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(54) **BIOLOGICAL EXERCISE INFORMATION DISPLAY PROCESSING DEVICE AND BIOLOGICAL EXERCISE INFORMATION PROCESSING SYSTEM**

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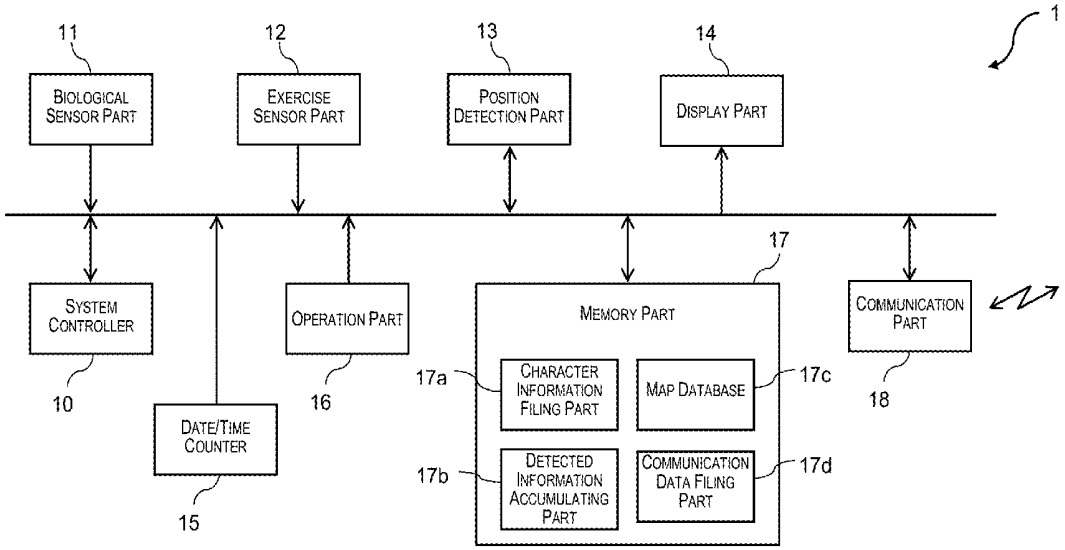
(57) **ABSTRACT**

A biological exercise information display processing device includes a biological information obtaining part, an exercise information obtaining part, a diet information obtaining part, a display character obtaining part, a display part, and a control part. The biological information obtaining part obtains biological information regarding a test subject. The exercise information obtaining part obtains exercise information regarding the test subject. The diet information obtaining part obtains diet information for the test subject. The display character obtaining part obtains a character representing the test subject. The display part displays the character. The control part determines a point based on the exercise information and the diet information, and when a given number of points has been accumulated, performs an exchange process to exchange the points for an item of the character.



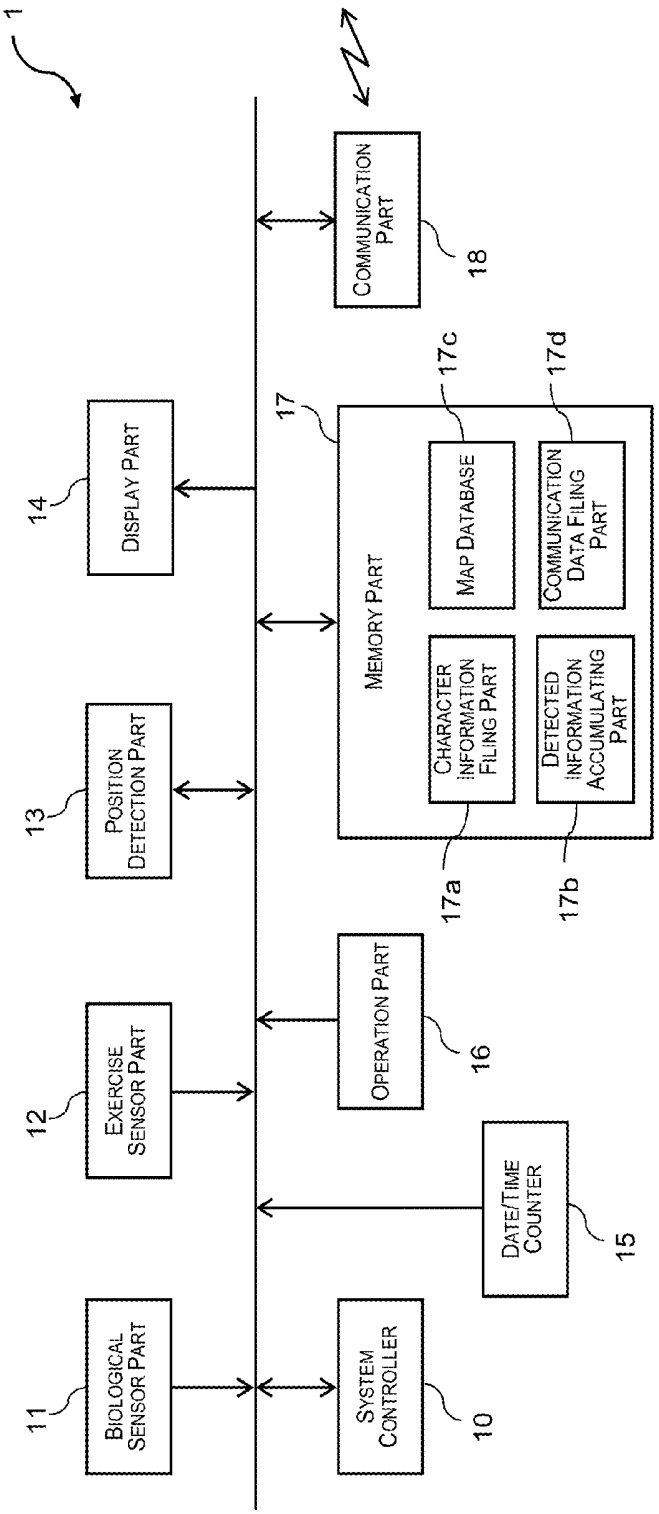

1
BIOLOGICAL SENSOR PART
11
EXERCISE SENSOR PART
12
POSITION DETECTION PART
13
DISPLAY PART
14
SYSTEM CONTROLLER
10
DATE/TIME COUNTER
15
OPERATION PART
16
MEMORY PART
17
CHARACTER INFORMATION FILING PART
17a
DETECTED INFORMATION ACCUMULATING PART
17b
MAP DATABASE
17c
COMMUNICATION DATA FILING PART
17d
COMMUNICATION PART
18

Fig. 1

	Character Display Specifics		Type	Items Of Information That Affect Expression/Action	Conditions Determined By Expression/Action
1	Change In Body Shape	—	Expression	BMI (Calculated Automatically From Height And Weight)	BMI is calculated from inputted height and weight, and body shape of character is determined from the BMI value. When the BMI changes due to a change in height/weight, the body shape also changes accordingly.
2	Illumination	Illumination (Moderate)	Expression	Diet Content, Diet Volume, Calorie Intake	Diet content, volume, and corresponding number of calories have been inputted for three daily meals.
3		Illumination (Bright)		Diet Content, Diet Volume, Calorie Intake	In addition to the above condition being satisfied, the total daily calorie intake is within the daily target set for each individual.
4	Jump	Jump (Small)	Action	Pulse Rate (or Heart Rate), Exercise Time	Daily exercise time within the target pulse rate zone set for each individual is equal to or greater than 10 minutes and less than 30 minutes.
5		Jump (Medium)		Pulse Rate (or Heart Rate), Exercise Time	Daily exercise time within the target pulse rate zone set for each individual is equal to or greater than 30 minutes and less than 60 minutes.
6		Jump (Large)		Pulse Rate (or Heart Rate), Exercise Time	Daily exercise time within the Target pulse rate zone set for each individual is equal to or greater than 60 minutes.
7	Sleep	—	Action	Diet Content, Diet Volume, Calorie Intake, Pulse Rate (or Heart Rate), Exercise Time	Diet content, volume, and corresponding number of calories have not been inputted, and exercise time within the target pulse rate zone set for each individual has not been inputted or is equal to zero.
8	Stand	—	Action	Diet Content, Diet Volume, Calorie Intake, Pulse Rate (or Heart Rate), Exercise Time	Diet content, volume, and corresponding number of calories have been inputted for one or two meals a day, and exercise time within the target pulse rate zone set for each individual is greater than zero and less than 10 minutes.
9	Posture	—	Action	Body Fat Percentage	For example, character posture is changed according to the inputted body fat percentage value, e.g., by posing if the body fat percentage is low.

Fig. 2

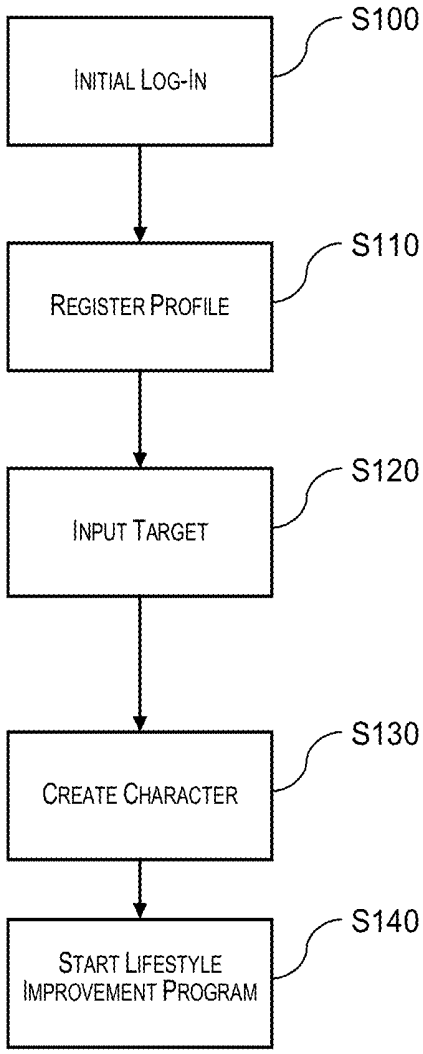

S100
INITIAL LOG-IN
S110
REGISTER PROFILE
S120
INPUT TARGET
S130
CREATE CHARACTER
S140
START LIFESTYLE IMPROVEMENT PROGRAM

