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N30P8 N30R**

(56) Documents Cited
GB 2273781 A

(58) Field of Search
UK CL (Edition O) **G1N NEAN NENT**
INT CL⁶ **G01K 13/00**
Online database: WPI

(54) Body temperature measurement device

(57) A device for measurements of body temperature has a temperature sensor 6 adapted to be held in contact with the skin by means of a clip 2 attachable to clothing 7 or diapers. Measurements can be effected when desired and also at preset intervals of time, means 4 being provided for the display of the temperature and if desired for transmitting it to a remote location and for storing data in a memory. Polarisation impedance may be measured between electrodes 8 and 9, and a change of impedance, eg due to sweat or urine, above a threshold may be indicated or used to trigger a temperature measurement. Ambient temperature may also be measured, displayed and transmitted to a remote location.

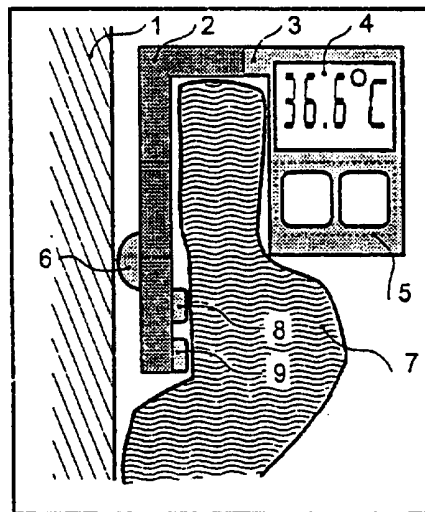


Fig. 1

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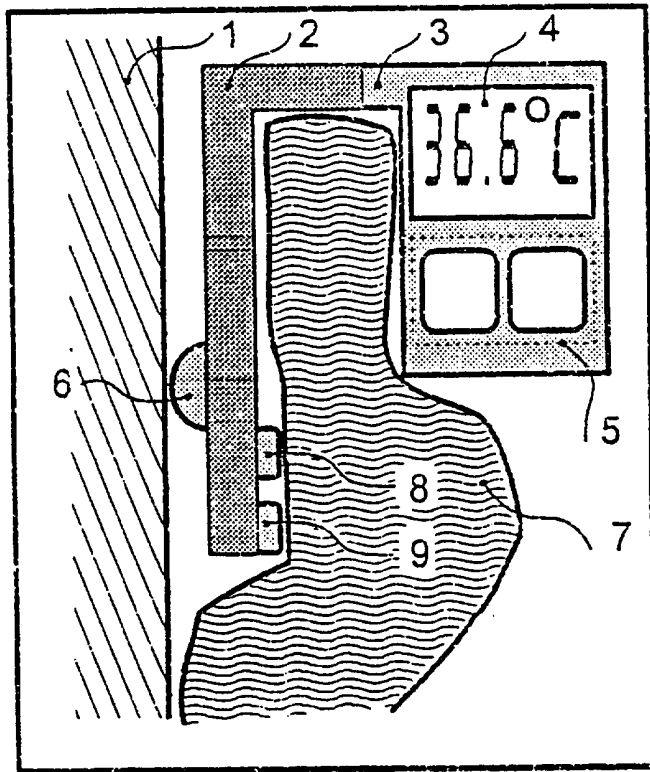


