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# United States Patent [19]

[11] Patent Number: **5,459,683**

Uesugi et al.

[45] Date of Patent: **Oct. 17, 1995**

[54] **APPARATUS FOR CALCULATING THE SQUARE ROOT OF THE SUM OF TWO SQUARES**

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[75] Inventors: **Mitsuru Uesugi; Kouichi Honma**, both of Yokohama, Japan

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[73] Assignee: **Matsushita Electric Industrial Co., Ltd.**, Osaka, Japan

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[21] Appl. No.: **277,826**

*Primary Examiner*—Tan V. Mai

[22] Filed: **Jul. 20, 1994**

*Attorney, Agent, or Firm*—Lowe, Price, LeBlanc & Becker

[30] **Foreign Application Priority Data**

Aug. 2, 1993 [JP] Japan ..... 5-191099

[57] **ABSTRACT**

[51] **Int. Cl.<sup>6</sup>** ..... **G06F 7/38**

A first digital signal of a serial form is processed into a second digital signal of a serial form. The second digital signal represents an absolute value of a value represented by the first digital signal. A third digital signal of a serial form is processed into a fourth digital signal of a serial form. The fourth digital signal represents an absolute value of a value represented by the third digital signal. The values represented by the first and third digital signals are compared to generate a comparison-result digital signal representing a result of the comparison. A calculation-result digital signal of a serial form is generated in response to the second digital signal, the fourth digital signal, and the comparison-result digital signal. The calculation-result digital signal represents a value which is approximate to a square root of a sum of a square of the value represented by the first digital signal and a square of the value represented by the third digital signal.

[52] **U.S. Cl.** ..... **364/752**

[58] **Field of Search** ..... **364/752**

### [56] **References Cited**

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**4 Claims, 9 Drawing Sheets**

