Aug. 30, 1966 J. H. ASHLEY 3,269,157

WRINGER

Filed July 16, 1964

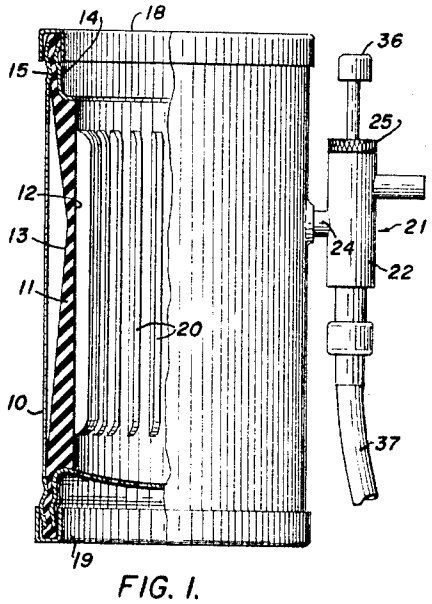


FIG. 1.

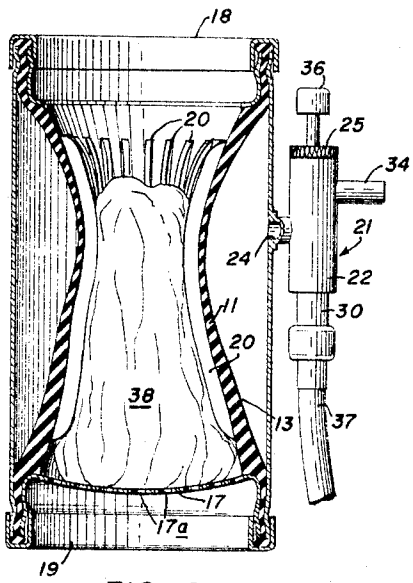


FIG. 2.

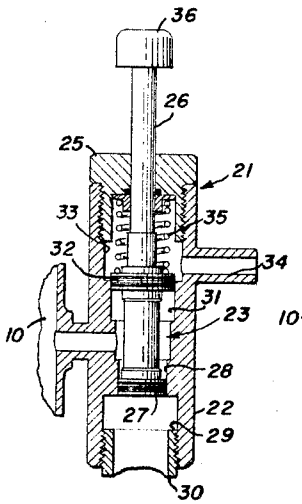


FIG. 3.

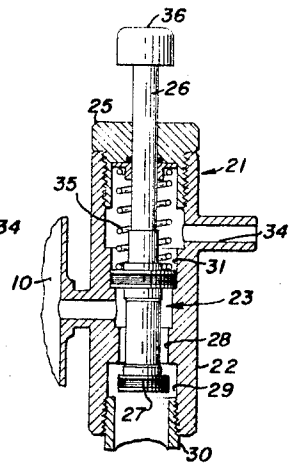


FIG. 4.

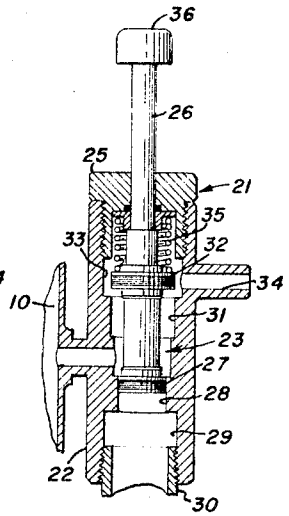


FIG. 5.

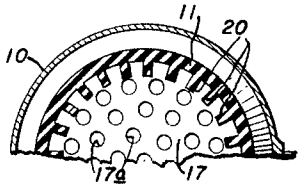


FIG. 6.

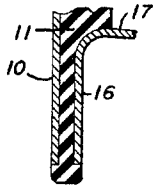


FIG. 7.

JORDAN H. ASHLEY
INVENTOR.

BY Herbert J. Brown

ATTORNEY

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WRINGER

Jordan H. Ashley, Graham, Tex., assignor to Aqua-Air, Inc., Graham, Tex., a corporation of Texas

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This invention relates to wringers for removing excess moisture from chamois, wiping cloths and the like.

