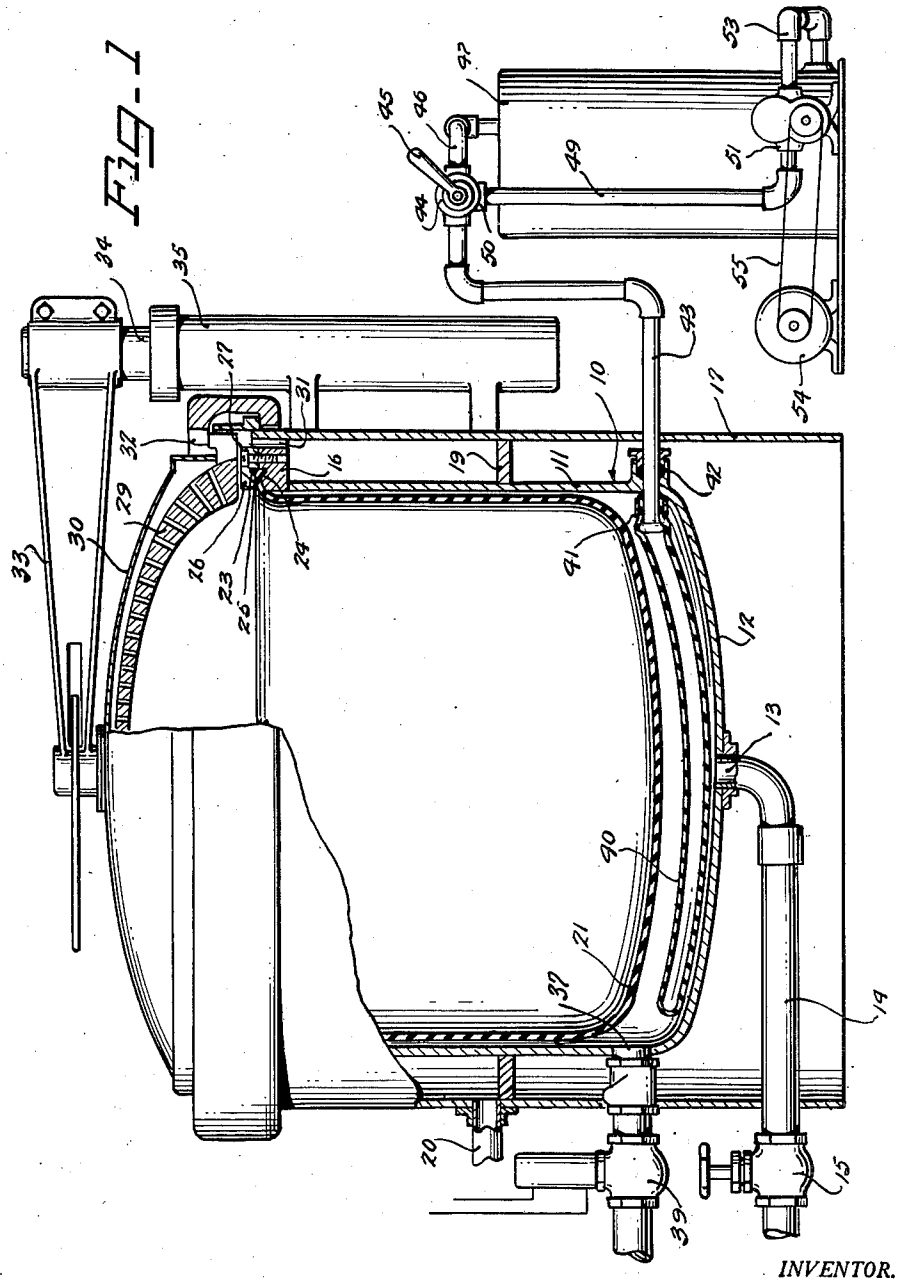
Dec. 24, 1957 H. KOPLIN 2,817,228

EXTRACTOR

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FIG. 1



