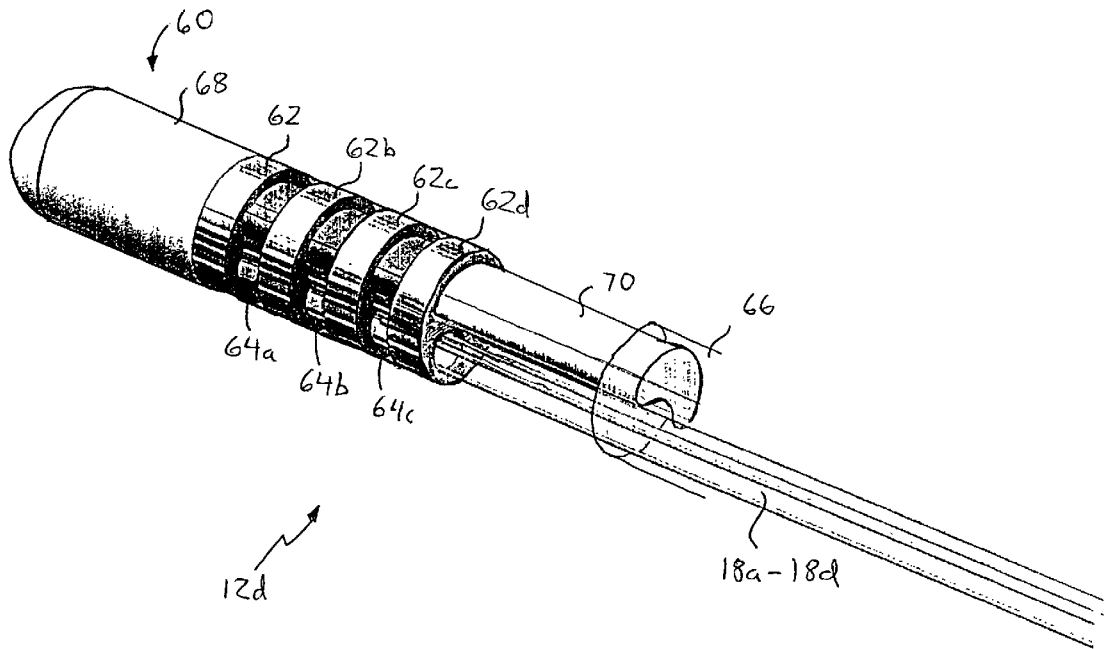


(19) **United States**(12) **Patent Application Publication**
Rock(10) **Pub. No.: US 2002/0013537 A1**(43) **Pub. Date: Jan. 31, 2002**(54) **IMPEDANCE SPECTROSCOPY SYSTEM
AND CATHETER FOR ISCHEMIC
MUCOSAL DAMAGE MONITORING IN
HOLLOW VISCOUS ORGANS**(52) **U.S. Cl. 600/547; 600/372**(57) **ABSTRACT**(76) **Inventor: Emilio Sacristan Rock, Santa Ursula
Xitla (MX)****Correspondence Address:**
Commonwealth of Massachusetts
171 Dwight Road
Longmeadow, MA 01106-1700 (US)(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.⁷ A61B 5/05; A61B 5/04**

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.



