



US005722412A

# United States Patent [19]

[11] Patent Number: **5,722,412**

**Pflugrath et al.**

[45] Date of Patent: **Mar. 3, 1998**

[54] **HAND HELD ULTRASONIC DIAGNOSTIC INSTRUMENT**

5,590,658 1/1997 Chiang et al. .... 128/661.01

### OTHER PUBLICATIONS

[75] Inventors: **Lauren S. Pflugrath**, Seattle; **Jacques Souquet**, Issaquah, both of Wash.

Minivisor Service Manual from Organon Teknika (Sep. 1979).

[73] Assignee: **Advanced Technology Laboratories, Inc.**, Bothell, Wash.

Ultra PCI System Specifications from Advanced Medical Products of Columbia, South Carolina (date unknown).

[21] Appl. No.: **672,782**

*Primary Examiner*—George Manuel

[22] Filed: **Jun. 28, 1996**

*Attorney, Agent, or Firm*—W. Brinton Yorks, Jr.

[51] Int. Cl.<sup>6</sup> ..... **A61B 8/00**

[52] U.S. Cl. .... **128/662.03**

[58] Field of Search ..... 128/660.07, 660.08,  
128/660.01, 661.1, 660.09, 662.03, 660.04,  
660.05, 661.08, 661.09

### [57] ABSTRACT

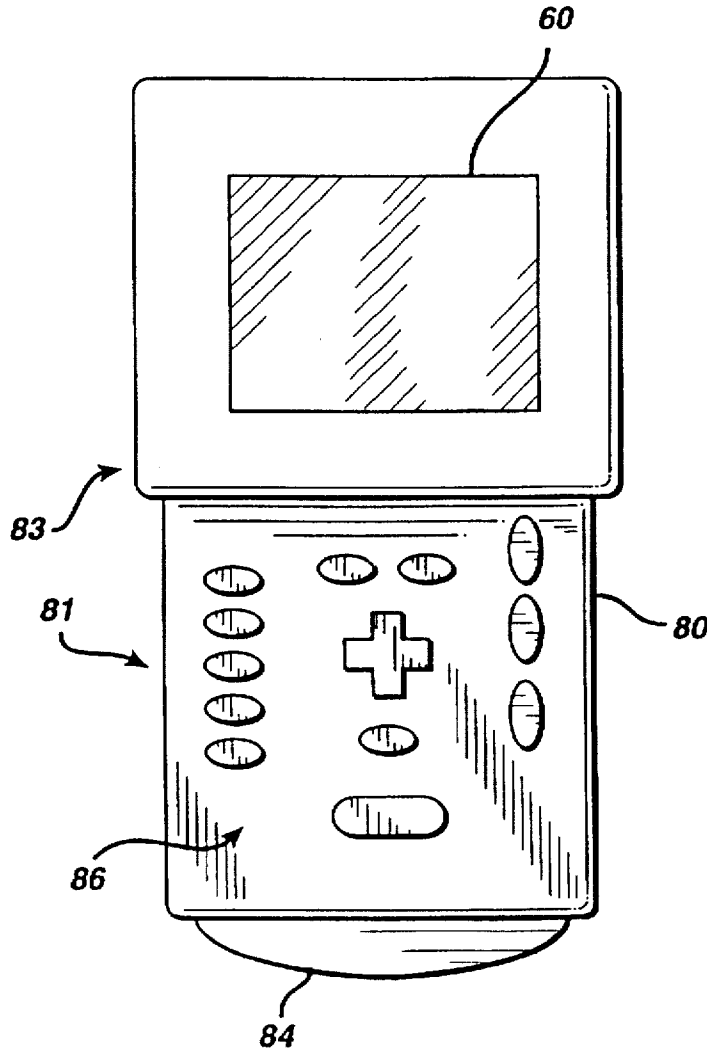
A hand held ultrasonic instrument is provided in a portable unit which performs both B mode and Doppler imaging. In a preferred embodiment an array transducer, digital beamformer, digital filter, and image processor are packaged in one or more enclosures weighing ten pounds (4.5 kilograms) or less.

