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(54) **ELECTRONIC EAR THERMOMETER WITH
MULTIPLE MEASUREMENT AND MEMORY
FUNCTION**

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374/142; 702/131; 702/187; 600/474; 600/549;
128/920

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374/108, 128, 142, 186; 702/131, 187;
600/549, 559, 474; 128/903, 904, 920

(56) **References Cited**

U.S. PATENT DOCUMENTS

3,940,742 A * 2/1976 Hudspeth et al. 600/549
4,121,574 A * 10/1978 Lester 702/131
4,321,933 A * 3/1982 Baessler 600/549
4,447,884 A * 5/1984 Wada 702/131

4,503,862 A * 3/1985 Baessler 600/549
4,790,324 A * 12/1988 O'Hara et al. 600/474
4,962,765 A * 10/1990 Kung et al. 600/549
5,181,521 A * 1/1993 Lemelson 600/549
6,110,124 A * 8/2000 Cheng 600/549
6,190,329 B1 * 2/2001 Cheng 600/549
6,332,867 B1 * 12/2001 Chen et al. 600/549
6,544,174 B2 * 4/2003 West et al. 128/903
6,790,178 B1 * 9/2004 Mault et al. 128/920
2001/0044588 A1 * 11/2001 Mault 600/549
2003/0130567 A1 * 7/2003 Mault et al. 600/300
2005/0059867 A1 * 3/2005 Cheng 600/549

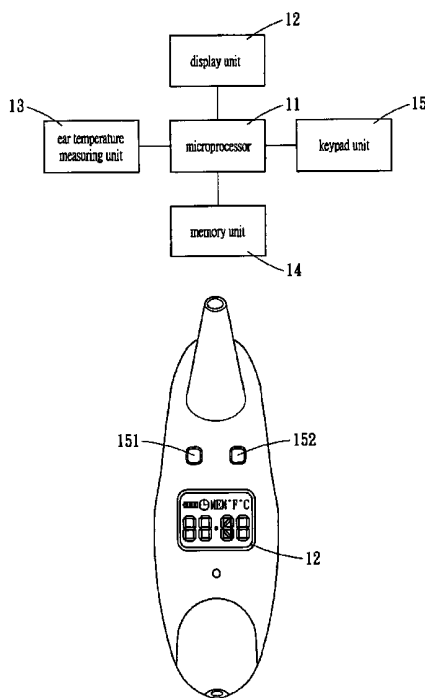
* cited by examiner

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(57) **ABSTRACT**

A multiple measurement memory-type electronic thermometer includes an ear temperature measuring unit, a microprocessor, a keypad unit, a display unit, and a memory unit. The ear temperature measuring unit, the display unit, and the memory unit are controlled by the microprocessor. When the activation key of the keypad unit is pressed by the user, being controlled by the microprocessor, the ear temperature unit is activated to perform measurement. The measuring result of the ear temperature unit is sent back to the microprocessor, displayed by the display unit, and saved in the memory unit. The memory unit is partitioned into a plurality of independent memory sectors. Each sector includes a queue data structure, such that the ear temperature measured from each person and the measuring time can be stored in the corresponding memory sector. Therefore, measurement of multiple people can be performed, memorized and retrieved.

