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[Continued on next page]

(54) Title: GRAPHICAL USER INTERFACE FOR GLUCOSE MONITORING SYSTEM

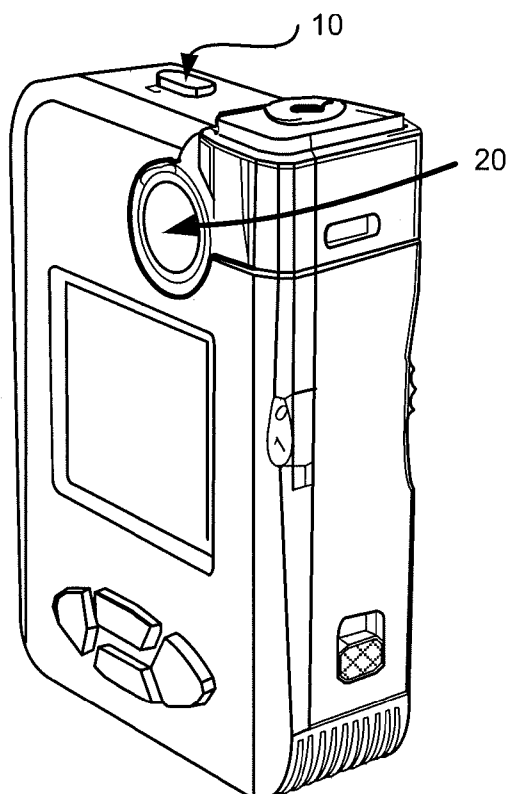


Figure 2A

(57) Abstract: Graphical user interfaces (GUIs) for a medical device such as a blood glucose meter, systems and methods are provided. Embodiments include GUIs in which a user may navigate between icons and select certain display outputs which summarize all or certain glucose data over particular time periods. In certain embodiments, animated icons and/or graphs and/or text summaries may be provided.



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GRAPHICAL USER INTERFACE FOR GLUCOSE MONITORING SYSTEM

CROSS REFERENCE TO RELATED APPLICATIONS

5 This application claims the benefit of U.S. Patent Application No. 12/233,584, filed September 18, 2008, which application is incorporated herein by reference in its entirety.

This application is related to US patent applications nos. 10/837,886 published as US2005/0245844; and 10/899,773 published as US2006/0024774; and 11/830,760; 11/830,779; 10 11/830,786; 11/831,706; 11/535,985; 11/535,986 published as US2007/0079783; 11/035,131 published as 2005/0164322, 11/831,649 published as 2008/0033318, 11/868,762, 12/035,348, 11/830,770, 10/701,993 published as 2004/0138588, 12/185,116; 12/185,117; and 12/185,118; as well as PCT applications PCT/US2005/014855; WO2006/19665; WO/2008/39946; and WO/2008/39949; and EP1779109; which are each assigned to the same assignee as the present 15 application and are hereby incorporated by reference.

BACKGROUND OF THE INVENTION

Self Care and Self Monitoring of Blood Glucose (SMBG) are central to the management of diabetes. Based on recommendations of a treating health care professional, a person with 20 diabetes will be instructed to use SMBG to check glucose levels and make appropriate adjustments to medication regimens, activity, diet or other behaviors. Figure 1 illustrates the tools typically used in conventional SMBG, including from left to right a lancing device 2 including a removable and replaceable cap 4, a glucose meter 6 and a container 8 of glucose testing strips. The self care regimen includes testing the glucose level periodically, sometimes 25 multiple times each day. The conventional process typically involves:

- 1-locating a new sterile lancet;
- 2-loading a lancet into the lancing device 2;
- 3-locating & opening test strip vial 8;
- 4-removing a test strip and replacing the lid on the vial 8;
- 30 5-inserting the test strip into the meter 6;
- 6-coding/calibrating the meter 6;
- 7-priming the lancing device 2;
- 8-lancing the finger or alternate site;
- 9-applying blood to the test strip;
- 35 10-waiting for the reading;

- 11-disposing of the used test strip;
- 12-replacing the cap 4 on the lancet 2;
- 13-disposing of the used lancet; and
- 14-disposing of the test strip.

5

SMBG systems are provided by Abbott Diabetes Care Inc., which is the assignee of the present application, including the Freestyle® and Precision® analyte monitoring lines of products. As monitoring analytes such as glucose continues to be of interest to those managing their health, it is desired to have a reliable and efficient analyte (e.g., glucose) testing system that is easy to use and which requires minimal steps each time a person tests his or her analyte level (e.g., a person with diabetes tests his or her glucose level), while not sacrificing accuracy, reliability nor functionality.

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SUMMARY OF THE INVENTION

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A graphical user interface (GUI) is provided for a portable medical device, such as an analyte monitoring device (e.g., a glucose meter), as well as devices, systems, methods and kits. In further describing the invention, embodiments will be described primarily as glucose—related devices, systems and methods, where such description is for exemplary purposes only and is in no way intended to limit the invention. It will be appreciated that embodiments of the invention may be employed in a variety of medical devices, for example a variety of analyte monitoring devices.

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Embodiments include meters that include an electronic display and one or more user input buttons, as well as processor-readable code embedded in a digital memory for programming a processor to generate and display a temporary user-readable output based on stored glucose data. The temporary display may include multiple icons configured for manipulation by a user. The GUI may be configured to be user-navigable between the icons and user-selectable among multiple configurations of the icons to produce a selected display output which summarizes all or certain glucose data over a particular time period.

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In one aspect, the selected display output includes a scrolling word summary on a portion of a display of the portable glucose meter that is smaller than the complete scrolling word summary. The scrolling word summary may include a query and/or a statement of fact relating to status of health of a user based on one or more relationships between the glucose data and one

or more target glucose levels. The summary statements support self-management through providing pattern recognition directly to users.

In another aspect, the glucose data may be configurable by the user through the manipulation of icons to selectably add metadata relating to conditions of particular glucose measurements including one or more temporal relationships to one or more meals, insulin boluses, or exercise events, or time period of a day, or combinations thereof, such that the selected display output is configurable by the user to summarize only certain glucose data corresponding to selected conditions.

In another aspect, a target range of glucose levels for the user may be configurable by the user. The selected display output may include a graph showing multiple glucose measurements plotted over the time period delineating those measurements inside and outside of the target range.

In a graph according to certain embodiments, a bubble icon may be generated and displayed which contains a summary of certain glucose data when those certain glucose data are highlighted or otherwise selected within the graph on the display. The summary contained in the bubble may include one or more glucose levels along with metadata relating to conditions of one or more glucose measurements corresponding to certain highlighted or otherwise selected glucose data. The metadata may include one or more temporal relationships to one or more meals, insulin boluses, or exercise events, or time period of a day, or combinations thereof.

In a graph according to certain embodiments, the delineating may include applying different shading and/or color to a region of the graph representing glucose levels within the target range compared with one or more regions of the graph representing glucose levels outside the target range. The graph may map to a calendar image with delineated glucose ranges to help users understand fluctuations in their blood glucose readings over time.

One or more instructive still and/or video icons may be generated and displayed to indicate current status of a glucose measurement and/or a next step for a user to take in a glucose measurement. An icon may be generated and displayed that illustrates a testing site of the body of a user in proximity with the portable glucose meter indicating to the user that a next step is to begin a glucose test by lancing the skin of the user. One or more icons may be generated and

displayed to indicate that the meter has detected initial body fluid flow into a testing strip and/or that a testing strip contains adequate body fluid to conduct an assay.

One or more power-up sequences of the portable medical device may be provided. The sequences may include ones with and without preparation for and expectation of performing a glucose measurement.

Logbook entries of glucose measurements may be generated and displayed that are selectable for reviewing specific details relating to the glucose measurements.

A series of reminder icons and/or screens may be generated and displayed to output one or more alarms to a user to remind the user to measure glucose or check or inject insulin at a certain time or within a certain amount of time, or combinations thereof. Automatic reminders to test again after a blood glucose measurement may indicate a glucose level that is below a selected target range or when the measurement is indicated as before meals helps users to comport with evidence based clinical practice guidelines that recommend re-testing a certain amount of time, e.g., 15 minutes, after a hypoglycemic event or a certain amount of time, e.g., 2 hours, after eating (i.e., post-prandial).

A method of operating a processor-based portable diabetes care apparatus that has a GUI as set forth above and below herein are also provided. In addition, processor-based portable diabetes care devices that include the GUI are also provided herein.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 illustrates a conventional glucose monitoring system including separate lancing device, lancets, glucose meter and testing strips.

Figures 2a-2c illustrate an advantageous glucose monitoring system including integrated glucose meter with cartridge containing combination strips with lancets according to certain embodiments.

Figure 3 illustrates a menu tree for overall operation of a graphical user interface of a glucose monitoring system according to certain embodiments.

Figures 4a-4q illustrate display screens of a graphical user interface for two power up options for testing and analysis of a glucose monitoring system according to certain embodiments.

5 Figures 5a-5i illustrate display screens of a graphical user interface for three test flow sequences of a glucose monitoring system according to certain embodiments.

 Figures 6a-6p illustrate display screens of a graphical user interface for four further test flow sequences with markings options of a glucose monitoring system according to certain
10 embodiments.

 Figures 7a-7f illustrate display screens of a graphical user interface for two further test flow sequences wherein Lo and Hi blood sugar levels have been determined by a glucose monitoring system according to certain embodiments.

15 Figures 8a-8f illustrate display screens of a graphical user interface for a SetUp Wizard for a glucose monitoring system according to certain embodiments.

 Figures 9a-9j illustrate display screens of a graphical user interface for analysis of
20 glucose monitoring results of a glucose monitoring system according to certain embodiments.

 Figures 10a-10h, as well as Figure 6n, illustrate display screens of a graphical user interface for providing reminders for a glucose monitoring system according to certain
25 embodiments.

 Figures 11a-11j illustrate display screens of a graphical user interface for adjusting settings of a glucose monitoring system according to certain embodiments, including setting date and time, target glucose ranges, and/or meal markers, reviewing summaries of glucose monitoring results and/or changing language of preference.

30 Figures 12a-12n illustrate display screens of a graphical user interface for using certain tools such as for running control tests, running SetUp Wizard and running diagnostics for a glucose monitoring system according to certain embodiments.

DETAILED DESCRIPTION OF THE EMBODIMENTS

Integrated lancing and testing systems have been described by Abbott Diabetes Care, the same assignee as the present application, which are described at US application serial nos.

11/535,985, 11/870,420 and 11/535,986 and other US and international patent applications

including US serial nos. 11/830,779, 11/831,649, 11/160,427, 10/899,773, 10/701,993,

11/146,897, 11/160,407, 11/350,398, 10/629,348, 11/830,770, 11/868,762, 12/035,348,

11/035,131, 10/837,886, 11/830,760, 11/830,786, and 11/831,706, the disclosures of which are

herein incorporated by reference. Figures 2A, 2B and 2C illustrate an embodiment of an

integrated self-care analyte system. Figure 2A illustrates an example of an integrated analyte

meter 10 having a cartridge such as that illustrated at Figure 2B loaded therein. The meter 10

includes a display and one or more user input features such as buttons that may include one or more press buttons, wheel buttons, track ball buttons, touch screen buttons, dials and/or keys,

and/or a voice actuation microphone. The cartridge 12 may contain many strips such that the

SMBG regimen involves loading the cartridge far less than each time a person with diabetes

tests his or her glucose level. Figure 2C illustrates a strip 14 including both a lancet 16 with a

cap 17 and a glucose testing component 18.

Once the cartridge is loaded, the process of testing a glucose level with the system illustrated at Figures 2A, 2B and 2C is simplified to:

1-pressing a test button 20 (see Figure 2A);

2-lancing a finger or alternate site (blood may be applied to the strip automatically after lancing, i.e., without user performing additional action);

3-waiting for the test result; and

4-disposing of the test strip 14 (which is automatically re-capped within the meter 10)

It is desired to both simplify the SMBG process further and provide additional functionality with a uniquely advantageous graphical user interface for an integrated diabetes system that fully supports self-management of diabetes.

