



US 20140107493A1

(19) **United States**

(12) **Patent Application Publication**

Yuen et al.

(10) **Pub. No.: US 2014/0107493 A1**

(43) **Pub. Date: Apr. 17, 2014**

(54) **PORTABLE BIOMETRIC MONITORING DEVICES AND METHODS OF OPERATING SAME**

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(21) Appl. No.: **13/924,784**

(22) Filed: **Jun. 24, 2013**

Related U.S. Application Data

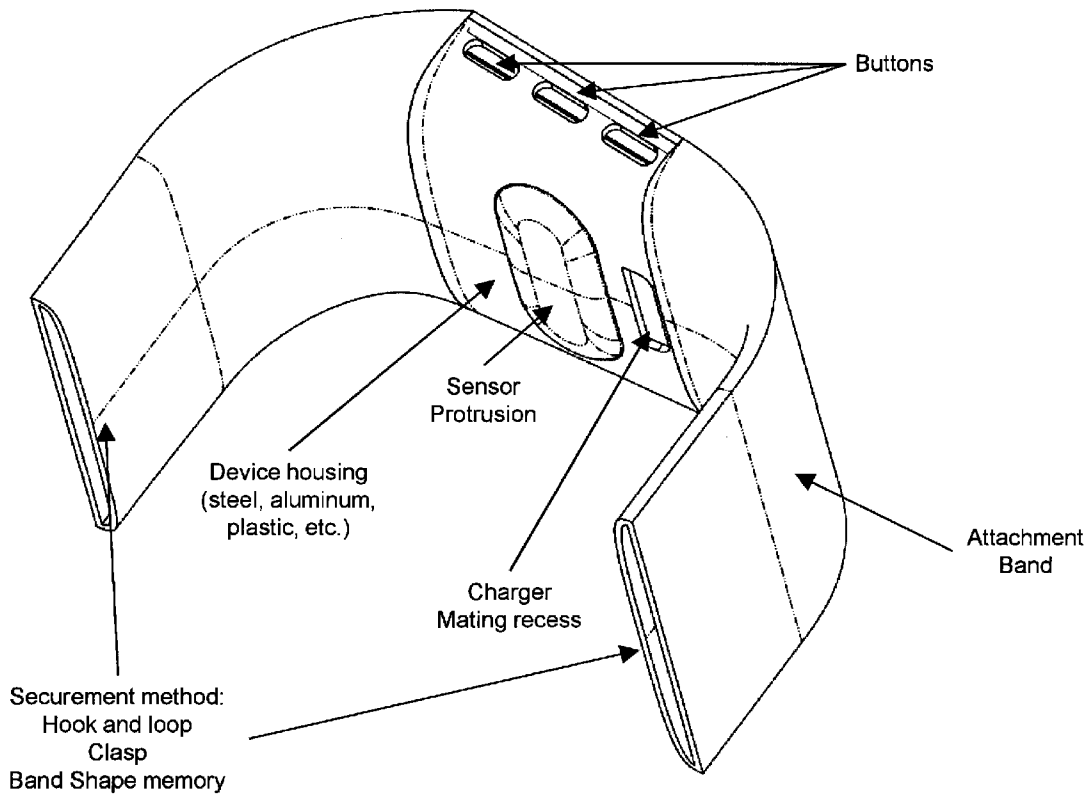
(60) Provisional application No. 61/662,961, filed on Jun. 22, 2012, provisional application No. 61/752,826, filed on Jan. 15, 2013.

Publication Classification

(51) **Int. Cl.**
A61B 5/024 (2006.01)
(52) **U.S. Cl.**
CPC *A61B 5/02427* (2013.01); *A61B 5/02438* (2013.01); *A61B 5/02433* (2013.01)
USPC **600/473**; 600/479

(57) **ABSTRACT**

The present inventions, in one aspect, are directed to portable biometric monitoring device including a housing having a physical size and shape that is adapted to couple to the user's body, at least one band to secure the monitoring device to the user, a physiological sensor, disposed in the housing, to generate data which is representative of a physiological condition of the user data. The physiological sensor may include a light source to generate and output light having at least a first wavelength, and a photodetector to detect scattered light (e.g., from the user). A light pipe is disposed in the housing and optically coupled to the light source directs/transmits light therefrom along a predetermined path to an outer surface of the housing. Processing circuitry calculates a heart rate of the user using data which is representative of the scattered light.



