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(54) **MEASUREMENT DEVICE**

MESSVORRICHTUNG

DISPOSITIF DE MESURE

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Description

TECHNICAL FIELD

[0001] The present invention relates to a measurement device for use in measuring bio data such as a blood glucose level.

BACKGROUND ART

[0002] An example of a conventional measurement device is disclosed in Patent Document 1. The measurement device includes measurement means capable of measuring a blood glucose level, means for determining the date and time of the measurement of the blood glucose level, and display means for displaying the measurement data on the blood glucose level and the data on the measurement date and time.

[0003] The measurement device further includes operation means capable of selectively inputting information as to whether the measurement of the blood glucose level is performed before or after a meal. With this arrangement, when the user or a doctor checks the measurement data, the user or the doctor can find whether the measurement data is obtained from measurement performed before or after a meal, which is suitable for proper evaluation of the measurement data.

[0004] However, there is still room for improvement in the conventional technique.

[0005] Specifically, the user is sometimes instructed by e.g. a doctor to measure the blood glucose level in a predetermined period of time from a meal. However, the above-described measurement device has no function to display the time elapsed from the meal on a screen.

[0006] Thus, in order for the user to follow the doctor's instruction, the user needs to remember the time at which the user had the meal and calculate how much time has elapsed from the meal based on the time of the meal and the current time. These tasks are troublesome. Further, the user may forget or mistake the time of the meal. In such a case, there is a high possibility that the measurement of the blood glucose level is performed in an improper period of time.

[0007] Patent Document 1: JP-A-2007-037 822

[0008] Further background art is provided in JP 2006 109895 A and WO 2005/106446 A1.

[0009] JP 2006 109895 A discloses a wrist watch adapted for measuring blood components. Whether or not an operation switch for the time of a meal is operated by a subject is judged by a main control part, and when the operation switch is operated, elapsed time from the point of time is measured by a clock function part. When an operation switch for starting measurement is operated after the operation switch is operated and the blood components are measured by a blood component detection unit, blood component relating information relating to the measured blood components and the time information on the elapsed time measured by the clock function part are displayed on a display panel.

[0010] WO 2005/106446 A1 discloses a portable blood sugar level measuring device enabling a diabetic patient to perform management of measurement timing of the blood sugar level, management of change of the blood sugar level, and prediction of the future blood sugar level. The portable blood sugar level measuring device having the function to measure the blood sugar level and manage the obtained measurement data includes a data calculation unit for calculating the measurement data by a predetermined method, displaying the calculation result, and notifying the blood sugar level measuring timing and a predicted blood sugar value to the diabetic patient.

DISCLOSURE OF THE INVENTION

[0011] The present invention is a measurement device as defined in Claim 1 of the appended claims.

[0012] A measurement device provided according to the present invention includes measurement means that perform measurement on a particular component contained in a sample, a display section capable of displaying measurement data obtained by the measurement means, a clock function section, event time setting means capable of setting a time of an event related to the measurement, and elapsed time display processing means that starts measurement of the elapsed time from the time of the event to the current time when the time of the event is set by the event time setting means and cause the display section to display the elapsed time.

[0013] Preferably, the elapsed time is displayed on a standby screen of the display section. The "standby screen", as used herein, is a screen displayed on the display section when the measurement device of the present invention is in a standby state in which the measurement device is not performing measurement or in a state in which the measurement device is not performing a particular function.

[0014] Preferably, the measurement device according to the present invention further comprises notification means capable of performing a notifying operation in a manner that is different from the displaying of the data by the display section. The notification means perform the notifying operation when a first predetermined period of time has elapsed from the time of the event.

[0015] Preferably, the displaying of the elapsed time is stopped when a second predetermined period of time has elapsed from the time of the event.

[0016] The second predetermined period of time can be set independently of the first predetermined period of time and may be equal or unequal to the first predetermined period of time.

[0017] Preferably, the elapsed time display processing means calculate the elapsed time based on the time of the event and the current time clocked by the clock function section. The displaying of the elapsed time is stopped when the time clocked by the clock function section is changed within a period during which the elapsed time

is displayed.

[0018] Preferably, the measurement device according to the present invention further comprises storage means in which the measurement data obtained by the measurement means is to be stored. When the measurement data is obtained from the measurement performed before the elapse of a third predetermined period of time from the time of the event, reference data indicating to that effect is stored in the storage means as attached to the measurement data.

[0019] The third predetermined period of time can be set independently of the first predetermined period of time and the second predetermined period of time and may be equal or unequal to the first predetermined period of time and the second predetermined period of time.

[0020] Preferably, the measurement device according to the present invention further comprises a terminal section capable of reading the measurement data obtained by the measurement means and the reference data out of the storage means and outputting the measurement data and the reference data to an external device.

[0021] Preferably, when a predetermined operation is performed, the event time setting means regards the time when the operation is performed as the time of the event.

[0022] Preferably, the measurement device according to the present invention further comprises an operation switch, and the predetermined operation is an operation to turn on the operation switch.

[0023] Preferably, the measurement means includes a sensor mount portion to which a sensor capable of retaining the sample is to be mounted, and a detection switch for detecting the mounting of the sensor to the sensor mount portion. The predetermined operation is an operation to mount the sensor to the sensor mount portion to cause the detection switch to detect the mounting of the sensor.

[0024] Preferably, when the predetermined operation is performed a plurality of times, the time when the operation is performed last is regarded as the time of the event, and data having been regarded as the time of the event earlier than that time is invalidated.

[0025] Preferably, the measurement device according to the present invention is provided with an edit function capable of changing at least one of the value representing the time of the event and the value representing the elapsed time by a predetermined operation.

[0026] Preferably, the measurement device according to the present invention includes a case having a size allowing the case to be held with one hand, and the display section is attached to the case so as to be viewable from outside. The case accommodates therein devices forming the measurement means, the clock function section, the event time setting means and the elapsed time display processing means, and the entirety of the measurement device is designed as a portable measurement device.

[0027] Preferably, the measurement means, the event time setting means and the elapsed time display processing means comprise a CPU and storage means attached to the CPU.

[0028] Preferably, the measurement means are capable of measuring a blood glucose level, and the event is a meal.

