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2,155,149

PHOTOGRAPHIC CONTACT PRINTING AND COPYING APPARATUS

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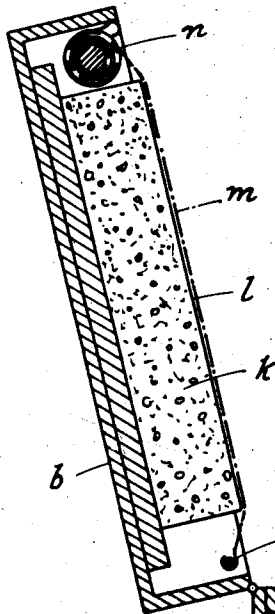


FIG. 1.

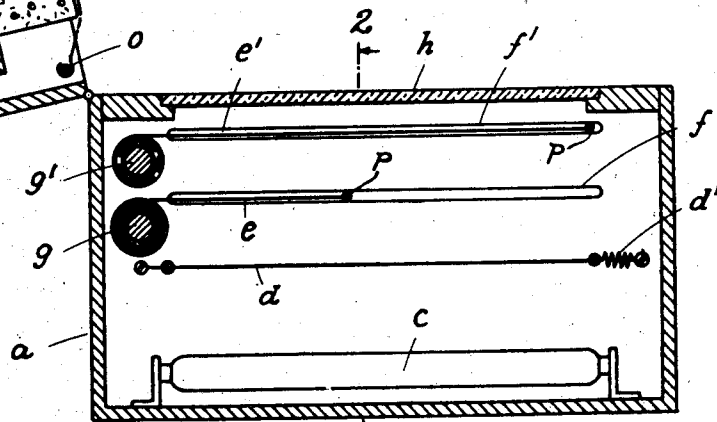
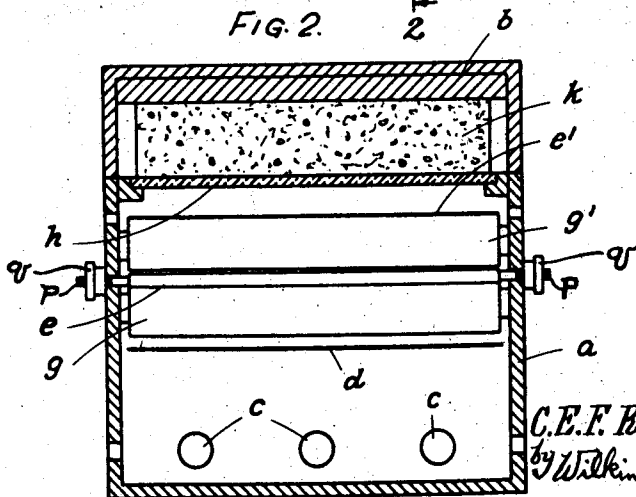


FIG. 2.



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## UNITED STATES PATENT OFFICE

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PHOTOGRAPHIC CONTACT PRINTING AND  
COPYING APPARATUSCuthbert Edward Foster Rutherford,  
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6 Claims. (Cl. 95—73)

The present invention relates to hand-operated contact printing apparatus of the kind comprising a box-like structure provided with a hinged lid to which is secured a pressure pad adapted to be brought into contact with light-sensitive photographic material resting upon the upper or lower surface of a document or the like to be copied, and which will hereinafter be referred to as "the medium".

10 A drawback associated with such machines at present in use is that the intensity or strength of the matter inscribed on the medium and required to be reproduced frequently varies at different parts of the medium. This necessitates a movable filter so arranged as to partially vignette the strong portions of the medium to be copied. Now when this operation is made by tray or draw-out filters, which protrude beyond the confines of the apparatus or have to be taken completely out for the quicker white light transmitted positive printing process, it makes a slow and cumbersome operation requiring care and manipulation, being proportionately greater in relation to increase in the copying dimensions of the apparatus employed.

In the case of an operator making hundreds of exposures a day of intermittent positive printing and reflex coloured screen printing manipulation of the filter alone may occupy an hour or more.

30 According to this invention one or more coloured filters is or are so arranged and mounted that it or they can be extended or retracted to any desired extent within the confines of the box. With this arrangement flexible filters can be employed, and the filters are preferably mounted on spring rollers so that they can be rapidly extended or retracted, thereby affording means whereby the operator can rapidly change over from white light positive printing to reflex coloured screen negative printing. The light may also be caused to pass through a semi-transparent white diffusing element which may, for example, be of a cellulose acetate material.

45 Another drawback inherent in existing apparatus is that when printing is effected by reflection, that is when the sensitised surface of the light-sensitised sheet is uppermost, unsatisfactory results have frequently been obtained owing to the nature of the background, which was permanent.

According to this invention, a movable coloured screen or filter is so arranged that it can at will be drawn over a permanent dark background.

One form of construction of the invention is 55 illustrated in the annexed drawing, in which:—

Fig. 1 is a sectional side elevation with the lid in the raised position, and

Fig. 2 is a section on the line 2—2 of Fig. 1, the lid being closed.

