



US006580086B1

(12) **United States Patent**  
**Schulz et al.**

(10) **Patent No.:** **US 6,580,086 B1**  
(45) **Date of Patent:** **Jun. 17, 2003**

(54) **SHIELDED OPTICAL PROBE AND METHOD**

JP 11053662 2/1999  
JP 11185193 7/1999  
WO 97/23159 7/1997

(75) Inventors: **Christian E. Schulz**, Rancho Santa Margarita; **Eugene E. Mason**, La Mirada; **Ammar Al Ali**, Tustin, all of CA (US)

**OTHER PUBLICATIONS**

“Pulse Oximeter 3 and 3i,” Minolta, <http://www.minoltausa.com/eprise/main/MinoltaUSA/MUSAContent/ISD/DetailPage?canam>, 1 page downloaded and printed from the World Wide Web on Aug. 7, 2002.

“PULSOX Sensors,” Minolta, <http://www.pulsoxminolta.ch/probes.htm>, 4 pages downloaded and printed from the World Wide Web on Aug. 7, 2002.

(73) Assignee: **Masimo Corporation**, Irvine, CA (US)

(\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

\* cited by examiner

(21) Appl. No.: **09/420,544**

(22) Filed: **Oct. 19, 1999**

*Primary Examiner*—Que T. Le

(74) *Attorney, Agent, or Firm*—Knobbe, Martens, Olson & Bear, LLP

**Related U.S. Application Data**

(60) Provisional application No. 60/150,922, filed on Aug. 26, 1999.

(51) **Int. Cl.<sup>7</sup>** ..... **G06K 15/00**

(52) **U.S. Cl.** ..... **250/557**; 250/461.2; 128/633

(58) **Field of Search** ..... 250/557, 227.14, 250/221, 214.1, 573, 461.2, 338.5, 239; 356/41, 39; 128/633, 665–667

(57) **ABSTRACT**

An optical probe, which is particularly suited for use in measurements on tissue material of a patient. In one embodiment, the probe comprises upper and lower housing elements incorporating a light energy source and corresponding detector. The tissue material of the patient is disposed between the upper and lower housing elements such that the light energy emitted by the source passes through the tissue material to the detector. A plurality of light shields are attached to one or both of the housing elements to reduce the amount of ambient and reflected light reaching the detector. Additionally, various portions of the upper and lower housing elements and shields utilize light absorbent coloration and/or coatings which further mitigate the effects of undesired ambient and reflected light, thereby reducing noise generated within the instrument and increasing its accuracy. In one embodiment, the light shields are made removable from the optical probe, thereby facilitating replacement. A circuit for monitoring the condition of the probe, and indicating when replacement of the probe is desirable, is also disclosed.