[0029] Other features and advantages of the present invention will become more apparent from the detailed description given below with reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0030]

Fig. 1	illustrates an appearance of an example of measurement device according to the present invention.
Fig. 2	is a block diagram of the measurement device shown in Fig. 1.
Figs. 3A to 3C	each is a front elevational view illustrating an example of screen displaying in the measurement device shown in Fig. 1.
Fig. 4	is a flow chart illustrating an example of process carried out by a signal processing section incorporated in the measurement device shown in Fig. 1.

BEST MODE FOR CARRYING OUT THE INVENTION

[0031] Preferred embodiments of the present invention will be described below with reference to the accompanying drawings.

[0032] Figs. 1 and 2 show an example of measurement device according to the present invention. The measurement device A of this embodiment is designed to measure a blood glucose level. As better shown in Fig. 1, the measurement device A includes a case 1 which has a size and shape suitable for holding and carrying with one hand. On an outer surface of the case 1, a display section 10 capable of displaying images and an operation switch 11 are provided. The display section 10 is formed using a liquid crystal display, for example. The measurement device A is capable of measuring the glucose level of blood by using a sensor 2 in the form of a strip for blood sampling.

[0033] As better shown in Fig. 2, in addition to the display section 10 and the operation switch 11, the measurement device A includes a sensor mount portion 12, a detection switch 19, an electric circuit section for analysis 13, a signal processing section 14, a storage section 15, a clock function section 16, an alarm 17, and an input/output terminal section 18. The signal processing section 14 comprises a CPU, for example. From the functional viewpoint, the signal processing section 14 comprises a measured value calculation portion 14a, an event time setting portion 14b, an elapsed time display processing portion 14c and a reference data attaching portion 14d.

[0034] The sensor mount portion 12 is a portion to which the sensor 2 is to be removably mounted. The case 1 includes an end formed with a hole for receiving the sensor 2, and the inside of the hole is the sensor mount portion 12. The detection switch 19 serves to determine whether or not the sensor 2 is mounted to the sensor mount portion 12. When the sensor 2 is mounted to the sensor mount portion 12, the detection switch is turned on by being pressed by the sensor 2.

[0035] When blood is applied to a predetermined portion of the sensor 2 mounted to the sensor mount portion 12, the electric circuit section for analysis 13 applies a voltage to the sensor 2 to generate a response current corresponding to the concentration of glucose in the blood. The electric circuit section for analysis 13 converts the response current to a voltage and inputs the voltage signal to the signal processing section 14. The measured value calculation portion 14a of the signal processing section 14 calculates the glucose level based on the voltage signal.

[0036] Such a technique of measuring the glucose level is known (see e.g. Japanese Examined Patent Application Publication JP-B- 8-010 208). The glucose level can also be measured by a technique which is different from this embodiment. The combination of the sensor mount portion 12, the electric circuit section for analysis 13 and the signal processing section 14 (the measured value calculation portion 14a) is an example of measurement means defined by the present invention.

[0037] The storage section 15 includes a RAM and an EEPROM for storing glucose level measurement data and other various data to be described later, as well as ROM storing control programs for the signal processing section 14. Preferably, the clock function section 16 has a calendar function to find the current date and is so designed that the time is adjustable.

[0038] The input/output terminal section 18 is provided for connection to e.g. a personal computer PC via a cable 30, as shown in Fig. 1. When the measurement device A is connected to the personal computer PC, it is possible to change the setting of each part of the measurement device A and transfer the data stored in the storage section 15 to the personal computer PC by accessing the signal processing section 14 from the personal computer PC.

[0039] When the operation switch 11 is pressed, the event time setting portion 14b regards the time of pressing as the time of an event and stores the data on that time in the storage section 15. However, the measurement device A is designed to be switchable between an event input setting ON mode in which the setting of the event time by the operation switch 11 is rendered valid and an event input setting OFF mode in which such setting is rendered invalid. Such switching can be achieved by rewriting data by using the personal computer PC, for example.

[0040] The combination of the signal processing section 14 (the event time setting portion 14b) and the storage section 15 is an example of event time setting means defined by the present invention. The elapsed time display processing portion 14c calculates the time elapsed from the time of the event to the current time and causes the display section 10 to display the calculation result. In storing the measured value of the glucose level in the storage section 15, the reference data attaching portion 14d attaches predetermined reference data to the measurement data under certain conditions. The above-described operation of the signal processing section 14 will be specifically described later.

[0041] The operation and advantages of the measurement device A are described below. An example of process carried out by the signal processing section 14 is also described referring to the flow chart shown in Fig. 4.

[0042] When the measurement device A is not used, the display section 10 is set in an OFF state for saving power. However, as indicated by the reference sign d1 in Fig. 3A, the current time can be displayed on the standby screen of the display section 10 by selecting a clock display function. When the user presses the operation switch 11 in the event input setting ON mode, the signal processing section 14 regards the time of press as the time of the event and stores the time of the event in the storage section 15 (S1: YES, S2: YES, S3). The event may be a meal, for example. In this case, the user operates the operation switch 11 just after eating a meal. Alternatively, the operation switch 11 may be operated before or during a meal.

[0043] Then, the signal processing section 14 starts to calculate the time elapsed from the time of the event to the current time and causes the display section 10 to display the elapsed time and a predetermined reference mark on the standby screen of the display section 10 (S4, S5). The definition of the standby screen has been described before. The elapsed time is displayed in such a manner as indicated by the reference sign d2 in Fig. 3B and updated every one minute, for example. The reference mark may be a pattern of a fork, as indicated by the reference sign d3. The reference mark is displayed to indicate that the current time is still within a predetermined period of time from the time of the event.

[0044] According to the process described above, since the time elapsed from a meal is displayed on the display section 10, the user can easily find the elapsed time by looking at the display. Thus, the user becomes free from troublesome tasks of remembering the time of a meal and calculating, after eating the meal, the elapsed time based on the time of the meal and the current time. Thus, the measurement at an improper time due to the user's forgetting or mistaking the time of the event is prevented. Moreover, by checking the reference mark indicated by the reference sign d3, the user can easily find that the current time is still within the predetermined period of time from the meal.

[0045] When a first predetermined period of time (e.g. two hours) has elapsed from the time of the event, the signal processing section 14 causes the alarm 17 to

sound an alarm (S6: YES, S7). The value of the first predetermined period of time, which is stored in the storage section 15 in advance, may be a period of time from the time of the meal to the time to measure the blood glucose level.

