COVERING FOR A CONNECTING MEMBER

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This invention relates to coverings to encase connector members. It is known to provide coverings with coverings as by a manual operation, molding the coverings onto the connecting members, placing the coverings onto the connecting members and then thermally fixing them thereon, or crimping the coverings onto the connecting members. The manual, molding and thermal application of the coverings onto the connecting members are time-consuming. The manual application is also awkward and generally precludes exact positioning of the coverings onto the connecting members. Once the coverings have been applied to the connecting members by molding, thermal and crimping techniques, the coverings are not removable for inspection of the connecting members; and once they are removed, they are not reusable. Thermally applied coverings also generally contain flash projections which impede the use of the connecting members therein.

It is, therefore, an object of the present invention to provide coverings for connecting members that completely encase connecting members, are capable of being opened for purposes of inspection and are reusable.

Other objects and attainments of the present invention will become apparent to those skilled in the art upon a reading of the following detailed description when taken in conjunction with the drawings in which there are shown and described illustrative embodiments of the invention; it is to be understood, however, that these embodiments are not intended to be exhaustive nor limiting of the invention but are given for purposes of illustration and principles thereof and the manner of applying them in practical use so that they may modify them in various forms, each as may be best suited to the conditions of a particular use.

In the drawings:

FIGURE 1 is a perspective view of a covering in the open position;

FIGURE 2 is a side elevational view of FIGURE 1;

FIGURE 3 is a side elevational view of the covering in a closed position on a connecting member;

FIGURE 3a is a front elevational view of FIGURE 3; and

FIGURES 4, 5 and 6 are views taken respectively along lines 4—4, 5—5 and 6—6 of FIGURE 3.

The present invention will be discussed in relation to coverings taking the form of insulating pods to be applied to connecting members in the form of flag-type electrical connectors as set forth in U.S. Patent No. 3,123,431.

Turning now to the drawings in FIGURES 1—6, there is illustrated an insulating pod P preferably molded from plastic material such as nylon, polypropylene, etc. Pod P includes two sections 1 and 2 interconnected by hinge sections 3. Section 1 is a base section and comprises three wall sections 4, 5 and 6 extending outwardly from a floor section 7. Wall sections 4 and 6 include outwardly projecting sections 8 and 9, respectively. Sections 8 and 9 have an inclined surface 10 at the top thereof. Wall 4 has a generally hemispherical depression 11 in the top thereof which extends across section 8.

Walls 4 and 6 have two sections, rear sections which have the same height as wall 5 and other sections forward thereof which have less height. Each of these sections includes an inclined surface 12 which has the same inclination as inclined surface 10. The top parts of the forward sections of walls 4 and 6 each include a projection 13. Downwardly from projections 13 on the outer surface of walls 4 and 6 are locating projections 14 which include inclined surfaces 15. The inner surface of wall 4 includes a projective surface 14 (see FIGURE 5) which extends from the front end to a point about midway between projection 13 and inclined surface 10.

At the forward end of floor 7 there is a projection 16 (see FIGURE 1) which extends slightly above the floor. Spaced ribs 17, 18 and 19 extend upwardly from floor 7 and are connected to rear wall 5. Ribs 17 and 18 have the same height while the height of rib 19 is slightly lower. Ribs 18 and 19 have upwardly projecting stops 18' and 19', respectively. Between rear wall 5 and hinges 3, there is a projection 20 which contains a hemispherical groove 21 in the upper surface.

Section 2 is a top section which includes a generally hollow hemispherical section 32 which merges into a flat section 33. Side walls 24 and 25 extend outwardly from the sides of section 2 and are arcuate across an opening 26 in the outer portion thereof which are adapted to engage locking projections 14. Wall 24 has a generally hemispherical depression 27 which, when the top section is in a closed position on the base section, forms a generally circular opening as shown in FIGURE 3.

