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(54) HEALTH MANAGEMENT APPARATUS, HEALTH MANAGEMENT METHOD, AND STORAGE MEDIUM

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G16H 40/67	(2006.01)
G16H 20/00	(2006.01)

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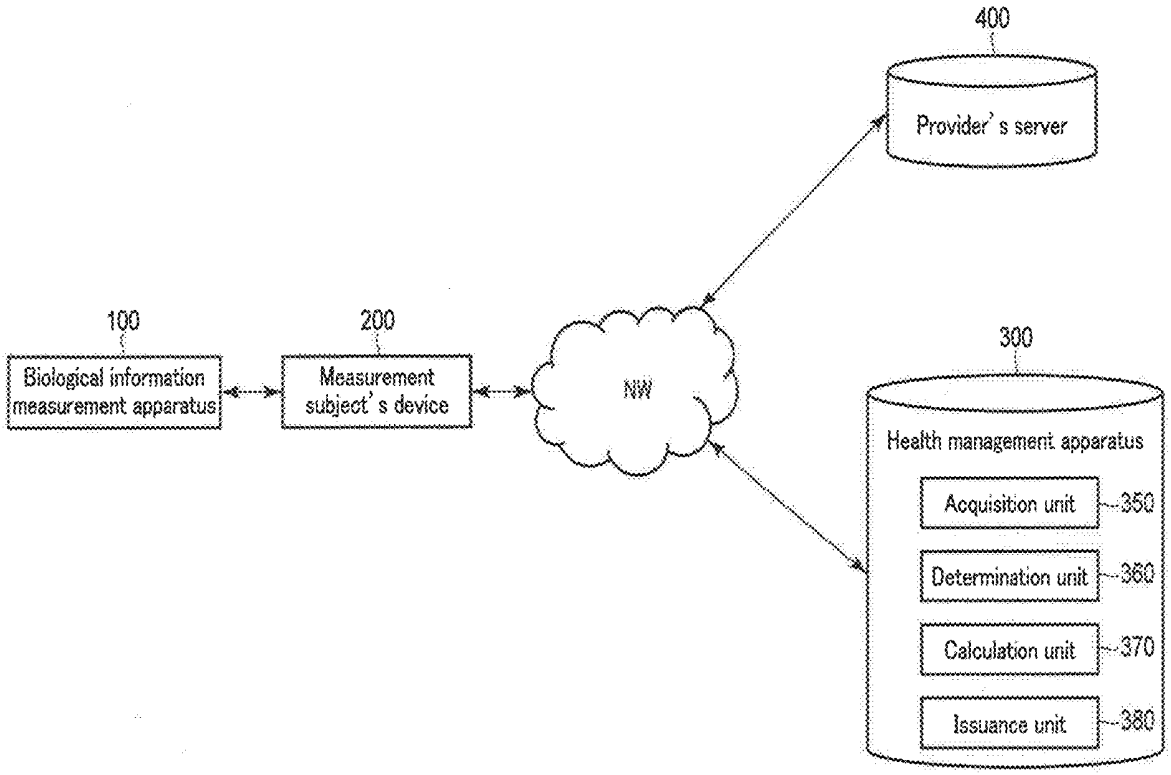
(57) **ABSTRACT**

A health management apparatus includes an acquisition unit configured to acquire biological information of a measurement subject, a determination unit configured to determine whether or not the acquired biological information attains a goal value set with respect to the biological information within a predetermined period of time, and a calculation unit configured to calculate an incentive value of the measurement subject based on a determination result obtained by the determination unit.



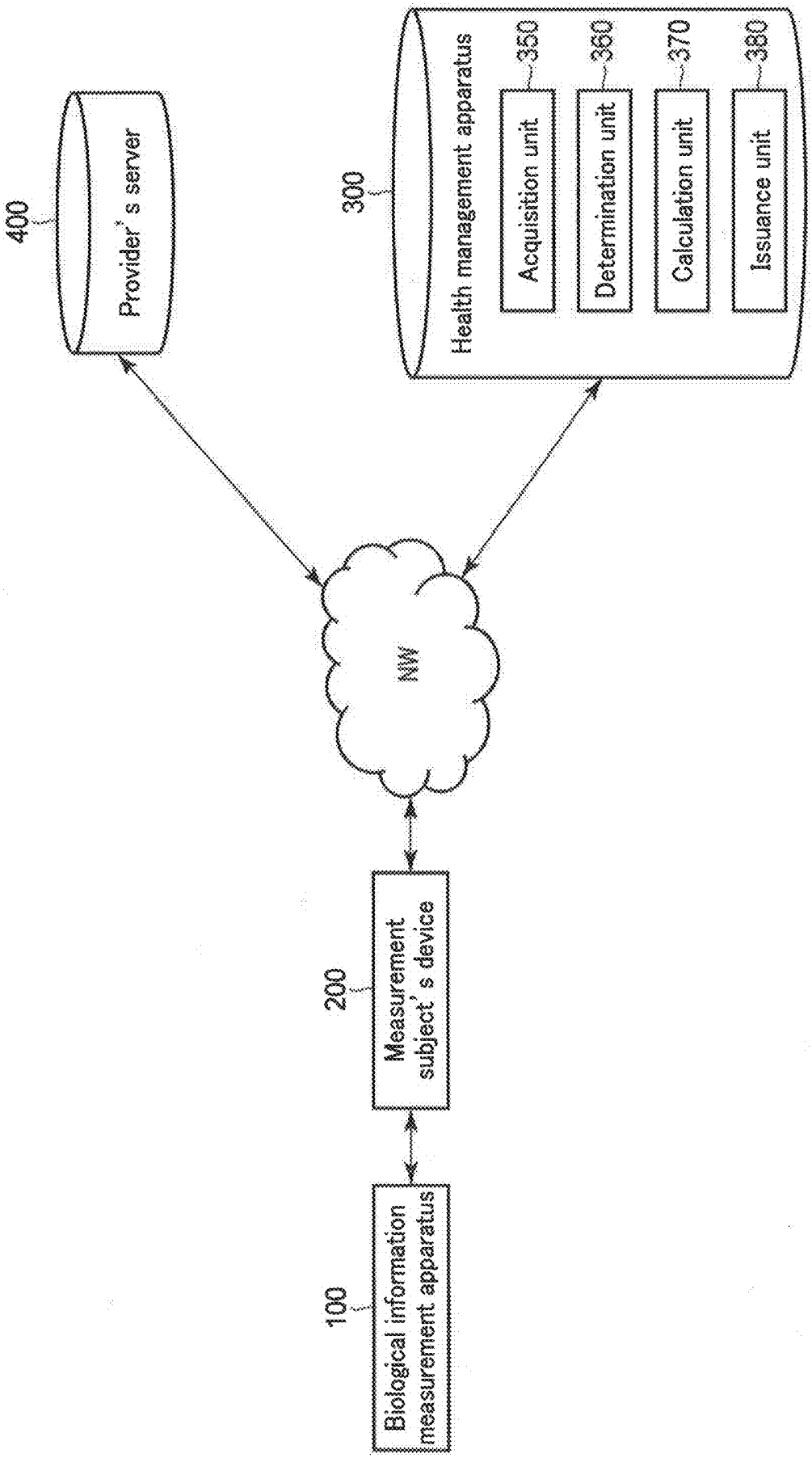
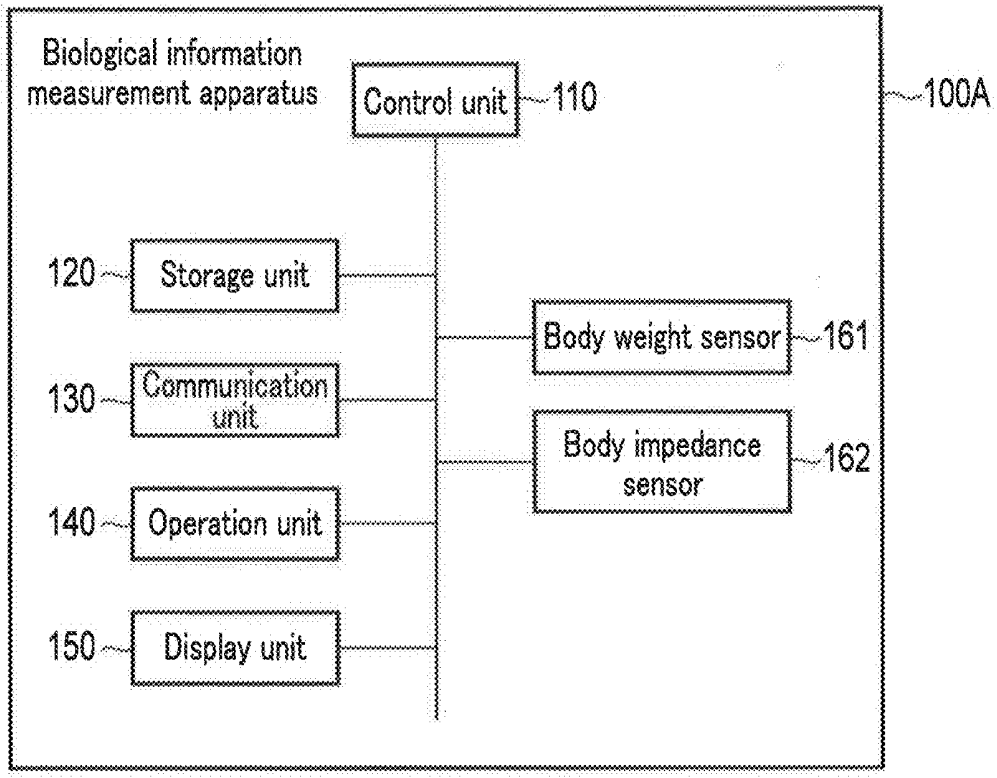
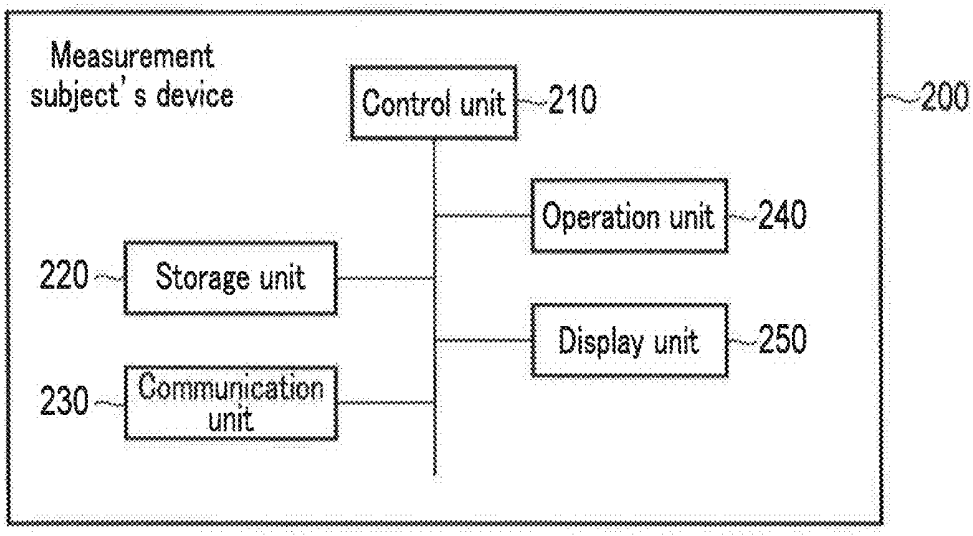

400
Provider's server
300
Health management apparatus
350
Acquisition unit
360
Determination unit
370
Calculation unit
380
Issuance unit
NW
200
Measurement subject's device
100
Biological information measurement apparatus

FIG. 1


Biological information measurement apparatus
Control unit
110
100A
120
Storage unit
130
Communication unit
140
Operation unit
150
Display unit
Body weight sensor
161
Body impedance sensor
162

F I G. 2


Measurement subject's device
Control unit
210
200
Operation unit
240
220
Storage unit
Display unit
250
230
Communication unit

