

Nov. 19, 1963

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3,111,134

SUPPLY AND EXHAUST VALVE FOR A PRESSURE CHAMBER

Filed Aug. 4, 1961

2 Sheets-Sheet 1

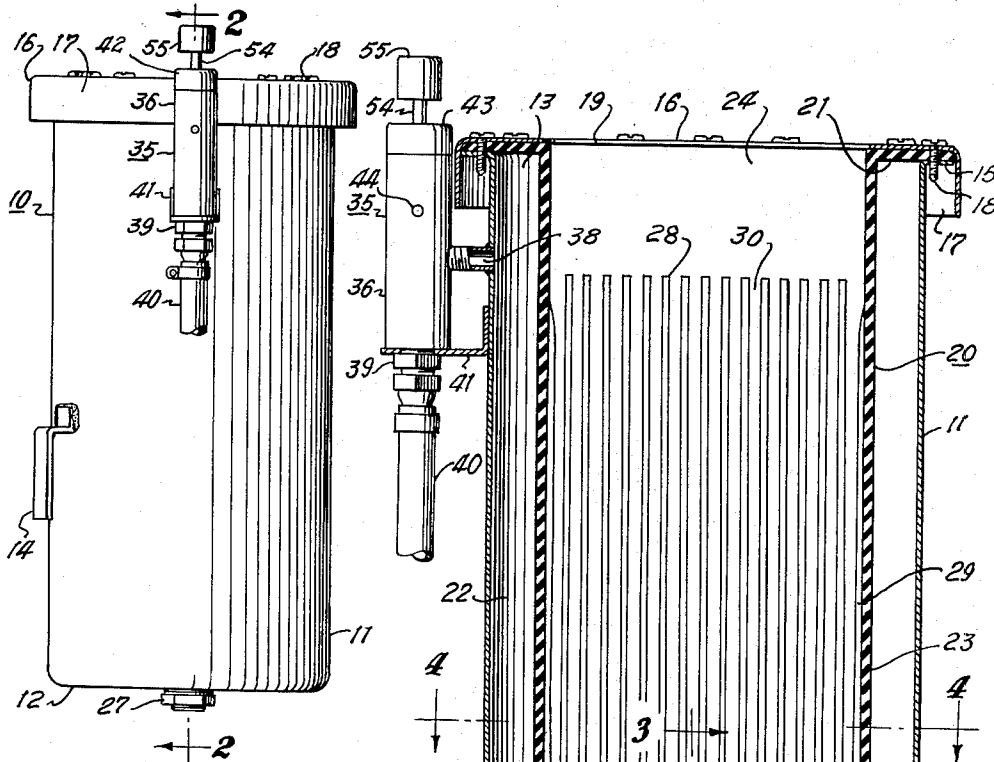


Fig. 1

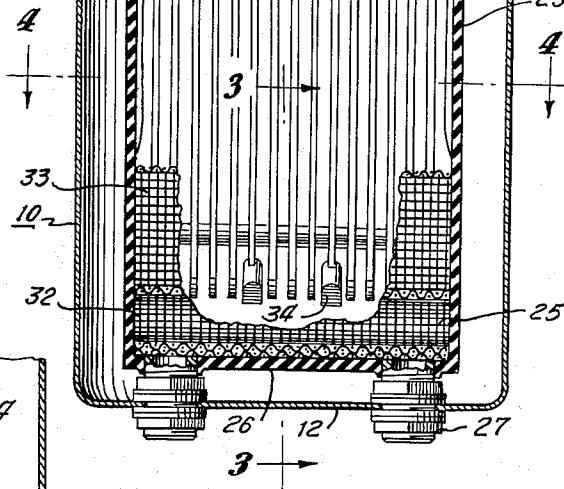


Fig. 2

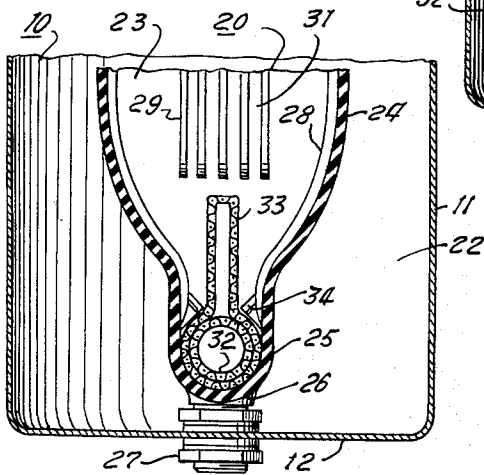


Fig. 3

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2 Sheets-Sheet 2

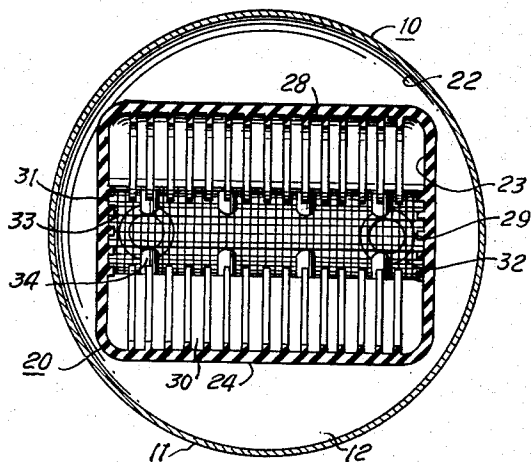


Fig. 4

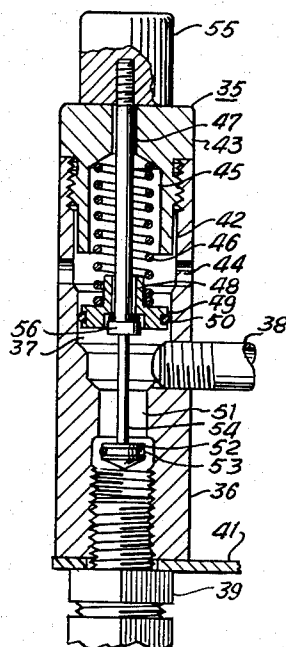


Fig. 5

