United States Patent

Blatter

[15] **3,681,643**

[45] **Aug. 1, 1972**

[54] **CATHODE-SYSTEM IN WHICH THE CATHODE IS SUPPORTED BY PRESTRESSED WIRES**

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[22] Filed: **Oct. 15, 1970**

[21] Appl. No.: **81,010**

[52] **U.S. Cl.** **313/337,** 313/261, 313/292

[51] **Int. Cl.**.....**H01j 1/20**

[58] **Field of Search**.....313/337, 266, 292

[56] **References Cited**

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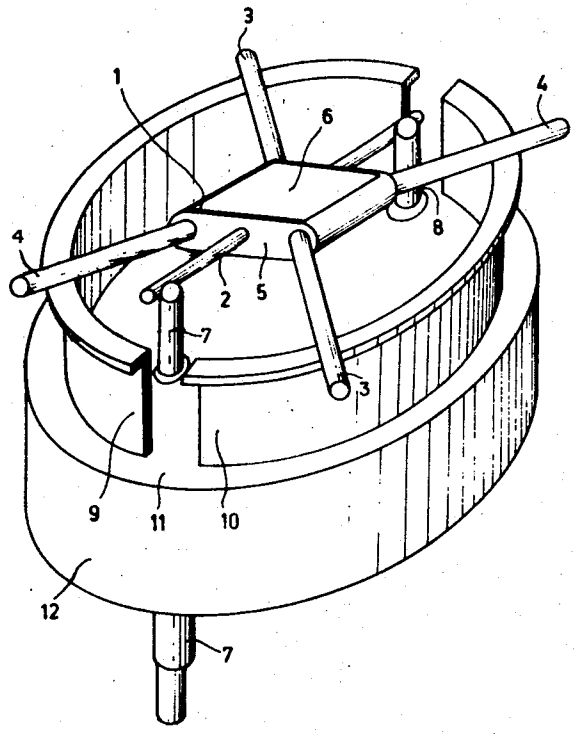
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[57] **ABSTRACT**

A cathode system in which a cathode comprising a squeezed metal tube having incorporated therein an insulated filament is supported by prestressed wires which extend parallel to the flat emitting surface of the cathode and extend radially outwardly from the squeezed metal tube in the shape of a star.

2 Claims, 3 Drawing Figures



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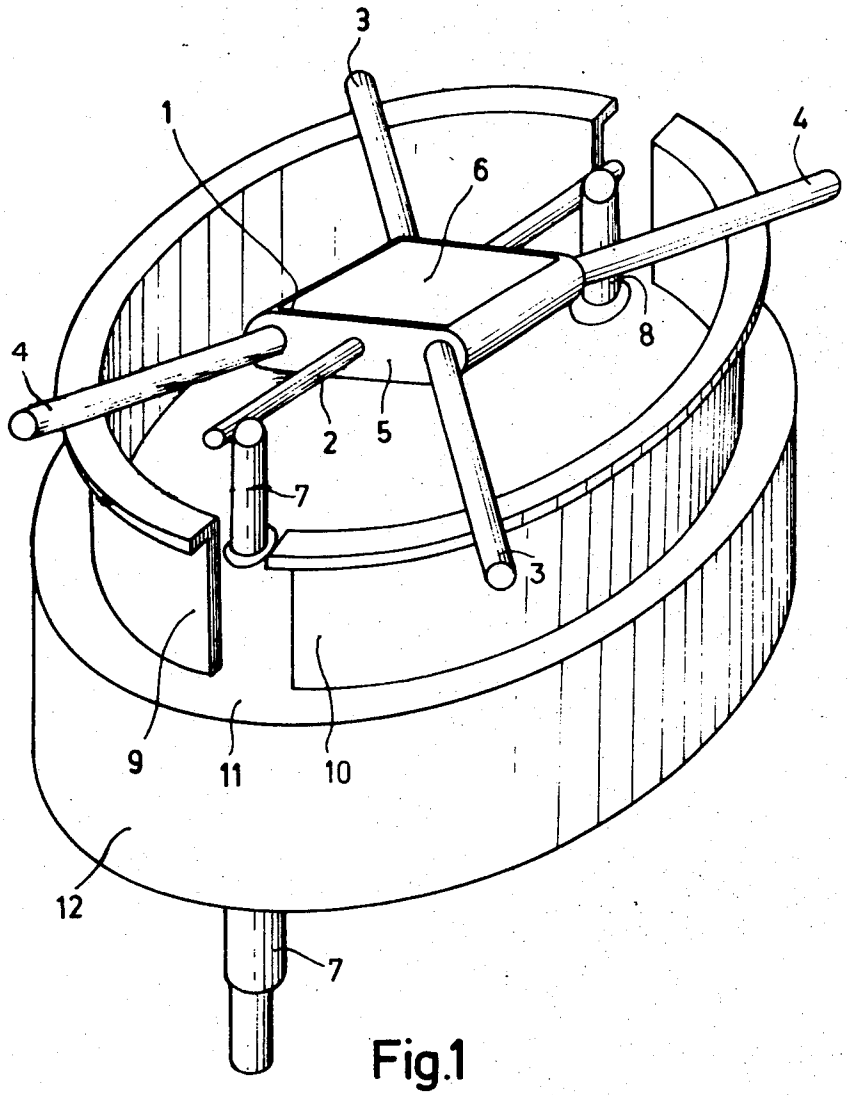


