Sept. 8, 1953 J. BARNES 2,651,191

WASHING MACHINE FOR AGITATING CLOTHES AND CLEANSING LIQUID BY THE USE OF AIR JETS SUBMERGED IN SAID CLEANSING LIQUID

Filed Aug. 9, 1949

2 Sheets-Sheet 1

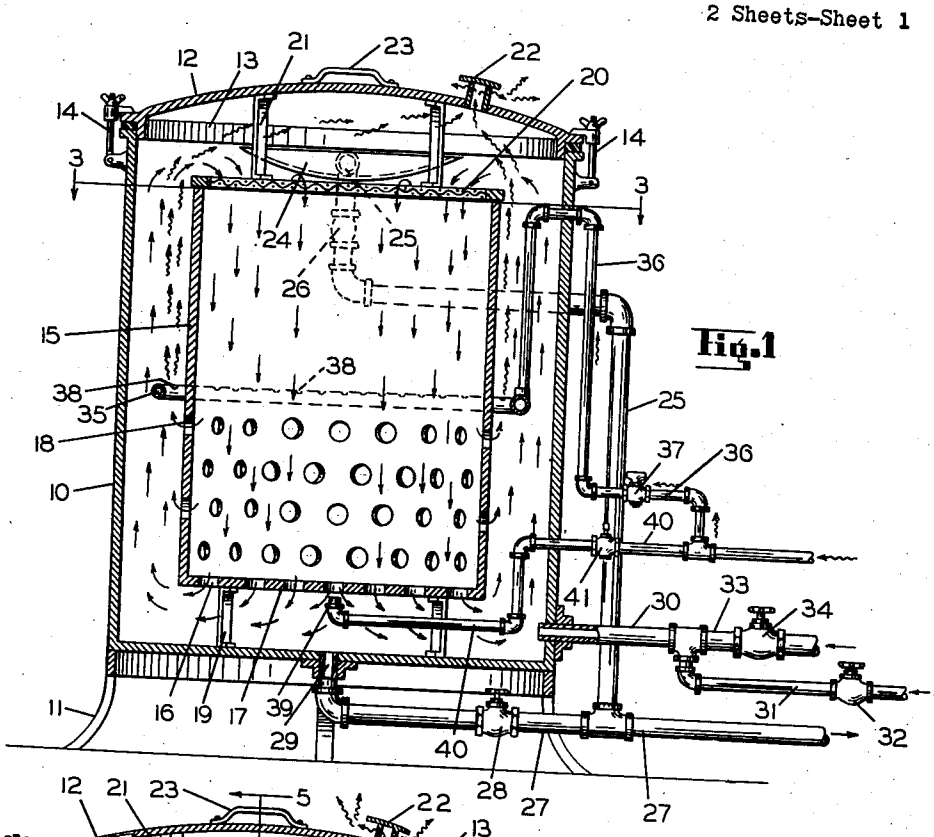


Fig. 1

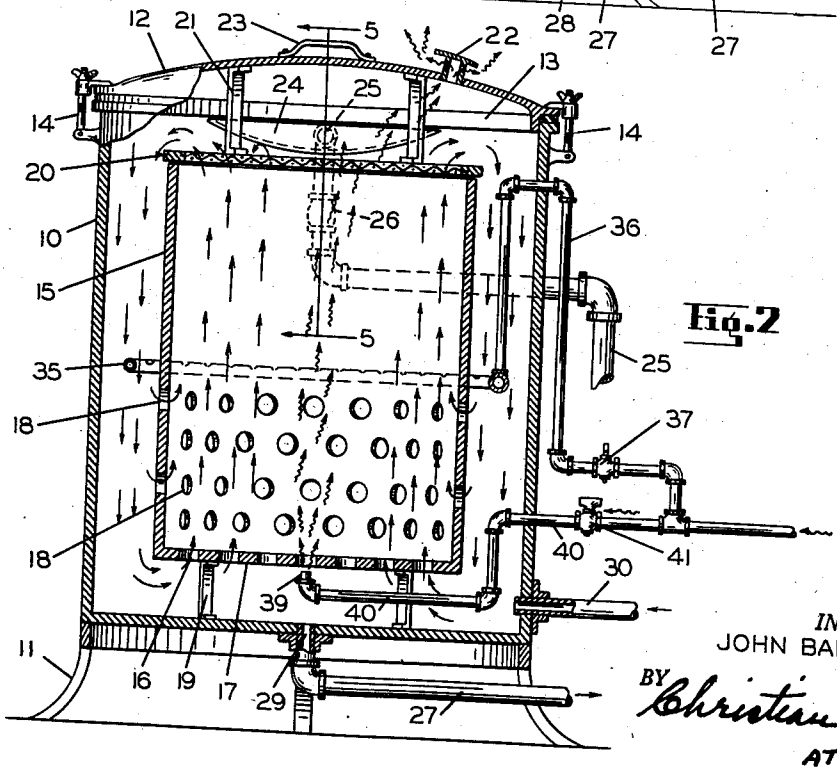


Fig. 2

INVENTOR.
JOHN BARNES
BY Christian R. Nielsen
ATTORNEY.

