



(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2002/0013537 A1**  
**Rock** (43) **Pub. Date: Jan. 31, 2002**

(54) **IMPEDANCE SPECTROSCOPY SYSTEM AND CATHETER FOR ISCHEMIC MUCOSAL DAMAGE MONITORING IN HOLLOW VISCOUS ORGANS**

(52) **U.S. Cl.** ..... **600/547; 600/372**

(57) **ABSTRACT**

(76) **Inventor: Emilio Sacristan Rock, Santa Ursula Xitla (MX)**

**Correspondence Address:**  
**Commonwealth of Massachusetts**  
**171 Dwight Road**  
**Longmeadow, MA 01106-1700 (US)**

An impedance spectroscopy system for monitoring ischemic mucosal damage in hollow viscous organs comprises a sensor catheter and an impedance spectrometer for electrically driving the catheter to obtain a complex tissue impedance spectrum. Once the catheter is in place in one of a patient's hollow viscous organs, the impedance spectrometer obtains the complex impedance spectrum by causing two electrodes in the tip of the catheter to inject a current into the mucosal tissue at different frequencies, while two other electrodes measure the resulting voltages. A pattern recognition system is then used to analyze the complex impedance spectrum and to quantify the severity of the mucosal injury. Alternatively, the complex impedance spectrum can be appropriately plotted against the spectrum of normal tissue, allowing for a visual comparison by trained personnel.

(21) **Appl. No.: 09/907,781**

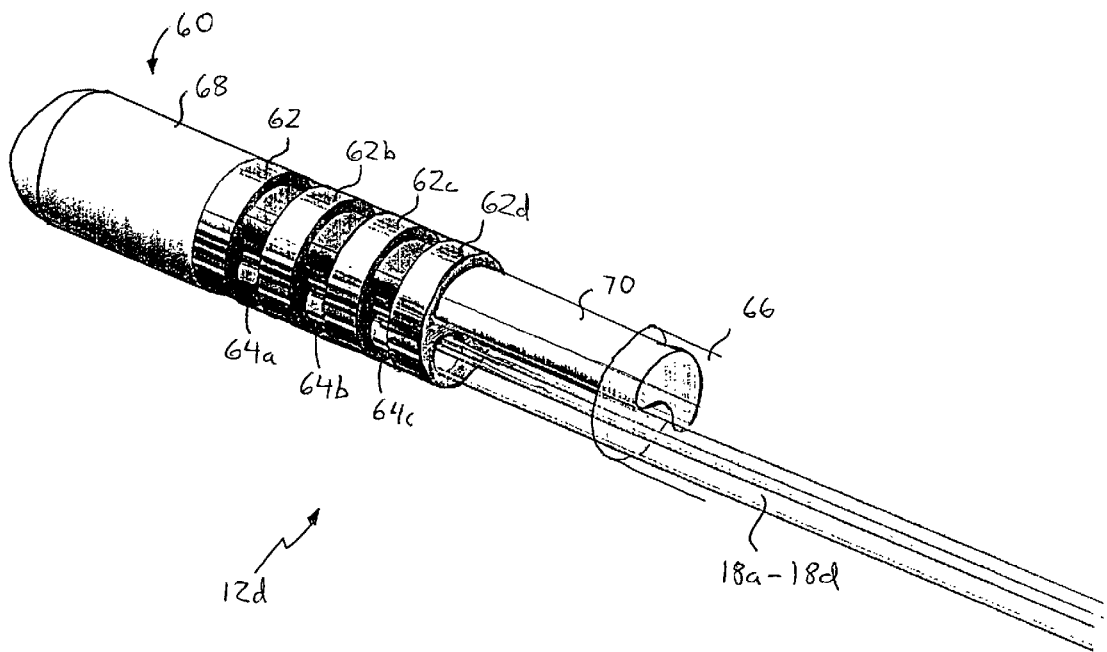
(22) **Filed: Jul. 18, 2001**

**Related U.S. Application Data**

(63) **Non-provisional of provisional application No. 60/219,281, filed on Jul. 19, 2000.**

