(19) **United States**

(12) **Patent Application Publication** (10) Pub. No.: **US 2011/0099460 A1**

Dusija et al. (43) **Pub. Date:** **Apr. 28, 2011**

(54) **NON-VOLATILE MEMORY AND METHOD WITH POST-WRITE READ AND ADAPTIVE RE-WRITE TO MANAGE ERRORS**

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(21) Appl. No.: **12/642,728**

(22) Filed: **Dec. 18, 2009**

**Related U.S. Application Data**

(63) Continuation-in-part of application No. 12/607,522, filed on Oct. 28, 2009.

**Publication Classification**

(51) **Int. Cl.**
| | |
|---|---|
| *G11C 29/52* | (2006.01) |
| *G06F 11/10* | (2006.01) |
| *G06F 12/16* | (2006.01) |
| *G06F 12/00* | (2006.01) |

(52) **U.S. Cl.** .. **714/773**; 711/103; 711/173; 711/E12.103; 711/E12.001; 714/E11.04
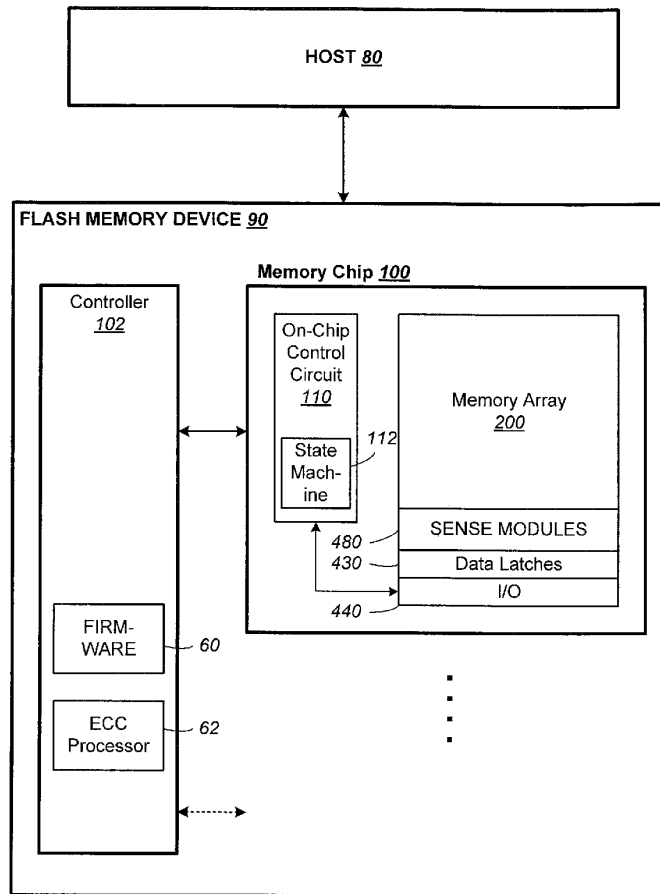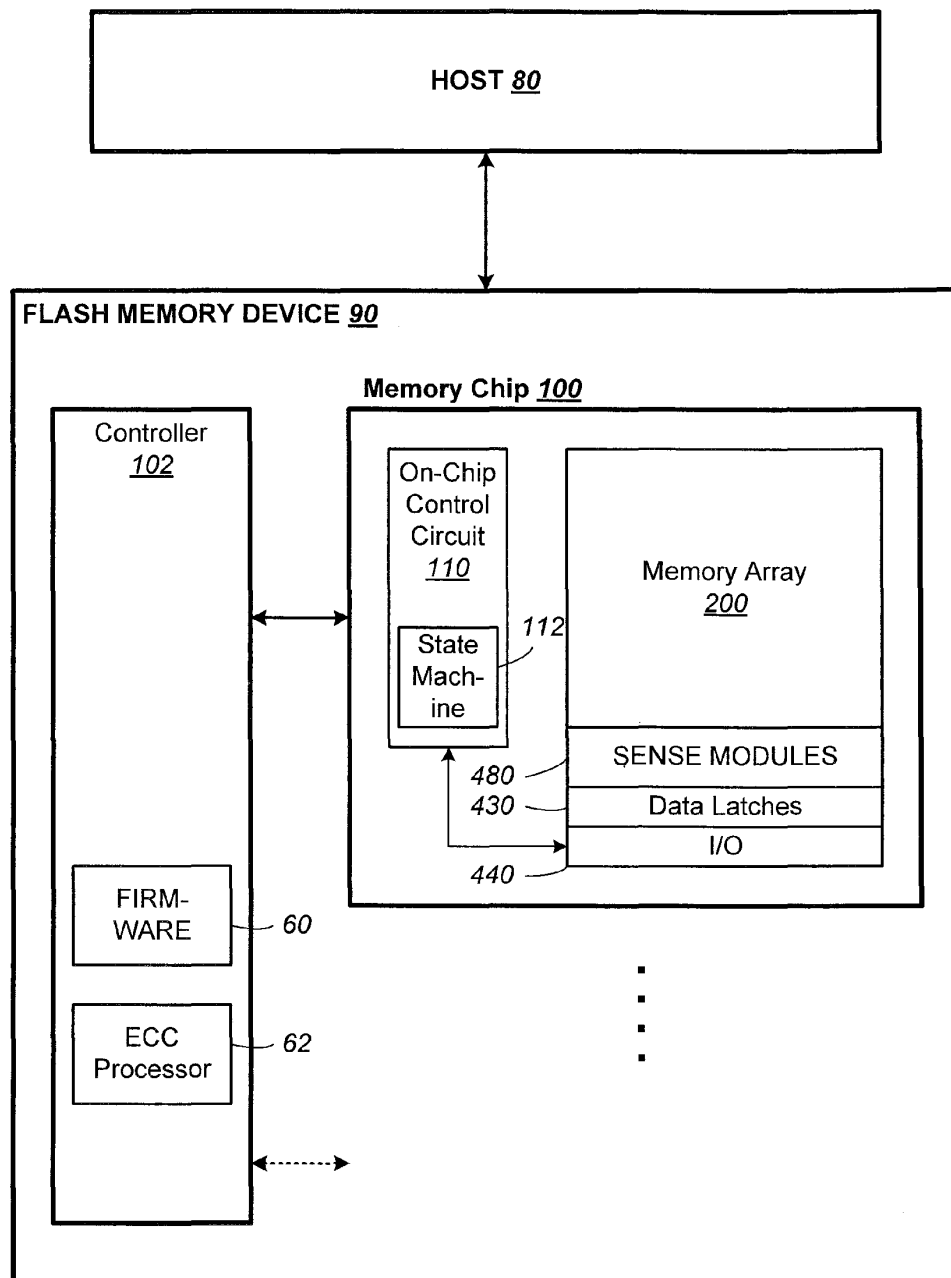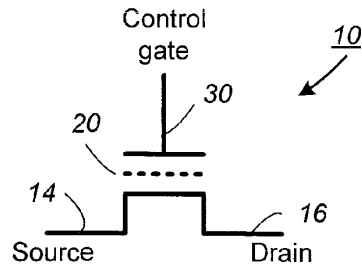
(57) **ABSTRACT**