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EXTRACTOR

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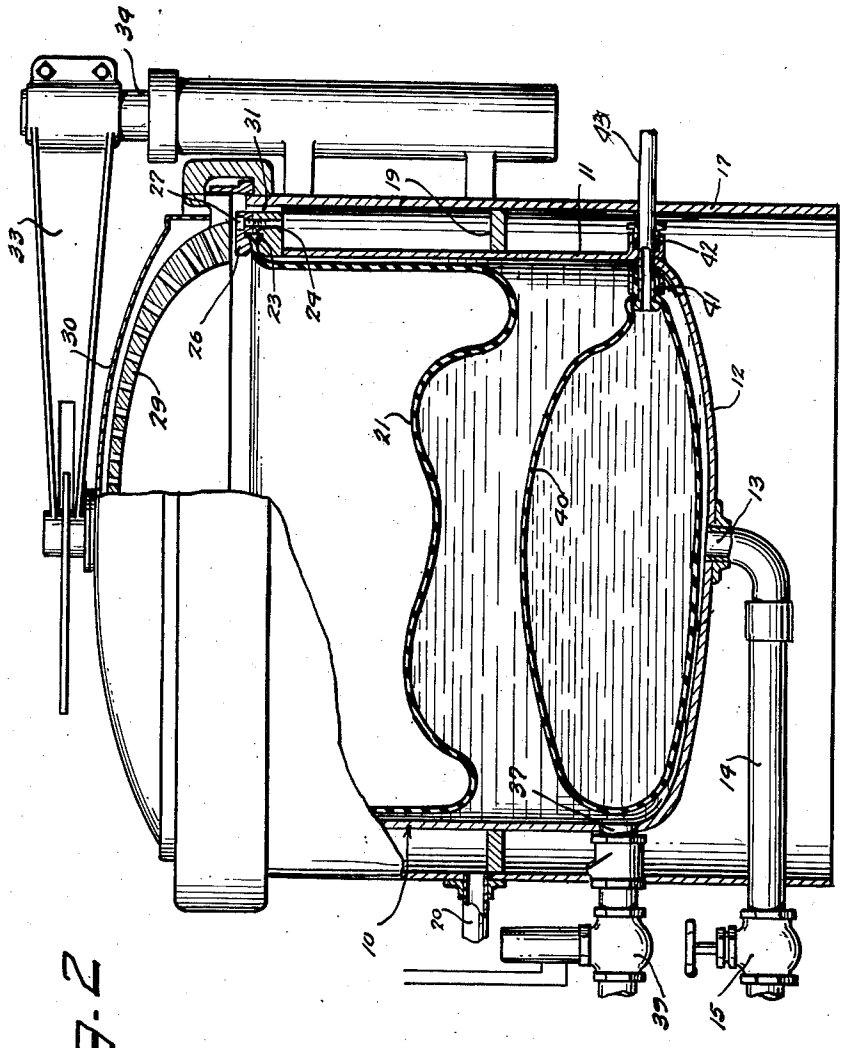