F I G. 3

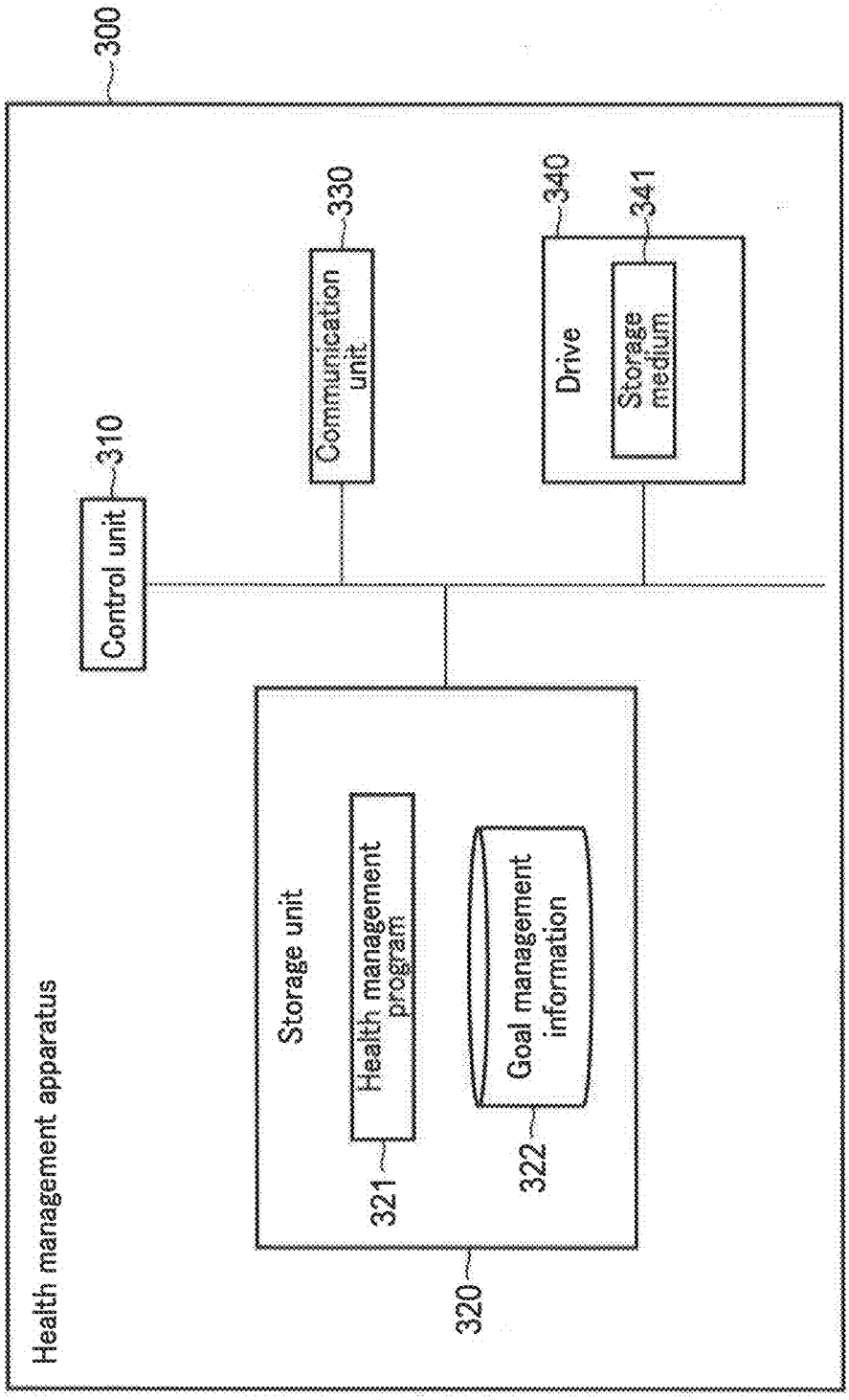

300
Health management apparatus
310
Control unit
330
Communication unit
340
Drive
341
Storage medium
320
Storage unit
321
Health management program
322
Goal management information

FIG. 4

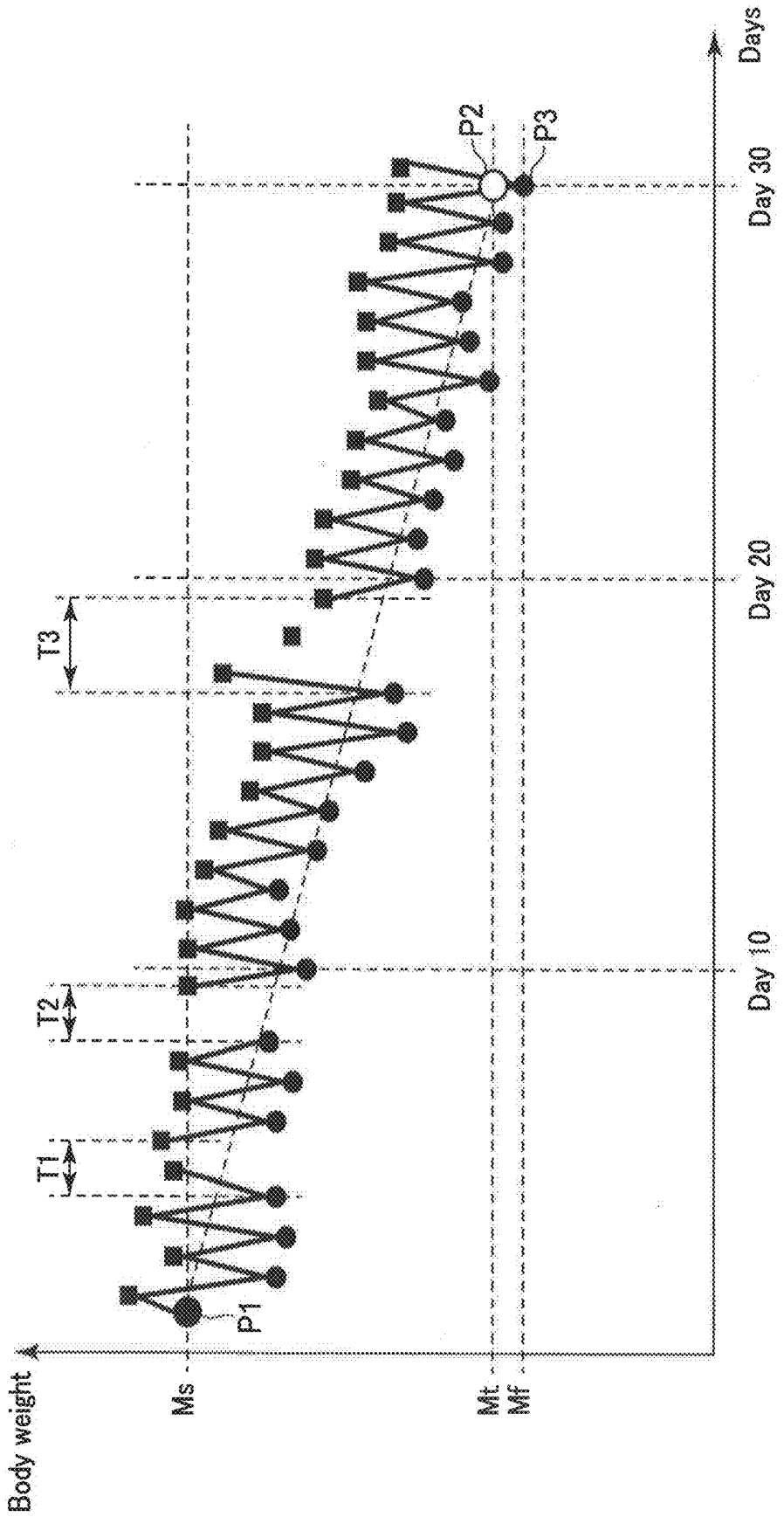


FIG. 5

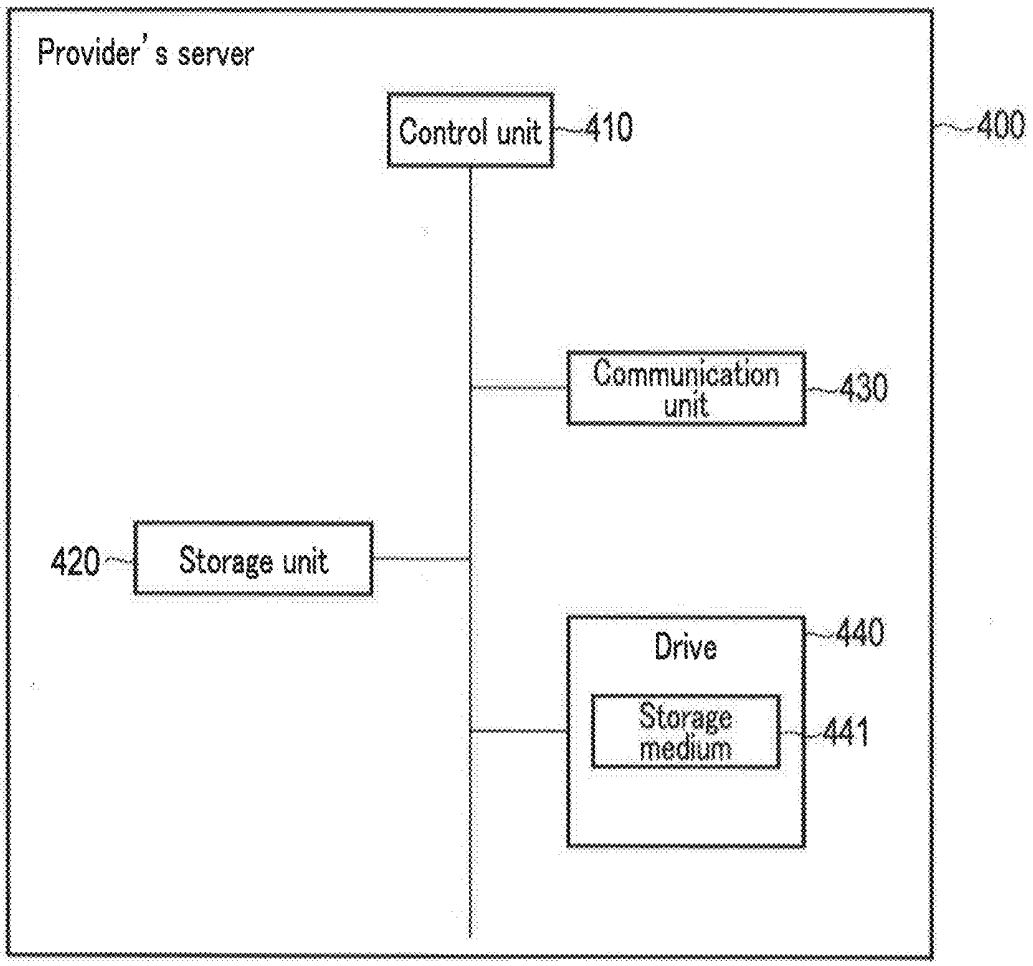

Provider's server
Control unit
410
400
Communication unit
430
420
Storage unit
Drive
440
Storage medium
441

FIG. 6

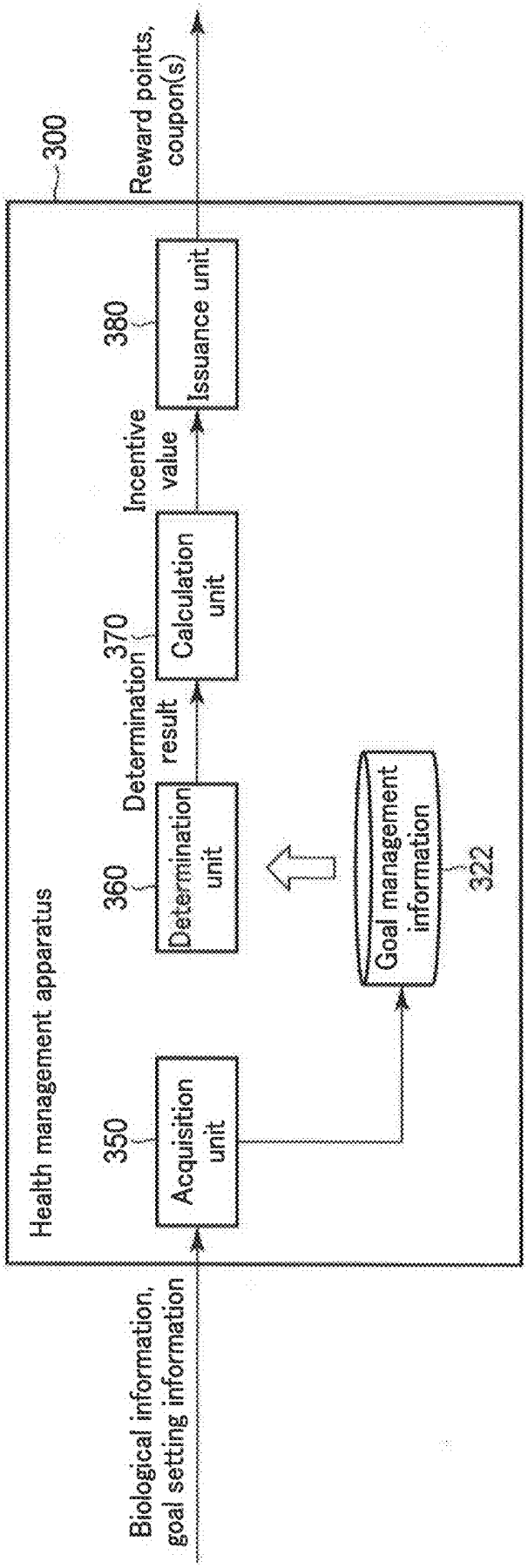

Biological information, goal setting information
Health management apparatus
350
Acquisition unit
360
Determination unit
Determination result
370
Calculation unit
Incentive value
380
Issuance unit
Goal management information
322
300
Reward points, coupon(s)

