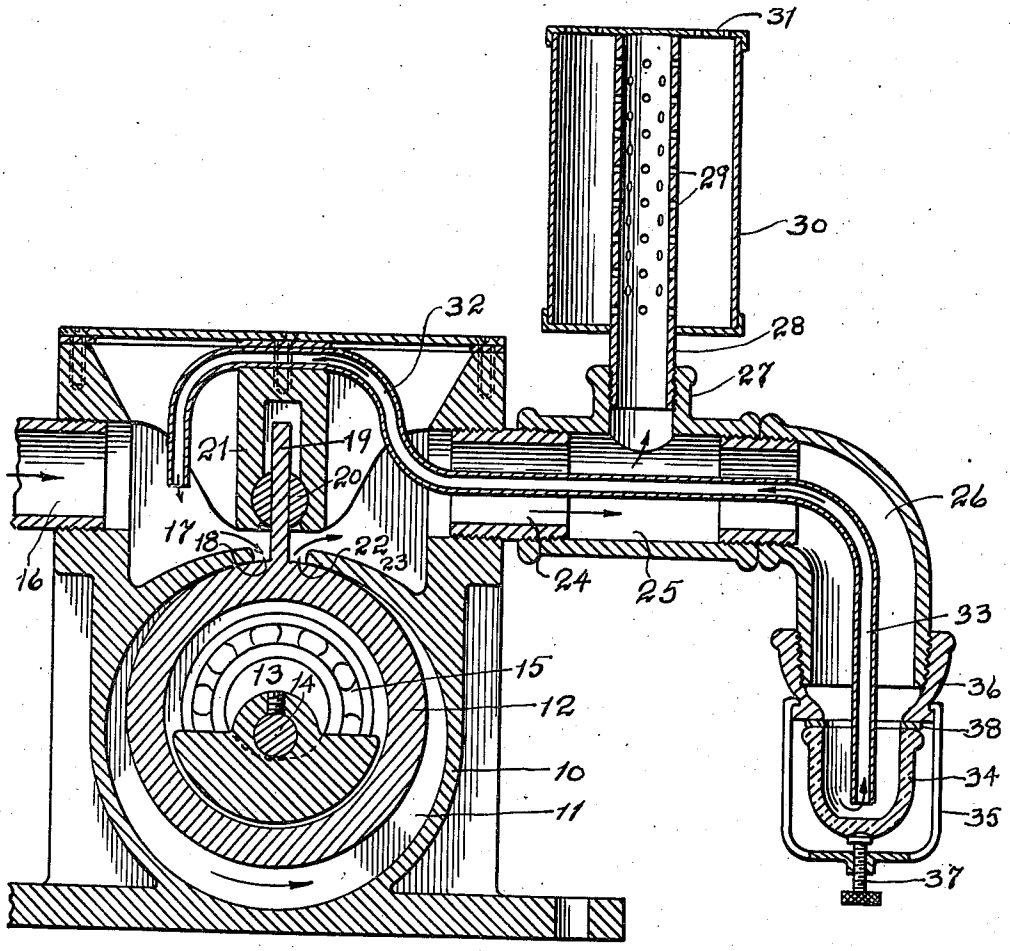
March 9, 1943. H. A. McARTHUR ET AL 2,313,387

OILING SYSTEM FOR ROTARY PUMPS

Filed Jan. 29, 1941



Inventors:
Herbert A. McArthur
and John B. Decker,
By Banning & Banning.
Attorneys.

Patented Mar. 9, 1943 2,313,387

UNITED STATES PATENT OFFICE

2,313,387

OILING SYSTEM FOR ROTARY PUMPS

Herbert A. McArthur, Mundelein, and John B. Decker, Evanston, Ill.

Application January 29, 1941, Serial No. 376,484

1 Claim. (Cl. 230—207)

This invention is directed to means for the conserving of oil employed in the lubrication of a rotary pump and circulating the same in such a way as to constantly maintain a film of oil between the moving surfaces.

In certain pump constructions with which we are familiar, and which are employed for the purpose of maintaining vacuum conditions, difficulty is experienced by reason of the fact that the lubricating oil follows the air currents through the pump and is dissipated and wasted in the discharge of the air, which not only requires frequent replenishing of the lubricating supply but also tends to produce disagreeable odors and to befoul objects in the neighborhood of the air exhaust.

The present invention is intended to overcome these difficulties by providing a return line for the oil in communication with the current flow of the air, so that the oil, instead of being blown out in the form of a mist or vapor with the air, will be sucked back into the system and recirculated.

Further objects and details will appear from the description of the invention in conjunction with the accompanying drawing, which illustrates a rotary pump section, with the oil circulation system of the present invention applied thereto.

