

[0031] FIG. 6 is a flow diagram of the measurement method. In step 600 the electrically conductive inner structure makes contact with the hand to which the device is attached. In step 602 at least parts of the electrically conductive outer structure make contact with the other hand, these parts being on opposite sides of the hand to which the measuring device is attached. In step 604, heart rate is measured from both hands of the user by means of the electrically conductive outer structure and inner structure. The measurement may be activated for example when the impedance between the electrically conductive outer structure and inner structure is less than one megohm due to the electrical conductivity of the skin between the skin contacts. Another way to ensure that the measurement is activated is to use a pressure-sensitive PVDF (polyvinylidene fluoride) film in the electrically conductive outer structure (and/or inner structure) at the locations brought into contact with the hand. The PVDF film transmits to the measuring unit an electric signal corresponding to the applied pressure and when the pressure exceeds a predetermined threshold value, a conclusion can be made that a sufficiently good contact has been created between the hands and the measuring device. Instead of this activation mechanism, the device may be activated by a mechanic switch. Measurement of heart rate in the measuring unit may be based on detecting, in manner known per se, an R peak of a QRS complex appearing in the signal, or on identifying the QRS complex in an EKG signal by means of a matched filter. The letters Q, R, and S in the QRS complex refer to potential phases, known per se, appearing in the functioning of the heart.

[0032] Although the invention is disclosed above with reference to examples illustrated in the accompanying drawings, it is apparent that the invention is not restricted thereto, but can be varied in many ways within the scope of the appended claims.

1. A heart rate measuring device to be attached around a user's hand, the device comprising:

- attaching means which are fixed to the measuring unit;
- an inner surface arranged to be in contact with the skin of the hand to which the device is attached;
- an outer surface, i.e. a surface other than the inner surface;
- an electrically conductive inner structure provided on the inner surface of the measuring device and functioning as an electrode for a contact with the skin of the hand to which the device is attached;
- an electrically conductive outer structure functioning as an electrode for a contact with the user's other hand and electrically isolated from the electrically conductive inner structure;
- a measuring unit to which the electrically conductive outer structure and inner structure are connected for heart rate measurement, wherein

the electrically conductive outer structure of the measuring device extends at least to opposite sides of the hand to which the device is attached; the electrically conductive outer structure comprises at least one electrode on the outer surface of the measuring device, on opposite sides of the hand to which the measuring device is attached, which at least one electrode the user

is to touch with separate fingers of his/her other hand from opposite directions of the hand to which the device is attached; and

the at least one electrode is connected to the measuring unit with a wire inside the wristband.

2. A measuring device according to claim 1, wherein the electrically conductive outer structure forms a uniform electrode on the outer surface of the measuring device, which electrode the user is to touch with separate fingers of his/her other hand at least from opposite directions in relation to the hand to which the device is attached.

3. A measuring device according to claim 1, wherein the electrically conductive outer structure forms a uniform electrode extending on part of the outer surface of the measuring device to opposite sides of the hand to which the device is attached, which electrode the user is to touch with separate fingers of his/her other hand at least from opposite directions in relation to the hand to which the device is attached.

4. A measuring device according to claim 1, wherein the electrically conductive outer structure comprises at least two electrodes which are connected together with the wire inside the wristband.

5. A measuring device according to claim 1, wherein the electrically conductive outer structure comprises two electrodes, which are on different sides of the hand to which the device is attached.

6. A measuring device according to claim 1, wherein the electrically conductive inner structure comprises at least two electrodes on the inner surface of the measuring device and on different sides of the hand to which the device is attached.

7. A measuring device according to claim 1, wherein the electrically conductive outer structure is made of electrically conductive plastic.

8. A measuring device according to claim 1, wherein the electrically conductive outer structure is made of electrically conductive metal.

9. A method for manufacturing a heart rate measuring device to be attached around a user's hand with attaching means which are fixed to the measuring unit; the method comprising:

providing an electrically conductive inner structure on an inner surface of the measuring device, the inner surface being in contact with the skin of the hand to which the device is attached and at least part of the electrically conductive inner structure being meant to function as an electrode for the skin contact with the hand to which the device is attached;

providing an electrically conductive outer structure on an outer surface of the measuring device to provide an electrode for a contact with the user's other hand, the electrically conductive outer structure being electrically isolated from the electrically conductive inner structure, the outer surface referring to a measuring device surface other than the inner surface;

providing a measuring unit with signal processing means; and

connecting the electrically conductive outer structure and inner structure to the signal processing means of the measuring unit for heart rate measurement, the method further comprising: