Aug. 16, 1932. W. T. TARBIN 1,871,479

COLOR PHOTOGRAPHY

Original Filed Jan. 21, 1928

Fig. 1.

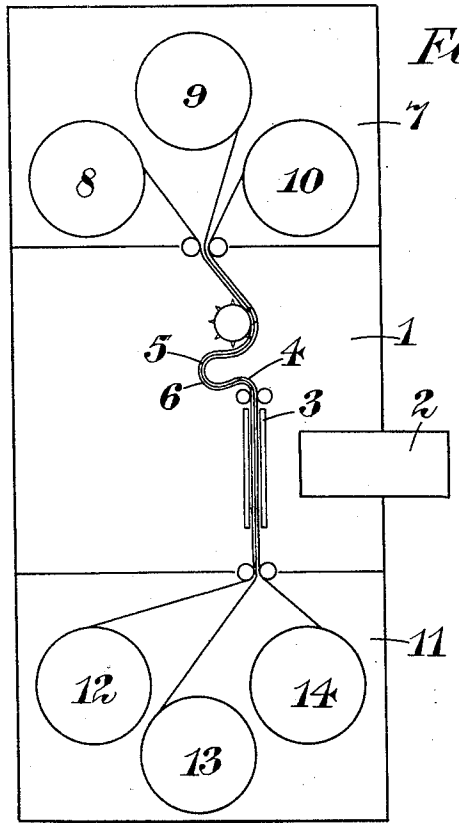
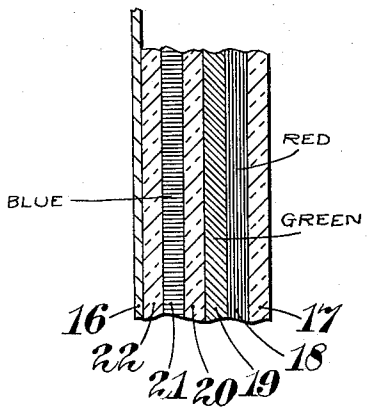


Fig. 3.



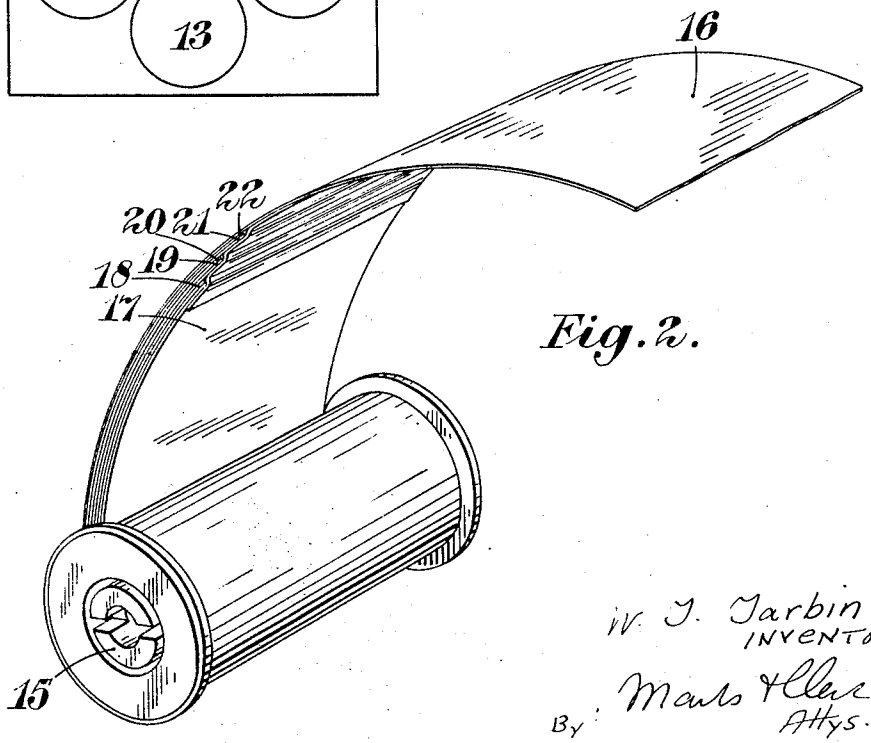


Fig. 2.

