
POWER DISTRIBUTION DEVICE AND POWER DISTRIBUTION SYSTEM

Technical Field

The present application relates to the field of power distribution, and in particular, to a power distribution device capable of distributing and supplying power, and a power distribution system including the power distribution device.

Background Art

In the prior art, in the field of power distribution in domestic homes and commercial buildings, outlets are often provided at predetermined locations. Such an arrangement requires not only pre-selecting the position at which the socket is arranged but there may be problems in that the socket is arranged improperly and in an insufficient number later in use.

In order to solve such problems, a person skilled in the art has developed a novel power distribution system, which generally comprises a power rail as a power distribution device and an adapter adapted to plug into the power distribution device. The power rail can be detachably mounted on a mounting surface, e.g. a wall surface or the like, and the adapter can be plugged into the power rail via an opening of an electrical channel of the power rail so that the adapter takes power from the power rail. However, with existing power rails, conductors near the opening of the electrical channel are always electrically connected to the live wires or neutral wires, whether or not an adapter is plugged into the electrical channel. This results in a safety hazard for the power distribution device.

Summary of the Invention

Technical Problem

The present application has been made on the basis of the above-mentioned defects of the prior art. It is an object of the present application to provide a power distribution device that is capable of substantially reducing or even eliminating the safety risk of the power distribution device due to the conductor near the opening of the electrical channel always being electrically connected to the live wire or neutral wire. It is another object of the present application to provide a power distribution system including the power distribution device described above.

In order to achieve the above-mentioned objective, the present application can adopt the following technical solutions.

Solution to Problem

The present application provides a power distribution device for supplying power to at least one adapter, comprising:

a housing detachably mounted on a mounting surface and having an opening for plugging the adapter;

an elongate conductor mounted in the housing and for electrically connecting to a neutral wire or live wire of a power supply; and

a contact conductive assembly mounted in the housing and comprising a contact conductive portion, when the power distribution device is in a standby state where the adapter is not plugged into, the contact conductive portion is separated from the elongate conductor; when the power distribution device is in an operating state where the adapter is plugged into, the adapter abuts against the contact conductive portion to elastically deform the contact conductive portion to contact the corresponding elongate conductor, whereby the adapter is electrically connected to the elongate conductor via the contact conductive portion.

In an alternative, there is provided one of the elongate conductors for electrically connecting to the live wire, and the contact conductive assembly corresponding thereto; or

provided two of the elongate conductors and the contact conductive assemblies corresponding to the two elongate conductors, one elongate conductor of the two elongate conductors being for electrically connecting to the live wire, and the other elongate conductor of the two elongate conductors being for electrically connecting to the neutral wire.

In another alternative, the elongate conductor is a linearly extending conductor comprising a first leg portion, a second leg portion, and a connection portion, the first leg portion and the second leg portion being fixed together via the connection portion such that the elongate conductor is configured with a U-shape in cross-section.

In another alternative, an insulating support body mounted in the housing to hold and support the elongate conductor is included.

In another alternative, the support body comprises a support portion to which the elongate conductor is mounted in such a manner that the first leg portion and the second leg portion sandwich the support portion from both sides.

In another alternative, the housing comprises a stopper portion, the support body is formed as an insulating pad, and the elongate conductor is mounted in the housing in such a manner that the first leg portion and the second leg portion sandwich the stopper portion from both sides and the insulating pad is located between the elongate conductor and the stopper portion.

In another alternative, only one of the contact conductive assemblies is provided corresponding to one of the elongate conductors; or

a plurality of the contact conductive assemblies is provided corresponding to one of the elongate conductors, and the plurality of the contact conductive assemblies are arranged side by side at intervals in an extending direction of the elongate conductors.

In another alternative, the contact conductive assembly further comprises an insulating fixing portion, the fixing portion is mounted in the housing, and the contact conductive portion is connected to the fixing portion and capable of bending around a portion connected to the fixing portion to realize the elastic deformation.

In another alternative, the fixing portion is formed integrally with a support body for supporting the elongate conductor.

In another alternative, the contact conductive portion comprises a sheet-like base connected to the fixing portion and a plurality of contact portions provided to the sheet-like base and protruding or tilting toward the elongate conductor with respect to the sheet-like base.

In another alternative, the contact portion is formed as a spherical projection that protrudes toward the elongate conductor with respect to the sheet-like base; or

the contact portion is formed as an elastic piece that tilts toward the elongate conductor with respect to the sheet-like base.

In another alternative, the sheet-like base is parallel to the elongate conductor, and the plurality of contact portions are arranged side by side at intervals in an extending direction of the sheet-like base.

In another alternative, the sheet-like base is further formed with a plurality of through-holes.

In another alternative, the plurality of through-holes and the plurality of contact portions are alternately arranged in an extending direction of the sheet-like base.

In another alternative, an insulating sealing lip mounted to the housing is further included, in the standby state, the sealing lip at least partially closes the opening, in the operating state, the adapter pushes the sealing lip open into the housing.

In another alternative, the sealing lip is formed with a wave-shaped concavo-convex at least on its surface intended to come into contact with the adapter.

In another alternative, a ground wire conductor and a grounding assembly are further included, the ground wire conductor mounted in the housing, and the grounding assembly comprises a grounding conductor which is in contact with the ground wire conductor to make an electrical connection, and a threaded connector fixing the ground conductor and the housing together while making an electrical connection.

In another alternative, the housing is a metal housing having an insulating layer on the surface, through which the threaded connector is fixed and electrically connected to the metal housing.

In another alternative, an insulating stopper mounted in the housing and limiting at least the elongate conductor is further included, the grounding conductor passing through the insulating stopper.

In another alternative, the housing comprises a housing body and a back plate assembled together,

the opening is formed in the housing body and is open toward the front side, and the back plate is detachably mounted to the housing body and is located at a back side with respect to the opening, and the housing is mountable on the mounting surface via the back plate.

In another alternative, the housing body is provided with only one of the openings; or the housing body is provided with two of the openings arranged spaced apart from each other.

In another alternative, further comprising a wiring assembly provided in the housing body, the wiring assembly having wiring terminals for electrically connecting to a live wire, a neutral wire, and a ground wire of the power supply,

the wiring terminal for electrically connecting to the live wire is always electrically connected to one of the elongate conductors;

the wiring terminal for electrically connecting to the neutral wire is always electrically connected to another elongate conductor;

the wiring terminal for electrically connecting to the ground wire is always electrically connected to the housing.

In another alternative, the housing further comprises two end caps detachably mounted to both ends of the housing body so as to limit components in the housing.

