

March 5, 1935.

W. H. YANDELL

1,993,201

CLOTHES DRYING APPARATUS

Filed March 21, 1927

3 Sheets-Sheet 1

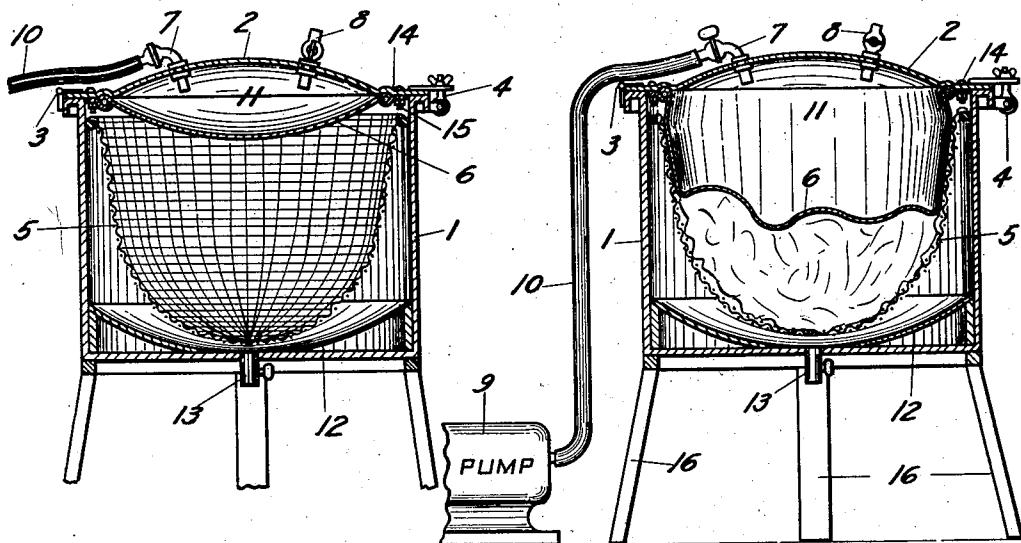


FIG-1

FIG-2

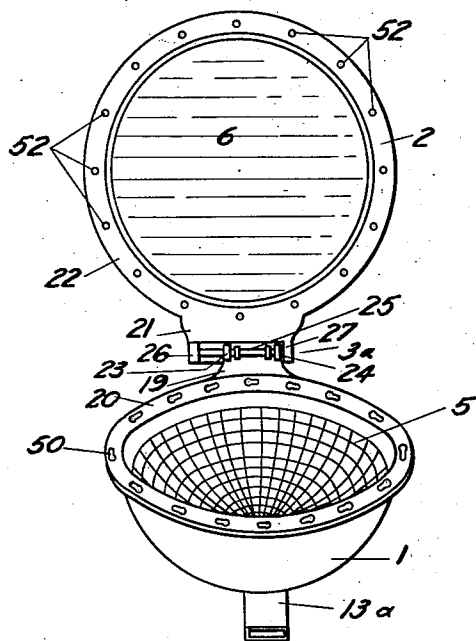


FIG-3

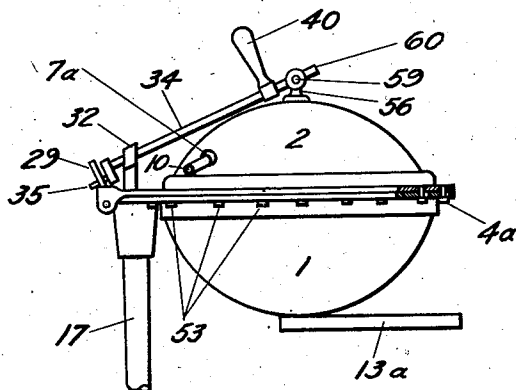


FIG-4

W. H. YANDELL INVENTOR

BY *Merrill M. Blackburn*
ATTORNEY

March 5, 1935.

