



US005627783A

**United States Patent** [19]  
**Miyachi**

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- [54] **SEMICONDUCTOR DISK DEVICE**
- [75] Inventor: **Shigenori Miyachi**, Tokyo, Japan
- [73] Assignee: **Mitsubishi Denki Kabushiki Kaisha**, Tokyo, Japan
- [21] Appl. No.: **580,410**
- [22] Filed: **Dec. 28, 1995**
- [30] **Foreign Application Priority Data**  
Jan. 31, 1995 [JP] Japan ..... 7-014030
- [51] Int. Cl.<sup>6</sup> ..... **C11C 13/00**
- [52] U.S. Cl. .... **365/185.33; 365/218; 365/230.03**
- [58] **Field of Search** ..... 365/185.33, 218, 365/238.5, 230.03

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[57] **ABSTRACT**

A semiconductor disk device comprising a flash memory having a plurality of blocks, and a CPU for converting a logical sector address into a physical-logical block number and its offset value, for searching for a block and a data memory area in the flash memory based on the physical-logical block number and offset value, and for reading the content of the data memory area when no chain data is stored in an update data chain information memory area. The block comprises a physical-logical block memory area, a plurality of data memory areas for storing data, data status flag memory areas, one disposed corresponding to each of the data memory areas, for storing a data status flag that indicates whether the data memory area stores data, and update data chain information memory areas, one disposed corresponding to each of the data memory areas, for storing chain information indicative of the destination of data.

The address conversion table for memory management is dispensed with and, accordingly, the data areas are expanded.

[56] **References Cited**

**U.S. PATENT DOCUMENTS**

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**FOREIGN PATENT DOCUMENTS**

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**9 Claims, 16 Drawing Sheets**

