

US007574556B2

## (12) United States Patent

#### Gill et al.

#### (54) WISE ORDERING FOR WRITES—COMBINING SPATIAL AND TEMPORAL LOCALITY IN WRITE CACHES

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- (\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 491 days.
- (21) Appl. No.: 11/384,939
- (22) Filed: Mar. 20, 2006

#### (65) **Prior Publication Data**

US 2007/0220201 A1 Sep. 20, 2007

- (51) Int. Cl. *G06F 12/00* (2006.01)
- (52) U.S. Cl. ..... 711/113; 711/130; 711/114

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## (10) Patent No.: US 7,574,556 B2

### (45) **Date of Patent:** Aug. 11, 2009

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#### (57) **ABSTRACT**

A storage system has a storage controller for an array of storage disks, the array being ordered in an sequence of write groups. A write cache is shared by the disks. The storage controller temporarily stores write groups in the write cache, responsive to write groups being written, and lists the write groups in order of their sequence in the array and in circular fashion, so that a lowest is listed next to a highest one of the write groups. The storage controller selects the listed write groups in rotating sequence. Such a write group is destaged from the write cache to the disk responsive to i) the selecting of the write group and ii) a state of a recency indicator for the write group, wherein the recency indicator shows recency of writing to the write group.

#### 27 Claims, 4 Drawing Sheets



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