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PROCESS OF PREPARING AND COATING
SCREEN MATERIAL ON TUBES
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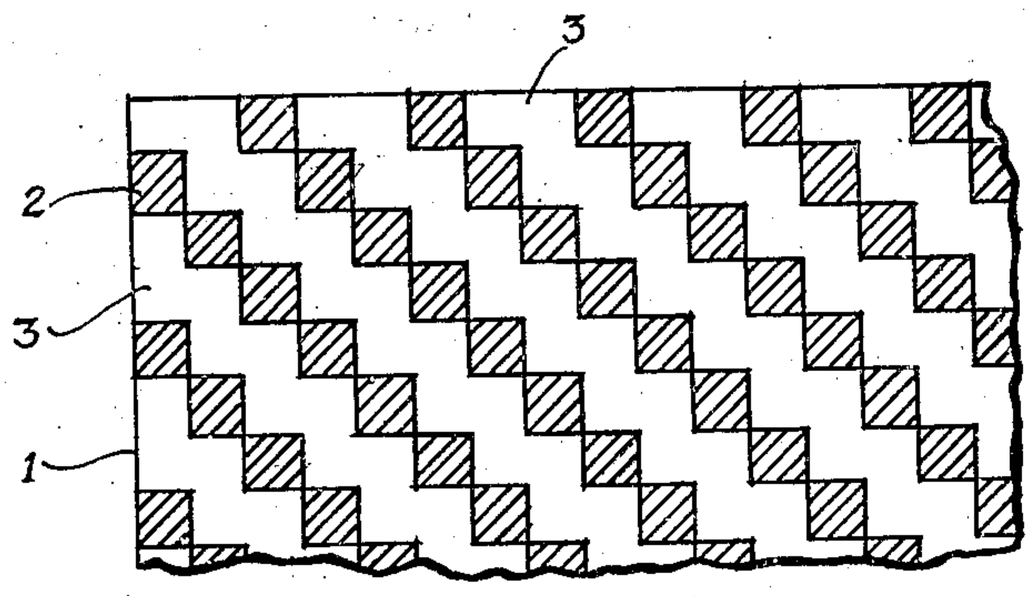

