Aug. 11, 1959 J. B. ROBERTSON ET AL 2,899,483

ELECTRON TUBE PROTECTIVE DEVICE

Filed Nov. 26, 1956

Fig. 1.

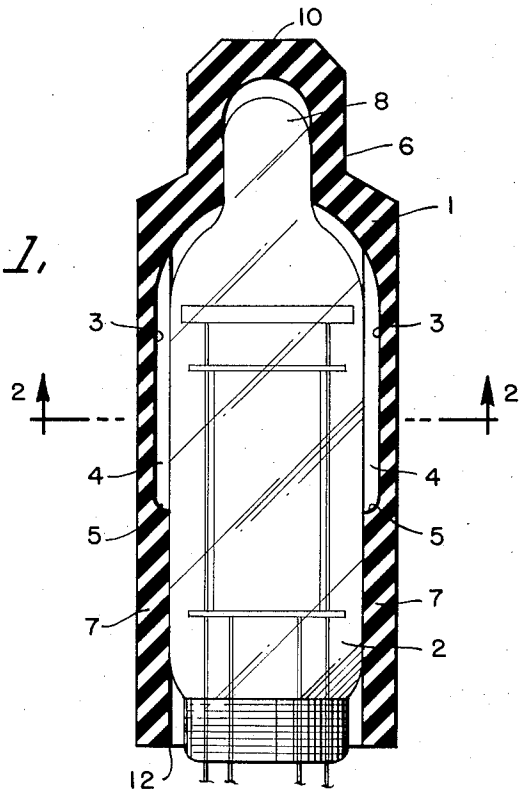
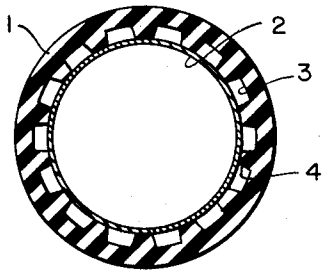


Fig. 2.



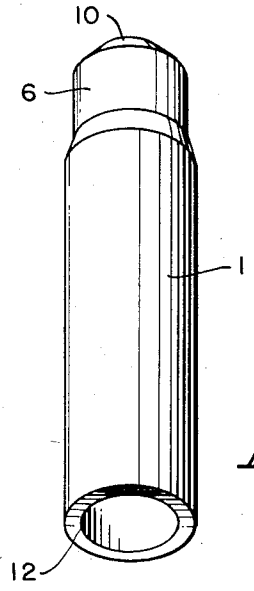


Fig. 3.

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United States Patent Office 2,899,483 Patented Aug. 11, 1959

2,899,483

ELECTRON TUBE PROTECTIVE DEVICE

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Application November 26, 1956, Serial No. 624,478

5 Claims. (Cl. 174—138)

The present invention relates to an improved electronic tube protective device, conveniently called a "tube boot."

Prior tube protection devices usually completely covered a tube with a solid wall of rubber and had the disadvantage of providing an insufficient amount of cushioning for the tube against compressive and shear stresses due to shrinkage of potting or embedment compounds and against vibration and shock, and in some cases were made of a plurality of parts which were difficult to install. The present invention overcomes these prior disadvantages by providing a new and improved one piece electronic tube protective device of resilient material which incorporates internal ribs.

The principal object of the present invention, therefore, is to provide a protective device for electron tubes incorporating internal ribs which provide greater cushioning effect than would be produced by a solid wall of resilient material.

Another object of the invention is to provide a new and improved electron tube protective device embodying vertical or circumferential ribs and a seal at the free ends of the ribs for preventing stray material from getting between the ribs and nullifying the cushioning effect of the device.

Other objects and many of the attendant advantages of this invention will be readily appreciated as the same become better understood by reference to the following detailed description when considered in connection with the accompanying drawings wherein:

Fig. 1 is a vertical cross-sectional view of an electron tube protective device of the present invention;

Fig. 2 is a cross-sectional view taken along line 2—2 of Fig. 1;

Fig. 3 is a perspective view of the electron tube protective device.

Referring now to the drawings, like numerals refer to like parts throughout each of the figures. In Figs. 1 and 2 the protection device 1 is a substantially cylindrical tube of insulating material and is shown enveloping an electron tube 2 except at the lowermost extremity of the tube and the prongs thereof. The protection device 1 may be made of rubber or other elastomer, polyethylene or other suitable resilient material. Grooves 3 which define ribs 4 extend along the inner side wall of the device for substantially one-half of its length. The upper portion of the device is of smaller diameter at 6, Figs. 1 and 3, so as to envelope and provide a seal at the narrow top 8 of the electron tube. Protection device 1 is shown closed at the top end 10, but may be left open to accommodate a terminal if desired. The bottom end of the device has an opening 12 large enough to accommodate an electron tube 2 with a snug fit. The lower ends of ribs 4 and grooves 3 terminate at 5 to define a seal 7 which extends snugly

about the lower end of tube 2. Seal 7 prevents entry of potting or embedment compound or other foreign matter into grooves 3, which would reduce the cushioning effect of ribs 4 and grooves 3. The two sealing areas with the internally grooved cushioning portion therebetween in the protective device of the present invention provide an electron tube protection against compressive and shear stresses and against shock, vibration and foreign matter.

Obviously, many modifications and variations of the present invention are possible in the light of the above teachings. It is therefore to be understood that within the scope of the appended claims the invention may be practical otherwise than as specifically described.

What is claimed is:

1. An electron tube protective device comprising a relatively thick walled cylindrical tube of resilient flexible material having one end closed and its other end open and adapted to snugly fit about the outside of the envelope of an electron tube, said cylindrical tube having substantially constant thickness and the inner wall formed with vertical grooves therein, said grooves defining ribs, said ribs and grooves cushioning said electron tube against shocks, said grooves and ribs terminating short of the open end of said cylindrical tube, the lower end of said cylindrical tube forming an annular seal which engages the lower end portion of the electron tube, said seal preventing foreign matter from entering said cylindrical tube and passing into said grooves, the upper closed end of said cylindrical tube above said ribs and grooves being smaller in diameter than the lower portion of the tube and also having a seal about the upper end of said electron tube, the seals about the lower end portion and the upper end of said tube completely sealing off said grooves and preventing the atmosphere from circulating therethrough.

2. A device as in claim 1 wherein said cylindrical tube is made of polyethylene.

3. An electron tube protective device comprising a relatively thick walled cylindrical tube of resilient flexible material having one end adapted to fit about the outside of the envelope of an electron tube, said cylindrical tube having substantially constant thickness, the inner wall of said cylindrical tube being formed with grooves therein, said grooves defining ribs, said ribs and grooves cushioning said electron tube against shocks, said grooves and ribs terminating short of the ends of said cylindrical tube, the lower end of said cylindrical tube forming an annular seal about the lower portion of said electron tube, the upper end of said tube forming a seal about the upper end of said electron tube, said seals being operable to prevent foreign matter from entering said cylindrical tube and getting into said grooves to nullify the cushioning effect of said device, and prevents the atmosphere from circulating through said grooves.

4. A device as in claim 3 wherein the ribs in said cylindrical tube are vertical.

5. A device as in claim 3 wherein said cylindrical tube is made of polyethylene.

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