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- (81) **Designated States** (*unless otherwise indicated, for every  
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(54) **Title:** APPARATUSES AND METHODS FOR PERFORMING AN EXCLUSIVE OR OPERATION USING SENSING CIRCUITRY

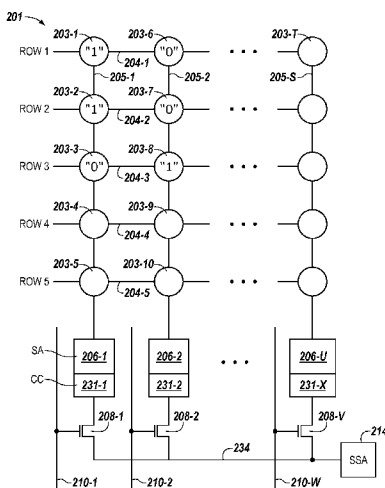
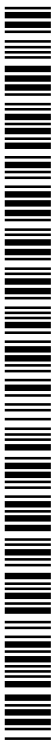


Fig. 2

(57) **Abstract:** The present disclosure includes apparatuses and methods related to determining an XOR value in memory. An example method can include performing a NAND operation on a data value stored in a first memory cell and a data value stored in a second memory cell. The method can include performing an OR operation on the data values stored in the first and second memory cells. The method can include performing an AND operation on the result of the NAND operation and a result of the OR operation without transferring data from the memory array via an input/output (I/O) line.



## INTERNATIONAL SEARCH REPORT

International application No.  
**PCT/US2015/033889****A. CLASSIFICATION OF SUBJECT MATTER****G11C 7/06(2006.01)i, G11C 7/10(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)  
G11C 7/06; G06F 12/02; G11C 7/10; G11C 5/06; G11C 8/00; G11C 7/00; G11C 11/24; G11C 5/02Documentation 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 modelsElectronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
eKOMPASS(KIPO internal) & Keywords: memory, cell, array, line, sensing, circuit, logic, operation, XOR, NAND, AND, OR**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

| Category* | Citation of document, with indication, where appropriate, of the relevant passages                         | Relevant to claim No. |
|-----------|--|-----------------------|
| Y         | US 05638317 A (HIEP V. TRAN) 10 June 1997<br>See column 5, lines 30-35, 38-40; claim 9; and figures 3b-3c. | 1,9,19-20             |
| A         |  | 2-8,10-18,21-32       |
| Y         | US 2013-0124783 A1 (SANG-YONG YOON et al.) 16 May 2013<br>See paragraph [0035]; and figure 1.              | 1,9,19-20             |
| A         | US 2012-0134216 A1 (ANANT PRATAP SINGH) 31 May 2012<br>See paragraphs [0055]-[0058]; and figure 4A.        | 1-32                  |
| A         | US 05654936 A (HO-YEOL CHO) 05 August 1997<br>See column 4, lines 32-67; and figure 3.                     | 1-32                  |
| A         | US 2009-0067218 A1 (PHILIPPE GRABER) 12 March 2009<br>See paragraphs [0102]-[0105]; and figures 15A-15C.   | 1-32                  |

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

\* Special categories of cited documents:

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"P" document published prior to the international filing date but later than the priority date claimed

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"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

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


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**INTERNATIONAL SEARCH REPORT**

Information on patent family members

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| Patent document cited in search report | Publication date | Patent family member(s)   | Publication date   |
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