

Feb. 11, 1964

P. E. DEGNAN ETAL
ELECTRICAL CORD CONNECTOR HAVING AN
IMPROVED PROTECTIVE COVERING

3,120,987

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2 Sheets-Sheet 1

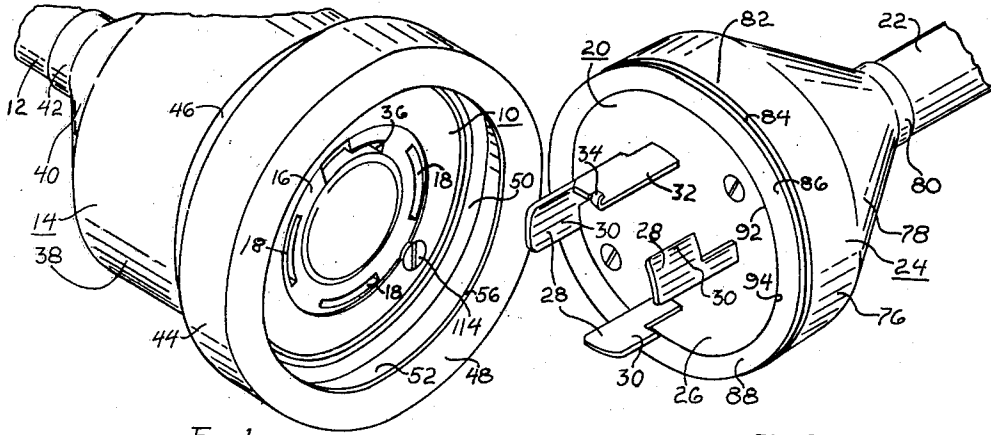


Fig. 1.

Fig. 2.

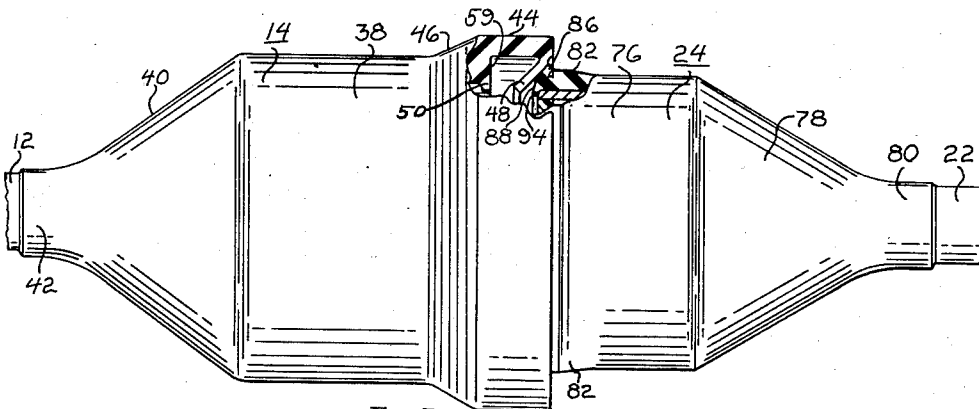


Fig. 3.

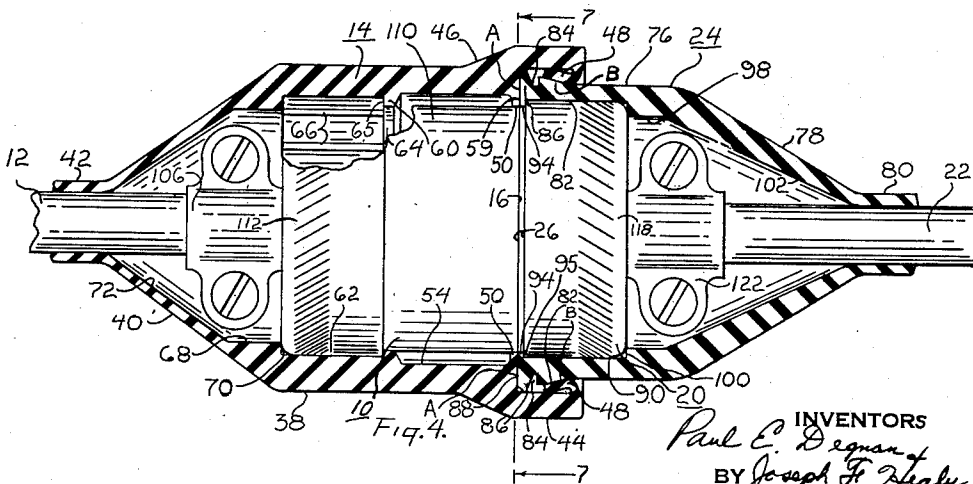


Fig. 4.