**Publication Classification**

(51) **Int. Cl.<sup>7</sup> ..... A61B 5/05; A61B 5/04**



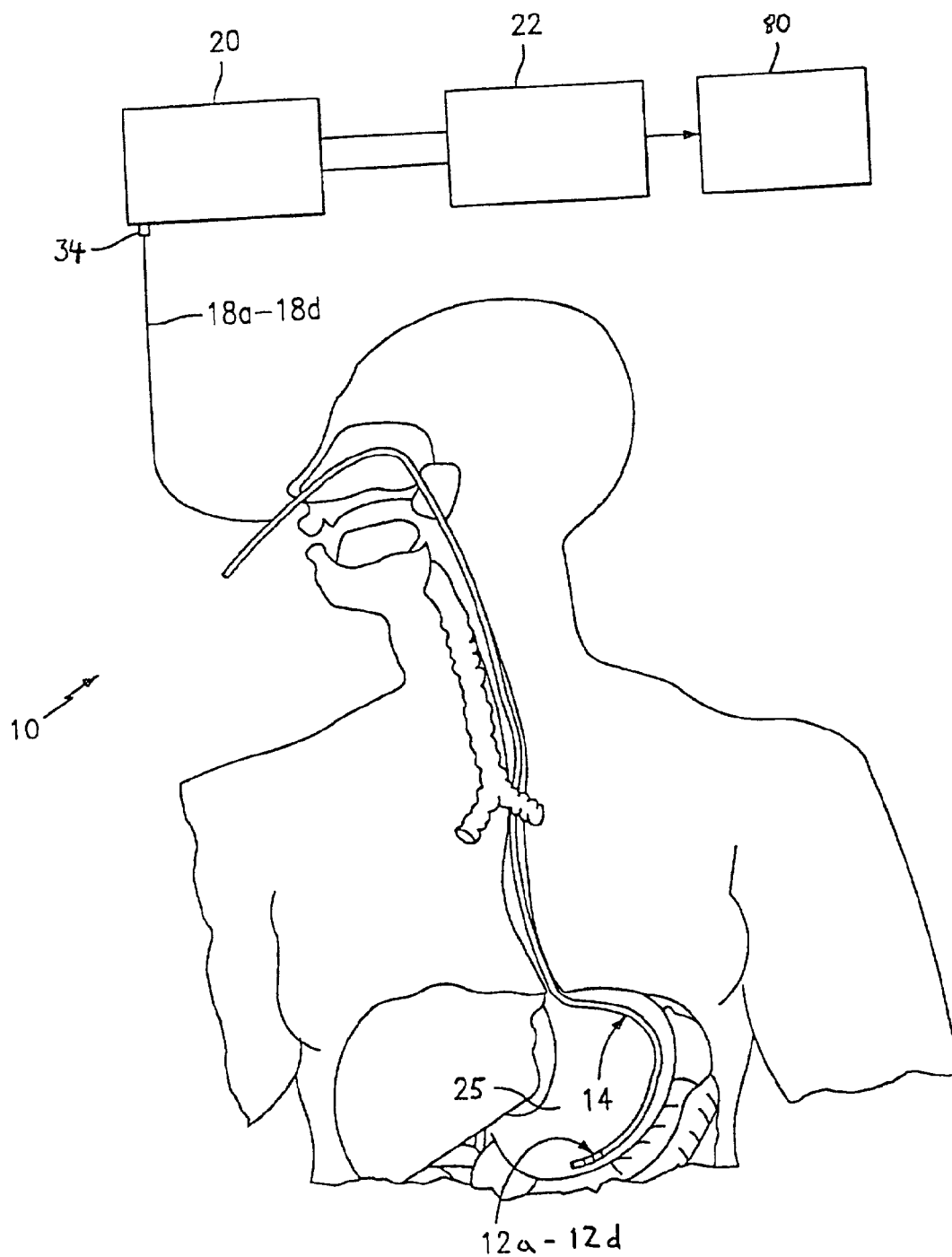


FIG. 1

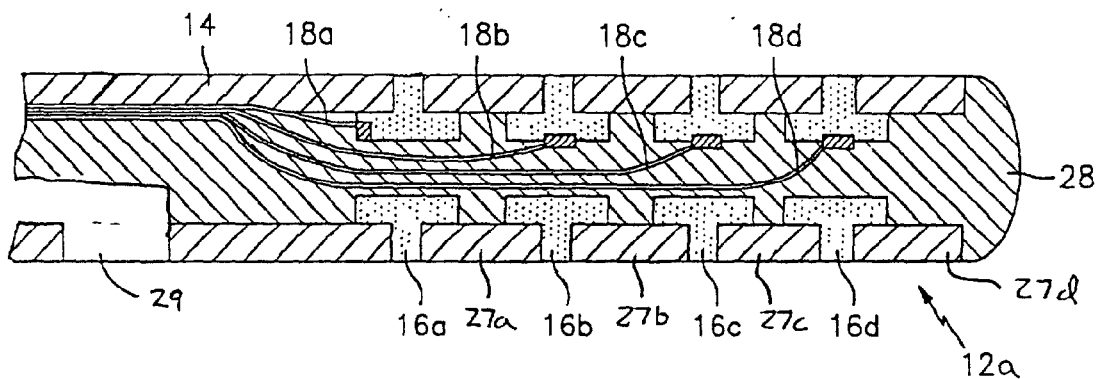


FIG. 2A

