

J. J. TOKHEIM.

ROTARY PUMP.

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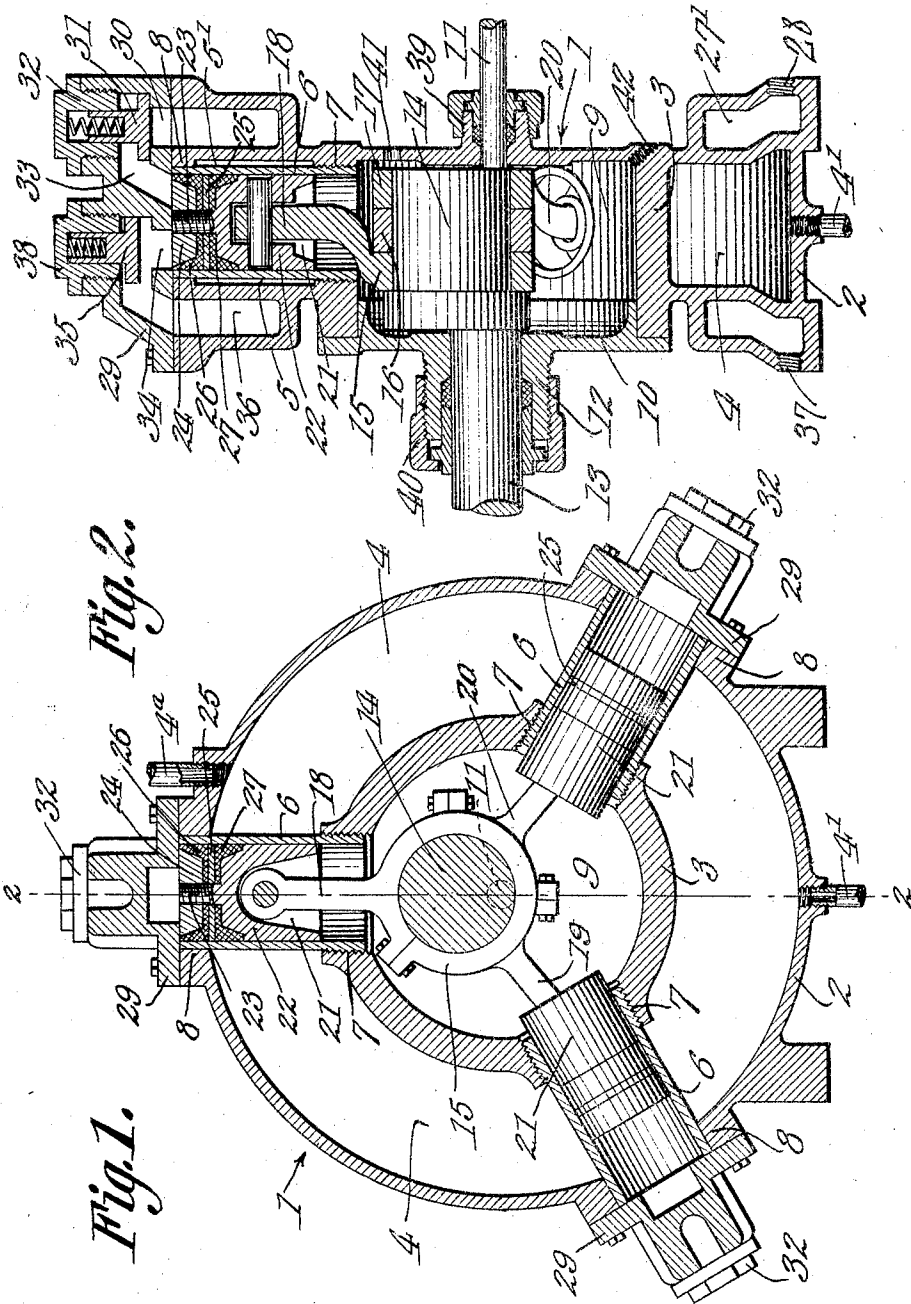


Fig. 2.

Fig. 1.

Witnesses

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ROTARY PUMP.

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To all whom it may concern:

Be it known that I, JOHN J. TOKHEIM, a citizen of the United States, residing at Cedar Rapids, in the county of Linn and State of Iowa, have invented a new and useful Rotary Pump, of which the following is a specification.

