Oct. 17, 1961 M. J. PIFER 3,005,174

TUBE SHIELD

Filed May 15, 1957

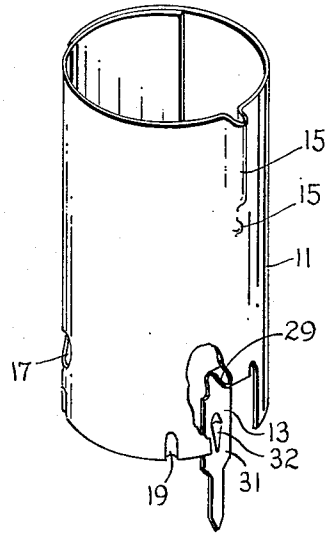


FIG. 1.

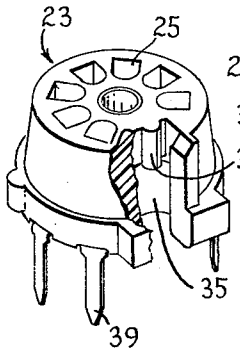


FIG. 2.

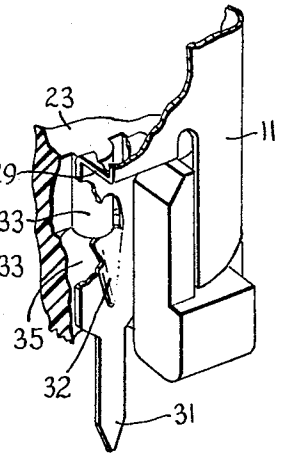


FIG. 3.

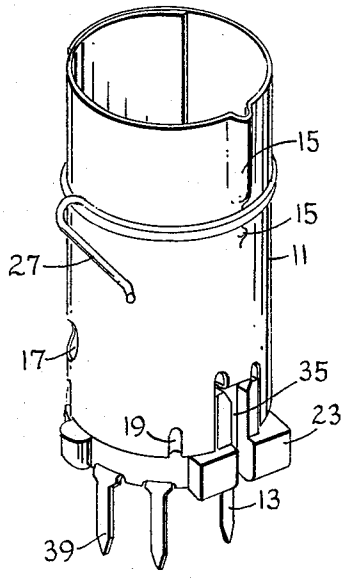


FIG. 4.

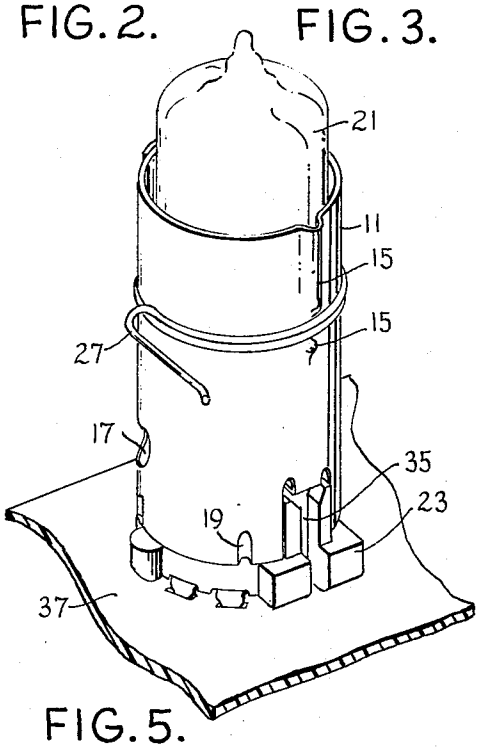


FIG. 5.

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TUBE SHIELD

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This invention relates to mounting assemblies for electrical devices such as electron discharge tubes, and more particularly to shields and shield assemblies for such devices.

It is an object of the invention to provide improved shielding for electrical devices, improved positioning of shields relative to their associated electrical devices, and improved grounding connections for such devices.

A further object is the maintenance of substantially constant capacitance between the electrical device electrodes and the associated shield under adverse conditions of handling and vibration.

Another object is the provision of a common electrical connection to ground for a plurality of electrical devices.

The foregoing objects of the invention, as well as other objects which will be apparent upon reference to the following description and accompanying drawings, are achieved in one aspect of the invention by the provision of a shield having a ground strap formed to snap into engagement with a socket and thereby provide affixation thereto. A conductor may be mounted upon the shield for contact with electrical devices disposed adjacent the device which is being shielded.

