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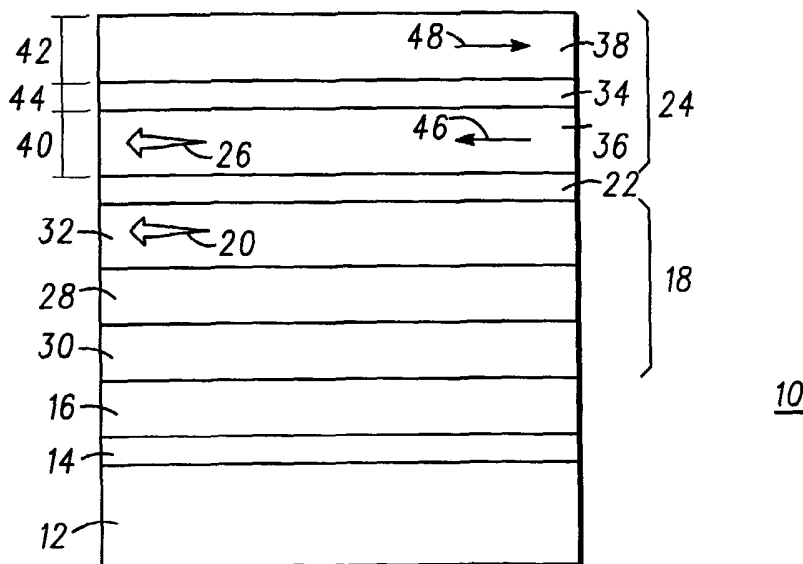
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[Continued on next page]

(54) Title: MAGNETORESISTIVE RANDOM ACCESS MEMORY WITH REDUCED SWITCHING FIELD VARIATION



(57) Abstract: An array of multi-state, multi-layer magnetic memory devices (10) wherein each memory device comprises a nonmagnetic spacer region (22) and a free magnetic region (24) positioned adjacent to a surface of the nonmagnetic spacer region, the free magnetic region including a plurality of magnetic layers (36, 34, 38), wherein the magnetic layer (36) in the plurality of magnetic layers positioned adjacent to the surface of the nonmagnetic spacer region has a thickness substantially greater than a thickness of each of the magnetic layers (34, 38) subsequently grown thereon wherein the thickness is chosen to improve the magnetic switching variation so that the magnetic switching field for each memory device in the array of memory devices is more uniform.

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International application No.

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A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : H01L 31/119; G11C 11/15
 US CL : 257/295,30,421,425,427 ; 438/3,48 ; 365/171,173

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. : 257/295,30,421,425,427 ; 438/3,48 ; 365/171,173

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
 NONE

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
 NONE

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6,166,948 A (Parkin et al.) 26 December 2000 (26.12.2000), abstract, fig 3A, column 2	1,5-11,12,14
---	lines 31-33, lines 58-61, column 7 line 49	-----
Y		2-4,13,15-32
X	US 6,545,906 B1 (Savtchenko et al) 08 April 2003 (08.04.2003), the abstract, fig 1, column 2 lines 30-40 column 5 lines 47-57	1,6-11
X	US 6,567,246 B1 (Sakakima et al) 20 May 2003 (20.05.2003) , fig 6,7,8, fig 12, fig 13, column 3 line 45-50	1,5-14
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Y		2-4,15-32
Y	US 6,205,052 B1 (Slaughter et al.) 20 March 2001(20.03.2001), abstract, Column 7 line 7-8	3,4

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

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"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
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