An exemplary menu tree for a graphical user interface or GUI for an advantageous glucose self care testing apparatus is illustrated at Figure 3. The menu tree illustrated at Figure 3 includes a SetUp Wizard™ 22 where a user can set various parameters, e.g., the language, date, and time, and target glucose level ranges, and the like.

The user can also use the SetUp Wizard to turn on or off a summary finder or periodic feedback relating to glucose test results. The summary finder can include summary information of a test or tests that appears on the screen or is otherwise output to the user at a predetermined time and/or day. Messages may include emoticons and other icons and/or messages, e.g., for in range numbers: a happy face icon and a message “your fasting numbers last week were in your range”, or the like. For high numbers, a warning or danger signal icon with the message “all of your before meal numbers have been above your range last week”, or the like, may appear. For low numbers, a warning or danger signal icon may appear with message “all of your morning numbers have been low this week”, or the like. For the situation where some numbers are in range and others not, a happy face or danger icon may appear depending on the ratio with a message “x out of y test have been in your range this week and the others were all high”, or the like. For the situation where some numbers are low and others in range, a happy face or danger icon may appear depending on the ratio with the message “your were low 5 out of the 20 times you last tested”, or the like. The SetUp Wizard can be used to customize the summary finder, e.g., to include all numbers, or just fasting numbers, or before or after meal numbers, or morning, day or night numbers, and the time period can be set, e.g., 1 day, 3 day, 7 day, 14 day, 30 days, 90 days, etc.

Once set up, the system is ready to perform a test. A user can press a lance button 23. The SetUp Wizard may also permit the user to turn markers on and off. Markers may be enabled 24 to indicate certain conditions under which glucose tests were performed such as proximity before, during or after a meal, meal contents or recent eating habits, exercise information, time of day or night, insulin dosages and time/date or dosage, among others. Results of the test may be viewed 26 including the actual glucose level along with a message such as you are low or high or in range along with an appropriate icon. If “before meal” is marked, then a countdown timer may be prompted 28, or a countdown reminder may be set which may show a screen for cancellation 30.

A user may navigate to a home screen 32 in the GUI which is certain embodiments may provide options to go to “My Numbers” 34, “My Reminders” 36, “My Settings” 38 and/or “My Tools” 40 in navigating the GUI. In My Numbers 34, a user may review an “At a Glance” screen that may show averages, highs, lows, summary finders or a manual or automatic summary information ticker or scrollable message. Also in My numbers 34, a user may view graphs, such as those that will be discussed in more detail with reference to Figures 16a-16b. The My Numbers section may also include a logbook, such as an electronic version of paper

logbooks such as those that persons living with diabetes have been keeping since before any electronic logbooks were available. Markings may be added or changed in the logbook by the user.

5 In My Reminders 36, a user may set a timer at 5, 10, 15, 30, or 45 minutes, or 1 hour, 2 hours, 3 hours, or days or weeks. In use, the timer may be used for events such as testing, and also meals and exercise and insulin dosing may be set by a user with the timer. Alarms with different sounds may be set to different timers by the user, and volumes may be set.

10 In My Settings 38, a user may set volume, markers on/off, summary finder or summary information on/off, including choosing day and/or time for the GUI to provide feedback. Time, date, target ranges and languages may be set in My Settings. In My Tools 40, a user can get back to the original SetUp Wizard 22, and can perform diagnostics and control solution tests.

15 Navigation within a GUI in accordance with certain embodiments is illustrated and discussed with reference to Figures 4a-4q. In such embodiments, the system may include various options of use, depending on the task required. For example, in certain embodiments, the system may have various optional configurations depending on whether a test is to be performed, or only access to data is desired, etc. Figures 4a-4f illustrate a power up of the
20 integrated meter with a test button. The user may power up according to this option when intending to test his or her glucose level. Figures 4g-4q illustrate a power up of the integrated meter with power button. The user may power up according to his second option when not intending to test his or her glucose level. The functionalities of navigating the GUI, accessing information stored on the meter and setting up the GUI using My Numbers, My Reminders, My
25 Setting and My Tools are accessible with either power up option.

In the power up with test button, Figure 4a shows a starting screen which moves to Figure 4b indicating the system is preparing to navigate the user through a test by loading a test device such as a test strip and/or lancet and/or a combines lancet and test device such as a
30 Striplot™ testing device (a Striplot device is a device that integrates a lancet and a test device as a unit (see for example US Patent Application Serial No. 11/535,986, published as US2007/0149897, the disclosure of which is herein incorporated by reference). In further describing the embodiments below, embodiments using an integrated lancet/test device such as a Striplot™ device will be used for exemplary purposes only and is in no way intended to limit the
35 scope of the invention. It will be appreciated that medical devices that use separate lancets and

testing devices (such as test strips) may be used, as well as those that use integrated lancets and test devices like StripleletsTM or otherwise. A Striplelet test device may be extracted from an installed cartridge within a meter for lancing to be followed by testing. Figure 4c illustrates a screen that appears when the meter is ready, indicating to the user that he or she may initiate lancing as soon as the user places the skin location to be lanced at the skin receiving surface of the meter. In addition to the image on the screen, an optional light around the test button may flash to indicate to the user that the meter is ready to lance. In the example of Figure 4c, the meter is arranged for lancing and testing at a finger site, while alternative site testing may also be used, i.e., at a location of a person's body different than a finger. When the user is ready, he or she may press the lance button which initiates lancing and testing as well as recapping the lancet and ejecting the used Striplelet automatically. Also not illustrated at Figure 4c, a blood droplet may appear on the screen that begins to fill when the meter senses at a sample application indicator, e.g., an electrode or the like, that body fluid has begun to fill the test strip, and may be indicated to be full when the meter senses at a fill indicator, e.g., a fill electrode, or the like, that the testing chamber is filled. In certain embodiments, adequate sample volume may be a small volume, e.g., less than about 1 microliter, e.g., less than about 0.5 microliters, less than about 0.3 microliters, less than about 0.1 microliters in certain embodiments.

The glucose test result will appear on a next screen as illustrated at Figure 4d. Figure 4d includes video icon 50 indicating to the user that a Striplelet is in the process of being recapped and ejected. In one embodiment, the Striplelet actually ejects from the meter when the Striplelet reaches the edge of the screen, and the testing result number appears on the screen at about the same time. In other words, a moving graphics or video shows the testing process by moving across the display. The ejection (and also re-capping if present) are illustrated when the representation of the testing unit is moved to an edge of the display. Thereafter, Figure 4e shows that the number of Striplelets remaining has been decremented by one from "23" in Figure 4d to "22" in Figure 4e. Figure 4e also illustrates that meal markers 52 have been set. Figure 4f illustrates a summary ticker 54 that provides some information beyond just the glucose level indicated as "113" that the test indicated, e.g., the summary ticker may provide information determined from comparing the test result number to target ranges and/or meal markers. At this point in the power up with test button process, the user may go to screens illustrated at any of Figures 4h-4q.

Screens 4h-4q are also accessible in a power up with power button process that does not involve testing and that does not even require that a test is now possible, e.g., there might not be

any strips or lancets or Striplelets (i.e., combined strip/lancets) in the meter, or the loaded strips may be damaged, or some other restriction may cause the meter not to permit a test as determined using meter diagnostics. In the absence of those circumstances restricting testing, a user may execute or press a “test now” icon or button and start a test even though the system was powered up using power button. There may also be conditions like expired strip or invalid date and time that may involve user confirmation to proceed with a test.

Figure 4i indicates that a user may select My Numbers and get a screen illustrated at Figure 4j allowing the user to select At A Glance, Graphs and Logbook. Figure 4k indicates that a user may select My Reminders and get a screen illustrated at Figure 4l allowing the user to select reminders and alarms. Figure 4m indicates that a user may select My Settings and get a screen illustrated at Figure 4n allowing the user to set volume, time, date, markers, summary finder, summary, target range and/or language, wherein a user may have to scroll to access one or more of the selectable items as illustrated at Figure 4o. Figure 4p indicates that a user may select My Tools and get a screen illustrated Figure 4q allowing the user to manage a control test of the meter and/or Striplelets using a control solution, or to access the SetUp Wizard or diagnostics.

Figures 5a-5i, 6a-6p and 7a-7f illustrate functions of a GUI in accordance with certain embodiments. Figure 5a illustrate a screen showing date 56, time 58, a recently-measured glucose level of “113 mg/dL” 60, and the number of Striplelets left in the cartridge 62. A user will want to check the date and time shown on this screen to be sure it matches the real date and time, otherwise the records of the meter will be off, as will markers, alarms and summaries of information that may be depend on the time of the day or day of the week. The meter may be configured to be able to detect if the meter has last time/date. If the meter recognizes that the time/date is invalid, the meter may be configured to notify the user. Figure 5a indicates that a just-used Striplelet is about to be ejected from the meter after being recapped inside the meter. Figure 5b illustrates a screen just after ejection of the used Striplelet. The date and time 64 of the test resulting in the glucose level shown in the provided screen of Figure 5b, as well as the current time 56 and date 58. At this point, the user may access the menu by clicking at 66 to get to My Numbers, My reminders, My Settings and My Tools. The user may also initiate another test by clicking at 68.

Figure 5c shows the screen of Figure 5a, except that this time summary finder is on. Once the just-used Striplelet is ejected from meter, then a screen is illustrated at Figure 5d

showing a ticker or scrolling message or video text appears. The scrolling messages may relate to glucose level history and provide queries. The GUI can be arranged to provide the scrolling messages after each test, after a specified number of tests, after certain types of tests (e.g., mornings, after meals), periodically, or upon request of the user.

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Examples of messages that may scroll across the screen include, but are not limited to, the following:

“My Range: 80 to 180. My mornings were in range last week.”

“Better this week than last.”

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“80 to 180. Your numbers have improved this week.”

“Below 80. A lot of lows last week in the mornings.”

“Felt unwell? Lots of lows last week.”

“Something different? Low morning results last week.”

“You were running high in the mornings last week.”

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“Levels in the mornings have been above my range.”

Examples of messages that may appear in 14 day summaries include the following:

“My mornings have been in range last 14 days.”

“80 to 180. You were in range before meals in the last 14 days.”

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“Feeling ok? A lot of morning lows in last two weeks.”

“Make any changes? You are running high before meals.”

“You have had a lot of results above your range in the last two weeks.”

“Last two weeks - Your levels have been high during the day.”

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Examples of message that may appear in 30 day summaries include the following:

“Your fastings were in range last month. Did you notice a difference?”

“Taken care of your lows? You improved last month.”

“You had several highs in the last 30 days, especially in the mornings.”

“Feeling unwell? You had low readings at night last month.”

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“Your range: 80 to 180. In the last 30 days, you have been above your range after meals.”

The next screen illustrated at Figure 5e is comparable to that of Figure 5b.

In another sequence, Figure 5f is the same screen as Figures 5a and 5c, except this time before and after meal markers 70 and 72, respectively, at Figure 5g have been set. Figure 5h indicates that a before meal marker has been set to indicate that the blood glucose result was conducted before eating. A reminder 76 to test again, for example 15 or 30 minutes, or one, two or three hours, after eating (configurable by the user) will appear visibly on the screen and with an audible alarm at the user configured hours following the meal. Once the reminder time has been set for post-meal testing, the user-configured time will appear as the default for future blood glucose tests indicated as before eating. Figure 5i illustrates that a 15 minute clock 78 is counting down after a hypoglycemic event (i.e., below a user-configured target range). The user is expected to retest 80 before the clock 78 gets to zero.

Figure 6a, 6b and 6c illustrate a sequence of after meal marking or none. Figure 6c indicates that the meter is ready to test 82.

