



US008130554B1

(12) **United States Patent**
Linnell

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

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

(56) **References Cited**

(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**

(22) Filed: **Sep. 29, 2008**

(51) **Int. Cl.**
G11C 16/04 (2006.01)

(52) **U.S. Cl.** **365/185.28**; 365/185.29; 711/159

(58) **Field of Classification Search** 365/185.28, 365/185.29; 711/159

See application file for complete search history.

U.S. PATENT DOCUMENTS

7,562,189 B2 * 7/2009 Hamilton et al. 711/114
2003/0005248 A1 * 1/2003 Selkirk et al. 711/165
2009/0164696 A1 * 6/2009 Allen et al. 711/1
* cited by examiner

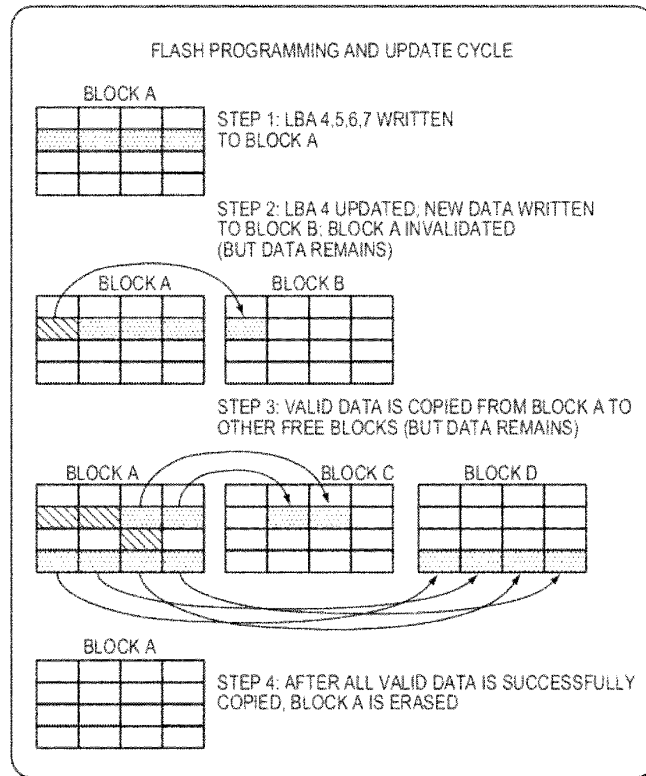
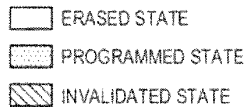
Primary Examiner — Hoai V Ho

(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



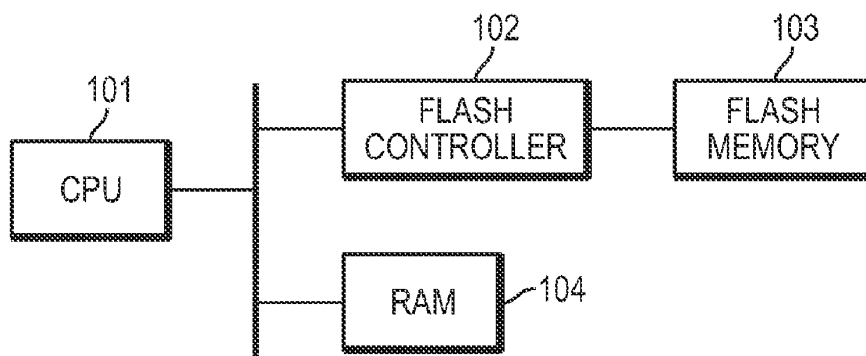


FIG. 1
(PRIOR ART)

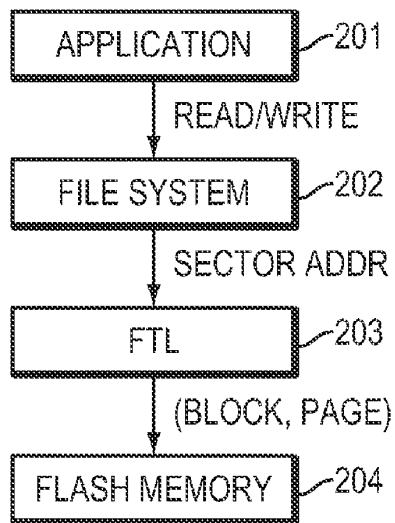


FIG. 2
(PRIOR ART)

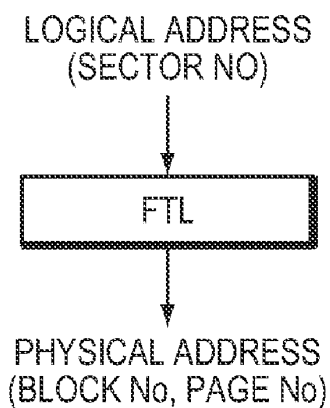


FIG. 3
(PRIOR ART)

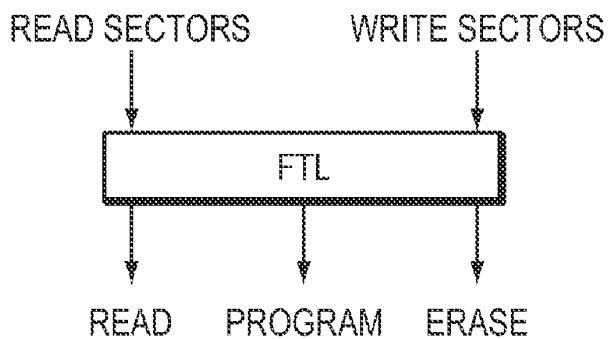


FIG. 4
(PRIOR ART)

