



US007894888B2

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

(10) **Patent No.:** **US 7,894,888 B2**
(45) **Date of Patent:** **Feb. 22, 2011**

(54) **DEVICE AND METHOD FOR MEASURING THREE-LEAD ECG IN A WRISTWATCH**

(75) Inventors: **Hsiao-Lung Chan**, Gueishan Township, Taoyuan County (TW); **Pei-Kuang Chao**, Gueishan Township, Taoyuan County (TW); **Jia-Chen Jheng**, Gueishan Township, Taoyuan County (TW)

(73) Assignee: **Chang Gung University**, Taoyuan County (TW)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 177 days.

(21) Appl. No.: **12/236,558**

(22) Filed: **Sep. 24, 2008**

(65) **Prior Publication Data**
US 2010/0076331 A1 Mar. 25, 2010

(51) **Int. Cl.**
A61B 5/04 (2006.01)

(52) **U.S. Cl.** **600/509**

(58) **Field of Classification Search** **600/301, 600/508, 509, 485, 595**

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,120,294 A *	10/1978	Wolfe	600/519
5,515,858 A *	5/1996	Myllymaki	600/301
5,613,495 A *	3/1997	Mills et al.	600/509
6,832,109 B2 *	12/2004	Nissila	600/509
7,171,259 B2 *	1/2007	Rytky	600/509
2008/0287751 A1 *	11/2008	Stivoric et al.	600/301

* cited by examiner

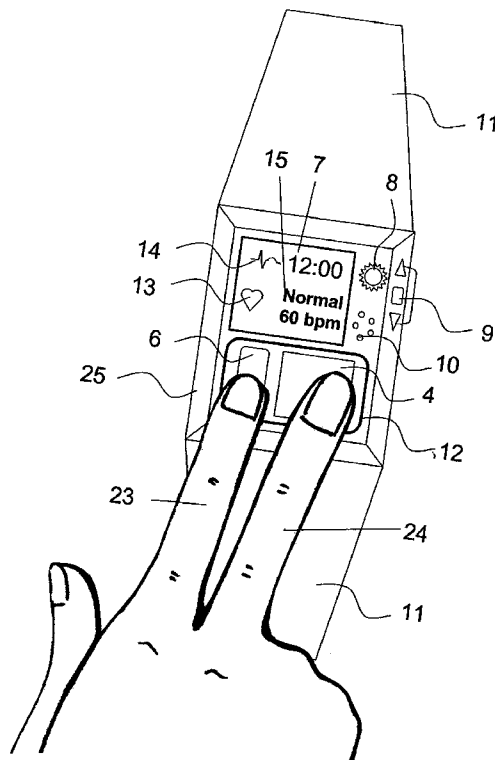
Primary Examiner—Carl H Layno

Assistant Examiner—Brian T Gedeon

(57) **ABSTRACT**

A wristwatch worn by a user for measuring a three-lead ECG includes three electrodes placed separately on the front, either side, and back or strap thereof. The wristwatch further includes an electrode panel having the electrode on the front or either side of the watch, sensing elements, pressure, infrared or impedance detectors, and circuits. The electrode panel is capable of sensing the contact or press of fingers to trigger the ECG measuring. While the electrode in the back-side of the watch contacts the hand wearing the watch, the electrode and electrode panel on the front or either side of the watch are pressed by fingers from the other hand, and the electrode in the strap contacts the abdomen or left leg simultaneously. Thus, a three-lead ECG can be measured. ECG data can be transmitted to a personal or hospital computer by wireless networks or flash memory.

