

- [54] **METHOD OF MONITORING BODY MOVEMENTS USING ACTIVITY MONITORING APPARATUS**
- [75] Inventor: **Robert W. Conlan**, Niceville, Fla.
- [73] Assignee: **Precision Control Design, Inc.**, Fort Walton Beach, Fla.
- [\*] Notice: The portion of the term of this patent subsequent to Jun. 17, 2011, has been disclaimed.

- [21] Appl. No.: **479,822**
- [22] Filed: **Jun. 7, 1995**

**Related U.S. Application Data**

- [63] Continuation of Ser. No. 341,316, Nov. 16, 1994, abandoned, which is a continuation of Ser. No. 38,629, Mar. 29, 1993, abandoned, which is a continuation of Ser. No. 716,853, Jun. 17, 1991, Pat. No. 5,197,489.
- [51] **Int. Cl.<sup>6</sup>** ..... **A61B 5/103**
- [52] **U.S. Cl.** ..... **128/782**
- [58] **Field of Search** ..... 128/782, 774, 128/721, 722, 670, 671, 687, 713, 714; 340/573

**References Cited**

**U.S. PATENT DOCUMENTS**

|           |         |                   |            |
|-----------|---------|-------------------|------------|
| 3,807,388 | 4/1974  | Orr et al.        | 128/690    |
| 4,088,139 | 5/1978  | Auerbach          | 128/419 PT |
| 4,117,834 | 10/1978 | McPartland et al. | 128/782    |
| 4,202,350 | 5/1980  | Walton            | 128/690    |
| 4,353,375 | 10/1982 | Colbrun et al.    | 128/782    |
| 4,425,921 | 1/1984  | Fujisaki et al.   | 128/690    |
| 4,428,378 | 1/1984  | Anderson et al.   | 128/419 PG |
| 4,819,652 | 4/1989  | Micco             | 128/661.09 |
| 4,830,021 | 5/1989  | Thornton          | 128/707    |
| 4,945,916 | 8/1990  | Kretschmer et al. | 128/671    |
| 4,989,612 | 2/1991  | Fore              | 128/721    |

|           |         |             |             |
|-----------|---------|-------------|-------------|
| 5,010,887 | 4/1991  | Thormander  | 128/696     |
| 5,010,893 | 4/1991  | Sholder     | 128/782     |
| 5,025,791 | 6/1991  | Niwa        | 128/670     |
| 5,031,614 | 7/1991  | Alt         | 128/419 OPG |
| 5,036,856 | 8/1991  | Thornton    | 128/670     |
| 5,044,365 | 9/1991  | Webb et al. | 128/419 PG  |
| 5,074,303 | 12/1991 | Hauck       | 128/419 PG  |
| 5,197,489 | 3/1993  | Conlan      | 128/782     |

**OTHER PUBLICATIONS**

Experimental Prototype (AM-16) Block Diagram (date unknown).  
 Redmond, D. and Hegge, F., "Observations on the design and specification of a wrist-worn human activity monitoring system" Behavior Res. Methods, Instruments & Computer, (1985).

*Primary Examiner*—Guy V. Tucker  
*Attorney, Agent, or Firm*—Lockwood, Alex, Fitzgibbon & Cummings

**ABSTRACT**

[57] An activity monitor adapted to be worn on the non-dominant wrist of a subject includes a bimorphous beam motion sensor. The output signal of the sensor is amplified in an amplifier circuit having a selectable amplification factor, and filtered by highpass and lowpass filter circuits having individually selectable cut-off frequencies to obtain an analog signal for processing having a bandpass and amplitude characteristic corresponding to a particular body activity under observation. A control and processing circuit within the monitor includes a microprocessor which responds to either resident internal operating instructions or to externally supplied operating instructions, or to designated data signal parameters, to provide configuration control signals to the amplifier and filter circuits, and processing of the collected data, appropriate to the particular activity being monitored. The processed data is digitally stored in an internal memory for subsequent transfer through a data port to an associated computer for display or further processing.

