PATENT SPECIFICATION 748,128

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COMPLETE SPECIFICATION.

Improvements relating to Squeeze Driers.

We, HOOVER LIMITED, a Company registered under the laws of Great Britain, of Perivale, Greenford, Middlesex, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to squeeze driers such as may be incorporated in or used in association with clothes washing machines for squeezing the washing or rinsing liquid from the clothes.

According to the present invention a squeeze drier for squeezing liquid from clothes, comprises a chamber for the clothes whereof at least the bottom part is formed by a flexible impervious bag while the upper part affords an open mouth which is closed by and sealed by a movable cover and means for connecting the chamber to a source of suction to collapse the bag and squeeze the clothes, in which the cover has an inner discontinuous surface for engaging the clothes having in it channels or openings communicating with the source of suction, this surface being connected at a number of points distributed over its area to the outer surface on which the atmospheric pressure acts, and the area of the inner surface on which the clothes act being substantially less than that on which the suction acts so that the pressure of the clothes is directly balanced against part of the atmospheric pressure leaving a resultant pressure to hold the cover closed and sealed.

In one form of the invention the mouth of the chamber is formed by an opening in a rigid member and the sealing surface between the cover and the rigid member embraces a substantially larger area than the said opening.

Preferably the cover comprises an inner pervious lid and an outer impervious lid formed of moulded synthetic resin, the suction being applied to the space between the lids and the lids being interconnected, for example by projections on one or each lid engaging the other lid, to transmit pressure from one lid to the other. The outer lid may have ribs on its inner surface while the inner lid may be indented towards the outer lid between such ribs to reduce the space enclosed between the two lids.

In a preferred arrangement the bag is supported by its mouth and is not provided with any outer water-tight casing. Thus the bag may be formed with a flange at its mouth, the cover having a surface engaging the said flange to effect a seal with it. The flange may be clamped to a rigid ring or platform, the sealing surface of the cover engaging it outside the means by which it is so clamped. An outlet pipe connection opening through the flange may be formed integrally with the bag.

Preferably the channels or openings in the inner surface of the cover are connected to a suction pump through a conduit having no valves in it.

In one convenient construction a pressure release valve is corporated in the cover, which may be carried by a hinged arm to which it is connected by a universal joint. In this case the pressure release valve may be arranged to be opened by a button incorporated in the hinged arm. Where the cover is hinged to the machine the release valve may be provided with means for automatically closing it when the cover is opened and closed again.

In one form of the invention the squeeze drier is mounted alongside a washing machine container and has a common outlet pipe, which may include a flexible hose, serving both the washing machine container and the squeeze drier. In this case the

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delivery from the suction pump is preferably arranged vertically in line with the outlet pipe whilst the delivery from the emptying pump for the container opens laterally into the outlet pipe. With this arrangement when the liquid is emptied from the washing container a certain amount of it may flow into the suction pump tending to lubricate and prime it. A valve in the delivery pipe from the emptying pump is preferably arranged near the top of the container and so located that any leakage from it will merely flow back into the washing machine container.

In the specific embodiment described below the combined washing machine and squeeze drier also embodies features claimed in the present applicants' companion patent Specification No. 30474/52 (Serial No. 748,129).

The invention may be carried into practice in various ways, but one specific embodiment will be described by way of example with reference to the accompanying drawings, in which:

Figure 1 is a diagrammatic perspective "ghost" view of a combined washing machine and squeeze drier indicating generally the relative position of the various parts.

Figure 2 is a plan view of the machine,

Figure 3 is a sectional elevation of the upper part of the squeeze drier and adjacent portions of the washing machine,

Figure 4 is a half under-plan view of the outer lid,

Figure 5 is a half under-plan view of the inner lid,

Figure 6 is an enlarged detail sectional elevation of the tap and drain pipe, and

Figure 7 is an enlarged detail sectional elevation of the release valve.

The invention is shown as applied to a squeeze drier incorporated in a washing machine comprising a generally rectangular outer casing 10 which has in its upper part a washing machine container 11 on the left, and a squeeze drier 12 on the right.

