(54) Title: SYSTEMS AND METHODS FOR HANDLING IMMEDIATE DATA ERRORS IN FLASH MEMORY
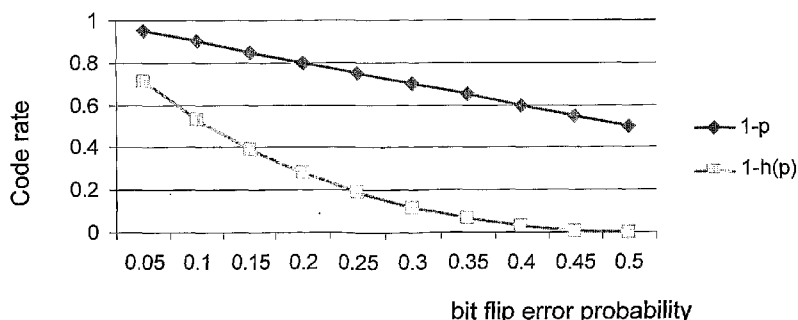

Figure 2

(57) Abstract: A flash memory system comprising temporary memory, writing apparatus for writing first logical data from the temporary memory into flash memory cells having at least two levels, thereby to generate a physical representation of the first logical data including known errors, reading apparatus for reading the physical representation from the cells, thereby to generate, and store in the temporary memory, second logical data which if read immediately is identical to the first logical data other than the known errors; and controlling apparatus controlling the writing apparatus and the reading apparatus and including known error ID apparatus operative to identify the known errors by comparing the first logical data to second logical data read immediately after the physical representation is generated, to store information characterizing the known errors and to use the information, when the second logical data is next read, to correct the known errors.
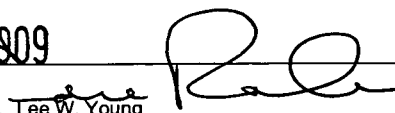
A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - G11C 7/10 (2009.01)
USPC - 365/189.05

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)
USPC - 365/189.05

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
USPC - 365/51, 63, 185.17, 230.08, 238.5, 244 (view search terms below)

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
Electronic Databases Searched: PubWEST (PGPB, USPT, EPAB, JPAB), Google
Search Terms Used: temporary, volatile, memory cell, RAM, cache, SRAM, flash, EEPROM, multilevel, MLC, write, encode, save, store, input, program, error, mistake, overprogram, compare, examine, analyze, check, verify, second, 2nd, duplicate, redundant

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2004/0153817 A1 (NORMAN et al.) 05 August 2004 (05.08.2004) entire document, especially Abstract, para [0006], [0008], [0014]-[0016], [0022]-[0026], [0029] and [0049]-[0055]; Figs.2, 5A and 5B	1-6, 8, 11-19
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Y		7, 9-10
Y	US 2007/0223277 A1 (TANAKA et al.) 27 September 2007 (27.09.2007) entire document, especially, para [0006]-[0008], [0016] and [0048]-[0050]	7, 9-10
A	US 2007/0109858 A1 (CONLEY et al.) 17 May 2007 (17.05.2007) entire document	1-19

☐ Further documents are listed in the continuation of Box C. ☐

* Special categories of cited documents:	"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
"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	"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 one or more 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	
"P" 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	Date of mailing of the international search report
15 January 2009 (15.01.2009)	2 8 JAN 2009

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