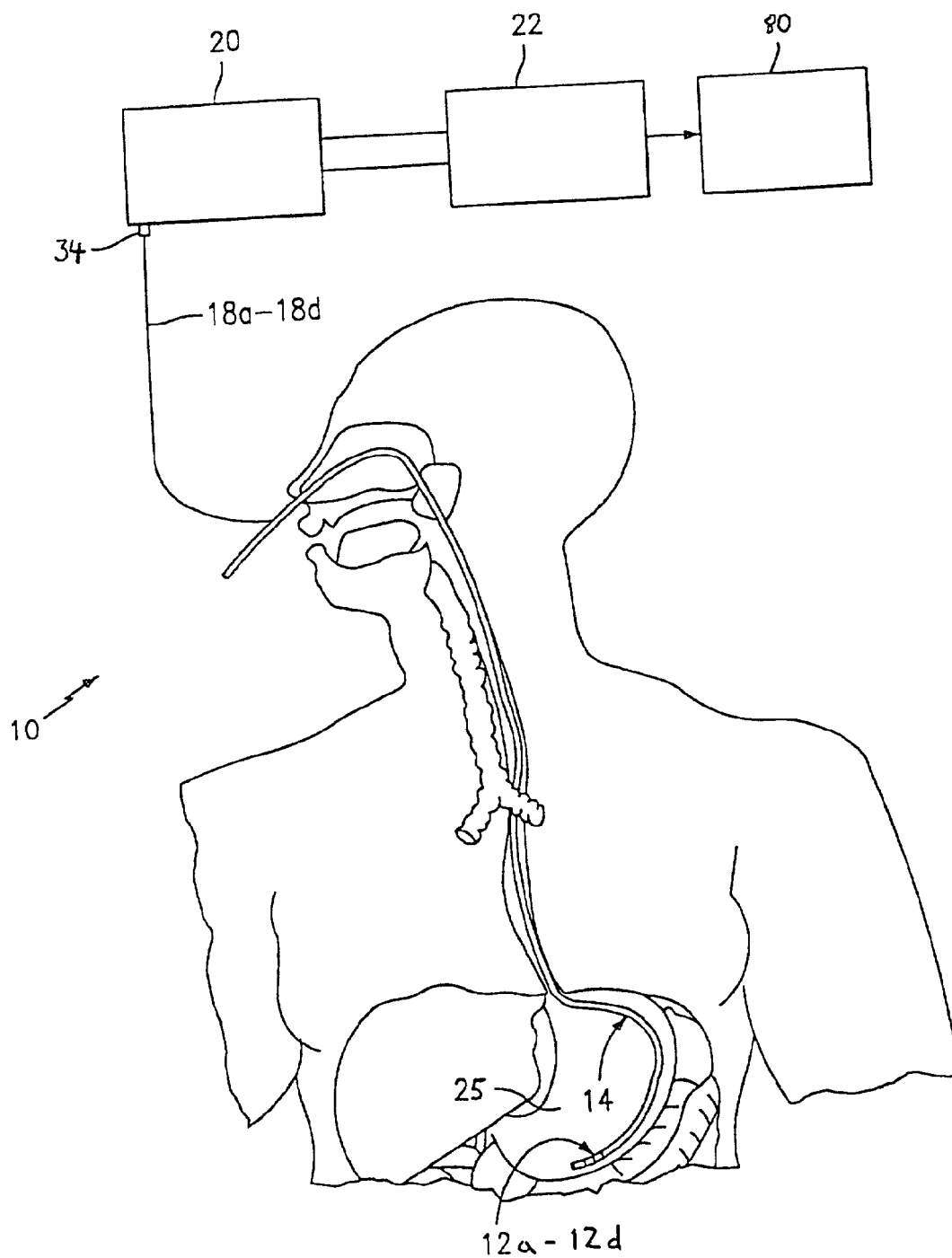


FIG. 1

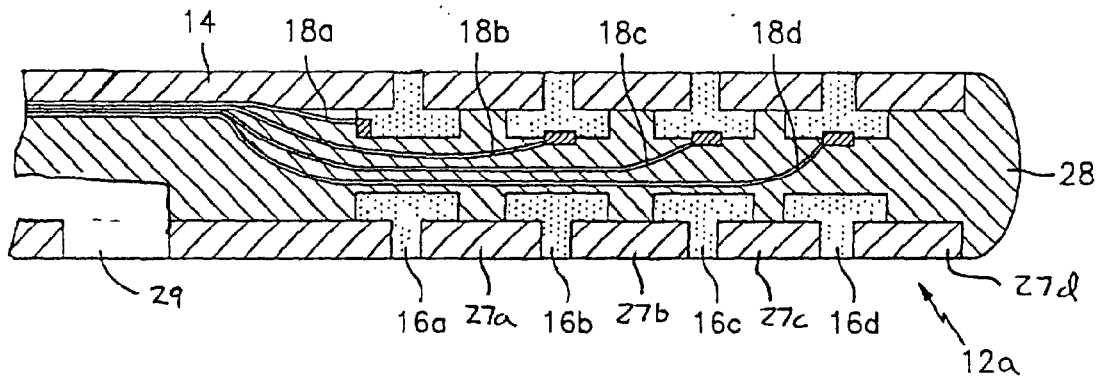


FIG. 2A

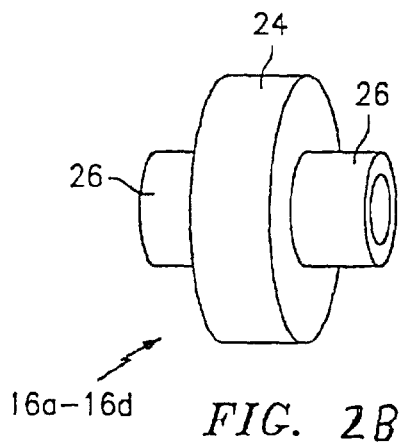


FIG. 2B

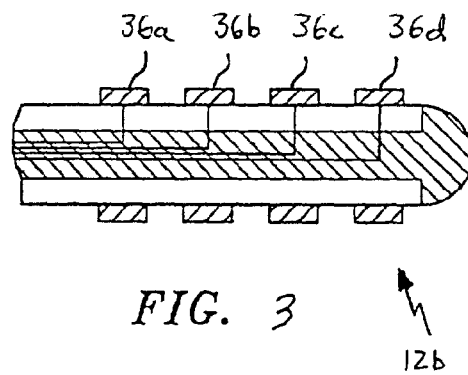


