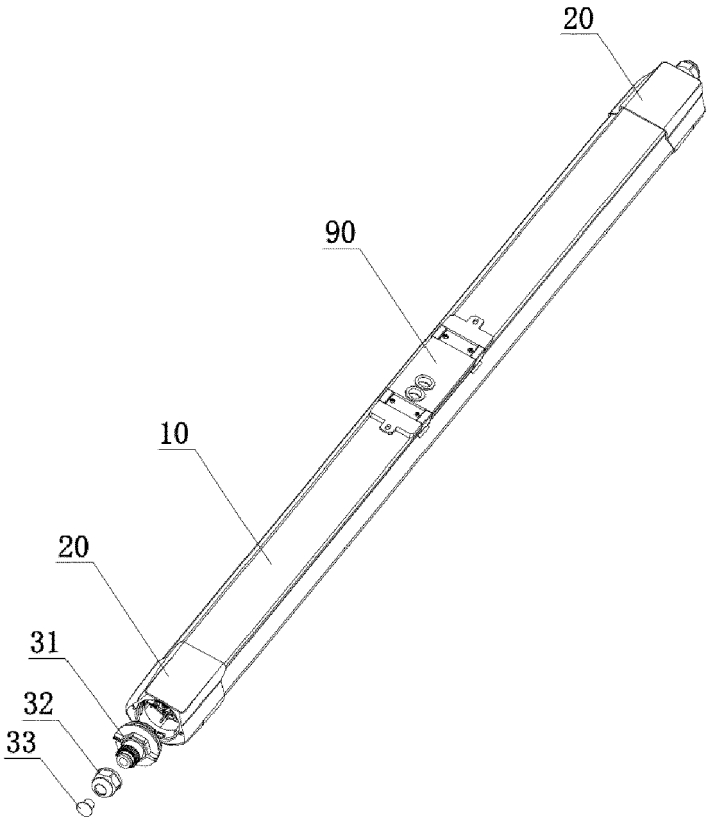

FIG. 5

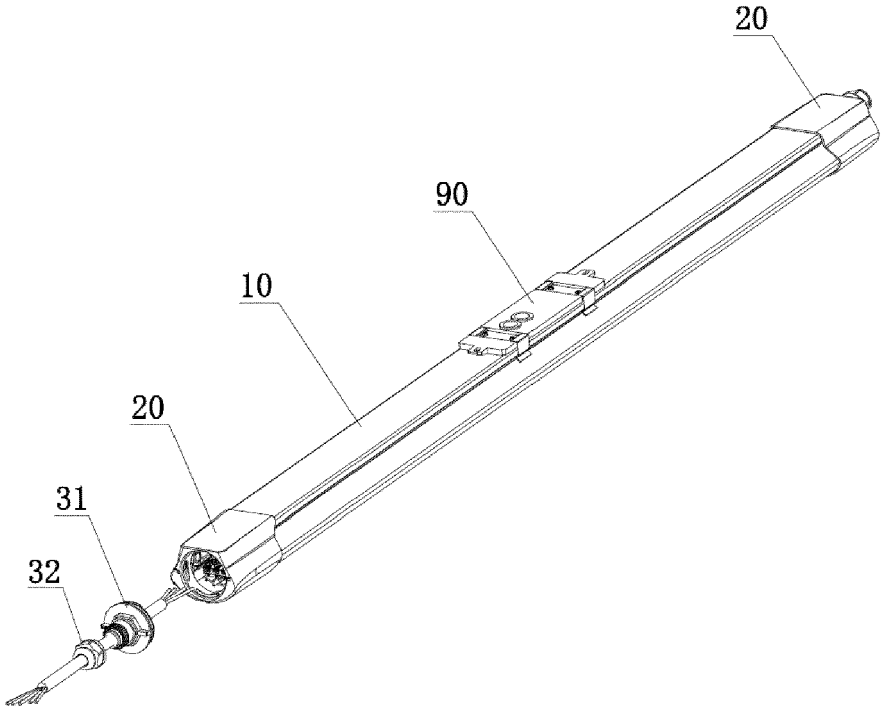

FIG. 6

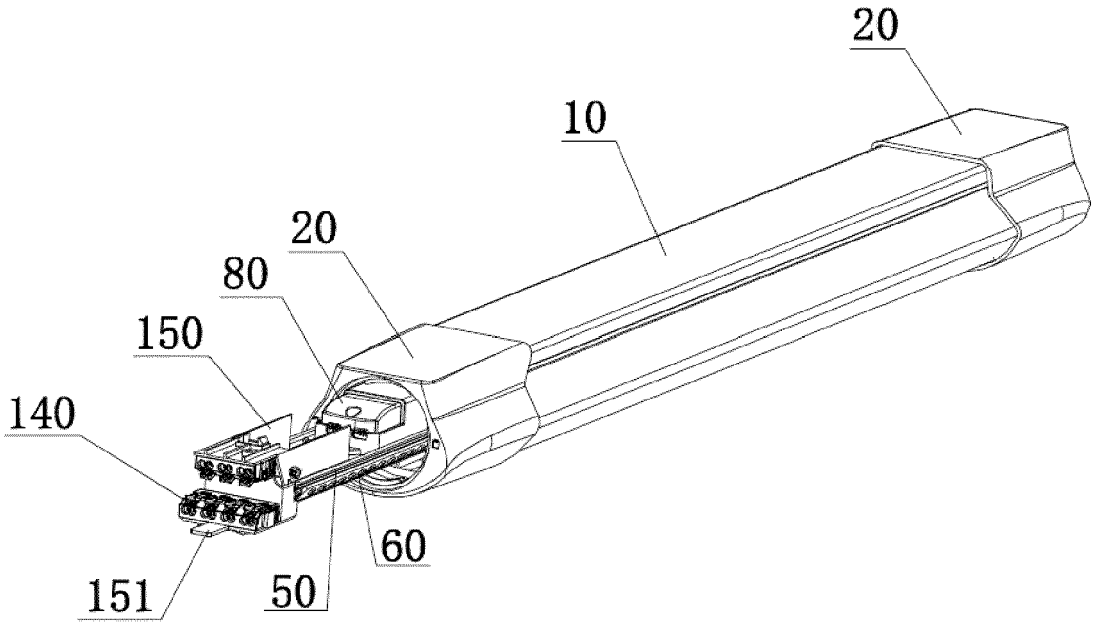

FIG. 7

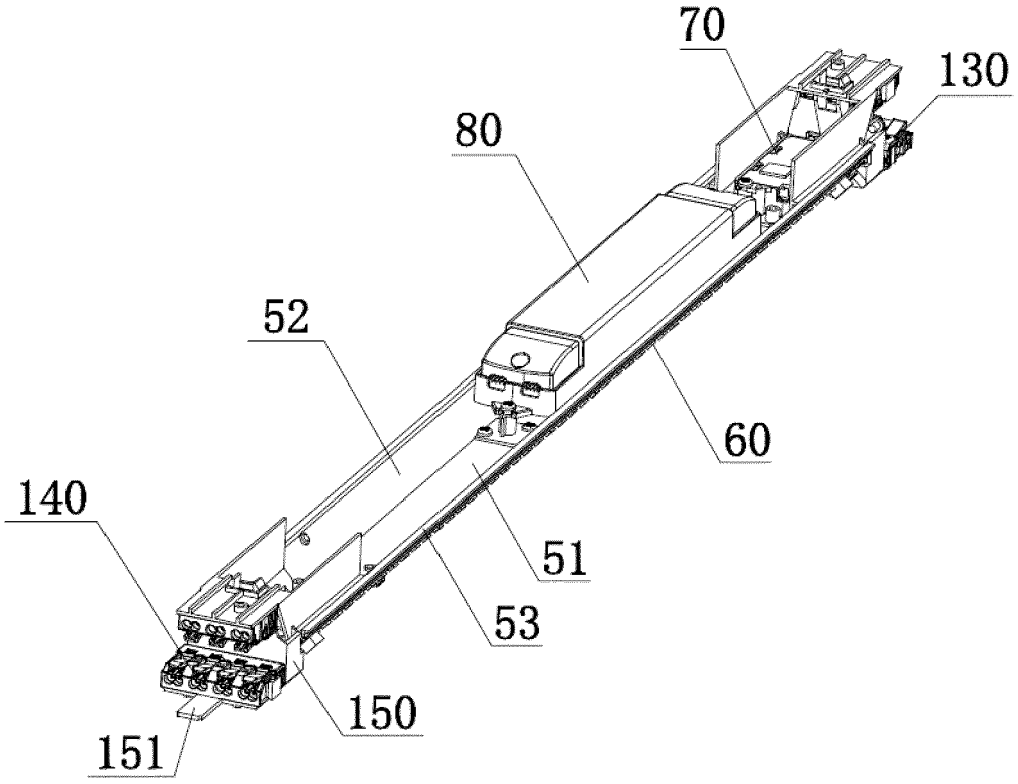

FIG. 8