In this drawing, *a* is a rectangular box-like container provided with a hinged lid *b*. At the lower part of the container strip lamps *c* are arranged side by side. Above these lamps a white diffuser *d* is horizontally arranged, and is provided with a tensioning spring *d'*. Above the diffuser *d* are located two yellow filters *e* and *e'* respectively, arranged to be movable in parallel slots *f* and *f'* and mounted on self-winding spring rollers *g* and *g'* to enable rapid backward movement of the filters to be obtained, each filter being provided with a catch by means of which it can be held in any extended position. Each of the catches in this form of the device consists in a guide pin *p* secured to the free end of the filter and being of a length to extend through the slots in opposite sides of the container *a* and to project beyond the outer surfaces thereof at opposite sides. The projecting ends of the pin *p* are screw threaded to receive clamping nuts *q* which frictionally engage against the outer surfaces of the container *a* to hold the filter at any selected position along the slots. These slots *f* and *f'* serve a three-fold purpose; in addition to serving as trackways for the filters they facilitate the entry of cooling air to the apparatus, and further they act as guides when pieces of filter are used for shadowing or vignetting a part of the medium. The usual glass working plate *h* is arranged at the top of the container *a*.

The lid *b* is provided with a pressure pad *k* of 35 spongy rubber, and is covered on its inner surface with a strip *l* of black material, which can serve as a background. In addition to this black surface there is a further background in the form of an opaque filter or light-reflecting screen *m*, preferably yellow, which can be drawn from 40 a roller *n* across the strip *l*. A catch *o* serves to hold the filter *m* in place.

Having thus described the nature of the said invention and the best means I know of carrying 45 the same into practical effect, I claim:

1. A photographic printing device comprising a box-like structure having a body and a hinged lid, a light source in the body, a support for photographic material including a light sensitive 50 material in the body between the light source and the lid, a pressure pad in the lid adapted to press upon photographic material on said support when the lid is closed, a flexible strip for modifying the light from said source, a self-winding 55

roller mounted in said structure near a side thereof and above said light source, said roller being adapted to receive said flexible strip wound thereon, and cooperating means on said flexible strip and said structure for releasably holding said flexible strip in unwound position extended substantially across said structure above said light source whereby to modify the light from the light source, said strip remaining wholly within said structure in both wound and unwound positions.

2. A photographic printing device for use in reflex copying comprising a box-like structure having a body and a hinged lid, a light source in the body, a support for photographic material including a light-sensitive material in the body between the lid and the light source, a pressure pad in the lid adapted to press upon photographic material on said support when the lid is in closed position, said pad having its outer surface of one color, a flexible background strip of a color different from the color of said pressure pad surface, at least one of said colors being light reflecting, a roller mounted in the lid at one side thereof to hold the said strip wound thereon, and releasable cooperating means on said strip and said lid at the side opposite said roller for holding the strip extended over the said pressure pad to form a printing background, whereby the reflecting color can be placed above the photographic material to reflect light passing through the material back to the material for reflex copying.

3. A photographic printing device for use in reflex copying comprising a box-like structure having a body and a hinged lid, a light source in the body, a support for photographic material including a light-sensitive material in the body between the lid and the light source, a pressure pad in the lid adapted to press upon photographic material on said support when the lid is in closed position, said pad having its outer surface of one color, a flexible background strip of a color different from the color of said pressure pad surface, at least one of said colors being light reflecting, a spring roller mounted in the lid at one side of the pressure pad to hold the said strip wound thereon, a hook on the said strip at the outer end thereof when wound on said roller, and means in the lid at the opposite side of the pressure pad engageable by said hook to hold the said strip releasably over said pressure pad to form a printing background whereby the reflecting color can be placed above the photographic material to reflect light passing through the material back to the material for reflex copying.

4. A photographic printing device comprising a box-like structure having a body and a hinged lid, a light source in the lower part of the body, a support for photographic material including a light-sensitive material in the upper part of the body, a pressure pad in the lid adapted to press upon photographic material on said support when the lid is in closed position, said pad having its

outer surface of one color, a flexible background strip of a color different from the color of said pressure pad surface, at least one of said colors being light reflecting, a roller mounted in the lid at one side thereof to hold the said strip wound thereon, cooperating releasable means on said strip and said lid for holding the strip extended over the said pressure pad to form a printing background, a flexible colored filter strip, a filter holding roller mounted near one side of the body between the light source and the said support to receive the said filter strip wound thereon, said body having guiding slots therein at substantially the horizontal plane of the said filter holding roller, and means attached to the free end of the said filter strip relative to its position when wound on its said roller for engagement in the said guiding slots to guide the filter strip to horizontal position between the said light source and support, said last named means releasably holding said filter in unwound filtering position, said filter modifying the light before it strikes the photographic material and said background strip modifying light passing through the photographic material.

5. A photographic printing device comprising a box-like structure having a body and a hinged lid, a light source in the body, a support for photographic material including a light-sensitive material in the body between the light source and the lid, a flexible colored filter strip, a spring roller mounted in the said body near a side thereof between said light source and support, said roller being adapted to receive the said filter strip wound thereon, guiding means in the body extending horizontally at substantially the plane of said roller, and means on the said filter strip cooperating with said guiding means to guide said strip to an extended position between said light source and support and to hold the strip releasably in extended position.

6. A photographic printing device comprising a box-like structure having a body and a hinged lid, a light source in the body, a support for photographic material including a light-sensitive material in the body between the light source and the lid, a flexible colored filter strip, a self-winding roller mounted in the body near a side thereof between said light source and support, said roller being adapted to receive the said filter strip wound thereon, said body having horizontal guiding slots therein at substantially the level of said roller, a guide pin attached to the free end of said strip and extending through said slots and projecting beyond the outer surface of the body, the projecting ends of said pin being screw threaded, and clamping nuts on the said projecting ends, whereby said strip can be moved horizontally across said body to filter light from said source and clamped at any position along the guiding slots.

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