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- (71) **Applicant (for all designated States except US):** ALBERT-LUDWIGS-UNIVERSITÄT FREIBURG [DE/DE]; Fahrenbergplatz, 79085 Freiburg (DE).
- (72) **Inventors; and**
- (75) **Inventors/Applicants (for US only):** VULTO, Paul [NL/NL]; Korendijkstraat 7, NL-2586 RM Den Haag (NL). URBAN, Gerald [DE/DE]; Kartäuserstr. 118d, 79104 Freiburg (DE). PODSZUN, Susann [DE/DE]; Am Herweg 28, 79110 Freiburg (DE).
- (74) **Agent:** KUHLE, Dietmar; Grünecker, Kinkeldey, Stockmair & Schwanhäusser, Leopoldstraße 4, 80802 München (DE).
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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))

- (88) **Date of publication of the international search report:**
23 September 2010

(54) **Title:** PHASEGUIDE PATTERNS FOR LIQUID MANIPULATION

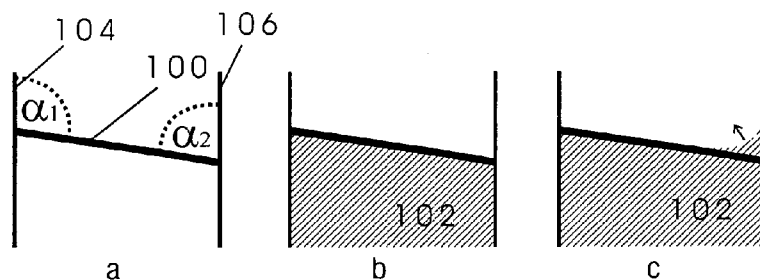


FIG. 4

(57) **Abstract:** The present invention relates to phaseguide patterns for use in fluid systems such as channels, chambers, and flow through cells. In order to effectively control filling and/or emptying of fluidic chambers and channels, techniques for a controlled overflowing of phaseguides are proposed. In addition, techniques of confined liquid patterning in a larger fluidic structure, including approaches for patterning overflow structures and the specific shape of phaseguides, are provided. The invention also proposes techniques to effectively rotate the advancement of a liquid/air meniscus over a certain angle. In particular, a phaseguide pattern for guiding a flow of a liquid contained within a compartment is provided, wherein an overflow of the phaseguide by a moving liquid phase is controlled by a local change in capillary force along the phaseguide, wherein said overflow by the liquid over the phaseguide is provoked at the position of the local change in capillary force.



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INTERNATIONAL SEARCH REPORT

International application No
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A. CLASSIFICATION OF SUBJECT MATTER
INV. B01F13/00 B01L3/00 F16K99/00

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)
B01F B01L F16K

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 practical, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2007/280856 A1 (ULMANELLA UMBERTO [US] ET AL) 6 December 2007 (2007-12-06) paragraphs [0075], [0078], [0079], [0080], [0082], [0095], [0096], [0098], [0110], [0122]; figures 2a-f, 3-6a-b, 7a-b, 8a, c, d, 9b, 11a	1-4, 14-17
X	WO 01/85602 A1 (AAMIC AB [SE]; GYROS AB [SE]; LARSSON OLLE [SE]; TIENSUU ANNA LISA [SE]) 15 November 2001 (2001-11-15) page 4, lines 14-26; figure 5f	1-4, 14-17
X	US 6 271 040 B1 (BUECHLER KENNETH FRANCIS [US]) 7 August 2001 (2001-08-07) column 11, lines 15-36; figures 1-8, 12 column 27, line 60 - column 28, line 45	1-4, 14-17
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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 document 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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Date of the actual completion of the international search

21 April 2010

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Name and mailing address of the ISA/

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040,
Fax: (+31-70) 340-3016

Authorized officer

Viskanic, Martino

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(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2007/059216 A1 (LARSSON OLLE [SE] ET AL) 15 March 2007 (2007-03-15) paragraphs [0003], [0016], [0018], [0039]; figures 1-5 -----	1-4, 14-17
X	US 2004/241051 A1 (WYZGOL RAIMUND C [DE] ET AL) 2 December 2004 (2004-12-02) paragraphs [0062] - [0069]; figures 1-5 -----	1-4, 14-17
X	WO 2006/074665 A (SCANDINAVIAN MICRO BIODEVICES [DK]; BARHOLM-HANSEN CLAUS [DK]; JONSMAN) 20 July 2006 (2006-07-20) page 41, line 9 - page 49, line 3; figures 1-10 -----	1-4, 14-17
X	US 4 761 381 A (BLATT JOEL M [US] ET AL) 2 August 1988 (1988-08-02) column 5, lines 31-45; figures 1-16 column 8, line 1 - line 13 column 12, lines 1-12; figure 1 -----	1,4
X	US 2008/295909 A1 (LOCASCIO LAURIE E [US] ET AL) 4 December 2008 (2008-12-04) paragraphs [0070] - [0078]; figures 10,11,16-20 -----	1,4
X	US 2004/202579 A1 (LARSSON ANDERS [SE] ET AL) 14 October 2004 (2004-10-14) paragraph [0061]; figure 8 -----	1

INTERNATIONAL SEARCH REPORT

International application No.
PCT/EP2010/000553

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.:
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:

3. Claims Nos.:
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:

see additional sheet

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 fees, this Authority did not invite payment of additional fees.
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.:

2-4, 14-17(completely); 1(partially)

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.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 2-4, 14-17(completely); 1(partially)

Phase guide pattern for guiding a flow of liquid to fill or empty a container.

2. claims: 5, 9-13(completely); 1(partially)

Phase guide pattern with confining phase guides to hold a liquid in a part of a container.

3. claims: 6-8(completely); 1(partially)

Phase guide pattern with an overflow compartment connected with a fluid container.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No PCT/EP2010/000553

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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