

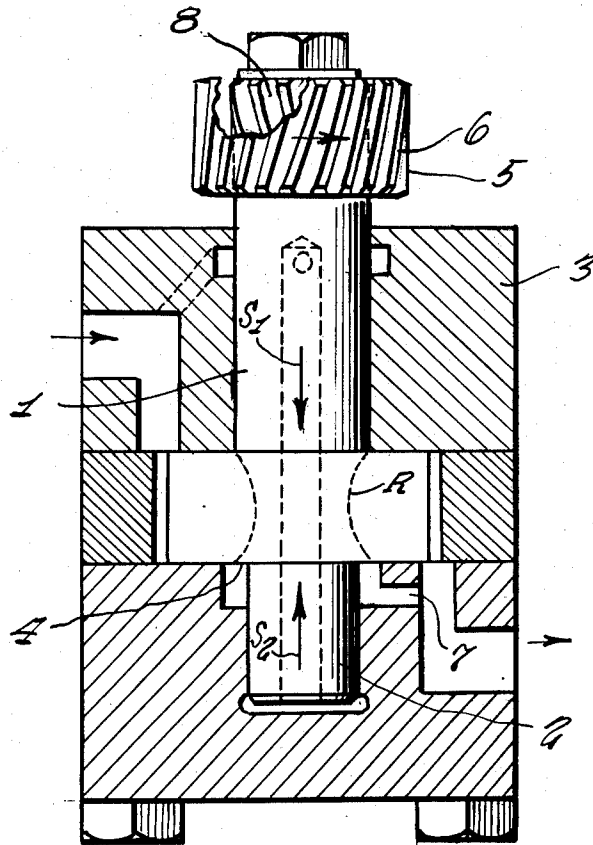
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ROTARY VANE-TYPE PUMP

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ROTARY VANE-TYPE PUMP

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1 Claim. (Cl. 103—136)

The present invention relates to a rotary vane-type pump.

More particularly the invention relates to the design of the bearing pins of the rotor of such pumps. The pumps I am particularly concerned with are those in which the rotor and the bearing pin form a unit.

In the starting of such pumps, the bearings are subjected to axial loads, e. g., as a consequence of the axial thrust of gearings with inclined teeth; such loads have to be taken up by the rotor and the bearing with the result of a rapid wear of the respective parts of rotor and bearing, except where sufficiently strong axial bearings are provided which, however, require too much space and which are too expensive.

It is the object of the present invention to provide a more satisfactory bearing arrangement for the rotor of rotary vane-type pumps.

For that purpose, the rotor is designed, according to the invention, with bearing pins having different diameters at opposite sides of the rotor. The stress on the rotor during the starting of the pump is then relieved by bringing pressure to bear on an annular shoulder which is formed on the rotor by the difference in diameter of the pins.

The design of the motor according to the invention may be more fully understood by the following description with reference to the accompanying drawing, in which an embodiment of the device according to the invention is illustrated in side elevation, with parts in section.

The embodiment shown in the drawing comprises a stator structure 3 and a rotor R, having two pins 1 and 2 of different diameter. Due to the difference in the diameter of pin 1, which is the larger pin, and pin 2, an annular surface 4 is formed abutting the rotor R. A channel or bore 7 is formed in the stator structure through

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which pressure fluid impinges against the annular surface 4, thereby exerting pressure on the rotor. A gear 5 with inclined teeth 6 is in mesh with pin 1.

When the pump is started, an axial thrust is produced, which is in proportion to the moment of rotation of the drive, as well as to the pressure of the fluid, which, in the illustrated embodiment of the invention, acts on the rotor over the annular surface 4. The dimensions of this annular surface may be so chosen that the force acting on the rotor from the right hand side (of the drawing) which is determined by the pressure multiplied by the annular surface area 4, will always be equal to the axial thrust generated in the beginning of the rotation of the pump, acting from the inclined teeth gearing at the inclined-teeth gearing. A compensation of the two forces, acting in opposite direction, is thus brought about, as shown by the two opposing arrows s_1 and s_2 in the drawing.

What I claim is:

In a vane-type rotary fluid transmission pump, the combination comprising a pump stator structure, a rotor having a cylindrical shaft extending axially through said rotor, said shaft comprising a driven end portion extending from one side of said rotor and journaled in said stator structure, said shaft comprising an opposite end portion extending from the other side of said rotor and journaled in said stator structure, the opposite end portion of said shaft being of reduced diameter with respect to said driven end portion to provide an annular surface at said other side of said rotor, a channel in said stator structure for admission of pressure fluid to said annular surface, means to drive said driven end portion of said shaft comprising gears with inclined teeth that exert an axial thrust on said rotor, said pressure fluid being operative to subject said annular surface at said other side of said rotor to pump fluid pressure during starting, whereby any axial thrust imparted by said drive means during starting will be counter-acted by pump pressure exerted against said annular surface.

References Cited in the file of this patent

UNITED STATES PATENTS

1,495,526	Phillips	May 27, 1924
2,057,381	Kenney et al.	Oct. 13, 1936
2,112,522	Czarnecki et al.	Mar. 29, 1938
2,182,072	Czarnecki	Dec. 5, 1939

FOREIGN PATENTS

855,672	France	Feb. 19, 1940
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