



US005459683A

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**

0437876 7/1991 European Pat. Off. .
2146200 4/1985 United Kingdom .

OTHER PUBLICATIONS

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

Electronics Letters, vol. 10, No. 13, 27 Jun. 1974, Engage GB, pp. 255-256, Braun et al. 'Digital hardware for approximating to the amplitude of quadrature pairs'.

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

Electronics, vol. 56, No. 17, 25 Aug. 1983, New York US, pp. 138-139, Ho et al. 'Comparator compares 2's complement numbers'.

[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.⁶** **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**

U.S. PATENT DOCUMENTS

3,829,671	8/1974	Gathright et al.	364/752
3,829,672	8/1974	Sather	364/752
3,858,036	12/1974	Lunsford	364/752
4,503,549	3/1985	Slabinski	364/752
4,553,260	11/1985	Belt et al.	364/752
4,599,701	7/1986	Vojir et al.	364/752
4,694,417	9/1987	Cantwell	364/752
4,736,334	4/1988	Mehrgardt	364/752
4,747,067	5/1988	Jagodnik, Jr. et al.	364/752
5,159,567	10/1992	Gobert	364/752

FOREIGN PATENT DOCUMENTS

0238300 9/1987 European Pat. Off. .

4 Claims, 9 Drawing Sheets

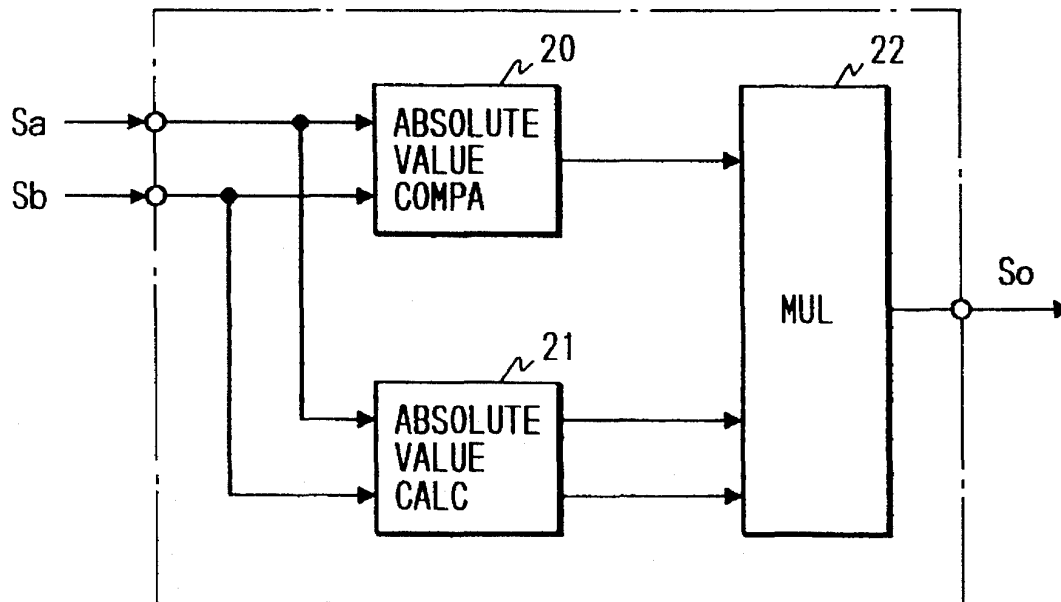


FIG. 1 PRIOR ART

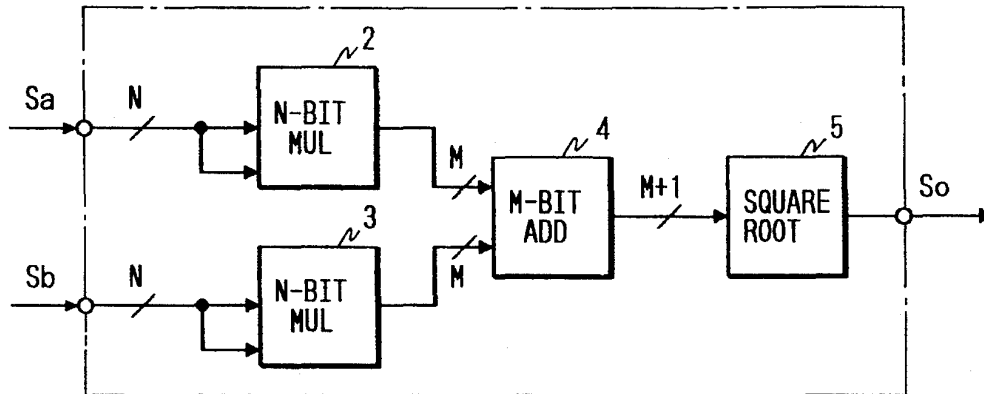


FIG. 2 PRIOR ART

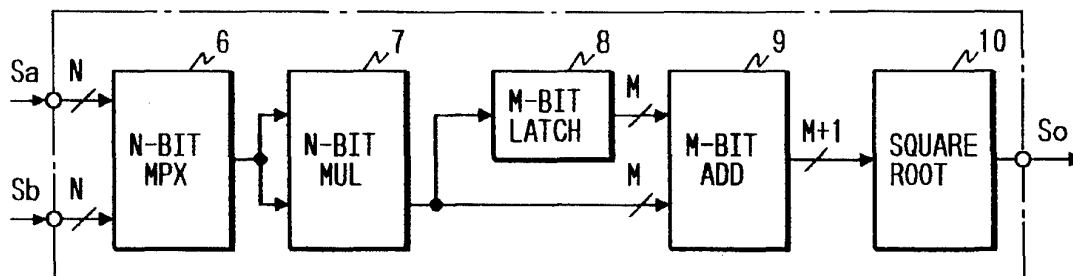


FIG. 3

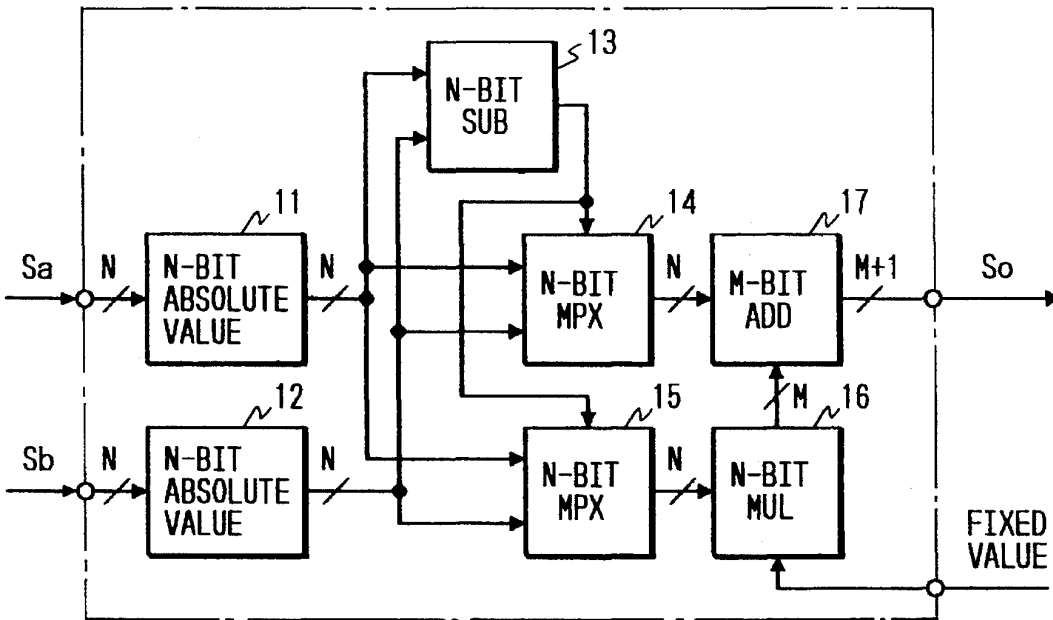


FIG. 4