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UNITED STATES PATENT OFFICE

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COLOR PHOTOGRAPHY

Original application filed January 21, 1928, Serial No. 248,391, and in Germany February 1, 1927. Divided and this application filed April 22, 1929. Serial No. 357,270.

This invention relates to the method of color photography, which expression as used herein includes color cinematography, and photo-mechanical color printing processes, for example the half-tone, intaglio, collotype and like processes of pictorial reproduction in substantially natural color, by the exposure simultaneously of a plurality of superimposed layers of light-sensitive compositions differing one from the other in respect of their sensitivity to light rays forming particular bands of the spectrum in such manner as to enable a corresponding number of differently colored photographic images to be obtained by printing or projection, which when superimposed will form a composite representation of a subject in substantially its natural colors.

Usually the number of superimposed layers of light-sensitive composition employed and the number of differently colored photographic images which are arranged in superposition in processes of this kind are two or three, the process in the one case being described as a "two-color" process and in the other case a "three-color" process.

Hitherto, processes of the kind in question, using a plurality of superimposed layers of light-sensitive composition, have not given wholly satisfactory results owing, firstly, to the lack of definition or diffusion of the image due to the scattering of light by the several layers and their supports and, secondly, to the length of the exposure needed in forming the negative.

The object of the invention is to provide an improved roll film of the kind referred to which shall not be open to the above-stated objections inherent in the prior proposals.

The invention is based upon the observation that the layer of light-sensitive composition which is selectively sensitive to the rays situated towards the blue end of the spectrum should be located in making the exposure to obtain the negative images farthest from the source of light.

A bromide emulsion of high sensitivity will normally be used as the layer of light-sensitive composition sensitive to blue in place of the chloro-bromide emulsions previously employed for forming the blue sensitive layer in the known processes.

Where the invention is applied to the three-color process it would seem relatively immaterial whether the layer of composition sensitive to red or green is arranged immediately in front of the blue sensitive layer though in view of the fact that the so-called "blue-printer" is most important in giving form and definition to the completed picture, it would be preferable for the red sensitive layer (which gives the blue print) to be nearest to the light source, and in practice this will be the arrangement usually adopted.

The several layers of light-sensitive composition may be associated with a transparent support or transparent supports in a variety of manners. In some cases it may be desirable or even necessary to employ layers of composition which may be stripped from the support; for example, in the three-color process the layer of composition sensitive to red may be in the form of a stripping film attached to a transparent support such as glass or celluloid while the layer of composition sensitive to green and the layer of composition sensitive to blue are non-stripping films on suitably transparent supports.

The invention will be described in detail and by way of example with reference to the accompanying drawing, in which:—

Figure 1 is a diagrammatic view of a camera adapted for taking cinematograph pictures or single pictures as desired upon three separate light sensitive films, while

Figure 2 is a perspective view of a composite spool of film in accordance with the invention adapted for use in hand cameras.

Figure 3 is an enlarged sectional view of the composite film illustrated in Figure 2.

Referring to Figure 1, 1 represents the camera body, 2 the lens, 3 the film guide through which the three films 4, 5, and 6 are caused to travel from the chamber 7 in which the spools 8, 9, and 10 for the individual films are located, while 11 represents a chamber in which the take-up spools 12, 13 and 14 are arranged.

Referring to Figures 2 and 3, 15 is a spool of the character usually employed with roll

films, 16 is the backing paper, 17 is the thin film of celluloid, 18 is a layer of light-sensitive emulsion of red sensitivity coated thereon, 19 is a layer of light-sensitive emulsion of green sensitivity in contact with the first-mentioned layer of light-sensitive emulsion, 20 is a celluloid support for the same, 21 is a layer of light-sensitive emulsion of blue sensitivity and 22 is the celluloid support on which the same is mounted.

