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G. J. RUBENS
ADHESIVELY ATTACHED RESILIENT SAFETY
DEVICE FOR ELECTRICAL CONNECTORS
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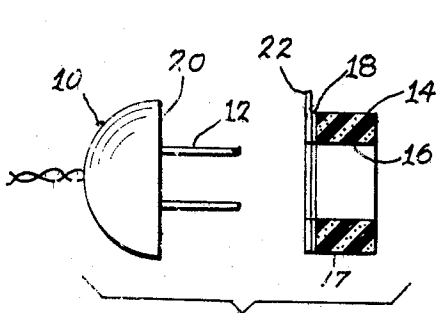


Fig. 1

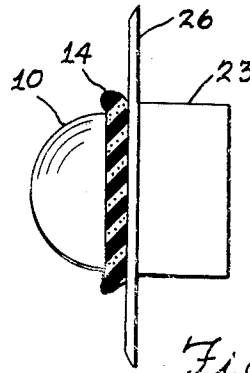


Fig. 2

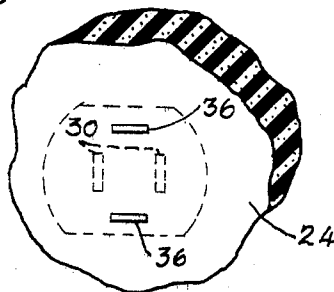


Fig. 5

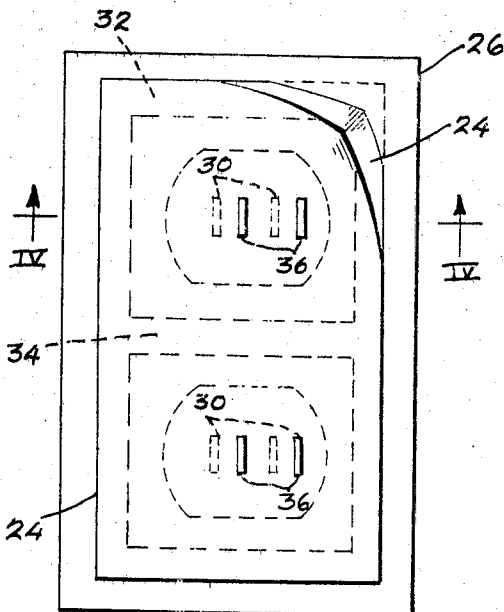


Fig. 3

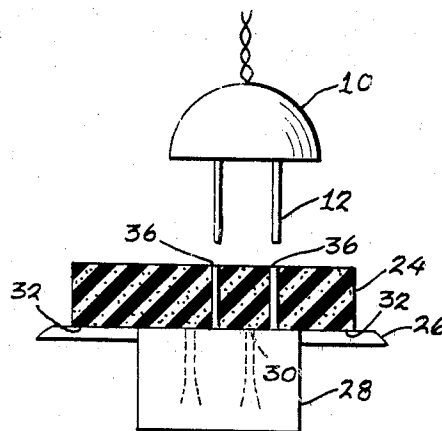


Fig. 4

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ADHESIVELY ATTACHED RESILIENT SAFETY DEVICE FOR ELECTRICAL CONNECTORS

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5 Claims. (Cl. 339-40)

This invention relates to safety devices for electrical connectors, and more important to a safety device capable of being adhesively attached to one half of a separable electrical connector for protecting the user from accidental electrical shock or a child while tampering therewith.

This invention is related to my pending patent application Serial No. 158,254 filed December 11, 1961, for "Resilient Safety Sleeve for Electrical Prongs," issued as Patent No. 3,147,055.

My prior patent application set forth the hazards, especially to children, present during the connecting and disconnecting of electrical connectors having male prongs. This condition arises because the prongs are initially energized when partially mated being open to accidental contact by the fingers of the user. My prior patent application covers a compressible protective device that is frictionally retained on the male half of the connector.

