

## PATENT SPECIFICATION

217,557

Convention Date (France) : June 11, 1923.

Application Date (in United Kingdom) : April 16, 1924. No. 9727 / 24.

Complete Accepted : Feb. 26, 1925.

COMPLETE SPECIFICATION.



## Improvements in or relating to Colour Photography.

I, LOUIS DUFAY, citizen of the French Republic, of 10, rue Champ Lagarde, Versailles (Seine & Oise), France, acting on his own behalf and as Assignee of

5 COMPAGNIE D'EXPLOITATION DES PROCÉDÉS DE PHOTOGRAPHIE EN COULEURS  
 LOUIS DUFAY, a French company, of 10, rue Champ Lagarde, Versailles (Seine and 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:—

15 It has been proposed to make multi-colour screens for colour photography and cinematography by spraying a fatty resist in the form of spots on to a previously dyed support, the portions of the support not protected by the resist being thereafter decoloured and then dyed with another colour. Then further fatty resists are sprayed on, the visible surfaces of the support are again decoloured and dyed with a third colour.  
 20 Thus, a screen in three colours has been produced, but the distribution of the said colours is not uniform.

The present invention relates to a process of making multi-colour screens on a support of celluloid or a celluloid substitute in which resists are likewise employed for the purpose of decolouring and then dyeing with another colour the surfaces of the support not covered by the said resists, so that a two colour screen is obtained after the resists have been eliminated. The process is chiefly characterised in that the screen thus obtained in two primary colours is coloured throughout with the third primary colour. A second series of resists can then be applied to the said screen in two complementary colours and the portions not covered by the resists are freed from the third primary colour

[Price 1/-]

thereby causing the two first primary colours to become visible again, and finally a complementary colour of the third primary colour used is applied thereto.

According to the invention, it is possible to first form in the thickness of the carrier or support and on either of its faces a group of primary juxtaposed colours in the form of lines or dots, blue and red for instance, and to add to this first group a second series of two juxtaposed colours in the form of lines or dots, these two colours being yellow, a primary colour which does not appear in the first group, and violet which is the complementary of the yellow. Of course, the first group might be red and yellow and the second group blue and its complementary colour orange, or alternatively, the first group might be yellow and blue and the second group red and its complementary colour green.

The coloured elements can be of any shape, geometrical or not, uniform or irregular.

Assuming that blue and red—yellow and violet are employed, the process comprises the following series of operations illustrated in succession in Figures 1 to 7 of the accompanying drawing.

The side of a celluloid support to receive the network is uniformly dyed for instance in blue (Figure 1) then it receives, after this dyeing, the typographic impression of a series of lines in a fatty ink (Figure 2). This series of fatty lines forms resists, so that if the celluloid is then subjected to the action of a red alcoholic colouring bath of such chemical nature that it destroys the blue dye-stuff and is substituted for this dye-stuff in the portions not covered by the fatty ink, the result, after elimination of the fatty ink by a suitable sol-

50

55

60

65

70

75

80

85

90

Price 2/-

vent, will be blue and red lines (Figure 3).

5 The substitution of the red dye-stuff for the blue dye-stuff is effected nearly instantaneously by the addition particularly in the red dye-stuff of a small proportion of an alkali, *i.e.* caustic soda or potash.

10 The total surface of this first two colour network is then dyed with a yellow alcoholic dye-stuff which will convert the blue into green and the red into orange (Figure 4). Then, on this network will be typographically printed a new series of fatty lines crossing on the green and orange lines at any suitable angle (Figure 5).

15 Then the surface thus treated is subjected to the action of a blue violet colouring bath of such a chemical nature that it destroys the yellow and takes its place in the portions not protected by the fatty ink which portions alone, will be pervious (Figure 6). The said bath may consist of a solution of crystal violet containing potash, intended to eliminate the previously applied yellow colour. In these non-protected portions the subjacent red and blue divisions will persist after elimination of the yellow but will only reinforce the selecting power of the blue violet, without modifying the absorption band of the latter. Then it is only necessary to eliminate the series of fatty lines, and the network remains without any black or colourless space and will present selecting elements coloured green, orange, violet-blue and violet-red (Figure 7).