Figures 6d-6g illustrate a sequence of screens in a GUI in accordance with certain embodiments wherein a low glucose level is measured. The initial screen shows the low result 84 which is "75 mg/dL" while the used, recapped Striplet is about to be ejected from the meter. Figure 6e illustrates a next screen in which a caution symbol 86 is shown and may even be flashing. A message 88 indicates that the user has low blood sugar, e.g., saying "YOU ARE LOW". A 15 minute countdown is shown beginning at Figure 6f during which time the user is expected to take action to raise his or her blood sugar, or perhaps simply wait to test again when the blood sugar may be measured to be higher. The user is expected to retest 90 as illustrated at Figure 6g. The feature has been designed to support automation of evidence based clinical practice guidelines to re-test after a hypoglycemic event.

Figures 6h-6k illustrate a sequence of screens in a GUI in accordance with certain embodiments with an after meal marking and summary finder each on. Figure 6i indicates that selection of an after meal marker 92. Figure 6j illustrates a summary finder scrolling across a screen, e.g., "Your before meal glucose level was in range", or the like. The screen illustrated at Figure 6k indicates that the result was marked as after meal.

Figures 6l-6p illustrate a sequence of screens in a GUI in accordance with certain embodiments with marking before and after meal and summary finder on. Figure 6m indicates selection of a before meal marker 96. Figure 6n indicates that a reminder 98 will be provided at an interval selected by the user (e.g., 15 or 30 minutes or 1,2 or 3 hours, or the like) 100. Then,

a summary message is shown at Figure 6o indicating that “your before meal level was 113”, or otherwise. The after-meal retest is expected after the meal. The indication of “retest” 102 may be instead “test”. Figure 6p illustrates a countdown like that of Figure 5i of 15 minutes during which time the user is expected to perform an after meal test.

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Figures 7a-7c indicate sequences in which a low glucose level is determined, e.g., under 20 mg/dL, which may be below the tolerance of the meter to precisely measure. Figure 7a simply shows “Lo” for the glucose level reading as the Striplet is being recapped for ejection from the meter. Figure 7b illustrates a screen with caution symbol flashing to warn the user that the last glucose test resulted in a seriously low reading. The screen illustrated at Figure 7c permits the user to test or retest, particularly if the user suspects that the low reading is anomalous and not indicative of his or her actual glucose level.

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Figures 7d-7f indicate sequences in which a high glucose level is determined, e.g., over 500 mg/dL, which may be below the tolerance of the meter to precisely measure. Figure 7d simply shows “Hi” for the glucose level reading as the Striplet is being recapped for ejection from the meter. Figure 7e illustrates a screen with caution symbol flashing to warn the user that the last glucose test resulted in a seriously high reading. The screen illustrated at Figure 7f permits the user to test or retest, particularly if the user suspects that the high reading is anomalous and not indicative of his or her actual glucose level.

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Figures 8a-8f illustrate screens that may appear when the user navigates through the SetUp Wizard. In Figure 8a, a language may be selected such as English, or other language as desired. In Figure 8b, the time may be selected as 12 hour or 24 hour time, and the particular time may be set. If the time is set and the format changed, the time will automatically convert to the corrected format. The date may be set as illustrated in Figure 8c. Similar to time, if the date is set and the format changed, the date will automatically convert to the corrected date format. The user should keep the date and time accurate so that the analysis performed by the meter and messages provided on the screen for the user to read will be accurate, as many of these are time/date dependent. The target range can be set as illustrated at Figure 8d. At Figure 8e, a screen is shown wherein markers may be set to signal when a glucose test is during fasting, or before or after a meal. Scrolling text describes to the user what markers are and how to use them. At Figure 8f, a screen is shown wherein the user is setting a summary finder for a selectable day of the week that will display a message after every blood glucose test on that day. For example, the summary may indicate on the day of the user’s choosing that “you have had

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several low readings this week” or your readings after meals have been high this week, else they have been in range” among many other possibilities. The scrolling text in certain embodiments describes for the user what the summary is, and in a subset of those embodiments also how to use it.

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Figures 9a-9k illustrate screens that may appear when the user navigates through the My Numbers sub-section of a GUI for an integrated glucose meter in accordance with certain embodiments. Figure 9a illustrates the selection of My Numbers from a home Menu screen. The screen illustrated at Figure 9a may be pulled up whenever a user clicks the Menu icon in the lower left of the screen shown Figures 4h, 5b, 5e, 5i, 6c, 6g, 6p, 7c, 7f, and 9h. The user may select At a Glance, Graphs or Logbook from My Numbers as illustrated at Figure 9b.

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Figure 9c illustrates the At a Glance screen. The At a Glance screen is configured to allow the user to view the most pertinent glucose data in one glance by choosing between various options. Along the top of the At a Glance screen are three icons in Figure 9c. The left-most icon is a duration which can be selected at 1 day, 3 days, 7 days, 14 days, 30 or 90 days or perhaps other relevant periods. The middle icon in the top row of the At a Glance screen may indicate either all, fasting, before meal, after meal, morning, day or night may be selected, and information falling within the selected category will be presented. Further options are provided at the right-most icon in the At a Glance screen illustrated at Figure 9c including averages, frequency counts of high, low and in range blood glucose results, and summary statements. In addition, the summary screen illustrated at Figure 9c, which appears when At a Glance is selected from the menu of Figure 9b, also may include an animated smiling face, caution symbol or other icon, delivering positive feedback to boost user confidence or warning of potentially dangerous blood glucose readings over time. A scrolling message may provide a most pertinent message for the user to read regarding the morning readings of the last 7 days in the example of Figure 9c. Multiple messages may be provided. The scrolling text summarizes information for users in words in addition to numerical presentations.

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Figure 9d illustrates a screen which shows the average glucose reading for a user over a single day under all circumstances to be 109. It is also indicated that 75 readings were taken during that day.

Figure 9e illustrates the high, low and in range readings of a user over a 7 day period under all circumstances. The screen shows that 73 results were below the selected target range,

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108 were within the selected target range and 175 were above the selected target range during that week of 356 measurements.

Figure 9f illustrates selection of graphs in the My Numbers menu. Graphs may be tailored and may be selected using the left-most icon of the top row of Figure 9g for a certain number of days such as 1 day, 3 days, 5 days, 7 days, 10 days, 14 days, 21 days, etc. Before meals, after meals, morning, day and night or all may be selected in the middle icon of the top row of Figure 9g. The right-most icon in the top row shows the current date. In the example of Figure 9g, a 7 day graph is selected for measurements taken at all times during those 7 days.

The graph appearing at Figure 9g shows glucose levels versus time plotted against a calendar. The dark band 105a at the center indicates the target range, while the light band 105b above the target range indicates high glucose levels and the light band 105c below the target range indicates low glucose levels. The calendar graph delivers visual images that display fluctuations over calendar days and times.

Figure 9h is another screen showing a 21 day graph. The user has selected a specific glucose reading on January 12, 2007 at 5:57 am. The glucose reading is “154 mg/dL” for that date and time as shown in the bubble 106. The bubble 106 appearing in Figure 9h includes certain information about the specific glucose reading that is selected. Other information might include whether the glucose was measured before or after a meal or during fasting, and there may be information regarding dosages of insulin a certain amount of time or at certain times before the reading was taken. Similar graphs can be provided for insulin dosages versus time and/or versus glucose levels.

Figure 9i illustrates a logbook selection in the My Numbers section of the Menu. Figure 9j illustrates a log book screen showing rows of glucose readings. Each row indicates at left the glucose reading and the time and date to the right of the glucose reading. To the right of the time and date in the log book screen of Figure 9j is any meal marker or flag. The logbook entries can be highlighted and edited. Figure 9k illustrates a screen that appears when a logbook entry is selected such as the top-most entry shown in Figure 9j. Figure 9k shows the glucose reading of “105 mg/dL”, the time and date, an icon, e.g., a rising sun, indicating that it is a morning measurement, and a before meal marker. Other indicators may include strip expired, out of temperature or invalid date/time or other dynamic feedback regarding disposable information. The GUI may be configured so that certain logbook entries are invalidated for

reasons such as these and therefore not used for determining averages, graphs, or in constructing summary information tickers.

Figures 10a-10h illustrate navigation through the My Reminders section of a GUI for an integrated glucose meter in accordance with certain embodiments. Figure 10a illustrates selection of My Reminders from the home screen menu. Figure 10b illustrates several reminders that have been set by the user including a timer indicating 2:43:44 and an alarm for 7:45 am, as well as other reminders at 8:15 pm and 12:00 am. Timers and alarms help users remember to check their body glucose levels. Figure 10c illustrates that the timing for 2:43:44 in Figure 10b actually started at 2:30 and has run for 13 minutes and 44 second and counting. Figure 10d shows selection of the 7:45 am reminder. Figure 10e shows a countdown to the 7:45 am alarm when the 7:45 am reminder is selected in Figure 10d. Figure 10f illustrates the 7:45 am alarm with volume turned down compared with the 2:30 timer which is at maximum volume. Figure 10g illustrates selection of the 2:43:44 timer including running time indicator 112.

Figures 11a-11j illustrate screens appearing when My Settings are selected from the home screen menu of a GUI for an integrated glucose meter in accordance with certain embodiments. Figure 11a illustrates selection of My Settings. Figures 11b and 11g provide various selections including volume, time, date, markings, summary, target range and language, and Figures 11c-11j show screens corresponding to selections of these options. The markings and summary options include scrolling tickers that describe functionality and an icon to turn off or on, while the summaries can be set for a particular day and optionally time of day, and may be set for specific information such as morning, noon or night, before or after meals, insulin dosage information or other diabetes self care information of use.

Figures 12a-12n illustrate screens appearing when My Tools are selected from the home screen menu of a GUI for an integrated glucose meter in accordance with certain embodiments. Figure 12a illustrates selection of My Tools, and Figure 12b shows that control test, setup wizard and diagnostics may be selected in My Tools.

When control test is selected, the screen of Figure 12c may appear illustrating to a user the next step in performing a control test, which is to apply control solution on the user's finger or alternate site where a user would be lanced in a glucose test. The GUI of the meter then provides the screen of Figure 12d illustrating the next step in the control test which is for the

user to place his or her finger or alternative site at the skin receiving surface of the meter. Figure 12e illustrates a screen indicating to the user that the meter is now performing the rest of the control test and that the user is only to continue to remain in contact with the skin receiving surface while the meter completes the test.

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Advantageously, an integrated meter in accordance with certain embodiments loads a test strip in to bring the test strip into contact with the control solution on the user's finger. The meter is programmed not to lance when a control test is being performed, while the meter would first lance before contact the testing strip to body fluid of the user. Figure 12f illustrates that a reading is approximately what was expected from the test indicating that the meter is working properly. Throughout the control test, a bottle 112 appears on screen illustrated at Figures 12c, 12d and 12f indicating that a control test rather than a body glucose test is underway.

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Figures 12g-12l illustrate screens appearing after selection of SetUp Wizard in the My Tools menu of Figure 12b. Figure 12g is a screen from which the language, e.g., English, is selected. Figures 12h and 12i are screen from which time and date are set, respectively. Figure 12j illustrates a screen from which a target range of glucose levels is set by the user. In an alternative embodiment, the GUI may be configured such that only a doctor, e.g., with username and password, may configure the target range. Figures 12k-12l illustrate screens for setting markings and summary messages, each of which have been previously described. Figure 12m illustrates a screen from which diagnostics may be selected. Figure 12n illustrates that an error log may be accessed, particularly by a person with sophisticated knowledge of the device and what certain errors mean, and from which meter tests and screen tests may be selected and run as diagnostic tests.

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While exemplary drawings and specific embodiments of the present invention have been described and illustrated, it is to be understood that that the scope of the present invention is not to be limited to the particular embodiments discussed. Thus, the embodiments shall be regarded as illustrative rather than restrictive, and it should be understood that variations may be made in those embodiments by workers skilled in the arts without departing from the scope of the present invention as set forth in the appended claims, and structural and functional equivalents thereof.

