United States Patent [19]

Fisher

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[54] **SHIELD FOR ELECTRICAL PLUG**

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[21] Appl. No.: **245,580**

[52] **U.S. Cl.** ..... **339/36,** 339/40 R, 339/94 R

[51] **Int. Cl.** **H01r 13/44,** H01r 13/52

[58] **Field of Search** ..... 339/36, 42, 40, 45 R, 339/75 R, 75 P, 59–63, 94 R, 94 A, 94 M, 110 P, 176 R, 176 P, 195 R, 196 R, 217 TP

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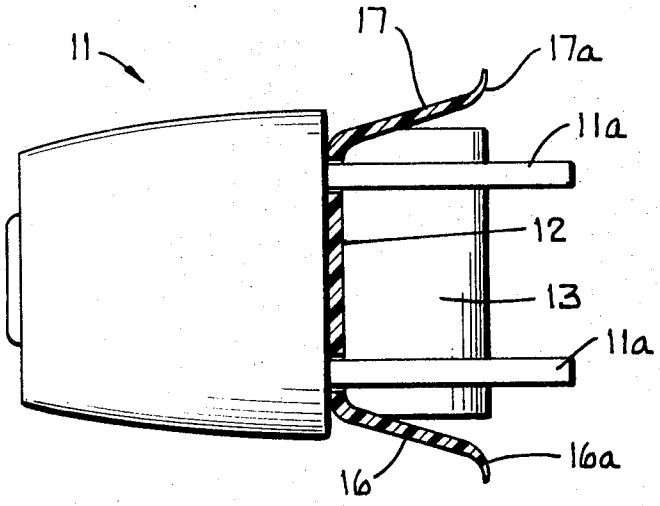
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Assistant Examiner—Terrell P. Lewis
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[57] **ABSTRACT**

Disclosed is a safety shield for an electrical connector plug formed of a flexible resilient material having a base wall from which the plug prongs extend and including flaps which extend along a substantial portion of the length of the prongs. The flaps extend at an obtuse angle to the plane of the base wall and are provided with a curved lip which engages the receptacle as the plug is inserted and pushed into the receptacle and insures that the flaps are driven outwardly away from the prongs as the plug moves into the receptacle.