The present application also provides a power distribution system comprising at least one adapter and a power distribution device according to any of the above technical solutions.

Advantageous Effects of Invention

By adopting the above-mentioned technical solution, the present application provides a novel power distribution device. In the novel power distribution device, a housing, an elongate conductor, and a contact conductive assembly are assembled together. The housing can be flexibly mounted on mounting surfaces of different positions and different shapes, the housing having an opening into which the adapter is plugged. Further, both the elongate conductor and the conductor assembly are mounted in the housing, the elongate conductor is adapted for electrically connecting to a live wire or neutral wire of the power supply, and the contact conductive assembly includes a contact conductive portion capable of elastic deformation. When the power distribution device is in a standby state where the adapter is not plugged into, the contact conductive portion is separated from the elongate conductor; when the power distribution device is in an operating state where the adapter is plugged into, the adapter is plugged into the opening to abut against the contact conductive portion, thereby elastically deforming the contact conductive portion to contact the corresponding elongate conductor, whereby the adapter is electrically connected to the elongate conductor via the contact conductive portion.

Thus, since the contact conductive portion near the opening is separated from the elongate conductor in the standby state and electrically connected to the elongate conductor only in the

operating state where the adapter is plugged into the opening, it is possible to ensure that the contact conductive portion is not charged in the standby state even if the elongate conductor is electrically connected to the live wire or the neutral wire of the power supply. Thus, it is possible to substantially reduce or even eliminate the safety risk of the power distribution device due to the conductor near the opening of the electrical channel always being electrically connected to the live wire or neutral wire, and to improve the safety performance of the electricity fetching. Further, the present application also provides a power distribution system including the above-described power distribution device, which has the same advantageous effects.

Brief Description of the Drawings

FIG. 1 is a schematic perspective view showing a power distribution device according to a first embodiment of the present application.

FIG. 2 is another schematic perspective view showing the power distribution device of FIG. 1.

FIG. 3 is a schematic cross-sectional view showing the power distribution device in FIG. 1, taken along the width direction and the thickness direction, in which section lines are omitted.

FIG. 4 is a schematic perspective view showing a partial configuration of the power distribution device in FIG. 1, in which partial structure of the housing or the like is omitted.

FIG. 5 is a schematic perspective view showing another partial configuration of the power distribution device in FIG. 1, in which partial structure of the housing or the like is omitted.

FIG. 6 is a schematic perspective view showing a housing body of the housing of the power distribution device in FIG. 1.

FIG. 7 is another schematic perspective view showing the housing body of FIG. 6.

FIG. 8 is a schematic perspective view showing a back plate of the housing of the power distribution device in FIG. 1.

FIG. 9 is a schematic perspective view showing an end cap of the housing of the power distribution device of FIG. 1.

FIG. 10 is a schematic perspective view showing a partial configuration of an elongate conductor of the power distribution device of FIG. 1.

FIG. 11 is a schematic side view showing the elongate conductor of FIG. 10.

FIG. 12 is a schematic perspective view showing a contact conductive assembly of the power distribution device of FIG. 1.

FIG. 13 is another schematic perspective view showing the contact conductive assembly of FIG. 12.

FIG. 14 is a schematic side view showing the contact conductive assembly of FIG. 12.

FIG. 15 is a schematic perspective view showing a support body of the power distribution device

in FIG. 1.

FIG. 16 is a schematic side view showing the support body of FIG. 15.

FIG. 17 is a schematic perspective view showing a sealing lip of the power distribution device of FIG. 1.

FIG. 18 is a schematic perspective view showing a ground wire assembly of the power distribution device of FIG. 1.

FIG. 19 is a schematic cross-sectional view showing a power distribution device according to a second embodiment of the present application, taken along the width direction and the thickness direction, in which section lines are omitted.

FIG. 20 is a schematic cross-sectional view showing a power distribution device according to a third embodiment of the present application, taken along the width direction and the thickness direction, in which section lines are omitted.

FIG. 21 is a schematic cross-sectional view showing a power distribution device according to a fourth embodiment of the present application, taken along the width direction and the thickness direction, in which section lines are omitted.

FIG. 22 is a schematic cross-sectional view showing a power distribution device according to a fifth embodiment of the present application, taken along the width direction and the thickness direction, in which section lines are omitted.

FIG. 23 is a schematic cross-sectional view showing a power distribution device according to a sixth embodiment of the present application, taken along the width direction and the thickness direction, in which section lines are omitted.

Description of Reference Numerals

1 housing; 11 housing body; 11h opening; 11p electrical channel; 11c1 first mounting groove; 11c2 second mounting groove; 11c3 clamping groove; 12 back plate; 121 clamping portion; 13 end cap;

2 elongate conductor; 21 first leg portion; 211 contacted portion; 22 second leg portion; 23 connection portion;

3 contact conductive assembly; 31 contact conductive portion; 311 sheet-like base; 311h through-hole; 312 contact portion; 32 fixing portion; 321 first body portion; 322 first protruding portion; 323 second protruding portion;

4 support body; 41 second body portion; 42 first support portion; 43 second support portion;

5 sealing lip; 51 root portion; 52 lip portion; 521 wave-shaped concavo-convex;

6 ground wire assembly; 61 ground wire conductor; 62 ground wire conductor holder;

7 grounding assembly; 71 grounding conductor; 71h connection hole;

8 insulating stopper; 81 stopper body portion; 82 stopper protruding portion

9 wiring assembly; 91 assembly housing; 92a first wiring terminal; 92b second wiring terminal; 92c third wiring terminal;

L length direction; W width direction; T thickness direction.

Detailed Description of the Invention (/Description of Embodiments)

Hereinafter, specific embodiments of the present application will be described in detail with reference to the accompanying drawings. It should be understood that these detailed descriptions are merely illustrative of how those skilled in the art may practice the present application and are not intended to be exhaustive or to limit the scope of the present application.

In particular embodiments of the present application, the power distribution device is configured to have a flat rectangular parallelepiped shape. Unless otherwise specified, "length direction", "width direction" and "thickness direction" refer to the length direction, width direction, and thickness direction, respectively, of the entire power distribution device (housing). The "front side" refers to the side facing the user after the power distribution device is mounted on the mounting surface (the upper side in FIG. 3), and the "back side" refers to the side facing away from the user after the power distribution device is mounted on the mounting surface (the lower side in FIG. 3).

In the present application, an "elongate conductor" is a guide having a strip-like structure with a dimension in its main direction of extension that is greater than the dimension in the other direction, e.g. in the following embodiments the elongate conductor extends in a length direction, the length of which is much greater than its width and thickness.