Fig. 2

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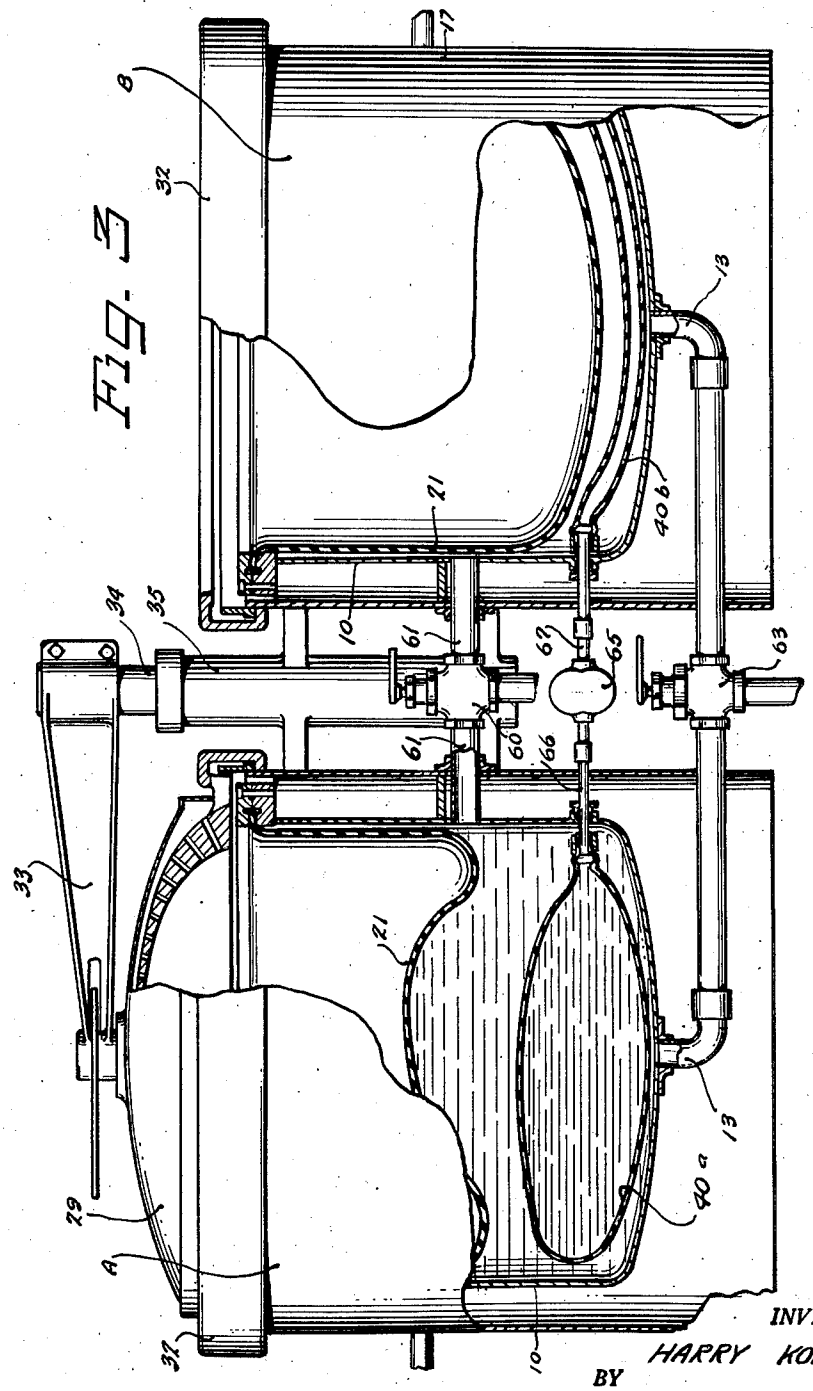
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EXTRACTOR

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Fig. 3



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2,817,228

EXTRACTOR

Harry Koplin, Glencoe, Ill.

Application April 18, 1955, Serial No. 501,989

6 Claims. (Cl. 68—242)

This invention relates to improvements in extractors of the type adapted to extract liquid from clothes by the application of pressure thereto.

A principal object of my invention is to provide an improved form of extractor for wringing liquids from clothes, fabrics or other materials by pressure, in which pressure is obtained for forcing liquid from the clothes or fabrics by the displacement of water against a flexible container.

Another object of my invention is to provide a pressure operated device for extracting liquid from clothes including a rigid container having a flexible clothes containing bag therein, in which the space between the container and bag is filled with liquid and in which the liquid is displaced to displace the bag to squeeze liquid from the clothes contained therein by means of an expansible member in the liquid in the container.

Still another object of my invention is to provide a simplified and improved means for supplying pressure to extract liquid from clothes or fabrics, in which a flexible expansible bag displaces liquid in a rigid container against the wall of a flexible container, to squeeze water from clothes or fabrics contained in the flexible container.

A further and important object of my invention is to provide a self contained pressure operated extracting unit particularly adapted for use in areas where water for supplying pressure to effect the extracting operation may be scarce.

A further object of my invention is to provide an extractor in which two flexible clothes containing bags contained in pressure applying containers are alternately operable to extract liquid from the clothes by pressure, and in which the means for supplying pressure for the extracting operation consists in expansible accumulator bags for displacing liquid in the pressure applying containers against the clothes receiving bags therein, and connected together through a closed fluid pressure system, whereby one bag forms an accumulator and storage container for hydraulic fluid for expanding the other bag.

