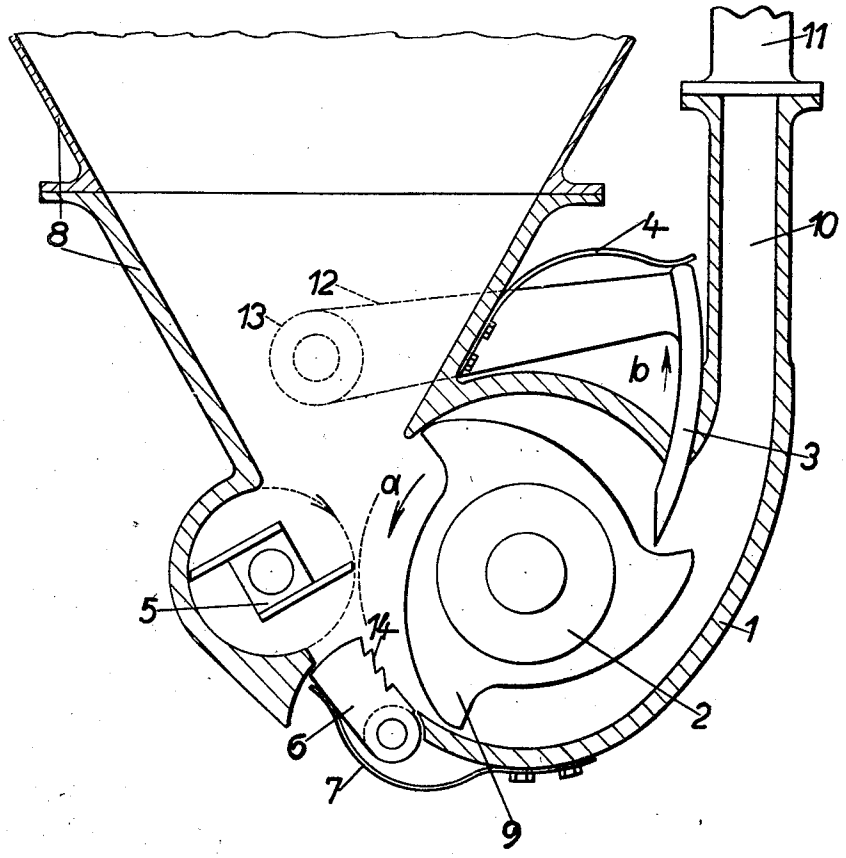
Dec. 10, 1935. F. NEBEL 2,023,608

ROTARY PUMP

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Fig. 1



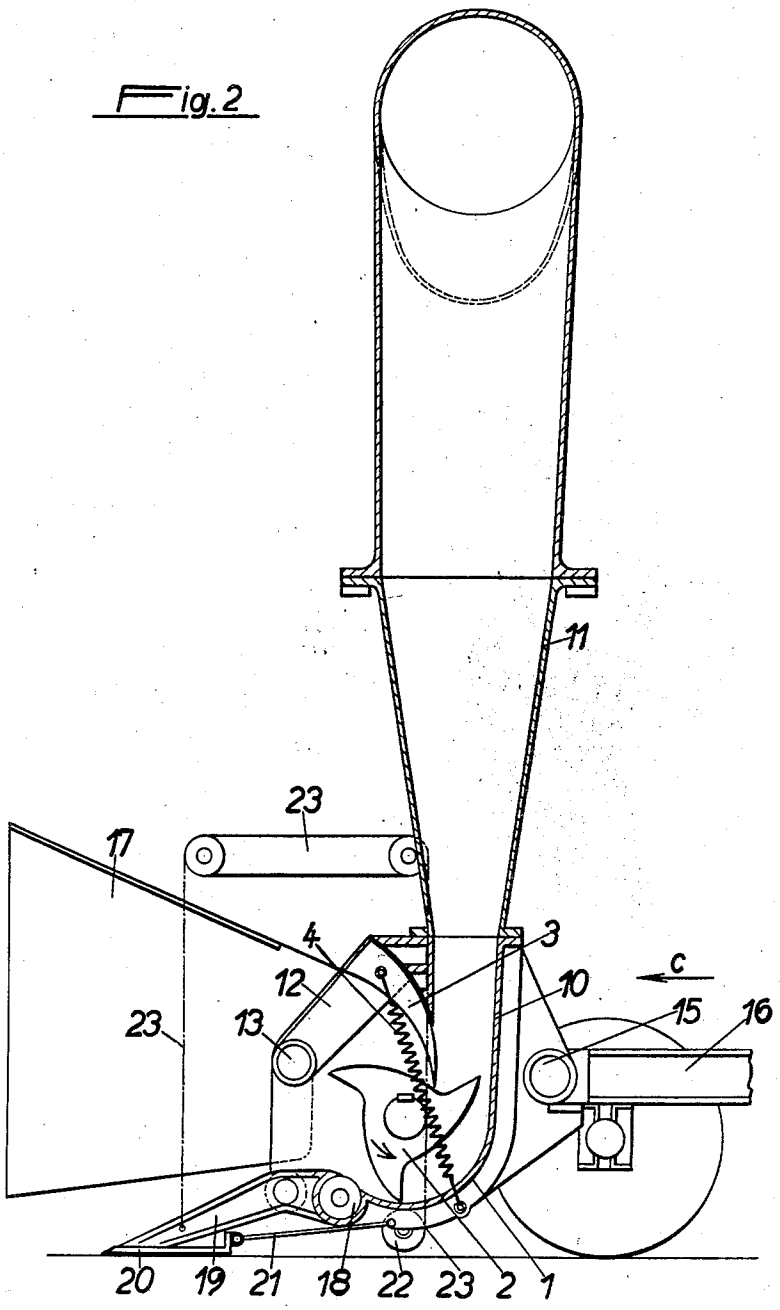
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ROTARY PUMP

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Fig. 2



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ROTARY PUMP

Franz Nebel, Vienna, Austria

Application March 15, 1933, Serial No. 660,828
In Austria March 22, 1932

1 Claim. (Cl. 103—123)

This invention relates to rotary pumps of the type in which there are one or more tapered conveyor chambers which are formed between the casing wall, on the one side, and a substantially radially directed surface on the rotor and a surface on the latter obliquely inclined towards the casing wall, on the other side.

Rotary piston pumps of this type, are suitable only for the conveyance of liquid matter, but do not permit of the conveyance of viscous to pulpy matter such as mud, slurry, dough, concrete or other matter intermixed with stones.

The present invention has for its object to provide a pump of the nature indicated which shall be capable of conveying not only liquid matter but also thick, heavily flowing matter intermingled with stones. Broadly, this object is achieved, in accordance with the invention, by the arrangement that the conveyor chambers of the pump are tapered out or expanded in a direction opposite to the direction of rotation of the rotor, and are terminated at their rear end by a piston-like pressing surface which is disposed substantially radially to the rotor body.

