

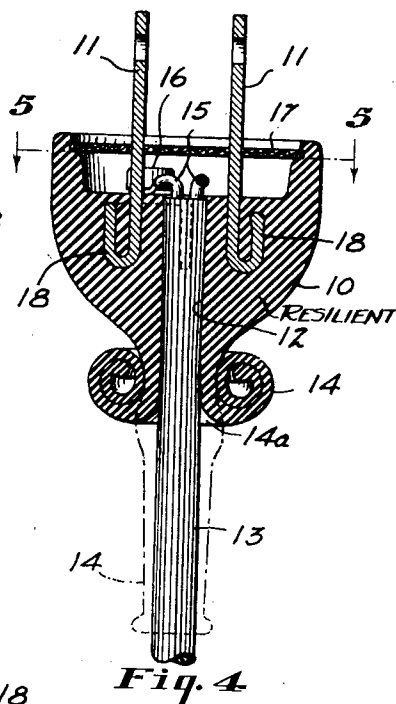
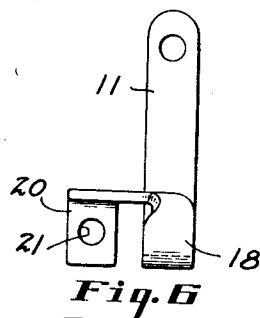
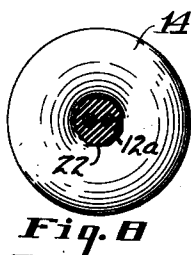
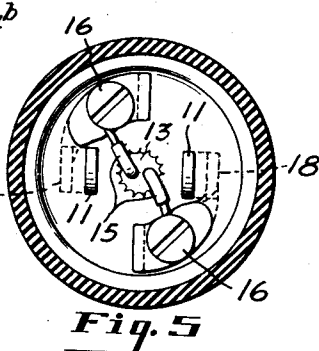
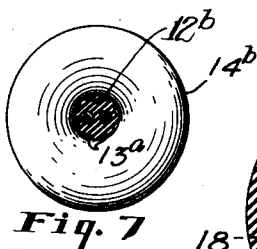
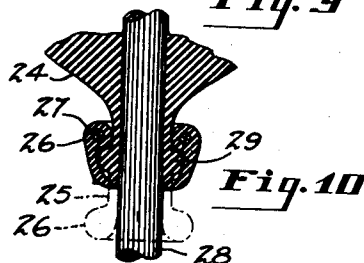
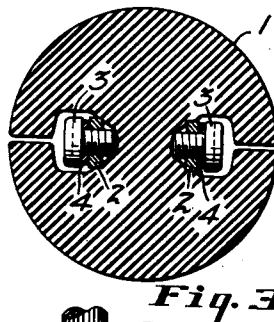
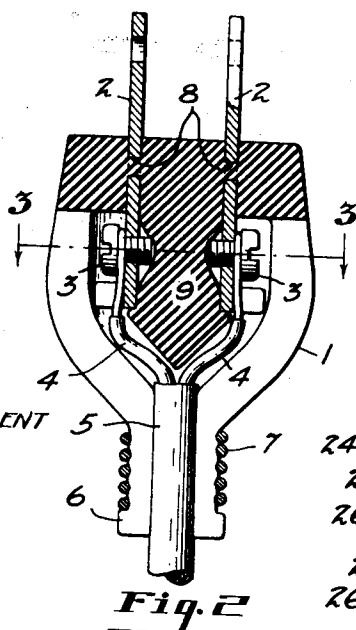
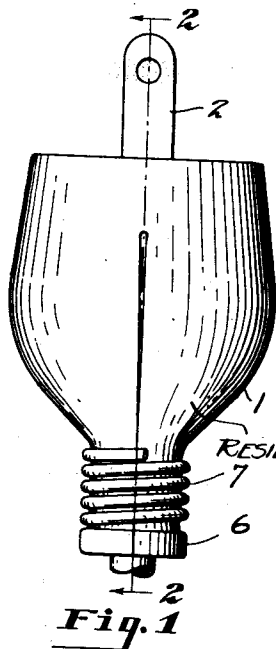
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E. J. TE PAS ET AL

2,092,820

PLUG CAP

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## UNITED STATES PATENT OFFICE

2,092,820

## PLUG CAP

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6 Claims. (Cl. 173—361)

This invention relates to electrical connectors as for example the terminal plug caps of attachment plugs for electrical cords and it has for its object the provision of a device of this character which is not liable to breakage, which is not liable to electrical short circuiting, and which is not apt to become detached from the cord or to have the electrical connection broken between the plug contacts and the conductor strands of the cord, the aforesaid objects being accomplished through the use of a simple and inexpensive form of plug cap construction which can be readily attached to an electric cord by persons unskilled and inexperienced in the construction of electrical devices and appliances.

