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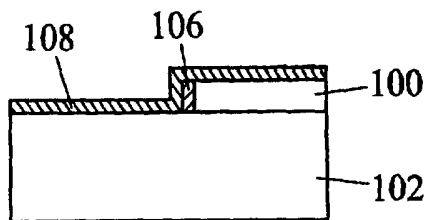
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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: METHOD AND SYSTEMS FOR SINGLE- OR MULTI-PERIOD EDGE DEFINITION LITHOGRAPHY



(57) Abstract: Methods and systems for multiperiod, edge definition lithography are disclosed. According to one method, a first material (104) is isotropically deposited on a substrate (102) and on a field mesa (100) also located on the substrate (102). The first masking material (104) is then anisotropically removed from the substrate (100) to leave a nanometer-pitched sidewall (106) adjacent to the field mesa. A second masking material (108) is then isotropically deposited on the substrate (102), the sidewall (106), and the field mesa (100). The second masking material (108) is then anisotropically removed from the substrate (102) to leave a second nanometer-pitched sidewall (110) adjacent to the first sidewall (106). The process may be repeated to create alternating nanometer-pitched

sidewalls of the first (104) and second (108) masking materials. One of the first (104) and second (108) masking materials may then be etched from the substrate (102) to leave nanometer-pitched channels (114) in one of the masking materials. The channels (114) may be used to etch nanometer-pitched features in the substrate (102).

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**INTERNATIONAL SEARCH REPORT**

International application No.

PCT/US04/08724

**A. CLASSIFICATION OF SUBJECT MATTER**

IPC(7) : H01L 21/338, 21/336

US CL : 438/173, 268, 274

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. : 438/173, 268, 274, 142, 175, 197, 212,

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.
Y	US 6,214,246 B1 (CRAIGHEAD) 10 April 10 2001 (04.10.2001), Figs. 8-9; Col. 9, lines 12-35.	1-24
Y	JP 2003-045325 A (HATAI et al.) 14 February 14 2003 (14.02.2003), Abstract; Figs. 1(a) - 1(f).	1-24
Y,P	EP 1319948 A2 (DONG) 18 June 2003 (18.06.2003), Abstract; Col. 7, line 34 - Col. 8, line 34); Figs. 2-8.	1-24
Y,P	US 6,593,065 B2 (SCHERER) 15 July 2003 (15.07.2003), Figs. 1(a) - 1(d) and 4 - 5(f); Col. 3, line 21 - Col. 5, line 5.	1-24
A	JP 2003-073859 A (WADA et al.) 12 March 2003 (12.03.2003)	1-24
Y,T	US 6,709,929 B2 (ZHANG et al.) 23 March 2004 (23.03.2004), Figs. 2A - 5F, Col. 6, line 36 - Col. 11, line 24.	1-24
Y,P	JP 2004-034270 A (II et al.) 05 February 2004 (05.02.2004), Abstract, Fig. 4.	1-24

Further documents are listed in the continuation of Box C.

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Date of the actual completion of the international search

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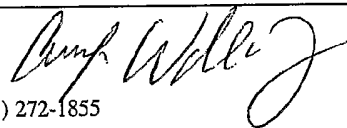
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International application No.

PCT/US04/08724

Continuation of B. FIELDS SEARCHED Item 3:  
EAST (USPAT, USPGPUB, EPO, JPO, DEWENT, IBMTDB)  
(nanometer or nonoscale) same (groove or mesa or trench or hole); etch\$3 or pattern\$4; channel with substrate