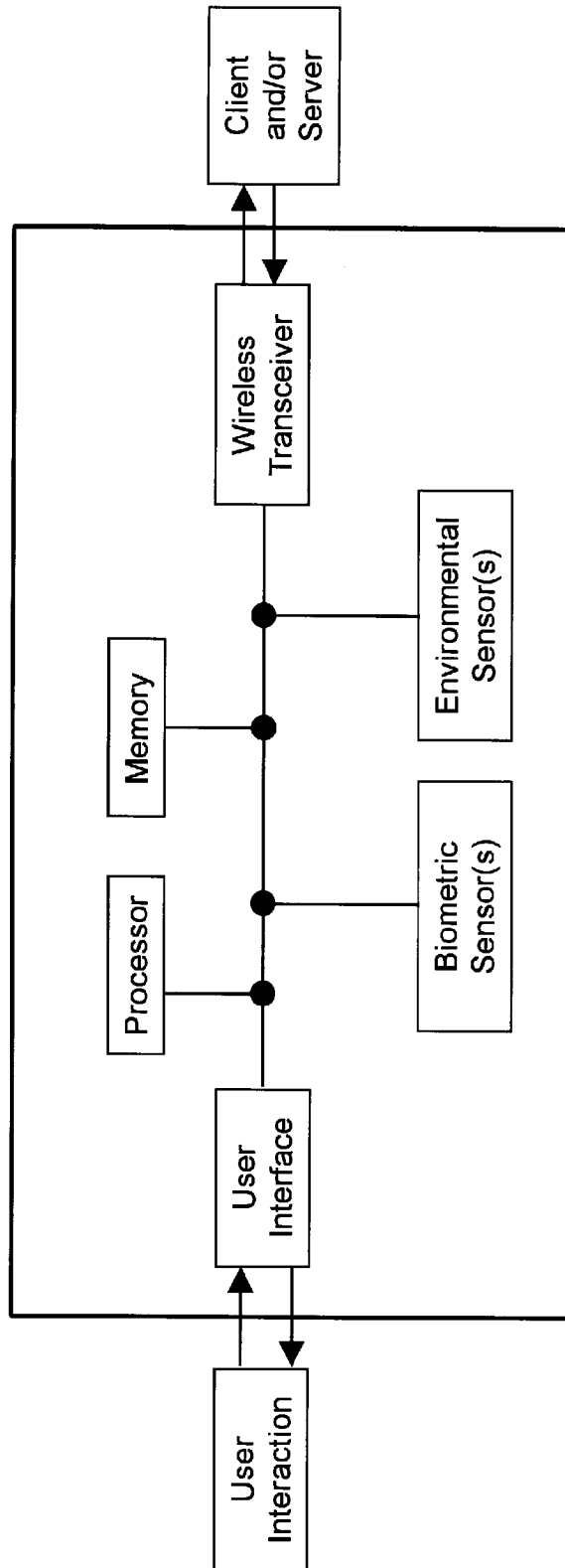


FIG. 1

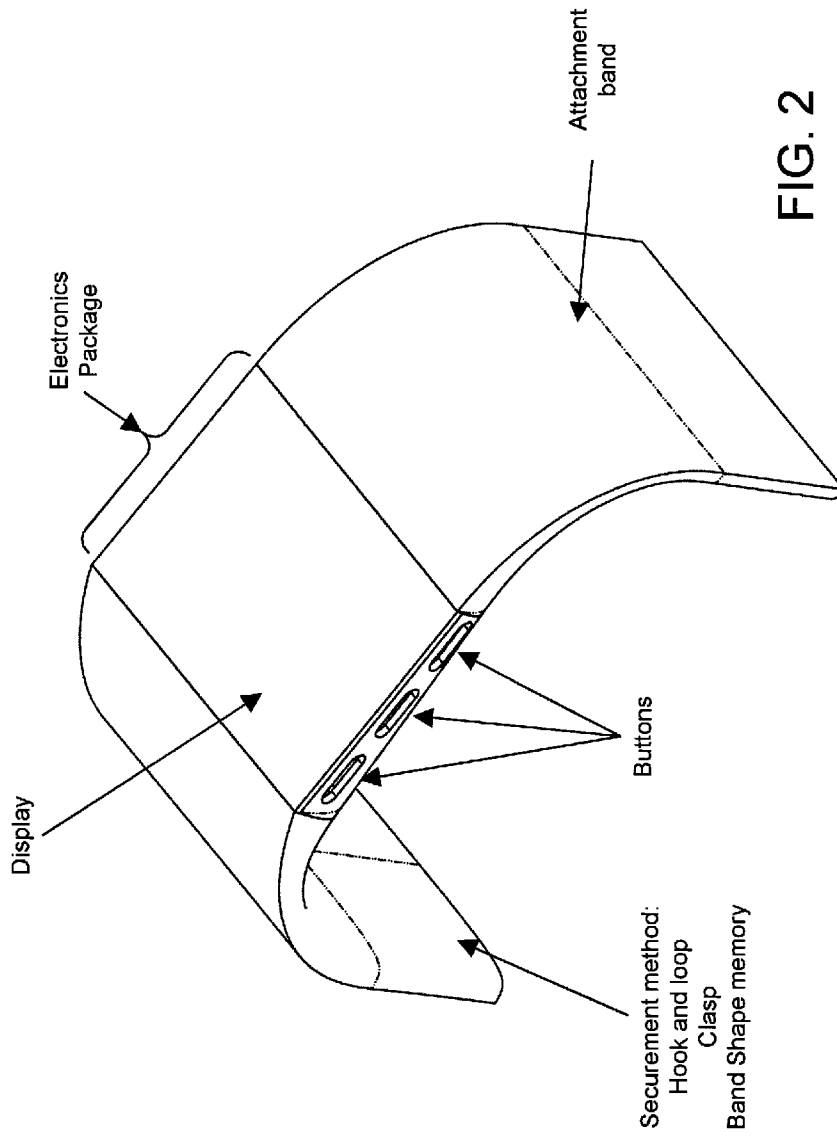


