

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

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
21 November 2002 (21.11.2002)

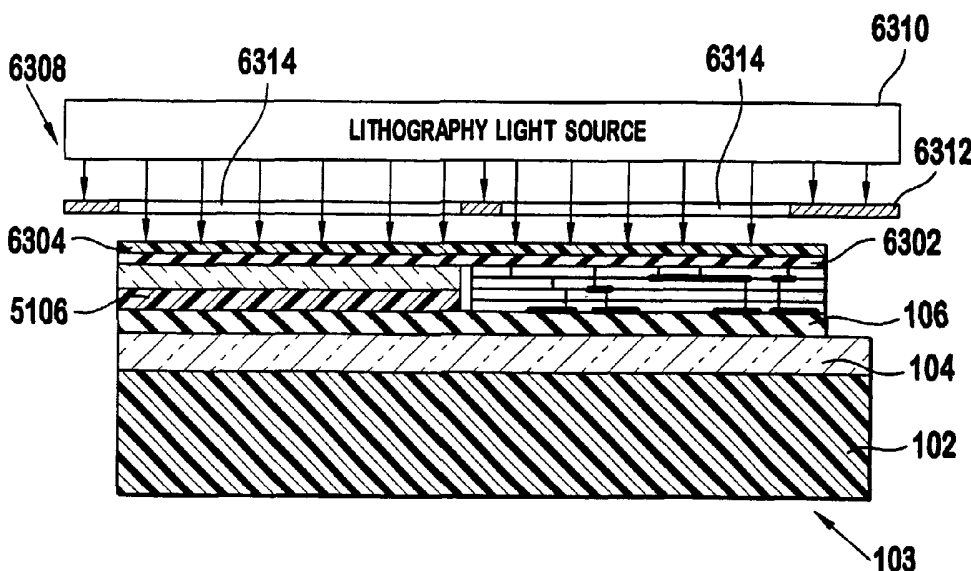
PCT

(10) International Publication Number
WO 02/093203 A3

(51) International Patent Classification ⁷ :	H01L 21/00,	60/297,208	8 June 2001 (08.06.2001)	US
	G02B 6/26, 6/42, G06G 7/48	09/991,542	10 November 2001 (10.11.2001)	US
		10/074,408	12 February 2002 (12.02.2002)	US
(21) International Application Number:	PCT/US02/15446	10/076,920	15 February 2002 (15.02.2002)	US
		10/077,026	15 February 2002 (15.02.2002)	US
(22) International Filing Date:	15 May 2002 (15.05.2002)	10/078,972	19 February 2002 (19.02.2002)	US
		10/078,203	19 February 2002 (19.02.2002)	US
(25) Filing Language:	English	10/079,668	20 February 2002 (20.02.2002)	US
		10/079,310	20 February 2002 (20.02.2002)	US
(26) Publication Language:	English	10/079,073	20 February 2002 (20.02.2002)	US
(30) Priority Data:				
	09/859,693	17 May 2001 (17.05.2001)		US
	09/859,663	17 May 2001 (17.05.2001)		US
	09/859,786	17 May 2001 (17.05.2001)		US
	09/859,297	17 May 2001 (17.05.2001)		US
	09/859,647	17 May 2001 (17.05.2001)		US
	09/859,239	17 May 2001 (17.05.2001)		US
	09/859,338	17 May 2001 (17.05.2001)		US
	09/859,279	17 May 2001 (17.05.2001)		US
	09/859,769	17 May 2001 (17.05.2001)		US
	09/859,321	17 May 2001 (17.05.2001)		US
	60/293,615	25 May 2001 (25.05.2001)		US
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			(81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH,	

[Continued on next page]

(54) Title: INTEGRATED OPTICAL/ELECTRONIC CIRCUITS AND ASSOCIATED METHODS OF SIMULTANEOUS GENERATION THEREOF



(57) Abstract: A method for forming a hybrid active electronic and optical circuit (103) using a lithography mask (6312) is disclosed. The hybrid active electronic and optical circuit (103) includes an active electronic device and at least one optical device on a Silicon-On-Insulator, SOI, wafer (102). The SOI wafer (102) includes an insulator layer (104) and an upper silicon layer (106). The upper silicon layer (106) includes at least one component of the active electronic device and at least one component of the optical device. The method includes projecting the lithography mask (6312) onto the SOI wafer (102) in order to simultaneously pattern the component of the active electronic device and the component of the optical device on the SOI wafer (102).