FIG. 7

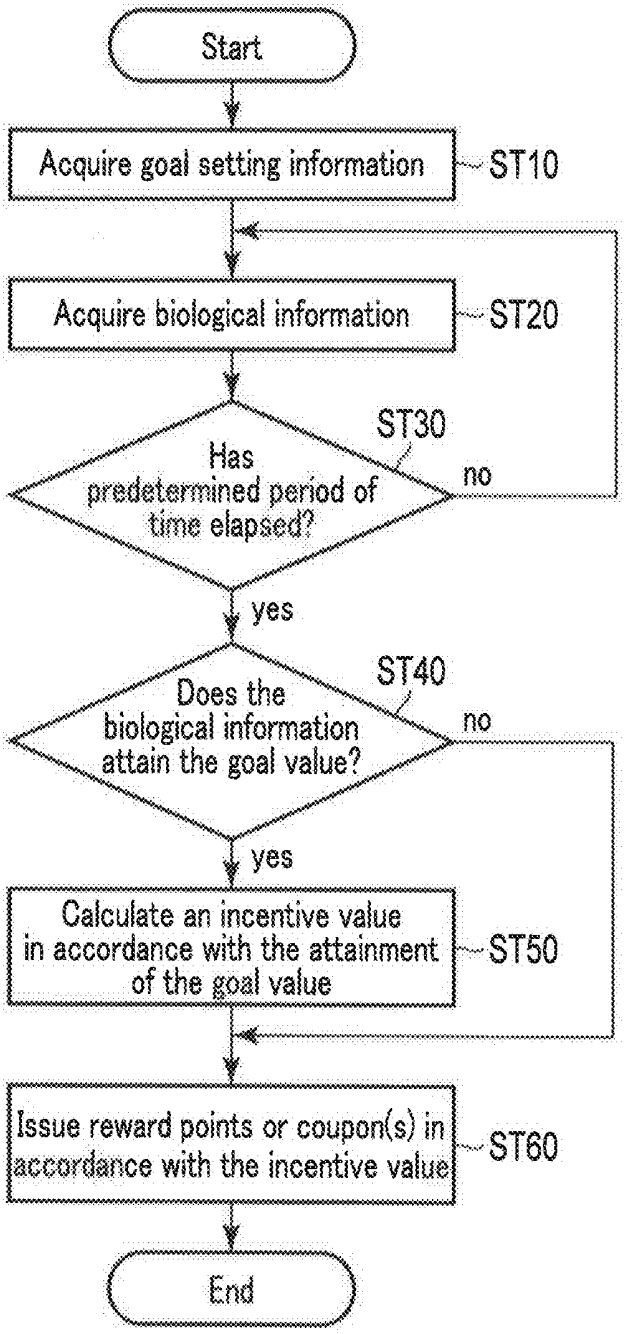
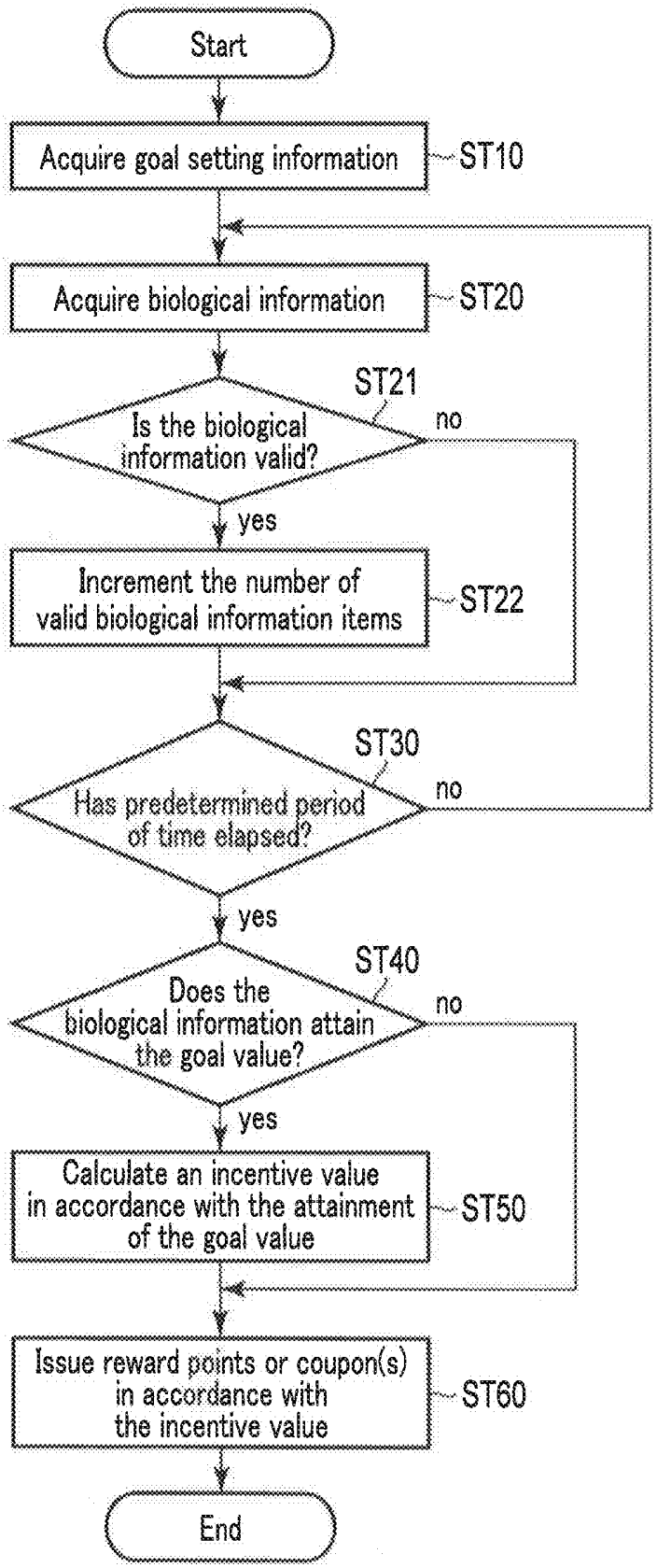
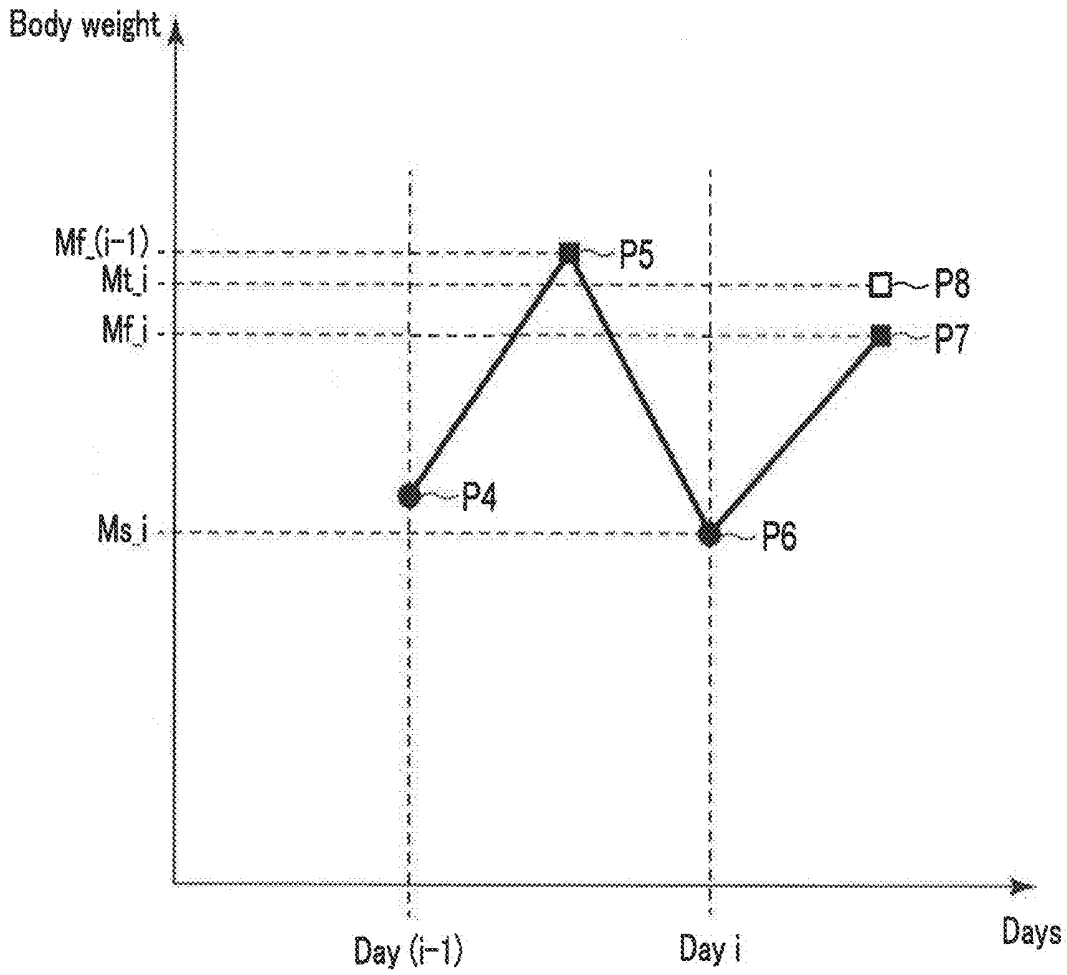

Start
Acquire goal setting information
ST10
Acquire biological information
ST20
ST30
Has predetermined period of time elapsed?
no
yes
ST40
Does the biological information attain the goal value?
no
yes
Calculate an incentive value in accordance with the attainment of the goal value
ST50
Issue reward points or coupon(s) in accordance with the incentive value
ST60
End

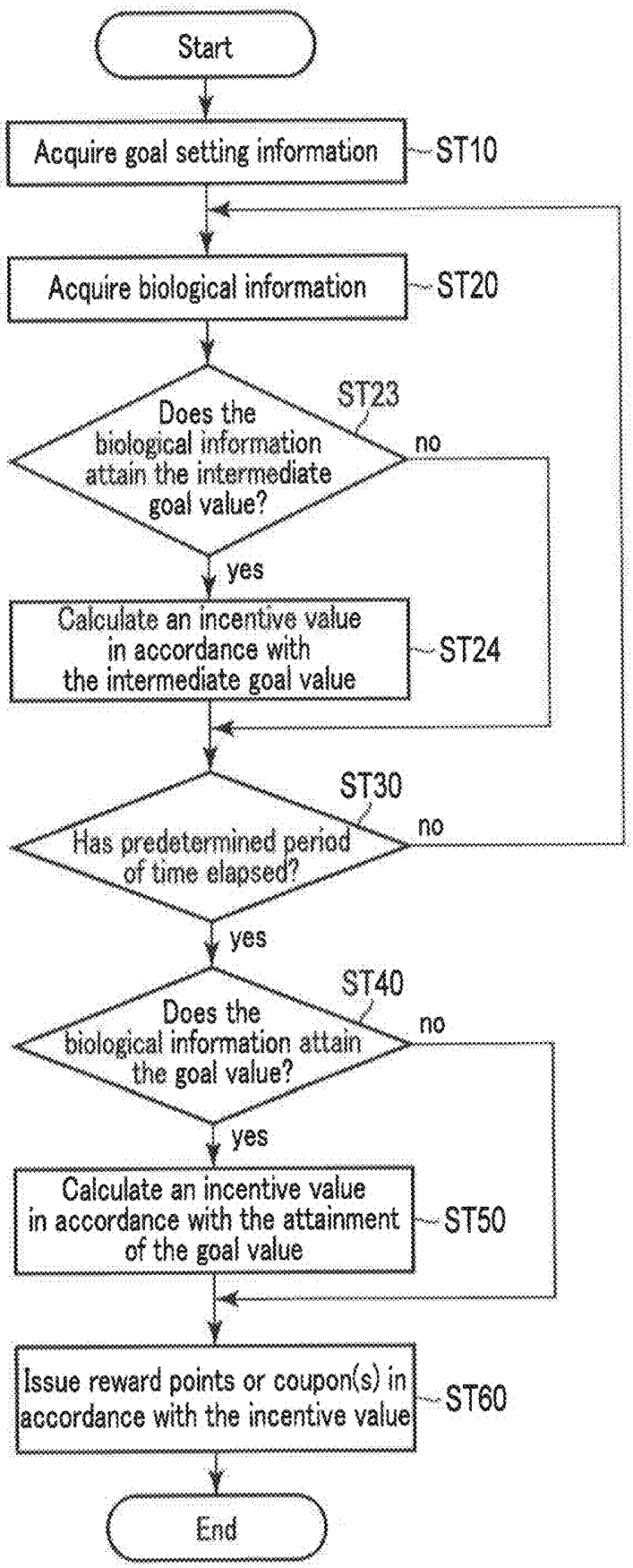
FIG. 8


Start
Acquire goal setting information
ST10
Acquire biological information
ST20
ST21
Is the biological information valid?
no
yes
Increment the number of valid biological information items
ST22
ST30
Has predetermined period of time elapsed?
no
yes
ST40
Does the biological information attain the goal value?
no
yes
Calculate an incentive value in accordance with the attainment of the goal value
ST50
Issue reward points or coupon(s) in accordance with the incentive value
ST60
End