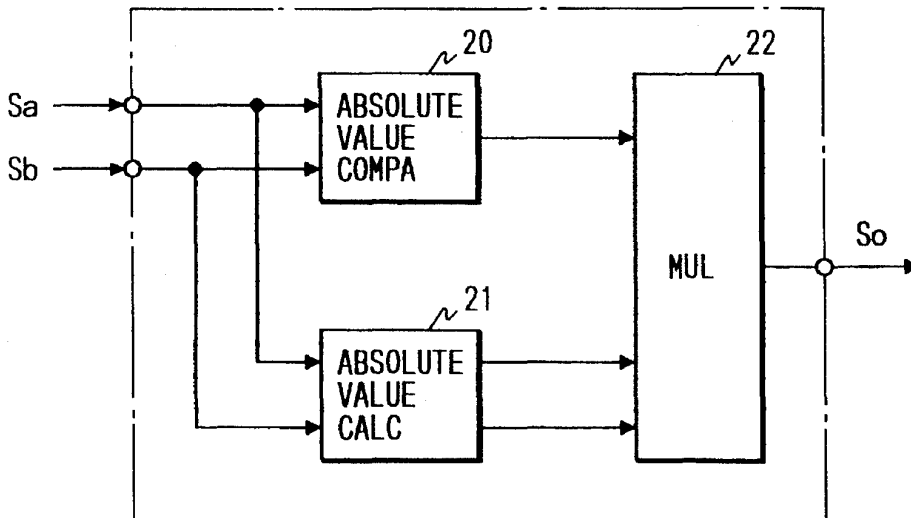


FIG. 5

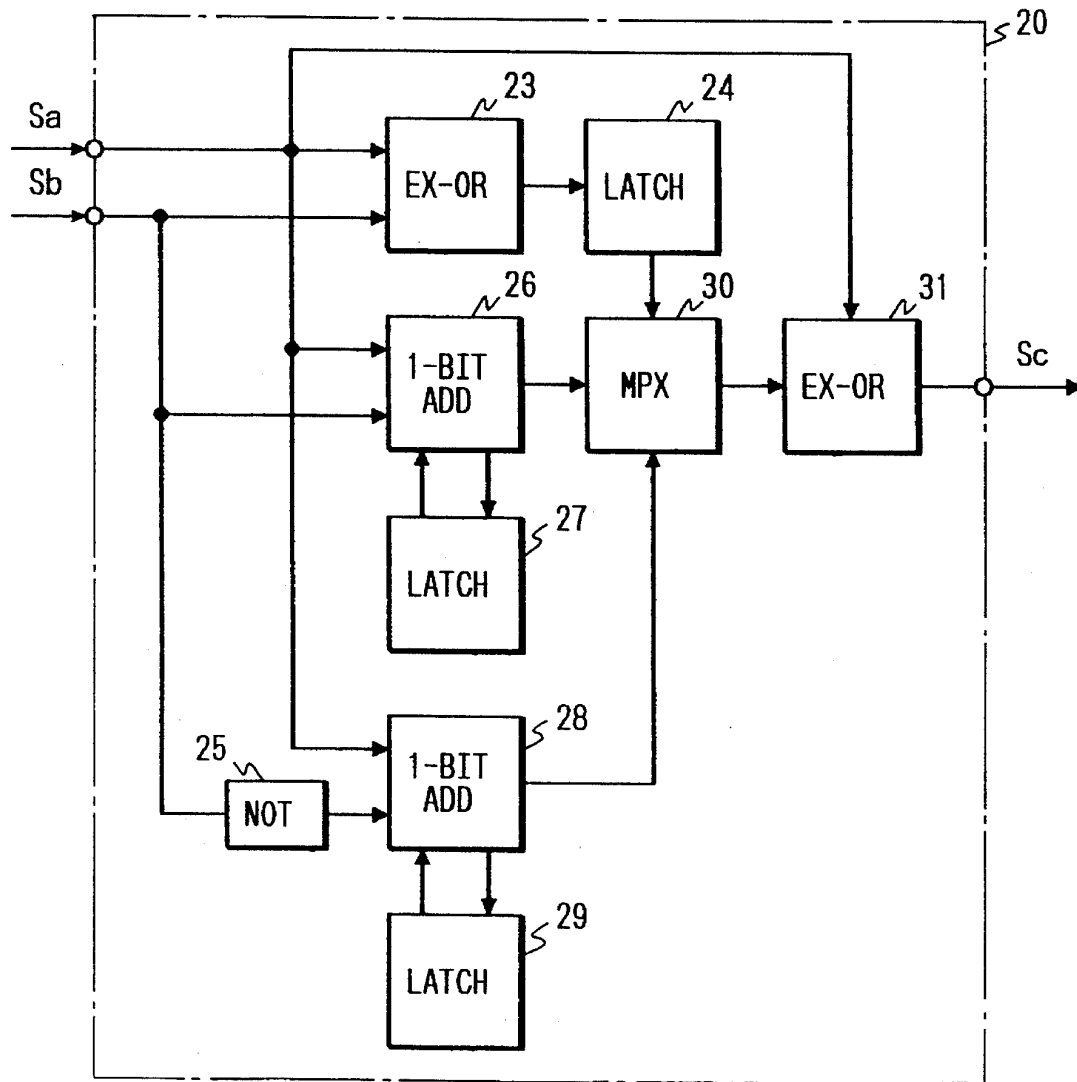
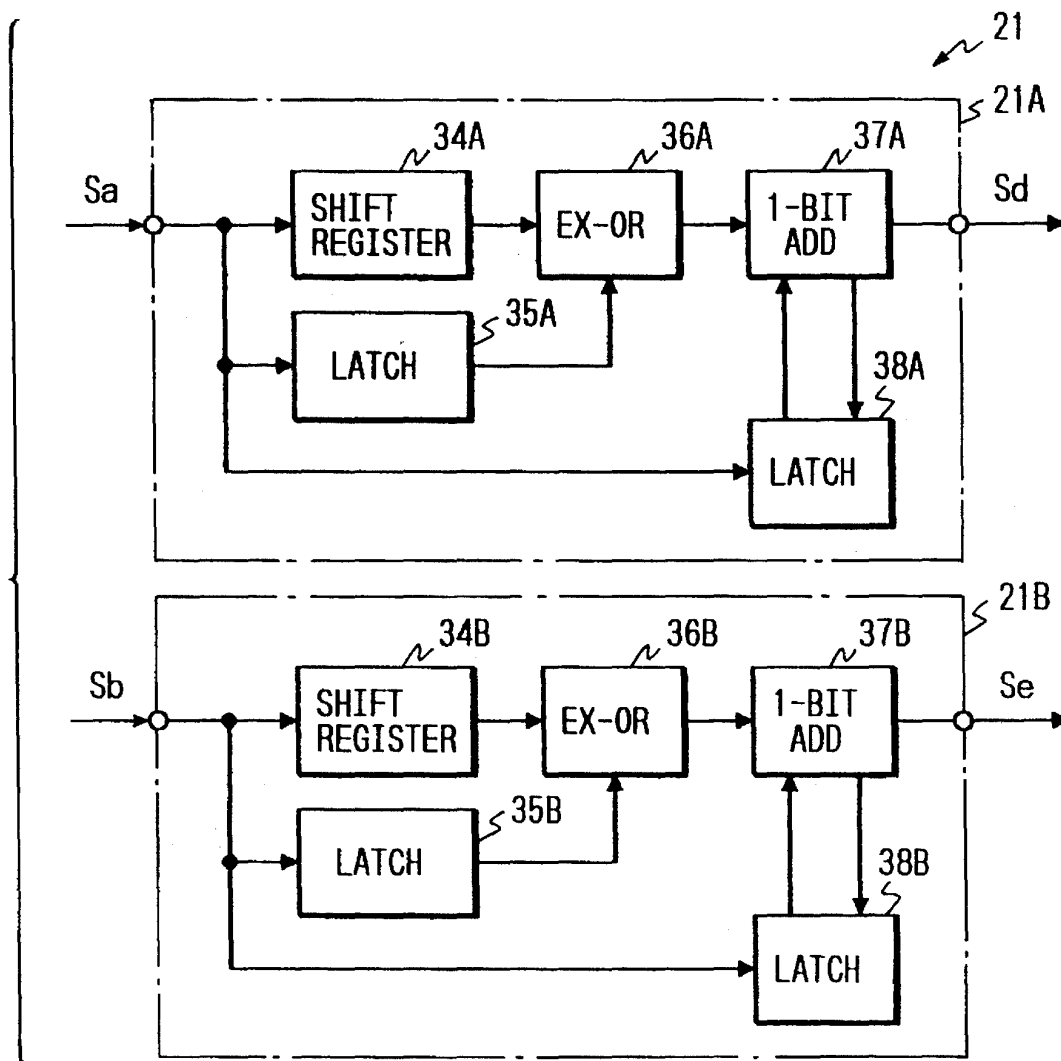


FIG. 6



Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

Real-Time Litigation Alerts



Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

Advanced Docket Research



With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

Analytics At Your Fingertips



Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.