July 3, 1956 J. J. KASTNER 2,752,986

HYDRAULICALLY ACTUATED SEAT LIFTING APPARATUS

Filed Oct. 18, 1952 3 Sheets-Sheet 1

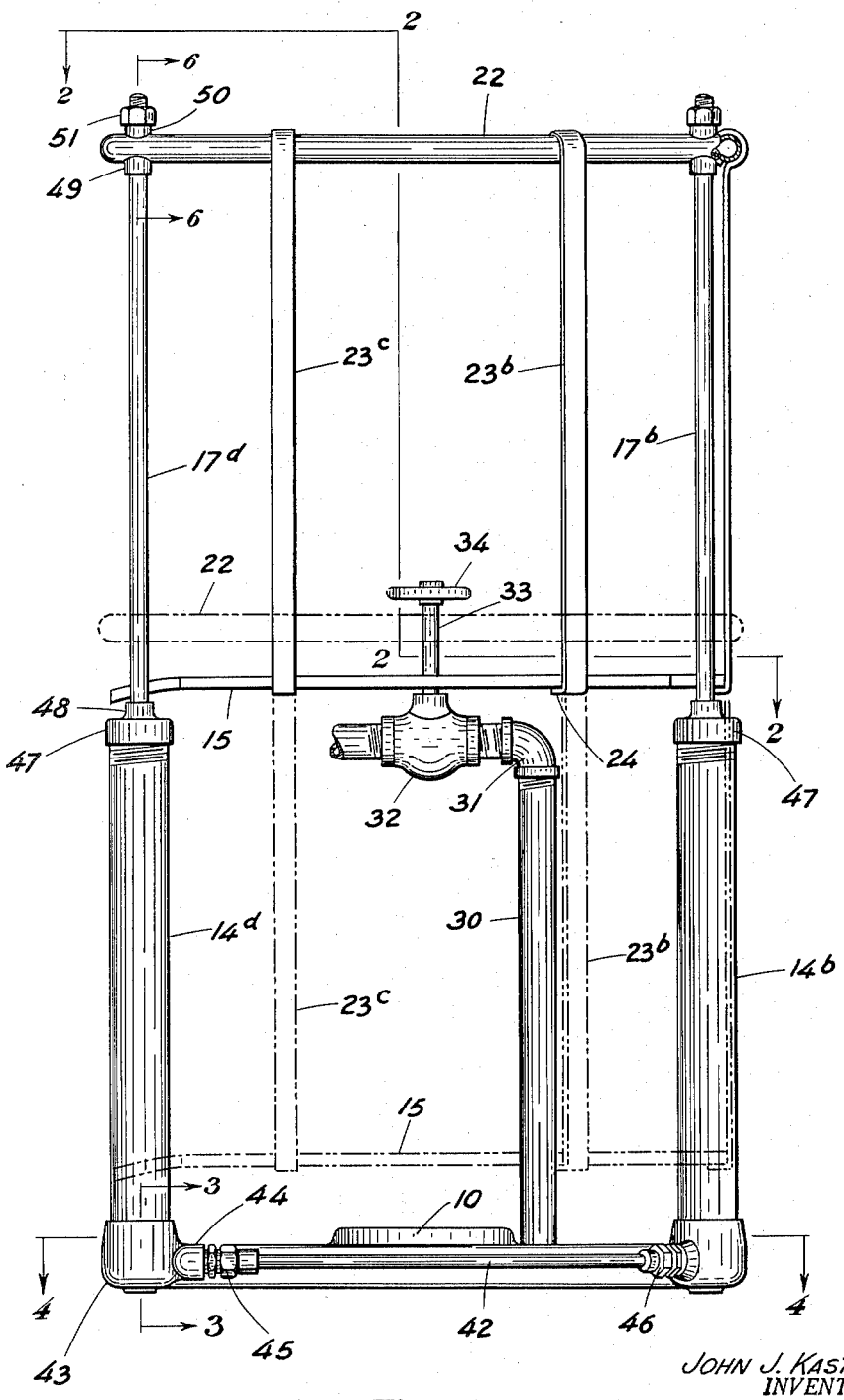


Fig. 1

