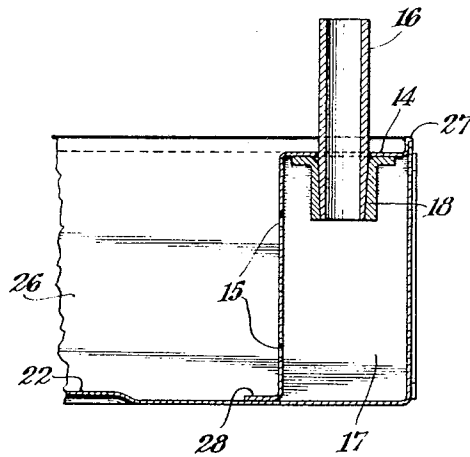


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Fig. 2.



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WASHING APPARATUS

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5 Claims. (Cl. 95—97)

This invention relates to an improvement in washing apparatus more particularly suitable for a photographic print washer, or for washing cut films, etc.

5 It is well known that in the development of photographic prints it is necessary to wash the chemicals from the print paper by some manner of liquid, usually water. Heretofore these washing devices have been provided with arrange-
10 ments to assure a continuous flow of water, but ordinarily the water flow was either from a point near the bottom, upward to an overflow at the top or, vice versa, there was an inflow at the top and outlet at the bottom.

15 In each construction heretofore made and known to me it has been invariably the experience that the prints, if more than one were washed at the same time, tended to compact or stick together, or there was a very uneven flow
20 of wash liquid across the print, or the apparatus was so extremely expensive and cumbersome as to be beyond the reach of the amateur photographer.

25 The principal object of my invention is to provide an improved washing apparatus especially for photographic prints, cut films, small roll films, etc., and to embody in such apparatus means to provide a continuous flow of liquid which would flow evenly and continuously above and below
30 the prints without a tendency to compact them, and preventing their becoming packed together.

Another and more specific object of my invention is to provide a very simple washing device especially for photographic prints, cut films, etc.,
35 which could be very economically made from a sheet of suitably stamped metal with an integral water header at one end and a series of discharge openings at the opposite end so that the water or other liquid would tend to flow horizontally and continuously.

40 Another object of the invention is to provide a relatively shallow, open tank for washing small sheets of print paper, free of chemicals, as in a photographic print washer, which device is inexpensive, of minimum size in length, width and
45 depth, which is provided with a detachable pipe nipple, or other device, which may be connected by a hose to a water supply, and which assures a continuous horizontal layer flow of liquid from one end to the other.

50 Further objects and advantages of my invention will appear from the following disclosure of a preferred form of embodiment thereof, taken in connection with the attached drawing, which
55 is illustrative of my invention, and in which

Fig. 1 is a perspective view of the composite print washer;

Fig. 2 is a detail vertical cross-section taken substantially along the line 2—2 of Fig. 1, and;

Fig. 3 is a plan view of a blank, partially completed, from which the photographic print washer may be constructed.

5 In accordance with a preferred form of embodiment of my invention, I have provided a shallow tank primarily adapted as a photographic
10 print washer, or for washing cut films, etc., such washer being generally indicated at 10. This tank is conveniently formed from a blank of sheet metal 12, as shown in Fig. 3, such blank being made of any desired type of metal, such as
15 galvanized iron, stainless steel, or other material unaffected by the chemicals normally present in photographic prints and normally resistant to rust under continuous exposure to water. Such metal can be of any suitable gauge to
20 render it sufficiently stiff. The tank may also be made of materials formerly used and described in the prior art, such as plastics, "Bakelite," "Celluloid," et cetera.

25 This tank 10 in its completed form is preferably arranged with a header 14, the vertical wall of which is suitably apertured, as at 15, to discharge water which is introduced into the header, as shown in Fig. 2, by a hose or the like having a
30 suitable detachable nipple 16 or other connection. The chamber 17 within this header serves to distribute the water, or other liquid, which enters through the nipple 16 under pressure so that the water, or liquid, is forced in approximately equal volume and pressure from each
35 of the apertures in the front of the header, the cross-sectional area of these apertures being substantially equal to the cross-sectional area of the inflow nipple 16. The inflow nipple 16 may be made of metal, of the same composition as
40 the washer itself, of hard rubber, fibre, or other material, and is secured in the receiving ferrule 18 of the header by a tapered frictional fit, threading, or otherwise, so as to be readily detachable. Such construction is leakproof and
45 facilitates attachment or detachment, a convenience in shipping when desired.

To assure an efficient flow of liquid across the tank 10, the apertures 15 are preferably laid out at horizontally spaced intervals on a plurality
50 of vertical levels suitably spaced from the bottom of the tank. As an example, which is illustrative of my invention, the spacing of the bottom row would be $\frac{3}{8}$ " from the bottom and the rows $\frac{1}{2}$ " apart. Preferably these inlet apertures
55

are $\frac{3}{4}$ " for a print washer which has an internal dimension of 9" and 11", which is adequate for washing 8" x 10" prints. Such apertures, under pressure, will serve as jets to give a strong flow across the tank.

The opposite vertical wall 19 is similarly apertured, having apertures 20, also preferably in a series of rows spaced from the bottom. The vertical and horizontal spacing is preferably the same as the spacing of the apertures in the header. The apertures, however, are preferably of a larger size so that there can be no overflow of the receptacle and so that there will be a continuous discharge of the washing liquid by gravity, which is equivalent to the pressure inflow. I have found that by making the outlet apertures $\frac{3}{8}$ " in diameter I can assure the desired control of the liquid and have an ample free flow without overflow.