FIG. 2

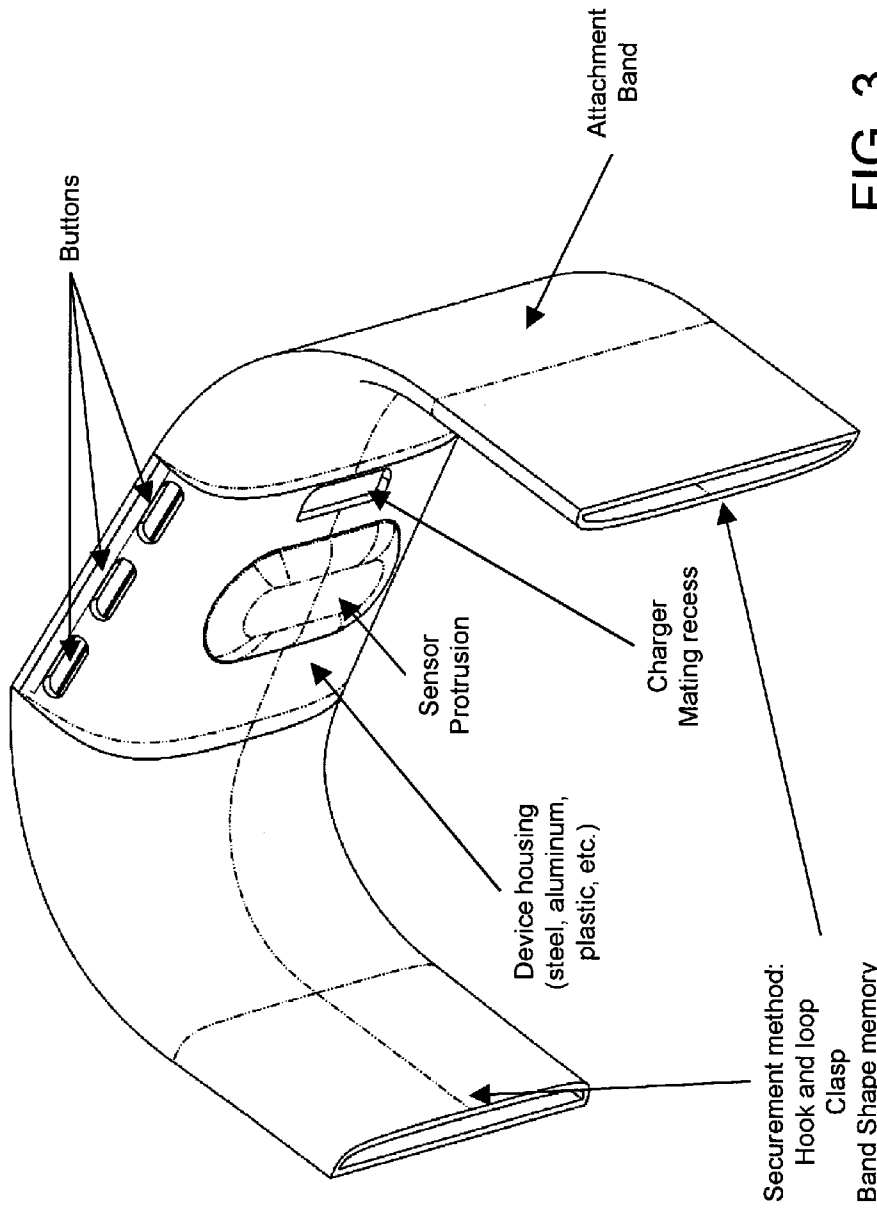


FIG. 3

