



(51) International Patent Classification:

H01L 27/146 (2006.01) **B29D 11/00** (2006.01)
H01L 31/0232 (2014.01)

(21) International Application Number:

PCT/SG2013/000354

(22) International Filing Date:

19 August 2013 (19.08.2013)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

61/684,909 20 August 2012 (20.08.2012)

US

(71) Applicant: **HEPTAGON MICRO OPTICS PTE. LTD.**
[SG/SG]; 26 Woodlands Loop, Singapore 738317 (SG).(72) Inventor: **RUDMANN, Hartmut**; Ruetiwiesstrasse 20,
8645 Jona (CH).(74) Agent: **ALLEN & GLEDHILL LLP**; One Marina
Boulevard, #28-00, Singapore 018989 (SG).

(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, BN, 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, 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, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, 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, 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, KM, ML, MR, NE, SN, TD, TG).

[Continued on next page]

(54) Title: FABRICATION OF OPTICS WAFER

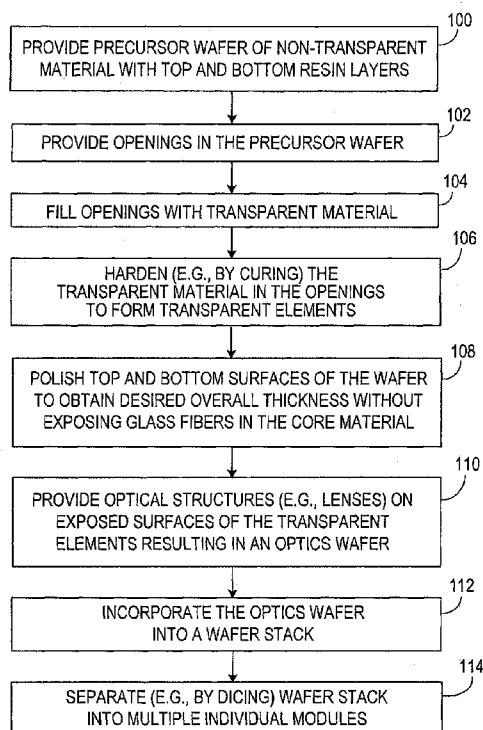


FIG. 13

(57) **Abstract:** Fabricating an optics wafer includes providing a wafer comprising a core region composed of a glass-reinforced epoxy, the wafer further comprising a first resin layer on a top surface of the core region and a second resin layer on a bottom surface of the core region. The core region and first and second resin layers are substantially non-transparent for a specific range of the electromagnetic spectrum. The wafer further includes vertical transparent regions that extend through the core region and the first and second resin layers and are composed of a material that is substantially transparent for the specific range of the electromagnetic spectrum. The wafer is thinned, for example by polishing, from its top surface and its bottom surface so that a resulting thickness is within a predetermined range without causing glass fibers of the core region to become exposed. Respective optical structures are provided on one or more exposed surfaces of at least some of the transparent regions.



Published:

— *with international search report (Art. 21(3))*