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What is claimed is:

1. A graphical user interface (GUI) for a portable medical device which includes an electronic display and one or more user input buttons, and processor-readable code embedded in a digital memory for programming a processor to generate and display a temporary user-readable output based on stored glucose data, and

wherein the temporary display comprises multiple icons configured for manipulation by a user, including navigation between the icons and selection among multiple configurations of the icons to produce a selected display output which summarizes all or certain glucose data over a particular time period, and

wherein the selected display output comprises a scrolling word summary on a portion of the electronic display that is smaller than the complete scrolling word summary.

2. The GUI of claim 1, wherein the code further programs the processor to generate and display one or more instructive still or video icons, or both, indicating current status of a glucose measurement or a next step for a user to take in a glucose measurement, or both.

3. The GUI of claim 2, wherein the code further programs the processor to generate a notification of a hypoglycemic event and a reminder to test again after a predetermined time period.

4. The GUI of claim 2, wherein the code further programs the processor to generate a reminder to conduct post-prandial testing after a user-selected period of time.

5. The GUI of claim 2, wherein the code further programs the processor to generate and display an icon illustrating a testing site of the body of a user in proximity with the apparatus indicating to the user that a next step is to begin a glucose test by lancing the skin of the user.

6. The GUI of claim 2, wherein the code further programs the processor to generate and display one or more icons indicating that the meter has detected initial body fluid flow into a testing strip or that a testing strip is full of body fluid, or both.

7. The GUI of claim 1, wherein the code further permits two power-up sequences of the portable medical device including power-up sequences with and without preparation for and expectation of performing a glucose measurement.

8. The GUI of claim 1, wherein the scrolling word summary comprises a query relating to status of glucose measurements of a user based on one or more relationships between the glucose data and one or more target glucose levels.

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9. The GUI of claim 1, wherein the scrolling word summary comprises a statement of fact based on one or more relationships between the glucose data and one or more target glucose levels.

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10. A graphical user interface (GUI) for a portable medical device which includes an electronic display and one or more user input buttons, and processor-readable code embedded in a digital memory for programming a processor to generate and display a temporary user-readable output based on stored glucose data, and

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wherein the temporary display comprises multiple icons configured for manipulation by a user, including navigation between the icons and selection among multiple configurations of the icons to produce a selected display output which summarizes all or certain glucose data over a particular time period, and

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wherein a target range of glucose levels for the user is configurable by the user, and wherein the selected display output comprises a graph showing multiple glucose measurements plotted over the time period delineating those measurements inside and outside of the target range.

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11. The GUI of claim 10, wherein the selected display output comprises a scrolling word summary on a portion of the electronic display that is smaller than the complete scrolling word summary.

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12. The GUI of claim 10, wherein the code further programs the processor to generate and display a bubble icon containing a summary of certain glucose data when said certain glucose data are highlighted or otherwise selected within said graph on said display.

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13. The GUI of claim 12, wherein the summary contained in said bubble comprises at least one glucose level along with metadata relating to conditions of one or more glucose measurements corresponding to said certain highlighted or otherwise selected glucose data including one or more temporal relationships to one or more meals, insulin boluses, or exercise events, or time period of a day, or combinations thereof.

14. The GUI of claim 10, wherein the delineating comprises applying different shading or color, or both, to a region of the graph representing glucose levels within the target range compared with one or more regions of the graph representing glucose levels outside the target range.

15. The GUI of claim 10, wherein the code further programs the processor to generate and display logbook entries of glucose measurements that are selectable for reviewing specific details relating to the glucose measurements.

16. The GUI of claim 10, wherein the code further programs the processor to generate and display a series of reminder icons or screens or both for outputting an alarm to a user to remind the user to measure glucose or check or inject insulin at a certain time or within a certain amount of time, or combinations thereof.

17. The GUI of claim 10, wherein said time period comprises one or more days and said multiple glucose measurements are mapped onto a calendar display object.

18. A graphical user interface (GUI) for a portable medical device which includes an electronic display and one or more user input buttons, and processor-readable code embedded in a digital memory for programming a processor to generate and display a temporary user-readable output based on stored glucose data, and

wherein the temporary display comprises multiple icons configured for manipulation by a user, including navigation between the icons and selection among multiple configurations of the icons to produce a selected display output which summarizes all or certain glucose data over a particular time period, and

wherein the glucose data is configurable by the user through said manipulation of icons to selectably add metadata relating to conditions of particular glucose measurements including one or more temporal relationships to one or more meals, insulin boluses, or exercise events, or time period of a day, or combinations thereof, such that the selected display output is configurable by the user to summarize only certain glucose data corresponding to selected conditions.

19. The GUI of claim 18, wherein the selected display output comprises a scrolling word summary on a portion of the electronic display that is smaller than the complete scrolling word summary.

5 20. The GUI of claim 18, wherein a target range of glucose levels for the user is configurable by the user, and wherein the selected display output comprises a graph showing multiple glucose measurements plotted over the time period delineating those measurements inside and outside of the target range.

10 21. The GUI of claim 20, wherein the selected display output comprises a scrolling word summary on a portion of the electronic display that is smaller than the complete scrolling word summary.

15 22. The GUI of claim 20, wherein the code further programs the processor to generate and display a bubble icon containing a summary of certain glucose data when said certain glucose data are highlighted or otherwise selected within said graph on said display.

20 23. The GUI of claim 22, wherein the summary contained in said bubble comprises at least one glucose level along with metadata relating to conditions of one or more glucose measurements corresponding to said certain highlighted or otherwise selected glucose data including one or more temporal relationships to one or more meals, insulin boluses, or exercise events, or time period of a day, or combinations thereof.

25 24. A processor-based portable diabetes care apparatus which includes an electronic display and one or more user input buttons, and includes processor-readable code embedded in a digital memory for programming a processor to generate and display a temporary user-readable output based on stored glucose data, and

30 wherein the temporary display comprises multiple icons configured for manipulation by a user, including navigation between the icons and selection among multiple configurations of the icons to produce a selected display output which summarizes all or certain glucose data over a particular time period, and

 wherein the selected display output comprises a scrolling word summary on a portion of the electronic display that is smaller than the complete scrolling word summary.

25. The apparatus of claim 24, wherein the code further programs the processor to generate and display one or more instructive still or video icons, or both, indicating current status of a glucose measurement or a next step for a user to take in a glucose measurement, or both.

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26. The apparatus of claim 25, wherein the code further programs the processor to generate a notification of a hypoglycemic event and a reminder to test again after a predetermined time period.

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27. The apparatus of claim 25, wherein the code further programs the processor to generate a reminder to conduct post-prandial testing after a user-selected period of time.

28. The apparatus of claim 25, wherein the code further programs the processor to generate and display an icon illustrating a testing site of the body of a user in proximity with the apparatus indicating to the user that a next step is to begin a glucose test by lancing the skin of the user.

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29. The apparatus of claim 25, wherein the code further programs the processor to generate and display one or more icons indicating that the meter has detected initial body fluid flow into a testing strip or that a testing strip is full of body fluid, or both.

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30. The apparatus of claim 24, wherein the code further permits two power-up sequences of the apparatus including power-up sequences with and without preparation for and expectation of performing a glucose measurement.

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31. The apparatus of claim 24, wherein the scrolling word summary comprises a query relating to status of glucose measurements of a user based on one or more relationships between the glucose data and one or more target glucose levels.

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32. The apparatus of claim 24, wherein the scrolling word summary comprises a statement of fact based on one or more relationships between the glucose data and one or more target glucose levels.

33. A processor-based portable diabetes care apparatus which includes an electronic display and one or more user input buttons, and processor-readable code embedded in a digital

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memory for programming a processor to generate and display a temporary user-readable output based on stored glucose data, and

wherein the temporary display comprises multiple icons configured for manipulation by a user, including navigation between the icons and selection among multiple configurations of the icons to produce a selected display output which summarizes all or certain glucose data over a particular time period, and

wherein a target range of glucose levels for the user is configurable by the user, and

wherein the selected display output comprises a graph showing multiple glucose measurements plotted over the time period delineating those measurements inside and outside of the target range.

34. The apparatus of claim 33, wherein the selected display output comprises a scrolling word summary on a portion of the electronic display that is smaller than the complete scrolling word summary.

35. The apparatus of claim 33, wherein the code further programs the processor to generate and display a bubble icon containing a summary of certain glucose data when said certain glucose data are highlighted or otherwise selected within said graph on said display.

36. The apparatus of claim 35, wherein the summary contained in said bubble comprises at least one glucose level along with metadata relating to conditions of one or more glucose measurements corresponding to said certain highlighted or otherwise selected glucose data including one or more temporal relationships to one or more meals, insulin boluses, or exercise events, or time period of a day, or combinations thereof.

37. The apparatus of claim 33, wherein the delineating comprises applying different shading or color, or both, to a region of the graph representing glucose levels within the target range compared with one or more regions of the graph representing glucose levels outside the target range.

38. The apparatus of claim 33, wherein the code further programs the processor to generate and display logbook entries of glucose measurements that are selectable for reviewing specific details relating to the glucose measurements.

39. The apparatus of claim 33, wherein the code further programs the processor to generate and display a series of reminder icons or screens or both for outputting an alarm to a user to remind the user to measure glucose or check or inject insulin at a certain time or within a certain amount of time, or combinations thereof.

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40. The apparatus of claim 33, wherein said time period comprises one or more days and said multiple glucose measurements are mapped onto a calendar display object.

41. A processor-based portable diabetes care apparatus which includes an electronic display and one or more user input buttons, and processor-readable code embedded in a digital memory for programming a processor to generate and display a temporary user-readable output based on stored glucose data, and

wherein the temporary display comprises multiple icons configured for manipulation by a user, including navigation between the icons and selection among multiple configurations of the icons to produce a selected display output which summarizes all or certain glucose data over a particular time period, and

wherein the glucose data is configurable by the user through said manipulation of icons to selectably add metadata relating to conditions of particular glucose measurements including one or more temporal relationships to one or more meals, insulin boluses, or exercise events, or time period of a day, or combinations thereof, such that the selected display output is configurable by the user to summarize only certain glucose data corresponding to selected conditions.

42. The apparatus of claim 41, wherein the selected display output comprises a scrolling word summary on a portion of the electronic display that is smaller than the complete scrolling word summary.

43. The apparatus of claim 41, wherein a target range of glucose levels for the user is configurable by the user, and wherein the selected display output comprises a graph showing multiple glucose measurements plotted over the time period delineating those measurements inside and outside of the target range.

44. The apparatus of claim 43, wherein the selected display output comprises a scrolling word summary on a portion of the electronic display that is smaller than the complete scrolling word summary.

45. The apparatus of claim 43, wherein the code further programs the processor to generate and display a bubble icon containing a summary of certain glucose data when said certain glucose data are highlighted or otherwise selected within said graph on said display.

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46. The apparatus of claim 45, wherein the summary contained in said bubble comprises at least one glucose level along with metadata relating to conditions of one or more glucose measurements corresponding to said certain highlighted or otherwise selected glucose data including one or more temporal relationships to one or more meals, insulin boluses, or exercise events, or time period of a day, or combinations thereof.

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47. A method of operating a processor-based portable diabetes care apparatus that includes a graphical user interface (GUI), an electronic display and one or more user input buttons for interactively generating a temporary user-readable output based on stored glucose data, the method comprising:

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generating a temporary display comprising multiple icons configured for manipulation by a user,

navigating between the icons based on user input;

selecting among multiple configurations of the icons based on user input to produce a

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display output which summarizes all or certain glucose data over a particular time period; and

generating a scrolling word summary on a portion of the electronic display that is smaller than the complete scrolling word summary.

48. The method of claim 47, further comprising generating one or more instructive still or video icons, or both, indicating current status of a glucose measurement or a next step for a user to take in a glucose measurement, or both.

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49. The method of claim 48, further comprising generating a notification of a hypoglycemic event and a reminder to test again after a predetermined time period.

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50. The method of claim 48, further comprising generating a reminder to conduct post-prandial testing after a user-selected period of time.

51. The method of claim 48, further comprising generating an icon illustrating a testing site of the body of a user in proximity with the processor-based portable diabetes care apparatus indicating to the user that a next step is to begin a glucose test by lancing the skin of the user.