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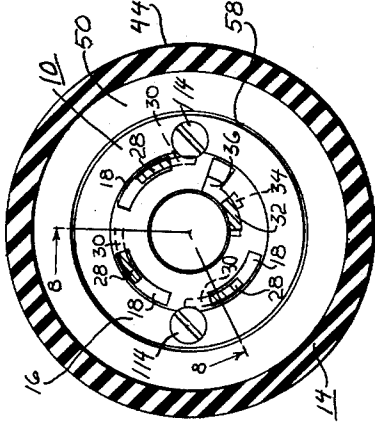


Fig. 7.

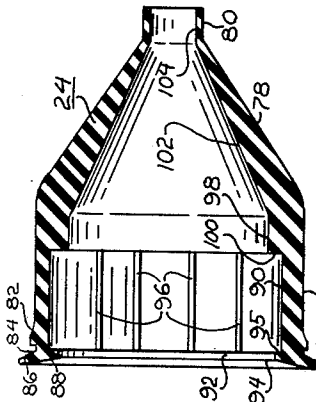


Fig. 6

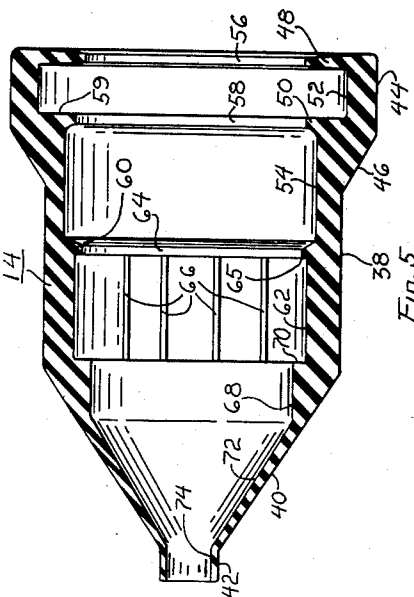


Fig. 5.

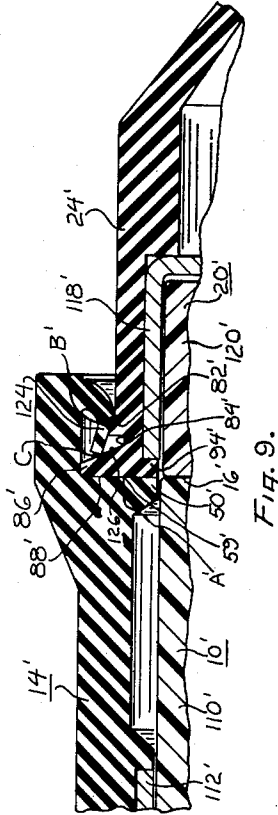


Fig. 9.

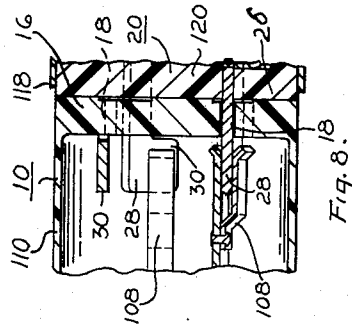


Fig. 8.

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3,120,987

ELECTRICAL CORD CONNECTOR HAVING AN IMPROVED PROTECTIVE COVERING

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11 Claims. (Cl. 339-60)

This invention relates generally to detachable electrical wiring devices, particularly to electrical cord connectors and more particularly to protective coverings therefor.

There are many detachable electrical wiring devices, such as electrical cord connectors, that are frequently used with flexible, heavy, resiliently sheathed electrical cords which are used in industrial, marine, trailer and garage areas to permit selective connection and disconnection of the cords, wherein the cords are subjected to water, moisture, metal filings, dust, dirt, lint and rough physical usage, including being knocked against hard floors and objects. In such environments, conventional electrical cord connectors are inadequate in that they are unable to withstand such severe conditions, and are subject to malfunctioning and destruction if exposed to such severe conditions, as by having their metallic elements corroded, having their contacts shorted out, having their usual brittle insulating bodies cracked, and by having other physical or functional breakdowns.

It is an object of the invention to provide a protective covering for an electrical wiring device, particularly an electrical cord connector, which covering becomes operatively effective to provide a fluid-tight covering for the entire electrical cord connector simply by connecting the usual connector components in the usual manner.

Another object of the invention is to provide an improved electrical cord connector covering as set forth in the preceding paragraph wherein the covering also functions as a shock absorber to protect the connector components from physical shocks, such as those which result from dropping the connector on a hard floor or knocking it against a hard object.