FIG. 3

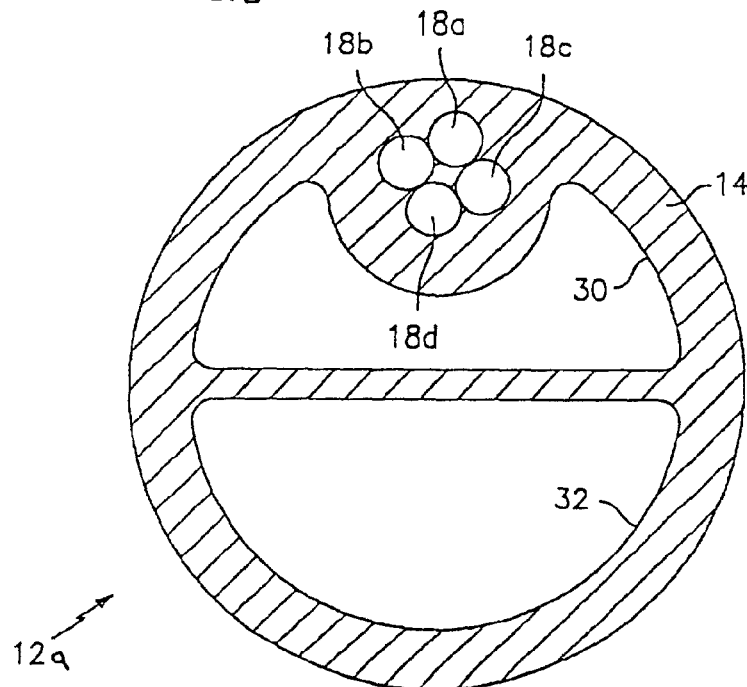
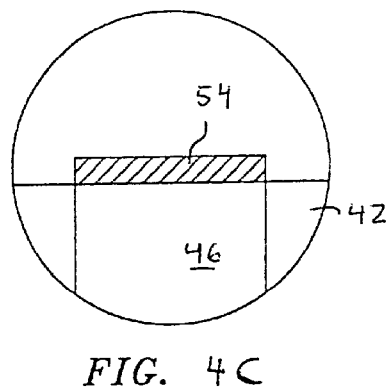
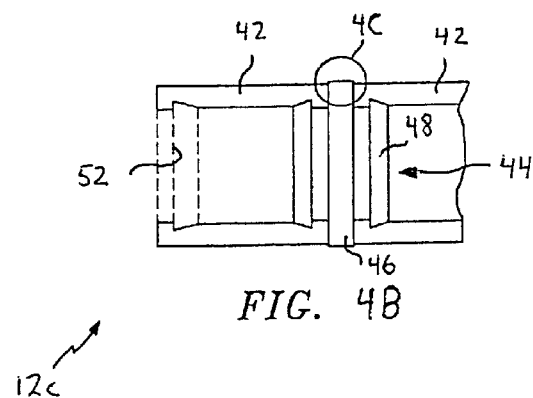
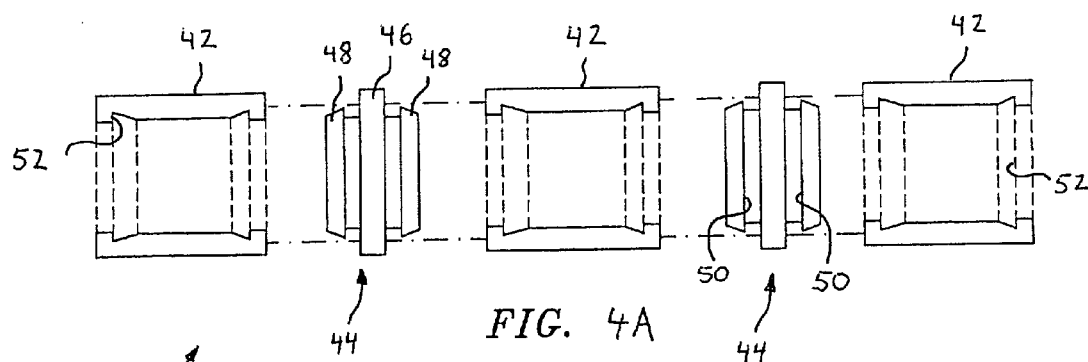