Fig. 3

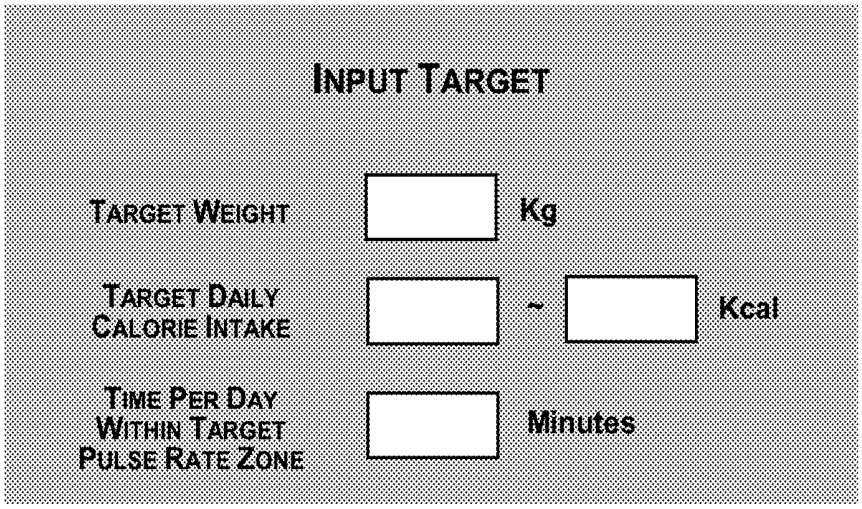

INPUT TARGET
TARGET WEIGHT
Kg
TARGET DAILY CALORIE INTAKE
~
Kcal
TIME PER DAY WITHIN TARGET PULSE RATE ZONE
Minutes

Fig. 4A

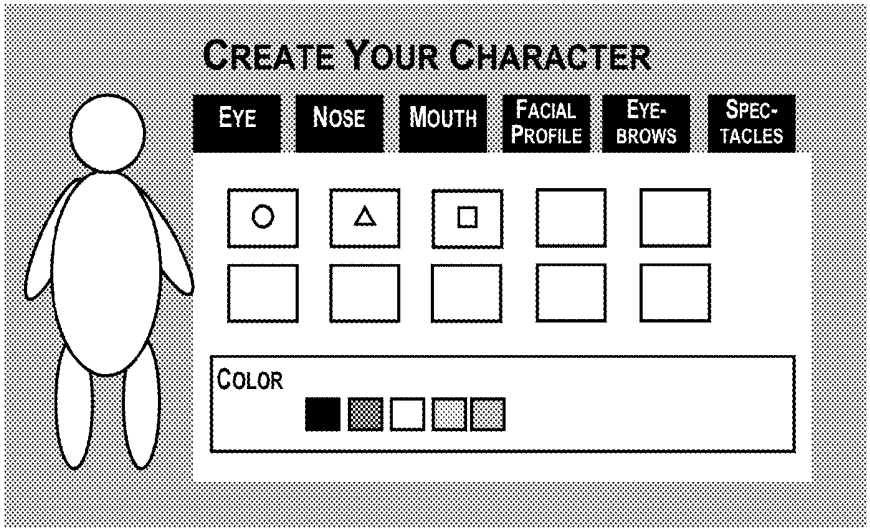

CREATE YOUR CHARACTER
EYE
NOSE
MOUTH
FACIAL PROFILE
EYE-BROWS
SPEC-TACLES
COLOR

Fig. 4B

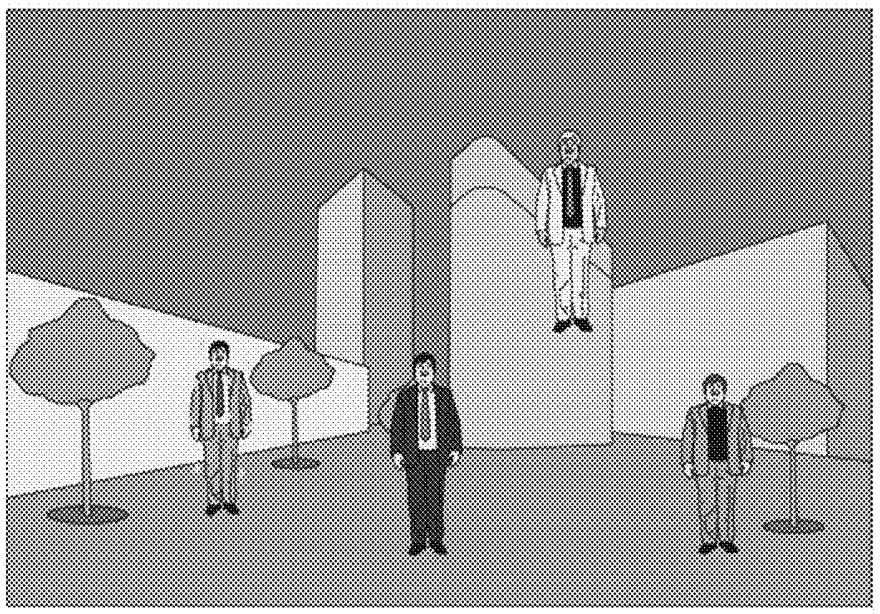


Fig. 5

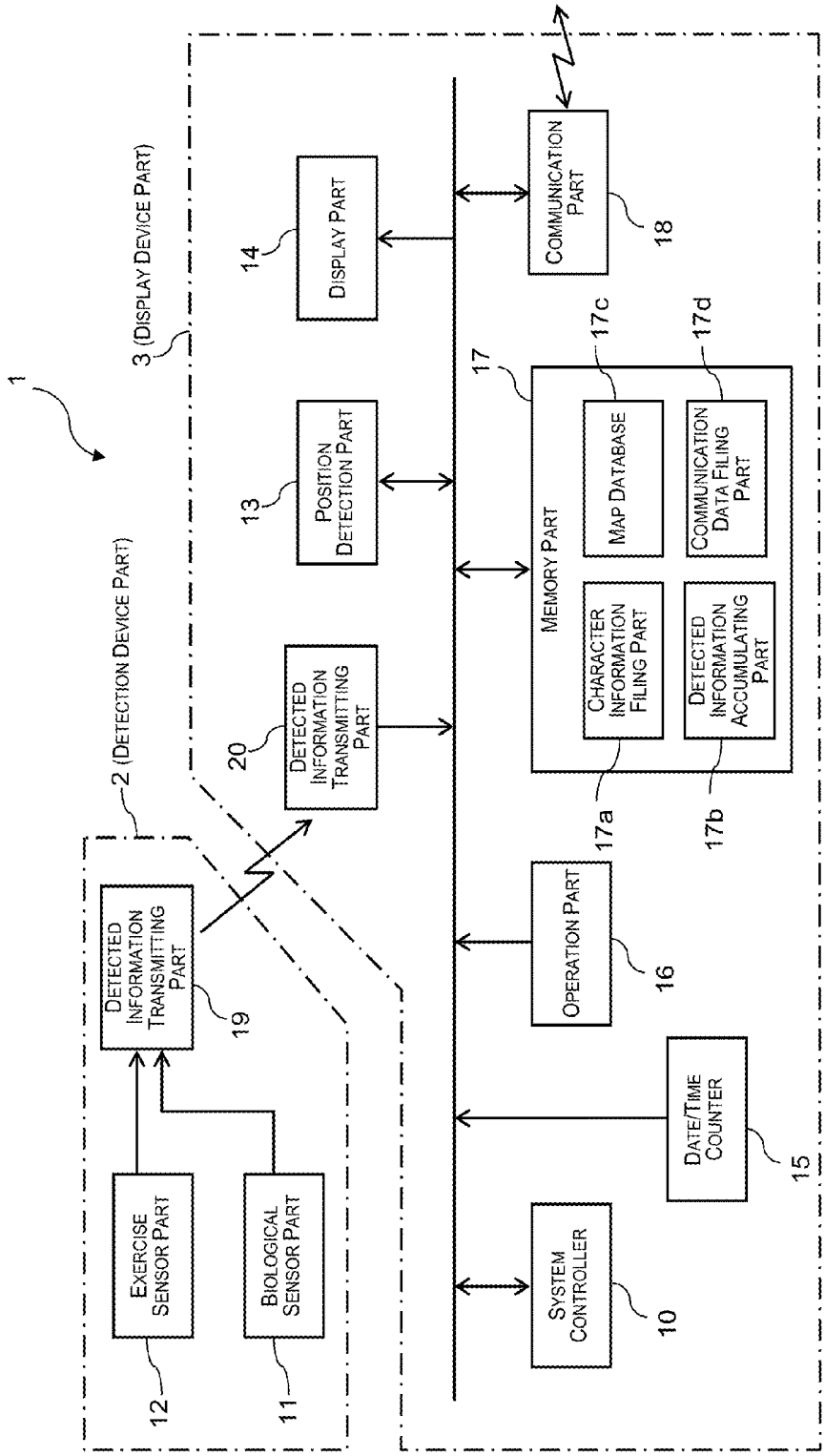

1
2 (DETECTION DEVICE PART)
3 (DISPLAY DEVICE PART)
EXERCISE SENSOR PART
12
BIOLOGICAL SENSOR PART
11
DETECTED INFORMATION TRANSMITTING PART
19
DETECTED INFORMATION TRANSMITTING PART
20
POSITION DETECTION PART
13
DISPLAY PART
14
COMMUNICATION PART
18
MEMORY PART
17
MAP DATABASE
17c
COMMUNICATION DATA FILING PART
17d
CHARACTER INFORMATION FILING PART
17a
DETECTED INFORMATION ACCUMULATING PART
17b
OPERATION PART
16
DATE/TIME COUNTER
15
SYSTEM CONTROLLER
10

Fig. 6

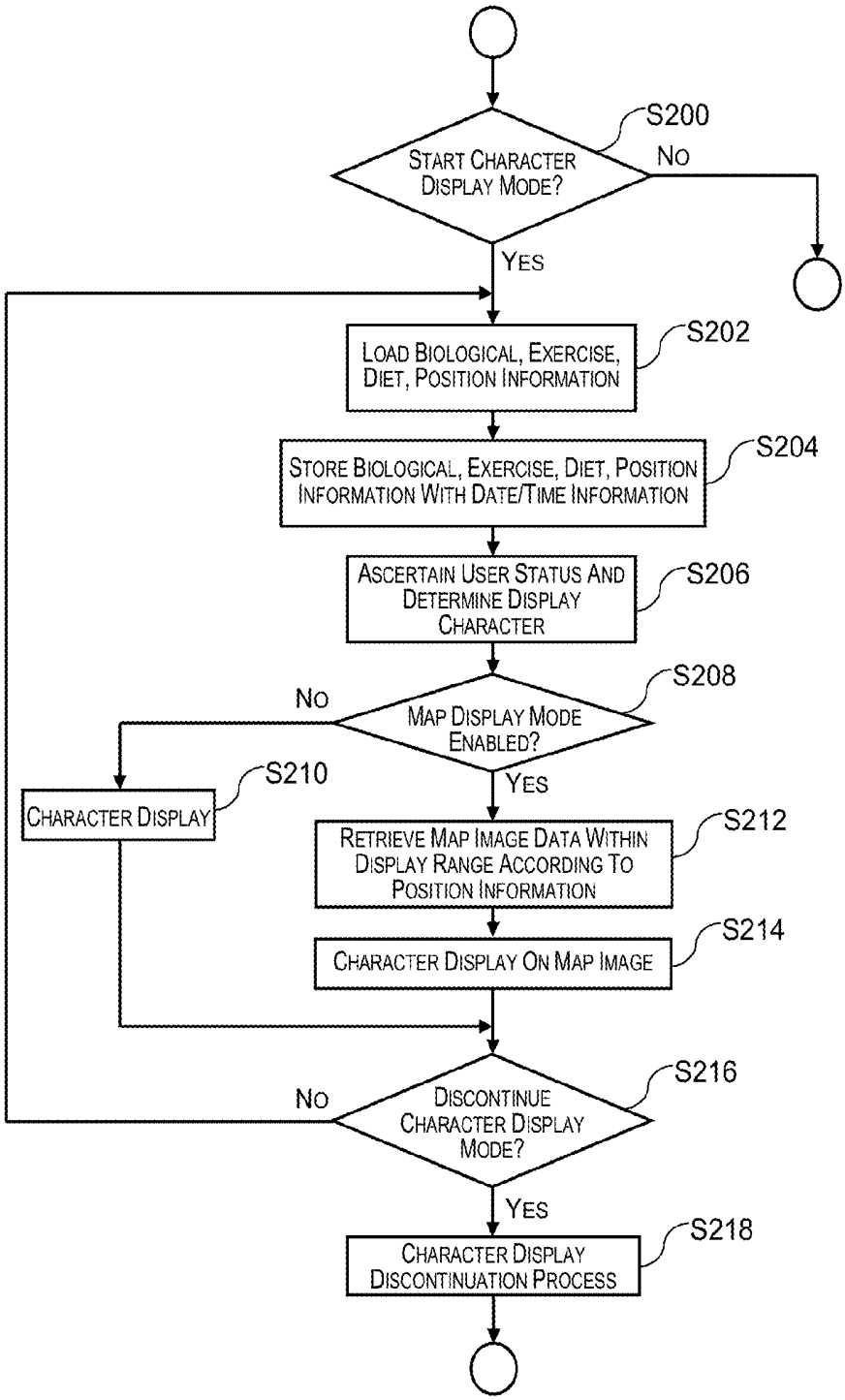

S200
START CHARACTER DISPLAY MODE?
NO
YES
S202
LOAD BIOLOGICAL, EXERCISE, DIET, POSITION INFORMATION
S204
STORE BIOLOGICAL, EXERCISE, DIET, POSITION INFORMATION WITH DATE/TIME INFORMATION
S206
ASCERTAIN USER STATUS AND DETERMINE DISPLAY CHARACTER
S208
MAP DISPLAY MODE ENABLED?
NO
YES
S210
CHARACTER DISPLAY
S212
RETRIEVE MAP IMAGE DATA WITHIN DISPLAY RANGE ACCORDING TO POSITION INFORMATION
S214
CHARACTER DISPLAY ON MAP IMAGE
S216
DISCONTINUE CHARACTER DISPLAY MODE?
NO
YES
S218
CHARACTER DISPLAY DISCONTINUATION PROCESS

Fig. 7

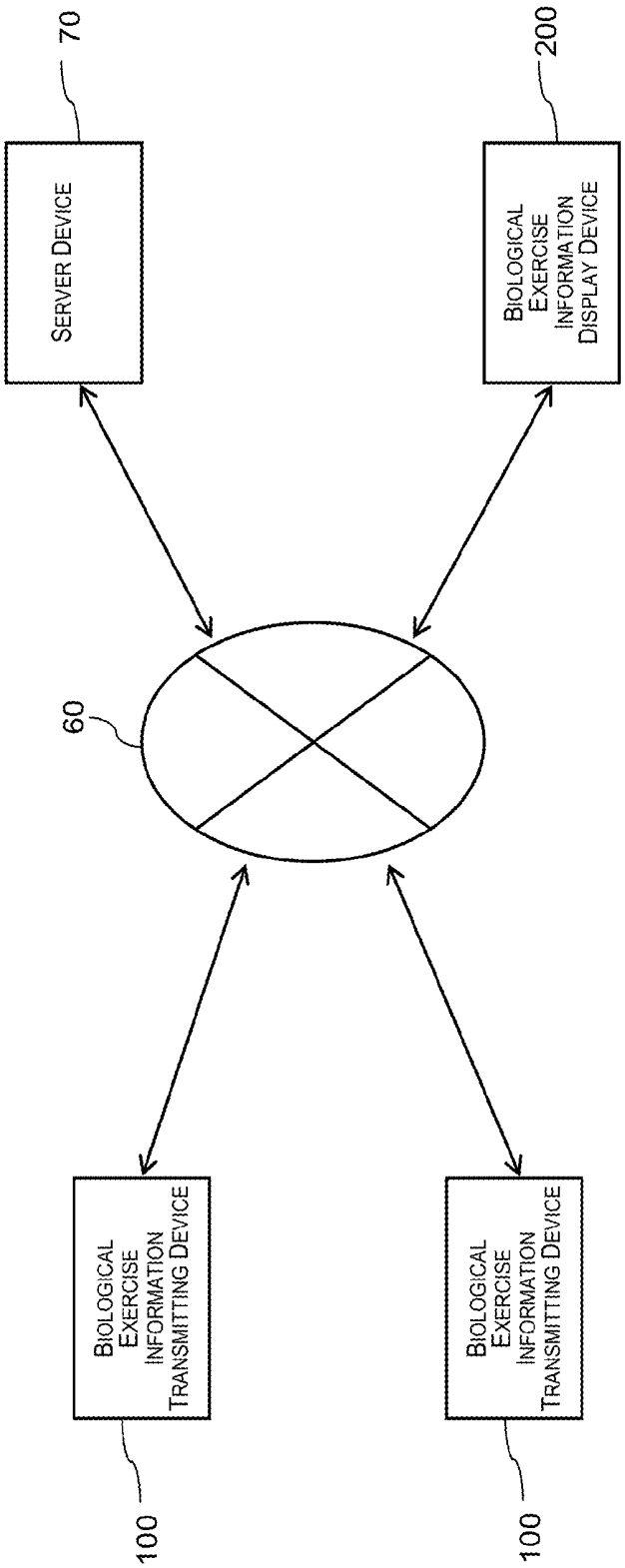

70
SERVER DEVICE
200
BIOLOGICAL EXERCISE INFORMATION DISPLAY DEVICE
60
BIOLOGICAL EXERCISE INFORMATION TRANSMITTING DEVICE
100
BIOLOGICAL EXERCISE INFORMATION TRANSMITTING DEVICE
100

Fig. 8

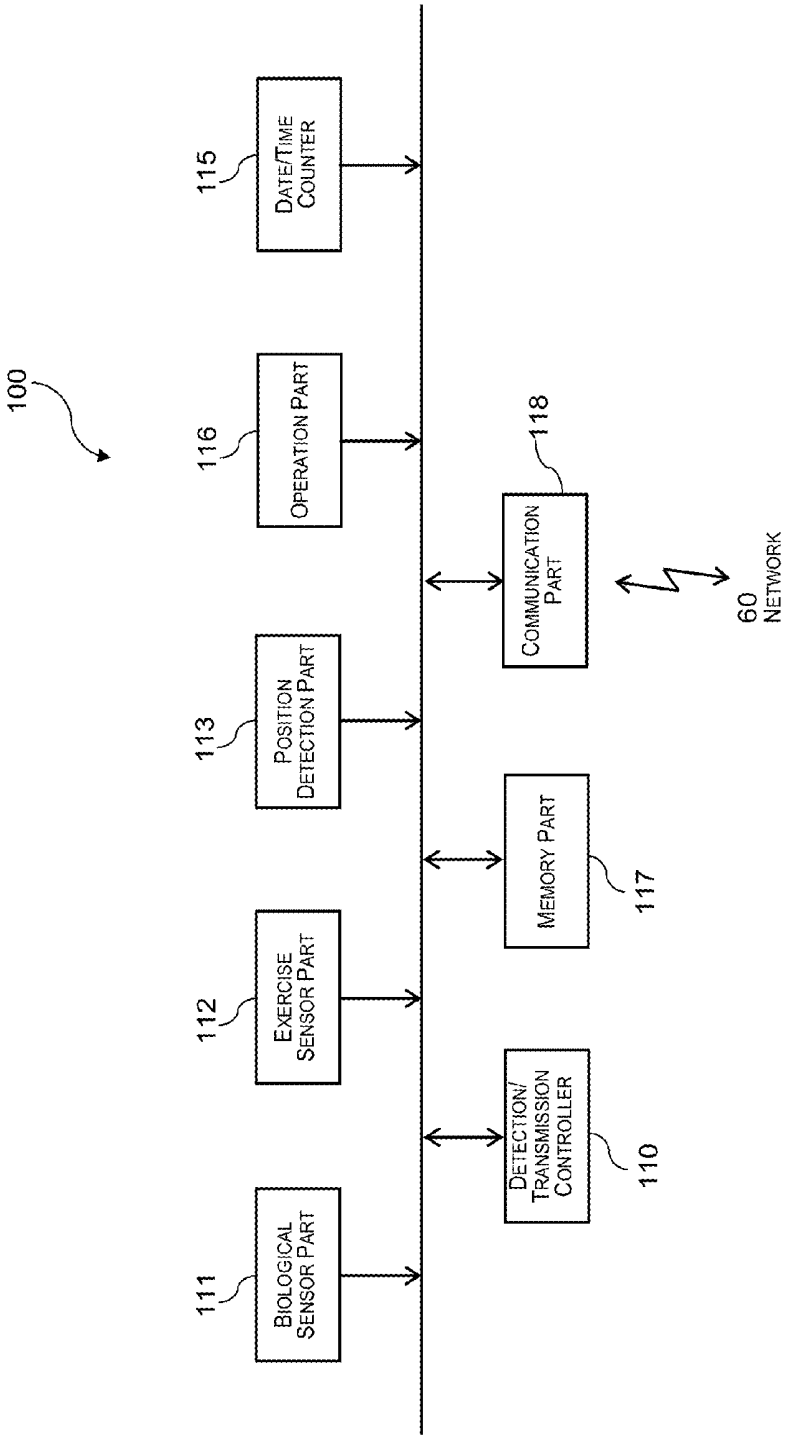

100
111
BIOLOGICAL SENSOR PART
112
EXERCISE SENSOR PART
113
POSITION DETECTION PART
115
DATE/TIME COUNTER
116
OPERATION PART
117
MEMORY PART
118
COMMUNICATION PART
110
DETECTION/ TRANSMISSION CONTROLLER
60
NETWORK