### [56] References Cited

#### U.S. PATENT DOCUMENTS

5,295,485 3/1994 Shinomura et al. .... 128/660.07

**24 Claims, 19 Drawing Sheets**



**FIG. 1**

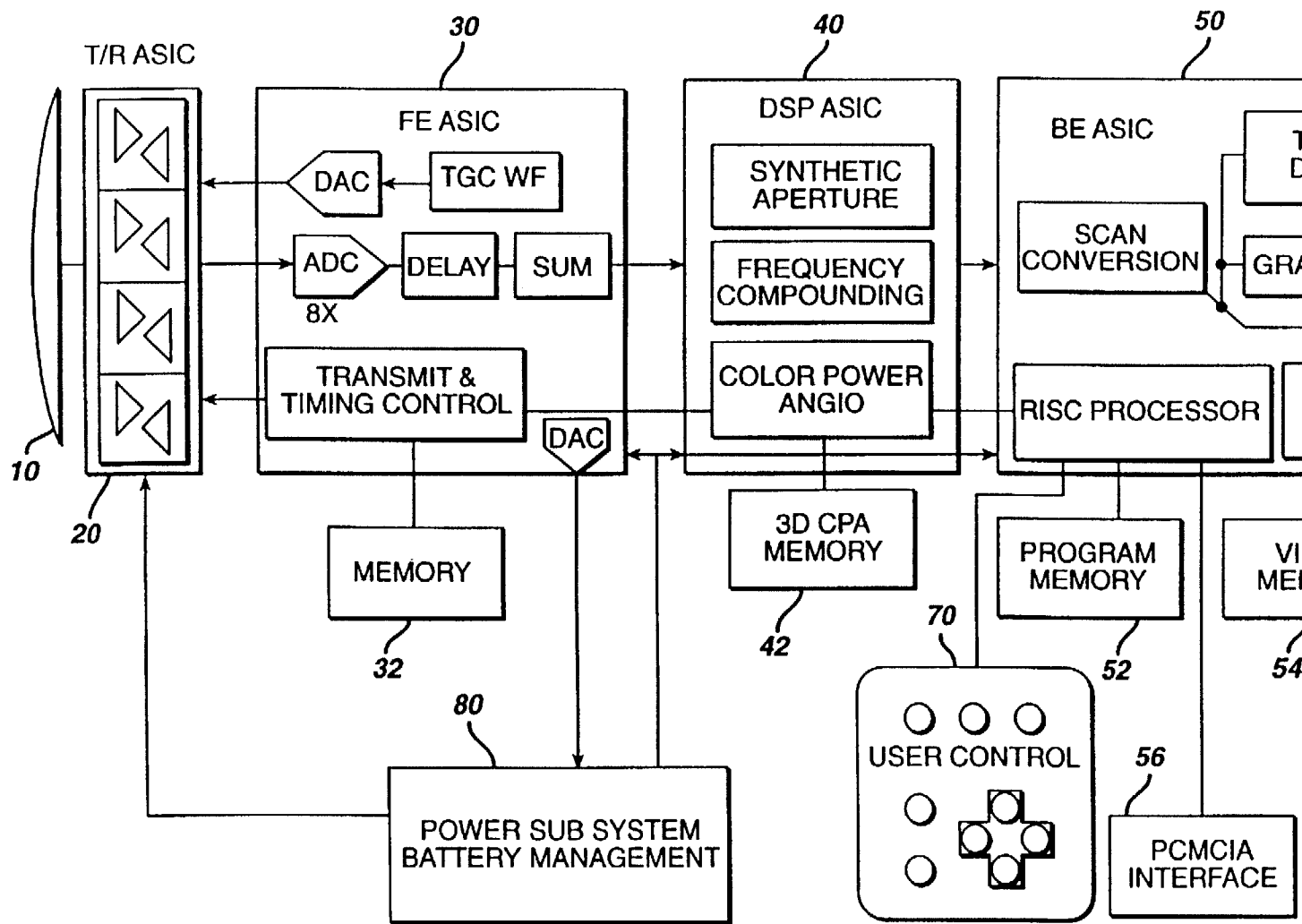


FIG. 2a

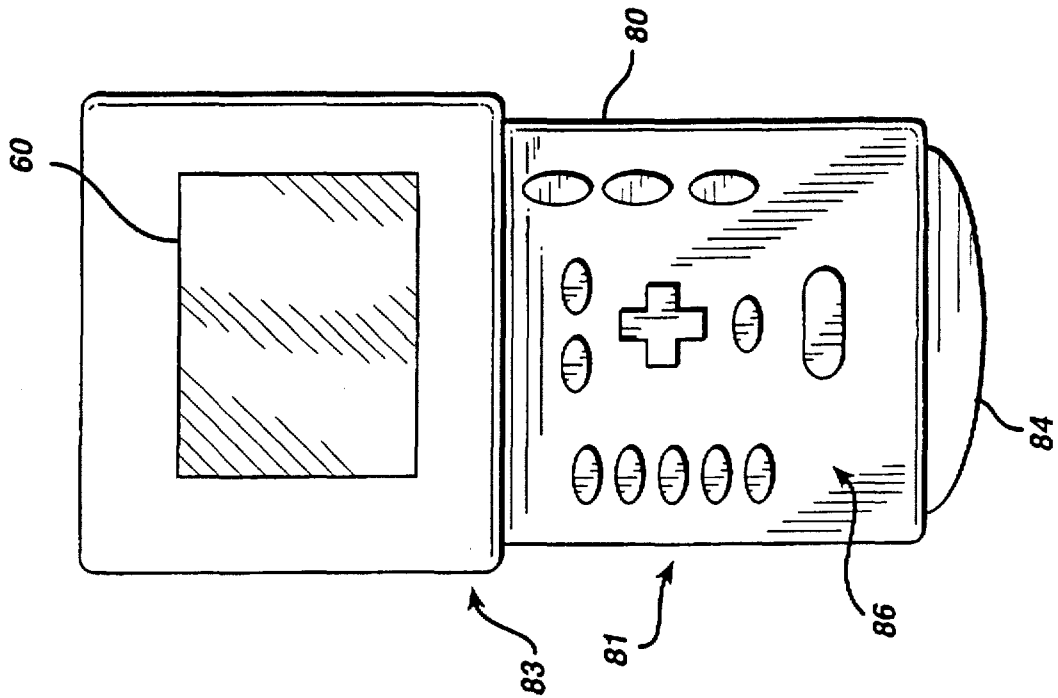


FIG. 2b

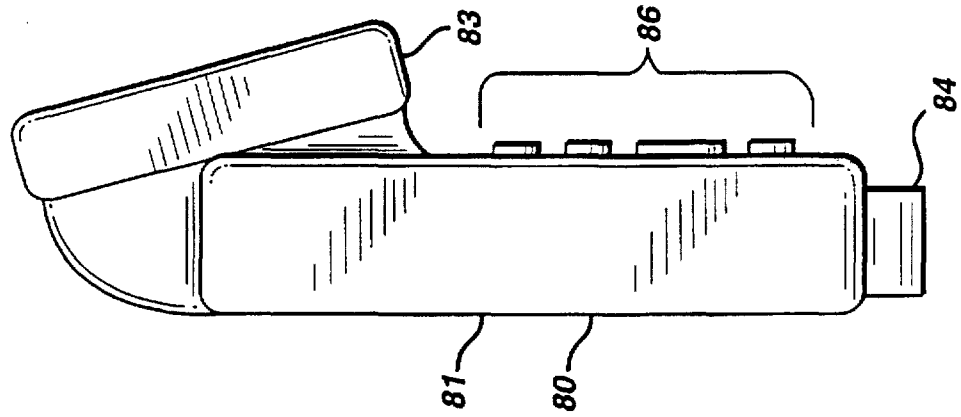


