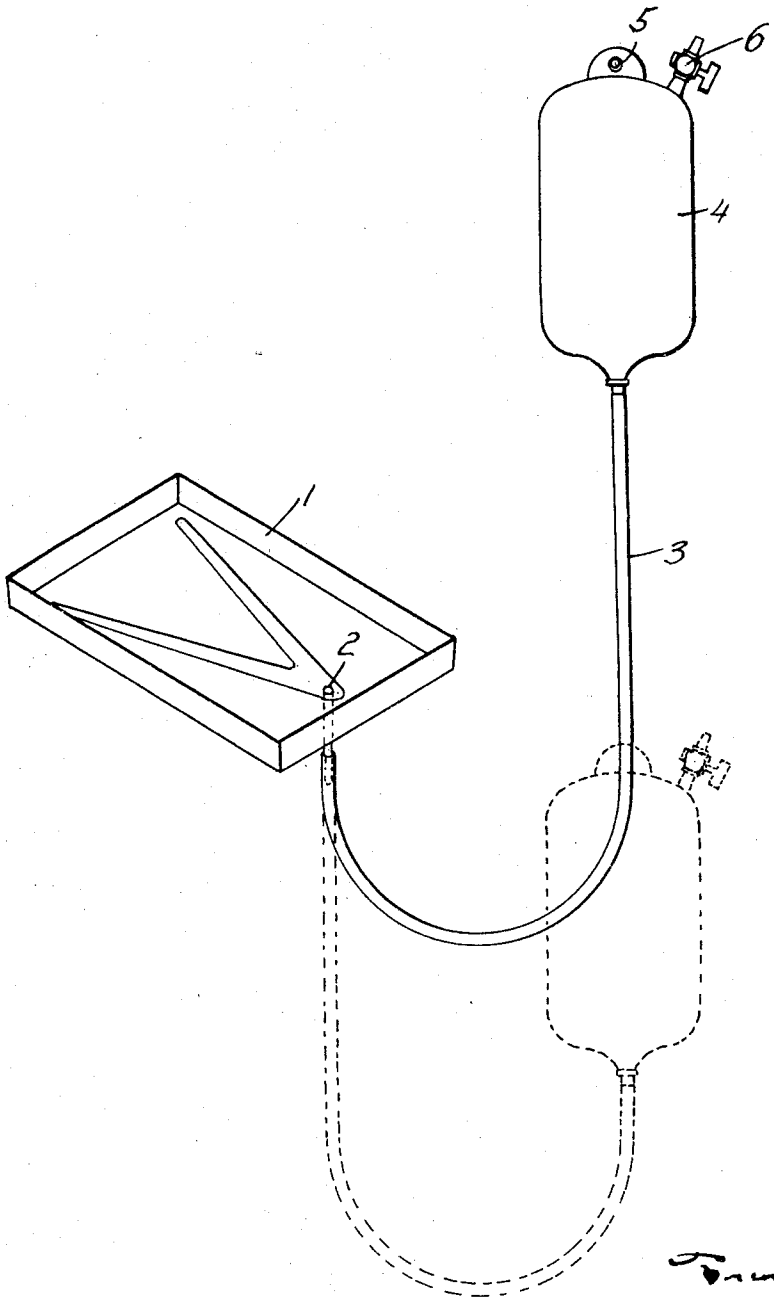
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FLUID HANDLING DEVICE

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INVENTOR

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FLUID HANDLING DEVICE

Application filed December 8, 1928. Serial No. 324,783.

My invention relates to apparatus for the handling and storage of chemically active solutions, and more particularly of those chemical solutions which deteriorate upon continued exposure to the atmosphere such as, for example, the developing solutions used to develop the image on exposed light-sensitive plates or films or papers.

The object of my invention is to provide a convenient means for handling and storing such developing solutions or other fluids which are best kept away from exposure to the atmosphere as much as possible, so that such fluids may be quickly transferred from the storage receptacle to the tray or other receptacle in which the developing process is carried on, and so that the fluid may be returned to the storage receptacle from the developing receptacle without danger or possibility of spilling any of the fluid even though the transfer from either receptacle to the other take place in the dark, and to keep the fluid out out of contact with the air during the transfer.

It is common, in the practice of the photographic art, to make up such developing solutions as are required and store them in glass bottles or other suitable receptacles or containers when not in use and to pour such quantities of these solutions as may be desired for use in flats or trays into which the exposed plate or film or paper is placed to carry out its development. After the process of developing is complete the fluid is poured back into the storage receptacle, but as this process is usually carried out in a very dim light there is often a spillage of the fluid and at best it is often a messy operation.

