PATENT SPECIFICATION

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COMPLETE SPECIFICATION.

Improvements in or relating to Colour Photography.

I, ALBERT KELLER-DORIAN, of rue Daguerre, Mulhouse, Alsace, France, citizen of the Republic of 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:—

It is known that total reflection from the inner face of a refracting medium, can take place only when the said face is separated from a medium of the same refractive index, by a distance equal at least to one quarter of the wave length. It follows that if at the back of the reflecting face a surface is arranged of the same refractive index, the distance of which increases from zero to the greatest wave length of the visible spectrum, the following effects are obtained:—

(1) At the points where the distance is less than one quarter of the length of the smallest visible wave, no reflection will take place, and an impression of black will be produced;

(2) Beginning from the point where the distance becomes greater than the said minimum, the colours of the spectrum will be seen to succeed each other from violet to red;

(3) Finally, if the distance increases beyond the quantity required for reflecting the red rays, a second spectrum (spectrum of the second order) will be seen to succeed the first one, and so on, until the colours merge into white light.

According to this invention, apparatus producing these phenomena is used for the polychrome selection required in certain colour photography processes, namely in those which are based on the use of sensitised surfaces mounted on a substratum provided with microscopic refracting elements.

This process is based on obtaining, on the sensitised layer, as many elementary images of the disc of the camera lens as there are microscopic refracting elements in the substratum of the sensitised layer. In order that the said process should result in a polychrome selection of the radiations emanating from the object, the radiations of different colours must pass through the camera lens at different points. In the Berthon process, the disc of the camera lens is covered by suitably arranged three-colour selection screens. This device has the drawback of using screens which are necessarily arbitrary in colour and which falsify the natural colours. The device hereinafter described is free from this drawback.

The present invention consists in the combination with a sensitised plate having microscopic refracting surfaces and a camera lens, of a reflecting device comprising relatively inclined surfaces for the purpose of producing interference, the said surfaces being located between the lens and the plate.

Figure 1 shows an arrangement of the apparatus. At P is a total reflection prism (it could be replaced by a plate with parallel faces, but this would result in doubling the image). At L is an optically flat plate located a very small angle with the hypotenuse of the prism. From the point of observation O, the colours of the spectrum will be seen in steps from below upwards, with the plate L inclined as shown in drawing; and assuming that the light admitted at S S S, is ordinary white light.

Figure 2 shows the arrangement of the same prism P with the plate L, at the

back of a camera lens H. In the focal plane is arranged a sensitised plate F with microscopic refracting elements. From any point M of the layer F, the disc of the camera lens will be seen in colours reflected by the device P L, assuming of course that the lens transmits white light to the point M. If the light transmitted is a monochromatic one, only the portion of the lens corresponding to the reflection of the said colour, will appear luminous. If the light is a complex polychrome light, the lens will appear in the form of coloured bands corresponding to the spectrum of the light in question. In fine, each microscopic refracting element of the sensitised plate will register a spectro-photograph of the radiations striking it. Chromatic analysis will thus be brought about independently of any arbitrary factor and merely owing to the properties of the light itself.

It must be pointed out that the device specified, is not necessarily constituted by two flat plates or by a prism and a flat plate. The plate can be very slightly convex and touch the hypotenuse face of the prism in its centre. In this case, the colours are arranged concentrically about a black point. They are Newton rings in their original form.

The reflection device above described may be replaced by a reflection device having multiple layers of air similar to that employed in Lippmann's interference spectrum.

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

1. In apparatus for use in colour photography, the combination with a sensitised plate having microscopic refracting surfaces and a camera lens, of a reflecting device comprising relatively inclined surfaces for the purpose of producing interference, the said surfaces being located between the lens and the plate.

2. Apparatus as claimed in Claim 1 in which one of the relatively inclined surfaces is the hypotenuse of a total reflection prism.

3. The process of producing colour photographs substantially as described.

Dated this 20th day of January, 1921.

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Fig. 1.

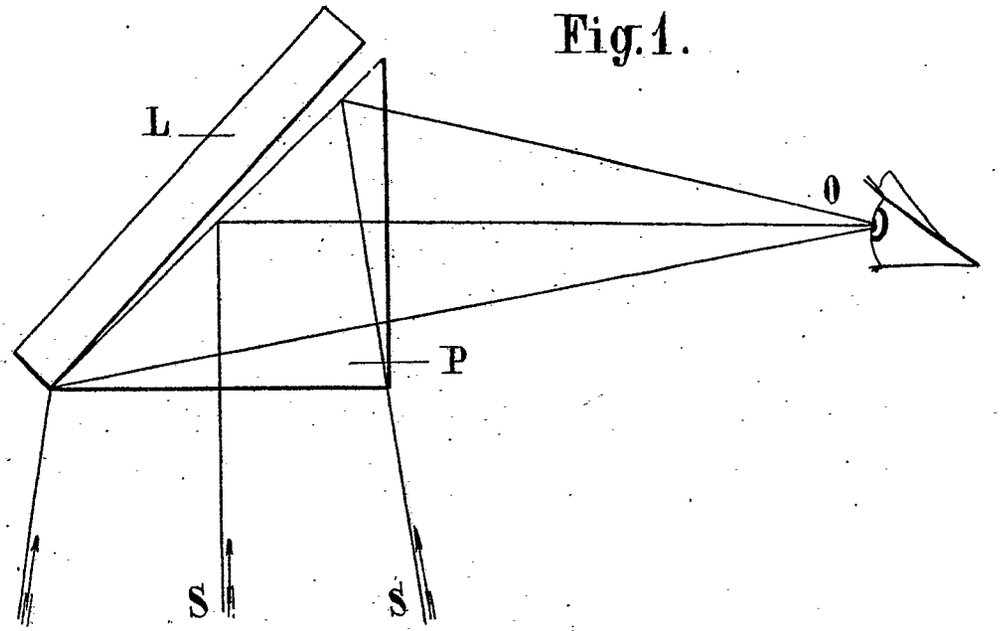
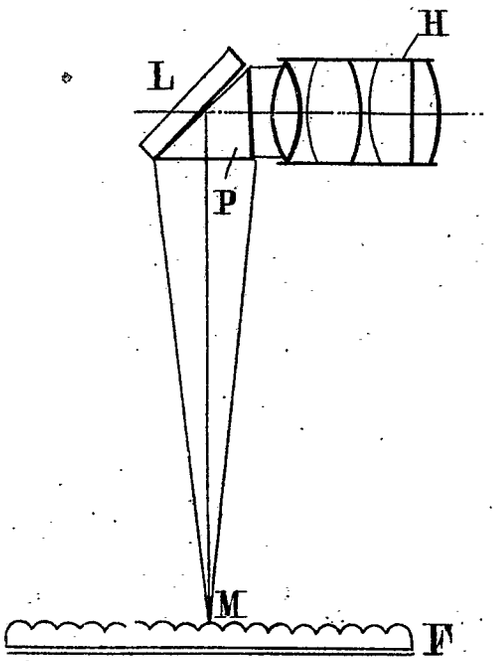


Fig. 2.



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