

Feb. 3, 1959

R. E. ROSS

2,872,502

TUBE SHIELD

Filed July 13, 1956

Fig. 1.

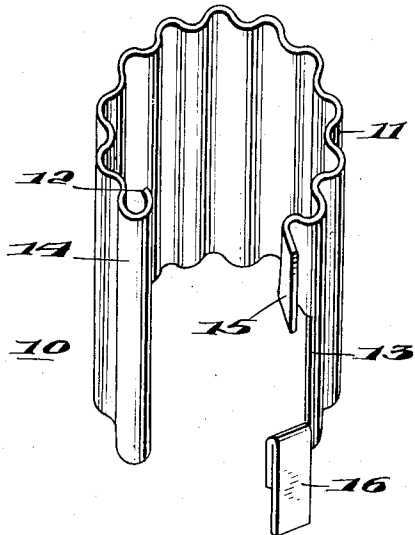


Fig. 2.

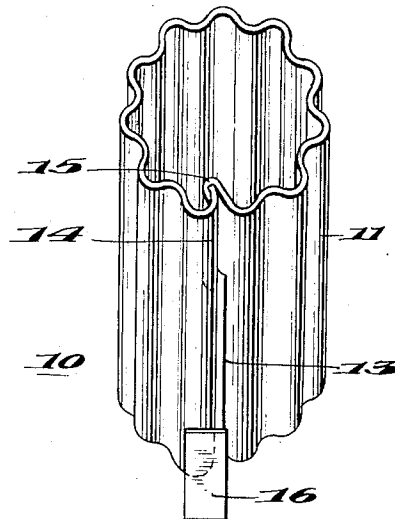


Fig. 3.

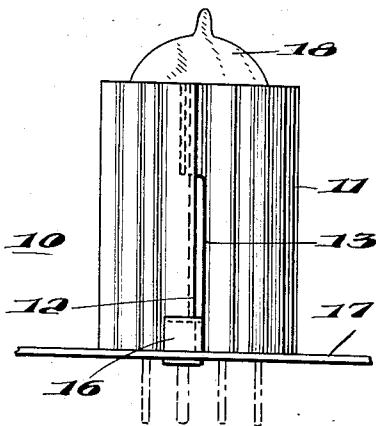
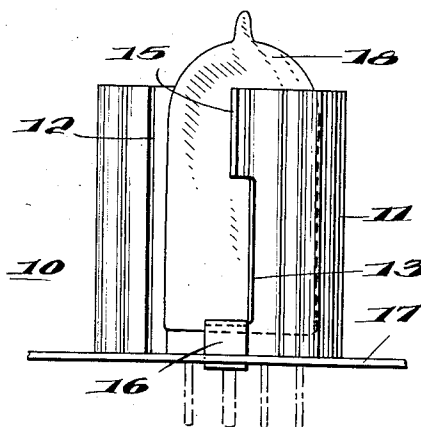


Fig. 4.



INVENTOR
ROBERT E. ROSS,

BY

Hall & Knight

ATTORNEY

1

2,872,502

TUBE SHIELD

Robert E. Ross, Cohasset, Mass.

Application July 13, 1956, Serial No. 597,720

1 Claim. (Cl. 174—35)

The present invention relates to an improved electrical shield construction, and more particularly to an improved tube shield construction for association with electron discharge tubes or the like in electrical apparatus to avoid undesirable reactions between the various elements thereof.

A wide variety of shielding means, generally identified as tube shields, have been employed heretofore in electrical apparatus, such as, for example, radio sets, to dissipate electro-magnetic and electrostatic fields set up therein by the electron discharge tubes during the operation of the apparatus. While such prior tube shields adequately perform their intended shielding function, such tube shields have possessed many disadvantages which have been found objectionable.

One of the most common forms of tube shields heretofore employed has consisted of a simple can or cylinder which is secured to the chassis in detachable relationship therewith by a friction fit or similar fastening means. When a tube is to be replaced in an apparatus employing the so-called can type tube shield, the tube shield is completely detached from the chassis of the apparatus, after which the tube is then replaced. Oftentimes the repairman or technician performing the operation will fail to replace the tube shield with a corresponding impairment in the operation of the apparatus. Moreover, the failure to replace the tube shield invariably results in the tube shield being left on the chassis, thereby resulting in the likelihood of a short circuiting of the electrical apparatus. Another disadvantage with the can type tube shield is that the continued insertion and withdrawal of the tube shield from time to time during the replacement results in a loose connection between the tube shield and the chassis. This will result in a vibration of the tube shield, oftentimes not insuring a positive grounding of the shield to the chassis.

