July 22, 1958 J. ERKELENS ET AL 2,844,769

SEMI-CONDUCTOR ELECTRODE SYSTEMS

Filed Nov. 19, 1954

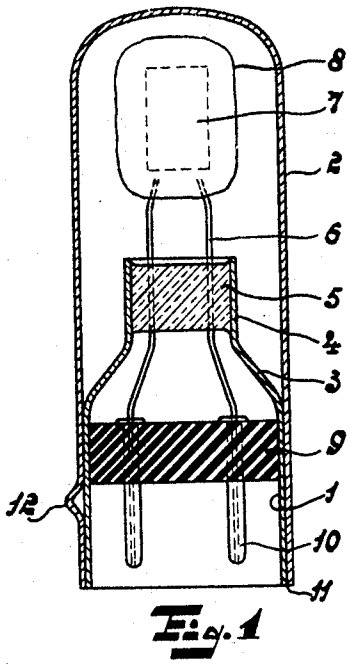

Fig. 1

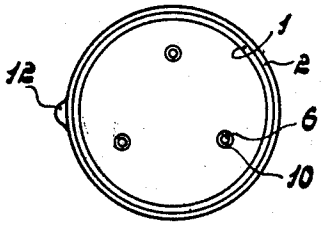

Fig. 2

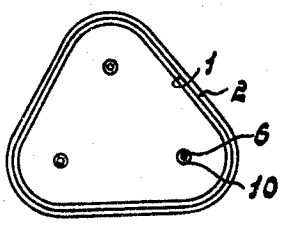

Fig. 3

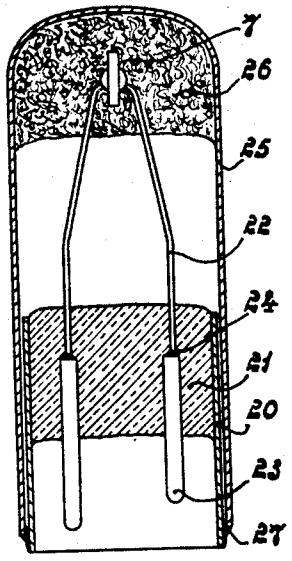

Fig. 4

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United States Patent Office 2,844,769 Patented July 22, 1958

2,844,769

SEMI-CONDUCTOR ELECTRODE SYSTEMS

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Application November 19, 1954, Serial No. 470,038

Claims priority, application Netherlands December 24, 1953

5 Claims. (Cl. 317—234)

The invention relates to an electrode system comprising a semi-conductor device, more particularly a transistor or a crystal diode having an envelope constituted by a bottom or base closure or header to which one or more current supply or lead-in wires are secured and by a cap or can united with the header at the edge and enclosing a space in which the semi-conductive body with one or more electrodes is located. The header and the can may be made of metal, in which case they may be soldered together at the edge, but they may, as an alternative, be made of insulating material, for example a thermoplastic synthetic resin, in which case the parts may be sealed or cemented together at the edge.

This construction has a disadvantage in that the connection area of the parts lies very near the semi-conductive body, so that the latter may be affected adversely by the high temperature needed for soldering or by the flux means to be used in this operation.

A further disadvantage is that the parts of the supply wires projecting beyond the housing may be readily bent. With respect to the usually small dimensions of the transistor or the diode, these wires are generally very thin.

The invention has for its object inter alia to obviate these disadvantages.

According to the invention the bottom closure is shaped in the form of a tube, which contains at one end an insulating obturation, in which one or more conductors are secured; at the other end the tube surrounds a hole or cavity, the cap or can being slipped over one end and secured at the edge to the other end of the tube.

Thus the connection area is located at a certain distance from the semi-conductive crystal. In order to reduce further the heat transmission to the semi-conductive body, the construction may be such that the tube is surrounded with a certain amount of clearance by the cap at the area of said one end. This is preferably obtained by choosing the diameter of the tube at the area of said one end to be smaller than that at the other end, while the cap is cylindrical. Internally of the tube a hole or cavity is formed, in which contacts connected to the conductors may be housed.

During operation, the transistor or the diode must be held in a holder or socket. In order to facilitate insertion into the holder and to prevent the contacts from being damaged due to erroneous insertion, the envelope may be provided at the lower edge with one or more locating lugs. With these lugs other lugs provided on the holder may co-operate in a manner such that the transistor or the diode must first be positioned correctly before the contacts can be engaged.