Generally, the invention is directed to and has for its primary object a simplified construction comprised of an upright casing having an opening in the top, a generally open bottom, a tubular membrane within the casing, which membrane is sealed to the casing and the top and bottom of the casing to provide a chamber therebetween, and a manual control valve mounted on the side of the casing to supply air or other fluid under pressure to the compartment and thereby squeeze the membrane inwardly on all sides. Thus, a moist rag or chamois placed in the container is thereby squeezed by the membrane and excess moisture drains through the substantially open bottom. One means of accomplishing the simplified construction is to make both the container and the membrane cylindrical, and another means for simplifying the construction is the provision of circular flanges within the top and bottom of the membrane, and which flanges are crimped along with corresponding portions of the container to provide an effective economically constructed seal.

Another object of the invention is to provide an improved simplified manual control valve for applying pressure to the outer surface of the membrane and automatically releasing such pressure after the squeezing operation. With the exception of a balancing spring the improved and simplified manual control valve has a single moveable unit comprised of a stem and a rigidly mounted valve member and a rigidly mounted valve element thereon in spaced relation. Thus, the moveable unit may be made, with the exception of the seals, by a simple turning operation.

A further object of the invention is to provide an improved simplified construction whereby squeezing the membrane first at the top and then progressively downward is assured.

These and other objects will become apparent from the following description and the accompanying drawing, wherein:

FIGURE 1 is an elevational and fragmentary sectional view of a wringer embodying the features of the present invention.

FIGURE 2 is a vertical sectional view similar to FIGURE 1, but showing the wringer in operation.

FIGURE 3 is a vertical sectional view of the manual control valve and showing the same in its neutral position.

FIGURE 4 is a sectional view similar to FIGURE 3, but showing the valve stem depressed so as to admit fluid pressure into the casing and around the membrane.

FIGURE 5 is a sectional view similar to FIGURES 3 and 4, but showing the valve in its exhaust position.

FIGURE 6 is a fragmentary transverse sectional view of the casing and membrane looking down and particularly showing the radial disposition of ribs within the membrane and the multiple openings in the bottom of the container.

FIGURE 7 is an enlarged vertical fragmentary sectional view of the lower left portion of FIGURE 1 or FIGURE 2 and showing the position of the lower end of the membrane, the lower end of the container and the flange of the bottom member prior to crimping.

In the drawing, the numeral **10** generally designates an upright cylindrical casing which receives a generally

cylindrical resilient squeezing membrane **11** therein. As best shown in FIGURE 1, the inner wall of the cylindrical membrane **11** is straight, at **12**, whereas the outer wall of the membrane is somewhat reduced in diameter therearound, at **13**, which construction has to do with assuring initial squeezing near the top of the membrane and thence downwardly as will be referred to in the following description of operation.

Within the upper end of the membrane **11** there is a circular cylindrical ring or flange **14** which engages the upper end of the membrane **11** with the upper end of the casing **10**. To assure a fluid proof fit and to rigidly secure the upper end of the membrane, the casing **10** and flange **14** are crimped, as at **15**. Similarly, the lower end of the casing **10** and the lower end of the membrane **11** are provided with the range **16** of a perforated bottom **17**, which flange is also crimped to provide the fluid tight seal and to secure the lower end of the membrane. As best shown in FIGURE 6, the bottom **17** has numerous perforations **17***a* throughout its horizontal area for quickly discharging excess moisture after the squeezing operation. Upper and lower channel shaped rims **18** and **19** fit over the upper and lower ends of the container **10** and over the upper and lower rings or flanges **14** and **16**.

As best shown in FIGURES 1 and 6, the inner wall of the membrane is provided with longitudinal inwardly extending spaced ribs **20** which have to do with draining moisture during the squeezing operation. These ribs are integral with and of the same material as the membrane **11**.