Data errors in non-volatile memory inevitably increase with usage and with higher density of bits stored per cell. The memory is configured to have a first portion operating with less error but of lower density storage, and a second portion operating with a higher density but less robust storage. Input data is written and staged in the first portion before being copied to the second portion. An error management provides checking the quality of the copied data for excessive error bits. The copying and checking are repeated on a different location in the second portion until either a predetermined quality is satisfied or the number or repeats exceeds a prede-termined limit. The error management is not started when a memory is new with little or no errors, but started after the memory has aged to a predetermined amount as determined by the number of erase/program cycling its has experienced.

**FIG. 1**

*FIG. 2*



Word lines

Bit lines

*FIG. 3*

*FIG. 4*

READ/WRITE CIRCUITS _270A, 270B_

480

| Sense Module 1 | Sense Module 2 | ----------- | Sense Module p |

36

Bit line

drain

10

| Cell 1 | Cell 2 | ----------- | Cell p |

source    $i_1$          $i_2$          $i_p$

CLSRC                                    Source Line    34

$i_{TOT}$

GND

**FIG. 5A**

Sense Module _480_

| Sense Amp |    490

**FIG. 5B**

# DOCKET ALARM
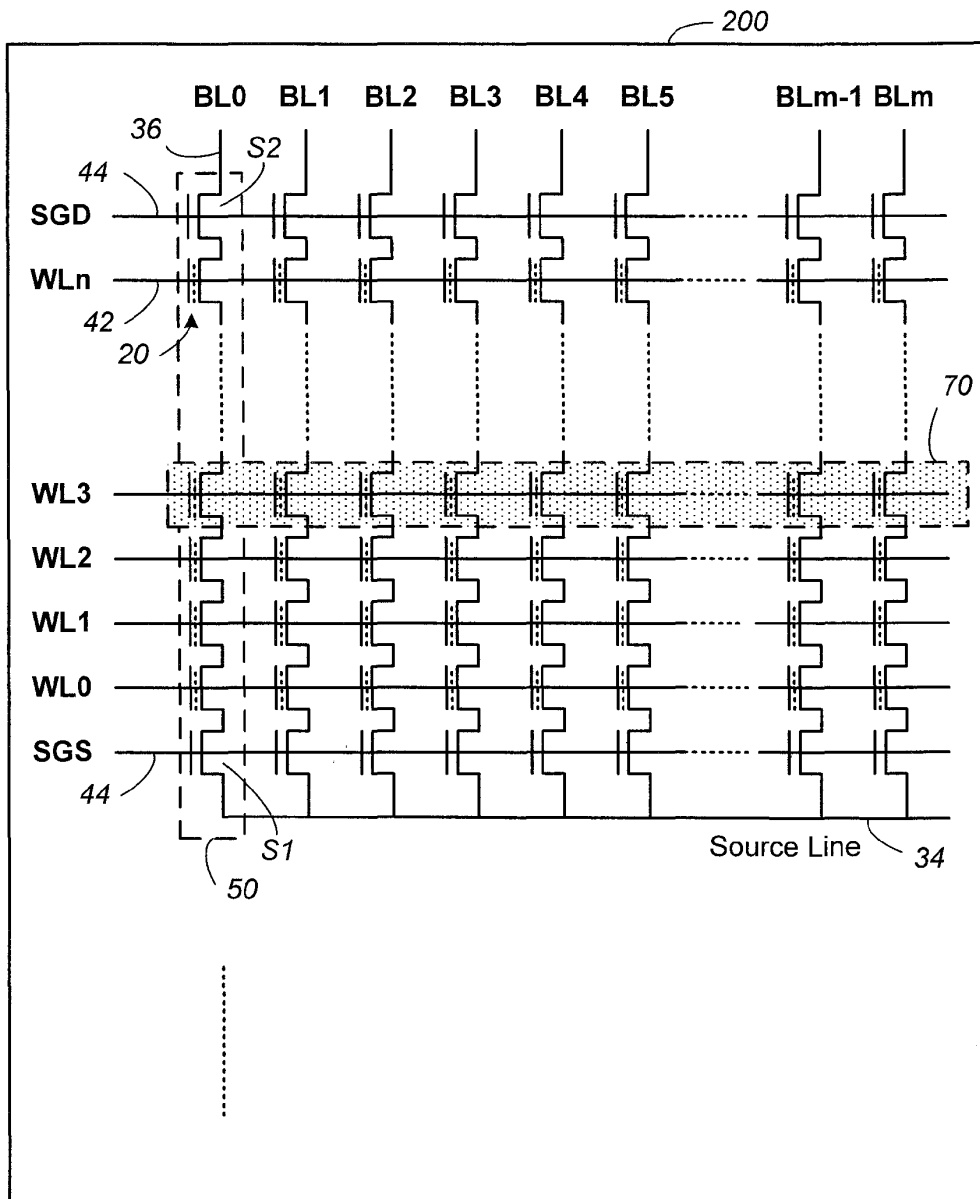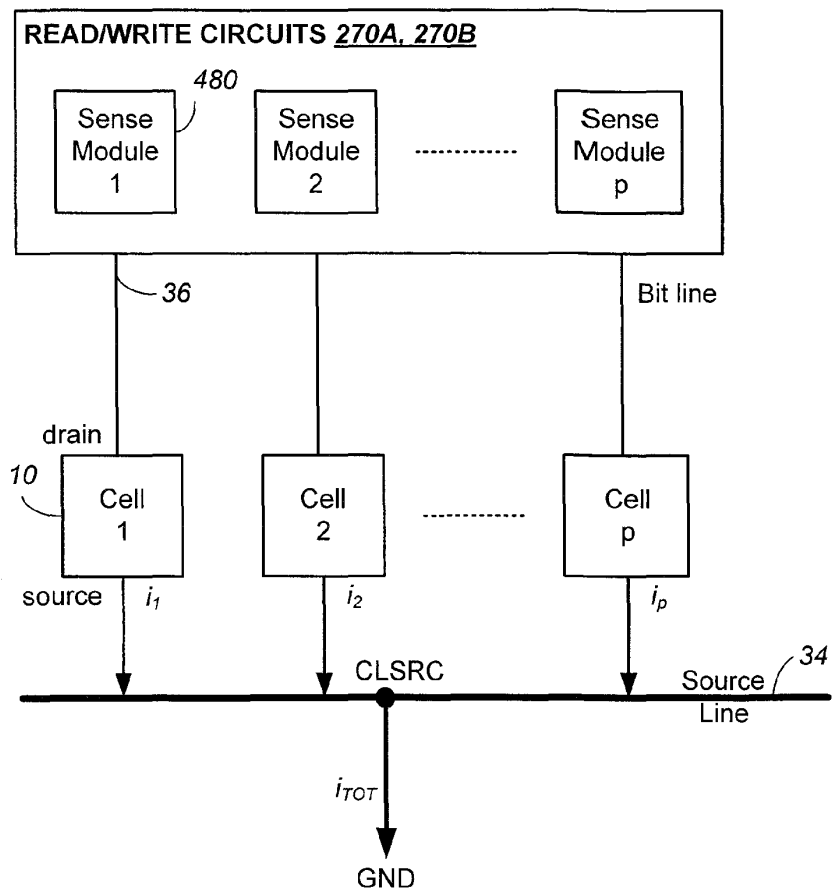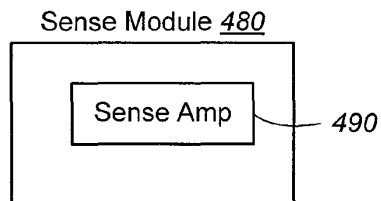
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