Sept. 8, 1953 J. BARNES 2,651,191

WASHING MACHINE FOR AGITATING CLOTHES AND CLEANSING LIQUID BY THE USE OF AIR JETS SUBMERGED IN SAID CLEANSING LIQUID

Filed Aug. 9, 1949

2 Sheets-Sheet 2

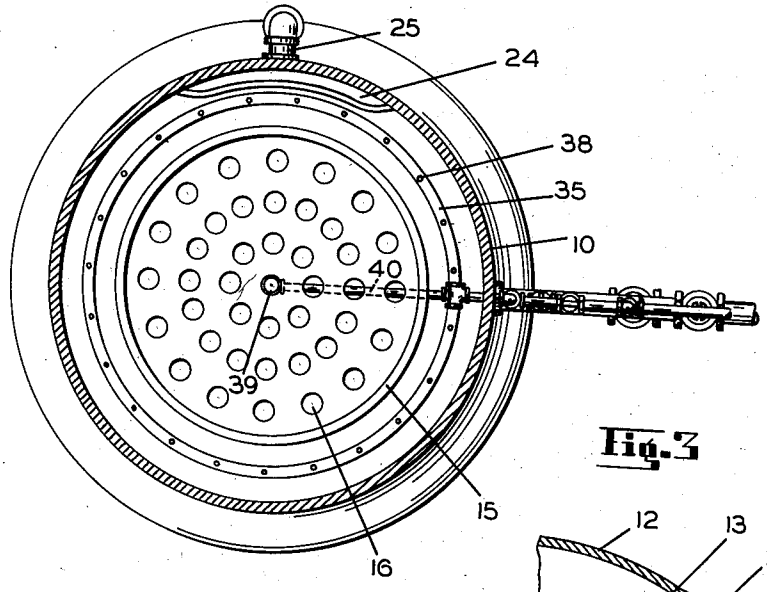


Fig. 3

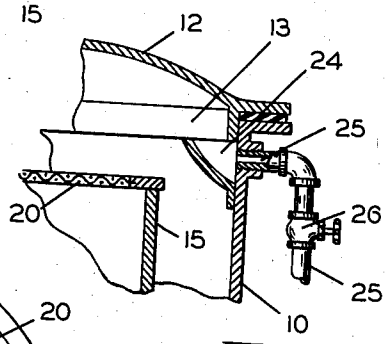


Fig. 5

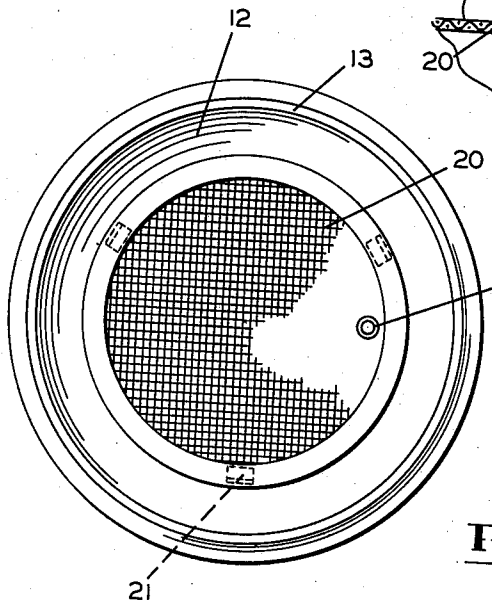


Fig. 4

INVENTOR.
JOHN BARNES

BY Christian R. Nielsen
ATTORNEY

Patented Sept. 8, 1953

2,651,191

UNITED STATES PATENT OFFICE

2,651,191

WASHING MACHINE FOR AGITATING CLOTHES AND CLEANSING LIQUID BY THE USE OF AIR JETS SUBMERGED IN SAID CLEANSING LIQUID

John Barnes, Milwaukee, Wis.

Application August 9, 1949, Serial No. 109,357

4 Claims. (Cl. 68—183)

1

My invention relates to washing machines and more particularly to an improvement in machines employed for domestic and commercial laundering and dry cleaning.