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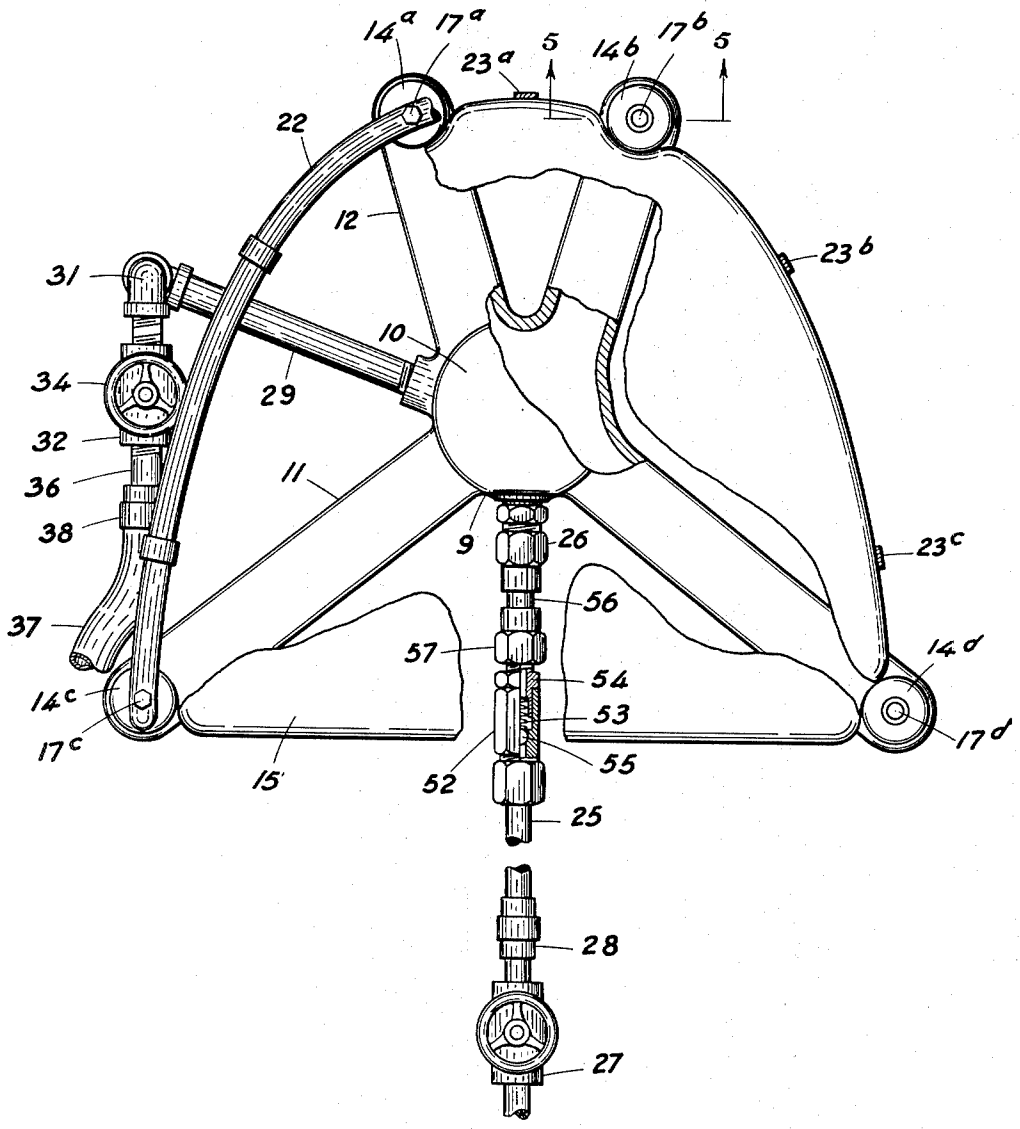


Fig. 2

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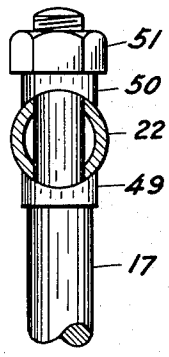