The present invention is directed to a similar protective device that is adhesively secured to one of the connector halves. In one embodiment the protective device is in the form of a sleeve that encircles the prongs and is adhesively secured to the end wall of the electrical plug body. In another embodiment the compressible protective device is in the form of a plate or sheet of compressible material, adhesively attached to a wall outlet, which has an additional feature of blocking the female socket from the inquisitive investigations of a child.

One object of this invention is to provide a device that can be adhesively attached to one of the connector halves of a prong-type connector for protection against the energized prongs of the connector during the connecting and disconnecting operation.

Another object is to provide such a device that can be attached either to the female wall socket, or the male plug of a separable connector.

A further object is to provide such a protective device for separable connectors that can be made simply and inexpensively, such as by a stamping operation.

A still further object is to provide a resilient and compressible protective device that can be secured over a female wall socket to cover the openings therein, serving the function of blocking the prong openings, much like a shutter, until it is knowingly uncovered by a user, and which also functions to protect the user from accidental engagement with the energized prongs during connector engagement and disengagement.

Other objects, advantages and novel features of the invention will become apparent from the following detailed description of the invention when considered in conjunction with the accompanying drawings wherein:

FIG. 1 is an exploded view of a conventional male connector plug having prongs and a resilient protective device in section having an adhesive backing at one end capable of securing the device to the plug according to the teaching of this invention;

FIG. 2 is similar view of the assembled plug and device of FIG. 1 connected to a female wall socket;

FIG. 3 is a front elevation view of a modified protective device adhesively secured to a wall cover plate, with a corner of the device peeled back;

FIG. 4 is a cross-section taken along line IV-IV of FIG. 3; and

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FIG. 5 is a modified arrangement of the prong slots in the protective device, partially illustrated, as related to the prongs openings in the wall socket.

Referring to the drawing where like reference numerals refer to similar parts throughout the drawing there is shown in FIG. 1 a conventional electrical plug 10 having two or more prongs 12. According to the teaching of this invention a protective device 14 is constructed in form of a sleeve with a bore opening 16 adapted to receive prongs 12. Protective device 14 is made, as disclosed in my prior patent application, of any insulating material having a high degree of compressibility and resilience, such as polyvinyl chloride, neoprene, sponge rubber etc. which also has a low compression set. Both the surfaces of bore opening 16 and outer periphery 17 are preferably concentric, that is they contain straight lines which are parallel to permit the device 14 to be easily and cheaply fabricated by stamping from a flat sheet of the desired material. The thickness of protective device 14 in an uncompressed condition extends for the exposed length of prongs 12 when initially energized to insulate the prongs whenever they are "hot," and throughout compression of the sleeve by the plug. In my prior patent application, the protective device is secured on the prongs by a restriction or by making the diameter of the bore opening less than the distance between the prongs so that the protective device frictionally engages the prongs.

In the present patent application protective device 14 is secured to the plug by an adhesive coating 18 applied to one end wall of the device and adapted to engage an end wall 20 of the plug. A protective throw-away cover sheet 22 protects the adhesive coating 18 prior to use. Thus in the instant patent application bore opening 16 of the protective device can fit loosely over the prongs, but as a practical matter the sleeve wall should be sufficiently thick to prevent it from being readily peeled back from the prongs by a child while in the energized condition to expose the "hot" prongs. As previously indicated the outside wall and bore wall should be concentric and parallel to permit inexpensive fabrication by stamping from a sheet of suitable material, instead of a more expensive molding operation which also could be used, if desired.

Upon removal of protective sheet 22, prongs 12 can be threaded through protective sleeve 14 and the sleeve adhesively secured to the end wall of plug 10. With the protective sleeve thus assembled to plug 10, the plug can be connected to wall socket 23, and the protective sleeve 14 will insulate the prongs in any energized position in the connecting and disconnecting operation.

