April 1, 1941. L. KEMPER 2,237,075

ROTARY PUMP

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Fig. 1.

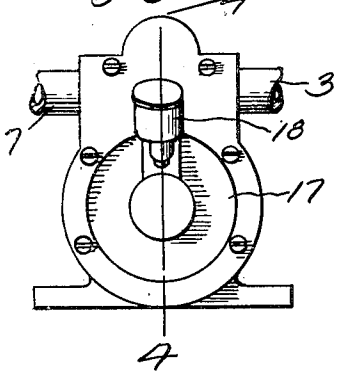


Fig. 2.

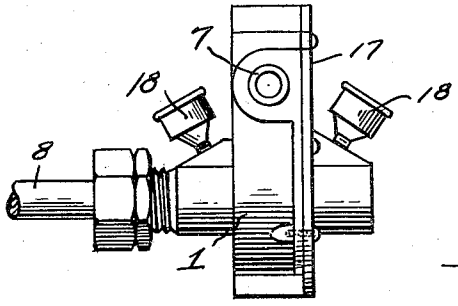
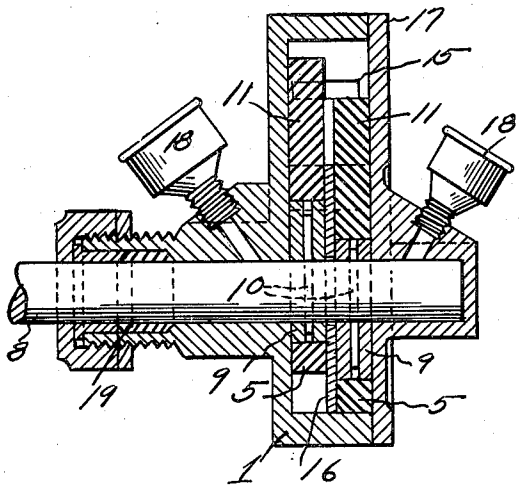


Fig. 4.



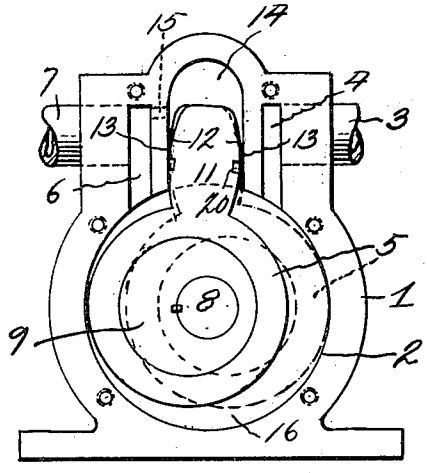


Fig. 3.

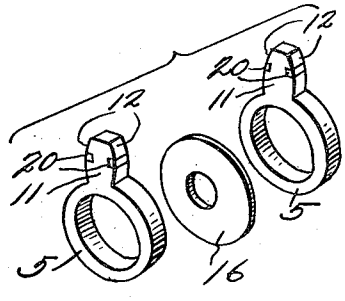


Fig. 6.

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Fig. 6.

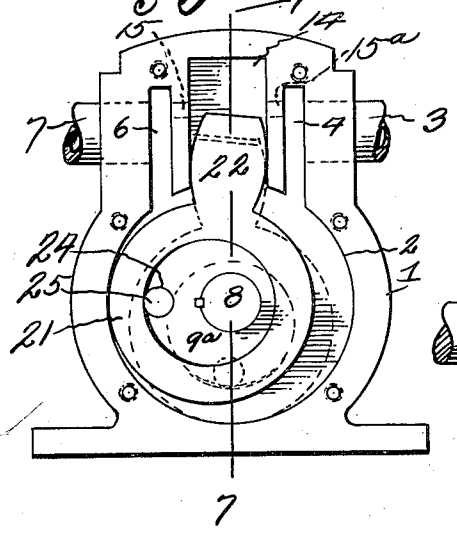
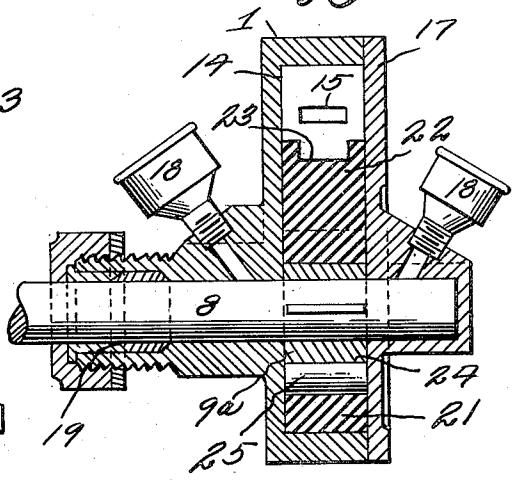