Fig. 6

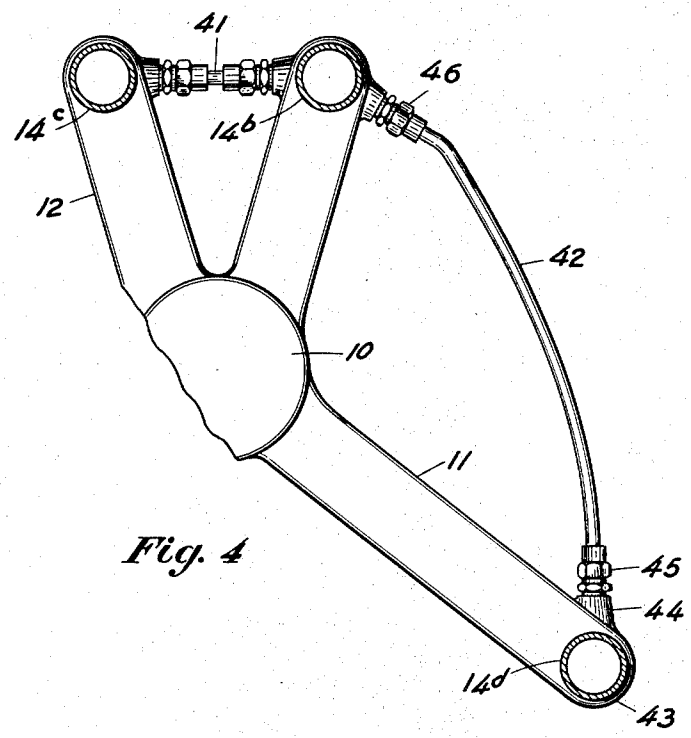


Fig. 4

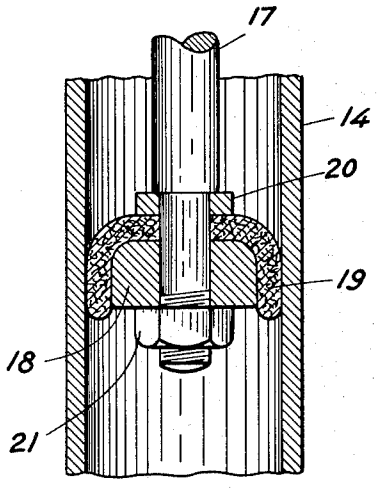


Fig. 5

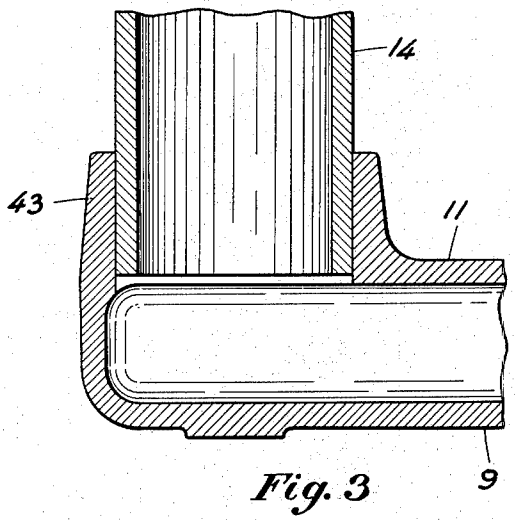


Fig. 3

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United States Patent Office

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HYDRAULICALLY ACTUATED SEAT LIFTING APPARATUS

John J. Kastner, Astoria, N. Y., assignor of one-third to Nan F. Wharton, Woodside, N. Y., and one-third to William H. Fiedler, Brooklyn, N. Y.

Application October 18, 1952, Serial No. 315,589

11 Claims. (Cl. 155—88)

This invention relates to an elevating seat, and is particularly directed to an apparatus, which may be mounted in the conventional type of bath tub, for elevating and lowering a person seated on it.

It is primarily directed to a hydraulically operated seat which may be mounted in a bath tub, or other type of unit for automatically lowering or raising a person seated on it from one height to another.

Due to physical disabilities of various types, it is often difficult for a person to move from a standing position to a low seated position, such as that required in a bath tub without the assistance of other persons.

The primary object of my invention is to provide a hydraulically actuated elevating seat, which may be mounted in a bath tub or other suitable location, to enable a person seated on it at one level to automatically lower himself to a lower level.

A further object is to provide an apparatus, which will enable an invalid to lower himself into a bath tub or raise himself therefrom without requiring the assistance of other persons.

A feature of the invention resides in the provision of a hydraulically actuated apparatus, completely operated by pressure of the water lines, from a bath tub faucet or other suitable water connection, so that the entire unit may be mounted and used in a bath tub.

A further object is to provide an apparatus which may be readily controlled by a person seated thereon without external assistance, while remaining in a seated position.

Another feature of the apparatus is that it is compact, and relatively open in all directions so that it can be fitted to the conventional type of bath tub without interfering with the bathing of a person seated thereon.

Another object is to provide a relatively simple compact apparatus, which may be installed in or removed from a bath tube by relatively unskilled persons and may be adjusted and regulated without special tools or equipment.

The accompanying drawings, illustrative of one embodiment of my invention, together with the description of its construction and the method of operation and installation thereof, will serve to clarify further objects and advantages of my invention.

In the drawings:

Fig. 1 is a side elevational view of the assembled unit in the raised position, as it would be mounted in a bath tub or other suitable location, showing the control valves, also indicating the relative position of the seat and other parts of the apparatus in the lowered position in dot-dash lines.

Fig. 2 represents a broken plan view of the assembled unit, shown in Fig. 1, and a partial section through the piston rods, showing the tubular columns, and the base therefor, the contour of the seat and other parts of the apparatus, the water connections and the control valves taken at 2—2, Fig. 1.

Fig. 3 is a vertical section through the lower part of one of the vertical hydraulic cylinders, and a portion of the supporting area of the base, taken at 3—3, Fig. 1.

Fig. 4 represents a plan view of a portion of the base, showing the tubular lines connecting the various cylinder support hub sections of the base.

Fig. 5 is a vertical section through a portion of one of the vertical hydraulic cylinders, and the piston and piston rod reciprocatingly fitted thereto, taken at 5—5, Fig. 2.

Fig. 6 is a vertical section through one of the piston rods and the seat support tube, showing the method of attaching the seat support tube to the piston rods.

It will be understood that the following description of the construction and operation of the unit is intended as explanatory of the invention and not restrictive thereof. In the drawings, the same reference numerals designate the same parts throughout the various views.

One embodiment of the construction shown in Figs. 1 and 2, is supported by a base **9**, comprising a hollow central reservoir section **10**, of substantially circular cross-section, as shown in Fig. 4, with a plurality of radial distributing conduits **11** and **12**, of rectangular cross-section integral with the base, the radial conduits **11** and **12** leading from the central reservoir to a plurality of tubular vertical cylinders **14**, located in a substantially semi-elliptical arrangement around the central base reservoir, to provide room for a seat **15**, of arcuate contour, sloping inward from the forward end thereof toward the rear. The space between the two rear cylinders **14***a* and **14***b* is considerably less than that between the two forward cylinders **14***c* and **14***d* to provide room for a person occupying the seat between the two forward cylinders.

