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(54) **Colour selection electrode with elongate apertures in a colour display tube**

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(73) Proprietor: **N. V. Philips' Gloeilampenfabrieken**
Pieter Zeemanstraat 6
NL - 5621 CT Eindhoven (NL)

(72) Inventor: **Plukker, Gerardus Wilhelmus**
c/o Int. Octrooibureau B.V.
6, Prof. Holstlaan
NL - 5600 Eindhoven (NL)

(74) Representative: **Duys, Andréas Maria Wilhelmus, et al**
INTERNATIONAAL OCTROOIBUREAU B.V.
Prof. Holstlaan 6
NL - 5600 Eindhoven (NL)

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Colour selection electrode with elongate apertures in a colour display tube

The invention relates to a colour selection electrode in a colour display tube comprising in an evacuated envelope consisting of a display window, a cone and a neck, a display screen on the inside of the display window consisting of a large number of phosphor lines luminescing in three different colours the said electrode being disposed at some distance in front of the display screen, and comprising a metal plate having a very large number of rows of apertures which are separated from each other by bridges and are elongate in the direction of the rows, the said rows extending in the direction of the phosphor lines.

Such a colour display tube is disclosed in United States Patent Specification 3,983,613. During the manufacture of the display screen, a photosensitive phosphor-containing layer is provided a few times successively (usually 3 times) on the display window which is then exposed *via* the elongate apertures in the colour selection electrode and is then fixed, so that the phosphor lines are formed on the display screen. The said exposure is carried out by means of an elongate light source whose longitudinal axis extends in the direction of the rows of apertures, so that the light distribution behind the rows of apertures which are separated by bridges is as homogeneous as possible. It has now been found that the adhesion of the ends of the phosphor lines in the tubes manufactured so far has left something to be desired. A staggered variation caused by the ends of the rows of apertures, as shown in the United States Patent Specification 3,983,613, also proved to be a less beautiful picture boundary, and the adhesion of the ends of the phosphor lines still leaves something to be desired.

It is therefore the object of the invention to provide a colour selection electrode in which the apertures follow the upper and lower edges of the colour selection electrode and in which a good adhesion of the ends of the phosphor lines is obtained.

According to the invention a colour selection electrode of the kind described in the first paragraph is characterized in that the last aperture at the two ends of each row being at least equally long as the penultimate aperture at the two ends of each row, and the short sides of the last apertures of all rows situated at the extreme ends are situated on lines which follow the edges of the colour selection electrode. Generally these edges are curved since the aperture which is situated at the ends of each row is as long as but usually is longer than the penultimate aperture, more light will impinge on the photosensitive phosphor-containing layer during exposure and the end of the phosphor line will adhere better to the inner wall of the display window.

The invention will now be explained and described in greater detail by way of example with reference to the accompanying drawings in which

Figure 1 is a perspective view, partly broken away, of a colour display tube made in accordance with the invention,

Figure 2 is a perspective view of the encircled part of the colour selection electrode and the display screen,

Figures 3 and 4 are elevations of a part of the upper edge of a colour selection electrode as used so far, and

Figure 5 is an elevation of a part of the upper edge of a colour selection electrode used in the cathode ray tube made in accordance with the invention.

Figure 1 is a perspective view, partly broken away, of a colour display tube made in accordance with the invention. This colour display tube comprises a glass envelope 1 which is composed of a display window 2, a cone 3 and a neck 4 having contact pins 5. Three electron guns 6, 7 and 8 are situated in the neck. The axes of these guns are situated in one horizontal plane and the outermost guns enclose a small angle with the central gun, so that the generated electron beams 9, 10 and 11 pass through apertures 12 in a colour selection electrode 13 at an angle and thus each impinge on phosphor lines 14, 15 and 16, respectively. The whole display screen 17 consists of such triplets of phosphor lines of which three are shown. Phosphor line 14 is a phosphor luminescing red (R), phosphor line 15 is a phosphor luminescing green (G) and phosphor line 16 is a phosphor luminescing blue (B). Colour selection electrode 13 consists of a metal plate having a very large number of rows of apertures 12 extending in the direction of the phosphor lines, which plate is secured in a metal ring 18 which is mounted in the display tube in front of the display screen.

Figure 2 is a perspective view of a part of the colour selection electrode 13 and the display screen 17. The apertures 12 of each row are separated by bridges 19. The elongate apertures usually have rounded-off short sides.

Figure 3 is an elevation of a part of an upper edge of a known colour selection electrode. As a result of the curved shape of the said upper edge, apertures 20 are obtained which are shorter than the adjacent apertures 12. During the manufacture of the display screen an insufficient amount of light passes through the said apertures and an unsatisfactory adhesion of the ends of the phosphor lines to the display window is obtained.