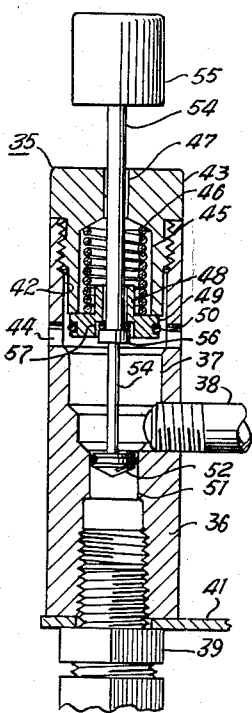


Fig. 6

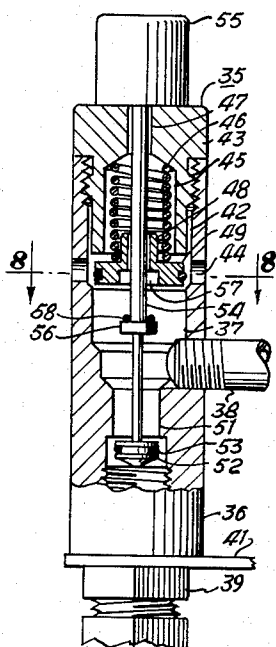


Fig. 7

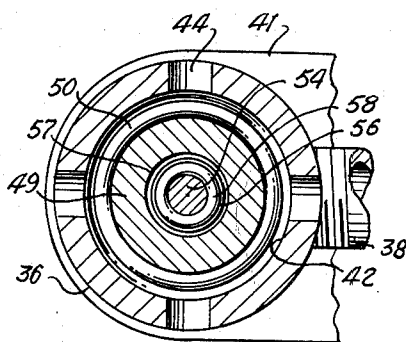


Fig. 8

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1

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SUPPLY AND EXHAUST VALVE FOR A PRESSURE CHAMBER

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2 Claims. (Cl. 137-102)

This invention relates to new and useful improvements in wringers for chamois, wiping cloths and the like.