Fig. 9

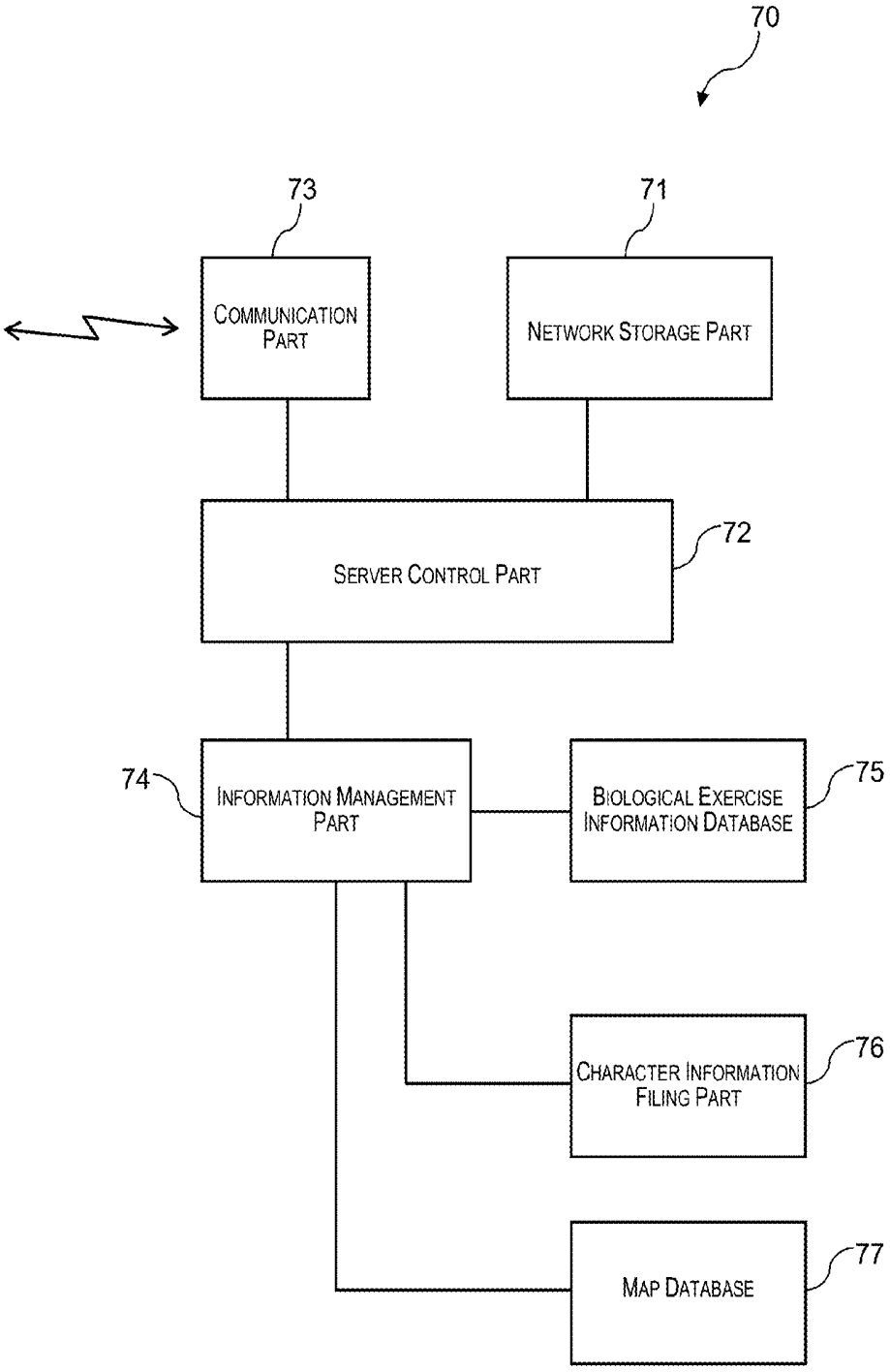

70
73
71
COMMUNICATION PART
NETWORK STORAGE PART
SERVER CONTROL PART
72
74
INFORMATION MANAGEMENT PART
BIOLOGICAL EXERCISE INFORMATION DATABASE
75
CHARACTER INFORMATION FILING PART
76
MAP DATABASE
77

Fig. 10

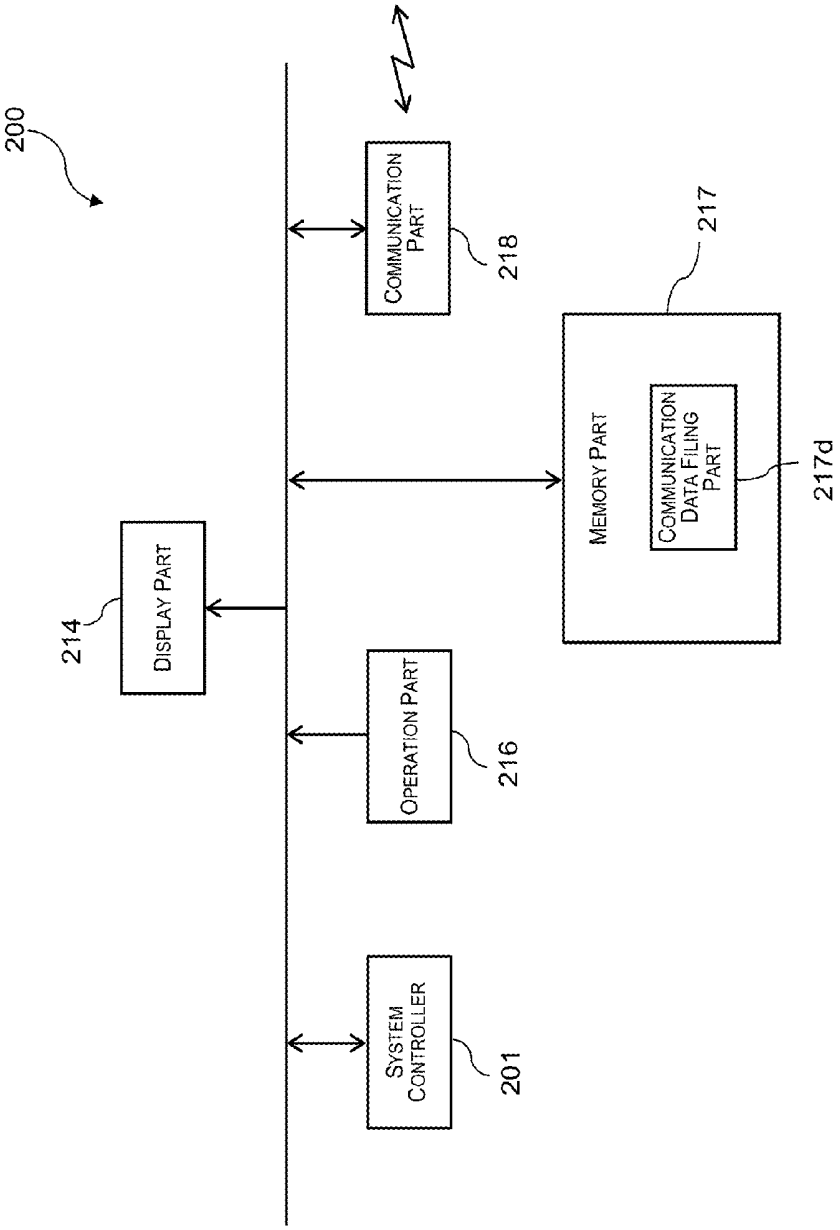

200
COMMUNICATION PART
218
217
MEMORY PART
COMMUNICATION DATA FILING PART
217d
214
DISPLAY PART
OPERATION PART
216
SYSTEM CONTROLLER
201

Fig. 11

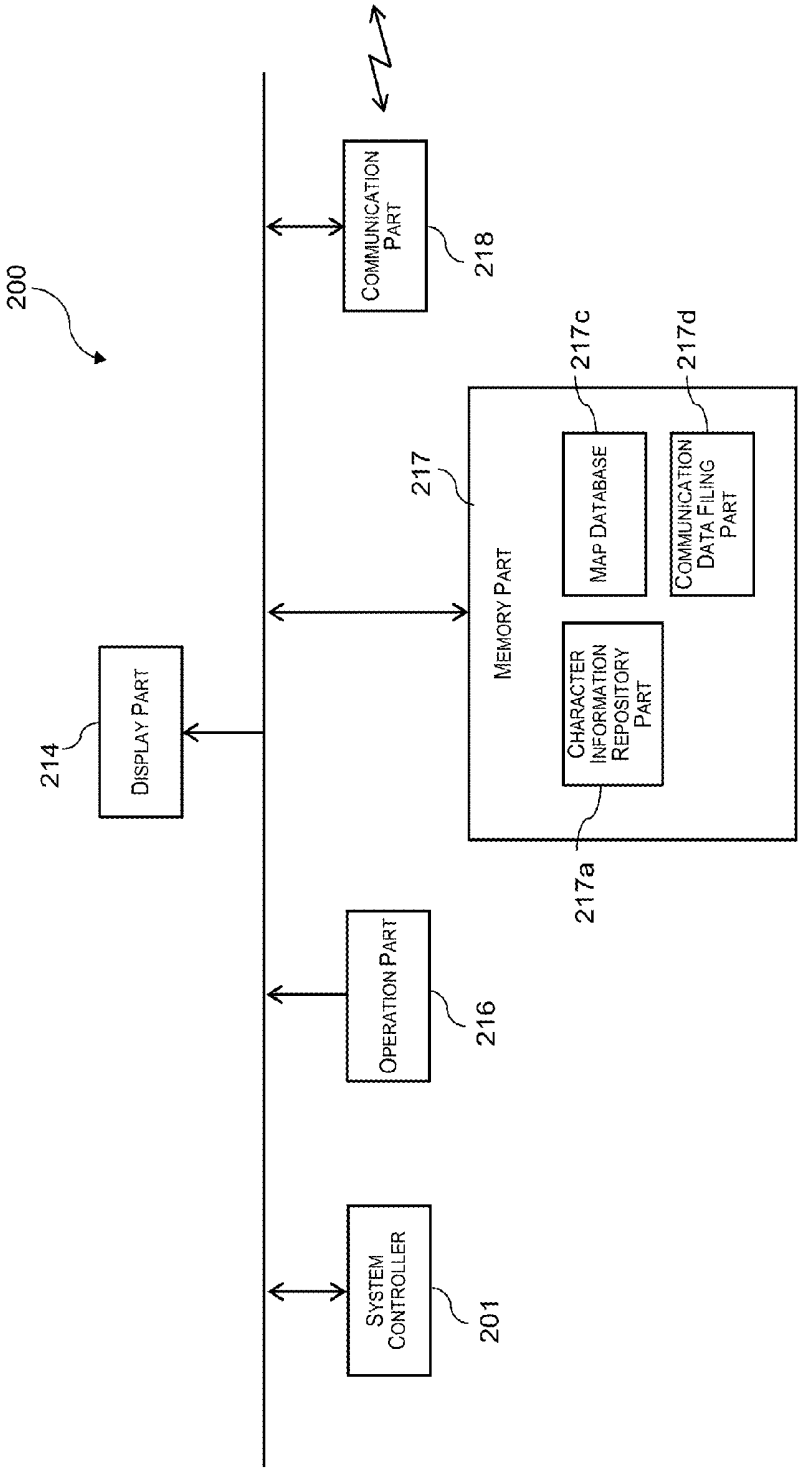

200
214
DISPLAY PART
SYSTEM CONTROLLER
201
OPERATION PART
216
COMMUNICATION PART
218
217
MEMORY PART
217a
CHARACTER INFORMATION REPOSITORY PART
217c
MAP DATABASE
217d
COMMUNICATION DATA FILING PART

Fig. 12

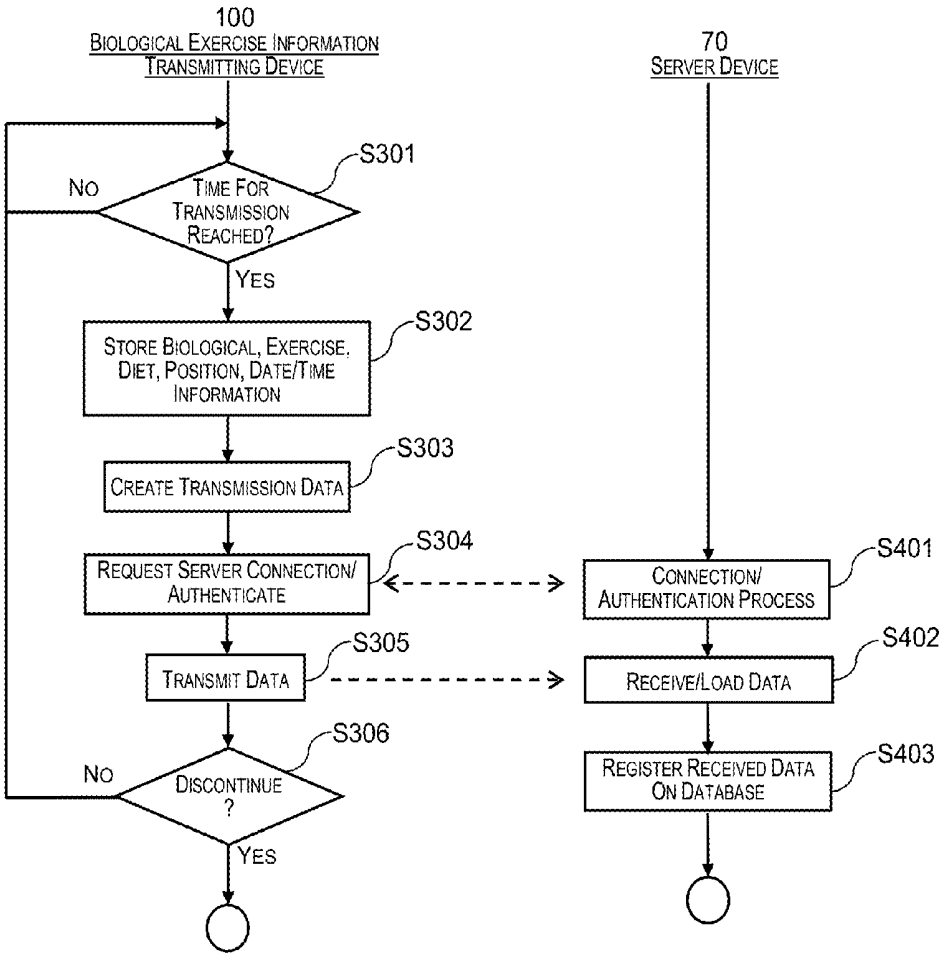

100
BIOLOGICAL EXERCISE INFORMATION TRANSMITTING DEVICE
70
SERVER DEVICE
S301
TIME FOR TRANSMISSION REACHED?
NO
YES
S302
STORE BIOLOGICAL, EXERCISE, DIET, POSITION, DATE/TIME INFORMATION
S303
CREATE TRANSMISSION DATA
S304
REQUEST SERVER CONNECTION/ AUTHENTICATE
S401
CONNECTION/ AUTHENTICATION PROCESS
S305
TRANSMIT DATA
S402
RECEIVE/LOAD DATA
S306
DISCONTINUE ?
NO
YES
S403
REGISTER RECEIVED DATA ON DATABASE

