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(54) Title: DEVICES AND METHODS FOR CELL MANIPULATION

(57) Abstract: Devices for fluid control and biological particle manipulation (e.g., cell enrichment and blood sampling) are disclosed. The devices are based on the ability to control the flow of fluids through the use of microfluidic valves. The valves are characterized, for example, by microstructures disposed on a mobile diaphragm.

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 06/39441

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(8): F16K 31/126 (2007.01)

USPC: 251/335.2, 57

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC(8): F16K 31/126 (2007.01)

USPC: 251/335.2, 57

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WEST (PGPB,USPT,EPAB,JPAB): microfluidic, channel, valve, chamber, diaphragm, actuate, closed state, open state, cell  
Espacenet: microfluidic, channel, valve, chamber, diaphragm; Google Scholar: microfluidic, channel, valve, chamber, diaphragm, microstructure; Derwent Patent Abstract, Life Science: microfluidic, channel, valve

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X --- Y	US 6,644,944 B2 (KARP) 11 November 2003 (11.11.2003), abstract, col 1, ln 13-15; col 2, ln 18-28; col 2, ln 45-49; col 2, ln 53-65; col 3, ln 10-14; col 4, ln 55-66; col 7, ln 49-50; col 7, ln 61-63; col 8, ln 15-47; Fig. 1D, Fig 2C, Fig 2D, Fig 5.	1, 7-10 ----- 2-6, 11-19
Y	US 2003/0214057 A1 (HUANG) 20 November 2003 (20.11.2003), para [057], [0138].	2-6, 14-19
Y	US 6,622,746 B2 (YANG et al.) 23 September 2003 (23.09.2003), col 3, ln 17; col 3, ln 34-47.	11-19

 Further documents are listed in the continuation of Box C.

\* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

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"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

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