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(54) **Title:** A MEMS GAS CHROMATOGRAPH AND METHOD OF FORMING A SEPARATOR COLUMN FOR A MEMS GAS CHROMATOGRAPH

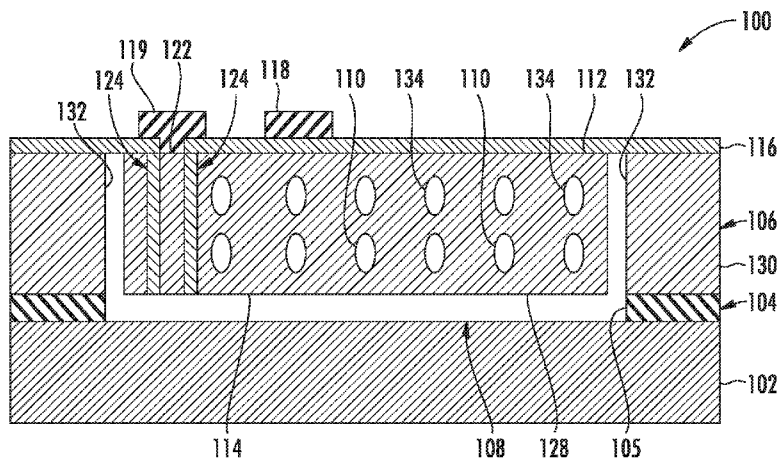


FIG. 1

(57) **Abstract:** A micro gas chromatograph includes one or more separator columns formed within a device layer. The separator columns have small channel cross sections and long channel lengths with atomic-smooth channel sidewalls enabling a high channel packaging density, multiple channels positioned on top of each other, and channel segments that are thermally decoupled from the substrates. The micro gas-chromatograph also enables electrostatic and thermal actuators to be positioned in close proximity to the separator columns such that the material passing through the columns is one or more of locally heated, locally cooled, and electrically biased.



INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2015/066076**A. CLASSIFICATION OF SUBJECT MATTER****G01N 30/60(2006.01)i, B81B 7/00(2006.01)i, B81C 1/00(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)

G01N 30/60; H03H 3/007; H01L 29/84; B81C 1/00; H01L 21/44; B81B 7/00

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

Japanese utility models and applications for utility models

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

eKOMPASS(KIPO internal) & Keywords: micro gas chromatography, MEMS, buried oxide layer, device layer, channel, horizontally, cavity, annealing, silicon-on-insulator wafer

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2013-0126989 A1 (TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY, LTD.) 23 May 2013 See paragraphs [0012]-[0035]; claims 1-20; and figures 1-10.	1-20
A	US 7582514 B2 (VANCURA et al.) 01 September 2009 See column 2, line 36-column 8, line 9; claims 1-27; and figures 1A-11.	1-20
A	WO 2010-136986 A2 (NXP B.V. et al.) 02 December 2010 See pages 5-10; claims 1-10; and figures 1-9.	1-20
A	ZANDI et al., Design and demonstration of an in-plane silicon-on-insulator optical MEMS fabry-perot-based accelerometer integrated with channel waveguides, Journal of Microelectromechanical Systems, 2012, Vol. 21, No. 6, pp. 1464-1470 See pages 1464-1469.	1-20
A	DE BOER et al., Micromachining of buried micro channels in silicon, Journal of Microelectromechanical Systems, 2000, Vol. 9, No. 1, pp. 94-103 See pages 94-102.	1-20

 Further documents are listed in the continuation of Box C. See patent family annex.

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INTERNATIONAL SEARCH REPORT

Information on patent family members

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2013-0126989 A1	23/05/2013	US 2012-0043626 A1 US 8343789 B2 US 8704317 B2	23/02/2012 01/01/2013 22/04/2014
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