The layer of emulsion 21 is that which is selectively sensitive to the rays situated towards the blue end of the spectrum and as will be seen in making the exposure to obtain a negative image this will be located farthest from the source of light.

Certain of the layers of light-sensitive composition may be arranged to act as compensating filters, such films being dyed with non-sensitizing dyes while the opacity or translucency of the emulsions may be regulated to facilitate securing the desired degree of speed or sensitivity to light of the several light-sensitive layers.

When films of celluloid of suitable thinness are employed as supports for the several emulsions it may be found unnecessary to use stripping films but when stripping films are used in accordance with the invention they will be of known character insofar as their capacity to be stripped from their original support is concerned.

By the arrangement of the several layers of light-sensitive composition in the manner above defined and by the regulation of the sensitivity, opacity and translucency of the several layers, a means for producing negative images adapted for use in the production of composite representations in natural colors will be secured which will be capable of working at speeds comparable with the speeds of photographic plates and cut films.

This application is a division of application Serial No. 248,391, filed January 21, 1928.

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

1. A negative taking combination for color photography comprising a roll having a plurality of flexible strips of transparent material in super-imposition, a coating on each of said strips of a light sensitive material selectively sensitive to light rays forming particular bands of the spectrum, which strips, after exposure and development, when superimposed, form a complete, negative, composite representation of a subject in substantially its natural colors, and one of said coatings of light sensitive material being selectively sensitive to blue rays of light and being located on the strip of transparent material which is farthest from the source of light during exposure.

2. A roll film for color photography comprising three super-imposed strips of light-sensitive materials for sectional simultaneous exposure, each strip being selectively sensitive to light rays of a primary color, the strip of the roll farthest from the light source during exposure being selectively sensitive to blue rays of light.

3. A roll film for color photography comprising three super-imposed strips of light-sensitive materials for sectional simultaneous exposure, the strip of the roll positioned farthest from the light source during exposure being selectively sensitive to blue rays of light, the strip nearest the light source during exposure being selectively sensitive to red rays of light, and the intermediate strip being selectively sensitive to green rays of light.

4. A negative roll film taking combination for color photography comprising a flexible backing strip, a plurality of flexible strips of transparent material secured thereto adjacent to one end of each of said strips, and in super-imposition, and a coating on each of said transparent strips of a light sensitive emulsion, each coating being selectively sensitive to light rays forming a particular band of the spectrum, which strips, after exposure and development, when super-imposed, will form a complete negative, composite, representation of a subject in substantially its natural colors, one of said emulsion coated strips being selectively sensitive to blue rays of light and being located immediately adjacent said backing strip during exposure.

5. A roll film for color photography comprising a flexible strip of opaque backing material, a plurality of strips of flexible, transparent material removably secured at one end to said backing strip in super-imposition, a light-sensitive coating on each of said transparent strips, each coating being selectively sensitive to light rays forming a particular band of the spectrum, which strips, after exposure and development, when super-imposed, will form a complete negative, composite, representation of a subject in substantially its natural colors, one of said coated strips being selectively sensitive to blue rays of light and being located immediately adjacent said opaque backing strip during exposure.

6. A roll film for color photography comprising a flexible strip of opaque backing material, a plurality of strips of flexible, transparent material removably secured at one end to said backing strip in super-imposition, a light sensitive coating on each of said transparent strips, each coating being selectively sensitive to light rays forming a particular band of the spectrum, which strips, after exposure and development, when super-imposed, will form a complete, negative, composite representation of a subject in substantially its natural colors, one of said coated strips being selectively sensitive to blue rays of light and being located immediately ad-

jacent said opaque backing strip during exposure, and another of said coated strips being selectively sensitive to red rays of light and being located farthest from said opaque backing strip during exposure.

In testimony whereof I have signed my name to this specification.

WILLIAM THOMAS TARBIN.