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(54) Title: APPARATUS AND METHOD FOR PROGRAMMABLE SPATIALLY SELECTIVE NANOSCALE SURFACE FUNCTIONALIZATION, SELF-FLOWING MICORFLUIDIC ANALYTICAL CHIP, AND STAND ALONE MICROFLUIDIC ANALYTICAL CHIP DEVICE

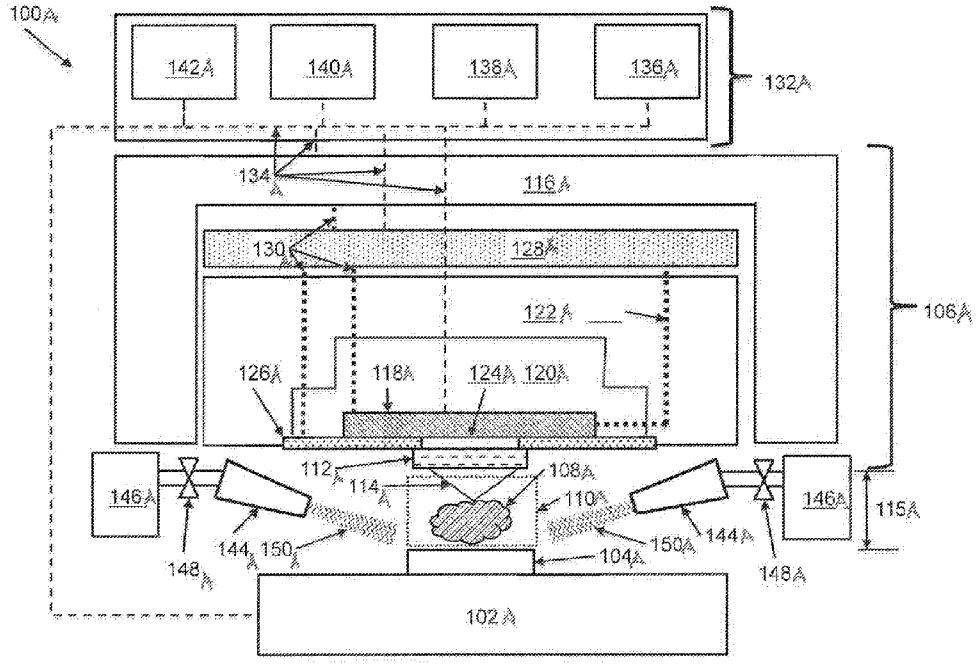


FIG. 1

(57) Abstract: A spatially selective surface functionalization device configured to generate a pattern of micro plasmas and functionalize a substrate. A self-flowing microfluidic analytical chip may undergo spontaneous flow of a fluidic sample through microfluidic channels without an internal or external pump or corresponding pumping support hardware for fluid pumping. An analytical device including: a self-flowing microfluidic system, having a sample extraction location, at least one sample preparation location, and at least one sample analytical chamber.

[Continued on next page]

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A. CLASSIFICATION OF SUBJECT MATTER

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B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
B01L 3/00; H05H 1/46; C40B 60/12; B23K 10/00; B05D 7/22; B81C 1/00; B81B 7/02; G03F 7/20

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: spatially, selective, surface functionalization, pattern, plasma, gas, electron, membrane, microfluidic, self flowing, maskless, card reader

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2013-0206720 A1 (BLOM, PAULUS PETRUS MARIA et al.) 15 August 2013 See paragraphs [0007], [0025], [0026], [0069], [0097], [0112]; claims 1, 19, 24, 28, 36, 39, 40, 42, 43; and figures 1, 3, 5A.	1-26
Y		27-43
A		44-62
Y	US 2004-0091399 A1 (CHUNG, KWANG HYO et al.) 13 May 2004 See paragraphs [0005], [0037]; and claims 1, 3, 8.	27-62
Y	US 2010-0105577 A1 (DUGAN, LAWRENCE CHRISTOPHER et al.) 29 April 2010 See paragraph [0055]; claim 1; and figure 8.	44-62
A	US 2003-0052096 A1 (CROWE, RICHARD et al.) 20 March 2003 See paragraphs [0023], [0024]; claims 1-4; and figure 1.	1-62
A	WO 2010-146153 A1 (DUBLIN CITY UNIVERSITY) 23 December 2010 See claim 1; and figures 1A-1C.	1-62

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

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