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Yamazaki et al.

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[54] **CONNECTING MEMBER IN POST FOCUSING TYPE COLOUR PICTURE TUBES**

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[51] **Int. Cl.** **H01j 29/06**

[58] **Field of Search**... 313/85 S, 92 R, 92 B, 92 PD, 313/291

[56] **References Cited**

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Attorney, Agent, or Firm—Chittick, Thompson & Pfund

[57] **ABSTRACT**

In a post focusing type colour picture tube of the type wherein a fluorescent screen is connected to an external terminal by means of a connecting member which is supported by a post focusing electrode through an insulating member, the insulating member is connected to the connecting member and the post focusing electrode member by welding, fusion or brazing instead of using a bonding agent which is liable to be broken by mechanical shock or aging.

7 Claims, 2 Drawing Figures

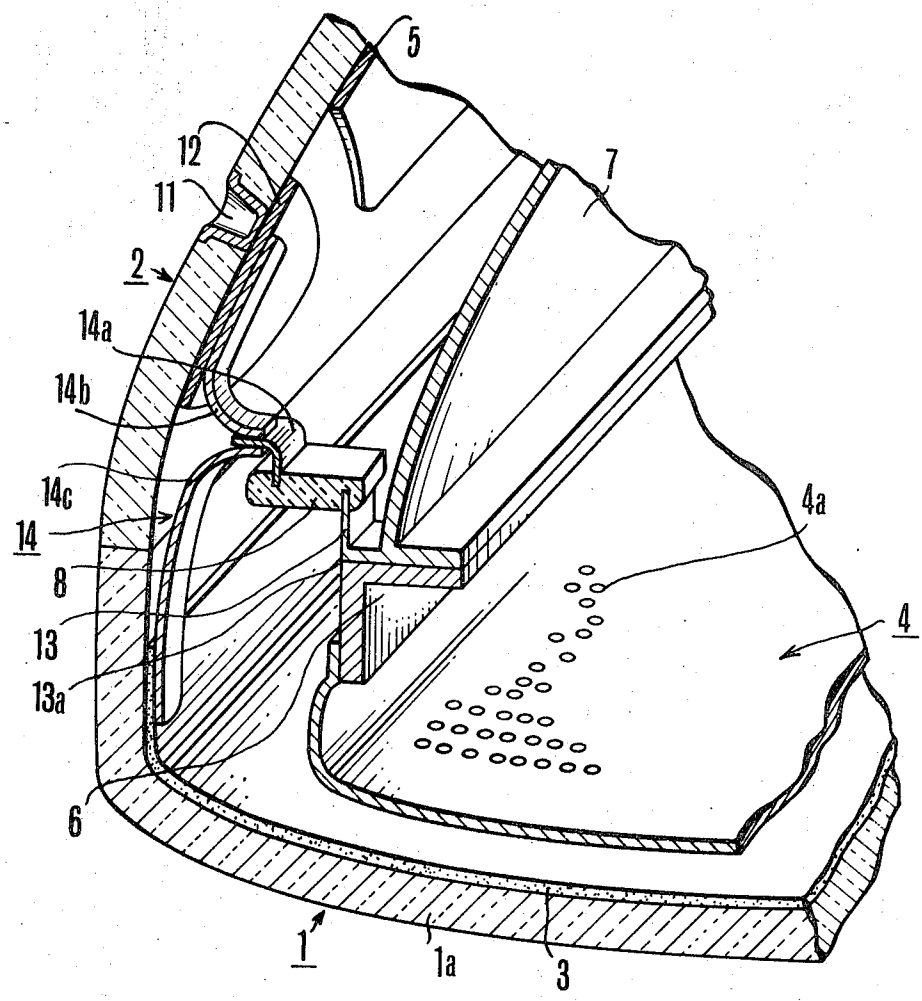
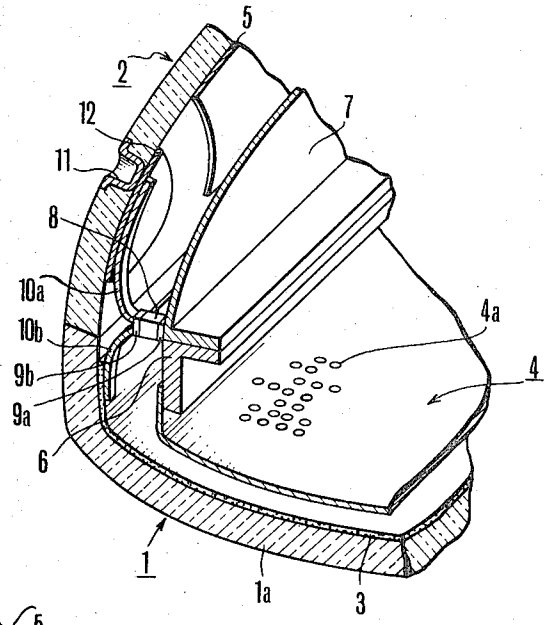