The washing machine container is of the type described in the present applicant's British Patent Specifications Nos. 612,737 and 701,977 having a continuously rotating disc-like impeller 13 in its rear wall driven by an electric motor 14, situated under the container, through pulleys 15 and 16 and a belt 17. The motor 14 also serves to drive an emptying pump 18 of centrifugal type for emptying the container, through friction wheels 19 and 20. For operating the squeeze drier the motor also drives a suction pump 21 of the type sold under the registered trade mark "Mono," that is to say of the type comprising a single-start screw rotor rotating orbitally in a double-start screw casing formed of rubber. The suction pump is driven through pulleys 22 and 23 and a belt 24.

The squeeze drier comprises a rubber bag 25 of circular plan shape having a side wall of frusto-conical form merging into a curved bottom wall. As shown in Figure 3 the upper edge of the rubber bag is formed with an out-turned flange 26 which rests on the margin of a large opening in a supporting platform 27 to which it is clamped by a cast ring 28 resting on it and screwed to the platform by a number of screws 29 passing through it. The cast ring is formed with a thickened curved inner periphery 30 to provide a smooth surface for engagement with the clothes.

The flange of the rubber bag extends outwardly beyond the outer periphery of the cast ring to provide a sealing surface 33 for the lid assembly, and the platform 27 is stepped and slopes down towards the bag so that this surface is normally wet.

The squeeze drier is provided with a cover, or lid assembly, comprising an outer impervious dished lid 34, which may conveniently be moulded from synthetic resin, having near its periphery a rib 35 engaging the sealing surface 33 of the rubber bag to form an air-tight seal. As shown in Figure 4, the inner surface of the outer lid is formed with a grid of ribs 36 and a number of bosses 37. Within the outer lid 34 is an inner lid 38 of pressed aluminium which has in it a number of perforations 39 and which engages the outer lid at a number of points distributed over its area corresponding to the bosses 37. The inner lid is formed with indentations 40 which are pressed out towards the outer lid in the spaces between the ribs 36, so as to reduce the total space between the lids, which, as described below, has to be evacuated by the suction pump. The inner lid is secured to the outer lid by four screws (not seen) passing through holes 41 into the four adjacent bosses 37.

Thus when suction is applied to the space between the outer and inner lids the pressure of the clothes upon the inner lid will be transmitted directly through the bosses 37 to the outer lid and will partly balance the pressure of the atmosphere on the outside of the latter. The bosses, and hence the points of contact, are sufficiently close together to ensure that there are no large unsupported areas of the lids upon which the pressure might be such as to overload the material, bearing in mind that the total force on a lid, a foot in diameter may amount to over 1,500 pounds.

At one point of its circumference the cast ring 28 has in it an opening and the platform 27 has in it a slot to register with a pipe connection 45 moulded integrally with the flange 26 of the rubber bag. To this pipe connection 45 is secured a flexible suction

pipe 46 leading to the suction side of the suction pump. Alternatively the pipe connection may be formed on the cast ring 28 and arranged to pass through a hole in the flange of the rubber bag.

The lid assembly is supported by a pivoted arm 50 carried by a pivot 51 so that it can be conveniently swung away from the rubber bag. For this purpose the outer lid is formed with a part-spherical convex surface 52 co-operating with a corresponding concave surface 53 afforded by the arm, to afford a universal joint, which is also arranged to accommodate a valve for releasing the vacuum. To this end a metal valve sleeve 54 is moulded into an opening in the outer lid at the centre of the part-spherical surface and passes through a larger opening in the corresponding surface of the arm, and carries a spring spider 55 bearing upon the upper side of the latter surface so as to hold the two part-spherical surfaces together. The upper end 56 of the valve sleeve 54 forms a seating for a valve member 57 which slides within it. The valve member may be moulded from synthetic resin and has an outwardly directed flange 58 at its upper end, and is surrounded by a packing ring 59 lying against this flange and engaging the seating 56 at the upper end of the sleeve 54. A compression spring 60 is interposed between the valve member 57 and an opposed top wall 61 of the arm so as to tend to keep the valve closed. The lower part of the valve member 57 has in it a diametrical slot 62 so that when it is raised it is raised to its open position as shown in Figure 7 air can flow across the seating 56 into the slot 62 and down through the sleeve 54 into the rubber bag to release the vacuum.