[0046] Thus, by hearing the alarm, the user is properly notified that the time to measure the blood glucose level has come. Thus, the user is prevented from forgetting to measure the blood glucose level in a predetermined period of time. Preferably, the value of the first predetermined period of time can be changed by operating the operation switch 11 or by performing a writing operation by way of the personal computer PC, This holds true for a second predetermined period of time in step S8, which is described below.

[0047] When the second predetermined period of time (e.g. three hours) has elapsed from the time of the event, the signal processing section 14 stops displaying the elapsed time and the reference mark indicated by the reference signs d2 and d3 in Fig. 3B (S8: YES, S9). Since the blood glucose level returns to a usual value (in a fasting state) after elapse of e.g. about three hours, displaying the elapsed time is practically meaningless. The above-described process properly accommodates such cases.

[0048] Even when the second predetermined period of time has not elapsed yet, the signal processing section stops displaying the elapsed time and the reference mark in a manner similar to the above when the time set in the clock function section 16 is changed (S8: NO, S14: YES, S9). In spite of the time change, if the elapsed time is calculated based on the time indicated after the time change and the time of the meal inputted before the time change, the value obtained by the calculation is likely to be incorrect. By the above-described process, however, such an elapsed time, which is likely to be incorrect, is prevented from being displayed on the display section 10.

[0049] When the blood glucose level is measured before the elapse of the second predetermined period of time from the time of the event without changing the time setting in the clock function section 16, the signal processing section 14 performs an arithmetic computation on the measured value and causes the display section 10 to display the value thus obtained (S8: NO, S14: NO, S15: YES, S16, S17). The measured value is displayed in such a manner as indicated by the reference sign d4 in Fig. 3C.

[0050] The various data described above are stored in the storage section 15 at substantially the same time as the above-described displaying (S18). In this process, in addition to the data on the measured value and the time of the measurement, reference data corresponding to a flag or an identifier is also stored in the storage section 15. The reference data corresponds to the reference mark indicated by the reference sign d3 and indicates that the measurement of the blood glucose level is performed within a third predetermined period of time from the time of the event.

[0051] In this embodiment, the third predetermined period of time is equal to the second predetermined period of time. Unlike this embodiment, when the device is so designed that the reference data is stored in the storage section 15 by the user's operation on a particular operation switch, the user may forget the operation on the switch and hence the reference data may not be properly stored.

[0052] According to this embodiment, by contrast, there is no such possibility because the operation to store the reference data in the storage section 15 is performed by the signal processing section 14. The data on the time of the event is also stored in the storage section 15. However, since this data item is already stored in the storage section 15 in step S3, the operation to newly write this data item in the storage section 15 can be omitted.

[0053] The data stored in the storage section 15 may be transferred to the personal computer PC to be monitored by a doctor, for example. In addition to the data on the blood glucose level and the time of the measurement, the above-described reference data and the data on the time of the meal may also be transferred to the personal computer PC. This enables the doctor to easily and properly judge the condition of the blood glucose level. Unlike this embodiment, the data on the elapsed time from the time of the meal to the time of the measurement may also be stored in the storage section 15 and transferred to the personal computer PC.

[0054] Unlike the above, the measurement of the blood glucose level may be performed after the displaying of the elapsed time and the reference mark is stopped. In this case again, the signal processing section 14 causes the data on the measured value to be displayed and stores the data on the measured value and the data on the time of the measurement in the storage section 15 (S9, S10: YES, S11-S13).

[0055] In this case, however, unlike the step S 18, the reference data and the data on the time of the meal are not stored. Similarly, when the blood glucose level is measured in a state in which the measurement device A is in the event input setting OFF mode (S1: NO) or in a state in which the operation indicating the execution of the event has not been performed, the reference data and the data on the time of the meal are not stored (S2: NO).

[0056] Though not illustrated in Fig. 4, the measurement device A may be designed as follows. In the case where the operation switch is operated twice with a time interval, the data on the time of the event set by the first operation is invalidated, while the time set by the second operation is determined to be the correct event time. With this arrangement, even when an incorrect time is set by mistake, the correct time can be set later by an easy operation, which is convenient.

[0057] The measurement device A may be provided with an edit function which is capable of varying the value of the time of the event or the value of the elapsed time as desired by the user by an operation on a predeter-

mined switch. With this arrangement, even when the user forgets to operate the operation switch 11 and operates the operation switch 11 after elapse of a considerable time from the event, the value of the elapsed time can be varied to a correct value.

[0058] The present invention is not limited to the foregoing embodiment. The specific structure of each part of the measurement device according to the present invention can be varied in design in many ways.

[0059] The setting of the event time is possible without using the operation switch 11. The time when the detection switch 19 detects the mounting of the sensor 2 to the sensor mount portion 12 is determined to be the time of the event. In this case, the
measurement device according to the present invention does not need to have the operation switch, similarly to the device disclosed in JP-A-7-128 338.

[0060] The measurement means according to the present invention needs to be provided with only the function to perform measurement on a particular component contained in a sample, and there is no limitation on the kind of the sample or a specific component to be subjected to measurement. For instance, components in blood other than glucose or a particular component in urine may be subjected to measurement. The display section may be of any design as long as it can display data.

[0061] Thus, a display other than a liquid crystal display may be employed. The notification means may comprise an alarm lamp or vibrator provided separately from the display section instead of or in addition to the auditory alarm which sounds an alarm. The "event" used in the present invention is not limited to a meal. For instance, instead of or in addition to a meal, an act such as doing a sport or taking medicine may be set as the event.

[0062] The elapsed time from the event time to the current time may be expressed by any other means than numeric characters, and the manner of expression of the elapsed time is not limited. For instance, the elapsed time may be expressed in the form of a bar graph or an image of a clock. In the case where the displaying of the elapsed time is to be stopped upon the elapse of a predetermined period of time from the time of the event, the predetermined period of time may not be fixed to e.g. three hours and may be changed appropriately by the user. The reference mark is not limited to the pattern of a fork, and other patterns, signs or letters may be used.