Further features of the invention comprise the provision at the end of the hopper of a rotary feeder adapted to rotate in the opposite direction to the rotor and to feed the matter into the conveyor chambers, and also the provision, beyond the rotary feeder, of a yielding member, for example a spring-laden flap or the like, which prevents stones or the like contained in the matter to be pumped from becoming jammed at this point.

The pump according to the present invention is distinguishable from known pumps intended for the conveyance of thick or pulpy matter and having rotary piston surfaces obliquely inclined to the casing wall in a direction opposite to that of the rotation. The distinction consists in that instead of the oblique rotary piston surface being adjacent to a surface which extends to the casing wall and which forms an acute angle therewith, increasing the danger of jamming in the conveyor chambers, in the pump according to the present invention the obliquely disposed surface of each rotor compartment is adjacent to a surface which is substantially radially disposed, and which is perpendicular or approximately perpendicular to the tangent to the casing wall. This radial surface thus constitutes a pressing surface which acts in the manner of a piston upon the matter pumped, so that the possibility of jamming is effectually eliminated.

Two forms of construction embodying the invention are shown by way of example in the accompanying drawings, in which:

Fig. 1 shows in vertical section a pump in accordance with the invention.

Fig. 2 shows in part section and in part elevation another form of pump in accordance with the invention.

