

DESCRIPTION

Title of Invention: **GAIT INFORMATION PROCESSING SYSTEM, GAIT INFORMATION PROCESSING DEVICE, GAIT INFORMATION PROCESSING PROGRAM, AND SHOE FOR GAIT INFORMATION PROCESSING**

TECHNICAL FIELD

[0001]

The present invention relates to a gait information processing system, a gait information processing device, a gait information processing program, and a shoe for gait information processing for accurately grasping and appropriately dealing with position information and gait information of a nursing-care target person such as an elderly person and a watching target person such as a child.

BACKGROUND ART

[0002]

In recent years, a technique for grasping the position of a nursing-care target person such as an elderly person and a watching target person such as a child has been proposed. In many of such technologies, a GPS function mounted on a portable information terminal such as a smartphone is used (see, for example, Patent Literature 1).

Citation List

Patent Literature

[0003]

Patent Literature 1: JP 2023-14747 A

SUMMARY OF INVENTION

Technical Problem

[0004]

However, for an elderly person, a portable information terminal such as a smartphone requires some button operation or screen operation, and for example, it is very difficult for an elderly person or the like who needs nursing care to use the portable information terminal, and the portable information terminal cannot be used appropriately. For a child, a portable information terminal such as a smartphone is generally expensive in terms of terminal price, communication fee, and the like, and further, it is considered to be necessary to restrict to use the portable information terminal due to educational reasons and the like, and thus it may be difficult for each child to have a portable information terminal such as a smartphone.

[0005]

The position detection by the GPS function has a problem in that the accuracy of the detected position is not sufficiently high. For example, a problem arises in that an elderly person is actually at home but is detected to be on a road or the like outside the home, and a family member or the like who has confirmed the position of the elderly person becomes anxious or feels uncomfortable.

[0006]

Since the GPS function consumes a large amount of power, it is necessary to charge a smartphone or the like at least every several days when the position is detected using the GPS function at all times. In this case, for example, when the user forgets charging, the position of the target person cannot be confirmed in an emergency. Even when a GPS tracker or the like dedicated to position detection by a GPS function is used instead of a smartphone, it is necessary to charge the GPS tracker every 1 to 2 months, so that the above problem occurs.

[0007]

In the case of causing the target person to have a portable information terminal, when the target person forgets to go out with the portable information terminal, there is a problem in that the position of the target person cannot be checked. This problem is remarkable, for example, in the case of an elderly person who frequently forgets things and in the case of a child who frequently forgets things.

[0008]

Even when the position of the target person can be confirmed, there is also a problem in that it is not possible to check what state the target person is in.

[0009]

The present invention has been made in view of the above circumstances. That is, an object of the present invention is to provide a gait information processing system, a gait information processing device, a gait

information processing program, and a shoe for gait information processing with which the position and state of a target person can be detected with high power efficiency and accuracy without causing the target person to carry a portable information terminal or operate a portable information terminal.

Solution to Problem

[0010]

The above object is achieved by the following means.

[0011]

A gait information processing system includes a shoe wearable by a target person, a target person terminal embedded in a sole portion of the shoe, a detection terminal detecting the target person terminal with which communication is possible via near field wireless communication, and a server registering information transmitted from the detection terminal. The target person terminal includes an acceleration sensor, a step counting unit measuring the number of steps of the target person based on a detection result of the acceleration sensor, and a near field wireless communication unit transmitting, via near field wireless communication, identification information for identifying the target person and step count information regarding the number of steps measured within a predetermined period by the step counting unit. The detection terminal includes a detection unit detecting a communicable target person terminal, and a transmission unit acquiring the identification information and the step count information transmitted from the target person terminal and transmitting the acquired identification information and step count information to the server when the target person terminal is detected by the detection unit. The server includes an acquisition unit acquiring the identification information and the step count information transmitted from the detection terminal and information regarding a position of the detection terminal, a specification unit specifying a position of the target person terminal based on the identification information and the position of the detection terminal acquired by the acquisition unit, and an output unit outputting the position of the target person terminal specified by the specification unit and the step count information acquired at the position in association with each other.