Claims

1. A measurement device comprising:

measurement means (2, 12) configured to perform measurement on a particular component contained in a sample;
a display section (10) capable of displaying measurement data obtained by the measurement means (2, 12);
a clock function section (16);
event time setting means (14b) capable of setting a time of an event related to the measurement; and
elapsed time display processing means (14c) configured to start measurement of an elapsed time from the time of the event to a current time when the time of the event is set by the event time setting means (14b), and to cause the display section (10) to display the elapsed time;

wherein the measurement means (2, 12) include a sensor mount portion (12) to which a sensor (2) capable of retaining the sample can be mounted, **characterised in that** the measurement means also include a detection switch (19) for detecting the mounting of the sensor (2) to the sensor mount portion (12); and
wherein the event is an operation to mount the sensor (2) to the sensor mount portion (12) to cause the detection switch (19) to detect the mounting of the sensor (2).

2. The measurement device according to claim 1, wherein the elapsed time is displayed on a standby screen of the display section (10).

3. The measurement device according to claim 1 or 2, further comprising
notification means capable of performing a notifying operation in a manner that is different from the displaying of the data by the display section (10),
wherein the notification means are configured to perform the notifying operation when a first predetermined period of time has elapsed from the time of the event.

4. The measurement device according to any of claims 1 to 3,
wherein the measurement device is configured such that displaying of the elapsed time is stopped when a second predetermined period of time has elapsed from the time of the event.

5. The measurement device according to any of claims 1 to 4,
wherein the elapsed time display processing means (14c) are configured to calculate the elapsed time based on the time of the event and the current time clocked by the clock function section (16); and
wherein the measurement device is configured such that displaying of the elapsed time is stopped when the time clocked by the clock function section (16) is changed within a period during which the elapsed time is displayed.

6. The measurement device according to any of claims

1 to 5,
further comprising
storage means (15) in which the measurement data obtained by the measurement means (2, 12) is to be stored,
wherein the measurement device is configured such that, when the measurement data is obtained from the measurement performed before elapse of a third predetermined period of time from the time of the event, reference data indicating to that effect is stored in the storage means (15) as attached to the measurement data.

7. The measurement device according to claim 6,
further comprising a terminal section (18) capable of reading the measurement data obtained by the measurement means (2, 12) and the reference data out of the storage means (15) and outputting the measurement data and the reference data to an external device.

8. The measurement device according to any of the claims 1 to 7,
wherein, when a predetermined operation is performed, the event time setting means are configured to regard the time when the operation is performed as the time of the event.

9. The measurement device according to claim 8,
further comprising an operation switch (11),
wherein the predetermined operation is an operation to turn on the operation switch (11).

10. The measurement device according to any of claims 1 to 9,
wherein the measurement device is configured such that, when the predetermined operation is performed a plurality of times, the time when the operation is performed last is regarded as the time of the event, and data having been regarded as the time of the event earlier than that time is invalidated.

11. The measurement device according to any of claims 1 to 10,
which is provided with an edit function capable of changing at least one of a value representing the time of the event and a value representing the elapsed time by a predetermined operation.

12. The measurement device according to any of claims 1 to 11,
which includes a case (1) having a size allowing the case to be held with one hand by a user in use, the display section (10) being attached to the case (1) so as to be viewable from outside,
wherein the case (1) accommodates therein devices forming the measurement means (2, 12), the clock function section (16), the event time setting means (14b) and the elapsed time display processing means (14c), and the entirety of the measurement device (A) is designed as a portable measurement device.

13. The measurement device according to any of claims 1 to 12,
wherein the measurement means (2, 12), the event time setting means (14b) and the elapsed time display processing means (14c) comprise a CPU (14) and storage means (15) attached to the CPU.

14. The measurement device according to any of claims 1 to 13,
wherein the measurement means (2, 12) are capable of measuring a blood glucose level, and the event is a meal.

Patentansprüche

1. Messvorrichtung, die Folgendes umfasst:

eine Messvorrichtung (2, 12), die konfiguriert ist, um eine Messung an einer bestimmten Komponente durchzuführen, die in einer Probe enthalten ist;
einen Anzeigeabschnitt (10), der in der Lage ist, Messdaten anzuzeigen, die von den Messmitteln (2, 12) erhalten werden;
einen Taktfunktionsabschnitt (16);
eine Ereigniszeiteinstellmittel (14b), das in der Lage ist, eine Zeit eines Ereignisses, das mit der Messung zusammenhängt, einzustellen, und
ein Anzeigeverarbeitungsmittel für verstrichene Zeit (14c), das konfiguriert ist, um die Messung einer verstrichenen Zeit von dem Zeitpunkt des Ereignisses bis zu einer aktuellen Zeit zu starten, wenn die Zeit des Ereignisses durch das Ereigniszeiteinstellmittel (14b) eingestellt wird, und um zu bewirken, dass der Anzeigeabschnitt (10) die verstrichene Zeit anzeigt;

wobei das Messmittel (2, 12) einen Sensormontageabschnitt (12) umfasst, an dem ein Sensor (2), der die Probe zurückhalten kann, montiert werden kann, **dadurch gekennzeichnet, dass** das Messmittel darüber hinaus einen Erfassungsschalter (19) zum Erfassen der Montage des Sensors (2) an dem Sensormontageabschnitt (12) umfasst; und
wobei das Ereignis ein Vorgang zum Montieren des Sensors (2) an dem Sensormontageabschnitt (12) ist, um zu bewirken, dass der Erfassungsschalter (19) die Montage des Sensors (2) erfasst.

2. Messvorrichtung nach Anspruch 1,
wobei die verstrichene Zeit auf einem Bereitschaftsbildschirm des Anzeigeabschnitts (10) angezeigt

wird.

3. Messvorrichtung nach Anspruch 1 oder 2, die ferner Folgendes umfasst:

ein Benachrichtigungsmittel, das in der Lage ist, eine Benachrichtigungsoperation in einer Weise durchzuführen, die von der Anzeige der Daten durch den Anzeigeabschnitt (10) verschieden ist,

wobei das Benachrichtigungsmittel konfiguriert ist, um die Benachrichtigungsoperation auszuführen, wenn eine erste vorbestimmte Zeitperiode ab dem Zeitpunkt des Ereignisses verstrichen ist.