19 Claims, 14 Drawing Sheets



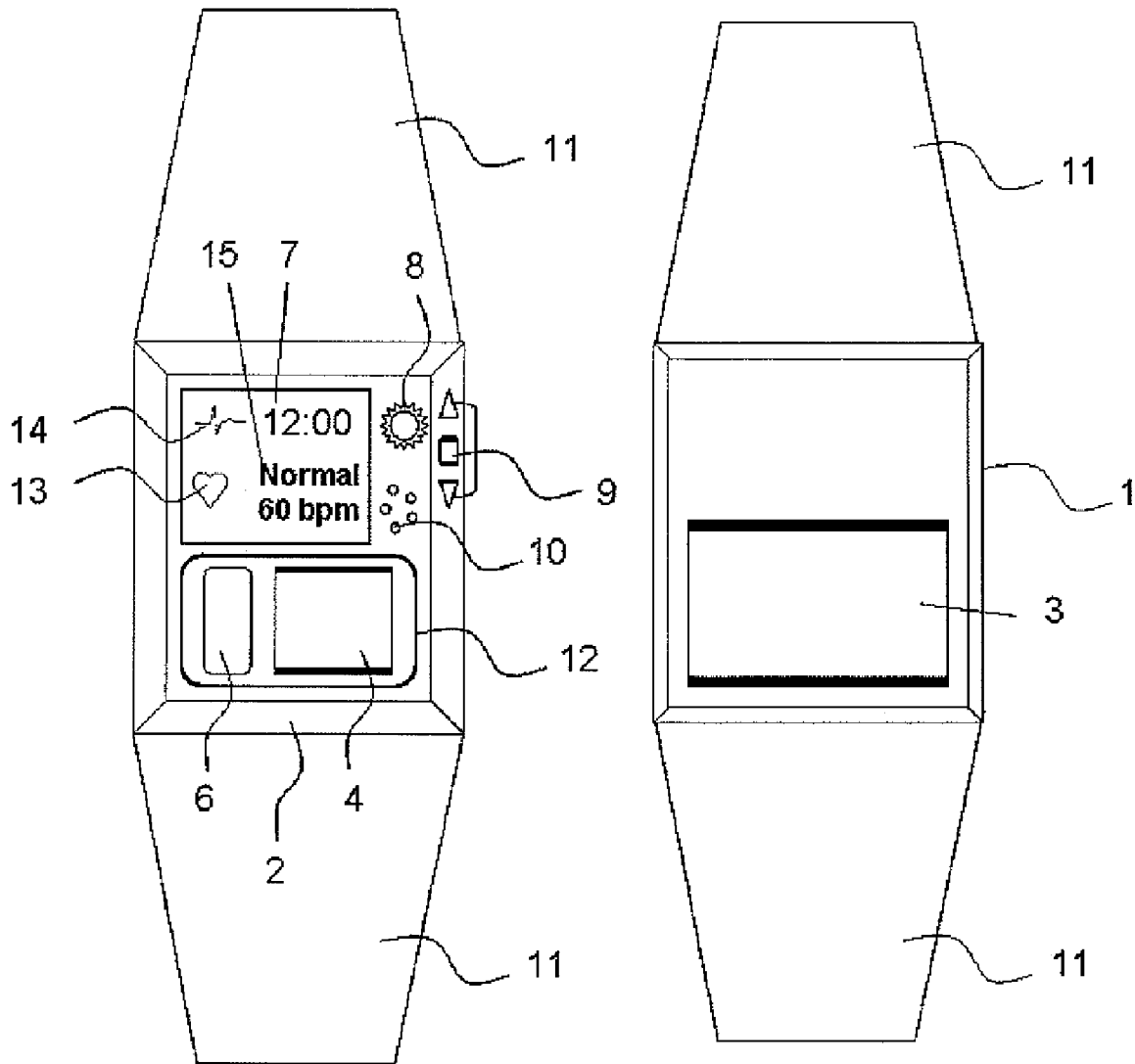


FIG.1A

FIG.1B

