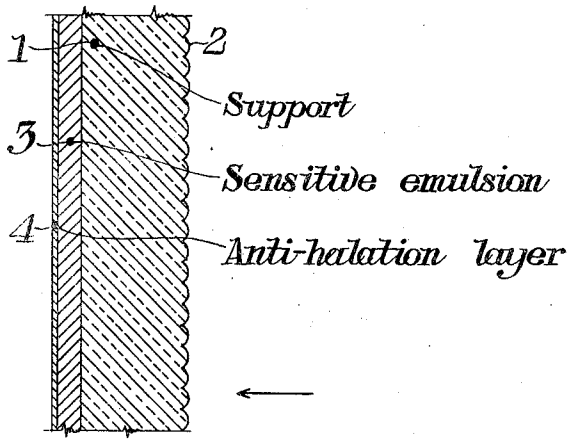
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FILM FOR COLOR PHOTOGRAPHY

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FILM FOR COLOR PHOTOGRAPHY

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1 Claim. (Cl. 95—2)

This invention relates to an improved film of the type having on one surface minute lenticulations and on the other a sensitive layer and useful particularly in a photographic color process.

This process involves the exposure of the film through the support, whereupon the lenticulations produce minute images, usually of a three color filter, in the emulsion. Since the size of the lenticulations is of the order of twenty to twenty-five per millimeter and there are, for each lenticulation, three filter band images registering the color component values, it follows that these filter band images are of the order of from sixty to seventy-five per millimeter. These minute images, in order to yield brilliant and correct color rendering, must be sharply defined and distinguished.

One of the principal causes for degradation of the color rendering is halation, because of which internally reflected rays impinge upon areas other than the originally correct ones.

This halation is caused in two ways when exposures are made through the support. In one case, light is reflected from the emulsion-support boundary upon the support-air boundary, and back again onto the emulsion. This defect can be minimized by incorporating in the support a transparent light absorbing medium of relatively low density, as disclosed in my Patent 1,817,963, granted August 11, 1931. A low density is effective because the harmful rays traverse the support three times, whereas, the image forming rays traverse it only once.

The second cause of halation has apparently been unsuspected hitherto, and comes from the rays which have passed through the light sensitive emulsion layer and been reflected from the gelatine-air boundary. Any rays reflected back onto the emulsion obviously cause degradation of the minute filter images in a lenticulated film color process.

The remedy for the defect is to apply a non-reflecting layer to the outer surface of the emulsion.

The incorporation of dye in the emulsion to overcome this defect is not a satisfactory solution of the problem for two reasons. In the first place, when a film is developed by a reversal process, the final image is developed up from the originally unexposed salts. If enough dye is included in the emulsion to overcome all halation due to reflection from the air-emulsion surface, it will effectively prevent exposure of a layer of sensitive salt next to such surface and there will then always be developed up finally a uniform density over the entire area which degrades and darkens the image. Moreover, the introduction of enough dye to prevent halation would alter the contrast or "gamma" of the images, for reasons pointed out fully in my Patent No. 1,690,617, granted November 6, 1928, to an entirely undesirable extent.

It is possible for the sake of gamma control to include a small amount of dye of a selected color in the emulsion but this would be insufficient to prevent halation.

Since the non-halation material carried on the surface layer and any gamma control dye carried in the emulsion layer are desirable during exposure in the camera and not during projection, both should be readily and completely removable in ordinary photographic processing baths.

I have obtained the desired results by applying to the outer surface only of the sensitive emulsion a non-halation layer which is either easily removed or from which the coloring matter is readily removed.

Referring to the accompanying drawing, the figure is a section on an enlarged scale of a film embodying a preferred form of my invention.

As shown in the figure, the film comprises a transparent support 1, preferably but not necessarily composed of a cellulosic compound, having one one surface a large number of minute lenticulations 2 of dimensions necessary for the known color process and on the other surface a sensitive photographic layer 3 on the outer surface of which is an anti-halation layer 4.

If the film is intended for use in a camera, as is customary, the sensitive layer will be panchromatic and the anti-halation layer will be preferably equally absorbent or non-reflective of all colors. If, however, the film is to be used in making duplicates or prints from existing films, it may be only ordinarily sensitive in which case the anti-halation layers need be non-reflective only of the colors to which the film is sensitive. In general, it may be stated that the layer must be in optical contact with the emulsion, must be practically inert to the emulsion and need have only a relatively low density, namely about 1.

The anti-halation layer may be formed in many ways, some of which will be specifically mentioned.

Moreover, the support may and preferably does contain a neutral dye to minimize halation due to internal reflection within the support.

The layer may consist of a binder or carrier

such as gelatine containing silver crystals in suspension. Such a layer is black or neutral in color and is removed in the bleaching bath to which the film is subject in the carrying out of the process.

The light absorbent material may be manganese dioxide in a suitable carrier. This is brown in appearance and sufficiently absorbent of light of all colors to be useful with a panchromatic emulsion. It is readily removed without affecting the photographic image.

The gelatine carrier may contain a dye or a mixture of dyes which are water-soluble or a dye may be applied from an alcoholic solution directly to the surface of the emulsion layer. Such a dye as Congo red, when so applied, will remain on the surface of the emulsion and is useful with film of ordinary sensitivity used in making prints.

The above described anti-halation layer is known and is not in itself new, but I consider as my invention the application of such a layer or its equivalent directly to the surface of a sensitive layer in a film of the special type as defined in the claim.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

A photographic element comprising a light transmitting support of cellulosic composition containing a neutral dye and having minute lenticulations on one surface, a sensitive, panchromatic layer on the other surface, and on the outer surface of the sensitive layer an anti-halation layer which embodies a material absorptive of light of all colors, said material being readily removable in the baths of a photographic reversal process.

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