The two forward cylinders **14***c* and **14***d* are normally located in such a position as to allow the unit to fit between the side walls of a bath tub of the conventional type, the arcuate contour of the seat, and the support therefor, allowing the unit to fit into the curved rear portion of a bath tub, while still allowing a person to comfortably occupy the seat.

A piston rod **17** is reciprocatingly mounted in each of the vertical cylinders, the lower end of each of the piston rods being reduced in diameter to support a piston **18**, and a formed sealing cup **19**, or packing of cupped cross-section, made of leather or other suitable material, which fits the interior of the cylinder, the pressure of the piston against the inner edge of the sealing cup retaining the vertical walls thereof against the inner cylinder wall.

The lower end of each of the piston rods **17** is reduced in diameter, a flat washer **20** being inserted between the shoulder on the piston rod, and the flat portion of the sealing cup **19** in the manner indicated in Fig. 5. A nut **21**, or other suitable attaching means may be threadably attached to the lower end of the reduced diameter end of the piston rod, the nut engaging the bottom of the piston, thereby pressing the piston against the flat portion of the sealing cup **19**.

A tubular seat support **22** is attached to the upper end of the piston rods **17***a*, **17***b*, **17***c* and **17***d*, the seat support following generally the substantially semi-elliptical contour of a seat **15**, located between the piston rods, above the upper end of the cylinders, as indicated in Figs. 1 and 2.

The seat **15** is attached to the tubular seat support by a plurality of flat metal straps **23**, the upper end of each of which is wrapped around and brazed or otherwise attached to the tubular seat support, with a flange **24**, integral with the lower end of each strap welded, riveted, or otherwise attached to the seat. The straps **23***a*, **23***b*, and **23***c*, may be located in any suitable relation around the tubular seat support, between the cylinders **14***a*, **14***b*, **14***c* and **14***d*.

Water under pressure to feed the cylinders, is supplied through an inlet hose or pipe **25**, located at the lower end of the center of the unit, the opposite end of which is attached to a water faucet, or other source of water supply, the unit end of the inlet pipe line being attached to the central reservoir **10** by a tube fitting **26**, pipe fitting or other suitable attaching means, an inlet valve **27**, or the regular faucet valve located remotely from the unit, and connected to the inlet line by a flexible hose **28** or other type of conduit, controlling the flow of water to the apparatus.

In place of the inlet valve **27**, a two-way faucet may be utilized, one faucet outlet supplying water to the tub, the other outlet being connected to the inlet pipe line **25** of the apparatus. In this manner water would flow through the bath tub outlet of the faucet after the seat reaches the top of its stroke, when the faucet outlet connected to the inlet pipe line is open.

The water from the cylinders **14** passes through the radial conduits **11** and **12**, and is discharged through an outlet pipe **29**, one end of which is attached to the central reservoir, with the opposite end connected by a fitting to a vertical discharge pipe **30**, which is connected by a fitting **31** to an outlet valve **32**, located adjacent the outer edge of the seat, a long stem **33** fitted to the valve having a circular or other suitable type of control handle **34**, located at the upper end thereof, attached thereto.

The control handle **34** of the valve is located slightly above the elevated level of the seat **15**, to enable a person seated on the seat to rotate the control handle, thereby opening and closing the valve.

An outlet conduit or pipe **36** is connected to the opposite end of the valve **32**, the opposite end of the pipe being connected by a flexible hose **37**, or a pipe, to a discharge line located outside the bathtub, or discharging directly into the bathtub.

A hose clamp **38**, or other suitable attaching means may be provided to clamp the flexible hose to the outlet conduit **36**, in the manner indicated in Fig. 2.

In order to equalize the water pressure between the cylinders, a series of connecting tubes **41** and **42** are used to interconnect the cylinder support hubs **43**, located at the outer end of each of the radial conduits **11** and **12**, as indicated in Figs. 1 and 4.

Each of the cylinders **14** may be threadably attached to an opening formed in the corresponding conduit cylinder hub **43**, or it may be pressed into the opening, and soldered, brazed, or otherwise attached to the hub in the manner indicated in Fig. 3.

The end of each of the tubes **41** and **42** is connected to an opening formed in a boss **44**, integral with the hub **43** by a pair of tube fittings **45** and **46**, each of which is threadably inserted in the corresponding hub boss.

A tubular cap **47** having an internally threaded body and a tubular neck **48** of a smaller diameter than the body, is threadably attached to the upper end of each of the cylinders **14**, a central longitudinal opening in the tubular neck **48** integral with the upper end of the cap body, reciprocatingly supporting and guiding the corresponding piston rod **17**.

The upper end of each of the piston rods is reduced in diameter, as indicated in Fig. 6, a washer **49**, the upper end of which is of concave contour to fit the contour of the seat support tube **22**, being seated against a shoulder at the upper end of the piston rod.

A similar washer **50**, the lower end of which is of concave arcuate contour to fit the upper end of the tube **22** engages the upper end of the tube **22**.

A nut **51** or other suitable attaching means, may be threadably attached to the reduced diameter upper end of each piston rod to clamp the two washers **49** and **50** against the seat support tube **22** and the shoulder on the piston rod, thereby supporting the tubular seat support.

