

IMPROVED ELECTRIC PLUG

FIELD OF THE INVENTION

5 The present invention relates generally to the field of electric plug.

BACKGROUND OF THE INVENTION

10 Electric plugs in general and fused electric plugs are well known in the art. They generally comprise 2 or 3 electrical prongs which are housed in a casing made of insulating material such as thermoplastic. Often, the electric plugs are sold as separate component with or without the fuse. To attach an electric plug to an electric wire, the casing needs to be disassembled and the electric wire must be electrically connected to the proper prongs. The disassembling process usually requires a removal of one or more screws which hold the casing together. The connection of the wire to the prong usually requires a type of fastener as well such as a screw which is used to secure the wire to the prong. If a fuse is not provided, a fuse needs to be inserted into the proper slot.

20 Even after the initial installation, there are many instances where the plug needs to be disassembled. For instance, the fuse may blow requiring a replacement. Or a wire may slip away from the prong or it may be accidentally cut. In either case, the wire needs to be reattached. Given these situations, it can be easily appreciated that there is a desirability for

electric plugs which are easily assembled and disassembled and which has the simplest design possible for easy manufacturing.

OBJECT OF THE INVENTION

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It is therefore the object of the present invention to provide an electric plug which can be easily assembled and disassembled.

It is another object of the invention to provide an electric plug which can be easily attached to a wire.

10 It is yet another object of the present invention to provide an electric plug which has a simple and efficient design.

SUMMARY OF THE INVENTION

15 The present invention is an improved electric plug having a simple and efficient design which allows a user to easily and quickly connect to plug to a wire. The external portion of the electric plug comprise a base and a cover. Protruding out from the base are three electric prongs. The cover is basically a shell body which encloses over the base which also
20 has a substantially a shell body. The base has a front , pair of sides and a back. The cover has a top, sides and a front.

The base is provided with a elongated groove on opposite sides of the base which slidably mates with a corresponding linear member which protrudes out of the inside portion of the sides of the cover. The groove
25 and the linear member are situated such that the base can slide fully out of

from the cover simply by applying a slight force in the direction of the groove. Similarly, the base and the cover can be joined simply by mating the groove with the linear member and pushing the base in towards the cover. The groove and the linear member should be mated sufficiently
5 tightly such that while the member can slide within the groove, the base and the cover should not disengage from each other without some force. By doing so, no external fastener is required to mate the two components together.

Internally, the base is provided with multiple compartments to
10 accommodate the various components. These compartments can be broadly categorized into three sets: one set for the electric prongs, one set for the fuse holder base and fuse holder block, and a set for the wires.

The compartments for accommodating the electric prongs are generally in the shape of the prongs and have a hole which extends
15 through the bottom of the base such that the prongs fit snugly when they are in position within the compartment. Some room, however, should be provided to accommodate the wire ends which extends through the holes in prongs.

To prevent the electric prongs from slipping out of their respective
20 compartments, linear blocks are provided inside the cover. The blocks are positioned inside the cover such that when the base is fully inserted into the cover, the blocks lie directly on top of the prongs, hence preventing the prongs from disengaging from their compartments. In addition, the linear blocks also prevent the wires from crossing over to another compartment.

The fuse holder base holds the fuse holder while the fuse holder block holds a wire. The fuse holder base and the fuse holder block are attached to each other. The compartment for the fuse holder block should snugly receive the fuse holder block and should provide an opening for the wire which will be connected to the fuse holder block. The fuse block is electrically connected to the fuse holder.

A set of compartments is provided to accommodate the wires. Two of the compartments each have a pole with a grooved surface where the wires loop around. The poles provide additional means for preventing the wires from slipping out of their respective prongs, though it may not be required in the instance where the prongs and fuse holder block themselves provide sufficient restraining force. An opening is provided for the entry of the wires into the electric plug base. On top of the poles are a hole which mates with a bump when the base is fully inserted into the cover. The mating between the bump and the hole provides additional means for preventing the base from inadvertently sliding out from the cover.

The present invention allows a user to very easily connect the electric plug to any wire because no fastener needs to be removed or replaced. The base easily slips out the cover. The prongs are easily removed and the wires are put in place with relative ease. Moreover, for the manufacturer, the assembly process is much improved since no fastener such as screws needs to be purchased and the plug can be assembled efficiently.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 illustrates a perspective bottom view of the present electric plug with the plug base partially engaged with the plug cover.

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FIG. 2 illustrates a perspective bottom view of the present electric plug with the plug base completely disengaged from the plug cover.

FIG. 3 illustrates a perspective top view of the present electric plug
10 with the plug base completely disengaged from the plug cover, but with the electric prongs and the fuse holder within the base.

FIG. 4 illustrates a perspective top view of the present electric plug
15 with the plug base completely disengaged from the plug cover, and with the electric prongs and the fuse holder removed from the base.

FIG. 5 illustrates a perspective view of an alternative cover embodiment having a plurality of extended linear blocks.