5 52. The method of claim 48, further comprising generating one or more icons indicating that the meter has detected initial body fluid flow into a testing strip or that a testing strip is full of body fluid, or both.

10 53. The method of claim 47, further comprising selecting based on user input to power up the processor-based portable digital apparatus wherein the code further permits two power-up sequences of the apparatus include power-up sequences with and without preparation for and expectation of performing a glucose measurement.

15 54. The method of claim 47, wherein the scrolling word summary comprises a query relating to status of glucose measurements of a user based on one or more relationships between the glucose data and one or more target glucose levels.

20 55. The method of claim 47, wherein the scrolling word summary comprises a statement of fact based on one or more relationships between the glucose data and one or more target glucose levels.

25 56. A method of operating a processor-based portable diabetes care apparatus that includes a graphical user interface (GUI), an electronic display and one or more user input buttons for interactively generating a temporary user-readable output based on stored glucose data, the method comprising:

generating a temporary display comprising multiple icons configured for manipulation by a user,

navigating between the icons based on user input;

30 selecting among multiple configurations of the icons based on user input to produce a display output which summarizes all or certain glucose data over a particular time period;

setting a target range of glucose levels for the user based on user input; and

generating a graph on the electronic display showing multiple glucose measurements plotted over the time period, including delineating those measurements inside and outside of the target range.

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57. The method of claim 56, further comprising generating a scrolling word summary on a portion of the electronic display that is smaller than the complete scrolling word summary.

58. The method of claim 56, further comprising generating a bubble icon containing a
5 summary of certain glucose data when said certain glucose data are highlighted or otherwise selected within said graph on said display.

59. The method of claim 58, wherein the summary contained in said bubble comprises at least one glucose level along with metadata relating to conditions of one or more glucose
10 measurements corresponding to said certain highlighted or otherwise selected glucose data including one or more temporal relationships to one or more meals, insulin boluses, or exercise events, or time period of a day, or combinations thereof.

60. The method of claim 56, wherein the delineating comprises applying different
15 shading or color, or both, to a region of the graph representing glucose levels within the target range compared with one or more regions of the graph representing glucose levels outside the target range.

61. The method of claim 56, further comprising generating logbook entries of glucose
20 measurements that are selectable for reviewing specific details relating to the glucose measurements.

62. The method of claim 56, further comprising generating a series of reminder icons or screens or both for outputting an alarm to a user to remind the user to measure glucose or check
25 or inject insulin at a certain time or within a certain amount of time, or combinations thereof.

63. The method of claim 56, wherein said time period comprises one or more days, and the generating of a graph further includes mapping said multiple glucose measurements onto a calendar display object.

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64. A method of operating a processor-based portable diabetes care apparatus that includes a graphical user interface (GUI), an electronic display and one or more user input buttons for interactively generating a temporary user-readable output based on stored glucose data, the method comprising:

generating a temporary display comprising multiple icons configured for manipulation by a user,

navigating between the icons based on user input;

selecting among multiple configurations of the icons based on user input to produce a display output which summarizes all or certain glucose data over a particular time period; and

adding metadata based on user input relating to conditions of particular glucose measurements including one or more temporal relationships to one or more meals, insulin boluses, or exercise events, or time period of a day, or combinations thereof, such that the selected display output is configurable by the user to summarize only certain glucose data

corresponding to selected conditions.

65. The method of claim 64, further comprising generating a scrolling word summary on a portion of the electronic display that is smaller than the complete scrolling word summary.

66. The method of claim 64, further comprising setting a target range of glucose levels for the user based on user input; and generating a graph showing multiple glucose measurements plotted over the time period, including delineating those measurements inside and outside of the target range.

67. The method of claim 66, further comprising generating a scrolling word summary on a portion of the electronic display that is smaller than the complete scrolling word summary.

68. The method of claim 66, further comprising generating a bubble icon containing a summary of certain glucose data when said certain glucose data are highlighted or otherwise selected within said graph on said display.

69. The method of claim 68, wherein the summary contained in said bubble comprises at least one glucose level along with metadata relating to conditions of one or more glucose measurements corresponding to said certain highlighted or otherwise selected glucose data including one or more temporal relationships to one or more meals, insulin boluses, or exercise events, or time period of a day, or combinations thereof.