As can be discerned, the inner periphery of section 2 has a configuration which mates with the tops of walls 4, 5 and 6 and projections 13 are disposed within depressions 28 in the bottom surface of flat section 23 adjacent openings 36 when the top section is in a closed position on the base section. Also, the uppermost configuration of walls 24 and 25 corresponds with the bottom of side walls 4 and 6, the inclination of inclined surfaces 15 and the top surface of sections 8 and 9 when the pod is in the closed position, as shown in FIGURE 3. Of course, the inside width between walls 24 and 25 is slightly larger than the outside width between walls 4 and 6 so that walls 24 and 25 can be positioned over walls 4 and 6.

The inner surface of flat section 23 comprises thin flexible ribs 29 which are spaced inwardly from depressions 28. Similar flexible ribs 30 are disposed within the inner surface of section 22. At the outer end of flat section 23 is an inwardly directed portion 31 which contains a centrally located projection 31' (see FIGURE 3a). Between hinges 3 and section 22, there is a projection 32 having a groove 33 in its upper surface which, as shown in FIGURE 3, forms with groove 21 a circle when the pod is in a closed position.

The electrical connector to be housed in pod P is shown in FIGURE 5 and is designated as E. The electrical connector comprises a ferrule portion 33a, a contact portion 34 and struts 35 and 36 interconnecting the ferrule and contact portions. Ferrule portion 33a is normal to the longitudinal axis of the electrical connector and is preferably crimped onto the wire and insulation of conductor means 37. The contact portion has a base or web 38 which has an arcuate cross-sectional configuration as shown in FIGURE 6. The contact portion also includes sides 39 which extend parallel to the plane passing through the axis of the connector. Edges 40 of sides 39 are bent inwardly and back toward the inner surface of base 38. As can be discerned, strut 36 has a curved orientation. This slight curvature is imparted to the strut during crimping as a result of elongation of the ferrule portion 33a of the terminal. By virtue of the fact that the strut is curved, damage to the receptacle portion of the terminal is avoided during crimping as fully explained in the above-mentioned patent.

In assembly, electrical connector E is placed within section 1 of pod P as shown in FIGURE 5. Ferrule portion 33a rests on ribs 17, 18 and 19 as shown in FIGURES 4 and 5. Stops 18' and 19' prevent the connector
from moving forwardly in section 1. The inner surface of wall 6 limits the side movement of the side of strut 36 and side 39 of the contact portion in alignment therewith whereas the inner surface of wall 4 in the area of rib 19 and projecting surface 4' limit the side movement of strut 36 and side 39 of the contact portion in alignment therewith. Sides 39 rest on floor 7. Of course, the outside width of the connector is slightly less than that of the inner width of walls 4 and 6 to allow the connector to be readily inserted within section 1. Conductor means 37 rests in hemispherical depression 11.

After the connector has been inserted in section 1, section 2 is then moved into engagement with section 1 so that openings 26 engage locking projections 14 to lock the pod on the connector. Inclined surfaces 15 facilitate the movement of sides 24 and 25 into their locked position.

After section 2 has been locked onto section 1 as shown in FIGURE 3, ribs 29 and 36, respectively, engage the contact portion and the ferrule portion as shown in FIGURES 6 and 4 to maintain constant pressure thereon so that the connector is stabilized within the pod and the sections of the pod are maintained in a positive locking condition. Hemispherical depression 27 surrounds the top part of conductor means 37.

FIGURE 3a shows the open front end of the pod ready to receive a tab connector element (not shown). Projections 16 and 31 serve to guide the tab element into the contact portion.

As can be discerned, pod P may be manually applied to a connector element to completely encase it. Pod P may also be removed from the connector element in order to inspect, clean or replace the element.

It will, therefore, be appreciated that the aforementioned and other desirable objects have been achieved, however, it should be emphasized that the particular embodiments of the invention, which are shown and described herein, are intended as merely illustrative and not as restrictive of the invention.