The pump to which the oil system is applied is of conventional form, comprising a casing 10 within which is located a drum-shaped chamber 11 which houses a rotor 12 of less diameter than the chamber 11, and which is actuated by an eccentric 13 carried by a shaft 14. The eccentric operates within a ball race 15, so that as the shaft is rotated the line of contact of the rotor will progressively follow around the inner cylindrical wall of the casing, thus progressively driving ahead the air from the point of inflow to the point of discharge, in a manner well understood in the operation of rotor pumps.

As shown, the air is admitted through a pipe 16 into an air inlet chamber 17 which communicates with the interior of the casing through a port 18 on the inlet side of a fin 19 slidably mounted within a bearing block 20 carried by a depending partition 21.

The fin projects upwardly from the periphery of the rotor and serves to separate the inlet port 18 from a corresponding outlet port 22, the wall of the chamber 11 being divided to afford a gap through which the fin projects. The outlet port 22 communicates with a discharge chamber 23 in communication with a threaded nipple 24 carrying a T-shaped coupling 25 which unites with a depending elbow 26.

The coupling is provided with an upstanding threaded leg 27 into which is screwed the end of a tube 28 provided with apertures 29 opening within a drum-shaped muffler casing 30 which is closed by a peripheral cap plate 31 through which the air is finally discharged.

Save for the elbow 26, the pump mechanism heretofore described is of standard or conventional formation and serves merely to illustrate a rotor pump of the general character to which the oiling system of the present invention is applied, so that it will be understood that the details of the pump construction may be varied or modified in numerous particulars without departing from the spirit of the invention.

The oiling system includes a duct 32 which, as shown for purposes of illustration, may be in the form of a separate pipe or tube, although the duct might be afforded by a passageway drilled or cored through the casing of the pump.

One end of the duct terminates within the inlet chamber 17, and the duct extends therefrom through the outlet chamber 23, and through the nipple 24, the coupling 25, and the elbow 26, and terminates in a downwardly extending leg 33 which enters a cup 34 secured by means of a clip 35 to a fitting 36 screwed onto the end of the downturned elbow 26.

The cup is held in place by means of a thumb screw 37 which bears against the base of the cup and holds the rim of the cup against a washer 38, so that the escape of oil is impossible.

Operation

In operation, with the shaft 14 rotating in a counter-clockwise direction, the rotor will likewise follow the wall of the surrounding chamber in a counter-clockwise direction, so that air will be drawn in through the pipe 16, chamber 17, and duct 18, and will be forced around the periphery of the rotor and out through the duct 22, discharge chamber 23, and thence through the pipe leading to the muffler through which the air will be discharged.

During the rotation of the rotor, there is a tendency for the lubricating oil to follow the air current and be forced out of the rotor chamber, but the oil being heavier than the air, and subject to a suction created through the duct 32, will pass downwardly through the elbow 26 and thence upwardly into and through the duct and back to the air inlet chamber 17 for recirculation through the rotor chamber. By thus providing a separate

return passage for the oil, whose intake is located at a level below the point of discharge for the air, the oil will separate from the air current and be returned into the system, thereby avoiding the waste of oil and the disagreeable odors occasioned by the discharge of an oil mist into the atmosphere surrounding the pump.

The invention is one which may be applied to numerous forms of rotor pumps of conventional type without modifying the structure of the pump itself, since it suffices merely to provide a duct or passageway leading back to the air inlet side of the pump, so that sufficient suction will be created to draw back the oil and prevent its escape with the discharge of air.

Although the inner terminus of the oil duct is shown as leading directly into the air inlet chamber, it will suffice to lead the duct into any portion of the pump structure which is subject to the suction occasioned by the rotation of the rotor, and it is not the intention, therefore, to limit the arrangement of the oil duct in the precise manner shown for purposes of illustration. In fact, the oil duct might be led back into the interior of the partition wall 21 above the bearing block 20, which is a region in some degree subjected to suction, so that, wheresoever the oil duct may terminate, a sufficient suction will be created through the oil duct to prevent the escape of oil and return it to the interior of the pump.

Although in the claim we have referred to the education and discharge of air, it will be understood that the term "air" is intended to include any gaseous fluid adapted to be dealt with by the pump of the present invention.

We claim:

In an oiling system for rotary pumps, the combination of a casing providing a rotor chamber and a rotor eccentrically mounted for progressive contact with the surrounding wall of the chamber to educt air therethrough, the rotor chamber being in communication with air inlet and air outlet chambers, the air outlet chamber having entered thereinto the inner end of an externally extending tubular passage provided with a port for the escape of air and being extended beyond said port and downturned to afford a passage for the separation by gravity of oil educted with the air from the rotor chamber, a cup below the end of the downturned passage, and a return oil duct having its end housed within the cup and extending backwardly therefrom through the tubular passage and through the casing to the air inlet side of the rotor casing and terminating at a point subjected to the suction occasioned by the current of air entering the rotor chamber.

HERBERT A. McARTHUR.
JOHN B. DECKER.