

US008130554B1

## (12) United States Patent Linnell

### (54) SECURELY ERASING FLASH-BASED MEMORY

- (75) Inventor: **Thomas E. Linnell**, Northborough, MA (US)
- (73) Assignee: **EMC Corporation**, Hopkinton, MA (US)
- (\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 828 days.
- (21) Appl. No.: 12/240,100

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- (22) Filed: Sep. 29, 2008
- (51) Int. Cl. *G11C 16/04* (2006.01)
- (58) Field of Classification Search ...... 365/185.28,

# (10) Patent No.: US 8,130,554 B1 (45) Date of Patent: Mar. 6, 2012

### Date of Patent: Mar. 0, 2012

### (56) **References Cited**

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* cited by examiner		

Primary Examiner — Hoai V Ho

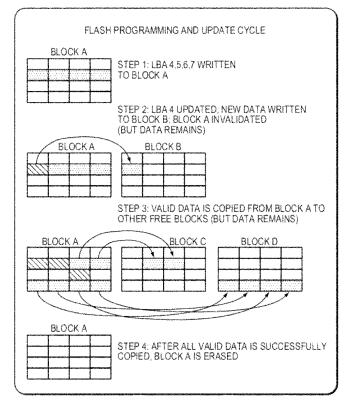
(74) Attorney, Agent, or Firm — Krishnendu Gupta; Jason A. Reyes

### (57) ABSTRACT

A method is used in securely erasing flash-based memory. A new version of data is received for a logical location of a flash-based memory. An old version of the data of the logical location is stored in a first physical location in the flash-based memory. The old version of the data is caused to be subject to an obscure operation. The new version of the data is caused to be stored in a second physical location in the flash-based memory.

### 19 Claims, 8 Drawing Sheets

ERASED STATE PROGRAMMED STATE



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<sup>365/185.29; 711/159</sup> See application file for complete search history.

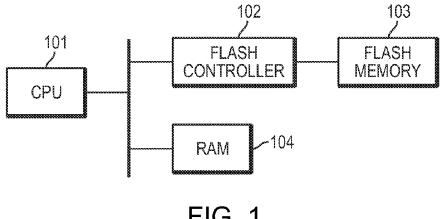


FIG. 1 (PRIOR ART)

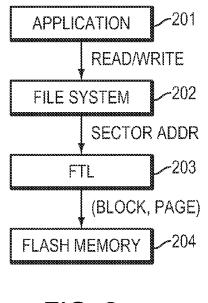


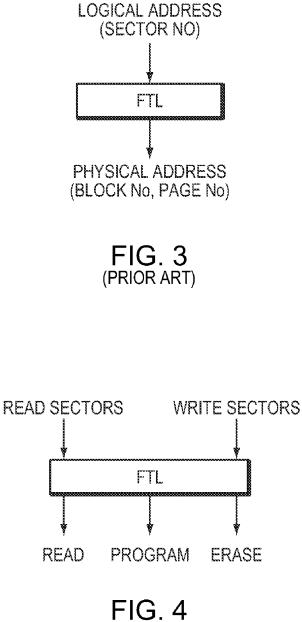
FIG. 2 (PRIOR ART)

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(PRIOR ART)

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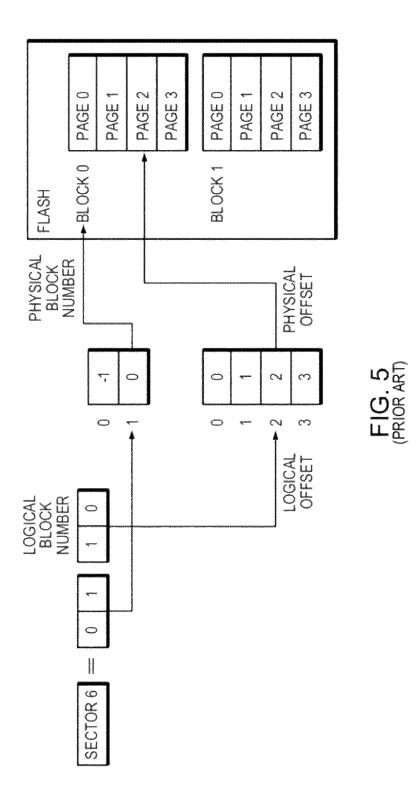
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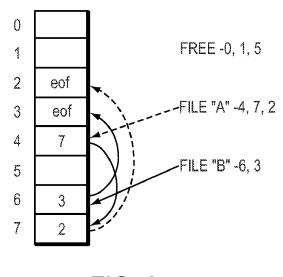


FIG. 6 (PRIOR ART)

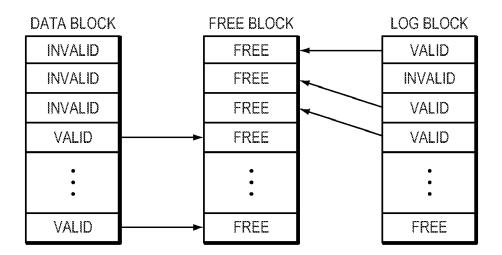


FIG. 7 (PRIOR ART)

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