In this application, "mounting surface" includes, but is not limited to, planar surfaces such as wall surfaces, furniture surfaces (e.g. table tops, cabinet surfaces, and cabinet surfaces), and curved surfaces having a very large radius of curvature.

First Embodiment

Hereinafter, a power distribution device according to a first embodiment of the present application will be described with reference to the accompanying drawings.

(power distribution device according to the first embodiment of the present application)

As shown in FIGs. 1 to 5, the power distribution device according to the first embodiment of the present application comprises a housing 1, an elongate conductor 2, a contact conductive assembly 3, a support body 4, a sealing lip 5, a ground wire assembly 6, a grounding assembly 7, an insulating stopper 8, and a wiring assembly 9 assembled together, the other components being mounted to and supported and protected by the housing 1.

In the present embodiment, as shown in FIGs. 1 to 3, the entire housing 1 has a flat rectangular parallelepiped shape. Specifically, the housing 1 includes a housing body 11, a back plate 12, and

two end caps 13 assembled together.

The housing body 11 may be made of an alloy metal such as an aluminum alloy and the surface thereof is coated with an oxide insulating layer (using an anodizing process). As shown in FIGs. 6 and 7, the housing body 11 has a front panel formed as one body and a structure body for forming an electrical channel 11p. The front panel has a rectangular structure, and is positioned on the front side to face the user in a state where the power distribution device is mounted to the mounting surface. The front panel is formed with two openings 11h. Each opening 11h extends linearly along the length direction L and has a length equal to that of the housing body 11, and also communicates with a corresponding electrical channel 11p so that an adapter of the power distribution system can be plugged into the corresponding electrical channel 11p via the opening 11h. Further, two structure bodies are located on the back side of the front panel. Each of the structural bodies defines, together with the front panel, an electrical channel 11p extending linearly along the length direction L, and a plurality of stopper portions protruding toward the inside of the electrical channel 11p are formed in the wall portion of the structure body defining the electrical channel 11p for mounting, stoppering, and partitioning a space for mounting other components in the electrical channel 11p. Further, on the one hand, the two structure bodies are spaced apart from each other in the width direction W so as to define therebetween a first mounting groove 11c1 for receiving the mounting back plate 12. The first mounting groove 11c1 extends linearly along the length direction L, and the width of the first mounting groove 11c1 matches the width of the back plate 12. On the other hand, the length of the two structures is less than the length of the front panel, and the structure of the housing body 11 on one side in the width direction of the two structure bodies is formed with a second mounting groove 11c2 for receiving the wiring assembly 9. The length and width of the second mounting groove 11c2 match the length and width of the wiring assembly 9, respectively. Further, in order to mount the back plate 12 to the housing body 11, the wall portions of the two structural members facing each other are formed with clamping grooves 11c3, each of the clamping grooves 11c3 linearly extends in the length direction L. The clamping grooves 11c3 of the two structural members respectively cooperate with the clamping portions 121 formed at both ends of the back plate 12 in the width direction, so that the back plate 12 is mounted to the housing body 11.

As shown in FIG. 8, the back plate 12 is located in the first mounting groove 11c1 of the housing body 11. A plurality of bent portions is formed at both ends in the width direction of the back plate 12, and each bent portion has a clamping portion 121 protruding toward the clamping groove 11c3 of the structure body corresponding to the housing body 11. Further, in a state where the back plate 12 is plugged into the first mounting groove 11c1 along the length direction L, the clamping portion 121 can be plugged into the corresponding clamping groove 11c3 along the longitudinal

direction L (see FIG. 3), so that the back plate 12 is attached to the housing body 11. Further, the back plate 12 is also formed with a plurality of mounting holes, and the back plate 12 can be detachably fixedly mounted on the mounting surface by a connector plugged through the mounting holes, thereby mounting the housing 1 to the mounting surface. Since the length of the back plate 12 is smaller than the length of the mounting groove, the housing body 11 can move relative to the back plate 12 within a predetermined range along the length direction L in a state where the back plate 12 is fixedly mounted to the mounting surface, whereby the relative positions of the housing body 11 and the back plate 12 in the length direction L can be adjusted.

As shown in FIG. 9, the end cap 13 is formed with a threaded hole. For example, two end caps 13 can be fixedly attached to both ends in the length direction of the housing body 11 by means of threaded connectors (not shown) plugged into threaded holes, thereby closing the electrical channels 11p and the grooves of the housing body 11 while limiting and protecting the components of the housing 1.

In this embodiment, the elongate conductor 2 may for example be made of a conductive material such as metal. As shown in FIGs. 3 to 5, two elongate conductors 2 are mounted to and housed in the housing 1. An elongate conductor 2 (e.g. the elongate conductor 2 on the left in FIG. 3) is plugged into an electrical channel 11p of the housing body 11 for electrically connecting to the neutral wire of the power supply; another elongate conductor 2 (e.g. the elongate conductor 2 on the right in FIG. 3) is plugged into another electrical channel 11p of the housing body 11 for electrically connecting to the live wire of the power supply.

As shown in FIGs. 3 to 5, 10, and 11, each elongate conductor 2 extends linearly along the length direction L. The majority of each elongate conductor 2 is located in the electrical channel 11p formed by the housing body 11, while the remainder protrudes from the electrical channel 11p, the portion of the elongate conductor 2 located in the electrical channel 11p being of equal length to both the electrical channel 11p, and the remainder being always electrically connected to the corresponding wiring terminal 92a, 92b of the corresponding wiring assembly 9. Further, each elongate conductor 2 comprises a first leg portion 21, a second leg portion 22, and a connection portion 23 formed in one piece, the first leg portion 21 and the second leg portion 22 are fixed together via the connection portion 23 such that the elongate conductor 2 is configured with a U-shape in cross-section. The first leg portion 21 and the second leg portion 22 of the elongate conductor 2 sandwich the first support portion 42 of the support body 4 from both sides in the width direction, so that the elongate conductor 2 is stably mounted to the support body 4. The first leg portion 21 is opposed to the contact conductive portion 31 of the contact conductive assembly 3 in the width direction W. The first leg portion 21 has a curved shape extending from the connection portion 23, and the first leg portion 21 has a contacted portion 211 for contacting the

contact conductive portion 31, the position and shape of the contacted portion 211 being configured to match the position and shape of the contact portion 312 of the first leg portion 21, respectively. With the first leg portion 21 in contact with the contact conductive portion 31, the elongate conductor 2 is electrically connected to the contact conductive portion 31. The second leg portion 22 has a curved shape during extension from the connection portion 23 to clamp the first support portion 42 in cooperation with the curved shape of the first leg portion 21. Furthermore, in order to avoid overheating of the elongate conductor 2 during operation, the elongate conductor 2 is formed with a large number of through-holes in the first leg portion 21 and the second leg portion 22, which through-holes are spaced apart in the length direction L.

