P. SLESAZECK.

ROTARY PUMP.

APPLICATION FILED JULY 2, 1912.

1,076,711.

Patented Oct. 28, 1913.

2 SHEETS—SHEET 1.

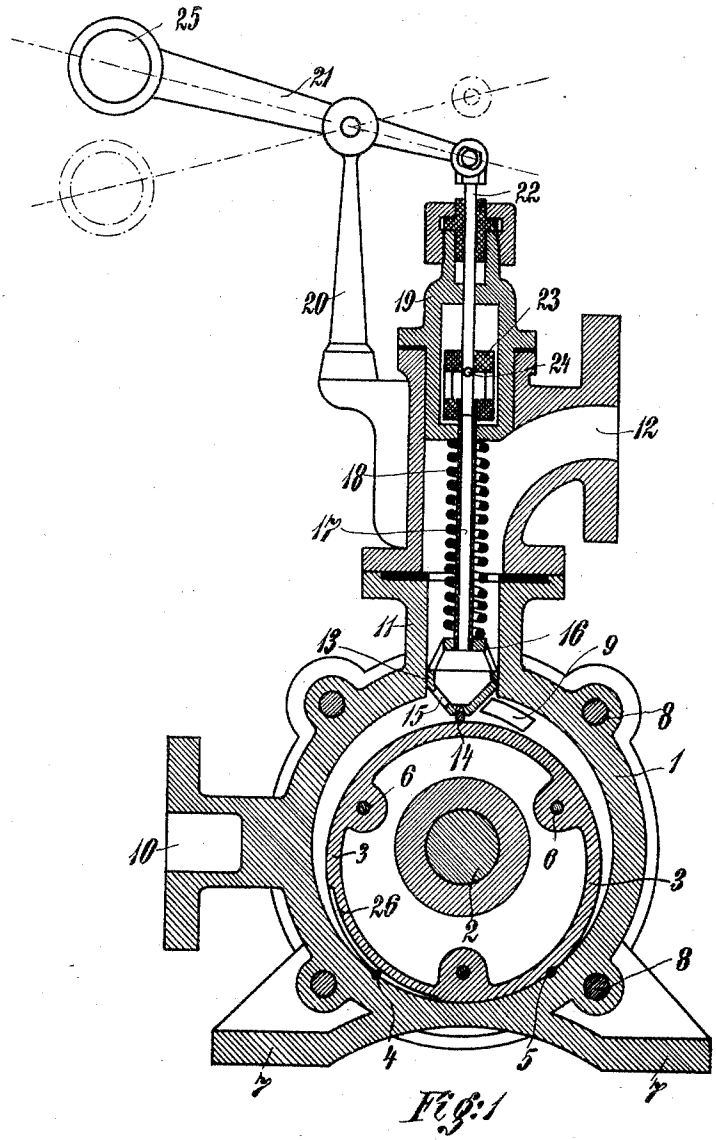


Fig. 1

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2 SHEETS—SHEET 2.

