This invention pertains to improvements in fluid pressure pumps and motors particularly to such devices capable of reversible variable delivery and volume control features in connection therewith.

One of the objects is to provide a variable delivery and reversible fluid pressure pump device of simple and rugged design.

Another object is to provide a fluid pressure pump device of the vane type in which a simple unique mechanism is provided to vary the shape, size and circumferential position of the pressure and suction chambers of the pump.

A still further object is to provide a vane pump with a plurality of spaced together rockable segments for varying the characteristics of suction of flow produced by the pump.

Further features and advantages of this invention will appear from a detailed description of the drawings in which:

FIG. 1 is a sectional view of the device including the features of this invention on the line 1—1 of FIG. 4, with the parts shown in forward operative position.

FIG. 2 is a view similar to FIG. 1 but showing the device with the parts arranged for reverse operation.

FIG. 3 is a view similar to FIGS. 1 and 2 in which the parts are shown in neutral position.

FIG. 4 is an enlarged sectional view on the line 4—4 of FIG. 1.

As an example of one embodiment of this invention, there is shown a fluid pressure pump or motor having a frame indicated generally at 10 comprising a part of suitable side plates 11 and 12 secured together in spaced relationship by appropriate spaces 13 and bolts 14. An input drive shaft 15, if used as a pump or the output shaft if used as a motor, is journalited in suitable bearings 16 and carried in the side plates 11 and 12 and isolated from the space 16 between the inner faces 17 and 18 of the side plates by suitable seals 19 carried in the side plate 11 and 12 and surrounding the shaft 15. Fixed on the shaft 15 between the side plates 11 and 12 by the key 20 is the rotor 21 having the usual vanes 22 movable radially in the slots 23 as the motor and shaft turn in the direction indicated by the arrow 24.

Surrounding the motor 21 are a plurality of circumferentially disposed rocking segment elements 25 located between the faces 17 and 18 of the side plates which are pivotally mounted in the side plates 11 and 12 by suitable pins 26 and 27, the pin 27 being preferably fixed by a pin 28 to one of the segments 25 and extends outwardly from the side plate 11 and has an operating handle 29 for rocking the pin 27.

Each of the segments 25 are provided with fluid cavities 33 in the arcuate vane contacting surfaces 30 of the segments which are connected to suitable fluid passageways 34 terminating at pipe tap openings 35 to which appropriate operating piping may be connected.

In FIG. 1 is shown the device operating as a pump for full delivery of fluid pressure in one direction wherein two of the diametrically opposite segments are sucking in fluid as indicated by the arrows 36 into the pipe tap opening 35 from suitable pipe lines connected to a reservoir, not shown, while the other two diametrically opposite segments 25 are discharging pressure fluid out through the pipe tap openings as indicated by their respective arrows 37.

By rocking the segments they may be moved to the opposite position shown in FIG. 2 to reverse the delivery and suction as shown by the arrows 36 and 37 or the segments may be rocked to an intermediate or neutral position as shown in FIG. 3 with a minimum or zero flow suction or discharge from the device.

While the apparatus herein disclosed and described constitutes a preferred form of the invention, it is also to be understood that the apparatus is capable of mechanical alteration without departing from the spirit of the invention and that such mechanical arrangement and commercial adaptation as fall within the scope of the appended claims are intended to be included herein.
conducting the supply and discharge of fluid from said pump.

3. A fluid pressure pump comprising in combination:
A. a frame having,
B. a pair of spaced side plates having inner faces facing toward each other,
C. a drive shaft journaled in said side plates,
D. a rotor fixed to said drive shaft and located between said side plates,
E. rotor vanes radially reciprocable in slots formed in said rotor,
F. a plurality of rockable segments pivotally mounted between said inner faces of said side plates having arcuate vane contacting surfaces adapted to slidingly engage the outer edges of said rotor vanes during the rotation of said rotor,
G. intermeshing gear tooth connections at the ends of each of said arcuate vane contacting surfaces of each of said segments to cause simultaneous rocking of each of said segments in the opposite direction from its adjacent intermeshing segment when any one or more of said segments are actuated in rocking movement on said frame,

H. means for rocking at least one of said rocking segment elements so that every other one of said rocking segments simultaneously rocks in the opposite direction from its adjacent segments to vary the volume and direction of fluid flow in said pump.

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