July 29, 1952

H. E. ALEXANDER ET AL
METHOD OF INCORPORATING LETTERING
IN PRINTED COLOR REPRODUCTIONS

2,605,181

Filed June 11, 1948

2 SHEETS—SHEET 1

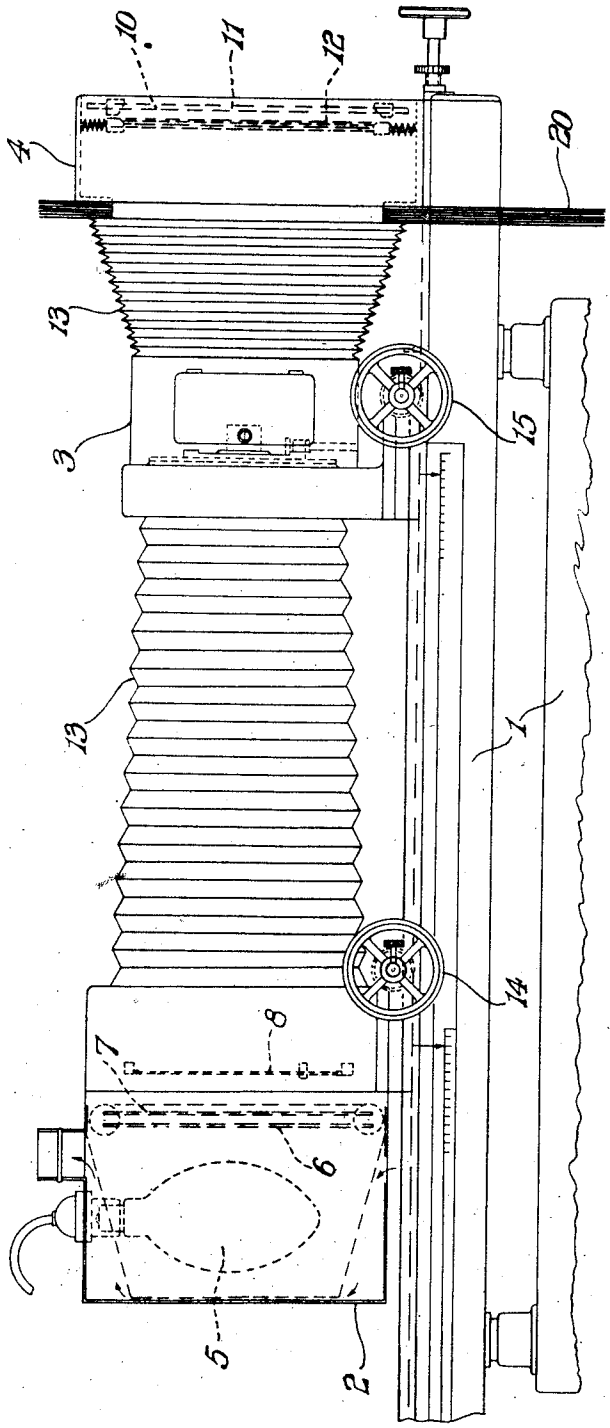

Fig. 1.

