July 1, 1952 R. A. FISCH 2,602,113

MOUNTING DEVICE FOR TELEVISION TUBES

Filed Dec. 22, 1950

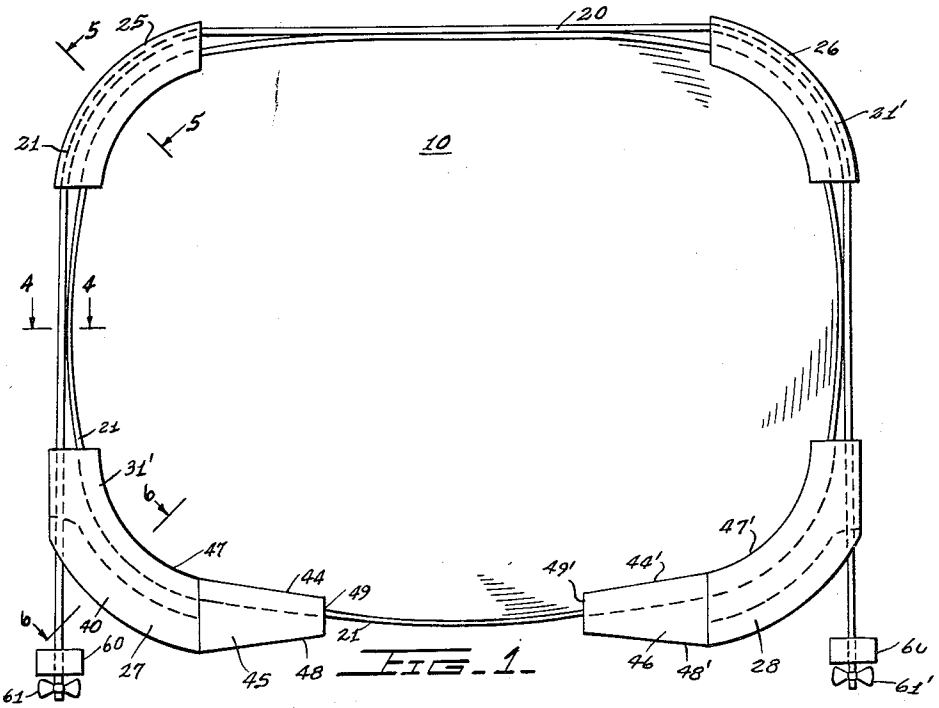

FIG. 1.

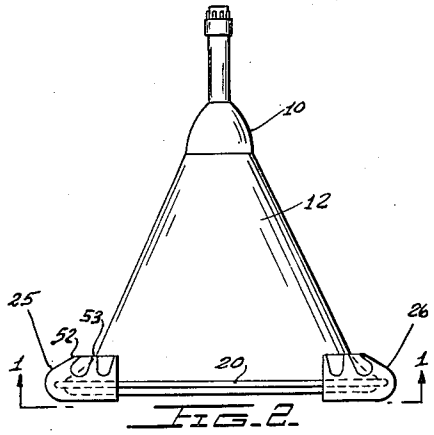

FIG. 2.

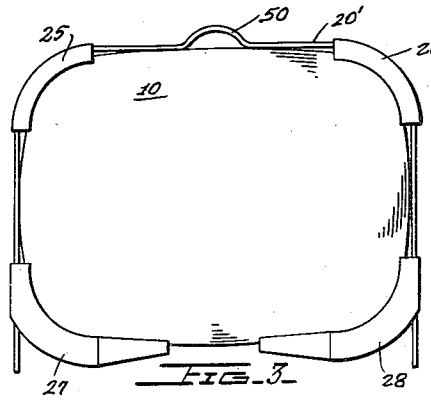

FIG. 3.

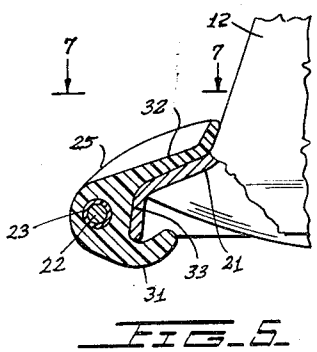

FIG. 5.