These and other objects of my invention will appear from time to time as the following specification proceeds and with reference to the accompanying drawings wherein:

Figure 1 is a partial vertical sectional view taken through a pressure operated clothes extractor constructed in accordance with my invention;

Figure 2 is a fragmentary vertical sectional view somewhat like Figure 1, but illustrating the device in a condi- upper end, a portion of which extends within an upwardly

Figure 3 is a view showing two connected extractors like those shown in Figures 1 and 2 in which the means for displacing water in one extractor serves as an accumulator or storage tank for the other extractor.

In the embodiment of my invention illustrated in Figure 1 of the drawings, I have shown a rigid pressure container 10 in the general form of the deep tub having a generally cylindrical wall 11, a bottom wall 12 of a downwardly curved or concave form leading to a drain 13 connected with a drain pipe 14 and closed by a valve 15. The valve

15 may be of any suitable form, but preferably may be a quick opening valve to dump liquid from the container 10 and to relieve pressure therefrom.

The container 10 also has a relatively heavy annular flange 16 extending outwardly from the upper end of the wall 11, and secured at its outer edge to a cylindrical wall 17, supporting the container 10 in vertically spaced relation with respect to the ground.

In the space between the walls 11 and 17 and above the bottom 12 of the container 10 is a partition 19 extending entirely around the wall 11 and with the walls 11 and 17, forming a drain duct in the space between said walls for draining liquid, such as, water or cleansing fluid, extracted from the clothes, through a drain pipe 20.

Extending within the container 10 and terminating above the bottom thereof is a flexible clothes containing bag 21 which may be made of rubber, neoprene or a like-flexible material. The bag 21 has a flanged rim 23 at its upper end, a portion of which extends within an upwardly opening annular groove 24 extending about the upper face of the flange 16, and another portion of which extends within a corresponding downwardly opening annular groove in a retainer ring 26, secured to the flange 16 as by cap screws 27 and sealing the bag to the flange 16 and retaining the bag thereto.

A foraminous cover 29 extends over the bag 21 during the operation of extracting water from the clothes therein. The cover 29 has a shield 30 of a generally dome-like form extending thereover in spaced relation with respect thereto for conducting liquid expelled through said cover to flow downwardly through passageways 31 leading downwardly along the flange 16 and the inside of the cylindrical wall 17, for the discharge of liquid within the duct formed between the walls 11 and 17 and the partition 19 and out through the drain 20. A clamping ring 32 is shown as being provided to clamp the cover 29 in engagement with the retaining ring 26 during the clothes extracting operation in a manner well known to those skilled in the art so not herein shown or described in detail.

The cover 29 and shield 30 are supported for removal from the top of the flexible clothes container 21 as by a pivoted arm 33 mounted on the vertical shaft 34 pivoted within a generally cylindrical upright support bracket 35 spaced outwardly from and supported on the wall 17. The arm 33 and shaft 34 thus form a movable support for the relatively heavy cover 29 and shield 30, accommodating ready opening of the flexible clothes container or bag 21 to place clothes therein and remove clothes therefrom and accommodating the cover to be alternately used for a plurality of extractors as shown in Figure 3.

An inlet pipe 37 leads within the container 10 adjacent the bottom thereof for supplying liquid thereto, which may be water under city water pressure. A valve 39, herein shown as being a solenoid operated valve, is connected with the inlet end of the pipe 37 for controlling the supply of liquid to the container 10 and for holding liquid therein.

Referring now in particular to the novel means for displacing liquid within the container 10, to displace the clothes containing bag 21 upwardly along said container and force the clothes therein against the inside of the cover 29 to squeeze liquid from the clothes therein, an inflatable bag 40 is provided in the bottom of the container 10 in the space between the bottom 12 thereof and the bottom of the clothes containing bag 21. The bag 40 may be made from neoprene or any other like material which will not be affected by the hydraulic fluid, such as oil for inflating the same and is shown as extending substantially across the bottom 12 of the container 10. The bag 40 has an inlet neck extending along and sealed to a pressure conduit 43 by a sealing clamp 41. A suitable

sealing connector and packing gland 42 is provided to seal the conduit 43 to the wall 11. The sealing clamp 41 and packing gland 42 may be of any well known form to provide a leakproof joint capable of withstanding the high pressures necessary for extracting water from the clothes in the bag 40.