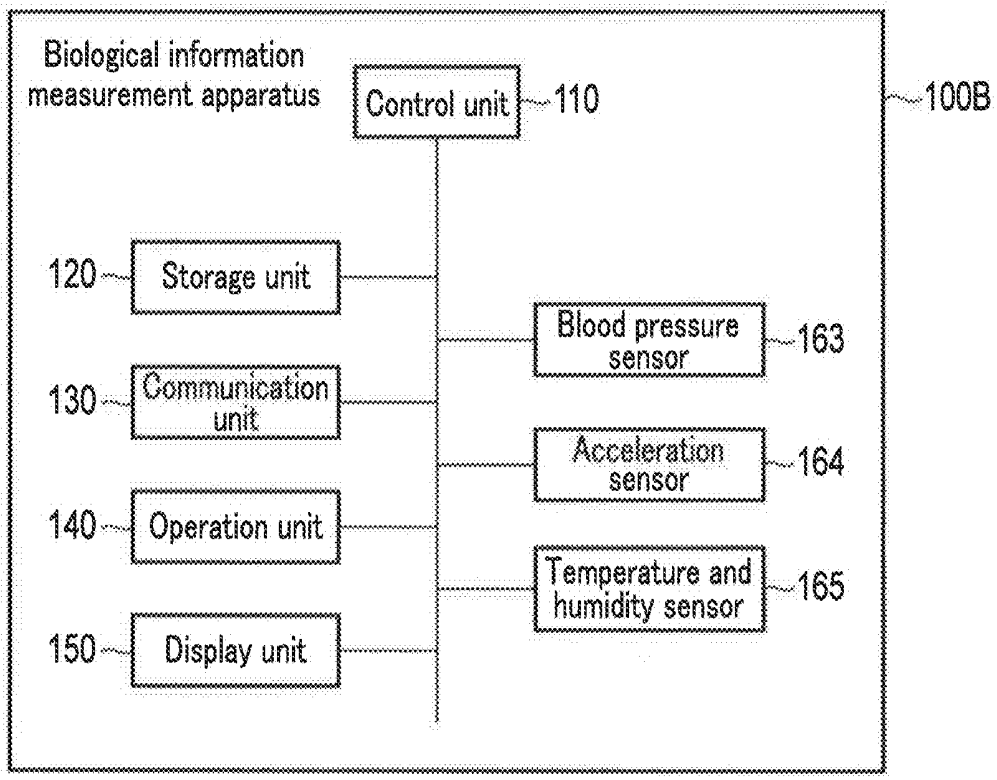
F I G. 9



F I G. 10


Start
Acquire goal setting information
ST10
Acquire biological information
ST20
Does the biological information attain the intermediate goal value?
ST23
no
yes
Calculate an incentive value in accordance with the intermediate goal value
ST24
Has predetermined period of time elapsed?
ST30
no
yes
Does the biological information attain the goal value?
ST40
no
yes
Calculate an incentive value in accordance with the attainment of the goal value
ST50
Issue reward points or coupon(s) in accordance with the incentive value
ST60
End

F I G. 11


Biological information measurement apparatus
Control unit
110
100B
120
Storage unit
130
Communication unit
140
Operation unit
150
Display unit
Blood pressure sensor
163
Acceleration sensor
164
Temperature and humidity sensor
165

F I G. 12

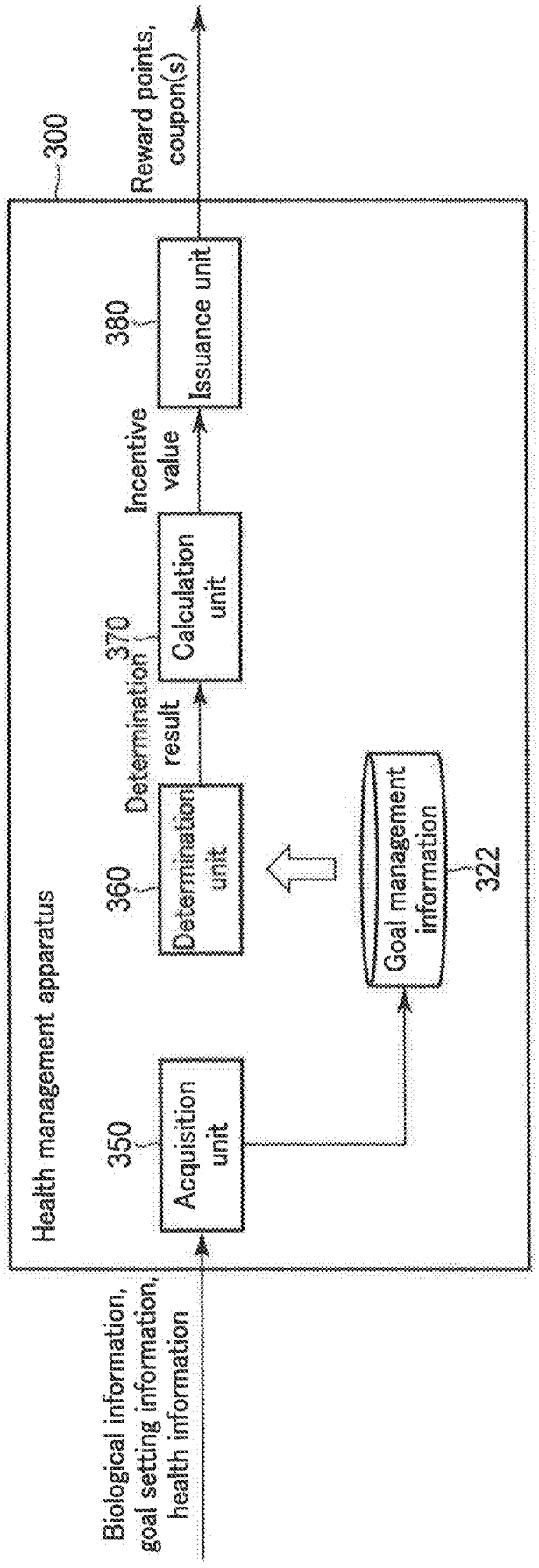

Biological information, goal setting information, health information
Health management apparatus
300
350
Acquisition unit
360
Determination unit
Determination result
370
Calculation unit
Incentive value
380
Issuance unit
Reward points, coupon(s)
Goal management information
322

FIG. 13

Health information (Health situation of measurement subject)	Predetermined conditions relating to blood pressure value (a time of day at which blood pressure tends to be high)
Sleep apnea syndrome	During sleep (particularly when a surge occurs)
Morning hypertension	Morning
Workplace hypertension	During work
×××	×××

FIG. 14

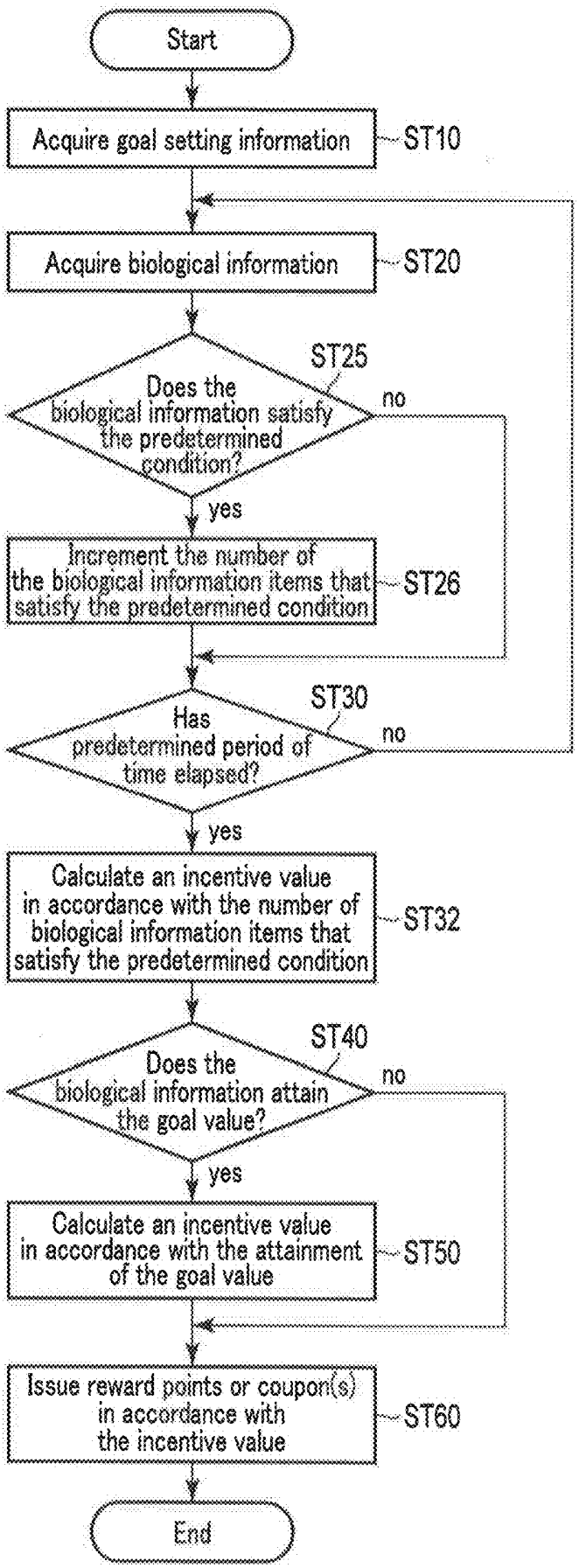

Start
Acquire goal setting information
ST10
Acquire biological information
ST20
ST25
Does the biological information satisfy the predetermined condition?
no
yes
Increment the number of the biological information items that satisfy the predetermined condition
ST26
ST30
Has predetermined period of time elapsed?
no
yes
Calculate an incentive value in accordance with the number of biological information items that satisfy the predetermined condition
ST32
ST40
Does the biological information attain the goal value?
no
yes
Calculate an incentive value in accordance with the attainment of the goal value
ST50
Issue reward points or coupon(s) in accordance with the incentive value
ST60
End

FIG. 15

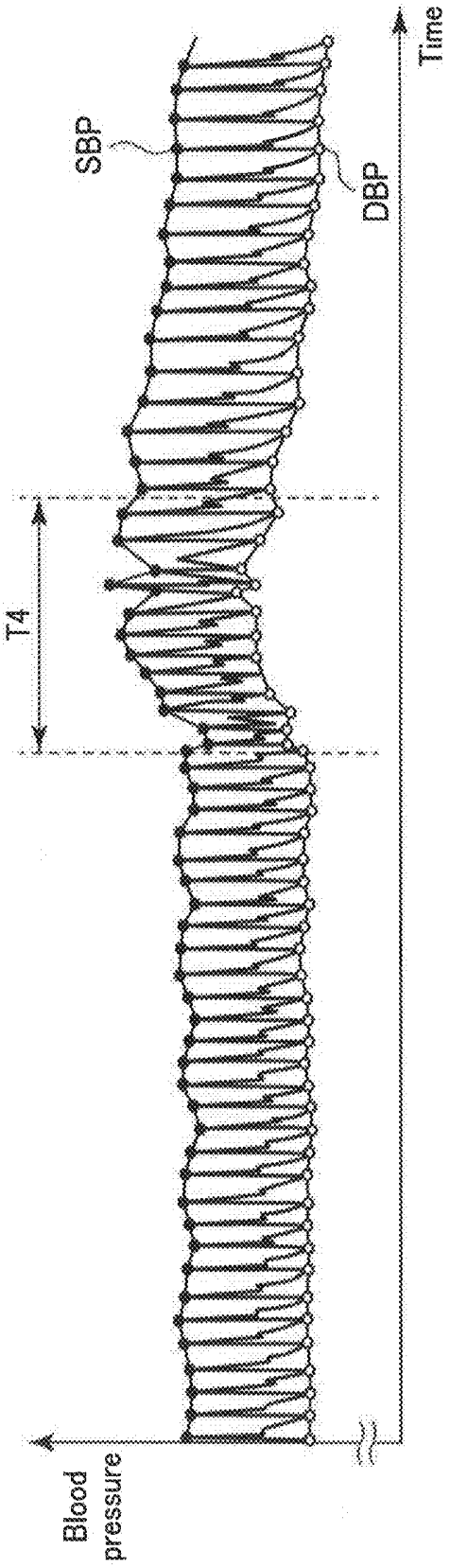


FIG. 16

HEALTH MANAGEMENT APPARATUS, HEALTH MANAGEMENT METHOD, AND STORAGE MEDIUM

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application is a Continuation Application of PCT Application No. PCT/JP2018/022225, filed Jun. 11, 2018 and based upon and claiming the benefit of priority from Japanese Patent Application No. 2017-119992, filed Jun. 19, 2017, the entire contents of all of which are incorporated herein by reference.

FIELD

[0002] The present invention relates generally to a health management apparatus, a health management method, and a storage medium.

BACKGROUND

[0003] Various approaches to the promotion of health maintenance for a person who becomes a subject of measurement through the use of a health care device have been proposed.

[0004] In Jpn. Pat. Appln. KOKAI Publication No. 2003-141260, a health point bank system is proposed. In the health point bank system in Jpn. Pat. Appln. KOKAI Publication No. 2003-141260, if a measurement subject (who is a subject of measurement) uses a health care device, such as a pedometer, the health care device converts biological information obtained as a measurement result into reward points in a predetermined manner, and transmits the reward points to a server. The server then stores the transmitted reward points for each user. The measurement subject receives products and services in accordance with the reward points stored in the server. According to this health point; bank system, it is possible to help the measurement subject to continue behaviors effective for maintaining their health with the use of a health care device.

SUMMARY

[0005] A health management apparatus according to one aspect of the present invention includes an acquisition unit configured to acquire biological information of a measurement subject, a determination unit configured to determine whether or not the acquired biological information attains a goal value set with respect to the biological information within a predetermined period of time, and a calculation unit configured to calculate an incentive value of the measurement subject based on a determination result obtained by the determination unit,

[0006] According to the above structure, a measurement subject is able to not only provide measured biological information but also obtain more incentives through attaining a goal value. As a consequence, a measurement subject comes to aim at attaining a goal value to obtain more incentives, and eventually start health management on their own. It is thus possible to accustom a measurement subject to measuring their biological information, and to improve their health situation.

[0007] According to the health management apparatus according to the above-described aspect, the determination unit further determines whether or not the acquired biological information is valid, and the calculation unit calculates the incentive value of the measurement subject further based on a number of biological information items that have been determined to be valid by the determination unit. According to the structure, a measurement subject is able to not only obtain incentives in accordance with whether or not a goal value is attained within a predetermined period of time, but also obtain more incentives through acquisition of the increased number of biological information items during the process of attaining a goal value. It is thus possible to motivate a measurement subject to continuously measure their biological information.

