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Published:

- with international search report (Art. 21(3))
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))

[Continued on next page]

(54) Title: MULTIPLEXED DETECTION SCHEMES FOR A DROPLET ACTUATOR

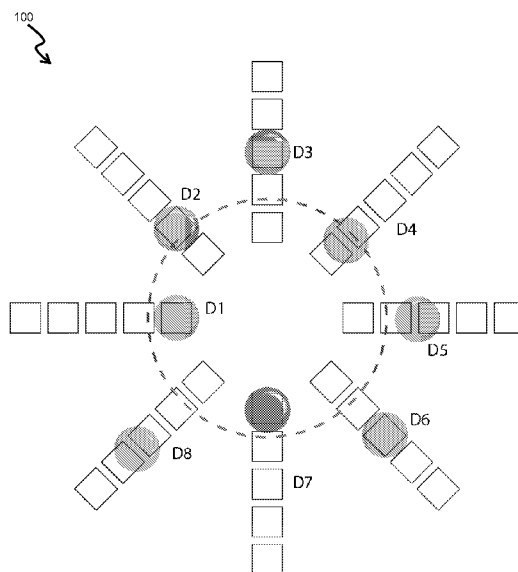


Figure 12

(57) Abstract: A droplet actuator having electrodes configured for ejecting droplet operations transporting droplets on a surface, and a sensor arranged in proximity to one or more of the electrodes establishing a detection window on the surface for detection of one or more properties of one or more droplets on the surface, wherein the electrodes establish at least two pathways for transport of droplets into the detection window. Also provided is, A method of detecting a property of a target droplet, including using droplet operations to modulate signals from a droplet set comprising the target droplet, detecting the modulated signals of the droplet set, demodulating the modulated signals to identify the signal produced by one or more individual droplets of the set Related methods and alternative embodiments are also provided.





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22 October 2009

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2008/079899**A. CLASSIFICATION OF SUBJECT MATTER***G01N 35/10(2006.01)i, G01N 27/26(2006.01)i, C12Q 1/68(2006.01)i, C12M 1/34(2006.01)i*

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 G01N 35/10, G01N 27/26, C12Q 1/68, C12M 1/34

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

Korean Utility models and applications for Utility models since 1975

Japanese Utility models and applications for Utility models since 1975

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

eKOMPASS(KIPO internal) & keywords: droplet, actuator, electrode, sensor

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2006-0054503 A1 (VAMSEE K. PAMULA et al.) 16 MARCH 2006 See paragraph [7] - paragraph [24]; Figures. 1-25B.	1-3,10,11,31,64,65
A	US 6565727 B1 (ALEXANDER DAVID SHENDEROV) 20 MAY 2003 See column 5, line 15 - column 6, line 48; Figures. 5-8.	1-3,10,11,31,64,65
A	US 6866762 B2 (PETER GASCOYNE et al.) 15 MARCH 2005 See column 21, line 57 - column 23, line 28; Figures. 10-11.	1-3,10,11,31,64,65



Further documents are listed in the continuation of Box C.



See patent family annex.

* 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

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"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

"&" document member of the same patent family

Date of the actual completion of the international search

19 AUGUST 2009 (19.08.2009)

Date of mailing of the international search report

20 AUGUST 2009 (20.08.2009)

Name and mailing address of the ISA/KR

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2008/079899

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☒ Claims Nos.: 5-9, 12-30, 32-63
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
Claims 5-9, 12-30 and 32-63 are not to make meaningful search, because the claims refer multiple dependent claim.

3. ☒ Claims Nos.: 4, 7-9, 12-17, 19-27, 29, 33-35, 38-48, 50-58, 61-63, 66-86
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2008/079899

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