Another detachable form of the tube shield that has received widespread usage is the so-called shaped shield. This type consists of two symmetrically paired parts of sheet metal and shaped to fit closely to the bulb of the tube. The paired parts are held together by a detachable ring, a detachable collar, or various other forms of clamping and connecting parts. Such shaped tube shields, in addition to the basic disadvantages attendant to detachable tube shields in general, suffer further in that all tubes are not one size. Therefore, several different sizes must be made and stocked, resulting in an unnecessary inventory. Moreover, the design and multiplicity of parts of the shaped tube shields have resulted in a relatively high cost for such shields.

Some attempts have been made to eliminate these disadvantages attendant to the various forms of detachable tube shields fixedly securing the tube shields to the chassis. Such fixed tube shield constructions have consisted of two mating or paired parts, each of which are hingedly connected at their bottom ends to one another or to the chassis. To replace a tube in an electrical apparatus employing such a construction, each of the

2

mating parts is pivoted upwardly away from one another, the tube then replaced, and the component parts then pivoted inwardly to one another to envelop and shield the new tube. A principal disadvantage with this type of tube shield is that it is extravagant of chassis space and does not permit the positioning of the tubes to the manufacturer's requirements. Another disadvantage with this form of shield is that latching or connecting means between the mating parts to insure proper engagement of the shield parts must be present, thereby increasing the complexity and cost of such tube shields. Therefore, the permanently affixed tube shields heretofore developed have met with very little success since compactness of design and simplicity of construction are necessities in most electrical apparatus.

It is therefore a principal object in the elimination of the foregoing and related disadvantages to provide a new and novel tube shield construction overcoming the disadvantages attendant to previously employed tube shields.

Another object of the present invention is the provision of an improved tube shield construction which will be permanently affixed to the chassis, thereby insuring the proper functioning of the tube shield at all times. Another object of the present invention is the provision of an improved tube shield construction that will remain in tight engagement and in proper grounded relationship with the chassis at all times.

A still further object of the present invention is the provision of an improved tube shield construction that is of extreme simplicity in design and operation, and inexpensive to manufacture.

Other and additional objects will become apparent from the ensuing description taken in conjunction with the accompanying drawings.

Broadly stated, in the attainment of the foregoing and related advantages, the tube shield construction of the present invention comprises shaped circumferentially flexible sleeve means having its longitudinally extending ends laterally spaced from one another when not in use, connecting means provided on each longitudinal end for securing the longitudinal ends to one another in detachable relationship to form a complete sleeve to provide the desired shielding, securing means carried by said sleeve means at one end thereof for securing same to a support.

To the accomplishment of the foregoing and related ends, the present invention then consists of the means hereinafter fully described and particularly pointed out in the claim, the annexed drawing and the following description setting forth in detail certain means in the carrying out of the invention, such disclosed means illustrating, however, but one of various ways in which the principle of the invention may be employed.

The present invention is illustrated by way of example in the accompanying drawing, in which:

Figure 1 is a perspective view of a sleeve means made in accordance with the present invention in open position and unattached to a support.

Figure 2 is a perspective view of the sleeve means shown in Figure 1 in which the sleeve means is in closed shielding position.

Figure 3 is a front elevation of the said shield construction made in accordance with the present invention and shown attached to a support and in closed shielding position.

Figure 4 is a front elevation of said tube shield construction made in accordance with the present invention shown attached to a support, and in open position.

Reference is now to be had to the drawing wherein an illustrative embodiment of a tube shield construction made in accordance with the present invention and generally designated by reference numeral 10 is shown. The tube shield construction 10 comprises a one-piece body

portion 11 possessing a height sufficient to provide the necessary shielding. The body portion 11 is shaped so as to possess a tubular configuration with the longitudinal ends 12 and 13 being normally spaced from one another when the tube shield construction 10 is not in use. The normal spacing between the longitudinal edges 12 and 13 of the body portion 11 should be of a distance sufficient to permit the lateral entry of the thumb and finger of a technician into the body portion 11.

The body portion 11 is circumferentially flexible in order to permit the longitudinally extending ends 12 and 13 to be secured to one another to form a completely enclosed tubular sleeve to provide the necessary shielding. The longitudinal end 12, as shown, is reversely bent inwardly to provide a longitudinally extending connecting channel 14, which will serve as one side of the connecting means. The opposite longitudinally extending end 13 is provided with a hook portion 15 bent outwardly and so shaped as to engage the connecting channel 14 to insure the connection of the two longitudinal edges 12 and 13 to complete the formation of the sleeve. It is to be understood that while the particular means for detachably connecting the two longitudinal edges 12 and 13 are preferred, with respect to the broader aspects of the invention, such connecting means is shown for purpose of illustration only since there are other means readily apparent that can be employed to permit a quick attachment or detachment of the longitudinal edges to or from one another.