Fig. 13

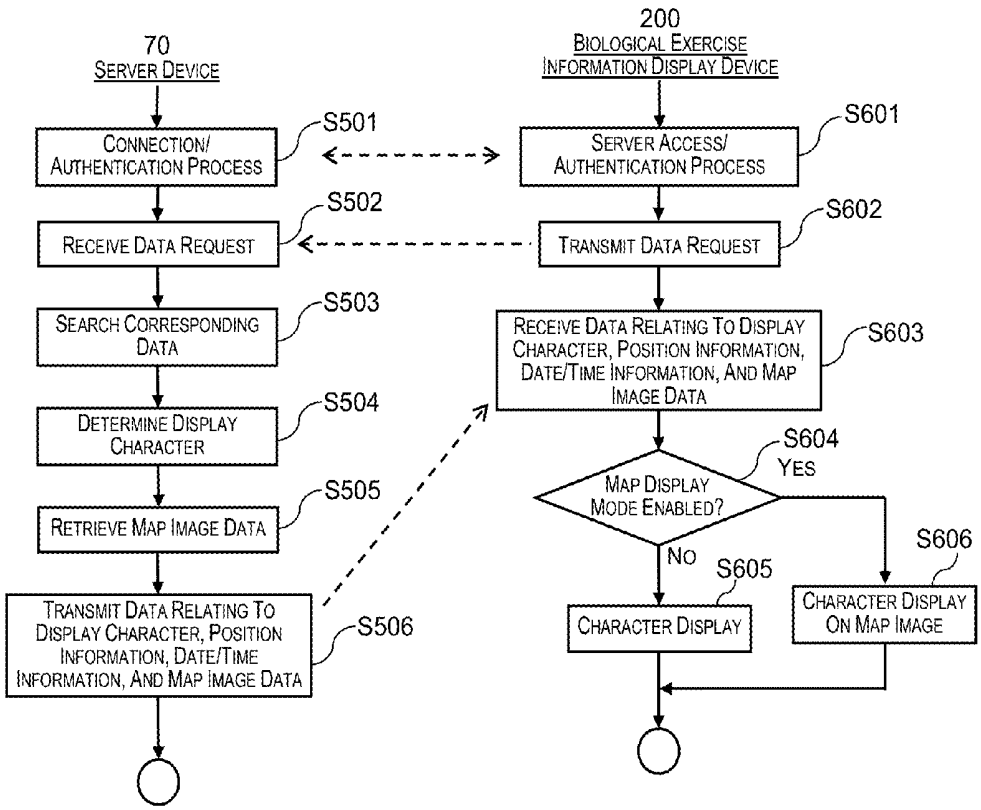

70
SERVER DEVICE
200
BIOLOGICAL EXERCISE INFORMATION DISPLAY DEVICE
CONNECTION/ AUTHENTICATION PROCESS
S501
SERVER ACCESS/ AUTHENTICATION PROCESS
S601
RECEIVE DATA REQUEST
S502
TRANSMIT DATA REQUEST
S602
SEARCH CORRESPONDING DATA
S503
RECEIVE DATA RELATING TO DISPLAY CHARACTER, POSITION INFORMATION, DATE/TIME INFORMATION, AND MAP IMAGE DATA
S603
DETERMINE DISPLAY CHARACTER
S504
S604
YES
MAP DISPLAY MODE ENABLED?
RETRIEVE MAP IMAGE DATA
S505
S606
NO
S605
TRANSMIT DATA RELATING TO DISPLAY CHARACTER, POSITION INFORMATION, DATE/TIME INFORMATION, AND MAP IMAGE DATA
S506
CHARACTER DISPLAY
CHARACTER DISPLAY ON MAP IMAGE

Fig. 14

BIOLOGICAL EXERCISE INFORMATION DISPLAY PROCESSING DEVICE AND BIOLOGICAL EXERCISE INFORMATION PROCESSING SYSTEM

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application is a continuation application of U.S. patent application Ser. No. 13/240,008, filed on Sep. 22, 2011. This application claims priority to Japanese Patent Application No. 2010-220810 filed on Sep. 30, 2010. The entire disclosures of U.S. patent application Ser. No. 13/240,008 and Japanese Patent Application No. 2010-220810 are expressly incorporated by reference herein.

BACKGROUND

[0002] 1. Technological Field

[0003] The present invention relates to a biological exercise information display processing device and a biological exercise information processing system.

[0004] 2. Background Technology

[0005] There have been disclosed biological exercise information display processing devices which display biological information, exercise information, or statuses that can be presumed therefrom with regards to the user or another person, in a manner that is readily understandable for non-expert members of the public; and which make it possible to create a variety of applications for purposes of health management or communication (e.g., see Patent Citation 1).

[0006] Japanese Patent Application Publication No. 2009-39157 (Patent Citation 1) is an example of the related art.

SUMMARY

Problems to be Solved by the Invention

[0007] However, with regards to guidance and support services intended to improve lifestyle so as to remediate/prevent metabolic syndrome or to maintain/improve health, an ordinary display method does not involve a character display that is linked to the status of progress of measures toward improvement to lifestyle, and therefore the status of progress cannot be grasped. Moreover, the characters are not set up by the user, and are therefore often lacking in a sense of reality or a sense of emotional attachment. As a result, there is a risk that the user will not be urged to maintain or increase their motivation or change their behavior, which are necessary in terms of improving lifestyle.

Means Used to Solve the Above-Mentioned Problems

[0008] The invention has been devised in order to solve at least some of the above-mentioned problems, and can be realized according to embodiments or application examples described below.

[0009] According to one aspect of the invention, a biological exercise information display processing device comprises a biological information obtaining part, an exercise information obtaining part, a diet information obtaining part, a display character obtaining part, a display part, and a control part. The biological information obtaining part obtains biological information regarding a test subject. The exercise information obtaining part obtains exercise information regarding the test subject. The diet information obtaining part obtains diet information for the test subject. The display character obtaining part obtains a character representing the test subject. The display part displays the character. The control part determines a point based on the exercise information and the diet information, and when a given number of points has been accumulated, performs an exchange process to exchange the points for an item of the character.

[0010] According to the aspect of the invention, the biological exercise information display processing device further comprises a storage part that stores the biological information, the exercise information, the diet information, the point, and the item.

[0011] According to the aspect of the invention, the control part retrieves the biological information, the exercise information, the diet information, the point, and the item, and displays the character with the item on the display part.

[0012] According to the aspect of the invention, the biological information is information regarding at least one of a pulse rate, heart rate, height, weight, BMI, abdominal girth, body fat percentage, blood pressure, glycemia, cholesterol, neutral fat, GOT, GPT, and γ-GTP.

[0013] According to the aspect of the invention, the exercise information is information regarding at least one of an exercise time, number of steps taken, calorie expenditure, and exercise type.

[0014] According to the aspect of the invention, the diet information is at least one of calorie intake, diet content, meal times, diet volume, nutritional balance, and dietary routines.

[0015] According to the aspect of the invention, the item includes clothes for the character.

[0016] According to another aspect of the invention, a biological exercise information processing system comprises an information transmitting device and an information processing device. The information transmitting device includes a biological information detection part that detects biological information regarding a test subject, an exercise information detection part that detects exercise information regarding the test subject, and a transmitting part that transmits the biological information and the exercise information. The information processing device includes a communication part that obtains the biological information and the exercise information, a diet information obtaining part that obtains diet information for the test subject, a display character obtaining part that obtains a character representing the test subject, a display part that displays the character, and a control part that determines a point based on the exercise information and the diet information, and when a given number of points has been accumulated, performs an exchange process to exchange the points for an item of the character.

[0017] According to the aspect of the invention, the display part displays the character with the item.

[0018] According to the aspect of the invention, the biological information is information regarding at least one of a pulse rate, heart rate, height, weight, BMI, abdominal girth, body fat percentage, blood pressure, glycemia, cholesterol, neutral fat, GOT, GPT, and γ-GTP.

[0019] According to the aspect of the invention, the exercise information is information regarding at least one of an exercise time, number of steps taken, calorie expenditure, and exercise type.

[0020] According to the aspect of the invention, the diet information is at least one of calorie intake, diet content, meal times, diet volume, nutritional balance, and dietary routines.

[0021] According to the aspect of the invention, the item includes clothes for the character.

BRIEF DESCRIPTION OF THE DRAWINGS

[0022] Referring now to the attached drawings which form a part of this original disclosure:

[0023] FIG. **1** is a block diagram of a biological exercise information detection display device according to the present embodiment;

[0024] FIG. **2** is a table showing conditions for determining the specifics of the expression/action of the character according to the present embodiment;

[0025] FIG. **3** is a flow chart showing the flow before the start of a lifestyle improvement program according to the present embodiment;

[0026] FIGS. **4**A and **4**B are drawings showing an illustration of a website screen according to the present embodiment;

[0027] FIG. **5** is a drawing showing the "street" screen for the character according to the present embodiment;

[0028] FIG. **6** is a block diagram of another example of the biological exercise information detection display device according to the present embodiment;

[0029] FIG. **7** is a flow chart showing the character image display process according to the present embodiment;

[0030] FIG. **8** is a drawing illustrating a biological exercise information processing system according to the present embodiment;

[0031] FIG. **9** is a block diagram of the biological exercise information transmitting device according to the present embodiment;

[0032] FIG. **10** is a block diagram of a server device according to the present embodiment;

[0033] FIG. **11** is a block diagram of the biological exercise information display device according to the present embodiment;

[0034] FIG. **12** is a block diagram of another example of the biological exercise information display device according to the present embodiment;

[0035] FIG. **13** is a flow chart showing the process of data transmission to the server device according to the present embodiment; and

[0036] FIG. **14** is a flow chart showing the process of transmitting data to the biological exercise information display device and performing a display according to the present embodiment.

DETAILED DESCRIPTION OF EXEMPLARY EMBODIMENTS

[0037] A description will now be given for the present embodiment. The description will be given in the following sequence.

[0038] (Configuration of the biological exercise information detection display device)

[0039] (Character display process)

[0040] (System configuration)

[0041] (Configuration of biological exercise information transmitting device)

[0042] (Configuration of server device)

[0043] (Configuration of biological exercise information display device)

[0044] (System operation for character display)

[0045] (Effect and modification examples)

(Configuration of Biological Exercise Information Detection Display Device)

[0046] FIG. **1** is a block diagram showing a biological exercise information detection display device according to the present embodiment.

[0047] First, a configuration of a biological exercise information detection display device **1** will be described. The biological exercise information detection display device (biological exercise information display processing device) **1** of the present embodiment is a device carried by a user (test subject), and is an instrument for displaying, on its display screen, a character (i.e., a display character) based on biological information, exercise information, and diet information regarding the user who carries the device.

[0048] The biological exercise information detection display device **1** may be, e.g., an instrument that has a display worn by the user on the head like goggles, or one that is worn by the user on the arm as a wristwatch-type instrument. The biological exercise information detection display device **1** may also be an instrument having a shape and size suitable for portable use, similar to a mobile telephone handset or a personal digital assistant (PDA), carried around by the user. A portion having the function of the biological exercise information detection display device **1** may also be provided as a function installed on a mobile telephone or a PDA. The biological exercise information detection display device **1** may be employed by the user to measure biological information and exercise information during exercise or when the user is active within normal life. As for the information to be measured, the date and time of measurement, pulse rate, total exercise time, time over which the user is within the target pulse rate zone, number of steps taken, calorie expenditure, or other variables may be recorded.

[0049] The biological exercise information detection display device **1** has a system controller (control part) **10**, a biological sensor part **11**, an exercise sensor part **12**, a position detection part **13**, a display part **14**, a date/time counter **15**, an operation part **16**, a memory part (storage part) **17**, and a communication part **18**.

[0050] The system controller **10** is configured from, e.g., a microcomputer including a central processing unit (CPU), a read-only memory (ROM), a random access memory (RAM), a non-volatile memory part, and an interface part; and is a control part for controlling the entire biological exercise information detection display device **1**.

[0051] The system controller **10** controls various parts within the biological exercise information detection display device **1** based on an internal operation program, and executes a character display operation and other operations based on the biological information, the exercise information, and the diet information.

[0052] The system controller **10** includes a biological information obtaining part, an exercise information obtaining part, a diet information obtaining part, and a display character obtaining part. The biological information obtaining part obtains the biological information regarding the test subject. The exercise information obtaining part obtains the exercise information of the test subject. The diet information obtaining part obtains the diet information of the test subject. The display character obtaining part obtains the display character of the test subject. The system controller **10** determines the expression or the action of the display character based on the biological information, the exercise information, and the diet information; and performs a control so that an image display

is performed on the display part **14** according to the expression or the action of the display character that has been determined.

[0053] The biological sensor part **11** detects the biological information regarding the user. Biological information refers to the pulse rate, heart rate, height, weight, BMI, abdominal girth, body fat percentage, blood pressure, glycemia, cholesterol, neutral fat, GOT, GPT, γ-GTP, and similar information regarding the user. The biological information regarding the test subject can thereby be readily obtained.

[0054] For example, a sensor that comes into contact with the skin of the test subject can be used to detect the pulse rate, blood pressure, or a similar variable. Biological information (BMI) is reflected in the character display or "body shape change."

[0055] The biological sensor part **11** outputs the required information regarding the results of detection by the sensor to the system controller **10**.

[0056] The exercise sensor part **12** detects the exercise information regarding the user. Exercise information refers to the exercise time, number of steps taken, calorie expenditure, exercise type, and similar information regarding the user. The exercise information regarding the test subject can thereby be readily obtained.

[0057] The exercise information can be detected using an acceleration sensor, a gyroscope (angular velocity sensor), a vibration sensor, or another sensor. Specifically, providing an acceleration sensor or a gyroscope makes it possible to detect, e.g., the movement of the whole body, head movement, neck movement, arm movement, leg movement, or another movement of the body as a signal corresponding to the movement of the user. It shall be apparent that, in an instance in which the movement of an arm or leg or some other event is to be detected, the acceleration sensor or the gyroscope is worn on the arm or the leg of the user.

[0058] The exercise sensor part **12** outputs information regarding results of detection by the acceleration sensor or another sensor to the system controller **10**.

[0059] The position detection part **13** is, e.g., a GPS receiving part. The GPS receiving part receives radio waves from a Global Positioning System (GPS) satellite, and outputs information regarding latitude and longitude to the system controller **10** as the current position.

[0060] The position detection part **13** may also use Wireless Fidelity (WiFi) or a position information service provided by a mobile phone provider.

[0061] The date/time counter **15** performs a constant date/time-counting operation, and counts the year, month, day, hour, minute, and second.

[0062] The operation part **16** is provided as a key, a dial, or another operating element for the user of the biological exercise information detection display device **1** to perform a variety of operations. Alternatively, a touch panel may be provided to the display part **14**, wherein the touch panel is capable of being operated by touch as the operation part **16**.

[0063] For example, a power on/off operation, display-related operations (e.g., a display mode selection operation or a display adjustment operation), a variety of setting operations, a past status history display operation (described further below), operation, and similar operations are made possible.

[0064] The diet information regarding the user is inputted from the operation part **16**. Diet information refers to the calorie intake, diet content, meal times, diet volume, nutritional balance, dietary routines, or similar information regarding the user. The diet information for the test subject can thereby be readily obtained. It shall be apparent that the biological information and the exercise information described above can also be inputted from the operation part **16**.

[0065] The operation part **16** outputs, to the system controller **10**, information regarding the results obtained through inputting as described above. The exercise information and the diet information are reflected in the character displayed on the "street" screen as the latest data. The character thereby performs an action according to the display and implementation status.

[0066] The system controller **10** performs the required control process based on operation information from the operation part **16**.

[0067] Since the biological exercise information detection display device **1** according to the present embodiment includes the biological sensor part **11** and the exercise sensor part **12**, conscious behavior on the part of the user may be ascertained from the biological information and the exercise information detected by the sensor parts, and judged by the system controller **10** as operation input information.