**7 Claims, 8 Drawing Sheets**

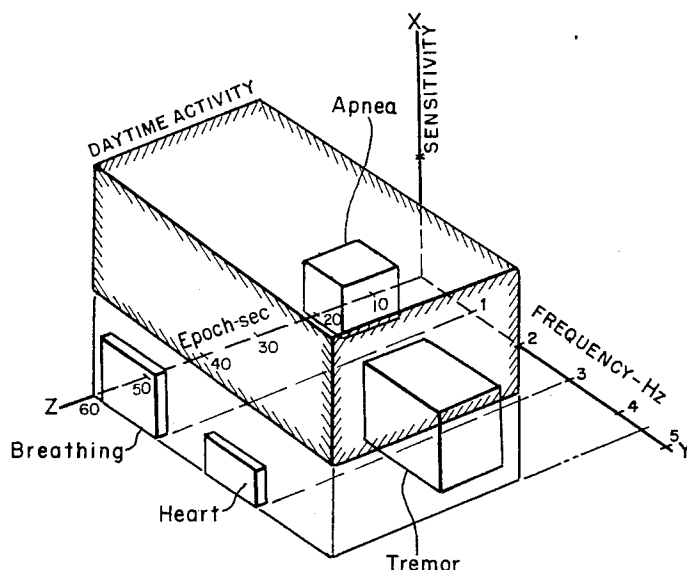


FIG. 1

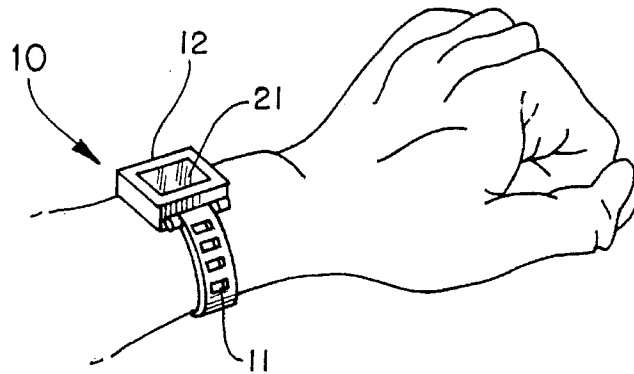


FIG. 2

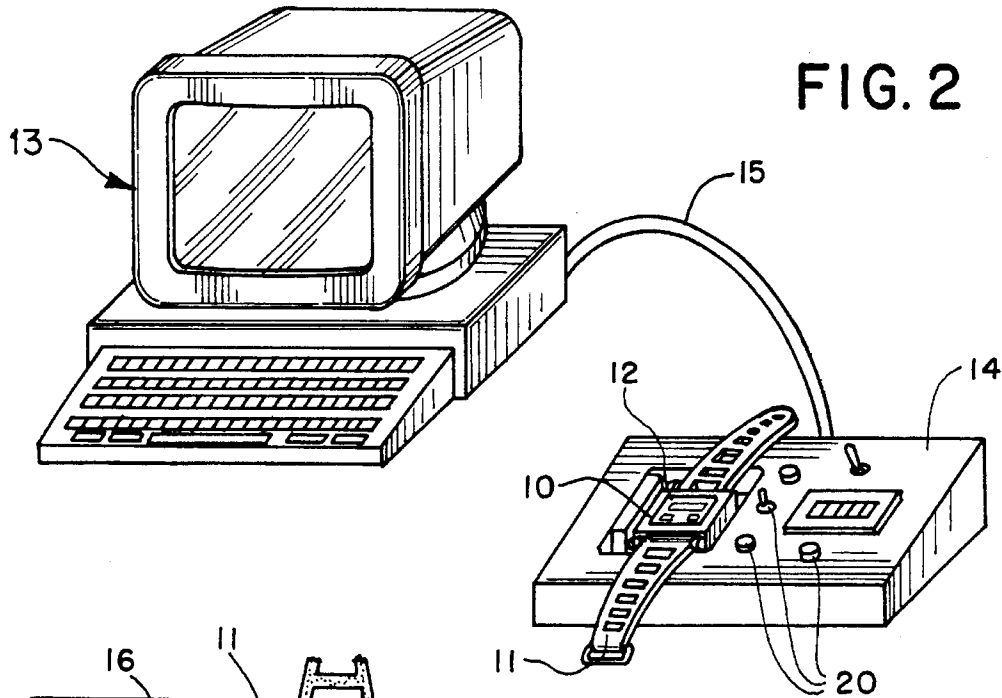


FIG. 3