In order to open the valve a pivoted release lever 65 is incorporated in the arm 50 and as shown in Figure 3 has a portion near its middle resting on a ridge 66 to form a fulcrum. One end 67 has projections engaging below the flange 58 of the valve member 57 so as to be capable of lifting the latter, whilst the other end 68 has a button 69 projecting through an opening in the upper wall of the pivoted arm 50 so that it can be depressed by the thumb of the user to open the valve.

A longitudinally movable latch link 70 extends from a point adjacent this end of the release lever to a point near the pivot 51 of the pivoted arm 50, where it is pivoted to one arm 71 of a small bell crank 72 on on the pivot 51 of the pivoted arm 50. The bell crank is acted on by a spring (not seen) so that when the button is depressed to open the valve the bell crank will turn so as to thrust the latch link 70 over the end 68 of the release lever 65 and hold the latter in its depressed condition thereby keeping the valve open. When the lid assembly is raised the other arm 74 of the bell crank engages a fixed stop 75 which causes it to turn relatively to the pivoted arm 50 thereby withdrawing the latch link and allowing the valve to close again. A spring 76 surrounds the pivot 51 tending to raise the arm 50 so as partly to counterbalance the weight of the lid assembly.

Accordingly the vacuum may be broken at any time by pressing the button on the latch lever and the release valve will then remain open. If, however, the lids are opened this will automatically close the release valve and there is no fear that the user, having inserted a new load of clothes in the rubber bag and closed the cover, will omit to close the valve so that the pump will operate without squeezing the water from the clothes.

As shown in Figure 6 a delivery pipe 78 from the emptying pump 18 and a delivery pipe 79 from the suction pump 21 communicate with a common outlet pipe 80, comprising a vertical rigid connection 81, arranged to swivel in a fixed socket 82, and a flexible hose 83. The hose is formed with an elbow 84 near its end adjacent the swivel joint so that in its normal condition it extends horizontally and by means of the swivel joint can be projected over the washing machine container or over the back of the machine or elsewhere.

The delivery pipe 79 of the suction pump opens upwardly in line with the socket 82, while the delivery pipe 78 from the emptying pump extends upwardly alongside that of the suction pump to a tap 88 mounted near and above the upper part of the washing machine container. The tap comprises a fixed rubber washer 89 and a stem 90 having at its lower end a head or cup 91 to engage the washer and a helical compression spring 92 bearing on the head to keep the tap closed. The stem passes through a fixed body 93 and at its upper end carries a handle 94. The body and handle are formed with steps 95 and 96 which co-operate to keep the tap open when the handle is raised and turned as shown in Figure 6.

From the tap a branch connection 97 extends laterally to the delivery pipe 79 of the suction pump so that when the tap is opened water emptied from the washing machine container is delivered to the outlet hose but some of it may trickle down into the suction pump. This tends to ensure that there is generally some liquid in the latter and this improves the operation of the pump which is of the type sold under the registered trade mark "Mono." The body 93 of the tap is mounted on a ledge or shelf 98 at the back of the washing machine container so that any leakage from it will merely flow straight back into the washing machine container.

In order to prevent water from being slowly drawn back into the rubber bag 25 through the suction pump 21 if the motor is left switched off without the vacuum being released, a non-return valve 99 comprising a rubber-clad ball is provided in the delivery pipe 79 of the suction pump. When the motor is running and air is being delivered from the suction pump, the ball will be lifted from its seating and will not prevent a small quantity of water from seeping down the delivery pipe to lubricate and seal the suction pump, but if the machine is left for an appreciable time with the motor switched off and suction still applied to a load of clothes that has been squeezed, the rubber ball will close and prevent water that may be in the outlet pipe 80 from being gradually drawn through any clearance in the suction pump back into the clothes in the bag.