Fig. 1

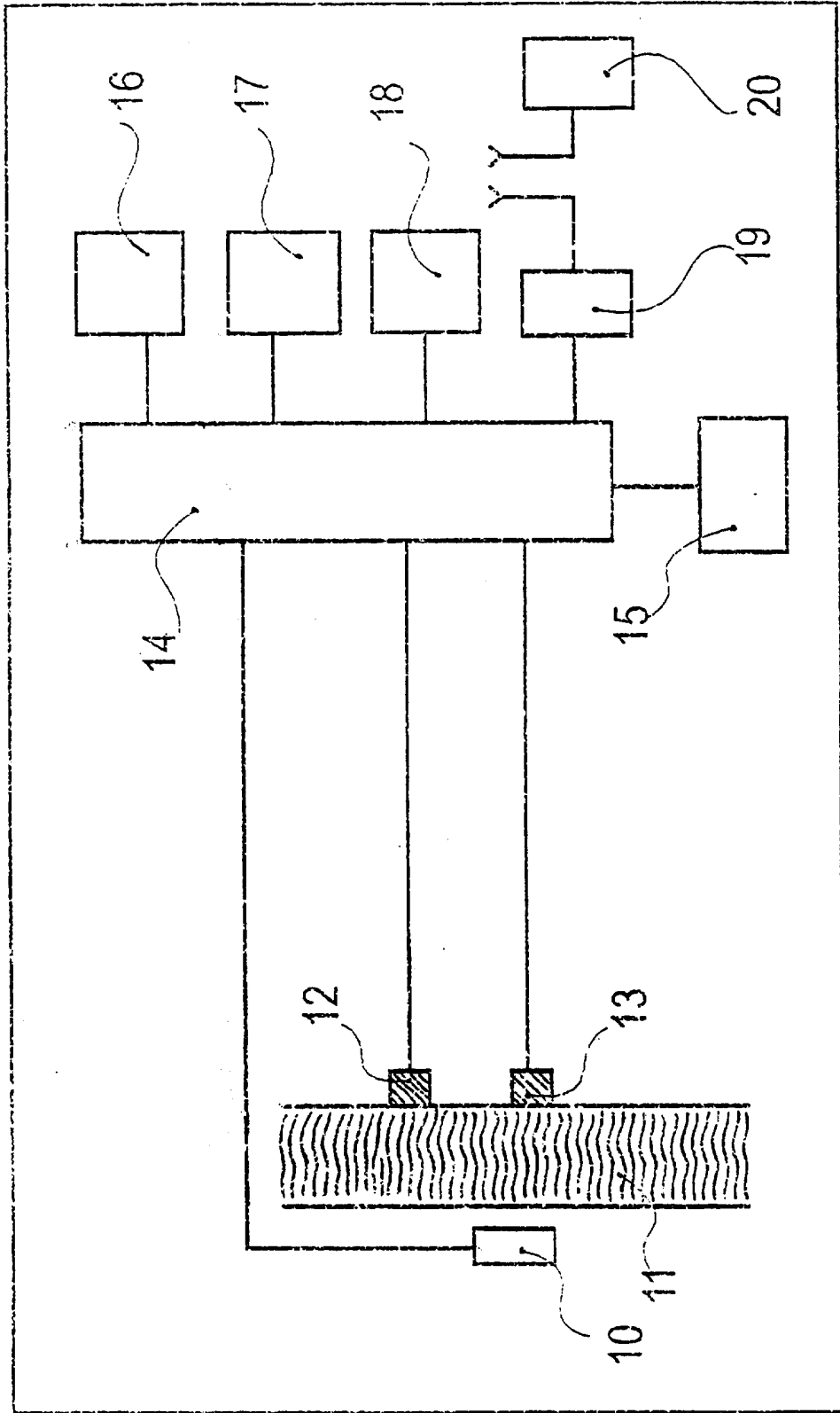


Fig. 2

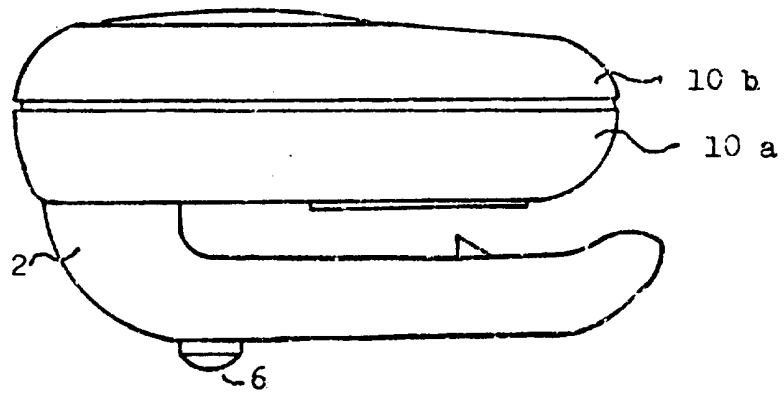


FIG. 3

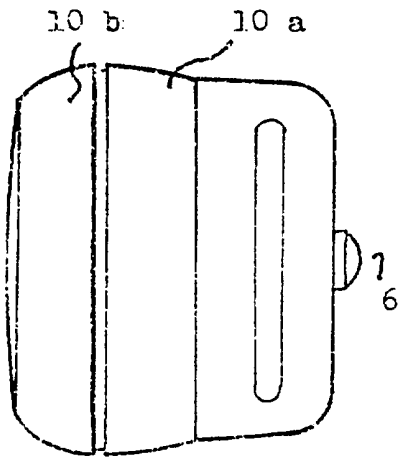


FIG. 4

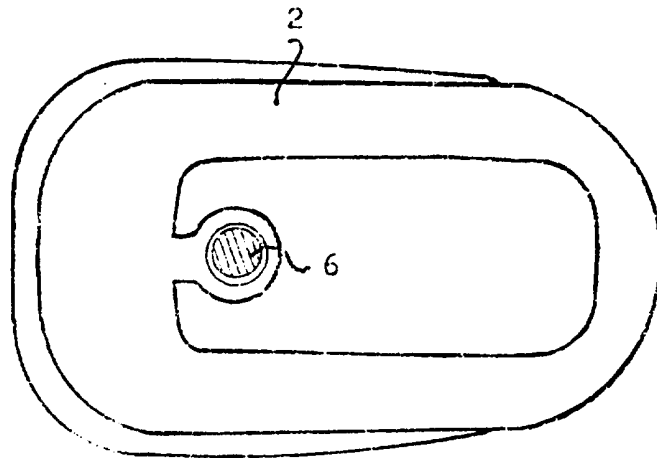


FIG. 5

TITLE: TEMPERATURE MEASUREMENT INSTRUMENT

DESCRIPTION

FIELD OF THE INVENTION:

The invention relates to a device for measuring the temperature of human bodies. The instrument is especially - but by no means exclusively - useful for application in the temperature measurement of infants and small children. It can also be used for measuring temperature of the environment.

BACKGROUND OF THE INVENTION

Traditionally the body temperature of a patient is measured by means of an analog or digital device. With both types of device, the probe has to be inserted into a selected site of measurement, i.e. a body cavity, making measurement of temperatures of infants and small children rather difficult.

SUMMARY OF THE INVENTION

The invention provides a device which makes it possible to measure automatically and at preset time intervals the body temperature of a patient, it is attachable to wearing apparel.

According to the invention the automatic temperature measurement system can be actuated at predetermined time

intervals. The device attaches to underwear or diaper by means of a clip and includes a suitable temperature sensor, such as a thermistor, thermocouple or the like for measuring temperature. The sensing means is in close contact with the body of the person to enable accurate and real time readings. The measured temperature may be either visually displayed, transmitted to an external device or stored in a memory for subsequent recall. It is also possible to define a specific temperature at which the device actuates a warning signal. If desired, the device can also be automatically actuated by an optional impedance sensor in the clip when a child urinates. It may record both said temperature and the exact time of measurement. The device generally measures temperature a number of times per day, and thus provides a good picture of the temperature variations as well as the maximum temperature.

DETAILED DESCRIPTION OF THE INVENTION:

The invention will now be described in detail, having reference to the accompanying schematic drawings not according to scale, in which:

Fig. 1 is a side view of the device partially in section,

Fig. 2 is a block diagram of the device,

Figs. 3, 4 and 5 show the mechanical external configuration of the device and the clip configuration.