1. A covering for a connecting member comprising a first section and a second section, means for hingedly connecting said sections together, one of said sections having a receiving chamber therein to receive the connecting member therein, and locking means on said sections to lock said sections together when they are brought into engagement with each other to completely encase said connecting member, one end of the closed covering being open to provide access to the connecting member; ribs provided in the receiving-chamber section to properly orient the connecting member within the receiving chamber, additional ribs provided on the other section which engage the connecting member to stabilize same within said covering and to aid in maintaining the covering in a locked position.

2. An insulating pod for insulating an electrical connector comprising a first section and a second section, means for hingedly connecting said sections together for movement from an open position to a closed position, said first section having a receiving chamber in which the electrical connector is to be disposed, one of said sections having locking projections to the other of said sections having openings adapted to be engaged by said locking projections when the sections are in said closed position to lock said sections together, stabilizing means including pressure-applying means extending from one of said sections to engage the electrical connector when the pod is in the closed position to stabilize the connector therein, and rib members in said receiving chamber on which the electrical connector rests to orient it thereubin.

3. An insulating pod according to claim 2 wherein one end of the closed pod is provided with an opening for access to the electrical connector by another electrical connector.

4. For use on an electrical connector, an insulating pod comprising a first section having a chamber therein for receiving said connector, a second section adapted to fit on said first section to encase said connector, hinge means interconnecting said sections so that said pod can be moved between an open position to a closed position, one end of each section when said pod is in said closed position defining an opening for insertion therethrough by a connector element to engage the encased connector, locking means on said sections to lock said pod in said closed position, stabilizing means including pressure-applying means extending from said pod to stabilize connected therewith, and one of said sections comprising rib means on which said connector rests thereby orienting said connector in this one section.

5. The insulating pod according to claim 4 wherein locking means includes locking projections on one of said sections and openings on the other of said sections through which said locking projections pass.

6. The insulating pod according to claim 4 wherein said stabilizing means include rib members in one of said sections which engage said connector.

7. An insulating member for insulating an electrical terminal comprising a first section and a second section, one of said sections having a terminal-receiving chamber for receiving said electrical terminal therein, hinge means hingedly connecting said sections together for movement between an open position and a closed position, orienting means including protrusive support means on an interior surface of at least one of said sections for engagement with said electrical terminal to orient said electrical terminal in said terminal-receiving chamber, latching means on said sections to latch said sections together to maintain said sections in said closed position, and stabilizing means including pressure-applying means extending from an interior surface of at least one of said sections to engage the electrical terminal when said sections are in said closed position to stabilize said electrical terminal therein and to aid in maintaining said sections in said closed position.

8. A dielectric housing member for insulatingly encasing electrical terminal means including contact section means and conductor-engaging means, said dielectric housing member comprising first section means and a second section means, said first section means having terminal-receiving chamber means to receive said electrical terminal means, hinge means connecting means to permit said section means to be moved between an open position and a closed position, said section means in said closed position defining an opening, orienting means including protrusion support means on one of said section means and engageable with said electrical terminal means to orient said electrical terminal means so that said contact section means is coaxial with said opening, stabilizing means including pressure-applying means extending from one of said section means and spaced from said orienting means to stabilize said electrical terminal means in said terminal-receiving chamber means when said section means are in said closed position, and latching means on said section means for latching said section means in said closed position.

9. A dielectric housing member according to claim 8 wherein said stabilizing means aids said latching means to maintain said section means in said closed position.

10. A dielectric housing member according to claim 8 wherein said section means in said closed position defining another opening so that said conductor-engaging means can be coaxial therewith.

11. A dielectric housing member according to claim 8 wherein said section means in said closed position defining another opening disposed substantially at right angles with respect to said first mentioned opening so that
said conductor-engaging means can be coaxial with said other opening.

12. A dielectric housing member according to claim 8 wherein said orienting means and said stabilizing means comprise flexible rib means.

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