20 FIG. 6a through 6e illustrate a general cross-sectional view of the mating scheme of the cover and the base.

DETAILED DESCRIPTION OF THE INVENTION

FIG. 1 illustrates a bottom view of the present electric plug 1. As can be seen from FIG. 1, the external portion of the electric plug 1 comprise a base 2 and a cover 3. Protruding out from the base 2 are electric prongs 4a, 4b, and 4c. The cover 3 is basically a shell body which encloses over the base 2 which also has a substantially a shell body. The base 2 has a front 2a, pair of sides 16 and a back 20. The cover 3 has top 21, sides 17 and a front 22.

Now referring to FIGS. 1 and 2, the base 2 is provided with a elongated groove 5 on opposite sides 16 of the base 2 (only one of the sides shown) which slidably mates with a corresponding linear member 6 which protrudes out of the inside portion of the sides 17 of the cover 3. The groove 5 and the linear member 6 are situated such that the base 2 can slide fully out of from the cover simply by applying a slight force in the direction of the groove as shown in FIG. 2. Similarly, the base 2 and the cover 3 can be joined simply by mating the groove 5 with the linear member 6 and pushing the base 2 in towards the cover 6. The groove 5 and the linear member 6 should be mated sufficiently tightly such that while the member 6 can slide within the groove 5, the base 2 and the cover 3 should not disengage from each other without some force. By doing so, no external fastener is required to mate the two components together.

Now to illustrate the internal portion of the electric plug 1, the FIGS. 3 and 4 illustrate the top view of the plug 1, where FIG. 3 shows the base 2 with the electric prongs 4 in the base 2, and FIG. 4 shows the prongs 4a, 4b, and 4c disengaged from the base 2 for easy viewing. The base 2 has been disengaged from the cover 3 in both FIGS. 3 and 4 for easy viewing.

As can be seen from the FIGS. 3 and 4, the base is provided with multiple compartments to accommodate the various components. These compartments can be broadly categorized into three sets: one set for the electric prongs 4, one set for the fuse holder base 7 and fuse holder block 8, and a set for the wires 9.

Still referring to FIGS. 3 and 4, the compartments 10a, 10b, and 10c accommodate the electric prongs 4a, 4b, and 4c, respectively. The compartments are generally in the shape of the prongs and have a hole which extends through the bottom 18 of the base such that the prongs fit snugly when they are in position within the compartment. Some room, however, should be provided to accommodate the wire ends (for instance, 9a) which extends through the holes in prongs 4a and 4c. Note that compartments 10a and 10c both have an opening 11a and 11c while the compartment 10b does not have such an opening. This is because prong 4b carries on top one of the pair (12a) of fuse holders 12a and 12b, and hence, no direct connection of the wire is necessary. Also, note that the openings 11a and 11c for the wire are generally positioned such that the wires need to bend in an acute angle in order to be connected to their respective prongs. By doing so, there is a less likelihood that the wires will slip out of the prongs inadvertently.

To prevent the electric prongs 4a, 4b, and 4c from slipping out of their respective compartments, linear blocks 25 are provided inside the cover 3, as shown in FIG. 2. The blocks 25 are positioned inside the cover such that when the base 2 is fully inserted into the cover 3, the blocks lie directly on top of the prongs 4a, 4b, and 4c, hence preventing the prongs

from disengaging from their compartments. In addition, the linear blocks 25 also prevent the wires from crossing over to another compartment. To further facilitate this barrier function of the linear blocks 25, the blocks 25 can be made longer as shown in FIG. 5. The extended linear blocks 26
5 functions better as a barrier for the wires. Moreover, the extended blocks 26 serves another important function of providing a user an indication as to which of the prongs or which part of the wire is out of position. This is because as the base 2 is slid into position in the cover 3, if any of the prongs or any part of the wires is out its position, the front part 26a of the
10 linear block 26 snags against the impediment and the cover 3 is prevented from fully mating with the base 2. Depending on at what point of the insertion the snag occurs, one can generally determine which portion of the base is causing the problem.

The compartments 13a and 13b accommodate the fuse holder base
15 7 and fuse holder block 8, respectively. The fuse holder base 7 holds the fuse holder 12b while the fuse holder block 8 holds the wire. The fuse holder base 7 and the fuse holder block 8 are attached to each other. Similar to the compartments 10a and 10c, the compartment 13b should also snugly receive the fuse holder block 8 and should provide an opening
20 23 for the wire which will be connected to the fuse holder block 8. The fuse block 8 is electrically connected to the fuse holder 12b. A support block 24 in the compartment 13a supports the fuse holder base 7.

The compartments 14a, 14b, 14c, 14d and 14e accommodate the wires. The compartments 14d and 14e each have a pole 15 with a
25 grooved surface where the wires loop around. The pole 15 provides

additional means for preventing the wires from slipping out of their respective prongs, though it may not be required in the instance where the prongs and fuse holder block themselves provide sufficient restraining force. An opening 15 is provided for the entry of the wires 9 into the electric plug base 2. On top of the poles are a hole 15a which mates with a bump 27 when the base 2 is fully inserted into the cover 3. The mating between the bump 27 and the hole 15a provides additional means for preventing the base from inadvertently sliding out from the cover 3.