9 Claims, 3 Drawing Sheets



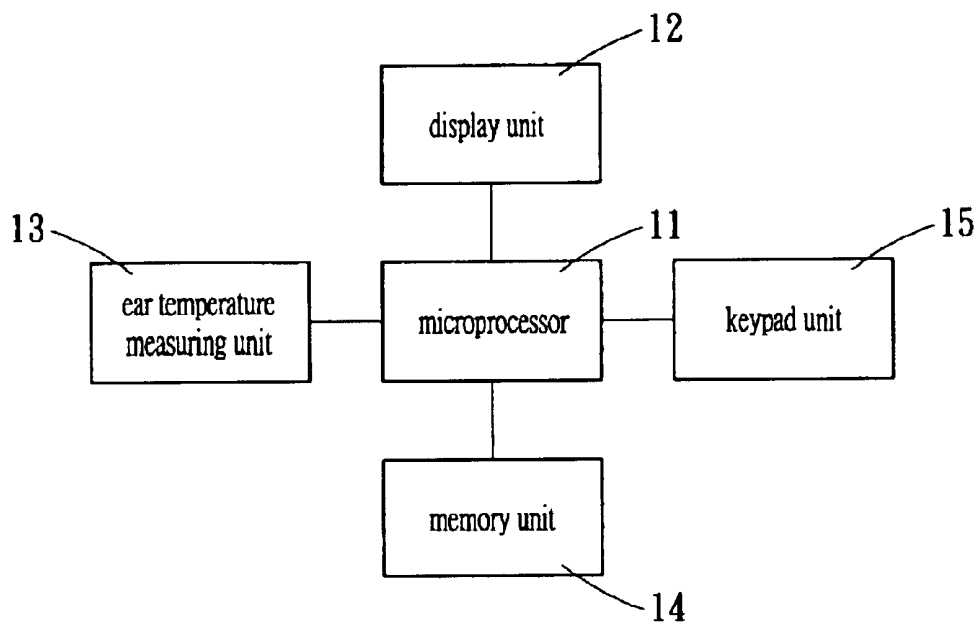


FIG. 1

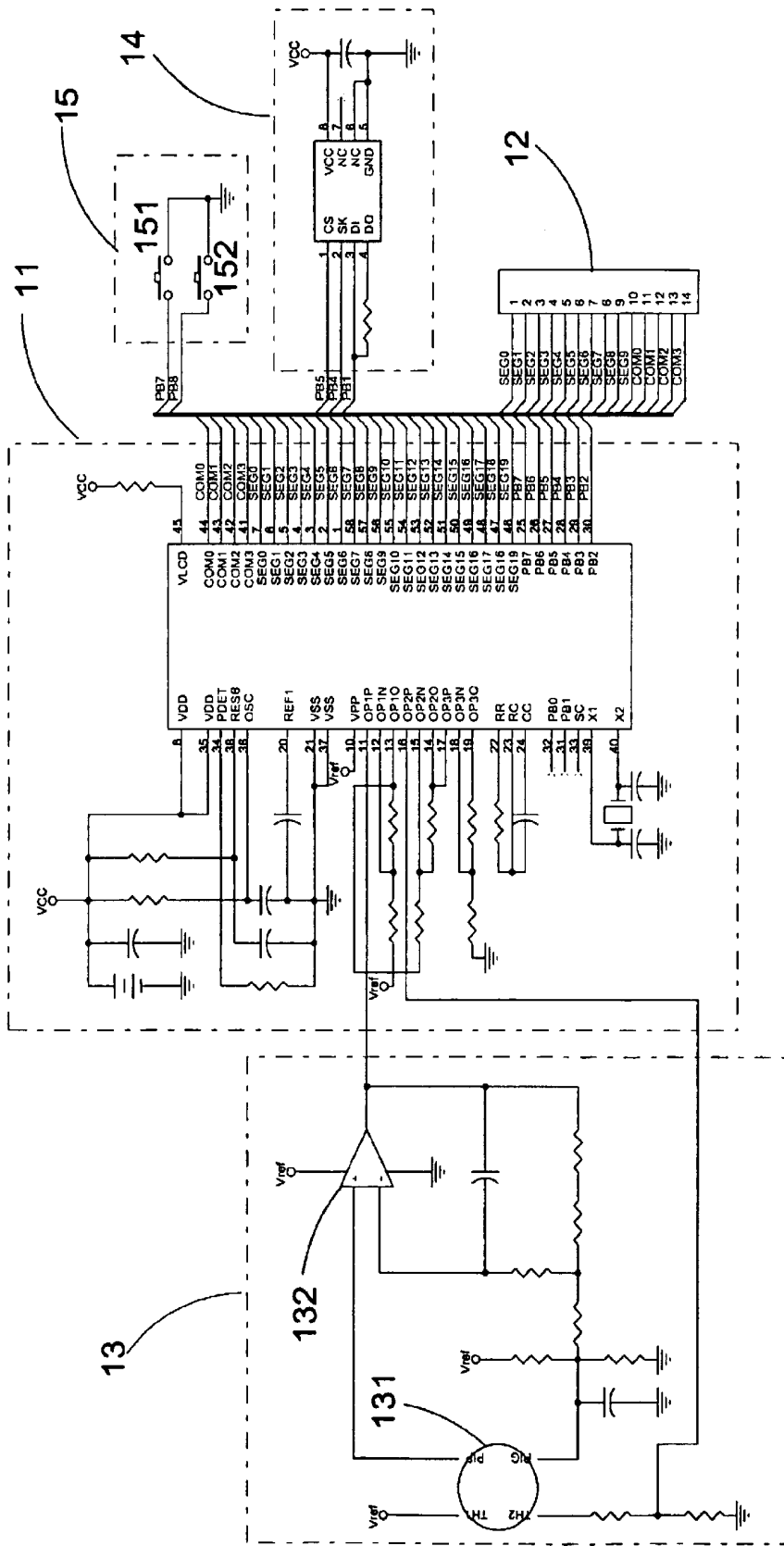


FIG-2

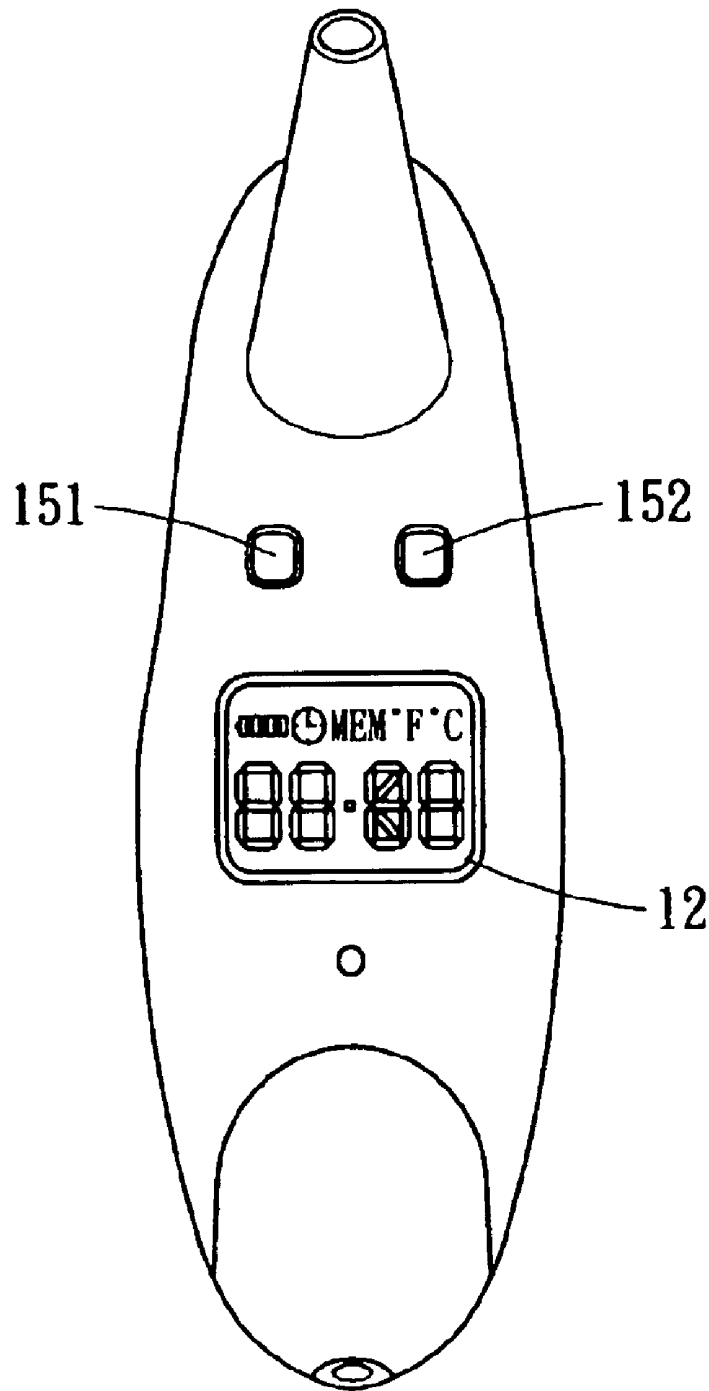


FIG. 3

ELECTRONIC EAR THERMOMETER WITH MULTIPLE MEASUREMENT AND MEMORY FUNCTION

BACKGROUND OF THE INVENTION

The present invention relates to a multiple measurement electronic thermometer, and more particular, to an electronic ear thermometer operative to measure, memorize and display ear temperatures of multiple people.

