

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
13 October 2005 (13.10.2005)

PCT

(10) International Publication Number
WO 2005/094530 A2

(51) International Patent Classification: Not classified

(21) International Application Number:
PCT/US2005/009872

(22) International Filing Date: 24 March 2005 (24.03.2005)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/555,993 24 March 2004 (24.03.2004) US
11/089,478 24 March 2005 (24.03.2005) US

(71) Applicants and

(72) Inventors: **PIEDE, David** [US/US]; 11 Jade Lane, Allentown, PA 18104 (US). **GOTHOSKAR, Prakash** [IN/US]; 6749 Windermere Court, Allentown, PA 18104 (US). **GHIRON, Margaret** [US/US]; 1875 Sherwood Road, Allentown PA 18103 (US). **MONTGOMERY, Robert, Keith** [US/US]; 810 Howe Street, Easton, PA 18040 (US). **PATEL, Vipulkumar** [US/US]; 8916 Grady Drive, Breinigsville, PA 18031 (US). **PATHAK, Soham** [US/US]; 6099 Palomino Drive, Allentown, PA 18106 (US). **SHASTRI, Kalpendu** [US/US]; 5529 Willow Way, Orefield, PA 18069 (US). **YANUSHEFSKI, Katherine, A.** [US/US]; 7487 Stein Road, Zionsville, PA 18092 (US).

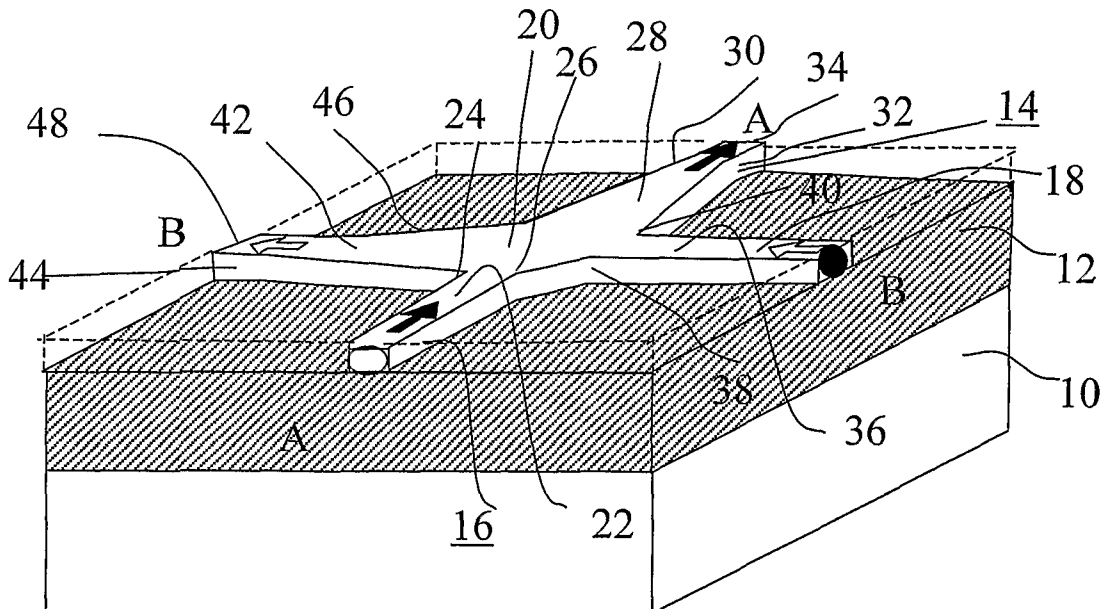
(74) Agent: **KOBA, Wendy, W.**; PO Box 556, Springtown, PA 18081 (US).

(71) Applicant (for all designated States except US): **SIOPTICAL, INC.** [US/US]; 7540 Windsor Drive, Lower Level, Allentown, PA 18195 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD,

[Continued on next page]

(54) Title: OPTICAL CROSSOVER IN THIN SILICON



(57) Abstract: An arrangement for providing optical crossovers between waveguides formed in an SOI-based structure utilize a patterned geometry in the SOI structure that is selected to reduce the effects of crosstalk in the area where the signals overlap. Preferably, the optical signals are fixed to propagate along orthogonal directions (or are of different wavelengths) to minimize the effects of crosstalk. The geometry of the SOI structure is patterned to include predetermined tapers and/or reflecting surfaces to direct/shape the propagating optical signals. The patterned waveguide regions within the optical crossover region may be formed to include overlying polysilicon segments to further shape the propagating beams and improve the coupling efficiency of the crossover arrangement.

WO 2005/094530 A2



MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— without international search report and to be republished upon receipt of that report

- (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, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO,

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.