The present invention allows a user to very easily connect the electric plug 1 to any wire because no fastener needs to be removed or replaced. The base 2 easily slips out the cover 3. The prongs 4a, 4b, and 4c are easily removed and the wires are put in place with relative ease. Moreover, for the manufacturer, the assembly process is much improved since no fastener such as screws needs to be purchased and the plug 1 can be assembled efficiently.

The present invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. For instance, although the present embodiment showed a fused electric plug, the principles of the present invention may be applied to plugs without a fuse and fuse holder. In such a case, the fuse holder block 8 would not be necessary and the wire which was connected to the block 8 would be directly connected to the prong 4b. Of course the fuse holders 12a, 12b, the fuse holder base 7, and the compartment for fuse holder block 8 and fuse holder base 7 would be eliminated. In addition, although here the mating scheme of the base 2 and cover 3 was shown to be that shown in

FIG. 6a (cross sectional view of the general contour of the base and cover), the mating scheme can have multiple variations such as those shown in FIGS. 6b through 6e.

The presently disclosed embodiments are, therefore, to be
5 considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims and all changes which come within the meaning and range of equivalency of the claims are, therefore, to be embraced therein.

CLAIMS

I Claim:

- 1 1. A fused electric plug comprising:
 - 2 a shell body cover and a shell body base, said cover enclosing over
 - 3 said base, said base having at least one elongated groove for slidably but
 - 4 snugly mating with a linear member on said cover, and an opening at a
 - 5 front for receiving a wire,
 - 6 a first, second, and a third prong, said first prong having a fuse
 - 7 holder on top of said first prong, said second and third prong having a hole
 - 8 for receiving a wire;
 - 9 a first, second, and a third compartment located within said base for
 - 10 snugly receiving said first, second, and third prong, respectively, each of
 - 11 said compartments having a hole which extends through the base to allow
 - 12 said prongs to protrude out from the base, said second and third
 - 13 compartment having an opening for a wire;
 - 14 a fuse holder base and a fuse holder block, said fuse holder base
 - 15 having a fuse holder and said fuse holder block having a hole for receiving
 - 16 a wire, said fuse holder block being electrically connected to said fuse
 - 17 holder;
 - 18 a compartment for snugly receiving said fuse holder base, said
 - 19 compartment being located adjacent to said first electric prong;
 - 20 a compartment for snugly receiving said fuse holder block, said
 - 21 compartment being provided with an opening for a wire;



22 compartments for holding wires connected to said second and third
23 prong and said fuse holder block; and
24 at least one block on said cover for preventing said prongs from
25 disengaging from said compartments.

1 2. The fused electric plug as recited in Claim 1 further comprising at
2 least one pole for looping a wire.

1 3. The fused electric plug as recited in Claim 1 wherein said pole has a
2 grooved surface.

1 4. The fused electric plug as recited in Claim 2 further comprising a
2 hole on top of said poles and a corresponding set of bumps on said cover
3 for mating with said holes when said cover is fully enclosed over said base.

1 5. The fused electric plug as recited in Claim 1 wherein said opening
2 for a wire for second and third compartments is situated such that a wire
3 connecting to said second and third prong is bent at an acute angle.

1 6. The fused electric plug as recited in Claim 2 wherein said opening
2 for a wire for second and third compartments is situated such that a wire
3 connecting to said second and third prong is bent at an acute angle.

1 7. The fused electric plug as recited in Claim 1 wherein said block is
2 an extended linear block.

1 8. An electric plug comprising:
2 a shell body cover and a shell body base, said cover enclosing over
3 said base, said base having at least one elongated groove for slidably but
4 snugly mating with a linear member on said cover, and an opening at a
5 front for receiving a wire,



6 a first, second, and a third prong, said first, second and third prong
7 having a hole for receiving a wire;
8 a first, second, and a third compartment located within said base for
9 snugly receiving said first, second, and third prong, respectively, each of
10 said compartments having a hole which extends through the base to allow
11 said prongs to protrude out from the base, said first, second and third
12 compartment having an opening for a wire;
13 holder;
14 compartments for holding wires connected to said first, second and
15 third prong; and
16 at least one block on said cover for preventing said prongs from
17 disengaging from said compartments.

1 9. The electric plug as recited in Claim 8 further comprising at least
2 one pole for looping a wire.

1 10. The electric plug as recited in Claim 9 wherein said pole has a
2 grooved surface.

1 11. The electric plug as recited in Claim 8 further comprising a hole on
2 top of said poles and a corresponding set of bumps on said cover for
3 mating with said holes when said cover is fully enclosed over said base.

1 12. The electric plug as recited in Claim 8 wherein said opening for a
2 wire for first, second and third compartment is situated such that a wire
3 connecting to said first, second and third prong is bent at an acute angle.

1 13. The fused electric plug as recited in Claim 8 wherein said block is
2 an extended linear block.