6 Claims, 6 Drawing Figures



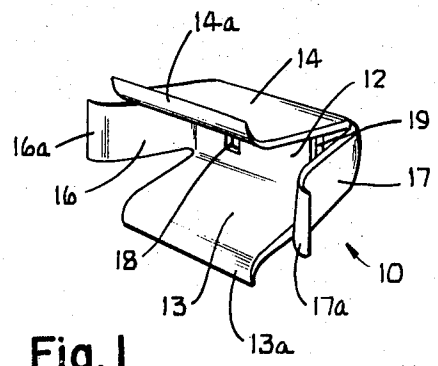


Fig. 1

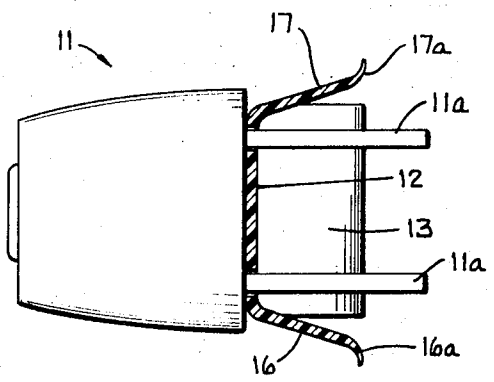


Fig. 2

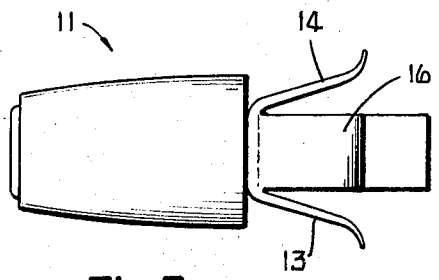


Fig. 3

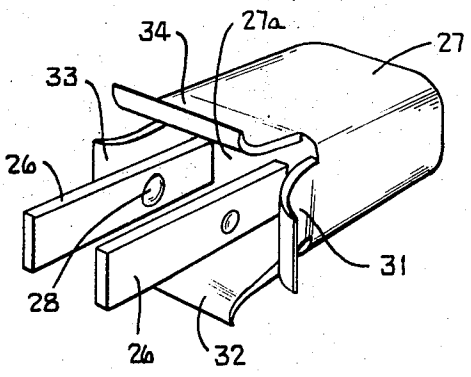


Fig. 4

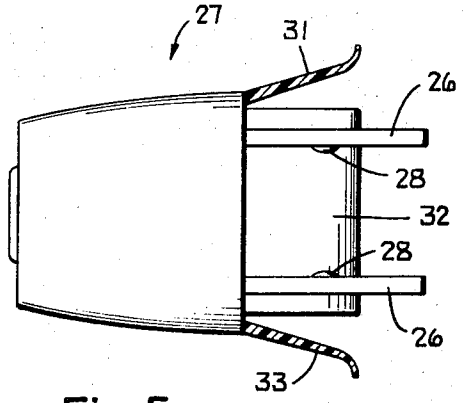


Fig. 5

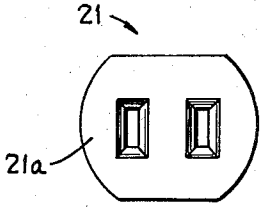


Fig. 6

SHIELD FOR ELECTRICAL PLUG

BACKGROUND OF THE INVENTION

Various types of safety plugs or electrical connectors are well known in the prior art. One primary objective of these prior art structures is to cover or shield the prongs of the male component of the separable connector while the plug is being inserted or removed from the female component or receptacle. These structures additionally provide shielding of the plug prongs when the plug, though with the plug prongs still making electrical contact with the receptacle terminals and at line voltage, is partially separated from the receptacle. Such a condition, since domestic electrical sockets or receptacles are often at baseboard level, is a particular hazard for small children.

In general, two types of plug prong shielding devices are known in the prior art. One type utilizes a rigid, spring-loaded shield which advances and retreats over the plug prongs as the plug is removed and inserted from the receptacle. An example of this general structure is disclosed in U.S. Pat. No. 3,575,684. The other type utilizes a flexible, resilient sleeve which is deformed and flattened between the plug and receptacle when the plug is inserted into the receptacle. This type of flexible shield is disclosed in U.S. Pat. No. 3,147,055.

The safety plug shield of the present invention is an improved version of the latter type mentioned above, and can be embodied in a separate flapped sheath to be fitted on the prongs of a conventional electrical plug. It has the advantage over prior art structures in that the prong shielding portion is not placed in extreme compressive stress when the plug is seated against the receptacle. Instead of being compressed between the plug and receptacle as the plug is inserted in the receptacle, the flaps of the shield embodying the present invention are forced outwardly away from the plug prongs. They spring back to prong-shielding position as the plug is withdrawn from the receptacle. Since the shield is not subjected to extreme compressive stress, as is typical of prior art structures, it has a prolonged service life.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a perspective view of an electrical plug shield embodying the present invention.

FIG. **2** is a top view of a conventional electrical plug with the shield of FIG. **1** installed on it, the shield being shown in section.

FIG. **3** is a side view of the structure shown in FIG. **2.**

FIG. **4** is a perspective view of a modified form of the invention.

FIG. **5** is a top plan view, partially in section, of the structure shown in FIG. **4.**

FIG. **6** is a front view of a conventional electrical receptacle.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Indicated generally at **10** in FIG. **1** is the insulating sheath embodiment of the invention, adapted for placement on a conventional electrical plug (indicated at **11** in FIG. **2**). The sheath is preferably formed of a resilient, flexible, but tough, material such as ethylene vinyl acetate and has a generally rectangular cup-shape. The

base wall **12** of the sheath has extending from it integral side flaps **13** and **14** and end flaps **16** and **17.** The flaps extend outwardly somewhat, that is, at an obtuse angle, with respect to the plane of the base wall **12,** and, at their outer margins, the flaps are curved outwardly as indicated at **13***a*, **14***a*, **16***a* and **17***a*.