FIG. 1

PRIOR ART



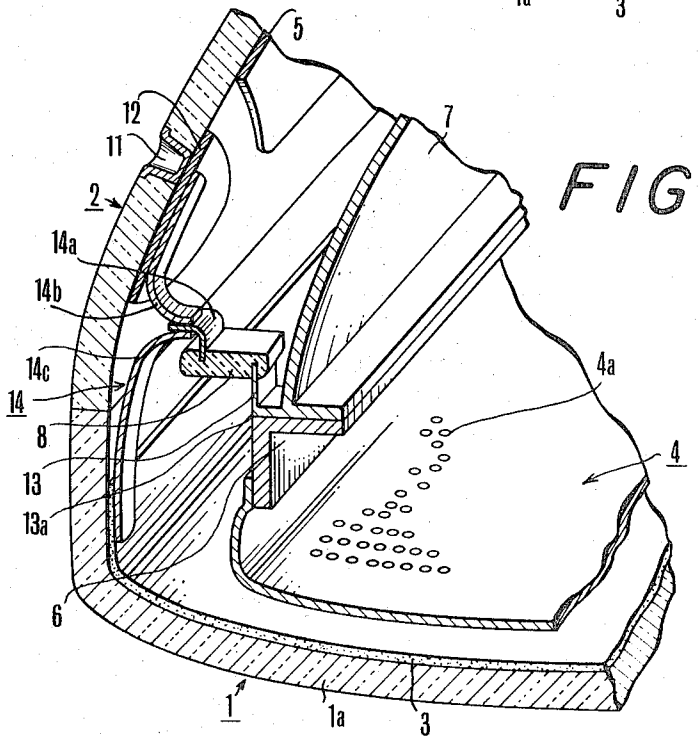


FIG. 2

CONNECTING MEMBER IN POST FOCUSING TYPE COLOUR PICTURE TUBES

BACKGROUND OF THE INVENTION

This invention relates to a post focusing type colour picture tube and more particularly to an improvement of an electrical connection between a fluorescent screen or electrode and an external terminal on the funnel of the colour picture tube.

The post focusing type colour picture tube generally comprises an evacuated envelope including a neck, funnel and a face plate or a panel, a fluorescent screen coated upon the inner surface of the face plate and a shadow mask or a colour selection electrode facing the fluorescent screen. Further, there are provided an electron gun assembly in the neck and a conductive coating on the inner wall of the funnel to act as the funnel electrode. The fluorescent screen, the shadow mask and the funnel electrode are applied with different potentials to establish an intense electrostatic field between the fluorescent screen and the shadow mask so as to focus the electron beam into a high density beam which is caused to impinge upon the fluorescent screen thereby to obtain a bright image.

Referring first to FIG. 1 of the accompanying drawing which shows a perspective view, partly in section of a portion of a prior art post focusing type colour picture tube there is shown an evacuated envelope comprising a panel 1 including a face plate 1*a*, and a funnel 2. A fluorescent screen 3 is applied onto the inner surface of the pannel 1 and a shadow mask 4 provided with a plurality of small perforations 4a is disposed close to the fluorescent screen 3 at a definite distance. A funnel electrode 5 is formed by coating an electroconductive substance onto the inner surface of the funnel 2. The shadow mask 4 is supported by a frame 6 which also supports a shield electrode 7 confronting the inner surface of the funnel 2, the shadow mask 4, frame 6 and shield electrode 7 constituting a post focusing electrode. In the prior art colour picture tube of the type described hereinabove, in order to apply potential to the fluorescent screen there is provided an insulator rod 8 made of glass, for example, which is bonded at one end to a portion of the post focusing electrode, for example the shield electrode 7 by a bonding agent 9*a* such as cement and at the other end to connecting pieces 10*a* and 10*b* by means of a bonding agent 9*b*. The outer free end of the connecting piece 10*a* urges against a conductive coating 12 which is electrically connected to an external terminal 11 hermetically extending through the wall of funnel 2, whereas the outer end of connecting piece 10*b* urges against the fluorescent screen 3 thereby connecting the same to the external terminal 11.

With this construction of the electrical connection, not only the construction is complicated but also the bonding agents 9*a* and 9*b* are subject of being separated from the insulator rod 8 due to mechanical vibration or aging with time. Separated bonding agent causes clogging of the perforations of the shadow mask, damage to the fluorescent screen or an abnormal discharge in the envelope.

SUMMARY OF THE INVENTION

Accordingly, it is an object of this invention to provide an improved post focusing type colour picture tube having a simplified electrical connection between the fluorescent screen and the external terminal.

A further object of this invention is to provide a post focusing type colour picture tube having an improved electrical connection between the fluorescent screen and the external terminal, which can overcome various defects of the prior art electrical connection caused by the use of a bonding agent which is liable to be broken by mechanical vibration or aging.