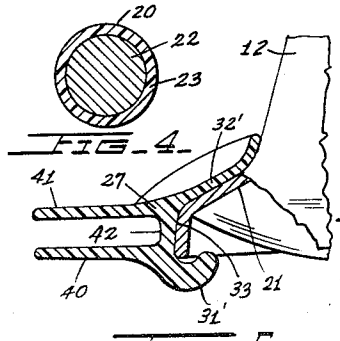

FIG. 6.

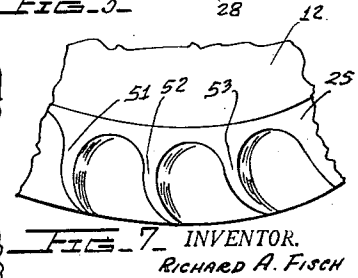

FIG. 7.

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MOUNTING DEVICE FOR TELEVISION TUBES

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6 Claims. (Cl. 177—316)

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This invention relates to a novel and improved device for shielding and protecting television and cathode ray tubes, and more particularly it relates to an improved and novel means for securing television tubes to their respective chassis.

The general idea of shielding electrical equipment having exposed parts is old and well known but the shielding of metal backed cathode ray or television tubes presents peculiar difficulties. The metal backed cathode ray or television tube comprises a glass bulb containing the electrode structure, a metal tube section which has a varying diameter (usually frustoconical) the small end of which is united to the end of the glass bulb and a glass lens element which is united to the open or large end of the said metal tube. In order that a good seal can be obtained between the lens and the metal backing, the metal back or conical section is flared outwardly at the large end to form a seat for the round edge portion of the lens.

In previously issued United States Letters Patent No. 2,503,813, I disclosed a skirt for protecting the backing of metal-backed television or cathode ray tubes, and a clamping member for securely holding the skirt snugly about the tube, and for securing the tube to the chassis. The clamping member disclosed in the aforementioned patent has been generally accepted in the industry as a most satisfactory means for mounting the tube on a chassis and may be adapted for the mounting of tubes of various shapes, the most commonly employed tubes having circular faces and frustoconical back portions. That clamping member has internal flanges adapted to straddle the flange of the tube and external flanges adapted to hold a retaining member for securing the tube to a chassis.

An object of the instant invention is to provide a new and improved clamping member which is specifically adapted for use with substantially rectangular or square-faced tubes.

Another object of this invention is to provide a new and improved means with a built-in retaining member for securing television and cathode ray tubes to their chassis.

Another object of the instant invention is to provide new and improved means for securing television and cathode ray tubes to their chassis in a manner which represents a substantial saving of materials and expense.

These objects and others ancillary thereto are accomplished by providing a U-shaped plastic coated metal rod of suitable diameter and length

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so that it will fit about three sides of the flared or lens end of a substantially square or rectangular faced tube. The ends of the rod are anchored in the chassis. The rod is provided with four suitably shaped plastic corner members so spaced on the rod so as to fit snugly over the flanged portion of the tube at its corners. Two of the plastic members are provided with exterior or outwardly extending annular flanges between which the edge of the cabinet or chassis fits.

The plastic coating on the U-shaped rod as well as the four corner members are preferably formed from hydrocarbon polymeric materials such as polyethylene, polyisobutylene, polystyrene, polymers and copolymers of butadienes, polymers and copolymers of methyl substituted homologues of butadiene such as isoprene etc. Other polymeric materials having high insulating values which may be employed are the polymers and copolymers of vinylidene chloride and vinylidene fluoride, polyvinyl carbazole, polyvinyl napthalene, etc. Impregnated fabrics such as cellulose acetate impregnated with vinyl butyral and similar materials may also be employed.

