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13/105,674 11 May 2011 (11.05.2011) US(71) Applicant (for all designated States except US): **LAM RESEARCH CORPORATION** [US/US]; 4650 Cushing Parkway, Fremont, CA 94538 (US).

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[Continued on next page]

(54) Title: HIGH PRESSURE BEVEL ETCH PROCESS

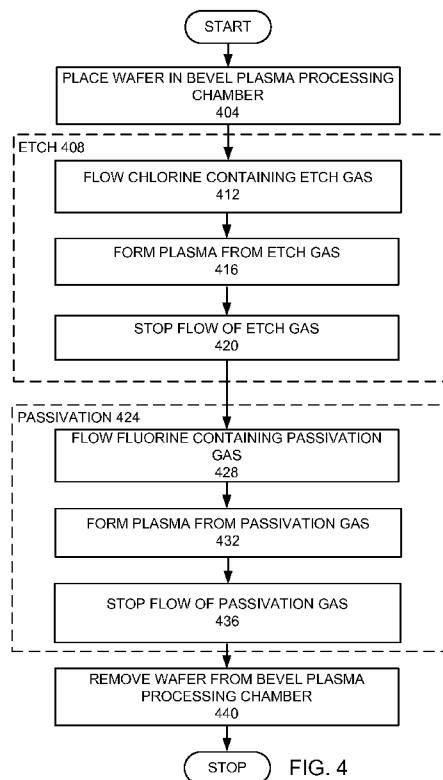


FIG. 4

(57) Abstract: A method of bevel edge processing a semiconductor in a bevel plasma processing chamber in which the semiconductor substrate is supported on a semiconductor substrate support is provided. The method comprises evacuating the bevel etcher to a pressure of 3 to 100 Torr and maintaining RF voltage under a threshold value; flowing a process gas into the bevel plasma processing chamber; energizing the process gas into a plasma at a periphery of the semiconductor substrate; and bevel processing the semiconductor substrate with the plasma.



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, ML, MR, NE, SN, TD, TG).

— *before the expiration of the time limit for amending the  
claims and to be republished in the event of receipt of  
amendments (Rule 48.2(h))*

**Declarations under Rule 4.17:**

— *as to the applicant's entitlement to claim the priority of  
the earlier application (Rule 4.17(iii))*

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**A. CLASSIFICATION OF SUBJECT MATTER*****H01L 21/3065(2006.01)i***

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)

H01L 21/3065; H01L 21/302; C03C 25/68; B05D 3/04; B05D 3/06; H01L 21/461

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

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

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

eKOMPASS(KIPO internal) &amp; Keywords: bevel edge, etching gas, passivation gas, chlorine, fluorine

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2010-0151686 A1 (FANG; TONG et al.) 17 June 2010	1,2
Y	See abstract; paragraphs [0011], [0018]; claim 1; and figure 1.	3-25
Y	US 2004-0074869 A1 (WANG; XIKUN et al.) 22 April 2004 See abstract; paragraphs [0034], [0043].	3-12, 14-25
Y	US 4325984 A (GALFO; CHRISTOPHER H. et al.) 20 April 1982 See claims 1-3.	4-9, 13, 14-25
Y	US 6391785 B1 (SATTA; ALESSANDRA et al.) 21 May 2002 See column 7 lines 43-60.	9, 25



Further documents are listed in the continuation of Box C.



See patent family annex.

\* Special categories of cited documents:

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"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

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"&amp;" document member of the same patent family

Date of the actual completion of the international search

27 NOVEMBER 2012 (27.11.2012)

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**INTERNATIONAL SEARCH REPORT**

Information on patent family members

International application No.

**PCT/US2012/036954**

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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