According to this invention there is provided a post focusing type colour picture tube of the type comprising an evacuated envelope including a neck, a panel and a funnel provided with an external terminal, an electron gun disposed in said neck, a fluorescent screen formed on the inner surface of said panel, and a post focusing electrode disposed in said envelope characterized in that there are provided an insulator member with its one end secured to said post focusing electrode, and a resilient electroconductive connecting member secured to the other end of said insulating member, said connecting member interconnecting said fluorescent screen and said external terminal, the connections between said insulating member and said post focusing electrode and said resilient insulating member being made by means of welding, brazing or fusion.

BRIEF DESCRIPTION OF THE DRAWINGS

Further objects and advantages of the invention will become apparent from the following detailed description taken in conjunction with the accompanying drawings in which:

FIG. 1 is a perspective view, partly in section, of a portion of one example of a prior art post focusing type colour picture tube and

FIG. 2 is view similar to FIG. 1 showing a portion of a post focusing type colour picture tube incorporated with an improved electrical connection embodying the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

In FIG. 2 illustrating a preferred embodiment of this invention, component parts corresponding to those shown in FIG. 1 are designated by the same reference numerals. There is provided a letter L shaped supporting member 13 with its horizontal leg 13*a* secured to a portion of the post focusing electrode, for example frame 6 for supporting the shadow mask 4 as by welding or brazing. The upper end of the vertical leg of the supporting member 13 is embedded in the insulator rod 8 made of a glass bead or ceramic, for example. The material from which supporting member 13 is constituted is not limited to metal provided that it can securely fix insulator rod 8 to the post focusing electrode. There is also provided a resilient connecting member 14 which in the illustrated example is composed of a metal piece 14*a* for securing the connecting member to the insulator rod 8 and a pair of oppositely curved leaf springs 14*b* and 14*c* for connecting the fluorescent screen 3 to the external terminal 11. The inner ends of leaf springs 14*b* and 14*c* are secured to metal piece 14*a* as by welding or brazing whereas the outer ends of the leaf springs are urged against the conductive film 12 which is connected to external terminal 11, and the fluorescent screen 3, respectively.

Although the conductive film 12 connected to the fluorescent screen 3 is shown separated from funnel

electrode 5, these electrodes may be interconnected so as to assume the same potential. Further, two leaf springs may be combined into a single leaf spring with its center secured to metal piece 14*a*. Also, the leaf spring may be secured directly to the insulator rod 8 without using metal piece 14*a*. Any resilient conductive member can be substituted for the leaf springs described above. Instead of embedding metal member 14*a* and supporting member 13 into a glass bead the glass bead may be fused to these members. Alternatively, the insulator rod may be made of ceramic with its surface metalized and metal members may be brazed or soldered to the metalized surface.

Further it should be understood that the invention is also applicable to a colour picture tube using a colour selection electrode of the slit or grid type.

Further, it should be understood that the invention is also applicable to a colour picture tube using an insulator rod firmly secured to any portion of inner members, if possible, though the insulator rod 8 is secured to the supporting member 13 in the above-mentioned embodiments.

What is claimed is:

1. In a post focusing type colour picture tube of the type comprising an evacuated envelope including a neck, a panel and a funnel provided with an external terminal, an electron gun disposed in said neck, a fluorescent screen formed on the inner surface of said panel, and a post focusing electrode disposed in said envelope, the improvement of a connecting member between said fluroescent screen and said external terminal which comprises an insulator member with one end secured to said post focusing electrode, and a resilient electroconductive connecting member secured to the other end of said insulating member, said resilient electroconductive connecting member electrically interconnecting said fluorescent screen and said external terminal, the supporting connections between said insulator member and said post focusing electrode and said resilient connecting member being made by metal means fused to the said ends of said insulating member to bond said ends respectively to said post focusing electrode and said resilient connecting member.

2. The post focusing type colour picture tube according to claim 1 wherein said post focusing electrode comprises a perforated shadow mask supported by a frame close to said fluorescent screen and a shield electrode supported by said frame to confront the inner surface of said funnel.

3. The post focusing type colour picture tube according to claim 1 wherein said one end of said insulating member is secured to said post focusing electrode through a letter L shaped metal member, the horizontal leg of said metal member is secured to the frame supporting said post focusing electrode and the vertical leg of said metal member is embedded in said insulator member.

4. The post focusing type colour picture tube according to claim 1 wherein said resilient electroconductive connecting member having spaced ends, one end of said resilient connecting member is in contact with a metal film which is formed on the inner surface of said funnel and connected to said external terminal, and the other end of said resilient connecting member is urged against said fluorescent screen.

5. The post focusing type colour picture tube according to claim 1 wherein said resilient connecting member is connected to said insulating member through a conductive supporting member.

6. The post focusing type colour picture tube according to claim 5 wherein said resilient connecting member comprises first and second leaf springs, one end thereof being connected to said conductive supporting member, and the other ends being connected to said external terminal and said fluorescent screen respectively.

7. The post focusing type colour picture tube according to claim 5 wherein said resilient connecting member comprises a single leaf spring having two oppositely curved legs, the juncture between said legs being secured to said conductive supporting member and the outer ends of said legs being connected to said external terminal and said fluorescent screen respectively.

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