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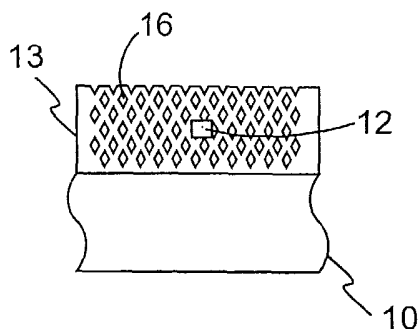
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(54) Title: METHOD FOR FABRICATING OPTICAL DEVICES IN PHOTONIC CRYSTAL STRUCTURES



(57) Abstract: A method for manufacturing optical components in a three-dimensional photonic crystal lattice. A first resist (9) is coated on a substrate (10) and exposed to an e-beam (11), to produce an imaged area (12). Another resist coating is applied to thicken the resist (13) and an interference exposure (15) is used to image the result. This is developed to form periodic voids (16), which may be filled with a materials having a high refractive index to form a pattern (18 and 12) when the resist (13) is removed.

**INTERNATIONAL SEARCH REPORT**

International application No.

PCT/US03/26499

**A. CLASSIFICATION OF SUBJECT MATTER**

IPC(7) : G03H 1/02  
 US CL : 430/1, 2, 321, 394; 359/3

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. : 430/1, 2, 321, 394; 359/3

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)  
 West, Search attached.

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	CAMPBELL, M., et al., "Fabrication of photonic crystals for the visible spectrum by holographic lithography", Nature, Vol. 404, March 2000, pages 53-56, particularly page 54.	1-14
Y	TURBERFIELD, A.J., "Photonic crystals made by holographic lithography, MRS Bulletin, August 2001, pages 632-636, particularly 633 (right column) and 635 (left column).	1-14
Y	LIN, B.J., "Combined optical and electron-beam means to produce 50- nanometer integrated circuit patterns", IBM Tech. Discl., Vol. 19(7), December 1976, pages 2779-2782. particularly pages 2780-2782.	1-14
Y	EP 0964305 A (CORNING INCORPORATED) 15 December 1999 (15.12.1999), figures 4A-5H and corresponding text	1-14
Y	JP 03-040481 A (HIKARI KEISOKU GIUTSU KAIHATSU KK) 21 February 1991 (21.02.1991), see abstract and text relating to figure 2a-c.	1-14
Y	JP 06-283813 A (OKI ELECTRIC IND. CO. LTD.) 07 October 1994 (07.10.1994), see abstract and [0008-0011] (machine translation attached)	1-14
Y	US RE35930 E (BRUECK et al.) 20 October 1998 (20.10.2998), description of exposure with respect to tables 1 and 2.	1-14

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	"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
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"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	

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## INTERNATIONAL SEARCH REPORT

## C. (Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 4,403,151 A (MOCHII et al.) 06 September 1983 (06.09.1983), column 2, line 66 to column 3, line 55.	1-14
Y	US 4,517,280 A (OKAMOTO et al.) 14 May 1985 (14.05.1985) column 3, lines 9-64.	1-14
Y	JP 59-009920 A (MATSUSHITA ELECTRIC IND. CO. LTD.) 19 January 1984 (19.01.1984) abstract, figure 1 and 2 and corresponding text.	1-14
Y	EP 0997994 A (NEC CORPORATION) 03 May 2000 (03.05.2000) figures 5a-e and corresponding text.	1-14