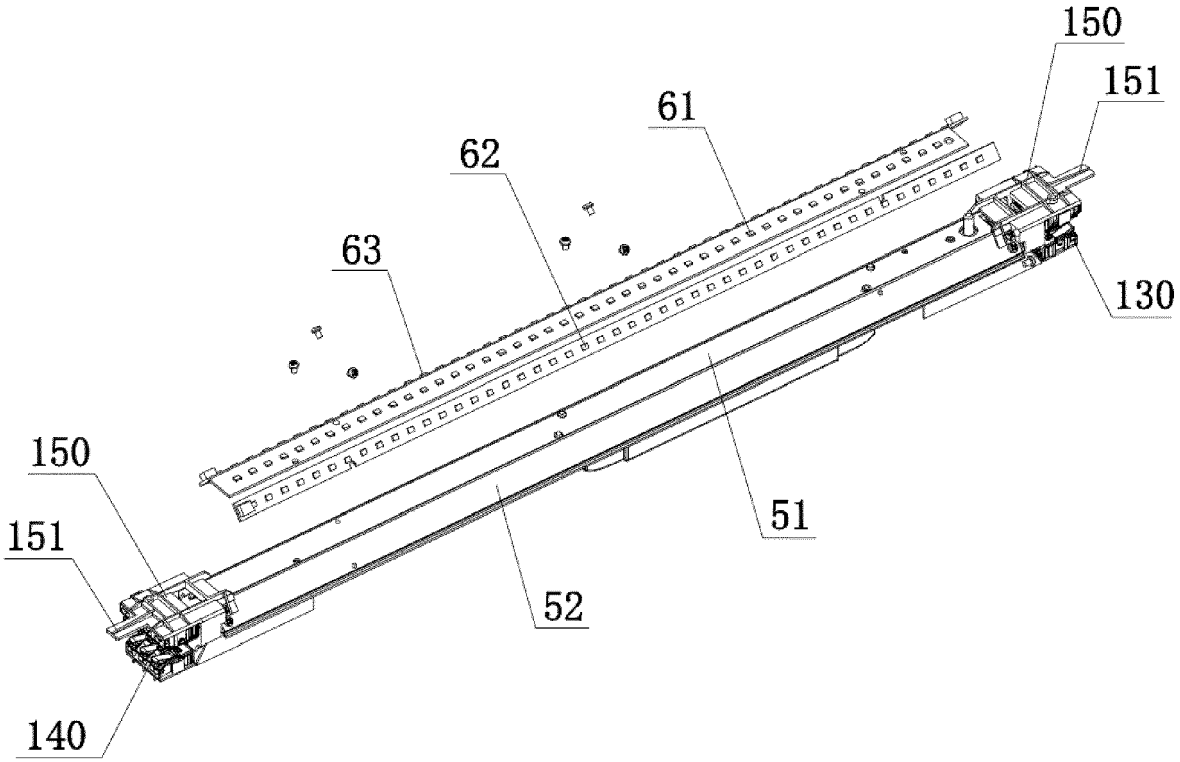
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FIG. 9

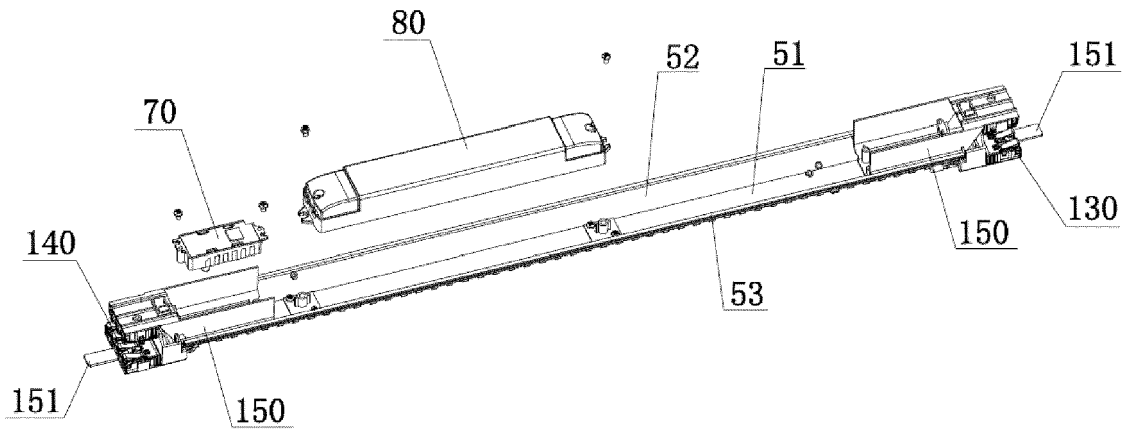
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FIG. 10

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 22 15 4289

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
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CATEGORY OF CITED DOCUMENTS

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