

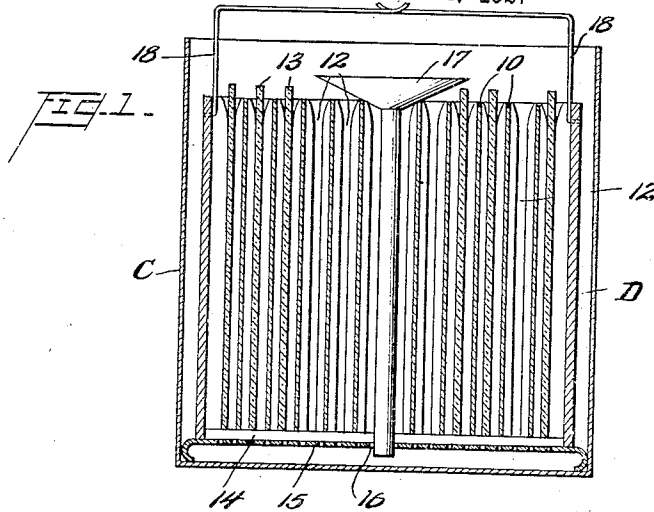
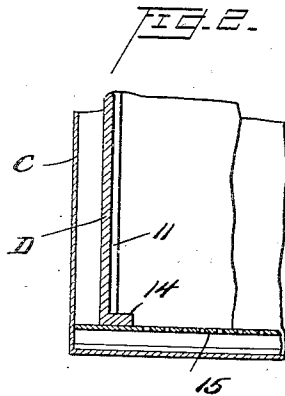
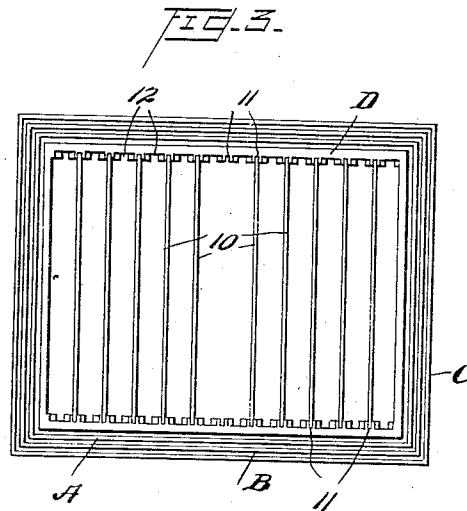
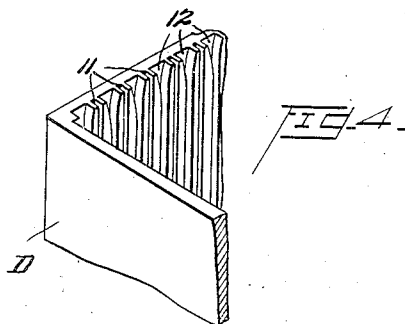
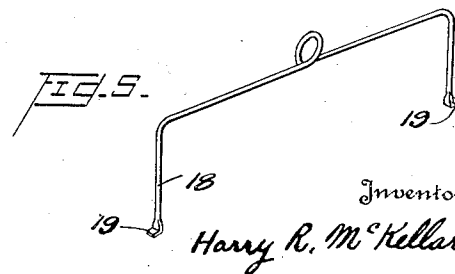
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1,661,378

PHOTOGRAPHIC DEVELOPING, FIXING, AND WASHING APPARATUS

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PHOTOGRAPHIC DEVELOPING, FIXING, AND WASHING APPARATUS.

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The present invention relates to photographic developing, fixing and washing apparatus, and has for its object in general to provide an apparatus of this character that is simple in construction, and convenient, efficient and economical in use.

A particular object of the invention is to provide an apparatus suitable to the developing, fixing and washing of panchromatic materials in the form of either so-called cut film, film of film pack, or plates. As panchromatic materials are most advantageously developed in the dark, the invention provides an apparatus adapted to be used in total darkness solely by the sense of touch, although of course it may be used with the special green light suitable for emulsions of this type. However the invention is by no means limited in its utility to the development of panchromatic materials, but on the contrary it can be used conveniently and efficiently in the development of other kinds of emulsions in any of the commonly used methods of development, viz, the "time and temperature" method, the "factorial" method, and the method of inspection. Moreover the apparatus embodying the invention is well adapted to such processes as intensification, desensitization, and reduction. In short the invention provides an apparatus of well nigh universal utility in photographic developing processes.

Referring now to the accompanying drawings for a particular description of a practical embodiment of the invention:—

Fig. 1 is a central vertical section through certain elements of the apparatus, viz, a washing tank and a film, or plate, holder;

Fig. 2 is a fragmentary vertical section through said elements;

Fig. 3 is a plan view showing the tanks and holder nested together for storage or transportation;

Fig. 4 is an isometric view of a portion of the holder; and

Fig. 5 is a fragmentary view showing a portion of the detachable handle for the holder.

As shown, the apparatus comprises three tanks, A, B and C; and a film, or plate, holder D. The tanks are of different sizes, so that they may be nested, and the holder is adapted to fit loosely within the smallest tank A, as shown in Fig. 3. Thus the entire apparatus can be disposed in a small

compass, whereby storage and transportation are greatly facilitated.