[0068] For example, a light tapping action applied by the user to the biological exercise information detection display device **1** can be detected by the acceleration sensor, the vibration sensor, or another sensor in the exercise sensor part **12**, and recognized by the system controller **10** as an operation performed by the user.

[0069] Alternatively, a movement such as head-turning movement or a head-shaking movement performed by the user may be detected using the acceleration sensor or the angular velocity sensor and recognized by the system controller **10** as an operation performed by the user.

[0070] The communication part **18** performs transmission/reception of data with respect to an external instrument. The communication part **18** may have a wired or wireless network connection for communication. For example, the communication part **18** is configured as a portion for performing network communication in a system such as the one shown in FIG. **8** described further below or for performing direct data communication with other instruments.

[0071] The memory part **17** records (stores) a variety of types of data, or reproduces (retrieves) recorded data, based on a control performed by the system controller **10**. Upon obtaining the biological information, the exercise information, and the diet information based on a control performed by the system controller **10**, the memory part **17** stores the obtained biological information, exercise information, and diet information. Alternatively, the memory part **17** stores character-related information representing expressions or actions of the character determined based on the obtained biological information, exercise information, and diet information. It is thereby possible to store the biological information, the exercise information, and the diet information for the test subject for a certain period of time.

[0072] The system controller **10** retrieves the biological information, the exercise information, and the diet information from the memory part **17** under predetermined conditions, and performs display control of the display character using the biological information, exercise information, and diet information that has been retrieved. Alternatively, the system controller **10** retrieves the character-related information, and performs display control of the display character using the character-related information that has been

retrieved. Since the biological information, the exercise information, and the diet information for the test subject is thereby stored for a certain period of time, by specifying a past point in time within the range in which the information is stored and causing the corresponding biological information, exercise information, and diet information to be extracted, it is possible to display the past status of the test subject using a display character.

[0073] The memory part **17** may be configured using a RAM, a flash memory device, or another solid-state memory device, or using, e.g., a hard disk drive (HDD).

[0074] The memory part **17** may also be a record/playback drive corresponding to a portable recording medium, e.g., a memory card on which a solid-state memory device is installed, an optical disk, an magneto-optical disk, a hologram memory device, or a similar recording medium, rather than an installed recording medium.

[0075] It shall be apparent that both a solid-state memory device, HDD, or another installed-type memory device; and a record/playback drive corresponding to a portable recording medium, may be furnished. The memory part **17** may be a server device described further below.

[0076] In the present embodiment, there is prepared in the memory part **17** a memory region used for, in particular, a character information filing part **17***a*, a detected information accumulating part **17***b*, a map database **17***c*, and a communication data filing part **17***d*.

[0077] Image data representing the character to be displayed is filed in the character information filing part **17***a*. For example, a variety of image data representing the expression of the character, the action of the character, or an image showing the character design are stored.

[0078] The detected information accumulating part **17***b* stores the biological information detected by the biological sensor part **11**, the exercise information detected by the exercise sensor part **12**, and the position information detected by the position detection part **13**. For example, the information described above is stored at given time intervals, alongside the date/time information counted by the date/time counter **15**, based on a control performed by the system controller **10**.

[0079] In other words, the detected information accumulating part **17***b* accumulates a history of the biological information, the exercise information, and the position information regarding the user.

[0080] The map database **17***c* stores a map image and other information necessary for map display.

[0081] The communication data filing part **17***d* is used for buffering or filing of data relating to transmission/reception by the communication part **18**.

[0082] The display part **14** is provided with, e.g., a liquid crystal panel, an organic EL panel, or another display panel part; and a display driving part for driving the display panel part so that displaying is performed. The display driving part is configured using a pixel driving circuit for causing supplied image data to be displayed by the display panel part. The pixel driving circuit applies, at predetermined horizontal/vertical driving timings, a driving signal based on a visual image signal for each of the pixels arranged in a matrix pattern on the display panel part; and causes displaying to be executed.

[0083] The display part **14** causes the display panel part to execute a predetermined display based on a control performed by the system controller **10**. In particular, in the present embodiment, the system controller **10** feeds character image data that is based on the biological information, the exercise information, and the diet information to the display part **14**, and causes the display part **14** to execute character display. The system controller **10** determines, from the biological information, the exercise information, and the diet information, the character image to be displayed; and feeds the character image to the display part **14**.

[0084] There are also instances in which the system controller **10** causes the display part **14** to execute map display using the map image data stored in the map database **17***c*.

[0085] The biological exercise information detection display device **1** of such description is preferably configured as a compact and light instrument so as to be capable of being worn by the user. Depending on the type of biological information to be detected, an appropriate format is, e.g., a wristwatch-type, goggle-type, headset-type, hat-type, helmet-type, or glove-type instrument; or an article of clothing in which the instrument has been installed; and in particular, one in which a part of the instrument (i.e., the biological sensor part **11**) can be brought into contact with the skin, the head, or another appropriate part of the test subject's body in accordance with the specifics of the detection.

[0086] Since at least the biological sensor part **11** (or, the exercise sensor part **12** depending on the specifics of the exercise information to be detected) is required to come into intimate contact with the user's body, the biological exercise information detection display device **1** may be formed using two units as shown in FIG. **6** described further below.

[0087] A description will next be given for the character.

[0088] The biological exercise information detection display device **1** accumulates the biological information, the exercise information, and the diet information regarding the user, and displays a character that has been determined based on the above information. For example, the biological exercise information detection display device **1** displays, on the "street" screen, characters representing the user or another person.

[0089] The body shape of each of the characters changes according to the biological information (BMI) regarding the user. The action of each of the characters is determined by the exercise information and the diet information. For example, with regards to the exercise information, the character jumps in an incremental manner depending on the total daily exercise time within a predetermined target pulse rate zone. With regards to the diet information, the character is incrementally increased in illumination depending on whether the diet information has been inputted or whether the daily calorie intake target has been reached. The character goes into sleep mode if neither the exercise information nor the diet information is present. Also, for further clarity, the character performs a walking motion if, e.g., the exercise information regarding the user shows that the user has performed a walking exercise for a long period of time. The user thereby views their own and other people's implementation status, increasing the motivation to exercise further.

[0090] According to the present embodiment, the status of progress in improving lifestyle is obtained from the biological information, the exercise information, and the diet information for the test subject and displayed as a character set up by the test subject themselves so as to be readily personalizable and easy to understand. It is thereby possible for the test subject to review their own progress status in a realistic manner for encouragement or reflection, or to compare their own

progress status with that of another person to boost competitiveness. The test subject is able to increase their motivation and change their behavior.

[0091] FIG. **2** is a table showing conditions for determining the specifics of the expression/action of the characters according to the present embodiment.

[0092] The specifics of character display include "body shape change" and "illumination" for expressions, and "jump", "sleep", and "stand" for actions. The conditions for determining the expression and action of the characters will now be described.

[0093] 1. "Body shape change" is determined from the BMI calculated from the inputted height and weight. When the BMI changes due to a change in the height or weight, the body shape also changes accordingly.

[0094] 2. "Illumination (moderate)" is determined in relation to the inputted diet content, diet volume, and calorie intake when the diet content, diet volume, and calorie intake in relation to three daily meals have been inputted.

[0095] 3. "Illumination (bright)" is determined in relation to the inputted diet content, diet volume, and calorie intake when the diet content, diet volume, and calorie intake in relation to three daily meals have been inputted; and when the total daily calorie intake satisfies the daily calorie intake target set for each individual.

[0096] 4. "Jump (small)" is determined when the inputted pulse rate (or heart rate) and exercise time show that the exercise time during which the user is within the target pulse rate zone set for each individual is 10 minutes or more and less than 30 minutes per day.

[0097] 5. "Jump (medium)" is determined when the inputted pulse rate (or heart rate) and exercise time show that the exercise time over which the user is within the target pulse rate zone set for each individual is 30 minutes or more and less than 60 minutes per day.

[0098] 6. "Jump (large)" is determined when the inputted pulse rate (or heart rate) and exercise time show that the exercise time over which the user is within the target pulse rate zone set for each individual is 60 minutes or more per day.

[0099] 7. "Sleep" is determined in relation to the inputted diet content, diet volume, calorie intake, pulse rate (or heart rate), and exercise time when the diet content, diet volume, and calorie intake are not inputted, and the exercise time over which the user is within the target pulse rate zone set for each individual is either not inputted or is zero minutes.

[0100] 8. "Stand" is determined in relation to the inputted diet content, diet volume, calorie intake, pulse rate (or heart rate), and exercise time when the diet content, diet volume, and calorie intake are inputted in relation to one or two meals a day, and the exercise time over which the user is within the target pulse rate zone set for each individual is greater than zero minutes and less than 10 minutes.

[0101] "Body shape change" may be determined so as to change according to the inputted abdominal girth.

[0102] "Posture" may be determined so as to change according to the inputted body fat percentage. For example, an arms-raised pose is adopted if the body fat percentage is low.

[0103] "Illumination (moderate)" may be determined in an instance in which, e.g., four or more of the inputted blood pressure, glycemia, cholesterol, neutral fat, GOT, GPT, and γ-GTP are within a reference value.

[0104] "Illumination (bright)" may be determined in an instance in which all of the inputted blood pressure, glycemia, cholesterol, neutral fat, GOT, GPT, and γ-GTP are within a reference value.

[0105] "Jump (small)" may be determined in an instance in which the inputted exercise time or the number of steps taken, or the calorie expenditure, shows that the number of steps taken per day is 5000 or more, or that the calorie expenditure is 100 kcal or more.

[0106] "Jump (medium)" may be determined in an instance in which the inputted exercise time or the number of steps taken, or the calorie expenditure, shows that the number of steps taken per day is 10,000 or more, or that the calorie expenditure is 300 kcal or more.

[0107] "Jump (large)" may be determined in an instance in which the inputted exercise time or the number of steps taken, or the calorie expenditure, shows that the number of steps taken per day is 15,000 or more, or that the calorie expenditure is 500 kcal or more.

[0108] "Posture" may be determined so that the character is displayed in a running posture if the inputted exercise type is "jogging," and a walking posture if the inputted exercise type is "walking."

[0109] "Illumination" may be determined so that a display will appear when the specifics of an inputted dietary routine ("no snacking" or the like) have been followed, and the fact that the routine has been implemented has been inputted (using a check box or another method).

[0110] FIG. **3** is a flow chart showing the flow before the start of the lifestyle improvement program according to the present embodiment. FIGS. **4**A and **4**B are drawings showing an illustration of a website screen according to the present embodiment.

[0111] First, in step S**100**, the user logs in on the log-in screen using an ID and password.

[0112] Next, in step S**110**, the user inputs and registers personal information on the profile registration screen. Examples include name, nickname, gender, date of birth, height, weight, and life pattern.

[0113] Next, in step S**120**, the user inputs targets in the target input screen. For example, the user inputs a target weight as shown in FIG. **4**A. A dietary target is also inputted.

[0114] A target value for the daily calorie intake is inputted. A value calculated using the following equation from the target weight and a coefficient related to life pattern is used as the target calorie intake value. An exercise target is inputted.

Target calorie intake(lower limit to upper limit)=target weight×coefficient related to life pattern

[0115] The coefficient related to life pattern is determined as follows. A value of 25 to 30 represents the user walking for about an hour for leisure or shopping, and otherwise remaining sedentary. A value of 31 to 35 represents the user walking, using public transport, dealing with customers, or performing housework for about two hours for commuting, for work, or for a similar purpose; and otherwise remaining sedentary. A value of 36 to 40 represents a user, whose coefficient related to life pattern would otherwise be 31 to 35, cycling or performing a similar exercise for about an hour a day. Standing activities, of which an hour involves heavy labor, represent the majority. A value of 41 to 45 represents strenuous training, carrying of wooden materials, farm work, or other strenuous activity performed for about an hour a day. A target value for the time over which the user is within the target pulse rate zone each day is also inputted.

[0116] Next, in step S**130**, the user creates their own character in the character creation screen. For the creation of the character, the body shape (BMI), the face (components selection), clothing (default), and other particulars are created. For example, the body shape is set according to the BMI. If the BMI is 30 or more, or 23 or less, the body shape does not change beyond a given extent. The face is created on the character setting screen by selecting the face shape, hairstyle, eyes, nose, mouth, eyebrows, ears, skin color, and other particulars. For example, as shown in FIG. **4**B, in the creation of the face, the eyes, nose, mouth, facial profile, eyebrows, spectacles, and color are selected. The body shape of the character to be displayed is determined according to the BMI, calculated from the height and weight inputted in profile registration.

[0117] The characters are used to generate interest in the program among a poorly motivated demographic through fun and comparison with others, as with a game; and change behavior.

[0118] With the character "body shape change," the body shape is changed according to the change in BMI since the start of the program. With regards to the character display, the character setting and the body shape change are displayed in order to generate, through fun, enthusiasm for participation in the program. With regards to the character display, the initial body shape is displayed as a silhouette so that it is easy to see the change in the body shape. For example, the initial body shape is visually expressed as being slightly thicker than reality.

[0119] Next, after the start of the lifestyle improvement program in step S**140**, the top page dedicated to the user is used to input data; view the character, various graphs, and rankings; or perform other operations.

[0120] FIG. **5** is a drawing showing the "street" screen for the character according to the present embodiment.

[0121] The "street" screen displays characters representing the user and other people in order to generate changes in awareness and in behavior through comparison with others. It is possible to see who is making an effort, and who is not making an effort, with regards to exercise and diet. It is also possible to see other people's exercise implementation status. It is possible, on the "street" screen, to see who is making an effort.

[0122] The "street" screen shows avatars of the user and other people to poorly motivated people, who see their own avatar being inactive while other people are active, and generates motivation.

[0123] For the characters displayed on the "street" screen, the top ten performers in exercise/diet are selected and displayed each month from the ranking (wherein the best and poorest performers are displayed on the "street" screen). This is to prevent the displayed characters being solely poor performers, since the aim is to show those who are performing well. The names of the bottom ten performers who have not been exercising are selected and displayed on a monthly basis.

[0124] The number of avatars displayed in the "street" screen is preferably about ten to twenty including the user. This is because the screen will become difficult to see if a large number of avatars are shown. The user's own character is always displayed in the center.

[0125] For information regarding other people, when a character on the screen is clicked, the body shape change, target achievement rate, exercise implementation status, and other information regarding another person are displayed in another window. The user thereby sees exercise progress regarding other people for reference. For example, the information regarding other people may be the target daily exercise time (e.g., 30 minutes or more), or the exercise time over which the person is within the target pulse rate zone. The above only applies when the user sets the information to be available to others.

[0126] The user's own character may perform a jumping action depending on the time over which the user is within the target pulse rate zone according to the exercise information. For example, the time over which the user is within the target pulse rate zone according to the exercise information may be categorized into 10 minutes or above, 30 minutes or above, and 60 minutes or above, and the height of the jumping action varied between three levels.

[0127] The character may moderately increase in illumination when diet information in relation to three meals has been inputted. The character may, in addition, appear in bright illumination when the calorie intake is within the target calorie intake range.

[0128] "Illumination (moderate)" may be displayed when diet information in relation to three or more meals per day has been inputted, and "illumination (bright)" may be displayed around the user's own character when a person falls within the target calorie level.

[0129] Characters who have no record for either exercise information o diet information may adopt a lazy posture. In an instance in which neither the exercise information nor the diet information has been inputted, the character may adopt a lying posture.

[0130] The character may be displayed using, e.g., the status of improvement in blood components as biological information. Improvements within the body are thereby shown using character display even in an instance in which there has been no change in the body shape, helping to increase motivation.

[0131] The user's own character may reflect behaviors actually made by the person, and may make actions in the "street" screen for their own character. The action of the user's own character in the "street" screen may reflect data from three days beforehand.

