Dec. 8, 1931. R. SCHMIDT 1,834,976

ROTARY COMPRESSOR, PUMP, OR THE LIKE

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Fig. 1

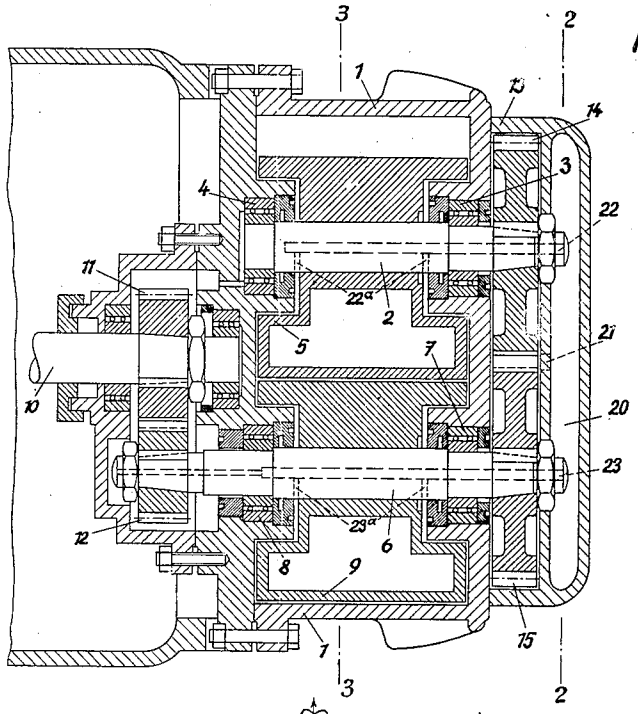
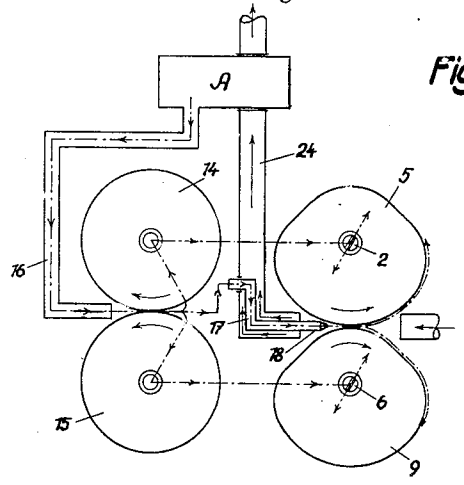


Fig. 4



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Fig. 2

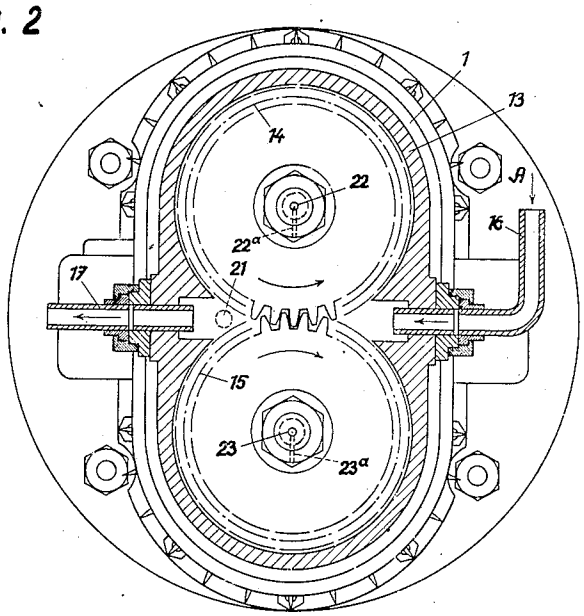
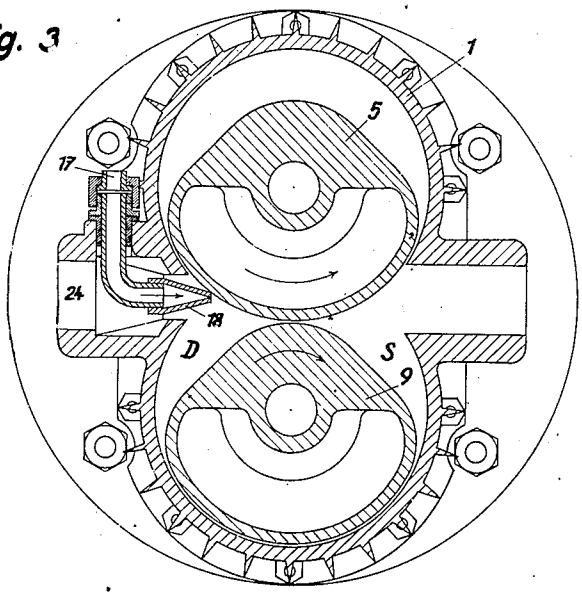


Fig. 3



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UNITED STATES PATENT OFFICE

RUDOLF SCHMIDT, OF VIENNA, AUSTRIA, ASSIGNOR TO "PATIAG" PATENTVERWERTUNGS-UND INDUSTRIE AKTIENGESELLSCHAFT, OF VADUZ, LIECHTENSTEIN, A CORPORATION OF LIECHTENSTEIN

ROTARY COMPRESSOR, PUMP OR THE LIKE

Application filed March 8, 1929, Serial No. 345,455, and in Austria March 9, 1928.

