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C. SANDOZ

ROTARY PUMP

Filed Nov. 16, 1921

Fig. 1.

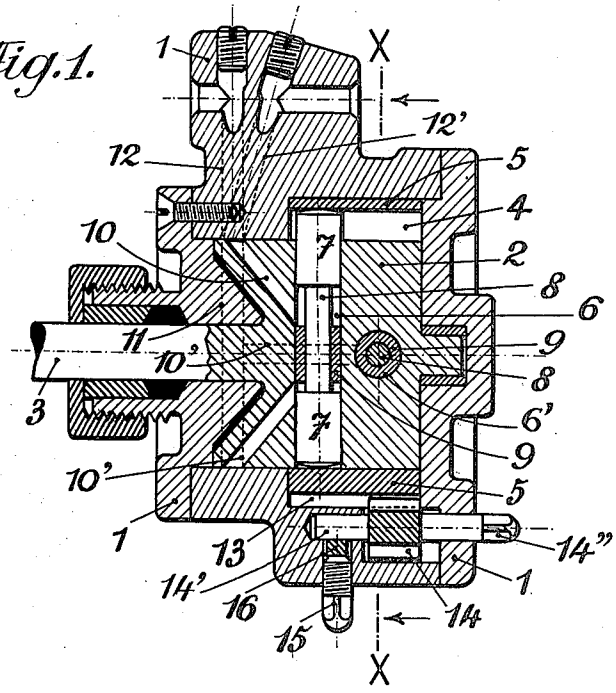
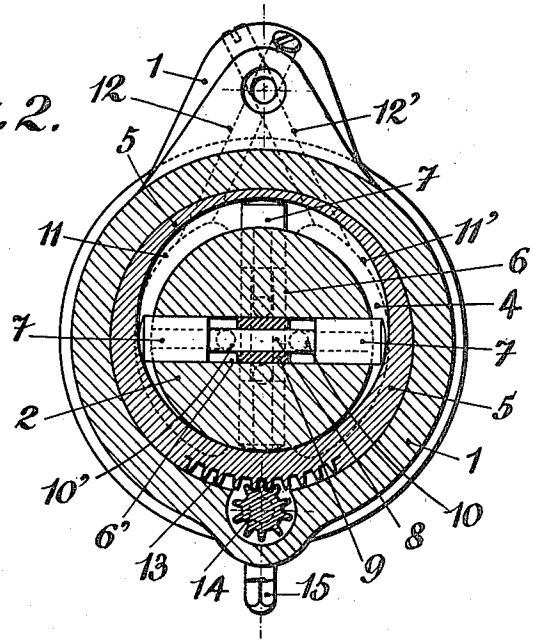


Fig. 2.



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ROTARY PUMP.

Application filed November 16, 1921. Serial No. 515,467.

To all whom it may concern:

Be it known that I, CHARLES SANDOZ, a citizen of the Swiss Republic, residing at Milan, Italy, 70 Via Washington, have invented new and useful Improvements in Rotary Pumps, of which the following is a specification.

The subject of the present invention is a rotary pump for use with viscous matter, which pump comprises a cylindrical body rotating in a cylindrical cavity in a casing, the said cavity being eccentric in relation to the axis of rotation of the said cylindrical body, so that the point of contact of the latter with its casing co-incides with a generatrix of the cylindrical body, this cylindrical body having at least one diametrical bore in which is disposed a piston bearing at each of its ends against the cylindrical wall of the cavity of the casing so that the piston performs a reciprocating movement on each revolution of the cylindrical body.

The pump may be characterized also by the fact that the casing, against the cylindrical cavity of which bears the double piston, is movable in such manner that it may be displaced relatively to the rotating cylindrical body and thus vary the output of the pump, independently of the speed at which it operates.

The annexed drawing shows by way of example one embodiment of the invention. Fig. 1 is a longitudinal section, while Fig. 2 is a transverse section.

