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United States Patent [19]

Wells et al.

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[54] **SECTOR-BASED STORAGE DEVICE EMULATOR HAVING VARIABLE-SIZED SECTOR**

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[73] Assignee: **Intel Corporation**, Santa Clara, Calif.

[21] Appl. No.: **969,131**

[22] Filed: **Oct. 30, 1992**

[51] **Int. Cl.**[6] **G06F 12/04**

[52] **U.S. Cl.** **711/171**; 395/500

[58] **Field of Search** ..... 395/400, 425, 395/412, 430, 497.01, 497.02, 497.03, 497.04, 500; 365/900 MS, 185; 711/171, 172

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Attorney, Agent, or Firm—Blakely, Sokoloff, Taylor & Zafman

[57] **ABSTRACT**

A solid state memory disk that stores data on a sector basis is described. The solid state disk includes an array of FLASH memory devices, which store the sectors of data. Each block of memory within the FLASH array includes data space for storing many sectors of data and a block sector translation table. The block sector translation table identifies each sector of data stored in the block's data space by a sector number. The solid state disk also includes a controller. Among its many responsibilities, the controller manages the writing of sector data into the array and the reading of sectors of data from the array. The controller responds to a write request by seeking an earlier version of the sector which has a logical sector number equal to the sector's sector number and marking that sector dirty. Afterward, the controller allocates free memory space for the sector of data. The sector of data is then written into the allocated memory space. The controller reads sectors of data by seeking a sector header translation table to convert sector numbers into physical addresses.

