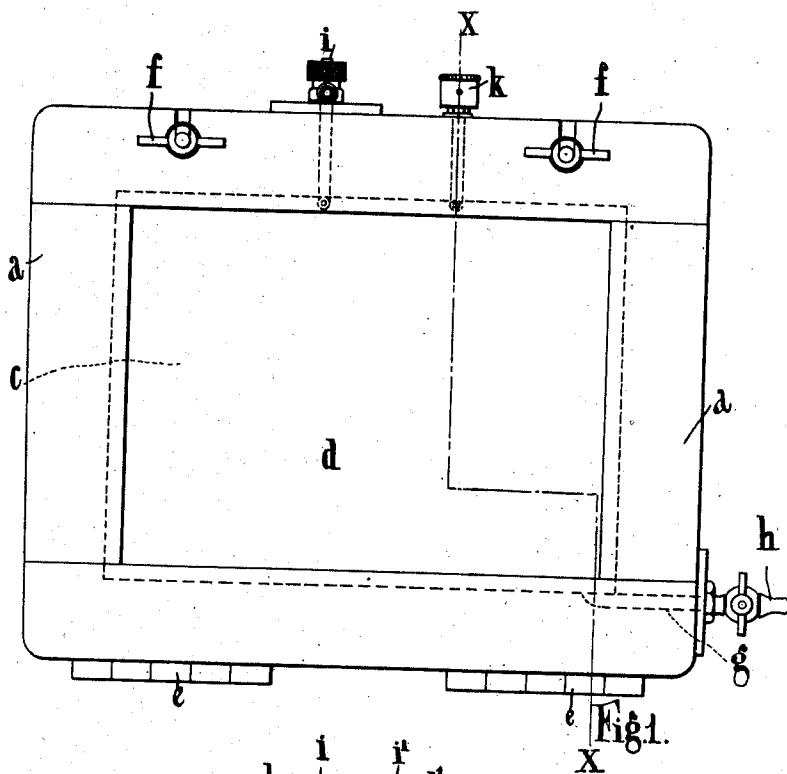
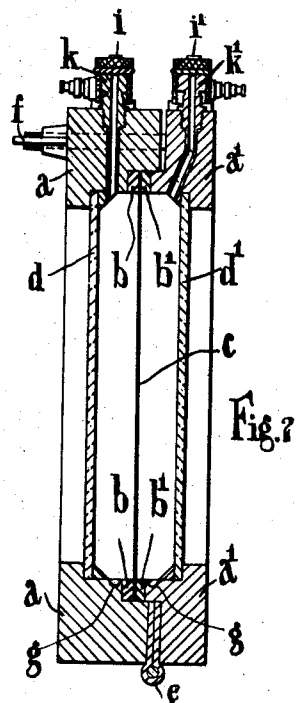


A. HAMBURGER.
 DEVELOPING, COLORING, AND WASHING TANK FOR TWO-SIDED PHOTOGRAPHIC FILMS.
 APPLICATION FILED MAY 20, 1919.

1,308,710.

Patented July 1, 1919.



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UNITED STATES PATENT OFFICE.

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DEVELOPING, COLORING, AND WASHING TANK FOR TWO-SIDED PHOTOGRAPHIC FILMS.

1,308,710.

Specification of Letters Patent.

Patented July 1, 1919.

Original application filed January 20, 1919, Serial No. 272,201. Divided and this application filed May 20, 1919. Serial No. 298,527.

To all whom it may concern:

Be it known that I, ARON HAMBURGER, a citizen of the United States of America, and residing at 38 Dover street, Mayfair, London, W. 1, England, have invented certain new and useful Improvements in Developing, Coloring, and Washing Tank for Two-Sided Photographic Films, of which the following is a specification.

This invention relates to the preparation of photographic reproductions of objects in natural colors, and to apparatus therefor.

In my co-pending application No. 272201, filed January 20, 1919, (of which the present case is a division,) I have described a multi-color process in which complementary color negatives say a red or orange red value negative and a blue or blue green value negative, one of which is reversed, are accurately superimposed, on opposite sides of a doubly sensitized film and photochemically printed. The combined positive is then bleached and dyed or pigmented in separate or simultaneous operations each side its respective color, and may itself be used as a finished two-color photograph or it may be combined after clearing with a yellow value positive prepared preferably by the process of my British Patent No. 20880, September 21, 1911, according to which mercury-silver iodid gives the yellow color.