Other objects and further details of that which we believe to be novel and our invention will be clear from the following description and claims taken with the accompanying drawings, wherein:

FIG. 1 is a perspective view of one of the connector components having a protective cover contemplated by the invention mounted on it and showing the front connecting end thereof;

FIG. 2 is a view similar to FIG. 1 but showing the other connector component and its protective cover;

FIG. 3 is a side elevational view showing the connector components with their assembled covers in an intermediate stage of connecting the connector components to each other, with cooperating portions of the covers broken away and shown in section for the sake of clarity;

FIG. 4 is a longitudinal sectional view taken through the connector components and their assembled covers after they have been fully connected, with portions of the connector components and their connected electrical cord sections shown in elevation to simplify the drawings;

FIG. 5 is a longitudinal sectional view taken through the cover for one of the connector components showing it in its free unassembled condition;

FIG. 6 is a view similar to FIG. 5 but of the cover for the other connector component;

FIG. 7 is a sectional view taken substantially on line 7-7 of FIG. 4;

FIG. 8 is a sectional view taken substantially on line 8-8 of FIG. 7, and

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FIG. 9 is an enlarged fragmentary sectional view of portions of a modified form of the invention.

In Patent No. 2,127,544, of C. T. Von Holtz, dated August 23, 1938, entitled Waterproof Rubber Covering for Cord Connectors, there is disclosed a waterproof rubber covering for an electrical cord connector of the general type to which our invention relates. In that patent a rubber covering is disclosed comprising two rubber covers which are individually mounted on two connector components and arranged to become operative on connection of the connector components in the usual manner to effect a seal to render the connector waterproof. Although the invention in the Von Holtz patent is fully satisfactory for its intended purposes, and has, in fact, met with wide-scale commercial usage and success, our invention constitutes a definite and distinct improvement thereover.

In FIG. 1 there is illustrated a connector body 10 having a section 12 of electrical cord electrically connected to its contacts internally thereof in any convenient known manner and a rubber cover 14 mounted on it and on a portion of the electrical cord section. The particular construction of the connector body 10 forms no specific part of our invention, as it may take many varied and different forms; however, the one illustrated is of the interlocking type, that is, the type which is constructed to receive the usual interlocking contact blades formed on the other connector component. It should be fully understood at the outset, however, that although the preferred form of the invention involves the utilization of an interlocking connector, the invention is not limited to including an interlocking connector and may be utilized with noninterlocking electrical connectors. In fact, the invention is not limited to utilization with or incorporation into electrical cord connectors, for it may be incorporated into other types of detachable electrical wiring devices, such as those which include an attachment cap and a receptacle. In FIG. 1 there is shown the generally flat, circular, diametral front face of the front wall 16 of connector body 10, which is accessible and visible through the adjacent front end of the connector body cover 14. A plurality of arcuate slots 18 are formed in the wall 16 and arranged to receive the interlocking contact blades of the other connector component.

The other connector component is shown in FIG. 2 and it comprises a connector cap 20 having a section 22 of electrical cord electrically connected to its contacts internally thereof in any convenient known manner, and a rubber cover 24 mounted on it and on a portion of the electrical cord section. The particular construction of connector cap 20 forms no specific part of our invention; however, it is designed to be complementary to connector body 14 and to cooperate therewith to effectuate electrical connection. Since the FIG. 1 connector body 10 is illustrated as being of the interlocking type, the connector cap 20 is also of the interlocking type. In FIG. 2 the generally flat, circular, diametral front face of the front wall 26 of connector cap 20 is shown, which is accessible through the adjacent front end of the connector cap cover 24. A plurality of projecting male contact blades 28, which are of the interlocking type, are supported by front wall 26 and are constructed and arranged to be inserted into the arcuate slots 18 in the connector body 10 and to cooperate therewith to both make electrical connection with the usual female contacts therein and also to effect a physically locked connection. This general type of interlocking electrical connector is well known in the electrical wiring device art and one particular type is described in the referred-to Von Holtz patent. This type of interlocking connector ordinarily operates by having the two connector com-

ponents juxtaposed with their front ends facing each other and moved longitudinally toward each other so as to cause the connector cap male contact blades to be inserted through slots into the connector body female contacts to effect electrical connection of the contacts, and thereafter on twisting of the electrical components relative to each other to cause lateral lugs on the male contact blades to engage internal wall portions formed adjacent the slots in the connector body to prevent separation of the components by longitudinal separating movement.

In FIG. 2 the locking lugs of male contact blades 28 are designated by reference numeral 30, and one of the connector cap male contact blades is formed slightly differently from the contact blades 30 and designated by reference numeral 32. Male contact blade 32 includes a bent-over tab 34 which is configured in such a manner that it can only be received in the special slot 36 formed in the front wall 16 of the connector body 10. In the illustrated embodiment, male contact blade 32 is intended to function as a "grounding" contact and to engage a cooperating "grounding" female contact in the connector body 10 positioned behind slot 36. The arrangement is such that the connector components may be connected in only one manner, and thereby the polarity of the contacts is controlled and only the grounding male contact blade may be connected with the grounding female contact. However, this grounding feature may be omitted, if desired, for it forms no specific part of our invention.