The arrangement described is convenient and effective. The use of suction for the squeeze drier eliminates any danger of bursting and the particular partially balanced arrangement of the lids ensures that whilst the bulk of the atmospheric pressure is balanced by the pressure of the clothes, there is a sufficient resultant to ensure a reliable seal at the edge of the lid.

What we claim is:—

1. A squeeze drier for squeezing liquid from wet clothes, comprising a chamber for the clothes whereof at least the bottom part is formed by a flexible impervious bag while the upper part affords an open mouth which is closed by and sealed by a movable cover and means for connecting the chamber to a source of suction to collapse the bag and squeeze the clothes, in which the cover has an inner discontinuous surface for engaging the clothes having in it channels or openings communicating with the source of suction, this surface being connected at a number of points distributed over its area to the outer surface on which the atmospheric pressure acts, and the area of the inner surface on which the clothes act being substantially less than that on which the suction acts so that the pressure of the clothes is directly balanced against part of the atmospheric pressure leaving a resultant pressure to hold the cover closed and sealed.

2. A squeeze drier as claimed in Claim 1 in which the mouth of the chamber is formed by an opening in a rigid member and the sealing surface between the cover and the rigid member embraces a substantially larger area than the said opening.

3. A squeeze drier as claimed in Claim 1 or Claim 2 in which the cover comprises an inner pervious lid and an outer impervious lid formed of moulded synthetic resin, the suction being applied to the space between the lids and the lids being interconnected, for example by projections on one or each lid engaging the other lid, to transmit pressure from one lid to the other.

4. A drier as claimed in Claim 3 in which the outer lid has ribs on its inner surface and the inner lid is indented towards the outer lid between such ribs to reduce the space enclosed between the two lids.

5. A drier as claimed in any one of the preceding claims in which the bag is supported by its mouth and not provided with any watertight outer casing.

6. A drier as claimed in any one of the preceding claims in which the bag is formed with a flange at its mouth and the cover has a surface engaging the said flange to effect a seal with it.

7. A drier as claimed in Claim 6 in which the flange is clamped to a rigid ring or platform and the sealing surface of the cover engages it outside the means by which it is so clamped.

8. A drier as claimed in Claim 6 or Claim 7 in which an outlet pipe connection is formed integrally with the bag and opens through the flange.

9. A drier as claimed in any one of the preceding claims in which the channels or openings in the inner surface of the cover are connected to a suction pump through a conduit having no valves in it.

10. A drier as claimed in any one of the preceding claims having a pressure release valve incorporated in the cover.

11. A drier as claimed in any one of the preceding claims, in which the cover is carried by a hinged arm to which it is connected by a universal joint.

12. A drier as claimed in Claims 10 and 11 in which the pressure release valve is arranged to be opened by a button incorporated in the hinged arm.

13. A drier as claimed in Claim 12 in which the cover is hinged to the machine and the release valve is provided with means for automatically closing it when the cover is opened and closed again.

14. A drier as claimed in Claim 13 in which the release valve is arranged to be opened by one end of a pivoted lever the other end of which carries the button for manual operation, and one end of a latch link is arranged to spring over the end of the said lever when it is depressed, but has its other end connected to a crank pivoted about the hinge of the cover and arranged to engage a stop when the cover is opened to withdraw the latch from the lever and allow the valve to close.

15. A drier as claimed in any one of the preceding claims which is mounted alongside a washing machine container, having an emptying pump and a common outlet pipe, which may include a flexible hose, which serves both the squeeze drier and the

In order to prevent water from being slowly drawn back into the rubber bag 25 through the suction pump 21 if the motor is left switched off without the vacuum being released, a non-return valve 99 comprising a rubber-clad ball is provided in the delivery pipe 79 of the suction pump. When the motor is running and air is being delivered from the suction pump, the ball will be lifted from its seating and will not prevent a small quantity of water from seeping down the delivery pipe to lubricate and seal the suction pump, but if the machine is left for an appreciable time with the motor switched off and suction still applied to a load of clothes that has been squeezed, the rubber ball will close and prevent water that may be in the outlet pipe 80 from being gradually drawn through any clearance in the suction pump back into the clothes in the bag.