Fig: 2

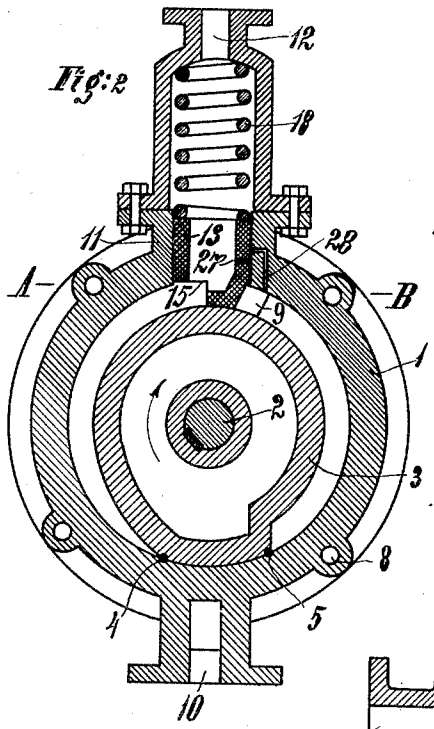


Fig: 3

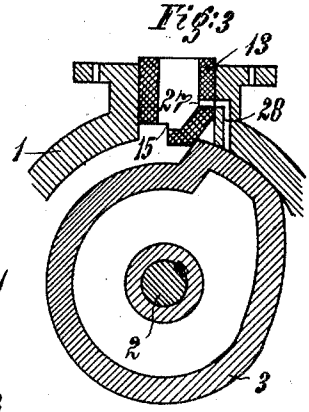


Fig: 4

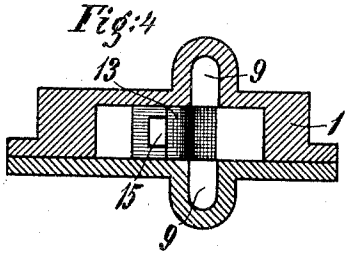
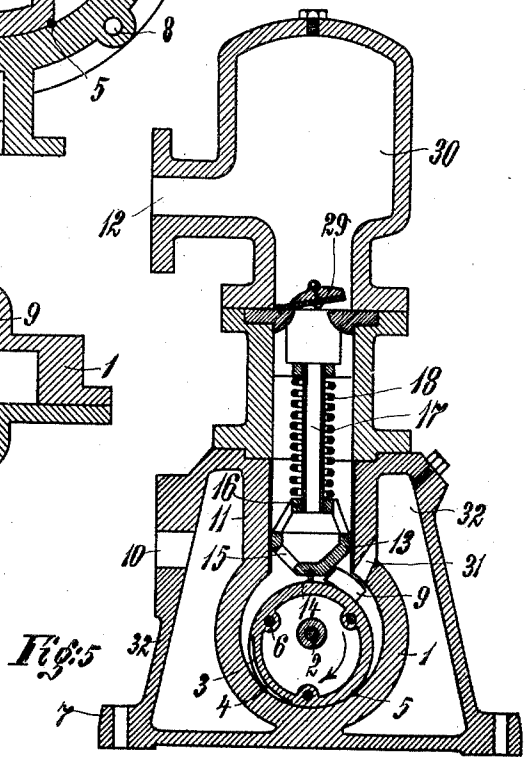


Fig: 5



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UNITED STATES PATENT OFFICE.

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ROTARY PUMP.

1,076,711. Specification of Letters Patent. Patented Oct. 28, 1913.

Application filed July 2, 1912. Serial No. 707,263.

To all whom it may concern:

Be it known that I, PAUL SLESAZECK, engineer, a citizen of the German Empire, residing at Berlin, Germany, have invented certain new and useful Improvements in Rotary Pumps; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

The invention relates to a pump having a rotary piston, which in coöperation with a slide bearing against the circumference of said piston forms the suction and pressure chambers.

The essential features of this new pump consist in arranging the inlet openings through which the liquid passes into the working chamber opposite to each other in the side walls of said chamber, and in making the slide hollow, so that it can serve as a channel to conduct the liquid under pressure. The advantage of this construction is that the liquid enters into the pump without any shocks or eddying movements and through openings of adequate size. Neither the slide nor the piston is therefore moved backward and forward by shocks, and the wear is consequently much reduced. Moreover, the entire distance between the external edges of the suction and pressure openings is specially small, which is of importance, because the piston must entirely cover both openings at the same time with its closing surface, and it is of advantage to make this surface as short as possible, in order to obtain a large operative stroke. The arrangement of the exit channel in the hollow slide, thus at the highest point of the pump chamber, enables, moveover, the air separated from the liquid in the suction chamber to be led off without any special organs being necessary for the purpose. On the piston, or at the lower edge of the slide, or in the side walls of said slide, and in the casing, openings or channels may be provided, which on momentarily raising the slide cause the highest points of the suction and pressure chambers to communicate with each other. Owing to the weight of the liquid entering through the suction pipe a momentary exchange of pressure takes place between the suction and pressure chambers, during which the separated air is caused to escape through the force pipe. By providing channels in the side walls of the slide and in the casing a further escape of air is effected by the fact that on lowering the slide before connecting the channels, the opening of said channel into the suction chamber is closed by the piston. In this case all the air collecting in the channel as the highest point is led off by the alternate opening of the two channel openings between the suction and pressure chambers.

An important feature of the invention consists in the provision of an edge piece on the slide, for example, a blunt steel edge, instead of the movable edge pieces heretofore used in such constructions, which enables a tight joint to be made, but are difficult to remove and absorb power on temporarily becoming fixed by suction. Such an edge on the slide wall resists the shocks occasioned by the lowering of the slide with the uncontrolled force of the hand and also the normal wear without becoming untight. The sucking fast of a surface packing might render the removal of the slide very difficult or indeed quite impossible.

It is of special importance that the surface of the piston is turned to be concentric at parts with two different centers, one of which centers is eccentric to the axis about which the piston turns, while the other center coincides with said axis, and enables a comparatively long contact between the corresponding part surface of the piston and the casing. By reason of this construction the fit between the piston and casing is sufficient even when the steel edge of the slide has made the piston defective. By reason of the piston being turned with parts concentric to two different centers, said piston has such a shape, that, when the surface of contact is sufficiently long, the entire pressure and suction openings are simultaneously closed, so that in the top position of the piston no temporary communication between the suction and pressure pipes takes place.

On the drawing several constructions of the invention are shown by way of example: Figure 1 being a section through a pump without an air vessel, showing a channel on the piston for allowing the air to escape, Fig. 2 a similar section of a pump having

another device for allowing the air to escape. Fig. 3 is a section of the principal parts in another position, Fig. 4, a plan of the slide from below in section along the line A—B in Fig. 2, Fig. 5, a section of a pump provided with an air vessel and with a third inlet opening for the liquid.

In all constructions similar parts are designated by the same reference letters.