FIGS. 3 to 5 illustrate a modification in which the protective device 24 is applied to the escutcheon or wall plate 26 of a female wall socket 28. In this application, device 24 serves an additional purpose of blocking or sealing the prong openings 30 from the inquisitive probing of a child, as well as for the purpose of insulating the "hot" prongs of the male connector during the connecting and disconnecting operation as does the modification of FIGS. 1 and 2. In other words the modifications of FIGS. 3 to 5 achieves a two-fold safety objective.

Protective device 24 is in the form of a sheet of the same material and thickness as in the above described modification. For standard plugs this thickness should be between 1/4" to 3/8". The outer configuration of device 24 is not critical, except as a matter of convenience. If it is made approximately the same size, or slightly less, than the outer configuration of the wall plate 26 which come in standard sizes, it will aid in the aligning the device with respect to the outlet, which is important as will be subsequently described. Safety device 24 is

best secured to the wall plate through a pressure sensitive adhesive 32. A band of the adhesive is applied preferably around the periphery of the back side of the sheet, leaving the central portion adjacent the wall socket fill of adhesive. Safety device 24 can be of a size to accommodate any conventional size outlet socket, a two outlet size being illustrated. However, it is apparent that safety device 24 could be cut in half with a scissors transversely the center if only one socket need be accommodated in which case it may be desirable to provide a central band of adhesive 34 to enable both halves of the safety device to be usable. A suitable protective cover means, not shown, for protecting the adhesive material should be provided.

A number of slots 36, corresponding to the number of prongs of the connector to be accommodated, are formed extending completely through safety device 24, a two prong connector being illustrated. Slots 36 can be formed during the same cutting operation that stamps out safety device 24, thus assuring a simple and inexpensive manufacture. If desired, it is apparent the safety device of FIGS. 3-5 can be fabricated by molding instead of stamping.

It should be noted that when the safety device is attached over the socket, slots 36 in safety device 24 should be off-set from the corresponding socket openings 30, shown in broken lines in FIGS. 3 and 5, for the purpose of blocking or sealing openings 30. In other words, with safety device 24 in a relaxed position applied to wall plate 26, slots 36 and openings 30 in the respective elements are not intended to be in alignment. This misalignment is designed for the purpose of discouraging a child from playing with a plug or inserting an electrically conductive object that could easily cause a painful burn, if not a fatal shock. In order to achieve alignment it is necessary for the responsible user to distort the material of the safety device adjacent the socket 28, in one of several ways, to force slots 36 into alignment with openings 30.

In FIGS. 3 and 4, this misalignment is achieved by laterally off setting slots 36 to one side (i.e. to the right side in FIG. 3) of socket openings 30, in the order of a quarter of an inch more or less depending on the resiliency of the material. This will require the user to insert the prongs of the plug 10 through safety device 24 until the prongs hit wall plate 26, necessitating the user to move the plug laterally to the left until prongs 12 engage openings 30, at which time the plug prongs can be fully inserted into the socket. In this condition the material of the safety device is slightly distorted in a lateral direction until a time when the plug is pulled out at which time the resilient material springs back to its normal relaxed condition covering openings 30 as illustrated. Thus, the ability of the material of safety device 24 to spring-back to its original state is utilized in two ways, under distortion just described as well as straight compression as originally described.

FIG. 5 shows an identical construction as in FIG. 3 except for a modified arrangement of slots 36 in protective device 24 relative to socket openings 30. In FIG. 5 slots 36 are rotated 90° from openings 30, in other words, slots 36 lie in normal relation to openings 30. In this modification, after the plug is initially inserted through slots 36 the plug (and surrounding material of protective device 24) is rotated 90° in either direction until the plug prongs 12 are aligned with openings 30 to permit full insertion. It is believed that the rotational maneuver is a little more complex to a child than a straight lateral movement, and hence, may represent a greater safety factor, although a greater distortion of the resilient material occurs in a rotational distortion than in a lateral distortion.

Since in either modifications in FIGS. 3 and 5, the resilient material of the protective device must be distorted in the immediate vicinity of the slots 36, it is be-

lieved that the back of the material in this area should be left free of adhesive 32 to permit readily such distortion and spring-back, and to avoid possible tearing the resilient material.