One object of the invention is to provide an improved wringer for chamois and wiping cloths after washing and/or rinsing thereof having means actuated by air or other fluid under pressure to squeeze excess moisture from the chamois and cloths whereby the wringer may be employed conveniently by service stations and garages or any place having a supply of compressed air or other fluid under pressure.

Another object of the invention is to provide an improved chamois wringer of the type having an open top bag of flexible material for receiving the chamois to be wrung and surrounded by a chamber adapted to receive air or other fluid under pressure for collapsing the bag to squeeze water or liquid from the chamois, wherein said bag has a drain opening in its bottom and means between its side walls for preventing complete flattening of said bag and for conducting the water or liquid to the bottom thereof.

A particular object of the invention is to provide an improved wringer, of the character described, wherein the collapsible bag has upright grooves extending longitudinally of its side walls for conducting water or liquid squeezed from the chamois to the bottom of said bag and a porous member for preventing complete flattening of said bag as well as for coacting with the grooves.

A further object of the invention is to provide an improved wringer, of the character described, wherein the porous member has a tubular portion extending transversely of the bag adjacent its drain opening to prevent collapsing of the bottom of said bag and to direct water or liquid into the opening.

An important object of the invention is to provide an improved chamois wringer, of the character described, having a novel valve for controlling the admission of air or other fluid under pressure to the chamber thereof and for venting air or fluid from said chamber when it exceeds a predetermined pressure.

A construction designed to carry out the invention will be hereinafter described, together with other features of the invention.

The invention will be more readily understood from a reading of the following specification and by reference to the accompanying drawings, wherein examples of the invention are shown, and wherein:

FIG. 1 is a side elevational view of a chamois wringer constructed in accordance with the invention,

FIG. 2 is an enlarged, transverse, vertical, sectional view, taken on the line 2-2 of FIG. 1,

FIG. 3 is a transverse, vertical, sectional view, taken on the line 3-3 of FIG. 2,

FIG. 4 is a horizontal, cross-sectional view, taken on the line 4-4 of FIG. 2,

FIG. 5 is a transverse, vertical, sectional view of a valve for controlling the admission of air or other fluid under pressure to the compression chamber of the wringer,

FIG. 6 is a view, similar to FIG. 5, of the valve in its closed position,

FIG. 7 is a view, similar to FIG. 5 of the valve in its venting position, and

2

FIG. 8 is an enlarged, horizontal, cross-sectional view, taken on the line 8-8 of FIG. 7.

In the drawings, the numeral 10 designates the upright casing or housing of a wringer for chamois, wiping cloths and the like which has a cylindrical side wall 11, a flat, horizontal bottom wall 12 and an open, upper end 13 (FIG. 2). An angular bracket or hook 14 is mounted on the side wall 11 to permit hanging of the housing within a tub or container (not shown) of water and/or cleansing solution. The upper end 13 of the housing 10 is surrounded by an external, radial flange or lip 15 for supporting a top plate or cap 16 which may be angular in cross-section so as to have an annular lip or skirt 17 depending in spaced, concentric relation to the side wall. A plurality of screws 18 fasten the cap 16 to the flange 15, and said cap has a large, rectangular opening 19 therein to permit access to the interior of the housing.

An open-top bag or tubular membrane 20, of rubber, plastics or other suitable flexible, impervious material, is suspended within the housing 10 by an external, radial flange or lip 21 at its upper end clamped between the flange 15 of said housing and the overlying cap 16 by the screws 18 so as to close and seal the upper end of said housing and provide a compartment or chamber 22 therein. The bag 20 is of elongate, rectangular cross-section, complementary to the cap opening 19, and has substantially flat, upright end and side walls 23 and 24 spaced from the housing side wall 11 (FIG. 4). As shown by the numeral 25 in FIG. 3, a reduced sump is formed in the bottom of the bag by reducing the width of the lower end portions of its end walls 23 and by the lower end portions of its side walls 24 being curved inwardly and converging to form a rounded bottom wall 26 for said bag and its sump. The bottom wall 26 is adjacent the bottom wall 12 of the housing and a pair of outlet fittings 27 extend through said walls to permit draining of the bag 20 and its sump 25. To further facilitate draining of the bag as well as prevent complete flattening upon collapsing thereof, a plurality of internal, spaced projections or ribs 28 and 29 extend longitudinally of the side and end walls so as to provide flow channels or grooves 30 and 31 therebetween. Preferably, the ribs are parallel and the side wall ribs 28 are of greater length and depend below the end wall ribs 29 into the upper portion of the sump 25.