Connector body cover 14 and connector cap cover 24 are shown by themselves in their free unassembled conditions in FIGS. 5 and 6, respectively. Both of these covers are made of a tough, but resilient, material, such as a relatively heavy, live rubber, which may be natural or synthetic. Connector body cover 14 on its exterior comprises a central axially extending cylindrical portion 38, a rearwardly and inwardly tapering conical portion 40 that terminates in a relatively short and small diameter tubular portion 42, and a forwardly extending enlarged cylindrical portion 44. On the exterior of connector body cover 14 the cylindrical portions 38 and 44 may be conveniently connected by conical portion 46. Internally of the connector body cover 14 there is formed a complete but nonuniform axial passageway. Within the enlarged cylindrical portion 44 there are formed a pair of spaced flat, radially inwardly extending flanges 48 and 50. The portion of the cover 14 at the right hand side of FIG. 5 will be referred to for convenience as the front end of the cover 14; therefore, the flange 48 will be designated the front flange and the flange 50 as the inwardly spaced flange. The flanges 48 and 50 are formed by a deep annular groove 52 and by an adjacent rearwardly spaced shallower annular groove 54. The flanges 48 and 50 have circular openings 56 and 58, respectively, formed therein. The flange 50 has a flat annular forwardly facing face 59 which functions as a major sealing element, as will become apparent subsequently. Within the cylindrical portion 38 of the connector body cover 14 a radially inwardly extending rib 60 is formed by an annular shallow groove 62 that is spaced rearwardly from the annular shallow groove 54. The rib 60 has a central opening 64 formed therein, and an annular flat radial rearwardly facing shoulder 65. The groove 62 forms an internal cylindrical wall on which are formed a plurality of circumferentially spaced axially extending ridges 66. Rearwardly adjacent to the groove 62 is a cylindrical wall 68 of lesser diameter than the groove 62 which cooperates therewith to form an annular, flat, radial, forwardly facing shoulder 70 therebetween. The wall 68 merges at its rearward end with a radially inwardly and rearwardly tapered wall 72 that terminates in a short and small diameter tubular wall 74. FIG. 5 illustrates the approximate thicknesses of the

various portions of the connector body 14 at the time when it is in its free unassembled condition.

In FIG. 6 it will be seen that when in its free unassembled condition the connector cap cover 24 comprises on its exterior a generally cylindrical portion 76, a rearwardly and radially inwardly tapered conical portion 78, and a short and small diameter tubular portion 80. In FIG. 6 the portion of the connector cap cover 24 that is located at the left hand side of this view is referred to as the front of the cover 24. It will be seen that on the periphery of the front end of the cylindrical portion 76 there is formed a slightly radially outwardly extending tapered conical portion 82, an annular radially inwardly extending somewhat V-shaped groove 84, and a radially outwardly extending tapered flange 86 that will herein be referred to as a sealing lip. The front face 88 of the sealing lip 86 is planar, but slightly conical, that is, annular and slightly tapered radially inwardly and rearwardly. On the interior of the cover 24, within the cylindrical portion 76 there is formed a shallow annular groove 90 that cooperates with the sealing lip 86, which has a central opening 92 of lesser diameter than that of the groove 90 to form a radially inwardly extending rib 94 having a flat annular radial rearwardly facing shoulder 95. The groove 90 forms a radially inwardly facing cylindrical wall that has a plurality of circumferentially spaced axially extending ridges 96 formed thereon. Adjacent to the groove 90 on its rearward side is a cylindrical wall 98 of lesser diameter relative thereto and which cooperates therewith to form a flat annular radial forwardly facing shoulder 100 therebetween. The wall 98 at its rearward side merges with a radially inwardly and rearwardly tapered conical wall 102 that terminates in short and small diameter tubular wall 104.

In FIG. 1, the cover 14 is illustrated as mounted on the connector body 10 and cable section 12, and in FIG. 2 the cover 24 is illustrated as mounted on the connector cap 20 and the cable section 22. In order to mount these covers on their respective connector components, it is necessary that they be stretched and distorted, and therefore, after being fully mounted, they are securely mounted and snugly embrace their associated connector component. In order to assemble the covers to their respective connector components and cord section, the following general procedure, which will be described with relation to the mounting of cover 14 on connector body 10, must be followed; however, it should be understood that the same general procedure is employed for mounting the cover 24 on the connector cap 20. Before the cover 14 is mounted on the connector body 10 and before the cord section 12 is connected to the connector body, the free end of the cord section to be connected to the connector body is inserted through the tubular portion 42 of the cover from its rearward side. In order to insert the cord section 12 through the tubular wall 74 it is necessary to force it therethrough and expand the tubular portion 74 whereby the latter snugly embraces the periphery of the cord section after it is mounted thereon and thereby provides a fluid-tight seal thereabout. The free end of the cord section 12 is then passed through the usual connector body cord clamp 106 (see FIG. 4) and into the connector body 10 where the individual wires of the cord section are individually connected in any convenient known manner to the female contacts 108 that are mounted therein (see FIG. 8). The particular construction of the connector body will not be described in detail; however, it does include, in addition to the previously described front wall 16, a cylindrical body section 110 which may be integral with the front wall, and both may be made of a rigid electrical insulating material, such as a hard rubber or plastic. The connector body includes a cup-shaped metallic shell 112 which is rigidly connected to the body section 110 in any convenient known manner, as by utilizing elongated screws 114 (see FIG. 1) that may be anchored in threaded