The present invention relates to improvements in rotary pumps, the primary object of the invention being the provision of a pump, whose casing is provided with two concentrically disposed compartments, the inner compartment of which is the lubricant holding compartment for the shaft and piston rods, which are radially disposed with relation to the casing, while the outer compartment is the circulating compartment, for water when it is desired to reduce the temperature due to the friction of the moving parts, or for steam where it is desired to heat the pump cylinders or carburate or gasify the fluid that it is desired to pump, such for instance as gasoline in dry cleaning establishments.

A further object of the present invention is the provision of a rotary pump provided with a plurality of radially disposed pump cylinders, the pistons of said pump cylinders being operated from a common eccentric, which eccentric is disposed within a centrally disposed lubricant holding compartment, the pump casing being further provided with an annular inlet chamber which is in communication with each of the pump cylinders through a check valved controlled duct, and an exhaust chamber which is also in communication with all of the pump cylinders through individually controlled check valve ducts.

A still further object of the present invention is a novel form of closure for the heads of the respective pump cylinders, each one of which bodily carries the intake and exhaust check valves, whereby the removal of the cap exposes all of the delicate parts of each pump cylinder.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of invention herein disclosed can be made within the scope of what is claimed without departing from the spirit of the invention.

In the drawings Figure 1 is a vertical central sectional view through the casing showing all of the pump cylinders, one of the pistons being shown in section to illustrate the connection thereof with its rod. Fig. 2 is a section taken on line 2—2 of Fig. 1, the same being through the complete pump.

Referring to the drawings, the numeral 1 designates the main casting of the pump which is provided with the outer ring 2 and the inner concentric ring 3, said rings with the wall of the casting providing the outer or extreme circulating chamber 4, which as shown in Fig. 2 has the narrow reduced passage ways 5 and 5' upon each side of the respective removably disposed pump cylinders 6, whereby complete circulation of the cooling or heating fluid may be permitted within the chamber 4 and about the respective cylinders 6.

The inner ends of the cylinders are screw threaded and fit within the threaded apertures 7 of the inner band 3 while the outer ends extend through the apertures of the reinforced portions 8 of the outer casing or ring 2, thus providing a means whereby the cylinders 6 are rigidly supported by the casing and in proper relation to each other, the preferable form of pump employing three of these cylinders as clearly illustrated in Fig. 1.

The inner ring 3 forms the peripheral walls of the lubricant containing compartment 9 which is sealed by the integral casting at one side while at the other side it is sealed with the removable cover 10.

The reduced portion 11 of the operating shaft is journaled in the center of the end of the chamber 9 while in the journal box 12 of the removable cap 10 rotatably fits the enlarged journal 13 of the shaft, which is provided with the eccentric 14 within the lubricant chamber 9 and carries the respective bands or rings 15, 16 and 17, which connect the respective piston rods 18, 19 and 20 properly upon the eccentric, so that the rotation of the shaft will operate the respective piston heads 21 mounted for reciprocation within their respective pump cylinders 16.

Each one of the pistons is composed of separable members, the lower or main member 22 as clearly shown being provided with the concentric threaded stem 23 for the reception of the outer clamping disk 24, so

that the metal plates 25 and the two flexible gaskets 26 and 27 will be properly held in position to produce the desired tight joint within the pump cylinder, the disk 24 being so disposed as to be readily removable through the outer open end of each cylinder when necessary.

Provided upon the outer face of the main casting 1 adjacent to the chamber 4 is the annular intake chamber 27' which is provided with the intake port 28, to which may be connected any form of pipe or connection that will lead the fluid to be compressed or pumped into the chamber 27'. Each of the respective pumps is sealed with the cap 29, all of which are identical in construction, as clearly shown in Fig. 2, and is provided with the check valved controlled intake port 30 which is in communication with the intake chamber 27', the check valve 31 being held in place by means of the removable cap or plug 32, so that it normally closes the port 30 and is opened upon the in-stroke of its respective piston 21. The duct 33 of the cap 29 leads from the check valve port to the upper end of its respective pump cylinder 6, while the port 34 controlled by the exhaust check valve 35 provides an exhaust chamber upon the out-stroke of the piston, to permit the fluid to enter into the annularly disposed exhaust chamber 36 so that the fluid is exhausted through the port 37 to any desired place.