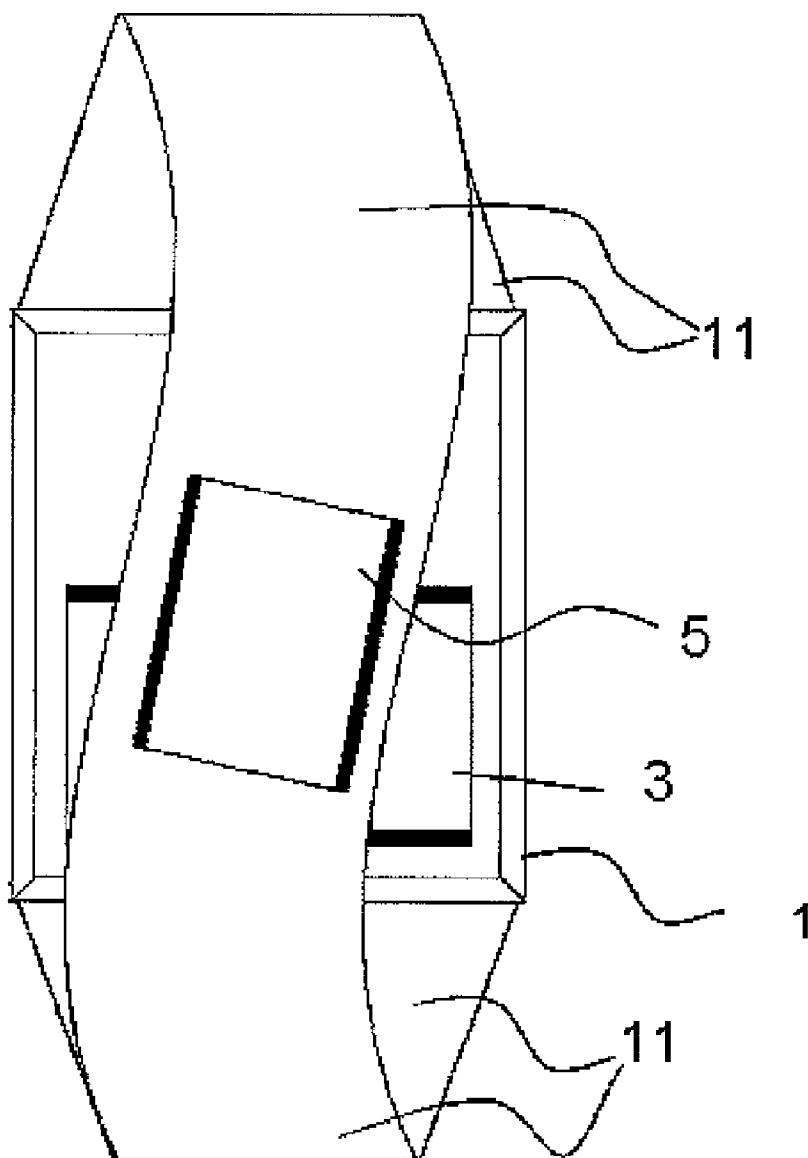


FIG. 2

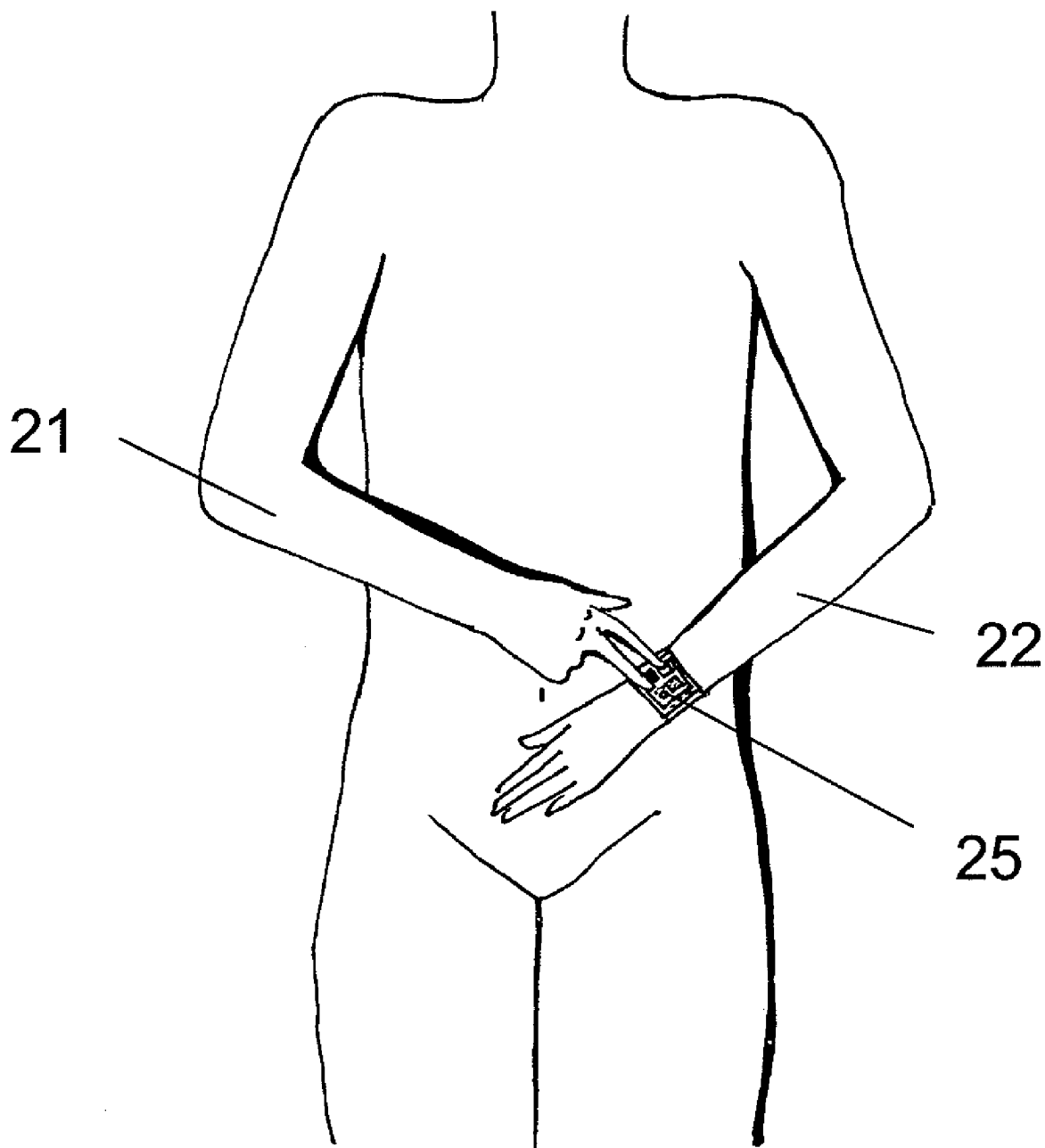


FIG.3A