[0012]

A gait information processing device being applied to a gait information processing system including: a target person terminal embedded in a sole portion of a shoe wearable by a target person and including an acceleration sensor, a step counting unit measuring the number of steps of the target person based on a detection result of the acceleration sensor, and a near field wireless communication unit transmitting, via near field wireless communication, identification information for identifying the target person and step count information regarding

the number of steps measured within a predetermined period by the step counting unit; and a detection terminal including a detection unit detecting the target person terminal with which communication is possible via near field wireless communication, and a transmission unit acquiring the identification information and the step count information transmitted from the target person terminal and transmitting the acquired identification information and step count information to the server when the target person terminal is detected by the detection unit, the gait information processing device including: an acquisition unit acquiring the identification information and the step count information transmitted from the detection terminal and information regarding a position of the detection terminal; a specification unit specifying a position of the target person terminal based on the identification information and the position of the detection terminal acquired by the acquisition unit; and an output unit outputting the position of the target person specified by the specification unit and the step count information acquired at the position in association with each other.

[0013]

A gait information processing program is configured to cause an information processing device to function as the gait information processing device.

[0014]

A shoe for gait information processing is wearable by a target person, and is configured by embedding a target person terminal in a sole portion. The target person terminal includes an acceleration sensor, a step counting unit measuring the number of steps of the target person based on a detection result of the acceleration sensor, and a near field wireless communication unit transmitting, via near field wireless communication, identification information for identifying the target person and step count information regarding the number of steps measured within a predetermined period by the step counting unit. The identification information and the step count information transmitted via near field wireless communication are acquired by a detection terminal for detecting the target person terminal and are transmitted to a server. A position of the target person terminal is specified based on the identification information and the step count information transmitted to the server and information regarding a position of the detection terminal, and the specified position of the target person terminal and the step count information acquired at the position are output in association with each other.

Advantageous Effects of Invention

[0015]

According to the gait information processing system of the present invention, the gait information processing system includes a shoe wearable by a target person, a target person terminal embedded in a sole

portion of the shoe, a detection terminal detecting the target person terminal with which communication is possible via near field wireless communication, and a server registering information transmitted from the detection terminal. The target person terminal measures the number of steps of the target person based on a detection result of the acceleration sensor, and transmits, via near field wireless communication, identification information for identifying the target person and step count information regarding the number of steps measured within a predetermined period by the step counting unit. The detection terminal detects a communicable target person terminal, and acquires the identification information and the step count information transmitted from the target person terminal and transmits the acquired identification information and step count information to the server when the target person terminal is detected. The server acquires the identification information and the step count information transmitted from the detection terminal and information regarding a position of the detection terminal, and specifies a position of the target person terminal based on the acquired identification information and information regarding a position of the detection terminal. The server outputs the specified position of the target person terminal and the step count information acquired at the position in association with each other. As a result, it is possible to detect and output the position and gait state of the target person with high power efficiency and accuracy without causing the target person to carry a portable information terminal or operate a portable information terminal.

BRIEF DESCRIPTION OF DRAWINGS

[0016]

Fig. 1 is a diagram illustrating a schematic configuration of a gait information processing system according to an embodiment of the present invention.

Fig. 2 is a block diagram illustrating a schematic configuration of a target person terminal.

Fig. 3 is a block diagram illustrating a schematic configuration of a detection terminal.

Fig. 4 is a block diagram illustrating a schematic configuration of a server.

Fig. 5 is a block diagram illustrating a functional configuration of the server.

Fig. 6 is a block diagram illustrating a schematic configuration of a guardian terminal.

Fig. 7 is a block diagram illustrating a schematic configuration of a manager terminal.

Fig. 8 is a sequence chart illustrating a flow of position specifying processing executed in the gait information processing system.

Fig. 9 is a view illustrating an example of a screen displaying information output by the server.

DESCRIPTION OF EMBODIMENTS

[0017]

Hereinafter, embodiments of the present invention will be described with reference to the accompanying drawings. Note that, in the description of the drawings, the same elements are denoted by the same reference numerals, and redundant description will be omitted. Dimensional ratios in the drawings are exaggerated for convenience of description, and may be different from actual ratios.

[0018]

<Configuration of gait information processing system>

Fig. 1 is a diagram illustrating a schematic configuration of a gait information processing system according to an embodiment of the present invention.

[0019]

As illustrated in Fig. 1, the gait information processing system includes a target person terminal 10, a detection terminal 20 (20a, 20b), a server 30, a guardian terminal 40, and a manager terminal 50. Hereinafter, the detection terminal 20a and the detection terminal 20b are collectively referred to as the detection terminal 20 unless otherwise distinguished.

[0020]

The target person terminal 10 communicates with the detection terminal 20 (20a, 20b) via near field wireless communication.

[0021]

The detection terminal 20 (20a, 20b) communicates with the target person terminal 10 via near field wireless communication, and is connected to the server 30 via a network via wired or wireless communication.

[0022]

The server 30 is configured to be able to communicate with the detection terminal 20 (20a, 20b), the guardian terminal 40, and the manager terminal 50 via a network.