As shown in FIGS. 2 and 3, the sump is substantially cylindrical and is reinforced by a porous, tubular member 32, of wire or plastics mesh or other suitable foraminous or reticulated material, which is complementary to and of substantially the same length as said sump. A coextensive, rectangular extension 33, of the same material, upstands from the member 32 between and in spaced relation to the lower portions of the side wall ribs 28 and below the end wall ribs 29 for preventing complete collapsing of the lower portion of the bag 20 immediately above its sump 25. If desired, the tubular member may have several concentric layers and the extension 33 may be made integral with the outer layer thereof. Accidental displacement of the member 33 from the sump is prevented by overlying projections or enlargements 34 at the lower ends of the ribs 28; however, insertion and removal of said member is permitted by the flexibility of the bag.

The chamois or wiping cloth to be wrung is dropped into the bag 20 through its open top and excess water or moisture is squeezed therefrom by collapsing and flattening of said bag. Due to the tubular member 32, the chamois or cloth is prevented from falling into the sump 25 and blocking the drain openings provided by the outlet fittings 27. Also, the member prevents collapsing

3

of the sump. The ribs 28 as well as the ribs 29 and the extension 33 of the member prevent complete flattening of the bag and the water squeezed from the chamois or cloth is directed to the sump by the channels 30 and 31 between said ribs as well as by said extension. For collapsing the bag, the chamber 22 is adapted to be filled with air or other fluid under pressure. It is noted that the material of the bag is relatively thick and has sufficient elasticity or resiliency to cause said bag to resume its original shape when the pressure in the chamber is released.

For controlling the admission and exhaust of air or other fluid to and from the chamber 22, a manual control valve 35 is provided and includes an elongate body 36 having a cylindrical bore or passage 37 extending longitudinally therethrough (FIGS. 5-8). The medial portion of the bore 37 communicates with the upper portion of the chamber through a lateral nipple or pipe 38. An inlet fitting 39 is screwthreaded in the lower or one end of the bore for connecting thereto a hose 40 which leads from a source of air or fluid supply (not shown). Preferably, a portion of an angular bracket 41, mounted on the housing side wall 11, is confined between the fitting 39 and the lower end of the valve body 36 for supporting said body in an upright position. The opposite or upper end of the bore 37 is enlarged to provide a counterbore 42 which has an end cap 43 screwthreaded thereinto and which communicates with radial outlet ports 44 in the valve body 36 (FIG. 8). An axial recess or socket 45 is formed in the cap 43 to receive a helical spring 46 and communicates with an axial, reduced opening 47 in the outer extremity of said cap. The upstanding, axial collar 48 of an annular valve element or plate 49, complementary to the bore 37 and reciprocable between said bore and the counterbore 42, is confined in or surrounded by the inner end of the spring 46. An O-ring or other annular packing 50 is carried by the periphery of the valve element 49 for sealing engagement with the counterbore to control flow therefrom through the outlet ports 44.

As shown by the numeral 51, the bore of the body 36 is reduced in diameter between its connection to nipple 38 and inlet fitting 39 for coacting with a circular valve member or disk 52 having an O-ring or other annular packing 53 on its periphery for sealing engagement with the reduced bore to control flow from said fitting to said nipple. An elongate rod or stem 54 extends axially upward from the valve member 52 through the valve element 49, its collar 48, spring 46 and opening 47 so as to project from the upper end of the valve body above its cap 43 for supporting an overlying, enlarged head or knob 55. As shown in FIG. 5, the valve member is positioned below the reduced bore 51 when the rod 54 is depressed to engage its knob 55 with the cap. A circular enlargement or disk 56 is provided on the intermediate portion of the rod for engaging within an annular recess 57, formed in the underside of the valve element 49 concentrically of its bore, and has an overlying O-ring or other packing 58 thereon for engaging the bottom of the recess so as to seal off between said rod and element.