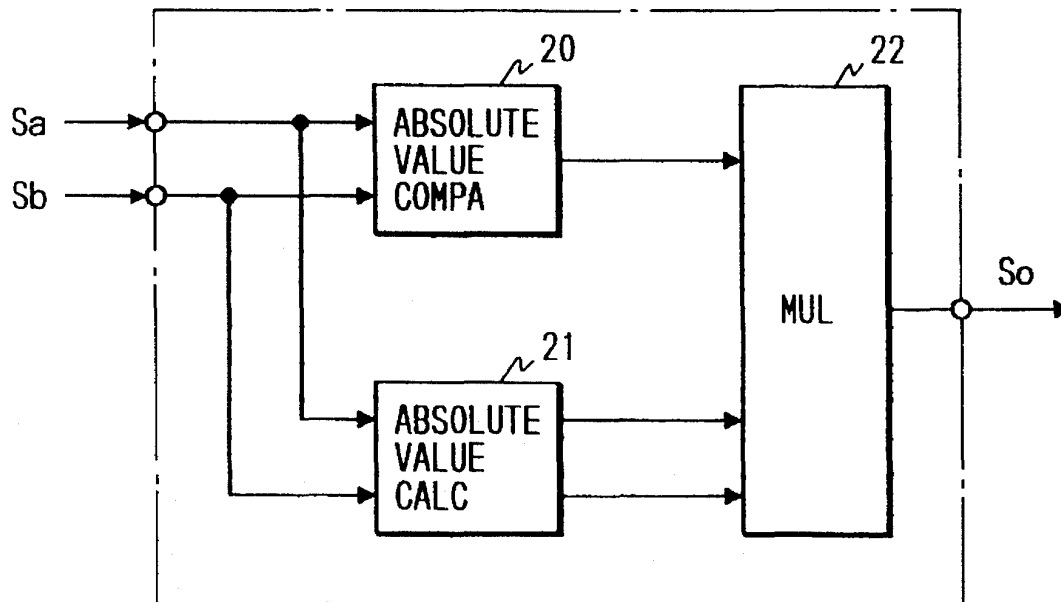


FIG. 1 PRIOR ART

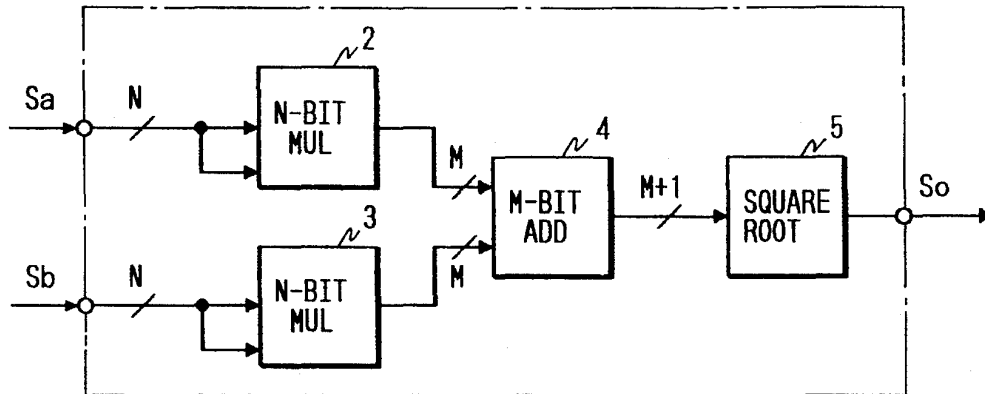


FIG. 2 PRIOR ART

