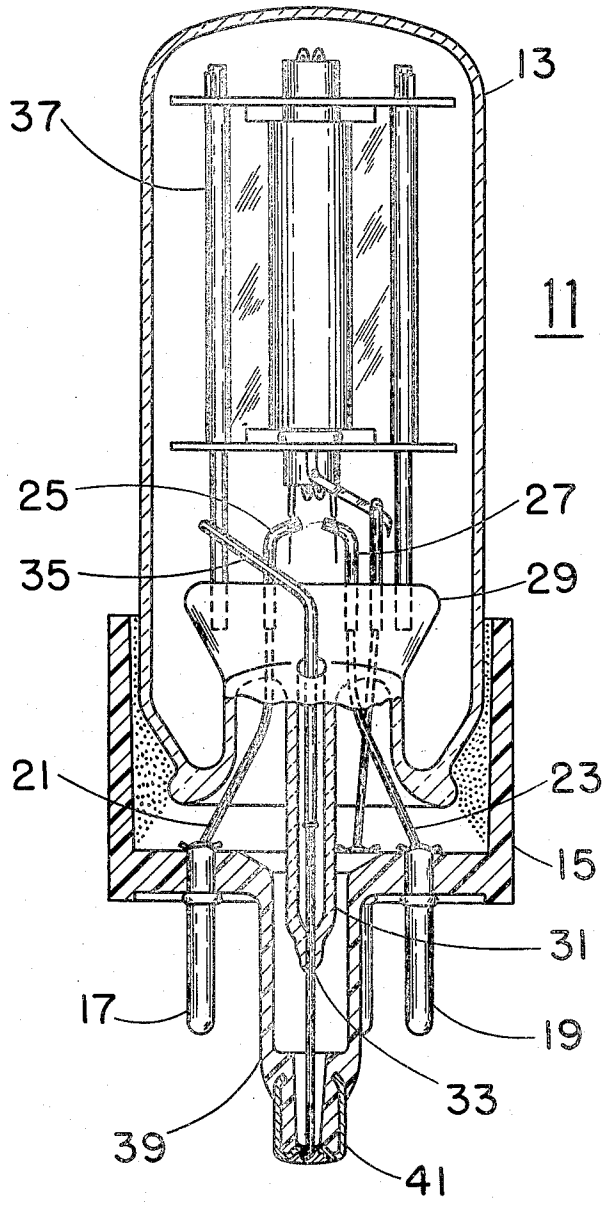
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ELECTRONIC TUBE

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ELECTRONIC TUBE

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This invention relates in general to electronic tubes and in particular to such tubes in high voltage applications.

It is the usual procedure where it is desired to introduce high voltage to an electronic tube to take advantage of the insulating properties of the glass envelope by making the high voltage connection at a point on the envelope remote from other leads. Although this arrangement is highly satisfactory from the standpoint of isolation of high voltage, there are instances where undesirable results are obtained. In most tube structures, the practice is to run all leads through the base pins to make contact with the socket. Wiring of the socket into circuit is of course done beneath the chassis on which the tube is mounted. When a high voltage connection is made to a point on the glass envelope, it becomes necessary to run a lead above the chassis to make that connection. In television receiver circuits, for example, high voltage leads of this type above the chassis are enclosed in a shielded compartment to avoid shock hazard to those adjusting or servicing the receiver. Such practice then requires the dismantling of shield compartments even for the simple purpose of tube removal.

One device practiced in an effort to avoid the use of shielded compartments is to place the entire tube beneath the chassis, usually in a horizontal position for economy of space. This leads to further complications, since many tubes must be properly oriented within narrow limits if horizontal operation is to be successful. Too, the problems of tube removal and of heat dissipation militate against such an expedient.

It is, therefore, an object of the present invention to provide an electronic tube wherein the high voltage connection is isolated from other connections.

It is another object of the present invention to provide an electronic tube which may be conventionally mounted without exposed high voltage leads.

It is a further object of the present invention to provide an electronic tube structure wherein an isolated lead is available beneath the chassis on which the tube is mounted.

In general the present invention consists in an electronic tube structure wherein a lead is brought through the exhaust tubulation, the tip, and the tube key. Provision is made for connecting circuit wiring to the lead by means of a cap and socket connector. For a better understanding of the present invention together with other and further objects, advantages and features, reference should be made to the following

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detailed description which is to be read in connection with the annexed drawing, the single figure of which is a sectional view of a preferred embodiment of the invention.