W. H. YANDELL

1,993,201

CLOTHES DRYING APPARATUS

Filed March 21, 1927

3 Sheets-Sheet 2

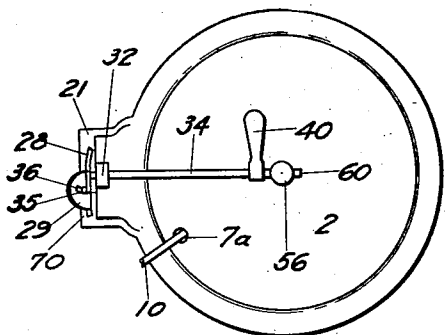


FIG-5

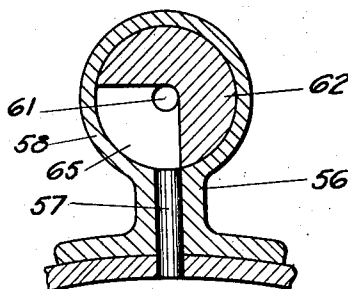


FIG-6

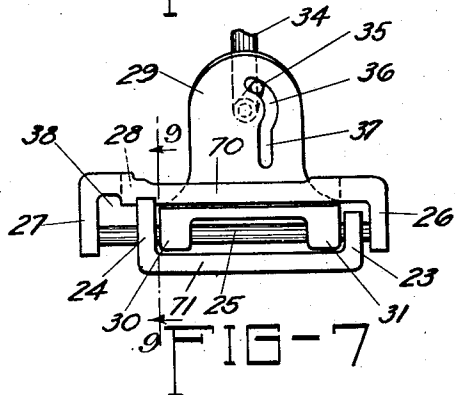


FIG-7

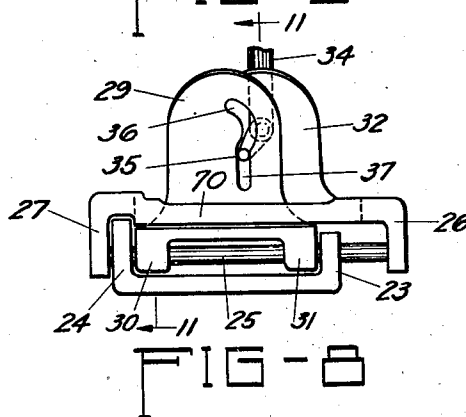


FIG-8

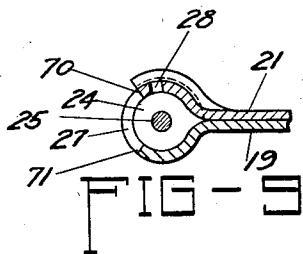


FIG-9

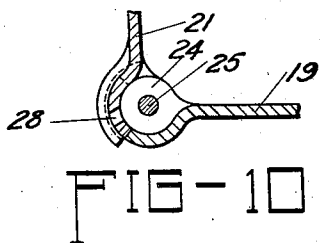


FIG-10

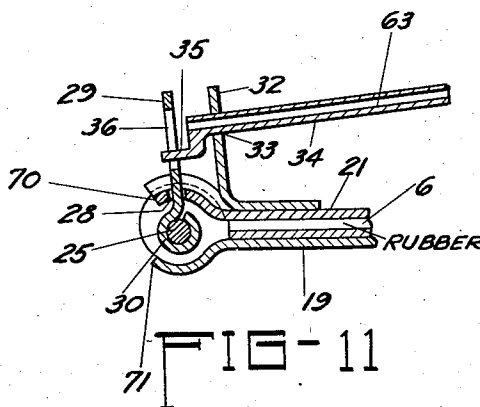


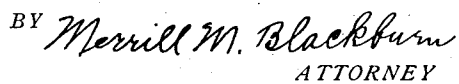
FIG-11

W. H. YANDELL INVENTOR

BY *Merrill M. Blackburn*
ATTORNEY

1,993,201

3 Sheets-Sheet 3



UNITED STATES PATENT OFFICE

1,993,201

CLOTHES DRYING APPARATUS

William H. Yandell, Joliet, Ill., assignor of fifteen
per cent to Williams, White & Company,
Moline, Ill.

Application March 21, 1927, Serial No. 177,163

50 Claims. (Cl. 100—50)

My present invention relates to apparatus for removing the greater portion of the liquid contained in clothing, during the operation of washing and drying the same. In the present specification and claims the term "clothing" is used to include wearing apparel, bed clothing, table linen and all other articles made of woven, crocheted or knitted thread or felted fibers or any other fabrics which have to be washed from time to time. The apparatus is designed for use in the laundries of either private homes or public clothes washing establishments and no limitation in this respect is therefore desired or intended.

Among the objects of my invention are to provide a novel substitute for and efficient mechanism to be used in place of clothes wringers, centrifugal extractors, and the like, the purpose of which is to remove the bulk of the water from a quantity of wet clothing. The present application is a continuation in part of my prior application Serial No. 650,535 filed July 9, 1923 and a continuation in part of my prior application Serial No. 16,938 filed March 20, 1925 and in part it comprises more recent developments of the basic idea disclosed in these two applications. By the use of a machine constructed in accordance with this invention it is possible to subject a quantity of clothing to an even pressure throughout the entire bulk thereof, irrespective of whether or not the clothing is carefully placed in the dryer, this being impossible with the ordinary type of dryer, that is, a roller wringer. Clothing passing through such a wringer unavoidably has wet spots therein when it leaves the wringer for the reason that it is impossible to have the same number of thicknesses of goods throughout the area of the clothing between the rollers and the rollers are not sufficiently plastic to permit the rubber to expand and come into contact with the articles passing between them. Also with a wringer of the roller type the articles are squeezed and stretched, often to their great harm, and buttons are torn off, not to mention also the danger of injury to the person using the wringer, notwithstanding the safety devices provided for the prevention of such injuries. When a centrifugal dryer is used the clothing must be carefully distributed about the axis of rotation of the rotatable clothes container in order to avoid the intense vibration which occurs when the holder is rotated at the necessary high speed required for such a process.

The present invention relates to a new method of drying clothing in which the water is pressed

from the clothing by fluid action against a flexible membrane which stretches and expands into contact with the wet clothing, exerting a substantially uniform pressure upon all parts thereof, irrespective of whether or not the clothing is arranged evenly in the dryer. With this method of drying there is no danger of pulling or tearing any clothing or any risk of tearing buttons therefrom. Also, there is no vibration such as described above and, in the more improved form of this invention, all danger of accidents has been removed.

My invention also resides in the combination, construction and arrangement of parts illustrated in the accompanying drawings and, while I have shown therein certain early developments of this invention and what is now considered the preferred form thereof, I desire the same to be understood as illustrative and not as limiting said invention.

In the drawings annexed hereto and forming a part hereof Figs. 1 and 2 show in sectional elevation one of the early forms in which my invention was reduced to practice, the former showing the machine not in use and the latter showing the machine with clothing enclosed therein and pressure being exerted upon said clothing to dry the same; Fig. 3 is a perspective view of another one of the early forms of my construction with the top or cover up to permit clothing to be inserted into the dryer or removed therefrom; Fig. 4 is a side elevation of the construction shown in Fig. 3 with the lid closed and in locked position but with the air exit from the dryer compartment open; Fig. 5, is a plan view of the structure shown in Fig. 4 but with the air valve closed in the position which it occupies when pressure is being built up on the clothing contained in the dryer; Fig. 6 is a transverse section through the exhaust valve upon the top of the dryer; Fig. 7 is an elevation of the hinge connecting the body and the top of the dryer and showing the mechanism for preventing the top from being raised until after the air has been permitted to escape from the dryer; Fig. 8 is a view similar to Fig. 7 but showing the parts in the position which they must occupy before the lid or cover can be closed; Fig. 9 is a transverse section through the hinge substantially along the plane indicated by the line 9—9, Fig. 7; Fig. 10 is a view similar to Fig. 9 but with the parts occupying the positions which they assume when the cover is raised; Fig. 11 is a fragmentary section showing the relationship of the hinge and its associated parts, this view being taken axially

through the pipe which carries off the air from the dryer and serves to cause relative motion of the body and top of the dryer in locking and unlocking the same; Fig. 12 is an elevation showing another form of my construction and illustrating its mounting upon a washing machine; Fig. 13 is an enlarged section of the dryer shown in Fig. 12; Fig. 14 is a bottom view of a fragmentary portion of the flange of the dryer, showing one of the openings utilized in the locking of the two parts together; Fig. 15 is a transverse section substantially along the plane indicated by the line 15—15, Fig. 14; Fig. 16 is an enlarged fragmentary view of the exhaust valve shown at the top of Figs. 12 and 13.