FIG. 2C



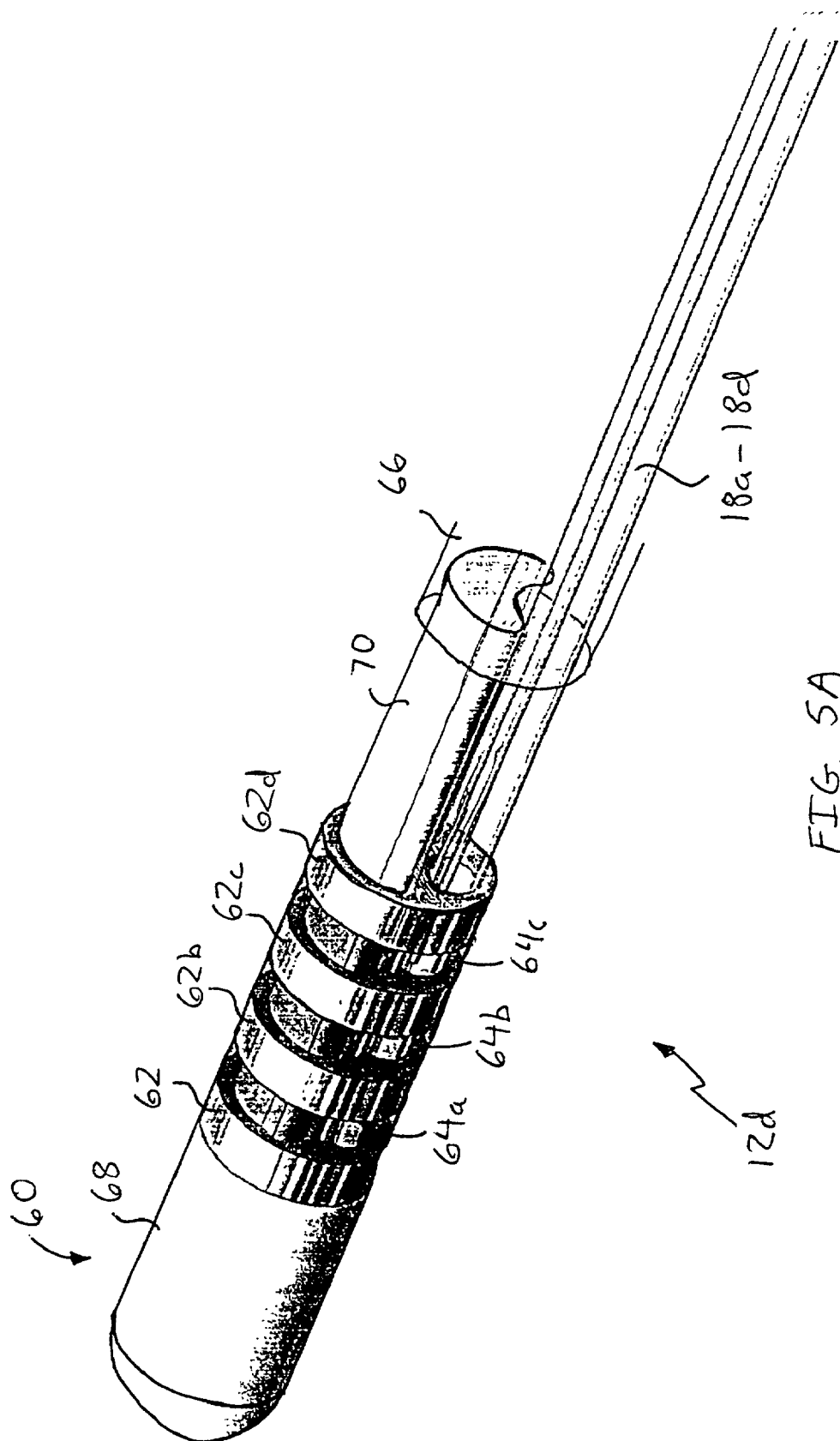


FIG. 5A

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