The body temperature is a health indication of human body. The condition of human immunity system is typically monitored by temperature variation. Therefore, thermometer is an instrument required for every household. During the outbreak period of severe acute respiratory syndrome (SARS), various types of thermometers, particularly the convenient electronic ear thermometer, were out of supply. As the conventional ear thermometer can only display the current measurement, and the current measurement erased after a short period of time such as 5 seconds of display. Therefore, the temperature variation for one or more than one person cannot be traced unless additional recording medium is applied. Although some electronic ear thermometers have memory functions, they are limited to records of a single person. In other words, the measurement obtained from different persons cannot be distinguished by the electronic ear thermometers.

BRIEF SUMMARY OF THE INVENTION

The present invention provides an electronic ear thermometer having the function of multiple measurement and memory. By such electronic ear thermometer, the temperature measurement of every users obtained at different time can be recorded into individual memory sectors and retrieved therefrom. Therefore, the temperature variation of each user can be easily monitored.

The electronic ear thermometer provided by the present invention comprises a microprocessor serving as a control and a memory unit in electric communication therewith. The memory unit is partitioned into a plurality of memory sectors. Each memory sector is in the form of a queue data structure, such that the ear temperature measured from each individual can be saved into the corresponding memory sector. Therefore, the temperature measurement and history of each user can be retrieved as required.

These and other objectives of the present invention will become obvious to those of ordinary skill in the art after reading the following detailed description of preferred embodiments.

It is to be understood that both the foregoing general description and the following detailed description are exemplary, and are intended to provide further explanation of the invention as claimed.

BRIEF DESCRIPTION OF THE DRAWINGS

These, as well as other features of the present invention, will become apparent upon reference to the drawings wherein:

FIG. 1 shows a block diagram of the electronic ear thermometer provided by the present invention;

FIG. 2 shows a circuit diagram of the electronic ear thermometer; and

FIG. 3 shows a perspective view of the electronic ear thermometer.

DETAILED DESCRIPTION OF THE INVENTION

Reference will now be made in detail to the preferred embodiments of the present invention, examples of which are illustrated in the accompanying drawings. Wherever possible, the same reference numbers are used in the drawings and the description to refer to the same or like parts.

As shown in FIG. 1, the electronic ear thermometer provided by the present invention comprises a microprocessor 11, a display unit 12, an ear temperature measuring unit 13, a memory unit 14 and a keypad unit 15. The microprocessor 11 serves as a control center in electric communication with the display unit 12, the ear temperature measuring unit 13, the memory unit 14 and the keypad unit 15. When the user presses a key or a button of the keypad unit 15, an input signal is sent from the keypad unit 15 to the microprocessor 11. According to the input signal, the microprocessor 11 outputs a control signal to a specific unit to the display unit 12, the ear temperature measuring unit 13, and/or the memory unit 14 to perform required actions in accordance with the input signal. The display unit 12 includes a liquid crystal display (LCD) for displaying ear temperature, measuring time and the identification code for the user, for example. The memory unit 14 includes an electrically erasable and programmable read only memory (EEPROM) or a random accessible memory (RAM) operative to store data such as ear temperature and measuring time.

FIG. 2 shows the circuit diagram of the electronic ear thermometer. As shown, the ear temperature measuring unit 13 includes a temperature sensor 131 operative to convert the measured temperature into an electric signal and an operation amplifier 132 to amplify the electric signal. The electric signal is then input to the microprocessor 11. The microprocessor 11 is operative to generate a control signal to the display unit 12 for displaying the temperature information carried by the electric signal input to the microprocessor 11. The microprocessor 11 is also operative to generate another control signal to the memory unit 14 for recording and saving the information carried by the electric signal. The memory unit 14 is partitioned into a plurality of memory sectors in the form of queues data structures. Therefore, the information is saved in a first in, first out manner. When the memory sector is full, the first-in data or information will be extruded to allow the current measurement to be saved therein. Therefore, the record saved in the memory sector is always the latest measurement of the user. For example, when each memory sector is operative to store only five sets of data, when the sixth measurement is performed, the first memory saved in the memory sector is erased from the memory sector while the sixth measurement is saved therein. The electronic ear thermometer also provides the functions of input the number of users by the number selection key 151 of the keypad unit 15. Further, identification code of each of the users such as user A and user B can also be defined by the keypad unit 15 as well. When the number of users and the identification code of the current user are input, the activation key 152 is pressed. Consequently, the temperature measurement is activated, and the measuring result is displayed by the display unit 12 and saved in the memory unit 14 under the control of the microprocessor 11. The measuring result includes not only the ear temperature, but also the duration of measurement. Therefore, the measuring history for each individual user can be properly maintained.