It is manifest to any one familiar with washing machines and dry cleaning equipment, that it is common practice to move the linens or clothes that are being processed, by mechanical agitation thereby removing the foreign matter from the clothes by means of the soap or chemicals suspended within the solution, and by the rubbing of the linens against the projecting members within the receptacle.

The object of my invention is to provide a device in which the linens are thoroughly agitated by the introduction of air through submerged jets.

Another object of my invention is to provide a means of bringing the soap and chemicals into contact with the entire surface of every garment or piece of linen, by means of agitating the garments, and the water, thereby causing contact of the garments one with the other.

Still another object of my invention is to eject the air from submerged jets at the top and bottom, at intermittent intervals to prevent tangling of the garments within the solution.

A further object of my invention is to remove the extraneous matter from the garments while they are suspended in the solution through their contact with one another.

A still further object of my invention is to provide a means of removing the fouled or soapy foam from the garments prior to the rinsing operation.

The device illustrated and described herein provides a means of soaking, washing and rinsing garments or linens within a single receptacle and facilitates ease of manipulation either manually or mechanically. The device may be horizontally or vertically disposed, and lends itself to laundering as well as dry cleaning. It is simple in construction, easily operated and efficient for the purpose for which it is intended.

Other and further objects of my invention will become more apparent as the description proceeds, when taken in conjunction with the drawings in which

Figure 1 is a fragmentary cross sectional view of a vertical cylindrical unit, illustrating the perforated container disposed inside of the receptacle, and showing the air agitation extending upward between the walls of the receptacle

2

and the container, thereby forcing the water upward to be brought downward in the center of the perforated container and to be re-circulated by means of the submerged air jets on the outside of the perforated container.

Figure 2 is a similar view of the device showing the air forced upward through the bottom within the central portion of the perforated container, thereby forcing the water to circulate downward between the container and the receptacle only to be forced upward again into the center of the container by means of the air.

Figure 3 is a fragmentary cross sectional view of the device taken at the line 3—3 in Figure 1.

Figure 4 is an inside or bottom view of the cover arrangement, showing the perforated engaging screen arranged to act as a top for the perforated container disposed within the outer receptacle, and

Figure 5 is a fragmentary cross sectional view of a portion of the device, taken at the line 5—5 in Figure 2 and illustrating the moat employed to drain the soiled, soapy foam off from the top of the solution prior to the rinsing operation.

Similar characters of reference indicate corresponding parts throughout the several views and referring now to the same; the character 10 shows a vertically disposed cylindrical receptacle supported at its bottom by a standard 11. The receptacle 10 is open at its upper end and is supplied with a cover 12 shown provided with an inwardly extending flange 13, and securely clamped to the upper edge of the receptacle 10 by means of the hinged clamp screws 14 or in any other convenient and efficient manner.

Obviously the receptacle 10 may be of any shape or contour, it may be rectangular, square, hexagon or round and it has, as shown, spaced apart from the inner face of its walls, a container 15 which is open at its upper end and supplied with apertures 16 in its bottom plate 17, and apertures 18 near the lower end of its side walls.

The container 15 is supported from the floor of the outer receptacle 10, by vertical standards shown as 19 which may be arranged in any convenient manner and the top of the container 15 is closed by the screen plate 20 which is supported from the inside of the cover 12 by the brackets 21. This screen plate 20 closes the upper end of the perforated container 15 when the cover 12 is applied to the top of the receptacle 10.

The cover 12 is shown provided with a vent 22

and a handle 23, obviously, as many vents may be employed as are found convenient or necessary, and the shape of the handle may be of any contour or design. The handle is merely a means to permit the manipulation of the cover during the loading and unloading of the container 15.

The inside of the side walls of the receptacle 10 are shown equipped with a moat or overflow 24, as indicated in Figure 5, this moat extends partially around the periphery, and drains through a tubular member 25 which is equipped with a valve shown as 26. The member 25 extends downward and connects with a drain pipe 27 which is provided with a valve 28 and which acts as a drain for the receptacle 10, at 29.

The receptacle 10 is further equipped with a water supply tube 30 which terminates from the hot water supply 31 which is provided with a valve 32 and from a cold water supply 33 which is provided with a valve 34.

There is a perforated tube 35 extending around the outer periphery of the container 15 at a point half way between the outer surface of the perforated container 15 and the inner surface of the receptacle 10. The tube 35 is disposed above the apertures 18 in the walls of the container 15, and is connected to a source of air pressure (not shown), by means of a tubular member 36 which is supplied with a valve 37.

The tube 35 has a plurality of apertures 38 which may be supplied with jets and which extend upward therefrom. A centrally disposed jet 39 is shown positioned below the bottom plate 17 of the container 15. This jet 39 is supplied from the same source of compressed air, by means of the tubular member 40 which is equipped with a control valve 41.

