

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
15 May 2008 (15.05.2008)

PCT

(10) International Publication Number  
**WO 2008/057351 A3**

- (51) **International Patent Classification:**  
*B08B 9/00 (2006.01)*      *B08B 5/04 (2006.01)*
- (21) **International Application Number:**  
PCT/US2007/022978
- (22) **International Filing Date:** 31 October 2007 (31.10.2007)
- (25) **Filing Language:** English
- (26) **Publication Language:** English
- (30) **Priority Data:**  
60/863,906      1 November 2006 (01.11.2006)      US
- (71) **Applicant (for all designated States except US):** APPLIED MATERIALS, INC. [US/US]; 3050 Bowers Avenue, Santa Clara, CA 95054 (US).
- (72) **Inventors; and**
- (75) **Inventors/Applicants (for US only):** RABINOVICH, Felix [US/US]; 19920 Baywood Drive, Cupertino, CA 95014 (US). ECHOLS, Thomas [US/US]; 836 Lyon Street, San Francisco, CA 94115 (US). MALESKI, Janet [US/US]; 15139 Old Ranch Road, Los Gatos, CA 95033

(US). **CHEN, Ning** [CA/US]; 38832 Argonaut Way, Fremont, CA 94536 (US). **TAN, Samantha, S., H.** [CA/US]; 4715 Finn Cove Court, Union City, CA 94587 (US).

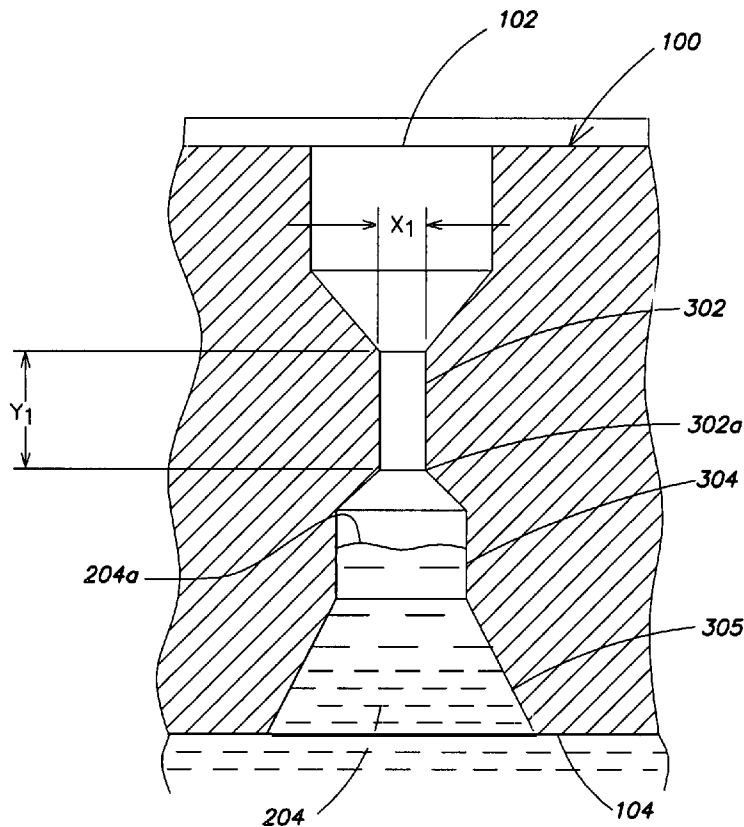
(74) **Agent:** DUGAN, Brian, M.; Dugan & Dugan, Pc, 55 South Broadway, Tarrytown, NY 10591 (US).

(81) **Designated States (unless otherwise indicated, for every kind of national protection available):** AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FT, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW

(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),

[Continued on next page]

(54) **Title:** METHODS AND APPARATUS FOR CLEANING CHAMBER COMPONENTS



(57) **Abstract:** In a first aspect, a method for cleaning a semiconductor fabrication chamber component having an orifice is provided. The method includes (A) placing the component into a bath having a cleaning solution; (B) flowing a fluid into the orifice thereby maintaining at least a first portion of the orifice free from cleaning solution while the cleaning solution cleans the component; and (C) withdrawing the fluid from the orifice such that cleaning solution enters into the first portion of the orifice and cleans the first portion of the orifice. Numerous other aspects are also provided.

WO 2008/057351 A3



European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, PL, PT, RO, SE, SI, SK, 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*

**Published:**

— *with international search report*

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

16 October 2008

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US07/22978

**A. CLASSIFICATION OF SUBJECT MATTER**  
 IPC: B08B 5/04( 2006.01);B08B 9/00( 2006.01)  
  
 USPC: 134/21,22. 1,22.12  
 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. : 134/21,22. 1,22.12

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

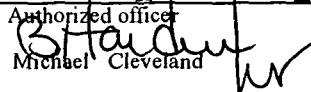
**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2003/0183244 (ROSSMAN) 2 October 2003 (02 10 2003), paragraphs 1-2 and 5.	1-19
Y	US 6,475,444 (ZMMERMANN et al) 5 November 2002 (05.11.2002), column 2, lines 14-34.	1-19
Y	US 2005/0050708 (HUANG et al) 10 March 2005 (10.03.2005), page 2, paragraph 10.	1-22

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

Special categories of cited documents		
"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 <i>one or more</i> 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		
"T" 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 31 July 2008 (31.07.2008)	Date of mailing of the international search report <b>18 AUG 2008</b>
--	--

Name and mailing address of the ISA/US (Mail) Stop PCT, ABn: ISA/US Commissioner for Patents PO. Box 1450 Alexandria, Virginia 223 13-1450 Facsimile No. (571) 273-3201	Authorized officer  Michael Cleveland Telephone No. 571-272-1700
--	---

**INTERNATIONAL SEARCH REPORT**

International application No.  
PCT/US07/22978

Continuation of B. FIELDS SEARCHED Item 3:

EAST keywords: (face\$plate or shower\$head or (shower adj (head or plate)) or manifold or sprayer or ((distribution or diffiiser) adj plate) or (gas adj injection adj orifices) or component); (educt\$4 or suck\$4 or suction\$4 or vacuum\$4 or depressuriz\$4)