Referring more in detail to the annexed drawings, numeral 1 denotes the body or bottom portion of the dryer and 2 the top or cover portion thereof, these parts being hinged together in a suitable manner as indicated at 3 or 3a and held closed by suitable securing means 4 or 4a. Inside of the body 1 is a suitable clothes container 5 which may be made of wire netting, perforated sheet metal, or the like, but which I prefer to make of wire netting because I believe this to be the most desirable material. In the form of construction shown in Figs. 1 and 2 this clothing container is made in the form of a deep basket while that used in the construction shown in Figs. 3, 4, 12 and 13 is in the form of a shallow basket.

Secured to the underside of the cover 2 is a flexible distensible membrane 6 which may be a bag connected in air-tight relation to the inlet 7 and the outlet 8 (see Figs. 1 and 2) but I prefer to use a sheet of rubber as shown in my drawings and have it connected in air-tight relation with the cover 2 so that fluid may be pumped into the space between the cover 2 and membrane 6 to cause distension of the membrane as shown in Fig. 2 to press upon the clothing contained in the basket 5, irrespective of any and all irregularities in the surface thereof. While a liquid may be used to cause the distension of membrane 6, I prefer to use air pressure which is generated by a pump 9 drawing air from the atmosphere and forcing it through a connection 10 to the inlet 7 and through this into the chamber 11 between the top 2 and the membrane 6. After the desired pressure has been produced in the chamber 11, it is preferable to let the machine stand for a short time with this pressure therein so that the fluid may drain from the clothing onto the bottom 12 of the machine and from thence through the drain cock 13 to be caught in a suitable container and saved for further use or to be conducted to a suitable drain and be disposed of.

It is of course understood that after the pressure has been maintained in the chamber 11 for a sufficient length of time the valve 8 will be opened and the fluid in chamber 11 will be permitted to escape therefrom, thus reducing the pressure in that chamber to a point where there is no danger of breaking the membrane 6 when the cover 2 is unlocked and opened. It will be noted that Fig. 1 shows the membrane 6 as being somewhat loose and baggy while Fig. 13 shows this membrane as being tight before air is admitted to the chamber 11 to cause distension of the membrane 6. In the apparatus shown in Fig. 13, the membrane 6 normally has a certain amount of bagginess which disappears upon the cover being closed, as will be set forth more fully hereinafter. However, it will be under-

stood that the membrane 6 may be either tight or baggy as desired, it being considered preferable to have it somewhat loose when the cover is open, that is, in the position shown in Fig. 3. If desired the membrane 6 may be provided around its edge with a bead to be secured between the cover 2 and the clamping means 14 shown in Figs. 1 and 2. However, as shown in these two figures, a ring is placed against the membrane 6, after it is placed in position, and then the clamping means is put in place and tightened up to press this ring against the rubber, compressing the same between the ring and the top 2, thus securely holding the rubber membrane 6 in place. Bolts 15 form a part of the clamping means 14 and the nuts are tightened up on these bolts until a sufficient pressure is placed upon the rubber to hold it in position, even under the tension which is caused by the fluid in the chamber 11.

In Figs. 1 and 2 the dryer is shown as a separate unit supported upon suitable legs 16, while in Figs. 4, 12 and 13 it is shown as supported by a pipe 17 mounted in any desired manner, as, for example, at the corner of a washing machine 18. This device may be made and sold as a separate unit having its own legs or it may be mounted upon a washing machine as shown, or it may be made and sold as an independent unit of the type illustrated in Fig. 12 to be applied to any washing machine or even to be mounted upon a stub shaft secured in proximity to wash tubs, stationary or otherwise. It will of course be obvious that it is not limited in its use to any particular location or under any particular conditions.

For purposes of safety it is desirable that the pump 9 shall not be capable of producing a greater pressure than a given maximum or, at least, that it shall be provided with means to adjust the pressure which it can produce so that not more than a safe maximum pressure shall be produced during the operation of the machine. I prefer to use a pump which can not produce a pressure of greater than 70 to 75 pounds. In conjunction with this I use an automatic stop which limits the pressure to any desired amount and which is adjustable to stop the pump at the desired pressure. However, this is subject matter for another application and is therefore not disclosed in the present application.

In the forms of construction disclosed in Figs. 3 to 15 the part 19 of hinge 3a is formed integral with or is secured to the flange 20 of the body or bowl 1 and the part 21 of said hinge is similarly formed integral with or secured to the flange 22 of the top 2. On the part 19 are formed ears 23 and 24 through which passes a pintle 25 which constitutes the axis of rotation of the hinge. Ears 26 and 27 are formed on the part 21 and the pintle 25 passes through these also, thus completing the hinge. The inside space between the ears 26 and 27 is greater than the outside space between the ears 23 and 24. It is thus possible for these parts to slide relatively to each other. An arcuate slot 28 is formed in member 21 (see Fig. 5) and an arm 29 which surrounds the pintle 25, as shown in Fig. 11, extends upwardly through this slot to assist in the relative movement of the parts 1 and 2 by causing relative movement of the ears 23, 24 and 26, 27. The ears 30 and 31 of the part 29 are bent around the pintle 25 and laterally engage the ears 23 and 24, as shown in Figs. 7 and 11. An arm or bracket 32 is rigidly se-

cured to the part 21 of the hinge and is perforated at 33 for the reception of a hollow rotary shaft 34 which carries at its rearward extremity a crank 35 which extends through a slot 36 in the arm or bracket 29. The upper portion of the slot 36 is arcuate, the center of the arc being in alignment with the axis of the shaft 34. Thus, when the crank 35 is at the upper limit of its motion and starts downwardly, it causes no relative shifting of the parts 29 and 32. However, when the crank 35 reaches the end of the arc and starts into the straight portion 37 of the slot it immediately begins to cause relative motion of the parts 29 and 32. This causes relative shifting of the parts 19 and 21 of the hinge, resulting in relative rotational movement of the bowl and cover of the dryer. In order to permit easy movement of the parts, the pintle 25 is slightly arcuate in form, though this is not absolutely necessary by reason of the fact that the entire rotational movement amounts to only approximately $\frac{1}{8}$ of an inch. A notch is formed in the upper end of the ear 24 to permit the same to slide along the bar connecting the ears 26 and 27. This is best illustrated in Fig. 7. A notch 38 permits relative rotation of the ears 24 and 27, when the former is adjacent the latter as shown in Fig. 8. However, when the ear 24 is out of this notch as shown in Fig. 7, it is impossible that there be relative rotary movement of these parts. Therefore, if the cover 2 is in elevated position as shown in Fig. 3, it will be impossible to take hold of the crank 40 and rotate the shaft 34 to cause relative rotary movement of the body and cover. However, when the top or cover 2 is closed as shown in Fig. 4 the shaft 34 can be rotated and will then cause relative rotary movements of these parts as explained above.