4. Messvorrichtung nach einem der Ansprüche 1 bis 3, wobei die Messvorrichtung so konfiguriert ist, dass die Anzeige der verstrichenen Zeit gestoppt wird, wenn eine zweite vorbestimmte Zeitperiode ab dem Zeitpunkt des Ereignisses verstrichen ist.

5. Messvorrichtung nach einem der Ansprüche 1 bis 4, wobei das Anzeigeverarbeitungsmittel für verstrichene Zeit (14c) dafür konfiguriert ist, die verstrichene Zeit basierend auf der Zeit des Ereignisses und der aktuellen Zeit zu berechnen, die durch den Taktfunktionsabschnitt (16) getaktet wird; und
wobei die Messvorrichtung so konfiguriert ist, dass die Anzeige der verstrichenen Zeit gestoppt wird, wenn die Zeit, die durch den Taktfunktionsabschnitt (16) getaktet wird, innerhalb einer Periode geändert wird, während der die verstrichene Zeit angezeigt wird.

6. Messvorrichtung nach einem der Ansprüche 1 bis 5, die ferner Folgendes umfasst:

ein Speichermittel (15), in dem die Messdaten, die von dem Messmittel (2, 12) erhalten werden, zu speichern sind,

wobei die Messvorrichtung so konfiguriert ist, dass, wenn die Messdaten aus der Messung erhalten werden, die vor dem Verstreichen einer dritten vorbestimmten Zeitperiode von dem Zeitpunkt des Ereignisses ausgeführt wird, Bezugsdaten, die diesen Sachverhalt anzeigen, in dem Speichermittel (15) an den Messdaten anhängend gespeichert werden.

7. Messvorrichtung nach Anspruch 6, die ferner einen Anschlussabschnitt (18) umfasst, der Folgendes ausführen kann: Lesen der Messdaten, die von den Messmitteln (2, 12) erhalten werden, und der Bezugsdaten aus dem Speichermittel (15) und Ausgeben der Messdaten und der Bezugsdaten an eine externe Vorrichtung.

8. Messvorrichtung nach einem der Ansprüche 1 bis 7, wobei, wenn eine vorbestimmte Operation durchgeführt wird, das Ereigniszeiteinstellmittel so konfiguriert ist, dass es die Zeit, zu der die Operation ausgeführt wird, als die Zeit des Ereignisses betrachtet.

9. Messvorrichtung nach Anspruch 8, die ferner einen Betriebsschalter (11) umfasst, wobei die vorbestimmte Operation eine Operation zum Einschalten des Betriebsschalters (11) ist.

10. Messvorrichtung nach einem der Ansprüche 1 bis 9, wobei die Messvorrichtung so konfiguriert ist, dass, wenn die vorbestimmte Operation mehrmals durchgeführt wird, die Zeit, zu der die Operation zuletzt ausgeführt wird, als die Zeit des Ereignisses angesehen wird, und Daten, die als die Zeit des Ereignisses vor dieser Zeit angesehen wurden, ungültig gemacht werden.

11. Messvorrichtung nach einem der Ansprüche 1 bis 10, die mit einer Bearbeitungsfunktion versehen ist, die in der Lage ist, mindestens einen Wert, der die Zeit des Ereignisses repräsentiert, und einen Wert, der die verstrichene Zeit repräsentiert, durch eine vorbestimmte Operation zu ändern.

12. Messvorrichtung nach einem der Ansprüche 1 bis 11, die ein Gehäuse (1) umfasst, das eine Größe aufweist, die es ermöglicht, dass das Gehäuse bei Gebrauch von einem Benutzer mit einer Hand gehalten wird, wobei der Anzeigeabschnitt (10) so an dem Gehäuse (1) angebracht ist, dass er von außen sichtbar ist,
wobei das Gehäuse (1) Vorrichtungen darin aufnimmt, die das Messmittel (2, 12), den Taktfunktionsabschnitt (16), das Ereigniszeiteinstellmittel (14b) und das Anzeigeverarbeitungsmittel für verstrichene Zeit (14c) bilden, und die Gesamtheit der Messvorrichtung (A) als tragbare Messvorrichtung ausgelegt ist.

13. Messvorrichtung nach einem der Ansprüche 1 bis 12, wobei das Messmittel (2, 12), das Ereigniszeiteinstellmittel (14b) und das Anzeigeverarbeitungsmittel für verstrichene Zeit (14c) eine CPU (14) und ein Speichermittel (15), das an der CPU angebracht ist, umfassen.

14. Messvorrichtung nach einem der Ansprüche 1 bis 13, wobei das Messmittel (2, 12) in der Lage ist, einen Blutzuckerspiegel zu messen, und das Ereignis eine Mahlzeit ist.

Revendications

1. Dispositif de mesure comprenant :

des moyens de mesure (2, 12) configurés de façon à réaliser une mesure sur un composant particulier contenu dans un échantillon ;
une section d'affichage (10) apte à afficher des données de mesure obtenues par les moyens de mesure (2, 12) ;
une section à fonction d'horloge (16) ;
des moyens de réglage d'horaire d'événements (14b) aptes à régler le moment d'un événement lié à la mesure ; et
des moyens de traitement de l'affichage du temps écoulé (14c) configurés de façon à démarrer la mesure d'un temps écoulé à partir du moment de l'événement jusqu'à un moment actuel lorsque le moment de l'événement est réglé par les moyens de réglage d'horaire d'événements (14b), et à amener la section d'affichage (10) à afficher le temps écoulé ;

cas dans lequel les moyens de mesure (2, 12) incluent une portion à monture de capteur (12) sur laquelle un capteur (2), apte à retenir l'échantillon, peut être monté, **caractérisé en ce que** les moyens de mesure incluent également un interrupteur de détection (19) pour détecter le montage du capteur (2) sur la portion à monture de capteur (12) ; et
cas dans lequel l'événement est une opération pour monter le capteur (2) sur la portion à monture de capteur (12) afin d'amener l'interrupteur de détection (19) à détecter le montage du capteur (2).

2. Dispositif de mesure selon la revendication 1,
le temps écoulé étant affiché sur un écran en veille de la section d'affichage (10).