To obviate this pouring back and forth of the developing fluid from storage receptacle to developing tray and vice versa I have devised an apparatus whereby this transfer may be accomplished by the mere raising or lowering of one or the other of the receptacles, while all contact with the atmosphere is prevented during the period of transfer and while the fluid is in the storage receptacle.

The drawing shows a preferred form of an apparatus embodying my invention and is illustrative of the manner in which I reduce my invention to practice. In this drawing 1 is a tray of suitable size to receive the plate or other exposed light-sensitive element to be developed. This tray is provided at 2 with an outlet to which one end of a flexible tube, 3, is attached. The other end of the flexible tube communicates with the lower portion of a receptacle, 4. In the drawing I have represented this receptacle, 4, as a flexible rubber bag similar to the type commonly called a "hot water bag" which indeed serves the purpose admirably since it will extend as it is filled, or will collapse as the fluid is withdrawn. The receptacle, 4, is provided with means whereby its elevation, with reference to the tray, may be controlled. In the drawing this means is shown as an eyelet, 5, whereby the receptacle may be hung on supports at various elevations relative to the tray, 1.

In use the method of operation is as follows: With the tray and receptacle in the relative positions shown in the drawing in full lines—that is, with the bottom of the receptacle, 4, at an elevation above that of the tray, 1, developer or other fluid is poured into the tray in such quantity as may be desired. With the apparatus in the position described only a very small quantity of the fluid will flow from the tray into the tube, 3.

The plate or other exposed light-sensitive element is then placed in the tray and developed in the fluid. At the conclusion of development the liquid which would rapidly deteriorate if left exposed to the atmosphere in the tray is quickly and conveniently entered into the receptacle, 4, by moving the receptacle from its elevation above the tray to an elevation below that of the tray, as indicated by the dotted lines in the drawing. The fluid within the tray will then automatically flow into the receptacle without danger of spilling, and moreover this transfer is accomplished just as quickly and easily in the dark as in the light. By permitting all of the air to escape from the upper portion of the receptacle by means of the pet cock or vent which is indicated in the drawing at 6, I am able to exclude all contact of the fluid with air while it is in storage. Or the air

within the flexible collapsible receptacle may be permitted to escape by inverting the said receptacle and placing it at an elevation below that of the receptacle 1, and expelling the air through the flexible tube by exerting pressure on the sides of the flexible collapsible receptacle. When glass bottles are used for the storage there is always some air in contact with the surface of the fluid unless the bottle is filled full, and this is seldom convenient to do.

After the chemical solution has once been transferred from the developing tray to the storage receptacle, and the air within the storage receptacle has been permitted to escape through the vent, 6, then thereafter the transfer of the chemical solution from one receptacle to the other and back again may be repeated again and again by the mere raising and lowering of the receptacle, 4, without exposing the chemical solution to contact with the air except during the period in which it is in the developing tray for use in developing a film, plate or paper.

Having described my apparatus fully and clearly so that one skilled in the art may make and use it, I now state what I believe to be new and novel and for which I pray that Letters Patent be granted to me.

1. A photographic developing device comprising in combination a shallow open receptacle provided with a drain opening, a flexible tube communicating at one of its ends with said drain opening and at its other end with a flexible, completely collapsible closed receptacle, having a vent at its top and means for closing said vent substantially as described.

2. In a photographic developing device the combination of a developing receptacle having a drain, a completely collapsible flexible storage receptacle, having a top vent and means for closing said vent, and flexible duct means communicating with said drain and the bottom of said receptacle, whereby oxidizable fluids may be placed and retained in storage out of contact with air, substantially as described.

3. A photographic developing device, comprising in combination a developing receptacle having a drain, a soft rubber, completely collapsible bag, having an opening to which is connected a flexible tube leading to the said drain, whereby easily oxidizible developing fluids may be transferred by gravity from the developing receptacle to the bag, or vice versa, and may remain in storage in the bag completely out of contact with air, substantially as described.

4. A photographic developing device comprising in combination a developing tray having a drain outlet, a flexible, completely collapsible fluid storage receptacle, a flexible duct connecting said drain outlet with said storage receptacle, whereby oxidizible developing fluid may be transferred by gravity from the storage receptacle to the developing tray, and vice versa, the said fluid being entirely out of contact with air while in transit and while in storage.

Signed at Douglaston, in the county of Queens, city and State of New York, this 5th day of Dec. A. D. 1928.

FRANK T. POWERS.