United States Patent [19]

Murray

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[54] **HIGH VOLTAGE ANODE CUP**

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[52] **U.S. Cl.** ..... **339/12 V**, 339/59 R

[51] **Int. Cl.** **H01r 11/30**

[58] **Field of Search** ..... 339/12 V, 12 R, 12 L, 339/59, 60, 61, 217 R, 218 R

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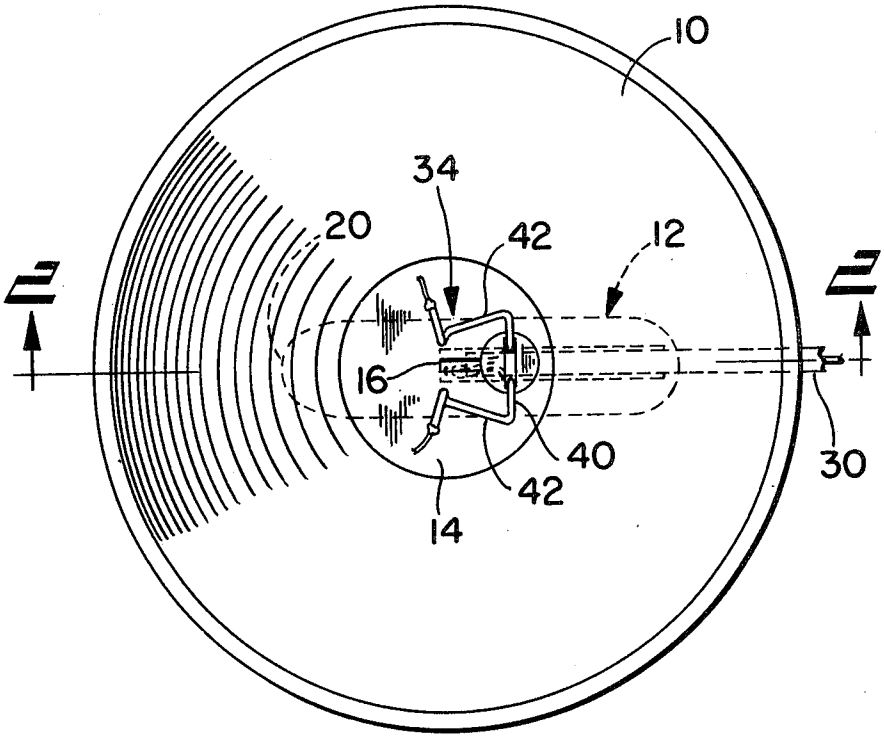
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[57] **ABSTRACT**

A suction type of high voltage lead connection comprising a molded elastomeric body having a bottom receptor portion of appreciable length with rounded exterior corners at its ends. There is a T-shape slot in the bottom of the cup which intersects an axial passage in the receptor part, with a power lead interiorly connected to a spring clip which extends upwardly through the slot to make the energy available for connection within the interior of the cup. The slot is filled with insulating material, such as silicone gel, and the exit end of the power lead passage is formed of a relatively reduced diameter which acts as a wiper to contain the sealant and provide a watertight joint for the lead.