[0132] In coordination with the ranking, a badge may also be displayed on a character in an instance in which the corresponding user is the poorest performer according to the ranking and given conditions are satisfied (e.g., weekly exercise time being under a certain number of minutes). Users whose character is wearing a badge are thereby identifiable to others as not exercising, and the users are therefore motivated so that the badge is no longer worn in the future.

[0133] Points may also be awarded according to exercise and diet status. The user can thereby understand their sustained progress from the number of points or items held by the character, where the items are purchased when a given number of points have been accumulated; and motivation for further effort can therefore be increased.

[0134] Points can be awarded according to the exercise information and diet information inputted, and exchanged for items for characters, in order to increase motivation by using incentives. The exercise information and the diet information can be reflected in the points awarded in the "street" screen as awardable-point data.

[0135] The character may also be downloaded as a screensaver. As a result, poorly motivated people who do not fre-

quently log into the website are shown the screensaver and therefore reminded to improve their lifestyle even when they do not log in.

[0136] The screensaver is set so that those who do not log into the website are shown the state of the character and reminded to take measures regarding their exercise/diet.

[0137] The character is displayed on the screensaver. The body shape of the character changes according to the inputted data. There is a possibility that persons having poor motivation will not log into the website itself. Therefore, a screensaver on which the current state of the character is displayed in real time is created. The character is thereby displayed, even if the user is not logged into the website. Therefore, the user is allowed to check their own state in an objective manner, and thereby reminded of the program even when not logged into the website.

[0138] A check is made as to whether the environment allows the screensaver to be downloaded. The most up-to-date body shape is always displayed on the screensaver through the website and the server device. All participants are required to use the screensaver. The screensaver is automatically deleted when the program is discontinued.

[0139] FIG. **6** is a block diagram of another example of the biological exercise information detection display device according to the present embodiment. FIG. **6** shows an example in which the biological exercise information detection display device **1** is configured from separate units, which are a detection device part **2** and a display device part **3**.

[0140] The detection device part **2** has the biological sensor part **11**, the exercise sensor part **12**, and a detected information transmitting part **19**.

[0141] The display device part **3** includes a detected information receiving part **20** in addition to the system controller **10**, the position detection part **13**, the display part **14**, the date/time counter **15**, the operation part **16**, the memory part **17**, and the communication part **18**.

[0142] The detected information receiving part **20** and the detected information transmitting part **19** communicate with each other by, e.g., wireless or wired communication.

[0143] In an instance in which wireless communication is used, Bluetooth or another short distance wireless communication scheme may be employed. Alternatively, an optical communication method, in which data communication is performed by optical pulse modulation using visible or invisible light, may be employed. It shall be apparent that network communication or a wireless communication scheme compatible with long distances may also be used.

[0144] In the instance shown in FIG. **6**, biological information detected by the biological sensor part **11** and exercise information detected by the exercise sensor part **12** are transmitted from the detected information transmitting part **19** and received by the detected information receiving part **20**. Diet information is inputted from the operation part **16**.

[0145] The system controller **10** controls the character image display, based on the diet information inputted from the operation part **16** and the biological information and the exercise information received by the detected information receiving part **20**.

[0146] According to the configuration shown in FIG. **6**, only the detection device part **2** is required to come into contact with the user's skin, head, or another required portion. Therefore, a mode is possible in which the burden placed on the user in wearing the biological exercise information detection display device is reduced. In particular, the detection device part **2** has a simple configuration having the biological sensor part **11**, the exercise sensor part **12**, and the detected information transmitting part **19**. Therefore, the size and weight can be readily reduced, and an instrument that can be worn on the required portion of the body is readily realized.

[0147] The display device part **3** may be a dedicated compact instrument carried by the user, or may also be realized as the function of the display device part **3** furnished on, e.g., a mobile telephone handset, a personal digital assistant (PDA), or another portable instrument. A usage configuration is possible in which the display device part **3** is not necessarily carried or worn by the user. In such an instance, the display device part **3** may be a relatively large device. The function of the display device part **3** may also be executed on a desktop-type or notebook-type PC or a similar device.

(Character Display Process)

[0148] FIG. **7** is a flow chart showing the character image display process according to the present embodiment.

[0149] The character display process performed by the biological exercise information detection display device **1** will now be described with reference to FIG. **7**. The display process described here is an operation in which the biological information, the exercise information, and the diet information are constantly detected; the character image is displayed on the display part **14** according to the detected information; and the status of the user is thereby expressed in real time.

[0150] For example, the biological exercise information detection display device **1** performs an operation for causing the display part **14** to display the status of the user when the character display mode has been enabled by an operation carried out by the user.

[0151] FIG. **7** shows a control process run by the system controller **10** to perform character image display.

[0152] When the character display mode is launched, the system controller **10** moves the process forward from step S**200** to step S**202**, and launches the character image display process.

[0153] In step S**202**, the system controller **10** loads the biological information and the exercise information as information detected by the biological sensor part **11** and the exercise sensor part **12**. The diet information inputted using the operation part **16** is also loaded. The position information detected by the position detection part **13** is also loaded.

[0154] Next, in step S**204**, the system controller **10** causes the detected information accumulating part **17***b* of the memory part **17** to store the loaded biological information, exercise information, diet information, and position information, together with the current date and time (in year, month, day, hour, minute, and second) counted by the date/time counter **15** at the corresponding point in time.

[0155] Next, in step S**206**, the system controller **10** ascertains the user status and determines the character, based on the loaded biological information, exercise information, and diet information.

[0156] The user status may be a status represented by the biological information, the exercise information, and the diet information themselves, or may be the user's psychological or emotional status inferred from the biological information, the exercise information, and the diet information.

[0157] In step S**208**, the process flow is separated according to whether the map display mode is currently enabled. The map display mode is a state in which the user has performed an operation so that map display is executed on the display

part **14**. For example, in an instance in which the user issues an instruction to enable the character display mode during map display or in an instance in which the user issues an instruction to display the map image while the process shown in FIG. **7** is being executed in character display mode, the map display mode is judged to be enabled in step S**208**.

[0158] If the map display mode is not currently enabled, the system controller **10** proceeds from step S**208** to step S**210** and performs character display control. Specifically, the system controller **10** feeds the character image data determined in step S**206** to the display part **14** and causes the character image data to be displayed.

[0159] Meanwhile, if the map display mode is enabled, the system controller **10** proceeds from step S**208** to step S**212**, and retrieves from the map database **17***c*, based on the current position information, the map image data relating to the range to be displayed. Then, in step S**214**, the system controller **10** generates the display image data from the map image data and the character image data; feeds the display image data to the display part **14**; and executes display of the character on the map image. For example, the character image is displayed so as to express the user being present at a position that corresponds with the current position on the map image.

[0160] The system controller **10** returns to step S**202** and repeats the same process until it is judged in step S**216** that the character display mode has been discontinued.

[0161] In an instance in which, e.g., the user performs an operation to issue an instruction to discontinue the character display mode, the system controller **10** proceeds from step S**216** to step S**218**, discontinues the character display on the display part **14**, and ends the process shown in FIG. **7**.

[0162] A specific character image may be prepared in advance and stored in the character information filing part **17***a*. However, e.g., communication may be performed with an external server device (e.g., a server device **70** described further below using FIG. **8**, FIG. **10**, and other drawings) using the communication part **18**, so that the character image data can be downloaded.

[0163] It shall be apparent that a large number of core characters may be prepared in advance and stored so that the user can make a selection; alternatively, the user can create their own desired character.

(System Configuration)

[0164] Operations for displaying a character image according to the current status of the user themselves or for reproducing and displaying a character image showing the past status of the user themselves using the biological exercise information detection display device **1** shown in FIG. **1** have been hitherto described. Next, a description will be given for a biological exercise information processing system using which the user can know the status of another person from a character image, and a device constituting such a system.

[0165] FIG. **8** is a drawing illustrating a biological exercise information processing system according to the present embodiment. FIG. **8** shows an example of a system configuration.

[0166] The biological exercise information processing system is an example of a system configured so that a biological exercise information transmitting device **100**, the server device **70**, and a biological exercise information display device **200** (biological exercise information display processing device) are capable of communicating with each other via a network **60**.

[0167] The system is one in which the user of the biological exercise information display device **200** is able to know, according to a character image, the status of another person wearing the biological exercise information transmitting device **100**.

[0168] A variety of types of network is possible for the network **60**, such as the Internet, a mobile telephone communication network, a PHS communication network, an ad-hoc network, a LAN, or a similar network.

[0169] The biological exercise information transmitting device **100** is inputted with the diet information regarding the wearer; detects the biological information, the exercise information, the position information, and the date/time information; and transmits the information to the server device **70** using network communication. The transmission may, for example, be performed periodically.

[0170] The server device **70** accumulates the biological information, the exercise information, the diet information, the position information, and the date/time information, which has been transmitted, in an internal database. As described further below, identification information uniquely applied to the wearer of the biological exercise information transmitting device **100** (hereafter referred to as the "user ID") is associated with the biological information and other information, and accumulates therewith.

[0171] The biological exercise information display device **200** is capable of using network communication to obtain the biological information, the exercise information, the diet information, the position information, and the date/time information regarding a specific user (another person) accumulated in the server device **70**. The biological exercise information display device **200** determines the character image to be displayed based on the obtained biological information, exercise information, and diet information, or the user ID; and displays the character image. The position information and the date/time information may also be reflected when the display is presented.

[0172] Alternatively, the biological exercise information display device **200** may obtain, from the server device **70** and by network communication, the character image itself that is to be displayed; and display the character image.

[0173] The biological exercise information detection display device **1** having the configuration shown in FIG. **1** may function as the biological exercise information transmitting device **100** shown in FIG. **8**, or may also function as the biological exercise information display device **200**.

(Configuration of Biological Exercise Information Transmitting Device)

[0174] FIG. **9** is a block diagram of the biological exercise information transmitting device according to the present embodiment.

[0175] An example of the configuration of the biological exercise information transmitting device **100** shown in FIG. **8** above is shown in FIG. **9**.

[0176] The biological exercise information transmitting device **100** has a detection/transmission controller **110**, a biological sensor part (biological information detection part) **111**, an exercise sensor part (exercise information detection part) **112**, a position detection part **113**, a date/time counter **115**, an operation part **116**, a memory part **117**, and a communication part (transmitting part) **118**.

[0177] The detection/transmission controller **110** is formed from, e.g., a CPU. The detection/transmission controller **110**

performs a control process for the operation of detecting, or the operation of transmitting, biological information.

[0178] The memory part **117** has a ROM, a RAM, a non-volatile memory device, or another memory region; and is used as a region for filing process programs for the detection/transmission controller **110**, as a work region, or for similar applications.

[0179] The memory part **117** may be configured as an internal memory for a microcomputer chip which functions as the detection/transmission controller **110**.

[0180] Also, identification information uniquely associated with each individual biological exercise information transmitting device **100** (i.e., device ID) or identification information for the user of the biological exercise information transmitting device **100** (i.e., user ID) may be stored in, e.g., the non-volatile memory region of the memory part **117**.

[0181] The communication part **118** transmits/receives data to/from an external communication instrument. Specifically, in the instance of the system configuration shown in FIG. **8**, the communication part **118** performs data communication with the server device **70** in the form of communication via the network **60**. In this instance, the communication part **118** may perform communication using a wireless or a wired connection to the network. An example is a configuration in which wireless communication is performed with a network access point.

[0182] The operation part **116** is provided for the user to perform the necessary operational input when the biological exercise information transmitting device **100** is to be used. For example, the operation part **116** may be configured so as to be capable of executing a power supply operation or a variety of setting operations.

[0183] The biological sensor part **111**, the exercise sensor part **112**, the position detection part **113**, and the date/time counter **115** have the same function as the biological sensor part **11**, the exercise sensor part **12**, the position detection part **13**, and the date/time counter **15** described for the biological exercise information detection display device **1** shown in FIG. **1**; and detect the biological information, the exercise information, the position information, and the date/time information regarding the user. The diet information is inputted from the operation part **116**.

[0184] In the biological exercise information transmitting device **100** of such description, the detection/transmission controller **110**, e.g., periodically stores, in the memory part **117**, the biological information, the exercise information, and the position information regarding the user detected by the biological sensor part **111**, the exercise sensor part **112**, the position detection part **113**, and the date/time counter **115**; the diet information inputted using the operation part **116**; and the date/time information corresponding to the point in time of detection. Then, the biological information, the exercise information, the diet information, the position information, and the date/time information loaded into the memory part **117** is used to generate transmission data, which is transmitted from the communication part **118** to the server device **70** via the network **60**. In this instance, the transmission data includes not only the biological information, the exercise information, the diet information, the position information, and the date/time information, but also the user ID, the device ID, and similar information.

[0185] The biological exercise information transmitting device **100** of such description is preferably configured as a compact and light instrument so as to be capable of being worn by the user in a convenient manner. Depending on the type of biological information, exercise information, and diet information to be detected, an appropriate configuration is, e.g., a wristwatch-type, goggles-type, headset-type, hat-type, helmet-type, or glove-type instrument; or an article of clothing installed with the instrument; and in particular, one in which a part of the instrument (i.e., the biological sensor part **111**) can be brought into contact with the skin, the head, or another appropriate part of the test subject's body in accordance with the specifics of the detection.

[0186] Although not shown, the biological sensor part **111** and the exercise sensor part **112** may also be configured as separate units, as with the example shown in FIG. **6**.

[0187] As can be understood by comparing the configuration shown in FIG. **9** and the configuration shown in FIGS. **1** and **6**, the biological exercise information detection display device **1** described using FIGS. **1** and **6** may also perform the same action as the biological exercise information transmitting device **100** shown in FIG. **9** and function as the biological exercise information transmitting device **100** shown in FIG. **8**. Specifically, e.g., the system controller **10** shown in FIG. **1** may generate, e.g., periodically, the transmission data using the biological information, the exercise information, the diet information, the position information, and the date/time information; and transmit the transmission data from the communication part **18** to the server device **70** via the network **60**.

[0188] The biological exercise information transmitting device **100** may also be configured so that a target pulse rate zone (upper limit, lower limit), in which the exercise intensity is between 40% and 70% where fat is said to readily burn, can be set. The biological exercise information transmitting device **100** may use an LED, vibration, or an alarm on the instrument, or otherwise notify the user when the pulse rate enters the target pulse rate zone during exercise measurement.

(Configuration of Server Device)

[0189] FIG. **10** is a block diagram of a server device according to the present embodiment.

[0190] Next, an example of the configuration of the server device **70** is shown in FIG. **10**.

[0191] As described above, the server device **70** is a device that is capable of accumulating the biological information, the exercise information, the diet information, the position information, and the date/time information transmitted from the biological exercise information transmitting device **100** through communication via, e.g., the network **60**; and of transmitting the accumulated biological information and other information to the biological exercise information display device **200**.

[0192] The server device **70** includes a server control part **72**, a network storage part (accumulating part) **71**, a communication part **73**, an information management part **74**, and a biological exercise information database **75**. The server device **70** may also include a character information filing part **76** and a map database **77**.

[0193] The server control part **72** controls operations that are necessary for the server device **70**.

[0194] Specifically, the server control part **72** performs control of the network communication operation; process control when the biological information, the exercise information, the diet information, the position information, and the date/time information have been transmitted from the biological exercise information transmitting device **100**; and

control relating to transmission of the biological information and other information to the biological exercise information display device **200**.

[0195] The network storage part **71** is formed from, e.g., an HDD; and is used to, e.g., temporarily store transmission/reception data relating to communication with the biological exercise information transmitting device **100** or the biological exercise information display device **200** via the network **60**, to store a variety of necessary data, or for similar uses.

[0196] The communication part **73** performs data communication via the network **60** with the biological exercise information transmitting device **100** or the biological exercise information display device **200**.

[0197] The information management part **74** manages the biological information, the exercise information, the diet information, the position information, and the date/time information transmitted from the biological exercise information transmitting device **100**.

