(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
10 June 2010 (10.06.2010)

PCT

(10) International Publication Number
WO 2010/065748 A3

(51) International Patent Classification:
H01L 21/70 (2006.01) *H01L 21/762* (2006.01)

(21) International Application Number:
PCT/US2009/066595

(22) International Filing Date:
3 December 2009 (03.12.2009)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
61/120,327 5 December 2008 (05.12.2008) US

(71) Applicant *(for all designated States except US)*: **LIQUIDIA TECHNOLOGIES, INC.** [US/US]; 419 Davis Drive, Suite 100, Durham, NC 27713 (US).

(72) Inventors; and
(75) Inventors/Applicants *(for US only)*: **ERMOCHKINE, Alexander** [RU/US]; 440 Robin Road, Chapel Hill, NC 27516 (US). **SCHORZMAN, Derek** [US/US]; 211 Roedling Lane, Cary, NC 27513 (US). **SPRAGUE, Jacob** [US/US]; 1203 Oak Tree Drive, Chapel Hill, NC 27517 (US).

(74) Agents: **LEUNG, Richard, L.** et al.; Morgan, Lewis & Bockius, LLP, 1701 Market Street, Philadelphia, PA 19103-2921 (US).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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: METHOD FOR PRODUCING PATTERNED MATERIALS

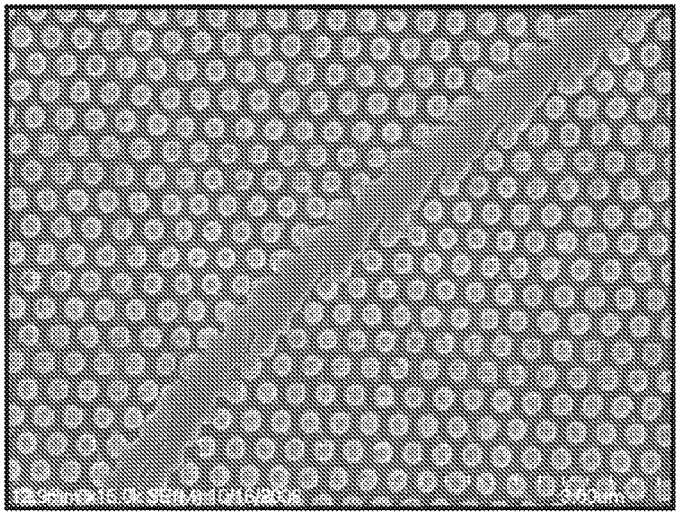


FIG. 5C

(57) Abstract: A large area patterned film includes a first patterned area; a second patterned area; and a seam joining the first patterned area and the second patterned area, wherein the seam has a width less than about 20 micrometers. A method for tiling patterned areas includes depositing a predetermined thickness of a curable material; contacting a first portion of the curable material with a mold; curing the first portion of the curable material; removing the mold from the cured first portion of the curable material; contacting a second portion of the curable material with the mold, such that the mold contacts a portion of the cured first portion of the curable material; curing the second portion of the curable material; and removing the mold to yield a seam between the cured first portion of the curable material and the cured second portion of the curable material, wherein the seam has a dimension less than about 20 micrometers.

WO 2010/065748 A3

(88) Date of publication of the international search report:
22 July 2010

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 09/66595

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - H01L 21/70, 21/762 (2009.01)
USPC - 257/347; 257/349
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(8) - H01L 21/70, 21/762 (2009.01)
USPC - 257/347; 257/349

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
USPC ? 257/347; 257/349; 257/350, 257/351, 257/352, 257/66, 257/69, 257/E21.545, 257/E21.564, 257/E21.703, 257/E27.112, 438/404, 438/405, 438/413, 438/429 (keyword search)

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
PubWEST; WIPO, Web: Google, Google Scholar
Search Terms Used: large area, patterned, film, seam, tiling, curable, mold, contact, remove, thickness, oxygen, seamless, nip point, fluoropolymer, overlap, undercoat

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X ---------- Y	US 5,597,613 A (Galarneau et al.) 28 January 1997 (28.01.1997) Entire document, especially: abstract; Fig 1, 5A-B, 7; col 2, ln 13-16; col 4, ln 3-11, 15-27, 48-60; col 5, ln 25-30, 44-47, 53-56; claims 1, 11	4, 7, 8 ---------- 1-3, 5, 6, 9-18, 20-22
Y	US 2006/0210755 A1 (Blazek) 21 September 2006 (21.09.2006) Entire document, especially: abstract; Fig 5; para [0020], [0021]	1-3
Y	US 2008/0251976 A1 (Rolland et al.) 16 October 2008 (16.10.2008) Entire document, especially: Fig 10A-C; para [0030], [0033]-[0035], [0047]	5, 6, 10
Y	Jeong, H.E., Kwak, R., Kim, J.K., Suh, K.Y., "Generation and Self-Replication of Monolithic, Dual-Scale Polymer Structures by Two-Step Capillary-Force Lithography," Small Journal, Vol 4, No 11, pg 1913-1918; published on-line 20 October 2008. (abstract) [online]. Retrieved from the Internet on [19 January 2010]. Retrieved from: <URL: http://www3.interscience.wiley.com/cgi-bin/fulltext/121462083/PDFSTART Entire document, especially: pg 1913, col 2; pg 1915, col 2; pg 1916, col 2; pg 1917; col 2	6, 9
Y	WO 2008/143650 A2 (Rolland et al.) 27 November 2008 (27.11.2008) Entire document, especially: Fig 4; para [0020], [0085], [00131]-[00134], [00140], [00153], [00171], [00175], [00183], [00195]	11-22

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

* 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 another 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	Date of mailing of the international search report
20 January 2010 (20.01.2010)	25 MAY 2010
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	Authorized officer: Lee W. Young PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

Form PCT/ISA/210 (second sheet) (July 2009)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 09/66595

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 2005/101466 A2 (Desimone et al.) 27 October 2005 (27.10.2005) Entire document, especially: Fig 2A-D; pg 22, ln 30, through pg 23, ln 12; pg 26, ln 3-7; pg 27, ln 13-27, 31-33	19-22