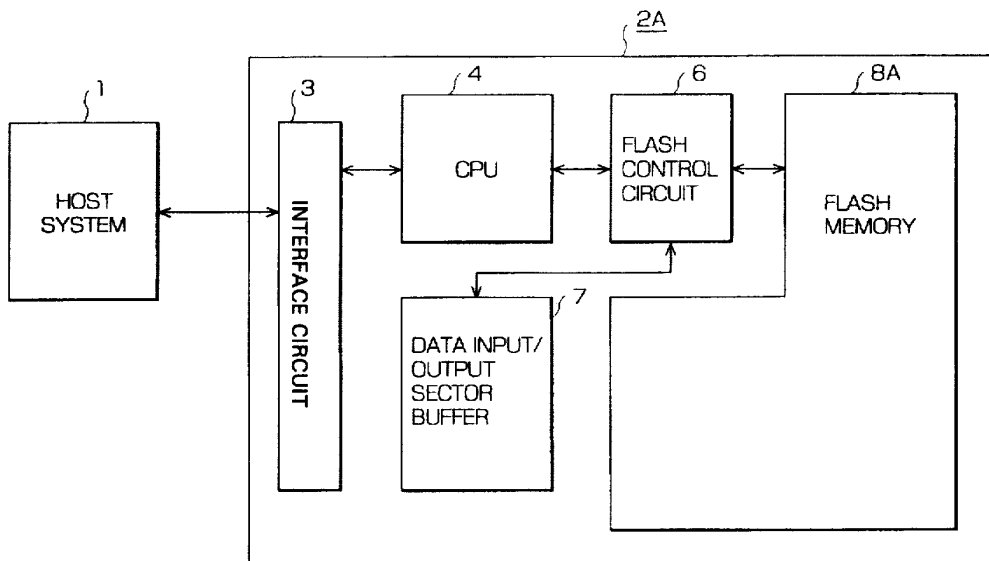


FIG. 1

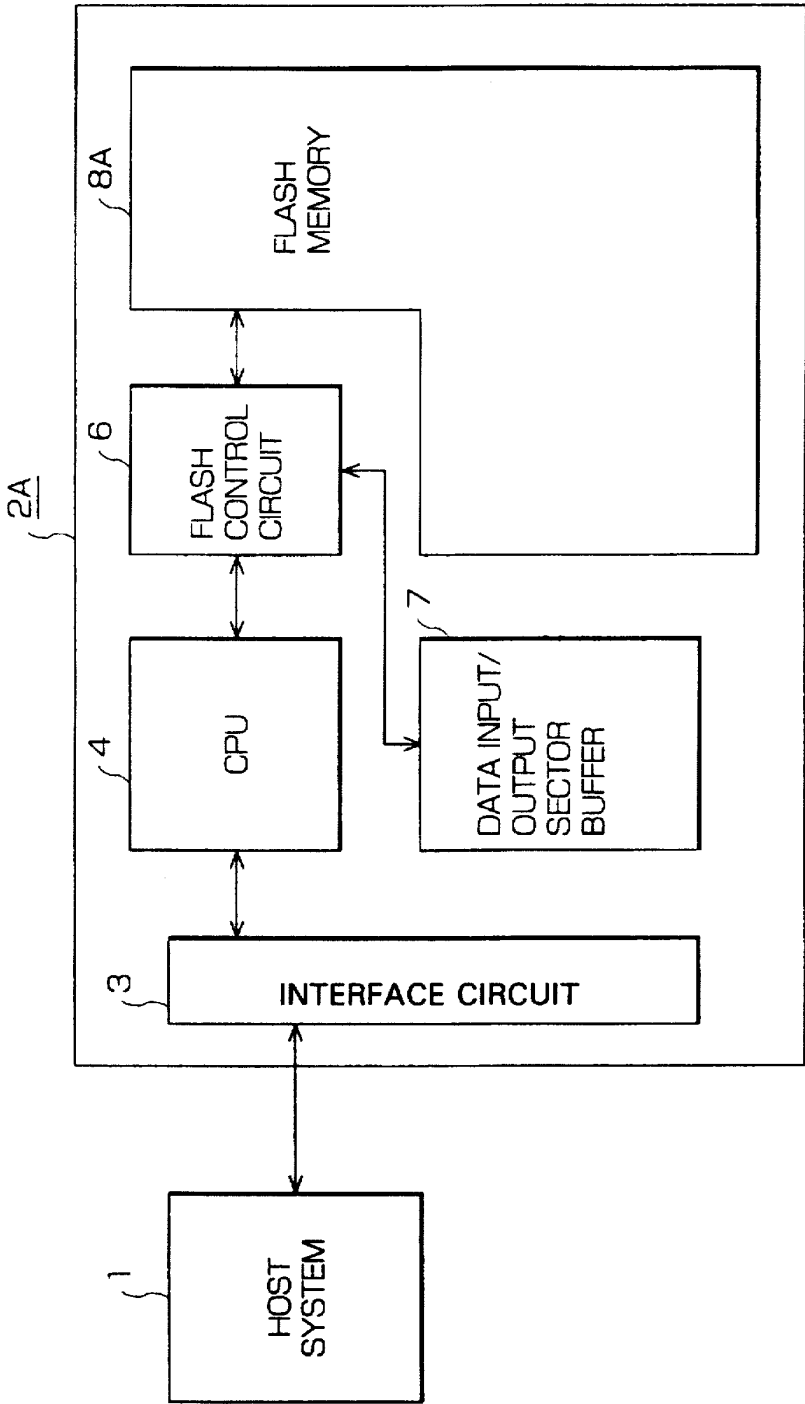


FIG. 2

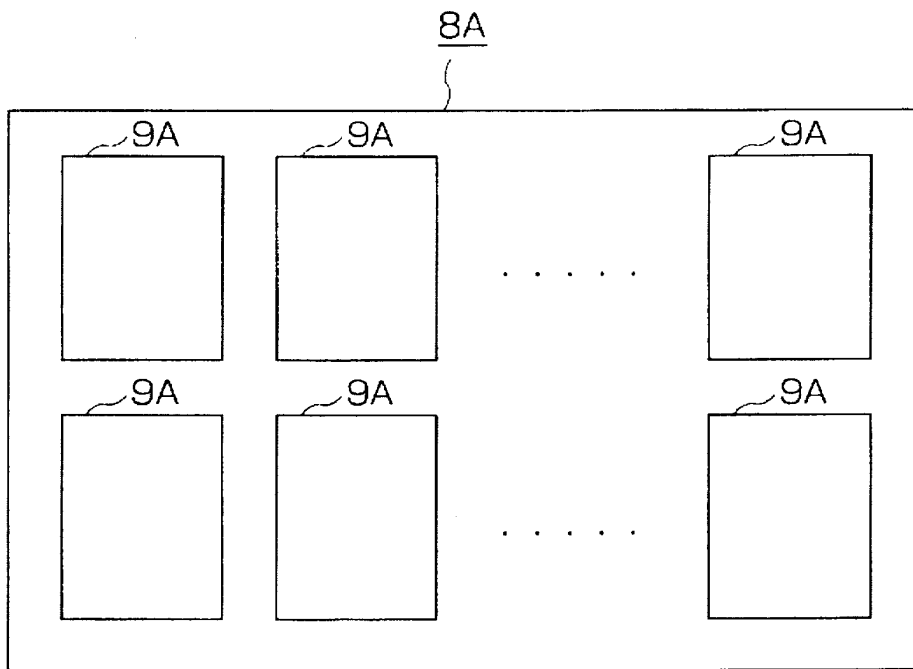
