Aug. 16, 1966 R. A. ROSENBERG ETAL 3,267,412

ANODE CONNECTOR FOR CATHODE RAY TUBE

Filed March 27, 1964

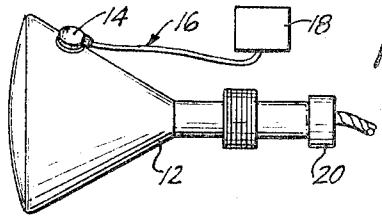


FIG. 1

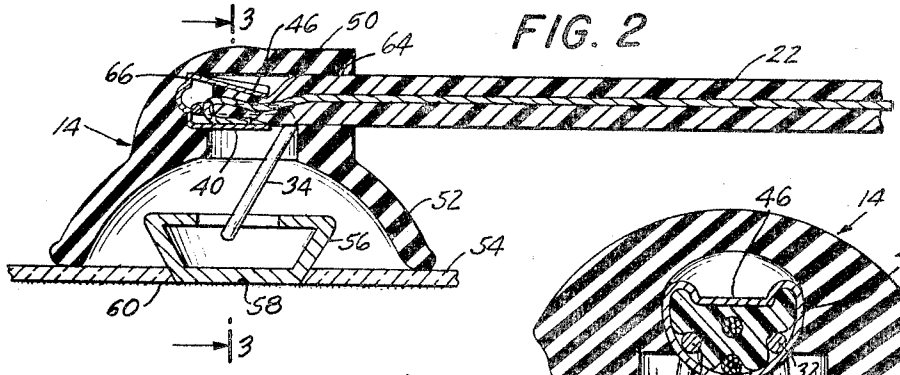


FIG. 2

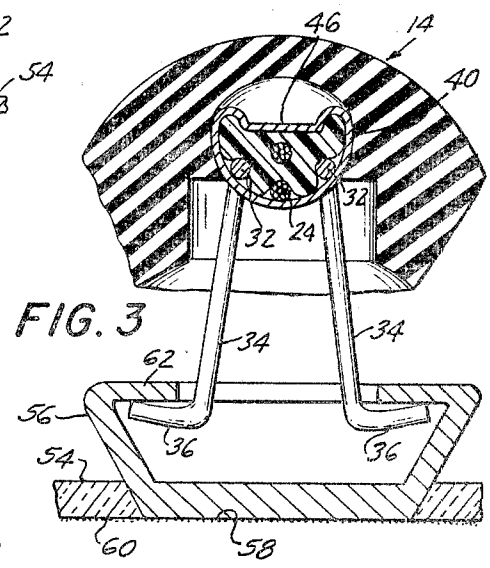


FIG. 3

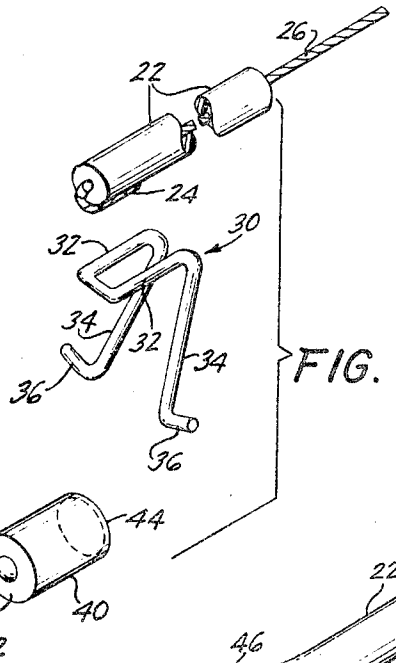


FIG. 4

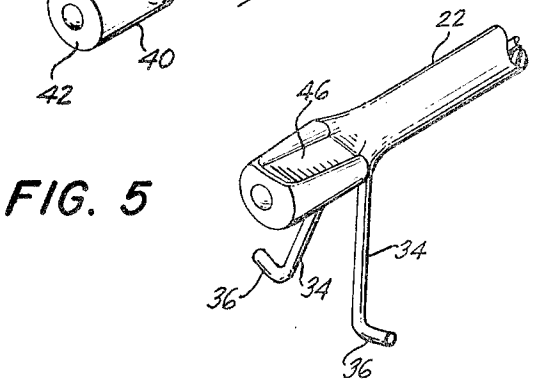


FIG. 5

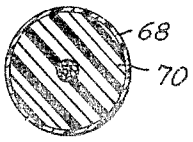


FIG. 6

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United States Patent Office 3,267,412 Patented August 16, 1966

3,267,412

ANODE CONNECTOR FOR CATHODE RAY TUBE

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Filed Mar. 27, 1964, Ser. No. 355,198
6 Claims. (Cl. 339—223)

This invention relates to anode connectors for cathode ray tubes, and more particularly for television picture tubes.

