

(43) International Publication Date
27 September 2012 (27.09.2012)

- (51) **International Patent Classification:**
G03F 7/20 (2006.01) *C11D 1/00* (2006.01)
- (21) **International Application Number:**
PCT/IB2012/050946
- (22) **International Filing Date:**
29 February 2012 (29.02.2012)
- (25) **Filing Language:** English
- (26) **Publication Language:** English
- (30) **Priority Data:**
61/453,983 18 March 2011 (18.03.2011) US
61/543,834 6 October 2011 (06.10.2011) US
- (71) **Applicant (for all designated States except US):** BASF SE [DE/DE]; 67056 Ludwigshafen (DE).
- (71) **Applicant (for MN only):** BASF (CHINA) COMPANY LIMITED [CN/CN]; 300 Jiangxinsha Road, Shanghai 200137 (CN).
- (72) **Inventors; and**
- (75) **Inventors/Applicants (for US only):** KLIPP, Andreas [DE/DE]; Viktoriarang 15, 67245 Lamsheim (DE). OETTER, Günter [DE/DE]; Hans-von-Marees-Str. 21, 67227 Frankenthal (DE). MONTERO PANCERA, Sabrina [BR/DE]; Kettelerstr. 30, 68519 Viernheim (DE). HONCIUC, Andrei [RO/DE]; Schmale Gasse 1, 67063 Ludwigshafen (DE). BITTNER, Christian [DE/DE]; Niederwaldstr. 50, 64625 Bensheim (DE).

(74) **Agent:** FITZNER, Uwe; Hauser Ring 10, 40878 Ratingen (DE).

(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, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

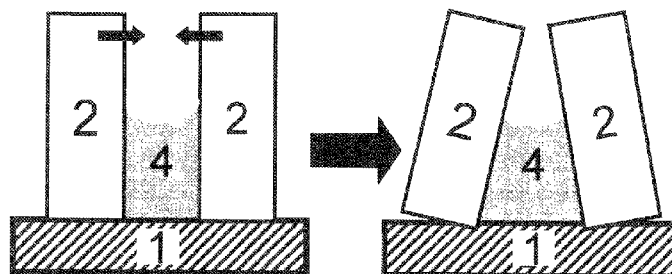
(84) **Designated States** (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, 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))

(54) **Title:** METHOD FOR MANUFACTURING INTEGRATED CIRCUIT DEVICES, OPTICAL DEVICES, MICROMACHINES AND MECHANICAL PRECISION DEVICES HAVING PATTERNED MATERIAL LAYERS WITH LINE-SPACE DIMENSIONS OF 50 NM AND LESS

Figure 1



(57) **Abstract:** A method for manufacturing integrated circuit devices, optical devices, micromachines and mechanical precision devices, the said method comprising the steps of (1) providing a substrate having patterned material layers having line-space dimensions of 50 nm and less and aspect ratios of >2 ; (2) providing the surface of the patterned material layers with a positive or a negative electrical charge by contacting the substrate at least once with an aqueous, fluorine-free solution S containing at least one fluorine-free cationic surfactant A having at least one cationic or potentially cationic group, at least one fluorine-free anionic surfactant A having at least one anionic or potentially anionic group, or at least one fluorine-free amphoteric surfactant A; and (3) removing the aqueous, fluorine-free solution S from the contact with the substrate.