31 Claims, 22 Drawing Sheets

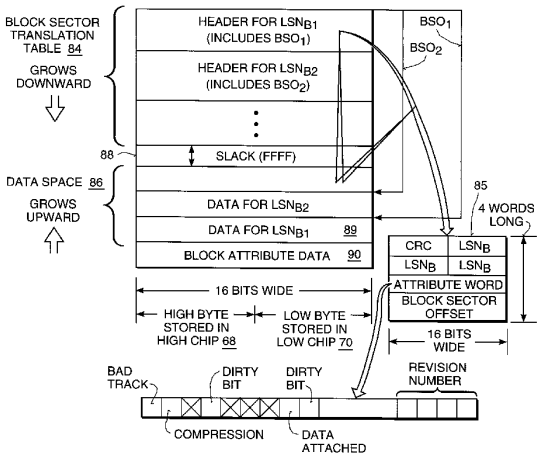

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FIG_1

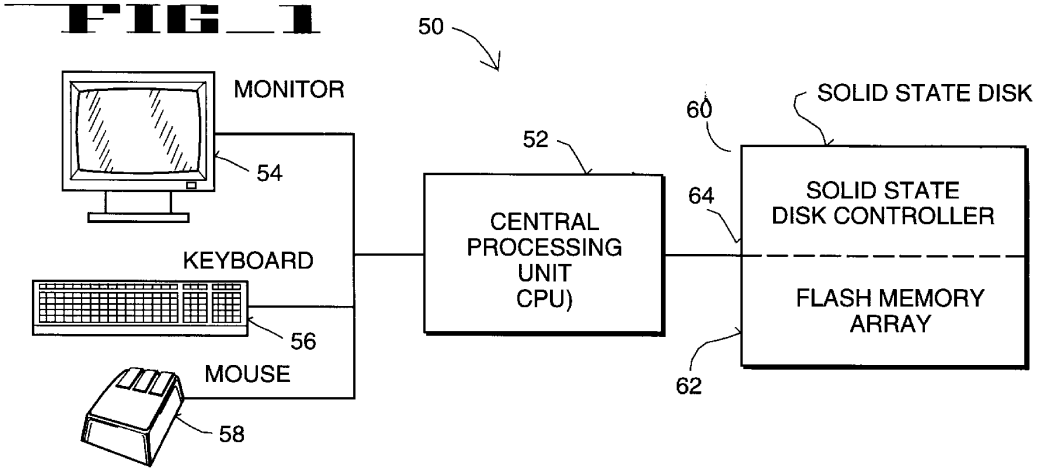

