PATENT SPECIFICATION

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COMPLETE SPECIFICATION.

Improvements in Processes for the Reproduction of Original Cinematograph Colour Record Positive Films having a Support Goffered in Lenticular Elements.

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:—

Our invention relates to improvements in the reproduction of original positive films on supports provided with lenticular elements.

If it is desired, with a simple image, to obtain the faithful reproduction of colours and graduations in shade such as those occurring in the original of a film bearing colour record images on a support provided with lenticular elements, it is necessary that the said image be the exact photographic replica of the original. That signifies that homologous points in the two images must have the same opacity. In the case of an image in which the contrast is different to that of the original the graduations in shades are sacrificed in certain regions of the subject taken.

The processes of reproduction which have been employed up to the present do not allow of a faithful image of the original to be obtained for the following reasons:

The image of the original cannot be obtained by contact of the two emulsions, but solely by optical means, that is to say, by forming an image of the original by means of an optical arrangement. It is known in the art that in these image-producing operations by optical means, it is necessary to work with directed light and to do away with the employment of diffused light if it is desired to reduce the time of exposure.

It has been demonstrated that the use of directed light leads to an increase in contrast. In fact, when a beam of light coming from a condenser falls upon a negative, the transparent parts allow all the rays to pass, whereas the opaque regions reflect a part of them. The density of the blacks is therefore increased by this action.

In current photographic reproduction the said increase in contrast can be easily remedied by choosing a sensitive coat of weak contrast or of a development duration producing a "gamma"—the tangent of the angle which the rectilinear part of the characteristic curve makes with the axis of the abscissa upon which are carried the luminations—less than unity.

On the contrary, when the original view is a positive view produced by reversal of a negative, one is obliged to produce a positive from a positive by having recourse to the reversal process once more. The process of developing with solvents, which is alone employable under the circumstances, possesses no elasticity and does not permit of obtaining a gamma less than unity. It follows that the reproducing processes by optical means, and the developing followed by reversal gives images whose contrast is superior to that of the original.

Reduction of the contrast of the originals to be reproduced could be attempted by reducing processes at present in use, but these processes are in no way automatic in character, but on the contrary require a very strict supervision when made use of. An action prolonged ever so little could render an original, which is almost always irreplaceable, worthless.

There exist a certain number of reactions, employed in photography for other purposes, which permit of automatic reduction of a proof in varying proportion determined in advance. Whatever may be the duration of the delay of the proofs in the baths which conduct the said reactions, once the time of the reaction has been attained, the latter cannot be continued any longer.

Several processes will now be indicated which are suitable for this purpose.

1. By means of so-called colour toning processes (by chemical substitution or by mordant dyeing), the black silver constituting the image can be transformed into a coloured compound having an actinic density of lower value. Thus, if the black image be replaced by a blue image, an original of less actinic contrast will be obtained.

2. Again, the metallic silver may be transformed into a less opaque composition by transforming it into a suitable salt by halogenisation or other reaction. If it is desired to subject the image to the action of a chloridising, bromodising, or iodising bath, an image is obtained formed of a chloride, bromide or iodide of silver compound slightly opaque. A solution of chromic acid containing soluble ferrocyanide gives ferrocyanide of silver.

Our invention consists of the application of these known reactions, which terminate automatically, to the reduction of the contrasts of images intended to be reproduced by optical means with a directed light. We transform the original image by means of one of the operative methods previously described into an image whose contrasts are reduced and which after optical reproduction thereof, have, after development and reversal, a contrast equal to the primitive contrast of the original.

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 for obtaining the faithful reproduction of original cinematographic films of the kind described by means of direct light which comprises the conversion of the original metallic silver image into either a silver compound such as chloride, bromide or iodine of silver or into a coloured compound of less actinic density, such as a compound obtained by converting the black original image into a blue coloured one, these compounds permitting of obtaining after optical reproduction of the original image followed by development and reversal of the copy, a copy having a contrast equal to the contrast of the original image.

2. The conversion of the original image in the process according to claim 1 by chemical substitution, mordant dyeing, chlorination, bromination or iodising, the reactions corresponding to these treatments being limited automatically and not necessitating any regulation.

3. As a new photographic product the film produced by the processes set forth in the preceding claims.

Dated the 8th day of February, 1928.

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