

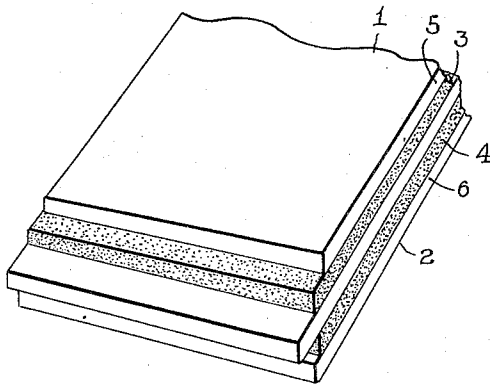
Jan. 17, 1939.

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2,144,040

INTENSIFYING FOIL FOR X-RAY PHOTOGRAPHY

Filed Nov. 5, 1936



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UNITED STATES PATENT OFFICE

2,144,040

INTENSIFYING FOIL FOR X-RAY
PHOTOGRAPHY

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Application November 5, 1936, Serial No. 109,204
In Germany October 9, 1935

5 Claims. (Cl. 250—80)

The invention relates to improvements in X-ray photography and more particularly to an improved combination of intensifying screens or foils.

5 Such intensifying screens or foils are employed in X-ray photography for the purpose of shortening the exposure time. The screens consist of a layer of a fluorescent material, for instance crystallized calcium tungstate which is chiefly applied on a carrier (cardboard, Celluloid sheet).
10 The X-ray film which is to be exposed is placed between two foils of this kind which when irradiated with X-rays cause the X-ray picture to emit a photographically effective fluorescent light and decrease the exposure time.

The efficiency of these intensifying foils is determined mainly by two factors: The intensifying factor and the definition or sharpness of the picture. It is possible to improve the definition of the foil by using very thin layers or by dyeing the fluorescent layer or by using a fluorescent material of very fine grain size, however, in all these cases the intensifying factor is impaired at the same time.

25 It is an object of my invention to improve the definition of the picture obtained by a foil combination for X-ray photography without materially impairing the intensifying factor.

30 It is another object of my invention to create foil combinations which produce a good definition and a favourable factor of intensification as well.

35 My invention also relates to a process for producing foil combinations for X-ray photography, in which the fluorescent material of the back foil or lower foil is of a finer grain size than that of the front foil or upper foil.

40 I have found that the definition of a foil combination can be improved without materially decreasing the intensifying factor, by using a fluorescent material of different grain size for the front and back foil, the coarser material always being employed for the front foil.

45 A foil combination embodying my invention has been illustrated, by way of example, in the accompanying drawing, showing a perspective view of my new foil combination. The arrangement consists of a front foil 1 and a back foil 2. The front foil 1 contains a layer 3 of grained fluorescent material. The back foil 2 contains a similar
50 layer 4 of fluorescent material.

55 For exposing the photographic film 7 to the X-rays it is placed between the two foils 1 and 2 in the manner known per se. However, according to my invention the grain size of the fluorescent

material in the layers 3 and 4 is so chosen that the average grain size in the layer 4 of the back foil is smaller than in the layer 3 of the front foil. In the embodiment shown in the drawing the layers 3 and 4 are applied on carrier layers 5 and 6. The fluorescent layer may be attached to the carrier layer in any suitable manner, for example with the aid of a transparent acetyl cellulose lacquer.

10 The above described example in no way restricts the scope of my invention. The important step merely consists in the use of a fluorescent material of finer grain size for the back foil than for the front foil. In all other respects the intensifying foils may be produced in any suitable manner. For instance the carrier layer or support for the fluorescent material may consist of cardboard or celluloid. Moreover, an intermediate layer may be arranged between such a support and the fluorescent layer. It is also possible to produce the intensifying foil without any carrier layer or support. In this case the grained or powderous fluorescent material is embedded in a gelatine layer. As a fluorescent material for
25 instance calcium tungstate may be used.

30 The new effect according to my invention does not depend on the actual grain size provided only that the back foil consists of a finer material than the front foil. Also the effect will be obtained if the coarse material is only partly replaced in the back foil by finer material or even a somewhat coarser material may be used for the back foil as an initial material, admixing thereto, however, a finer material for obtaining a smaller average grain size than that of the front foil.

35 I have found that a combination giving very favourable results as to sharpness of the picture and intensifying factor is obtained for instance if a calcium tungstate powder having a particle size of 3 to 5 microns (1 micron=0.001 mm.) is used for the front foil and a mixture of 50 percent by weight of calcium tungstate of a particle size of 3 to 5 microns and 50 percent by weight of a calcium tungstate of a particle size of 0.5 to 1 micron for the back foil.

45 I claim:

1. A screen combination for intensification in X-ray photography, comprising a front foil having a layer of fluorescent material and a back foil having a layer of the same fluorescent material, the average grain size of the fluorescent material of the back foil being smaller than the average grain size of the fluorescent material of the front foil.

2. A combination of intensifying foils for X-ray 55

photography, comprising a front foil having a layer of fluorescent material and a back foil having a layer of the same fluorescent material, the grains of the back foil being smaller in diameter than the grains of the fluorescent material of the front foil.

3. In an arrangement for X-ray photography, a front foil including particles of fluorescent material and a back foil including a mixture of particles of the same material and of the same size as the particles of the front foil and particles of the same material and of a smaller size.

4. In a combination of intensifying foils for X-ray photography, a front foil comprising a

layer of calcium tungstate having an average particle size in the order of 3-5 microns and a back foil comprising a fluorescent layer including calcium tungstate of a particle size in the order of 3-5 microns and calcium tungstate of a particle size of 0.5 to 1 micron.

5. In a combination of intensifying foils as claimed in claim 4, a back foil comprising approximately equal percentages by weight of the said particles in the order of 3-5 microns and of the said particles having a particle size of 0.5 to 1 micron.

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