The arrangement described is convenient and effective. The use of suction for the squeeze drier eliminates any danger of bursting and the particular partially balanced arrangement of the lids ensures that whilst the bulk of the atmospheric pressure is balanced by the pressure of the clothes, there is a sufficient resultant to ensure a reliable seal at the edge of the lid.

What we claim is:—

1. A squeeze drier for squeezing liquid from wet clothes, comprising a chamber for the clothes whereof at least the bottom part is formed by a flexible impervious bag while the upper part affords an open mouth which is closed by and sealed by a movable cover and means for connecting the chamber to a source of suction to collapse the bag and squeeze the clothes, in which the cover has an inner discontinuous surface for engaging the clothes having in it channels or openings communicating with the source of suction, this surface being connected at a number of points distributed over its area to the outer surface on which the atmospheric pressure acts, and the area of the inner surface on which the clothes act being substantially less than that on which the suction acts so that the pressure of the clothes is directly balanced against part of the atmospheric pressure leaving a resultant pressure to hold the cover closed and sealed.

2. A squeeze drier as claimed in Claim 1 in which the mouth of the chamber is formed by an opening in a rigid member and the sealing surface between the cover and the rigid member embraces a substantially larger area than the said opening.

3. A squeeze drier as claimed in Claim 1 or Claim 2 in which the cover comprises an inner pervious lid and an outer impervious lid formed of moulded synthetic resin, the suction being applied to the space between the lids and the lids being interconnected, for example by projections on one or each lid engaging the other lid, to transmit pressure from one lid to the other.

4. A drier as claimed in Claim 3 in which the outer lid has ribs on its inner surface and the inner lid is indented towards the outer lid between such ribs to reduce the space enclosed between the two lids.

5. A drier as claimed in any one of the preceding claims in which the bag is supported by its mouth and not provided with any watertight outer casing.

6. A drier as claimed in any one of the preceding claims in which the bag is formed with a flange at its mouth and the cover has a surface engaging the said flange to effect a seal with it.

7. A drier as claimed in Claim 6 in which the flange is clamped to a rigid ring or platform and the sealing surface of the cover engages it outside the means by which it is so clamped.

8. A drier as claimed in Claim 6 or Claim 7 in which an outlet pipe connection is formed integrally with the bag and opens through the flange.

9. A drier as claimed in any one of the preceding claims in which the channels or openings in the inner surface of the cover are connected to a suction pump through a conduit having no valves in it.

10. A drier as claimed in any one of the preceding claims having a pressure release valve incorporated in the cover.

11. A drier as claimed in any one of the preceding claims, in which the cover is carried by a hinged arm to which it is connected by a universal joint.

12. A drier as claimed in Claims 10 and 11 in which the pressure release valve is arranged to be opened by a button incorporated in the hinged arm.

13. A drier as claimed in Claim 12 in which the cover is hinged to the machine and the release valve is provided with means for automatically closing it when the cover is opened and closed again.

14. A drier as claimed in Claim 13 in which the release valve is arranged to be opened by one end of a pivoted lever the other end of which carries the button for manual operation, and one end of a latch link is arranged to spring over the end of the said lever when it is depressed, but has its other end connected to a crank pivoted about the hinge of the cover and arranged to engage a stop when the cover is opened to withdraw the latch from the lever and allow the valve to close.

15. A drier as claimed in any one of the preceding claims which is mounted alongside a washing machine container, having an emptying pump and a common outlet pipe, which may include a flexible hose, which serves both the squeeze drier and the

emptying pump for the washinig machine container.