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openings in the shell 112 to assemble the connector body as a unit after electrical connection of the individual wires of cord section 12 to the female contacts in the connector body has been made. The shell 112 supports the cord clamp 106, which may be of any desired known construction, in any desirable known manner. After the cord section 12 has been electrically connected to the connector body 10, the cord clamp may be tightened on the cord section to relieve any strain on the connections of the cord section wires with the female contacts in the connector body. Thereafter, the cover 14 is drawn forwardly over the cord clamp 106, shell 112 and body section 110 until it reaches its fully assembled position wherein it completely envelopes these parts except for the front face of the front wall 16 (see FIG. 1).

After the cover 14 is fully mounted on the connector body 10, the dispositional relationship of these parts is as illustrated in FIG. 4, wherein the following will be observed: The metallic shell 112 is axially "captured" between the flat spaced annular confronting shoulders 70 and 65, and therefore, relative axial movement of the cover 14 and metallic shell 112, and hence the entire connector body 10, is prevented. The metallic shell 112 tightly fits within the groove 62 in the cover 14 and, in fact, squashes the ridges 66, whereby the latter function to prevent rotation of the metallic shell, and hence the entire connector body 10, relative to the cover 14. Therefore, the cover 14 is rigidly mounted on connector body 10 and incapable of moving relative thereto, except for certain sealing portions thereof, as will become apparent. The cord clamp 106 is disposed within the conical portion 72 and cylindrical portion 68 of the cover 14. The tubular portion 42 of cover 14 has a larger diameter than it originally had in its free condition (compare these diameters in FIGS. 4 and 5) and snugly embraces the periphery of the cord section 12. The front face of front wall 16 of the connector body is substantially coplanar with the forwardly facing face 59 of the inner flange 50 of the cover 14. The connector body cylindrical portion 44 overhangs the front end of the connector body, that is, it projects axially beyond the front wall 16. FIG. 4 illustrates the precise structural relationship of the cover 14 and connector body 10 when they are assembled except for the position of the front flange 48. Since FIG. 4 shows all the parts positioned when the connector components are connected, the front flange 48 is shown in its sealing condition, wherein it is deformed from its normal free position which is as shown in FIG. 5, in which it extends radially inwardly, parallel to inner flange 50.

FIG. 4 also clearly illustrates the dispositional relationship of the cover 24 and connector cap 20 after these parts are fully assembled, and in this regard the following should be observed in FIG. 4: The connector cap 20 includes a cup-shaped metallic shell 118 that internally rigidly supports a body section 120 (see FIG. 8) made of a rigid insulating material, such as hard rubber or plastic. Body section 120 includes the previously referred to front wall 26 which supports male contact blades 28 and 32. Shell 118 supports a cord clamp 122 that clamps the cord section 22 so as to function as a strain relief for the connection of the individual wires of cord section 22 and the male contacts within the connector cap. The shell 118 is axially captured between the shoulders 100 and 95 of the cover 24, and therefore, relative axial movement of the cover 24 and shell, and hence the entire connector cap 20, is prevented. The shell 118 tightly fits within the groove 90 in the cover 24 and squashes the ridges 96 formed therein, whereby the latter function to prevent rotation of the shell 118, and hence the entire connector cap 20, relative to the cover 24. The cord clamp 122 is disposed generally within the conical portion 78 and cylindrical portion 98 of the cover 24. The tubular portion 80 of the cover 24, which has been distorted in order to force the cord sec-

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tion 22 through it, has a larger diameter than it originally had in its free condition (compare FIGS. 4 and 6). The front face of the connector cap body section 120 is substantially coplanar with the front face 88 of the sealing lip 86; however, the latter is slightly tapered away therefrom. The disposition of the cover 24 when it is mounted on the connector cap 20 is precisely as illustrated in FIG. 4, except that the front face 88 of the cover sealing lip 86 is not exactly coplanar with connector cap front face, but rather slightly tapered as in its normal free condition. FIG. 4 shows the parts positioned when the connector components are connected, and therefore, the sealing lip 86 is shown deformed and in sealing condition wherein its face 88 is precisely coplanar with front face of front wall 26.