In this construction an inlet 7a is connected with the cover and admits the fluid pressure to the space 11 while a drain spout 13a is provided through which the liquid expressed from the clothing may be drained into a washing machine, a wash tub, bucket or other suitable receptacle. This drain spout 13a is rotatable about a cylindrical flange 41 on the bottom side of the body 1. As shown in Fig. 13 it is preferable to have some sort of soft gasket 42 between the drain spout 13a and the body 1, thus reducing to a minimum the friction and wear between these parts. In this form of construction an arm or bracket 43 is secured to the body or bowl 1 and surrounds the supporting shaft 17 to serve as a means for assisting in holding up the weight of the dryer and clothing contained therein. A resilient arm 44 is pivoted at 45 on the arm 43 and carries a stop 46 to limit the swinging movement thereof in one direction. This stop is desirable though not necessary. A projection 47 is formed upon the arm 44 and engages in a corresponding depression in the under side of the drain spout 13a. This arm 44 serves to hold the drain spout in place but it can readily be turned upon its pivot so as to permit the drain spout to be removed from the flange 41. The projection 47 being located axially with relation to the flange 41 it is possible to rotate the spout 13a without any binding of parts. In the form of construction shown in Figs. 3 and 4 the drain spout is secured to the flange by being screw-threaded thereon. This makes it possible to rotate the drain spout with relation to the body 1 and also to remove the spout from the body when this is desirable.

By referring to Figs. 3 and 14 it will be noted that the flange 20 of the body is provided with key-hole slots 50 into the circular end 51 of which the lugs 52 enter. Upon rotation of the parts 1 and 2 with relation to each other the lugs or pins 52 enter the narrow part of the slots 50 and the heads 53 of the lugs can then not be pulled upwardly out of engagement with the flange 20. As shown in Figs. 14 and 15 a slight depression 54 is formed on the under side of the reenforcing ring 55 for the reception of the heads of the lugs or pins 52. When the fluid pressure in the chamber 11 tends to cause separation of the parts 1 and 2 the heads of these pins engage in the depressions 54 and make it impossible to relatively rotate the parts 1 and 2. It is therefore necessary to wait until the pressure has been sufficiently relieved from the chamber 11 so that such rotation can be caused. When this is done, there will be no danger in turning the shaft 34 or 34a as there will then not be sufficient pressure in the chamber 11 to burst the diaphragm 6 in event the dryer is unlocked.

In the constructions shown in Figs. 3 to 13 a post 56 is secured to or integral with the top of the cover 2. As a matter of economical construction, it is believed best that this be secured to the cover as shown in Fig. 6. This can be done in any suitable manner as by brazing or electric welding. A channel 57 extends from the interior of the cover through the post 56 to a transverse opening 58 into which the air from the chamber 11 may be vented. Various ways for getting rid of this air are available. For example, a lateral opening from the channel 58 may lead out through the wall of the post 56 as shown at 59 in Fig. 4. If desired, a longitudinal opening through the end 60 of the shaft 34 might be provided. However, it is not considered desirable to have this vent opening exposed, as a child playing around the machine might cover such opening with a finger and prevent the air from being vented through such opening. If this were done when the cover 2 is up and the pump 9 operating, it would cause the membrane 6 to be exploded. In order to provide against this, I have made a longitudinal opening 61 substantially axially of the valve core 62 permitting the air which passes through the openings 57 and 61 to escape into the axial opening 63 of the tube 34 or 34a. This air will then be vented out through the end of this tube at 64 which is covered by the plate 29 so that it will be impossible to get at and cover up this opening with a finger. Therefore, if the pump is operating and the dryer is open, the air will pass outwardly through openings 57, 61 and 63 and escape without danger to the diaphragm 6.

As shown in Figs. 6 and 16 an opening of approximately 90° is cut through one wall of the valve core 62 to permit the escape of air through the openings 57 and 61 from a time when the handle 40 reaches a point nearly vertical until it reaches the limit of its unlocking motion. This prevents any building up of pressure in the chamber 11 during any time that the dryer is unlocked. It will of course be understood that in order to transmit motion from the handle 40 to the hollow shaft 34a it will be necessary that the connection at 66 be of non-circular cross section. However, the surfaces at this connection will be sufficiently rounded so that this will have somewhat the action of a universal joint, thereby permitting rotation, notwithstanding the angular relation of the parts with respect to each other.

When the handle 40 is in horizontal position as shown in Fig. 5 the crank 35 is near the top of slot 36 as shown in Fig. 7 and the cover and bowl are in locked position, with opening 57 closed.

When the handle 40 reaches the vertical position the core 62 will be substantially in the position shown in Fig. 6 with the vent opening unobstructed so that air may vent from the chamber 11 to the exterior at the point 64. When the handle 40 is turned 90° further, the opening 57 still communicates with the opening 65 and the air continues to be vented as before, so that it is impossible to start the pump going and build up a pressure in the chamber 11. Fig. 5 shows the position of the parts when the body and cover are fully locked and the air vent closed while a rotation of handle 40 and shaft 34 through substantially 180° results in opening the vent and completely unlocking the cover.

It is obvious that the locking operation will be just the opposite of what has been described above. In other words, starting with the cover in the position shown in Fig. 3 and with the clothing placed in the dryer body, the cover is lowered into closed position and the handle 40 raised to the position shown in Fig. 4. This operation rotates the cover relatively to the body until the locking elements are completely engaged with the small portion of the key-hole slots 50. Further turning of the handle 40 toward the position shown in Fig. 5 starts to close the exit 57 from the chamber 11 and, when the handle is in the position shown in Fig. 5, the opening is entirely closed and there will be no leakage of air through 57, 60 and 63. The top or cover is therefore necessarily closed and locked before the opening 57 can be closed and before pressure can be built up in the chamber 11.