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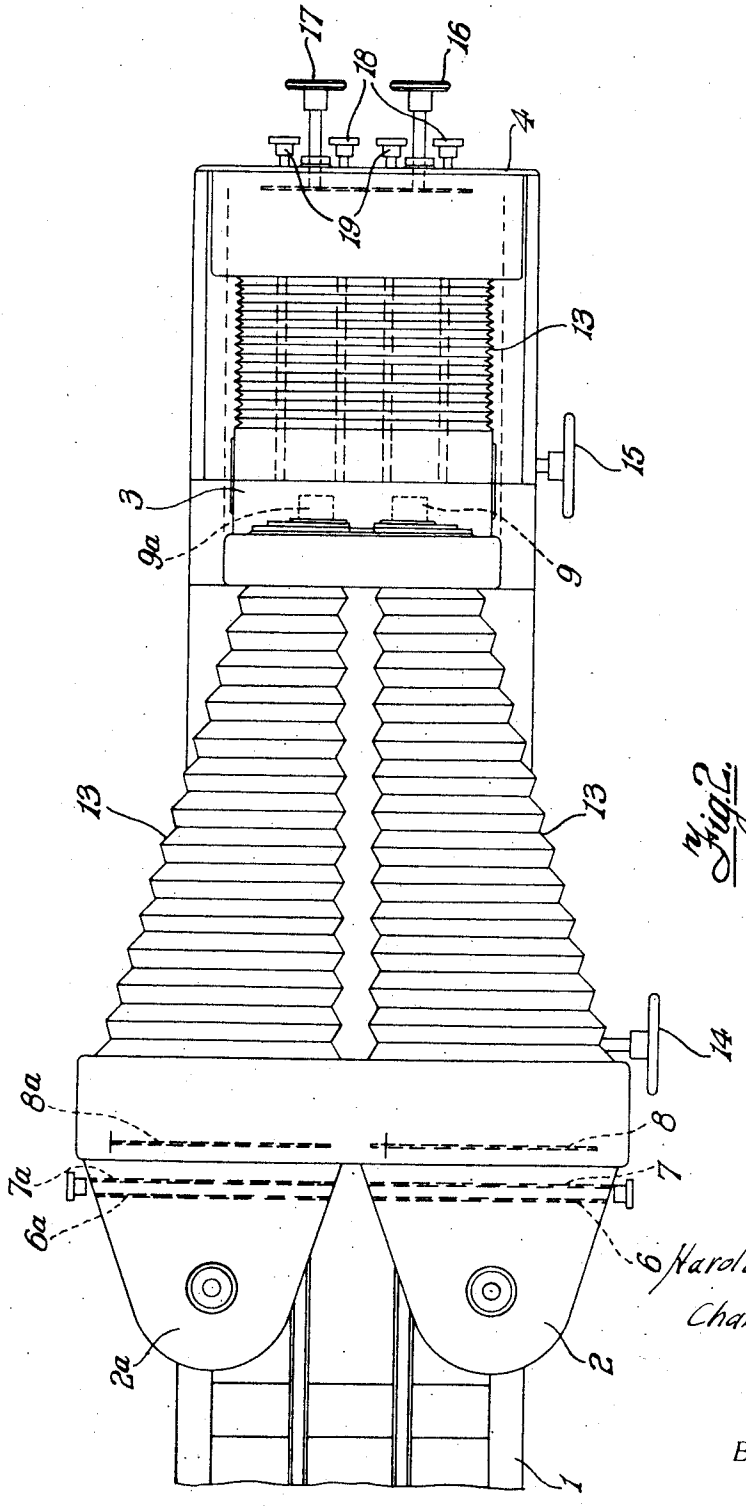

Fig. 2.

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Patented July 29, 1952 2,605,181

UNITED STATES PATENT OFFICE

2,605,181

METHOD OF INCORPORATING LETTERING IN PRINTED COLOR REPRODUCTIONS

Harold Edward Alexander and Charles Frederick Cook, Watford, England

Application June 11, 1948, Serial No. 32,494
In Great Britain June 16, 1947

1 Claim. (Cl. 95—5.1)

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This invention relates to colour printing and in particular to that employing a three colour system of process engraving. In such work it is frequently necessary or desirable to obtain a colour reproduction from coloured transparent films such as are sold under the registered trademarks, Ansco, Kodachrome, Dufay colour, Agfa, Ektachrome or colour films of a similar nature, including hand-tinted coloured films. A difficulty arises when it is desired to incorporate, on the finished colour print, printed or written lettering, since the separate colour sensitive negatives which have to be prepared are obtained by the use of light transmitted htrough the transparency, in contrast to the use of reflected light where the coloured original is not transparent. Thus, lettering in any colour which is superimposed on the original coloured transparency will appear as a darker colour when photographed, since the effect of the colour of the lettering will be additive to the colour of the corresponding portions of the original. For this reason it has not generally been possible, hitherto, to superimpose lettering in other than darker colours than the original, or black, a fact which has frequently detracted from the artistic merit of the finished colour printed reproduction.

