Jan. 26, 1926. 1,570,861

F. A. QUIROZ

PUMP

Filed April 15, 1924

Fig. 1

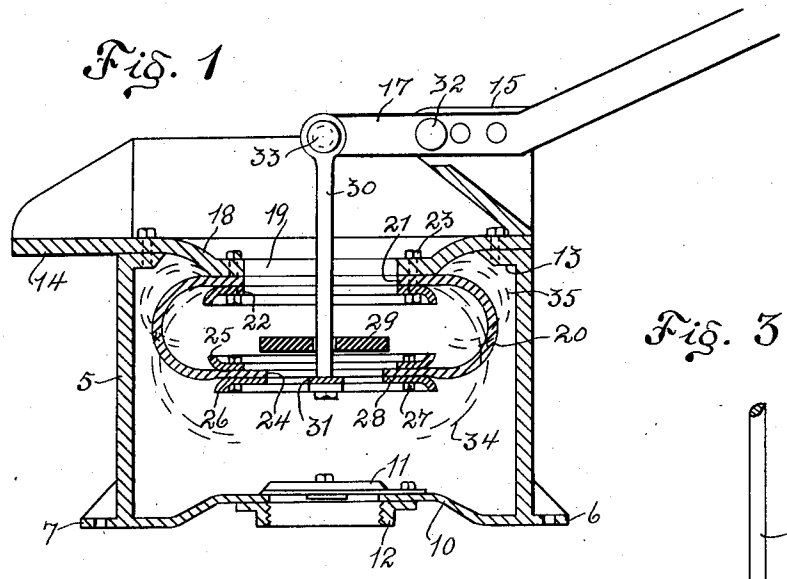


Fig. 3

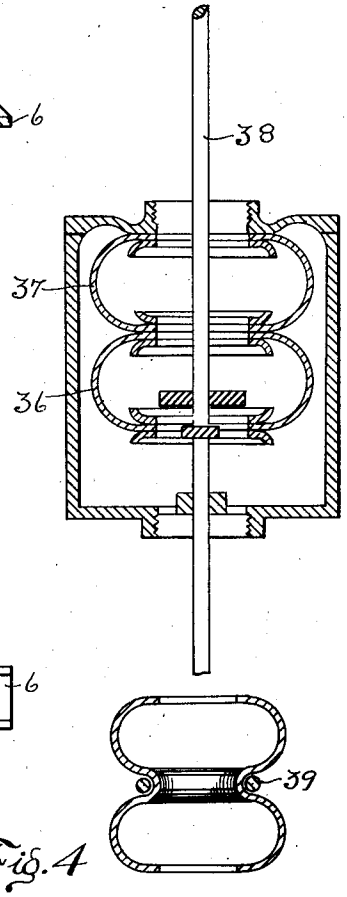


Fig. 2

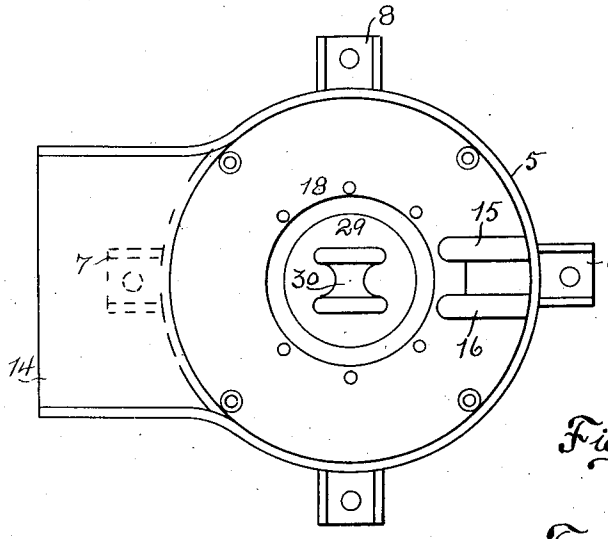


Fig. 4

INVENTOR

Francisco A. Quiroz

BY

Clifton Rhodes Marr

ATTORNEY

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UNITED STATES PATENT OFFICE.

FRANCISCO A. QUIROZ, OF NEW YORK, N. Y.

PUMP.

Application filed April 15, 1924. Serial No. 706,632.

To all whom it may concern:

Be it known that I, FRANCISCO A. QUIROZ, a citizen of the Republic of Mexico, and resident of the borough of Manhattan, city, county, and State of New York, have invented certain new and useful Improvements in Pumps, of which the following is the specification.

The device which I am about to describe is of the class commonly termed diaphragm pumps or contractors pumps and refers to the type of pumps of simple construction, wherein the piston is a sheet of flexible material, usually rubber, connected in part to the pump casing and to an operating rod and disk, the movement of the diaphragm causing the suction and discharge.

The objects of this invention are to eliminate the diaphragm usually employed and which is subjected to sharp bends during operation and to substitute therefor, an equally flexible member that will not be required to bend at a sharp angle.