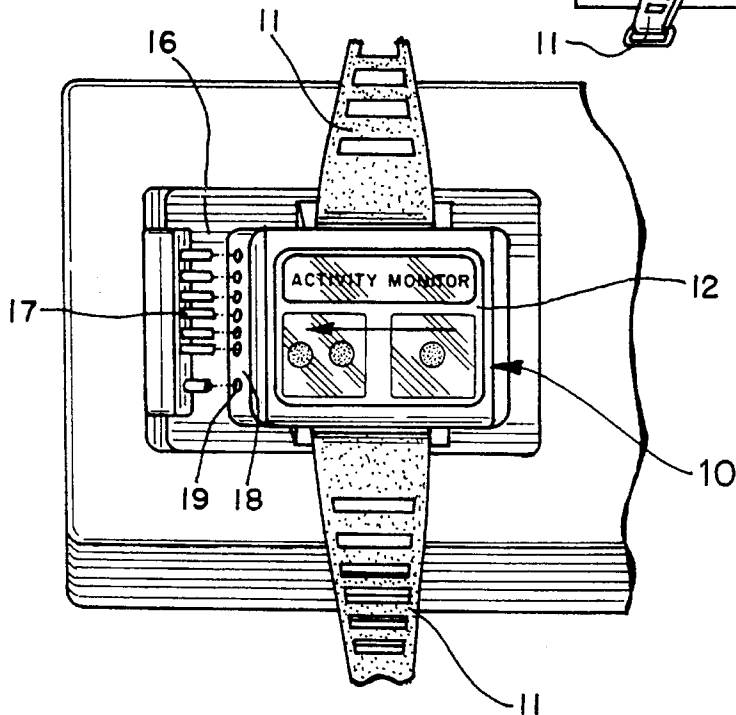


FIG. 4

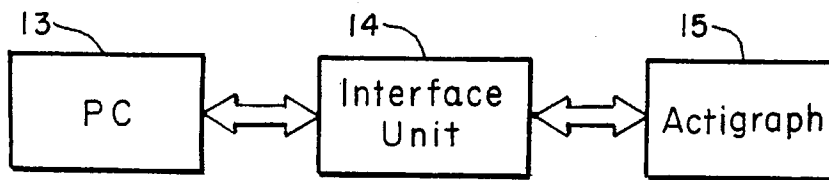


FIG. 5

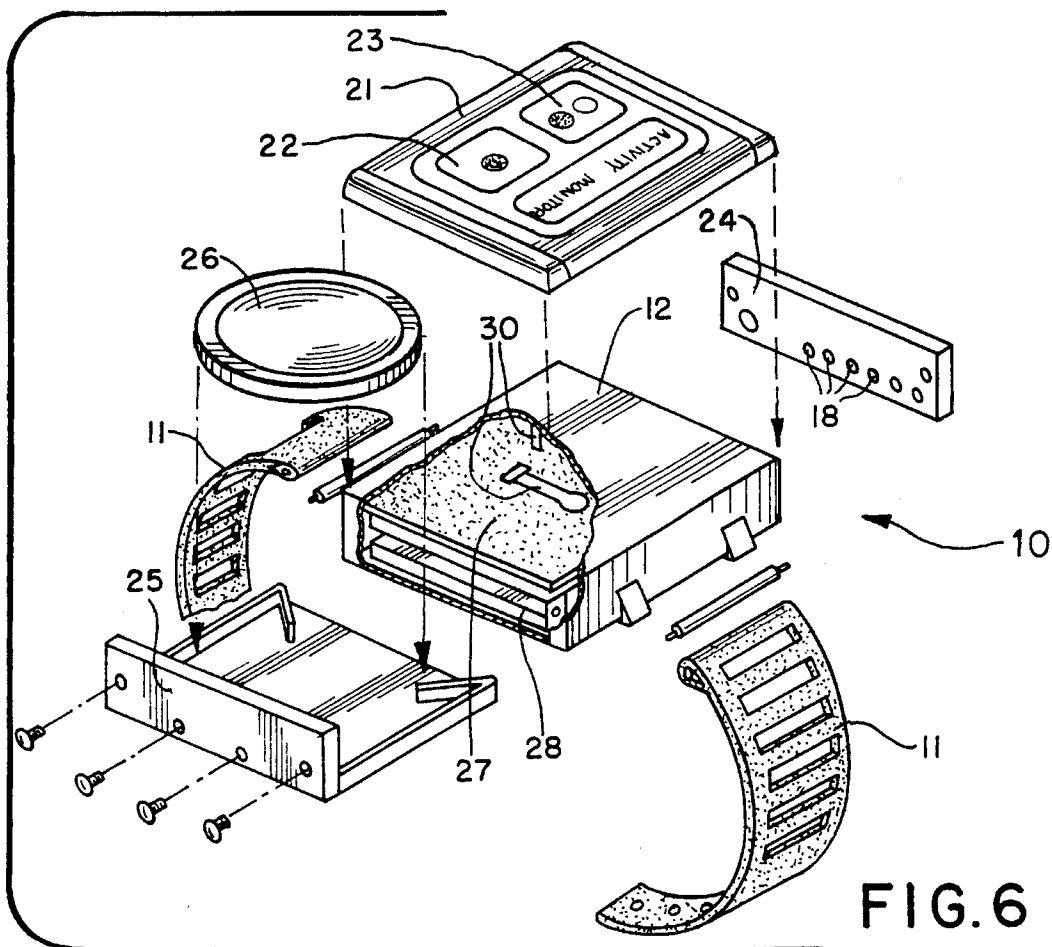
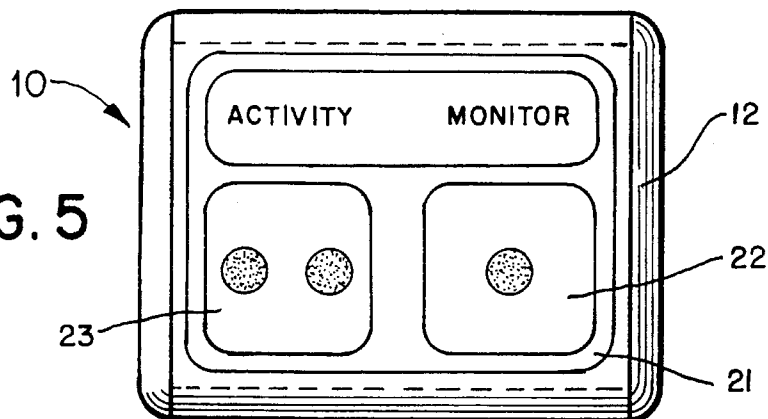