Figure 4 is an elevation of a part of the upper edge of the colour selection electrode as disclosed in United States Patent Specification 3,983,613. The smaller apertures are omitted. The picture boundary shown in Figure 3 and the

adhesion of the ends of the phosphor lines still leaves something to be desired.

Figure 5 is an elevation of a part of the upper edge of the colour selection electrode to be used in the cathode ray tube shown in Figure 1. The length of the last apertures 22 is always larger than or equal to the length of the adjacent apertures 12 in the row. As a result of this, the short sides of the last apertures 22 of all rows situated at the extreme end are situated on a smooth curved line which follows the edge 21 of the colour selection electrode. Since the apertures 22 are extra long a better adhesion of the phosphor lines to the inner wall of the display window is obtained during the manufacture of the said lines as a result of the extra good exposure at the ends. These longer apertures at the same time ensure a beautiful smooth picture boundary.

Claims

1. A colour selection electrode in a colour display tube comprising in an evacuated envelope consisting of a display window, a cone and a neck, a display screen on the inside of the display window consisting of a large number of phosphor lines luminescing in three different colours, the said electrode being disposed at some distance in front of said display screen, and comprising a metal plate having a very large number of rows of apertures which are separated from each other by bridges and are elongate in the direction of the rows, the said rows extending in the direction of the phosphor lines, characterized in that the last aperture at the two ends of each row is at least equally long as the penultimate aperture at the two ends of each row, and the short sides of the last apertures of all rows situated at the extreme ends are situated on lines which follow the edges of the colour selection electrode.

2. A colour selection electrode as claimed in Claim 1, wherein the edges of the colour selection electrode are curved.

Revendications

1. Electrode de sélection des couleurs (13) appartenant à un tube d'images en couleur comportant une enveloppe (1) en verre vidée d'air comprenant une fenêtre image (2), un cône (3) et un col (4) et contenant un écran image (17) appliqué sur la face intérieure de la fenêtre image (2), qui est constituée par un grand nombre de lignes luminescentes (13, 14, 15) s'illuminant en trois couleurs différentes, ladite électrode étant disposée à quelque distance devant ledit écran image, étant constituée par une plaque métallique munie d'un très grand nombre de rangées d'ouvertures oblongues (12) ménagées dans la direction des rangées et espacées par de petits ponts (19), ces rangées s'étendant dans la direction des lignes luminescentes, caractérisé en ce que la dernière ouverture (22) ménagée aux deux extrémités de chaque rangée est au moins aussi longue que l'avant-dernière ouverture (12) aux deux extrémités de chaque rangée et que les côtés courts, situés aux extrémités extrêmes, des dernières ouvertures de toutes les rangées se situent sur des lignes, qui suivent les bords (21) de l'électrode de sélection des couleurs.

2. Electrode de sélection des couleurs selon la revendication 1, dont les bords (21) sont incurvés.

Patentansprüche

1. Farbauswahlelektrode (13) in einer Farbbildröhre, enthaltend in einem evakuierten Glaskolben (1), der aus einem Frontglas (2), einem Konus (3) und einem Hals (4) besteht, einen Bildschirm (17) auf der Innenseite des Frontglases, der aus einer Vielzahl in drei verschiedenen Farben aufleuchtender Leuchtstoffstreifen (13, 14, 15) besteht, wobei die genannte Elektrode in einiger Entfernung vor diesem Bildschirm angeordnet ist, und aus einer Metallplatte mit einer sehr grossen Anzahl von in Richtung der Leuchtstoffstreifen verlaufenden Reihen durch Stege voneinander getrennter in Richtung der reihen langgestreckter Oeffnungen (12) besteht, dadurch gekennzeichnet, dass die letzte Oeffnung (22) an den zwei Enden jeder Reihe mindestens gleich lang wie die zweitletzte Oeffnung (12) an den zwei Enden jeder Reihe ist und die an den äussersten Enden liegenden kurzen Seiten der letzten Oeffnungen aller Reihen auf Linien liegen, die den Rändern (21) der Farbauswahlelektrode folgen.

2. Farbauswahlelektrode nach Anspruch 1, dadurch gekennzeichnet, dass die Ränder (21) der Farbauswahlelektrode gekrümmt sind.

