

PATENT SPECIFICATION



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COMPLETE SPECIFICATION.

Improvements in or relating to Colour Photography and Kinematography.

I, LOUIS DUFAY, a citizen of the French Republic, of 10^{bis} rue Champ Lagarde, Versailles (Seine-et-Oise), France, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

Methods of reproduction, printing or multiplication of a transparent image in colours obtained by the process utilising juxtaposed green, violet and orange networks, are already known. In these methods use is made of a carrier or support on which is traced a network in complementary colours, which must be exactly registered in its red, yellow and blue elements on the green, violet and orange elements of the network belonging to the transparent image. The carrier comprises moreover a sensitive layer.

When it is desired to print an image on the support, the transparent image is placed on the said support, in such a manner that the light does not pass through the network of the said support before reaching the sensitive layer. In other words, the network of the support does not effect any selection; it serves only for synthesis purposes, that is to say for reconstituting the colours when the print is observed. The said known method presents the inconvenience of necessitating an exact registration of the screen patterns.

Methods eliminating this inconvenience are also known, and consist in utilising, for the support, a screen composed of green, violet and orange parts. But, it is known, that, in order that green, violet and orange, elements may effect a correct selection, their colorimetric intensity must be such that each coloured element absorbs the two thirds of the solar spectrum and allows only one third to filter through. It results therefrom that the general intensity of the network thus constituted is very high and that, examined by reflection, such a network has a general tonality akin to black. The photographic image is thus considerably darkened and this, among other inconveniences, renders impossible the ex-

amination of colour negative images by reflection and limits the photography of colours to the transparent images only. 55

The present invention rests on this new consideration that, for the printing of colour positive images by means of a transparent colour negative image obtained by the method utilising networks formed of juxtaposed green, violet and orange elements, that is to say of an image the colours of which are already selected by the coloured elements which constitute it and give it, by synthesis, its colourations, it is not necessary, when any registration of the screen patterns is not desired, to use for the support a selecting network composed of green, violet and orange elements, but that in this case, the use of a network constituted by juxtaposed yellow, blue and red elements, presents all the advantages of networks in green, violet and orange elements, used up to now, and have a lesser colorimetric intensity. 60 65 70 75

In fact, it will be noted that, in the special case of the printing of colour positive images by means of colour negative images obtained by the method utilising selecting networks of binary colours, violet, green and orange, it is no longer a question of selecting the colours of the original object since the said colours have been already selected on the negative images, the colours of which are, in fact, reduced to green, violet and orange. The function of the reproduction network is therefore limited to ensure the correct printing of the primary colours which are complementary of these three colours, and a network composed of yellow, red and blue elements, called "positive network" is suited for fulfilling such a function, on the necessary and sufficient condition that each of the coloured elements of the positive network allows the passage of two coloured elements of the green, violet and orange network of the negative image, called "negative network" and stops the third element. 80 85 90 95 100

The invention consists therefore in a process for obtaining pictures in natural colours on transparent, translucent or 105

opaque supports including kinematographic films, comprising first the production of a screen negative, using green, violet and orange for the screen colours, 5
 second, printing or copying this screen negative (which may be reversed to form a positive if desired) on to a sensitized support which is associated with a colour screen, having yellow, blue and red 10
 colours for the screen, the printing or reproduction taking place through both the negative screen and the positive screen, without any pattern registration, and the colours of the positive screen having 15
 the following colour transmission properties:—

The yellow is chosen for allowing the passage of all the green, yellow, orange and red radiations of the solar spectrum, 20
 by absolutely stopping the violet and blue radiations; the blue for allowing the passage of the blue, violet and green radiations, but for absorbing the orange and red radiations; finally, the red for 25
 allowing the passages of the red orange and violet radiations and stop the complementary radiations of the solar spectrum, that is to say the blue and green region of the said spectrum.

Yellow, red and blue colouring 30
 materials are known, which realise the above mentioned conditions, and presenting such a brilliancy that the positive network, thus constituted, will have a 35
 luminosity considerably greater than the negative networks composed of green, violet and orange elements and in all cases practically sufficient so that an 40
 image, photographically created (by contact or enlargement) on such a network may be examined by reflection.

The positive networks composed of 45
 juxtaposed yellow, red and blue elements can be obtained, by any industrial process, on translucent paper or on any suitable translucent or transparent support, more particularly by (1) dyeing, sprayed or sprinkling with the aid of solutions of, 50
 for example, auramine or tartrazine for yellow; erythrosine or eosine for red; and night blue or methylene blue for blue; or (2) by photographic or photo-mechanical impression such as typography, lithography or copper-plate 55
 engraving, with transparent fatty inks coloured with pigments or with the chemical colouring matters just men-

tioned. The coloured elements may be arranged in any way and in any form.

I desire to point out that a method of 60
 printing positive colour images by means of negative colour images, in which the screen of the positive and negative both have primary colours, is already known. In this method there is no pattern 65
 registration but the screens are made of parallel transparent coloured silk, cotton or like fabric material filaments, and the filaments of the positive are placed, when printing, perpendicularly to those of the 70
 negative. The printing takes place through both the screens.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is 75
 to be performed, I declare that what I claim is:—

1. A process for obtaining pictures in natural colours on transparent, translucent or opaque supports comprising: 1st 80
 the production of a screen negative, using green, violet and orange for the screen colours; 2nd printing or copying this screen negative (which may be reversed to form a positive if desired), on to a 85
 sensitized support which is associated with a colour screen having yellow, blue and red colours for the screen, the printing or reproduction taking place through both the negative screen and positive 90
 screen, without any pattern registration, and the colours of the positive screen having the following colour transmission properties:—The yellow allows the passage of the green, yellow, orange and 95
 red radiations of the solar spectrum and completely stops the violet and blue radiations; the blue allows the passage of the violet, blue and green radiations and absorbs the orange and red radiations, 100
 finally, the red allows the passage of the red, orange and violet radiations, and stops the complementary radiations of the solar spectrum, that is to say the blue and green region of the said spectrum. 105

2. The method for the printing and the reproduction of photographic images in colours, substantially as hereinbefore described.

Dated this 7th day of September, 1927.

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