In order to prevent the return flow of water into the feed pipe line **25**, when the water is discharged from the cylinders **14** into the central reservoir **10**, a check valve **52** may be inserted into the feed line, as indicated in Fig. 2, thus preventing the return flow of water from the reservoir into the line.

A coiled compression spring **53**, one end of which rests against a flat shoulder formed in a connector **54**, threadably attached to an opening in the body of the check valve, is inserted in the check valve to retain the ball **55** against its spherical segmental seat, except when the ball is raised therefrom by the pressure of the water entering through the inlet conduit **25**.

A tube **56**, connected to a boss, integral with the forward end of the reservoir connects the check valve connector **54** to the central reservoir, a pair of tube fittings **26** and **57**, pipe fittings or other suitable connecting means being provided at opposite ends of the tube **56**, one fitting **26** being threadably inserted in an opening formed in the boss, integral with the reservoir, the opposite fitting being threadably or otherwise attached to the reduced diameter end of the connector **54**.

The operation for the unit is substantially as follows: When the seat **15** is in the lower position, shown by dot-dash lines, Fig. 1, the operator fully closes the discharge valve **32**, and opens the inlet valve **27**, or a faucet, in the bath tub, thereby allowing water under pressure to enter the inlet conduit, through the hose **28**.

The water forces the ball **55** of the ball check valve **52** off its seat, and enters the central reservoir **10** through which it is fed to the various radial distributing conduits **11** and **12**, through which it enters the vertical cylinders **14***a*, **14***b*, **14***c* and **14***d*.

The water entering the lower end of the cylinders **14**, forces the corresponding pistons **18** upward in each of the cylinders, the water pressure tending to expand the walls of the sealing rings, thereby sealing the pistons and preventing the flow of water past the sealing rings and into the upper portion of the cylinder.

The pistons and the piston rods **17** are raised from the lower position, shown by dot-dash lines Fig. 1, until the seat **15** reaches the upper position, Fig. 1, after which the faucet or water inlet valve **27** is closed, thus shutting off the flow of water to the cylinders.

With the outlet valve closed, the water in the cylinders is retained therein, the closing of the inlet valve retaining the seat in the upper position shown in Fig. 1, the water pressure in the cylinders sustaining the weight of a person seated on the seat. The check valve **52** prevents the return flow of water from the reservoir and the cylinders into the inlet line when the inlet valve is closed.

The equalizing tubes **41** and **42** connecting the cylinder conduit hubs in the base, equalize the water pressure between the various cylinders, thus retaining the seat at a uniform level in all positions during the elevating and lowering of the seat.

The person then sits on the seat, and opens the outlet valve **32**, the degree of opening of the outlet valve **32** regulating the rate of flow of water through the valve, and therefore the rate at which the seat descends to the lower position, shown by dot-dash lines Fig. 1.

The outlet valve **32** may be kept open while the seat is in the lower position, or fully closed to retain the seat in any intermediate position, between the extreme upper position and the extreme lower position.

The check valve **52** prevents the return flow of water through the inlet hose, whether the outlet valve is open or closed.

When the operator desires to again ascend to the upper position, the outlet valve **32** is fully closed, and the inlet valve **27**, or the faucet opened, thereby allowing the water under pressure to enter the reservoir and the cylinders, the operation of the unit being repeated in the manner hereinbefore described.

Where an adequate supply of water under pressure is not available, a motor-driven or other suitable type of water pump may be provided to supply a source of water or other fluid instead of water.

The number of cylinders employed may be increased,

and the spacing thereof adjusted depending upon the weight for which the seat is designed.

The contour of the base formed by the tubes **41**, **42**, and the outer ends of the radial conduits **11** and **12** integral with the central reservoir section **10**, as well as the form of the seat support tube may be altered to suit the requirements of the location and space available for installations other than a bath tub, the spacing and location of the cylinders following generally the contour of the base and the seat support tube.

For installations requiring a greater range than that shown in Fig. 1, the length of the piston rods may be increased, the height of the cylinders being similarly increased to increase the length of the stroke of the pistons within the cylinders.

The diameter of the cylinders may be varied depending upon the load imposed on them and the number of cylinders used in a particular installation.

The construction of the piston may be altered from that shown in Fig. 5, other types of seals or rings being provided to seal the pistons within the cylinders.

In place of the equalizing tubes **41** and **42**, shown in Fig. 2, the base casting may be extended to provide a series of integral conduits connecting the hubs of the various cylinders, thus providing a one-piece cast base including the reservoir, conduits, cylinder hubs and equalizing conduits.

Whenever tubes or tube fittings are shown in the drawings and described, pipes and various types of pipe fittings may be substituted therefor, the location of the conduits being essentially the same.

It will be apparent to one skilled in the art that applicant's principles may be applied in many modified forms and therefore the following claims should not be limited to the forms illustrated but be deemed to apply to all equivalents as well.