This invention relates to an improved rotary compressor, pump or the like. According to the invention the rotary compressor comprises in combination a cylindric casing, two cam-shaped pistons having a contour line free from recesses, rolling on each other with a slight clearance, gear wheels operating the said pistons and constituting a geared pump, a pipe leading from the pressure side of the geared pump to a nozzle for continually pressing sealing liquid against the clearance between the two pistons.

One mode of carrying out the present invention is illustrated by way of example on the accompanying sheets of drawings in which—

Fig. 1 shows an embodiment in sectional elevation.

Figs. 2 and 3 are cross-sectional views, the sections being taken on line 2—2 and on line 3—3 of Fig. 1 respectively.

Fig. 4 is a diagrammatic view of the plant.

1 designates the casing of the compressor (pump), 2 is the shaft of the top piston 5, 3 and 4 are ball bearings in which the said shaft runs, 6 designates the shaft of the bottom piston 9 and 7, 8 the corresponding ball bearings. A shaft 10 operates the piston 9 by means of gear wheels 11 and 12. The shaft 2 and the top piston 5 are operated by the piston 9 by means of toothed wheels 14, 15, arranged in a gear case 13 and operating as rotary gear pump for the objects hereinafter set forth. S designates the suction channel and D the delivery (pressure) channel of the encased gear.

The rotary gear pump sucks-in oil, supplied by an oil separator A (Figs. 2 and 4), through the pipe 16 and delivers the same by way of a pipe 17 to a nozzle 18, which continuously ejects towards the approaching zone of the two pistons 5 and 9 the oil at a pressure somewhat higher than the delivery pressure of the compressor (pump). In this way a steady and sealing oil flow is maintained in the zone of the nearest approach of both cam-shaped pistons as well as in the packing zone between the body of piston and the casing.

Besides the branch current just described, the geared pump also discharges a branch current of the sealing fluid into an axial bore 22 of the piston shaft 2 and into the axial bore 23 of the piston shaft 6 by way of the port 21 terminating in the compartment 20. From these axial bores the liquid is forced by way of transverse channels 22^a and 23^a through the packing faces between the lateral walls of the piston and the casing. The sealing liquid (for instance oil), passing by way of the nozzle 18 and the bores 22, 23 through the packing faces, is separated from the supplied air in the separator A (into which both are delivered by way of the pipe 24) and is again delivered to the geared pump by way of the pipe 16.

The pumps or compressors constructed according to the present invention do not require to be lubricated in usual manner because directly contacting faces are not present between the moving delivery members and the casing. Instead of a direct contact, the moving surfaces approach each other and the walls of the casing, the extent of approach depending on the size of the compressor or pump. Thereby, in case of compressors, the quantity of delivered sealing liquid amounts only to a fraction of the quantity of air or gas which would flow through the same packing faces at the same conditions of pressure. Therefore the total volumetric efficiency of the delivered medium (which consists of a mixture of air or gas and the sealing liquid) of a compressor constructed according to the present invention is considerably higher than would be the case if air or gas alone is delivered.

I claim—

1. In a rotary compressor, pump or the like a cylindric casing, two cam-shaped pistons having a contour line free from recesses, rolling on each other with a slight clearance, gear wheels operating the said pistons and constituting a geared pump, a pipe leading from the pressure side of the geared pump, and a nozzle connected with said pipe and directed toward the clearance between the two pistons for continually pressing sealing liquid against said clearance between the two pistons.

2. In a rotary compressor, pump or the like a cylindric casing, two cam-shaped pistons having a contour line free from recesses, rolling on each other with a slight clearance, gear wheels operating the said pistons and constituting a geared pump, a pipe leading from the pressure side of the geared pump, a nozzle connected with said pipe and directed toward the clearance between the two pistons for continually pressing sealing liquid against said clearance, axial bores in the shafts of the pistons communicating with the pressure side of the geared pump and transverse bores to the said axial bores leading to the clearances between the side faces of the casing and the side faces of the pistons, so that sealing liquid is continually pressed in the last mentioned clearances.

RUDOLF SCHMIDT.