In operation the device functions as follows:

All valves 26, 28, 32, 34, 37 and 41 are closed. The cover 12 is removed which automatically removes the screen plate 20 from the top of the container 15. The soiled linens or garments are placed into the container 15 and the cover 12 is securely fastened to the open top end of the receptacle 10.

The valve 34 is opened to permit a supply of cold water to enter the receptacle 10 through the tube 30, and enough water is permitted to enter the receptacle 10, to bring the water line near the top of the container 15, the valve 34 is then closed. This will submerge the ports 38 in the air line 35 and the jet 39 in the air lines 40. The valve 37 in the tube 36 is next opened and the compressed air will be forced upward as indicated by the arrows in Figure 1, and will cause a flow of water over the outer walls of the container 15 into the container 10, to circulate through the bottom aperture 16 and the side apertures 18. If the valve 37 is closed and the valve 41 in the tubular member 40 is opened, a reversed flow or current is produced. In this manner the valves 37 and 41 will be alternately manipulated either manually or mechanically thereby causing agitation of the water and movement of the garments or linens suspended within the water. Obviously, the cold water may then be drained by means of the valve 28 in the drain tube 27. When this valve 28 is again closed the same operation will be repeated with hot water supplied through the tube 31 when the valve 32 is opened. The soap powder or chemicals can be placed into the solution by opening the cover 12 or may be supplied by injecting them into the water supply. The soiled soapy foam may be removed before rinsing by increasing the water level to the top of the moat 24 where it will be permitted to drain into the tube 27 when the valve 26 is opened.

The proper proportions of soap and water, the temperature of the water and the volume of air admitted, are obviously features that enter into the proper performance and efficiency of the device, however the arrangement as described will provide a means of properly moving the garments or linens suspended in the solution by agitation of the water, due to the compressed air escaping through the submerged jets or ports. This agitation will cause the soap or cleaning agent to contact all surfaces of the garments or linens held in suspension within the water, and by contact of the pieces being processed one with the other, it will cause all foreign matter to be removed from the clothes.

The device may also be employed for dry cleaning garments or the like, and the same solution may be recirculated and filtered when drained.

In the chosen embodiments of my invention there are features not heretofore revealed in the prior art, and although I have shown a specific arrangement of the component parts constituting the device I am fully cognizant of the fact that many changes in their form and configuration may be made without effecting their operativeness or without effecting the spirit of my invention or the scope of the appendant claims.

Having thus described my invention what I claim and desire to secure by Letters Patent in the United States is:

1. A device of the character described comprising in combination, a receptacle open at its top, a cover for said receptacle, a container provided with apertures around its outer wall near the lower end thereof and supported within said receptacle the top of said container being below the top of said receptacle, said container open at its top and of a dimension smaller than the inside diameter of said receptacle, a tubular water supply line entering said receptacle, a drain at the bottom of said receptacle, a perforated tubular member extending around the outer periphery of said inner container above said perforations in the wall of said container, a tubular member provided with a jet extending below said container, said jet centrally disposed below said container, said container provided with apertures through the bottom thereof, means for supplying compressed air to said tubular members, said tubular members, said water supply line, and said drain provided with controlling means for regulating the flow of air and water.

2. A device as described in claim 1, in which the inner wall of said receptacle is provided with an over flow moat equipped with a drain tube and valve.

3. A device of the character described comprising an outer shell open at its top and an inner shell open at its top, said inner shell being disposed within said outer shell and spaced therefrom, the top of said inner shell being below the top of said outer shell, a cover on the open top of said outer shell, said cover having a perforated screen suspended inwardly therefrom, said screen adapted to fit the open end of said inner shell, said inner shell being provided with apertures adjacent the lower end thereof, the bottom of said inner shell being provided with a plurality of apertures, said outer shell having a water supply line and further having a perforated tubular air supply line encircling the outer periphery of said inner shell and positioned above the apertures formed therein, said perforated air supply

line being disposed between the outer face of said inner shell and the inner face of said outer shell, and valves disposed within said water supply line and air supply line for controlling the water and air supply entering said outer shell.

4. A device of the character described in claim 3, in which the inner wall of said outer shell is provided with an overflow moat equipped with a drain tube and valve.

JOHN BARNES.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
642,460	Kersten	Jan. 30, 1900
655,717	Koppelmann	Aug. 14, 1900
780,133	Schirmer	Jan. 17, 1905
814,173	Stone	Mar. 6, 1906
1,014,243	Mills	Jan. 9, 1912
1,715,282	Dunham	May 28, 1929