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International application number: **PCT/US2014/070170**

International filing date: **12 December 2014 (12.12.2014)**

Document type: **Certified copy of priority document**

Document details:      Country/Office: **US**  
   Number: **61/970,551**  
   Filing date: **26 March 2014 (26.03.2014)**

Date of receipt at the International Bureau: **05 January 2015 (05.01.2015)**

Remark: Priority document submitted or transmitted to the International Bureau in compliance with Rule 17.1(a),(b) or (b-bis)

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**APPLICATION NUMBER: 61/970,551**

**FILING DATE: *March 26, 2014***

**RELATED PCT APPLICATION NUMBER: *PCT/US14/70170***

**THE COUNTRY CODE AND NUMBER OF YOUR PRIORITY APPLICATION, TO BE USED FOR FILING ABROAD UNDER THE PARIS CONVENTION, IS *US61/970,551***



Certified by

*David J. Kyffes*

Under Secretary of Commerce  
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## ABSTRACT

A method for alerting an individual to record an electrocardiogram (ECG) includes the following steps. Heart rate and activity are monitored using a smart watch. The smart watch include nontransitory memory storing computer executable code that when executed by one or more processors cause the one or more processors to determine if the monitored heart rate and activity measurements represent an advisory condition for recording an ECG, and to generate and send notification signals when an advisory condition for recording an ECG is determined.

**What is claimed is:**

1. A smart phone having a removable back plate, the removable back plate comprising:

an electrode assembly positioned on an outer surface of the removable back plate and configured to sense heart-related signals upon contact with a user's skin, and to convert the sensed heart-related signals to ECG electrical signals; and

a converter assembly including an audio transmitter, positioned on an inner surface of the removable back plate, the converter assembly integrated with, and electrically connected to the sensor assembly and configured to receive the ECG electrical signals generated by the sensor and output ECG sound signals through the audio transmitter to a microphone in the smart phone, wherein the converter assembly is further configured to output the ECG signals as an ultrasonic FM sound signal.

2. A replaceable, removable smart phone back plate, the smart phone back plate comprising:

an electrode assembly positioned on an outer surface of the removable back plate and configured to sense heart-related signals upon contact with a user's skin, and to convert the sensed heart-related signals to ECG electrical signals; and

a converter assembly including an audio transmitter, positioned on an inner surface of the removable back plate, the converter assembly integrated with, and electrically connected to the sensor assembly and configured to

receive the ECG electrical signals generated by the sensor and output ECG sound signals through the audio transmitter to a microphone in a computing device within range of the audio transmitter, wherein the converter assembly is further configured to output the ECG signals as an ultrasonic FM sound signal.

3. An ECG device comprising:

an electrode assembly configured to sense heart-related signals upon contact with a user's skin, and to convert the sensed heart-related signals to ECG electrical signals wherein the electrode assembly is positioned on an outer surface of a removable back plate for a smartphone; and

a converter assembly including an audio transmitter for outputting frequency modulated ultrasonic signals, positioned on an inner surface of the removable back plate for the smartphone, the converter assembly integrated with, and electrically connected to the electrode assembly and configured to receive the ECG electrical signals generated by the electrode assembly and output ECG sound signals through the audio transmitter as an ultrasonic FM sound signal, wherein the output from the audio transmitter is detectable by a microphone in a smartphone when the back plate is positioned on the smartphone.

4. A smart watch for monitoring a subject to determine when to record an electrocardiogram (ECG), the smart watch comprising:

at least one heart rate monitor;

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