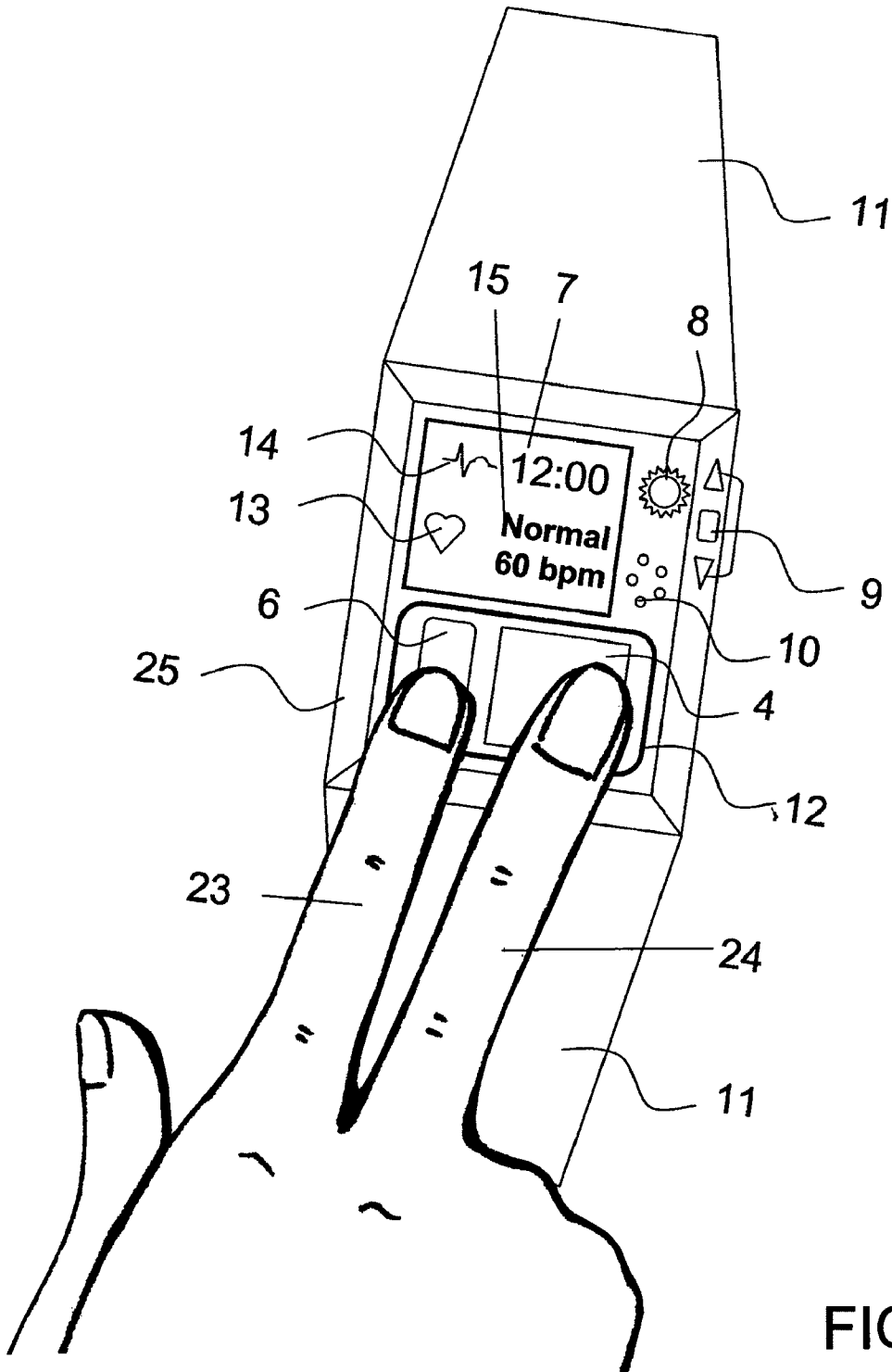


FIG.3B

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.