FIG. 1

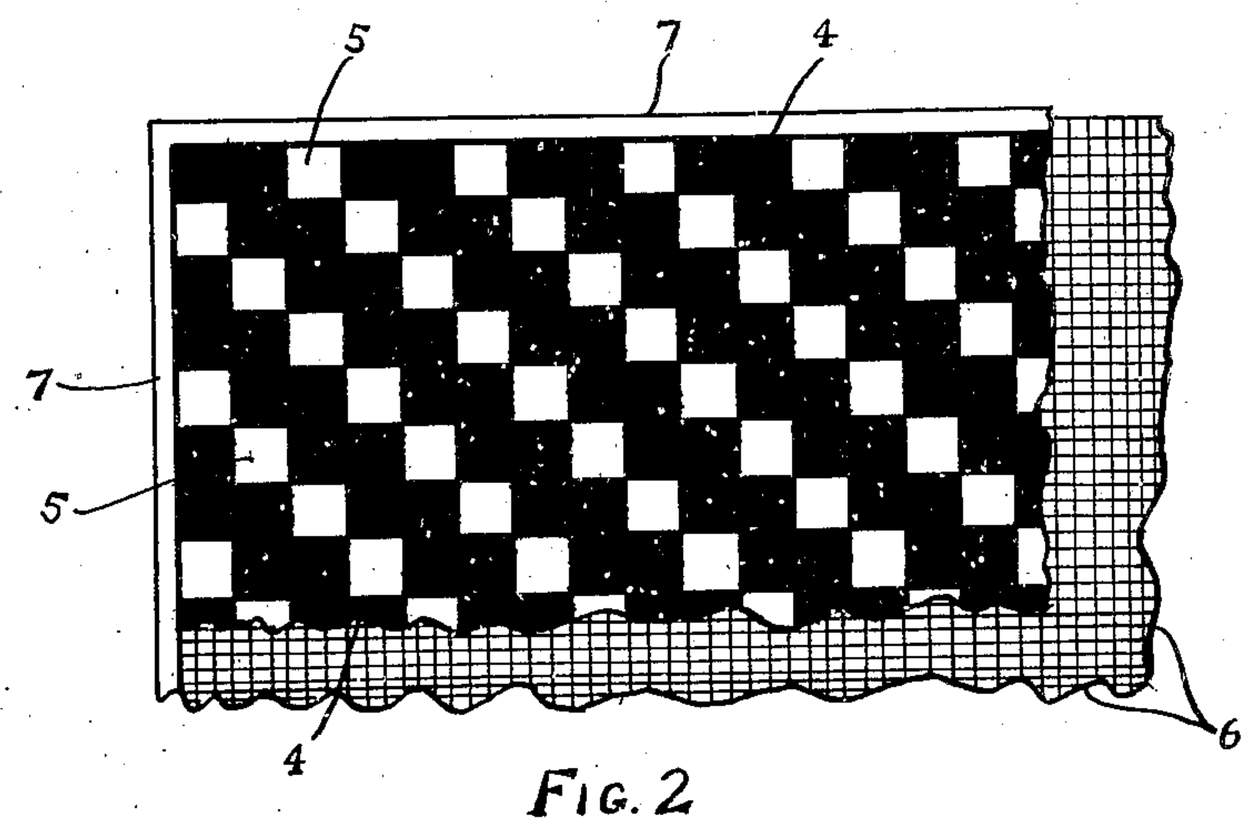

FIG. 2

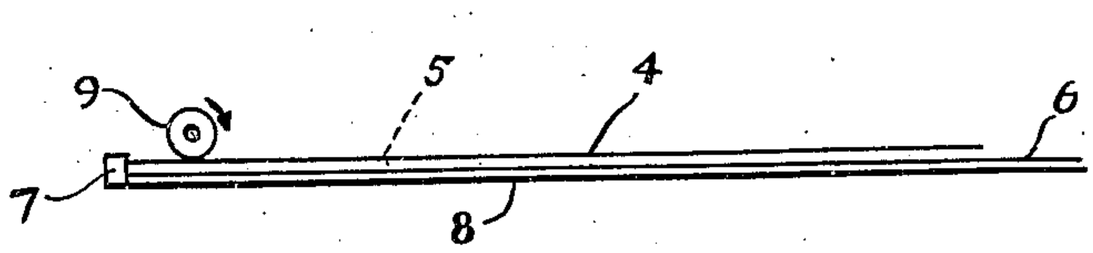

FIG. 3

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PROCESS OF PREPARING AND COATING SCREEN MATERIAL ON TUBES

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5 Claims. (Cl. 117—33.5)

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This invention relates to a process for coating the inside face of cathode-ray tubes such as tubes to be used for television, for example. With this invention phosphorescent or fluorescent screen materials may be deposited or coated upon the inside faces of such tubes in different patterns or configurations.

In accordance with this invention screen materials can be deposited on the inside faces or surfaces at the large ends of such tubes in whatever different patterns or configurations may be desired. Fluorescent or phosphorescent materials which have different color emissive properties can be deposited as screens in such a way as to have the desired orientation with respect to each other. Also, extremely small areas can be coated in juxtaposition to each other in a regular pattern without overlapping and without leaving blank spaces or uncoated portions on the surface of the tube.

The invention is particularly useful for coating a number of photoelectric materials or fluorescent materials of different sorts in predetermined patterns on the inside faces of cathode-ray tubes.

The invention will be particularly described in connection with the coating of a cathode-ray tube with different sorts of photoelectric or fluorescent materials so that each is symmetrical with respect to the other two, and each different coated area is the same size as the others, but it will be obvious from the description that it is not limited to such coating.

The invention may be understood from the description in connection with the accompanying drawing in which:

Fig. 1 is an enlarged plan view partly broken away of a negative film used in carrying out the invention;

Fig. 2 is a corresponding plan view of a photographic print made from the negative of Fig. 1; and

Fig. 3 is an edge view partly broken away indicating how fluorescent material may be applied to a film or sheet.

The negative photographic film 1 is prepared in the known way in such a manner that separate black squares 2, each of which is the same size as the others, are left thereon. These squares are spaced in horizontal and vertical rows at right angles to each other with rectangular spaces 3 between the squares in vertical and horizontal directions. These rectangles have the same width as a side of a square and are twice as long as they are wide. The squares may, for example, be two thousandths of an inch along each side.

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A contact print 4 (Fig. 2) is made from this negative film 1 on a sensitized sheet or strip of carbon tissue or other transparent material coated with sensitized material which has the property of being soluble until it is struck by light. After exposure to light through the negative 1 these sheets or strips 4 are then developed in warm water or other suitable solvent to dissolve out the unexposed portions of the gelatine, leaving a sheet with open square holes 5 therethrough of the same size as and spaced like the black squares 2 of the negative photographic film 1.

This contact print 4 or carbon tissue may be mounted on a silk screen 6 for convenience in using it as a stencil. A frame 7 may be provided along the edges of the screen 6.

