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MATRIX FOR A CHARACTER DISPLAY TUBE COMPLIANT AREA
OUTSIDE INDICIA AREA TO MINIMIZE DISTORTION
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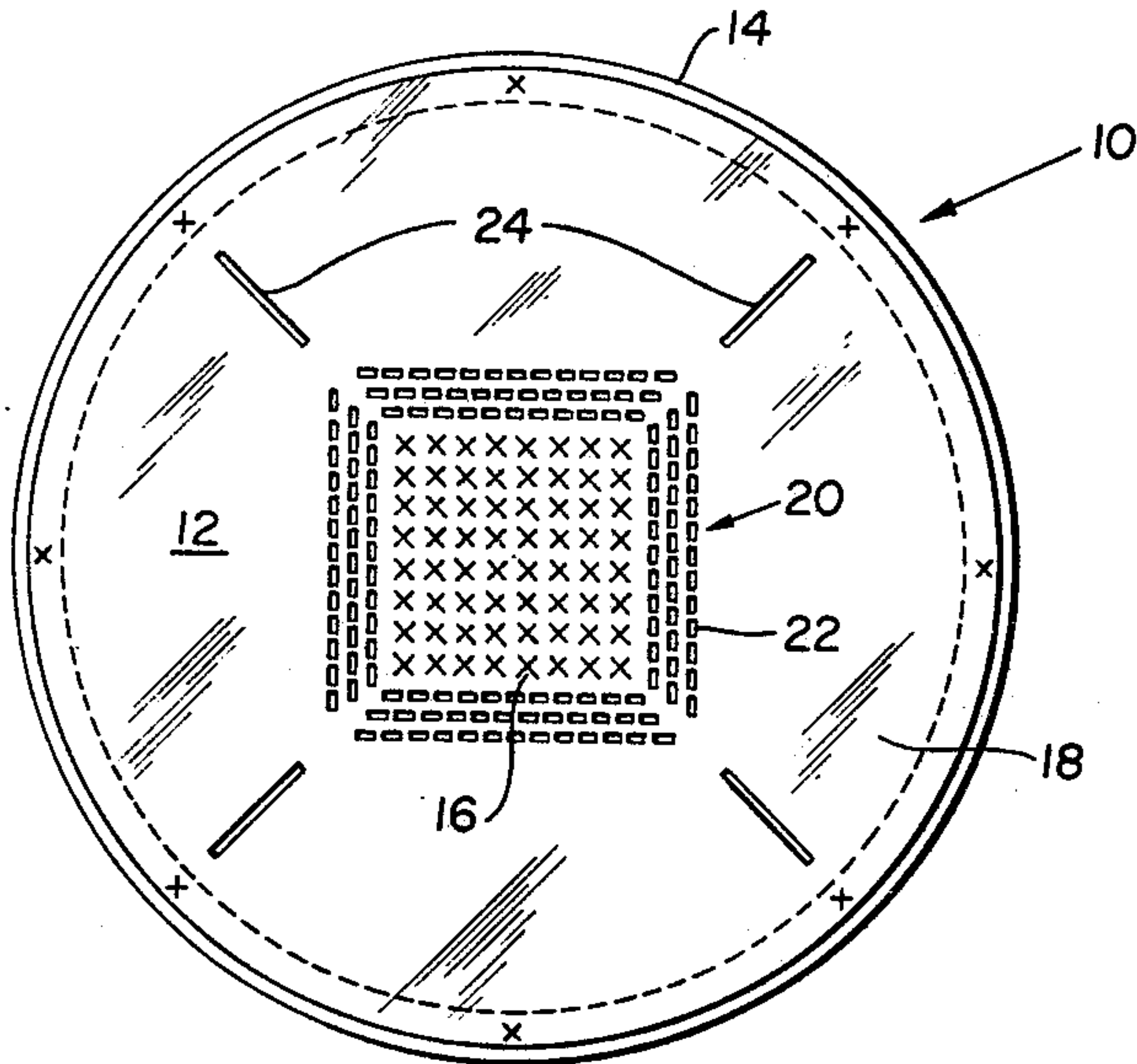


