



- (51) **International Patent Classification:**
G06F 12/00 (2006.01) *G11C 16/02* (2006.01)
- (21) **International Application Number:**
PCT/US2012/049492
- (22) **International Filing Date:**
3 August 2012 (03.08.2012)
- (25) **Filing Language:** English
- (26) **Publication Language:** English
- (30) **Priority Data:**
13/197,460 3 August 2011 (03.08.2011) US
- (71) **Applicant (for all designated States except US):** **Micron Technology, Inc.** [US/US]; 8000 So. Federal Way, MS 525, Boise, Idaho 83716 (US).
- (72) **Inventor; and**
- (75) **Inventor/Applicant (for US only):** **BALTAR, Robert** [US/US]; 106 Lakeside Way, Folsom, California 95630 (US).
- (74) **Agent:** **POLGLAZE, Daniel J.**; Leffert Jay & Polglaze, P. A., P. O. Box 2230, Minneapolis, Minnesota 55402-0230 (US).
- (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, BN, BR, BW, BY,

BZ, CA, CH, CL, 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, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

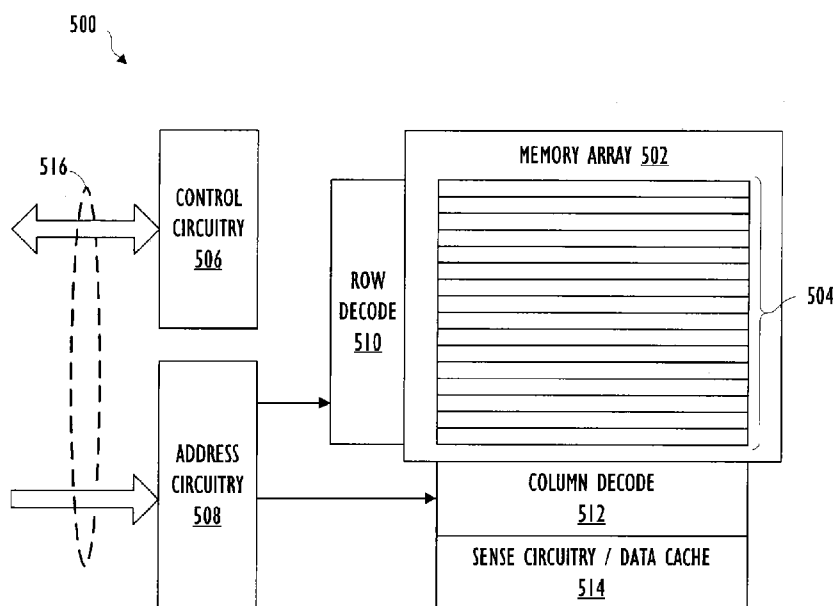
- (84) **Designated States (unless otherwise indicated, for every kind of regional protection available):** ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, 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).

Published:

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

- (88) **Date of publication of the international search report:**
25 April 2013

(54) **Title:** WEAR LEVELING FOR A MEMORY DEVICE



(57) **Abstract:** Memory devices and methods to facilitate wear leveling operations in a memory device. In one such method, particular blocks of memory cells are excluded from experiencing wear leveling operations performed on the memory device. In at least one method, a user selects blocks of memory to be excluded from wear leveling operations performed on the remainder of blocks of the memory device. Selected blocks of memory are excluded from wear leveling operations responsive to a command initiated by a user identifying, either directly or indirectly, the selected blocks to be excluded.



INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2012/049492**A. CLASSIFICATION OF SUBJECT MATTER****G06F 12/00(2006.01)i, G11C 16/02(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)

G06F 12/00; G06F 12/02; G11C 11/34; G11C 16/04; G11C 16/14; G11C 8/12

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) & Keywords: memory, cell, array, wear leveling, group of blocks, and similar terms.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y A	US 2006-0256623 A1 (ROOHPARVAR, FRANKIE F.) 16 November 2006 See paragraphs [0021]-[0041]; claims 9 and 17-20; and figures 2-5.	1,3-10,12-15 2,11
Y	US 2010-0318719 A1 (KEAYS, BRADY L. et al.) 16 December 2010 See paragraphs [0022]-[0027], [0042]-[0044], [0049]-[0065], [0074]-[0084]; claims 1, 22, and 43; and figures 1, 4A-4C, and 6.	1,3-10,12-15
A	US 2006-0106972 A1 (GOROBETS, SERGEY et al.) 18 May 2006 See paragraphs [0037]-[0041] and [0077]-[0114]; claims 1 and 13; and figures 1A-2 and 14.	1-15
A	US 2008-0219053 A1 (KIM, JIN-KI) 11 September 2008 See paragraphs [0036]-[0038], [0056]-[0062], and [0073]-[0077]; claims 1, 7, and 18; and figures 3, 7a-8, and 11.	1-15
A	US 2009-0091978 A1 (YEH, CHIH-KANG) 09 April 2009 See paragraphs [0070]-[0092]; claims 1 and 11; and figures 2A-3.	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

"&" document member of the same patent family

Date of the actual completion of the international search

22 FEBRUARY 2013 (22.02.2013)

Date of mailing of the international search report

25 FEBRUARY 2013 (25.02.2013)

Name and mailing address of the ISA/KR

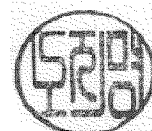
Korean Intellectual Property Office
189 Cheongsu-ro, Seo-gu, Daejeon Metropolitan
City, 302-701, Republic of Korea

Facsimile No. 82-42-472-7140

Authorized officer

NHO, Ji Myong

Telephone No. 82-42-481-8528



INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2012/049492

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2006-0256623 A1	16.11.2006	None	
US 2010-0318719 A1	16.12.2010	TW 201109920 A WO 2010-144139 A2 WO 2010-144139 A3	16.03.2011 16.12.2010 31.03.2011
US 2006-0106972 A1	18.05.2006	US 7441067 B2	21.10.2008
US 2008-0219053 A1	11.09.2008	CA 2678886 A1 CN 101681677 A EP 2135253 A1 EP 2135253 A4 JP 2010-520571 A KR 10-2010-0015423 A TW 200849261 A US 2010-0226183 A1 US 7804718 B2 WO 2008-106778 A1 WO 2008-106778 B1	12.09.2008 24.03.2010 23.12.2009 14.04.2010 10.06.2010 12.02.2010 16.12.2008 09.09.2010 28.09.2010 12.09.2008 06.11.2008
US 2009-0091978 A1	09.04.2009	TW 200917261 A US 7649794 B2	16.04.2009 19.01.2010