The object of the invention is to avoid the aforesaid disadvantages and to provide a method of incorporating written or printed lettering or other matter of any desired colour in printed colour reproductions prepared from a coloured transparent film or plate.

According to the invention the improved method of incorporating lettering or the like in reproductions made by a photogravure colour printing process from a colour transparency original consists in preparing a transparency of the said lettering or the like and in superimposing on a focussing screen the separately projected images from the original and the lettering transparency, the said screen then being replaced by a series of photographic plates which are successively exposed to said superimposed images with the interposition of colour filters to produce the desired number of colour sensitive negatives.

Also according to the invention, the colour of the superimposed lettering or the like is varied as required by the insertion of the desired colour filter with the transparency of the lettering, the time of exposure of the lettering being varied to vary the depth of colour of said lettering in the printed reproduction.

The invention employs, for carrying into effect the aforesaid method, an apparatus (forming the subject matter of our application Ser. No. 280,956, filed April 7, 1952, a division of the present case) wherein a double camera or enlarger is provided with means for projecting on to a focussing screen by transmitted light the images of said original and said lettering transparency, the lenses

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in said camera being so arranged that the field or projection of one overlaps that of the other on said screen, and adjusting means being provided to enable the said projected original and lettering images to be superimposed on the overlapping portions of said fields with any desired ratio of size between said images. The invention also enables register marks with a shaped mask area to be provided without any damage to the colour film.

Reference will be made to the accompanying drawings which show diagrammatically one form of construction of a dual camera or enlarger suitable for carrying into effect a process according to the present invention and in which:

Fig. 1 is a side elevation of the camera or enlarger, and

Fig. 2 is a plan view thereof.

The camera or enlarger comprises a supporting base 1 on which are slidably mounted projection housings 2, 2a, a lens housing 3, and a plate housing 4. Each projector housing contains a lamp 5, the light from which passes through a heat absorbing glass 6, (6a) and a diffusing glass 7, (7a) before passing through the coloured transparencies (not shown) which are arranged in parallel planes in adjustable plate bars or holders 8, (8a) one containing the transparency of the original picture or the like and the other the transparency of the lettering or other matter which is to be superimposed on to the original picture.

The lens housing 3 contains two lenses 9, 9a, through which the images of the coloured transparencies in the holders 8 or 8a are projected on to a focusing screen 10 arranged within the plate housing 4. The lenses are so arranged that their planes are parallel and their axes are closer to each other than the central axes of the transparencies so that their respective fields of projection overlap on the focussing screen. The said plate housing 4 is provided with adjustable plate bars or holders 11 into which sensitised photographic plates are adapted to be fitted with their planes parallel to those of the transparencies and those of the lenses, as shown. An adjustable masking member 12 which is movable in relation to the plates is also provided in the said housing 4. The said masking member 12 may conveniently include register marks for reproduction on the prepared negatives.

The housings 2, 2a, 3 and 4 are connected by light-proof bellows 13c in the normal manner and manual adjusting devices 14 and 15 are provided for adjusting the position of the projection housings 2, 2a and the lens housing 3 for focussing purposes; additional manual controls 16 and 17 are provided to give a fine adjustment for the longitudinal position of the said projector and lens housings whilst manual controls 18 and 19 are provided for the vertical and lateral

adjustment of the lenses 9, 9a. The supporting base 1, housings 2 and 3, and bellows 13 may conveniently be mounted on one side of the wall 20 of a dark room within which is mounted the plate housing 4.