The pump as shown comprises a cage 1, in which is mounted a cylindrical rotatable body 2. To the latter is imparted by means of the shaft 3 a continuous rotary movement. The rear portion of the body 2 rotates in a cylindrical cavity 4 in a movable casing 5, forming a kind of ring which may rotate in the cage of the pump. The external surface of the casing 5 is concentric with the axis of rotation of the cylindrical body 2, while the cavity 4 is eccentric in relation to the said axis, so that the point of contact of the cylindrical body 2 and the casing 5 co-incides with the generatrix of the body 2. The latter has two diametrical bores 6 and 6′, disposed at 90° to one another. In each of these bores operates a double piston 7 bearing against the cylindrical wall of the cavity 4. The two pistons 7 are connected to one another by a rod 8, guided in a sleeve 9, dividing the bores 6, 6′ into two equal parts or cavities in which move respectively the double piston 7. Moreover, each of these cavities communicates with a passage 10 or 10′, the outlet openings of which are located in the same straight section of the cylindrical body 2 and lead in the course of rotation into a passage 11 or 11′ in the cage 1 extending concentrically of the cylindrical body 2 over a smaller part than the half circumference of the latter. The passages 11, 11′ communicate respectively one with an inlet 12 and the other with a discharge outlet 12′.

The casing 5 is toothed at 13 over a small portion of its periphery. With this toothed part engages a pinion 14, the spindle 14′ of which is mounted in the cage 1 of the pump and has a squared portion 14″ accessible from the exterior. By means of a key fitted on the squared portion 14″ the pinion 14 may be moved and the casing 5 turned to change its angular position relatively to the cylindrical body 2 and to the passages 11 and 11′. The pinion 14 and the casing 5 may be locked together by a screw 15 acting on a distance piece 16 interposed between the screw 15 and the spindle of the pinion 14.

The operation of the pump is as follows:—

When the cylindrical body 2 rotates in clockwise direction each double piston 7 is compelled to reciprocate by the cylindrical body 2. At the same time the passages 10 and 10′ alternately communicate with the passages 11, 11′ so that each piston 7 draws in liquid through the passage 10, or 10′. Then the latter communicates with the passage 11 and immediately discharges the liquid drawn in into the passage 11′, when the latter is in communication with the passage 10 or 10′. One of the pistons 7 is drawing in liquid while the other is discharging it.

When the casing 5 occupies the position shown in the drawing the output of the pump is the maximum for a given speed. It is obvious that this output may be increased or reduced by reducing the number of revolutions of the cylindrical body 2 per unit of time. However, the output of the pump may also be reduced independently of its speed by an angular displacement of the casing 5 by means of the pinion 14; in fact, if the casing 5 is rotated the suction and discharge period of the pistons is displaced

and no longer co-incides with the period during which the passages 10 and 10′ communicate with the passages 11 and 11′.

The output of the pump thus becomes less and becomes zero when the casing 5 is turned through 90°, since then the pistons draw in and discharge, or inversely, while the passages 10, 10′ communicate with the passages 11 and 11′.

It the rotation of the casing 5 is continued the output will again be increased, but the action of the pump will be reversed, that is to say the liquid will circulate in a direction opposite to the preceding. The output will attain a maximum when the casing 5 is turned through 180°.

The rotating body of the pump will comprise one or more double pistons; in lieu of double pistons there might be used single pistons. The means for controlling and locking the casing may differ from those described and shown.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:—

1. A rotary pump, comprising, in combination, a cage, a casing disposed in said cage and having a cylindrical opening, a cylindrical body mounted for rotation in said casing with its axis of rotation in eccentric relation to the axis of said opening, a shaft for rotating said body, the body being provided with at least one diametrically extending bore, a sleeve disposed centrally of said bore, a rod guided in said sleeve and carrying at its opposite ends a pair of piston heads reciprocable in said bore and having their outer ends in contact with the wall of said casing, whereby a reciprocating motion is imparted to the pistons at each revolution of the body, said casing and cage being provided with communicating passages constituting an inlet channel and an outlet channel, and said body having passages communicating with the bore in the body and adapted to communicate alternately with said inlet and outlet channels during rotation of the cylindrical body.

2. In a rotary pump, the combination of a casing mounted for rotary movement and having a toothed portion, a pinion in engagement with said toothed portion, a spindle supporting said pinion and provided at one end thereof with a squared portion for the reception of a handle for turning the same, the opposite end of the spindle being extended beyond the pinion, and means for engaging said extended portion of the spindle to prevent rotation thereof.

In testimony whereof I have signed my name to this specification.

CHARLES SANDOZ.