The novel features characteristic of this invention are set forth with particularity in the appended claims. The invention itself, however, both as to its organization and its method of operation, together with additional objects and advantages thereof, will best be understood from the following description of specific embodiments when read in connection with the accompanying drawings in which:

Figure 1 is a plan view showing my invention as it is mounted on a television tube.

Figure 2 is an elevation view showing my invention as it appears from the top, when mounted on a television tube.

Figure 3 shows a modification of the device shown in Figures 1 and 2.

Figure 4 is a cross-section view of the plastic coated metal rod.

Figure 5 is a sectional view taken through line 5—5 of Figure 1 showing one corner member and part of the tube to which it is applied in cross-section.

Figure 6 is a sectional view taken through line 6—6 of Figure 1.

Figure 7 is a detail view of the rear of the corner members showing reinforcing and heat dispersing fins.

The lens 10, of a substantially square or rectangular television tube for which this invention

is especially useful, is shown in Figure 1. It is the practice in the industry to construct such tubes with rounded corners.

The mounting device of the invention comprises the corner members **25, 26, 27** and **28** which are connected by and firmly united to the plastic coated U-shaped metal rod **20**.

The corner members **25, 26, 27** and **28** are made of a stiff, flexible plastic material such as polyethylene. The plastic coated metal rod **20** is curved into a U-shape so as to fit around three sides of the periphery of the flange **21** at the lens end of the tube **12** and the corner members are so constructed as to prevent the intermediate sections of the rod **20** from exerting any substantial pressure directly on the flange **21** of the tube. The curves in the rod **20**, however, have a greater radius of curvature than the corners of the flange **21**.

The two upper corner members **25** and **26** are each constructed with two interior annular flanges **31** and **32** forming channel **33** there between as shown in Figure 5. The members **25** and **26** shown in Figure 1 curve through approximately 90° arcs, and the channel **33** has a radius of curvature substantially equal to that of the outside of the flange **21** at the corners thereof. The annular flanges **31** and **32** of corner members **25** and **26** fit snugly adjacent the exterior flange **21** at its rounded upper corners. It is, of course, understood that the channel **33** may be shaped to fit any desired shape of corner flange on the cathode-ray tube.

The lower corner members **27** and **28** are similar to members **25** and **26** in that they contain inwardly extending annular flanges **31'** and **32'** forming channel **33'** therebetween. They are constructed to fit the flange **21** at its lower corners in the same manner that members **25** and **26** fit flange **21** at its upper corners. However, the lower edges of corner members **27** and **28** also contain outwardly extending flanges **40** and **41** forming channel **42** therebetween.

Each of corner members **27** and **28** has integrally joined at the inner end thereof the plastic flap **45** or **46**, respectively. The flaps **45** and **46** are continuations of the corner members **27** and **28** except that their upper edges **44** and **44'** are not curved but extend tangentially from the inner edges **47** and **47'** of corner members **27** and **28** respectively while the lower edges **48** and **48'** of flaps **45** and **46** respectively taper upwardly toward edges **44** and **44'**. Flaps **45** and **46** are approximately two inches long, thin enough to be flexible and terminate at the vertical edges **49** and **49'** respectively.

Since it is desirable to keep television sets as compact as possible, many of the delicate parts are located near the lens end of the tube and in close proximity thereto. The flaps **45** and **46** serve to protect these parts as well as the lower portion of the tube against shock and jarring.

The outer rear surface of corner members **25, 26, 27** and **28** contain suitably disposed fins **51, 52, 53**, shown in Fig. 7 which serve to reinforce and keep the corner members **25, 26, 27** and **28** firmly in place and which also aid in the dissipation of any excess heat.

In one modification of my invention, best shown in Fig. 3, the upper part or top of the inverted U of the plastic-coated rod **20'** is made longer than necessary. The excess is taken up in the damper or spring portion **50** located between the upper corner members **25** and **26**. Television tube manufacturers allow a large tolerance in the manufacture of the tubes with the result that the periphery of the flange **21** varies somewhat in different tubes of the same general size. The damper **50** gives my invention sufficient flexibility to permit its use on all tubes of the particular size for which it is constructed.