The conduit 43 is connected with a three-way valve 44, operated by handle 45. A conduit 46 leads from one outlet from the valve to a fluid storage tank 47 for returning oil thereto. Another conduit 49 is connected from an inlet 50 of the valve 44 to the pressure end of a pump 51, which is herein shown as being a well-known form of gear pump, but which may be of any form desired. A supply conduit 53 is connected from the storage tank 47 to the suction side of the pump 51, for supplying hydraulic fluid such as oil thereto. The pump 51 is shown as being driven from a motor 54 through a belt drive 55.

When the flexible clothes container 31 is filled with wet clothes and the valve 44 is in position to admit fluid under pressure to the flexible accumulator bag 40 through the conduit 43, the oil entering said bag will inflate the same and displace the liquid in the container 10 to displace the clothes containing bag 21 upwardly and force the clothes therein against the inside of the cover 29 and force liquid from the clothes contained within said clothes containing bag. Liquid forced from the clothes in the clothes containing bag 21 will flow through the foraminous cover 29 and downwardly along the passageways 31, to drain through the drain outlet 20 in an obvious manner.

At the end of the extracting operation, the valve 44 may be turned to a position to relieve oil under pressure therefrom and accommodate the oil therein to flow to the tank 41 through the return conduit 46. If desired pressure may be held in the bag 40 by turning the valve 44 in position to bypass fluid from the pump 51 to the tank 49 and hold fluid under pressure in the conduit 43.

When it is desired to rapidly relieve pressure from the clothes containing bag 21, the valve 15 may be opened to dump water from the container 11. While the valve 15 is shown as being manually operated, it is of course, understood that it may be power or solenoid operated if desired.

In Figure 3 of the drawings I have shown an extractor A and an extractor B, like the extractors shown in Figures 1 and 2, in which the storage tank 47 is eliminated and an accumulator bag 40*a* in one extractor forms a storage tank for oil for inflating a similar bag accumulator 40*b* in the other extractor. The bags 40*a* and 40*b* thus serve as accumulators for oil under pressure to be supplied to either bag.

In this form of my invention the extractors are of the same construction as shown in Figures 1 and 2, so the same part numbers will be applied to each extractor as were applied in the form of my invention shown in Figure 1, new part numbers only being applied to parts not illustrated in Figures 1 and 2, except for the inflatable accumulator bags, which have been designated by reference characters 40*a* and 40*b*.

The containers 10 may be connected with a source of liquid, such as, water at city pressure by means of a three way valve 60 and pipes 61, 61 leading therefrom and connected to supply liquid to an individual container to fill the same. The drains 13 may be connected to a common 3-way valve 63 operable to dump liquid from either container 10, as selected, to relieve pressure therefrom.

The accumulator bags 40*a* and 40*b* are connected with a common pump 65 by pressure conduits 66 and 67 respectively.

The pump 65 may be a well known form of reversible gear pump, which when driven in one direction will take fluid from the accumulator bag 40*a* and supply it to the accumulator bag 40*b*, and when driven in an opposite direction will take fluid from the accumulator bag 40*b* and supply it to the accumulator bag 40*a*. In this manner, each accumulator bag acts as an accumulator and storage tank for hydraulic fluid, and one extractor may be loaded while liquid is being extracted from clothes in the other extractor.

As herein shown, the cover 29 pivotally carried on arm 33 and shaft 34 may be used for both containers, and may be moved from one to the other by swinging movement from one container to the other as is usual with such extractors.

It will be understood that modifications and variations in the present invention may be effected without departing from the spirit and scope of the novel concepts thereof.

I claim as my invention:

1. A pressure applying device comprising a rigid container, a flexible container within said rigid container and having a rim sealed to said rigid container and a bottom spaced from the bottom of said rigid container to define a substantially liquid tight space between said containers, the space between said containers being filled with liquid, means for displacing liquid in the space between said containers and thereby exerting pressure against said flexible container comprising an expansible bag loosely carried in the space between said containers and surrounded by the liquid therein, and means for supplying fluid under pressure to expand said bag.