The exhaust check valve 35 is held in place by means of the removable cap or plug 38 carried by the cap 29, thus placing both of the valves of each pump in ready access to the operator without the necessity of taking the main casing apart, while when it is desirable to obtain access to the pump piston, it is simply necessary to remove the entire cap 29 thus exposing the inner end of each respective pump cylinder 6 so that access may be had to the piston to repair the same.

In order to properly pack the reduced portion 11 of the shaft and the enlarged portion 13 thereof, the respective stuffing boxes 39 and 40 are employed, while to permit the proper introduction of the lubricant within the chamber 9, the port 41 is provided while the sealed port 42 provides a means whereby the said chamber may be emptied when desired without the necessity of removing the top or cover 10.

From the foregoing description taken in connection with the drawings, it is evident that a rotary pump constructed according to the present invention, presents all of the valves of the pump exteriorly of the casing, so that the removal of the respective caps 29 permits the immediate access to the pump and its working parts, and when it is only necessary to repair the respective check valves 31 and 35, the respective retaining caps 32 and 38 may be removed without

necessitating the removal of the main carrying cap 29.

The lubricant chamber 9 may be filled with the lubricant or it may be supplied from a circulating feed, or a limited amount of lubricant may be placed therein, and by reason of the fact that it is confined and practically hermetically sealed, all of the moving parts will be properly lubricated with the least possible waste of lubricant, as all of the moving parts are directly in communication with the chamber 9.

By reason of the fact that the intake and exhaust chambers 28 and 36 respectively, are cast integral with the main casting 1 of the pump, it is evident that a single intake conduit may be connected thereto, and a single intake and exhaust conduit may be connected to the respective chambers and yet place the same so as to be acted upon by the respective pumps in succession during the rotating of the shaft and its eccentric 14.

What is claimed is:

1. A rotary pump, having a main casing provided with two concentric chambers, the inner chamber being a sealed lubricant holding chamber, a plurality of pump cylinders in communication with said lubricant chamber and opening exteriorly of the main casing, a shaft journaled in the lubricant chamber and having an eccentric disposed within the chamber, a plurality of plungers operably connected to the eccentric, one to each cylinder, an intake and exhaust valve carrying cap connected to the main casing and sealing each pump cylinder, said main casing being provided with an annular intake chamber in communication through the intake port with each pump cylinder, and with an annular exhaust chamber upon the opposite side of the casing to the intake chamber in communication with the pump cylinders through the exhaust ports thereof.
2. A rotary pump, having a main casing provided with a centrally disposed cylindrical portion providing a lubricant carrying and shaft journaling chamber, a circulating chamber disposed concentrically about said lubricant chamber, a plurality of removably disposed pump cylinders in communication with the lubricant chamber exteriorly of the main casing and providing upon opposite sides thereof reduced passages to form a complete circulation with the circulating chamber of the casing, a piston mounted for reciprocation in each cylinder and accessible from the outer end of each cylinder, a shaft mounted within the lubricant chamber, a plurality of piston rods connected to the shaft and to the piston, a removable cap connected to the main casing and sealing the outer end of the respective pump cylinders, and an intake and exhaust check valve carried by each cap for control-

ling the intake and exhaust of fluid due to the reciprocation of the piston.

3. A rotary pump, having a main casing provided with a centrally disposed cylindrical portion providing a lubricant carrying and shaft journaling chamber, a circulating chamber disposed concentrically about said lubricant chamber, a plurality of removably disposed pump cylinders in communication with the lubricant chamber exteriorly of the main casing and providing upon opposite sides thereof reduced passages to form a complete circulation with the circulating chamber of the casing, a piston mounted for reciprocation in each cylinder, and accessible from the outer end of each cylinder, a shaft mounted within the lubricant chamber, a plurality of piston rods connected to the shaft and to the pistons, a removable cap

connected to the main casing and sealing the outer end of the respective pump cylinders, said main casing being provided with two annular oppositely disposed intake and exhaust chambers connected to the main casing one to each pump cylinder, and provided with ports therethrough forming communication with the intake chamber and exhaust chamber, a check valve carried by the cap for controlling the intake, and another check valve carried by the cap for controlling the exhaust.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

JOHN J. TOKHEIM.

Witnesses:

OSSO SEROSA,

WM. M. KACENA.