[0008] According to the health management apparatus according to the above-described aspect, the acquisition unit further acquires health information indicating a health situation of the measurement subject, the determination unit further determines whether or not the acquired biological information satisfies a predetermined condition which is based on the acquired health information, and the calculation unit calculates the incentive value of the measurement subject further based on a number of biological information items determined to satisfy the predetermined condition by the determination unit. According to the structure, a measurement subject can obtain more incentives through providing biological information items which are of particular importance among all the acquired biological information items. For example, if a measurement subject has a symptom of workplace hypertension, a blood pressure value acquired during work tends to be high, and such a value may be particularly important among biological information acquired from the measurement subject. The calculation unit calculates more incentive values for blood pressure values acquired during work for a measurement subject who has a symptom of workplace hypertension. As a consequence, a measurement subject comes to measure their blood pressure during work to obtain more incentives, and eventually start health management on their own. It is thus possible to accustom a measurement subject to measuring their particularly important biological information, and to effectively promote improvement in their health situation.

[0009] According to the health management apparatus according to the above-described aspect, the goal value includes at least one intermediate goal value set correspondingly to a point: of time in the predetermined period of time, and

[0010] the determination unit further determines whether or not the acquired biological information attains the intermediate goal value at the point of time. According to the structure, a measurement subject is able to not only obtain incentives in accordance with whether or not a goal value is attained within a predetermined period of time, but also obtain more incentives through attaining an intermediate goal value during the process of attaining a goal value. It is thus possible to accustom a measurement subject to measuring their biological information and to promote improvement in their health situation.

[0011] According to the health management apparatus according to the above-described aspect, the biological information includes at least one of a blood pressure value and a body weight. According to the structure, a blood pressure value and a body weight of a measurement subject can be targeted for health management. It is thus possible to accustom a measurement subject to measuring their blood pressure value and body weight. It is also possible to

motivate a measurement subject to bring their blood pressure value and body weight closer to a goal value.

[0012] According to the health management apparatus according to the above-described aspect, further includes an issuance unit configured to issue at least one of reward points and a coupon to the measurement subject based on the calculated incentive value. According to the structure, reward points or a coupon(s) can be issued to a measurement subject by the health management apparatus in accordance with an incentive value. For this reason, a measurement subject can receive specific benefit as a reward for attaining a goal value. It is thus possible to reinforce the motivation to attain a goal value.

[0013] According to the present invention, technologies can help build a routine of biological information measurement and promote improvement in a health situation.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014] FIG. **1** is a block diagram showing a configuration of a health management system including a health management apparatus according to an applied example.

[0015] FIG. **2** is a block diagram showing a hardware configuration of a biological information measurement apparatus according to an embodiment.

[0016] FIG. **3** is a block diagram showing a hardware configuration of a measurement subject's device according to the embodiment.

[0017] FIG. **4** is a block diagram showing a hardware configuration of a health management apparatus according to the embodiment.

[0018] FIG. **5** is a diagram showing goal management information according to the embodiment.

[0019] FIG. **6** is a block diagram showing a hardware configuration of a provider's server according to the embodiment.

[0020] FIG. **7** is a block diagram showing a function configuration of the health management apparatus according to the embodiment.

[0021] FIG. **8** is a flow chart showing a procedure of a health management process in the health management apparatus according to the embodiment.

[0022] FIG. **9** is a flow chart showing a procedure of a health management process in a health management apparatus according to a first modification of the embodiment,

[0023] FIG. **10** is a diagram showing goal management information according to a second modification of the embodiment.

[0024] FIG. **11** is a flow chart showing a procedure of a health management process in a health management apparatus according to a second modification of the embodiment.

[0025] FIG. **12** is a block diagram showing a hardware configuration of a biological information measurement apparatus according to a third modification of the embodiment.

[0026] FIG. **13** is a block diagram showing a function configuration of a health management apparatus according to the third modification of the embodiment.

[0027] FIG. **14** is a table showing a relationship between a health situation of a measurement subject and a time of day at which blood pressure becomes high according to the third modification of the embodiment.

[0028] FIG. **15** is a flow chart showing a procedure of a health management process in a health management apparatus according to the third modification of the embodiment.

[0029] FIG. **16** is a diagram showing biological information according to a fourth modification of the embodiment.

DETAILED DESCRIPTION

[0030] As in the health care point bank system described in Jpn. Pat. Appln. KOKAI Publication No. 2003-141260, motivation to use a health care device can be promoted through conversion of biological information measured by a health care device into reward points, and health management of a measurement subject can thus be improved.

[0031] Use of a health care device to continue measuring biological information is not easy for a measurement subject who is not habituated to such a device.

[0032] In one aspect, the present embodiments are proposed in consideration of such a circumstance and so as to provide technologies which help accustom a measurement subject to measuring their biological information, and to promote improvement in, their health situation.

[0033] Hereinafter, embodiments will be described with reference to the drawings. In the descriptions below, constituent elements having the same functions and configurations will be denoted by the same reference symbols. Where there is a need to distinguish constituent elements having the same reference numerals, additional symbols are appended to the reference numerals. If no distinction is necessary, the constituent elements are referred to by the same reference numerals only, and no additional symbols are appended.

1. Applied Example

[0034] First, an example of an application of the present invention will be described with reference to FIG. **1**.

[0035] As shown in FIG. **1**, the health management system includes a biological information measurement apparatus **100**, a measurement subject's device **200**, a health management apparatus **300**, and a provider's server **400**. The biological information measurement apparatus **100** and the health management apparatus **300** are connected to each other in a communicatory manner via the measurement subject's device **200**. The measurement subject's device **200** and the provider's server **400** are connected to the health management apparatus **300** in a communicatory manner via a network NW.

[0036] The biological information measurement apparatus **100** measures biological information of a measurement subject (who is a subject of measurement), and transmits the information along with data and time of the measurement to the measurement subject's device **200**. The biological information includes, for example, information related to body composition (such as a body weight, a body mass index (BMI), a body fat rate, muscle mass, bone mass, a basal metabolic rate, etc.) and information related to life activities (such as a blood pressure value and a physical activity amount). The biological information measurement apparatus **100** includes, for example, a body composition measurement apparatus capable of measuring body composition, or a blood pressure measurement apparatus capable of measuring a blood pressure value. The biological information measurement apparatus **100** may be either an installation-type device installed in a house, etc. or a wearable device that can be continuously worn by the measurement subject.

[0037] The measurement subject's device **200** is an information communication device used by the measurement subject, and includes, for example, a portable information

communication device, such as a smart phone, a mobile phone, a tablet PC, or a laptop PC. The measurement subject's device **200** receives an input of goal setting information set by the measurement subject in order to improve their health situation, and transmits the information to the health management apparatus **300**, in accordance with an operation by the measurement subject. The goal setting information includes a goal value relating to biological information, for example. Upon receipt of biological information from the biological information measurement apparatus **100**, the measurement subject's device **200** transfers the biological information to the health management apparatus **300**. The measurement subject's device **200** receives reward points or a coupon(s) issued by the health management apparatus **300**. The measurement subject's device **200** receives provision of services from the provider's server **400** based on the biological information.

[0038] The biological information measurement apparatus **100** may only have a function of measuring biological information, and does not necessarily have a function of transmitting the biological information to the measurement subject's device **200**. In this case, the measurement subject's device **200** may receive an input of biological information measured by the biological information measurement apparatus **100** in accordance with an operation of the measurement subject, and may transmit the biological information to the health management apparatus **300**.

[0039] The health management apparatus **300** is a server apparatus comprising a function configuration for accustoming the measurement subject to measuring their own biological information, and for promoting improvement in a health situation of the measurement subject. The health management apparatus **300** includes an acquisition unit **350**, a determination unit **360** a calculation unit **370**, and an issuance unit **380**.

[0040] The acquisition unit **350** acquires biological information and goal setting information of the measurement subject. The goal setting information is set in the health management apparatus **300** as goal management information including a goal value that should be attained within a predetermined period of time. The determination unit **360** determines whether or not the biological information acquired by the acquisition unit **350** attains the goal value set with respect to the biological information within the predetermined period of time. The calculation unit **370** calculates an incentive value of the measurement subject based on a determination, result obtained by the determination unit **360**. The issuance unit **380** issues at least either reward points or a coupon(s) to the measurement subject based on the incentive value calculated by the calculation unit **370**.

[0041] The health management apparatus **300** integrates the biological information acquired from the measurement subject, and provides the information to the provider's server **400**.

[0042] The provider's server **400** is a server apparatus used by a service provider via the use of the biological information acquired from the measurement subject, for example. The service provider includes an insurance company or a health insurance association, for example. The provider's server **400** uses the biological information integrated by the health management apparatus **300** to calculate insurance, and provides insurance services to the measurement subject.

[0043] As described above, the health management apparatus **300** determines whether or not biological information, acquired from the measurement subject attains a goal value set by the measurement subject. The health management apparatus **300** calculates an incentive value in accordance with whether or not the goal value is attained. It is thereby possible for the measurement subject to receive reward points or a coupon(s) in accordance with whether or not the goal value is attained. It is thus possible to motivate the measurement subject to attain the goal value so that they can obtain a higher incentive,

[0044] Now being motivated to attain the goal value, the measurement subject comes to continuously measure their biological information so as to check whether or not the goal value is attained. It is thus possible to accustom the measurement subject to measuring biological information.

[0045] The health management apparatus **300** can acquire the increased number of biological information items through accustoming the measurement subject to measuring their biological information. It is thus possible for the health management apparatus **300** to provide more biological information items to the provider's server **400**. A service provider can provide services of higher quality through the use of the increased number of biological information items for their services. It is thus possible for the measurement subject to receive services of higher quality from a service provider.

2. Embodiment

[0046] An Embodiment of the health management apparatus according to the foregoing applied example will be described below. In the following, a health management system including an apparatus, as an example of a biological information measurement apparatus, capable of measuring a body weight and body composition will be described.

2.1 Examples of Hardware Configuration

[0047] An example of a hardware configuration of each apparatus in the health management system according to the embodiment will be described.

2.1.1 Example of Hardware Configuration of Biological Information Measurement Apparatus

[0048] First, a hardware configuration example of the biological information measurement apparatus **100**A according to the embodiment will be described. FIG. **2** is a block diagram showing a hardware configuration of a biological information measurement apparatus **100**A according to the embodiment. As shown in FIG. **2**, the biological information measurement apparatus **100**A according to the embodiment includes a control unit **110**, a storage unit **120**, a communication unit **130**, an operation unit **140**, a display unit **150**, a body weight sensor **161**, and a body impedance sensor **162**.

[0049] The control unit **110** includes a central processing unit (CPU), a random access memory (RAM), and a read only memory (ROM), etc., and controls each constituent element in accordance with information processing. The control unit **110** includes a clock (not shown), and has a clock function to display current date and time.

[0050] The control unit **110** generates body weight information and body composition information based on a measurement result obtained by the body weight sensor **161** and the body impedance sensor **162**, and basic information

relating to the measurement subject input through an operation of the operation unit **140** by the measurement subject themselves.

[0051] The basic information relating to the measurement subject includes, for example, age, sex, and a height, etc. of the measurement subject. The body weight information includes a body weight and a EMI of the measurement subject, for example. The body composition information includes a body fat rate, muscle mass, bone mass, and a basal metabolic rate of the measurement subject. In the following descriptions, the body weight information and the body composition information will be referred to as "body weight and composition information". Since the body weight and composition information is one piece of biological information, the body weight and composition information may be simply referred to as "biological information" in the following description. The biological information is associated with the date and time of measurement indicated by the clock. The biological information may be further associated with basic information of the measurement subject, a device ID for uniquely identifying the biological information measurement apparatus **100**A, and so on.

[0052] The storage unit **120** is an auxiliary storage apparatus, such as a hard disk drive (HDD) or a solid state drive (SSD). The storage unit **120** temporarily stores the biological information items until those information is transmitted to the measurement subject's device **200**.

[0053] The communication unit **130** is a communication interface that administers communications with the measurement subject's device **200**. The communication unit **130** transmits the biological information to the measurement subject's device **200**, for example. In the embodiment, a short-distance communication, such as Bluetooth (registered trademark), is applicable to a communication between the communication unit **130** and the measurement subject's device **200**, but not limited thereto. A communication via a network NW, such as a local area network (LAN), or a wired communication using a communication cable may be adopted for the communication by the communication unit **130**.

[0054] The operation unit **140** includes a user interface, such as a touch panel and operation buttons, etc., for example. The operation unit **140** detects an operation by the measurement subject via the user interface, and outputs to the control unit **110** a signal indicating a type of the operation.

[0055] The display unit **150** includes, for example, a display screen (e.g., a liquid crystal display (LCD) or an electroluminescence (EL) display) and an indicator, etc. The display unit **150** displays information in accordance with a signal from the control unit **110**, and notifies the information to the measurement subject.

[0056] The body weight sensor **161** is, for example, a distortion gauge, and measures a body weight of the measurement subject.

[0057] The body impedance sensor **162** measures a body impedance of the measurement subject, for example. The body impedance sensor **162** includes, for measuring body impedance, an electrode for applying a constant current to the body of the measurement subject and an electrode for measuring a voltage derived from the body when the current is applied.

