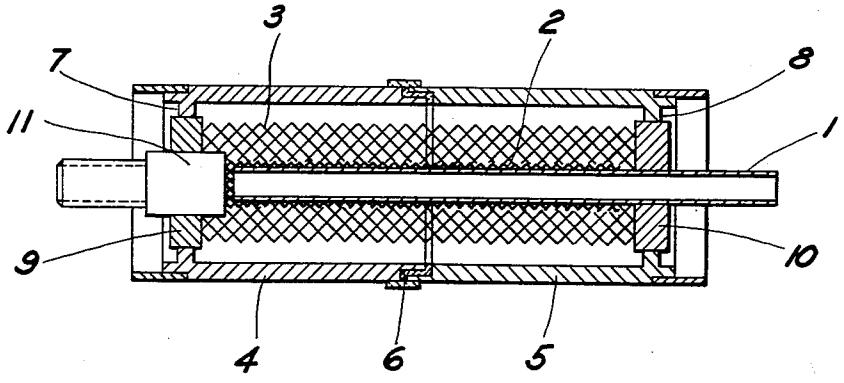
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ELECTRON TUBE HAVING COAXIAL TERMINALS FOR AN INTERIORLY EMISSIVE CATHODE

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ELECTRON TUBE HAVING COAXIAL TERMINALS FOR AN INTERIORLY EMISSIVE CATHODE

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My invention relates to an electron discharge tube and more particularly to an electron discharge tube in which a cathode surrounds the anode and other electrodes.

Tubes of this type can be operated with large currents, e.g. 2,000 amps and are particularly adapted for pulsed operation at a low duty cycle, the average anode dissipation being, therefore, small. Such tubes may be used, for example, in installations requiring a large pulsed power output such as particle accelerators, radars, and the like.

The invention will be described with reference to the accompanying drawing in which the sole figure is a sectional view of the tube according to the invention.

The tube according to the invention comprises an anode 1, preferably water-cooled, surrounded by a grid electrode 2, both of which are surrounded by an external cathode 3, preferably of the mesh type.

Since this cathode has an extremely large effective area, and if made from sufficiently thick wires, it can emit very large currents, for instance, with pulsed operation 2,000 amps from a 10 kw.–10 v.–1,000 amp rated cathode.

In order to furnish such large currents to the cathode, it is a further feature of the invention to employ an outer shell which comprises two large diameter coaxial metal cylinders 4, 5 insulated from each other by a thin ceramic or glass ring 6.

Each metal cylinder is provided with an internal flange 7, 8 onto which the ends 9, 10 or the mesh cathode are fixed, e.g. welded. The metal cylinders, which can be water or air-cooled, provide the necessary contact surfaces required in view of the high cathode current.

On both ends of the tube, ceramic or glass insulators 11 are brazed, one carrying a grid input terminal, the other a terminal for the anode.

The anode may be cooled either by liquids, air or gas.

While I have thus described my invention in connection with a specific embodiment thereof, other modifications will be apparent to those skilled in the art. The invention is limited only by the scope of the claims appended hereto.

What I claim is:

1. An electron discharge tube comprising an anode, a cathode adapted to emit currents of the order of thousands of amperes surrounding said anode, and terminal means for said cathode comprising a pair of coaxial metal cylinders surrounding said cathode and insulated from each other.

2. An electron discharge tube comprising an anode, a mesh cathode adapted to emit currents of the order of thousands of amperes surrounding said anode, and terminal means for said cathode comprising a pair of coaxial metal cylinders surrounding said cathode and insulated from each other.

3. An electron discharge tube comprising an anode, a cathode adapted to emit currents of the order of thousands of amperes surrounding said anode, a control electrode between and concentric with the anode and cathode, and terminal means for said cathode comprising a pair of coaxial metal cylinders surrounding said cathode and insulated from each other.

4. An electron discharge tube comprising an anode, a cathode adapted to emit currents of the order of thousands of amperes surrounding said anode, and terminal means for said cathode comprising a pair of coaxial metal cylinders surrounding said cathode and separated from each other by an insulating annular member.

5. An electron discharge tube comprising an anode, a mesh cathode adapted to emit currents of the order of thousands of amperes surrounding and concentric with said anode, a control electrode between and concentric with the anode and cathode, and terminal means for said cathode comprising a pair of coaxial metal cylinders surrounding said cathode and separated from each other by an insulating ceramic annular member.

6. An electron discharge tube comprising a hollow anode, means to supply a cooling medium to said anode, a cathode adapted to emit currents of the order of thousands of amperes surrounding and concentric with said anode, a control electrode between and concentric with said anode and cathode, and terminal means for said cathode comprising a pair of coaxial metal cylinders surrounding and concentric with the cathode, said metal cylinders being separated from each other by an insulating ceramic annular member.

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