

[72] Inventor **Frank Rummo**
1623 81st St., Brooklyn, N.Y. 11214
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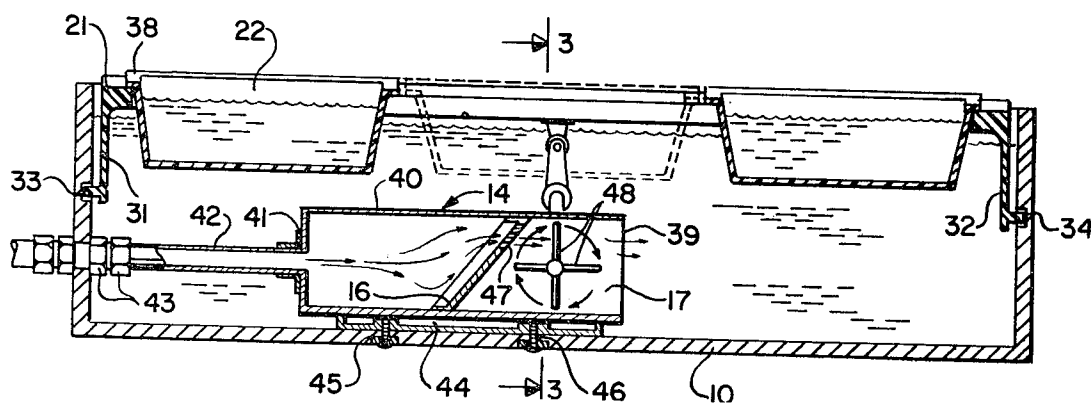
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Primary Examiner—Samuel S. Matthews
Assistant Examiner—Edna M. Bero
Attorney—Polachek & Saulsbury

[54] **MULTIPLE-TRAY PHOTOGRAPHIC PRINT
 AGITATOR**
4 Claims, 7 Drawing Figs.

[52] U.S. Cl. 95/99
 [51] Int. Cl. G03d 3/04
 [50] Field of Search. 95/99;
 259/73

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ABSTRACT: An agitator comprising a bottom tank in which water is kept at a definite level and at an even temperature, an inlet water supply and a drain pipe. Inlet water supply operates a water wheel device by conveying water through an inclined plate having orifices at its upper end so that water is directed against the vanes of a water wheel. A crank is connected to the water wheel and to a pivoted frame within said tank to rock the frame. The frame is adapted to support print trays so that their bottoms depend into the tank and below the level of the water therein. The liquids within the developer trays are thus maintained at a constant temperature by the water within the tank.



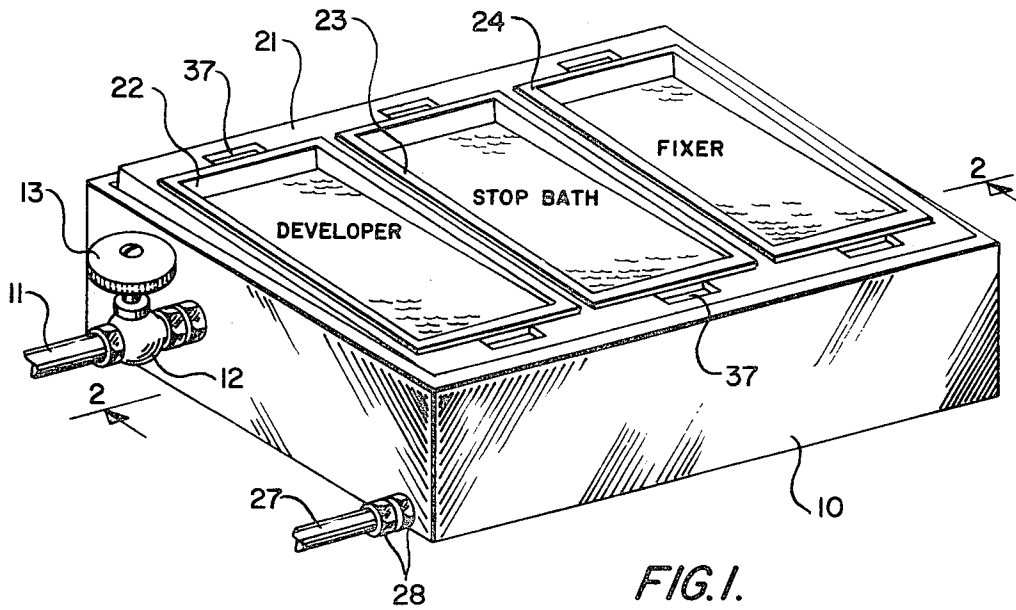


FIG. 1.