The manual control valve **21** is comprised of a cylindrical body **22** having a cylindrical bore, generally indicated at **23**, and which valve body is parallel with the upright cylindrical casing **10**. Intermediate the ends of the body **22** there is a lateral fitting **24**, herein referred to as an operating port, connecting the area between the casing **10** and the membrane **11** with the valve bore **23**. A cap **25** is threaded in the upper end of the body **22**, and a valve stem **26** slidably extends therethrough. The lower end of the stem **26** is always below the operating port **24** and is provided with a piston like valve member **27** which is rigid with or integral with the valve stem. The bore **23** is of reduced diameter immediately below the operating port **24** to provide a cylinder **28** in which the valve element **27** operates during certain phases of operation. That portion of the bore **23** beneath the cylinder **28** is enlarged to provide a bypass chamber **29**, and an inlet fitting **30** is connected with the lower end of said chamber. The fitting **30** is also herein referred to as the valve inlet. Immediately above the operating port **24** there is an enlarged diameter in the bore **23**, which diameter serves as a cylinder **31** for a piston like valve element **32**; and immediately above the cylinder **31** there is a further enlarged diameter which serves as an exhaust chamber **33**. The valve element **32** is rigid with or integral with the stem **26** and the spacing thereon is such that when the valve element **32** is in its lowermost position the valve member **27** is in and spaced from the walls of the bypass chamber **29**. Conversely, when the valve member **27** is in its uppermost position, the valve element **32** is in the enlarged exhaust chamber **33**, and thereby communicates the operating port **24** with an exhaust port **34** in the side of the last said chamber. A balancing compression spring **35** is mounted around the stem **26** and bears against the cap **25** and the valve element **32**. The compression of the spring **25** is such that the valve **21** normally assumes a closed neutral position as shown in FIGURE 3 with the valve member **27** and the valve element **32** in their respective cylinders **28** and **31**. Details shown in the drawing include a knob **36** on the upper end of the stem **26** and a supply hose **37** connected with the inlet fitting **30**.

In operation, the chamois or rag to be squeezed is dropped in the top of the container **10** and the valve stem **26** is pushed down by means of the knob **36**. Fluid under pressure is then admitted to the area between the inner wall casing and the outer wall membrane **11** through the operating port **24**. It is to be noted, as shown in FIGURE 4, that the fluid under pressure moves through the bypass chamber **29** around the valve member **27** and thence through the operating port **24**, the central bore **23** being closed above the operating port by the valve element **32**. Action of the fluid pressure within the container first acts upon the membrane at its circumferential reduced diameter **13** and continued pressure then squeezes the membrane progressively downwardly, thus squeezing excess moisture from the chamois **38**. After the maximum volume of fluid has been received within the container, continued pressure received through the inlet **30** acts upon the valve element **32** and moves the same upwardly against the compression spring **35**. In this connection it is to be noted that the diameter of the valve element **32** is greater than the diameter of the valve member **27**. Upward movement of the stem **26** causes the valve member **27** to be received within the cylinder **28** and the pressure against that member and pressure from the container **10** against the valve element **32** moves the stem upwardly and allows pressure from the container to escape through the exhaust port **34**. With the pressure in the container thus relieved, the balancing spring **35** returns the valve element **32** and the valve member **27** to their normal closed positions.

The invention is not limited to the exemplary construction herein shown and described, but may be made in various ways within the scope of the appended claims.

What is claimed is:

1. A wringer comprising: a vertical circular cylindrical casing, a substantially cylindrical resilient membrane received within said casing, means securing said membrane around its peripheral ends only to the ends of said casing, a substantially open bottom across the lower end of said casing, an operating port in the wall of said casing, said membrane being of reduced thickness circumferentially therearound and above its axial center whereby said membrane will initially collapse above said center when a pressure fluid is introduced through said

operating port, and radially disposed spaced longitudinal resilient ribs on the inner surface of said membrane.

2. A wringer as defined in claim **1**, and wherein said means securing said membrane at its ends to the ends of said casing is comprised of a circular flange in each end of said membrane, and wherein said flanges and the ends of said container are crimped around the ends of said membrane.

3. In combination with a wringer as defined in claim **1**, a manually operated control valve comprising a body having a bore therein, inlet and exhaust ports in said body communicating with the ends of said bore, a lateral port in said body between said inlet and said exhaust ports communicating with said operating port in the wall of said casing, a stem received in said bore and extending outwardly of said body at the end of said bore opposite said inlet port, cylinders in said bore on opposite sides of said lateral port, enlarged chambers in said bore adjacent and in communication with said inlet port and said exhaust port, pistons rigidly mounted on said stem and slidably moveable in said cylinders, the spacing of said pistons relative to each other being such that said pistons are received in their respective said cylinders when said valve is in its off position and one of said pistons is in one or the other of said enlarged chambers when said valve is in other than its off position, and spring means normally urging said stem and said pistons toward the end of said bore including said inlet port.

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LOUIS O. MAASSEL, *Primary Examiner.*