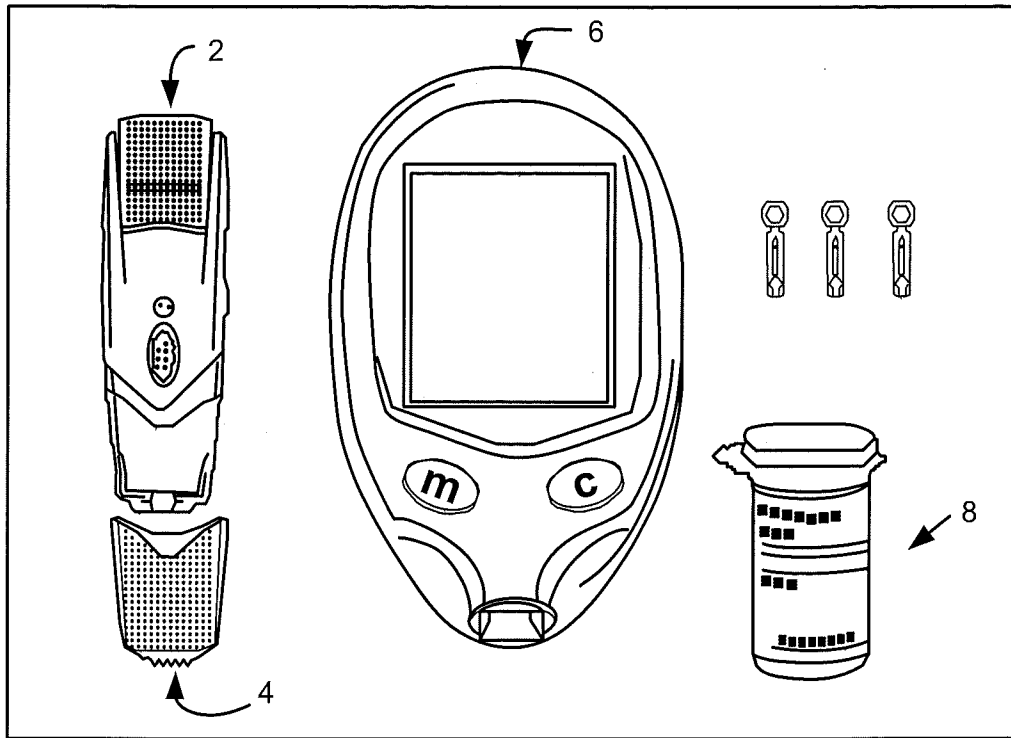


Figure 1

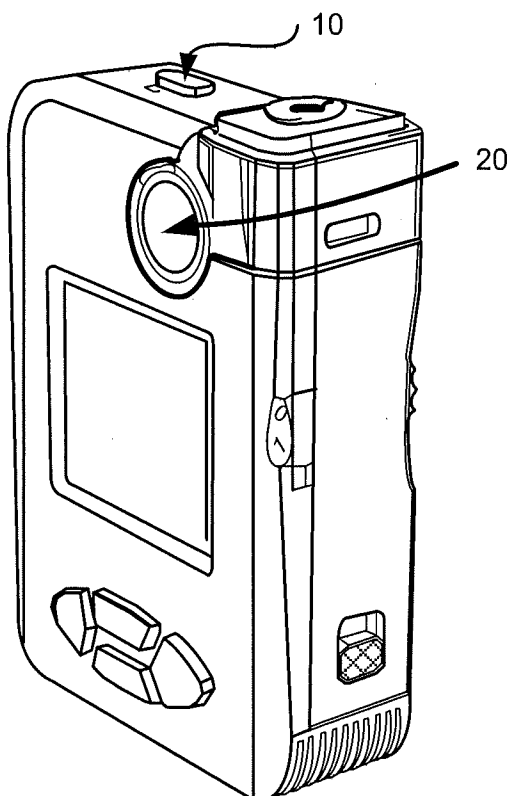


Figure 2A

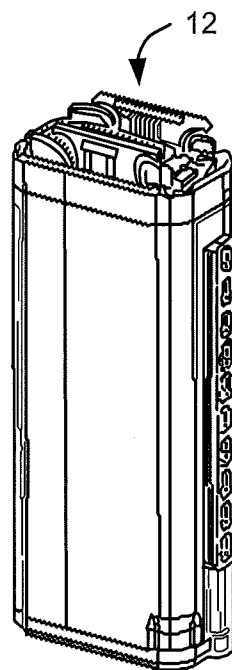


Figure 2B

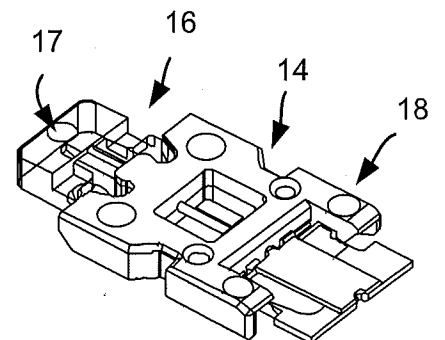


Figure 2C

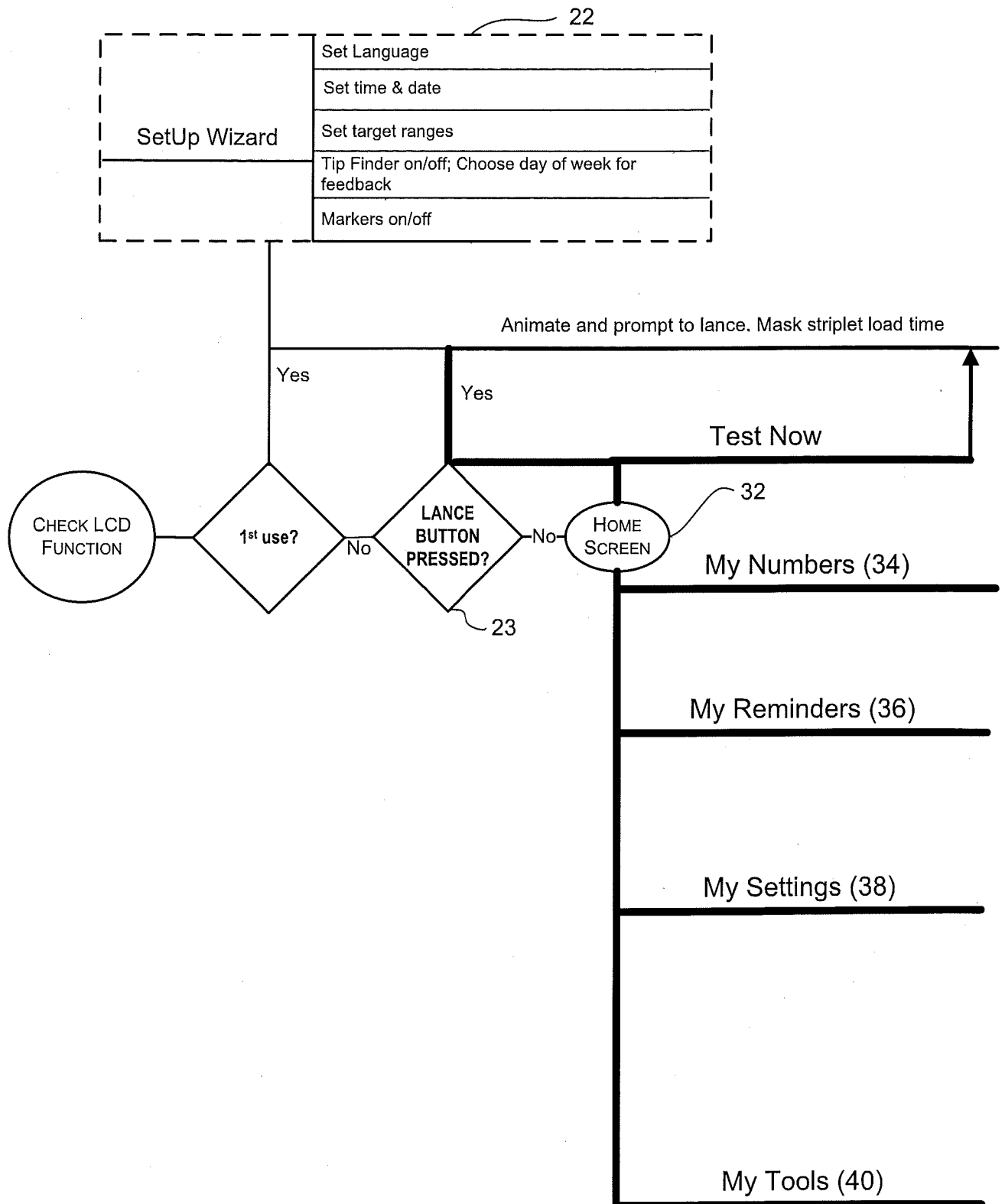


Figure 3A

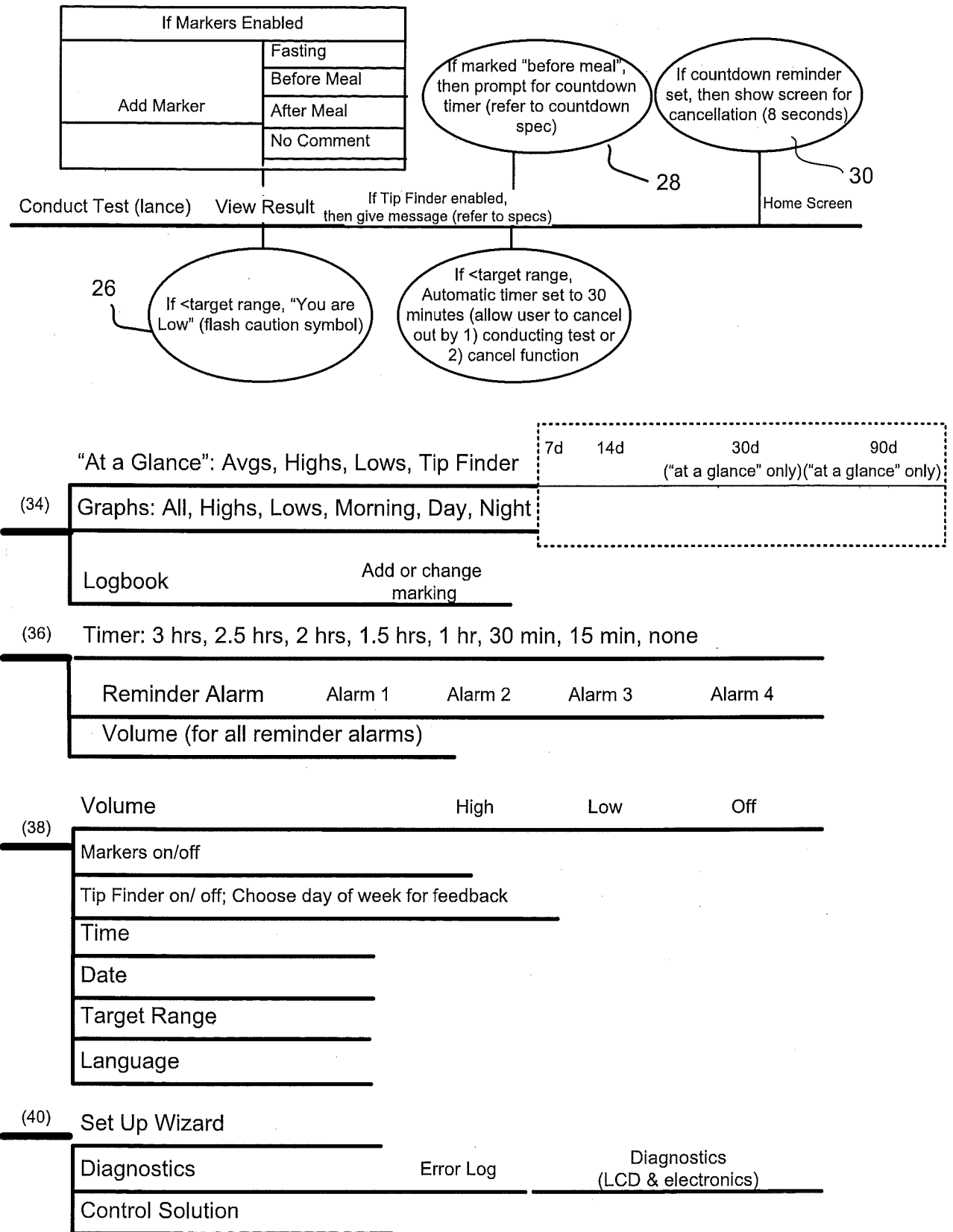
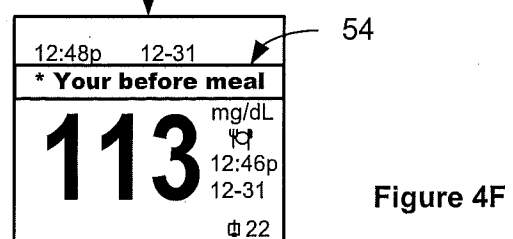
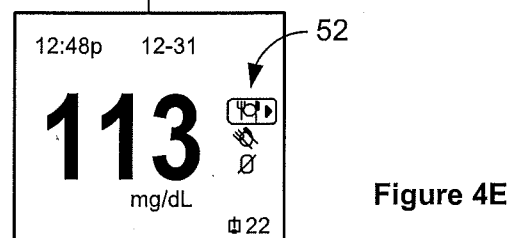
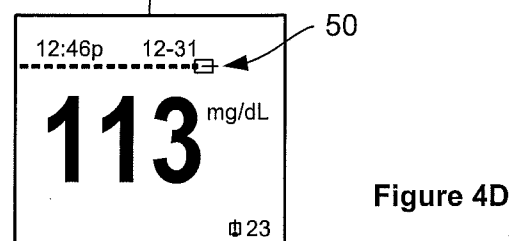
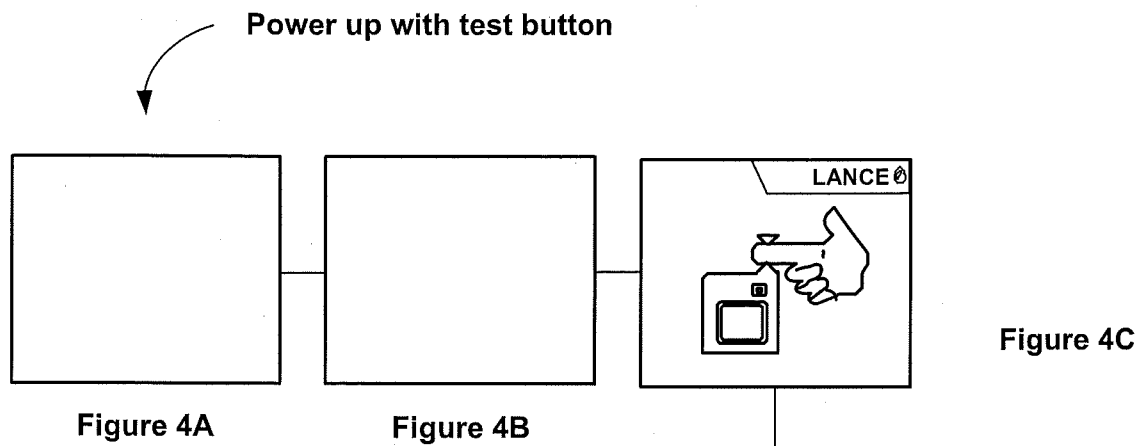
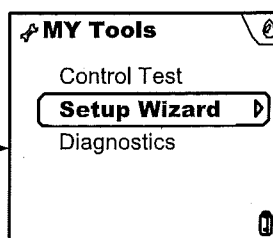
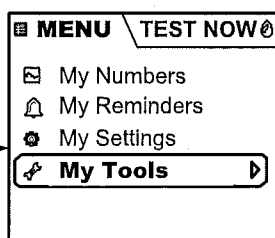
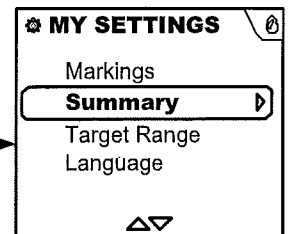
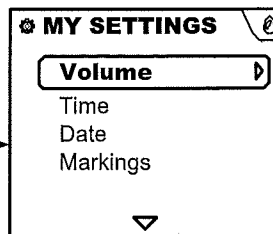
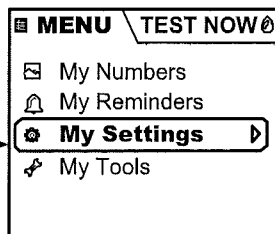
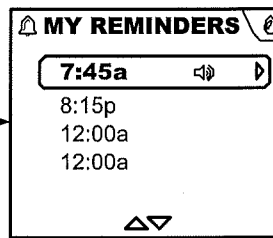
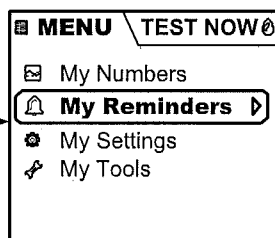
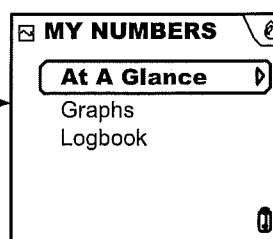
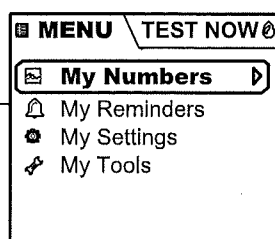
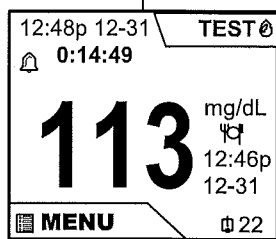
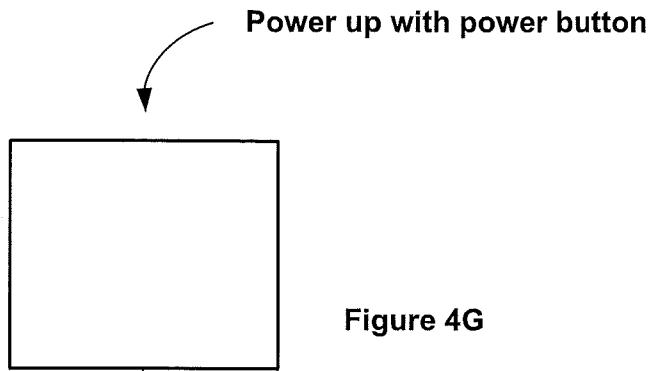
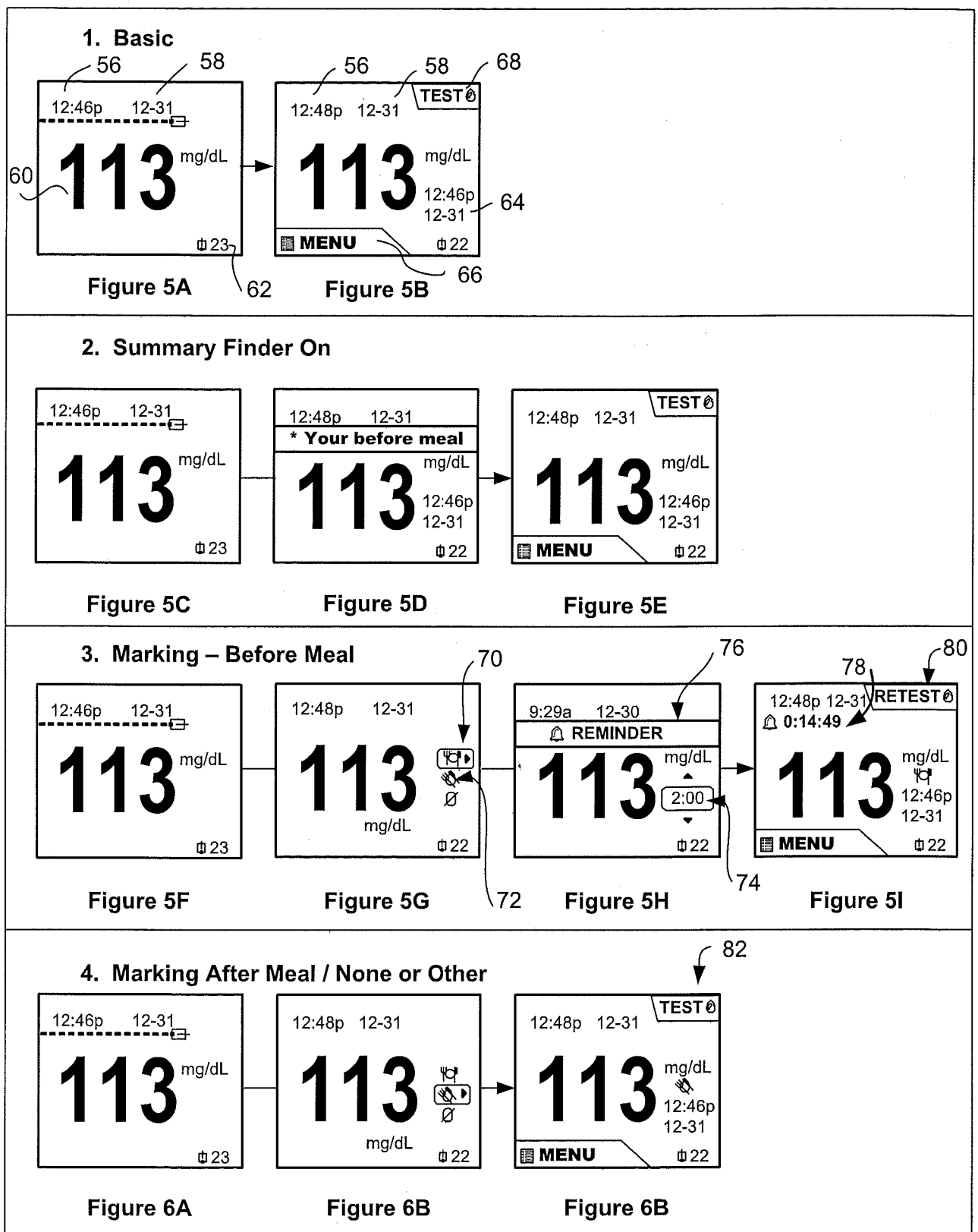


