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(54) **ELECTROKINETIC HIGH PRESSURE HYDRAULIC SYSTEM**

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Related U.S. Application Data

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(51) **Int. Cl.**⁷ **B01D 61/44**

(52) **U.S. Cl.** **204/450; 204/600; 204/647; 204/648**

(58) **Field of Search** 204/450, 600, 204/647, 648

(56) **References Cited**

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(57) **ABSTRACT**

An electrokinetic high pressure hydraulic pump for manipulating fluids in capillary-based systems. The pump uses electro-osmotic flow to provide a high pressure hydraulic system, having no moving mechanical parts, for pumping and/or compressing fluids, for providing valve means and means for opening and closing valves, for controlling fluid flow rate, and manipulating fluid flow generally and in capillary-based systems (Microsystems), in particular. The compact nature of the inventive high pressure hydraulic pump provides the ability to construct a micro-scale or capillary-based HPLC system that fulfills the desire for small sample quantity, low solvent consumption, improved efficiency, the ability to run samples in parallel, and field portability. Control of pressure and solvent flow rate is achieved by controlling the voltage applied to an electrokinetic pump.

28 Claims, 4 Drawing Sheets