For a better understanding of the invention, reference is made to the following description taken in conjunction with the accompanying drawings in which:

FIG. 1 is a perspective view of a tube shield;

FIG. 2 is a partially sectioned perspective view of a tube socket;

FIG. 3 is a cut-away view of the tube shield and socket in an operative relationship;

FIG. 4 is a perspective view showing a shield and socket assembly; and

FIG. 5 illustrates a shield and socket in operative relationship with an electrical device and a chassis panel.

Referring to the drawings, a tubular shield **11**, which may be blanked from a strip of conductive material and rolled to form, is shown comprising a grounding strap **13**, spaced protrusions or positioning means **15**, indentations **17** and dimples **19**. The indentations are formed to engage an electrical device such as tube **21** while dimples **19** are formed to press against the surface of socket **23**. This socket is generally of the type shown and described in copending application S.N. 479,518, now United States Patent Number 2,863,131, entitled "Tube Socket," and assigned to the same assignee as the present invention.

The protrusions **15** may serve a dual function. Since the shield **11** is maintained in position upon socket **23** after assembly, the protrusions or positioning means may serve as indexing means for alignment of the tube contact prongs with the clips **25** of socket **23** during insertion of the tube. In addition, the spaced protrusions **15** may serve to position a spring **27** which is formed to wrap around the external surface of shield **11**. The end of spring **27** is formed to extend outwardly so that it may engage adjoining electrical devices such as an I.F. can, and thereby provide grounding contact for these adjoining devices.

The ground strap **13** has a first section **29** extending inward and transverse to the tubular body portion of shield **11**, and a second section **31** which extends from the first section along a plane substantially parallel to

the axis of the body portion and within the projected peripheral surface thereof. Section **31** of ground strap **13** has a resilient contact **32** formed to engage the shelf or retention device **33** formed in channel **35** of the socket. Contact **32** may be in the form of an integral pressed protrusion terminating in an aperture as shown, or it may comprise a resilient pivotally attached tab biased to snap beneath device **33**.

Manufacturers of electrical apparatus are using an ever increasing number of printed circuit panels of the type indicated by the numeral **37** in FIG. 5. These panels are often mounted vertically and are sometimes inverted so that the components hang from the panel. Under these conditions, it is advantageous to have shields which will remain in position under adverse conditions of handling and vibration and during removal of the electrical devices or tubes. Therefore, it is apparent that the shield should remain affixed to the socket so that it cannot fall and cause breakage or short circuiting of other electrical components.

Shield **11** may be efficiently assembled upon socket **23** by telescoping the shield over the external surface of the socket while threading ground strap **13** through channel **35**. When in position, resilient contact **32** engages the lower edge of retention device **33** to thereby lock the shield to the socket. Since ground strap **13** is integral with the body portion of shield **11** and is affixed to socket **23**, the capacitance between the shield and the electrodes of any given tube remains constant by virtue of the fact that vibration or insertion and removal of the tube cannot cause the shield to alter its position.

When using printed circuit type electrical chassis panels, it is desirable to have the connectors which go through the panels to be substantially symmetrically arranged and to have the contacts for each device take up a minimum amount of space. In accordance with these requirements, ground strap **13** is formed to extend from shield **11** along a plane lying substantially within the projected peripheral surface of the shield. This construction allows the ground connection **13** to be positioned on panel **37** in a substantially symmetrical relationship with other connectors **39**, in addition to alleviating the necessity of an externally mounted type shield ground strap.

Although one embodiment of the invention has been shown and described, as will be apparent to those skilled in the art that various modifications may be made therein without departing from the scope of the invention as defined by the appended claims.

What is claimed is:

1. A shield assembly for an electrical device adapted to be employed in an electrical circuit having a grounding element and adjacent another electrical device comprising an open-ended electrically conductive tubular body portion formed with spaced protrusions, a contact element maintained upon said body portion by said protrusions having a conductor formed to extend from said body portion and engage said other electrical device, and a ground strap extending from said body portion formed to engage the grounding element in the electrical circuit.

2. A shield assembly for an electrical device adapted to be employed in an electrical circuit having a grounding element and adjacent another electrical device comprising an open ended electrically conductive tubular body portion formed with spaced protrusions, a contact element maintained upon said body portion by said protrusions having a conductor formed to extend from said body portion and engage said other electrical device, and a ground strap integrally formed with said body portion extending therefrom within the projected surface thereof along a plane lying substantially parallel to the longi-

tudinal axis thereof, said strap being formed to engage the grounding element in the electrical circuit.

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