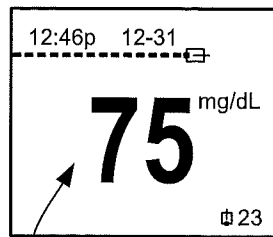
Figure 3B





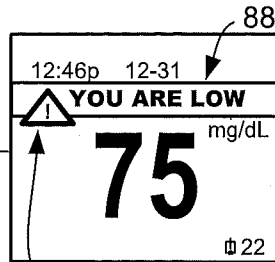


5. Low Result (below target range)



84

Figure 6D



86

Figure 6E

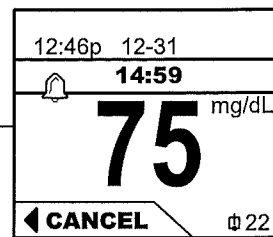
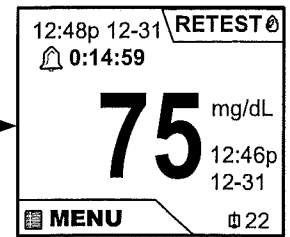


Figure 6F



90

Figure 6G

6. Marking After Meal / None or Other; Summary Finder On

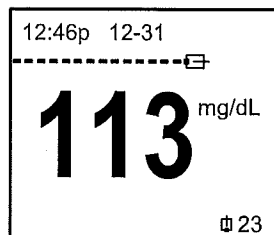


Figure 6H

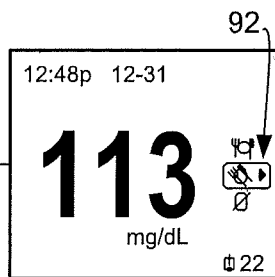


Figure 6I

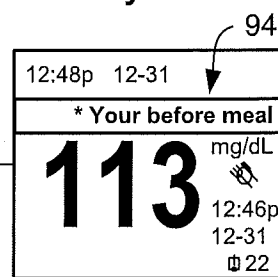


Figure 6J

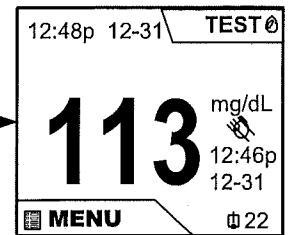


Figure 6K

7. Marking After Meal / None or Other; Summary Finder On

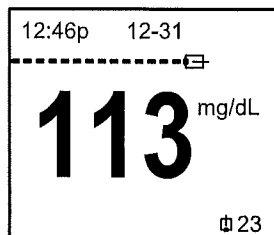


Figure 6L

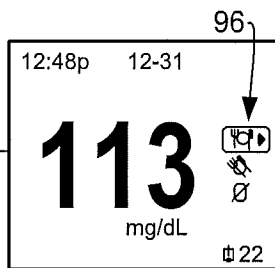


Figure 6M

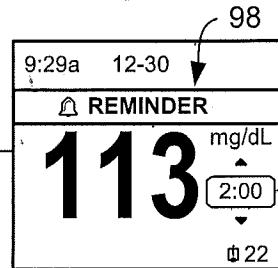


Figure 6N

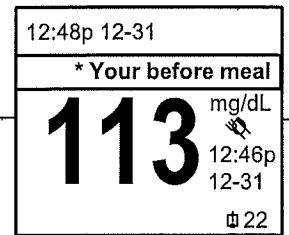


Figure 6O

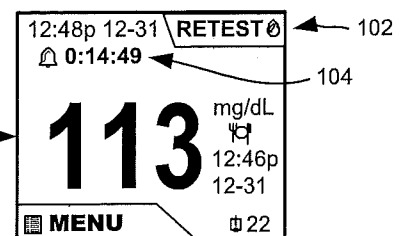


Figure 6P

8. Lo (blood glucose <20mg/dL)

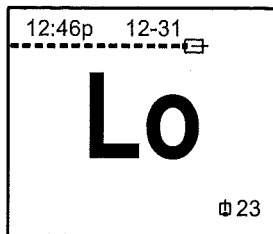


Figure 7A

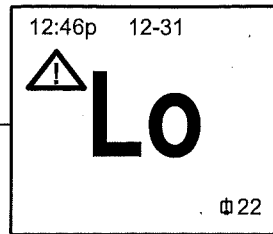


Figure 7B

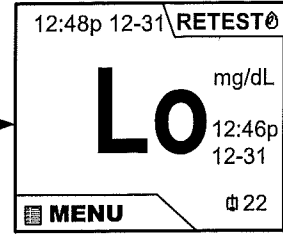


Figure 7C

9. Hi (blood glucose >500mg/dL)

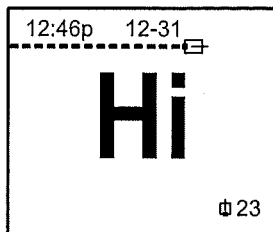


Figure 7D

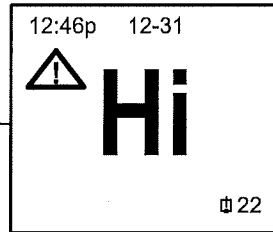


Figure 7E

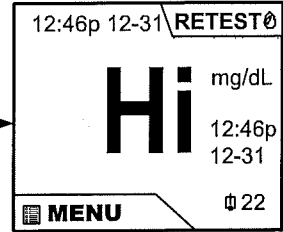


Figure 7F

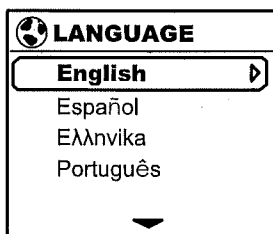


Figure 8A

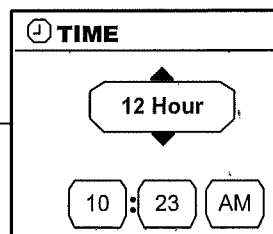


Figure 8B

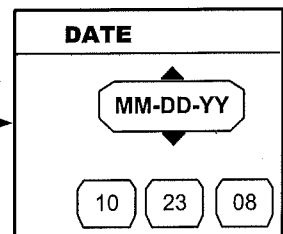


Figure 8C

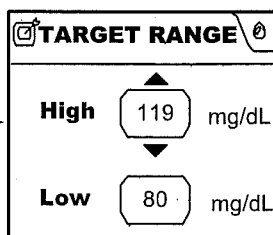


Figure 8D

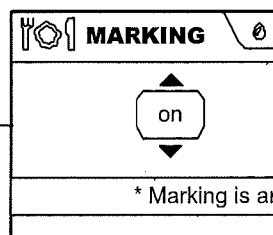


Figure 8E

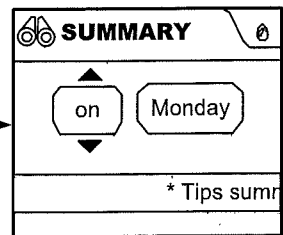
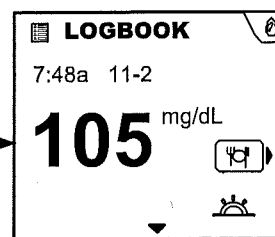
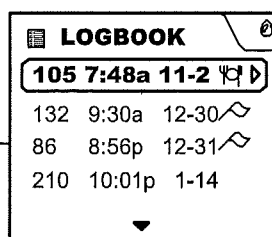
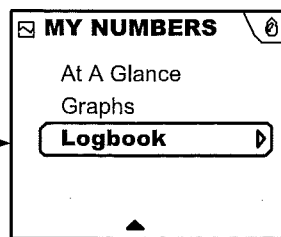
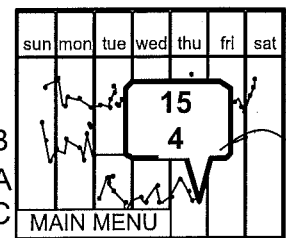
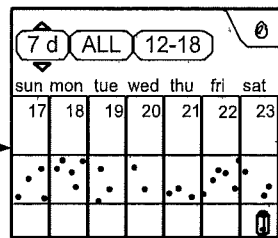
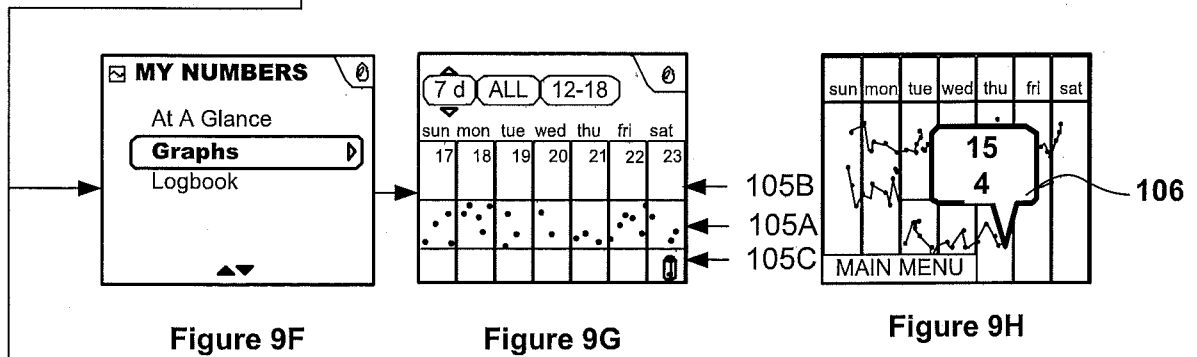
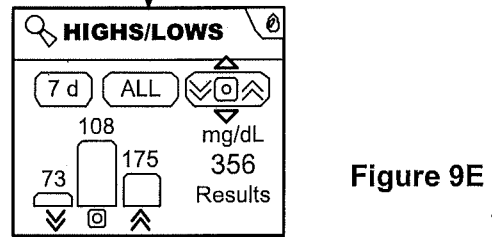
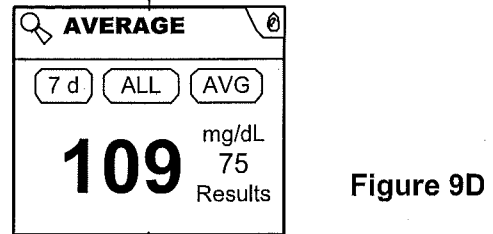
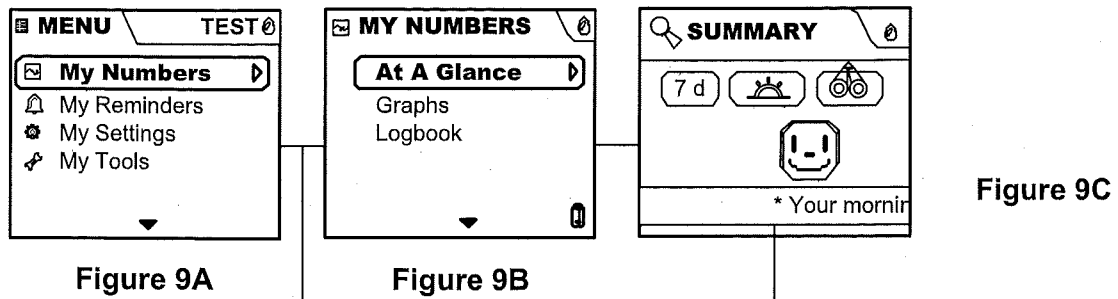


