

[54] **POST FOCUSING TYPE COLOUR PICTURE TUBES**

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[51] Int. Cl..... **H01j 29/70**

[58] Field of Search **315/14, 17; 313/81, 313/92 B, 92 PD**

[56] **References Cited**

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[57] **ABSTRACT**

In a post focussing type colour picture tube comprising an evacuated envelope including a panel, a funnel and a neck, a fluorescent screen formed on the inner surface of the panel, an electron gun assembly contained in the neck, a colour selection electrode disposed between the electron gun assembly and the fluorescent screen, and a supporting member for supporting the colour selection electrode, the colour selection electrode is electrically insulated from the supporting member and a potential higher than that impressed upon the colour selection electrode is impressed upon the supporting member.

6 Claims, 3 Drawing Figures

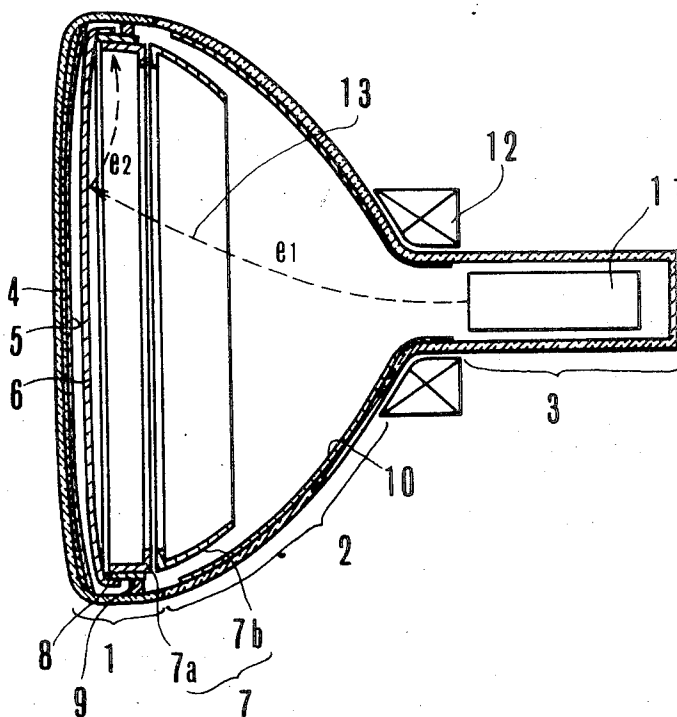


FIG. 1

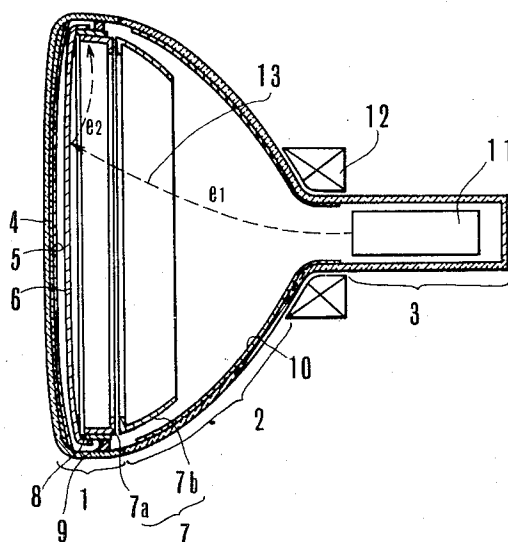


FIG. 2a

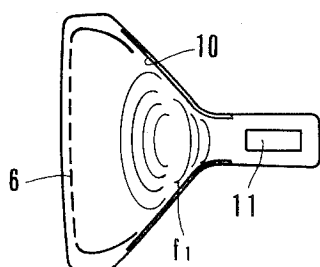
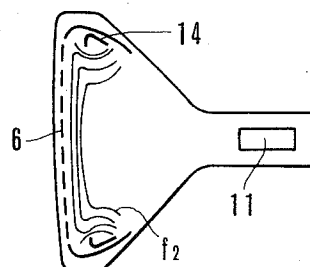


FIG. 2b



POST FOCUSING TYPE COLOUR PICTURE TUBES

BACKGROUND OF THE INVENTION

This invention relates to a post focussing type colour picture tube having an improved colour purity.

