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ELECTRON TUBE MOUNTING APPARATUS

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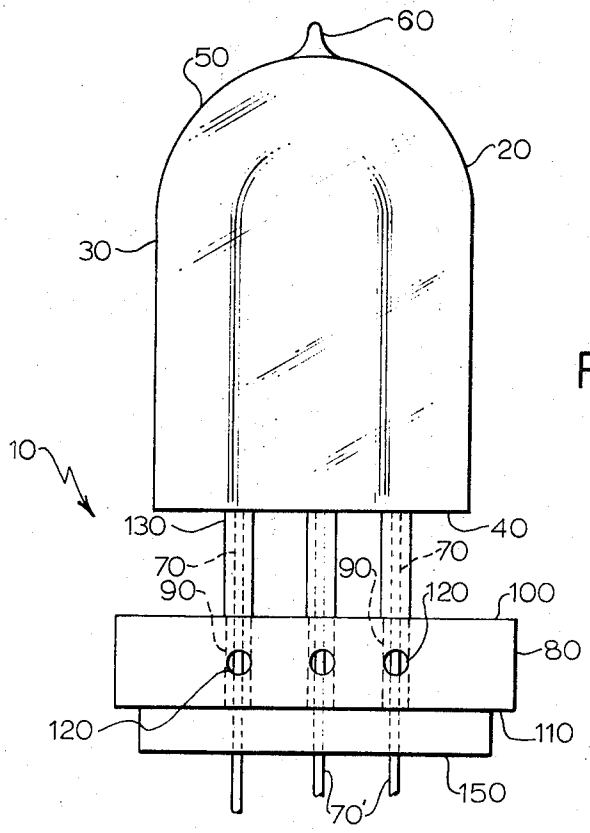


Fig. 1

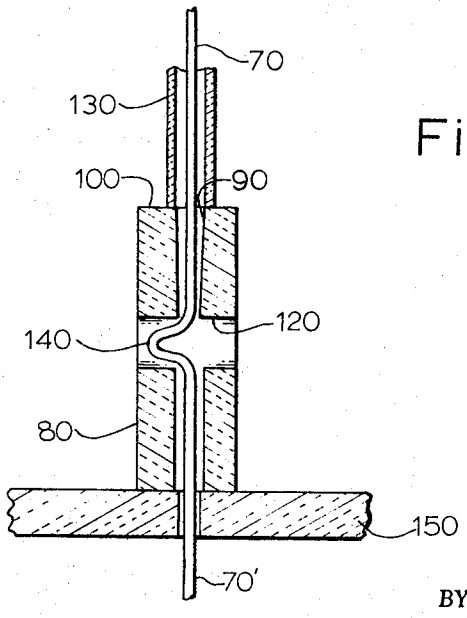


Fig. 2

INVENTOR.
William M. Hennessey
BY Robert A. Green
ATTORNEY

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ELECTRON TUBE MOUNTING APPARATUS

William M. Hennessey, Somerville, N.J., assignor to Burroughs Corporation, Detroit, Mich., a corporation of Michigan

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ABSTRACT OF THE DISCLOSURE

The disclosure is of an electron tube having a plurality of thin, flexible leads which carry insulating sleeves which extend along the greater portion of the length of each lead. An insulating plate is provided which has longitudinal apertures, into which the uncovered end of each lead is to be inserted. The leads extend through the plate, and a relatively short length extends from the opposite end. The plate includes, between its ends, transverse openings through which access may be had to each wire. By means of a suitable tool, each wire is bent so that a portion enters each transverse opening, and this portion acts as a lock which prevents the lead from being pulled out of the plate. The assembly is adapted to be inserted into a socket or printed circuit board by means of the relatively short lengths of the flexible leads which extend from the lower end of the plate.

BACKGROUND OF THE INVENTION

At the present time, electron tubes such as gas-filled indicator tubes which include ten or twelve cathode electrodes and an anode electrode have a similar number of thin, flexible leads extending from the base of the tube which, in miniature tubes, may be of the order of ½" or less in diameter. It can be seen that, in a tube of this size, the leads are very closely spaced, and it can also be appreciated that inserting the leads of such a tube into a tube socket is not an easy matter.

SUMMARY OF THE INVENTION

Briefly, the invention comprises an assembly of an electron tube having a plurality of filamentary leads, to which is coupled a rigid plate and from which a short length of each lead extends. The leads and plate are so coupled that the leads cannot be removed from the plate, and the assembly can be easily inserted into a tube socket by means of the insulating plate.

DESCRIPTION OF THE DRAWING

In the drawing:

FIG. 1 is a front elevational view of a tube and apparatus embodying the invention; and

FIG. 2 is an enlarged sectional view of a portion of the apparatus shown in FIG. 1.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The apparatus of the invention **10** is adapted to permit insertion of a tube **20** having filamentary leads into a tube socket or printed circuit board. A typical tube with which the invention may be practiced is a character display tube and includes an envelope **30** having a base or stem **40** and a dome **50** which carries tubulation **60**. The tube **20** contains an electrode assembly (not shown), which ordinarily includes ten cathode character electrodes arranged in a stack, an anode electrode which surrounds the stack of cathodes, and at least two auxiliary character electrodes, usually decimal points. The stem **40** usually carries twelve or fourteen flexible wires or leads **70** (only three are

shown) which are connected to the various electrodes inside the tube and are to be inserted in a tube socket or printed circuit board or the like.

The apparatus **10** of the invention also includes an insulating plate **80** which is generally rectangular and includes tapered longitudinal holes or slots **90** which extend through the plate from a relatively large opening at the upper end **100** to the lower end **110**. One hole **90** is provided for each lead **70** in the tube **20**. The plate also includes a plurality of holes or apertures **120** which extend through the plate **80** transverse to holes **90**.

In using the apparatus **10**, an insulating sleeve **130** is placed on each flexible lead **70**, and each lead is threaded into one of the holes **90** in the plate **80**. Each insulating sleeve extends between the upper end **100** of the plate **80** and the base **40** of the tube **20**, and the lead itself is of sufficient length so that a portion **70'** of its length, for example ½", extends from the lower end **110** of the plate. With the plate **80** thus positioned on the leads, a suitable tool is inserted into each of the transverse openings **120**, and each lead **70** is bent so that a kink **140** is formed which extends laterally in a direction transverse to the major axis of the lead and into the opening **120** offset from hole **90**. The kink **140** essentially locks each lead **70** in place in the plate **80** and keeps it from being removed accidentally.

The assembly is now ready for mounting on a tube socket or printed circuit board **150**, and this can be done easily by inserting the free ends **70'** of the leads into suitable openings therein.

What is claimed is:

1. A tube mounting assembly comprising

a tube including an envelope from which a plurality of thin, flexible leads extend,

an insulating plate having a plurality of longitudinal apertures extending therethrough,

a transverse aperture extending through the plate, and through each longitudinal aperture,

each lead of said tube being inserted into one end of a longitudinal aperture in said plate, extending through said aperture, and having an end portion extending out of its aperture and accessible outside said plate, and

a bend formed in each lead and positioned laterally of its longitudinal aperture and in its transverse aperture so that each lead is held securely in place in said plate and said plate can be manipulated to insert said leads outside said plate into apertures in a mounting member.

2. The tube defined in claim **1** wherein said insulating plate is coupled to said leads remote from said tube whereby a portion of each lead is exposed between said tube envelope and said insulating plate, said portion of each lead carrying a sleeve of insulating material.

3. The assembly defined in claim **1** wherein each longitudinal aperture is tapered and has a relatively large opening to permit easy insertion of a lead.

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