This invention consists in apparatus adapted for simultaneous dyeing of both sides of a film such as a positive referred to above.

Referring to the accompanying drawings:—

Figure 1 is a side elevation of a dyeing frame constructed according to one form of my invention.

Fig. 2 is a sectional elevation on line X—X of Fig. 1.

Two rectangular frames *a a'* of a suitable size for the positive film to be treated are constructed similar to printing frames, but the one is adapted to fit into the rabbet of the other, just as if it were the glass of an ordinary printing frame. The rabbet of the one frame is provided with rubber *b* or like jointing material, so that the film *c* when pressed against it around the edges will be sealed with a watertight joint. The second half of the frame is also provided with a ring of jointing material *b'*, and is placed on the top of the film, clamping the latter

against the other half frame all around its edges in a watertight manner. The outer side of each of the halves of the frame is provided with a sheet of glass *d d'* sealing against the edges of the frames and thus forming a tank chamber on each side of the film. The two halves of the frame may be arranged for rapid opening and closing by means of hinges *e* along the bottom edge and wing nuts and screws *f* on the top edge. The tank chambers on each side of the film are provided with outlet passages *g* at their lower ends, and these are controlled by suitable cocks or valves *h*. Inlets *i i'* are provided at the top edges of the tank chambers, for the admission of the dyeing fluids. Means are also provided for the outlet of air by the valves *k k'* as the fluid is introduced. The air exit valves *k k'* may be adapted to be closed at will. To prevent sagging of the film, the two fluids may be introduced simultaneously. The film prepared according to one of the methods described in my co-pending application No. 272201 is introduced into the dyeing tank clamped therein and dyed by the introduction of the appropriate dyeing fluids on each side. The film may thus be simultaneously dyed on both sides. The dyeing fluids are then run off, and the positive thoroughly washed, until all the non-silver parts are cleared of dye. Fixing is then effected in a solution of sodium thiosulfate ("hypo") containing 5 per cent. of tannic acid, and the film is then washed and dried in the ordinary way.

The positive film thus obtained can then be combined with a yellow toned positive as described in my co-pending application No. 272201, or may be mounted on paper or otherwise treated as described in that application.

I claim:

1. Means for dyeing the two sides of a film practically simultaneously, comprising a tank in which a film may be placed and held to form a complete partition therein dividing the tank into two compartments.

2. Apparatus for a multi-color photography in which two sides of a film are to be colored, including a tank comprising two rectangular frames capable of fitting together, means adapted to clamp each of said frames to said film, inlet and outlet means for each of the two compartments into which

the tank is divided by said film, means for admitting coloring fluid to each of said compartments, and for withdrawing the same, and air escape means for each of said compartments.

3. Apparatus for multi-color photography in which two sides of a film are to be colored, including a tank comprising two rectangular frames capable of fitting together, hinges connecting said frames to each other, jointing material applied to the frames, means adapted to clamp both frames and jointing material against the film, inlet and outlet connections for each of the two compartments into which the tank is divided by said film, means for admitting treating liquid to each of said two compartments, and for withdrawing the same therefrom and regulable air escape connections for each of said compartments.

4. A tank capable of being divided by a film into two compartments for separately treating the two sides of a photographic film, said tank comprising a receptacle hav-

ing means for locking a film into a position in which it will divide the tank into two mutually liquid-tight compartments, each provided with a liquid inlet and a liquid outlet.

5. A tank for separately treating the two sides of a photographic sheet-form element, which comprises a receptacle of which the side walls are each rigidly attached to longitudinal parts of the bottom, top and end walls, each set of said longitudinal parts forming a frame, and said two frames being hinged to each other, liquid tight packing rings carried by each of said frames where said two frames meet, such rings being capable of supporting a photographic sheet-form element to separate said tank into two mutually liquid-tight compartments, a liquid inlet and a liquid outlet connection for each of said compartments.

In testimony whereof I have signed my name to this specification.

ARON HAMBURGER.