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United States Patent [19]

[11] Patent Number: **6,075,743**

Barth et al.

[45] Date of Patent: ***Jun. 13, 2000**

[54] **METHOD AND APPARATUS FOR SHARING SENSE AMPLIFIERS BETWEEN MEMORY BANKS**

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[73] Assignee: **Rambus Inc.**, Mountain View, Calif.

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[*] Notice: This patent issued on a continued prosecution application filed under 37 CFR 1.53(d), and is subject to the twenty year patent term provisions of 35 U.S.C. 154(a)(2).

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[21] Appl. No.: **08/862,603**

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[22] Filed: **May 23, 1997**

Primary Examiner—Terrell W. Fears

Related U.S. Application Data

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

[60] Provisional application No. 60/033,889, Dec. 26, 1996.

[51] **Int. Cl.**⁷ **G11C 13/00**

[57] **ABSTRACT**

[52] **U.S. Cl.** **365/230.01; 361/230.04; 361/230.06**

A memory device includes a first memory bank and a second memory bank, each memory bank having at least one subarray of memory cells. Multiple sense amplifiers are coupled to both the first memory bank and the second memory bank. The multiple sense amplifiers are configured for use by both the first memory bank and the second memory bank, but not simultaneously. A control mechanism is used to avoid accessing the first memory bank and the second memory bank simultaneously. The sharing of sense amplifiers between memory banks minimizes the die area penalty caused by additional memory banks.

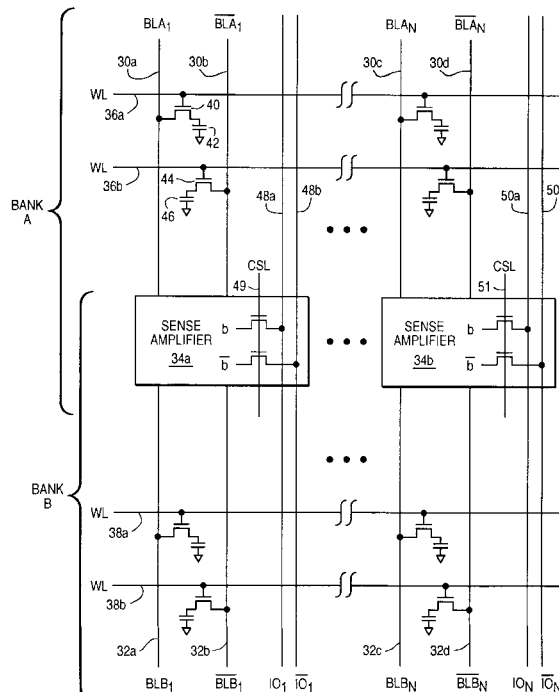
[58] **Field of Search** 365/200, 230.01, 365/230.04, 230.6, 189.01