With these and other objects in view, the invention consists in the novel construction, arrangement and combination of parts, hereinafter illustrated and described in some of its embodiments in the accompanying drawing, and particularly pointed out in the appended claims.

In the drawing Figure 1 is a side elevational view of a plug cap illustrating one form of carrying out this invention; Figure 2 is a sectional view taken on line 2—2, Figure 1; Figure 3 is a sectional view taken on line 3—3, Figure 2; Figure 4 is a sectional view taken on the axis of a modified form of plug cap; Figure 5 is a sectional view taken on line 5—5, Figure 4; Figure 6 is a detail view of one of the contact prongs of the plug cap shown in Figure 4; Figures 7 and 8 are end views of slightly modified forms of plug caps and cords in which the plug caps follow generally the construction shown in Figure 4; Figure 9 is a detail view of another modified form of cord construction; and Figure 10 is a fragmentary sectional view of a modified form of plug construction similar to the form shown in Figure 4.

Three forms of plug caps are shown in the drawing for purposes of illustrating some of the different modes of carrying out this invention. The plug cap shown in Figures 1 to 3 comprises a soft rubber-like electrically non-conducting plug cap body 1 having contact prongs 2 projecting from the outer end thereof. These prongs may be detachably associated with the cap body 1 as shown in Werme U. S. Patent No. 1,858,196 issued May 10, 1932 or they may be anchored in this body at the time it is molded, in which case holes 8 would be formed in the prongs to permit the material of the plug cap to flow through the prongs for insuring their better securement. The body 1 is slit along opposite sides whereby access may be had to the hollow interior of the plug cap.

The concealed ends of the contact prongs inside the hollow interior of the plug end abut against a depending portion 9 integrally formed with the plug. The contact prongs are threaded for reception of the screws 3 by means of which the conductor strands 4 of a cord 5 are secured to the contact prongs after which operation has been performed the slitted portion of the plug may be allowed to assume its normal position whereupon the complementary parts 6 forming the sleeve of the plug may be anchored to the cord by means of binding the same with a string or wire 7.

The modification shown in Figures 4 to 8 comprises an integrally formed plug cap body 10 formed from a soft rubber-like electrically non-conducting material of molded construction in which are permanently embedded a pair of contact prongs 11. The central interior portion of the plug cap body is formed with a longitudinally grooved passageway 12 for receiving a cord 13 which has a longitudinally corrugated exterior surface complementary to the surface of the passageway 12. The exterior diameter of the cord and the diameter of the passageway 12 are substantially the same so that the cord freely yet closely fits within the plug.

The plug cap is provided at one end with a sleeve 14 which may be rolled up as shown in Figure 4 to cause this portion of the plug cap to firmly grip the cord. The complementary contacting surface of the cord and the plug cooperate at the same time to prevent twisting of the cord within the plug. The conductor strands 15 of the cord are secured to the contact prongs by means of suitable screws 16.

A washer 17 having apertures for receiving the prongs 11 is fitted over the screws 14 and the exposed ends of the conductor strands 15. Each of the contact prongs 11 has a folded over portion 18 and a bent-over part 20 which is provided with an aperture 21. These parts of the plug are embedded within the body of the plug and the material of the plug will flow between the bent-over parts 18 and through the aperture 21 whereby the contact prongs 11 are firmly anchored in the plug.