What I claim is:

1. A hydraulic seat lifting apparatus for use in combination with a pressure fluid supply, comprising a base having a hollow central reservoir with a plurality of integral conduits leading radially therefrom, a plurality of tubular cylinders, each of said cylinders being attached to the corresponding base conduit each of said conduits having a support hub at the outer end thereof, in which a cylinder is supported, said cylinders being located in substantially semi-ellipitical formation around the base, one pair of said cylinders having a relatively wide space therebetween, each of said cylinders having a piston reciprocatingly fitted thereto, with a piston rod attached to each of said pistons, a tubular seat support member of substantially semi-ellipitical contour attached to one end of said piston rods, a seat following substantially to contour of the tubular seat support member, mounted substantially perpendicularly to the cylinders, below the tubular seat support member means suspending the seat from the seat supporting member, the piston rods being operative to lower the seat to a position close to the upper surface of the base, the piston rods when raised to their elevated position being operative to raise the seat to a position above the top of the cylinders, means feeding a liquid under pressure to the cylinders, conduit means connected to the reservoir allowing the liquid discharged from the cylinders to pass therethrough, shut-off means controlling the flow of liquid from the liquid feeding means to the cylinders, and means controlling the flow of the liquid discharged from the cylinders.

2. A hydraulic seat lifting apparatus for use in combination with a supply of liquid under pressure, comprising a base having a central hollow reservoir with a plurality of hollow integral conduits in communication therewith, each of said conduits having a cylinder support hub at one end thereof, a plurality of tubular cylinders located in arcuate formation around the base reservoir, each of said cylinders being attached to the corresponding base conduit hub, a reciprocating piston fitted to each of said cylinders, a piston rod attached to each of said pistons, a seat support member following the arcuate cylinder arrangement attached to the ends of the piston rods opposite the pistons, a substantially flat seat mounted in the space surrounded by the cylinders, below the tubular seat support member, means suspending the seat from the seat support member, the piston rods being operative to lower the seat to a position close to the upper surface of the base, the piston rods when raised to their elevated position being operative to raise the seat to a position above the top of the cylinders, an inlet conduit supplying liquid under pressure to the cylinders through the base reservoir, a discharge conduit connected to the base reservoir allowing liquid discharged from the cylinders to pass therethrough, valve means connected to the inlet conduit operative to control the flow of liquid to the cylinders, and valve means connected to the discharge conduit operative to control the flow of liquid from the cylinders.

3. A lifting apparatus for use in combination with a supply of liquid under pressure, comprising a base having a central hollow reservoir, with a plurality of substantially radial conduits leading therefrom, a plurality of tubular cylinders, located in semi-oval formation around the base reservoir, one pair of said cylinders having a relatively wide space therebetween, each of said cylinders being connected to the corresponding radial base conduit, a piston reciprocatingly fitted to each of said cylinders, a piston rod having one end thereof attached to each of said pistons extending beyond each of said cylinders, means connecting the ends of said piston rods opposite the pistons, a relatively flat seat of semi-oval contour located substantially perpendicularly to the cylinders, below the piston rod connecting means, means suspending the seat from the piston rod connecting means, the piston rods being operative to lower the seat to a position close to the upper surface of the base, the piston rods when raised to their elevated position being operative to raise the seat to a position above the top of the cylinders, an inlet conduit supplying liquid under pressure to the base reservoir, valve means restricting the return flow of liquid from the base reservoir to the inlet conduit, a discharge conduit conected to the base reservoir allowing liquid discharged from the cylinders to pass therethrough, valve means connected to the inlet conduit operative to control the flow of liquid to the cylinders, and valve means connected to the discharge conduit operative to control the flow of liquid from the cylinders through the base reservoir.

4. A hydraulic seat lifting apparatus for use in combination with a supply of liquid under pressure, comprising a base having a central hollow reservoir with a plurality of hollow, substantially radial conduits integral therewith, a plurality of tubular cylinders located in substantially semi-oval arrangement around the base reservoir, with a wide gap between one pair of said cylinders, each radial base conduit having means integral therewith supporting one of said cylinders, a reciprocating piston fitted to each of said cylinders, a cupped packing fitted around each of said pistons sealing each piston within the corresponding cylinder, a piston rod attached to each of said pistons, said piston rods extending beyond the ends of the corresponding cylinders, a tubular support member following the semi-oval cylinder arrangement attached to the ends of the piston rods opposite the pistons, a substantially flat seat mounted in the space surrounded by the cylinders, below the tubular seat support member, means closing the end of each cylinder opposite the base, said closing means reciprocatingly supporting the corresponding piston rod, means suspending a seat from the seat support member, the piston rods being operative to lower the seat to a position close to the upper surface of the base, the piston rods when raised to their elevated position being operative to raise the seat to a position above the top of the cylinders, a pipe line supplying liquid under pressure to the cylinders through the base reservoir, an outlet pipe con-

nected to the base reservoir allowing liquid discharged from the cylinders to pass therethrough, valve means connected to the inlet pipe line operative to control the flow of liquid to the cylinders, and valve means connected to the outlet pipe operative to control the flow of liquid from the cylinders.