Fig. 1

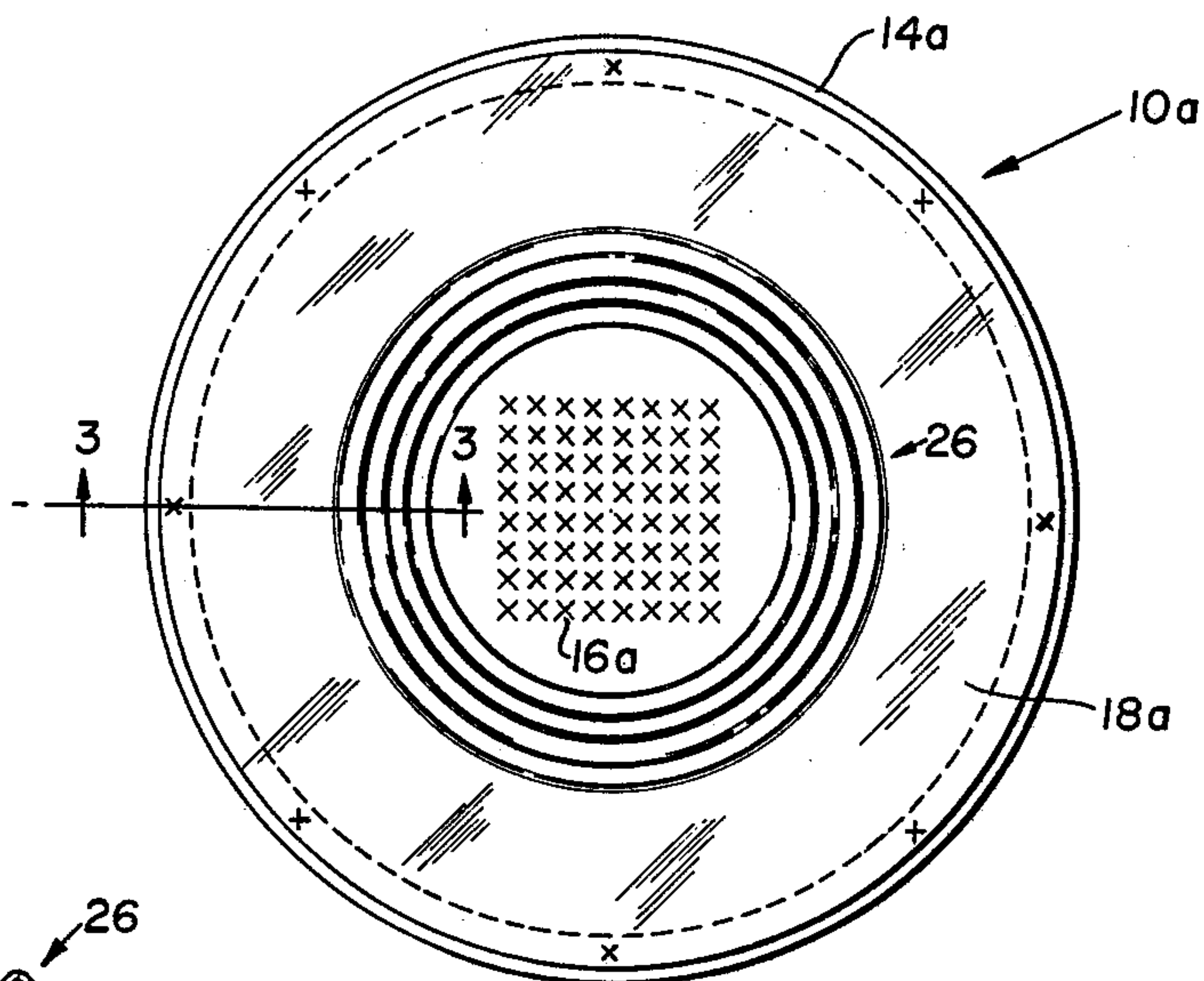


Fig. 2

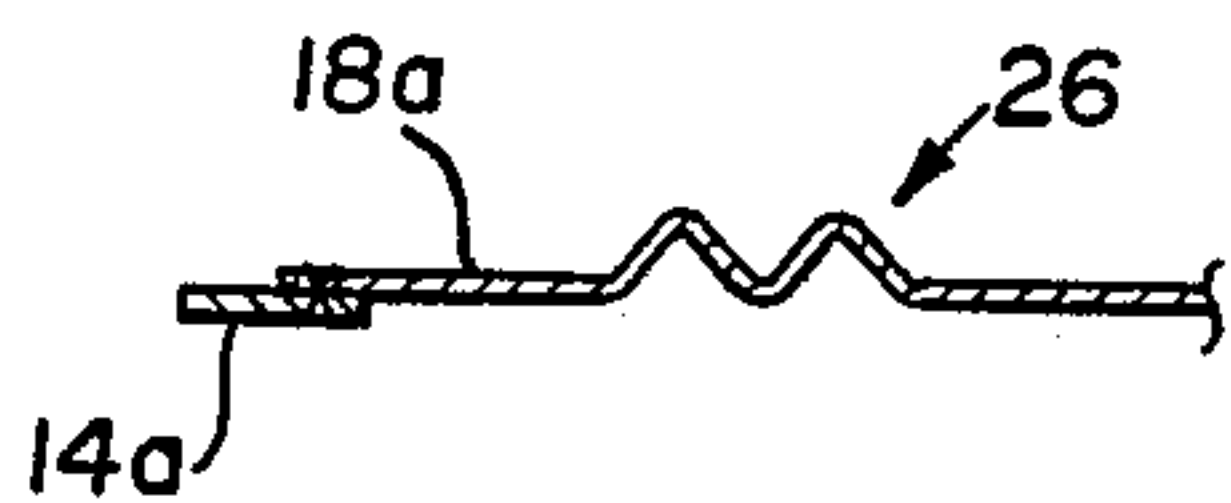


Fig. 3

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MATRIX FOR A CHARACTER DISPLAY TUBE COMPLIANT AREA OUTSIDE INDICIA AREA TO MINIMIZE DISTORTION

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Int. Cl. H01j 29/46

U.S. Cl. 313—86

4 Claims

ABSTRACT OF THE DISCLOSURE

A matrix for cathode-ray display tubes having a central area providing a plurality of character-shaped apertures and a flexible, easily distorted area outside of and immediately surrounding said central area, which latter area may be provided as a plurality of lines of apertures, a plurality of concentric lines of accordion pleats or the equivalent.

This application is a continuation of application Ser. No. 452,679, filed May 3, 1965, now abandoned.

This invention relates to cathode-ray display tubes and, more particularly, to a matrix for use therein.

In shaped-beam cathode-ray display systems, such as that system disclosed in the United States Patent 2,824,250 to Joseph T. McNaney et al., filed Feb. 18, 1958, and assigned to General Dynamics Corporation, an electron beam is selectively directed at one of a plurality of variously shaped apertures in a matrix to shape the beam in accordance with the shape of a selected aperture, which, in turn, corresponds to the shape of a particular character to be manifested or displayed to a desired area of the tube face. Such tubes are manufactured by General Dynamics Corporation under the trademark "Charactron."

The present state of the art of cathode-ray display tubes utilizes therein a matrix having character-shaped cross-sections formed therethrough. The matrix in its present form is often warped or misshapen when the matrix is being mounted on its outer retaining ring. Also, distortion of the matrix is caused by thermal expansion. The energy from the electron beam heats the matrix and it will expand oftentimes nonuniformly. This causes a distortion of the matrix across the active character area.