With the covers 14 and 24 individually mounted on the connector body and connector cap, respectively, they appear as illustrated in FIGS. 1 and 2. In order to connect the connector cap to the connector body, they are juxtaposed with their front ends adjacent and axially aligned with the connector cap male contact blades 28 in registry with the connector body slots 18. In the illustrated embodiment, as previously pointed out, it is also necessary to align the grounding male contact blade 32 with the slot 36 in the connector body. When this is done, the connector components are moved axially toward each other. FIG. 2 illustrates the connector parts in an intermediate connected condition prior to full connection. It will therein be observed that the covers 14 and 25 are dimensioned in such a manner that the front end of the cover 24 snugly fits within the cylindrical portion 44 of the cover 14 and its sealing lip 86 contacts the front side of the forward flange 48 and both the sealing lip and this flange are deflected in opposite axial directions. On forcing the connector components axially toward each other further, the flange 48 is deflected wholly within the cylindrical portion 44 further and ultimately to the point whereby it is distorted from its original flat radial disposition to a substantially cylindrical disposition, whereby the sealing lip 86 passes axially past it and is lodged against the front face 59 of inner flange 50.

This fully connected condition is illustrated in FIG. 4, wherein it will be observed that at this time the sealing lip 86 has unstressed itself and undeflected relative to its FIG. 3 intermediate connected condition to a considerable extent, but that it is still slightly deflected relative to its original unstressed condition, shown in FIG. 6, and that the result is that its planar face 88 is biased axially against and into tight sealing contact with the planar face 59 of the flange 50 and is substantially coplanar therewith. At this time it will also be observed in FIG. 4 that the forward flange 48 has been forced past conical portion 82 of cover 24 and has complete peripheral sealing contact therewith. When the connector components have been moved longitudinally toward each other and achieved the FIG. 4 position, they are effectively sealed in the zone of their areas of connection, and the cooperating portions of the covers 14 and 24 function to retain the covers in the assembled condition illustrated in FIG. 4. However, if an interlocking type of electrical connector is involved, as is illustrated, the connection of the connector components may be locked against longitudinal separation by rotating them with their covers relative to each other after they have been fully longitudinally connected. It should be understood, however, that it is not essential that an interlocking connector be involved and that the connector components be locked in this manner; however, when such an interlocking connector is involved, the overall arrangement is most effective, and therefore, this is the preferred arrangement.

There are two areas where the covers 14 and 24 cooperate to provide effective fluid-tight seals in the FIGS. 1-8 modification of the invention, in addition to the seals which they provide about their associated cord sections. By reference to FIG. 4, the first sealing area has been

designated by reference character A, and it comprises an annular radial area of planar contact between the face 59 of the flange 50 of the cover 14 and the face 88 of the sealing lip 86 of cover 24. The second sealing area is designated by reference character B, and comprises an annular circumferential area of sealing contact between the outer surface of conical portion 82 of cover 24 and the surface of flange 48 of cover 14 which faces generally radially inwardly at this time. The overall arrangement is such that the connector body 10, the connector cap 20, their associated elements and the portions of cord sections 12 and 22 that are disposed within the covers, are all effectively sealed. The covers 14 and 24 are dimensioned relative to the connector components so as to provide for a sufficient amount of axial compression between the interengaging faces of the covers (face 59 and face 88) when the connector components are connected to effectuate sealing area A. The covers are dimensioned and designed so as to provide for a sufficient amount of circumferential compression between the conical portion 82 and flange 48 to effectuate sealing area B. Throughout connection of the connector components, their covers are rigidly retained in proper assembled condition, notwithstanding the stresses to which the cooperating sealing portions of the covers are subjected which tend to move the covers axially on their cord sections, by the axial restraining effect of the shoulders 65 and 70 of cover 14 and shoulders 95 and 100 of cover 24.

In FIG. 9 there are illustrated portions of a modification of the invention, which is identical to the FIGS. 1-8 form of the invention in all respects other than one. Therefore, most parts are similar and they will be designated by similar reference characters to those used in FIGS. 1-8 with a prime (') added. It should be understood that the construction and operation of the FIG. 9 form are identical to those of the FIGS. 1-8 form in all respects other than those specifically mentioned as being different.

It will, therefore, be seen in FIG. 9 that the connector body 10' having a metallic shell 112' and a body section 110' with a front wall 16' has a cover 14' mounted on it, and that connector cap 20' having a metallic shell 118' and a body section 120' has mounted on it a cover 24'. The cover 24' is identical to cover 24 in the first modification and includes conical portion 82', an external peripheral groove 84', a sealing lip 86', a rib 94' and a front face 88'.