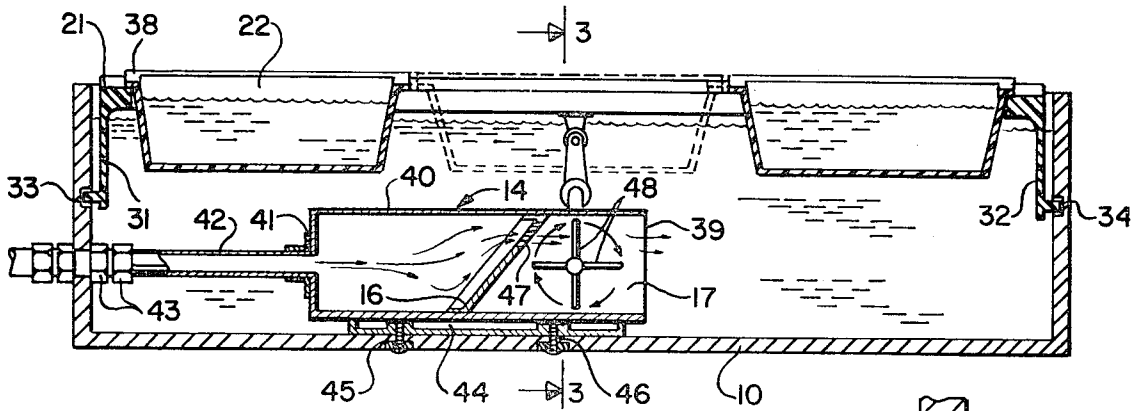


FIG. 2.

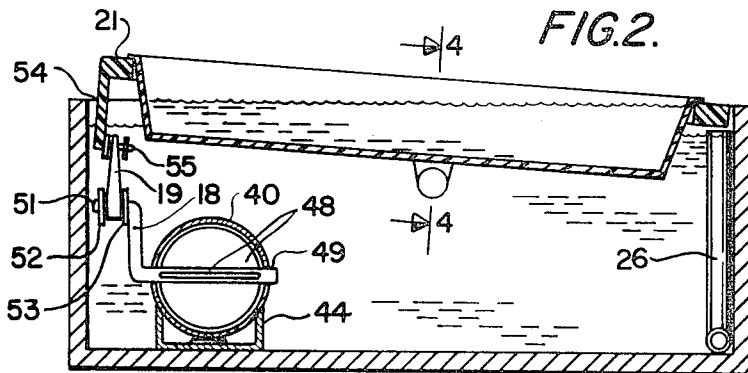


FIG. 3.

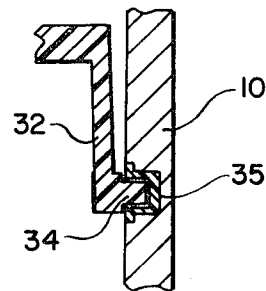


FIG. 4.

