Nov. 10, 1925. 1,560,804

G. F. K. ROSÉN

ROTARY PUMP OR MOTOR

Filed July 12, 1923

Fig. 1

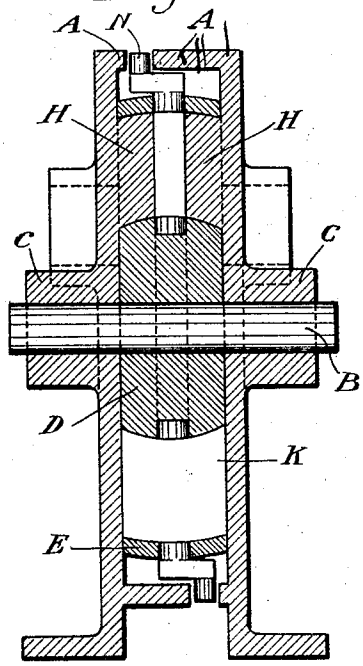


Fig. 2

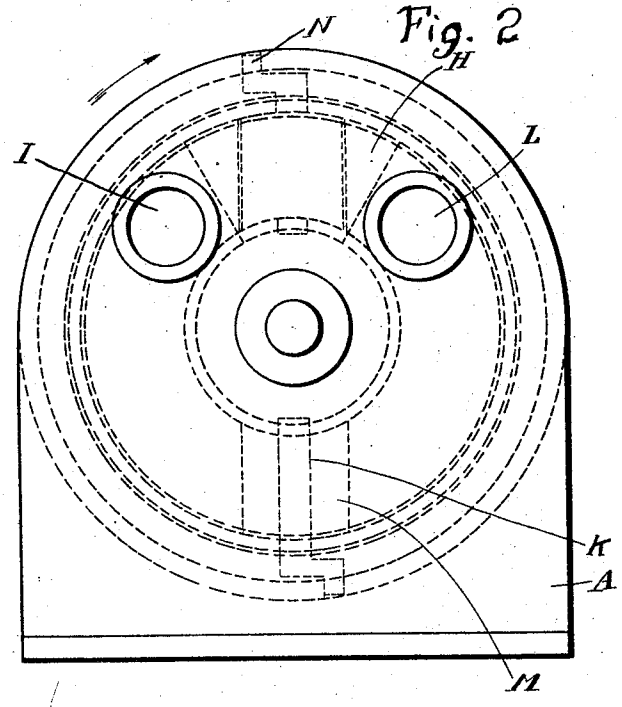
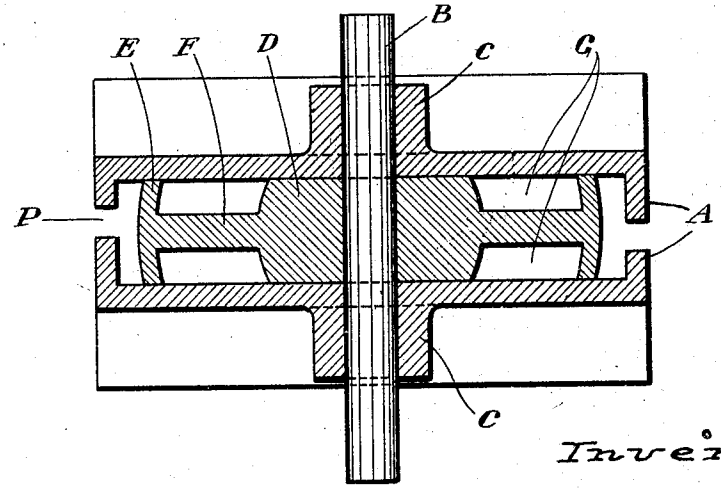


Fig. 3



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UNITED STATES PATENT OFFICE.

GUSTAF FREDRIK KONRAD ROSÉN, OF KALMAR, SWEDEN.

ROTARY PUMP OR MOTOR.

Application filed July 12, 1923. Serial No. 651,116.

To all whom it may concern:

Be it known that I, GUSTAF FREDRIK KONRAD ROSÉN, a subject of the King of Sweden, residing at Larmtorget 4, Kalmar, Sweden, have invented certain new and useful Improvements in Rotary Pumps or Motors, of which the following is a specification.

This invention relates to such rotary pumps or motors, which consist of a casing provided with working surfaces and abutments and having within it a rotor provided with working vanes turnable about radially disposed axes and co-operating with the working surfaces formed in the casing, said vanes being automatically brought to turn about their axes, when passing the abutments so as to pass freely along said abutments.

One object of the invention is to provide for a rigid mounting of the radially disposed axes of the working vanes. A further object is to secure a tight bearing of the vanes against the rotor in all positions of the vanes.