2.1.2 Example of Hardware Configuration of Mobile Device

[0058] Next, the hardware configuration example of the measurement subject's device **200** will be described. FIG. **3** is a block diagram showing an example of a hardware configuration of the measurement subject's device **200** according to the embodiment. As shown in FIG. **3**, the measurement subject's device **200** includes a control unit **210**, a storage unit **220**, a communication unit **230**, an operation unit **240**, and a display unit **250**.

[0059] The control unit **210** and the storage unit **220** are respectively the same as the control unit **110** and the storage unit **120** of the biological information measurement: apparatus **100**A. However, the control unit **210** of the measurement subject's device **200** generates goal setting information based on information input upon an operation of the operation unit **240** by the measurement subject. In addition, the storage unit **220** of the measurement subject's device **200** temporarily stores the goal setting information and the biological information received from the biological information measurement apparatus **100**A, until these information items are transmitted to the health management apparatus **300**.

[0060] The goal setting information is information set by the measurement subject for improving their health situation, and includes, for example, a goal value relating to biological information. The goal setting information may further include information indicating a time limit for attaining the goal value. Specifically, for example, the goal setting information includes information indicating "biological information (e.g., a body weight) attains a goal value (e.g., 60 kg) within a predetermined period of time (e.g., 30 days of the present time)". The goal setting information is not limited to the above example, and a goal may be set in various ways. For example, biological information set in the goal setting information is not limited to a body weight, and any biological information can be set. For example, a goal value set in the goal setting information is not necessarily a specific numerical value, and a notion such as "bring the value to the standard value", for example, may be set.

[0061] The communication unit **230** is a communication interface that administers communications between the biological information measurement apparatus **100**A, the health management apparatus **300**, and the provider's server **400**. For example, the communication unit **230** receives biological information from the biological information measurement apparatus **100**A. The communication unit **230** transmits biological information and the goal setting information to the health management apparatus **300**, and receives reward points or coupon(s). The communication unit **230** may be provided with services from the provider's server **400**. In the embodiment, for example a communication via a network NW is applicable to a communication between the health management apparatus **300** and the provider's server **400** administered by the communication unit **230**; however, the communication is not limited thereto, and a short-distance wireless communication or a wired communication is also applicable.

[0062] The operation unit **240** and the display unit **250** are respectively the same as the operation unit **140** and the display unit **150** of the biological information measurement apparatus **100**A.

2.1.3 Example of Hardware Configuration of Health Management Apparatus

[0063] Next, the hardware configuration example of the health management apparatus **300** will be described. FIG. **4** is a block diagram showing an example of a hardware configuration of the health management apparatus **300** according to the embodiment. As shown in FIG. **4**, the health management apparatus **300** includes a control unit **310**, a storage unit **320**, a communication unit **330**, and a drive **340**.

[0064] The control unit **310** and the storage unit **320** are respectively the same as the control unit **110** and the storage unit **120** of the biological information measurement apparatus **100**A. The storage unit **320** of the health management apparatus **300** stores goal management information **322**, etc. used in a health management program **321** executed in the control unit **310**.

[0065] The communication unit **330** is a communication interface that administers communications between the measurement subject's device **200** and the provider's server **400**. For example, the communication unit **330** receives the biological information and the goal setting information from the measurement subject's device **200**. The communication unit **330** transmits, for example, a set of biological information items measured from the same measurement subject to the provider's server **400**.

[0066] The communication unit **330** may receive a desired type of reward from the provider's server **400** in exchange for provision of the set of biological information items. Rewards may consist of a monetary reward, points, or a coupon(s), for example. The communication unit **330** may receive information regarding a health situation of the measurement subject from the provider's server **400**, and may transmit a desired type of reward in exchange for the information. The information relating to a health situation of the measurement subject that may be received from the provider's server **400** includes, for example, a diagnosis result of a health checkup or a thorough medical checkup of the measurement subject, etc.

[0067] The drive **340** is a drive, such as a compact disk (CD) drive or a digital versatile disk (DVD) drive, etc., and is a device for reading programs stored in the storage medium **341**. A type of the drive **340** may be selected as appropriate in accordance with a type of the storage medium **341**. The health management program **321** and the goal management information **322** may be stored in the storage medium **341**.

[0068] The storage medium **341** is a medium storing information of programs recorded thereon in an electronic, magnetic, optical, mechanical, or chemical manner so that the information of programs is readable for a computer, device or machine. The health management apparatus **300** may obtain the health management program **321** and the goal management information **322** from the storage medium **341**.

[0069] The health management program **321** is a program for managing a health situation of the measurement subject through determination of whether or not biological information attains a goal value within a period of time, and causing the health management apparatus **300** to perform the health management process (FIG. **8**) in which reward points or a coupon(s) are issued in accordance with a result of the determination.

[0070] The goal management information **322** is information indicating a relationship between biological information obtained by the measurement subject and a set goal value. In the goal management information **322**, a goal value, biological information acquired until a current point of time since the goal value is set, and a time limit for attaining the goal value are set based on the goal setting information obtained from the measurement subject's device **200**. In the case where a notion of "bring the value to the standard value" is set as a goal value in the goal setting information, the control unit **310** sets a goal value which is preset as a standard value in the goal management information **322** based on the basic information relating to the measurement subject. The goal management information **322** is updated every time biological information is acquired between the point at which the goal value is set and the point at which a predetermined period of time for attaining the set goal value elapses.

[0071] FIG. **5** is a diagram showing an example of the goal management information **322** according to the embodiment. The example of FIG. **5** shows a case where a body weight is acquired as biological information. In the example of FIG. **5**, 30 days is set as a time limit for attaining the goal value, and the goal management information **322** at the time when the period of 30 days elapses is visually shown. Specifically, in FIG. **5**, a number of days elapsed since the goal value is set is indicated on the horizontal axis, and a body weight as biological information is indicated on the vertical axis. In FIG. **5**, the actually-acquired body weights are indicated as a black plot, and the body weight set as the goal value is indicated as a white plot. In FIG. **5**, of the actually-acquired body weights, body weights acquired during a morning (for example, from the sunrise to noon) are indicated as a plot of round dots, and body weights acquired during a night (for example, from the sunset to midnight) are indicated as a plot of square dots.

[0072] As shown in FIG. **5**, the goal management information **322** includes a point P**1** indicating an initial value Ms at the time of setting the goal value, a point P**2** indicating a goal value Mt determined based on the goal setting information, and a point P**3** indicating a final value Mf at the time when the predetermined period of time elapses. The goal management information **322** further includes multiple points indicating body weights acquired within a period between the point P**1** and the point P**3**. According to FIG. **5**, through referring to the goal management information **322**, the control unit **310** can determine that biological information is acquired twice, namely during a morning and at night, over the entire period of time of 30 days except for periods T**1**, T**2**, and T**3**. The control unit **310** can determine that the body weight of the measurement subject at the initial value Ms gradually becomes closer to the goal value Mt, and attains the goal value Mt on day 28.

2.1.4 Example of Hardware Configuration of Provider's Server

[0073] Next, the hardware configuration example of the provider's server **400** will be described. FIG. **6** is a block diagram showing an example of a hardware configuration of the provider's server **400** according to the embodiment. As shown in FIG. **6**, the provider's server **400** includes a control unit **410**, a storage unit **420**, a communication unit **430**, and a drive **440**. The drive **440** is an apparatus for reading programs stored in the storage medium **441**.

[0074] The control unit **410** and the storage unit **420** are respectively the same as the control unit **310** and the storage

unit **320** of the health management apparatus **300**. The storage unit **420** of the provider's server **400** stores services, etc. (not shown).

[0075] The communication unit **430** is a communication interface that administers communications between the measurement subject's device **200** and the health management apparatus **300**. For example, the communication unit **430** receives a set of biological information items from the health management apparatus **300**. The communication unit **430** provides a service generated using the set of biological information to the measurement subject's device **200**.

[0076] The drive **440** and the storage medium **441** are respectively the same as the drive **340** and the storage medium **341** of the health management apparatus **300**.

2.2 Example of Function Configuration

[0077] Next, an example of a function configuration of the health management system according to the embodiment will be described.

2.2.1 Example of Function Configuration of Health Management Apparatus

[0078] FIG. **7** is a block diagram schematically showing an example of a function configuration of the health management apparatus **300** of the health management system according to the embodiment.

[0079] The control unit **310** of the health management apparatus **300** loads the health management program **321** stored in the storage unit **320** in the RAM. Then, the control unit **310** interprets and executes, courtesy of the CPU, the health management program **321** loaded in the RAM to control each constituent element. Thus, as shown in FIG. **7**, the health management apparatus **300** according to the embodiment functions as a computer that includes the acquisition unit **350**, the determination unit **360**, the calculation unit **370**, and the issuance unit **380**.

[0080] The acquisition unit **350** acquires the biological information measured by the biological information measurement apparatus **100**A and the goal setting information set by the measurement subject's device **200**, and transfers the information to the storage unit **320**. The transferred biological information and goal setting information are integrated and stored as goal management information **322**, for example.

[0081] The determination unit **360** reads the goal management information **322**, and determines whether or not the acquired biological information attains a goal value within a predetermined period of time. The determination unit **360** generates a determination result, and transmits it to the calculation unit **370**. When making the determination regarding the attainment, the determination unit **360** may compare only the biological information acquired at the last of the predetermined period of time with the goal value; however, the determination can be made in a different manner. For example, the determination unit **360** may compare an average of a predetermined number of biological information items acquired within the predetermined period of time (for example, items acquired in the last of the predetermined period of time) with the goal value.

[0082] Upon receipt of the determination result from the determination unit **360**, the calculation unit **370** calculates an incentive value in accordance with the determination result. The calculation unit **370** transmits the calculated incentive value to the issuance unit **380**.

[0083] Upon receipt of the incentive value from the calculation unit **370**, the issuance unit **380** converts the incentive value into reward points or a coupon(s) correspondingly. The issuance unit **380** issues the reward points or coupon(s) obtained through the conversion of the incentive value to the measurement subject. The reward points or a coupon(s) are transmitted to, for example, the measurement subject's device **200**.

2.3 Example of Operation

[0084] Next, an example of an operation of the health management system according to the embodiment will be described. The process procedure described hereinafter is merely an example, and the process can be changed as far as possible. Omission, replacement, or addition of a step in the process procedure described hereinafter can be made as appropriate, in accordance with an actual situation where the embodiment is realized.

2.3.1 Example of Operation of Health Management Apparatus

[0085] FIG. **8** is a flow chart schematically showing an example of a health management process in the health management apparatus **300** according to the embodiment.

[0086] (Step ST**10**)

[0087] In step ST**10**, the control unit **310** causes the communication unit **330** to function as the acquisition unit **350**, and the communication unit **330** acquires the goal setting information from the measurement subject's device **200**. The control unit **310** sets an initial value of the biological information of the acquired goal setting information, a goal value, and a time limit for attaining the goal value in the goal management information **322**, and causes the storage unit **320** to store the values and the time limit. The goal value set by the measurement subject is thereby managed by the health management apparatus **300**.

[0088] (Step ST**20**)

[0089] In step ST**20**, the control unit **310** causes the communication unit **330** to function as the acquisition unit **350**, and the communication unit **330** acquires biological information measured within the predetermined period of time via the measurement subject's device **200**, and causes the storage unit **320** to store the acquired biological information. The control unit **310** updates the goal management information **322** every time biological information is acquired.

[0090] (Step ST**30**)

[0091] In step ST**30**, the control unit **310** determines whether or not the predetermined period of time elapses based on the time limit set in the goal management information **322**. If it is determined that the predetermined period of time has not yet elapsed (No in step ST**30**), the process proceeds to step ST**20** and the control unit **310** acquires most recent biological information. If it is determined that the predetermined period of time has elapsed (Yes in step ST**30**), the control unit **310** finishes acquiring biological information, and the process proceeds to step ST**40**.

[0092] (Step ST**40**)

[0093] In step ST**40**, the control unit **310** functions as the determination unit **360**, and determines whether or not the biological information attains the goal value within the

predetermined period of time by referring to the goal management information **322**. If it is determined that the biological information does not attain the goal value (No in step ST**40**), the control unit **310** does not calculate an incentive value for the measurement subject in exchange for attaining the goal value, and the process proceeds to step ST**60**. If it is determined that the biological information attains the goal value (Yes in step ST**40**), the process proceeds to step ST**50** so that the control unit **310** calculates an incentive value.

[0094] (Step ST**50**)

[0095] In step ST**50**, the control unit **310** functions as the calculation unit **370** in accordance with the determination result in step ST**40**, and calculates an incentive value for the measurement subject in exchange for attaining the goal value.

[0096] (Step ST**60**)

[0097] In step ST**60**, the control unit **310** functions as the issuance unit **380**, and, after converting the incentive value calculated in step ST**50** into reward points or a coupon(s), issues the reward points or coupon(s) to the measurement subject's device **200**. If an incentive step is not calculated in step ST**50** because the goal value has not yet been attained, the control unit **310** need not issue reward points or a coupon(s).

[0098] The operation of the health management apparatus **300** is thus finished.

2.4 Advantageous Effects

[0099] According to the embodiment, technologies to build a routine of biological information measurement and promote improvement in a health situation are provided. This advantageous effect will be described below.