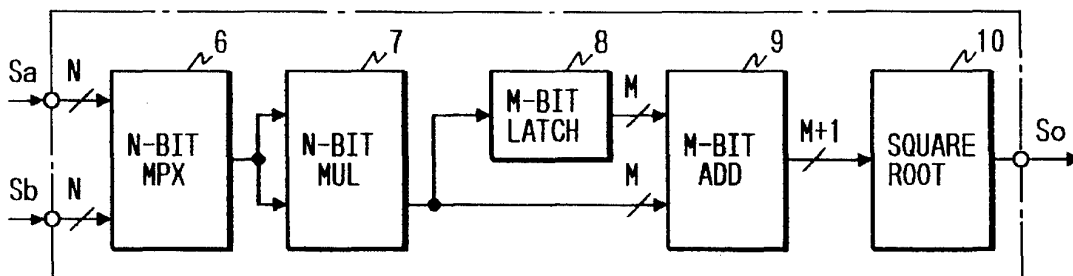


FIG. 3

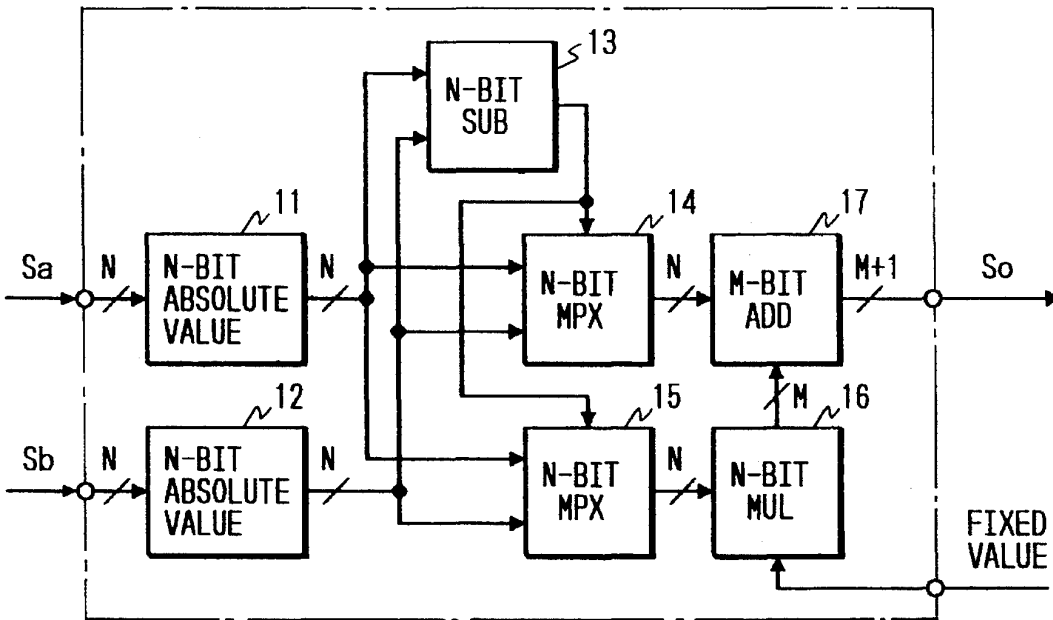


FIG. 4

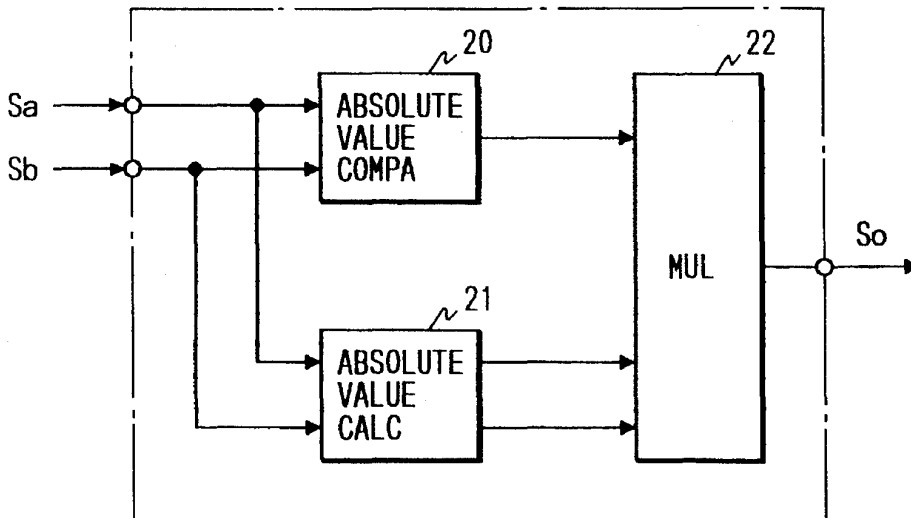


FIG. 5

