

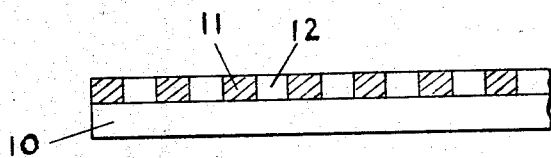
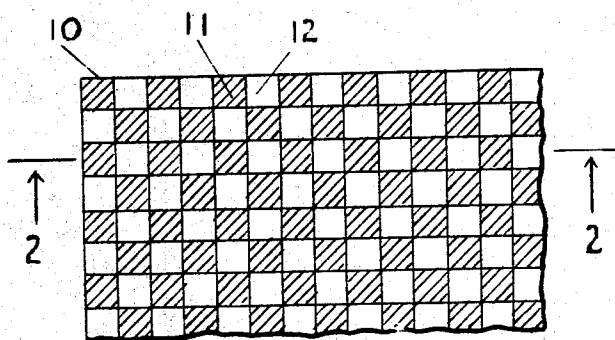
Sept. 27, 1966

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3,275,828

RADIOGRAPHIC INTENSIFYING MEANS

Filed April 2, 1962



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1

3,275,828

RADIOGRAPHIC INTENSIFYING MEANS

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Filed Apr. 2, 1962, Ser. No. 184,532

3 Claims. (Cl. 250—80)

This invention relates to radiography, and more particularly to fluorescent substances of different sensitivity radiography. It relates to fluorescent substances of different sensitivity arranged in dots side by side, and relates to fluorescent substances of different color light emission arranged in dots side by side so as to form a mosaic of contrasting color lights.

It is an object of this invention to produce radiographs with sharp density differentiation and clear definition of detail.

Another object is to produce radiographs in contrasting color with distinct color differentiation.

The above and other objects will become apparent in the description below.

Intensifying screens, sometimes called amplification foils, are old in the art. They consist of sheeting provided with a coating of a suitable fluorescent compound, dispersed in an appropriate medium, in accordance with the well known techniques of photographic plate coating, X-ray intensifying screen coating, and the like. In contrast, I show mosaic-like intensifying means.

As an example, this invention is practiced by arranging on a support dots of fluorescent crystals with different sensitivity and/or different color light emission. The dots are arranged alternately, side by side, and practicably in single thickness. When the arrangement is exposed to penetrating radiation through an object, the penetrating rays will excite differently sensitized and/or different color light producing dots of fluorescent crystals. As a result, a mosaic of colored light dots is produced in the image of the object to be reproduced.

In connection with photographic film, the color light emitted by each fluorescent dot exposes the part of the film in closest proximity thereto. In combination with color sensitized film, the color light emitted by each fluorescent dot exposes the part of the color film in closest proximity thereto which has been sensitized to the corresponding color.

The result of the described mosaic-like arrangement is a clear and sharp color differentiation between the colored light dots, because grayed color caused by superposition of different color lights is avoided.

The mosaic-like intensifying screens may be formed by printing, stamping, impression, rolling, painting, stenciling, spraying, floating, adhesion, or by any other means, and comprises arranging side by side dots of fluorescent substances having different sensitivity to penetrating radiation, and/or emitting different color lights.

As a simple example of making, a support such as fibre-board, plastic or other sheeting is coated with adhesive substances such as varnish or laquer to provide a sticky surface. Dry fluorescent crystals of different sensitivity to penetrating radiation and of different color emission are thoroughly mixed and are sprinkled over the sticky surface of the support, so that only a single layer of mixed fluorescent crystals will adhere, arranged side by side. The surplus crystals will fall off when the screen is turned over and tapped lightly. The adhering crystals, when subjected to penetrating radiation through an object to be reproduced, will form a mosaic-like image in different colored light dots.

The surface of the screen may be further processed by smoothing and by applying protective coating.

It must be understood that the fluorescent substances, when applied, may be other than dry, and they may be

2

mixed with any suitable medium. Examples of usable fluorescent substances are calcium tungstate, zinc cadmium sulphide, and cadmium borate, but any other fluorescent substances may be utilized.

Superior intensifying means are made by alternating differently sensitized dots of fluorescent substances in rotation.

It is known that the ordinary photographic plate is much more sensitive to blue or green than to red. Accordingly, if we have a blue and red point of light of the same visual magnitude, the blue point will make a much stronger image on the photographic plate than will the red.

Accordingly, in radiography and in combination with intensifying screens, blue light emitting fluorescent crystals will make a much stronger image on ordinary photographic film than will red light emitting crystals of the same visual magnitude. Therefore, in this invention and in combination with regular film, I arrange blue or red light emitting fluorescent crystals in dots, side by side, producing mosaic-like images consisting of differently colored points of light, resulting in radiographs with sharp and detailed density differentiation. This is an example for producing monochromatic renditions.

It is known that superposition of different color lights will often result in grayed color. But if different color lights are arranged side by side mosaic-like, grayed color due to superposition is avoided. Therefore, in another example of this invention, I use mosaic-like fluorescent light dots of different color in combination with color sensitized photographic film. As described, the different color lights are emitted side by side, without superposition, and grayed color due to superposition is avoided. As a result, radiographs with sharp color differentiation are produced.

The accompanying drawing illustrates the invention, but the invention is not limited to the particular examples illustrated.

Referring briefly to the drawing, FIGURE 1 is a greatly enlarged sectional view of a mosaic-like intensifying screen, illustrating an embodiment of the invention.

FIGURE 2 is a cross-section elevation view taken along the line 2—2 of FIGURE 1.

Referring in detail to the drawing, the numeral 10 in FIGURE 1 indicates a support sheet covered with alternate dots of unequal fluorescent substances. The alternate dots may be unequal in sensitivity, in color light emission, or in both. The shaded dots may be red emitting, and the clear dots 12 blue emitting. When in this case the fluorescent screen is exposed to penetrating radiation through an object, a mosaic of red and blue light dots is produced in the image of the object to be reproduced. Since the illustrated red and blue emitting dots alternate, it can be seen that collectively each species occupies approximately half of the screen surface.

By "alternate" is basically meant two species in alternation.

The dots 11 and 12 may have a different response to equal intensities of penetrating radiation, so that equal radiation intensities produce unequal fluorescent intensities, thereby improving the image.

It can be seen by the drawing and description that in connection with different color emitting fluorescent dots the penetrating radiation produces different qualities of fluorescent light of various spectral composition and of unequal photographic value.

In combination with color film, a single intensifying screen will produce a density analysis in brilliant contrasting colors, brilliant because the different color light dots are not superposed, and therefore grayed color is avoided.

If in this invention the image is examined from a rea-

3

sonable distance, the dots are no longer seen individually but merge to form a continuous image.

It is difficult, if not impossible, to distribute or alternate the unequal fluorescent dots evenly and accurately; and it must be understood that in practice these dots may be of any shape or form, and that said dots are disposed alternately or in rotation as is practicable. Therefore, in the text and claims, by alternate is also meant alternate as is practicable.

The principles involved in this invention may be applied to all fields of radiology.

Changes may be made within the spirit and scope of this invention.

I claim:

1. Radiographic intensifying screen comprising a support and a mixture of only red and blue fluorescent dots laid down on said support substantially side by side in single thickness.

2. Radiographic intensifying screen comprising a support and a mixture of only two fluorescent dot species of respectively unequal exposure value laid down on said support substantially side by side in single thickness.

4

3. Radiographic intensifying screen comprising a support and only red and blue light emitting fluorescent dots laid down on said support alternately and substantially side by side in single thickness.

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