The invention consists chiefly in this that the rotor comprises a hub and a peripheral annular part connected with the hub by a, preferably, central disk and having an inner spherical surface having its centre located on the axis of the rotor, the outer end surface of the working vanes being correspondingly shaped and bearing on said spherical surface of the annular rotor part. If desired, also the hub may be spherically shaped with the centre of curvature located on the axis of the rotor, the inner end surface of the working vane being shaped correspondingly.

In the accompanying drawing, one form of embodiment of a rotary pump according to this invention is shown. Fig. 1 is a vertical axial section of the pump. Fig. 2 is a side view of the pump. Fig. 3 is a horizontal axial section thereof.

Referring to the drawing, A designates a casing comprising two parallel side portions connected in any suitable manner. Disposed between the said side portions is a rotor comprising a hub D and an annular peripheral part E, both the hub and the peripheral part bearing tightly against the inner side surfaces of the casing. The annular part E is connected with the hub D by a disk-shaped intermediate part F having but such a thickness that annular chambers G will be formed between the disk F, the hub D, the annular part E and the sides of the casing A. Each of said chambers G is provided with an inlet opening L and an outlet opening I. Pivotally connected to the hub D and the annular part E are vanes K extending across the chambers G and bearing when in working position against the inner side surfaces of the casing A. The vanes K are capable of being turned from the position, shown at the lower part of Fig. 1 to the position shown at the upper part of said figure, and for this purpose apertures M corresponding to the width of the vanes K are made in the partition F.

According to the invention the inner surface of the peripheral part E of the rotor is spherical having its centre located on the axis of the rotor, so as to provide for a close fitting of the correspondingly shaped outer ends of the vanes in all positions thereof. Further, by carrying out the rotor in the manner set forth, i. e., with an annular peripheral part E connected to the hub D a rigid mounting of the turnable vanes K is obtained.

The turning of the vanes K is obtained by providing crank-shaped projections N at the outer ends of the vanes, said projections being guided when turning the rotor into an annular slot P formed in the peripheral part of the casing A and having such a shape that the vanes will be turned automatically when rotating with the rotor. Provided at the inner side of each half of the casing A is an abutment H bearing against the partition F and dividing each of the chambers G into a suction chamber and a pressure chamber, respectively. The slot P has such a form that the vanes K will be turned into the position shown at the upper part of Fig. 1 immediately before they approach the abutments H so that they will pass freely between the abutments. Immediately after the vanes have passed said abutments they are turned by means of the slot P into the position shown at the lower part of Fig. 1. The rotor is carried by a shaft B mounted in bearings C on the casing A.

Supposing the rotor to be turned in the direction of the arrow in Fig. 2, fluid will be sucked through the inlet L into the suction chamber formed between a valve K and the abutments H and, simultaneously, the fluid previously sucked in at the other side

of the vane will be forced out through the pressure chamber formed between said vane and the abutment and through the outlet I.

Obviously, the turning of the vanes K may, if desired, be performed by other means than the cranks N and the slot P.

Further, it is obvious that the pump above described and shown in the drawing may also serve as a motor.

What I claim as new and desire to secure by Letters Patent of the United States of America is:—

1. In a rotary pump or motor, the combination with an outer housing, of a rotor comprising a hub, an annular peripheral part and a central disk-shaped part connecting the hub and the annular part together, said peripheral part having an inner spherical surface and extending throughout the width of the interior of said housing, and working vanes carried by said rotor within said peripheral part and turnable about radially disposed axes, the outer ends of said vanes being formed so as to correspond to the inner spherical surface of said peripheral part.

2. In a rotary pump or motor, the combination with an outer housing, of a rotor comprising a hub an annular peripheral part and a central disk-shaped part connecting the hub and annular part together, said peripheral part having an inner spherical surface and extending throughout the width of the interior of said housing, and working vanes carried by said rotor within said peripheral part and turnable about radially disposed axes; the outer ends of said vanes being formed so as to correspond to the inner spherical surface of said peripheral part, and means for automatically turning the working vanes about said radially disposed axes, said means being located outside said annular peripheral part.

3. In a rotary pump or motor, the combination with an outer housing, of a rotor comprising a hub, an annular peripheral part and a central disk-shaped part connecting the hub and annular part together, said peripheral part having an inner spherical surface and extending throughout the width of the interior of said housing, and working vanes carried by said rotor within said peripheral part and turnable about radially disposed axes, the outer ends of said vanes being formed so as to correspond to the inner spherical surface of said peripheral part, and means for automatically turning the working vanes about said radially disposed axes, said means comprising cranks connected to the vanes and projecting outside the said annular peripheral part, and curved slots in said housing cooperating with said cranks.

In testimony whereof I affix my signature.

GUSTAF FREDRIK KONRAD ROSÉN.