Title (en)

ACTIVE VALVE AND ACTIVE VALVING FOR PUMP

Title (de)

AKTIVES VENTIL UND AKTIVE VENTILSTEUERUNG FÜR EINE PUMPE

Title (fr)

VALVE ACTIVE ET ENSEMBLE DE VALVES ACTIVES POUR POMPE

Publication

EP 1836394 A2 20070926 (EN)

Application

EP 05855847 A 20051230

Priority

- US 2005047354 W 20051230
- US 2493704 A 20041230

Abstract (en)

[origin: US2006147329A1] A pump (20, 120, 320, 420) comprises a pump body (22); an actuator (26); and, one or more active valves (30, 32). The pump body at least partially defines a pumping chamber (28) which has an inlet port (29) and an outlet port (31). The actuator (26) is situated at least partially in the pumping chamber for acting upon a fluid in the pumping chamber. The active valve (30, 32) selectively opens and closes a port with which it is aligned, e.g., either the inlet port (20) or the outlet port (31). In some embodiments, the active valve (30, 32) comprises a piezoelectric element (40) which responds to voltage for the selective opening and closing of its aligned port. In an illustrated embodiment, the piezoelectric element is a piezoceramic film (42). In one implementation of the pump, both the inlet valve (30) and the outlet valves (32) are active valves. In another implementation of the pump, the inlet valve (30) is an active valve but the outlet valve (323) is a passive valve (e.g., is influenced by flow of fluid in the pump). In other embodiments, active valves operate in accordance with magnetic forces and have electric conductors (64) or wiring embedded or otherwise formed therein in a coil shape to form a magnetic field. In addition, the ports which host the magnetically activated active valves have a magnet (60) formed therearound. In some embodiments, when an electric current is applied to the circuit in the valve, the direction of electric flow in the conductors in the flexible valve is such that the magnetic field created thereby attracts the magnetic field extant at the port opening to close the valve.

IPC 8 full level

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