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**PATENT SPECIFICATION**



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**395,124**

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COMPLETE SPECIFICATION.

Three-colour Photography.

We, I. G. FARBENINDUSTRIE AKTIENGESELLSCHAFT, a Joint Stock Company organised according to the laws of Germany, of Frankfurt a/Main, Germany, 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:—

10 All of the three-colour processes of photography have certain drawbacks. In applying the tri-pack process, the second and third pictures, especially the third, lack satisfactory sharpness. When three  
15 part-pictures are taken simultaneously behind corresponding filters by means of three objectives arranged side by side or one above the other, these part-pictures show local parallaxes. When a single ob-  
20 jective is used, the course of the rays being split into three different pencils by means of prisms or mirrors, there occurs a considerable loss of light. The same is true in the case of all processes using  
25 screen films, particularly the Berthon process (cf. Specification No. 10,611 of 1909), because it involves a three-colour filter, each area of which absorbs two of the three component colours of the spec-  
30 trum. If, for avoiding this disadvantage, the process is restricted to the reproduction of only two colours, the colours of the pictures obtained are essentially different from those of the object to be photo-  
35 graphed.

The object of this invention is a process which profits by all the technical advantages offered by the two-colour process without giving up the third colour. The  
40 process consists in exposing behind one objective two light-sensitive layers one arranged behind the other, after the manner of a bi-pack, the layer next to the objective being associated with a lenticular screen according to the known  
45 Berthon process, and the objective being provided with a two-colour filter placed in front of, or in, or behind it. Each area of this two-colour filter is capable of absorbing at least one of the three component spectral colours, that is to say one  
50 area of this filter is permeable for about two of the three component spectral

colours and the other area is permeable for about one or two of the three component colours of the spectrum. The  
55 third component colour which is in any case absorbed by the last-named filter area corresponds with one of the two component colours to which the first-named area is  
60 permeable. Such filters are, for instance, a filter composed of a blue area and a yellow area, the yellow area being permeable to green and red and the blue area to blue; or a filter having a purple area  
65 and a yellow area, the yellow area being permeable to green and red, and the purple area being permeable to blue and red, but absorbing green.

The colour sensitiveness of the photographic emulsion layers is to be so selected that the emulsion of the lenticular screen film is sensitised for two of the three component colours of the spectrum and that  
70 of the smooth film for the remaining component, the smooth film being sensitised for one of the two component colours to which at least one of the filter areas is permeable or for that component of the three component spectral colours to which  
75 both filter areas are permeable.

It will be understood that when the blue sensation is to be recorded on the lenticular film, a yellow or red filter is placed between the lenticular film and the smooth  
80 film as is usual in bi-pack practice. The invention however is not limited to the recording of the blue sensation on the lenticular film, and in fact methods are known in bi-pack practice whereby the  
85 blue sensation may be recorded on the film which is more remote from the objective.

The emulsion layer associated with the lenticular screen which preferably is composed of cylindrical lenses, is sensitised, for instance, for blue and green, and registers behind each of the lenticular elements in juxtaposition a green sensation and a blue sensation of the object. The  
90 emulsion layer arranged in the optical axis behind the first-named emulsion layer and associated with an ordinary support is sensitised for the third colour (red) and registers the red sensation. The coloured  
95 part-picture negatives so obtained can be

[Price 1/-]

used for the production of positives in any of the known processes. For instance, the two partial colour records on the lenticular film can be printed on to ordinary film analogous to the method described in British Patent No. 353,121. If a positive is printed also from the partial colour record on the ordinary film, the three positives can be projected as usual in the additive multi-colour process.

The process will be more clearly understood by reference to the accompanying drawings, in which

Figs. 1, 2 and 3 represent respectively two-colour filters useful for the process and

Figs. 4 and 5 illustrate diagrammatically the production of three-colour photographs when different two-colour filters are used.

The filters shown in Figs. 1 and 2 have a blue area 10 and a yellow area 11 with the difference that the parts marked *a* in Fig. 2 are masked. Fig. 3 shows a two-colour filter having a purple area 12 and a yellow area 13. In Fig. 4, the light rays coming from the object pass through the two-colour filter 1 having a blue area 10 and a yellow area 11, and are projected on to the lens elements of the lenticular film 2. In the sensitive layer of this film, which is sensitised for green (the film is generally sufficiently sensitive to blue owing to its standard sensitivity), there is produced the green sensation 4 and the blue sensation 5 of the object. Adjacent to the lenticular film 2 there is arranged the smooth film 3 which is separated from the lenticular film by a yellow or red filter layer (not shown). In this smooth film, the light sensitive layer of which is sensitised for red, there is produced the red sensation 6 coinciding with the green sensation 4. The part 7 of the emulsion of the smooth film is in the present case simply blackened. If there is inserted a two-colour filter having a purple area 12 and a yellow area 13 as shown in Fig. 5, also that part of the emulsion layer of the smooth film, coinciding with part 5 of the lenticular screen film, adds to the red sensation, so that instead of obtaining a screened negative as with the arrangement of Fig. 4, a uniform negative is obtained.