Figure 8F



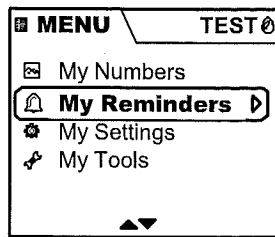


Figure 10A

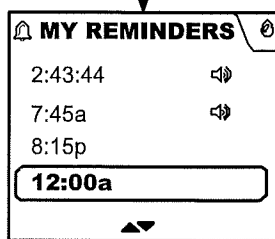


Figure 10B

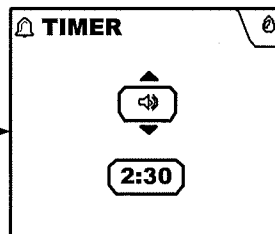


Figure 10C

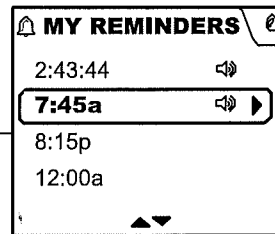


Figure 10D

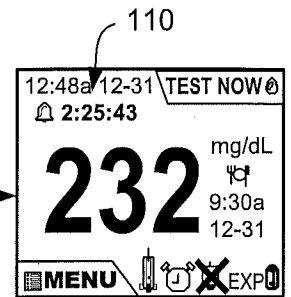


Figure 10E

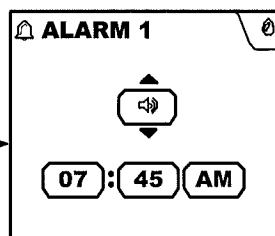


Figure 10F

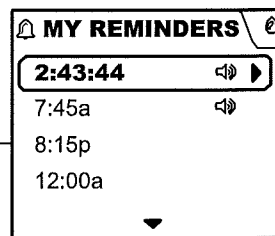


Figure 10G

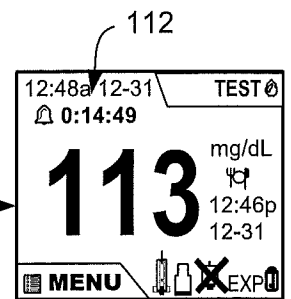


Figure 10H

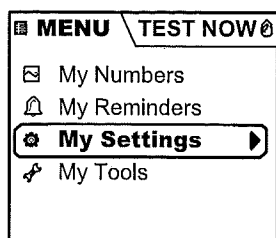


Figure 11A

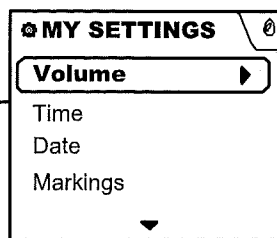


Figure 11B

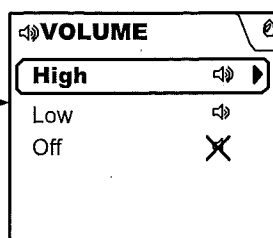


Figure 11C

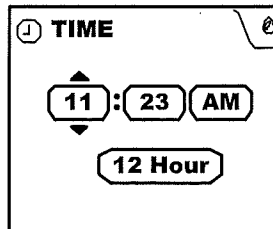


Figure 11D

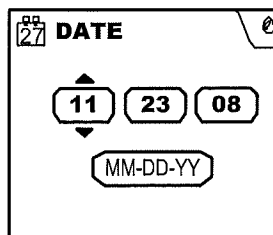


Figure 11E

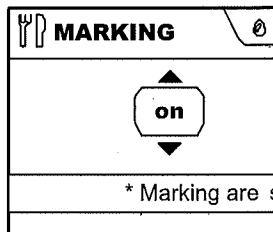


Figure 11F

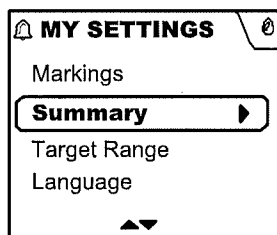


Figure 11G

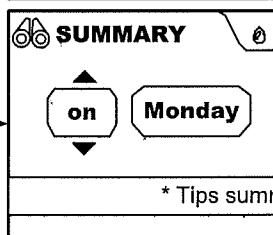


Figure 11H

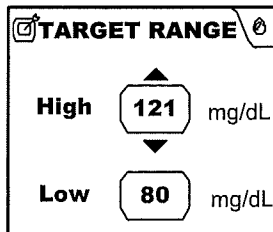


Figure 11I



Figure 11J

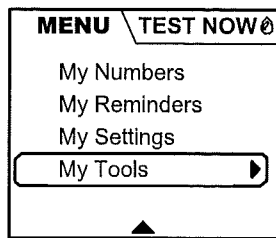


Figure 12A



Figure 12B

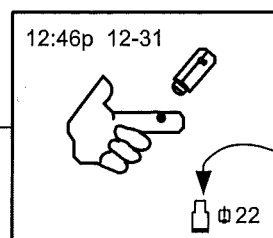


Figure 12C

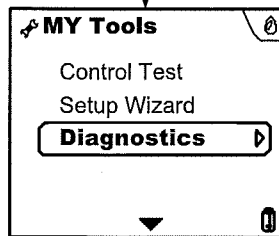


Figure 12M

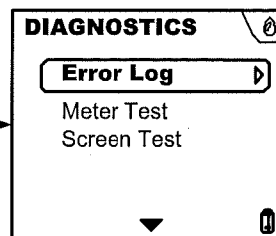


Figure 12N

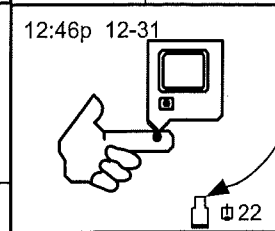


Figure 12D

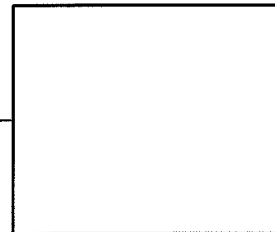


Figure 12E

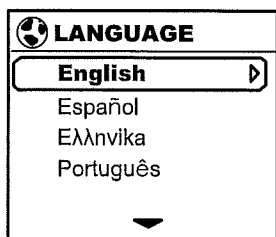


Figure 12G

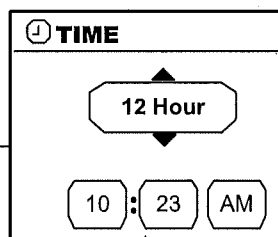


Figure 12H

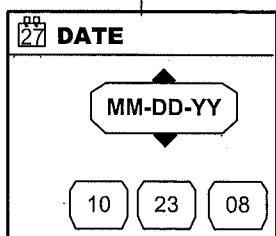


Figure 12I

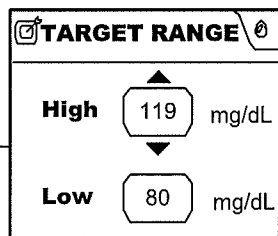


Figure 12J

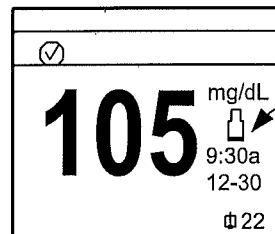


Figure 12F

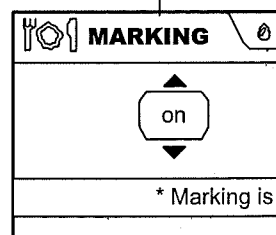


Figure 12K

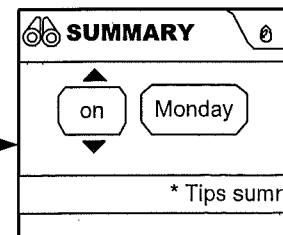


Figure 12L

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 09/56982

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - A61B 5/05 (2009.01)

USPC - 600/347

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC(8): A61B 5/05 (2009.01)

USPC: 600/347

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

USPC: 600/347, 702/127, 702/108 (keyword delimited)

IPC(8): A61B 5/05 (2009.01)

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

PubWEST(USPT, PGPB, EPAB, JPAB); Google Scholar

Search Terms Used: meter, monitor, device, glucose, lancet, lancing, blood, sample, sugar, icons, icon, GUI, graphic, graphical, user, interface, scroll, scrolling, summary, summarize, data, time, code, multiple

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2005/0038332 A1 (SAIDARA) 17 February 2005 (17.02.2008), entire document especially Fig. 1A, Fig. 1B, Fig. 2B, Fig. 3A, Fig. 3B, Fig. 3C, Fig. 4B, Fig. 4F, Fig. 4G, Fig. 7A, Fig. 8A, Fig. 8B, Fig. 8E; para [0014], [0053], [0054], [0057], [0061], [0062], [0067], [0069], [0080], [0083], [120], [0126], [0138], [0141], [0150], [0152], [0164]	10, 12-18, 20, 22, 23, 33, 35-41, 43, 45, 46, 56, 58-64, 66, 68, 69
Y		1-9, 11, 19, 21, 24-32, 34, 42, 44, 47-55, 57, 65, 67
Y	US 5,659,741 A (EBERHARDT) 19 August 1997 (19.08.1997), entire document especially Fig. 2, Fig. 4, col 10, ln 43-58	1-9, 11, 19, 21, 24-32, 34, 42, 44, 47-55, 57, 65, 67
Y	US 2008/0103377 A1 (BROWN) 01 May 2008 (01.05.2008), Fig. 6, 7; para [0004], [0007], [0101]	5, 28, 51
A	US 5,108,889 A (SMITH) 28 April 1992 (28.04.1992), entire document	1-69
A	US 2001/0013006 A1 (BROWN) 09 August 2001 (09.08.2001), entire document	1-69
A	US 2008/0076973 A1 (MURADIA) 27 March 2008 (27.03.2008), entire document	1-69
A	US 2008/0119705 A1 (PATEL et al.) 22 May 2008 (22.05.2008), entire document	1-69

☐ Further documents are listed in the continuation of Box C.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

16 October 2009 (16.10.2009)

Date of mailing of the international search report

28 OCT 2009

Name and mailing address of the ISA/US

Mail Stop PCT, Attn: ISA/US, Commissioner for Patents
P.O. Box 1450, Alexandria, Virginia 22313-1450

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