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20 Claims, 6 Drawing Sheets



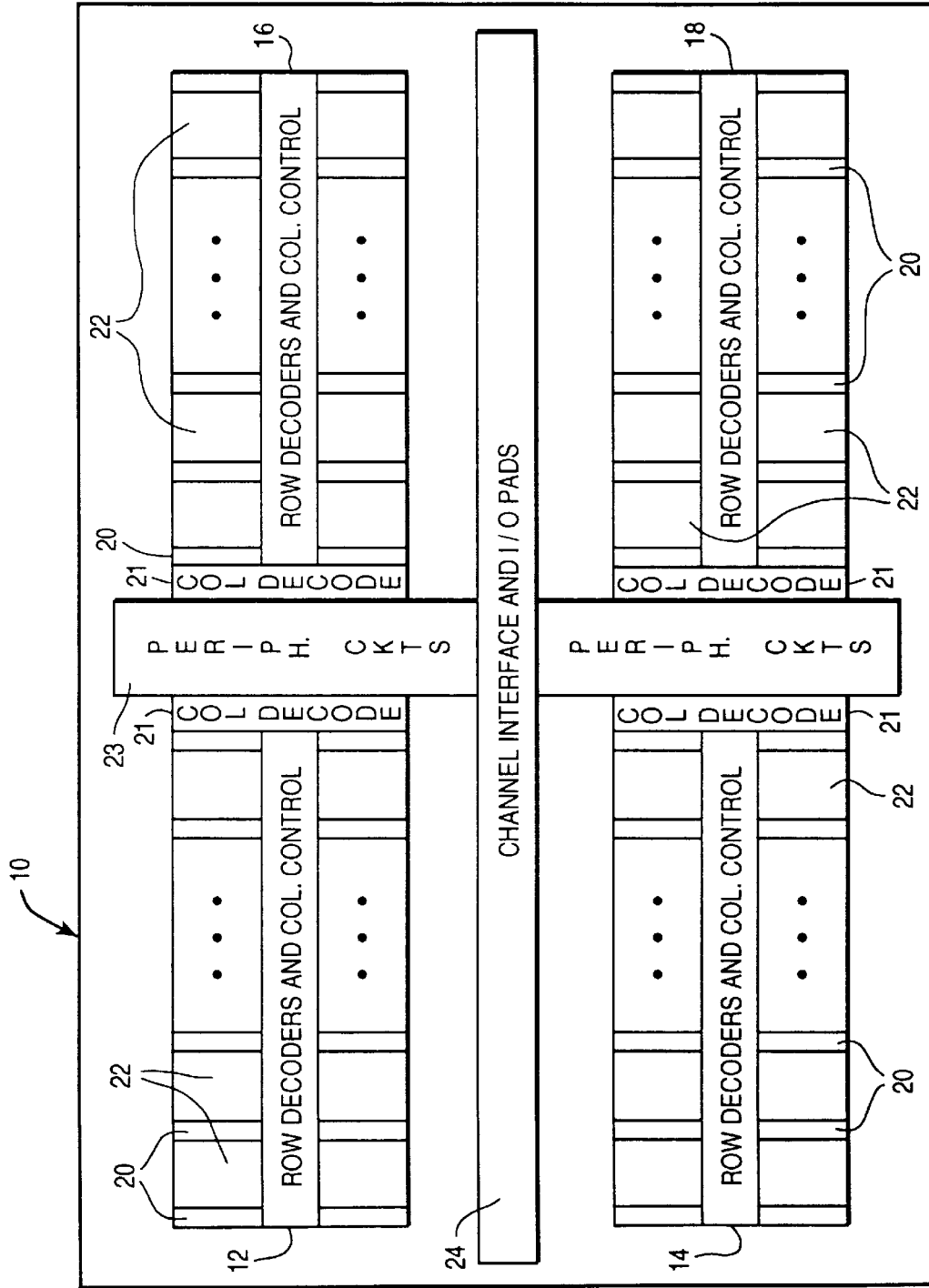


FIG. 10 (PRIOR ART)

