Feb. 7, 1967 NI KIA TCHEN 3,302,869

MULTI-PURPOSE ROTARY MACHINE

Filed April 2, 1964

FIG. 1

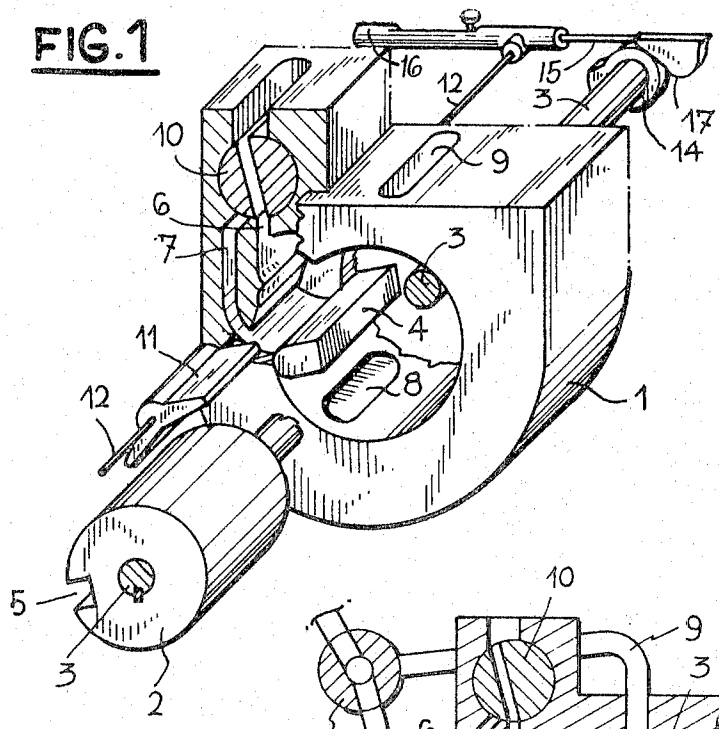


FIG. 2

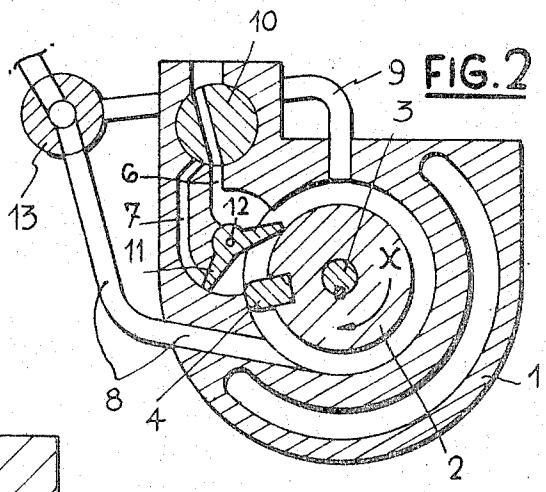
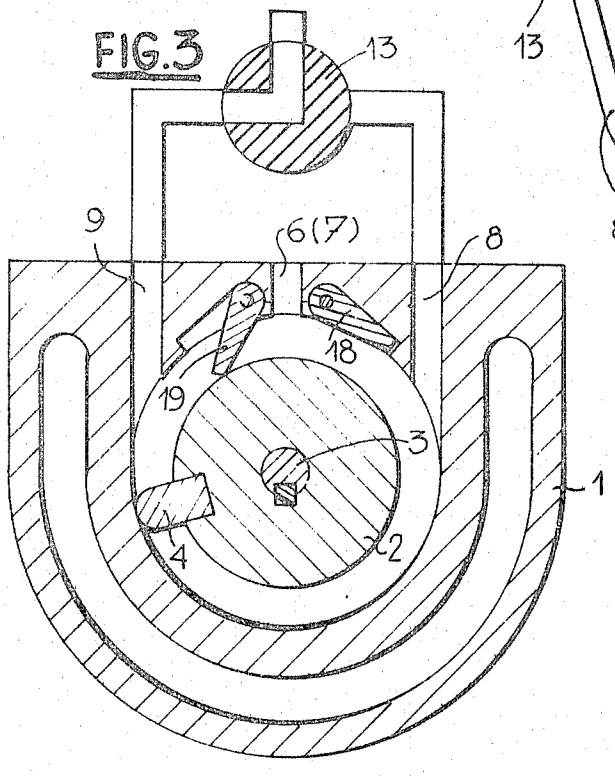


FIG. 3



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MULTI-PURPOSE ROTARY MACHINE

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1 Claim. (Cl. 230—149)

The present invention concerns a multipurpose rotary piston machine comprising a cylinder in which is mounted a rotary piston provided with at least one blade for the conveyance of a fluid admitted in the cylinder through an inlet pipe and delivered from the said cylinder through an outlet pipe. Such a machine can be driven by means of a motor and ensures the suction and delivery of the fluid to be conveyed. In consequence, it is a rotary compressor, an exhauster, a ventilator, a vacuum pump or an ordinary pump. In known machines of this type, the rotary piston is mounted eccentrically in the cylinder and therefore the blade must slide radially in its housing under the action of springs. The latter constantly press the said blade against the internal wall of the cylinder. The constant spring urged contact between the edge of the blade and the internal surface of the cylinder during rotation of the piston causes wear to the cylinder and to the blade and in particular is liable to scratch the cylinder wall. Further, the blade springs, under constant compression, and liable to high temperatures, can become inoperative after a relatively short period of service. Subsequently, these known machines present the disadvantage of rapid wear, frequent renewal of certain moving parts and, what is more, their construction is relatively complicated resulting in a high purchase price.