Referring to the drawings, the pump consists in the main of the following parts: pump casing 1, rotary piston wheel or rotor 2, rotary feeder 5, baffle slide 3, baffle spring 4, yielding flap 6 with spring 7, and hopper 8.

The mode of operation is as follows: The matter to be pumped is placed in the hopper 8, and is flung into the pump casing by the action of the rotary or centrifugal feeder 5, so that the spaces between the impelling projections 9 on the rotor 2 are filled out as completely as possible. The direction of rotation of the rotor is indicated by the arrow *a* in the drawings, and is also implied by the fact that the conveyor chambers of the rotor 2 are tapered-in in the direction of rotation of the rotor and tapered-out in the opposite direction, and terminated by the substantially radially disposed driving or pressing surfaces of the impelling projections 9 on the rotor 2, so that these surfaces act in the manner of pistons to force the matter forward. In view of the fact that the conveyor chambers are expanded or widened in a direction opposite that of rotation, stones or the like contained in the matter pumped can not become clamped or jammed between the casing wall and the inclined surfaces of the rotor. The matter acted upon by the impelling projections 9 on the rotor 2 is then forced forward into the discharge branch 10 and thence into the delivery pipe 11. In order that the matter shall in fact be able to pass into the discharge branch 10, the end of the wall of this discharge branch 10 adjoining the rotor is formed by a baffle slide 3 which is attached to a rocking lever 12 mounted outside the casing 1 of the pump, and which is acted upon by a spring 4 and projects, through packing, into the interior of the casing. The end of the baffle slide 3 bears, in consequence of the action of the spring 4, against the outer surface of the rotor 2, and is caused to ride over the impelling projections 9 as the rotor revolves. It is forced up against the spring 4 by the steep face of the said impellers and pressed down again after traversing the highest point, by the action of this spring. This cycle is repeated during the passage of each of the impelling projections 9, so that the baffle slide 3 prevents the matter from

becoming forced from the delivery- to the suction-side of the pump, and compels the same to pass on into the discharge branch 10. The rocking of the baffle slide 3 about its axis of oscillation 13 is rendered possible, in spite of the apparently unfavorable directions of drive, by the fact that favorable rotation moments are set up.

The flap 6 is serrated on its inner surface 14, and is adapted to yield against the action of the spring 7, so that it effectually eliminates the possibility of the clamping or jamming of larger stones in the matter to be pumped.

In the form of construction shown in Fig. 2, which is intended more particularly for snow clearing, the casing 1 is attached by means of a bolt 15 to the front end of the chassis 16 of a vehicle, and is provided with a hopper 17 which is so disposed that when the vehicle travels in the direction of the arrow *c* the matter to be pumped is driven by the hopper straight on to the rotor 2, so that it fills the conveyor chambers automatically, and is thence forced into the riser 11 from which it is finally laterally discharged. For the purpose of rejecting larger stones and the like there is provided in the casing 1 a roller 18 which is caused to revolve in the same direction as the rotor 2. About the axis of the roller 18 there is arranged to rock on an arm 19 a plate 20 which bears of its own weight upon the road surface to be cleared. In order to permit of the circumvention of obstacles, such as projecting cobble stones, the said plate is provided on one side with a thrust rod 21 which is eccentricaly attached to a drum 22 upon which a tensile member, such as a cord 23, is adapted to be wound, thereby lifting the plate 20 over the obstacle, when this plate is arrested relatively to the vehicle, since in this case the thrust rod 21 rotates the drum 22. The plate 20 receives the matter to be pumped lying upon the roadway and conducts the same over the upper outer surface of the arm 19, to the rotor 2.

I claim:

In a rotary piston pump for viscous material, a substantially cylindrical casing having an inlet and an outlet opening through its peripheral wall, a rotor in said casing having a plurality of radial surfaces, the outer end of each radial surface being connected to the inner end of the succeeding radial surface, whereby there are formed between the casing and the periphery of the rotor a plurality of conveyor chambers which taper in the direction of rotation of the rotor, and a baffle slide mounted to oscillate about a point outside the casing and having a portion spring urged into casing and into contact with the rotor periphery, said baffle portion separating the casing inlet from the outlet and being formed as an extension of that wall of the outlet which is anterior with respect to the direction of rotation.

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