

Jan. 21, 1936.

B. GASPAR
PHOTOGRAPHIC MATERIAL
Filed Dec. 1, 1932

2,028,279

Fig. 1.

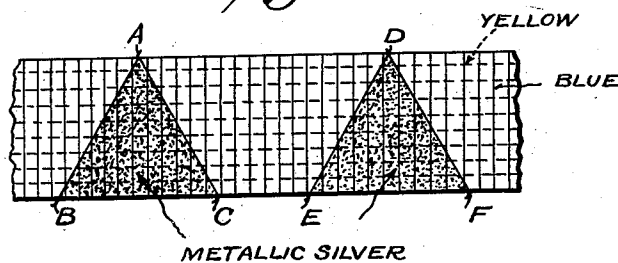
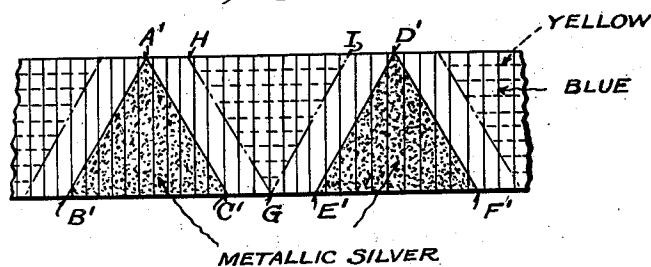


Fig. 2.



Inventor

Bela Gaspar,

By

D. P. Wrehan

Attorney

UNITED STATES PATENT OFFICE

2,028,279

PHOTOGRAPHIC MATERIAL

Béla Gaspar, Berlin, Germany

Application December 1, 1932, Serial No. 645,313
In Germany December 2, 1931

7 Claims. (Cl. 95—2)

This invention relates to photographic materials, and more particularly to colored silver halide layers.

It is known to produce two-color films by coloring films, which are sensitized on both sides, after the tanning or mordanting process, on the one side red and on the other side green. It has been proposed to employ for coloring purposes mixtures of dyestuffs, which color the layer to different degrees, whereby the silver salt employed as mordant should reveal a varying selectivity as regards the single parts of the dyestuff mixture of the dye solution. This method is intended to result in a two-color image, in which the effect is similar to that of three-color images. After the tanning of the layer, the one color is removed at points, and re-coloring performed with a second color. It is also known to produce two-color films in which the dyestuff is incorporated in the layer.

Silver halide layers have already been proposed, which contain mixtures of dyestuffs, for example one or more sensitizing dyestuffs and a filter dyestuff. These dyestuffs, however, incorporated in the layer, have been employed in low concentration and do not serve towards the production of a dyestuff image.

Now it has been found that two-color images may be obtained having a great similarity with three-color images, if sensitized layers are employed, containing dyestuffs which possess varying powers of resistance against an agent or solvent destructive to the dyestuff, more particularly oxidizing or reducing agents.

Accordingly, it will be apparent that the present invention contemplates the provision of a color photographic material consisting of a plurality of layers poured one upon the other and having incorporated therein different dyestuffs having different powers of resistance to the effect of an agent serving to discharge the said dyestuffs for the production of the colored image.

The invention may be diagrammatically illustrated as shown in the accompanying drawing in which Figures 1 and 2 are diagrammatic views illustrating one embodiment of the invention to be later described in detail.

Two layers, of which the one is colored red and the other green, are either poured one over the other on a desired support or backing, or applied to both sides of a film, or also poured on the single films, which are intended to be afterwards united to form a compound film. It is possible to obtain with the photographic material prepared in this manner a very wide range

of effects, and the particular object of use may also be considered when selecting the dyestuffs to be added to the emulsion.

For example for portrait work in order to obtain proper flesh color, also for interior work, there is employed for the red colored layer a dyestuff mixture, which contains a rapidly bleaching purple red and a slowly bleaching orange or yellow. The blue-green dye employed for coloring purposes will be, in accordance with the invention, a blackish green. In the blue-green part of the image there will be employed a reddish orange dye in place of the yellow dye, and a blue, which bleaches more readily than the yellow-orange. The desired color combination may be provided in one or more layers.

Example

The one layer is colored with Pyramine Orange and Azo Fuchsin and the other with Benzo Pure Blue and Pyramine Orange.

For landscapes there is employed in the red-orange portion a mixture of dyestuffs containing a rapidly bleaching red and a more slowly bleaching yellow dyestuff.