3. Dispositif de mesure selon la revendication 1 ou 2, comprenant en outre :

des moyens de notification aptes à réaliser une opération de notification suivant une manière qui est différente de l'affichage des données par la section d'affichage (10),

cas dans lequel les moyens de notification sont configurés de façon à réaliser l'opération de notification lorsqu'un premier laps de temps prédéterminé s'est écoulé depuis le moment de l'événement.

4. Dispositif de mesure selon l'une quelconque des revendications 1 à 3,
le dispositif de mesure étant configuré de sorte que l'affichage du temps écoulé est arrêté lorsqu'un deuxième laps de temps prédéterminé s'est écoulé depuis le moment de l'événement.

5. Dispositif de mesure selon l'une quelconque des revendications 1 à 4,
les moyens de traitement de l'affichage du temps écoulé (14c) étant configurés de façon à calculer le temps écoulé sur la base du moment de l'événement et du moment actuel cadencés par la section à fonction d'horloge (16) ; et
le dispositif de mesure étant configuré de sorte que l'affichage du temps écoulé est arrêté lorsque le temps cadencé par la section à fonction d'horloge (16) est changé au sein d'une période au cours de laquelle le temps écoulé est affiché.

6. Dispositif de mesure selon l'une quelconque des revendications 1 à 5,
comprenant en outre :

des moyens de stockage (15) dans lesquels les données de mesure obtenues par les moyens de mesure (2, 12) sont destinées à être stockées,

le dispositif de mesure étant configuré de sorte que, lorsque les données de mesure sont obtenues à partir de la mesure réalisée avant l'écoulement d'un troisième laps de temps prédéterminé depuis le moment de l'événement, des données de référence avec une indication à cet effet sont stockées dans les moyens de stockage (15) telles qu'elles sont attachées aux données de mesure.

7. Dispositif de mesure selon la revendication 6,
comprenant en outre une section à terminal (18) apte à lire les données de mesure obtenues par les moyens de mesure (2, 12) et les données de référence à partir des moyens de stockage (15) et à présenter les données de mesure et les données de référence à un dispositif externe.

8. Dispositif de mesure selon l'une quelconque des revendications 1 à 7,
lorsqu'une opération prédéterminée est réalisée, les moyens de réglage d'horaire d'événements étant configurés de façon à considérer le moment où l'opération est réalisée comme étant le moment de l'événement.

9. Dispositif de mesure selon la revendication 8, comprenant en outre un interrupteur d'opérations (11),
l'opération prédéterminée étant une opération pour activer l'interrupteur d'opérations (11).

10. Dispositif de mesure selon l'une quelconque des revendications 1 à 9,
le dispositif de mesure étant configuré de sorte que, lorsque l'opération prédéterminée est réalisée une pluralité de fois, le moment auquel l'opération a été réalisée la dernière fois est considéré comme étant

le moment de l'événement, et les données qui ont été considérées comme le moment de l'événement antérieures à ce moment sont invalidées.

11. Dispositif de mesure selon l'une quelconque des revendications 1 à 10,
qui est muni d'une fonction d'édition apte à changer au moins une valeur parmi une valeur représentant le moment de l'événement et une valeur représentant le temps écoulé par une opération prédéterminée.

12. Dispositif de mesure selon l'une quelconque des revendications 1 à 11,
qui inclut un boîtier (1) ayant une taille qui permet au boîtier d'être tenu avec une main par un utilisateur lors de l'utilisation, la section d'affichage (10) étant attachée au boîtier (1) de sorte à pouvoir être visualisée à partir de l'extérieur,
cas dans lequel le boîtier (1) abrite dans celui-ci des dispositifs formant les moyens de mesure (2, 12), la section à fonction d'horloge (16), les moyens de réglage d'horaire d'événements (14b) et les moyens de traitement de l'affichage du temps écoulé (14c), et l'intégralité du dispositif de mesure (A) est conçue en tant que dispositif de mesure portable.

13. Dispositif de mesure selon l'une quelconque des revendications 1 à 12,
les moyens de mesure (2, 12), les moyens de réglage d'horaire d'événements (14b) et les moyens de traitement de l'affichage du temps écoulé (14c) comprenant une CPU (14) et des moyens de stockage (15) attachés à la CPU.

14. Dispositif de mesure selon l'une quelconque des revendications 1 à 13,
les moyens de mesure (2, 12) étant aptes à mesurer un niveau de glucose dans le sang, et l'événement étant un repas.