FIG.4

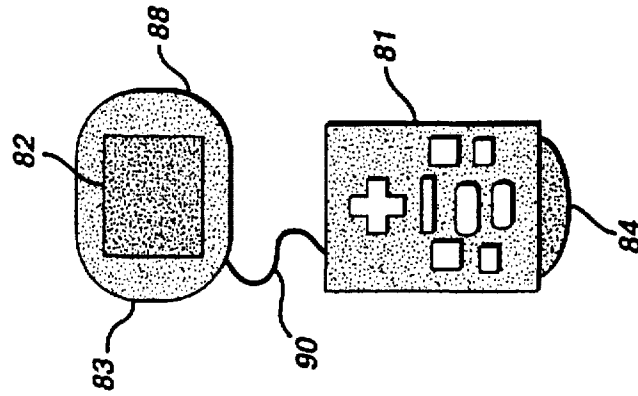


FIG.3b

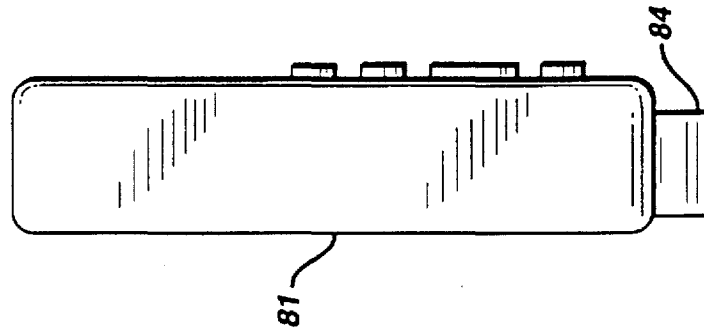


FIG.3a

