CLAIMS

1. A smartwatch, comprising:

a watch band;

a watch plate connected to the watch band, wherein the watch plate comprises:

an electrocardiosignal collection circuit configured to obtain electrocardiosignal data of a user by using a first electrode, a second electrode and a third electrode;

a housing comprising:

a side wall; and

a bottom wall coupled to the side wall and comprising:

a central region and a peripheral region around the central region, wherein a detect ion window is disposed in the central region, a transparent lens covering the detection window;

a processor electrically connected to the electrocardiosignal collection circuit and configured to generate an electrocardiogram according to the electrocardiosignal data;

a display electrically connected to the processor and configured to display the electrocardiogram, wherein the display and the bottom wall are disposed opposite to each other, and wherein the side wall is positioned between the display and the bottom wall;

a photoplethysmogram apparatus disposed inside the housing, wherein the photoplethysmogram apparatus is capable of detecting a heart rate of a user through the detection window;

a first electrode electrically connected to the electrocardiosignal collection circuit and positioned in the peripheral region, wherein the first electrode is capable of contacting a first body part of the user;

a second electrode electrically connected to the electrocardiosignal collection circuit, and positioned in the peripheral region, wherein the second electrode is capable of contacting a second body part of the user, wherein the first electrode and the second electrode are alternately disposed, the first electrode and the second electrode are arc-shaped segments and are positioned around the detection window;

a third electrode, electrically connected to the electrocardiosignal collection circuit, exposed to the side wall, wherein the third electrode is capable of contacting a third body part of the user;

a first surface of the first electrode or the second electrode protrudes above a second surface on which no electrode is arranged in the peripheral region.

2. The smartwatch of claim 1, wherein the third electrode comprises:

a touch portion configured to contact the third body part of the user; and

a fixing portion connected to the touch portion; wherein the fixing portion extends into the housing.

3. The smartwatch of claim 1, wherein the first electrode, the second electrode, and the third electrode are made of metal.

4. The smartwatch of claim 1, wherein the watch plate further comprises:

a circuit board coupled to the housing, wherein the circuit board is configured to connect the electrocardiosignal collection circuit and includes a first through hole;

a fixed circuit board electrically connected to the circuit board, wherein the fixed circuit board comprises:

a second through hole and a pad located on a periphery of the second through hole;

an electrode sheet coupled to the first electrode;

a connection base connected to the electrode sheet; and

a screw coupled to the connection base, wherein the connection base extends into the first through hole, and wherein the screw is connected to the connection base after passing through the second through hole such that the connection base is in contact with the pad.

5. The smartwatch of claim 4, wherein the pad comprises:

a first subpad, wherein the first subpad is disposed on a side of the fixed circuit board in contact with the connection base and

a second subpad coupled to the first subpad, wherein the first subpad and the second subpad are disposed opposite to each other, wherein the second subpad is disposed on a side of the fixed circuit board away from the connection base, wherein the second subpad is in contact with the screw, and wherein the screw is made of a conductive material.

6. The smartwatch of claim 1, wherein the watch plate further comprises:

a first electrode spring coupled to the housing, wherein one end of the first electrode spring extends into a groove to be connected to the fixing portion; and

a flexible circuit board coupled to the housing, wherein another end of the first electrode spring is connected to one end of the flexible circuit board, and wherein the

other end of the flexible circuit board is electrically connected to the electrocardiosignal collection circuit.

7. The smartwatch of claim 4, wherein the watch plate further comprises:

a second electrode spring, wherein the second electrode spring is located inside the housing; and

a connection circuit board coupled to the housing and electrically connected to the flexible circuit board, wherein the first electrode is located on an outer side of the bottom wall, wherein the bottom wall is disposed with a third through hole, and wherein the second electrode spring passes through the third through hole, and is firmly pressed between the first electrode and the connection circuit board.

8. A smartwatch, comprising:

a housing comprising;

a bottom wall comprising;

a central region; and

a peripheral region, wherein the peripheral region is aligned around the central region;

a first electrode positioned along a first portion of the peripheral region and is capable of contacting a first body part of a user, wherein the first electrode is arc-shaped;

a second electrode positioned along a second portion of the peripheral region and is capable of contacting a second body part of the user, wherein the second electrode is arc-shaped, and separated from the first electrode;

a third electrode is not positioned in the bottom wall and is capable of contacting a third body part of the user; and

a processor, inside the housing, configured to generate an electrocardiogram by using the first electrode, the second electrode, and the third electrode.

9. The smartwatch of claim 8, further comprising an electrocardiosignal collection circuit positioned inside the housing, and electrically connected to the processor, wherein the first electrode, the second electrode, and the third electrode are electrically connected to the electrocardiosignal collection circuit, wherein the electrocardiosignal collection circuit is configured to obtain electrocardiosignal data of the user by using the first electrode, the second electrode, and the third electrode, and wherein the processor is further configured to process the electrocardiosignal data to generate the electrocardiogram.

10. The smartwatch of claim 8, further comprising a circuit board located inside the housing, wherein the circuit board is connected to the electrocardiosignal collection circuit.