(56) **References Cited**

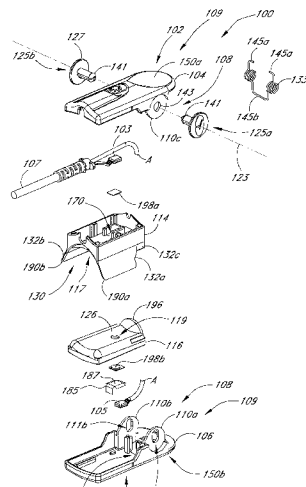
**U.S. PATENT DOCUMENTS**

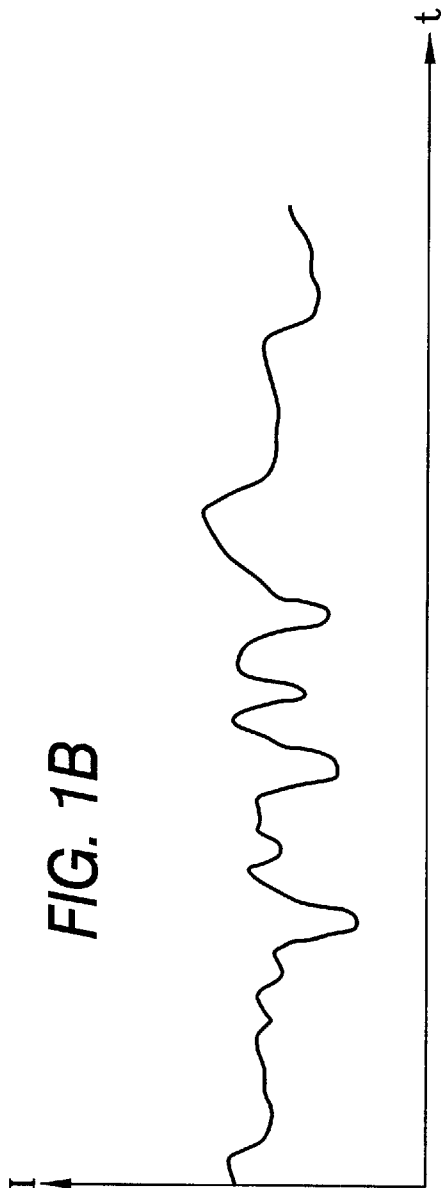
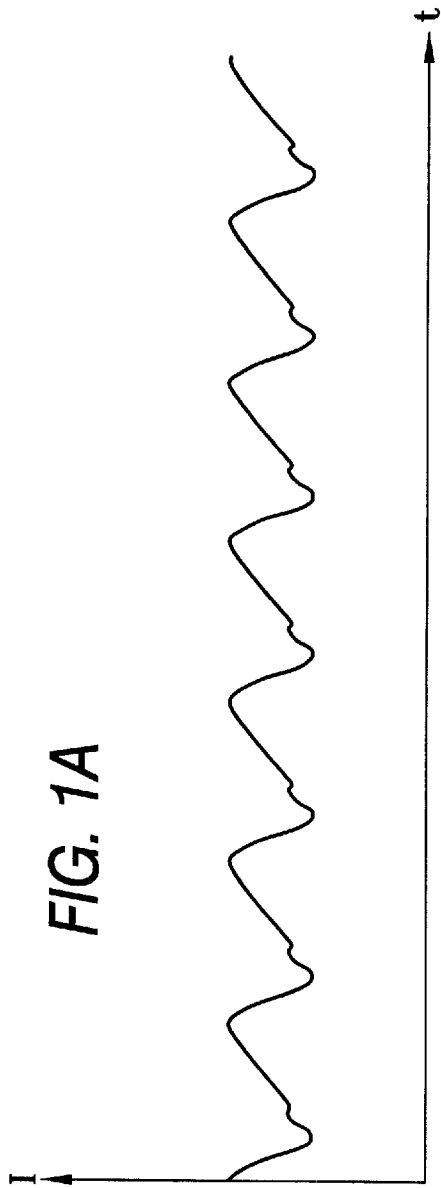
4,685,464 A	8/1987	Goldberger et al.	128/633
5,247,931 A	9/1993	Norwood	128/633
5,313,940 A	5/1994	Fuse et al.	128/633
5,438,986 A	8/1995	Disch et al.	128/633
5,490,523 A *	2/1996	Isaacson et al.	128/633
5,939,609 A	8/1999	Knapp et al.	73/1.01