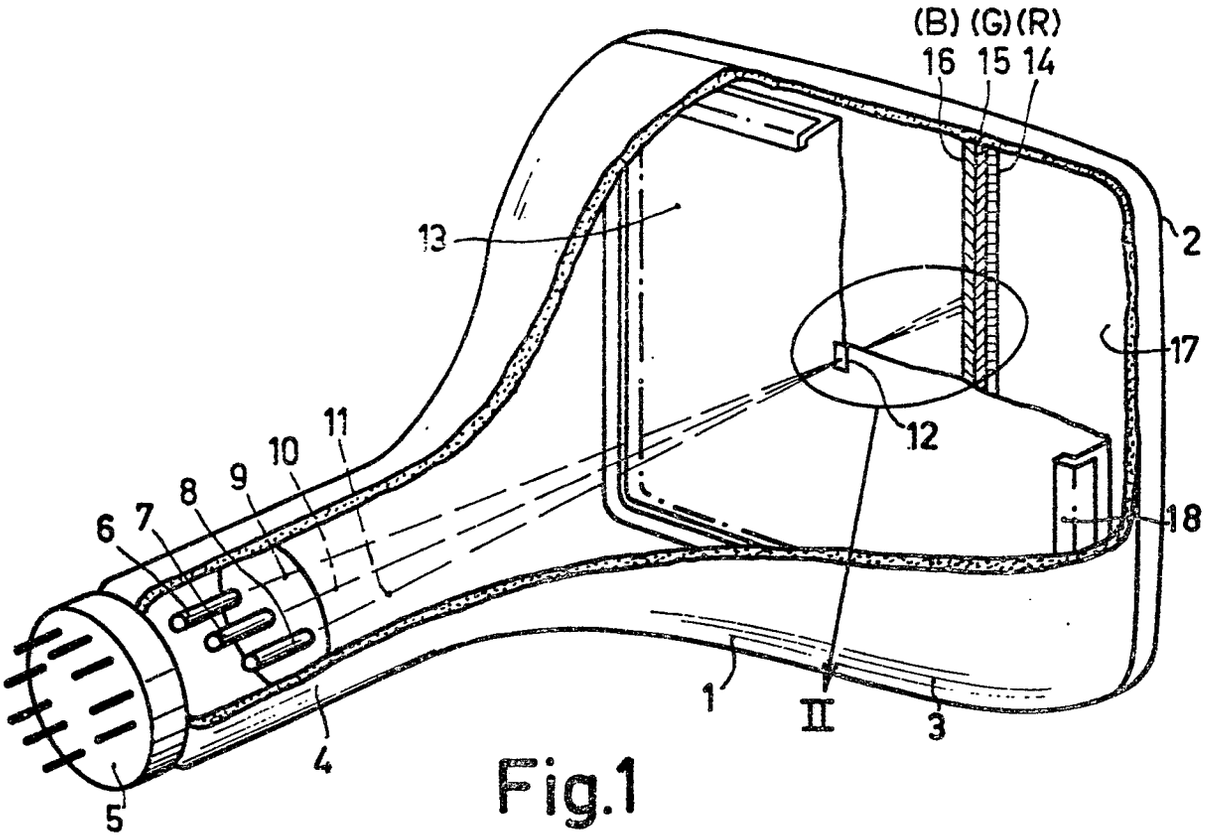


Fig.1

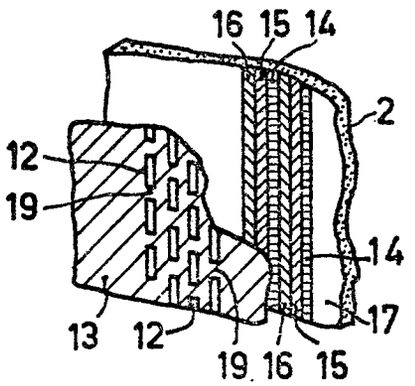


Fig. 2

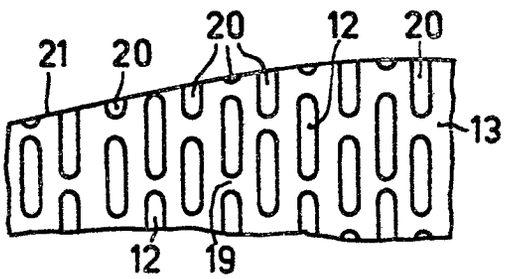


Fig. 3

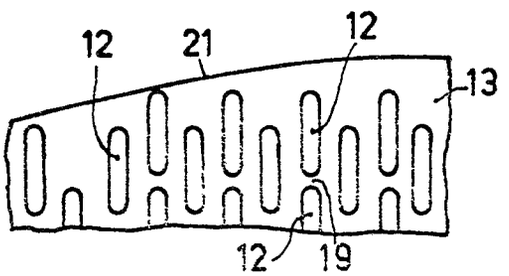


Fig. 4

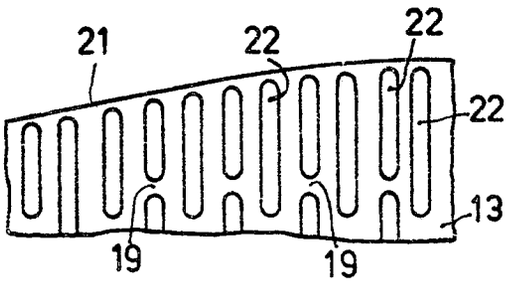


Fig. 5