The cords 13<sup>a</sup> and 22 shown in Figures 7 and 8 are provided with different forms of surface covering and when a cord of this type is used the passageways 12<sup>a</sup> and 12<sup>b</sup> of the plug caps 14<sup>a</sup> and 14<sup>b</sup> would be provided with a surface complementary to the surface of the cord. The carrying out of this feature of the invention would also be accomplished in some degree by having the

passageway 12 of the plug cap smoothly finished and by using a cord with an irregularly formed outer surface or one with a roughened surface as shown in Figure 9 on the cord 23, as it is not absolutely essential that the passageway 12 have a surface complementary to the cord surface although better results are achieved when the plug is so constructed and the plug cap and cord may have a looser fit than is necessary in accomplishing the same results with a plug cap having a smoothly finished cord passageway.

In the modified form of plug cap construction shown in Figure 10 the plug cap body 24 is provided with a sleeve portion 25 terminating in a thickened annular end portion 26 within which there is vulcanized one or more turns of cord 27 so that when the plug cap is attached in position on the cord 28 the end portion 27 is rolled over the annular thickened sleeve part 29 and the cord 27 is thus tensioned placing the rubber beneath it in compression whereby the cord is firmly gripped by the plug cap. The thickened portion 14<sup>a</sup> of the sleeve of the plug shown in Figure 4 is provided to prevent the unrolling of the rolled-up sleeve 14.

Furthermore it is to be understood that the particular forms of apparatus shown and described, and the particular procedure set forth are presented for purposes of explanation and that various modifications of said apparatus and procedure can be made without departure from this invention as described in the appended claims.

Having thus described our invention what we claim is:

1. An attachment plug cap for use in connection with a flexible electric cord having conductor strands comprising an integrally formed soft rubber-like body, contact prongs carried by said body, means for connecting the conductor strands to said prongs, said body having a passageway the walls of which are complementary to the surface of the cord, the cord being of irregular outline in cross-section whereby twisting of the cord in the plug is prevented, and means for anchoring said cord to said body, comprising a rolled-up sleeve carried by and forming a part of said body.

2. An attachment plug cap for use in connection with a flexible electric cord having conductor strands comprising an integrally formed soft rubber-like body of molded construction with a sleeve extending therefrom, contact prongs fixedly carried by said body, and means for connecting the conductor strands to said prongs, said body and sleeve having a passageway the walls of which are complementary to the surface of the cord, the cord being non-circular in cross-section whereby twisting of the cord in the plug is prevented,

said sleeve being rolled-up to anchor the plug cap to the cord.

3. An attachment plug cap for use in connection with a flexible electric cord having conductor strands comprising an integrally formed soft rubber-like body, contact prongs embedded in said body with portions of said body extending over bent-over parts of said prongs for anchoring the same in said body, means for connecting the conductor strands to said prongs, said body having a passageway the walls of which are complementary to the surface of the cord, the cord being non-circular in cross-section whereby twisting of the cord in the plug is prevented, and means for anchoring said cord to said body comprising a rolled-up sleeve carried by and forming a part of said body.

4. An attachment plug cap for use in connection with a longitudinally corrugated flexible electric cord having conductor strands comprising an integrally formed soft rubber-like body, with a sleeve extending therefrom, contact prongs embedded in said body, and means for connecting the conductor strands to said prongs, said body and sleeve having a passageway the walls of which have corrugations complementary to those on the cord, the cord being non-circular in cross-section whereby twisting of the cord in the plug is prevented, said sleeve being rolled-up to anchor the plug cap to the cord.

5. An attachment plug cap for use in connection with a flexible electric cord having conductor strands comprising an integrally formed soft rubber-like body, contact prongs having bent-over portions embedded in said body and surrounded by the material thereof, means for connecting the conductor strands to said prongs, said body having a passageway the walls of which are complementary to the surface of the cord, the cord being non-circular in cross-section whereby twisting of the cord in the plug is prevented, and means for anchoring said cord to said body comprising a rolled-up sleeve carried by and forming a part of said body.

6. An attachment plug cap for use in connection with a flexible electric cord having conductor strands comprising an integrally formed soft rubber-like body, contact prongs carried by said body, means for connecting the conductor strands to said prongs, and means for anchoring said cord to said body comprising a rolled-up sleeve carried by and forming a part of said body, said sleeve having embedded therein a substantially non-extensible element encircling said cord and placing the material therebeneath in compression whereby the plug cap firmly grips the cord.

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