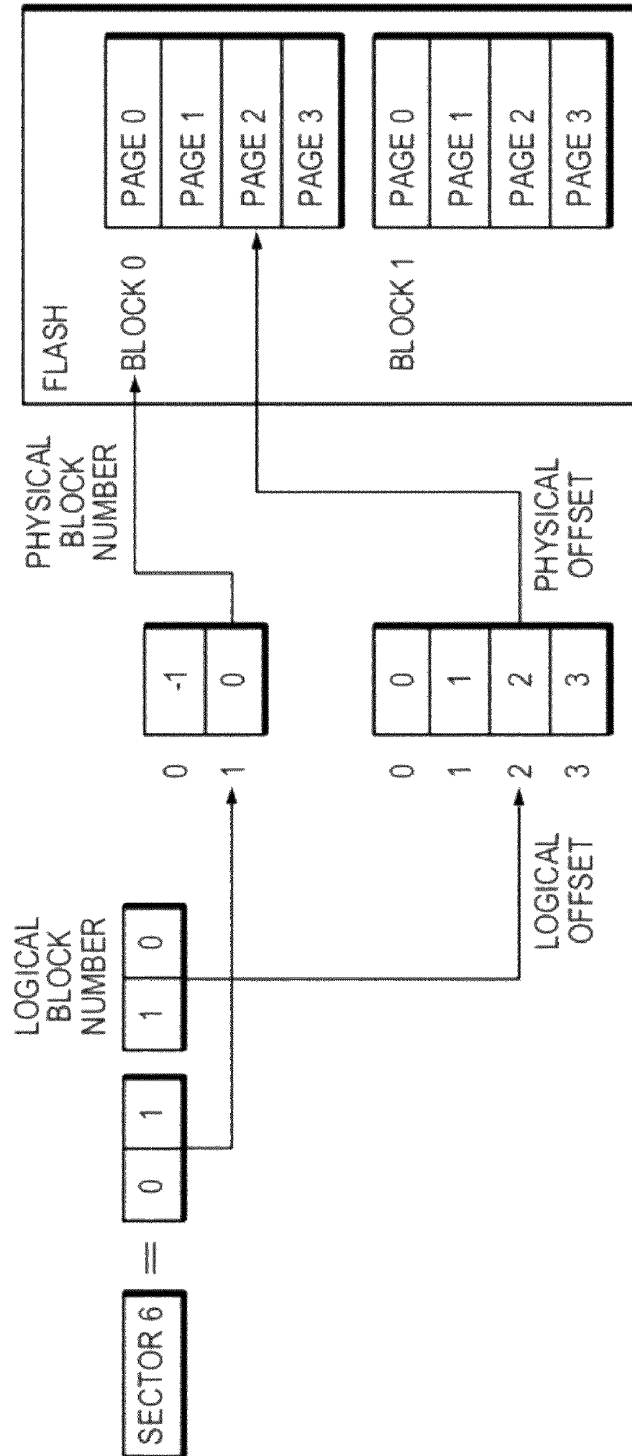


FIG. 5
(PRIOR ART)

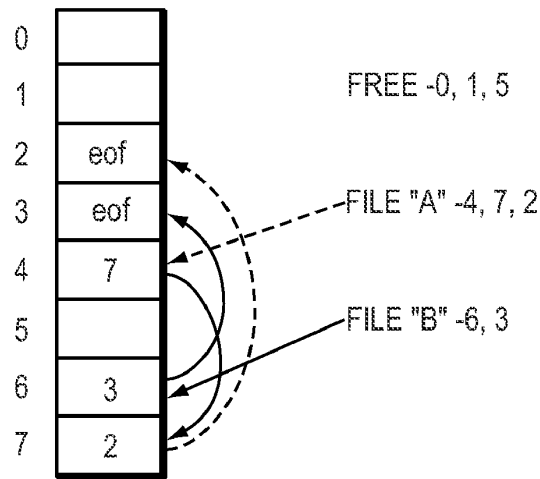


FIG. 6
(PRIOR ART)

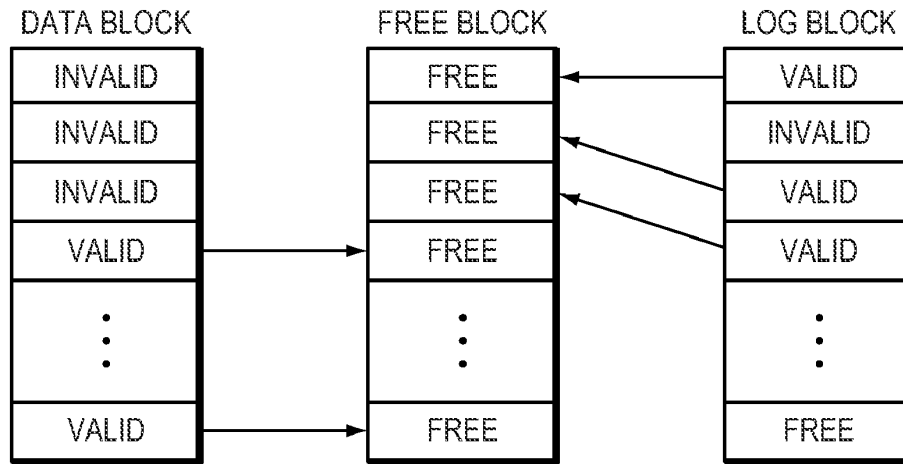


FIG. 7
(PRIOR ART)

Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

Real-Time Litigation Alerts



Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

Advanced Docket Research



With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

Analytics At Your Fingertips



Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.