FIG. 1

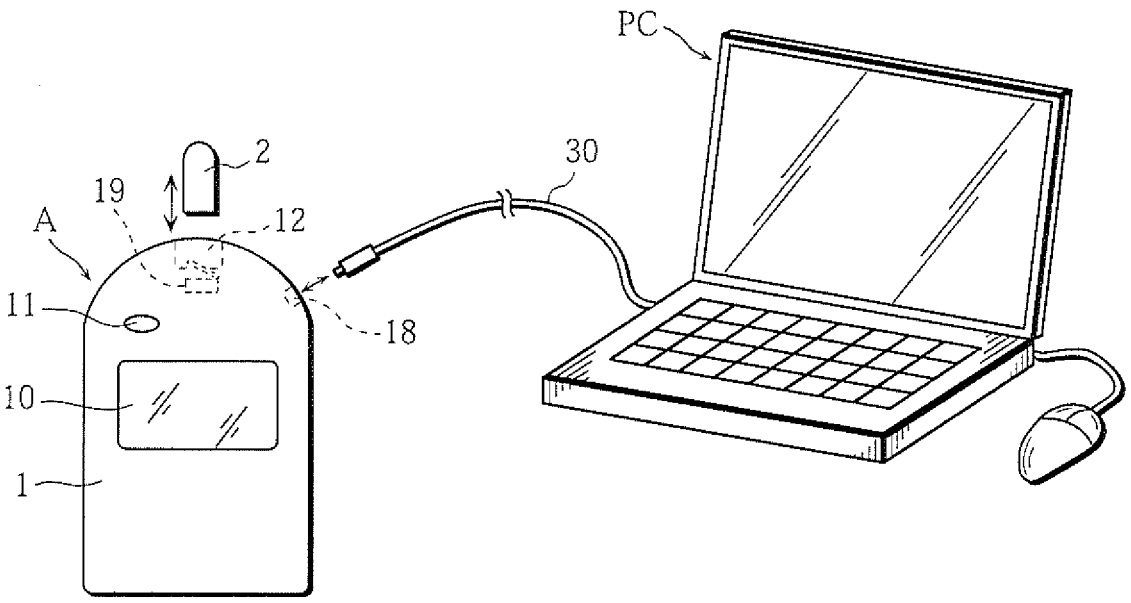


FIG. 2

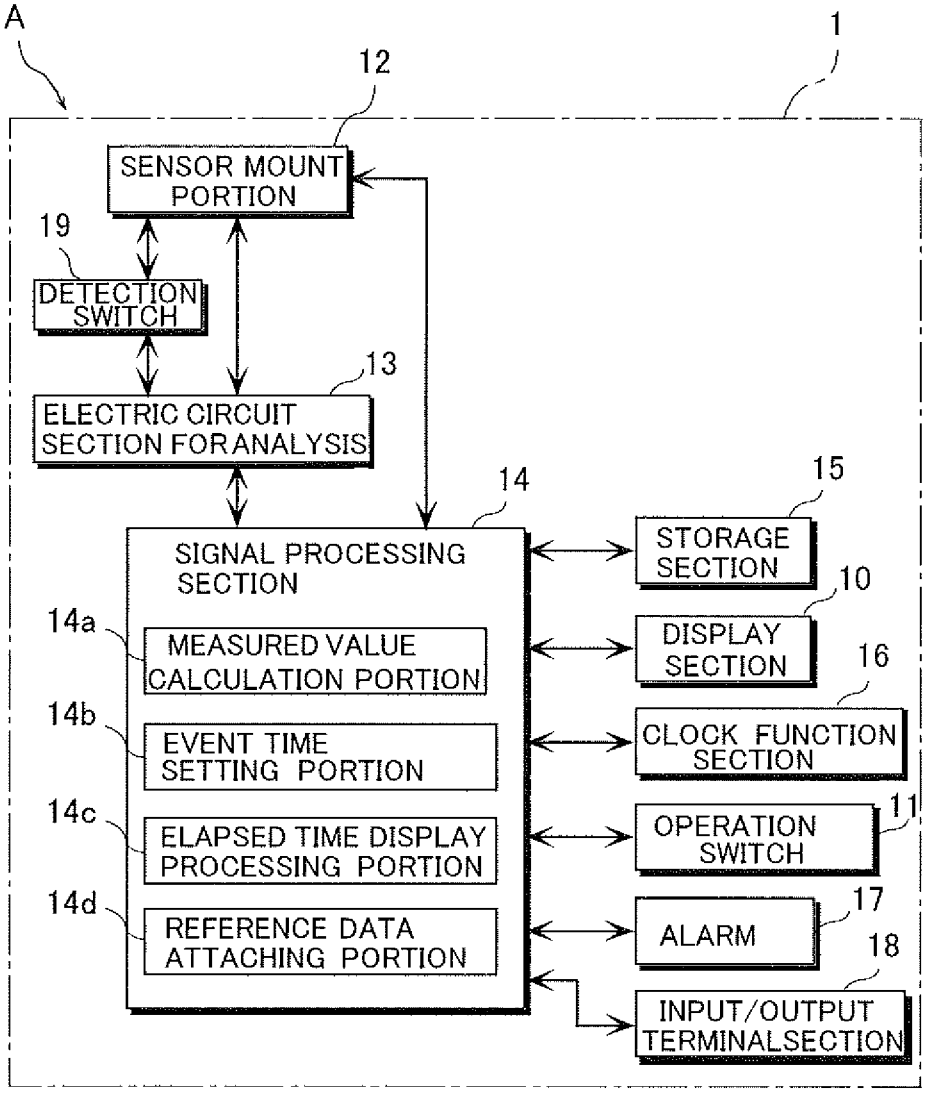

A
1
12
SENSOR MOUNT PORTION
19
DETECTION SWITCH
13
ELECTRIC CIRCUIT SECTION FOR ANALYSIS
14
SIGNAL PROCESSING SECTION
14a
MEASURED VALUE CALCULATION PORTION
14b
EVENT TIME SETTING PORTION
14c
ELAPSED TIME DISPLAY PROCESSING PORTION
14d
REFERENCE DATA ATTACHING PORTION
15
STORAGE SECTION
10
DISPLAY SECTION
16
CLOCK FUNCTION SECTION
11
OPERATION SWITCH
17
ALARM
18
INPUT/OUTPUT TERMINAL SECTION