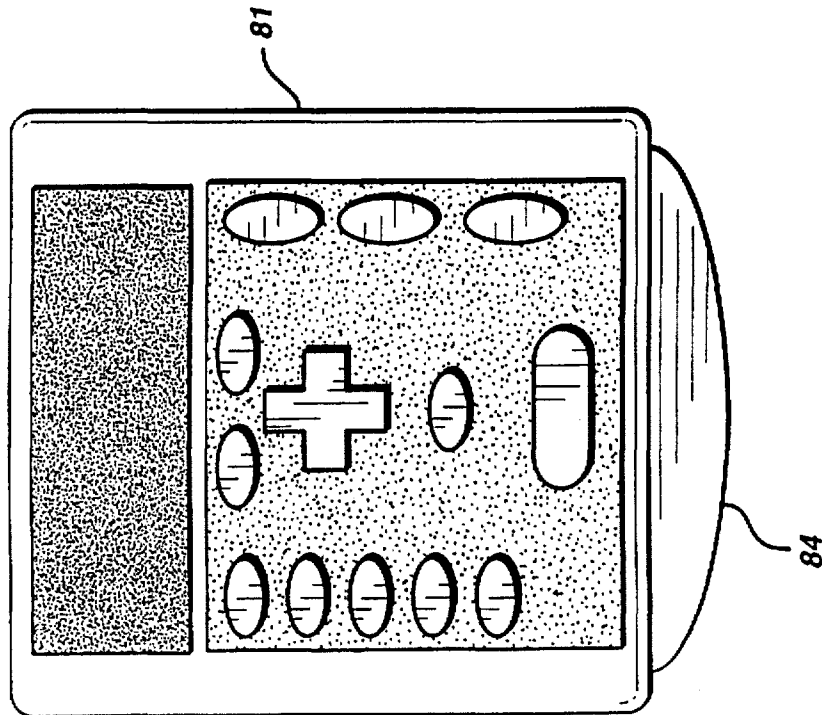
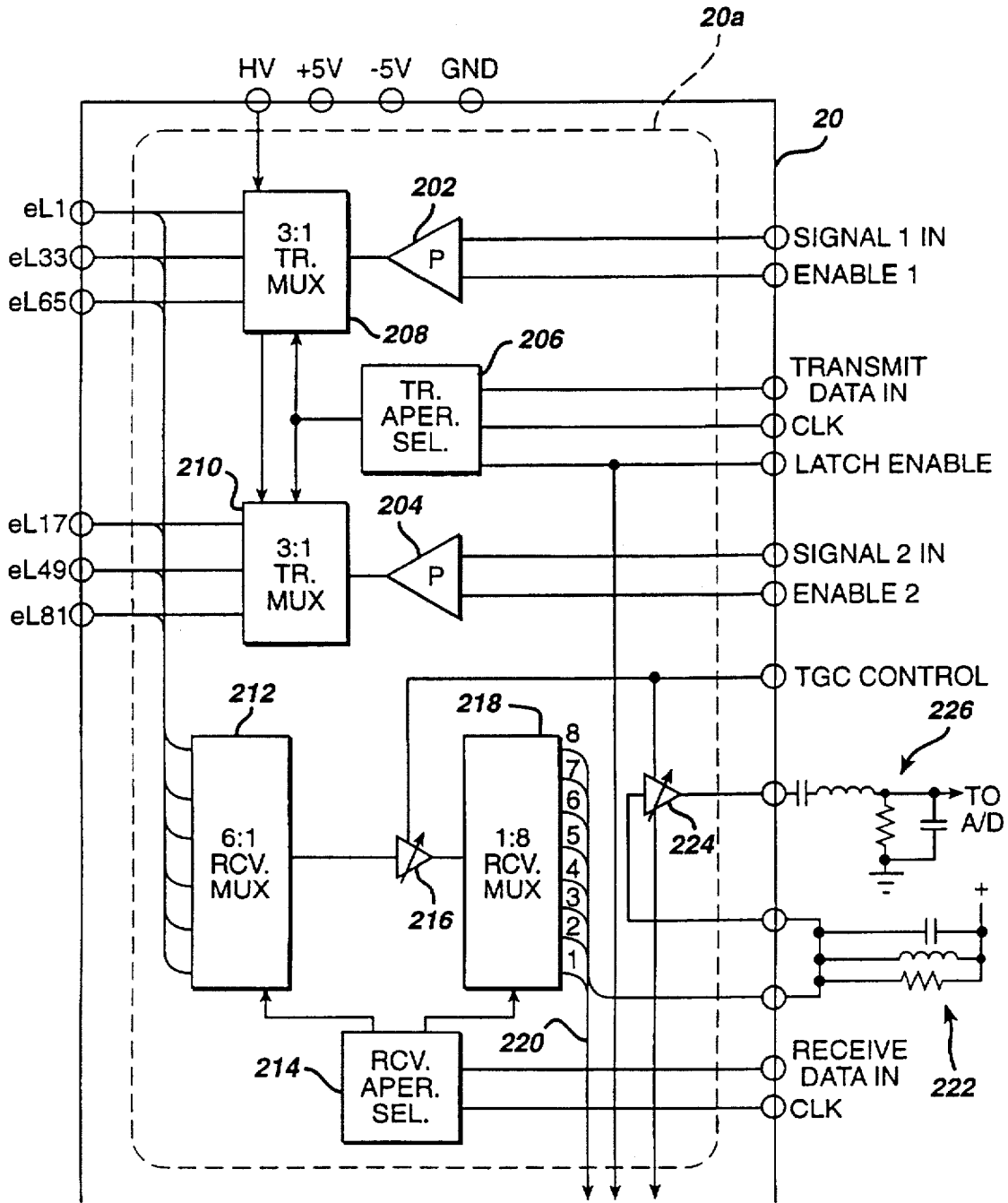


FIG. 5



# 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.