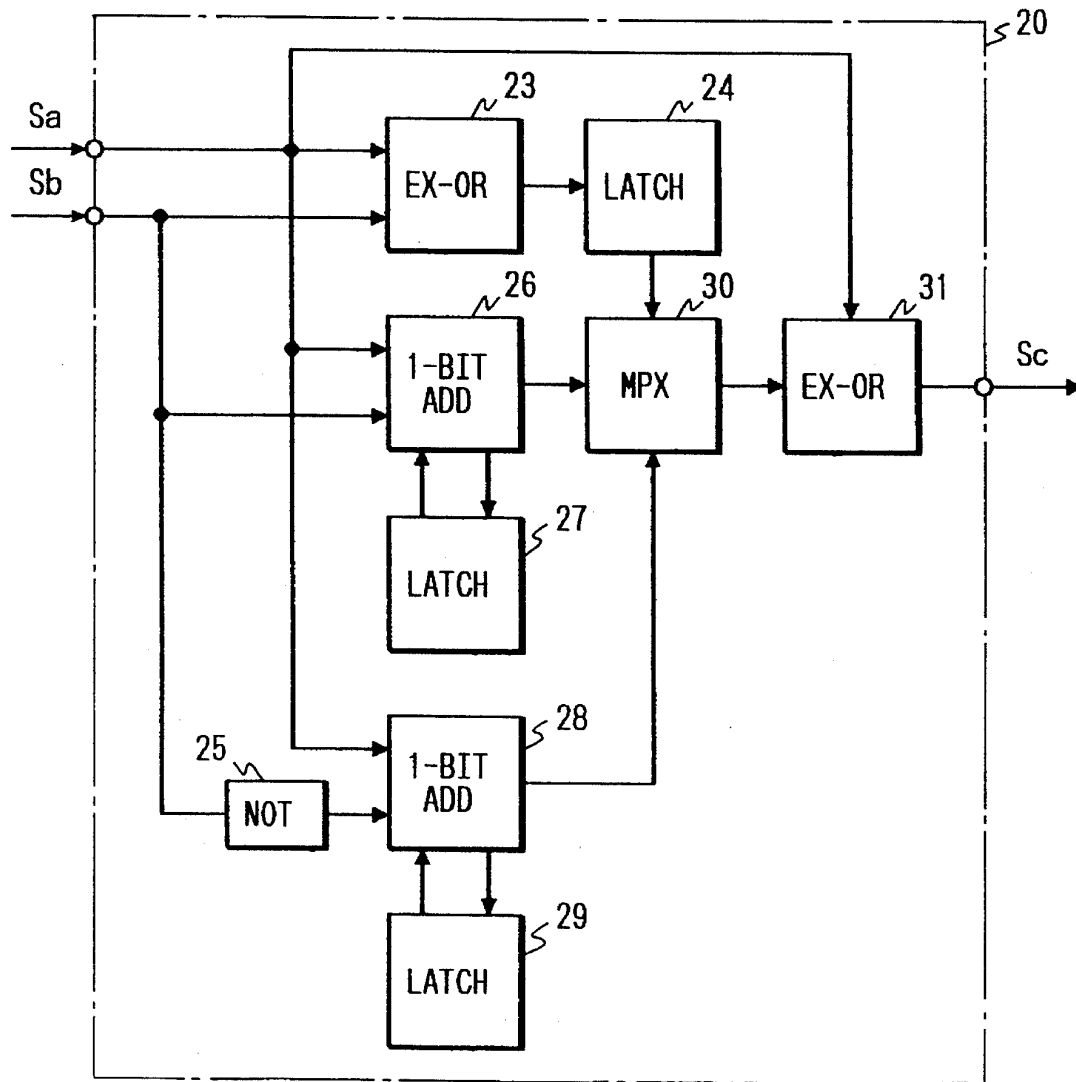
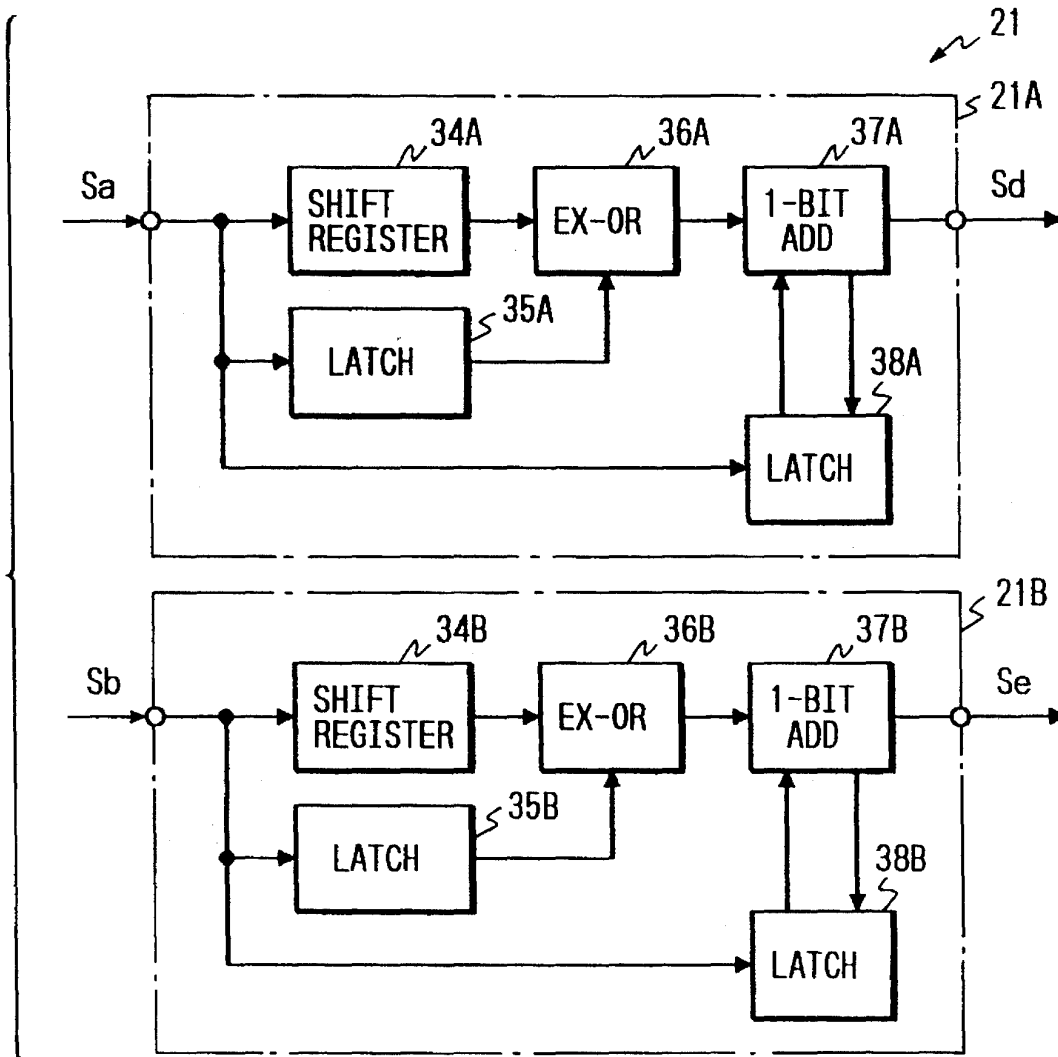


FIG. 6



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