FIG. 3A

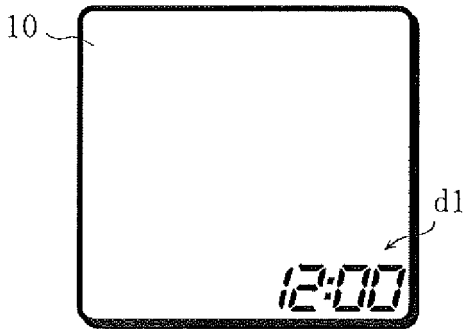


FIG. 3B

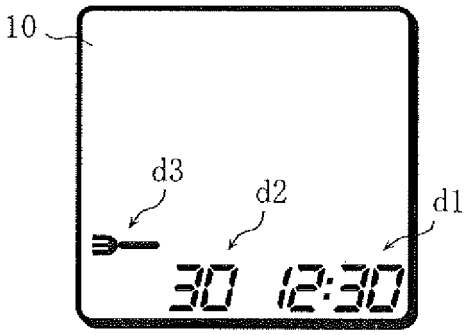


FIG. 3C

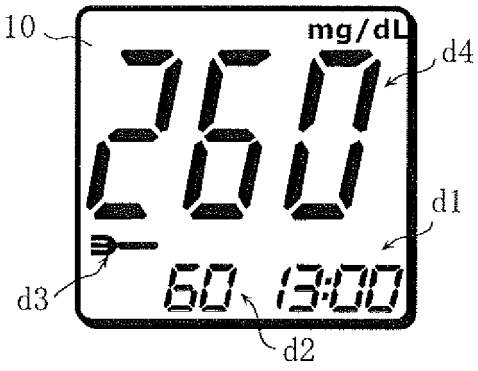
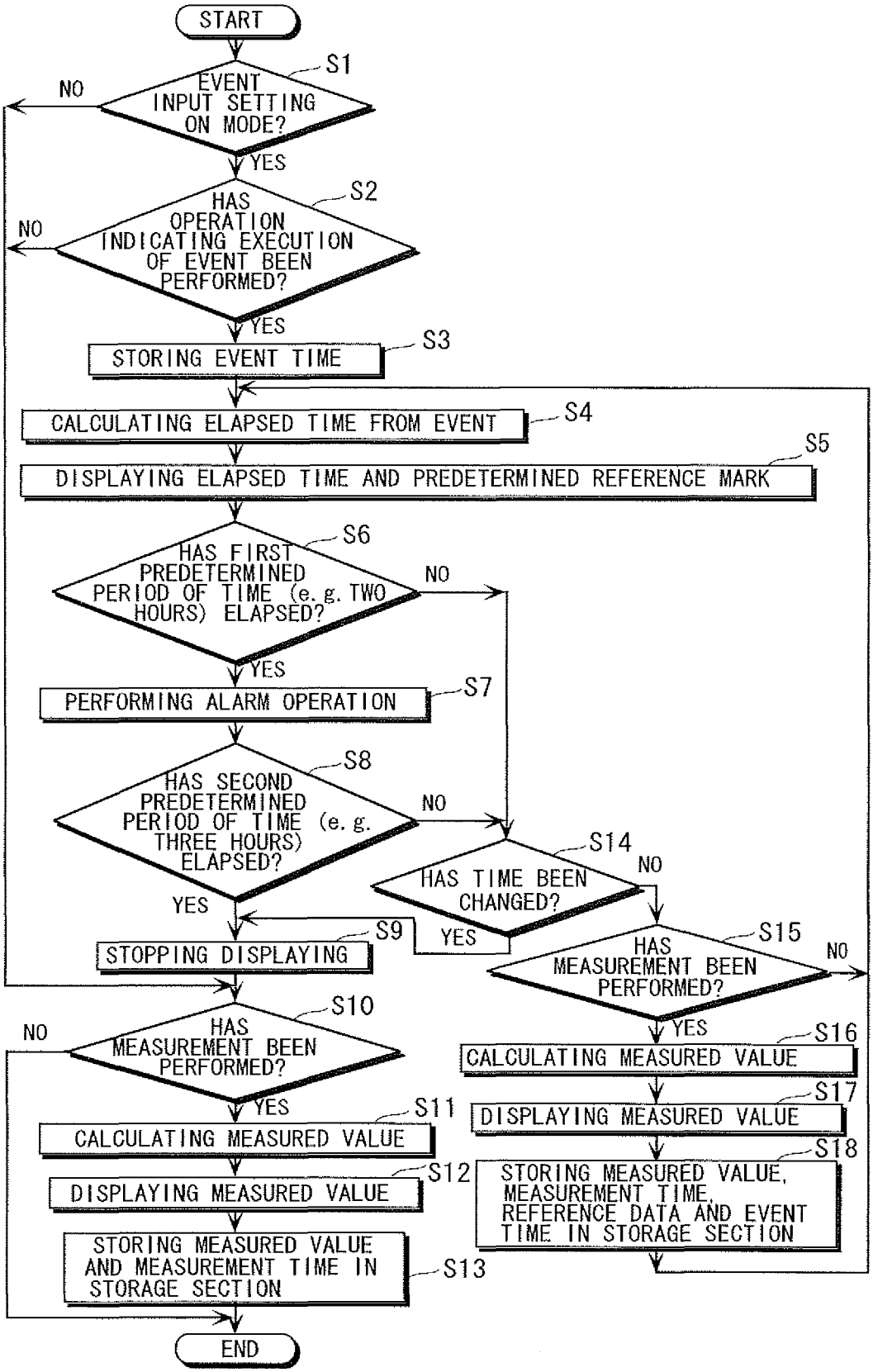


FIG. 4


START
S1
EVENT INPUT SETTING ON MODE?
NO
YES
S2
HAS OPERATION INDICATING EXECUTION OF EVENT BEEN PERFORMED?
NO
YES
S3
STORING EVENT TIME
S4
CALCULATING ELAPSED TIME FROM EVENT
S5
DISPLAYING ELAPSED TIME AND PREDETERMINED REFERENCE MARK
S6
HAS FIRST PREDETERMINED PERIOD OF TIME (e.g. TWO HOURS) ELAPSED?
NO
YES
S7
PERFORMING ALARM OPERATION
S8
HAS SECOND PREDETERMINED PERIOD OF TIME (e.g. THREE HOURS) ELAPSED?
NO
YES
S14
HAS TIME BEEN CHANGED?
NO
YES
S9
STOPPING DISPLAYING
S15
HAS MEASUREMENT BEEN PERFORMED?
NO
YES
S10
HAS MEASUREMENT BEEN PERFORMED?
NO
YES
S16
CALCULATING MEASURED VALUE
S17
DISPLAYING MEASURED VALUE
S18
STORING MEASURED VALUE, MEASUREMENT TIME, REFERENCE DATA AND EVENT TIME IN STORAGE SECTION
S11
CALCULATING MEASURED VALUE
S12
DISPLAYING MEASURED VALUE
S13
STORING MEASURED VALUE AND MEASUREMENT TIME IN STORAGE SECTION
END

REFERENCES CITED IN THE DESCRIPTION

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专利名称(译)	测量装置		
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[标]申请(专利权)人(译)	爱科来株式会社		
申请(专利权)人(译)	ARKRAY，INC.		
当前申请(专利权)人(译)	ARKRAY，INC.		
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发明人	KUBO, MASAYUKI ISHIGURO, KIYOAKI		
IPC分类号	A61B5/00 A61B5/145		
CPC分类号	A61B5/14532 A61B5/7445		
优先权	2007118135 2007-04-27 JP		
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外部链接	Espacenet		

摘要(译)

测量装置（A）包括能够显示由测量装置（12,13,14a）获得的测量数据的显示部分（10），时钟功能部分（16），能够进行的事件时间设定装置（14b，15）。设定事件的时间，以及经过时间显示处理装置（14c），其开始测量从事件时间到事件时间设定装置设定事件时间的当前时间的经过时间和原因显示部分（10）显示经过的时间。利用这种安排，用户不需要执行计算经过时间的麻烦任务，并且在事件被提升之后的适当时间段内测量样本。