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X-RAY INTENSIFYING SCREEN

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Fig. 1.

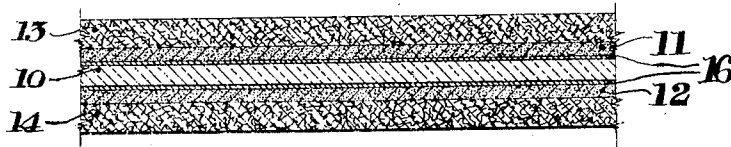
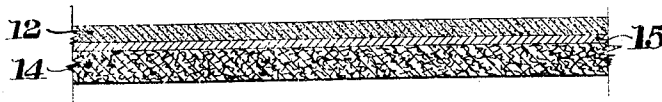


Fig. 2.



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X-RAY INTENSIFYING SCREEN

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Application October 27, 1931. Serial No. 571,374

5 Claims. (Cl. 250—34)

This invention relates to X-ray intensifying screens and particularly to supports for the active fluorescent agent used in such screens. Ordinarily X-ray intensifying screens are built up on a paper or cardboard support or on some cellulose ester support, which carries a fluorescent agent such as calcium tungstate. It is well known that such screens, when left in contact with photographic film, may either produce fog on unexposed film or may intensify or destroy latent images on previously exposed film. Such undesirable results are largely due to emanations from the support for the fluorescent agent.

These emanations are believed to be due to the fixation of oxygen as an organic peroxide by constituents of the wood used in making the paper or card-board and liberation of volatile peroxides, chiefly, hydrogen peroxide.

I have found that this fogging of the film or deleterious effects on the latent image may be markedly reduced by incorporating in the support for the fluorescent agent a substance which will destroy, or promote decomposition of, hydrogen peroxide.

There are many substances which apparently act as catalysts to cause violent decomposition of hydrogen peroxide among which are: lead oxide, cobaltic oxide, vanadium oxide, manganese dioxide and silver oxide. Other substances such as hydroquinone and pyrogallol acid will also serve to accomplish the same purpose.

In the case of a paper support, a solution of potassium permanganate may be incorporated in the pulp while in the beater to stain it uniformly, or the paper may be passed through a weak solution of potassium permanganate which the carbohydrates present will reduce to manganese dioxide.

In the accompanying drawing which are enlarged sectional views, Fig. 1 illustrates two X-ray intensifying screens embodying my invention, as used with a film and

Fig. 2 illustrates a single screen with an additional protection layer.

Referring to the drawing, a film 10 provided with a photographic emulsion 16 on each side is positioned between two intensifying screens 11 and 12. The screens 11 and 12 are carried on the supports 13 and 14 respectively in which has been incorporated a small amount of colloidal manganese dioxide as above described. In the case of the front screen support 13, (so designated because the rays incident on the sensitive film pass through it) the amount of the manganese dioxide is quite small as otherwise its absorbing effect on X-rays will reduce the efficiency of the intensifying screen. I have found that very satisfactory results may be obtained by passing the paper for the support through a solution 1/100 normal potassium permanganate.

The amount of manganese oxide incorporated in the back screen support 14 may be made as large as desired since the X-rays do not have to penetrate it.

An additional protection against any residual emanations reaching the fluorescent salt and the film from the back support is illustrated in Fig. 2 in which a dense layer of baryta 15 is coated on the support 14 prior to the application of the tungstate layer 12. The layer of baryta 15 may be applied to the support 14 in hardened gelatine as effected in the preparation of photographic paper and which is well known.

The invention herein claimed is a specific form of that broadly claimed in my co-pending application Serial No. 570,035, filed Oct. 20, 1931. I contemplate as included within the present invention such modifications and equivalents as fall within the scope of the appended claims.

What I claim is:

1. An intensifying screen having a layer containing a fluorescent salt and a supporting layer having incorporated therein a small amount of manganese dioxide.

2. An intensifying screen comprising an active layer, and a backing layer having incorporated therein a small amount of an oxide of an element selected from the group consisting of lead, cobalt, vanadium, manganese and silver.

3. An intensifying screen comprising a supporting layer, an active layer and a protecting layer between said supporting layer and said active layer consisting of a dense layer of baryta.

4. An article of manufacture comprising an X-ray film emulsion-coated on each side and positioned between a front and back intensifying screen, a support for said front screen having incorporated therein a small amount of manganese dioxide and a support for said back screen having incorporated therein a large amount of manganese dioxide.

5. An intensifying screen comprising an active layer, a supporting layer of a material containing a substance which gives off hydrogen peroxide and having incorporated therein a substance the presence of which causes the hydrogen peroxide to decompose, said substance being selected from the group consisting of lead oxide, cobalt oxide, vanadium oxide, manganese dioxide, silver oxide, hydroquinone and pyrogallol acid.

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