Although not so stated above, it is clear that the membrane 6 may be either tight as shown in Fig. 13 or loose and baggy as shown in Fig. 1. It is considered preferable to have it somewhat baggy in the types of construction shown on sheet 1 of the drawings and to have it tight in a construction of the type shown in Fig. 13. The reason for the tightness in Fig. 13 is that it makes a more effective seal where the rubber is pinched between the cover 2 and the ridge 73, formed by bending a bead on the body as shown in Fig. 13. This bead is reinforced by a ring 74 which is placed within the bead and securely held therein in any desired manner, such as by being held therein by the reinforcing ring 55. In this construction, the stretching of the rubber over the bead 73 assists in forming a tight joint at this point to keep the water from leaking through the joint in event it should not run out of the pipe 13a fast enough.

A cross bar 70, constituting a part of member 21, and connecting ears 26 and 27, engages at 71 with the extremity of member 19 as best shown in Fig. 10 to prevent the cover from being turned too far over, when the dryer is opened.

Various modifications of the basic idea here set forth are possible but the structure disclosed is considered preferable to any such modifications. For example, the cover, instead of being hinged to the body, may be entirely detachable therefrom and may be provided with means for securing it in place. This cover may have the diaphragm secured to it as here shown or the membrane may be secured to a ring and be entirely free from the body and cover, the two parts each having a slight groove for the reception of the

ring so that, when the parts are clamped together, the rubber and ring will act as a seal between them and prevent the escape of fluids, either liquids or gases, at the joint. Another possible but probably undesirable construction would be a cover similar to that shown in Figs. 3 to 13 permanently secured to a body mounted on trunnions so that it could be turned over. This body would have a cover which could be removed to permit the clothing to be inserted in the body. A perforate container would then need to be put over the clothing to keep it away from the walls of the dryer. The cover now being placed on the body, the dryer could be operated either side up. A suitable drain opening or openings would need to be provided for escape of water from the dryer as it is pressed out of the clothing. The primary difficulty with this construction is that it would not permit the removal of the diaphragm when worn out, unless the cover and body were detachably connected. It is not considered necessary or desirable to refer to any others of the contemplated modifications and further reference is therefore omitted.

It is of course understood that the specific description of structure and method set forth above may be departed from without departing from the spirit of my invention as set forth in this specification and the appended claims.

Having now described my invention,

I claim:

1. A device of the class described, comprising a receptacle, and a cover therefor, said parts being provided with interlocking devices capable of being engaged with each other upon a partial rotation of the cover on the receptacle, a hinge uniting said parts so as to permit a limited movement of the cover with relation to the receptacle, and means for preventing such movement while the cover is in an open position.

2. A device of the class described, comprising a receptacle, and a cover hingedly connected therewith, the hinge connection being constructed to permit a limited rotary movement in the plane of the cover with relation to the receptacle, cooperating locking means carried by said receptacle and cover, and capable of being engaged or released upon such rotary movement of the cover, and means constituting a part of the hinge for preventing the turning of the cover upon its hinge except when said locking means are in fully released position.

3. A device of the class described, comprising a receptacle and a cover hingedly connected therewith, said parts being provided with interlocking devices capable of being engaged with each other upon a partial rotation of the cover on the receptacle, a hinge uniting said receptacle and cover so as to permit a limited amount of rotation of the cover on the receptacle, means connected with said hinge for preventing the turning of the cover on its hinge except when the interlocking means are in fully released position and for preventing rotation of the cover while it is in an open position.

4. In a device of the class described, a receptacle designed to receive a fluid supply, under compression, said receptacle being formed of two parts provided with interlocking means capable of engagement upon movement of one of said parts with relation to the other, a hinge connection for said parts permitting a limited movement of one thereof with relation to the other, an exhaust valve connected with one of said parts,

and means necessitating opening said valve preceding the separation of said parts.

5 In a device of the class described, a receptacle, formed of two separable parts, provided with interlocking means capable of engagement upon movement of one of said parts with relation to the other, hinge mechanism connecting said parts so as to permit a limited movement of one thereof with relation to the other, means connected with said hinge for causing the movement of one of said parts with relation to the other one thereof, a relief valve in one of said parts, and an operating device connecting said relief valve with said last-named means, so that an initial movement of said operating device will open said valve, and a continued movement thereof release said interlocking means.

6. A device of the class described, comprising a bowl-shaped receptacle, provided at its circumference with interlocking devices, a dish-shaped cover therefor, having cooperating interlocking devices at its circumference, capable of engaging with said first-named devices upon a limited rotation of the cover on said receptacle, a fixed hinge member at one side of said receptacle, a relatively movable hinge-member secured to said cover, shift devices associated with said hinge members, a release valve on said cover, and an operator's rod attached at one end to said shift devices and at the opposite end to said valve, an initial movement of said rod operating to open said valve, and a continued movement thereof actuating said shift devices to disconnect the interlocking devices on said cover and receptacle, the valve remaining open during such continued movement and until the cover is again locked in place.

7. A device of the class described, comprising a receptacle and cover therefor, provided on their rims with interlocking devices, and adapted to receive a charge of fluid under compression, a stationary hinge member at one side of said receptacle, a movable hinge member secured to said cover, a release valve on said cover, an operator's rod connected with said release valve, and operatively connected with the movable hinge member, to shift the position thereof, said shifting movement following the opening of said valve, and means on said hinge members for preventing swinging movement of the cover on its hinge except when the interlocking devices are fully disengaged.

8. A device of the class described, comprising a receptacle and cover therefor, provided on their rims with interlocking devices, capable of being engaged or disengaged upon a partial rotation of the cover, a hinge member fixed to said receptacle, a cooperating hinge member secured to said cover, and having a limited movement on said first-named hinge member, to permit a partial rotation of said cover, shift mechanism for operating said movable hinge member, a release valve on said cover, an operator's rod connecting said shift mechanism, and valve, adapted to open said valve preceding the movement of said shift mechanism, and interlocking mechanism on said hinge members for preventing the movement of one hinge member with reference to the other or the operation of said rod to close said valve, while the cover is in an open position.