7 Claims, 3 Drawing Figures



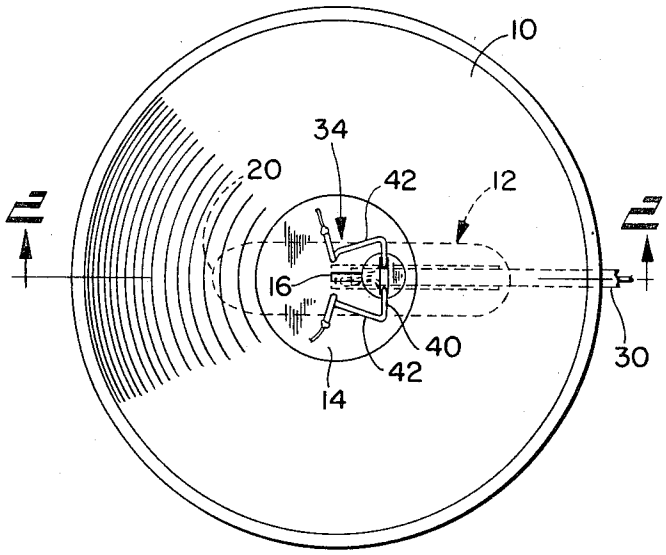


FIG. 1

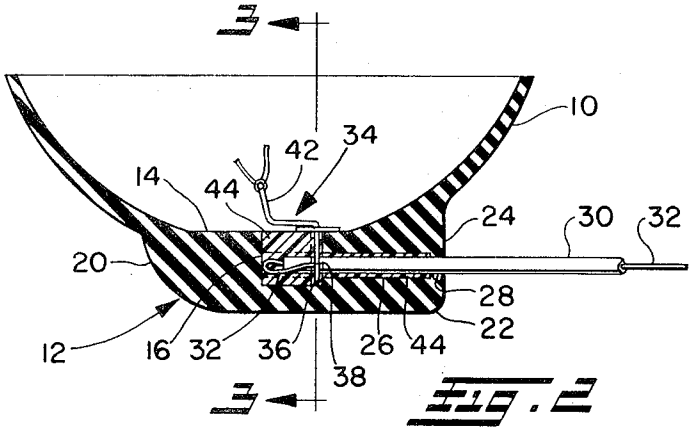


FIG. 2

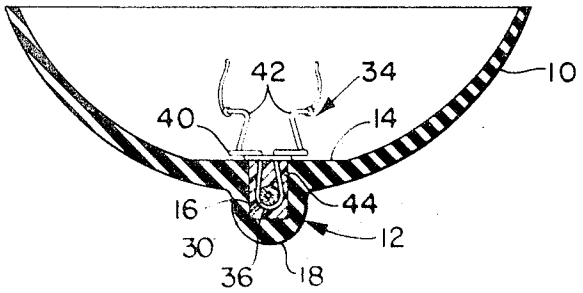


FIG. 3

HIGH VOLTAGE ANODE CUP

This invention relates to a cup form of connector for a high voltage lead and the like, such as is applied to a side of a cathode ray tube for a television receiver to power a beam deflector coil of the same.

It is a principal object of the invention to provide a molded cup for this purpose of a particular configuration which minimizes electrical stress concentration at the exterior.

For example, conventional cups on this order are formed with generally rectangular exterior protrusions which receive the high voltage lead for connection with a contact member within the cup, and it is common to use a fairly cheap grade of old neoprene rubber. This material has a tendency to craze in the presence of ozone, which results in deterioration and eventually partial failure through which a spark might pass and present a fire hazard. Furthermore, the configuration of the contact receiving portion has squared edges which tend to produce stress or charge concentration thereon.

Such disadvantages are eliminated by the present invention and, additionally, the latter insures that the connection of the joint with the power lead, where the same exits from the cup, is watertight.

Other advantages of the present invention will become apparent as the following description proceeds.

To the accomplishment of the foregoing and related ends the invention, then, comprises the features hereinafter fully described and particularly pointed out in the claims, the following description and the annexed drawings setting forth in detail a certain illustrative embodiment of the invention, this being indicative, however, of but one of the various ways in which the principle of the invention may be employed.

In said annexed drawing:

FIG. 1 is a bottom plan view of a high voltage anode cup in condition for use in accordance with the present invention;

FIG. 2 is a transverse cross-section of the cup assembly as viewed from the plane of the line 2—2 in FIG. 1; and

FIG. 3 is a further cross-sectional view at right angles to the first as indicated by the lines 3—3 in FIG. 2.

Referring now to the drawing in detail, the cup itself is formed of a suitable elastomeric material molded to the configuration illustrated and thus having a generally hemispherical body part **10** and, at the bottom, an integral generally diametric contact receptor portion **12.** The cup may, of course, be molded in different sizes depending upon the particular application in which it is to be used.

The interior cup bottom is flat, as shown at **14,** and is formed with a slot **16** of generally T-shape which extends into the receptor portion **12** for a purpose to be later described. The receptor portion itself has an exterior curved surface **18** along its length, as best shown in FIG. **3,** and its forward edge **20** is also rounded lengthwise to its juncture with the cup exterior. The radius of this forward edge curvature is not critical, but as a general matter the larger the radius, the more the tendency for stress concentration at this area will be reduced. At the rear edge, the outer corner **22** is also curved and the end surface **24** generally flat or square.

The receptor portion **12** is molded with an axial cylindrical passage **26** in communication with the T-

shaped slot **16** and extending as shown to the end of the leg of the latter. At the open end of the passage, the latter has an end section **28** of relatively reduced diameter to firmly engage about the insulated high voltage lead **30** which extends from a power source, not shown, and has its end inserted in the passage to extend beyond the bar of the T-slot **16,** but not fully to the inner closed end of the passage **26.** In the clearance which results from this last spacing, the conductor element **32** of the lead **30** is exposed and brought back for electrical connection to a spring clip **34** of general U-shape, for example, by soldering to a loop **36** which extends downwardly from the interior of the cup about the insulated part of the lead **30,** the point of attachment being indicated by reference numeral **38.** The base **40** of the spring clip extends outwardly beyond the ends of the T-slot bar and has integral upwardly extending arms or legs **42** for connection within the cup to the cathode ray tube or other device to receive the high voltage energy supplied by the lead.