In this embodiment, as shown in FIGs. 3 to 5 and FIGs. 12 to 14, a contact conductive assembly (which may also be referred to as a conductive bridge assembly) 3 is mounted and fixed to a housing body 11 and plugged into an electrical channel 11p formed in the housing body 11. Specifically, the contact conductive assembly 3 includes a contact conductive portion 31 and a fixing portion 32 fixed together, the fixing portion 32 being fixedly mounted in the housing 1, the contact conductive portion 31 being connected to the fixing portion 32 and capable of bending around a portion connected to the fixing portion 32 so as to elastically rotate within a predetermined range to realize elastic deformation. When the power distribution device is in a standby state where the adapter is not plugged into, the contact conductive portion 31 is separated from the elongate conductor 2; when the power distribution device is in an operating state where the adapter is plugged into, the adapter is plugged into the electrical channel 11p via the opening 11h, further to abut against the contact conductive portion 31, so that the contact conductive portion 31 elastically deforms to contact the corresponding elongate conductor 2, whereby the adapter makes electrical connection to the elongate conductor 2 via the contact conductive portion 31. Further, after the power distribution device is switched from the operating state to the standby state, the contact conductive portion 31 returns to the posture in the standby state, that is, to separate from the elongate conductor 2, by the elastic force. Thus, in the standby state, since the contact conductive portion 31 near the opening 11h formed in the housing body 11 is separated from the elongate conductor 2, the safety risk of the power distribution device due to the conductor near the opening 11h of the electrical channel 11p being always electrically connected to the live wire or the neutral wire is greatly reduced or even eliminated, improving the safety performance.

The contact conductive portion 31 is made of a conductive material such as metal. As shown in FIGs. 12 to 14, the contact conductive portion 31 includes a sheet-like base 311 and a plurality of contact portions 312 formed as one body. The sheet-like base 311 has an elongated flat plate shape and linearly extends along the length direction L. One end portion of the sheet-like base 311 in the

width direction is fixedly connected to the first body portion 321 of the fixing portion 32, and the included angle between the sheet-like base 311 and the first body portion 321 in the above-mentioned standby state is formed to be a large obtuse angle so that the sheet-like base 311 is completely separated from the first leg portion 21 of the elongate conductor 2 with a large interval. A plurality of contact portions 312 are provided on a surface of the sheet-like base 311 facing the first leg portion 21 and protrude with respect to the surface, the contact portions 312 being arranged spaced apart in the length direction L with respect to the sheet-like base 311 toward the first leg portion 21. Each contact portion 312 is formed in a spherical shape, and the contour shape of the contact portion 312 matches the contour shape of the contacted portion 211 of the first leg portion 21 in a cross-section taken along the width direction W and the thickness direction T, whereby the contact portion 312 will partially enter the recessed portion formed by the contacted portion 211 of the first leg portion 21 after the contact conductive portion 31 is elastically deformed, whereby the contact portion 312 makes stable and sufficient contact with the contacted portion 211 so that the contact conductive portion 31 makes electrical connection to the elongate conductor 2. In addition, in order to avoid overheating of the contact conductive portion 31 during operation, the sheet-like base 311 is further formed with a plurality of through-holes 311h which are staggered from the plurality of contact portions 312 and are alternately arranged in the length direction L.

The fixing portion 32 is made of an insulating material. As shown in FIGs. 12 to 14, the fixing portion 32 is fixed with respect to the housing 1. Specifically, the fixing portion 32 includes a first body portion 321 formed as one body, a first protruding portion 322, and a second protruding portion 323 protruding from the first body portion 321. After the contact conductive assembly 3 is plugged into the electrical channel 11p, the shape of the first body portion 321 is configured to fit with the corresponding portion of the electrical channel 11p. A recess is formed between the first protruding portion 322 and the second protruding portion 323, and the recess is installed in correspondence with a stopper portion of the structure body of the housing body 11. Further, the second protruding portion 323 and the second support portion 43 of the support body 4 abut against each other in the thickness direction T, so that the fixing portion 32 and the support body 4 cooperate with each other to limit.

Further, in the present embodiment, a plurality of contact conductive assemblies 3 are provided corresponding to one of the elongate conductors 2, and the plurality of contact conductive assemblies 3 are arranged side by side at intervals in the length direction L. Thus, in the case where the contact conductive portion 31 of one of the contact conductive assemblies 3 is pushed into contact with the elongate conductor 2 by the corresponding adapter to make an electrical connection, the posture of the other contact conductive assembly 3 remains unchanged in the

standby state, thereby further improving the safety of the power distribution device. Furthermore, even if one of the contact conductive assemblies 3 fails, the contact conductive assembly 3 can be individually replaced or repaired without affecting the other contact conductive assemblies 3, thereby reducing the complexity and corresponding cost of the associated work process.

In this embodiment, the support body 4 is made of an insulating material. As shown in FIGs. 3 to 5, the support body 4 is fixedly attached to the housing body 11. The support body 4 is fixed relative to the housing 1. The elongate conductor 2 is arranged on the support body 4 such that the elongate conductor 2 is held and supported by the support 4 such that the elongate conductor 2 is fixed relative to the housing 1. As shown in FIGs. 15 and 16, the support body 4 includes a second main body portion 41, a first support portion 42, and a second support portion 43 formed as one body. The second body portion 41 is formed with a recess portion that is fitted in correspondence with another stopper portion of the structure body of the housing body 11. The first support portion 42 and the second support portion 43 protrude inward from the second body portion 41 toward the electrical channel 11p. As described above, the elongate conductor 2 is attached to the first support portion 42 such that the first leg portion 21 and the second leg portion 22 sandwich the first support portion 42 from both sides in the width direction. The second support portion 43 correspondingly abuts against the second protruding portion 323 contacting the fixing portion 32 of the contact conductive assembly 3, and the side portion of the second support portion 43 is formed with a snap-fit structure for cooperating with the stopper portion of the housing body 11.

