Jan. 7, 1958 H. W. CHRISTENSON 2,818,816

RADIAL PISTON PUMP

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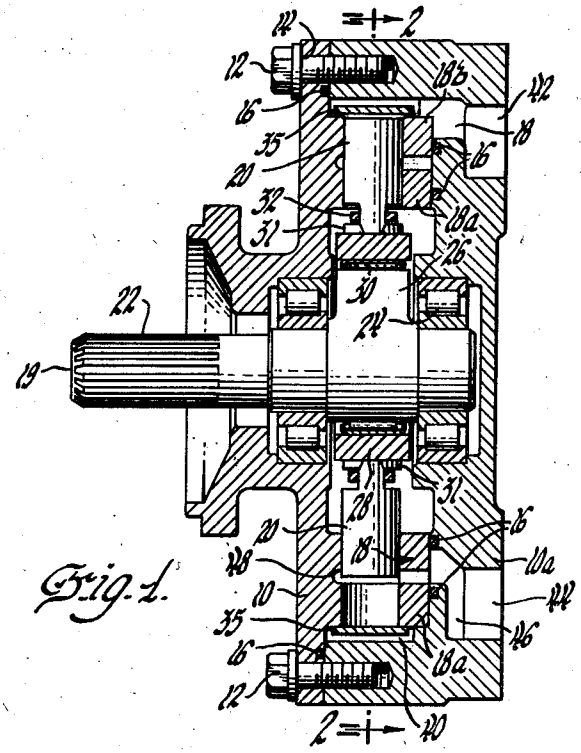


Fig. 1.

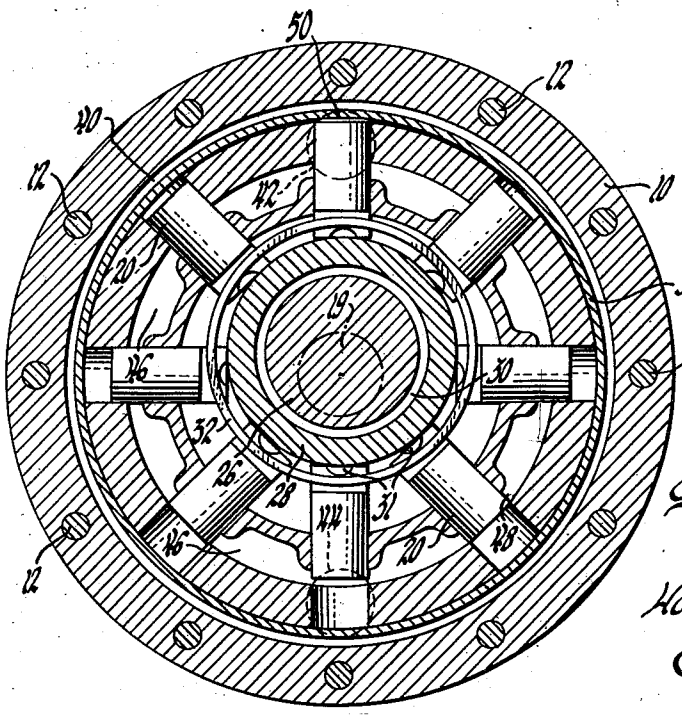


Fig. 2.

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RADIAL PISTON PUMP

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2 Claims. (Cl. 103—174)

This invention relates to fluid pumps and more especially concerns a radial piston pump adapted to provide the high pressures required for the operation of servo machanisms associated with heavy off-the-road vehicles and similar equipment.

The invention has as its principal object to provide a pump answering fully to the indicated requirements which is of simple design as compared to previously proposed pumps and which as a consequence is easier and less costly to fabricate and assemble.

Other objects and features of the invention will appear from the following description.

In the accompanying drawings illustrating the invention in its presently preferred embodiment,

Fig. 1 is a transverse section through the pump; and

Fig. 2 is a section taken at right angles to the section of Fig. 1.

From the drawings it will be seen that the pump housing is formed of two members **10** and **10***a* secured together by bolts **12** adapted to extend through holes **14** in the member **10**. Seals **16** render the joint between the two housing members fluid tight.

Housing member **10** is formed to provide a plurality of cylinders **18** adapted to accommodate pistons **20** reciprocal in the cylinders as later explained. Each cylinder consists of spaced-apart sections **18***a* and **18***b*.

The pump is driven through a shaft **19** splined at **22** for connection to a driving member, not shown. Within the pump housing the shaft turns in roller bearing **24** of any suitable design. That portion **26** of the shaft between the bearings will be seen formed as a cam so that on rotation of the shaft, the race piece **28** confining the needle bearings **30** is caused to move eccentrically, resulting in reciprocation of the pistons **20** in the cylinders.

Pistons **20** comprise laterally extending portions **31** for the accommodation of a pair of retainer rings or bands **32** which act to maintain the necessary contact between the pistons and the outer periphery of the race piece **28**.

Cylinders **18** are surrounded by a ring or band **35**, so fabricated that a measure of clearance is provided between it and the cylinders. The annular space **40** in which the ring is disposed serves as part of a manifold communicating with the discharge port **42**. An inlet port **44** connects with each cylinder **18** via a manifold **46** and the annular space **48** between the cylinder sections **18***a* and **18***b*.

In Fig. 2, the upper piston is shown in a position of discharge while the lower piston is shown in intake position. Due to the pressure of the oil being forced under the ring

35 (note the clearance **50**) that portion of the ring beneath or outward of the lower piston is pulled tight against the outer end of the corresponding cylinder, assuring efficient loading of the chamber of the cylinder from the intake manifold **46**. As a consequence of the described action, the ring in operation of the pump tends to "walk around" the cylinders, a condition which is highly desirable in that the formation of deposits between the ring and cylinders, which might intefere with the proper functioning of the ring, is largely precluded. In other words, by means of the valving ring, there is achieved what amounts to a self-cleaning pump.

The invention having been thus described and illustrated what is claimed is:

1. A pump or the like comprising a pair of housing members, one of said members being formed to provide a plurality of radially arranged cylinders, each cylinder being without end walls and having a laterally disposed port in open communication with the corresponding ports of the other cylinders, the other of said housing members including a portion formed to encircle said cylinders in spaced relation and having therein a discharge passage open to the clearance between the outer ends of said cylinders and the said encircling portion and an inlet passage common to said laterally disposed ports, a piston in each of said cylinders, powered means for reciprocating said pistons and a ring element surrounding said cylinders to close the outer ends thereof, said element being wider than such ends and serving as a valve controlling the discharge from the cylinders into said discharge passage.

2. A pump or the like comprising a pair of housing members, one of said members being formed to provide a plurality of radially arranged cylinders, each cylinder being without end walls and having a laterally disposed port in open communication with the corresponding ports of the other cylinders, the other of said housing members including portion formed to encircle said cylinders in spaced relation and having therein a discharge passage open to the clearance between the outer ends of said cylinders and the said encircling portion and an inlet passage common to said laterally disposed ports, a piston in each of said cylinders, each of said pistons during its discharge stroke operating of itself to close off the lateral port of the corresponding cylinder, eccentric means for reciprocating said pistons, and a ring element having a width exceeding the diameter of the said outer ends of the cylinders and surrounding the cylinders to serve as a valve controlling the discharge from the cylinders into said discharge passage, said ring element having an inner diameter slightly grater than the outer diameter of the cylinder bank and in operation being held tightly against the outer ends of the intaking cylinders by the pressure of the fluid passing from the discharging cylinders, such action proceeding with rotary movement of said ring member relative to said cylinders.

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