[0100] In the embodiment, in step ST**40**, after the predetermined period of time has elapsed since the goal value was set, it is determined whether or not the biological information acquired from the measurement subject attains the goal value. If the goal value is attained within the predetermined period of time, an incentive value is calculated in step ST**50** in accordance with the attained goal value, and reward points or a coupon(s) are issued to the measurement subject in step ST**60** in accordance with the calculated incentive value. Thus, the measurement subject can receive more points or coupons if the goal value is attained. As a consequence, the measurement subject comes to make efforts to attain the goal value, and continue measuring their biological information. Thus, the measurement subject is accustomed to conducting health management on their own. It is thus possible to accustom the measurement subject to measuring their biological information as well as improve their health situation.

[0101] The biological information is important information for quantifying risks of brain and cardiovascular diseases of the measurement subject, for example. For this reason, the biological information acquired by the health management apparatus **300** may have economic values for service providers specialized in services relating to such risks, for example health insurance. In the embodiment, the health management apparatus **300** can acquire the increased number of biological information items through accustoming the measurement subject to measuring their biological information. For this reason, the health management apparatus **300** can provide the increased number of biological information items to the provider's server **400**. It is thereby possible for the service provider who manages the provider's server **400** to provide services of a higher quality to the measurement subject through using the biological information items provided from the health management apparatus **300**.

3. Modifications

[0102] Although the embodiment of the present invention has been described in detail in the foregoing, the description is merely an example of the present invention in every respect. Various improvements and modifications can of course be made to the embodiment to the extent that no deviation is made from the scope of the present invention. The following modifications can be made for example. In the following, the same reference numerals are used for the same constituent elements of the foregoing embodiment, and redundant descriptions are omitted as appropriate. The following modifications can be combined as appropriate.

3.1 First Modification

[0103] In the foregoing embodiment, a case where the calculation unit **370** calculates an incentive value based on whether or not the goal value is attained within a predetermined period of time is described; however, he embodiment is not limited thereto.

[0104] Specifically, the calculation unit **370**, for example, may calculate an incentive value further based on the number of biological information items acquired within a predetermined period of time. Specifically, the calculation unit **370**, for example, may calculate an incentive value in proportion to the number of the biological information items, and may further add the incentive value in a gradual manner if the number of biological information items reaches a predetermined threshold value.

[0105] The number of biological information items that contributes to the calculation of an incentive value may be the number of biological information items determined to be valid among all the biological information items acquired within a predetermined period of time. In this case, the determination unit **360** further determines whether or not the acquired biological information items are valid. After determining whether or not the biological information items are valid, the determination unit **360** calculates the number of the valid biological information items, and transmits this number to the calculation unit **370**.

[0106] Specifically, the determination unit **360** determines the validity of the most recent biological information item by comparing the time and date of measuring the most-recent item with the time and date of measuring the immediately-preceding valid biological information. More specifically, the determination unit **360** determines that the most-recent biological information is valid if the date and time of the item is apart from the date and time of the immediately-preceding valid biological information by a certain period of time (e.g., a half day), and determines that the most-recent biological information is not valid if those dates and times are not apart by the certain period of time. The determination unit **360** determines, for example, whether or not the date and time of the most-recent biological information is measured within the predetermined period of time, thereby determining validity of the most-recent biological information.

[0107] The determination unit **360** may add determination items as appropriate, in addition to the above-described

example. For example, the determination unit **360** may determine validity based on whether or not the most-recent biological information is associated with a device ID of the biological information measurement apparatus **100**A used by the measurement subject.

[0108] FIG. **9** is a flow chart schematically showing an example of an operation of the health management apparatus **300** according to the first modification of the embodiment. In FIG. **9**, in addition to the operation described with reference to FIG. **8**, steps ST**21**, ST**22**, and ST**31** are added for calculating an incentive value further based on the number of valid biological information items.

[0109] Since the operations in step ST**10** and step ST**20** are the same as those shown in FIG. **8**, descriptions are omitted.

[0110] (Step **5**T**21**)

[0111] In step ST**21**, the control unit **310** functions as the determination unit **360**, and determines whether or not a most-recently acquired biological information item is valid. If it is determined that the biological information item is not valid (No in step ST**21**), the process proceeds to step ST**30**. If it is determined that the biological information item is valid (Yes in step ST**21**), the process proceeds to step ST**22**.

[0112] (Step ST**22**)

[0113] In step ST**22**, the control unit **310** continuously functions as the determination unit **360**, and, after incrementing the number of valid biological information items, causes the storage unit **320** to store the incremented number of valid biological information items.

[0114] Since the operation in step ST**30** is the same as that shown in FIG. **8**, descriptions of the step are omitted.

[0115] (Step ST**31**)

[0116] In step ST**31**, the control unit **310** functions as the calculation unit **370**, and calculates an incentive value in accordance with the number of valid biological information items.

[0117] Since the operations in step ST**40** and step ST**50** are the same as those shown in FIG. **8**, descriptions of those steps are omitted.

[0118] (Step ST**60**)

[0119] In step ST**60**, the control unit **310** functions as the issuance unit **380**, and, after converting a sum of the incentive value calculated in steps ST**31** and ST**50** into reward points or a coupon(s), issues the reward points or coupon(s) to the measurement subject's device **200**.

[0120] The operation of the health management apparatus **300** is thus finished.

[0121] It is thus possible for the health management apparatus **300** to give the measurement subject incentives in accordance with not only whether or not the goal value is attained but also the number of biological information items acquired during the process of attaining the goal value. For this reason, the measurement subject can be motivated to continuously provide biological information during the process of attaining the goal value.

[0122] Through the continuous provision of biological information during the process of attaining the goal value from the measurement subject, the health management apparatus **300** can acquire a set of biological information items during the process of attaining the goal value. It is thus possible for the health management apparatus **300** to provide a set of biological information items to the provider's server **400**. The set of biological information items may have a value higher than biological information merely indicating whether or not the goal value is attained. For example, when the goal value cannot be attained, a service provider can know changes that have occurred in the biological information of the measurement subject based on the set of biological information items. For this reason, the service provider can enhance service quality based on the set of biological information items.

3.2 Second Modification

[0123] In the foregoing embodiment, a case where a final goal value within a predetermined period of time is set in the goal management information **322** is described; however, the present embodiment is not limited thereto. An intermediate goal value at any discretional point of time within a predetermined period of time may be set.

[0124] FIG. **10** is a diagram showing goal management information according to a second modification of the embodiment. FIG. **10** shows a part of the goal management information shown in FIG. **5**, and shows biological information items acquired on day (i-1) and day i since the goal value is set and, an intermediate goal value set on day i (i is any natural number). Specifically, FIG. **10** shows points P**4** and P**5** respectively indicating body weights acquired during a morning and a night of a particular day (i-1), and points P**6** and P**7** respectively indicating body weights acquired during a morning and a night of a particular day i. FIG. **10** shows a point P**8** indicating an intermediate goal value Mt_i of the body weight for the night of day i.

[0125] Generally, a body weight at night tends to be heavier than a body weight during a morning of the same day because of the weight of food consumed during the day. Furthermore, a body weight during a morning of the following day tends to be lighter than a body weight of a night before because of basal metabolic activities which take place during the night, Accordingly, to achieve weight reduction, it is desirable to restrict the an amount of increase (Mf_i−Ms_i) obtained by subtracting the body weight Mf_i during a night of day i from the body weight Ms_i during the morning of the day i to be lower than, for example, an amount of reduction (Mf_(i-1)−Ms_i) obtained by subtracting the body weight Ms_i during the morning of day i from the body weight Mf_(i-1) during the night of day (i-1). For this reason, the intermediate goal value Mt_i of day i is, for example, determined based on point P**5** indicating the value Mf (i-1) and point P**6** indicating Ms_i, and is compared with point P**7** indicating the value Mf_i.

[0126] The determination unit **360** reads the goal management information **322**, and determines whether or not the acquired biological information attains the intermediate goal value set correspondingly to a point of time in a predetermined period of time. The determination unit **360** generates a determination result, and transmits it to the calculation unit **370**. In the example of FIG. **10**, since the value Mf_i is smaller than the value Mt_i, it is determined that the intermediate goal value set on day i is attained.

[0127] Upon receipt of the determination result regarding the intermediate goal value from the determination unit **360**, the calculation unit **370** calculates an incentive value in accordance with the determination result. The calculation unit **370** sums the incentive value calculated for the intermediate goal value, and the incentive value regarding the final goal value, and transmits the sum to the issuance unit **380**.

[0128] FIG. **11** is a flow chart schematically showing an example of an operation of the health management apparatus **300** according to the second modification of the embodiment. In FIG. **11**, in addition to the operation described with reference to FIG. **8**, steps ST**23** and ST**24** for calculating an incentive value further based on whether or not the intermediate goal value is attained are added.

[0129] Since the operations in step ST**10** and step ST**20** are the same as those shown in FIG. **8**, descriptions of those steps are omitted.

[0130] (Step ST**23**)

[0131] In step ST**23**, the control unit **310** determines whether or not the biological information attains the intermediate goal value by referring to the goal management information. **322**. If it is determined that the biological information does not attain the intermediate goal value (No in step ST**23**), the control unit **310** does not calculate an incentive value in exchange for attaining the intermediate goal value for the measurement subject, and the process proceeds to step ST**30**. If it is determined that the biological information attains the intermediate goal value (Yes in step ST**23**), the process proceeds to step ST**24** so that the control unit **310** calculates an incentive value.

[0132] (Step ST**24**)

[0133] In step ST**24**, the control unit **310** functions as the calculation unit **370** in accordance with a determination result in step ST**23**, and calculates an incentive value in exchange for attaining the intermediate goal value for the measurement subject.

[0134] Since the operations in steps ST**30**, ST**40**, and ST**50** are the same as those shown in FIG. **8**, descriptions of those steps are omitted.

[0135] (Step ST**60**)

[0136] In step ST**60**, the control unit **310** functions as the issuance unit **380**, and, after converting a sum of the incentive value calculated in steps ST**24** and ST**50** into reward points or a coupon(s), issues the reward points or coupon(s) to the measurement subject's device **200**.

[0137] The operation of the health management apparatus **300** is thus finished.

[0138] It is thus possible for the health management apparatus **300** to set an intermediate goal value during the process of attaining the final goal value, and to calculate an incentive value in accordance with the attained intermediate goal value. For this reason, the measurement subject can be motivated not only to attain the final goal value but also to pay attention to the improvement of their biological information during the process. Accordingly, it is possible to further advance the health management capabilities of the measurement subject.

3.3 Third Modification

[0139] In the foregoing embodiment, an apparatus capable of measuring body composition information is adopted as the biological information measurement apparatus **100**; however, the embodiment is not limited thereto. For example, an apparatus capable of measuring a blood pressure value, etc. can be adopted as the biological information measurement apparatus **100**. If an apparatus capable of measuring a blood pressure value is adopted as the biological information measurement apparatus **100**, the health management apparatus **300** may further acquire health information indicating a health situation of the measurement subject. The health management apparatus **300** may determine that biological information having a higher value is acquired if the acquired blood pressure value satisfies a predetermined condition based on the health information, and consequently calculate more incentive values.

[0140] FIG. **12** is a block diagram showing a hardware configuration of a biological information measurement apparatus according to the third modification of the embodiment. The biological information measurement apparatus **100**B shown in FIG. **12** is an apparatus capable of measuring a blood pressure value, etc. as biological information, for example a wearable device that can be attached/detached by the measurement subject. The biological information measurement apparatus **100**B includes a control unit **110**, a storage unit **120**, a communication unit **130**, an operation unit. **140**, a display unit **150**, a blood pressure sensor **163**, an acceleration sensor **164**, and a temperature and humidity sensor **165**.

[0141] The control unit **110**, the storage unit **120**, the communication unit **130**, the operation unit **140**, and the display unit **150** are respectively the same as those of the biological information measurement apparatus **100**A. The control unit **110** of the biological information measurement apparatus **100**B, however, generates blood pressure information, activity information, and environment information based on measurement results obtained by the blood pressure sensor **163**, the acceleration sensor **164**, and the temperature and humidity sensor **165**. The blood pressure information includes a blood pressure value of the measurement subject based on the measurement by the blood pressure sensor **163**. The activity information includes a physical activity amount, the number of steps, and a sleeping condition of the measurement subject, based on the measurement by the acceleration sensor **164**. The environment information includes temperature and humidity of the environment of the measurement subject based on the measurement by the temperature and humidity sensor **165**. Each of the blood pressure information, the activity information, and the environment information is associated with the time and date of the measurement indicated by a clock. Each of the blood pressure information, the activity information, and the environment information may be further associated with a device ID for uniquely identifying the biological information measurement apparatus **100**B.

[0142] The control unit **110** generates blood pressure information, etc. based on basic information of the measurement subject that is input through the operation of the operation unit **140** by the measurement subject. The basic information of the measurement subject may further include, for example, health information indicating a health situation of the measurement subject. The health situation of the measurement subject include, for example, a symptom relating to hypertension of the measurement subject. For example, the health information includes information indicating whether or not the measurement subject has sleep apnea syndrome (SAS), whether or not the measurement subject has morning hypertension, and whether or not the measurement subject has workplace hypertension, and the like.