When air or other fluid under pressure is supplied to the valve 35 through the hose 40, the valve member 52 is lifted into the reduced bore 51 of the valve body 36 to prevent flow to the nipple 38 and the chamber 22 of the housing 10 (FIG. 6). Due to this upward movement, the disk 56 of the rod 54 engages in the recess 57 of the valve element 49 and raises said element into engagement with the inner end of the cap 43 so as to compress the spring 46 and prevent additional upward travel. The outlet ports 44 communicate with the housing chamber through the bore 37 to permit the escape of any pressure therein, and the knob 55 of the rod is spaced above the cap. By depressing the rod 54, the valve member 52 is lowered out of the reduced bore 51 to permit the flow of air or fluid therethrough into the

4

medial portion of the bore 37 and through the nipple 38 into the housing chamber 22 (FIG. 5) so as to collapse the bag 20. The disk 56 moves downwardly with the rod to permit the compression of the spring to force the valve element 49 downwardly from the counterbore 42 into sealing engagement with the bore so as to prevent the escape of the air or fluid through the outlet ports.

When the pressure in the housing chamber exceeds the force of the compressed spring 46, the valve element 49 is forced upwardly out of the bore 37 into the counterbore so as to compress said spring and permit the venting of the excess pressure through the outlet ports 44 (FIG. 7). This relief of the pressure prevents the collapsible bag 20 from being exposed to excessive pressure which might rupture or otherwise damage said bag in the event that the knob 55 of the rod 54 is held down so as to keep the valve member 52 open, the fluid merely flowing through the bore of the valve body and holding the valve element in the counterbore 42. Upon release of the knob 55, the valve member 52 is lifted into sealing engagement with the reduced bore 51 to stop the admission of air or fluid to the housing chamber 22. The valve element 49 rises, with the valve member, out of sealing engagement with the bore 37 into the counterbore 42 so as to compress the spring 46 and permit the escape of air or fluid from the chamber through the outlet ports 44 (FIG. 6) whereby the bag 20 returns to the position shown in FIGS. 2-4. Manifestly, the use of air is preferred since it may be exhausted safely to the atmosphere.

The foregoing description of the invention is explanatory thereof and various changes in the size, shape and materials, as well as in the details of the illustrated construction may be made, within the scope of the appended claims, without departing from the spirit of the invention.

What I claim and desire to secure by Letters Patent is:

1. A valve for controlling the flow of fluid under pressure into and out of a pressure chamber including a body having a bore, the bore having a pressure fluid inlet at one end portion and an outlet at its opposite end portion and communicating with the chamber therebetween, a valve member freely reciprocable in said bore inwardly of the inlet for controlling the flow of pressure fluid to the chamber and movable to closed position solely by the pressure fluid, a valve element reciprocable in said bore adjacent the outlet for controlling communication therebetween, the valve member having a portion extending slidably through the valve element to the exterior of the body to permit manual movement of said valve member to opened position and engageable with said valve element to hold the same in opened position when said valve member is closed, and spring means for holding said valve element in closed position when said valve member is opened and assisting in holding said valve member opened due to the aforesaid engagement, the spring means permitting opening movement of said valve element by the pressure fluid whenever the fluid in said bore exceeds a predetermined pressure due to manual holding of said valve member in its opened position, the opening movement of said valve element disengaging said valve element from said valve member to permit closing movement of said valve member by the pressure fluid and reengagement of said valve member with said valve element to move said valve element to opened position when said valve member is released.

2. A valve as set forth in claim 1 wherein the valve member is spaced from the valve element and wherein the slidably extending portion of said valve member includes a rod having an enlargement for engagement and disengagement with said valve element.

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5

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