The different fluorescent materials that are to be applied to the inside face of the end of a cathode-ray tube are dispersed respectively is suitable media, such as ethyl nitrocellulose, for example, and printed through the square holes 5 in the print 4 and through the corresponding portions of the silk screen 6 onto a thin sheet 8 of soluble material such as nitrocellulose, for example. In carrying out this part of the process, one of the solutions of fluorescent materials is passed through the holes 5 and the silk screen 6 by means of a squeegee 9, for example, thus applying this fluorescent material to the nitrocellulose sheet 8 through the openings 5 onto small square areas of this sheet 8 spaced like the areas 2 in Fig. 1, both horizontally and vertically.

After drying the printing screen 4 or the nitrocellulose sheet 8 is then moved longitudinally or laterally with respect to the other a distance equal to one side of a small square 2. A coating or suitable dispersion of another one of the fluorescent materials is then passed through the silk screen 6 in the same way thus applying the same size of squares of this other fluorescent material to the nitrocellulose sheet 8 with the edges of the squares touching.

After drying again and moving the screen 4 or sheet 8 the same distance as described, a coating of the third fluorescent material is passed through the silk screen 6 thus applying this fluorescent material to the nitrocellulose sheet 8 over the third set of square areas and covering the sheet 8 with fluorescent materials.

This nitrocellulose film or sheet 8 is flexible and the areas of fluorescent materials adhere thereto. This film or sheet 8 is rolled up into a cylinder and passed through the neck of the

cathode-ray tube such as a television tube, for example, of which the surface of the inside face is provided with a binder of the known sort that will cause the particles of fluorescent materials to adhere to the face. This film is unrolled and adjusted in the tube in contact with the binder to the desired position on the inside face of the tube and firm contact is made along the whole surface of the film with the inside face of the tube.

A solvent for the nitrocellulose sheet is then introduced into the tube to dissolve the nitrocellulose base leaving the respective areas of fluorescent material adhering to the tube surface. Any excess of binder for the fluorescent material may be removed by heating where there is need for doing so.

What is claimed is:

1. The process of applying a succession of screen materials of different sorts along a plurality of parallel lines in a sequence of deposits equal in number to the sorts of materials applied to the face of a cathode-ray tube, which comprises coating said materials in succession through aligned square holes in a sheet of solid material onto a sheet of soluble material along a plurality of parallel lines, each sort of material being applied so as to produce a straight line of said material with the successive deposits adjoining without overlapping the previous deposits, adhering said sheet to the inside face of said tube, dissolving said sheet, and leaving the deposits of said material in straight lines on said face.

2. The process of applying a succession of screen materials of different sorts along a plurality of parallel lines in a sequence of deposits equal in number to the sorts of materials applied to the face of a cathode-ray tube, which comprises coating said materials in succession through aligned square holes in a sheet of solid material onto a sheet of soluble material along a plurality of parallel lines, each sort of material being applied in the form of a succession of squares so as to produce a straight line of said material with the successive deposits adjoining without overlapping the previous deposits, adhering said sheet to the inside face of said tube, dissolving said sheet, and leaving the deposits of said material in straight lines on said face.

3. The process of applying a succession of screen materials of different sorts along a plurality of parallel lines in a sequence of deposits equal in number to the sorts of materials applied to the face of a cathode-ray tube, which comprises coating said materials in succession through aligned square holes in a sheet of solid material onto a

sheet of soluble material along a plurality of parallel lines, each sort of material being applied in the form of a succession of squares of the same size so as to produce a straight line of said material with the successive deposits adjoining without overlapping the previous deposits, adhering said sheet to the inside face of said tube, dissolving said sheet, and leaving the deposits of said material in straight lines on said face.

4. The process of applying a succession of screen materials of different sorts along a plurality of parallel lines in a sequence of deposits equal in number to the sorts of materials applied to the face of a cathode-ray tube, which comprises coating said materials in succession through aligned square holes in a sheet of solid material onto a sheet of soluble material along a plurality of parallel lines, each sort of material being applied in the form of a succession of squares each having an edge about two thousandths of an inch long so as to produce a straight line of said material with the successive deposits adjoining without overlapping the previous deposits, adhering said sheet to the inside face of said tube, dissolving said sheet, and leaving the deposits of said material in straight lines on said face.

5. The process of applying a succession of screen materials of different sorts along a plurality of parallel lines in a sequence of deposits equal in number to the sorts of materials applied to the face of a cathode-ray tube, which comprises coating said materials in succession through aligned square holes in a sheet of solid material onto a sheet of soluble material along a plurality of parallel lines, each sort of material being applied so as to produce a straight line of said material with the successive deposits adjoining without overlapping the previous deposits, adhering said sheet to the inside face of said tube, dissolving said sheet, and leaving the deposits of said material in straight lines on said face.

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