The body portion 11 is provided adjacent its bottom edge and along one of the longitudinal edges with a securing tab 16 which extends downwardly from the body portion 11. The securing tab 16 serves as the means for securing the tube construction 10 to the chassis or other support 17. As shown in Figures 1 and 2, the first of the hooking means 15 extends throughout only a portion of the associated end of the longitudinally split body portion 11 and the tab 16 is formed of metal derived from an underlying portion of said end, and is folded downwardly over an area of said end remote from said first hooking means 15, and extends below the lower edge of said flexible sleeve. As shown in Figures 3 and 4, the tab 16 thus provided is bent outwardly after being inserted into the slot in the support 17 with the bent portion of the tab 16 engaging the under surface thereof. This particular support securing means or tab 16 has certain advantages in flexibility, etc., but in the broader aspects of the invention is illustrative only, since other means by which the tube construction 10 may be secured to the support 17 in fixed relation thereto will be apparent to one skilled in the art in light of the present disclosure.

The body portion 11 may be made from any suitable conductive material that possesses the desired longitudinal rigidity and circumferential flexibility. In the form shown in the drawings, the body portion 11 is made from corrugated metal, and such is preferred since the longitudinal corrugations provide the necessary longitudinal strength. Conversely, the corrugations facilitate the circumferential opening and closing of the body portion 11 in a manner to be more fully described hereinafter. However, it is to be understood that the tube shield construction 10 can be made from flat metal stock.

The tube shield construction 10 is preferably formed from a flat blank of either corrugated or flat sheet metal stock which is rolled to the required diameter, such that the longitudinal ends will not normally contact one another. As shown in Figures 3 and 4, the height of the tube shield construction 10 is slightly less than that of the envelope of the electron discharge tube 18, but sufficient to shield the tube elements therein. Such arrangement is preferred as it facilitates grasping of the tube

to effect removal thereof, but in its broader aspects the invention is not limited to any particular height of the shield element.

To mount the tube shield construction 10 to the support 17 to function as the shielding means, the tab 16 is inserted into a slot in the support 17 immediately adjacent the tube socket and bent outwardly locking one end of the body portion 11 in fixed relation to the support. In this position, the longitudinal ends 12 and 13 are spaced from one another as shown in Figure 4. The tube 18 is then inserted into the tube socket of the support 17. To close the tube shield construction 10, the body portion 11 is circumferentially flexed to draw the longitudinal end 12 toward the longitudinal end 13. This will result in the hook portion 15 engaging the channel portion 14, thereby locking the two longitudinal ends together, thus forming a completely enclosed tubular member which will provide the necessary shielding. To replace a tube, the hook portion 15 is disengaged from the channel portion 14, thus permitting a circumferential expansion or snapping open of the body portion 11, as shown in Figure 4, thus permitting the technician to reach in through the lateral opening and expanded top of the shield and grasp the tube 18 to withdrawn same. Upon the insertion of the new tube, the longitudinal ends 12 and 13 are circumferentially flexed in the manner hereinafore described, with the hook portion 15 again locking with the channel portion 14 to provide the desired shielding.

While there have been described herein what are at present considered preferred embodiments of the invention, it will be obvious to those skilled in the art that modifications and changes may be made therein without departing from the essence of the invention. It is therefore to be understood that the exemplary embodiments are illustrative and not restrictive of the invention, the scope of which is defined in the appended claim, and that all modifications that come within the meaning and range of equivalency of the claim are intended to be included therein.

I claim:

A tube shield construction comprising a shaped, longitudinally split, circumferentially flexible sleeve means having the longitudinally extending ends thereof spaced from one another when not in use, reversely bent complementary hooking means provided along each longitudinally extending end for securing said ends to one another in detachable relationship to close the shield, the first of said hooking means extending throughout only a portion of its associated longitudinally extending end, a portion of said associated longitudinally extending end derived from an area thereof adjacent said first hooking means being folded downwardly over a portion thereof more remote from said first hooking means, and extending below the lower edge of said circumferentially flexible sleeve means and constituting means for securing said sleeve means to a support.

References Cited in the file of this patent

UNITED STATES PATENTS

2,169,708	O'Callaghan	Aug. 15, 1939
2,265,632	Coffin	Dec. 9, 1941
2,745,895	Lideen	May 15, 1956
2,771,278	Slack	Nov. 20, 1956

OTHER REFERENCES

Publication I, "Subminiature Tube Sockets and Shields," published in Electrical Manufacturing, October 1952, page 166 relied on. (Copy in the Scientific Library and Div. 69, Class 174-355.)