Fig. 7.



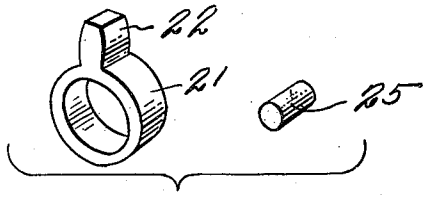


Fig. 8.

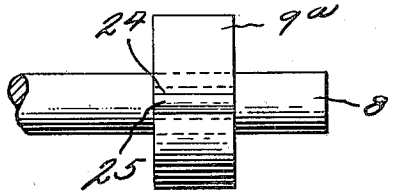


Fig. 9.

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Patented Apr. 1, 1941

2,237,075

UNITED STATES PATENT OFFICE

2,237,075

ROTARY PUMP

Louis Kemper, Newark, N. J., assignor to Economy Faucet Co., Newark, N. J., a corporation of New Jersey

Application April 11, 1940, Serial No. 329,156

2 Claims. (Cl. 103—132)

The invention relates to rotary pumps, and has for its object to provide a device of this kind wherein an annular rubber rotor is eccentrically mounted and driven within the chamber of the casing for sucking fluid into the chamber at one side of the rotor and discharging said fluid from the chamber at the other side of the rotor during the eccentric rotation of the rotor.

A further object is to provide the rotor with an integral yieldable extension slidably mounted in a pocket to one side of the rotor chamber for preventing rotation of the eccentrically mounted rotor during the rotation of the eccentric, and to provide a transverse recess through the extension end for the passage of fluid in the passage to compression relief ports in the wall of the pocket.

A further object is to provide a double acting rotary pump comprising annular rotors disposed in a casing chamber and eccentrically rotated by eccentrics within the rotors and carried by a driven shaft.

A further object is to provide the rotors with extension members slidably mounted in a guide pocket and a spacing disc entirely filling the rotor chamber between the rotors and maintaining the extension members spaced so that fluid will freely pass between the extension members to a compression relief port in the pocket.

A further object is to provide a rotatable bearing in the periphery of the rotor operating eccentric and extending beyond the periphery of the eccentric in engagement with the inner periphery of the rotor for facilitating the rotation of the eccentric in the rotor.

With the above and other objects in view the invention resides in the combination and arrangement of parts as hereinafter set forth, shown in the drawings, described and claimed, it being understood that changes in the precise embodiment of the invention may be made within the scope of what is claimed without departing from the spirit of the invention.

In the drawings:

Figure 1 is an end view of the pump.

Figure 2 is a side elevation of the pump.

Figure 3 is an end view of the pump with the cover plate removed, and showing a double acting pump structure.

Figure 4 is a vertical longitudinal sectional view through the pump taken on line 4—4 of Figure 1.

Figure 5 is a collective detail perspective view of the double acting rotors and the spacing disc.

Figure 6 is an end view of a single acting pump with the cover plate removed.

Figure 7 is a vertical longitudinal sectional view through the pump taken on line 7—7 of Figure 6.

Figure 8 is a detail perspective view of the single rotor and the bearing therefor.

Figure 9 is a side elevation of the rotor and a portion of the drive shaft.

Referring to the drawings, and particularly to Figures 1 to 5, the numeral 1 designates the pump casing and 2 a chamber therein, which chamber is round as shown in Figure 3.

