Nov. 15, 1938. H. D. GEYER 2,136,498

ELECTRIC PUSH-IN PLUG

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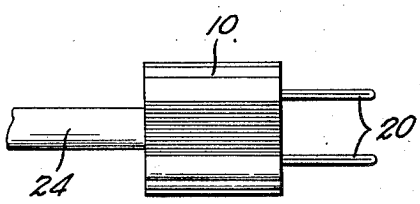


Fig. 1

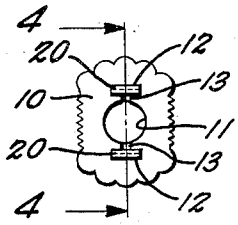


Fig. 2

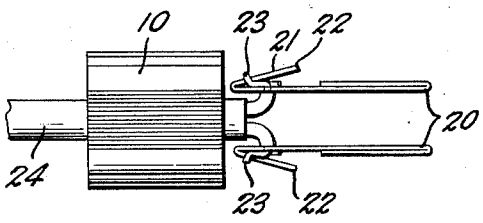


Fig. 3

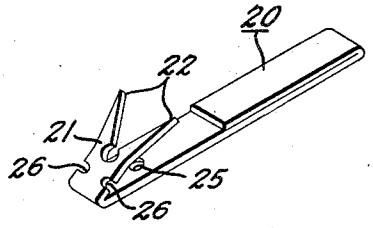


Fig. 5

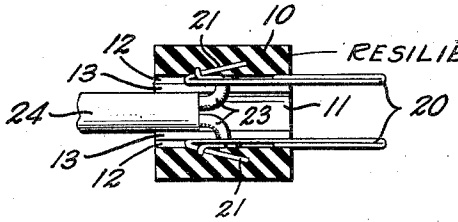


Fig. 4

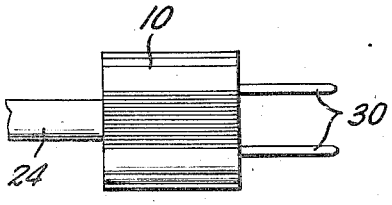


Fig. 6

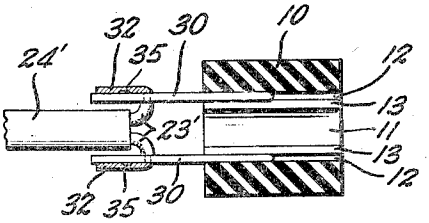


Fig. 7

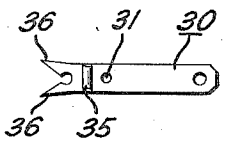


Fig. 8

INVENTOR
Harvey D. Geyer
BY
Spencer Hardman & Fehr
HIS ATTORNEYS

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ELECTRIC PUSH-IN PLUG

Harvey D. Geyer, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich., a corporation of Delaware

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4 Claims. (Cl. 173—361)

This invention relates to electric connector plugs which may be attached to the end of a flexible electric cord for connecting electric appliances such as lamps, fans, irons, toasters, motors, etc. to an electric convenience outlet or the like.

An object of this invention is to provide a very simple but strong and efficient connector plug which can be very rapidly and economically made and assembled in large quantity.

An important feature of this invention is the design of the one-piece soft rubber main body of the plug of a shape which permits the uncured rubber blank to be readily extruded in long lengths having the same desired cross-section and also permits these long lengths to be vulcanized by the open cure method and then have the individual bodies cut to length afterward.

Further features are the simple and efficient methods of connecting the electric wires to the individual contact prongs before any of these parts are slipped to their final positions in the soft rubber main body, and thereafter slipping these connected parts as a unit to their final positions where they are firmly anchored in place.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawing wherein a preferred embodiment of the present invention is clearly shown.

In the drawing:

Fig. 1 is a side elevation of the completely assembled connector plug.

Fig. 2 is an end view of Fig. 1.

Fig. 3 shows the electric cord passed thru the main rubber body and thereafter attached to the two contact prongs and ready to have the rubber body pushed into its final position.

Fig. 4 is a section taken on line 4—4 of Fig. 2.

Fig. 5 is a perspective view of one of the metal contact prongs.

Figs. 6, 7, 8 show a second form of this invention.

Fig. 6 is a side elevation of the assembled plug.

Fig. 7 shows the electric cord already attached to the two contact prongs and the rubber body partially pushed into place over the two contact prongs.

Fig. 8 is a face view of one of the contact prongs.

Similar reference characters refer to similar parts throughout.

Referring to Figures 1 to 5, 10 designates the resilient rubber main body of the connector plug which may have any desired external shape but which is preferably of the same cross section thruout its length in order that it may be first made in long lengths and the individual bodies 10 cut to suitable length therefrom. Body 10 has a central cord-receiving recess 11 extending therethru and on each side of recess 11 is a contact prong-receiving recess 12 which communicates thruout its entire length with recess 11 thru the relatively small slots 13. Thus it is seen that all the recesses in body 10 are also of the same cross section thruout the length of the body 10. This permits the uncured rubber blank from which body 10 is made to be extruded in long lengths with all the recesses therein and these long lengths to be then vulcanized by the open cure method which greatly reduces the costs of making these bodies over any method where individual molds are required.