The tanks A, B and C are preferably composed of thin sheet material which is immune to the action of the chemicals used, such as Monel metal. The carrier D may be of the same material as that of the tanks, or it may be of hard rubber or a synthetic material of similar properties. The smallest tank A is for the developer; the tank B, next in size, is for hypo; and the tank C is the washing tank.

As illustrated, the carrier D is a rectangular frame open at the top and bottom, and is divided into a number of compartments by thin plates, or septa, 10. These septa fit in vertical grooves 11 formed in the inner side walls of the carrier. Between the grooves 11 the carrier is formed with vertical grooves 12 in which the film or plates are disposed. These grooves are made flaring at the top, so that the film or plates may be easily inserted in total darkness by the sense of touch. Flanges 14 project inwardly from the bottom side edges of the carrier, providing shoulders on which the septa 10 and the film or plates are supported.

The washing tank C is provided with a false bottom 15 which, as shown in Fig. 1, is formed with downwardly bent, or curled, ends which rest on the bottom of the tank. The false bottom 15 is formed with numerous small perforations and with a larger perforation 16 at the center for the reception of the small end of a funnel 17.

A detachable handle 18 is provided for the carrier. This handle is preferably formed of a strip of spring metal with the ends bent outwardly and adapted to engage slots in the carrier near the top thereof. The handle is inserted between the plates or film and the end walls of the carrier and is held in place by its spring action. Thus the handle does not occupy any space at the sides of the holder, as it would if inserted from the outside, and accordingly the tanks may be made of minimum size. By forming the handle with rectangular ends engaging rectangular slots in the carrier the latter is non-rotatable with respect to the handle and the operator can with one hand tip the holder as desired.

The height of the carrier is such that the films or plates, resting upon the shoulder 14, project above the top of the carrier by

an amount affording a convenient grasp of the film or plates between the two finger tips, for the purpose of removal or inspection. The height of the carrier is substantially less than the height of the tanks, so that when the carrier with film or plates loaded therein is completely immersed in the solution, spilling does not readily occur.

Only enough of the solution to develop and fix the materials is prepared, and only a small quantity is required, due to the great compactness of the apparatus. The solutions are used once and then thrown away, and hence are always fresh and of known strength and efficiency. Perfect uniformity of development of all parts of each film, and of all the films with each other, is assured by slightly raising and lowering the carrier at brief intervals, to mix the solution and maintain it uniform in strength in every portion. The film or plate remains in the carrier throughout development, fixation, and washing.

Development by the use of the apparatus above described gives, with a minimum of care, negatives free from all the defects sometimes produced in development, such as dumbbells, spots, streaks, lines, scratches and abrasions, or fog. Plates cannot touch and injure each other nor can films buckle and stick together. When development, fixation, and washing are complete, the film is already flat and not bent, as is the case in some other methods of development. Since each plate or film has a separate compartment, time is not consumed in placing the plates with their backs together, nor in placing films in sheaths and removing them therefrom. The inconvenience, particularly in darkness, of using one tank for several process steps, and making the necessary changes of solution, is avoided.

Washing is safely and efficiently carried out in the apparatus of the present invention. Fresh water may be introduced by the funnel into the space below the false bottom 15, the funnel being wide enough to facilitate the introduction of water from a faucet. The water thus introduced at the bottom of the tank makes its way up through the numerous small openings in the false bottom, whereby a uniform distribution of the fresh water is effected, and the

danger of injuring the emulsion by water jets and currents is eliminated. Moreover this method of washing by introducing the water at the bottom of the tank is particularly advantageous due to the fact that hypo solution is heavy and tends to settle and stagnate at the bottom.

The apparatus is capable of other uses than those indicated above. For instance, the tanks may be used to develop roll film by the tray method; the washing tank C may be inverted over the holder D and developing tank A, except during actual inspection, in the development of panchromatic materials by the method of inspection with the special green light; and other uses may suggest themselves.

Now having particularly described an apparatus embodying my invention, what I claim as new and desire to secure by Letters Patent of the United States is:—

1. In photographic apparatus of the kind described, a film or plate holder consisting of a rectangular frame open at the top and bottom and having flanges projecting inwardly from its lower side edges, the inner side walls of the carrier being formed with spaced vertical grooves, septa in said grooves dividing the carrier into a plurality of compartments, the inner side walls of the carrier being also formed with vertical grooves for the reception of plates or films between the first mentioned grooves.

2. In photographic apparatus of the kind described, a film or plate holder consisting of a frame open at the top and bottom and divided into a number of compartments by spaced parallel septa, said frame being formed with vertical grooves for the reception of plates or films.

3. In photographic apparatus of the kind described, a film or plate holder consisting of a frame open at the top and bottom and divided into a number of compartments by spaced parallel septa, said frame being formed with vertical grooves between said septa for the reception of plates or films, said grooves opening through flaring mouths at their upper ends.

In testimony whereof I hereunto affix my signature.

HARRY REX McKELLAR.