5. A hydraulic seat lifting apparatus for use in combination with a supply of liquid under pressure, comprising a base having a central hollow reservoir with a plurality of hollow, substantially radial conduits connected thereto, each of said conduits having a hollow hub integral with the end thereof opposite the central reservoir, a plurality of tubular cylinders located in semi-oval formation around the base reservoir, each of said cylinders being supported by and connected to the corresponding base conduit hub, a reciprocating piston fitted to each of said cylinders, a piston rod attached to each of said piston, each of said piston rods extending beyond the corresponding cylinder, a tubular seat support member following the semi-oval cylinder arrangement, attached to the ends of the piston rods opposite the pistons, a substantially flat seat mounted in the space surrounded by the cylinders, below the tubular seat support member, means suspending the seat from the seat support member, the piston rods being operative to lower the seat to a position close to the upper surface of the base, the piston rods when raised to their elevated position being operative to raise the seat to a position above the top of the cylinders, tubular means connecting the radial conduit hubs to balance the pressures within the cylinders, an inlet pipe supplying liquid under pressure to the cylinders through the base reservoir to elevate the pistons and the seat connected thereto, an outlet pipe connected to the base reservoir allowing liquid discharged from the cylinders to pass therethrough, valve means connected to the inlet pipe operative to control the flow of liquid to the cylinders, and valve means connected to the outlet pipe operative to control the flow of liquid discharged from the cylinders on the return piston stroke.

6. A hydraulic seat lifting apparatus for use in combination with a pressure water supply, comprising a base having a hollow central reservoir, with a plurality of substantially radial conduits leading therefrom integral therewith, a plurality of tubular cylinders located in substantially semi-oval arrangement around the base reservoir, each of said cylinders being connected to one of the radial conduits by means connected to each of said conduits and supporting the corresponding cylinder, a piston reciprocatingly fitted to each of the cylinders, a piston rod attached to each of said pistons extending beyond the corresponding cylinder, means closing the end of each cylinder, opposite the base, said closing means reciprocatingly supporting the corresponding piston rod, a tubular member having a wide gap at one end thereof, in substantial alignement with the one pair of cylinders, connecting the ends of the piston rods, opposite the pistons, a seat located within the space surrounded by the cylinders, below the piston rod tubular connecting members, means suspending the seat from the tubular piston rod connecting member, the seat being lowerable to a position close to the upper surface of the base, the piston rods in their extended position being operative to elevate the seat to a position above the top of the cylinders, an inlet pipe supplying water under pressure to the central reservoir, an outlet pipe connected to the central reservoir allowing water discharged from the cylinders to pass therethrough, a check valve connected to the inlet pipe restricting the return flow of water from the central reservoir through the inlet pipe, an inlet valve operable to regulate the flow of water therethrough connected to the inlet pipe, and an outlet valve connected to the outlet pipe operable to control the flow of water from the reservoir.

7. A hydraulic seat lifting apparatus for use in combination with a supply of water under pressure, comprising a base having a central reservoir, with a plurality of substantially radial conduits integral therewith, each of said radial conduits having a cylinder support hub integral therewith, a tubular cylinder supported by each of said radial conduit hubs, said cylinders being located in a substantially semi-oval arrangement, with a relatively wide space between the two forward cylinders, a piston reciprocatingly fitted to each of said cylinders, a piston rod attached to each of said pistons projecting beyond the corresponding cylinder, a tubular seat support member attached to the ends of the piston rods opposite the base, a seat fitted between the tubular cylinders, below the tubular seat support member, means suspending the seat from the tubular seat support member, the seat being lowerable to a position close to the upper surface of the base, the piston rods in their extended position being operative to elevate the seat to a position above the top of the cylinders, tubular means connecting adjacent cylinders equalizing the liquid pressure therebetween, an inlet pipe line connected to the central reservoir supplying liquid under pressure through the central reservoir to the cylinders, a control valve operable to regulate the flow of water through the inlet pipe connected thereto, means connected to the inlet pipe restricting the return flow of water from the central reservoir through the inlet pipe, an outlet pipe line connected to the central reservoir allowing water discharged from the central reservoir to pass therethrough, and valve means connected to the outlet pipe operable to control the flow of water discharged from the cylinders through the central reservoir.

8. A lifting apparatus for use in combination with a supply of liquid under pressure, comprising a base having a central hollow reservoir, with a plurality of substantially radial conduits leading therefrom, a plurality of tubular cylinders, located in substantially semi-oval arrangement around the base reservoir, the forward pair of said cylinders having a relatively wide space therebetween, each of said cylinders being connected to the corresponding base radial conduit, a piston reciprocatingly fitted to each of said cylinders, a cupped packing fitted around each of said pistons sealing each piston within the corresponding cylinder, a piston rod having one end thereof attached to each of said pistons extending beyond each of said cylinders, a cap attached to each of said cylinders closing the end of the cylinder opposite the base, each of said caps reciprocatingly supporting the corresponding piston rod, a tubular member connecting the ends of said piston rods opposite the pistons, a relatively flat seat of semi-oval contour located substantially perpendicularly to the cylinders, below the piston rod tubular connecting member, means suspending the seat from the tubular piston rod connecting member, the piston rods being operative to lower the seat to a position close to the upper surface of the base, the piston rods in their extended position being operative to elevate the seat to a position beyond the upper end of the cylinders, an inlet pipe supplying liquid under pressure to the base reservoir, valve means connected to the inlet pipe restricting the return flow of liquid from the reservoir to the inlet pipe, an outlet pipe connected to the central reservoir, allowing liquid discharged from the cylinders to pass therethrough, valve means connected to the inlet pipe operative to control the flow of liquid to the cylinders through the central reservoir, and valve means connected to the outlet pipe operative to control the flow of liquid from the cylinders through the central reservoir.