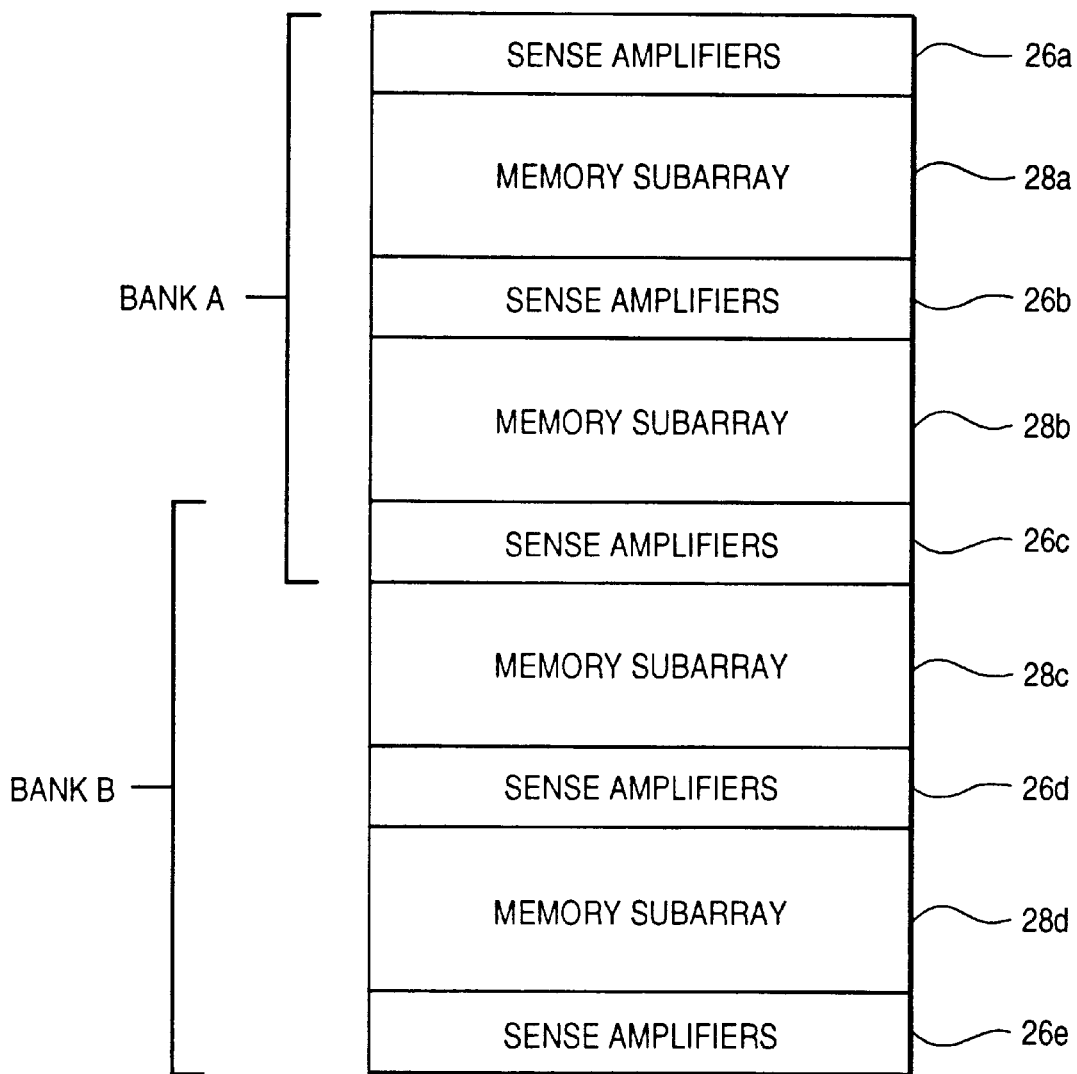


FIG 2

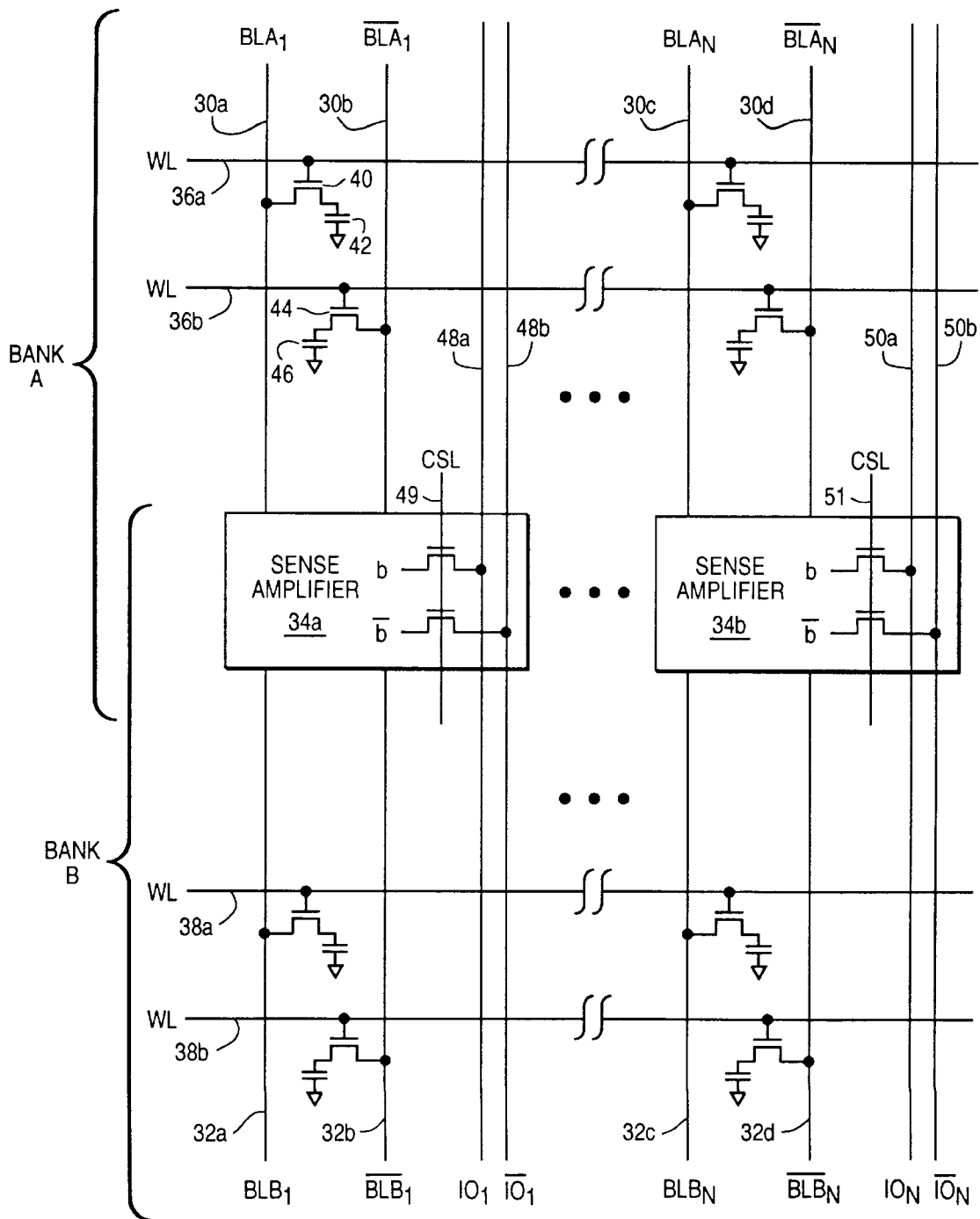


FIG. 3

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