In this embodiment, the sealing lip 5 is made of an elastic material having insulating properties (for example it may be a strip of glue). As shown in FIGs. 3 to 5 and 17, the sealing lip 5 is fixedly mounted to the housing 1. Specifically, the sealing lip 5 includes a root portion 51 and a lip portion 52 formed as one body. The root portion 51 is formed in a bent structure, and the root portion 51 is form-fitted to the installation space defined by the further stopper portion of the structure body of the housing body 11 so that the root portion 51 is defined in the installation space defined by the front panel, the wall portion of the structure body, and the further stopper. In the standby state, the lip portion 52 extends in the width direction W to a position where the opening 11h is located, so that the sealing lip 5 functions as a non-contact seal lip to partially close the opening 11h of the electrical channel 11p. In the operating state, the adapter is plugged into the push sealing lip 5 via the opening 11h to enter the housing 1. Further, the lip portion 52 of the sealing lip 5 is formed with a wave-shaped concavo-convex 521 that forms a relief structure on the surface of the lip portion 52 for contact with the adapter. In the case where the adapter is plugged into the electrical channel 11p through the opening 11h of the electrical channel 11p, the contact of the adapter with the wave-shaped concavo-convex 521 of the lip portion 52 can reduce the frictional force therebetween, not only facilitating the plugging and removal of the adapter but

also reducing the abrasion of the sealing lip 5 by the plugging and removal of the adapter.

In the present embodiment, as shown in FIGs. 3 to 5 and FIG. 18, two ground wire assemblies 6 corresponding to the two elongate conductors 2, respectively, are provided, and the respective ground wire assemblies 6 and the corresponding elongate conductors 2 are located in the same electrical channel 11p and separated from each other by a sufficient safety distance. Specifically, each ground wire assembly 6 includes a ground wire conductor 61 and a ground wire conductor holder 62. The ground wire conductor 61 may be made of a conductive material such as metal, and the ground wire conductor 61 linearly extends along the length direction L. A large portion of the ground wire conductor 61 is plugged into the electrical channel 11p, and the remaining portion protrudes from the electrical channel 11p, so that one end portion in the length direction of the ground wire conductor 61 is electrically connected to the third wiring terminal 92c of the wiring assembly 9. In a cross-section taken along the width direction W and the thickness direction T, the ground wire conductor 61 matches the shape and structure of the ground wire conductor holder 62, so the ground wire conductor 61 is mounted in the housing body 11 via the ground wire conductor holder 62. The ground wire conductor holder 62 may be made of an insulating material, the ground wire conductor holder 62 is plugged and mounted in a mounting space defined by the above-mentioned further stopper portion and a wall portion of the structure body, and the ground wire assembly 6 composed of both the ground wire conductor holder 62 and the ground wire conductor 61 integrally matches the above-mentioned mounting space shape and structure, so that the ground wire assembly 6 is mounted in the housing body 11.

In the present embodiment, as shown in FIG. 4, a grounding assembly 7 corresponding to each of the two ground wire assemblies 6 is provided, and the ground wire conductor 61 of the ground wire assembly 6 is electrically connected to the housing body 11 via the grounding assembly 7. Specifically, each grounding assembly 7 includes a grounding conductor 71 and a threaded connector (not shown). The grounding conductor 71 is in contact with the other end portion in the length direction of the ground wire conductor 61 to make an electrical connection. The grounding conductor 71 is also formed with a connection hole 71h that fits into the clamping groove 11c3 of the housing body 11. The ground wire conductor 61 is electrically connected to the housing body 11 via the grounding conductor 71 and the threaded connector through the clamping groove 11c3 and the connection hole 71h while the grounding conductor 71 and the housing 1 are fixed together, that is, the threaded connector electrically connects the insulating layer, which breaks the housing body 11, to the metal part. In addition, the threaded connection of the grounding assembly 7 also simultaneously serves as a threaded connector for fixing the end cap 13 to the housing body 11, thereby simplifying the structure of the power distribution device. Further, the insulating stopper 8 is made of an insulating material, as shown in FIG. 4, the insulating stopper 8 is

mounted in the housing 1 and limits the elongate conductor 2 and the support in the length direction L. Specifically, the insulating stopper 8 includes a stopper body portion 81 and a stopper protruding portion 82 formed as one body. The stopper body portion 81 has a rectangular parallelepiped shape, and the grounding conductor 71 passes through the stopper body portion 81 so that the stopper body portion 81 is fixed together with the ground wire assembly 6. The stopper protruding portion 82 protrudes from the stopper body portion 81 and is located at one side of the elongate conductor 2 and the supporting member plays a main role in the stopper of the elongate conductor 2 and the support body 4.

In the present embodiment, as shown in FIG. 5, a wiring assembly 9 is provided in a housing 1, the wiring assembly 9 having an assembly housing 91 and three wiring terminals (a first wiring terminal 92a, a second wiring terminal 92b, and a third wiring terminal 92c) provided in the assembly housing 91 for electrically connecting to a live wire, a neutral wire, and a ground wire of a power supply. The first wiring terminal 92a is intended to be electrically connected to the live wire of the power supply at the same time as it is always electrically connected to one of the elongate conductors 2 via a connecting conductor. The second wiring terminal 92b is intended to be electrically connected to the neutral wire of the power supply at the same time as it is always electrically connected to the other elongate conductor 2 via the connecting conductor. The third wiring terminal 92c is used to be electrically connected to the ground wire of the power supply while being always electrically connected to the ground wire conductors 61 of the two ground wire assemblies 6 through the connection conductors.

In this manner, the entire power distribution device is detachably mounted on a mounting surface, such as a wall surface, through the back plate 12. Then, the relative positions of the housing body 11 and the back plate 12 are appropriately adjusted so as to mount the live wire, the neutral wire, and the ground wire of the power supply to the corresponding wiring terminals 92a, 92b, 92c, respectively, so that the power distribution device is in a standby state. When the power distribution device is in a standby state where the adapter is not plugged into, the contact conductive portion 31 is separated from the elongate conductor 2; when in the operating state where the adapter is plugged into, the adapter abuts against the contact conductive portion 31 to elastically deform the contact conductive portion 31 to contact the corresponding elongate conductor 2, whereby the adapter is electrically connected to the elongate conductor 2 via the contact conductive portion 31. Thus, since the contact conductive portion 31 near the opening 11h is separated from the elongate conductor 2 in the standby state and electrically connected to the elongate conductor 2 only in the operating state where the adapter is plugged into the opening 11h, it is possible to ensure that the contact conductive portion 31 is not charged in the standby state even if the elongate conductor 2 is electrically connected to the live wire. As a result, it is possible

to greatly reduce or even eliminate the safety risk of the power distribution device since the conductor near the opening 11h of the electrical channel 11p is always electrically connected to the live wire or neutral wire.