Another object of the invention is to so construct pumps of this nature that their operating range may be greatly increased, that they may be used for greater lifts or suction from a greater depth. Like all pumps of this class, my pump has, what may be termed, a gravity discharge.

Another object of my invention is to so shape and support the flexible member that the thickness thereof may be increased to any desirable extent and thereby the effective working pressure may be increased, as desired. To accomplish this, I employ a built-up flexible member, somewhat similar to the shoe of an automobile tire, the walls of which may be formed of alternate layers of rubber and fabric.

Other objects and the construction, which allows the accomplishment of all objects sought will be fully set forth as the specification progresses and the accompanying drawing should be referred to for a complete understanding of the specification.

In the drawing:—

Fig. 1, is a vertical, sectional view, the section being taken at approximately the central, vertical line of the pump.

Fig. 2, is a top, plan view of the pump body.

Fig. 3, is a sectional view of a modified construction, showing a pump of greater capacity.

Fig. 4, is in section and shows a modified construction of the flexible means.

Similar reference numerals indicate like parts in all the figures where they appear.

The body of the pump is a cylindrical member as indicated at 5 and may be formed of any suitable material. The body member is provided with outstanding lugs 6, 7, 8, and 9, for securing the pump in operable position and an inwardly extending part 10, formed in the base of the pump may support a valve 11 and a flange 12. To the flange 12, a suction pipe may be secured.

The valve 11 may be of simple construction and I have shown a flapper valve, as I have found that such a valve operates satisfactorily.

To an inwardly projecting flange 13, the top of the pump is secured, the top consisting of a discharge spout 14 and a plurality of brackets 15 and 16, which support the operating handle 17.

Formed integral with the top of the pump is an inwardly projecting, downwardly depressed portion 18, provided with a central passage 19.

The flexible or movable member of my pump, that which causes the suction and discharge is an annular member of rubber and fabric or other soft and readily flexible material, formed hemispherical in cross section, as shown at 20. The axis of this annular member is arranged upon the axis of the pump body and the upper free edge 21 of this flexible member is secured between a saucer shaped disk 22 and an inwardly projecting portion of the pump head or body 18, previously referred to, bolts 23 being used to secure the saucer shaped member 22 to the pump head and clampingly engaging the flexible member therebetween.

The lower edge 24 of the flexible member is secured between a plurality of saucer shaped member 25 and 26, by means of suitable bolts 27 and it will be noted that all of the saucer shaped member are provided with central passages, resulting in the formation of saucer shaped member, which are in reality, flanged rings.

It will be noted that the ring 27 extends inwardly to a greater degree than do the other similar members, the inward extension being shown at 28 and that the flexible member also extends inward to the same distance as does the member 26. This inward

extension provides a valve seat for the valve 29, which is nothing more or less than a disk of suitable weight arranged upon the piston rod 30. The piston rod passes through and is secured to a hub 31, formed integral with the member 26.

In the operation of this device, the handle 17, pivoted at 32 operates the piston rod 30, to which it is loosely secured by means of a pin 33 and as this rod 30 is caused to move up and down or in and out of the cylinder 5, the saucer shaped member 25 and 26 are also caused to move, carrying upward and downward or inward and outward the lower edge of the flexible member 20. The downward movement of this member is indicated by the dotted lines 34 and may be termed the full extension of the member. The full compression of this flexible member is indicated by the dotted lines 35.

To start this pump, it should be primed in the usual manner, by introducing water in the valve 29 to approximately fill the space in the pump body under the moving parts. The downward movement of the member 25 and 26, which may be termed the piston, will cause the water to pass above the valve 29 and an upward movement of the so-called piston will cause an effective suction in the pump body, opening the valve 11 and drawing in water from the suction pipe. The upward movement of the piston, bodily lifts the water contained thereon, causing it to flow upward and outward through the spout 14.

To increase the length of the stroke and therefor, the capacity of my pump, I may provide a plurality of flexible members and component parts, as indicated at 36 and 37 in Fig. 3, the rod 38 of this construction being a piston rod, properly guided and operated by any suitable means.

The flexible members for the device shown in Fig. 3, may be formed of separate parts as shown in that figure, or may formed integral as shown in Fig. 4, a band of wire or other suitable retaining means being provided as shown at 39.

Different types of valves may be used, than those shown and other modifications may be made within the scope of the appended claims, without departing from the principle or sacrificing the advantages of the invention.

Having carefully and fully described my invention, what I claim and desire to obtain is:—

1. A pump having a flexible retractable and extendable member, a plurality of saucer shaped rings engaging the edges thereof, a hub formed in the innermost ring, an operating rod secured to said hub and passing through said flexible member and a valve surrounding said operating rod, all combined for joint operation as herein set forth.

2. A pump having a main body and a head secured thereto, a flexible member in said body and operable therein and secured to said head, said head being provided with a depressed portion, forming a recess for the reception of said flexible member, when said flexible member is retracted, a foot valve in the main body and away from said flexible member and a valve in the edge of said flexible member, next adjacent to said foot valve.

Signed at the city, county and State of New York, this 11 day of April, 1924.

F. A. QUIROZ.