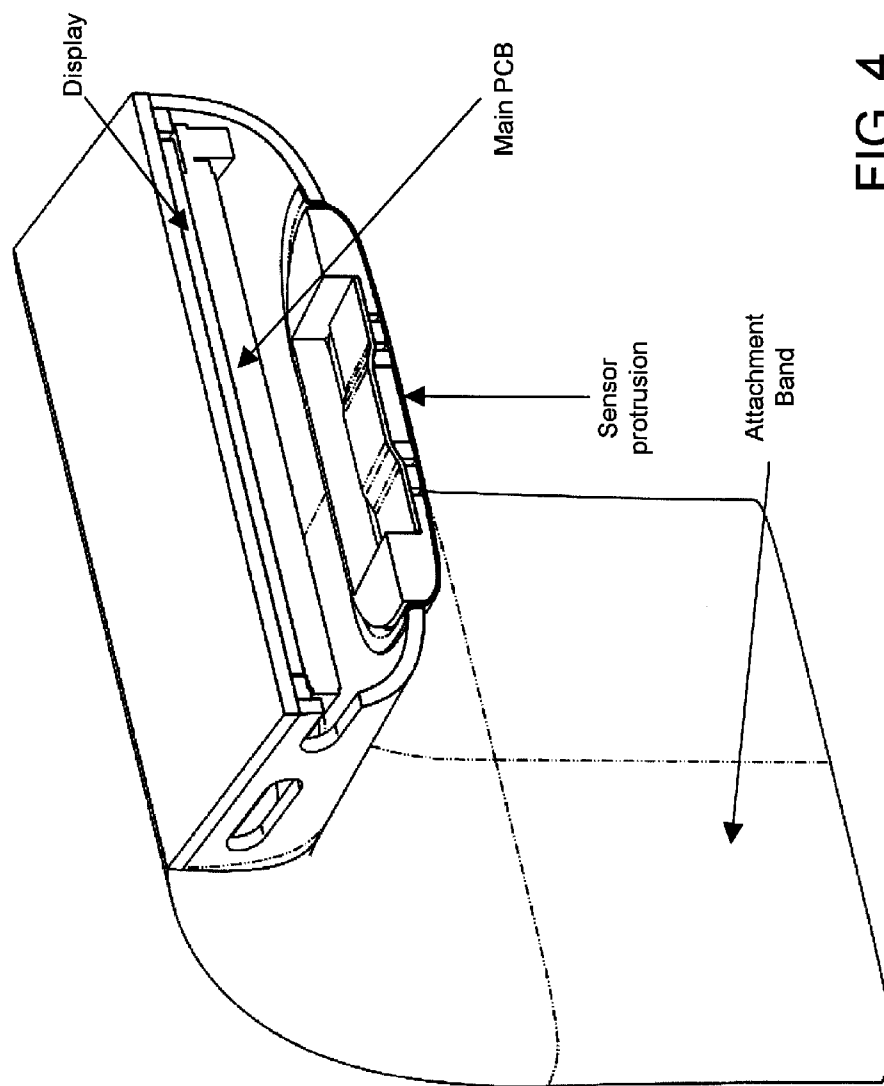


FIG. 4

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