The present invention eliminates any distortion of the matrix by providing a compliant area of staggered apertures or accordion pleats immediately surrounding the active character aperture area. This compliant area provides a flexible or easily distorted strip between the active character area and the outer retaining ring or mounting flange. Any uneven or excessive movement of the matrix outer area or stretching of the outer retaining ring will not be transmitted to the inner area, thereby providing an active character area free of warp or distortion for the delicate characters therethrough. The present invention also eliminates distortion caused by thermal expansion in the character area. The normal thermal expansion of the inner area will not be "contained" within a colder outer area but will also be allowed to expand into the compliant area. The expansion of the inner area of the matrix may be more than the outer area and the difference will be absorbed by the flexible or easily distorted strip. This will permit the inner active character area to expand without any distortion to the characters therethrough.

Accordingly, it is the principal object of the present

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invention to provide a matrix without any distortion of the character area thereby producing true characters or symbols to be displayed on the tube surface.

Other objects and advantages of the invention will become apparent as the following description proceeds, and the features of novelty which characterize the invention will be pointed out with particularity in the claims annexed to and forming a part of this specification.

For a better understanding of the invention, reference may be had to the figures which disclose the embodiment of the present invention.

FIG. 1 discloses the preferred embodiment of the present invention;

FIG. 2 discloses another embodiment of the present invention; and

FIG. 3 discloses an enlarged section of the embodiment of FIG. 2.

In FIG. 1 of the drawing the numeral 10 indicates in general a matrix used in a "Charactron" shaped-beam tube. A thin unitary member 12, subject to expansion and contraction and with its edge securely fastened to the outer retaining ring 14, is supported within an evacuated shaped-beam (not shown). The active character area 16 with its delicate characters and symbols (x being used to designate same) is located within the center of the thin unitary member 12. The area 18 between the active character area 16 and the outer retaining ring 14 provides a compliant area 20 immediately surrounding the active character area 16. This compliant area 20 is provided with a plurality of staggered apertures 22; also, four apertures 24 are provided at each of the corners and evenly spaced between the compliant area 20 and the outer retaining ring 14.

In FIG. 2 of the drawing the general matrix 10a is essentially the same as described in FIG. 1, differing therefrom only in that the matrix 10a is provided with an accordion pleated compliant area 26 so that any uneven or excessive movement of the outer area will not be transmitted to the inner area. Any movement or stretching of the outer retaining ring will not warp or distort the inner character area.

FIG. 3 of the drawing is an enlarged cross-section taken at line 3—3 of the drawing of FIG. 2. This figure shows the cross-section of the accordion pleated compliant area.

While there has been shown and described what is at present considered to be the preferred embodiment of the invention, other modifications will readily occur to those skilled in the art. It is not, therefore, desired that the invention be limited to the specific arrangement shown and described, and it is intended in the appended claims to cover all such modifications as fall within the true spirit and scope of the invention.

What is claimed is:

1. A matrix for a cathode ray display tube, said matrix comprising a unitary conductive metal having a character area including a plurality of indicia representing apertures therethrough, a compliant area outside of and immediately surrounding said active character area, said compliant area consisting of a plurality of lines of apertures, with the apertures in each line being staggered with respect to the apertures in an adjacent line.

2. A matrix for a cathode-ray display tube, said matrix comprising a unitary conductive metal member having a centrally disposed character area including only a plurality of indicia representing apertures therethrough, a flexible, easily distorted area formed by at least one line of rectangular apertures located radially outward of and

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immediately surrounding all of the indicia representing apertures in said member, and a solid unbroken band of metal interposed between and separating said character area from said easily distorted area.

3. A matrix as defined in claim 1 further including a plurality of additional apertures, larger than the apertures of said line of apertures, spaced about said active character apertures outside of and spaced from said flexible, easily distorted area.

4. A matrix as defined in claim 1 wherein said flexible, easily distorted area is a compliant area consisting of a plurality of lines of apertures in closely spaced relationship to one another.

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ROBERT SEGAL, Primary Examiner

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