Aug. 21, 1962 A. C. FREIRE 3,049,905

CLOTHES WASHING MACHINE HAVING SQUEEZING MEANS TO EXTRACT LIQUID

Filed June 28, 1960 3 Sheets-Sheet 1

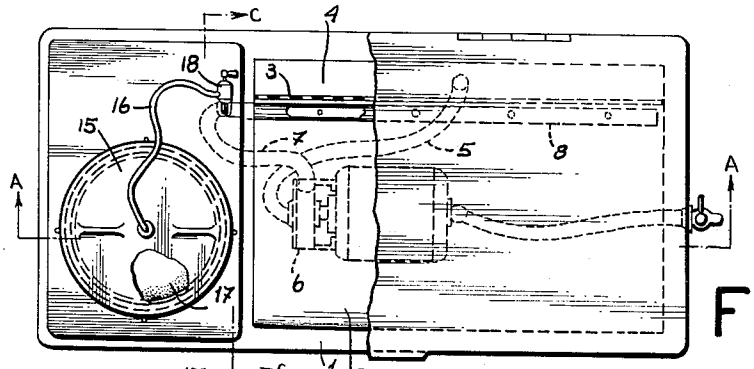


FIG. 1

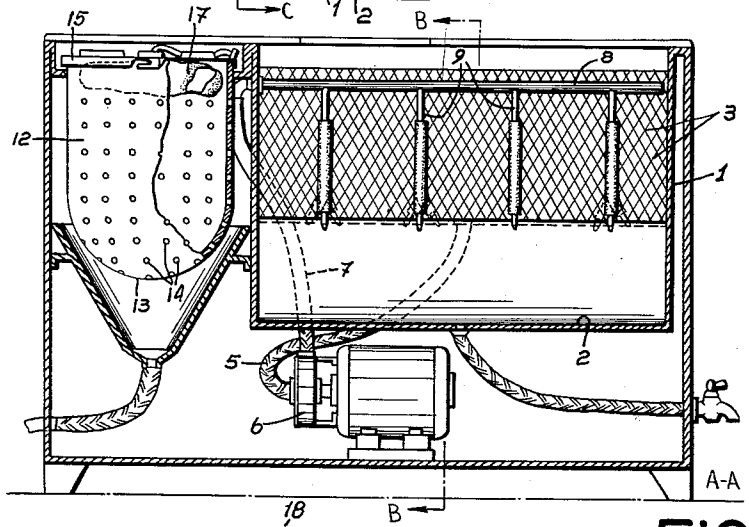


FIG. 2

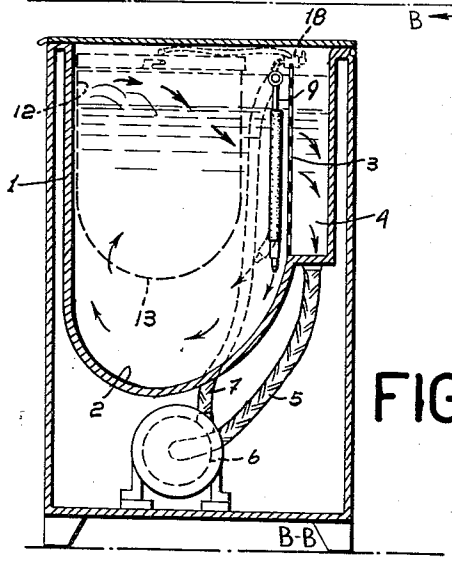


FIG. 3

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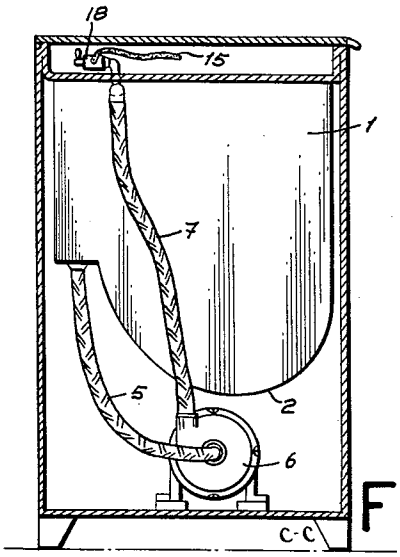