The invention will be described more fully with reference to a few embodiments shown in the drawing, in which:

Fig. 1 is a sectional view of a transistor.

Fig. 2 is a bottom view of this transistor.

Fig. 3 is a bottom view of a further embodiment of such a transistor.

Fig. 4 shows a sectional view of a third embodiment.

The drawing is made on a greatly exaggerated scale. The entire length of the housing may be 16 mm. and the diameter may be 5 mm.

The transistor shown in Fig. 1 has an envelope constituted by a bottom or base **1** and a cap or can **2**. The bottom **1** is tubular and funnel-shaped at **3**. In the narrow portion **4** provision is made of a plug **5** of insulating material. It is very efficient to use glass to this end, since this can be readily sealed in as a bead. In the plug **5** are sealed three current supply conductors or terminals **6**, of which Fig. 1 shows two. These conductors support a semi-conductive body **7**, having electrodes and being shown diagrammatically in broken lines; the combination is referred to as a semi-conductor device. The body is usually surrounded by an insulating moisture-impervious layer, designated by **8**.

In the cavity at the lower end of the bottom piece **1** provision is made of a disc **9**, which may for example be made of polystyrene and be moulded in the tube. In the disc **9** are riveted three contacts in the form of hollow pins **10**, through which the conductors **6** are taken.

After the bottom with the transistor and the contacts have been assembled, the cap or can **2** is slipped over the bottom and secured thereto preferably by clamping. Then the bottom **1** and the cap **2** are sealed at the lower edge **11** by soldering. To this end the lower side of the housing may be immersed into a soldering bath. During this operation the conductors **6** may be soldered tightly to the pins at the same time. It will be obvious that with the shape described above, any harmful vapour which may be produced during soldering can substantially not penetrate to the transistor itself.

In this embodiment the cap has a locating lug **12**, so that correct positioning of the transistor in its holder (not shown) is ensured.

As an alternative, the envelope may exhibit such a non-circular profile that it can be inserted into a holder only in one manner. Fig. 3 shows one example of such a profile, which is in this case triangular.

In the construction shown in Fig. 4 the bottom or base **20** is constituted by a cylindrical tube, in which a glass plug or closing member **21** is sealed. The conductors or terminals for the semi-conductor device are constituted by a thin portion **22** and thicker contacts **23** extending into the cavity formed in the lower end of the tube **20**, which conductor parts are welded together at **24**. The semi-conductive body **7** is located in the upper part of the cap **25**, and is enveloped in a fill **26**, for example of silicone grease.

Before the cap **25** is slipped over the bottom **20**, their lower edges are provided with a layer of solder; then they are carefully cleaned from the flux means used. After the two parts have been united, the lower edge of the envelope is heated for a short instant, so that the solder **27** becomes liquid and intermixes. A satisfactory sealing may be furthered by arranging the edges of the bottom and the cap on different levels.

With the transistor shown in Fig. 4, one of the contacts **23** is longer than the other, so that it operates as a locating lug.

What is claimed is:

1. An electrode system comprising a tubular base member, an insulating closing member secured in one end of said base member and defining at the other end a cavity, a semi-conductor device mounted on said base member adjacent said one end and remote from said other end and including at least one terminal member sealed within and passing through said insulating member and extending into said cavity, a hollow, cap-like member surrounding said base member and said semi-conductor device mounted thereon and being secured to said base mem-

ber at said other end thereof and thus at an area remote from said semi-conductor device.

2. An electrode system as set forth in claim 1 wherein inner wall portions of the cap-like member is spaced from outer wall portions of the base member, except where the two are secured together at said other end of the base member.

3. An electrode system as set forth in claim 1 wherein said one end of the tubular base member has a smaller diameter than said other end of said base member, said cap-like member being cylindrical in shape.

4. An electrode system as set forth in claim 1 wherein a locating lug is provided at one end of said cap-like member.

5. An electrode system comprising a metallic tubular base member, an insulating closing member secured in one end of said base member and defining at the other end a cavity, a semi-conductor device mounted on said base member adjacent said one end and remote from said other end and including at least one conductive member sealed within said insulating member, a contact pin secured to said conductive member and extending within said cavity, a metallic, hollow, cylindrical can surrounding said base member and said semi-conductor device mounted thereon, and solder means securing said can to said base member along an edge at said other end thereof and thus at an area remote from said semi-conductor device.

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