Second Embodiment

Hereinafter, a power distribution device according to a second embodiment of the present application will be described with reference to the accompanying drawings.

(power distribution device according to the second embodiment of the present application)

The structure of the power distribution device according to the second embodiment of the present application is substantially the same as the structure of the power distribution device according to the first embodiment of the present application, and the differences between the two are mainly described below.

In the present embodiment, as shown in FIG. 19, each elongate conductor 2 includes a first leg portion 21, a second leg portion 22, and a connection portion 23 formed as one body, the first leg portion 21 and the second leg portion 22 being fixed together via the connection portion 23 such that the elongate conductor 2 is configured to have a U-shape in cross-section. The first leg portion 21 and the second leg portion 22 of the elongate conductor 2 sandwich the first support portion 42 of the support body 4 from both sides in the width direction, so that the elongate conductor 2 is stably mounted to the support body 4. Both the first leg portion 21 and the second leg portion 22 have a curved shape in extending from the connection portion 23, and they approach each other after moving away from each other in the width direction W, so that the free end portions of both the first leg portion 21 and the second leg portion 22, which are away from the connection portion 23, can more stably clamp the first support portion 42. The first leg portion 21 is opposed to the contact conductive portion 31 of the contact conductive assembly 3 in the width direction W. With the first leg portion 21 in contact with the contact conductive portion 31, the elongate conductor 2 is electrically connected to the contact conductive portion 31. Further, in the contact conductive portion 31, the contact portion 312 is formed as an elastic piece that is tilted toward the elongate conductor 2 with respect to the sheet-like base 311, and the elastic piece may be formed by punching, for example.

Third Embodiment

Hereinafter, a power distribution device according to a third embodiment of the present application will be described with reference to the accompanying drawings.

(power distribution device according to the third embodiment of the present application)

The structure of the power distribution device according to the third embodiment of the present application is substantially the same as the structure of the power distribution device according to the second embodiment of the present application, and the differences between the two are mainly

described below.

In the present embodiment, as shown in FIG. 20, each elongate conductor 2 includes a first leg portion 21, a second leg portion 22, and a connection portion 23 formed as one body, the first leg portion 21 and the second leg portion 22 being fixed together via the connection portion 23 such that the elongate conductor 2 is configured to have a U-shape in cross-section. The first leg portion 21 and the second leg portion 22 of the elongate conductor 2 sandwich the support portion of the support body 4 from both sides in the thickness direction, so that the elongate conductor 2 is stably mounted to the support body 4. Both the first leg portion 21 and the second leg portion 22 extend linearly in the width direction W from the connection portion 23 and then bend toward each other so that the free end portions of both the first leg portion 21 and the second leg portion 22 remote from the connection portion 23 can be snap-fitted to the support body 4. The connection portion 23 is opposed to the contact conductive portion 31 of the contact conductive assembly 3 in the width direction W. With the connection portion 23 in contact with the contact conductive portion 31, the elongate conductor 2 is electrically connected to the contact conductive portion 31. In addition, the fixing portion 32 of the contact conductive assembly 3 is integrally formed with both of the support body 4 for supporting the elongate conductor 2, and the shape of both bodies matches the shape of the installation space corresponding to the electrical channel 1p, whereby the manufacturing and installation processes can be further simplified.

Fourth Embodiment

Hereinafter, a power distribution device according to a fourth embodiment of the present application will be described with reference to the accompanying drawings.

(power distribution device according to the fourth embodiment of the present application)

The structure of the power distribution device according to the fourth embodiment of the present application is substantially the same as the structure of the power distribution device according to the second embodiment of the present application, and the differences between the two are mainly described below.

In the present embodiment, as shown in FIG. 21, each elongate conductor 2 is integrally formed in a cylindrical shape having a notch. The first leg portion 21 and the second leg portion 22 of the elongate conductor 2 sandwich the support portion of the support body 4 from both sides in the width direction, so that the elongate conductor 2 is stably mounted to the support body 4. The first leg portion 21 is opposed to the contact conductive portion 31 of the contact conductive assembly 3 in the width direction W. With the first leg portion 21 in contact with the contact conductive portion 31, the elongate conductor 2 is electrically connected to the contact conductive portion 31. Further, in the contact conductive portion 31, the contact portion 312 is formed as an elastic piece that is tilted toward the elongate conductor 2 with respect to the sheet-like base 311, and the

elastic piece may be formed by punching, for example. Further, the support body 4 is formed as an insulating pad, and the elongate conductor 2 is mounted on one of the stopper portions of the structure body of the housing body 11 in such a manner that the first leg portion 21 and the second leg portion 22 clamp the stopper portion from both sides and the insulating pad matches the shape of the elongate conductor 2 and is located between the elongate conductor 2 and the limiting portion. It will be appreciated that the insulating pad is not necessary and may be omitted in the alternative.

Fifth Embodiment

Hereinafter, a power distribution device according to a fifth embodiment of the present application will be described with reference to the accompanying drawings.

(power distribution device according to the fifth embodiment of the present application)

The structure of the power distribution device according to the fifth embodiment of the present application is substantially the same as the structure of the power distribution device according to the fourth embodiment of the present application, and the differences between the two are mainly described below.

In the present embodiment, as shown in FIG. 22, each elongate conductor 2 includes a first leg portion 21, a second leg portion 22, and a connection portion 23 formed as one body, the first leg portion 21 and the second leg portion 22 being fixed together via the connection portion 23 such that the elongate conductor 2 is configured to have a U-shape in cross-section. The first leg portion 21 and the second leg portion 22 of the elongate conductor 2 sandwich the support portion of the support body 4 from both sides in the width direction, so that the elongate conductor 2 is stably mounted to the support body 4. Both the first leg portion 21 and the second leg portion 22 extend parallel to each other in the thickness direction T from the connection portion 23. The first leg portion 21 is opposed to the contact conductive portion 31 of the contact conductive assembly 3 in the width direction W. With the first leg portion 21 in contact with the contact conductive portion 31, the elongate conductor 2 is electrically connected to the contact conductive portion 31. Further, the support body 4 is formed as an insulating pad having a U-shape in cross-section, and the elongate conductor 2 is mounted to a stopper portion of the structure body of the housing body 11 in such a manner that the first leg portion 21 and the second leg portion 22 sandwich the housing body 11 from both sides in the thickness direction, the insulating pad being located between the elongate conductor 2 and the stopper portion. It will be appreciated that the insulating pad is not necessary and may be omitted in the alternative.

Sixth Embodiment

Hereinafter, a power distribution device according to a sixth embodiment of the present application will be described with reference to the accompanying drawings.

