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(71) Applicants (for all designated States except US):

ADVANCED LIQUID LOGIC, INC. [US/US]; PO Box 14025, Research Triangle Park, North Carolina 27709 (US). **ECKHARDT, Allen** [US/US]; 908 Kimball Drive, Durham, North Carolina 27705 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **SISTA, Ramakrishnan** [IN/US]; 2800 C Golden Horseshoe Circle, Morrisville, North Carolina 27560 (US). **PAMULA,**

Vamsee [IN/US]; 2807 Skybrook Lane, Durham, North Carolina 27703 (US). **SRINIVASAN, Vijay** [IN/US]; 2805 Skybrook Lane, Durham, North Carolina 27703 (US). **POLLACK, Michael** [US/US]; 1102 Hill Street, Durham, North Carolina 27709 (US).

(74) Agent: **MILLS, Eric**; Post Office Box 867, New Bern, North Carolina 28563-0867 (US).

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(54) Title: MANIPULATION OF BEADS IN DROPLETS

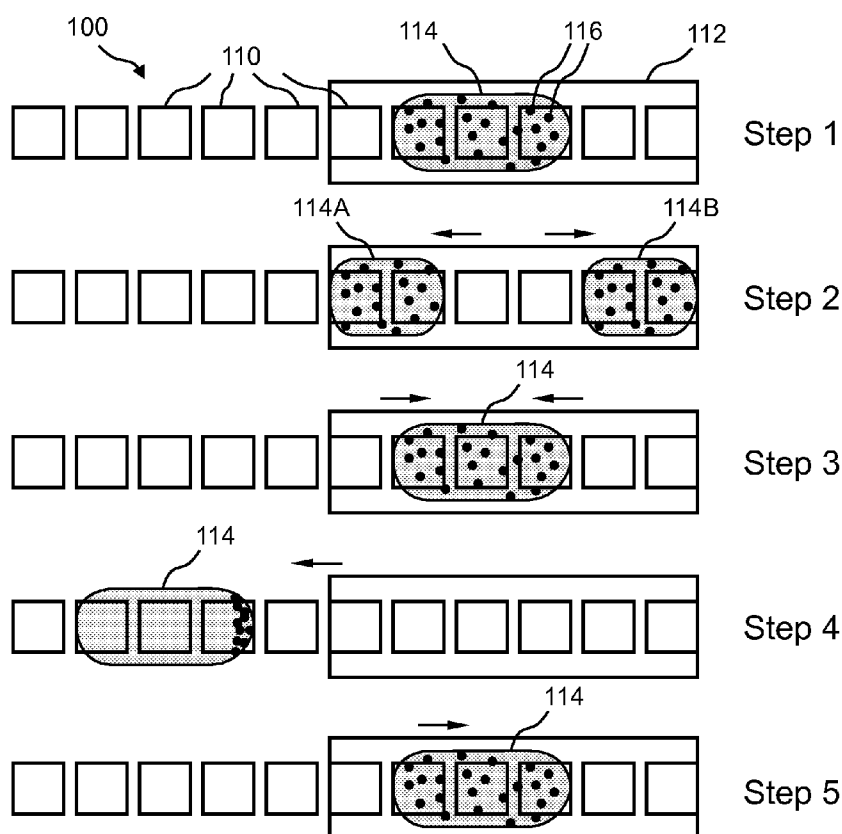


Figure 1

(57) Abstract: The invention provides a method of dispersing or circulating magnetically responsive beads within a droplet in a droplet actuator. The invention, in one embodiment, makes use of a droplet actuator with a plurality of droplet operations electrodes configured to transport the droplet, and a magnet field present at a portion of the plurality of droplet operations electrodes. A bead bead-containing droplet is provided on the droplet actuator in the presence of the uniform magnetic field. Beads are circulated in the droplet during incubation by conducting droplet operations on the droplet within a uniform region of the magnetic field. Other embodiments are also provided.



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A. CLASSIFICATION OF SUBJECT MATTER*G01N 27/26(2006.01)i, B01J 19/08(2006.01)i*

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B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

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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)

D/B : eKIPASS

KEY WORD : Electrowetting, Magnet, Droplet actuator

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	Academic Year 2004-2005, 1-11(http://old.ee.duke.edu/undergrads/independent_study.php), (Nicole Weaver) 31 DEC. 2005 "Application of Magnetic Microspheres to Pyrosequencing on a Digital Microfluidic Platform", with Dr. Richard Fair. see page 4-6; figure 2	36-38, 49, 51
X	J. Micromech. Microeng. Vol.17: 2148-2156(Yizhong Wang et al.) 21 SEP. 2007 "Efficient in-droplet separation of magnetic particles for digital microfluidics ", see page 2149-2150; figure 2	49-51
A	Microfluid nanofluid, Vol.4: 159-165(Yves Fouillet et al.) 20 MAR. 2007 "Digital microfluidic design and optimization of classic and new fluidic functions for lab on a chip systems", see page 162-164; figure 2	1-59
A	Sensors and Actuators B Vol.113: 563-569 (Mitsuhiro Shikida et al.) 08 MAR. 2005 "Using wettability and interfacial tension to handle droplets of magnetic beads in a micro- chemical-analysis system" see page 564-565; figure 2	1-59



Further documents are listed in the continuation of Box C.



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Korean Intellectual Property Office
Government Complex-Daejeon, 139 Seonsa-ro, Seo-
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Authorized officer

CHOI, SOK JIN

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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2006-0186048 A1 (Roy H. Tan) 24 AUG. 2006 see the whole document	1-59
A	US 2003-0205632 A1 (Kim Chang-Jin et al.) 6 NOV. 2003 see the whole document	1-59
PX	US 2007-0243634 A1 (Vamsee K. Pamula et al.) 18 OCT. 2007 see pages 30-31; figures 12, 14	49, 51, 54
PX	WO 2008-098236 A2 (Sista, Ramakrishna et al.) 14 AUG. 2008 see pages 8-10, 13-15; figures 2-3, 6-7	25, 36, 37, 49

INTERNATIONAL SEARCH REPORT

Information on patent family members

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US 2003-0205632 A1	06.11.2003	NONE	
WO 2008-098236 A2	14.08.2008	NONE	