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GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZM, ZW.

(84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

- *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for all designations*
- *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii)) for all designations*

Published:

- *with international search report*

(88) Date of publication of the international search report:

1 May 2003

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.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US02/15446

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : H01L 21/00; G02B 6/26, 6/42; G06G 7/48
 US CL : 438/69; 385/30; 703/4, 6

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)
 U.S. : 438/69, 29; 385/30, 33, 36, 37, 43, 45, 49; 703/4, 6

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
 Please See Continuation Sheet

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 5,838,870 A (Soref) 17 November 1998 (17.11.98), Abstract, cols 4-6, Figs. 2-4.	1-4, 6, 10, 11, 33, 36, 37, 39, 43-46, 56, 57, 60, 63, 65, 66, 67, 96- 100, 102, 103 ----- 5, 7-9, 31, 32, 34, 35, 41, 42, 58, 59, 61, 64, 70-74, 90-95, 101, 104-118
Y ✓	US 5,140,651 A (Soref et al.) 18 August 1992 (18.08.92), Abstract, col 1, line 1 to col 2, line 8; col 3, lines 34-58; col 4, lines 5-13; Figs. 1-4.	5, 7, 101
Y ✓	US 5,355,237 A (Lang et al.) 11 October 1994 (11.10.94), Abstract, col 6, line 59 to col 9, line 2, cols 11-12, Figs. 1, 2, 4, 10, 11.	8, 41, 104-118
X ✓ --- Y	US 6,222,951 B1 (Huang) 24 April 2001 (24.04.01), Abstract; col 4, lines 33-59; col 5, line 37 to col 6, line 29; col 7, lines 12-15; col 7, line 57 to col 8, line 43.	1, 3, 4, 6, 8, 10, 11 ----- 9, 31, 32, 34, 35, 42, 69, 90-95

Further documents are listed in the continuation of Box C. See patent family annex.

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"A"	document defining the general state of the art which is not considered to be of particular relevance	"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
"E"	earlier application or patent published on or after the international filing date	"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
"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)	"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
"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	"&" document member of the same patent family

Date of the actual completion of the international search

06 November 2002 (06.11.2002)

Date of mailing of the international search report

27 JAN 2003

Name and mailing address of the ISA/US
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C. (Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X --- Y	US 6,108,472 (Rickman et al.) 22 August 2000 (22.08.00), Abstract, col 2, lines 7-37, Fig. 2.	5, 38, 68, 75-77 ----- 69-74
X	XIAO, X., et al. Fabry-Perot Optical Intensity Modulator at 1.3 mm in Silicon, IEEE Photonics Technology Letters, Vol. 3, No. 3, March 1991, pp. 230-231.	1-3, 6, 7, 10
X	US 5,559,912 A (Agahi et al.) 24 September 1996 (24.09.96), Abstract, col 5, lines 5-21, lines 55-60; Figs. 4, 5.	1-4, 6, 10, 39, 43
X	US 4,904,039 A (Soref) 27 February 1990 (27.02.90), Abstract, col 5, line 40 to col 6, line 32.	1, 2, 4, 6, 9, 10, 39, 42, 43
X	US 5,844,822 A (Yoshida) 1 December 1998 (01.12.98), Abstract; Figs. 2-3.	47-55
X	JP 2000-304956 (Oki Electric Ind Ltd) 2 November 2000 (02.11.00), Abstract, Figs. 2(n) to 2(Q).	86-89
X	JP 61-11708 (Nippon Telegraph and Telephone Corp) 20 January 1986 (20.01.86), Abstract, Figs. 1-6.	86-89
Y, P	US Publication No. 2002/0048422 A1 (Cotteverte et al.) 25 April 2002 (25.04.02), paragraph [0064], Fig. 16; Figs. 1-15.	58, 59, 61, 64

INTERNATIONAL SEARCH REPORT

PCT/US02/15446

Continuation of B. FIELDS SEARCHED Item 3:

EAST: optoelectronic, optical, electronic, SOI, silicon-on-insulator, semiconductor-on-insulator, lithography, patterning, waveguide, Fabry-Perot cavity, multiplexer, demultiplexer, mirror, lens, deflector, evanescent, coupler, photonic band gap, photonic crystal, photonic waveguide, topography, simulation, carrier, etch