The process is, in the first place, suited for colour cinematography, but, if desired, may be employed in colour photography. It is, in short, suited for all processes which aim at the production of three-colour sensations, while avoiding too

great deficiency of sharpness and considerable loss of light.

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

1. A process of producing three-colour pictures which comprises exposing behind an objective a lenticular film and a smooth film arranged after the manner of a bi-pack with their light-sensitive layers adjacent and with the lenticular film nearer to the objective, the lenticular film being sensitised for two of the three component spectral colours and the smooth film being sensitised for the remaining component colour, the objective being provided with a two-colour filter each area of which absorbs at least one of the three component spectral colours, the absorption bands of the two filter areas being such that they do not appreciably overlap and each area being permeable respectively for at least one of the two component spectral colours for which the lenticular film is sensitised and at least one area being permeable for the third colour component for which the smooth film is sensitised.

2. A process as referred to in claim 1, wherein each filter area is adapted to absorb one of the three component spectral colours and the smooth film is sensitised for that component of the three component spectral colours to which both filter areas are permeable, while the lenticular film is sensitised for the remaining two component spectral colours.

3. A process as referred to in claim 1, wherein one area of the two colour filter absorbs one of the three component spectral colours while the other area absorbs two of the three component spectral colours but is permeable to that colour component which the first area absorbs, and the smooth film is sensitised for one of the three component spectral colours to which the first of the said areas is permeable and the lenticular film is sensitised for the remaining two component spectral colours.

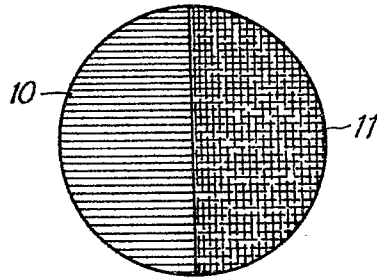
4. A process as referred to in claim 1, wherein the two-colour filter has a purple area and a yellow area, and the smooth film is sensitive to red and the lenticular film is sensitive to blue and green.

Dated this 28th day of April, 1932.

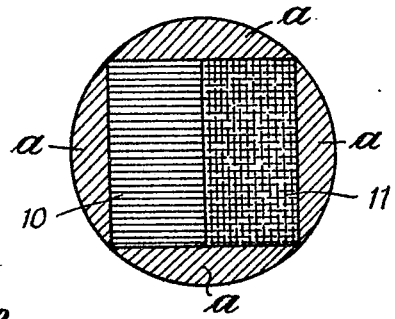
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Agents for the Applicants.

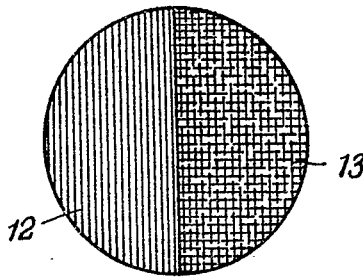
*Fig. 1*



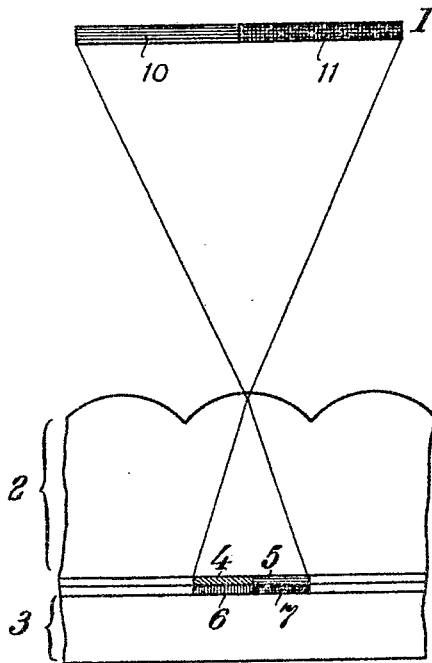
*Fig. 2*



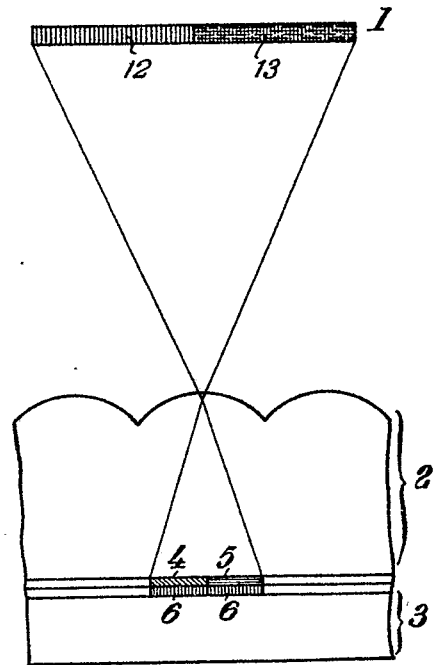
*Fig. 3*



*Fig. 4*



*Fig. 5*



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