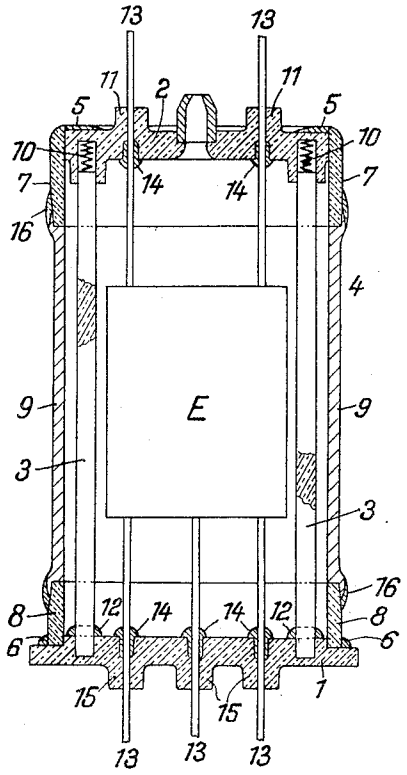
June 11, 1940. F. HERRIGER 2,204,217

ELECTRON TUBE

Filed Sept. 10, 1938



Inventor:
Felix Herriger
by R. C. Hopgood
Att'y

Patented June 11, 1940 2,204,217

UNITED STATES PATENT OFFICE

2,204,217

ELECTRON TUBE

Felix Herriger, Berlin, Germany, assignor to C. Lorenz Aktiengesellschaft, Berlin-Tempelhof (Germany), Lorenzweg, a company

Application September 10, 1938, Serial No. 229,246
In Germany September 20, 1937

8 Claims. (Cl. 250—27.5)

In the manufacture of vacuum vessels for electron tubes, especially high power tubes, it is found that the electrodes are difficult to adjust and that therefore the tubes are frequently of different electric properties. The method of manufacturing these tubes is generally such that the electrodes are fastened on a so-called stem and that then the electrode system is surrounded with a glass bulb or a metal bulb serving as anode. If a stem is employed the tubes are found to be of considerable lengths. Also, glass and metal are difficult to fasten to each other by means of sealing melts.

It has also been proposed to arrange the electrode system on a ceramic support having leads fixed therein by seals in a manner to insure vacuum tightness. Sometimes, especially in the case of short wave tubes, it is desirable not to use such single support common to all the leads but to have some leads supported apart from the others. In order to achieve this, it has been customary to fasten flexible conductors to the respective electrodes and subsequently to seal these conductors in the bulb wall. This method is disadvantageous in some respects. In fact, the subsequent provision of seals can cause the electrode system to be unduly heated by the melting flame. Furthermore, when arranging some of the leads in the bulb as supports it is not possible perfectly to comply with the dimensional requirements by which the leads shall be invariably held in definite relation to each other and to the electrode system. In addition, such arrangement of these separate leads is very sensitive to mechanic stresses.

In order to overcome these drawbacks the invention provides at least two ceramic discs for supporting the leads, the electrode system being arranged between two such discs.

The invention will be more readily understood from the following description and be particularly pointed out in the appended claims, reference being had to the accompanying drawing, which is a partially diagrammatic sectional view of an embodiment of the invention.

The electron tube here shown by way of example has a vacuum vessel that consists of two ceramic cover discs 1, 2 and a cylindrical part of envelope 4 composed of two ceramic rings 7, 8 and of a cylinder 9 to which these rings are fastened. Cylinder 9 may be of glass or metal. Alternatively, in case water cooling is provided for the electrode system E, part 4 may be entirely of ceramic material. Disc 1 carries rods 3 rigidly fastened to it. These rods are preferably of ceramic material. Disc 2 is slidably fitted to the rods 3, springs 10 being disposed between these and disc 2. The electrode system E has leads or conductors 13 rigidly secured to it and fastened in the discs 1, 2, which to such end are fitted with tubular extensions 15, 11. The reference numerals 5, 6, 12, 14, 16 designate seals made of glass, for instance.

In the manufacture of electron tubes of this novel type first the electrode system E is fastened to the discs 1, 2 by means of the conductors 13. This can be readily accomplished and allows the electrode system to be precisely adjusted. Subsequently part 4 is slid over disc 2 until it comes against disc 1.

The rings 7, 8 being of ceramic material facilitate the provision of the seals 5, 6. In order here to avoid the use of a melting flame the electron tube may be heated as a whole in a high vacuum or in a protective gas.

The discs 1, 2 being of ceramic material constitute supports which are invariably of the same desired dimensional characteristics, that is to say, will invariably hold the leads or conductors 13 in the proper positions.

Over the tubular extensions 11, 15 contact members in the shape of caps or hoods are inserted in well known manner. These members, not shown in the drawing, and the conductors 13 are then electrically interconnected. Preferably elastic means serve this purpose in order to prevent the seals 14 from being influenced by mechanic stresses.

What is claimed is:

1. An electron tube having two ceramic cover discs and a cylindrical closure member extending therebetween, said closure member comprising a ceramic ring fastened to one of said cover discs, a ceramic ring fastened to the other of said cover discs and a cylinder of different material interconnecting said ring.

2. An electron tube according to claim 1, wherein the envelope is composed of a glass cylinder, a ceramic ring fastened to one of the cover discs, and a ceramic ring fastened to another cover disc.

3. An electron tube according to claim 1, wherein the envelope comprises a metal cylinder, a ceramic ring fastened to one of the cover discs, and a ceramic ring fastened to another cover disc.

4. An electron tube as defined in claim 1, having ceramic rods within the envelope and whereby the cover discs are interconnected.

5. An electron tube as defined in claim 1,

having ceramic rods fastened to one of the cover discs and slidably attached to another cover disc, and elastic means interposed between these rods and that cover disc to which said rods are slidably attached.

6. The method of manufacturing electron tubes comprising ceramic discs, electrodes supported by said discs and a cylindrical closure member which comprises fastening said electrodes to said discs and thereafter sliding said closure member over one of said discs until it contacts with the other of said discs and sealing said member to said discs.

7. An electron tube having two ceramic covered discs, a plurality of ceramic rods fastened to one of said discs and slidably connected to the other of said discs to hold said discs in alignment and a cylindrical closure member extending between said cover discs, said closure member comprising a ceramic ring fastened to one of said cover discs and a ceramic ring fastened to the other of said cover discs.

8. A device in accordance with claim 7 wherein elastic means is interposed between said rods and the cover disc to which said rods are slidably interconnected.

FELIX HERRIGER.