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RADIAL PISTON PUMPS

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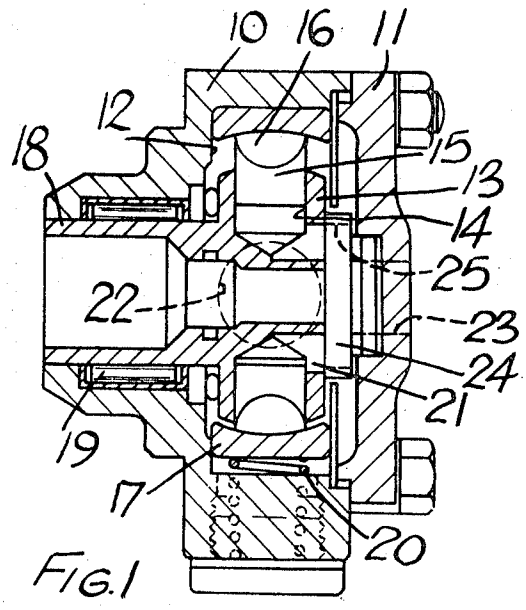


FIG. 1

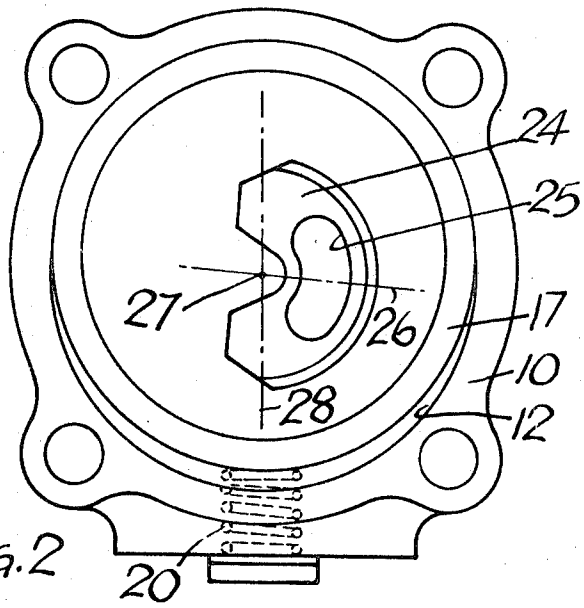


FIG. 2

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RADIAL PISTON PUMPS

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Continuation of application Ser. No. 699,680, Jan. 22, 1968. This application Mar. 24, 1969, Ser. No. 810,924
Int. Cl. F04b 1/10, 49/00, 21/02
U.S. Cl. 91—475 1 Claim

ABSTRACT OF THE DISCLOSURE

A pump comprising a body part containing a rotor with radially reciprocable pistons in bores thereof, a ring against an internal surface of which the pistons bear, an inlet and an outlet for liquid to be pumped and a part between an apertured side face of the rotor and the portion of the body part in which the outlet is formed, said part having a port through which liquid flows from the bores, to the outlet and said part being disposed so that the port occupies a plane which is inclined to the line of action of the biasing means.

This application is a continuation application of application 699,680 filed Jan. 22, 1968, now abandoned.

The invention relates to liquid pumps of the kind including a rotor supporting a plurality of radially reciprocable pistons, the pistons engaging a surface which, for the purpose of pumping liquid, is eccentric with respect to the axis of rotation of the rotor, said rotor being mounted within a body part in which are defined inlet and outlet ducts for the liquid.

The invention will now be described by way of example with reference to the accompanying drawings in which:

FIG. 1 is a side elevation cross-sectional view of a pump constructed in accordance with the invention, and

FIG. 2 is a view of one interior end face of the pump with the rotor and pistons omitted.

The pump illustrated has a body part **10** incorporating a detachable end cover **11** at one end. Within the body part is defined a cavity **12** within which is rotatably mounted a rotor **13**. The rotor **13** has a plurality of radially extending bores **14** containing respective pistons **15**. Slippers **16** incorporated in the outer ends of the pistons **15** bear against the internal surface of a ring **17** mounted in the body part **10**. The internal surface of the ring **17** is part-spherical.

The rotor **13** has an integral tubular driving shaft **18** extending out of the body part **10** at its end remote from the end cover **11**, and this shaft **18** is mounted in a bearing **19** in the body part **10**.

Acting against the ring **17** is a coiled compression spring **20** arranged to urge the ring **17** towards a position (illustrated in FIG. 1) in which the ring and rotor are eccentric with respect to one another.

The side face of the rotor **13** adjacent to the end cover **11** is provided with a plurality of holes **21** communicating with the bores **14** respectively. The body part **10** has an inlet **22** and the end cover **11** has an outlet **23** for liquid to be pumped.

Between the end cover **11** and the adjacent end of the rotor **13** is a part **24** in which is formed a kidney shaped port **25** affording communication between the holes **21** in the rotor **13** and the outlet **23**.

This part **24** is shown in FIG. 2 and remains stationary when the rotor is rotating. Inlet to the bores **14** through the holes **21** occurs as the rotor rotates when they are out of contact with the part **24**.

As shown in FIG. 2 the part **24** is symmetrical about a plane which is identified by numeral **26**, this plane passing through the axis of rotation of the rotor which is identified by numeral **27**. This plane is inclined to the axis of the spring **20** (identified by numeral **28**) which also passes through the axis **27**.

In use, there exists a force which is the resultant of the forces applied by the pistons **15** to the ring **17**, this resultant force tending to move the ring towards a position in which the ring **17** and rotor **13** having their axes substantially coincident. Movement under the action of this force takes place against the spring **20** and only occurs when the value of the force in the plane of the spring axis exceeds the spring rating.

The off-set position of the part **24** changes the direction of the resultant force mentioned from that which exists if the plane **26** is perpendicular to the axis **28** of the spring **20**. The resultant force acts instead in a direction away from a point of contact between the exterior of the ring **17** and the interior cylindrical surface of the cavity **12** of the body part **10**.

The ring **17** is constrained to move against the action of the spring towards a position in which axes of the ring and rotor are truely coincident. The sides of the cavity **12** may includes parallel straight portions parallel to the axis **28** these portions guiding the ring **17**.

Alternatively a roller is incorporated into the wall of the cavity **12** to form a fulcrum about which the ring will move.

In a further alternative, the spring **20** is replaced by a diamond shaped blade spring, the line of action of this however, being identified by the plane **28** in the FIG. 2 construction.

I claim:

1. A radial piston type pump comprising a body part, an inlet and an outlet in the body part for liquid, a rotor mounted in the body part for rotation about an axis, a plurality of pistons occupying radially extending bores in the rotor respectively, a ring disposed within the body part, said ring providing an internal surface against which the outer ends of the pistons bear, biasing means acting between the body part and said ring having an axis passing through the axis of rotation of the rotor, the biasing means urging the ring towards a position in which said surface thereon is eccentric with respect to the axis of rotation of the rotor, axially extending holes in the side of the rotor, said holes communicating with the inner ends of the bores respectively, and a port plate disposed between said side of the rotor and the body part, the port plate having a port affording communication between the holes in the rotor in turn as the rotor rotates and the outlet in the body part, said port plate being disposed symmetrically about a plane passing through the axis or rotation of the rotor and being inclined with respect to the axis of the biasing means which also passes through the axis of rotation of the rotor.

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