INVENTOR.
FRANK RUMMO

BY
Polachek & Saulsbury
ATTORNEYS

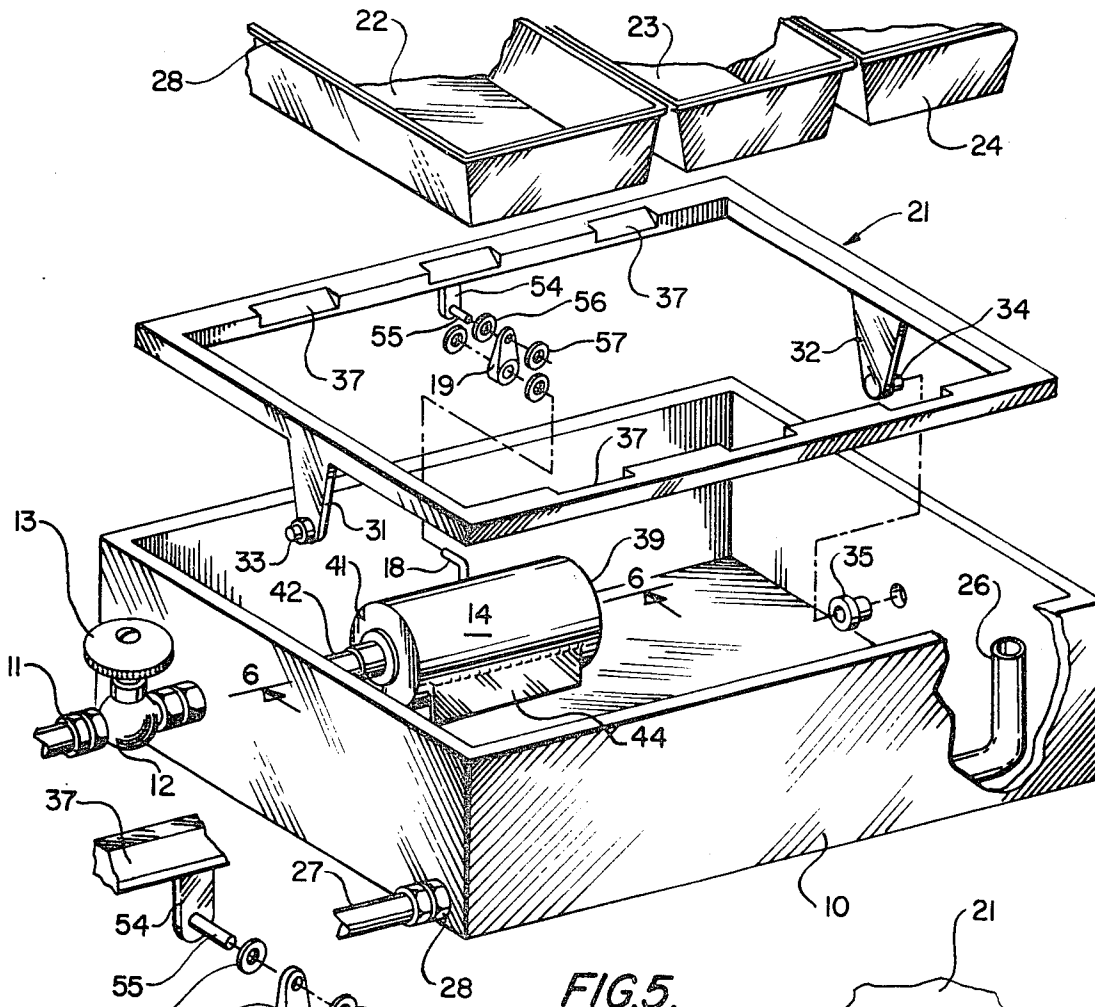


FIG. 5.

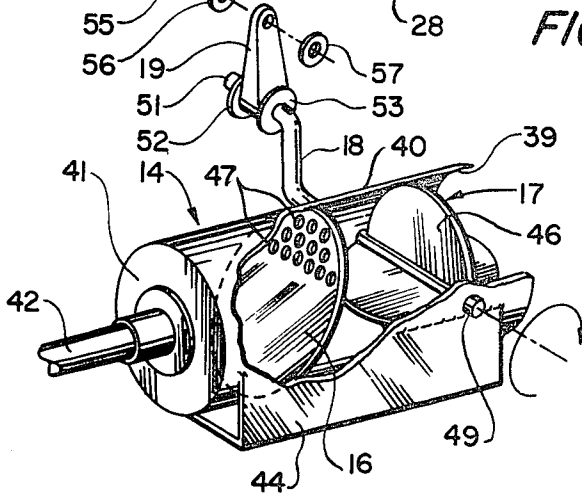


FIG. 6.

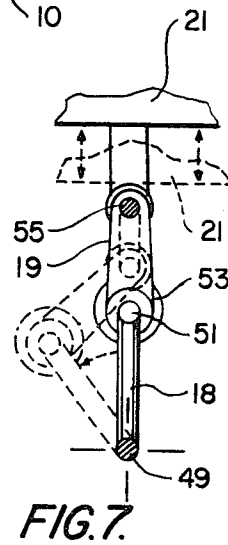


FIG. 7.

INVENTOR.
FRANK RUMMO
BY
Polach & Saulsbury
ATTORNEYS

MULTIPLE-TRAY PHOTOGRAPHIC PRINT AGITATOR

This invention relates to a multiple-tray photographic print agitator.

It is an object of the present invention to provide a multiple-tray photographic print agitator which will be actuated by a water wheel device that is supplied by the water that maintains the tank at the desired level and wherein the trays will be supported upon a frame rocked by the water wheel device and in such a manner that the bottoms of the trays are extended into the even temperature water in the tank.