The T-shaped slot **16** is filled with a flame retardant rubber silicone **44,** and preferably the inserted part of the insulated power lead **30** in the receptor passage **26** is coated with a lubricant **44** having some adhesive property. This coating thus has a restraining influence on withdrawal of the lead and acts as a sealant against the entry of moisture.

In making the complete assembly, the cup is, as indicated earlier, molded as a single piece to the shape illustrated, the connection of the spring clip **34** and the lead **30** is made, and then the latter is drawn through the slot **16** and receptor passage **26.** The slot can then be filled with the aforementioned silicone rubber, e.g., as a gel, for sealing the voids, and it will be understood that the reduced diameter receptor end **28** through which the power lead **30** exits acts as a wiper to retain the sealant.

The cup is attached conventionally by pressing against the device to be energized, such as a cathode ray tube exterior, preferably against a surface thereof of larger radius than the cup, for suction holding of the connector assembly in place.

If desired, an annular groove can be provided adjacent the interior peripheral edge of the cup to contain a suitable sealant to enhance sealed attachment of the same to the connected component or device.

I, therefore, particularly point out and distinctly claim as my invention:

1. A cup form of connector for a high voltage lead and the like, comprising a body molded of an elastomeric material having a generally hemispherically shaped first portion and an integral power lead receptor portion extending generally lengthwise at the bottom exterior of said body, the receptor portion having forward and rear ends, with an integral passage opening at the rear end and having a closed inner end, the outer surface of the receptor portion and the rear end thereof having rounded corners where they join the exterior surface of said first portion, the forward end being curved also lengthwise to its juncture with the exterior surface of said first portion, a slot in the bottom interior of the body in communication with the passage in the receptor portion, an insulated power lead having a connector electrically connected to an end thereof within said slot, the connector projecting through said slot to the interior of said body and said lead extending through said passage for external connection of the

same, and insulating material filling voids within the slot.

2. A connector as set forth in claim 1, wherein the connector is a spring clip type of contact preassembled about the power lead end before insertion thereof in the slot.

3. A connector as set forth in claim 1, wherein the passage in said receptor portion has a relatively reduced diameter section firmly to engage and seal about the inserted power lead.

4. A connector as set forth in claim 3, wherein said reduced diameter section occurs at the opening in the rear end face of the receptor portion.

5. A connector as set forth in claim 4, wherein the power lead has an exterior coating thereon sealing the extent of the same within said passage.

6. A cup form of connector for a high voltage lead and the like, comprising a body molded of an elastomeric material having a generally hemispherically shaped first portion and an integral power lead receptor portion extending generally lengthwise at the bottom exterior of said body, the receptor portion having forward and rear ends, with an internal passage opening at the rear end and having a closed inner end, the outer surfaces of the receptor portion and the rear end thereof having rounded corners, where they join the exterior surface of said first portion, the forward end being curved also lengthwise to its juncture with the exterior surface of said first portion, a slot in the bottom interior of the body in communication with the passage and the receptor portion, an insulated power lead having a conductor element exposed at one end and bent back about the exterior of the lead, and a U-shaped clip having its closed portion engaged about such end of the lead and the conductor element thereof, the clip being thus pre-assembled about the lead and secured thereto, with the lead inserted through the slot and said passage, locating the clip and lead connection in the slot with the legs of the former projecting therefrom to the interior of the molded body.

7. A cup form of connector for a high voltage lead and the like, comprising a body molded of an elastomeric material having a generally hemispherically shaped first portion and an integral power lead receptor portion extending generally lengthwise at the bottom exterior of said body, the receptor portion having forward and rear ends, with an internal passage opening at the rear end and having a closed inner end, the outer surface of the receptor portion being substantially semicircular in cross section along its length and the rear end of the receptor portion having rounded corners where it joins with said outer surface of the receptor and with said first portion, with the forward end being curved also lengthwise to its juncture with the exterior surface of said first portion, a slot in the bottom interior of the body in communication with the passage in the receptor portion, and an insulated power lead having a connector electrically connected to an end thereof within said slot, the connector projecting through said slot to the interior of said body and said lead extending through said passage for external connection of the same.

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