The two contact prongs 20 are each bent up from a metal strip, preferably hard brass which is approximately .025 of an inch in thickness, to the shape clearly shown in Fig. 5. Each contact prong 20 has its inner end 21 bent back at an acute angle to form a resilient or compressible foot which terminates in two sharp points 22 which preferably are spread apart slightly more than the width of the prong 20. A simple and convenient means for connecting the wires 23 of the flexible electric cable 24 to the prongs 20 will now be described. The end of cable 24 is first passed thru the central hole 11 in the main body 10 and the insulation removed from the ends of the two wires 23. To securely connect each wire 23 to its contact prong 20, the wire is first passed thru a small hole 25 in the prong and then wrapped one or more turns around the resilient metal foot 21 which preferably has notches 26 therein to better retain the wire in place. The parts will then be as clearly shown in Fig. 3. The final step of assembling is simply pushing the main body 10 to the right as shown in Fig. 3 with sufficient force so that each prong 20 will enter its recess 12 and the transverse portion of each wire 23 will slide along the communicating slots 13. As each resilient metal foot 21 enters its recess 12 it will be pressed tightly down upon the wire end 23 wrapped therearound and thus each wire is very firmly anchored to its prong 20. The resiliency of the metal and the tight fit however causes the sharp metal points or spurs 22 to bite into the confining soft rubber body 10, substantially as illustrated in Fig. 4, thus firmly anchoring the contact prong 20 in place. Obviously the spurs 22 will serve as barbs to prevent the prongs 20 from being pulled out of the rubber body 10 in the reverse direction. If desired, the

ends of wires **23** may be connected to the prongs **20** by any suitable means other than as above described, since when the parts are in the position shown in Fig. 3 ready access can be had for any desired type of connection.

Figs. 6, 7 and 8 show a slightly modified form of the invention. In this form the main body **10** of soft rubber or the like is the same as that described above. In this second form the two metal contact prongs **30** are stamped from heavier metal, preferably from a brass strip about .05 of an inch thick and .25 of an inch wide. Each prong **30** has a small hole **31** to receive the end of a wire **23'** after its insulation is removed. The projecting uninsulated end **32** of the wire **23'** may then be easily soldered to the brass prong **30** as clearly shown in Fig. 7. In order to facilitate this soldering operation at the time of assembling the connector plug, a small piece of solder wire **35** containing a resin or flux core may be tinned to one side of each prong **30** at the time it is made (as shown in Fig. 8). Hence at the time of assembling it will be necessary only to bend the wire end **32** down against the attached solder piece **35** and apply only a slight amount of heat as by a soldering iron.

The inner ends of the prongs **30** have laterally spread sharp metal points **36** as shown in Fig. 8. Now when the prongs **30** are pushed with considerable force into their tight-fitting recesses **12** with the parts as illustrated in Fig. 7, the transverse portions of wires **23'** will slide along the open slots **13** in body **10** and thus permit the end of cable **24'** to be forced to a position substantially within the body **10**. The sharp metal spurs **36** bite into the confining rubber and thus aid in firmly anchoring the contact prongs **30** within the main body **10**. If desired, the soldering of the wire ends **32** to the prongs **30** may be omitted since the pressure of the rubber body **10** upon these ends **32** will prevent them from being pulled out of the small holes **31** in the prongs whether or not there is a solder connection.

While the embodiment of the present invention as herein disclosed, constitutes a preferred form, it is to be understood that other forms might be adopted, all coming within the scope of the claims which follow.

What is claimed is as follows:

1. An electric push-in plug attached to the end of a flexible electric cord, said plug comprising: a resilient rubber main body having a constant cross-section from end to end thereof and having two spaced contact prong recesses extending the entire axial length thereof and an intermediate recess adapted to receive the inner end of the electric cord, two metal contact prongs having barbed portions thereon inserted snugly into said spaced recesses, means for attaching the wires of said cord individually to said spaced contact prongs prior to slipping said prongs to their final position in said spaced recesses, said body having two relatively small axially extending slots interconnecting said cord recess to said prong recesses respectively thru which the attached wires may slide when said prongs and cord are slipped to their final position.

2. An electric push-in plug attached to the end of a flexible electric cord, said plug comprising: a resilient rubber main body of constant cross-section throughout its length and having two spaced contact prong recesses extending the entire axial length thereof and an intermediate recess adapted to receive the inner end of the electric cord, said cord-receiving recess communicating with both of said prong-receiving recesses by open-ended slots, two metal contact prongs having means on their inner ends for connecting same to the individual wires of said cord while said inner ends are uncovered by said rubber body, said cord and two prongs being slidable into final position in said rubber body after being connected together as a unit.

3. An electric push-in plug attached to the end of a flexible electric cord, said plug comprising: a resilient rubber main body having a substantially centrally disposed through aperture snugly receiving the electric cord and two laterally adjacent through apertures snugly receiving the contact prongs, two elongated contact prongs having portions embedded in the resilient walls of said apertures, said cord-receiving aperture interconnecting with said two prong-receiving apertures by two open-ended wire-receiving narrow slots, whereby the individual wires of said cord may be individually connected to the inner ends of said two prongs prior to slipping said prongs with the wires connected thereto to their final position in said rubber body.

4. An electric push-in plug attached to the end of a flexible electric cord, said plug comprising: a resilient rubber main body having a constant cross-section and having a substantially central through aperture snugly receiving said cord and two laterally adjacent through apertures snugly receiving the contact prongs, two elongated contact prongs each having its inner end individually connected to one of the wires of said cord, said connections being thereafter forced to a concealed location within the corresponding apertures, said cord-receiving aperture interconnecting with said two prong-receiving apertures by wire-receiving narrow slots whereby the individual wires of said cord may be connected to said prongs prior to inserting said prongs and cord to their final position in said rubber body.

HARVEY D. GEYER.