

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
9 July 2009 (09.07.2009)

PCT

(10) International Publication Number  
**WO 2009/086023 A3**

(51) International Patent Classification:  
C23C 14/24 (2006.01) C23C 14/04 (2006.01)

(74) Agents: DUGAN, Brian, M. et al.; Dugan & Dugan, PC,  
245 Saw Mill River Road, Suite 309, Hawthorne, NY  
10532 (US).

(21) International Application Number:  
PCT/US2008/087551

(81) Designated States (unless otherwise indicated, for every  
kind of national protection available): AE, AG, AL, AM,  
AO, 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, FI, 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, ST, SV, SY, TJ, TM, TN, TR, TT, TZ, UA,  
UG, US, UZ, VC, VN, ZA, ZM, ZW.

(22) International Filing Date:  
18 December 2008 (18.12.2008)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
61/015,068 19 December 2007 (19.12.2007) US

(71) Applicant (for all designated States except US): AP-  
PLIED MATERIALS, INC. [US/US]; 3050 Bowers Av-  
enue, Santa Clara, CA 95054 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): TAN, Samantha,  
S., H. [CA/US]; 4715 Finn Cove Court, Union City, CA  
94587 (US). WANG, Jianqi [CA/US]; 41031 Ramon  
Terrace, Fremont, CA 94539 (US).

(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), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE,  
ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV,  
MC, MT, NL, NO, PL, PT, RO, SE, SI, SK, TR), OAPI

[Continued on next page]

(54) Title: METHODS FOR CLEANING PROCESS KITS AND CHAMBERS, AND FOR RUTHENIUM RECOVERY

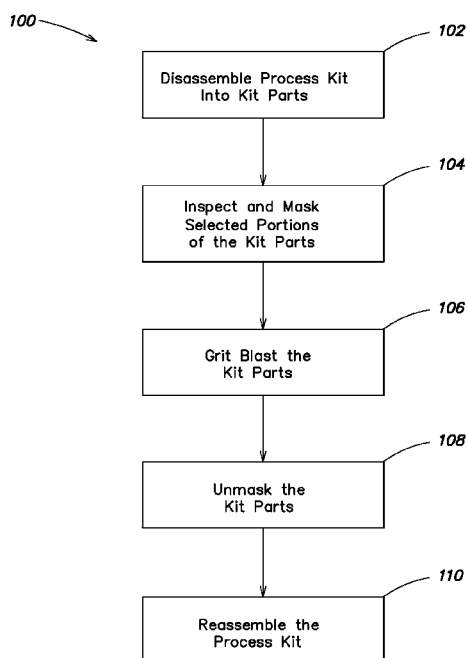


FIG. 1

(57) Abstract: A method is provided for recovering a metal from elec-  
tronic device deposition equipment including: providing deposition  
equipment wherein the deposition equipment is at least partially coated  
with a deposited metal; blasting the deposition equipment with a grit to  
remove at least some of the deposited metal to form a blasted grit and a  
removed metal; and separating at least some of the removed metal from  
the blasted grit to form a recovered metal. Numerous other aspects are  
provided.



WO 2009/086023 A3



(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))

**Published:**

— with international search report (Art. 21(3))

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

1 October 2009

**A. CLASSIFICATION OF SUBJECT MATTER***C23C 14/24(2006.01)i, C23C 14/04(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)

IPC: C23C 14/24, C23C 14/04

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 since 1975

Japanese Utility models and applications for Utility models since 1975

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

eKOMPASS(KIPO internal) &amp; keywords: cleaning, deposition, blasting, grit

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2005-0089699 A1 (LIN YIXING et al.) 28 April 2005 See the abstract; figures 1A-3; and claims 1-19	1-15
A	US 7264679 B2 (SCHWEITZER MARC O'DONNELL et al.) 04 September 2007 See the abstract; figures 1-3; and claims 1-24	1-15
A	US 6902628 B2 (WANG HONG et al.) 07 June 2005 See the abstract; figures 1-9; and claims 1-11	1-15
A	US 5651723 A (BJORNARD ERIK J. et al.) 29 July 1997 See the abstract; figures 1-4; and claims 1-22	1-15
A	US 2004-0011385 A1 (HENDERSON PHILIP BRUCE et al.) 22 January 2004 See the abstract; and claims 1-26	1-15
A	US 5265304 A (HUGHES JOEL) 30 November 1993 See the abstract; figures 1-6; and claims 1-17	1-15

 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

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of citation or other special reason (as specified)

"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

"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

"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

"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

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

Date of the actual completion of the international search

31 JULY 2009 (31.07.2009)

Date of mailing of the international search report

**31 JULY 2009 (31.07.2009)**

Name and mailing address of the ISA/KR

Korean Intellectual Property Office  
Government Complex-Daejeon, 139 Seonsa-ro, Seo-gu, Daejeon 302-701, Republic of Korea

Facsimile No. 82-42-472-7140

Authorized officer

JUNG Sug Woo

Telephone No. 82-42-481-8443



**INTERNATIONAL SEARCH REPORT**

Information on patent family members

International application No.

**PCT/US2008/087551**

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2005-0089699 A1	28.04.2005	KR 10-2005-0039605 A	29.04.2005
US 7264679 B2	04.09.2007	KR 10-2007-0003892 A US 2005-0172984 A1 WO 2005-083154 A3	05.01.2007 11.08.2005 09.09.2005
US 6902628 B2	07.06.2005	JP 2007-528938 A KR 10-2005-0086825 A KR 10-2007-0026369 A TW 304612 A US 2004-0099285 A1 US 06902627 B2 US 2004-0163669 A1 US 2005-0028838 A1 WO 2005-068681 A3 WO 2004-048636 A3	18.10.2007 30.08.2005 08.03.2007 21.12.2008 27.05.2004 07.06.2005 26.08.2004 10.02.2005 28.07.2005 10.06.2004
US 5651723 A	29.07.1997	WO 1995-028256 A1	26.10.1995
US 2004-0011385 A1	22.01.2004	EP 1394287 A2 EP 1394287 A3 JP 2004-060054 A US 06857433 B2	03.03.2004 07.04.2004 26.02.2004 22.02.2005
US 5265304 A	30.11.1993	CA 2148947 C EP 0660684 A4 EP 0660684 A1 EP 0660684 B1 US 05365634 A US 05287589 A WO 1994-005195 A1	25.06.2002 02.11.1995 05.07.1995 08.07.1998 22.11.1994 22.02.1994 17.03.1994