It is another object of the invention to provide a photographic print agitator which will support the three trays needed for developing, stop bath and fixer in a side-by-side relationship and wherein all of the trays will be rocked to cause the flow of the liquids therein to pass over the prints and wherein this liquid is being maintained at an even temperature with the liquids of all of the trays by the body of water lying thereunder and in which the trays are rocked by a motor connected to the inlet supply of water to the tank.

It is a further object of the invention to provide a photographic print agitator with a frame in which the print trays are suspended into the water of the tank and in which the supporting frame is notched to provide easy access to the edges of the print trays for easy removal from the rockable tray support frame.

It is a further object of the invention to provide a photographic print agitator in which the water in the agitator can be maintained automatically by maintaining the height of the overflow for the water and the water continually touching the bottoms of the processing trays while the supporting frame for the trays are continually rocked and the liquids in the trays being sloshed back and forth in the trays.

Other objects of the invention are to provide a photographic print agitator, having the above objects in mind which is of simple construction, has a minimum number of parts, compact, easy to assemble and disassemble, inexpensive to manufacture, easy to maintain, of pleasing appearance, durable, efficient and effective in use.

For a better understanding of the invention, reference may be had to the following detailed description taken in connection with the accompanying drawings, in which:

FIG. 1 is a top perspective view of the multiple-tray photographic agitator embodying the features of the present invention.

FIG. 2 is an enlarged longitudinal sectional view of the print agitator as viewed on line 2—2 of FIG. 1.

FIG. 3 is a transverse vertical sectional view of the agitator as viewed generally on line 3—3 of FIG. 2.

FIG. 4 is an enlarged fragmentary vertical sectional view of the tiltable tray supporting frame pivot bearing by which the frame is mounted in the tank for rocking movement and as viewed on line 4—4 of FIG. 3.

FIG. 5 is an exploded perspective view of the parts of the print agitator lifted upwardly from the tank.

FIG. 6 is a fragmentary perspective view of the water wheel agitator and crank connections with the tray frame by which to effect the rocking movement thereof.

FIG. 7 is an end elevational view of the crank and link connection with the tray supporting frame.

Referring now to the figures, 10 represents a tank, open at the top and generally rectangular in shape into which water is tended through a water supply pipe 11 having a throttle valve 12 with a manipulatable handle. Water entering the pipe 11 passes the valve 12 in any desired quantity determined by the adjustment of the handle 13 and to a water wheel device 14 having an inclined nozzle plate 16 adapted to urge water under pressure against a vane-type water wheel 17 that drives a crank 18 connected through a link 19 to a print tray rockable frame 21. It is desirable in a photographic print developer to maintain the temperature of the print emulsion and working liquids contained in trays 22, 23 and 24 at a temperature between 68° and 72° F. This automatic controlling of the temperature of the processing chemicals provided in the trays

which are mounted in the tray support frame 21 will be maintained by the tank 10 being filled with the water supplied by the pipe 11 maintained by the height of the overflow pipe 26 that extends from the tank 10 and through the wall of one end of the tank, the same end of the tank in which the water supply inlet pipe 11 is connected with its valve 12 and to an outlet pipe 27 connected to the pipe 26 by coupling nuts 28. The height of the overflow pipe 26 into the upper end of which water will flow is such as to keep the water touching at all times the bottoms of the processing trays 22, 23 and 24.

The tray supporting frame 21 is four sided and at its opposite ends there depends pivot support arms 31 and 32 having respectively pivot projections 33 and 34 which extend into journal bearing sleeve inserts 35 mounted in the inner faces of the walls above the tank and below the upper edges thereof. These pivot projections 33 and 34 are in longitudinal alignment and the trays supporting frame 21 will be rocked upon the sleeves 35 in the tank wall by the water agitator 14 in the manner to be described more in detail and at the same time maintaining the booms of the trays 22, 23 and 24 within the water levels of the water tank 10.

The sides of the frame 21 are provided with hand notches 37 to serve in the locating of the trays in the frame and for the purpose of permitting the fingers of the hands to be placed under ends of the trays for lifting the trays readily out of the frame 21. The trays 22, 23 and 24 each have a top flange 38 for the support of the tray on the top edge surfaces of the frame. The tray 22 may be filled with a print developer, the tray 23 having a stop bath liquid and the tray 24 having a fixer liquid. The photographic prints will in order be placed into the respective trays 22, 23 and 24.

It can be seen that the liquids in the trays will be sloshed back and forth along the length of the respective trays and over the surfaces of the photographic paper or prints and being coated with a sensitized emulsion or coating and which is worked upon by the respective fluids. A good flow of the liquid is maintained over the coated surfaces of the print and at the same time the bottoms of the tray and the liquids therewithin are kept and maintained at a controlled temperature from the water filling the tank 10.