[0198] The biological information, the exercise information, the diet information, the position information, and the date/time information transmitted from the biological exercise information transmitting device **100** is converted into a database format and filed in the biological exercise information database **75** in a state in which the information is associated with, e.g., a user ID or similar information.

[0199] The information management part **74** also performs data registration, searches, and similar processes with regard to the biological exercise information database **75**.

[0200] The character information filing part **76** stores a variety of character images to be displayed on the biological exercise information display device **200**. Specifically, the character image may be stored in a state in which it is associated with a user ID and managed.

[0201] Images and other necessary data for performing map display on the biological exercise information display device **200** are filed in the map database **77**.

(Configuration of the Biological Exercise Information Display Device)

[0202] FIG. **11** is a block diagram of the biological exercise information display device according to the present embodiment. FIG. **12** is a block diagram of another example of the biological exercise information display device according to the present embodiment.

[0203] Next, examples of the configuration of the biological exercise information display device **200** will be described with reference to FIGS. **11** and **12**.

[0204] The biological exercise information display device **200** shown in FIG. **11** is an example in which the biological exercise information display device **200** has a system controller (control part) **201**, a communication part **218**, a display part **214**, an operation part **216**, and a memory part **217**. A communication data filing part **217***d* is present as a memory region in the memory part **217**.

[0205] The example of the configuration of the biological exercise information display device **200** shown in FIG. **12** is an example in which, in addition to the configuration shown in FIG. **11**, memory regions representing a character information filing part **217***a* and a map database **217***c* are formed in the memory part **217**.

[0206] Each of the parts in the configurations shown in FIGS. **11** and **12** is the same as the system controller **10**, the communication part **18**, the display part **14**, the operation part **16**, and the memory part **17** shown in FIG. **1**, and a duplicate description will not be provided.

[0207] Specifically, the communication part **218** performs data communication with the server device **70** in the form of communication via the network **60** shown in FIG. **8**.

[0208] The system controller **201** also controls the character display operation and the process of communication with the server device **70**.

[0209] The biological exercise information display device **200** mentioned with regards to the system configuration shown in FIG. **8** may be a device which displays, on the display part **214**, a character image showing the status of a certain person (i.e., a user of the biological exercise information transmitting device **100**, who is a different person from the user of the biological exercise information display device **200**), based on the information received from the server device **70**.

[0210] In order to achieve this, two types of configuration examples of the biological exercise information display device **200** can be envisaged, in consideration of the system operation.

[0211] As described in the present embodiment, a character image is an image for expressing the user status, judged based on the biological information, the exercise information, and the diet information.

[0212] Specifically, the character image to be displayed is determined based on the user status judged from the biological information, the exercise information, and the diet information. In an instance in which the process of determining the character image is considered a system operation, the process may be performed on the server device **70**, or may be performed on the biological exercise information display device **200**.

[0213] In an instance in which the character image to be displayed based on the user status judged from the biological information, the exercise information, and the diet information is determined on the server device **70**, the server device **70** may transmit, to the biological exercise information display device **200**, the data corresponding to the character image to be displayed. In such an instance, the biological exercise information display device **200** may stores the received character image data in the communication data filing part **217***d*, and then use this character image data to perform the display process; and can therefore be realized as the configuration shown in FIG. **11**.

[0214] In an instance in which the character image to be displayed based on the user status judged from the biological information, the exercise information, and the diet information is determined on the server device **70**, the server device **70** may transmit, to the biological exercise information display device **200**, information that specifies the character image to be displayed, or information that specifies the expression or the action of the character to be displayed, instead of the data that corresponds to the character image to be displayed.

[0215] In such an instance, the biological exercise information display device **200** selects the character image and performs the display process based on the received information. Therefore, the configuration shown in FIG. **12**, in which the biological exercise information display device **200** includes the character information filing part **217***a*, is appropriate.

[0216] In an instance in which a map image display is taken into account, if the map image data is to be downloaded from the server device **70** to the biological exercise information

display device **200**, the biological exercise information display device **200** may store the downloaded map data in the communication data filing part **217***d*, and then use this map data to perform the display process. Therefore, the biological exercise information display device **200** can be realized as a configuration in which the map database is not provided, as shown in FIG. **11**.

[0217] In an instance of a system operation in which the process of determining the character image is performed on the biological exercise information display device **200**, the configuration shown in FIG. **12** is appropriate.

[0218] In such an instance, the server device **70** transmits at least the biological information, the exercise information, and the diet information regarding a certain person (user ID) to the biological exercise information display device **200**. The determining of the character image to be displayed based on the user status judged from the received biological information, exercise information, and diet information, and the performing of the display process, take place on the biological exercise information display device **200**. Therefore, a configuration in which the character information filing part **217***a* is present is required.

[0219] As can be seen from the description hitherto given, the configuration shown in FIG. **11** is an example of a configuration that aims to simplify the biological exercise information display device **200**, assuming a system operation in which the data representing the character image to be displayed is transmitted from the server device **70**; and the configuration shown in FIG. **12** is an example of a configuration that can be employed irrespective of whether the process of determining the character is performed on the server device **70** or the biological exercise information display device **200**.

[0220] Similarly, the biological exercise information detection display device **1** shown in FIG. **1** is an example of a configuration in which the biological exercise information detection display device **1** can function as the biological exercise information display device **200** irrespective of where the process of determining the character is performed.

(System Operation for Character Display)

[0221] A description will now be given for an example of an operation of a biological exercise information processing system configured from the biological exercise information transmitting device **100**, the server device **70**, and the biological exercise information display device **200** described above.

[0222] FIG. **13** is a flow chart showing the process of data transmission to the server device according to the present embodiment. FIG. **13** shows the operation when the biological information and other information is to be transmitted from the biological exercise information transmitting device **100** to the server device **70**. In FIG. **13**, the process performed by the biological exercise information transmitting device **100** is a process executed according to a control performed by the detection/transmission controller **110**, and the process performed by the server device **70** is a process executed according to a control by the server control part **72**.

[0223] In the biological exercise information transmitting device **100**, the detection/transmission controller **110** stands by for the time to transmit in step S**301**. When the time for transmission is reached, the flow proceeds to step S**302**. The transmission may be performed at, e.g., a periodic timing, or a timing based on an operation performed by the user or another trigger.

[0224] In step S**302**, the detection/transmission controller **110** loads the biological information obtained by the biological sensor part **111**; the exercise information obtained by the exercise sensor part **112**; the biological information, the exercise information, and the diet information inputted at the operation part **116**; the position information obtained by the position detection part **113**; and the current date/time information obtained by the date/time counter **115**; and stores the above information in the memory part **117**.

[0225] Next, in step S**303**, the detection/transmission controller **110** generates the transmission data. Specifically, the detection/transmission controller **110** generates data for transmission that includes the user ID or the instrument ID in addition to the biological information, the exercise information, the diet information, the position information, and the date/time information loaded to the memory part **117**.

[0226] In step S**304**, a communication connection is established with the server device **70**. The detection/transmission controller **110** commences network communication from the communication part **118**, and causes the server device **70** to execute a communication connection. At the same time, on the server device **70**, the server control part **72** performs, as step S**401**, a process of establishing a communication connection at the communication part **73**, and an authentication process. A variety of schemes can be envisaged for the authentication process. For example, a possible scheme is one in which the device ID is transmitted from the biological exercise information transmitting device **100**, and the server device **70** judges whether the corresponding device ID is one that has been correctly registered.

[0227] When authentication is successful and a connection is established, the biological exercise information transmitting device **100** performs data transmission. Specifically, the detection/transmission controller **110** transmits, from the communication part **118**, data including the biological information, the exercise information, the diet information, the position information, the date/time information, and the user ID (or instrument ID).

[0228] Meanwhile, the server control part **72** of the server device **70** loads data received by the communication part **73** into the network storage part **71** as step S**402**.

[0229] When loading of the received data is complete, the server control part **72** performs, in step S**403**, decoding processing and data extraction with regard to the received data that has been loaded, and performs a process in which the biological information, the exercise information, the diet information, the position information, the date/time information, and the user ID (or the instrument ID) included in the received data is transferred to the information management part **74** and registered in the biological exercise information database **75**.

[0230] On the biological exercise information transmitting device **100**, the flow returns from step S**306** to step S**301** and performs the processes of steps S**302** to S**305** each time, e.g., a periodic transmission timing is reached, until the operation is discontinued (e.g., the power is switched off).

[0231] The process described above is, e.g., performed in a successive manner, whereby, on the server device **70**, information transmitted from each of the biological exercise information transmitting devices **100** is accumulated in the biological exercise information database **75**.

[0232] Based on the information thus accumulated in the server device **70**, the biological exercise information display

device **200** is able to display to the user of the biological exercise information display device **200** the status of another user, using a character image.

[0233] An example of a process for performing this display is shown in FIG. **14**.

[0234] FIG. **14** is a flow chart showing the process of transmitting data to the biological exercise information display device and performing a display according to the present embodiment. FIG. **14** shows a process performed by the server device **70** and the biological exercise information display device **200**. The process performed by the server device **70** is a process performed according to a control by the server control part **72**, and the process performed by the biological exercise information display device **200** is a process performed according to a control by the system controller **201**.

[0235] FIG. **14** is an example of the process in an instance in which the process of determining the character is performed in the server device **70**.

[0236] First, the example of the process shown in FIG. **14** will be described.

[0237] In an instance in which the user of the biological exercise information display device **200** is aiming to know the current status of another person (e.g., an acquaintance), the user performs an operation for specifying the user ID (or the device ID) corresponding to the other person, and issues an instruction to access the server. For example, if the user ID of the other person is known, specifying this user ID makes it possible to perform an operation to request the status of the other person to be displayed.

[0238] In accordance with the user performing an operation of such description, the biological exercise information display device **200** performs the process shown in FIG. **14** in order to execute character display representing the status of the other person.

[0239] First, a communication connection is established with the server device **70** as step **S601**. The system controller **201** commences network communication from the communication part **218**, and causes the server device **70** to execute a communication connection. At the same time, on the server device **70**, the server control part **72** performs, as step **S501**, a process of establishing a communication connection at the communication part **73**, and an authentication process. In this instance too, a variety of schemes can be envisaged for the authentication process. For example, a possible scheme is one in which the user ID of the user of the biological exercise information display device **200**, or the device ID, is transmitted from the biological exercise information display device **200**, and the user ID or the device ID is checked on the server device **70**.

[0240] When communication with the server device **70** results in a successful authentication and communication is established, the system controller **201** of the biological exercise information display device **200** transmits to the server device **70**, in step **S602**, a data request including the user ID (or the device ID) of the other person specified by the user of the biological exercise information display device **200**.

[0241] When the server control part **72** detects, in step **S502**, that the data request has been received, the server control part **72** notifies the information management part **74** of the user ID (or the device ID) in step **S503**, and instructs the information management part **74** to search for the corresponding data. The information management part **74** extracts, from the biological exercise information database **75**, data (i.e., the biological information, the exercise information, the diet information, the position information, and the date/time information) corresponding to the specified user ID (or device ID). When this happens, in an instance in which a plurality of registration data units have been accumulated (the biological information, the exercise information, the diet information, the position information, and the date/time information representing one registration data unit), the biological information, the exercise information, the diet information, the position information, and the date/time information representing the most up-to-date registration data unit may be retrieved according to the date/time information DATE.

[0242] Next, in step **S504**, the server control part **72** causes the information management part **74** to execute a process for determining the character.

[0243] The information management part **74** ascertains the user status using the biological information, the exercise information, and the diet information in particular, in relation to the biological information, the exercise information, the diet information, the position information, and the date/time information that has been retrieved. Then, the information management part **74** determines, from among the various character images stored in the character information filing part **76**, the character image that represents the expression or the action corresponding with the ascertained user status.

[0244] At this time, if different character images have been prepared in advance for each of the user IDs, then the user ID is also used when determining the character image.

[0245] In step **S505**, the server control part **72** instructs the information management part **74** to retrieve the map image data. Based on the position information PL retrieved from the biological exercise information database **75**, the information management part **74** retrieves, from the map database **77**, the map image data within the necessary range including the position indicated by the image information PL.

[0246] In step **S506**, the server control part **72** receives, from the information management part **74**, data relating to the determined character (e.g., the character image data itself), the position information PL and the map image data, and the date/time information DATE; and causes the received data to be transmitted from the communication part **73** to the biological exercise information display device **200**.

[0247] In an instance in which the biological exercise information display device **200** has the configuration shown in FIG. **11**, it is suitable for the data relating to the character to be the character image data. However, in an instance in which the biological exercise information display device **200** holds the character image as with the configurations shown in FIGS. **12** and **1**, the data relating to the character may be information that specifies the character image or information regarding the ascertaining of the user status for specifying the character image.

[0248] On the biological exercise information display device **200**, the system controller **201** performs, in step **S603**, the process of receiving the data relating to the character, the map image data, the position information PL, and the date/time information DATE. Specifically, the system controller **201** stores the above data received by the communication part **218** in the communication data filing part **217***d* of the memory part **217**.

[0249] The system controller **201** then performs character image display based on the received/stored data.

[0250] In this instance, the system controller **201** checks, in step S**604**, whether the map display mode is currently enabled. This is the same as the process described for step S**208** in FIG. **7**.

[0251] If the map display mode is not enabled, the display part **214** is caused to execute character image display in step S**605**. Specifically, the received/stored character image data is fed to the display part **214**, which is caused to execute character display.

[0252] If the map display mode is enabled, the display part **214** is caused to execute character image display on the map image in step S**606**. Specifically, the received/stored character image data and the map image data is fed to the display part **214**, which is caused to execute character display.

[0253] In this instance, the user of the biological exercise information display device **200** is able to know, according to the character image, the current status (status based on the most up-to-date biological information, exercise information, and diet information accumulated in the server device **70**) of their acquaintance.

[0254] Performing the above system operation allows the user of the biological exercise information display device **200** to know, from the character image display, the current status of another person who is wearing the biological exercise information transmitting device **100**.

[0255] For example, the user of the biological exercise information display device **200** can recognize, from the character image, a variety of statuses regarding an acquaintance or another person, such as whether they are currently running or are feeling unwell. Also, it is possible for a mentor to analyze the data and guide each user in a manner that suits each individual. For example, the mentor refers to the data and encourages, praises, or otherwise guides the user.

[0256] According to the description above, the current status of another person is displayed using the character image. However, the past status of another person can also be displayed.

[0257] For example, if the biological information and other information regarding the user of the biological exercise information transmitting device **100** is stored for a certain period of time in the biological exercise information database **75** of the server device **70**, by specifying a past point in time within the range in which the information is stored and causing the corresponding biological information and other information to be extracted, it is possible to display the past status of another person using a character image.

[0258] Also, in this example, the user of the biological exercise information display device **200** is able to see the status of another person whose user ID is known as for an acquaintance or due to a similar relationship. However, it is also possible to allow the status of a complete stranger, a celebrity, or a similar person to be seen using character display. For example, a configuration is possible in which a particular person consents to publicly disclose their own status, and registers on the system as such, whereby the user of the biological exercise information display device **200** is able to cause the biological exercise information display device **200** to display the status of the person who has consented to have their details disclosed, as desired.

[0259] The user may initially create their own character on the network. The character may be created by combining facial components (i.e., eyes, nose, mouth, facial profile, hairstyle, and similar components) in any manner. Since it is thereby possible to create a character according to individual choice, the user develops an emotional attachment to the character, and the user can gain enjoyment from the body shape change described below, or from a comparison between themselves and other people. This can inspire the user to persevere.

[0260] The body shape of the character may change according to the biological information (BMI value) inputted into the network by the user. The body shape of the character thereby improves due to a decrease in the BMI if lifestyle improvement is progressing well, making it possible for the user to gain a sense of achievement or encouragement upon viewing the improving body shape. Also, displaying characters representing other people generates enjoyment in viewing a variety of characters; and competitiveness arising from comparisons with other people, such as when the user is performing better than another person or is performing at a level that should be sustained regardless; making it possible to inspire the user to persevere. In Patent Citation 1, the height, weight, body fat percentage, and BMI are not items that are included as biological information.

