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**PATENT SPECIFICATION**

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COMPLETE SPECIFICATION.

**Process and Apparatus for Reproducing Cinematograph Films in Colours.**

We, SOCIETE FRANCAISE DE CINEMATOGRAPHIE ET DE PHOTOGRAPHIE FILMS EN COULEURS KELLER-DORIAN, formerly known as Societe du Film en Couleurs Keller-Dorian, a Societe Anonyme, organised under the laws of France, of 42, rue d'Enghien, Paris, 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:—

This invention relates to an improved process and apparatus for reproducing cinematographic pictures in colours on photographic films with reticulated support.

It is known in the art that the reproduction of views in colours recorded on films having a reticulated support can likewise be effected on films having a reticulated support by means of an optical device constituting an objective.

The present invention has for its object a new process for the reproduction of views which consists in projecting on a virgin film, the image of the views carried by the film to be reproduced, by means of a concave mirror of large radius combined with suitable prisms, the moires forming on the reproduced film being completely eliminated by a slight displacement of the reproduced image during the period of exposing. The said displacement is such that the moires become displaced on the image for a distance equalling half that separating two consecutive moires. This process is applicable in the case of virgin films whose lenticular elements are of the same size as the lenticular elements of the original as well as in the case of films whose lenticular elements are larger or smaller than those of the original.

The invention likewise contemplates an apparatus for carrying the above outlined process into execution.

In the drawing:

Fig. 1 is a diagrammatic view of a device for reproducing views according to our process; and

Fig. 2 is a diagrammatic view of a device for eliminating moires.

The apparatus for carrying our process,

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above outlined, into practice comprises displacing means for a film A to be reproduced and a film B which is to receive an impression, each of said films being adapted to be displaced along one of the faces of a total reflecting prism, which faces are substantially parallel to the optical axis  $x-y$  of a concave mirror E. The said prisms indicated at C and D are symmetrically disposed with respect to the optical axis. Each of the said films is displaced in the focal plane of the mirror determined by the corresponding prism. The luminous rays arriving in the direction of the arrow (Fig. 1) traverse the film A and are reflected by the prism C on to the surface of the mirror E, which transmits them in turn, through the prism D on to the film B.

This device is of great simplicity and gives great luminosity, eliminating aberration which is always difficult to correct in objectives of large size.

It is known in the art that when a reticulated film is reproduced with an optical device having a high degree of definition, moires occur on the reproduced film, which render this reproduction worthless.

We have discovered a means for eliminating this disadvantage and have proved that the moires disappear from the reproduction when their image is slightly displaced. Relying upon this we are able to eliminate totally the said moires in the reproduced image by varying by suitable means the displacement of the image during the time of its exposure to the luminous rays. It has been established, in fact, that if, during the formation of the image, the moires are displaced on said image for a distance equal to half that separating two consecutive moires, in the end the said moires no longer appear on the image.

This displacement of the reproducing image may be obtained by any appropriate means, but we prefer to use the device shown in Fig. 2 of the drawing. Referring to said figure, between two films (not shown) in the path of the luminous rays whose axis is indicated by  $a-b$  is interposed perpendicular to said rays, a sheet of glass F having parallel surfaces,

which during the period of formation of the image undergoes a displacement about an axis perpendicular to the direction of the rays. In the embodiment shown, the displacement of said glass plate is obtained by an arm G which is pivoted at J to the support K of the plate F, the support K being mounted on a spring L attached to some fixed part M of the apparatus. The arm G and the plate F can be adjusted relatively to one another by a set screw N, and the arm G carries a roller I which bears against a rotating cam disk H. Said disk H is driven at the desired speed by any suitable source of power and may be advantageously actuated by the reproducing machine.

It will be obvious from the foregoing that the apparatus for eliminating moires could readily be applied to other optical devices for reproducing without departing from the invention as comprehended within the scope of the appended claims.

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:—

I. A process for reproducing cinematographic pictures in colours on photographic films having a reticulated support which comprises throwing the image of the views carried by the film to be reproduced on a reticulated virgin film by means of a concave mirror of large radius, reflecting through prisms, and eliminating moires by slightly displacing the image

reproduced during the formation of said image so that the moires become displaced correspondingly.

2. An apparatus for reproducing cinematographic pictures in colours on photographic films having a reticulated support which comprises, in combination, a concave mirror, a pair of total reflecting prisms disposed symmetrically with respect to the optical axis of said mirror and means for displacing the reproduced image in the focal plane of said mirror.

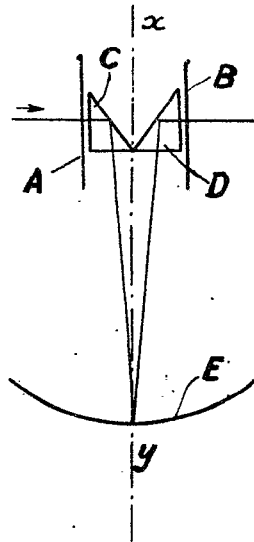
3. In an apparatus for eliminating moires during reproduction of cinematographic pictures in colours on photographic films having a reticulated support, in combination, optical means for reflecting the image of the developed film on the non-exposed film, a glass plate having parallel surfaces interposed in the path of light between said films and means for displacing said glass plate for modifying the light rays during formation of said image whereby the length of travel of said light rays in the interior of said plate is altered thereby slightly displacing the image reproduced.

4. The improved apparatus for reproducing cinematograph films substantially as described with reference to the accompanying drawings.

Dated the 29th day of June, 1928.  
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*(This Drawing is a reproduction of the original on a reduced scale.)*

*Fig. 1*



*Fig. 2*