Fig.1

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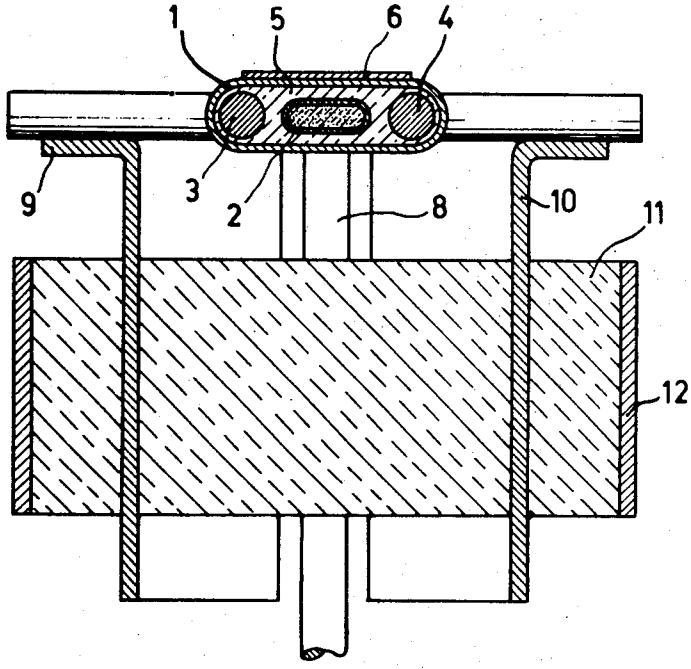


Fig.2

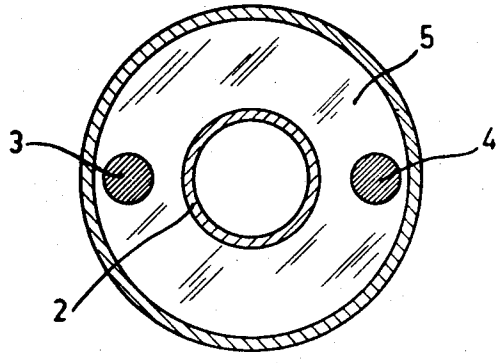


Fig.3

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CATHODE-SYSTEM IN WHICH THE CATHODE IS SUPPORTED BY PRESTRESSED WIRES

The invention relates to a cathode system in which the cathode is supported by pre-stressed wires, said wires extending parallel to the flat emitting surface of the cathode.

In the construction known from Dutch Pat. specification No. 100,487, the cathode consists of a cylindrical body which on the side remote from the emitting surface is welded to two parallel wires which are under a prestress and which are secured to a heat screen.

In the known construction it is difficult to direct the emitting end face of the cylindrical cathode body correctly during welding the wire, while the resistance to vibration is low due to the large length of the cathode body relative to the mutual distance and length of the supporting wires. The overall heating power of the cathode is also high, in the order of a few W.

It is the object of the invention to provide a construction which has advantages relative to the known construction.

In a cathode system in which the cathode is supported by prestressed wires which extend parallel to the flat emitting surface of the cathode, the emitting cathode body consists of a squeezed metal tube in which an insulated filament is incorporated and in which near the squeezed sides two supporting wires are pressed in which, outside the cathode body, show a mainly star-like shape.

The advantage of the squeezed metal tube which is covered on the emission side with a suitable emitting material is that the irradiating surface of the cathode is hardly larger than twice the emitting surface.

The cathode body lies substantially in the same flat plane with the supporting wires, and can therefore be accurately directed by means of the supporting construction. The cathode-body itself comprises no welds which might result in brittle fracture. Due to the small mass, vibrations are substantially not possible.

The supporting wires are preferably welded to the bent edges of two cylinder segments which are secured in the cathode support. By slightly bending said segments towards each other during the welding, a sufficient prestress is ensured also at higher cathode temperature.

The invention will now be described with reference to the accompanying drawing, in which:

FIG. 1 is a perspective drawing of a cathode. system according to the invention, and

FIG. 2 is an axial cross-sectional view thereof, while

FIG. 3 shows the cathode parts prior to squeezing.

In the figures, reference numeral 1 denotes a squeezed nickel tube 1 mm square. This is obtained (FIG. 3) by squeezing a nickel tube 1 mm long, 6 mm diameter, 75 μ wall thickness. A filament coil 2 and two supporting wires 3 and 4 of 50 μ thickness are present in the tube. The material of said supporting wires is tungsten with 26 percent rhenium.

Alundum 5 is present in the tube 1 to insulate the filament 2. On the upper surface of the squeezed tube 1, barium strontium carbonate denoted by 6 has been sprayed.

The ends of the wires 3 and 4 which are star-shaped are welded to the bent ends of the cylinder segments 9 and 10 consisting of nickel which during welding are slightly pressed together. The cylinder segments are incorporated in powder glass 11 enclosed in the nickel ring 12. The pins 7 and 8 are welded to the ends of the filament. The emitting power of the cathode is 0.25 W.

The cathode system may have a small length and is particularly suitable for camera tubes.

What is claimed is:

1. An indirectly heated cathode comprising a support, a flattened tubular body having side and end walls, and top and bottom flat surfaces, said side and end walls having dimensions smaller than the length and width of said top and bottom flat surfaces one of said flat surfaces supports an electron emissive material, an insulated heating filament extending through said body, and prestressed supporting wires extending radially outwardly to said support from the end walls of said body and substantially parallel to said flat surface supporting said emissive material.

2. A cathode-system as claimed in Claim 1 wherein the supporting wires are secured to bent edges of two cylinder segments which are secured in the cathode support.

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