FIG. 4

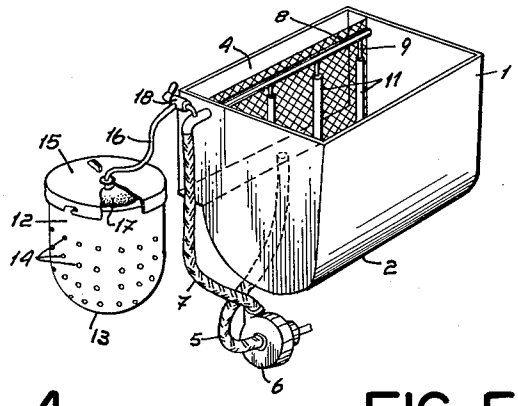


FIG. 5

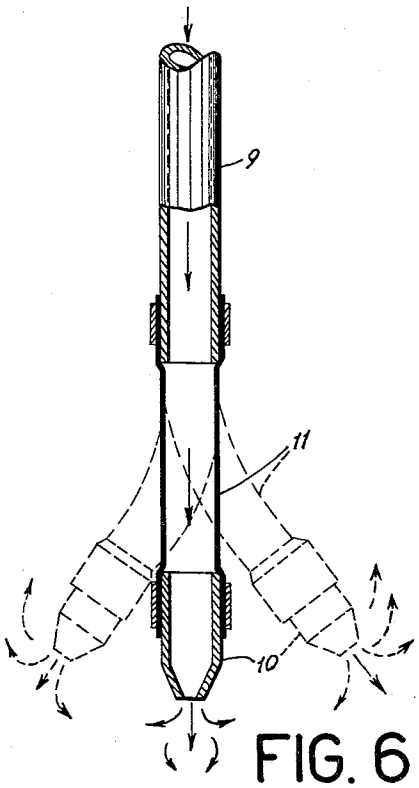


FIG. 6

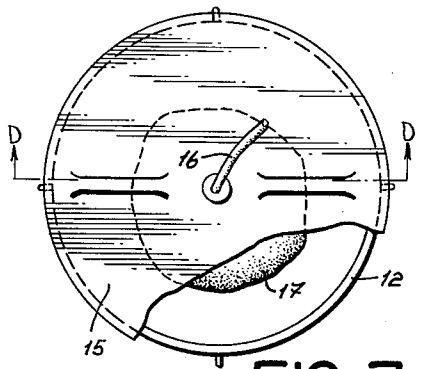


FIG. 7

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CLOTHES WASHING MACHINE HAVING SQUEEZING MEANS TO EXTRACT LIQUID

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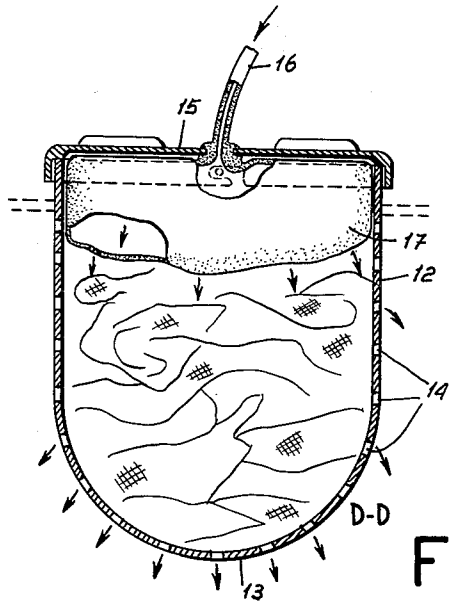


FIG. 8

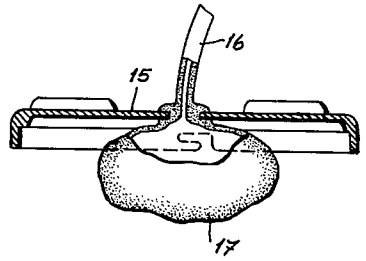
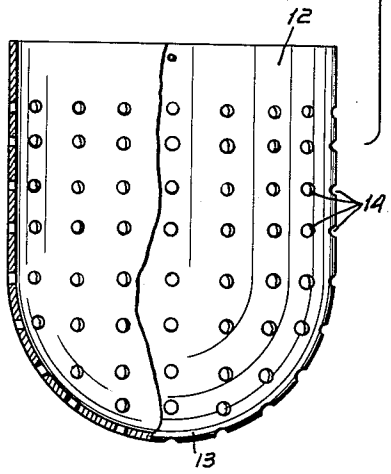


FIG. 9



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CLOTHES WASHING MACHINE HAVING SQUEEZING MEANS TO EXTRACT LIQUID

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8 Claims. (Cl. 68—21)

This invention relates to clothes washing machines.