The blue-green layer will contain a dyestuff mixture, in which the yellow dyestuff bleaches more rapidly than the blue, in view of the fact that this layer is intended for the reproduction of sky and foliage.

Example

The one layer is colored with Azo Fuchsin and Mordant Yellow GG, the other with Benzo Pure Blue and Metanil Yellow.

It is, however, also possible to produce various other combinations in accordance with the desired effect. Two-color films may be produced in fantastic colors employed, for example, for advertising purposes or in revue scenes. For example the one layer contains a mixture of red and violet dyestuff and is colored purple-mauve. The other layer is colored yellow-green and contains a yellow and a blue-green dyestuff. The layers are sensitized in respect of rays, which are allowed to pass by the dyestuff employed for coloring the layer, and under certain circumstances for rays which are allowed to pass by the layer situated thereover. The layers are then exposed, developed and subsequently treated, for example according to the method described in my prior Patent No. 2,020,775, patented November 12, 1935.

By reference to the drawing, it may be pointed out that Fig. 1 represents a cross-section

through a developed and fixed photographic layer. ABC and DEF are two silver deposits. This layer is colored blue (vertical shading) and yellow (horizontal shading). The two dyestuffs are diffusely distributed so that prior to the destruction of the dyestuff the layer appears green.

Fig. 2 shows a cross-section after the destruction of the dyestuff at the points of the silver image proportional to the quantity of silver present (A'B'C' and D'E'F'). Below the broken line all yellow has been destroyed and only blue remains. Above the broken line, in the neighbourhood of the silver all yellow has been destroyed, while at the center, at the points indicated by the horizontal shading, yellow still remains. This part, therefore, is green-blue. To obtain the pure dyestuff image the remaining silver is discharged by means of Farmer's reducer.

A'C'GH is colored blue, GID'E' is also blue; GHI is yellow and blue, i. e. green.

The treatment of the exposed material may, however, also be such that, for example, the layer is hardened by tanning development or subsequent tanning, and this layer subjected to the action of a solvent, as set forth by Schinzel in the "Chemikerzeitung", 1908, page 667. In this case the procedure in the selection of the dyestuffs will be such that in place of the dyestuffs of different bleaching rapidity variously soluble or variously reacting dyestuffs will be employed.

The dyestuffs employed may be identified by reference to Schultz Dyestuff Tables, 5th Edition, 1920. The index numbers for the particular colors herein specified are as follows: Pyramine Orange, R. 360; Azo Fuchsine, 71; Benzo Pure Blue, 426; Mordant Yellow GG, 48; Metanil Yellow, 134.

What I claim is:—

1. A color-photographic material, comprising a silver halide emulsion having incorporated therein differently colored dyestuffs having varying powers of resistance to the effect of the agent serving locally to discharge the said dyestuffs for production of the color image.

2. A color-photographic material, comprising a silver halide emulsion having incorporated therein differently colored dyestuffs adapted to bleach with varying rapidity under the action of an oxidizing agent serving locally to produce the color image.

3. A color-photographic material, comprising a silver halide emulsion having incorporated therein differently colored dyestuffs adapted to bleach with varying rapidity under the action of a reducing agent serving locally to produce the color image.

4. A photographic material comprising a support having thereon a homogeneously colored sensitized silver halide emulsion containing different colored dyestuffs in high concentration and of different stability with respect to a reducing agent.

5. A photographic material comprising a support having thereon a plurality of layers of homogeneously colored sensitized silver halide emulsion, each containing a differently colored dyestuff in high concentration and of different stability with respect to a common reducing agent.

6. A photographic material comprising a support having thereon a plurality of layers of homogeneously colored sensitized silver halide emulsion, one layer containing a red dyestuff mixture comprising rapidly bleaching purple and red and a slowly bleaching yellow in high concentration and another layer containing a blue-green dyestuff mixture also in high concentration and containing a reddish orange and a blue which bleaches more readily than the yellow and orange.

7. A photographic material comprising a support having thereon a plurality of layers of homogeneously colored sensitized silver halide emulsion, one layer containing a red orange dyestuff mixture containing a rapidly bleaching red and a more slowly bleaching yellow dyestuff, and another layer containing a blue-green dyestuff mixture including a yellow dyestuff which bleaches more rapidly than the blue.

BÉLA GASPÁR.