Generally, a post focussing type colour picture tube comprises a metal back electrode associated with a fluorescent screen formed on the inner surface of the panel of the tube, a colour selection electrode in the form of a shadow mask or a shadow grid which is disposed at a predetermined distance from the metal back electrode and means for establishing strong electric field between the metal back electrode and the colour selection electrode for improving the deflection sensitivity and brightness of the reproduced image. However, in the post focussed type colour picture tube, reflected electrons and secondary electrons (in the following description, the term "secondary electrons" includes both types of electrons) which are formed by the collision of an electron beam emanated from an electron gun upon the colour selection electrode are accelerated by the strong electric field established between the colour selection electrode and the metal back electrode and the accelerated electrons impinge upon the metal back electrode to excite the fluorescent screen thereby greatly degrading the colour purity of the reproduced picture image.

Various proposals have been made to obviate this difficulty. According to one approach, the potential of the funnel electrode is made to be higher than that of the colour selection electrode and according to the other approach, an auxiliary electrode is located near the colour selection electrode and the potential of the auxiliary electrode is made higher than that of the colour selection electrode. In either case, however, as the potential of the funnel electrode or the auxiliary electrode is increased the distortion of the electric field is increased which interferes with the orbit of the primary electric beam so that the improvement of the colour purity is not substantial.

SUMMARY OF THE INVENTION

Accordingly, it is an object of this invention to provide an improved post focussing type colour picture tube capable of improving the colour purity of the reproduced image without increasing considerably the potential of the funnel electrode beyond that of the colour selection electrode.

Another object of this invention is to provide a novel post focussing type colour picture tube capable of improving the colour purity of the reproduced image without using any auxiliary electrode or the like for collecting the secondary electrons emitted from the colour selection electrode.

According to this invention, there is provided a post focussing type colour picture tube of the type comprising an evacuated envelope including a panel, a funnel and a neck, a fluorescent screen formed on the inner surface of the panel, an electron gun assembly contained in the neck, a colour selection electrode disposed between the electron gun assembly and the fluorescent screen, and a supporting member for supporting the colour selection electrode, characterized in that the colour selection electrode is electrically insulated from the supporting member and that a potential higher than that impressed upon the colour selection electrode is impressed upon the supporting member.

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 diagrammatic longitudinal sectional view of one example of a post focussing type colour picture tube embodying the invention, and

FIGS. 2A and 2B are diagrams to show the distortion of the electric field in the tube of the prior art post focussing colour picture tube.

DESCRIPTION OF THE PREFERRED EMBODIMENT

FIG. 1 shows one example of the invention applied to a post focussing type colour picture tube in which a shadow mask is used as the colour selection electrode. The colour picture tube shown in FIG. 1 comprises a panel 1, a funnel 2 and a neck 3 which are fused together into an evacuated envelope. A fluorescent screen 4 is coated on the inner surface of the panel 2 and a metal back electrode 5 is formed on the fluorescent screen 4. A shadow mask 6 or a colour selection electrode 6 is disposed at a predetermined distance from the metal back electrode 5. The shadow mask 6 is supported by a supporting member 7 through an insulator 8, the supporting member and the shadow mask comprising a shadow mask assembly. The supporting member 7 comprises a frame 7a and a shield 7b which may be electrically connected or insulated from each other. The insulator 8 is secured to predetermined points of the panel 1 by connecting members 9. A funnel electrode 10 is formed on the inner surface of the funnel 2 and an electron gun assembly 11 is housed in the neck 3. A deflection coil 12 is mounted on the outside of the tube at the joint between the funnel and the neck. The electron beam e_1 emanated from the electron gun assembly 11 travels along an orbit 13. Generally, the supporting member 7 comprising a portion of the post focussing means is applied with a voltage of about from 30 to 2,000 volts, preferably about 1,000 volts which is higher than that of the shadow mask 6.