The water wheel supply device 14 for the water entering the tank serves as well as above mentioned through the turning of its water wheel 17 to effect the rocking of the tray frame. This water wheel supply device 14 comprises a cylindrical shaped outer housing open at its supply end 39 and to its inner end 41 there is connected a portion 42 of the supply pipe 11 that is connected to the supply pipe 11 through a water connection fitting extending through the wall of the tank as indicated at 43 having coupling nuts and from these throttle valve 12 by which the force of the water entering the cylinder is determined. This cylinder indicated at 40 has a base 44 that can rest upon the bottom of the tank 10 and connected thereto against displacement by bottom-fastening screws 45 and 46. The inclined nozzle plate 16 lies within the cylinder 40 and has a plurality of nozzle holes or orifices 47 through which water is extended under force and directed against the respective vanes 48, there being four in number, to effect rotation of the water wheel 17 in the direction of the arrows as viewed in FIG. 2.

The crank 18 has its shank 49 extending diametrically across the sides of the cylinder wall 40 and journaled therein for rotation. The crank 18 will turn as the water is thrust against the vanes 48 and the link 19 that is pivotally connected at 51 to an outwardly turned end of the crank 18 and held in place thereon by washer elements 52 and 53. The upper end of the link 19 is connected to a depending arm 54 that has an inwardly extending pin 55 and washers 56 and 57 so that it can pivot upon the pin and so that as the crank 18 is given full rotation about its shank 49, the link 19 will be drawn downwardly pulling with it the side of the frame 21 to thereby effect a downward rocking movement of one side of the frame and then as the crank 18 completes its rotation to move upwardly the frame 21 will be tilted upwardly beyond its level position so as to cause the flow of the liquid in the trays 22, 23

and 24 to be sloshed from opposite ends of the trays. The movement of the tray supporting frame 21 as effected by the crank 18 and link 19 is illustrated in FIG. 7, the crank 18 rotating about its shank 49 and making complete rotations as illustrated by the arrow shown in FIG. 6.

It should be apparent that the water wheel device 14 not only serves to rock the tray supporting frame 21 but it also serves for the maintaining of the supply of water and keeps the water well circulated within the tank 10 so that the temperature of the water in the tank will be more or less automatically kept within the range of 68° to 72° F. throughout the full water body. The temperature of the water is of course effected in the area of the outlet end 39 of the water wheel cylinder 40.

For the best use of the fluid in the developing trays in the trays 22, 23 and 24, it is important that these liquids be kept at this even temperature and this is done by maintaining the water level in the tank well over the bottoms of the print developing trays during the rocking of the frame. The tray supporting frame 21 and the bottoms of the trays will of course also work in the water in the tank to agitate the water and further help to maintain the temperature evenly throughout the full body of the water.

What is claimed is:

1. A multiple-tray photographic print agitator comprising a bottom tank, a water wheel device connected to the water supply pipe, said water wheel device comprising a cylinder shaped housing, a nozzle plate mounted in the housing and inclined upwardly and outwardly from the bottom of the housing and the end of said pipe respectively, a vane-type water wheel journaled in the housing behind the nozzle plate, said nozzle plate having orifices in the upper portion thereof for

directing a stream of water to the upper part of the housing and against the vanes of the water wheel, a crank extending through the housing and attached to the water wheel, a print tray supporting frame pivotally connected to the opposite ends of the water tank for rocking movement, print trays supported in the supporting frame and one side of said frame having a pin projection, and link means extending between the water wheel crank and the pin projection of the frame, whereby as the water wheel is turned the tray supporting frame will be rocked.

2. A multiple-tray photographic print agitator as defined in claim 1 and a drain pipe in said tank for maintaining a water level within the tank about the print trays depending from the support frame.

3. A multiple-tray photographic print agitator as defined in claim 2 and said trays having a flanged top edge and resting on the top of the frame while depending downwardly therethrough, said frame having notches to permit the extension of the operator's fingers under the flanged top edges of the trays to facilitate removal of said trays from the frame.

4. A multiple-tray photographic print agitator as set forth in claim 2 and said tray supporting frame being pivotally connected to the ends of the tank by means of depending members having outwardly extending projections, said tank having openings with bushings for receiving the projections of the depending members of the frame and said depending members connected with the tank depending from the frame side intermediate the length of the frame, said water wheel device being located in the tank at one side thereof.

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