2. A laundry apparatus particularly adapted to dry clothes by wringing water therefrom by pressure comprising a rigid container, a flexible clothes containing bag within said rigid container and sealed thereto at its rim and spaced vertically from the bottom thereof to provide a pressure chamber between the outside of said clothes containing bag and the inside of said rigid container, a foraminous cover for said clothes containing bag, means clamping said cover to said rigid container, means for admitting liquid to said pressure chamber to fill the same, an expansible bag within said pressure chamber, contained in and surrounded by the liquid in said pressure chamber and freely movable with respect to said rigid and flexible containers and a pump supplying fluid under pressure to said bag for expanding the same to displace liquid in said pressure chamber and force said clothes containing bag and the clothes therein to move toward said cover to wring liquid therefrom.

3. In a pressure operated extractor, a rigid container having an open upper end portion defining a peripheral edge, a generally cylindrical wall and a bottom sloping toward and having a drain, a flexible clothes containing bag within said rigid container and extending along the wall thereof and spaced from the bottom thereof, means sealing said flexible clothes containing bag to the edge of said rigid container and forming a pressure chamber within said rigid container, a valve for controlling the flow of liquid from said chamber through said drain, a foraminous cover for said flexible clothes container, a second valve for admitting liquid to said pressure chamber to fill the same, an expansible accumulator bag in said pressure chamber surrounded by the liquid therein and free from said clothes containing bag, and a pump having fluid connection with said bag to expand the same and displace liquid in said pressure chamber to force liquid from clothes contained within said flexible clothes containing bag by pressure.

4. In a laundry apparatus for extracting liquid from clothes by pressure, a pair of rigid containers, a flexible clothes container in each of said containers, each clothes container being spaced from the bottom of its associated container and being sealed thereto at the upper end thereof to provide a sealed space between the bottom of each rigid container and flexible clothes container therein, means for admitting liquid to said rigid containers in the sealed spaces therein to fill the same, means for displacing liquid in said containers to supply pressure to wring liquid from clothes in said flexible container comprising an expansible accumulator bag in each rigid container contained in the liquid therein, and a closed hydraulic pres-

sure circuit connected between said accumulator bags for transferring hydraulic fluid from one bag to the other under pressure whereby one bag serves as an accumulator and storage container for the other.

5. In a laundry machine for extracting liquid from clothes by pressure, a plurality of rigid pressure containers, a flexible clothes containing bag in each of said containers and sealed to the rim thereof and spaced from the bottom thereof to provide a sealed space between the bottom of each rigid container and the flexible clothes container therein, a foraminous cover movable to close the top of either of said containers, means for admitting liquid to the sealed spaces in said containers to fill the same and to hold liquid therein, means selectively operable to displace liquid within said containers and to supply pressure to move a selected flexible container toward said foraminous cover to squeeze clothes thereagainst comprising in expansible accumulator bag in each container in the liquid therein, a closed fluid pressure circuit connecting said bags together whereby one serves as an accumulator and fluid storage tank for the other, and other means for releasing pressure from a selected rigid container comprising means for dumping liquid therefrom.

6. A pressure applying device comprising at least two rigid containers, a flexible container within each rigid container having a rim sealed to the associated rigid container, said flexible containers being spaced from the bottoms of said rigid containers and providing sealed spaces between said rigid containers and said flexible containers, means for admitting liquid in the sealed spaces in said containers, expansible means in each sealed space for displacing liquid in said sealed spaces and exerting pressure against said flexible containers, and a closed hydraulic circuit interconnecting each said expansible means for transferring hydraulic fluid from one expansible means to the other, whereby one expansible means serves as an accumulator and storage container for the other.

References Cited in the file of this patent

UNITED STATES PATENTS

1,988,468	Woodward	Jan. 22, 1935
2,042,378	Barge	May 26, 1936
2,056,466	Kauffman	Oct. 6, 1938
2,336,428	Watson	Dec. 7, 1943
2,423,878	Dawson	July 15, 1947
2,612,100	Bates et al.	Sept. 30, 1952

FOREIGN PATENTS

111,857	Australia	Nov. 1, 1940