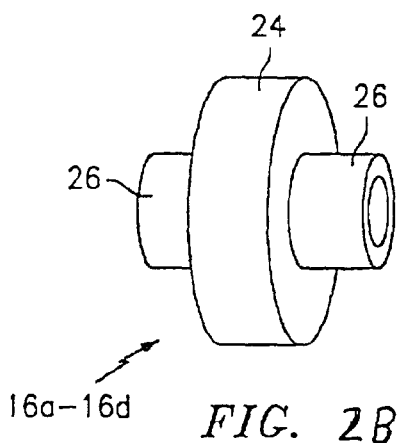


FIG. 2B

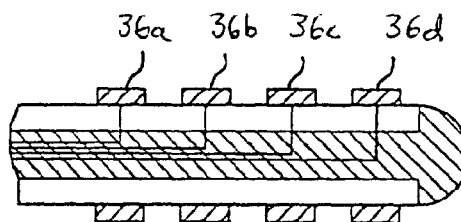


FIG. 3

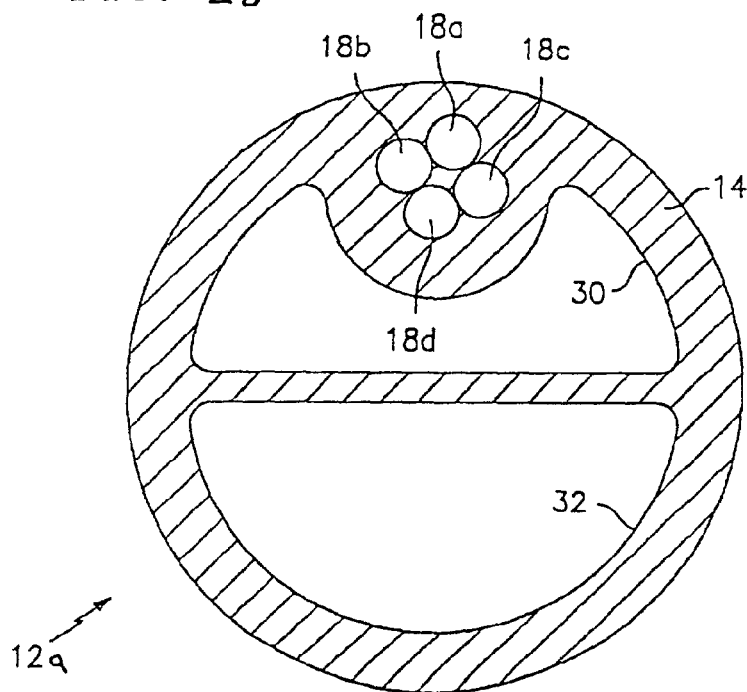


FIG. 2C

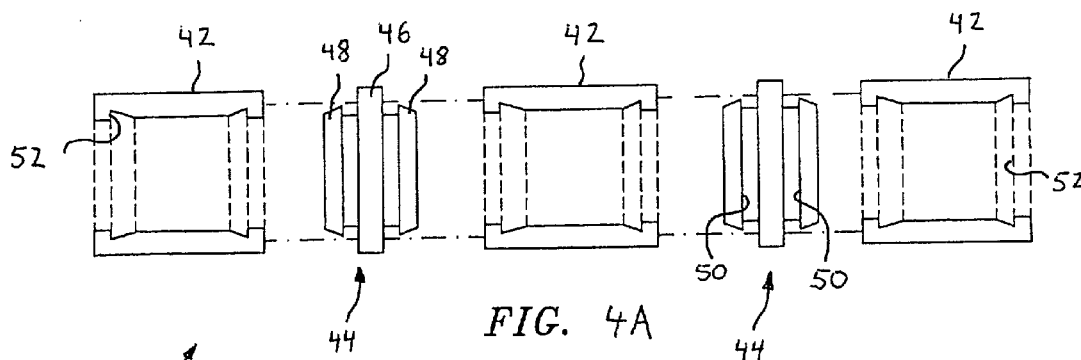


FIG. 4A

12c ↗