The member **20** consists of a metal rod **22** coated with a layer of plastic **23** as shown in Figure 4. Any suitable metal and plastic may be used. In the preferred embodiment of my invention I employ a steel rod of about $\frac{5}{16}$ inch coated with plastic layer of approximately .015 inch of polyethylene. The coating is accomplished in any conventional manner such as by extruding the plastic while drawing the rod through a wire-coating extrusion nozzle. It is necessary that the rod **22** be sufficiently rigid to retain whatever shape it is bent into. When the instant invention is applied to a television tube, the interior annular flanges **31** and **32** of corner members **25** and **26** and interior annular flanges **31'** and **32'** of corner members **27** and **28** are engaged with flange **21**. The plastic coated rod **20** is then securely anchored in the cabinet in any conventional manner. In the present disclosure I have shown member **20** anchored to cabinet **60** by means of threaded wing nuts **61** and **61'**.

In the preferred embodiment of my invention, I employ a four cavity mold, one cavity for each corner member. The plastic-coated metal rod **20** is suitably shaped to form a U of the desired size and proportions after which it is positioned into the four mold cavities. The corner members **25, 26, 27** and **28** and the flaps **45** and **46** are then injection molded in one or more operations so as to form the corner members **25** and **26** about the curved portions of the plastic-coated metal rod **20** at its curves and so as to form the corner members **27** and **28** partially about the legs of the U as shown in Figure 1 and at a distance from the upper corner members **25** and **26** so as to fit the specific tube for which the device of the invention is being constructed.

Since a four cavity mold may be employed, it will be understood that the mold may be made in four or more sections which can be moved with respect to each other so that it is possible to make the product of this invention for square or rectangular tubes of many sizes with only one set of molds.

It will be seen that this invention provides a new and novel means for securing square or rectangular faced cathode ray or television tubes to their chassis, for protecting the flanges on the lens end of such tubes, and for accomplishing these results in an efficient, material saving manner. Whereas with the clamping member of Patent No. 2,503,813 it is necessary to first secure the clamping member onto the tube flange and then add a retaining member to secure the tube to the chassis, with the device of this application the retaining rod is part of the clamping member and is applied to the tube at the same time the insulating corners are applied. Thus the retaining rod **20** serves the double purpose of holding the corners in position and of securing the tube to the chassis.

I claim:

1. In a mounting device for a metal backed cathode ray tube which is held upon a chassis and which includes a glass bulb, a metal tube section of varying diameter and a glass lens united to the large end of the tube section by means of an outwardly extending tube flange, the new and improved construction comprising

a U-shaped rod member and four flange-contacting members, the distance between the two legs of said U-shaped member being greater than at least one dimension of said cathode ray tube measured across the flange thereof, said flange-contacting members being integrally affixed to said U-shaped rod member and extending into the interior portion of said U so as to retain said rod member out of contact with said tube flange, each of said flange-contacting members being provided with a suitable channel on its inner side for straddling said outwardly extending tube flange means at the ends of the legs of said U-shaped member for securing the latter to said chassis.

2. In a mounting device for a metal backed cathode ray tube which is held upon a chassis and which includes a glass bulb, a metal tube section of varying diameter and a glass lens united to the large end of the tube section by means of an outwardly extending tube flange, the new and improved construction comprising a U-shaped metal-cored, rod member, a first pair of corner members and second pair of corner members, said first pair of corner members being integrally affixed to said U-shaped rod member with one corner member at each of its corners, said second pair of corner members being integrally affixed to the opposite legs of said rod member, each of said corner members having a plurality of inwardly extending flanges forming at least one channel therebetween, each of said channels being suitable for straddling said outwardly extending tube flange, each of the said first and second pairs of corner members extending inwardly from said U-shaped rod member so as to retain said rod member out of contact with said tube flange, means at the extremities of said U-shaped rod member for securing it to said chassis.