9. In a device of the class described, a receptacle and cover therefor, provided with interlocking means whereby said parts may be rigidly held together by a partial rotation of the cover, hinge mechanism uniting said parts so as

to permit a limited rotation of said cover, a shift plate supported on said hinge mechanism, so as to tip rearwardly with the cover, and provided with a vertical slot, a relief valve on said cover, and an operator's rod having a crank connection with said slotted plate, and forming the stem for said valve, the initial movement of said rod operating to open said valve, and a secondary movement thereof turning said valve to a farther open position and actuating said shift-plate to disconnect said cover and receptacle.

10. A device of the class described, comprising a receptacle, a cover hingedly connected therewith, interlocking devices on said parts capable of being engaged with each other upon a partial rotation of the cover on the receptacle, a hinge uniting said receptacle and cover so as to permit a limited amount of rotation of the cover on the receptacle, and means for preventing closing of the cover until the parts are in such position that the interlocking means can be brought into registry upon swinging the cover to closed position, said means preventing rotation of the cover while it is in open position.

11. In a clothes dryer, a receptacle comprising hollow parts hinged together and having interlocking means capable of engagement upon movement of one of said parts relatively to the other, the hinge mechanism connecting said parts being so constructed as to permit a limited movement of one thereof with relation to the other, venting means connected with the cover for permitting fluid to escape therefrom, said venting means including a rotary valve member, in combination with a connection between the rotary valve member and the hinged parts such that the vent openings will be opened before the hinged parts are moved with relation to each other into unlocked position.

12. A laundry apparatus for the extraction of water from wet clothing comprising a substantially spherical shell composed of parts, one part having an inlet and the other part an outlet, a flexible diaphragm mounted substantially in the separating plane of the parts in a manner to provide a liquid-impervious partition between the inlet and the outlet, said diaphragm dividing the interior of the shell into a pressure-receiving space into which said inlet opens and a clothing-receiving space from which said outlet leads, and the diaphragm having sufficient flexibility and distensibility to permit either of said spaces to become substantially coextensive with the full internal volume of the shell, said diaphragm being secured to one of said shell parts adjacent its outer edge; and said shell having provisions for being opened to receive wet clothing in said clothing-receiving space.

13. A laundry apparatus for extraction of water from wet clothing comprising a substantially spherical shell composed of substantially semi-spherical parts, one part having an inlet and the other part an outlet, and a water impervious flexible and elastic diaphragm arranged substantially in the separating plane of the parts and dividing it into two chambers, into one of which chambers the inlet opens and from the other of which the outlet leads, said diaphragm being adapted to be set over toward either the inlet or the outlet and being secured to one of the shell parts at or approximately at its outer edge in air-tight relation.

14. A laundry apparatus for the extraction of water from wet clothing, comprising a curved hollow shell having means for opening and clos-

ing it to receive and confine wet clothing, said shell being composed of two similar parts, each forming substantially one-half of the complete shell, one part having an inlet for pressure fluid 5 and the other part a water outlet, and a flexible diaphragm arranged substantially in the separating plane of the parts to divide the interior of the shell into two chambers, said diaphragm being water impervious, elastic and resilient, having sufficient bagginess to permit it to recede into 10 that side of the shell in which said inlet opens and being secured to the top shell part at its outer peripheral portion.

15 15. In a clothes dryer, body and cover portions hingedly connected, said body portion having a bead around its upper edge and said cover having an elastic membrane secured to the edge thereof adjacent the body member, said membrane being adapted to be flexed into either the 20 body or cover and being adapted to engage the bead on the body member to constitute a seal between the body and cover members, said body member having a reinforcing member inserted into and held in the bead to strengthen the upper 25 edge of the body member.

16. In a dryer having a body member provided in its lower portion with a drain opening and a flange surrounding the same, a drain spout having an opening in one face thereof surrounding 30 the flange, and resilient means for holding the drain spout in position to receive water drained from the body member through said opening.

17. A dryer comprising body and cover members, said cover member having a chamber therein for the reception of air under pressure and having one wall thereof adapted to be distended by such pressure, said cover having a vent opening outwardly and a valve member controlling 40 said vent, said valve member being rotatable and permitting venting of air during one portion of its period of rotation and preventing such venting during another portion of its period of rotation, in combination with locking means for locking 45 the body and cover members in closed position, and connections between the valve member and the locking means such that the locking means cannot be unlocked until the valve member has been open long enough to permit reduction of pressure in the structure to a point of 50 safety.

18. A dryer comprising body and cover members, said cover member having a chamber therein for the reception of air under pressure and 55 having one wall thereof adapted to be distended by such pressure, said cover having a vent opening outwardly and a valve member controlling said vent, and said dryer being provided with means for preventing the opening thereof when the distensible wall is exerting a pressure against 60 the inner face of the body member or the contents thereof without releasing said pressure.

19. A laundry apparatus for the extraction of water from wet clothing, said apparatus comprising a shell composed of a dome-shaped lower 65 portion and a dome-shaped upper portion separably connected, each of said portions comprising substantially one-half of the shell, a flexible diaphragm arranged to provide a liquid-impervious partition between the said portions and located 70 substantially in the separating plane of the portions, said diaphragm dividing the interior of the shell into a pressure-receiving space above said diaphragm and a clothing-receiving space below 75 said diaphragm, and the diaphragm having suffi-

cient flexibility and distensibility to permit the same to expand into either of said dome-shaped portions, said diaphragm being distensible and flexible throughout its area, and being secured substantially immovably, normally, to the outer 5 edge of one of the shell parts but being removable therefrom for repair or replacement.

20. A laundry apparatus for extraction of water from wet clothing comprising a shell 10 formed of dome-shaped upper and lower portions, each portion constituting substantially one-half of the shell and a water impervious flexible and distensible diaphragm separating said portions and forming upper and lower 15 chambers, the upper chamber having an inlet for pressure and the lower chamber having means to permit escape of water therefrom, said diaphragm being capable of being flexed and distended into either of the dome-shaped portions, to conform to the shape thereof, substantially, 20 and being secured in air-tight relation to the peripheral portion of one of the dome-shaped portions.

21. A clothing drying apparatus having a dome-shaped hollow body and a dome-shaped 25 hollow cover therefor, said body and cover each constituting substantially one-half of the apparatus enclosure, said cover having an entirely flexible, distensible membrane secured thereto across the opening thereof and adapted to be 30 flexed into the hollow of the cover or to be flexed outwardly to exert pressure upon the clothing contained in the dryer and means for admitting pressure exerting fluid into the hollow of the cover to force the membrane outwardly and extend 35 the same beyond the cover, said member being attached in substantially airtight relation to the cover.