(power distribution device according to the sixth embodiment of the present application)

The structure of the power distribution device according to the sixth embodiment of the present application is substantially the same as the structure of the power distribution device according to the fifth embodiment of the present application, and the differences between the two are mainly described below.

In the present embodiment, as shown in FIG. 23, each elongate conductor 2 includes a first leg portion 21, a second leg portion 22, and a connection portion 23 formed as one body, the first leg portion 21 and the second leg portion 22 being fixed together via the connection portion 23 such that the elongate conductor 2 is configured to have a U-shape in cross-section. The first leg portion 21 and the second leg portion 22 of the elongate conductor 2 sandwich the support portion of the support body 4 from both sides in the width direction, so that the elongate conductor 2 is stably mounted to the support body 4. Both the first leg portion 21 and the second leg portion 22 approach in the process of extending in the thickness direction T from the connection portion 23. The first leg portion 21 is opposed to the contact conductive portion 31 of the contact conductive assembly 3 in the width direction W. With the first leg portion 21 in contact with the contact conductive portion 31, the elongate conductor 2 is electrically connected to the contact conductive portion 31. Further, the support body 4 is formed as an insulating pad having a U-shape in cross-section, and the elongate conductor 2 is mounted to a stopper portion of the structure body of the housing body 11 in such a manner that the first leg portion 21 and the second leg portion 22 sandwich the housing body 11 from both sides in the thickness direction, the insulating pad being located between the elongate conductor 2 and the stopper portion. It will be appreciated that the insulating pad is not necessary and may be omitted in the alternative.

Additional Note

Although the specific technical solution of the present application has been described in detail above, the present application is not limited to the above technical solution, and the supplementary description is provided below.

i. The present application also provides a power distribution system comprising a power distribution device according to the present application and at least one adapter, which is capable of achieving the same advantageous effects. When the power distribution system according to the present application is used, the adapter (contact terminal or electrical connection portion) is plugged into the opening 11h of the power distribution device so that the power distribution device can supply power to the adapter. In contrast to the prior art in which the adapter needs to be twisted at a certain angle (for example, 90 degrees) to be plugged into the electrical channel so as to be able to obtain power, with the dual-slot power distribution device of the present application, the adapter can obtain power without rotating after being directly plugged into the electrical

channel 11p via the opening 11h. That is to say after the adapter is plugged into the electrical channel 11p, the adapter abuts against the contact conductive portion 31 of the contact conductive assembly 3, so that the contact conductive portion 31 is in contact with the elongate conductor 2 so that the adapter and the elongate conductor 2 make an electrical connection via the contact conductive portion 31 and then take power successfully; after the adapter is removed from the electrical channel 11p, the contact conductive portion 31 will automatically return to a state of separation from the elongate conductor 2 so that the contact conductive portion 31 is uncharged. With such a solution, on the one hand, it is possible to make an electrical connection solution without requiring an adapter rotation angle, facilitating the handling of the adapter and simplifying the use method; on the other hand, making the contact conductive assembly 3 act as an intermediate transition bridge between the adapter and the intermediate conductor 2, effectively improving the safety performance of electricity fetching while improving the stability performance of electricity fetching. In addition, the provision of a plurality of spaced-apart contact conductive assemblies 3 for one elongate conductor 2 further improves the safety of power extraction.

ii. In the above embodiments it has been described that the live wires and neutral wires of the power supply are each electrically connected to one elongate conductor 2, that is to say, two elongate conductors 2 are provided together with a corresponding contact conductive assembly 3, but the present application is not limited thereto. For example, in an alternative variation of the above embodiment, only one elongate conductor 2 which may be electrically connected to the live wire of the power supply, and a corresponding contact conductive assembly 3 may be provided. It should be understood that this modification, does not mean that the power distribution device of the present application is not provided with a structure to be electrically connected to the neutral wire of the power supply, but means that the electrical connection to the neutral wire of the power supply can be made using assemblies having other structures.

iii. In the above embodiments, a plurality of contact conductive assemblies 3 spaced apart in the length direction L are provided for one elongate conductor 2, but the present application is not limited thereto. For example, only one contact conductive assembly 3 may be provided for one elongate conductor 2, and the length of the contact conductive assembly 3 may be approximately the same as or slightly shorter than the length of the elongate conductor 2.

iv. In the above embodiments it has been described that two electrical channels 11p and two openings 11h are provided for two elongate conductors 2, realizing a so-called double-slotted power distribution device, but the present application is not limited thereto. For example, it is possible to arrange both of the elongate conductors 2 and the other members electrically connected to the live wire and the neutral wire of the power supply, respectively, in one electrical channel

11p, and to arrange only one opening 11h in the housing body 11 to correspond to the electrical channel 11p, to realize a so-called single slot type power distribution device.

v. In an alternative variation of the above embodiment, the third wiring terminal 92c, the ground wire assembly 6 and the grounding assembly 7, etc. for electrically connecting to the ground of the power supply may be omitted, and instead part of the insulating layer of the housing 1 may be removed by laser or grinding, etc. so that the housing 1 is directly electrically connected to the ground of the power supply. As a result, it is possible to further simplify the structure and save costs of the power distribution device of the present application to reduce the size of the power distribution device.

vi. It is to be understood that in the above specific embodiments, the following structural layouts exist: (a) two electrical channels 11p are arranged side by side in the width direction W, and one elongate conductor 2 electrically connected to the live wire of the power supply and the other elongate conductor 2 electrically connected to the neutral wire of the power supply are respectively located in different electrical channels 11p; (b) two ground wire assemblies 6 are respectively located in the two electrical channels 11p, one ground wire assembly 6 is also arranged side by side with the above-mentioned one elongate conductor 2 in the width direction, and the other ground wire assembly 6 is arranged side by side with the above-mentioned other elongate conductor 2 in the width direction; (c) the structures such as the ground wire assembly 6, the contact conductive portion 31 of the contact conductive assembly 3, the elongate conductor 2, and the back plate 12 of the housing 1 are arranged side by side in the width direction W in a structural layout, thereby enabling the entire power distribution device interior components to be arranged in a more compact layout, particularly reducing the thickness of the entire power distribution device and making the thickness of the entire power distribution device thinner.