3. In a mounting device for a cathode ray tube which is held upon a chassis and which includes a glass bulb, a tube section of varying diameter and a glass lens united to the large end of the tube section by means of an outwardly extending tube flange, the new and improved construction comprising a U-shaped rod member, a first pair of corner members and a second pair of corner members, said first pair of corner members being integrally affixed to said U-shaped rod member with one corner member at each of its corners, said second pair of corner members being integrally affixed to the opposite legs of said rod member, each of said corner members having two inwardly extending flanges forming a channel therebetween, said channel being suitable for straddling said outwardly extending tube flange, each of the said first and second pairs of corner members extending inwardly from said U-shaped rod member so as to retain said rod member out of contact with said tube flange, each of the said second pair of corner members containing two outwardly extending annular flanges forming a channel therebetween for straddling portions of said chassis, means at the extremities of said U-shaped rod member for securing it to said chassis.

4. In a mounting device for a cathode ray tube which is contained within a chassis and which includes a glass bulb, a tube section of varying diameter and a glass lens united to the large end of the tube section by means of an outwardly extending tube flange, the new and improved construction comprising a substantially rigid U-shaped, plastic-coated, metal rod member, a first pair of insulating corner members, and a second pair of insulating corner members, each of said corner members describing an arc of substantially 90°, said first pair of corner members being integrally affixed to said U-shaped rod member with one of said corner members at each of its corners, said second pair of corner members being integrally affixed to the opposite legs of said rod member, each of said corner members having two inwardly extending flanges forming a channel therebetween, each of said channels being suitable for straddling said outwardly extending tube flange each of the said first and second pairs of corner members extending inwardly from said U-shaped rod member as to retain said rod member out of contact with said tube flange, means at the ends of said U-shaped rod member for securing it to said chassis, the exterior surface of each of said corner members having reinforcing and heat dispersing fins.

5. In a mounting device for a cathode ray tube which is contained within a chassis and which includes a glass bulb, a tube section of varying diameter and a substantially rectangular glass lens united to the large end of the tube section by means of an outwardly extending substantially rectangular tube flange, the new and improved construction comprising a substantially rigid, U-shaped, plastic-coated, metal rod member, a first pair of insulating corner members and a second pair of insulating corner members, each of said corner members describing an arc of substantially 90° each of said first pair of corner members being integrally affixed throughout its length to one of the corners of said U-shaped rod member, a portion of each of said second pair of corner members being integrally affixed to a leg said rod member, each of said corner members having a pair of inwardly extending annular flanges forming a channel therebetween, each of said channels being adapted to straddle said outwardly extending substantially rectangular tube flange at one of its corners, the said first and second pairs of corner members extending inwardly from said rod member so as to retain said rod member out of contact with said tube flange, means at the ends of said U-shaped rod member for securing it to said chassis, said rod member including at least one expansion loop between two of the corner members.

6. In a mounting device for cathode ray tube which is contained within a chassis and which includes a glass bulb, a tube section of varying diameter and a substantially rectangular glass lens united to the large end of the tube section by means of an outwardly extending substantially rectangular tube flange, the new and improved construction comprising a substantially rigid U-shaped, plastic-coated, metal rod member, a first pair of insulating corner members and a second pair of insulating corner members each of said corner members describing an arc of substantially 90°, each of said first pair of corner members being integrally affixed throughout its length to said U-shaped rod member at opposite corners, thereof, a portion of each of said second pair of corner members being integrally affixed to a leg of said rod member each of said corner members having a pair of inwardly extending annular flanges forming a channel therebetween, the four of said channels, in the four corner members being adapted to straddle said outwardly extending substantially rectangular tube flange at the four corners, of

the latter each of the said members extending inwardly from said rod members so as to retain said rod member out of contact with said tube flange, means at the end of said U-shaped rod member for securing it to said chassis, said rod member including an extensible arcuate loop between said first pair of corner members, said second pair of corner members having integral flexible plastic flaps.

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