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PATENT SPECIFICATION

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COMPLETE SPECIFICATION.

Improved Process and Apparatus for Printing Colour-record Lenticular Films.

We, I. G. FARBENINDUSTRIE AKTIEN-GESELLSCHAFT, 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 In printing colour-record images from a lenticular film on to a light-sensitive lenticular film by contact, the original film, as it is called, and the film to be printed on are placed with their embossed sides facing each other, and the exposure is through the emulsion layer of the original film. When exposure is made with direct light, as is necessary in printing lenticular films, the known phenomena producing moiré effects occur. In order to eliminate these moiré effects numerous expedients have been proposed; for instance, optical elements have been placed between the source of light and the film, or each individual picture has been displaced in printing by the breadth of one lenticular element with relation to the film to be printed on.

30 According to this invention the formation of moiré effects in contact printing is avoided by the mere application of mechanical means, without displacing the lenticular embossings of the original with relation to the film to be printed on. For this purpose the printing film is arranged in contact with the original with the embossings facing each other and is exposed through the original to a source of light limited both in a direction parallel to the lenticular elements and in a direction transversely thereof. This source of light is reciprocated while printing each individual picture in such a manner that, in either end position the centre of the source of light, the border of the gate aperture and the centre of that plane which, during exposure of the original film, is occupied by the virtual image of the exposure filter, lie on a straight line.

The accompanying drawing represents diagrammatically an arrangement in [Price 1/-]

accordance with the present invention. A is the original film and B is the printing film having their embossed sides in contact. CD is the virtual image of the exposure filter, through which the original film A has been exposed. M is the centre of CD. EF represents a source of light limited in the direction parallel to that of the lenticular elements (in the drawing the source of light is shown in the two positions E_1F_1 and E_2F_2). The source of light consists of a slotted diaphragm, a piece of ground glass placed behind the slot and an incandescent lamp behind the ground glass, or it may consist of a simple incandescent thread. In a direction transversely of the lenticular elements this source of light has at least such an extension that it subtends the same angle as is subtended by the virtual image of the exposure filter CD when viewed from the film. Over the gate aperture is placed a slotted diaphragm S which in its longitudinal direction extends parallel to the direction of the lenticular elements and in this direction leaves the aperture uncovered throughout its extension. The breadth of the slot has an influence on the picture produced. It is possible to obtain pictures with a slot having a breadth equal to 25 per cent. or more of the breadth of the film; however, good results will be obtained with a slot having a breadth equal up to about 5 per cent. of the breadth of the film. During the exposure of each individual picture, both the source of light EF and the slotted diaphragm S make one reciprocal movement between the two end positions E_1F_1 and E_2F_2 . At any point of the movement the centre of the source of light EF, the centre of the slot S and the point M must be on a straight line. For this purpose the slot and the source of light are mounted on a common support which moves about M as a pivot. Instead of the source of light EF there may be used a stationary source of light G which in the direction parallel to that of the lenticular elements has only a small extension, for instance, by masking the source of light by a slotted diaphragm. In front of the source of light thus limited

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another slotted diaphragm is arranged parallel to the lenticular elements and this diaphragm is moved to and fro. The end positions of this slotted diaphragm are the same as the end positions E_1F_1 and E_2F_2 of the source of light EF.

In order to avoid moving the slot and the source of light, there may be substituted for this latter a number of individual lamps which are so connected that a definite number of them may be switched on in succession in a well-known manner. The individual lamps must correspond in width and position with the source of light EF which they displace.

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 printing colour-record images from a lenticular film on to a light-sensitive lenticular film which comprises arranging an original lenticular film and a light-sensitive lenticular film in contact with the embossed sides facing each other, illuminating the original film through a slotted diaphragm having a slot extending in the direction parallel to the lenticular elements by means of a source of light having at least such a breadth that it subtends the same angle as that subtended by the virtual image of the exposure filter when viewed from the original film, and reciprocating the source of light and slotted diaphragm about the centre of the said virtual image, while printing each individual picture, in such a manner that the centres of the source of light, slotted diaphragm and virtual image lie always in a straight line.

2. A modification of the process claimed in claim 1, wherein there is used instead of the source of light and slotted diaphragm an incandescent thread extending in the direction parallel to the lenticular elements.

3. An apparatus for printing by contact colour-record lenticular films comprising a gate provided with an aperture, means for carrying in the gate the films concerned in the printing, a source of light arranged to illuminate the original film and having at least such a breadth that it subtends the same angle as is subtended by the virtual image of the exposure filter when viewed from the original film, a slotted diaphragm arranged near the gate, and means for reciprocating the source

of light and slotted diaphragm arranged in such a manner that the centres of the source of light and of the slotted diaphragm lie always in a straight line through the point corresponding with the centre of the virtual image of the exposure filter.

4. An apparatus as claimed in claim 1, wherein the source of light comprises a disc of ground glass illuminated by an incandescent lamp arranged on and limited by a diaphragm so that the illuminating beam has the required breadth.

5. An apparatus for printing by contact colour-record lenticular films comprising a gate provided with an aperture, means for carrying in the gate the films concerned in the printing, a slot-shaped source of light arranged to illuminate the original film and extending in the direction parallel to the lenticular elements, the said slot-shape being of such a breadth that it subtends the same angle as is subtended by the virtual image of the exposure filter when viewed from the original film, a slotted diaphragm near the gate, and means for reciprocating the slot-shaped source of light and the slotted diaphragm, the arrangement being such that the centres of the diaphragm and the source of light lie always in a straight line through the point corresponding with the centre of the virtual image of the exposure filter.

6. An apparatus for printing by contact colour-record lenticular films comprising a gate provided with an aperture, means for carrying in the gate the films concerned in the printing, an illuminating device arranged to illuminate the original film comprising a series of individual sources of light which can be switched on in succession so as to afford an illumination which has at least such a breadth that it subtends the same angle as is subtended by the virtual image of the exposure filter when viewed from the original film, a slotted diaphragm near the gate, and means for reciprocating this diaphragm about the point corresponding with the centre of the virtual image of the exposure filter.

Dated this 15th day of January, 1934.

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Agents for the Applicants.

[This Drawing is a full-size reproduction of the Original.]