[0143] The blood pressure sensor **163** measures a blood pressure value of the measurement subject. The blood pressure value includes typical indices of a highest blood pressure and a lowest blood pressure, for example. The blood pressure sensor **163** may be, for example, a continuous-measurement type capable of measuring blood pressure of

the measurement subject per heartbeat (namely, in a continuous manner), or a non-continuous-measurement type capable of measuring blood pressure for a predetermined timing on the spot (namely, in a non-continuous manner). For the blood pressure sensor **163** of the continuous-measurement type, a method of continuously measuring blood pressure of the measurement subject based on a pulse transmit time (PTT) or a method of continuously measuring blood pressure based on a pressure pulse wave (the tonometry method) are applicable. The procedure of continuously measuring blood pressure is not limited to the above procedure; a procedure of detecting pulse wave using a light-emitting device can be adopted as appropriate. As the blood pressure sensor **163** of the non-continuous measuring type, for example, a procedure of detecting a pulse wave through pressing blood vessels using a cuff as a pressure sensor (the oscillometric method) can be adopted.

[0144] The acceleration sensor **164** detects an acceleration rate of the measurement subject which is caused at a place where the biological information measurement apparatus **100**B is attached as a set of triaxial components. The acceleration sensor **164** may further include a gyro sensor, and may further detect angular velocity as a set of triaxial components in addition to the acceleration rate.

[0145] The temperature and humidity sensor **165** measures temperature and humidity of the environment of the measurement subject.

[0146] FIG. **13** is a block diagram showing a function configuration of a health management apparatus according to the third modification of the embodiment.

[0147] As shown in FIG. **13**, the acquisition unit **350** acquires biological information, health information, and goal setting information via the measurement subject's device **200**, and transfers the information to the storage unit **320**. The biological information, health information, and goal setting information are integrated and stored as goal management information **322**, for example.

[0148] The determination unit **360** determines whether or not the biological information satisfies a predetermined condition based on the health information. The determination unit **360** generates a determination result, and transmits it to the calculation unit **370**.

[0149] Generally, a measurement subject who has a symptom of hypertension wants to know their blood pressure value when the value is high. For this reason, the blood pressure value acquired at a time of day when the blood pressure value is high is more valuable. On the other hand, a time of day at which a blood pressure value becomes high may vary depending on a health situation of a measurement subject. For this reason, whether or not the acquired blood pressure value is more valuable may be individually determined in accordance with a health situation of the measurement subject.

[0150] FIG. **14** is a table showing a relationship between a health situation of the measurement subject and a time of day at which blood pressure tends to be high according to the third modification of the present embodiment.

[0151] As shown in FIG. **14**, if the measurement subject has sleep apnea syndrome for example, the blood pressure value is likely to be high during sleep, particularly when a surge occurs. If the measurement subject has morning hypertension, their blood pressure value is likely to become high during a morning. If the measurement subject has workplace hypertension, their blood pressure value is likely to become high during work time.

[0152] For this reason, the determination unit **360** determines whether or not the time at which the blood pressure value is acquired is a time of day at which blood pressure becomes high, in accordance with a health situation of the measurement subject. If the blood pressure value is acquired during the time of day at which blood pressure tends to high, it is determined that the value satisfies the predetermined condition; if the value is not acquired during the time of day at which blood pressure tends to be high, it is determined that the value does not satisfy the predetermined condition.

[0153] FIG. **15** is a flow chart schematically showing an example of a procedure of the health management process in the health management apparatus according to the third modification of the embodiment.

[0154] In FIG. **15**, in addition to the operation described with reference to FIG. **8**, steps ST**25**, ST**26**, and ST**32** are added for calculating an incentive value further based on whether or not biological information satisfies a predetermined condition based on health information.

[0155] Since the operations in step ST**10** and step ST**20** are the same as those shown in FIG. **8**, descriptions of those steps are omitted.

[0156] (Step ST**25**)

[0157] In step ST**25**, the control unit **310** determines whether or not the biological information satisfies a predetermined condition based on the health information. If it is determined that the biological information does not satisfy the predetermined condition (No in step ST**25**), the process proceeds to step ST**30**. If it is determined that the biological information satisfies the predetermined condition (Yes in step ST**25**), the process proceeds to step ST**26**.

[0158] (Step ST**26**)

[0159] In step ST**26**, the control unit **310** continuously functions as the determination unit **360**, and, after incrementing the number of biological information items that satisfy the predetermined condition, causes the storage unit **320** to store the incremented number of valid biological information items.

[0160] Since the operation in step ST**30** is the same as that shown in FIG. **8**, descriptions of the step are omitted.

[0161] (Step ST**32**)

[0162] In step ST**32**, the control unit **310** functions as the calculation unit **370**, and calculates an incentive value in accordance with the number of biological information items that satisfy the predetermined condition.

[0163] Since the operations in step ST**40** and step ST**50** are the same as those shown in FIG. **8**, descriptions of those steps are omitted.

[0164] (Step ST**60**)

[0165] In step ST**60**, the control unit **310** functions as the issuance unit **380**, and, after converting a sum of the incentive value calculated in steps ST**32** and ST**50** into reward points or a coupon(s), issues the reward points or coupon(s) to the measurement subject's device **200**.

[0166] The operation of the health management apparatus **300** is thus finished.

[0167] Thus, the health management apparatus **300** can give an incentive to the measurement subject in accordance with the number of biological information items acquired during a particularly important time of day, among all the biological information items acquired from the measure-

ment subject who finds himself or herself in a particular health situation. For this reason, the measurement subject can be motivated to provide biological information measured during a particularly important time of day in accordance with their health situation. Specifically, if the measurement subject has symptoms of hypertension, the health management apparatus **300** can motivate the measurement subject to measure a blood pressure value during a time of day at which the value becomes particularly high.

3.4 Fourth Modification

[0168] In the third modification of the foregoing embodiment, a blood pressure value is set as a goal value; however, another index that can be calculated from a blood pressure value can be set as a goal value. For example, if the measurement subject has sleep apnea syndrome, an upper limit of the number of times when a surge occurs during sleep may be set as a goal value.

[0169] In this case, it is preferable to continuously measure a blood pressure value during sleep with the biological information measurement apparatus **100**B so as to determine whether or not a surge occurs. Accordingly, the continuous-measurement type is more preferable than the non-continuous measurement type for the biological information measurement apparatus **100**B.

[0170] FIG. **16** is a diagram showing biological information according to a fourth modification of the embodiment. FIG. **16** shows a state of a blood pressure value continuously measured during sleep. Specifically, FIG. **16** shows points SBP and DBP as the highest blood pressure and lowest blood pressure per heartbeat. FIG. **16** shows a situation where a surge occurs in the period T**4**.

[0171] As shown in FIG. **16**, in a normal state, the highest and lowest blood pressure values are stable for every heartbeat during sleep. However, once a surge occurs, both the highest and lowest blood pressures rise rapidly.

[0172] The acquisition unit **350** acquires biological information continuously measured over a night, as shown in FIG. **16**, for a few days.

[0173] The determination unit **360** determines whether or not a surge occurs based on the acquired biological information. If it is determined that a surge occurs, the determination unit **360** increments the number of instances of surge occurrence, and then causes the storage unit **320** to store the incremented number of times of surge occurrence. The determination unit **360** may further determine whether or not the number of times of surge occurrence within the predetermined period of time is less than the upper limit set as the goal value.

[0174] If it is determined that the number of times of surge occurrence attains the goal value, the calculation unit **370** may calculate an incentive value in accordance with the determination result.

[0175] With the apparatus configured as described above, even if an evaluation item other than the acquired biological information is set as a goal value, an incentive value can be calculated as appropriate.

3.5 Others

[0176] In the foregoing embodiment, each of the functions of the health management apparatus **300** is included in one server apparatus; however, the embodiment is not limited to this example, and the functions may be separately included in multiple server apparatuses. For example, among the functions in the health management apparatus **300**, the issuance unit **380** may be included in a server apparatus (for example, the provider's server **400**) differing from the server apparatus that includes the acquisition unit **350**, the determination unit **360**, and the calculation unit **370**.

[0177] In the foregoing embodiment, the health management apparatus **300** acquires biological information of the measurement subject via the biological information measurement apparatus **100**; however, the embodiment is not limited to this example. For example, the health management apparatus **300** may acquire biological information of the measurement subject acquired by a service provider on their own from the provider's server **400**. Even in this case, the operation of the health management apparatus **300** is no different to the acquisition of biological information from the measurement subject, although the acquisition is achieved through the business-to-business ("B2B") exchange of biological information via the provider's server **400**. For this reason, if the acquired biological information attains the goal value, the health management apparatus **300** may calculate an incentive value in accordance with the attainment of the goal value, and issue reward points or a coupon(s) to the measurement subject in accordance with the incentive value.

[0178] Furthermore, an example in which a blood pressure value or a body weight is used as biological information is described in the foregoing embodiment; however, the embodiment is not limited to this example. Other than this example, the present invention is applicable to examples where the biological information is pulse, body temperature, blood sugar value, or cardiogram, and the like.

[0179] The present invention is not limited to the above-described embodiment, and can be modified in practice, without departing from the gist of the invention. The respective embodiments may be appropriately combined and practiced. In this case, a combined effect is obtained. The above-described embodiment incorporates various kinds of inventions, and various kinds of inventions can be extracted by combinations selected from the plurality of disclosed constituent elements. For example, even if some constituent elements are deleted from all the constituent elements disclosed in the embodiment, an arrangement from which some constituent elements are deleted can be extracted as an invention as long as the problem can be solved and the effect can be obtained.

What is claimed is:

1. A health management apparatus comprising

an acquisition unit configured to acquire biological information of a measurement subject;

a determination unit configured to determine whether or not the acquired biological information attains a goal value set with respect to the biological information within a predetermined period of time; and

a calculation unit configured to calculate an incentive value of the measurement subject based on a determination result obtained by the determination unit, and a number of the biological information items, wherein

the acquisition unit further acquires health information indicating a health situation of the measurement subject,

the determination unit

sets a condition which includes a time of day at which blood pressure tends to be high in the biological information in accordance with the acquired health information, and

further determines whether or not the acquired biological information satisfies the set condition which includes a time of day at which blood pressure tends to be high, and

the calculation unit calculates the incentive value of the measurement subject further based on a number of biological information items that have been determined to satisfy the condition by the determination unit.

2. The health management apparatus according to claim **1**, wherein

the determination unit further determines whether or not the acquired biological information is valid, and

the calculation unit calculates the incentive value of the measurement subject further based on a number of biological information items that have been determined to be valid by the determination unit.

3. The health management apparatus according to claim **1**, wherein

the goal value includes at least one intermediate goal value set correspondingly to a point of time in the predetermined period of time, and

the determination unit further determines whether or not the acquired biological information attains the intermediate goal value at the point of time.

4. The health management apparatus according to claim **1**, wherein

the biological information includes at least one of a blood pressure value and a body weight.

5. The health management apparatus according to claim **1**, further comprising

an issuance unit configured to issue at least one of reward points and a coupon to the measurement subject based on the calculated incentive value.

6. A health management method performed by an apparatus for managing a health situation of a measurement subject, the method comprising:

a step of acquiring biological information of the measurement subject;

a step of determining whether or not the acquired biological information attains the goal value set with respect to the biological information within a predetermined period of time; and

a step of calculating an incentive value of the measurement subject based on a result of the determination and a number of the acquired biological information items, wherein

in the step of acquiring, health information indicating a health situation of the measurement subject is further acquired,

in the step of determining,

a condition which includes a time of day at which blood pressure tends to be high is set in the biological information in accordance with the acquired health information,

whether or not the acquired biological information satisfies the set condition which includes a time of day at which blood pressure tends to be high is further determined, and

in the step of calculating, the incentive value of the measurement subject is calculated further based on a number of biological information items that have been determined to satisfy the condition.

7. A non-transitory computer readable medium storing a computer program which is executed by a computer to provide steps of:

acquiring biological information of the measurement subject;

determining whether or not the acquired biological information attains the goal value set with respect to the biological information within a predetermined period of time; and

calculating an incentive value of the measurement subject based on a result of the determination and a number of the acquired biological information items, wherein

in the step of acquiring, health information indicating a health situation of the measurement subject is further acquired,

in the step of determining,

a condition which includes a time of day at which blood pressure tends to be high is set in the biological information in accordance with the acquired health information,

whether or not the acquired biological information satisfies the set condition which includes a time of day at which blood pressure tends to be high is further determined, and

in the step of calculating, the incentive value of the measurement subject is calculated further based on a number of biological information items that have been determined to satisfy the condition.

* * * * *

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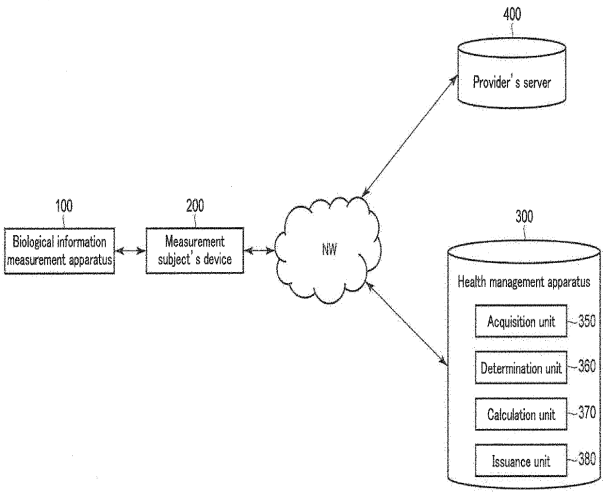
一种健康管理设备，包括：获取单元，被配置为获取被测者的生物信息；确定单元，被配置为确定所获取的生物信息是否在预定时间段内达到针对所述生物信息设定的目标值；以及 计算单元，被配置为基于由所述确定单元获得的确定结果来计算所述测量对象的激励值。