Cover 14' includes an inner flange 50' having a front face 59' and a forward flange 124 which is similar to forward flange 48 of the first modification with one important exception: flange 124 extends radially inwardly to a greater extent than flange 48. When the covers 14' and 24' are in their free unassembled condition, they are substantially the same as their counterparts illustrated in FIGS. 5 and 6, respectively, the only difference being that the flange 124 extends radially inwardly farther than the flange 48. On the connector body 10' and connector cap 20' being connected, the parts assume the position illustrated in FIG. 9, wherein it will be observed that the additional radial length of the flange 124 results in effectuating a third area of sealing designated by reference character C. Therefore, in the modified FIG. 9 form of the invention there are three areas of sealing:

(1) Area A', which is identical to sealing area A of the first form and substantially radial and annular, being formed by the engaging planar faces 59' of cover 14' and 88' of cover 24';

(2) Area B', which is identical to sealing area B of the first form and substantially circumferential and formed by conical portion 82' of cover 24' and the radially inwardly facing side of the flange 124 of cover 14' when the latter is in the FIG. 9 sealing position, and

(3) Area C formed by the circular free edge of the flange 124 making firm contact with the annular flat inclined wall 126 which in part forms the groove 84'.

As will be evident from the foregoing description, certain aspects of our invention are not limited to the particular details of construction of the examples illustrated, and we contemplate that various and other modifications and applications will occur to those skilled in the art. It is, therefore, our intention that the appended claims shall cover such modifications and applications as do not depart from the true spirit and scope of our invention.

What we claim as new and desire to secure by Letters Patent of the United States is:

1. A detachable electrical connector for an electrical cord comprising: two detachable connector components; each connector component comprising a body; electrical contact means carried by each body and arranged to be brought into engagement on said connector components being moved longitudinally toward each other; each of said bodies arranged to have a separate electrical cord section connected to its contact means; a separate resilient cover supported on and substantially enveloping each body except for their front ends which are adjacent and confronting when the connector components are operatively associated; each cover having an opening for the passage of a cord section associated with the body on which it is supported; each cover having means to effect a fluid-tight seal where its associated cord section passes through its opening; one of said covers having its longitudinal front end facing the other cover and having an overhanging portion projecting longitudinally beyond its associated body; a pair of longitudinally spaced transversely inwardly extending flanges formed on said overhanging portion that generally define a sealing zone; the flange that is spaced longitudinally outward on said overhanging portion being more flexible than said overhanging portion, the other of said covers having a longitudinal front end that faces the longitudinal front end of said one cover and is dimensionally related thereto so that on moving said connector components longitudinally toward each other with their covers mounted thereon the longitudinal front end of said other cover contacts and deforms said outwardly spaced flange longitudinally inwardly and is insertable longitudinally within said overhanging portion into the sealing zone and when the connector components are fully connected with their contact means engaged the end of the longitudinal front end of said other cover is in continuous transverse fluid-tight sealing contact with a longitudinal side of the flange that is spaced inwardly on said overhanging portion and said outwardly spaced flange is deformed so as to have its normally outermost side in continuous peripheral fluid-tight sealing contact with the periphery of said other cover, said overhanging portion being dimensioned to provide a sealing zone of sufficient volume to accommodate said outwardly spaced flange when deformed and the front end of the other of said covers.

2. The combination defined in claim 1 which further includes interlocking means on said connector components that operates to prevent their separation after they are connected and interlocked by longitudinal separating movement alone; said interlocking means being rendered operative by relative turning movement of said connector components after they have been connected by being longitudinally moved toward each other.

3. The combination defined in claim 2 wherein said covers include means in the form of internal axially extending ridges for preventing turning of themselves relative to their associated connector component bodies when said connector components are turned relative to each other.

4. A detachable electrical connector for an electrical cord comprising: two detachable connector components; each connector component comprising a body; electrical contact means carried by each body and arranged to be brought into engagement on said connector components being moved longitudinally toward each other; each of said bodies arranged to have a separate electrical cord

section connected to its contact means; a separate resilient cover supported on and substantially enveloping each body except for their front ends which are adjacent and confronting when the connector components are operatively associated; each cover having an opening for the passage of a cord section associated with the body on which it is supported; each cover having means to effect a fluid-tight seal where its associated cord section passes through its opening; one of said covers having its longitudinal front end facing the other cover and having an overhanging portion projecting longitudinally beyond its associated body; a pair of longitudinally spaced transversely inwardly extending flanges formed on said overhanging portion that generally define a sealing zone; the flange that is spaced longitudinally outward on said overhanging portion being more flexible than said overhanging portion, the other of said covers having a longitudinal front end that faces the longitudinal end of said one cover and has a continuous forwardly and transversely outwardly inclined lip; the dimensional relationship between said lip and said flanges being such that on moving said connector components longitudinally toward each other with their covers mounted thereon said lip contacts and deforms said outwardly spaced flange longitudinally inwardly and is insertable longitudinally within said overhanging portion into the sealing zone and when the connector components are fully connected with their contact means engaged the end of said lip is in continuous transverse fluid-tight sealing contact with a longitudinal side of the flange that is spaced inwardly of said overhanging portion and said outwardly spaced flange is deformed so as to have its normally outermost side in continuous peripheral fluid-tight sealing contact with a portion of said other cover.

