

PATENT SPECIFICATION

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COMPLETE SPECIFICATION.

Improvements in or relating to Electronic Apparatus for Television Systems and the like.

We, CORNING GLASS WORKS, of Foot of Walnut Street, Corning, New York, United States of America, a corporation organized under the laws of New York, United States of America, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to improvements in electronic apparatus for television systems and the like.

In the past it has been common practice to manufacture envelopes for cathode ray tubes, used in television receivers to display images translated from picture signals received, by blowing the envelopes to the desired contour. The shape of the envelope usually is that of a funnel, closed at the large end to form a screen upon which the images are displayed; and having the electrical elements constituting an electron gun for developing a cathode ray and for directing the same at the screen to produce images thereon, mounted in the stem. A similar practice has also been followed in the manufacture of the iconoscope tube for viewing scenes for television transmission and similar applications, and which is composed of an envelope containing an electron gun focused on a photosensitive signal plate within the tube to develop picture signals in accordance with reflections received on the photosensitive signal plate of objects or scenes within view of a window comprising a part of the tube envelope structure.

In the blowing of a glass body it is impossible to obtain a perfect distribution and uniform thickness of glass in the wall, and while in ordinary vacuum tubes this may not be important, it is highly important in a cathode ray tube that the distribution, thickness and contour of the glass in that portion of the wall serving the screen be uniform, as otherwise distortion of the image produced thereon will result. For similar reasons it is important that the thickness and contour of the window of an iconoscope tube be uniform, as otherwise the object reflections

on the signal plate will be distorted and fidelity of transmission and reproduction will be seriously impaired.

In such tubes it has been proposed to make an optical glass portion separately, and to seal this portion to an opening in the blown glass envelope of the tube, in order to avoid the optical imperfections which frequently occur in the optical surfaces forming integral parts of blown envelopes.

The primary object of the present invention is to provide an apparatus which will transmit and reproduce pictures and views with fidelity.

According to the invention, the apparatus comprises an envelope having that portion thereof serving as an optical surface pressed in a molding press to insure such portion having a degree of optical perfection which cannot otherwise be so economically obtained and which is then fused to a blown glass portion of the envelope.

The invention will now be fully described with the aid of the accompanying drawings which illustrate two different constructional examples of apparatus according to the invention.

In the drawings:

Figure 1 is a side view of a cathode ray tube having an envelope embodying this invention;

Fig. 2 is a side view, in section, of the blown and pressed parts of the envelope shown in Fig. 1 before they are sealed together;

Fig. 3 is a side view of an iconoscope tube having an envelope embodying this invention;

Fig. 4 is a view, similar to Fig. 2 of the parts of an iconoscope tube envelope embodying this invention; and

Fig. 5 is an end view of the intermediate part of the envelope shown in Fig. 4.

In the cathode ray tube the envelope is composed of a blown glass body portion 10, the large end of which is carefully ground and sanded to free it of any metallic inclusions, and then welded or fused to a similarly prepared surface of a saucer-like pressed glass part 11 having

a concavo-convex screen or roundel area 12 in which the mass of glass is of uniform thickness and curvature throughout. If desired, the screen may be of plano-parallel configuration, but the concavo-convex configuration gives the exposed surface of the screen greater resistance to fracture, and also corrects distortion caused by the changing curvature of the field with distance away from the cathode when a plano-parallel screen is used. An electron gun 13 of any known form is sealed in the neck of the envelope and is directed toward the screen area 12 in the usual manner.

The iconoscope tube envelope comprises a main body in the form of a cylinder 16, the one end of which is ground, sanded and then welded or fused to a similarly prepared surface of a saucer-like part of pressed glass or the like having a plano-parallel screen or window area 18 within its wall areas 19 and 20. The lower wall area 20 has a protuberance 21 partly ground off at the point indicated (Fig. 4) by the interrupted line 17 to form an apertured seat 22 to which a tubular part 23 of the envelope is welded at such an angle with respect to the axis of the cylinder 16 that an electron gun 24, sealed in the remote end of tube 23, can scan the usual photosensitive mosaic surfaced signal plate 25 to develop picture signals in accordance with light reflected from objects or scenes within view of the window area 18.

It will be apparent from the foregoing that by the use of a combination of blown and pressed glass parts it is possible to produce envelopes for cathode ray and iconoscope tubes or the like having screen or window areas of perfect optical fidelity.

Having now particularly described and ascertained the nature of our said invention, and in what manner the same is to be performed, we declare that what we claim is:—

1. A cathode ray apparatus comprising an envelope having that portion thereof serving as an optical surface pressed in a moulding press to insure such portion having a degree of optical perfection which cannot otherwise be so economically obtained and which is then fused to a blown glass portion of the envelope.

2. Apparatus according to claim 1 in which the end portion having the optical surface has also a perforated wall portion to which a cylindrical body is sealed.

3. Apparatus according to claim 1 comprising a tubular or cylindrical body of blown glass, a unit of pressed glass sealed to said tubular body and containing a window of uniform thickness and contour forming the optical portion, and a second tubular body sealed to an opening in said unit.

4. An iconoscope tube according to claim 2 or 3 in which a glass cylinder has its one end closed by a saucer-like portion of glass having a plano-parallel window in its base and having a tubular member welded to an aperture in the wall of said saucer-like portion of glass, said tubular member being arranged with its axis at a predetermined angle with respect to the axis of the cylinder.

5. An iconoscope tube according to claim 4 having an electron gun sealed in the end of the tubular member most remote from the cylinder.

6. An iconoscope tube comprising an electron gun focused on a photosensitive mosaic surface, an inclosing envelope having a window made with a high degree of accuracy in a moulding press so that light reflected from objects or scenes within view of the window will pass to such surface with a high degree of fidelity.

7. Apparatus according to any of claims 1-6 in which the glass envelope is composed of a pressed optical portion forming a window through which a picture is to be projected or viewed and a blown body portion fused together at their peripheries.

8. Cathode ray apparatus and envelopes for the same, as herein described and illustrated in the accompanying drawings.

Dated this 16th day of September, 1936.

For the Applicants,
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2nd Edition

[This Drawing is a reproduction of the Original on a reduced scale.]