Installation of the protective device over any electrical wall outlet is quite simple. First the correct size protective device is selected for the particular outlet, type and number of sockets, involved. The protective backing is removed from the adhesive and the device centered over the outlet wall plate. Making the wall plate and protective device about the same dimension assures that the slots 36 in the protective device will be properly positioned offset from socket openings 30. The protective device will camouflage the outlet from the inquisitive probing of a child. In the event the child tries to insert a metal object through slots 36, the object will only engage the wall of the cover plate or the socket, since slots 36 and openings are not aligned if the protective device is properly installed on the wall plate.

In the event a user desires to insert a conventional male plug, the plug need only be moved laterally (FIG. 4) or rotated (FIG. 5) in order to fully engage the socket. Throughout the electrical connection the user is protected by the material from accidentally touching the "hot" prongs by the thickness of the material which is surrounding the prongs. The resiliency of the material is such that the plug will remain frictionally engaged with the socket until intentionally removed, at which time the material will spring-back to its original thickness and original orientation, ready for the next connection. It should be noted that either or both of the outlets can be used without affecting each other or the protective features of the device.

If desired, the exterior surface of protective device 24 could be colored or given a decorative appearance or configuration.

The adhesive should be sufficiently tenacious to avoid being readily pulled off by a small child, but capable of being peeled off by an adult when permanent removal is desired, or for repairs on the socket. The corners of the protective sheet could be made rounded to discourage gripping by a child.

I claim:

1. The combination of an electrical connector plug having a body with exposed prongs extending from one end wall thereof, and a female socket connector having openings to receive said prongs, said female socket having a wall escutcheon plate mounted thereabout, and a safety device for insulating said prongs when energized from contact with the fingers of a user and normally covering said socket openings when not in use, said safety device constructed in form of a sheet material having a thickness extending for the length of the exposed prongs when initially energized, said sheet having a plurality of apertures extending through the thickness corresponding to the number of prongs on the plug, said sheet being made of an insulating material having a high degree of compressibility capable of being squeezed by the plug when inserted into the socket precluding contact between the energized prongs and the user's fingers one wall surface of said sheet having an adhesive coating securing the sheet to the wall plate, the area of said sheet opposite the female socket being free of adhesive, said safety device being secured to the escutcheon plate so that the prong apertures are in a non-aligned position with the socket openings, whereby it is necessary for the user to insert the plug through the safety device and then move the plug and the sheet material adjacent thereto until the prongs become aligned with the socket openings for energization thereby.

2. A safety device for mounting between an electrical plug having prongs and a wall socket having an escutcheon plate, comprising a sheet of insulation material having a wall surface adapted to cover said socket, said material being made of uniform thickness, said

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material having a plurality of individual openings extending through said thickness one opening for each prong of the plug, said material having a high degree of compressibility capable of being squeezed by the plug when inserted into the socket, said wall surface of the sheet of material having an adhesive coating for securing the periphery of said sheet to said escutcheon plate, an area of said wall surface around the openings being free of adhesive to permit said area to be moved relative to said socket when the plug is inserted therein.

3. The safety device of claim 2 wherein the thickness of the material is in the order of $\frac{1}{4}$ " to $\frac{5}{8}$ ".

4. The combination of a female socket connector having prong openings mounted in an escutcheon plate, and a safety device, said female socket connector adapted to receive the prongs of a male plug, said safety device constructed in the form of a sheet of insulating material having a high degree of compressibility, said sheet of insulating material having a plurality of individual openings extending therethrough, one opening for each prong of the plug, said sheet of insulating material adhesively secured to the escutcheon plate, said sheet of

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insulating material when in a secured relaxed condition oriented on the escutcheon plate so that the openings in the safety device are in a non-aligned position with respect to the openings in the female socket.

5. The combination of claim 4 wherein the outer configuration of the safety device conforms substantially to the outer configuration of the escutcheon plate.

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