16. A drier as claimed in Claim 15 in which the source of suction comprises a suction pump whereof the delivery pipe has in it a non-return valve but no other valve.

17. A drier as claimed in Claim 16 in which the delivery from the suction pump is arranged vertically in line with the outlet pipe whilst the delivery from the emptying pump for the container opens laterally into the outlet pipe.

18. A drier as claimed in any one of Claims 15 to 17 in which the delivery pipe from the emptying pump has in it a control valve near the top of the container and so located that any leakage from it will flow back into the washing machine container.

19. A squeeze drier as specifically described herein with reference to the accompanying drawings.

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PROVISIONAL SPECIFICATION.

Improvements relating to Squeeze Driers.

We, HOOVER LIMITED, a Company registered under the laws of Great Britain, of Perivale, Greenford, Middlesex, do hereby declare this invention to be described in the following statement:—

This invention relates to squeeze driers such as may be incorporated in or used in association with clothes washing machines for squeezing the washing or rinsing liquid from the clothes.

According to the present invention a squeeze drier for squeezing liquid from clothes, comprises a flexible impervious bag to receive the clothes, an inner pervious lid and an outer impervious lid to close the bag, means for applying suction to the space between the lids to collapse the bag and remove the liquid, and is characterised in that the lids are inter-connected. for example by projections on one or each lid engaging the other lid, to transmit pressure from one to the other and hence balance the air pressure on the outer lid against the pressure of clothes on the inner lid. Preferably the lids are inter-connected at a number of points distributed over their area.

In a preferred arrangement the bag is supported by its mouth and is not provided with any outer water-tight casing.

In one convenient construction the lid assembly, comprising the two lids secured together, is carried by a hinged arm to which it is connected by a universal joint. In this case a pressure release button may be incorporated in the lid or its arm. The space between the lids may be connected direct to a suction pump through a conduit having no valves in it.

In one form of the invention the squeeze drier is mounted alongside a washing machine container and a common outlet pipe, which may include a flexible hose, serves both units. In this case the delivery from the suction pump is preferably arranged vertically in line with the outlet pipe whilst the delivery from the emptying pump for the container passes through a control valve and opens laterally into the outlet pipe. With this arrangement when the liquid is emptied from the washing container a certain amount of it may flow down into the suction pump tending to lubricate and prime it. The valve in the outlet pipe from the emptying pump is preferably arranged near the top of the container and so located that any leakage from it will merely flow back into the washing machine container.

In one specific embodiment that will be described by way of example the invention is applied to a squeeze drier incorporated in a washing machine comprising a generally rectangular outer casing which has in its upper part a washing machine container on the left and a squeeze drier on the right. The washing machine container is of the type described in the present applicants' British Patent Specifications Nos. 612,737 and 26005/50 having a continuously rotating disc-like impeller in its rear wall driven by a motor situated under the container through pulleys and a belt. The motor also serves to drive an emptying pump of centrifugal type for emptying the container, and for operating the squeeze drier, a suction pump of the type sold under the registered trade mark "Mono," that is to say of the type comprising a single start screw rotor rotating orbitally in a double-start screw casing of rubber.

The squeeze drier comprises a rubber bag of circular plan shape having a side wall of frusto-conical form merging into a curved bottom wall. The upper edge of the rubber bag is formed with an out-turned flange which rests on the margin of a large opening in a supporting platform to which it is clamped by a cast ring resting on it and screwed to the platform by a number of screws passing through it. The cast ring is formed with a thickened curved inner periphery to provide a smooth surface for engagement with the clothes.

