

July 30, 1963

F. W. SCHWARTZ
ELECTRICAL CONNECTOR

3,099,505

Filed Aug. 16, 1961

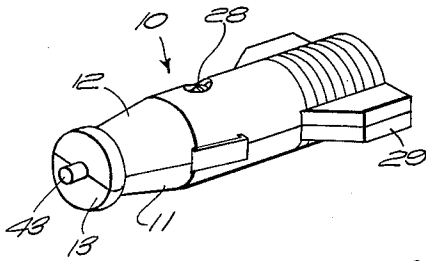


FIG. 1

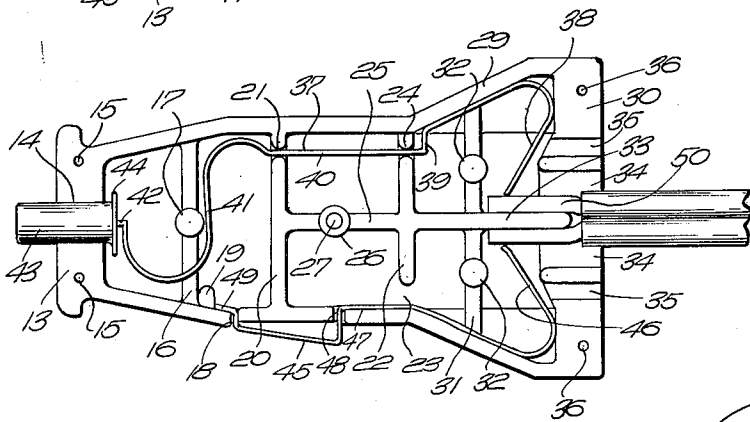


FIG. 2

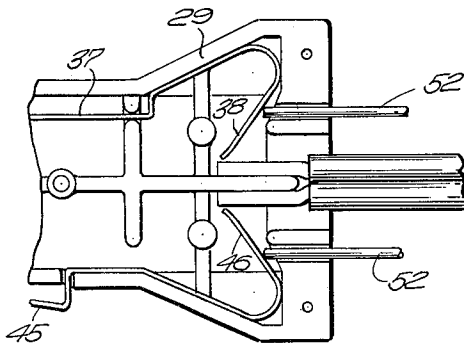


FIG. 4

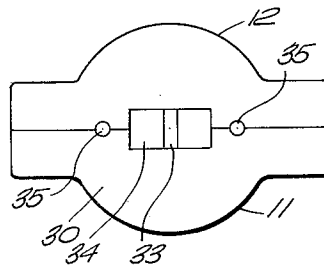


FIG. 3

INVENTOR.
FREDERICK W. SCHWARTZ
BY

Max Schwartz
ATTORNEY

1

3,099,505

ELECTRICAL CONNECTOR

Frederick W. Schwartz, Providence, R.I., assignor to Cable Electric Products, Inc., Providence, R.I., a corporation of Rhode Island

Filed Aug. 16, 1961, Ser. No. 131,772

1 Claim. (Cl. 339-95)

My present invention relates to the electrical art and more particularly to a novel electrical connector.

The principal object of the present invention is to provide an electrical connector in which the cord lead connections can be attached and disconnected rapidly.

Another object of the present invention is to provide an electrical connector in which the cord lead connections can be rapidly attached without soldering and without other connecting means.

A further object of the present invention is to provide an electrical connector having a pair of integral unitary blades which provide the contact area and also the cord holding device.

Another object of the present invention is to provide an electrical connector of simple construction and easy and economical to manufacture and assemble.

With the above and other objects and advantageous features in view my invention consists of a novel arrangement of parts more fully disclosed in the detailed description following in conjunction with the accompanying drawings and more particularly defined in the appended claims.

In the drawings,

FIG. 1 is a perspective view of an electrical connector embodying my invention.

FIG. 2 is an enlarged plan view of the connector with the cover removed.

FIG. 3 is an enlarged elevation of the rear of the connector.

FIG. 4 is an enlarged fragmentary plan view of the rear portion of the connector showing the method of releasing the cord connections.

In certain electrical appliances it has been found desirable to provide the connector with means for easily and rapidly connecting the cord lead wires. This permits the user to make his own repairs in the event the wire breaks. Such connectors must be provided with some means of holding the wire in addition to the contact means. The present invention provides an electrical connector having a pair of unitary one piece contact members. One end of the contact members is utilized for contacting and picking up the electric current. The other end is designed for rapid assembly with the electrical wires and without the use of special tools. The present invention can readily be applied to any type of electrical connector. However, for purposes of illustration it has been shown as applied to a more complex device used to plug into the cigarette lighter of a motor vehicle for the purpose of obtaining battery power for operating a light, razor, or any other appliance.

Referring more in detail to the drawings, the connector of the present invention comprises a housing 10 which is longitudinally split in two to form a bottom portion or base 11 and a cover portion 12. The housing 10 is made of dielectric material and can be molded out of rubber or plastic. In the illustrated form the housing is generally cylindrical. FIGS. 2 and 4 illustrate the internal construction of the base 11. The cover portion 12 is not further illustrated because its interior is identical with the base 11 except that it is a mirror image thereof.