FIG_2

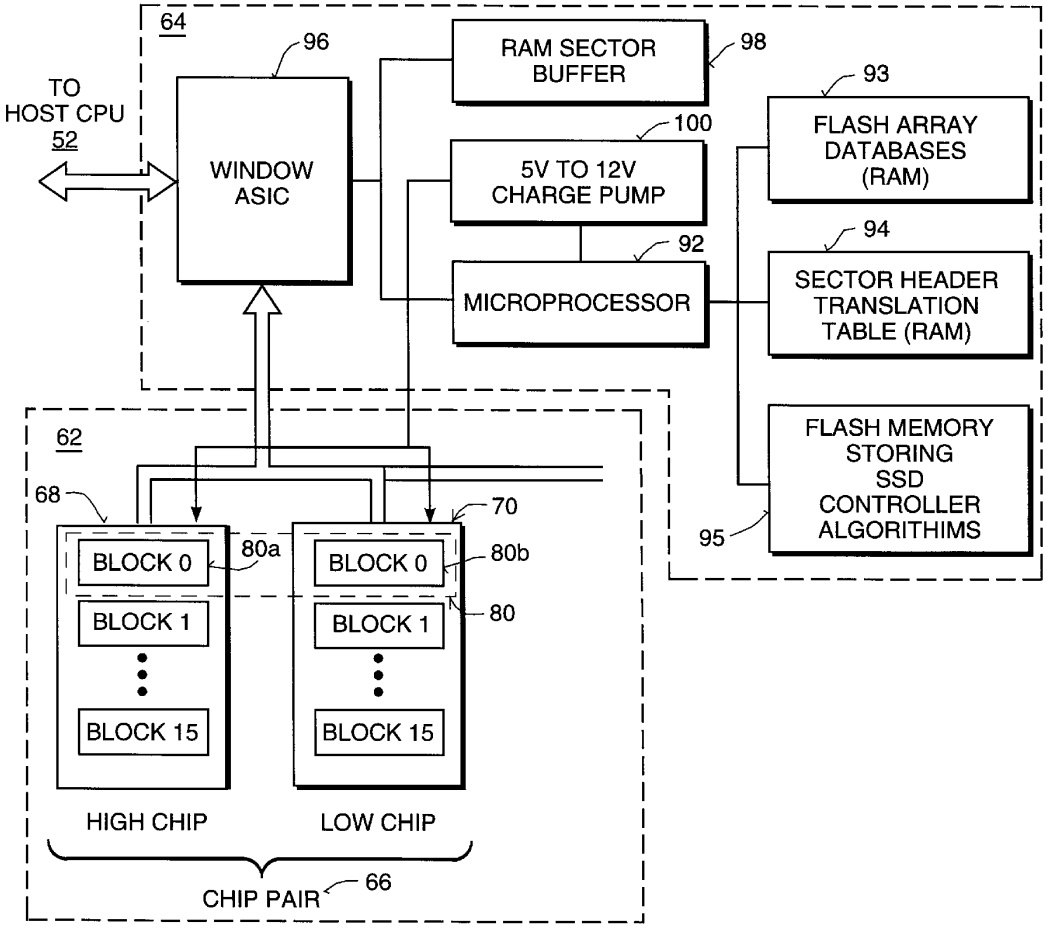

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FIG_3

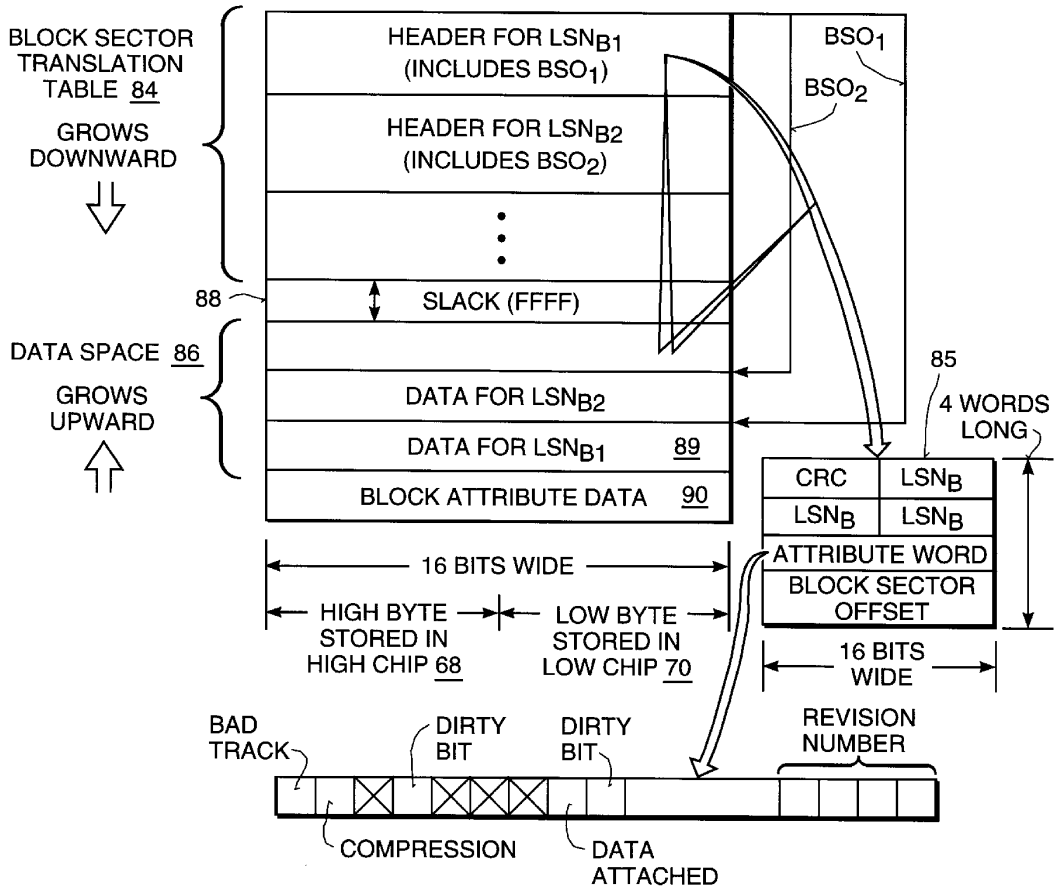

FIG_4

