which is typically assumed. In this case, the corrected pulse wave data MKD' which is generated at each heart beat becomes data M11~M88, shown in FIG. 30B.

Next, an explanation will be made of the case where pulse rate calculator 114 determines the pulse rate from corrected pulse wave data MKD'. When examining the pulse components of a typical pulse waveform, a sharp rise may be noted in each beat. For this reason, data indicating the high frequency components in this rising portion become large. Accordingly, first, pulse rate calculator 114 specifies the changing portion of the high frequency component, third, determines the interval of this portion, i.e., the interval of the beat, and third, calculates the inverse of this interval as the pulse rate.

For example, if corrected pulse wave data MKD' is a value such as shown in FIG. 30C, then the value of data M18 corresponding to this rising portion becomes larger than the values of the other data, such as [10]. The pulse interval is judged to be from the time until the next such value is detected, with the pulse rate then determined by taking the inverse of the pulse interval.

<3-3: Other examples of the embodiments>

The preceding embodiments employed a wristwatch structure for the calorie expenditure measuring device, however, the present invention is not limited thereto. A number of examples for the arrangement of the calorie expenditure measuring device according to the present invention will now be explained.

<3-3-1: Necklace model>

The calorie expenditure measuring device according to the present invention may be rendered in the form of a necklace such as shown in FIG. 32.

In this figure, pressure sensor Ps and temperature sensor Ts are provided to the end of a cable 31, and are attached to the area of the carotid artery by means of an adhesive tape 39, such as shown in FIG. 33. In FIG. 32, essential components of the device may be incorporated into a case 32 which is in the form of a broach which is hollow inside. The above-described display 205, switch Sw1 and switch Sw2 are provided to the front surface of this broach. One end of cable 31 is embedded in chain 33, with pressure sensor Ps and temperature sensor Ts electrically connected to pressure sensor interface 210 and temperature sensor interface 211 which are housed in case 32.

<3-3-2: Eyeglasses>

The calorie expenditure measuring device according to the present invention may also be incorporated into a pair of eyeglasses such as shown in FIG. 34.

As shown in the figures, the main body of the device in this embodiment is separated into a case 41*a* and a case 41*b*, which are attached to the stems 42 of the eyeglasses, respectively, and are connected electrically via a lead wire embedded in stems 42. A liquid crystal panel 44 is attached over the entire surface of the lens 43 side of case 41*a*. A mirror 45 is fixed to the edge of this lateral surface at a specific angle. A drive circuit for liquid crystal panel 44 which includes a light source (not shown) and a circuit for forming the display data are incorporated in case 41*a*. These form display 205 shown in FIGS. 2 or 3. The light emitted from this light source passes via liquid crystal panel 44, and is reflected at mirror 45 to incident on lens 43 of the eyeglasses. The principle elements of the device are incorporated in case 41*b*, with switches Sw1 and Sw2 described above attached to the upper surface thereof. On the other hand, pressure sensor Ps and temperature sensor Ts are electrically connected to pressure sensor interface 210 and temperature sensor interface 211 which are housed in case 41*b*, via cable 31. Pressure sensor Ps and temperature sensor Ts are attached to the carotid artery in the same manner as in the case of the necklace. The lead wires which connect case 41*a* and case 41*b* may be designed so as to extend along stems 42. In this example, the device main body was divided into case 41*a* and case 41*b*, however, it is also acceptable to employ a case formed in a unitary manner. Mirror 45 may be moveable so that the user can adjust the angle between the liquid crystal panel 44 and mirror 45.

<3-3-3: Card model>

As another example of an embodiment of the present invention, the calorie expenditure measuring device may be rendered in the form of a card such as shown in FIG. 35. The device in this form is stored in the left breast pocket of the subject's shirt, for example. Pressure sensor Ps and temperature sensor Ts are electrically connected to pressure sensor interface 210 and temperature sensor interface 211 which are stored in a case, via cable 31. As in the case of the necklace, they are attached to the area of the carotid artery of the test subject.

<3-3-4: Pedometer>

As another embodiment of the present invention, the calorie expenditure measuring device may be incorporated into the pedometer shown in FIG. 36A, for example. The main body of this pedometer device is attached to the subject's waist belt 51 as shown in FIG. 36B. Pressure sensor Ps and temperature sensor Ts are electrically connected to pressure sensor interface 210 and temperature sensor interface 211 housed in a case, via cable 31. They are fixed in place to the area of the femoral artery at the subject's hip joint by means of adhesive tape, and are protected by supporter 52. In this case, it is preferable to sew cable 31 into the clothing, so that it does not present a hindrance to the subject's daily activities.

<3-4: Arrangements for display and notification>

The preceding embodiments employed a design in which the calculated results were all displayed on display 205; however, the present invention is not limited thereto. Namely, a variety of arrangements are possible for notification, which do not rely on the sense of sight. In this sense, notification in the present invention means a method which relies on any one of the five senses. For example, a design may be provided which relies on the sense of sound in which the subject is notified of the calculated calorie expenditure, achievement rate G, or rate of change by means of a synthesized voice. Similarly, a design is also possible which relies on the tactile sense by employing vibration in the notification.

What is claimed is:

1. A calorie expenditure measuring device, comprising:

a basal metabolic state specifying means for specifying a subject's basal metabolic state;

a correlation storing means for storing a correlation between a subject's pulse rate and calorie expenditure;

a correlation correcting means for correcting the correlation stored in the correlation storing means by using the basal metabolic state specified by the basal metabolic state specifying means; and

a calorie expenditure calculating means for applying the subject's pulse rate to the correlation stored in the correlation storing means, to calculate the calorie expenditure corresponding to the pulse rate.

2. A calorie expenditure measuring device according to claim 1, further comprising:

a pulse wave detecting means for detecting over a specific area the pulse pressure around a site at which the subject's pulse is present;