In the construction shown in Fig. 1 there is a casing 1 in which a shaft 2 is concentrically arranged, and on this shaft is fixed a piston 3, the circumference of which, between the points 4 and 5, is turned concentric to the axis of said shaft, while the remaining surface of said piston is concentric to another center and has a smaller radius. The piston is hollow and consists of two parts connected together by bolts 6. The casing 1 rests on feet 7 and consists of two parts connected together by the bolts 8. At the side of this casing a suction opening, or two such suction openings opposite to each other can be provided which communicate through channels with the socket 10. Further, on the top of said casing 1 a slide box 11 is provided which also carries the socket 12 for the pressure pipe. The short surface 4—5 of the piston in contact with the inner circumference of the casing 1 has such a length that, when in its top position, the opening of the slide box 11 and the suction opening 9 are simultaneously closed, and this is preferably effected with some overlap. In the slide box is tightly fitted a vertical slide 13 which has a wedge shaped bottom surface and a steel strengthening edge 14. This slide 13 is hollow and connects by its open wedge surface 15 and the space between its boss 16 and the slide box 11 the working chamber of the pump casing with the socket 12. The slide 13 is pressed down on the surface of the piston by a spiral spring 18 guided by the spindle 17, the top end of which spring presses against the casing 19. The casing 12 also carries a standard 20, in which a lever 21 is journaled, and to this lever is connected a rod 22 which is so coupled to the slide 13, by means of a pin 24 moving in a slot in the head 23 of the spindle 17, that said slide can move up and down independent of the lever 21, when the right end of said lever is in its lowest position shown in full lines on the drawing. The lever 21 carries a counter weight 25 which has the tendency to raise the right end of said lever, and it is kept in the operative position by a fastening of any kind. On releasing said fastening, which may, for example, consist of an eccentric, the weight 25 can fall and pull the slide 13 out of contact with the piston as shown in dotted lines. The counter weight can be adapted to slide on the lever 21, in order to be able to adjust its operation. The adjustment can be so effected that in one position the right arm of said lever has the greater weight, in which case the fastening above mentioned is not necessary. Instead of the horizontal lever 21 an angular lever may be employed, the upright arm of which may be moved to either side of its vertical position, so that it will remain in either end position. The rod 22 passes through a stuffing box in the casing 19 and is attached to the lever 21 by a small slot in order to enable said lever to move in an arc. The piston 3 has a groove 26 on its circumference which is in advance of the closing surface 4—5 and partially projects into said surface, so that it will enable a short exchange of pressure between the suction and pressure chambers as soon as it arrives underneath the edge 14 of the slide. During this short exchange of pressure the air collecting in the neighborhood of the suction opening 9 will escape to the pressure opening 15.

In the second construction shown in Figs. 2–4 a channel 27 is provided in the wall of the slide, and there is a channel 28 in the wall of the casing. As a consequence, the air escapes on the slide rising by the communication of the two channels, as also on the slide sinking (see Fig. 3) in which case the air escapes by reason of the fact that, previously, the lower opening of the channel in the suction chamber has been closed by the surface 4—5 of the piston, so that the air, which has collected in the channel 28, will rise into the force pipe. The circumference of the piston is not symmetric on both sides in this pump, but falls off more suddenly on the back side, in order to obtain a quicker closing action of the slide. This results in a larger volume, but can only be used for slow speed pumps.

The last construction illustrated in Fig. 5 is provided with a valve 29 in the force pipe through which valve the liquid flows to an air vessel 30. In the wall of the casing, close to the slide 13, a further channel 31 is provided, through which the water flows into the working chamber. This construction is necessary for pumps which have longer pistons so that the liquid could not enter quickly enough from the sides alone. At the top edge of this channel 31 the surface of the liquid adjusts itself, where the top part of the casing 32, into which this channel 31 enters, acts as an air vessel. The socket 10 opens into said casing.

Claims:

1. The described pump, comprising in combination, a cylindrical casing, an eccentrically arranged piston rotating about the axis of said casing and having a groove therein forward of the most eccentric part, a hollow slide bearing against said piston, substantially as, and for the purpose, set forth.

2. The described pump, comprising in combination, a cylindrical casing, an eccentrically arranged piston rotating about the axis of said casing, a hollow slide bearing against said piston, a channel in the side wall of said slide, and a channel in the casing guiding said slide opening into the casing and arranged to communicate with the channel in said slide when said slide is raised, substantially as, and for the purpose, set forth.

3. The described pump, comprising in combination, a cylindrical casing having inlet openings opposite to each other on both sides and having inlet openings in its circumference, an eccentrically arranged piston rotating about the axis of said casing, and a hollow slide bearing against said piston, substantially as, and for the purpose, set forth.

In testimony that I claim the foregoing as my invention, I have signed my name in presence of two subscribing witnesses.

PAUL SLESAZECK.

Witnesses:
OTTO RASCH,
ERVIN WESNEGH.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."