Claims

1. A power distribution device, for supplying power to at least one adapter, characterized by comprising:
 - a housing (1) detachably mounted on a mounting surface and having an opening (11h) for plugging the adapter;
 - an elongate conductor (2) mounted in the housing (1) and for electrically connecting to a neutral wire or live wire of a power supply; and
 - a contact conductive assembly (3) mounted in the housing (1) and comprising a contact conductive portion (31), when the power distribution device is in a standby state where the adapter is not plugged into, the contact conductive portion (31) is separated from the elongate conductor (2); when the power distribution device is in an operating state where the adapter is plugged into, the adapter abuts against the contact conductive portion (31) to elastically deform the contact conductive portion (31) to contact the corresponding elongate conductor (2), whereby the adapter is electrically connected to the elongate conductor (2) via the contact conductive portion (31).
2. The power distribution device of claim 1, characterized by
 - providing one of the elongate conductors (2) and the contact conductive assembly (3) corresponding to the elongate conductor (2), the elongate conductor (2) for electrically connecting to the live wire; or
 - providing two of the elongate conductors (2) and the contact conductive assemblies (3) corresponding to the two elongate conductors (2), one elongate conductor of the two elongate conductors (2) for electrically connecting to the live wire, and the other elongate conductor of the two elongate conductors (2) for electrically connecting to the neutral wire.
3. The power distribution device of claim 2, characterized in that the elongate conductor (2) is a linearly extending conductor, comprises a first leg portion (21), a second leg portion (22) and a connection portion (23), the first leg portion (21) and the second leg portion (22) being fixed together via the connection portion (23) such that the elongate conductor (2) is configured with a U-shape in cross-section.
4. The power distribution device of claim 3, characterized by further comprising an insulating support body (4) mounted in the housing (1) to hold and support the elongate conductor (2).
5. The power distribution device of claim 4, characterized in that the support body (4) comprises a support portion (42) to which the elongate conductor (2) is mounted in such a manner that the first leg portion (21) and the second leg portion (22) sandwich the support portion (42) from both sides.
6. The power distribution device of claim 4, characterized in that the housing (1) comprises a

stopper portion, the support body (4) is formed as an insulating pad, the elongate conductor (2) is mounted in the housing (1) in such a manner that the first leg portion (21) and the second leg portion (22) sandwich the stopper portion from both sides and the insulating pad is located between the elongate conductor (2) and the stopper portion.

7. The power distribution device of any one of claims 1 to 6, characterized by providing only one of the contact conductive assemblies (3) corresponding to one of the elongate conductors (2); or

providing a plurality of the contact conductive assemblies (3) corresponding to one of the elongate conductors (2), and the plurality of the contact conductive assemblies (3) are arranged side by side at intervals in an extending direction of the elongate conductors (2).

8. The power distribution device of claim 7, characterized in that the contact conductive assembly (3) further comprises an insulating fixing portion (32), the fixing portion (32) is mounted in the housing (1), and the contact conductive portion (31) is connected to the fixing portion (32) and capable of bending around a portion connected to the fixing portion (32) to realize the elastic deformation.

9. The power distribution device of claim 8, characterized in that the fixing portion (32) is formed integrally with a support body (4) for supporting the elongate conductor (2).

10. The power distribution device of claim 8, characterized in that the contact conductive portion (31) comprises a sheet-like base (311) connected to the fixing portion (32) and a plurality of contact portions (312) provided to the sheet-like base (311) and protruding or tilting toward the elongate conductor (2) with respect to the sheet-like base (311).

11. The power distribution device of claim 10, characterized in that the contact portion (312) is formed as a spherical projection that protrudes toward the elongate conductor (2) with respect to the sheet-like base (311); or the contact portion (312) is formed as an elastic piece that tilts toward the elongate conductor (2) with respect to the sheet-like base (311).

12. The power distribution device of claim 10, characterized in that the sheet-like base (311) is parallel to the elongate conductor (2), and the plurality of contact portions (312) are arranged side by side at intervals in an extending direction of the sheet-like base (311).

13. The power distribution device of claim 12, characterized in that the sheet-like base (311) is further formed with a plurality of through-holes (311h).

14. The power distribution device of claim 13, characterized in that the plurality of through-holes (311h) and the plurality of contact portions (312) are alternately arranged in an extending direction of the sheet-like base (311).

15. The power distribution device of any one of claims 1 to 6, characterized by further comprising

an insulating sealing lip (5) mounted to the housing (1),
in the standby state, the sealing lip (5) at least partially closing the opening (11h),
in the operating state, the adapter pushing the sealing lip (5) open into the housing (1).

16. The power distribution device of claim 15, characterized in that the sealing lip (5) is formed with a wave-shaped concavo-convex (521) at least on the surface thereof intended to come into contact with the adapter.

17. The power distribution device of any one of claims 1 to 6, characterized by further comprising a ground wire conductor (61) and a grounding assembly (7),
the ground wire conductor (61) mounted in the housing (1), and
the grounding assembly (7) comprising a grounding conductor (71) in contact with the ground wire conductor (61) to make an electrical connection, and a threaded connector fixing the ground conductor (71) and the housing (1) together while making an electrical connection.

18. The power distribution device of claim 17, characterized in that the housing (1) is a metal housing having an insulating layer on the surface, through which the threaded connector is fixed and electrically connected to the metal housing.

19. The power distribution device of claim 18, characterized by further comprising an insulating stopper (8) mounted in the housing (1) and limiting at least the elongate conductor (2), the grounding conductor (71) passing through the insulating stopper (8).

20. The power distribution device of any one of claims 1 to 6, characterized by the housing (1) comprises a housing body (11) and a back plate (12) assembled together, the opening (11h) is formed in the housing body (11) and is open toward a front side, the back plate (12) is detachably mounted to the housing body (11) and is located at a back side with respect to the opening (11h), and the housing (1) is mountable on the mounting surface via the back plate (12).

21. The power distribution device of claim 20, characterized in that
the housing body (11) is provided with only one of the openings (11h); or
the housing body (11) is provided with two of the openings (11h) arranged spaced apart from each other.

22. The power distribution device of claim 20, characterized by further comprising a wiring assembly (9) provided in the housing body (11), the wiring assembly (9) having wiring terminals (92a, 92b, 92c) for electrically connecting to a live wire, a neutral wire, and a ground wire of the power supply,
the wiring terminal (92a) for electrically connecting to the live wire is always electrically connected to one of the elongate conductors (2);
the wiring terminal (92b) for electrically connecting to the neutral wire is always electrically connected to another the elongate conductors (2);

the wiring terminal (92c) for electrically connecting to the ground wire is always electrically connected to the housing (1).

23. The power distribution device of claim 22, characterized in that the housing (1) further comprises two end caps (13) detachably mounted to both ends of the housing body (11) so as to limit components in the housing (1).

24. A power distribution system, characterized by comprising at least one adapter and the power distribution devices of any one of claims 1 to 23.