FIG. 6

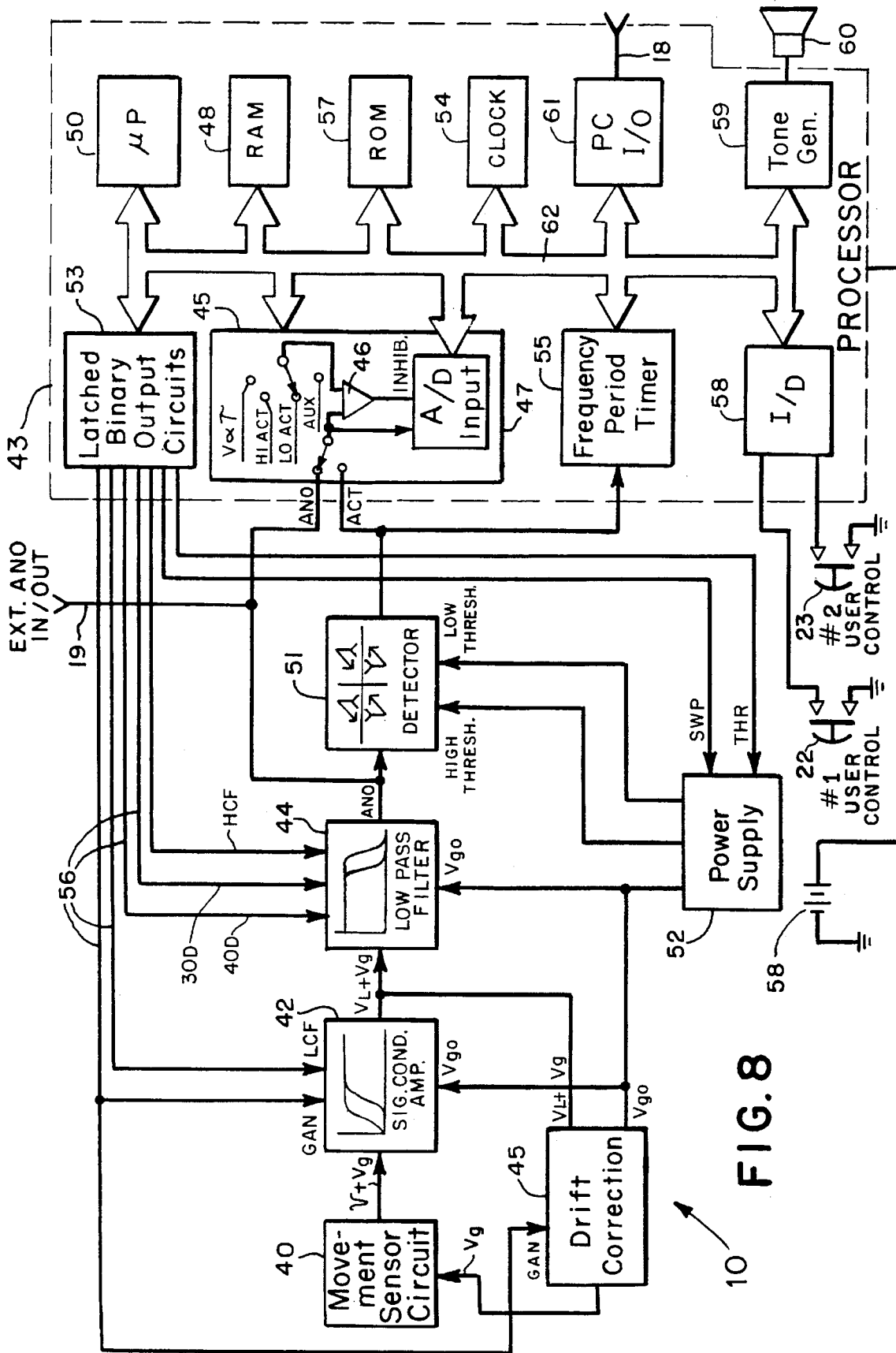


FIG. 8

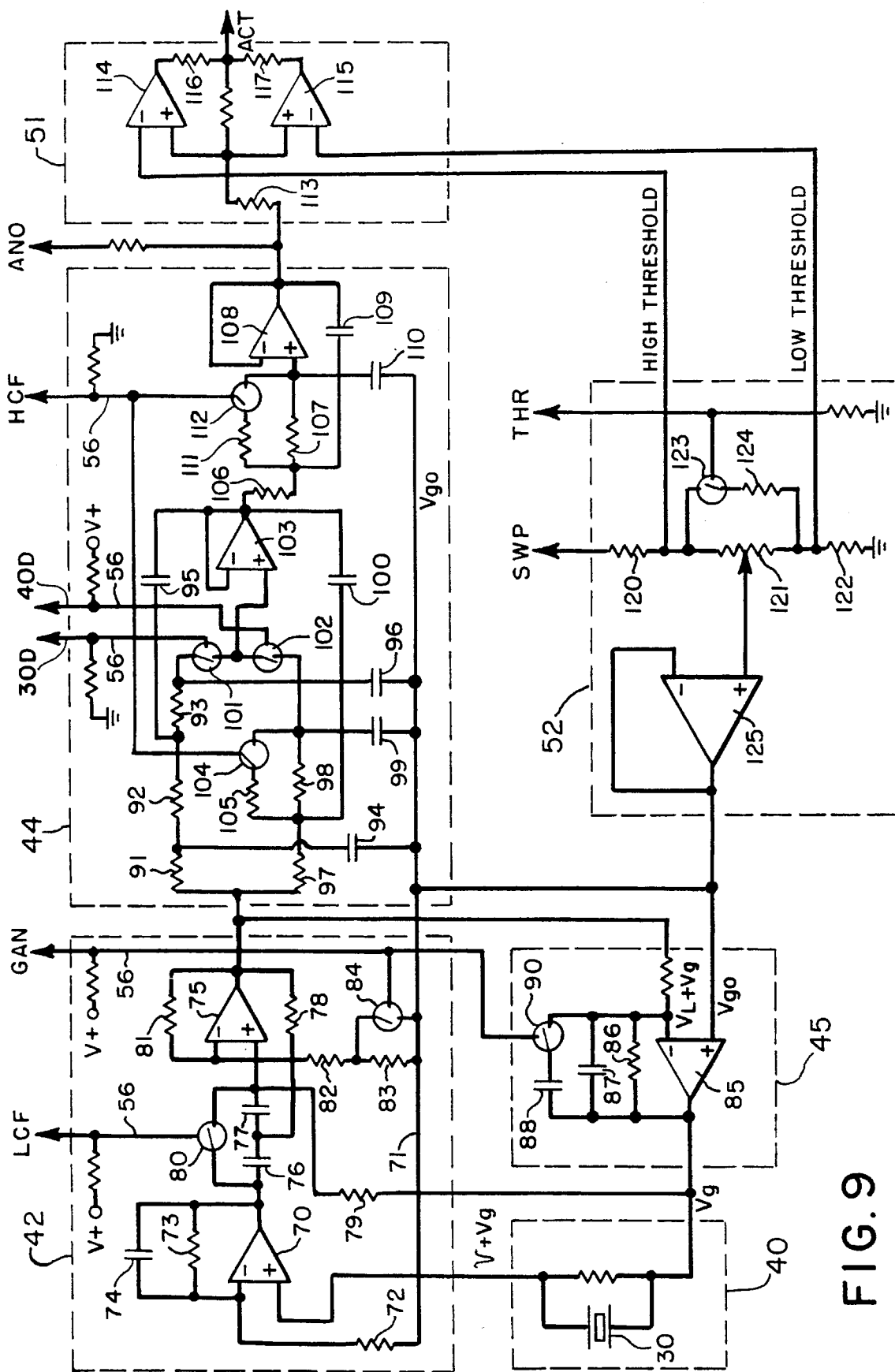


FIG. 9

# 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.