The general object of the present invention is to improve such anode connectors. A more particular object is to minimize sharp edges and corners, this being of advantage in reducing corona effect, and possible injury to the rubber cap in which the end of the connector is protectively housed. Still another object is to so design the anode connector as to facilitate assembly of the parts thereof.

To accomplish the foregoing general objects, and other more specific objects which will hereinafter appear, our invention resides in the anode connector elements and their relation one to another, as are hereinafter more particularly described in the following specification. The specification is accompanied by a drawing in which:

FIG. 1 is explanatory of how the anode connector is used;

FIG. 2 is a longitudinal section through the end of the anode connector applied to a tube;

FIG. 3 is a transverse section taken approximately on the line 3—3 of FIG. 2, and drawn to enlarged scale;

FIG. 4 is a perspective view showing the parts in disassembled relation;

FIG. 5 is a similar view showing the parts assembled; and

FIG. 6 is a section through a different conductor.

Referring to the drawing, and more particularly to FIG. 1, the cathode ray tube or television picture tube **12** has an anode terminal, not visible in FIG. 1, but over which the insulation cap **14** of an anode connector **16** has been applied. The other end of the anode connector leads to a high voltage power supply **18** forming part of a television receiver chassis. The leads to the tube **12** other than the high voltage connection **16** are applied by means of a detachable tube base or connector **20**.

Referring now to FIG. 4, the anode connector comprises a length of insulated high voltage wire **22** having a bared end **24** which is bent back along the insulation of the wire. The remote end of the wire is also bared as indicated at **26**, the wire preferably being a stranded wire, and the insulation being designed for high voltage. In typical receivers, the wire is designed to withstand a voltage of twenty-five thousand; but for small portable receivers, a different wire may be employed to accept the voltage, say, ten thousand.

The anode connector further comprises a clip generally designated **30**, this being bent up out of relatively stiff resilient wire, sometimes referred to an piano wire. The clip has a reversely bent base portion **32** and divergent legs **34** which extend generally transversely of the base portion **32** and which terminate in bent tips **36**.

The assembly further includes a drawn sheet metal cup **40**, this being cylindrical and having a closed end **42**. The cup is much like a standard product used for eyelets, except that the closed end **42** is left intact instead of being removed, and there is no flange at the open end **44**.

The bared end **24** of the wire is bent back along the insulation of the wire; the clip **30** is disposed with its base **32** lengthwise of the wire; and the cup **40** is used to enclose the bared end of the wire and the base; following which the cup is forcibly indented as shown at **46** in FIG. 5, to strongly secure the said parts on the wire.

In preferred form the bared end **24** is turned under the insulation of the wire, as shown in FIGS. 3 and 4, and the base **32** of the clip is disposed beneath the wire with its sides **32** astride the reversely bent end **24**. The cup is indented at the top, that is, on the side of the cup remote from the clip. The relation of the parts then is as shown in FIG. 3, in which cup **40** is indented at **46**, and the lower wall of the cup contacts the sides **32** of the clip as well as the reversely bent end **24** of the wire, thereby electrically connecting one to the other. By reference to FIG. 2, it will be seen that the indentation **46** is somewhat deeper at the open end of the cup, thereby anchoring the parts against removal from the wire.

The assembly of the parts is quick and easy because in practice the base of clip **30** is simply inserted in the cup **40**, and the wire **22** with its reversely bent end **24** is slid into the cup over the base of the clip, the end **24** naturally and readily assuming a position between the sides **32** of the base. The amount of insertion of these parts is inherently limited by the fact that the part **40** is a closed cup. The assembly is then struck in a suitable die to form the indentation **46** which locks the parts together.

While not essential, the anode connector usually is provided with a rubber cap previously designated **14**. This cap is made of a flexible rubber, preferably an artificial rubber such as neoprene, and the cap has a top portion **50** which receives the cup **40**, and a skirt **52** which surrounds the legs **34**. The skirt **52** yields against the glass wall **54** of the tube when the connector is applied to the terminal **56**. The terminal may be conventional, it being a dished button-like metal member secured through the glass wall **54**, so that its inner face **58** is exposed inside the tube and receives a conductive coating **60** to which the high anode voltage is to be applied. The rim of terminal **56** is flanged inward at **62** to receive the outwardly bent tips **36** of the legs **34**, the latter being squeezed together when inserted in the terminal **56**, thereby anchoring the anode connector in position.

To assemble the sub-assembly of FIG. 5 with the rubber cap **14**, the free end of the wire **22** is passed upwardly through skirt **52** and through the lateral passage **64** of the cap. It is then pulled lengthwise through the cap until the cup **40** reaches the top **50**, at which time it is forced into a receptive recess at **66**. The yieldable elastic nature of the cap affords this type of assembly.