20 With regard to the action of the de-colouring agent, it must be noted that the first dyeing (blue and red) colours the celluloid support and penetrates therein. The first colouring offers a fairly strong resistance to the yellow colour which is subsequently applied. The yellow colour penetrates the thickness of the celluloid only to a slight extent and when the de-colouring agent is applied all the yellow colour and only a portion of the previously applied blue or red colour is removed. However, as the blue and red colours have penetrated more deeply in the celluloid, they remain, whereas the yellow colour disappears.

25 Colours soluble in alcohol are preferably used, these colours being for example rhodamine B or rhodamine N6J, malachite green or auramine, methylene blue, crystal victoria or

crystal violet. The de-colouring agents may be caustic potash or caustic soda.

As an example, a multi-colour screen according to the invention may be made as follows :—

Dye the support with methylene blue; de-colour with potash and dye with rhodamine B; dye the whole of the two-colour screen with auramine; de-colour with potash and dye with crystal violet.

Obviously the combinations of dye-stuffs can be varied, and instead of a series of fatty lines, figures, geometrical or not, uniform or irregular can be used.

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

1. A process of making a multi-colour screen for colour photography or cinematography, in which there is applied to a dyed support of celluloid or a celluloid substitute fatty resists enabling the portions of the support which are not protected by the resists to be de-coloured and dyed with another colour, characterised in that after the said resists have been eliminated, the screen thus obtained in two primary colours is completely dyed with the third primary colour.

2. A process of making a multi-colour screen for colour photography or cinematography, characterised in that the screen in two complementary colours obtained according to Claim 1 is printed with fatty resists, the portions not covered by the resists being freed from the third primary colour, so that the other two primary colours thus made visible may be dyed with the complementary colour of the third primary colour used, the fatty resists being subsequently eliminated so as to obtain a screen in four complementary colours.

3. A multi-colour screen produced according to the process claimed in Claim 2, comprising juxtaposed coloured elements produced by dyeing the support with two primary colours on which are superposed a third primary colour and the complementary colour thereof.

4. The process of making multi-colour screens substantially as described.

Dated this 16th day of April, 1924.

LOUIS DUFAY,

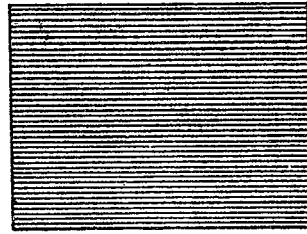
Per Boulton, Wade & Tennant,  
111/112, Hatton Garden, London,  
E.C. 1.

Chartered Patent Agents.

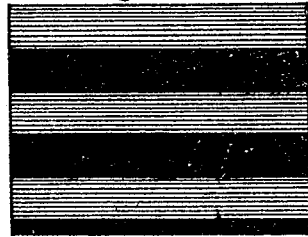
2<sup>nd</sup> Edition

[This Drawing is a reproduction of the Original on a reduced scale.]

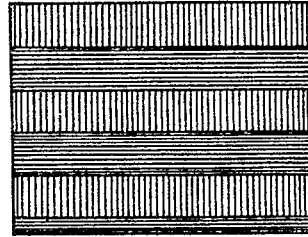
*Fig.1.*



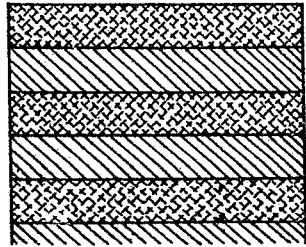
*Fig.2.*



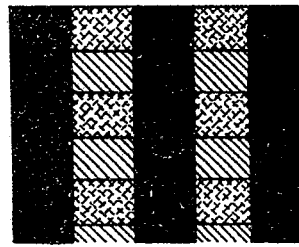
*Fig.3.*



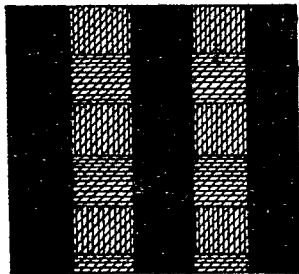
*Fig.4.*



*Fig.5.*



*Fig.6.*



*Fig.7.*