[0261] The action/expression of the character may be displayed according to the biological information/exercise information instrumentally measured by the user and the diet information inputted into the network. Characters representing the user and other people can thereby be viewed.

[0262] The progress status of lifestyle improvement can be displayed using a character in a manner that is easy to understand so that anybody viewing the character can visually gain an understanding of the progress status. For example, with regards to the biological information/exercise information, the character can be made to jump in an incremental manner according to the total daily exercise time within a predetermined target pulse rate zone.

[0263] Also, with regards to diet information, the character may be displayed so as to incrementally increase in illumination according to whether the daily target calorie intake has been achieved.

[0264] The character may adopt a sleeping posture if neither the exercise information nor the diet information has been inputted. It is thereby possible for the user to view the action/expression of the character to understand the progress status regarding lifestyle improvement behavior (i.e., exercise or diet), allowing the user to self-review and reflect, such as when a user who did not achieve anything on a given day is inspired to perform in the future; when a user can see that although they did not exercise, they have performed well with regards to the diet; or when a user who sees their own character constantly sleeping is inspired to exercise.

[0265] The action/expression of the character and the body shape change may also be combined.

[0266] The user can thereby recognize the correlation between lifestyle improvement behavior (i.e., exercise and diet) and effect, appreciate the effectiveness of their actions, and gain encouragement and inspiration to continue to persevere. Also, the user can make a comparison with the action/expression of characters representing other people, and gain satisfaction from performing better than other people, or feel regret from not making sufficient effort or embarrassment from being seen to be doing nothing (i.e., the character is seen to be sleeping), encouraging the user to change behavior. In Patent Citation 1, a person's action status, health status, emotions, and similar statuses are displayed. However, the status of progress with regards to lifestyle improvement measures cannot be viewed, and a change in behavior does not ensue.

[0267] A method of comparing oneself with others to generate competitiveness which results in motivation is a ranking, where users are ranked using an indicator converted to numerical values. However, although this method motivates users who are ranked higher, users who are ranked lower are not motivated due to reasons such as an excessively wide gap between themselves and those in higher ranks or an aversion to being compared with others. Using characters for an indirect comparison or an expression that values individuality and that is easy to understand, rather than a direct and mechanical comparison using numerical values such as ranking, makes it possible to motivate particularly users who are poorly motivated, and cause them to change their behavior.

[0268] Points may also be awarded according to inputting of exercise information/diet information. Points may be exchanged for items for characters (such as clothes) when a given number of points has been accumulated, where the obtained items can be placed on the character as desired. The user can thereby view the appearance of characters representing other people, appreciate the efforts of other people who hold a large collection of items, gain interest in obtaining particular items, and be inspired to persevere. Also, an incentive is awarded for effort, resulting in enjoyment and encouragement. Patent Citation 1 does not describe incentives or changes to the appearance of characters.

[0269] Lifestyle-improving motivation can be inputted and displayed using the character. Other people's enthusiasm can thereby be viewed, which is associated with motivation for lifestyle improvement.

[0270] It is possible to communicate with other people through the characters. Information is thereby exchanged between those who are aiming to improve their lifestyle, and motivation is increased.

[0271] Position information obtained using GPS can be combined so that courses/locations of exercise performed by the user themselves and other people can be viewed together with the pulse rate data. Motivation for exercise is thereby increased, and a source of reference when exercise is performed is provided.

[0272] Points may also be awarded according to exercise and diet implementation status. The user can thereby understand sustained progress made by themselves or others from the number of points or items held by the character, where the items are purchased when a given number of points have been accumulated. Motivation for further effort can thereby be increased.

[0273] Exercise information regarding a character representing another person within a given period of time may be made viewable by clicking the character representing the other person.

[0274] It is thereby possible to see when and what time of day at which the other person performs exercise, and the amount of exercise performed by the other person, which the user can use as a reference in terms of their own exercise. It is possible to view information about people who have consented to having their information publically disclosed.

Effect and Modification

[0275] According to the above embodiment, the user of the biological exercise information detection display device **1** (biological exercise information display device **200**) can recognize their own status as well as that of other people through expressions and actions of characters. It is thereby possible to readily know their own status as well as that of other people in an enjoyable manner.

[0276] For example, a character display of a user's own status makes it possible to enjoy the display image.

[0277] Displaying a replayed character to display prior status makes it possible for the user to faithfully recall their own behavior or enjoy pleasant memories.

[0278] Also, by generating a character display of another person's status, the user can faithfully ascertain another person's status.

[0279] For example, the user can know the status or the current position of a friend who is running late for an appointment. Also, a parent can check the current position or the status of a child. Also, the status of a health-impaired person when they are not at home can be readily checked by a family member or another person. A variety of applications such as those described above can be imagined.

[0280] The above embodiments are not provided by way of limitation, and a variety of modifications can be envisaged as examples of device configurations or processes.

[0281] The above-described configuration of each of the biological exercise information detection display device **1**, the biological exercise information transmitting device **100**, the biological exercise information display device **200**, and the server device **70** is merely given by way of example; it being apparent that a variety of constituent elements can be added or removed according to the actual example of operation or function to be performed.

[0282] The biological exercise information processing system shown in FIG. **8** is configured so that the biological exercise information display device **200** obtains, via the server device **70**, the biological information and other information detected in the biological exercise information transmitting device **100**. However, a system configuration in which the server device **70** is not required is also possible. Specifically, it is also possible to use a system in which the biological exercise information transmitting device **100** and the biological exercise information display device **200** directly communicate with each other, wherein the biological exercise information display device **200** receives the biological information, the exercise information, the diet information, the position information, and other information detected by the biological exercise information transmitting device **100**, whereby character display based on the biological information, the exercise information, and the diet information of another person, or character display on a map image in which the position information is used, can be performed.

[0283] Although a description was given for a configuration in which the biological exercise information detection display device **1** and the biological exercise information display device **200** include a display part **14** (**214**), it is also possible for the biological exercise information detection display device **1** and the biological exercise information display device **200** to not include a display part, and for character display to be executed using a separate display device.

[0284] In terms of privacy protection and similar issues, it is appropriate that a certain degree of restriction be placed on character display based on the biological information, the exercise information, and the diet information, or position display based on the position information, in regard to another person.

[0285] For example, a configuration can be envisaged in which, in an instance where the user of the biological exercise

information display device **200** makes a request for character display or display of current position in relation to the user of the biological exercise information transmitting device **100**, the server device **70** checks the preferences on the biological exercise information transmitting device **100**, and only transmits biological information or character-related information to the biological exercise information display device **200** in an instance in which the user of the biological exercise information transmitting device **100** is shown to have consented.

[0286] A configuration is also possible in which in an instance in which the heart rate, blood pressure, or similar detected biological information is a normal value, the detected information is not used for character display, and it is only in an instance in which the value is physiologically abnormal that the corresponding biological information used in displaying the character, whereby character display is executed as a warning or a caution for the user or for another person.

[0287] According to an aspect of one embodiment, a biological exercise information display processing device, including a biological information obtaining part for obtaining biological information regarding a test subject; an exercise information obtaining part for obtaining exercise information regarding the test subject; a diet information obtaining part for obtaining diet information for the test subject; a display character obtaining part for obtaining a display character for the test subject; a display part for performing image display; and a control part for determining an expression or action of the display character based on the biological information, the exercise information, and the diet information; and performing a control so that an image display is performed on the display part according to the expression or action of the display character that has been determined.

[0288] According to the aspect described above, it is possible to present a biological exercise information display processing device in which the status of progress in improving lifestyle as described under the headings 1, 2, and 3 below is obtained from the biological information, the exercise information, and the diet information for the test subject; and displayed as a character display set up by the user themselves so as to be readily personalizable and easy to understand; whereby the test subject reviews their own progress status in a realistic manner for encouragement or reflection, or compares their own progress status with that of another person to boost competitiveness; and the test subject is able to increase their motivation and change their behavior.

[0289] The status of progress in improving lifestyle described above refers, for example, to the following.

[0290] 1. Whether action targets that have been set to improve lifestyle are being achieved. Examples include whether the calorie intake in kilocalories is within the daily target calorie intake, or, with regard to exercise, whether the test subject is walking for 20 minutes a day.

[0291] 2. The status of items regarding health management (e.g., weight, body fat percentage, BMI). An example is whether weight is decreasing.

[0292] 3. Whether actions toward improving lifestyle (e.g., exercise, diet) are being sustained.

[0293] According to the aspect of the embodiment, the biological exercise information display processing device described above, further includes a storage part for storing information; wherein upon the biological information, the exercise information, and the diet information being obtained, the control part causes the storage part to store the obtained biological information, exercise information, and diet information, or character-related information representing expressions or actions of the display character determined based on the obtained biological information, exercise information, or diet information.

[0294] According to the aspect described above, the biological information, the exercise information, and the diet information for the test subject can be stored for a certain period of time.

[0295] According to the aspect of the embodiment, the biological exercise information display processing device described above, wherein the control part retrieves the biological information, the exercise information, and the diet information, or the character-related information, from the storage part under predetermined conditions, and performs display control of the display character using the biological information, the exercise information, and the diet information, or the character-related information, that have been retrieved.

[0296] According to the aspect described above, the biological information, the exercise information, and the diet information for the test subject are stored for a certain period of time. Therefore, by specifying a past point in time within the range in which the information is stored and causing the corresponding biological information, exercise information, and diet information to be extracted, it is possible to display the past status of the test subject using the display character.

[0297] According to the aspect of the embodiment, the biological exercise information display processing device described above, wherein the biological information is information regarding at least one of a pulse rate, heart rate, height, weight, BMI, abdominal girth, body fat percentage, blood pressure, glycemia, cholesterol, neutral fat, GOT, GPT, and γ-GTP.

[0298] According to the aspect described above, the biological information regarding the test subject can be readily obtained.

[0299] According to the aspect of the embodiment, the biological exercise information display processing device described above, wherein the exercise information is information regarding at least one of an exercise time, number of steps taken, calorie expenditure, and exercise type.

[0300] According to the aspect described above, the exercise information regarding the test subject can be readily obtained.

[0301] According to the aspect of the embodiment, the biological exercise information display processing device described above, wherein the diet information is at least one of a calorie intake, diet content, meal times, diet volume, nutritional balance, and dietary routines.

[0302] According to the aspect described above, the diet information for the test subject can be readily obtained.

[0303] According to another aspect of the embodiment, a biological exercise information processing system having a biological exercise information transmitting device and a biological exercise information display processing device, the biological exercise information processing system wherein the biological exercise information transmitting device includes a biological information detection part for detecting biological information regarding a test subject; an exercise information detection part for detecting exercise information regarding the test subject; and a transmitting part for transmitting/outputting the biological information and the exercise information; the biological exercise information display

processing device includes a biological information obtaining part for obtaining the biological information regarding the test subject; an exercise information obtaining part for obtaining the exercise information regarding the test subject; a diet information obtaining part for obtaining diet information for the test subject; a display character obtaining part for obtaining a display character for the test subject; a display part for performing image display; a communication part for communicating information; and a control part for causing the communication part to execute a process for receiving the biological information and the exercise information; determining an expression or action of the display character based on the diet information and on the biological information and the exercise information received by the communication part; and performing a control so that an image display is performed on the display part according to the expression or action of the display character that has been determined.

[0304] According to the aspect described above, the user of the biological exercise information display device can know the current status of a test subject wearing the biological exercise information transmitting device using the display character image.

[0305] According to the aspect of the embodiment, the biological exercise information processing system described above, further having a server device including an accumulating part for accumulating the biological information, the exercise information, and the diet information; wherein the communication part of the biological exercise information display processing device transmits the biological information, the exercise information, and the diet information to the server device; the server device accumulates, in the accumulating part, the biological information, the exercise information, and the diet information that has been transmitted; and the communication part of the biological exercise information display processing device receives character-related information representing an expression or action of the display character, determined by the server device based on the biological information, the exercise information, and the diet information accumulated in the accumulating part.

[0306] According to the aspect described above, if the biological information and other information regarding the test subject who is wearing the biological exercise information transmitting device are stored for a certain period of time in the server device, by specifying a past point in time within the range in which the information is stored and causing the corresponding biological information and other information to be extracted, it is possible to display the past status of the test subject using a display character image.

What is claimed is:

1. A biological exercise information display processing device, comprising:

a biological information obtaining part that obtains biological information regarding a test subject;

an exercise information obtaining part that obtains exercise information regarding the test subject;

a diet information obtaining part that obtains diet information for the test subject;

a display character obtaining part that obtains a character representing the test subject;

a display part that displays the character; and

a control part that determines a point based on the exercise information and the diet information, and when a given number of points has been accumulated, performs an exchange process to exchange the points for an item of the character.

2. The biological exercise information display processing device according to claim **1**, further comprising

a storage part that stores the biological information, the exercise information, the diet information, the point, and the item.

3. The biological exercise information display processing device according to claim **2**, wherein

the control part retrieves the biological information, the exercise information, the diet information, the point, and the item, and displays the character with the item on the display part.

4. The biological exercise information display processing device according to claim **1**, wherein

the biological information is information regarding at least one of a pulse rate, heart rate, height, weight, BMI, abdominal girth, body fat percentage, blood pressure, glycemia, cholesterol, neutral fat, GOT, GPT, and γ-GTP.

5. The biological exercise information display processing device according to claim **1**, wherein

the exercise information is information regarding at least one of an exercise time, number of steps taken, calorie expenditure, and exercise type.

6. The biological exercise information display processing device according to claim **1**, wherein

the diet information is at least one of calorie intake, diet content, meal times, diet volume, nutritional balance, and dietary routines.

7. The biological exercise information display processing device according to claim **1**, wherein

the item includes clothes for the character.

8. A biological exercise information processing system comprising:

an information transmitting device; and

an information processing device,

the information transmitting device including

a biological information detection part that detects biological information regarding a test subject,

an exercise information detection part that detects exercise information regarding the test subject, and

a transmitting part that transmits the biological information and the exercise information,

the information processing device including

a communication part that obtains the biological information and the exercise information,

a diet information obtaining part that obtains diet information for the test subject,

a display character obtaining part that obtains a character representing the test subject,

a display part that displays the character, and

a control part that determines a point based on the exercise information and the diet information, and when a given number of points has been accumulated, performs an exchange process to exchange the points for an item of the character.

9. The biological exercise information display processing system according to claim **8**, wherein

the display part displays the character with the item.

10. The biological exercise information display processing system according to claim **8**, wherein

the biological information is information regarding at least one of a pulse rate, heart rate, height, weight, BMI, abdominal girth, body fat percentage, blood pressure, glycemia, cholesterol, neutral fat, GOT, GPT, and γ-GTP.

11. The biological exercise information display processing system according to claim **8**, wherein

the exercise information is information regarding at least one of an exercise time, number of steps taken, calorie expenditure, and exercise type.

12. The biological exercise information display processing system according to claim **8**, wherein

the diet information is at least one of calorie intake, diet content, meal times, diet volume, nutritional balance, and dietary routines.

13. The biological exercise information display processing system according to claim **8**, wherein

the item includes clothes for the character.

* * * * *

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摘要(译)

生物学运动信息显示处理装置包括生物信息获取部分，运动信息获取部分，饮食信息获取部分，显示字符获取部分，显示部分和控制部分。生物信息获取部分获得关于测试对象的生物信息。运动信息获取部分获得关于测试对象的运动信息。饮食信息获取部分获得测试对象的饮食信息。显示字符获取部分获得表示测试对象的字符。显示部分显示角色。控制部分基于锻炼信息和饮食信息确定点，并且当累积了给定数量的点时，执行交换处理以交换角色的项目的点。