Where the frame 7a and the shield 7b of the supporting member 7 are electrically isolated and impressed with different potentials, the same object can be accomplished by impressing higher potentials upon the frame 7a and shield 7b than that upon the shadow mask 6. The relative magnitude of the potentials of the frame 7a and the shield 7b may be selected to any desired value.

When the electron beam e_1 emanated from the electron gun assembly 11 is deflected by the deflection coil 12 to impinge upon the shadow mask 6, secondary electrons e_2 are emitted from the shadow mask and tend to collide upon the funnel electrode 10 or metal back electrode 5. According to this invention, however, as a potential higher than that of the shadow mask 6 is impressed upon the supporting member 7, the secondary electrons are collected by the supporting member 7 instead of impinging upon the funnel electrode 10 and the metal back electrode 5. With this arrangement, it is not necessary to increase the potential of funnel electrode 10 beyond that of the shadow mask 6 and to provide an auxiliary electrode which is maintained at a higher potential than the shadow mask. In contrast, where a potential is impressed upon the funnel elec-

trode 10 which is higher than that of the colour selection electrode 6, the electric field in the tube will be distorted as shown by f_1 in FIG. 2a, whereas where an auxiliary electrode 14 is provided near the colour selection electrode and a potential higher than that of the colour selection electrode 6 is applied to the auxiliary electrode 14, the electric field will be distorted as shown by f_2 in FIG. 2b. According to this invention, it is possible to eliminate such distortions of the field. In other words, according to this invention, because of the presence of a secondary electron collecting member which is located near the colour selection electrode it is possible to efficiently remove the adverse effect of the secondary electrons with a potential of applied to the secondary electron collecting member which is lower than that of the prior art.

Although in the illustrated embodiment, the shadow mask 6 or the colour selection electrode and the supporting member 7 were interconnected directly through insulator 8 it is also possible to provide a reinforcing frame for the peripheral edge of the shadow mask and to connect the reinforcing frame to the frame 7a through insulator 8. Any other suitable connecting means can also be used provided that it electrically insulates the shadow mask for the supporting member.

The insulator 8 may be made of any insulator such as multi-foamed glass or steatite.

It should also be understood that the invention is also applicable to other types of post focussed colour picture tube such as a Trinitron or Chromatron utilizing a colour selection electrode in the form of stripes or grids.

As described above, this invention provides an improved post focussing type colour picture tube capable of collecting secondary electrons or reflected electrons without distorting the electric field established between the metal back electrode and the colour selection electrode thus reproducing a high quality picture image.

What is claimed is:

1. In a post focussing type colour picture tube comprising an evacuated envelope including a panel, a funnel and a neck, a fluorescent screen formed on the inner surface of said panel, an electron gun assembly contained in said neck, a colour selection electrode disposed between said electron gun assembly and said fluorescent screen, and a supporting member for supporting said colour selection electrode, the improvement which comprises means interposed between said colour selection electrode and said supporting member for electrically insulating these members from each other, and means for impressing a potential upon said supporting member which is higher than that impressed upon said colour selection electrode.

2. The post focussing type colour picture tube according to claim 1 wherein said supporting member comprises a frame adapted to support said colour selection electrode and a shield member.

3. The post focussing type colour picture tube according to claim 1 wherein a reinforcing frame is provided for the periphery of said colour selection electrode and said reinforcing frame is mounted on said supporting member through an insulator.

4. The post focussing type colour picture tube according to claim 1 which further comprises a metal back electrode overlying said fluorescent screen and means to establish electric field across said metal back electrode and said colour selection electrode.

5. The post focussing type colour picture tube according to claim 2 wherein said frame and said shield member are maintained at the same potential.

6. The post focussing type colour picture tube according to claim 2 wherein said frame and said shield member are electrically isolated from each other and are maintained at different potentials.

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