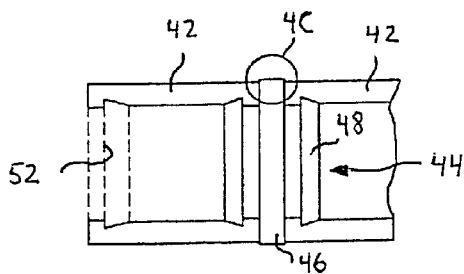


FIG. 4B

12c ↗

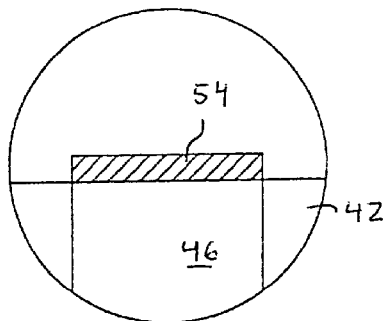


FIG. 4C

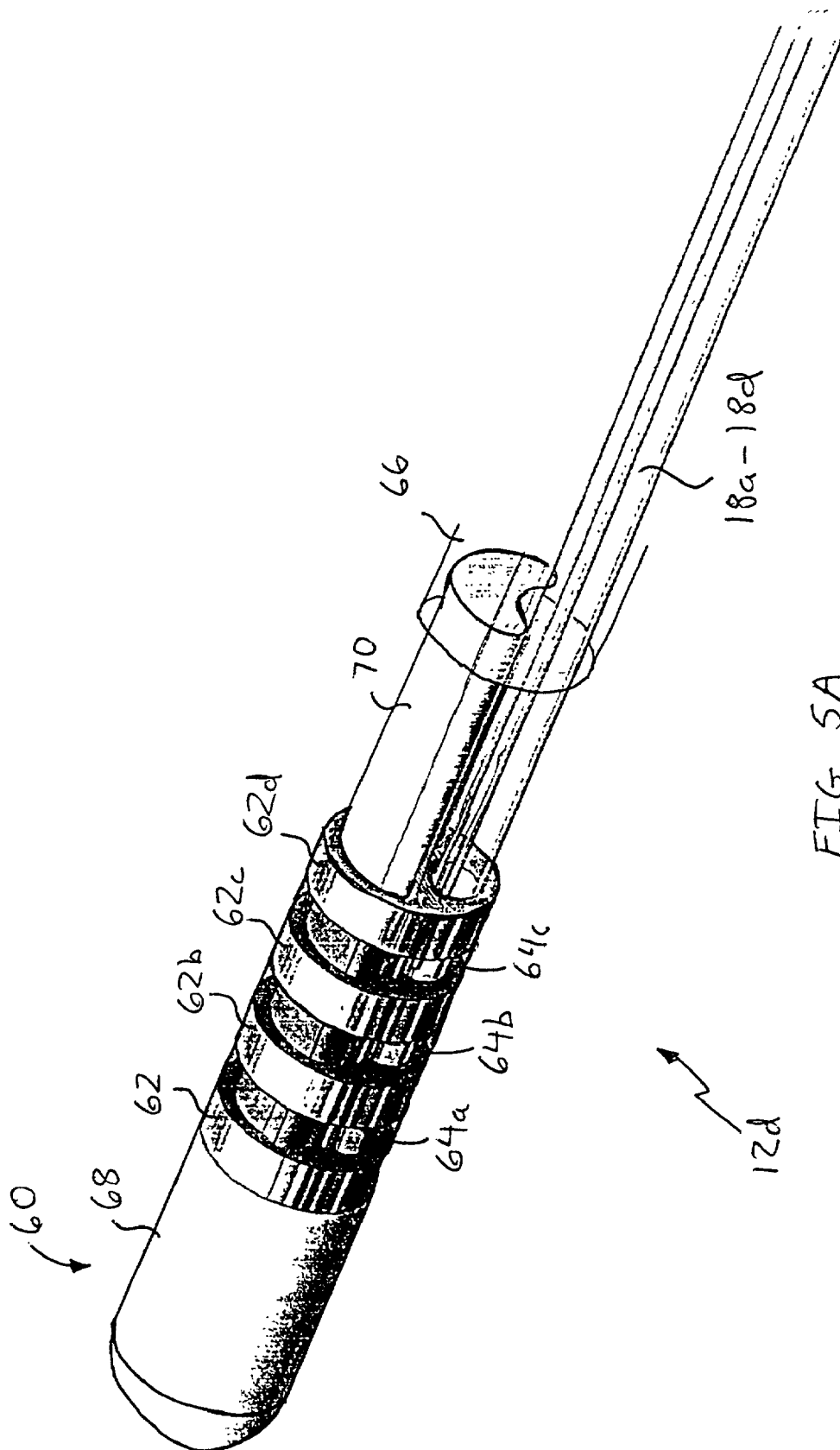


FIG. 5A

# 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.