Referring to FIG. 2, the base 11 is generally hollow and is provided with a thick front wall portion 13 having a central axial groove 14 which forms an annular opening when the cover 12 is in place. Spaced locating pins

2

15 are positioned on each side of the groove 14 and the cover portion 12 is provided with complementary openings for receiving the pins. Spaced from the front end the base 11 is provided with an integral transverse raised rib 16 having a central post 17. The post 17 extends to the height of the side walls of the base. The rib 16 extends approximately halfway up the side wall. Spaced from the ribs 16 rearwardly, and at the bottom in FIG. 2, the base 11 is provided with a slot 18 through the side wall. The vertical rib 19 is positioned at the inside just forwardly of the slot 18. Moving rearwardly, a second integral transverse rib 20 of the same height as the side walls extends across the base. Adjacent the upper edge is a slot 21. Spaced rearwardly from the rib 20 is a third transverse rib 22 also of the same height as the base wall. The rib 22 is short of the bottom edge leaving a gap 23. The rib 22 is also provided at its upper edge with a slot 24 in longitudinal alignment with the slot 21. The ribs 20 and 22 are connected integrally by a longitudinal rib 25 of the same height having a bearing portion 26 with a central opening 27 through which a nut and bolt 28 can be placed to lock the base and cover together.

From the rib 23 the housing tapers outwardly at 29 to provide room for the rear portion of the contact members. Since these members are narrow, the outwardly tapered portions 29 may be in the form of flat fins as shown in FIG. 1. The housing terminates in a comparatively thick rear end 30. Between the rib 22 and rear end 30 is a fourth transverse rib 31 of the same height as the forward rib 16 and having spaced posts 32 extending upwardly to the height of the side walls. A central longitudinal rib 33 extends from the rib 22 partially into the rear wall 30 and of the same height as the side walls. The rear wall 30 is cut away at 34 to provide a large opening around the rib 33 as shown in FIGS. 2 and 3. On each side of the opening 34 the rear wall is provided with a longitudinal groove 35 which forms a small opening when the cover is in place as shown in FIG. 3. Adjacent each side edge the rear wall may be provided with locating pins 36 similar to the pins 15.

The contact elements are each designed in a single unitary piece. Both elements are made from flat stock, preferably brass with a spring temper. Referring to FIG. 2, the upper contact element 37 has its rear end bent into a U-shape to form a spring arm 38 extending towards the central rib 33 and normally having its free end resting on said rib. The other arm of the V-shape rests on the rib 31 and is flat against the tapered wall portion 29. At the end of the taper is an S-shaped bend 39 leading to a straight portion 40 which passes through the slots 24 and 21. Forwardly of the rib 20 the contact element forms an S-shaped spring 41 which rests on the ribs 16 and terminates with a forwardly extending portion 42 which enters a rivet 43 extending through the opening 14. The inner end of the rivet 43 is provided with an enlarged flange 44. With this construction the rivet 43 forms a front contact which can be pushed inwardly against the action of the spring portion 41 and thus makes a firm resilient electrical contact with the inner wall of the cigarette lighter.

The other contact 45 is also provided with a U-shape with its free arm 46 normally contacting the rib 33 at an angle from the opposite side of the arm 38. The other arm passes along the tapered portion and then bends longitudinally at 47 along the wall of the housing until it reaches a slot 48. It is then bent at right angles outwardly through the slot and at an acute angle back towards the wall until it reaches the slot 18. It is then bent inwardly through the slot 18 and then forwardly at 49 until its front end abuts the rib 19. The portion of the contact 45 outside of the housing forms a spring contact which electrically engages the side wall of the cigarette lighter.

3

In use an electrical cord 50 is bared at the ends so that the bare wires 51 can be pushed into the rear opening 34 one wire at each side of the central rib 33. As the wires are pushed inwardly the spring arms 38 and 46 will be pushed inwardly and allow the wires to pass by 5 they will engage the ends of the arms 38 and 46 and pull them inwardly causing a jamming action which locks the wires in place. The stronger the pull the more tightly will the spring arms hold. These spring arms also form the 10 electrical connection to the wires. If it is desired to release the wires then a pin or paper clip such as 52 can be pushed into the openings 35 where they will bear against the arms 38 and 46 and hold them away from the wire until the wire is slipped out.

I have thus provided a simple construction which permits the rapid assembly with an electrical wire by merely pushing the bare wire into the connector. Provision is also made for easily releasing the wire. This rear portion can also be applied to any other type of electrical connector. Other advantages of the present invention will be readily apparent to a person skilled in the art.

I claim:

An electrical connector comprising a generally cylindrical housing including front and rear walls, the rear wall 25 of said housing having a central opening, a central longitudinal wall dividing the rear portion of said housing into two equal chambers, said wall extending into said

4

opening, a pair of tapered portions extending laterally from the rear portion of said housing, said tapered portions being hollow and forming lateral extensions at opposite sides of the rear portion of said housing, and a pair of electrical contact members mounted in said housing, the rear portion of each contact member being bent into a U-shape, each U-shaped portion extending into one of said laterally extending hollow tapered portions of said housing, the free arm of each U-shaped portion extending 10 angularly toward said central wall away from said opening and resiliently contacting said central wall, whereby said free arm will electrically engage a cord lead wire inserted into said opening and lock said wire between the end of said arm and said wall, said rear wall having a 15 spaced opening on each side of said central opening to permit the insertion of a tool to release the electrical cord connection by pushing said free arm away from said wall, said housing being formed of two mating longitudinal portions having a plurality of integral transverse strengthening ribs, said ribs having slots, said contact 20 members extending through said slots.

References Cited in the file of this patent

UNITED STATES PATENTS

2,705,785	Benander	Apr. 5, 1955
2,780,790	Hubbell	Feb. 5, 1957
2,954,544	Focosi	Sept. 27, 1960