22. A laundry apparatus for expressing water from wet clothing comprising a shell divided into 40 two concave rigid sections detachably secured together with the concave sides facing each other, each section constituting substantially one-half of the shell, a distensible entirely flexible membrane closing the open side of one section and 45 secured thereto in fluid-tight relation at or adjacent its periphery, means for detachably securing the two sections together with their concave faces directed toward each other, the section of the shell having the flexible membrane being provided 50 with an inlet opening for the admission of pressure fluid to the space between the shell section and the membrane, and the other section of the shell being provided with a single discharge opening and means for directing fluid expressed 55 from the clothing to a desired point.

23. In a device of the class described, a receptacle comprising two cooperating members adapted to receive fluid under pressure, means for securing said members together, a substantially 60 homogeneous distensible membrane having its edge portion contacting throughout with an edge of one of the cooperating members and held securely between them when in closed position, a valve for exhausting said fluid, and means associated with said valve and securing means arranged to make the release of said securing 65 means dependent upon the prior opening of said valve.

24. In a device of the class described, a receptacle comprising two cooperating members adapted to receive fluid under pressure, a flexible and distensible membrane secured by its edge portion 70 between said cooperating members, means for securing said members together, means for re- 75

leasing said securing means, a valve for exhausting said fluid, and means associated with said valve and releasing means arranged to make the release of said securing means dependent upon the prior opening of said valve.

25. In a device of the class described, a receptacle comprising two cooperating members adapted to receive fluid under pressure, securing means for holding said members together, a substantially homogeneous distensible membrane having its edge portion contacting throughout with an edge of one of the cooperating members and held securely between them when in closed position, a valve for exhausting said fluid, and common means for operating said valve and releasing said securing means, said common means being arranged to open said valve for exhausting said fluid in advance of the release of said securing means.

26. In a device of the class described, a receptacle comprising two cooperating and separable members adapted to receive a fluid under pressure, securing means for holding said members together, a flexible and distensible diaphragm secured between the members when in operative relation and dividing the enclosed space into compartments, a valve for exhausting said fluid, and means associated with said valve and said securing means arranged to make the closing of said valve dependent upon the prior releasing of said securing means.

27. In a device of the class described, a receptacle comprising two cooperating and separable members adapted to receive fluid under pressure, securing means for holding said members together, a substantially homogeneous distensible membrane having its edge portion contacting throughout with an edge of one of the cooperating members and held securely between them when in closed position, a valve for exhausting said fluid from said receptacle, and common means for operating said valve and said securing means, said common means being arranged to maintain said valve open until said members have been placed in receptacle-forming position and said securing means have been fastened.

28. In a device of the class described, a receptacle comprising two cooperating and separable members adapted to receive fluid under pressure, securing means for holding said members together, a flexible and distensible membrane secured by its edge portion between said cooperating members, a valve for exhausting said fluid from said receptacle, and means associated with said valve and securing means arranged to make the closing of said valve dependent upon the prior fastening of said securing means and to make the release of said securing means dependent upon the prior opening of said valve.

29. In a device of the class described, a receptacle comprising two cooperating and separable members adapted to receive fluid under pressure, securing means for holding said members together, a flexible, distensible diaphragm secured between the members when in operative relation and dividing the enclosed space into two compartments a valve for exhausting said fluid from said receptacle, and common means for operating said valve and said securing means, said common means being arranged to maintain said valve open until said members have been placed in receptacle-forming position and said securing means have been fastened, and adapted to open said valve to exhaust said fluid prior to the release of said securing means.

30. A device of the class described, comprising a receptacle and a cover therefor, said parts being provided with interlocking devices capable of being engaged with each other upon a relative, rotary movement of said cover and receptacle in their meeting plane, a hinge uniting said parts, and means for preventing such rotary movement while the cover is in an open position.

31. In a clothes dryer, a receptacle comprising hollow parts having interlocking means, one of said parts serving as a cover, venting means connected with the cover for permitting fluid to escape therefrom, said venting means including a valve member, in combination with a connection between the valve member and the hollow parts such that the vent opening will be opened before the hollow parts are unlocked from each other, and a flexible, distensible membrane having its periphery located between the contacting parts of the hollow parts.

32. In a clothes dryer, a pair of receptacle-forming members to receive and confine clothing, flexible distensible means between said members to divide the space between them into two compartments, means for securing said members in receptacle-forming position, said members being adapted to confine a fluid under pressure, means for admitting a pressure fluid to the receptacle, means for exhausting said fluid therefrom, and means associated with said exhausting and securing means arranged to prevent separation of said members until the exhausting means has released enough of the pressure fluid so that said members may be released from each other without danger of accident.

33. A device for removing moisture from wet clothing comprising receptacle-forming members adapted to form a receptacle closed on both top and bottom, securing means for said members, a flexible distensible diaphragm forming with one of said members a closed container, a conductor for conveying fluid under pressure to said closed container, means of communication between the container and atmosphere, and means associated with said securing and communicating means adapted to isolate the container from the atmosphere only when the members are secured together and to communicate the container with the atmosphere in advance of releasing said securing means.

34. A device for removing moisture from wet clothing comprising receptacle-forming members, at least one of which is concave on the side toward the other, means for securing said members together to form a closed container and for disconnecting said members so that said container may be opened, means for building up a fluid pressure in said container, and means associated with said securing and pressure means adapted to prevent the building up of pressure in the container until said securing means has been fastened.

35. In a clothes dryer, body and cover portions, said body portion having a bead around its upper edge and said cover having an elastic membrane secured to the edge thereof adjacent the body member, said cover being adapted to receive fluid under pressure between itself and the membrane and said membrane being adapted to be flexed into either the body or cover and being further adapted to engage the bead on the body member with increasing pressure as the member is flexed into the body member whereby to constitute a seal between the body and cover members.

36. In a device of the class described, a receptacle comprising two cooperating members, means for securing said members together, a distensible diaphragm between said members to divide into two compartments the space enclosed thereby, means for admitting a fluid pressure into said receptacle, means for exhausting said pressure, and means associated with said securing and exhausting means which first operates the securing means to securing position and then the exhausting means to closed position to prevent the building up of pressure in said container until said securing means has been fastened.