The present invention enables the elimination of these disadvantages. With this aim in view, in a multi-purpose rotary piston machine according to the invention, the piston is mounted concentrically in relation to the cylinder and the blade is in contact freely with the interior surface of the cylinder. Other particularities and details of the invention will become apparent with reference to the description and the drawings accompanying the present specification which illustrate, for guidance only, two embodiments of the multi-purpose rotary piston machine in accordance with the invention.

FIGURE 1 is a partial opened view with partial section of a first embodiment of the new machine.

FIGURE 2 is a section plan view of the machine.

FIGURE 3 is a section showing a second embodiment of the new machine.

In these figures, the same reference numbers designate the similar elements of the two embodiments. The new machine comprises a cylinder 1 the external side face of which is not necessarily round but is adapted to its support or to its application. A piston 2 is mounted inside cylinder 1 and is keyed to a shaft 3 driven by a motor not shown in the drawing. The piston 2 revolves inside the cylinder 1. The axis common to piston 2 and to the shaft 3 coincides with the axis of the internal surface of the cylinder 1. The piston 2 supports a fluid conveyor blade 4 housed in a corresponding groove 5 provided in the cylindrical face of piston 2. The blade 4 is located parallelly to and in the plan with the axis of the piston 2 and extends to the entire length of the said piston. The edge of the blade 4 located outside the groove 5 presses lightly against the internal wall of cylinder 1 or is located at a slight distance from this surface. The machine is intended for the conveyance of a fluid such as air, for example, which is drawn into the cylinder 1 by the rotary piston 2 through an inlet duct 6 or 7 and which is then pumped from the cylinder 1 by the rotary piston 2 through an outlet duct 8 or 9. The two inlet ducts lead to a

one-way cock 10 the body of which is formed by the cylinder 1 itself. This one-way cock connects the external source either with the duct 6 or the duct 7. The ducts 6 and 7 are obturated on the cylinder 1 side by means of a rocker abutment 11 mounted on a pin 12. According to the extreme position of the rocker abutment 11, either the duct 6 or the duct 7 is shut off. The ducts 8 and 9 lead to a one-way cock 13 located outside the cylinder 1. The cocks 10 and 13 can be hand-operated. The rocker abutment 11 is actuated by means of a cam 14 fixed on the shaft 3 which raises and lowers a lever 15 that is fixed to its pin 12. The height of lift of the cam 14 corresponds to the pivoting or rocking angle of the abutment 11 thus ensuring a smooth passage of the blade 4 when passing under the said abutment. The position of the eccentric of the cam 14 is such that the abutment 11 is actuated shortly before, during, and shortly after the passage of the said blade 4 under the abutment 11. The machine illustrated can revolve in either direction. In the drawings, the direction of rotation of the piston 2 is indicated by the arrow X. The cock 10 enables the flow of air through the duct 6 and the abutment 11 normally closes the duct 7 leaving the duct 6 free. The air delivered by the blade in the course of its rotation leaves the cylinder through the duct 8 with the duct 9 shut off by means of the cock 13. It is a simple matter to understand the normal position of abutment 11 and that of the cocks 10 and 13 when the piston 2 revolves in a direction opposite to that indicated by the arrow X. In order to correctly situate the abutment 11 in relation of the direction of rotation of the machine, the rod 15 can be adjustable in a tube 16 fixed to the pin 12 of the abutment 11. What is more, this rod 15 is provided with a cam-follower formed by a spring 17 attached to the said rod 15. This spring 17 forms a kind of inclined plane with a projection part. When the cam 14 presses against the lower base of this inclined plane, the normal position of the abutment 11 is such that it normally shuts off duct 7 with the machine revolving in the direction indicated by the arrow X. When the cam 14 presses against the top of the inclined plane, the abutment 11 normally shuts off the duct 6, but in that case the machine revolves in the direction opposite to that indicated by the arrow X. The second embodiment of the new machine illustrated in FIGURE 3 differs from the preceding embodiment insofar that the inlet ducts 6 and 7 are replaced by a single duct and the rocker abutment is replaced by two rocker flaps 18 and 19. One of the flaps, 18 for example, remains in a raised position and allows continual free passage to the blade 4 when the piston 2 revolves in clockwise direction. Normally, the other flap 19 is closed and is lifted only shortly before, during and shortly after passage of the blade 4 under this rocker flap 19 when the piston 2 revolves in this direction. With the help of two machines it is possible to obtain an internal combustion engine. For this purpose, a combustion chamber proprovided with means for ignition is located between the two machines. One of the said machines supplies the said combustion chamber with air and fuel and the other operates as a receiver of the energy resulting from the combustion of the gases in the said combustion chamber.

What I claim is:

A multiple-purpose rotary machine comprising a cylinder in which is lodged concentrically a rotary piston on which is mounted at least one blade for the conveyance of a fluid admitted into the cylinder through an inlet cock provided with two inlet ducts operating respectively with their two corresponding outlet ducts, each couple of inlet and outlet ducts being destined for each direction of rotation; a twin-winged abutment is provided for closing and opening other of the two inlet ducts according to

the direction of rotation desired; either of the two inlet ducts in function is closed shortly before, during, shortly after the passage of the moving blade of the rotary piston opposite said abutment; the twin-winged abutment's swinging is actuated by a system of cam and lever, the cam is mounted on the shaft of the rotary piston, the lever is able to slide and be secured in an element that is connected to the shaft of the swinging abutment; said lever has an inclined plane with a projecting part, preferably flexible, which part contacts the cam, the lever rises and falls through the medium of the cam; when the upper side of the inclined plane is in contact with the cam, the rotary piston rotates in one direction; when its lower side is in contact with the cam, the rotary piston rotates in other direction, the reversing of the rotation is ensured by the inclined plane, with a projection part, of the lever.

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