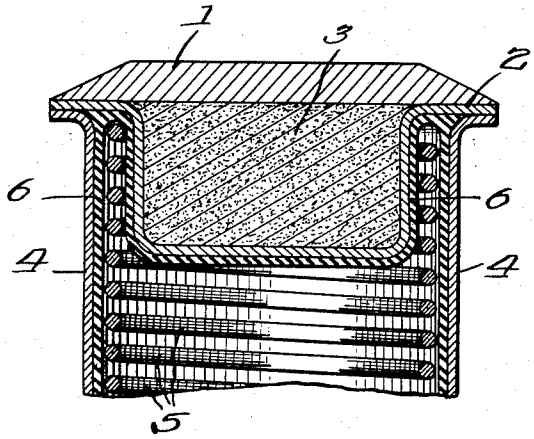
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CATHODE FOR USE IN ELECTRICAL DISCHARGE DEVICES

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CATHODE FOR USE IN ELECTRICAL DISCHARGE DEVICES

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4 Claims. (Cl. 313—340)

This invention is concerned with a dispenser type cathode having a supply of an emission substance which migrates during operation to the emitting surface and having an insulating layer on the side of the cathode structure which faces the heating filament.

It was found, in connection with cathodes having a supply of an emission substance in back of the member forming the emitting surface, that favorable emission is obtained if care is taken to provide for proper permeability, for example, for a possibility for the migration of the emission substance to the cathode surface. This may be obtained, for example, by winding about the cathode suitable wires, bands or the like so as to form fine channels for the passage of the emission substance. The fine channels may also be obtained, for example, by the use of porous sintered bodies. Tungsten or molybdenum are mentioned as materials which favor the migration of emission substances such as thorium or barium compositions.

The temperature distribution in such a cathode frequently requires heating filament temperatures exceeding those of the tungsten or molybdenum cathode body which forms the emitting surface, thereby producing the danger of damaging the insulation of the heating member or filament.

This drawback is avoided by the invention which proposes to utilize wholly or partially the emitting cathode body to form the insulation therebetween and the heating member, in contradistinction to prior structures in which this insulation is formed on the heating member.

The emitting cathode body, which is preferably made of tungsten or molybdenum, is for this purpose provided with an insulating layer on the side thereof which faces the heating member. This layer may be provided in suitable manner, for example, by spraying or cataphoresis. The heating member may be formed in any desired and suitable manner and may be free of insulation. It may be particularly advantageous to form the heating member in the manner of a freely disposed noninsulated coil.

An example of the invention is illustrated in the accompanying drawing, showing on an enlarged scale a sectional view of a flat cathode comprising a sintered porous body forming the emitting surface.

The porous sintered member or body of the structure, which forms the emitting surface, is indicated by numeral 1. Such body may be made, for example, of sintered tungsten. In the back of this body is disposed a pot-shaped member made of molybdenum or like material, forming with the body 1 a container in which is disposed the supply of emission substance 3. The rim 2 of pot-shaped member is tightly connected with the sintered body 1 and with the tubular carrier 4 which encloses the heating filament made in the form of the winding 5.

The emission substance 3 is caused to migrate through the fine pores of the sintered body 1 to the emitting surface formed thereby, responsive to heating by the filament 5. The pot-shaped member 2 forming with the emitting body 1 the container must be brought to a high temperature in order to obtain this action, and the heating filament 5 consequently assumes a still higher temperature. If a heating filament were used which is in usual manner insulated, for example, by aluminum oxide, there would appear the danger of damage to the insulation in the presence of the high temperatures involved.

In order to eliminate this danger and disadvantage there is, in accordance with the invention, provided an insulating layer 6 on the side of the cathode structure (member 2 and emitting body 1) which faces the filament 5. The insulation for the heating filament or wire may be omitted, if desired.

Changes may be made within the scope and spirit of the appended claims.

I claim:

1. A dispenser type cathode for use in an electrical discharge tube comprising a metallic body forming an emitting surface, a substantially pot-shaped member connected with the side of said body facing away from said emitting surface and forming with said side a receptacle for enclosing an emission substance, a tubular carrier connected with and extending from said body and forming with a wall of said receptacle an annular space, a heater element disposed within said space for heating said receptacle and therewith said emission substance enclosed therein to cause migration thereof through said body to the emitting surface formed thereby, and an insulating coating carried on the wall of said receptacle which faces said heater.

2. A cathode according to claim 1, comprising a molybdenum body constituting said metallic body.

3. A cathode according to claim 1, comprising a tungsten body constituting said metallic body.

4. A cathode according to claim 1, comprising a non-insulated coil-like element constituting said heater.

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