The disadvantages of clothes washing machines of the conventional type are well known and include the following:

(*a*) They break down frequently;
(*b*) They need continuous and expensive maintenance;
(*c*) They are of complex construction;
(*d*) Their cost is high.

The object of the present invention is to provide a clothes washing machine, which is different from conventional assemblies by numerous characteristics, which make its use extremely advantageous.

An electrical pump, rotary or of any other conventional type, by means of oscillating ejectors, effects the circulation of water in a reservoir so that the washing of clothes results only from the movement of the water. The machine comprises a larger reservoir for washing separated by a screen from a small circulation reservoir. Therefore, the machine has no movable parts, and only the circulating water washes the clothes.

Another detail of the invention is a clothes wringing and drying device, of a simple but practical conception, operated by the same water pump used in the washing device of the assembly.

The invention will be described with reference to the accompanying drawings, illustrating an embodiment thereof in which:

FIG. 1 is a top plan view, partially in section, of the machine embodying the invention;

FIG. 2 is a section along the line A—A of FIG. 1 in the direction of the arrows;

FIG. 3 is a section along the line B—B of FIG. 2 in the direction of the arrows;

FIG. 4 is a section along the lines C—C of FIG. 1 in the direction of the arrows;

FIG. 5 is a perspective view of the assembly without its outer casing;

FIG. 6 is a detail, partially in section, of the swinging ejector used in the machine embodying the invention;

FIG. 7 is a top plan view, partially broken away, of the wringing drying device of the assembly;

FIG. 8 is a section along the line D—D of FIG. 7 in the direction of the arrows;

FIG. 9 is an exploded sectional side view, partially broken away, of the parts comprising the wringing drying device.

The machine is composed of a washing chamber or reservoir **1**, having a concave bottom wall **2** or lower part curved in a parabolic shape; the reservoir **1** communicates through divider means consisting of a net or perforated vertical plate **3** with another reservoir or filter chamber **4**, which is small, lateral and auxiliary, for circulation. This small lateral reservoir **4** communicates at its lowest point with the conduit or hose **5** providing a water outlet to a pump **6**, of suitable power and characteristics. The pump **6** forces the water through a hose or pipe **7** and an elongated header or pipe **8**. The header **8** is equipped with a plurality of vertical pipes **9**, whose free ends are near the curved bottom of the reservoir **1**.

Each one of the mentioned vertical pipes **9** forms part of an oscillating ejector or flexible nozzle **9**, **10**, **11**, whose object is that of producing a spray in an oscillating and irregular manner. It will be noted that the supporting base of the pipes **9** is stable.

FIG. 6 shows one of the above mentioned ejectors **9**, **10**, **11**. Each one of these ejectors consists of a pipe made of two metallic parts **9** and **10** of a suitable diameter, connected to each other by means of the interposition of a hose pipe **11**, of a corresponding diameter and a small length, made of latex, rubber or any other material having great flexibility. Through the ejector thus made of parts **9**, **10** and **11**, the water circulates.

The rapid discharge of the liquid under pressure by the header, owing to the elasticity of the pipe **11**, produces quick and erratic movements of the part **10**, which determines the path of the fluid current which goes out of the ejector. The flow is dependent on the dynamic equilibrium and the limits of the modulus or coefficient of elasticity of the material constituting the latex pipe **11**, which contracts and distends accordingly.

This ejector has the object of causing the interrupted flow of the liquid mass by swinging in all directions during the washing operation, creating flows of liquid with varying power and direction which, being in contact with the clothes, mechanically completes the cleaning and carries away the liberated dirt particles by the action of detergents and the emulsive power of soap.

The wringer means or wringing drying device comprises a cylindrical perforated container **12** with a curved bottom **13**, having small lateral holes **14** formed therein. A cap or cover **15** is fitted on the open top of the container by means of a bayonet, or any other type of fitting. The cap or cover **15** is formed with a central hole through which passes a flexible pipe or tube **16**, connected internally to a rubber chamber or bag **17** of smaller dimensions than those of the container **12**.

The pipe **16** is connected externally with a hand operated valve **18** to the pipe **7** of the pump **6**.