Connected to the casing 1, adjacent its upper end, is a fluid supply pipe 3 through which pipe and pocket 4 fluid is sucked into the chamber 2 and discharged as the annular rubber rotors 5 are rotated, and the trapped fluid discharged upwardly through the discharge port 6 and discharge pipe 7 at the opposite side of the casing 1. Extending axially into the chamber 2 is a drive shaft 8 which has pinned thereon eccentrics 9; said pins being shown at 10, Figure 4. The eccentrics 9 rotate within the annular rotors 5, and while one rotor is in discharge position as shown in Figure 3, the other rotor is in suction position. Each rotor 5 is provided with an integral extension 11 having convexed outer faces 12 which slidably and rockably engage the opposite walls 13 of the guide pocket 14 into which the extensions extend and slide, therefore it will be seen that the rotors will be prevented from rotating with the eccentrics 9, and said eccentrics will rotate within the rotors for the suction and discharge operations.

In devices of this character, it has been found that water or fluid will be compressed in the pocket 14 unless means is provided for relieving the pressure therein. To accomplish this result a relief port 15 is provided in one of the walls 13 so the fluid in the pocket will be discharged into the discharge port 6. It will be noted that a metallic disc 16 is provided between the eccentrics 9 and the rotors 5, and which disc fills the chamber 2 by peripherally engaging the same and divides the chamber into two compartments.

Disc 16, by providing two chambers, in each of which rotors rotate, provided a double acting pump and at the same time spaces the guide extensions 11 so that said extensions will have a fluid passage therebetween at all times, and when the curved surfaces 12 extend across the pressure relief port 15, therefore compression of fluid within the extension pocket 14 will be prevented at all times.

The casing 1 is provided with a removable cover plate 17 whereby access may be had to the pump when desired. If desired lubricating cups 18 may

be used and a packing gland 19 may be used around the shaft 8. The rotors and their extensions are preferably formed from rubber and to prevent excessive wear thereon packing strips 20 may be imbedded in the convex faces of the extensions 11, shown in Figure 5.

Referring to Figures 6 to 9 inclusive, wherein a single acting pump is shown, a single rotor 21 is provided which is formed of rubber and which rotor is provided with an integral extension 22, slidably and rockably mounted in the extension pocket 14. In this form the outer end of the extension 22 is provided with a transverse recess or notch 23 in the plane of the relief port 15, therefore it will be seen that the ports 15 and 15a will relieve the pressure in the pocket 14 when the extension 22 is in upper position; otherwise the operation is the same excepting in this form the periphery of the eccentric 9a is provided with a transverse round bearing recess 24 for the reception of a cylindrical bearing 25, one side of which extends slightly to the outside of the periphery of the eccentric 9a into engagement with the inner periphery of the rotor 21, thereby relieving the friction and giving a rolling contact on the rotor at the point of greatest eccentricity.

From the above it will be seen that a rotary pump is provided which is simple in construction, double acting, thereby getting a more uniform and steady discharge, and constructed in a manner whereby fluid, which may from time to time squeeze through between the extensions and the pocket wall into the pocket, will be discharged from said pocket.

The invention having been set forth what is claimed as new and useful is:

1. A rotary pump comprising a casing having a chamber therein, a partition within said chamber dividing it into two chambers, said partition being formed from a floating disc axially disposed and rotatably movable in the chamber and of the same diameter as the chamber, a rotor within each of said chambers on opposite sides of the partition, a drive shaft extending into the chambers and through the partition, eccentrics carried by said drive shaft and disposed within the rotors in each chamber, guide extensions carried by said rotors, a pocket in the casing for said extensions, said partition maintaining the extensions in spaced relation within the pocket so that fluid can pass therebetween and a relief port for the pocket.

2. A rotary pump comprising a casing having a chamber therein, a partition within said chamber dividing it into two chambers, said partition being formed from a floating disc axially disposed and rotatably movable in the chamber and of the same diameter as the chamber, a rotor within each of said chambers on opposite sides of the partition, a drive shaft extending into the chambers and through the partition, eccentrics carried by said drive shaft and disposed within the rotors in each chamber, guide extensions carried by said rotors, a pocket in the casing for said extensions and a relief port for the pocket.

LOUIS KEMPER.