Referring now to the drawing, there is illustrated an electronic tube 11 having a glass envelope 13 and a base of the octal type 15. Base 15 is cemented to envelope 13 and has eight pins extending therefrom, pins 17 and 19 being representative. Leads 21 and 23 extend from pins 17 and 19 and, as is common in the electronic tube art, are sealed in stem press 29. Tubulation 31 communicates with the interior of envelope 13 through an opening beneath stem press 29 and terminates in a tip 33. Lead 35 connects to electrode 37, which in this instance is an electrode designed to be operated at high voltage. Lead 35 then passes into tubulation 31 and through its length. Tip 33 is actually formed over lead 35 when envelope 13 has been sufficiently evacuated during the manufacture of electronic tube 11. Lead 35 then extends into key 39 and passes through the end thereof. Cap 41 is cemented to the end of key 39 and a soldered connection is formed between 41 and lead 35. It is, of course, equally simple to embody the present invention in tubes using a "button" rather than stem press 29, the high voltage lead 35 being connected in the same manner as outlined above and passing through the tubulation which communicates centrally of the button with the interior of the bulb.

It may be seen that lead 35 is substantially completely isolated from all other leads of the tube, on both the evacuated and the unevacuated sides. On the evacuated side, lead 35 passes through tubulation 31 and may be spaced any reasonable amount from the other electrode leads as they pass through the stem press. On the unevacuated side, the thickness of the wall of the key in addition to the spacing between pins and key maintain lead 35 entirely apart from the other leads of the tube.

Suitable connections can easily be made to the isolation lead below the chassis with no interference with conventional connections or socket wiring. Also, if desired, the socket may be modified to receive cap 41 with resilient contact members appropriately located for plug-in connection.

While what has been disclosed is the preferred embodiment of the invention, the structure need not be limited to the exact details shown, since the separate concepts of utilization of the tubulation for insulation and high leakage resistance paths as well as the use of the tube key for similar purposes each are believed to be novel. Hence,

the invention should only be limited by the spirit and scope of the appended claims.

What is claimed is:

1. In combination with an electron tube, a lead connected to one of the electrodes of said tube, said lead passing through the exhaust tubulation of said tube, the tip on said exhaust tubulation being formed around said lead, a base on said tube having a key, said lead also passing through said key, and means for connecting external circuit elements to said lead.

2. In combination with an electron tube, a lead connected to one of the electrodes of said tube, said lead passing through the exhaust tubulation of said tube, the tip on said exhaust tubulation being formed around said lead, a base cemented to said tube and having a hollow key, said tip being disposed within said key, said key having an aperture formed therein, and a cap cemented to the end of said key, said lead passing through said aperture in said key and being electrically connected to said cap.

3. An electron tube comprising, a glass envelope, a plurality of electrodes within said envelope, a similar plurality of leads each being connected to one of said electrodes, a base cemented to said glass envelope, said base having a central key and a number of pins extending therefrom, means for connecting each of said plurality of leads less one to one of said pins through vacuum-tight seals, an exhaust tube extending from said glass envelope and terminating in a vacuum-tight tip within said central key, said one of said plurality of leads extending from one of said electrodes through said tip and through said key, and a cap electrically connected to said one lead and physically attached to the extremity of said key.

4. An electron tube comprising, a glass envelope, a plurality of electrodes within said envelope, one of said electrodes being designed for high voltage operation, a similar plurality of leads, a base having a central key and a number of pins extending therefrom, said base being cemented to said envelope, a stem press enclosing said plurality of leads less one, said plurality of leads less one each connecting one of said electrodes to one of said pins through said stem press, an exhaust tubulation having one end communicating with the interior of said envelope through an aperture formed adjacent said stem press, a tip being formed on the other end of said tubulation, said other end being disposed within said central key, and a hollow cap cemented to the end of said key, said key having an aperture formed therein communicating with the interior of said hollow cap, said one of said leads being connected from said cap to said one of said electrodes through said key and said exhaust tubulation.

5. An electron tube comprising, an evacuated bulb, a base of insulating material cemented to said bulb, said base having a plurality of metallic pins circularly arranged and molded into the end thereof and a key centrally disposed relative to said pins, a lead wire for connecting each of the said pins to an element within said evacuated bulb, an additional lead wire passing through said key, and a connecting cap attached to said key and electrically connected to said additional lead wire.

6. An electron tube comprising, an evacuated bulb, a plurality of electrodes within said bulb, one of said electrodes being adapted for high voltage operation, a lead wire connected to said one of said electrodes, means for insulating said lead wire, said means including an exhaust tubulation through which said lead wire runs, a base attached to said tube and having a hollow key portion through which said lead wire also passes, and means for making connection to said lead wire disposed on the exterior of said hollow key portion.

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