To facilitate removing the prints from the box and to prevent the prints from adhering to the bottom, I also prefer to indent or corrugate the bottom of the box by projections 22, which conveniently extend longitudinally and in the path of the liquid flow.

I have found that the blank in Fig. 3 can be readily formed, not only with the necessary marginal edges, apertures and sides, but can also be formed to include the header heretofore mentioned. In such construction the marginal edges 24 can be conveniently folded over to form a smooth, finished bead to the box, and the edges 25 of the sides 26 can be suitably cut away to form the desired attaching flaps, which assist in forming the corners in making the box watertight, and insure a rigid construction.

I also prefer to form a bead 27 on the header by suitable creases in the pattern so that the top of the header 14 is slightly below the margin of the top of the box so that there can be no accidental overflow. The header may be provided with a foot piece 28 to seal along the interior of the box across the bottom so that the joints may be made tight. It will be understood that the corners can be suitably soldered, welded, brazed, or otherwise fastened, to prevent leakage. A one-piece construction proves to be the most inexpensive for the desired purpose, although, if a plurality of pieces are used, the construction is within the contemplation of my invention.

By this type of construction I can readily attach a connection for fluid to the header and assure an automatic and continuous horizontal flow of liquid across the tank so that I can wash one or more prints, cut films, etc., simultaneously. This flow is of a layer nature and tends to hold the prints apart so that they will be completely and uniformly washed on the upper as well as the lower surfaces and without interference, one from the other. It is, of course, to be understood that the side walls 26 of the box may also be made perforate, if desired, but ordinarily I find it best to merely use the apertures at the opposite end from the header to assure a sufficient outflow of wash liquid. In any case, the inflow and outflow are on substantially the same level, and normally below the liquid level.

While I have shown a preferred form of embodiment of my invention, and have described it with particular reference to a photographic print washer, I am aware that modifications may be made thereto and that the features may be suitable for other purposes, and I, therefore, desire a broad interpretation of my invention

within the scope and spirit of the disclosure herein and of the claims appended hereinafter.

I claim:

1. A washing apparatus for washing flexible sheets which comprises an open box having a bottom and upstanding walls, one of said walls being the discharge wall and having a series of horizontal rows of vertically spaced, substantially equal sized apertures, a liquid feeder header in said box opposite said discharge wall and having an inlet wall exposed to the box, said inlet wall having a series of horizontal rows of vertically spaced apertures, said header and discharge wall establishing a horizontal flow of liquid across the bottom of the box in which the rate of flow varies from top to bottom of the box, said header being pressure tight for pressure feed of liquid into said box, the apertures in said header having a substantially smaller total area than the apertures in the discharge wall so that under pressure feed and gravity discharge of liquid the level in the box can be maintained at a desired height.

2. A washing apparatus for washing flexible sheets which comprises an open box having a bottom and upstanding walls, one of said walls being the discharge wall and having a plurality of spaced apertures distributed substantially over a major portion of the wall, a liquid feeding header in said box opposite said discharge wall and having an inlet wall exposed to the interior of the box, said inlet wall having a series of spaced apertures distributed substantially over a major portion of the wall, said header and discharge wall establishing a horizontal flow of liquid across the bottom of the box in which the rate of flow varies from top to bottom of the box, said header being pressure tight for pressure feed of liquid into said box, the apertures in said header having a substantially smaller total area than the apertures in the discharge wall so that under pressure feed and gravity discharge of liquid the level in the box can be maintained at a desired height.

3. A washing apparatus comprising a box having a bottom wall and upstanding side walls, one of said side walls having rows of outlet apertures spaced vertically and horizontally from each other distributed over the major portion of the area thereof and serving as discharge outlets for the apparatus, and a header consisting of a perforate wall spaced across from the discharge outlets and having rows of inlet apertures spaced vertically and horizontally from each other and distributed over the major portion of the area thereof and means to join said perforate wall with portions of the other walls to form a pressure tight liquid chamber therewith, whereby fluid entering said header will be discharged across said box to said discharge outlets, the area of the discharge outlets being substantially four times the area of the inlet apertures whereby the liquid in the box may be maintained at a desired level.

4. A portable washing apparatus comprising an open relatively shallow box having a bottom wall and upstanding side walls, one of said side walls having outlet apertures spaced from each other and distributed substantially over a major portion of the wall and serving as discharge outlets for the apparatus and a header consisting of a chamber formed by a perforate wall and portions of certain of the walls of the box, said perforate wall being provided with inlet apertures spaced from each other and distributed

over the major portion of the area thereof, means to introduce a fluid under pressure into said header chamber, said apertures producing streams directed parallel to the bottom of the box and directed inwardly into the box to establish a flow of liquid from the header to the outlet apertures, the area of the discharge outlets being substantially greater than the area of the inlet apertures whereby under pressure feed and gravity discharge of liquid the liquid level in the box can be maintained at any desired height.

5. A washing apparatus for washing flexible sheets which comprises an open box having a bottom and upstanding walls, one of said walls being the discharge wall and having a series of vertical rows of horizontally spaced, substantially equal sized apertures, a liquid feeding header in said box opposite said discharge wall

and having an inlet wall exposed to the box, said inlet wall having a series of vertical rows of horizontally spaced apertures, said header and discharge wall establishing a horizontal flow of liquid across the bottom of the box in which the rate of flow varies from top to bottom of the box, said header being pressure tight for pressure feed of liquid into said box, the apertures in said header having a substantially smaller total area than the apertures in the discharge wall so that under pressure feed and gravity discharge of liquid the level in the box can be maintained at a desired height, said box, including said header, being of a single sheet of metal folded into the predetermined pattern and means to seal the edges thereof.

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