This disclosure provides exemplary embodiments of the present invention. The scope of this disclosure is not limited

by these exemplary embodiments. Numerous variations, whether explicitly provided for by the specification or implied by the specification, such as variations in shape, structure, dimension, type of material or manufacturing process may be implemented by one of skill in the art in view of this disclosure.

What is claimed is:

1. A multiple measurement and memory electronic ear thermometer, comprising:

a keypad unit including an activation key and a selection key, wherein when the activation key is pressed, the keypad unit is operative to generate a first input signal and when the selection key is pressed, the keypad is operative to generate either a second input signal for selecting the number of users or a third input signal for selecting one of the users;

a microprocessor in electric communication with the keypad unit, the microprocessor being operative to generate a first control signal in response to the first input signal, a third control signal in response to the second input signal and a fourth control signal in response to the third input signal;

an ear temperature measuring unit, operative to measure ear temperature from a selected user in response to the first control signal generated by the microprocessor and convert the ear temperature into an electric signal sent to the microprocessor to generate a second control signal;

a display unit, operative to display the ear temperature in response to the second control signal; and

a memory unit, being partitioned into an individual memory sector for each one of the users, wherein the memory sector is operative to save the ear temperature measurement in response to the second control signal and the fourth control signal or later to retrieve the stored ear temperature measurement in response to the fourth control signal.

2. The thermometer of claim 1, wherein each of the memory sectors is in the form of a queue data structure.

3. The thermometer of claim 1, wherein the display unit includes a liquid crystal display.

4. The thermometer of claim 1, wherein the memory unit includes an electrically erasable and programmable read only memory (EEPROM) or a random access memory (RAM).

5. The thermometer of claim 1, wherein the ear temperature measuring unit is also operative to count time for ear temperature measurement.

6. The thermometer of claim 1, wherein the keypad unit further includes a key for inputting an identification code for each user.

7. The thermometer of claim 1, wherein the ear temperature measuring unit is operative to measure ear temperature among different users in response to the actuating of the activation key or the selection key, wherein the ear temperature measurements can be stored, retrieved and displayed to/from the corresponding memory section of each user.

8. A multiple measurement and memory electronic ear thermometer, comprising: a keypad unit including an activation key and a selection key, wherein when the activation key is pressed, the keypad unit is operative to generate a first input signal and when the selection key is pressed, the keypad is operative to generate either a second input signal for selecting the number of users or a third input signal for selecting one of the users;

a microprocessor having a real time clock in electric communication with the keypad unit, the microprocessor being operative to generate a first control signal in response to the first input signal, a third control signal in response to the second input signal and a fourth control signal in response to the third input signal;

an ear temperature measuring unit, operative to measure ear temperature from a selected user in response to the first control signal generated by the microprocessor and convert the ear temperature into an electric signal sent to the microprocessor to generate a second control signal;

a display unit, operative to display the ear temperature and a measuring time from the real time clock in response to the second control signal; and

a memory unit, being partitioned into individual memory sectors for each users, wherein the memory sector is operative to save the ear temperature measurement and the measuring time in response to the second control signal and the fourth control signal or later to retrieve and display the stored ear temperature measurement and the measuring time in response to the fourth control signal.

9. The ear thermometer claimed as claim 8, wherein the display unit can display a user identification with the ear temperature measurement and the measuring time.

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专利名称(译)	电子耳温计，具有多种测量和记忆功能		
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[标]申请(专利权)人(译)	HSIEH青志		
申请(专利权)人(译)	HSIEH CHIN-CHIH		
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[标]发明人	HSIEH CHIN CHIH		
发明人	HSIEH, CHIN-CHIH		
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其他公开文献	US20050083993A1		
外部链接	Espacenet USPTO		

摘要(译)

多测量记忆型电子体温计包括耳温测量单元，微处理器，键盘单元，显示单元和存储单元。耳温度测量单元，显示单元和存储单元由微处理器控制。当用户按下键盘单元的激活键时，由微处理器控制，激活耳温单元以进行测量。耳温单元的测量结果被发送回微处理器，由显示单元显示，并保存在存储单元中。存储器单元被划分为多个独立的存储器扇区。每个扇区包括队列数据结构，使得从每个人测量的耳温和测量时间可以存储在相应的存储扇区中。因此，可以执行，记忆和检索多个人的测量。