11. The smartwatch of claim 8, wherein the housing further comprises:

a groove, wherein a fixing portion is engaged into the groove such that the third electrode is fastened to the housing;

a first electrode spring; and

a flexible circuit board, wherein one end of the first electrode spring extends into the groove to be connected to the fixing portion, wherein the other end of the first electrode spring is connected to one end of the flexible circuit board, and the other end of the flexible circuit board is electrically connected to the electrocardiosignal collection circuit.

12. The smartwatch of claim 8, further comprises:

a fixing band configured to fasten a fourth electrode to a fourth body part of the user, wherein the fixing band comprises the fourth electrode;

a socket is disposed with a jack, wherein a hole of the jack is disposed with a spring, and the spring is configured to clamp a plug inserted into the jack;

wherein the smartwatch comprises, detachably connected to the smartwatch, either the plug, wherein the smartwatch is disposed with the plug electrically connected to the electrocardiosignal collection circuit, or a magnetic head, wherein the magnetic head is detachably adsorbed on the third electrode;

a cable connected between the fixing band and the plug or magnetic head; and

a temperature detection electrode fastened to the fixing band, wherein the temperature detection electrode is electrically connected to the plug or magnetic head by the cable.

13. The smartwatch of claim 9, wherein the smartwatch further comprises:

a detection window disposed in the central region;

a transparent lens covering the detection window; and

a sensor disposed inside the housing, wherein the sensor is configured to detect a heart rate of the user through the detection window.

14. The smartwatch of claim 13, wherein the first electrode and the second electrode are symmetrically positioned around the detection window.

15. The smartwatch of claim 13, wherein the first electrode and the second electrode are substantially and concentrically positioned around the detection window.

16. The smartwatch of claim 13, wherein the sensor is electrically connected to the processor, the sensor is further configured to transmit heart rate data of the user to the processor.

17. The smartwatch of claim 16, wherein the processor is further configured to:

calculate a time difference between the electrocardiosignal data the heart rate data; and

obtain a blood pressure value of the user.

18. The smartwatch of claim 8, wherein the peripheral region is a ring.

19. The smartwatch of claim 8, wherein the first electrode, the second electrode, and the third electrode are made of metal.

20. The smartwatch of claim 8, wherein the third electrode comprises:

a touch portion configured to contact the third body part of the user; and

a fixing portion connected to the touch portion, and wherein the fixing portion is configured to be connected to the housing.

21. The smartwatch of claim 10, wherein the smartwatch further comprises

a first through hole, coupled to the bottom wall;

a fixed circuit board electrically connected to the circuit board, wherein the fixed circuit board comprises:

a second through hole; and

a pad located on a periphery of the second through hole;

an electrode sheet, coupled to the first electrode;

a connection base connected to the electrode sheet; and

a screw, wherein the connection base extends into the first through hole, and the screw is connected to the connection base after passing through the second through hole such that the connection base is in contact with the pad.

22. The smartwatch of claim 21, wherein the pad comprises:

a first subpad disposed on the fixed circuit board and in contact with the connection base; and

a second subpad, coupled to the first subpad, wherein the second subpad is disposed on a side of the fixed circuit board away from the connection base, wherein the second subpad is in contact with the screw, and wherein the screw is made of a conductive material.

23. The smartwatch of claim 8, further comprising a display, wherein the display is configured to display the electrocardiogram.

24. The smartwatch of claim 8, wherein a first surface of the first electrode and the second electrode protrudes above a second surface on which no electrode is arranged in the peripheral region.

25. The smartwatch of claim 10, wherein the smartwatch further comprises:

a second electrode spring, the second electrode spring is located inside the housing, and

a connection circuit board, wherein the connection circuit board is located inside the housing and is electrically connected to the circuit board, wherein the first electrode is located on an outer side of the bottom wall, wherein the bottom wall is disposed with a third through hole, and wherein the second electrode spring passes through the third through hole and is firmly pressed between the first electrode and the connection circuit board.

26. A smartwatch, comprising:

a watch band;

a watch plate connected to the watch band, wherein the watch plate comprises:

an electrocardiosignal collection circuit configured to obtain electrocardiosignal data of a user by using a first electrode, a second electrode, and a third electrode;

a housing comprising:

a side wall; and

a bottom wall coupled to the side wall and comprising:

a central region, and a peripheral region around a periphery of the central region, wherein a detection window is disposed in the central region, a transparent lens covering the detection window;

a processor electrically connected to the electrocardiosignal collection circuit and configured to generate an electrocardiogram according to the electrocardiosignal data;

a display electrically connected to the processor and configured to display the electrocardiogram, wherein the display and the bottom wall are disposed opposite to each other, and wherein the side wall is positioned between the display and the bottom wall;

a photoplethysmogram apparatus disposed inside the housing, wherein the photoplethysmogram apparatus is configured to detect a heart rate of a user through the detection window;

the first electrode electrically connected to the electrocardiosignal collection circuit and positioned in the central region, wherein the first electrode is capable of

contacting a first body part of the user;

a second electrode electrically connected to the electrocardiosignal collection circuit, and positioned in the central region, wherein the second electrode is capable of contacting a second body part of the user, wherein the second electrode is disposed separately from the first electrode;

the detection window is disposed between the first electrode and the second electrode;

a third electrode, electrically connected to the electrocardiosignal collection circuit, exposed to the side wall, and wherein the first electrode is capable of contacting a third body part of the user;

the central region protrudes relative to the peripheral region.