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Detachable Plug



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Background of the Invention

1. Field of the Invention

5 The present invention relates to a detachable plug that can be detached to allow replacement of blades and/or wires in the plug.

2. Description of the Related Art

10 Fig. 12 of the drawings illustrates a conventional plug 1 including a mounting plate 11 and a cover 12 attached to a rear side of the mounting plate 11. In manufacture, blades 13 are placed in a mold and an injection molding is then performed to form the mounting plate 11. Next, wires of cables 14 are respectively attached by a terminal-coupling machine to rear ends of the blades 13. The cover 12 is resilient to allow the mounting plate 11 to be forcibly inserted into a compartment in the cover 12. However, detachment of the mounting plate 11 from the cover 11 is impossible. The whole plug is useless
15 when the cables 14 are wrongly connected to the blades 13. Further, it is not uncommon that the wires of the cables 14 are burnt by the heat generated during use or oxidized after a period of time. Replacement of the blades and the wires is impossible for the plug of this type.

Summary of the Invention

20 An object of the present invention is to provide a detachable plug that can be detached to allow replacement of blades and/or wires in the plug.

25 A detachable plug comprises a mounting plate and a cover mounted to a rear side of the mounting plate, the cover including a compartment for accommodating the mounting plate. A plurality of blades each have an end securely attached to the mounting plate, and a plurality of cables each contain wires therein for electrical connection with the end of an associated blade. The

mounting plate includes an upright wall extending therefrom. A plurality of ribs are formed on an inner periphery defining the compartment of the cover. The upright wall of the mounting plate presses against the inner periphery defining the compartment of the cover. Each rib has an outer end. A distance
5 between the outer end of each rib and an end face of the cover is equal to a width of the upright wall of the mounting plate. The ribs prevent excessive movement of the mounting plate into the compartment. A screw is extended through the mounting plate into the cover, thereby securing the mounting plate and the cover together.

10 A plurality of connecting blocks are provided for respectively connecting the wires of the cables to the ends of the blades. Each connecting block includes a through-hole having a first end and a second end. Each connecting block further includes a radial screw hole. The wires of each cable are mounted in the first end of the through-hole. A screw is extended through the
15 radial screw hole to adjustably press against the wires.

Other objects, advantages, and novel features of the invention will become more apparent from the following detailed description when taken in conjunction with the accompanying drawings.

Brief Description of the Drawings

20 Fig. 1 is a perspective view of a first embodiment of a plug in accordance with the present invention.

Fig. 2 is an exploded perspective view of the plug in Fig. 1.

Fig. 3 is an exploded perspective view of the plug as viewed from another direction.

25 Fig. 4 is a perspective view of a mounting plate of the plug in Fig. 3.

Fig. 5 is a sectional view of the plug in Fig. 1.

Fig. 6 is a schematic side view, partly sectioned, illustrating assembly of a blade, a connecting block, and wires of the plug in Fig. 3.

Fig. 7 is a view similar to Fig. 6, illustrating a modified embodiment of the connecting block.

5 Fig. 8 is a perspective view illustrating another modified embodiment of the connecting block.

Fig. 9 is a perspective view illustrating a further modified embodiment of the connecting block.

10 Fig. 10 is a view similar to Fig. 6, illustrating still another modified embodiment of the connecting block

Fig. 11 is a view similar to Fig. 6, illustrating yet another modified embodiment of the connecting block.

Fig. 12 is an exploded perspective view of a conventional plug.

Detailed Description of the Preferred Embodiments

15 Referring to Figs. 1 through 5, a plug 2 in accordance with the present invention generally comprises a mounting plate 21 and a cover 22 mounted to a rear side of the mounting plate 21. Blades 13 are placed in a mold (not shown) and an injection molding is then performed to form the mounting plate 21. The cover 22 includes a compartment 222 (Fig. 2). Further, the mounting
20 plate 21 includes an upright wall 212 (Fig. 3) extending from the rear side thereof. The cover 22 includes a plurality of ribs 221 (Fig. 2) on an inner periphery defining the compartment 222. Each rib 221 has an outer end, and a distance L between the outer end of the rib 221 and an end face 223 of the cover 22 is equal to a width M (Fig. 5) of the upright wall 212 of the mounting
25 plate 21.

In assembly, the upright wall 212 of the mounting plate 21 is received in the cover 22 with the upright wall 212 pressing against the inner periphery defining the compartment 222. The ribs 221 prevent excessive movement of the upright wall 212 into the compartment 222 of the cover 2. A screw 211 is then extended through a hole 213 in the mounting plate 21 and a hole 224 in the cover 22 to thereby secure the mounting plate 21 and the cover 22 together.

A connecting block 24 is provided to each blade 23 for connection with an associated cable 25. Each connecting block 24 includes a through-hole 241 (Fig. 3) having a first end and a reduced second end 242. Further, each connecting block 24 includes a radial screw hole 26 communicated to the through-hole 241. Wires 251 in each cable 25 are clamped together by a coupler 252 so as to be inserted into the through-hole 241 easily. A rear end 231 of each blade 23 is engaged in the reduced second end 242 of the through-hole 24 of an associated connecting block 24. A screw 261 is extended through the screw hole 26 of the associated connecting block 24 to adjustably press against the coupler 252.