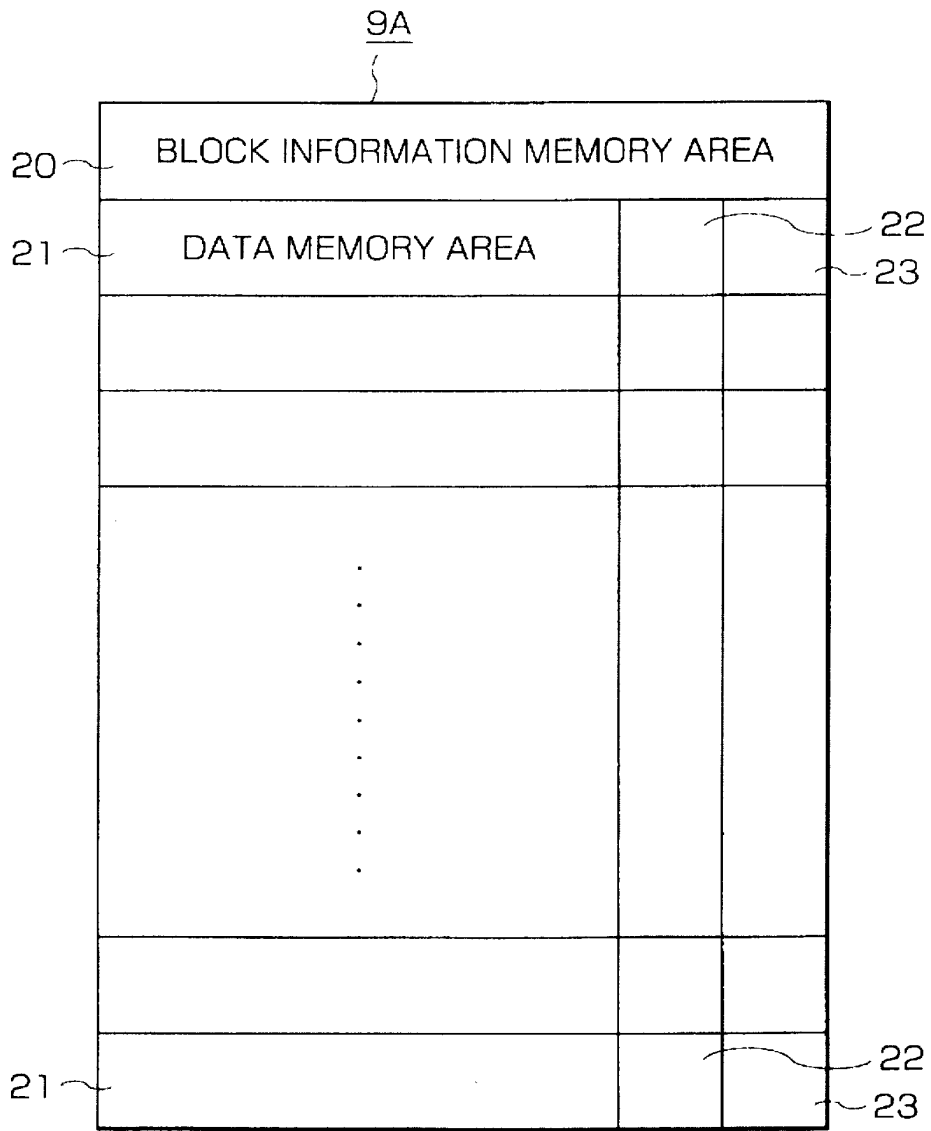
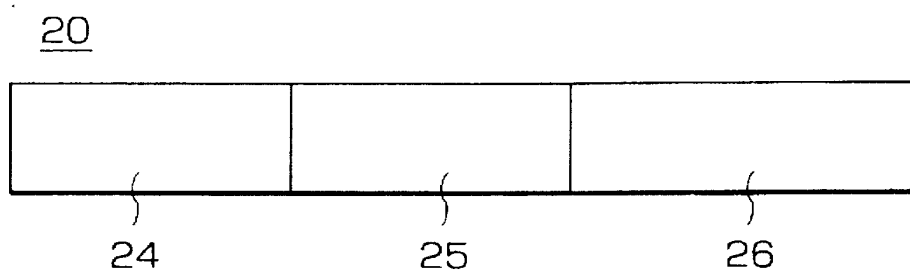


FIG. 3



# FIG. 4



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