The flange of the rubber bag extends outwardly beyond the periphery of the cast

ring to provide a sealing surface for the lid assembly and the platform slopes down towards the bag so that this surface is normally wet. The lid assembly comprises an outer impervious dished lid which may conveniently be moulded from synthetic resin, having near its periphery a rib engaging the sealing surface of the rubber bag to form an air-tight seal. Within the outer lid is an inner lid of pressed aluminium which has in it a number of perforations and is formed with ribs and projections engaging the outer lid at a number of points distributed over its area. Thus when suction is applied to the space between the outer and inner lids the pressure of the clothes upon the inner lid will be transmitted directly through these projections to the outer lid and will partly balance the pressure of the atmosphere on the outside of the latter. The projections and hence the points of contact are sufficiently close together to ensure that there are no large unsupported areas of the lids upon which the pressure might be such as to overload the material, bearing in mind that the total force on a lid a foot in diameter may amount to over 1,500 lbs.

At one point of its circumference the ring is formed with a pipe connection to which is secured a flexible suction pipe leading to the suction side of the suction pump. Alternatively the pipe connection may be formed on the bag and arranged to register with a slot in the ring.

The lid assembly is supported by a pivoted arm so that it can be conveniently swung away from the rubber bag. For this purpose the outer lid is formed with a part-spherical convex surface co-operating with a corresponding concave surface afforded by the arm, to afford a universal joint which is also arranged to accommodate a valve for releasing the vacuum. To this end a valve sleeve extends through an opening in the outer lid at the centre of the part-spherical surface and through a larger opening in the corresponding surface of the arm, and carries a spring spider bearing upon the upper side of the latter surface so as to hold the two part-spherical surfaces together. The other end of this valve sleeve forms a seating for a valve member which slides within it. The valve member has an outwardly directed flange at its upper end and is surrounded by a packing ring lying against this flange and engaging the upper surface or seating of the sleeve. A compression spring is interposed between the valve member and an opposed wall of the arm so as to tend to keep the valve closed.

In order to open the valve a pivoted release lever is incorporated in the arm and has a portion near its middle pressing on a ridge to form a fulcrum. One end has projections engaging below the flange of the valve member so as to be capable of lifting the latter, whilst the other end has a button projecting through an opening in the upper wall of the pivoted arm so that it can be depressed by the thumb of the user to open the valve.

A longitudinally movable latch link extends from a point adjacent this end of the release lever to a point near the hinge of the pivoted arm, where it is pivoted to a small bell-crank on the pivot of the arm. The bell-crank is acted on by a spring so that when the button is depressed to open the valve the bell-crank will turn so as to thrust the latch link over the end of the release lever and hold the latter in its depressed condition thereby keeping the valve open. When the lid assembly is raised the other arm of the bell-crank engages a stop which causes it to turn relatively to the pivoted arm thereby withdrawing the latch link and allowing the valve to close again.

Accordingly the vacuum may be broken at any time by pressing the button on the latch lever and the valve will then remain open. If, however, the lids are opened this will automatically close the valve and there is no fear that the user, having inserted a new load of clothes in the rubber bag and closed the lids, will omit to close the valve so that the pump will operate without squeezing the water from the clothes.

The delivery from the emptying pump and the delivery from the suction pump communicate with a common outlet pipe including a length of flexible hose. The delivery from the suction pump opens upwardly in line with the outlet pipe to which the hose is connected by a swivel joint. The hose is formed with an elbow at its end adjacent the swivel joint so that in its normal condition it extends horizontally and by means of the swivel joint can be projected over the washing machine container or over the back of the machine, or elsewhere. The delivery from the emptying pump extends upwardly alongside that of the suction pump to a screw tap mounted near and above the upper part of the washing machine container. From the tap a branch connection extends laterally to the delivery from the suction pump, so that when the valve is open water emptied from the washing machine container is delivered to the outlet hose but some of it may trickle down into the vacuum pump. This tends to ensure that there is generally some liquid in the latter and this improves the operation of the pump which is of the type sold under the registered trade mark "Mono." Moreover any leakage from the valve will merely flow straight back into the washing machine container.

The arrangement described is convenient and effective. The use of suction for the squeeze drier eliminates any danger of bursting and the particular partially balanced arrangement of the lids ensures that whilst the bulk of the atmospheric pressure is balanced by the pressure of the clothes, there is a sufficient resultant to ensure an absolutely reliable seal at the edge of the lid.

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