9. A lifting apparatus for use on combination with a supply of liquid under pressure, comprising a base having a central hollow reservoir, with a plurality of substantially radial conduits leading therefrom integral therewith, a plurality of tubular cylinders located in substantially semi-oval arrangement around the central reservoir, one pair of said cylinders having a relatively wide space therebetween, each of said cylinders being supported by and connected to the corresponding radial base conduit,

a piston reciprocatingly fitted to each of said cylinders, a compressible cupped seal ring sealing each piston within the corresponding cylinder, a piston rod having one end thereof attached to each of said pistons extending beyond each of said cylinders, a cap attached to each cylinder closing the cylinder end opposite the base, each of said caps reciprocatingly supporting the corresponding piston rod, a tubular seat support member of semi-oval contour, connecting the ends of the said piston rods opposite the pistons, tubular means connecting the cylinders to balance the liquid pressure therebetween, a relatively flat seat of semi-oval contour located substantially perpendicularly to the cylinders, below the tubular seat support member, means suspending the seat from the tubular seat support member, the piston rods being operative to lower the seat to a position close to the upper surface of the base, the piston rods in their extended position being operative to elevate the seat to a position beyond the upper end of the cylinders, an inlet pipe supplying liquid under pressure to the central reservoir, a check valve connected to the inlet pipe restricting the return flow of liquid from the central reservoir to the inlet pipe, an outlet pipe connected to the base reservoir allowing liquid discharged from the cylinders to pass therethrough, valve means connected to the inlet pipe operative to control the flow of liquid to the cylinders through the central reservoir, and valve means connected to the outlet pipe operative to control the flow of liquid from the cylinders through the central reservoir.

10. A hydraulic seat lifting apparatus for use in combination with a supply of liquid under pressure, comprising a base having a central hollow reservoir with a plurality of hollow radial conduits integral therewith and connected thereto, each of said conduits having a hollow hub integral with the end thereof opposite the central reservoir, a plurality of tubular cylinders located in substantially semi-oval arrangement around the base reservoir, with a wide gap between the forward pair of said cylinders, each of said cylinders being supported by and connected to the corresponding radial base conduit hub, a reciprocating piston fitted to each of said cylinders, a compressible sealing cup surrounding the piston to seat the piston within the cylinder, a piston rod attached to each of said pistons, each of said piston rods extending beyond the end of the corresponding cylinder, a tubular seat support member following the semi-oval cylinder arrangement attached to the ends of the piston rods opposite the pistons, a substantially flat seat mounted in the space surrounded by the cylinders, below the tubular seat support member, means closing the end of each cylinder opposite the base, said closing means reciprocatingly supporting the corresponding piston rod, a plurality of straps suspending the seat from the tubular seat support member, the piston rods being operative to lower the seat to a position close to the upper surface of the base, the piston rods in their extended position being operative to elevate the seat to a position beyond the upper end of the cylinders, an inlet pipe line supplying liquid under pressure to the cylinders through the base reservoir, a check valve connected to the inlet pipe line restricting the return flow of liquid through the inlet pipe line, an outlet pipe connected to the base reservoir allowing liquid discharged from the cylinders to pass therethrough, a valve connected to the inlet pipe line operative to control the flow of liquid to the cylinders, and a valve connected to the outlet pipe operative to control the flow of liquid from the cylinders.

11. A seat lifting apparatus for mounting in a bath tub, for use in combination with a supply of water under pressure, comprising a base having a central hollow reservoir, with a plurality of substantially radial conduits leading therefrom integral therewith, a plurality of tubular cylinders located in substantially semi-oval arrangement around the base reservoir, the forward pair of said cylinders having a relatively wide space therebetween, each of said cylinders being connected to and supported by the corresponding radial base conduit, a piston reciprocatingly fitted to each of said cylinders, compressible means sealing each piston within the corresponding cylinder, a piston rod having one end thereof attached to each of said pistons extending beyond the end of each of said cylinders, a cap attached to each cylinder closing the end of the cylinder opposite the base, each of said caps reciprocatingly supporting the corresponding piston rod, a tubular seat support member connecting the ends of said piston rods opposite the pistons, tubular means connecting the cylinders to balance the water pressure therebetween, a relatively flat seat of semi-oval contour located substantially perpendicularly to the cylinders, below the tubular seat suport member, a plurality of strips suspending the seat from the tubular seat support member, the seat being lowerable to position close to the upper surface of the base, the piston rods in their extended position being operative to elevate the seat to a position above the top of the cylinders, an inlet pipe supplying water under pressure to the base reservoir, a check valve connected to the inlet pipe restricting the return flow of water from the base reservoir to the inlet pipe, an outlet pipe connected to the base reservoir allowing water discharged from the cylinders to pass therethrough, valve means connected to the inlet pipe operative to control the flow of water to the cylinders through the base reservoir, and valve means connected to the outlet pipe operative to control the return flow of water from the cylinders through the base reservoir.

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