**FOREIGN PATENT DOCUMENTS**

EP	262 779	4/1988
EP	481 612	10/1990
EP	745 348	12/1996
EP	0 832 598 A2	4/1998
JP	02017462	1/1990
JP	10314149	12/1998

**36 Claims, 11 Drawing Sheets**







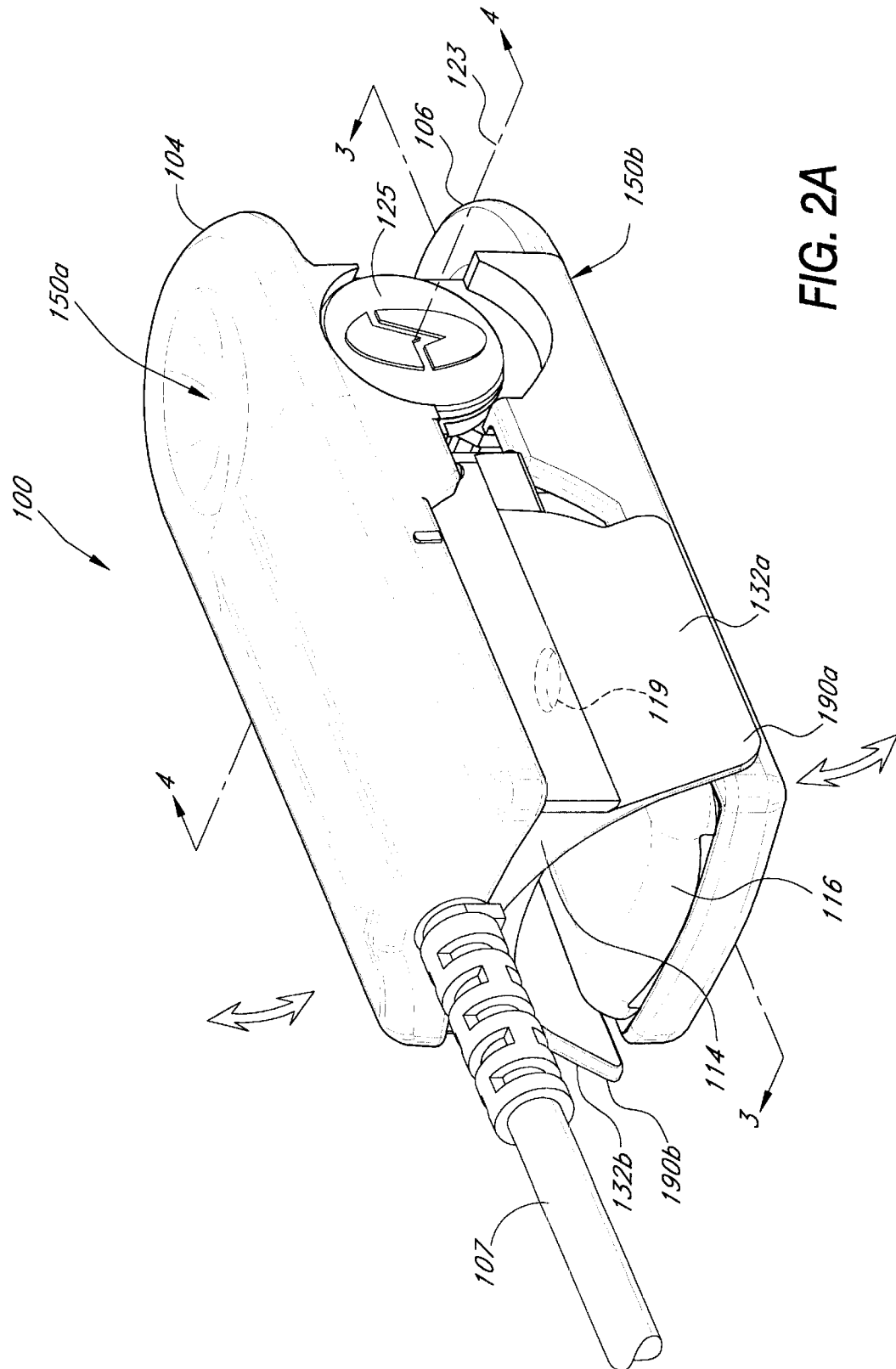


FIG. 2A

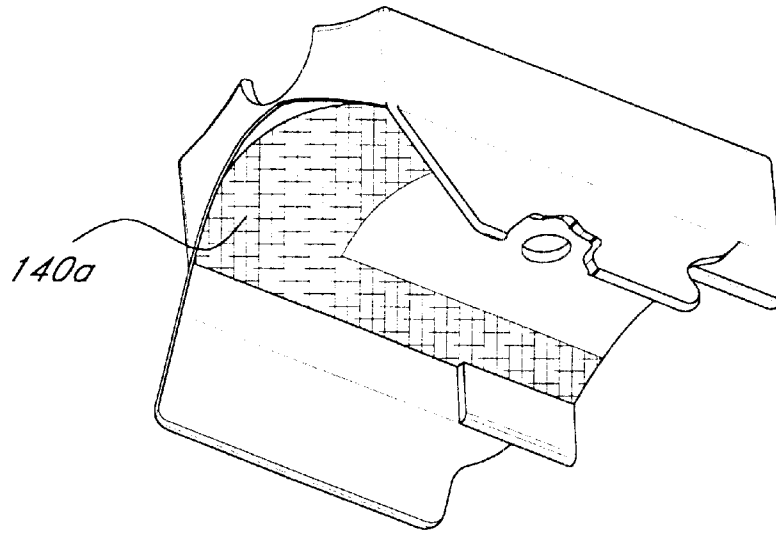


FIG. 2B

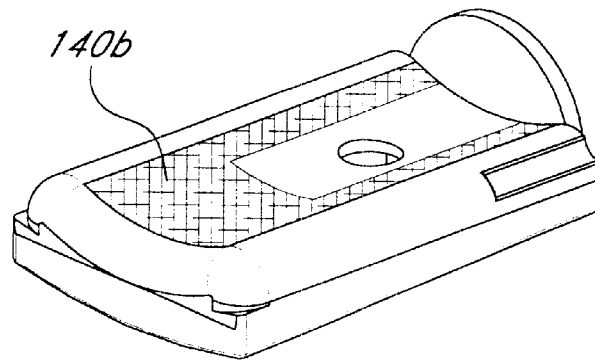


FIG. 2C

# 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.