The base wall **12** of the sheath is provided with apertures **18** and **19** (FIG. **1**) adapted to accommodate the prongs **11***a* of the electrical plug. As may be seen in FIGS. **2** and **3,** when the sheath is in place on the plug the base wall **12** is contiguous with the adjacent flat surface of the plug **10** and the flaps extend along a substantial portion of the length of the prongs **11***a*.

In operation, with the sheath **10** installed on the plug **11,** as the plug prongs are inserted into a conventional electrical receptacle (indicated at **21** in FIG. **6**), the extending flaps will engage the face **21***a* of the receptacle. As the plug is moved into fully inserted position, the flaps will be forced outwardly, their angle of extension from the sheath base and their curved margins assuring that the flaps will be moved outwardly and will not jam between the receptacle face and the plug. The flaps are moved to this outwardly extended position without undergoing extreme stress, and they spring back to sheathing position with respect to the prongs as the plug is removed from the receptacle. If the plug is, inadvertently only partially removed from the receptacle, the flaps cover the portion of the prongs outside the receptacle. Since the flaps are not greatly stressed, the service life of the sheath is prolonged.

Referring to FIGS. **4** and **5,** a modified form of the structure is shown wherein the sheath flaps extend from and are molded integrally with electrical plug. The plug, itself, further differs from the conventional type type shown in FIGS. **2** and **3** in that the prongs **26** of the plug **27** are provided with abutments **28.** The abutments are preferably formed by striking them from the metal forming the prongs, and they extend above the prong surface and are aligned with each other. The purpose of these abutments is to provide detenting retainers for holding the plug firmly seated in the electrical receptacle. They are positioned to detent on, or snap behind the front face **21***a* of a receptacle **21** (FIG. **6**) and are a convenient, economical means for providing a detent position of the plug when inserted into the receptacle.

The plug **27** (FIG. **4**) is molded of a suitable material, such as polyvinyl chloride, and flaps **31, 32, 33** and **34** are molded integrally with the body of the plug and extend at an obtuse angle with respect to the flat face **27***a* of the plug. They are provided with outwardly curved marginal areas to assure, as with the structure of FIGS. **1–3,** that the flaps are moved outwardly as the plug is inserted into a receptacle.

I claim:

1. An electrical safety plug adapted to plug into an electrical outlet, said plug comprising a body portion having a planar face, electrical prongs extending from said face of the plug body and adapted to enter the registering apertures of an electrical outlet, a sheath for said prongs formed by flexible resilient and electrically insulating flaps extending from said plug body surface along a substantial portion of the length of said prongs, two opposite ones of said flaps having a width spanning the distance between the prongs, two further opposite ones of said flaps having a width at least equal to the width of said prongs, whereby the ends of said flaps

move outwardly to expose said prongs as the plug is inserted in the outlet without subjecting said flaps to appreciable compressive stress.

2. An electrical safety plug as claimed in claim 1 in which said flaps have marginal end portions formed to curve outwardly to provide receptacle engaging surfaces assuring outward movement of the flaps as said prongs enter the receptacle apertures and preventing jamming of the flaps between the plug body and the receptacle.

3. An electrical safety plug as claimed in claim 1 in which the inner facing side surfaces of said prongs are provided intermediate their lengths with detent abutments extending slightly above the prong surface and adapted to cooperate with the receptacle to retain the plug in prong-inserted relation with the receptacle.

4. An insulating sheath for the prongs of an electrical plug of the type adapted to be inserted in a receptacle, said sheath being formed of a flexible resilient insulating material and having a base wall from which a plurality of integral flaps extend at an obtuse angle, said base wall of the sheath having apertures adapted to receive the prongs of an electrical plug, said sheath being thus adapted to be accommodated on the prongs of an electrical plug with the sheath base wall contiguous with the adjacent surface of the plug and said flaps extending for a substantial portion of the length of the plug prongs, said flaps being moved outwardly away from the prongs when the plug is inserted in the receptacle.

5. An insulating sheath as claimed in claim 4 in which said flaps have marginal end portions formed to curve outwardly to provide receptacle engaging surfaces assuring outward movement of the flaps as the plug is fitted to the receptacle.

6. An insulating sheath as claimed in claim 4 in which said base wall of the sheath is rectangular in configuration and an integral flap extends from each of the four side margins of the base wall.

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