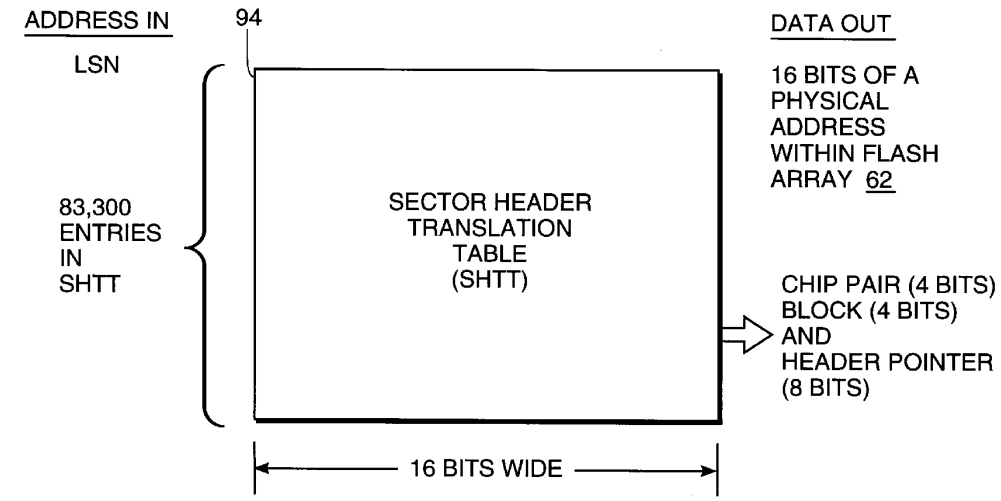

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FIG_5

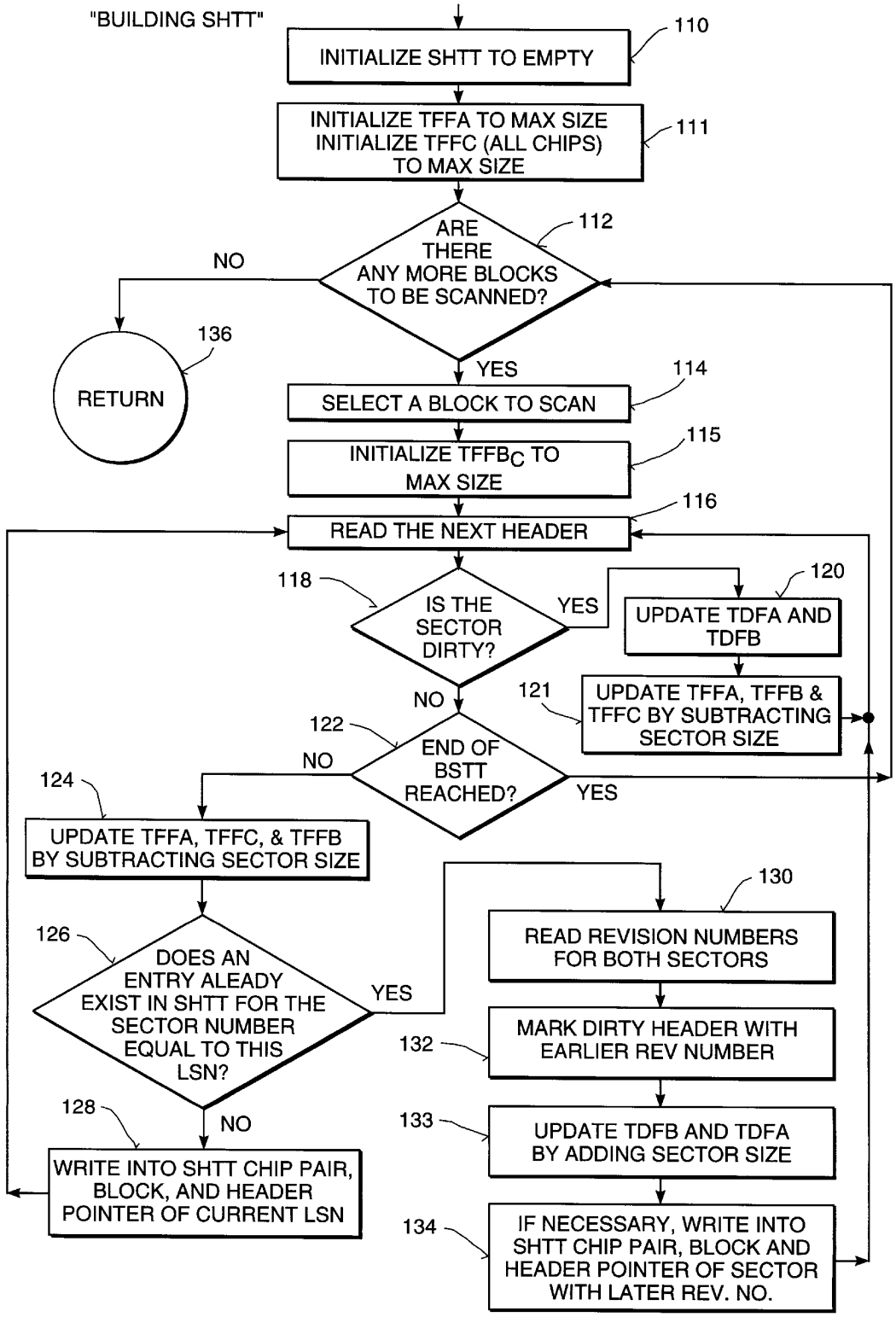

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FIG_6