37. A moisture extracting device comprising receptacle forming members adapted to form a receptacle closed at both top and bottom, securing means for said members, a flexible, distensible diaphragm forming with one of said members a closed container, a conductor for conveying fluid under pressure to said closed container, means for exhausting said fluid to the atmosphere, means associated with said securing and exhaust means arranged to maintain said exhaust means open when said members are unsecured, and means for shielding the delivery end of said exhaust means to prevent inadvertent closing thereof while said members are unsecured and a possible rupture of the diaphragm.

38. A moisture extracting device comprising receptacle forming members hinged together to form a receptacle closed on the top and bottom, securing means for said members, a flexible, distensible diaphragm forming with one of said members a closed container, a conductor for conveying fluid under pressure to said closed container, means for exhausting said fluid to the atmosphere, means associated with said securing and exhaust means arranged to maintain said exhaust means open when said members are unsecured, and means constituting a part of a hinge for shielding the delivery end of said exhaust means to prevent inadvertent closing thereof while said members are unsecured and a possible rupture of the diaphragm.

39. A laundry apparatus for the extraction of water from wet clothing comprising a shell having a pair of hingedly connected sections, a flexible diaphragm mounted in the shell in a manner to provide a liquid-impervious partition, said diaphragm dividing the interior of the shell into a pressure-receiving space and a clothes-receiving space, the clothing contacting surface of the diaphragm extending across the shell from side to side in proximity to the plane of division between the sections and being connected to the peripheral portion of one of said sections in air-tight relation, means to supply fluid pressure to said first space and means for discharging water from said second space, and the diaphragm having sufficient flexibility and distensibility to permit either of said spaces to become substantially coextensive with the full internal volume of the shell, and said shell having provisions for being opened to receive wet clothing in said clothing-receiving space, including means for releasably securing the two sections in closed position.

40. A laundry apparatus for the extraction of water from wet clothing comprising a shell having curved top and bottom members provided with an inlet and an outlet, and a water-impervious, flexible and distensible diaphragm arranged within the shell and dividing it into two chambers, into one of which chambers the inlet opens and from the other of which the outlet leads, said diaphragm being adapted to be set

over toward either the inlet or the outlet and being secured to the peripheral portion of one of the shell members in fluid-tight relation.

41. A laundry apparatus for the extraction of water from wet clothing, comprising a shell divided into separable semi-spherical parts, means for detachably connecting said parts together, and a distensible flexible diaphragm secured to the peripheral portion of one of said separable parts substantially in the dividing plane between said parts, and that part to which said flexible diaphragm is secured having an inlet opening through the wall of the shell for the reception of fluid under pressure, the other of said parts having an outlet for discharge of the water expressed from wet clothing placed in the shell.

42. In a device of the class described, a drier unit comprising two cooperating members adapted to receive fluid under pressure, means for securing said members together, a valve for exhausting said fluid, a flexible and distensible membrane secured by its edge portion between said cooperating members, and means associated with said valve and securing means necessitating the opening of said valve before the securing means can be released.

43. In a device of the class described, a receptacle comprising two cooperating members adapted to receive fluid under pressure, a substantially homogeneous distensible membrane having its edge portion contacting throughout with an edge of one of the cooperating members and held securely between them when in closed position, means for securing said members together, means for releasing said securing means, a valve for exhausting said fluid, and means associated with said valve and releasing means arranged to make the release of said securing means dependent upon the prior opening of said valve.

44. In a device of the class described, a receptacle comprising two cooperating members adapted to receive fluid under pressure, securing means for holding said members together, a valve for exhausting said fluid, and common means for operating said valve and said securing means to release the latter, said common means being arranged to open said valve for exhausting said fluid in advance of the release of said securing means.

45. In a device of the class described, a receptacle comprising two cooperating and separable members adapted to receive a fluid under pressure, a flexible and distensible membrane secured by its edge portion between said separable members, securing means for holding said members together, a valve for exhausting said fluid, and means associated with said valve and securing means arranged to make the closing of said valve dependent upon the prior fastening of said securing means.

46. In a device of the class described, a receptacle comprising two cooperating and separable members adapted to receive fluid under pressure, securing means for holding said members together, a valve for exhausting said fluid from said receptacle, and common means for operating said valve and said securing means, said common means being arranged to maintain said valve open until said members have been placed in receptacle-forming position and said securing means have been fastened.

47. In a device of the class described, a receptacle designed to receive a fluid supply, under compression, said receptacle being formed of two

parts provided with interlocking means capable of engagement upon movement of one of said parts with relation to the other, a flexible, elastic diaphragm cooperating with one of said parts to form a closed container, a hinge connection for said parts permitting a limited rotary movement of one thereof with relation to the other, an exhaust valve connected with one of said parts, and means associated with said interlocking means and valve arranged to make the disengagement of said interlocking means dependent upon the prior opening of said valve.

48. In a clothes drier, a pair of receptacle-forming members to receive and confine clothing, means for securing said members in receptacle-forming position, said members being adapted to confine a fluid under pressure, a tube for admitting a pressure fluid to the receptacle, means for exhausting said fluid therefrom, and means functionally connecting said exhausting and securing means so as to prevent separation of said members until the exhausting means has released enough of the pressure fluid so that said members

may be released from each other without danger of accident.

49. In a device of the class described, a receptacle comprising two cooperating members, means for securing said members together, means for admitting a fluid pressure into said receptacle, means for exhausting said pressure, and means associated with said securing and exhausting means which first operates the securing means to securing position and then the exhausting means to closed position to prevent the building up of pressure in said container until said securing means has been fastened.

50. A laundry apparatus for the extraction of water from wet clothing comprising a hollow shell provided with an inlet and an outlet, and a water-impervious, flexible and distensible diaphragm arranged within the shell and dividing it into two chambers, into one of which the inlet opens and from the other of which the outlet leads, said diaphragm being securely held by its peripheral portion between the shell members when they are in closed and operating position.

WILLIAM H. YANDELL.

CERTIFICATE OF CORRECTION.

Patent No. 1,993,201.

March 5, 1935.

WILLIAM H. YANDELL.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 5, second column, lines 41-42, claim 12, strike out the words "substantially spherical" and in line 42, after the word "of" insert the words substantially semi-spherical; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 18th day of June, A. D. 1935.

Leslie Frazer

(Seal)

Acting Commissioner of Patents.