The operation of the assembly is as follows: the pump **6** sucks the water contained in the reservoir **1**, through the pipe **5**, forces it through the pipe **7** and header **8**, towards the ejector ends or nozzles described. The interrupted flow of the mass of water which contains the clothes to be washed thus performs the washing operation.

After this, the wet clothes are transferred to the wringing drying device, whose cap or cover is then closed.

By operating the valve **18**, a portion of the liquid in circulation is displaced through the tube **16** into the rubber bag **17**. The bag **17** dilates and compresses the clothes against the perforated side walls of the container **12** and its bottom wall **13**. The water is expelled from the clothes which are thereafter withdrawn from the assembly, practically dry.

It is thus apparent that the assembly described presents, among other advantages, the following ones: the space occupied is minimal; the cost of manufacturing is very small, chiefly in comparison with that of conventional machines; it does not require complex mechanisms which may easily become inoperative; it does not require any maintenance; the motor and the pump are securely mounted and are not subject to varying and unusual stresses and strains.

The machine is stationary, there being only movement of water, so that its maintenance is very easy, for there is, practically, no wear; there are no valves, joints or bushings, nor any other part movable in the midst of the liquid mass which, in a conventional machine, causes friction and consequent damage to the articles to be washed and which causes frequent obstruction and breakdown of conventional machines.

Having thus described my invention, what I claim is:

1. In a washing machine, in combination, reservoir means adapted to be filled with water to a predetermined level; divider means disposed in said reservoir means and forming a washing chamber and a filter chamber therein,

said washing chamber being adapted to receive articles to be washed and to receive water for washing said articles, said divider means adapted to pass only water between said washing chamber and said filter chamber; flexible nozzle means in said washing chamber extending below said predetermined level of water therein for injecting water into said washing chamber, said flexible nozzle means reacting from the pressure of the water issuing therefrom so as to swing and thus agitate the water and the articles to be washed to separate the dirt therefrom and to divert said articles from blocking said divider means while allowing the water to pass through said divider means; and pump means connected to said filter chamber for removing the water therefrom and connected to said flexible nozzle means for circulating the water from said filter chamber therethrough.

2. In a washing machine, in combination, reservoir means adapted to be filled with water to a predetermined level; a perforated partition disposed in said reservoir means and forming a washing chamber and a filter chamber therein, said washing chamber being adapted to receive articles to be washed and to receive water for washing said articles, said perforated partition adapted to pass only water between said washing chamber and said filter chamber; flexible nozzle means in said washing chamber extending below said predetermined level of water therein for injecting water into said washing chamber, said flexible nozzle means reacting from the pressure of the water issuing therefrom so as to swing and thus agitate the water and the articles to be washed to separate the dirt therefrom and to divert said articles from blocking said perforated partition while allowing the water to pass through said perforated partition; and pump means connected to said filter chamber for removing the water therefrom and connected to said flexible nozzle means for circulating the water from said filter chamber therethrough.

3. In a washing machine, in combination, reservoir means adapted to be filled with water to a predetermined level; divider means disposed in said reservoir means and forming a washing chamber and a filter chamber therein, said washing chamber being adapted to receive articles to be washed and to receive water for washing said articles, said divider means adapted to pass only water between said washing chamber and said filter chamber; an elongated header in said washing chamber; a plurality of flexible nozzle means in said washing chamber connected to said header and extending below said predetermined level of water therein for injecting water into said washing chamber, said flexible nozzle means reacting from the pressure of the water issuing therefrom so as to swing and thus agitate the water and the articles to be washed to separate the dirt and to divert said articles from blocking said divider means while allowing the water to pass through said divider means; and pump means connected to said filter chamber for removing the water therefrom and connected to said flexible nozzle means through said header for circulating the water from said filter chamber therethrough.

4. In a washing machine, in combination, reservoir means adapted to be filled with water to a predetermined level; divider means disposed in said reservoir means and forming a washing chamber and a filter chamber therein, said washing chamber being adapted to receive articles to be washed and to receive water for washing said articles, said divider means adapted to pass only water between said washing chamber and said filter chamber; an elongated header in said washing chamber; a plurality of flexible nozzle means in said washing chamber hanging freely from said header and adapted to swing haphazardly and extending below said predetermined level of water therein for injecting water into said washing chamber, said flexible nozzle means reacting from the pressure of the water issuing therefrom so as to swing and thus agitate the water and the articles to be washed to separate the dirt and divert said articles from blocking said divider means while allowing water to pass through said divider means; and pump means connected to said filter chamber for removing water therefrom and connected to said flexible nozzle means through said header for circulating the water from said filter chamber therethrough.