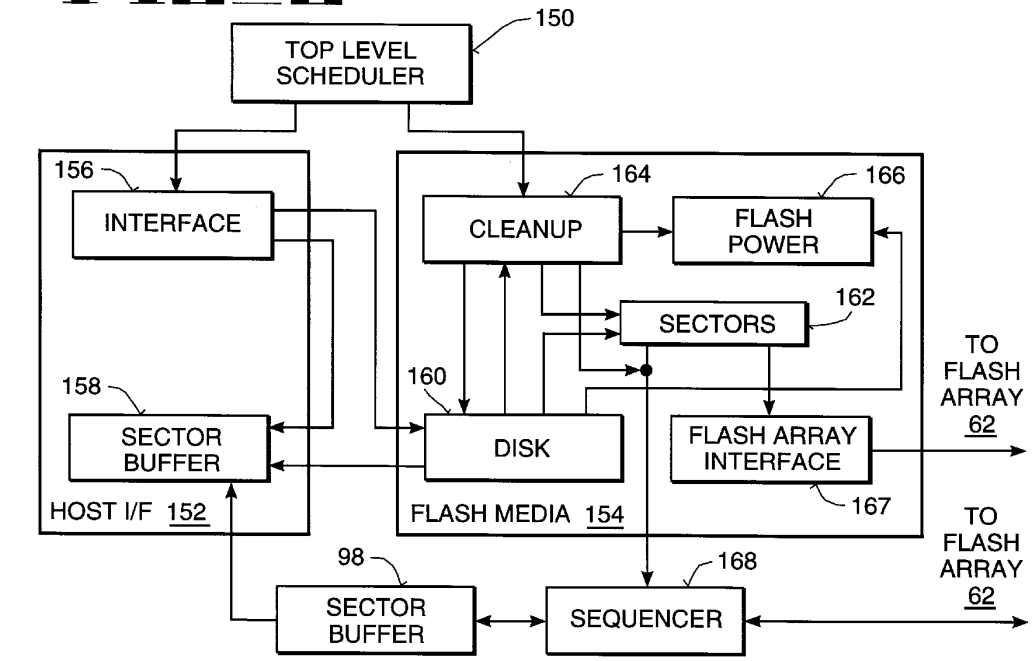
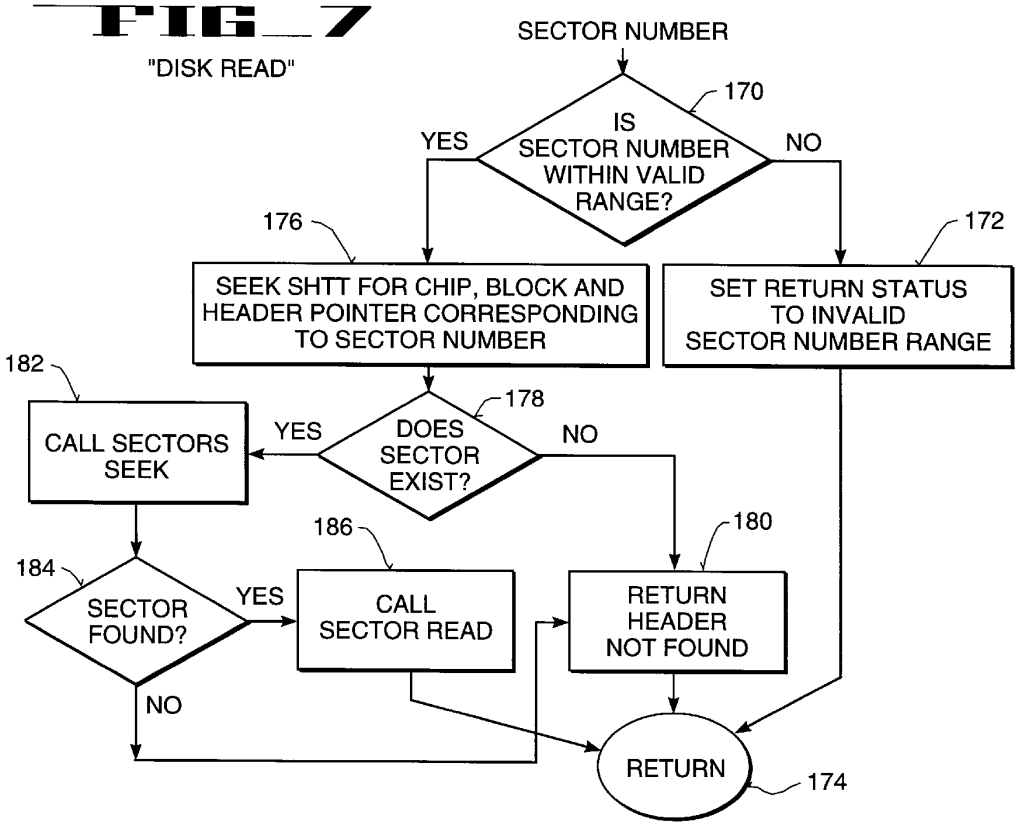


FIG_7



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