Referring to Fig. 6, the end 231 of the blade 23 is inserted into the reduced second end 242 of the through-hole 241 of the connecting block 24 and partially into the first end of the through-hole 241 having a larger diameter. The end 231 of the blade 23 is then punched to form an enlarged end portion 232 having a diameter greater than that of the reduced second end 242 of the through-hole 241, thereby preventing disengagement of the blade 23 from the connecting block 23. Thus, the end 231 of the blade 23 is positioned by riveting.

Fig. 7 illustrates a modified embodiment of the invention, wherein the connecting block (now designated by 24A) has a hole 241 for receiving the

wires 252 of the cable 25 that are clamped together by a coupler 252. The mounting plate 21 includes a fuse clip 27 for holding a fuse 271. The connecting block 24 is made of conductive metal and thus electrically connected to the end 231 of the blade 23 through the fuse 271 and the fuse clip
5 27. Thus, it is not necessary to connect the end 231 of each blade 23 to the coupler 252.

The connecting blocks 24 are cylindrical in the embodiment shown in Figs. 1 through 5. Modified embodiment of the connecting blocks are shown in Figs. 8 and 9, wherein the connecting block 24B in Fig. 8 is a parallelepiped and the
10 connecting block 24C in Fig. 9 is a polyhedron such as a hexahedron.

Fig. 10 illustrates still another modified embodiment of the connecting block, wherein the reduced second end 242 of the connecting block 24D includes inner threading 243 for threadedly engaging with an outer threading 232 on the end 231 of the blade 23.

Fig. 11 illustrates yet another modified embodiment of the connecting
15 block, wherein the end 23 of the blade 231 includes a screw hole 233, and a screw 28 is mounted in the through-hole 241 of the connecting block 24E and extended through the reduced second end 242 of the connecting block 24E into the screw hole 233 of the blade 23.

20 A pressing block 20 (Figs. 2 and 3) may be provided to retain the cables 25 in place. Thus, the cables 25 could be located in a tidy manner.

After assembly, the upright wall 212 presses against the inner periphery defining the compartment 222 of the cover 22. The ribs 221 prevent excessive movement of the upright wall 212 into the compartment 222 of the cover 22. A
25 screw 211 is provided to secure the cover 22 and the mounting plate 21 together. Such an arrangement allows detachment of the plug 2 after assembly.

As a result, when the wires have been oxidized or burnt, the manufacturer or user may detach the plug 2 for replacement. The production cost of the manufacture is reduced, and the waste to the user is avoided.

5 Although the invention has been explained in relation to its preferred embodiment, it is to be understood that many other possible modifications and variations can be made without departing from the scope of the invention as hereinafter claimed.

Claims:

1. A detachable plug comprising:

a mounting plate (21), a plurality of blades (23) each having an end (231) securely attached to the mounting plate (21), a plurality of cables (25) each containing wires (251) therein for electrical connection with the end (231) of an associated one of the blades (23); and

a cover (22) mounted to a rear side of the mounting plate (21), the cover including a compartment (222) for accommodating the mounting plate (21);

characterized in that:

the mounting plate (21) includes an upright wall (212) extending therefrom, a plurality of ribs (221) are formed on an inner periphery defining the compartment (222) of the cover (22), the upright wall (212) of the mounting plate (21) presses against the inner periphery defining the compartment (222) of the cover (22), each said rib (221) has an outer end, a distance (L) between the outer end of each said rib (221) and an end face (223) of the cover (22) is equal to a width (M) of the upright wall (212) of the mounting plate (21), the ribs (221) prevent excessive movement of the mounting plate (21) into the compartment (222), a first screw (211) is extended through the mounting plate (21) into the cover (22), thereby securing the mounting plate and the cover together;

a plurality of connecting blocks (24) are provided for respectively connecting the wires (251) of the cables (25) to the ends (231) of the blades (23), each said connecting block (24) includes a through-hole (241) having a first end and a second end (242), each said connecting block (24) further includes a radial screw hole (26), the wires of each said cable are

mounted in the first end of the through-hole (241), a second screw (261) is extended through the radial screw hole (26) to adjustably press against the wires (251).

- 5 2. The detachable plug as claimed in claim 1, wherein the end (231) of each said blade (23) is mounted in the second end (242) of the through-hole (241) of an associated one of the connecting blocks (24).
- 10 3. The detachable plug as claimed in claim 2, wherein the second end (242) of the through-hole (241) has a diameter smaller than that of the first end of the through-hole, the end (231) of each said blade (23) is extended through the second end (242) of the through-hole (241) of an associated one of the connecting blocks (24) into the first end of the through-hole (241) and then punched to form an enlarged end portion (232) having a diameter greater than that of the second end (242) of the through-hole (241).
- 15 4. The detachable plug as claimed in claim 1, wherein the end (231) of each said blade (23) is electrically connected to the wires (251) of an associated one of the cables (25) through a fuse (271).
- 20 5. The detachable plug as claimed in claim 1, wherein the second end (242) of the through-hole (241) has an inner threading (243), and wherein the end (231) of each said blade (23) has an outer threading (232) for threadedly engaging with the inner threading.
6. The detachable plug as claimed in claim 1, wherein each said connecting block is cylindrical.
- 25 7. The detachable plug as claimed in claim 1, wherein each said connecting block is a parallelepiped.

8. The detachable plug as claimed in claim 1, wherein each said connecting block is a polyhedron.
9. The detachable plug as claimed in claim 1, wherein the end (231) of each said blade (23) has a screw hole (233), a screw (28) is mounted in the first
5 end of the through-hole (241) of each said connecting block (24) and extended through the second end (242) of the through-hole (241) into the screw hole (233) of an associated one of the blades (23).