The wire **22** may have two kinds of insulation, as shown in FIG. 6, there being a protective insulation skin **68** around an insulation body **70**. FIGS. 2 and 3 show a single insulation in order to simplify the drawing.

It is believed that the construction and method of assembly of our improved anode connector, as well as the advantages thereof, will be apparent from the foregoing detailed description. By using the closed cup **40**, the presence of sharp edges and corners is minimized, and there is no tendency to tear the rubber cap **14**. Assembly of the parts shown in FIG. 4 is facilitated because the clip may be inserted in the cup as far as it will go, and the wire then may be inserted in the cup. These parts fit snugly and remain safely on the wire as it is put into a suitable die for indenting the top of the cup. The indentation locks the parts together mechanically, and the cup itself provides an electrical connection between the wire and the clip. The same cup and clip may be used for insulated wires designed for different high voltages, and despite the fact that such wires have different outside diameters.

It will be understood that while we have shown the anode connector in a preferred form, changes may be

made without departing from the scope of the invention, as sought to be defined in the following claims.

We claim:

1. An anode connector comprising a short length of insulated high voltage wire having a bared end, a drawn sheet metal cup, a clip bent up out of relatively stiff resilient wire, said clip having a reversely bent base portion and divergent legs extending generally transversely of the base portion and terminating in bent tips, said bared end being bent back along the insulation of the wire, said clip being disposed with its base lengthwise of the wire, said cup enclosing the bared end of the wire and the base, and being forcibly indented to strongly secure the said parts on the wire, said cup contacting the bared end and the clip and thereby electrically connecting one to the other, the legs of the clip projecting transversely of the wire at the open end of the cup.

2. An anode connector comprising a short length of insulated high voltage wire having a bared end, a drawn sheet metal cup, a clip bent up out of relatively stiff resilient wire, said clip having a reversely bent base portion and divergent legs extending generally transversely of the base portion and terminating in outwardly bent tips, said bared end being bent back along the insulation of the wire, said clip being disposed with its base lengthwise beneath the wire, said cup enclosing the bared end of the wire and the base, and being forcibly indented to strongly secure the said parts on the wire, said cup contacting the bared end and the clip and thereby electrically connecting one to the other, the legs of the clip projecting transversely of the wire at the open end of the cup.

3. An anode connector comprising a short length of insulated high voltage wire having a bared end, a drawn sheet metal cup, a clip bent up out of relatively stiff resilient wire, said clip having a reversely bent base portion and divergent legs extending generally transversely of the base portion and terminating in outwardly bent tips, said bared end being bent back along the insulation of the wire, said clip being disposed with its base lengthwise beneath the wire, said cup enclosing the bared end of the wire and the base, and being forcibly indented to strongly secure the said parts on the wire, said cup contacting the bared end and the clip and thereby electrically connecting one to the other, the legs of the clip projecting transversely of the wire at the open end of the cup, and a flexible insulation cap having a top and a skirt, said top enclosing said cup and said skirt surrounding said legs.

4. An anode connector comprising a short length of insulated high voltage wire having a bared end, a drawn sheet metal cup, a clip bent up out of relatively stiff resilient wire, said clip having a reversely bent base portion and divergent legs extending generally transversely of the base portion and terminating in outwardly bent tips, said bared end being bent back along the insulation of the wire, said clip being disposed with its base lengthwise beneath the wire, said cup enclosing the bared end of the wire and the base, and being forcibly indented at the top to strongly secure the said parts on the wire and to electrically connect the bared end to the clip, the legs of the clip projecting transversely of the wire at the open end of the cup.

5. An anode connector comprising a short length of insulated high voltage wire having a bared end, a drawn sheet metal cup, a clip bent up out of relatively stiff resilient wire, said clip having a reversely bent base portion and divergent legs extending generally transversely of the base portion and terminating in outwardly bent tips, said bared end being bent down under the insulation of the wire, said clip being disposed with its base lengthwise beneath the wire, said cup enclosing the bared end of the wire and the base, and being forcibly indented at the top to strongly secure the said parts on the wire and to electrically connect the bared end to the clip, the legs of the clip projecting transversely of the wire at the open end of the cup.

6. An anode connector comprising a short length of insulated high voltage wire having a bared end, a drawn sheet metal cup, a clip bent up out of relatively stiff resilient wire, said clip having a reversely bent base portion and divergent legs extending generally transversely of the base portion and terminating in outwardly bent tips, said bared end being bent down under the insulation of the wire, said clip being disposed with its base lengthwise beneath the wire, said cup enclosing the bared end of the wire and the base, and being forcibly indented at the top to strongly secure the said parts on the wire and to electrically connect the bared end to the clip, the legs of the clip projecting transversely of the wire at the open end of the cup, and a flexible insulation cap having a top and a skirt, said top enclosing said cup and said skirt surrounding said legs.

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