Turning first to Fig. 1, the novel device comprises a temperature sensor 6, located on the device clip 2 and connected with the measurement device 3. The optional polarization impedance (P.I) sensor 8, 9 is on the reverse side of the clip, also connected to the measurement device 3, where a lead passes through a layer 7 of clothing, a sheet or the like, the sensor 6 being in close contact with the body 1 of the patient. The device 3 comprises an LCD display 4 of the temperature and a keyboard 5, comprising the required number of keys for manual control of the device.

The components of the instrument are set out in Fig. 2 and comprise a thermosensor 10, optional impedance sensor 12 and 13, with P.I. sensor connected to the microcontroller 14, whereas the temperature sensor 10 is connected to microcontroller 14. Signals from the sensors, detected by microcontroller 14, which is controlled by key 15, an LCD display 17 for readouts display connected to memory 16 and to sound output means 18. The control unit 14 is in charge of all the

automatic functions of the device, such as temperature measurement at preset intervals, automatic transfer to memory at preset intervals and automatic activation of alarm according to preset limits. The keyboard 15 used for actuation of the instrument, activates the device to the measurement mode, reads measurements stored in the memory to the LCD of the device, and switches the device to other modes.

The polarization impedance (P.I) probe comprises electrically conducting members, separate from each other, which are connected by electrical leads to other components of the system. The probe should be of a suitable material, such as stainless steel, which will not corrode under the conditions of use of the device. Current passing through the leads is measured, which current is a function of the impedance between the two electrodes. When the P.I. probe comes into contact with sweat or urine, the impedance changes drastically and an indication of such change is readily observed.

For the temperature measurement, any suitable temperature sensor such as a thermistor, bimetal, thermocouple etc., can be used. It is advantageous to use also a P.I.

probe, which can be positioned in close proximity to the temperature probe on the same clip, attached to the underwear/diaper as shown in Fig. 1. The device of the invention can be provided with means of indicating either a minimum or a maximum temperature, or both. It can also be provided with means of indicating a change of impedance above a certain predetermined threshold. It can also be provided for temperature measurement when urination is detected.

When the temperature measurement by the thermosensor 10 is actuated by events such as pressing a suitable key on the keyboard 15 of the instrument or at a predetermined time, measured data are amplified and displayed on the LCD 17, while at the same time such data are transmitted by transmitter 19 to a remote receiver 20, where such data can be displayed or recorded.

The external configuration of the new device is clearly depicted by Figs. 3, 4 and 5.

The device comprises a casing 10 which is composed of a main part 10a and a lid 10b.

The innovative system is located in part 10a. To the main part 10a is fixedly attached the clip 2 on the rear of which is located the sensor 6.

CLAIMS:

1. A system for measuring and indicating body temperature, including a clip permitting attachment of the system to wearing apparel of a person, including diapers, the reverse side of the mechanical clip containing a sensing element which is of minimal mass to enable very fast temperature stabilization, by utilizing the permanent contact between the device and the body, automatic constant measurement being implemented at intervals as short as the temperature stabilization permits, and new temperature being displayed each time, the automatic option, automatic temperature measurements being either displayed and/or transmitted and/or stored in a memory.

2. The system claimed in Claim 1, including also alarm means adapted to indicate preset temperature limits and/or wetting of wearing apparel or diapers.

3. The system claimed in claim 1 provided with means for transmitting the data to a remote unit.

4. A system according to claim 1, provided with means for measuring also open air temperature, displaying it and if desired transmitting it to a remote unit.

5 A device according to claim 1, housed in a waterproof housing, preventing damage by body fluids.

6. A system for measuring and indicating body temperature, substantially as hereinbefore described with reference to and as illustrated in, the accompanying drawings.



Application No: GB 9610184.5
Claims searched: All

Examiner: Bob Clark
Date of search: 7 August 1996

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:
UK CI (Ed.O): G1N (NEAN, NENT)
Int CI (Ed.6): A61B 5/00; G01K 13/00
Other: Online database: WPI

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
X	GB2273781 A (TIUS ELCON) Figure 1	1 to 3

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.