5. In a washing machine, in combination, reservoir means adapted to be filled with water to a predetermined level; divider means disposed in said reservoir means and forming a washing chamber and a filter chamber therein, said washing chamber having at least one side wall and being adapted to receive articles to be washed and to receive water for washing said articles, said divider means adapted to pass only water between said washing chamber and said filter chamber; an elongated header in said washing chamber adapted to receive a supply of water through the side wall thereof; a plurality of flexible nozzle means in said washing chamber hanging freely from said header, adapted to swing haphazardly and extending below said predetermined level of water therein for injecting water into said washing chamber, said flexible nozzle means reacting from the pressure of the water issuing therefrom so as to swing and thus agitate the water and the articles to be washed to separate the dirt and to divert said articles from blocking said divider means while allowing the water to pass through said divider means; and pump means connected to said filter chamber for moving the water therefrom and connected to said flexible nozzle means through said header for circulating the water from said filter chamber therethrough.

6. In a washing machine, in combination, reservoir means adapted to be filled with water to a predetermined level; divider means disposed in said reservoir means and forming a washing chamber and a filter chamber therein, said washing chamber being adapted to receive articles to be washed and to receive water for washing said articles, said divider means adapted to pass only water between said washing chamber and said filter chamber; flexible nozzle means in said washing chamber extending below said predetermined level of water therein for injecting water into said washing chamber, said flexible nozzle means reacting from the pressure of the water issuing therefrom so as to swing and thus agitate the water and the articles to be washed to separate the dirt therefrom and to divert said articles from blocking said divider means while allowing the water to pass through said divider means; pump means connected to said filter chamber for removing the water therefrom and connected to said flexible nozzle means for circulating the water from said filter chamber therethrough; and wringer means for squeezing moisture from the washed articles, said wringer means comprising a perforated container for receiving the washed articles, a cover means detachably secured to said container formed with an opening therein, and expansible bag means within said container having a tube protruding through the opening of said cover means and connected to said pump means for delivering a portion of the water circulated by said pump means under pressure to said bag means whereby said bag means expands under the pressure of said water and exerts pressure on the washed articles received in said container, squeezing the moisture therefrom and out through the perforations in said container.

7. In a washing machine, in combination, reservoir means adapted to be filled with water to a predetermined level; a perforated partition disposed in said reservoir means and forming a washing chamber and a filter chamber therein, said washing chamber having a substantially concave bottom wall and being adapted to receive articles to be washed and to receive water for washing said articles, said filter chamber having a bottom wall connected to the substantially concave bottom wall of said washing chamber along an edge of said concave bottom

wall, said perforated partition being adapted to pass only water between said washing chamber and said filter chamber; flexible nozzle means in said washing chamber extending below said predetermined level of water therein for injecting water into said washing chamber, said flexible nozzle means reacting from the pressure of water issuing therefrom so as to swing and thus agitate the water and the articles to be washed to separate the dirt and to divert said articles from blocking said perforated partition while allowing the water to pass through said perforated partition; and pump means connected to said filter chamber for removing the water therefrom, and connected to said flexible nozzle means for circulating the water from said filter chamber therethrough.

8. In a washing machine, in combination, reservoir means adapted to be filled with water to a predetermined level; a perforated partition disposed in said reservoir means and forming a washing chamber and a filter chamber therein, said washing chamber being adapted to receive articles to be washed and to receive water for washing said articles, said perforated partition adapted to pass only water between said washing chamber and said filter chamber; flexible nozzle means in said washing chamber adjacent said perforated partition extending below said predetermined level of water therein for injecting water into said washing chamber, said flexible nozzle means reacting from the pressure of the water issuing therefrom so as to swing and thus agitate the water and the articles to be washed to separate the dirt therefrom and to divert said articles from blocking said perforated partition while allowing the water to pass through said perforated partition, said flexible nozzle means also reacting from the pressure of the water issuing therefrom so as to swing and thus rub against said perforated partition to clean said partition and maintain the perforations in said partition free from lint and the like; and pump means connected to said filter chamber for removing the water therefrom and connected to said flexible nozzle means for circulating the water from said filter chamber therethrough.

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