It will be understood that although the arrangements illustrated show the camera or enlarger in a horizontal position it may equally be arranged for operation in a vertical position.

The camera shown is provided with two lenses only, but it will be appreciated that it may equally be provided with three or four separate lenses in order to superimpose three or more images, but in each case the lenses will be arranged in such a manner that their fields of projection will overlap or partially overlap on the focussing screen 10.

In carrying the invention into effect according to a preferred embodiment thereof, the colour transparency of the original subject (herein referred to as the original transparency), on the colour printed reproduction of which it is desired to incorporate printed or written lettering or the like, such as a title or advertising matter, is placed in the plate holder 8 of the dual camera and the image of the said transparency is projected by transmitted light from the lamp 5 through the lens 9 on the focussing screen 10.

A transparency made of the lettering or the like (herein referred to as the lettering transparency) is placed in the other plate holder 8a and the image of the lettering transparency is projected through lens 9a on to the said focussing screen 10. The original and lettering transparencies are adjusted in the holders 8, 8a so that their images are each projected on to that portion of the focussing screen 10 over which the projection fields of the lenses 9, 9a overlap. Since the planes of the primary and secondary subjects, the planes of the lenses, and the common plane upon which the projected images are brought into focus in at least partially overlapping relation, are all parallel to each other, the images projected from each of the subjects are maintained in parallel planar relation while traveling along mutually converging axes, and any distortion of one image in relation to the other is avoided. The lenses 9, 9a and holders 8, 8a are also adjusted longitudinally, laterally and vertically when it is desired to vary the size of the image of the lettering transparency in relation to that of the original transparency, and to permit its superimposed position on the other to be adjusted as required.

When the superimposed images are correctly focussed and in exact register on the screen 10 the latter is withdrawn and a series of photographic plates placed in the holders 11 are successively exposed to make colour sensitive negatives of the superimposed images. For this purpose a different colour filter is placed in the path of the projected image of each transparency before exposure of each plate, the normal practice being to use blue-violet, green and orange-red filters.

In order to produce coloured lettering on the separated negatives, a lettering transparency, coloured to the desired shades, is filtered with colour filters identical with those used for making the separated negatives. The dual exposure incorporates or superimposes the two originals.

Alternatively, to produce coloured lettering on the original the lettering transparency is put in the holder 8a with the desired colour plate, and in order to vary the strength of colour of the lettering the exposure of the letter transparency is varied in relation to the exposure of the original transparency, a short exposure giving a light colour and vice versa.

The colour sensitive negatives thus obtained are then employed to make the yellow, red and blue printing plates from which the printed colour reproduction is made by the normal methods of colour printing.

This camera will also enable photo composing i. e. in letter press halftone a page containing three, four, six or eight subjects of the same scale can be photographed on to the same plate and thus avoid stripping to register. It must be understood that the colour transparencies must be within the area of the transparency holder.

It will be understood that whilst the invention has been described with more particular reference to the incorporation of lettering on a coloured transparency, the invention may equally be applied to the incorportion of matter other than lettering.

We claim:

A method of incorporating lettering of any desired color in printed color reproduction prepared from a multi-colored positive planar primary subject, which method comprises the steps of preparing a planar secondary subject comprising a transparency of said lettering in an opaque background, arranging the planar primary and lettering subjects on the same side of a focusing screen in planes parallel to the plane of said screen with said subjects mutually spaced to not overlap each other, projecting from each of said subjects images maintained in parallel planar relation but travelling along mutually converging axes, the light forming the lettering projection passing through at least one color filter in the path of the light rays between the light source and the plane of the focusing screen to produce the desired color therefor, bringing the so projected images into focus on said screen in at least partially overlapping relation to form a composite image of the primary subject and lettering at the plane of said screen, producing a set of color separation negatives of the composite primary and lettering images on light sensitive elements substituted for said screen, and preparing color printing plates from said composite color separation negatives.

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