5. The combination defined in claim 4 wherein an annular outwardly facing transverse groove is formed adjacent said lip; and said outwardly spaced flange extends across said groove and its free edge makes transverse fluid-tight sealing contact with a side wall of said lip on the groove side thereof.

6. A pair of cooperating protective covers for a pair of electrical cord connector components comprising: a first resilient cover adapted to be mounted on one of the connector components including a portion for receiving and snugly embracing a cord section that is connected to the one of the connector components; a portion for surrounding and gripping the one of the connector components; a cylindrical overhanging portion at the front end of said first cover extending axially beyond where the front face of the one of the connector components on which said first cover is adapted to be mounted is disposed when it is mounted thereon; and a pair of axially spaced radially inwardly extending flanges formed on said overhanging portion; the flange that is spaced axially outwardly on said overhanging portion being more flexible than said overhanging portion; and a second resilient cover adapted to be mounted on the other connector component including a portion for receiving and snugly embracing a cord section that is connected to the other connector component; a portion for surrounding and gripping the other connector component, and a continuous annular forwardly inclined lip at the front end of said second cover; said covers being dimensioned relative to each other in such a manner that the front end of said second cover is axially insertable within said overhanging portion by contacting and deforming said outwardly spaced flange axially inwardly, and said lip is arranged to be received fully therein with the front face of said lip in planar fluid-tight sealing contact with a planar side of the flange on the inner side of said overhanging portion and the outwardly spaced flange deformed so as to have its normally axially outermost side in peripheral fluid-tight sealing contact with an annular portion of said second cover.

7. The combination defined in claim 6 wherein: said lip is inclined radially outwardly; an annular outwardly facing groove is formed adjacent said lip; and said outwardly spaced flange is dimensioned so as to extend across said groove and have its free edge make annular fluid-tight sealing contact with a side wall of said lip.

8. A protective cover adapted to be mounted on a fully assembled connector component comprising a resilient unitary body having: a portion for receiving and snugly embracing a cord section that is connected to the connector component; a portion for surrounding and gripping a connector component; a cylindrical overhanging portion extending axially beyond where the front face of the connector component on which it is adapted to be mounted is disposed when it is mounted on the connector component; and a pair of axially spaced radially inwardly extending flanges formed on said overhanging portion, the outermost flange being thinner and more flexible than said overhanging portion whereby it is capable of being deformed within said overhanging portion in operation said overhanging portion being dimensioned to accommodate the outermost flange when deformed.

9. A detachable electrical connector for an electrical cord comprising: two detachable connector components, one a connector body and the other a connector cap; each connector component comprising a substantially cylindrical body; electrical contact means carried by each body and arranged to be brought into engagement on said connector components being moved axially toward each other; each of said bodies arranged to have a separate electrical cord section connected to its contact means; a separate resilient cover supported on and substantially enveloping each body except for their front ends which are adjacent and confronting when the connector components are operatively associated; the cover mounted on said connector body being unitary and resilient and including a portion for receiving and snugly embracing the cord section that is connected to said connector body, a cylindrical portion that surrounds and grips said connector body so as to prevent relative axial movement between said connector body and its cover, a cylindrical overhanging portion extending axially beyond the front end of said connector body and a pair of axially spaced radially inwardly extending flanges formed on said overhanging portion; the flange that is spaced axially outwardly on said overhanging portion being more flexible than said overhanging portion; the cover mounted on said connector cap being unitary and resilient and including a portion for receiving and snugly embracing the cord section that is connected to said connector cap, a cylindrical portion that surrounds and grips said connector cap so as to prevent relative axial movement of said connector cap and its cover, and a continuous annular forwardly and radially outwardly inclined lip at the front end of the cover for said connector cap; said covers being dimensioned relative to each other in such a manner that the front end of said connector cap cover is axially insertable within said overhanging portion by contacting and deforming said outwardly spaced flange axially inwardly, and said lip is arranged to be received fully therein with the front face of said lip in planar fluid-tight sealing contact with a planar side of the flange that is located on the inner side of said overhanging portion and the outwardly spaced flange deformed so as to have its normally axially outermost side in peripheral fluid-tight sealing contact with an annular portion of the connector cap cover.

10. The combination defined in claim 9 wherein an annular outwardly facing groove is formed adjacent said lip; and said outwardly spaced flange extends across said groove and its free edge makes transverse fluid-tight sealing contact with a side wall of said lip on the groove side thereof.

11. The combination defined in claim 9 wherein said connector components include interlocking means for pre-

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venting their axial separation after they are connected and interlocked, said interlocking means being arranged to be rendered operative by relative turning movement of said connector components after they have been connected by being axially moved toward each other; and said covers include means in the form of internally extending ridges for preventing turning of themselves relative to their associated connector components when said connector components are turned relative to each other.

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