[0023]

The guardian terminal 40 and the manager terminal 50 are connected to the server 30 via a network via wired or wireless communication. Hereinafter, each configuration will be described in detail.

[0024]

<Target person terminal 10>

The target person terminal 10 is a terminal embedded in a sole portion of a shoe of a nursing-care target person such as an elderly person and a watching target person such as a child (hereinafter, referred to as the target person).

[0025]

Fig. 2 is a block diagram illustrating a schematic configuration of a target person terminal.

[0026]

As illustrated in Fig. 2, the target person terminal 10 includes a control unit 11, a storage unit 12, a near field wireless communication unit 13, and a sensor unit 14. The respective components are communicably connected to each other via a bus.

[0027]

The control unit 11 includes a CPU (Central Processing Unit), and executes, according to a program, control of each component described above and various types of arithmetic processing.

[0028]

The storage unit 12 includes a ROM (Read Only Memory) that stores various programs and various types of data in advance and a RAM (Random Access Memory) that temporarily stores programs and data as a work region, and stores various programs and various types of data.

[0029]

The storage unit 12 stores identification information for identifying the target person terminal 10, information indicating a time interval at which the near field wireless communication unit 13 transmits the identification information, and the like.

[0030]

The near field wireless communication unit 13 outputs a signal for performing near field wireless communication using, for example, Bluetooth (registered trademark) standard, and communicates with another terminal, device, or the like existing in proximity via near field wireless communication. As a standard of near

field wireless communication, for example, Bluetooth 4.0 (also referred to as Bluetooth Low Energy or BLE) is used. This standard is suitably used in the present embodiment because it achieves significant power saving instead of not pursuing a communication speed. The near field wireless communication unit 13 performs the near field wireless communication at a relatively short time interval of about several tens of milliseconds to several seconds, for example, and transmits the identification information for identifying the target person terminal 10 to the surroundings. The time interval can be set to, for example, about 3 seconds.

[0031]

The sensor unit 14 includes various sensors such as an acceleration sensor and a gyro sensor, and detects the movement and inclination of the target person terminal 10.

[0032]

The control unit 11, as a step counting unit, measures the number of steps of the target person based on the detection result of the sensor unit 14, and acquires step count information.

[0033]

The near field wireless communication unit 13 transmits, via near field wireless communication, identification information for identifying the target person and step count information regarding the number of steps measured within a predetermined period.

[0034]

The target person terminal 10 in the present embodiment operates by a built-in battery. Since the target person terminal 10 of the present embodiment does not have a GPS function and a long-range wireless communication function and achieves power saving, the target person terminal 10 can be operated for one year or more (about 3 to 4 years) without charging by a battery having a capacity of 200 mAh to 300 mAh.

[0035]

<Detection terminal 20 (20a, 20b)>

The detection terminal 20 is a terminal that exists in a detection area where the target person (target person terminal 10) can be detected and detects the target person terminal 10 with which communication is possible via near field wireless communication. The detection terminal 20a is a fixed terminal installed at a predetermined indoor or outdoor location included in the detection area. The detection terminal 20b is a mobile terminal provided on a person, a vehicle, or the like that is a mobile body moving in a region including the detection area. Examples of the vehicle include various vehicles such as a private car, a taxi, a bus, and a train. For example, the detection terminal 20 may be configured by installing a dedicated application in a general-

purpose information terminal such as a smartphone or a tablet PC, or may be configured as a dedicated terminal having a minimum configuration as described below.

[0036]

Fig. 3 is a block diagram illustrating a schematic configuration of a detection terminal.

[0037]

As illustrated in Fig. 3, the detection terminal 20 includes a control unit 21, a storage unit 22, a communication unit 23, a detection unit 24, an operation display unit 25, and a sound input/output unit 26. The respective components are communicably connected to each other via a bus. Since the control unit 21 and the storage unit 22 of the detection terminal 20 have the same configurations as the control unit 11 and the storage unit 12 of the target person terminal 10, respectively, the description thereof will be omitted.

[0038]

The communication unit 23 is a configuration for communicating with other terminals, devices, and the like via a network. The communication unit 23 transmits and receives various types of information to and from the server 30, for example.

[0039]

The detection unit 24 is configured to detect the target person terminal 10 with which communication is possible via near field wireless communication such as Bluetooth described above. As described above, the target person terminal 10 performs communication via near field wireless communication by the near field wireless communication unit 13. For example, when the identification information transmitted by the near field wireless communication unit 13 of the target person terminal 10 is received, the detection unit 24 can detect the target person terminal 10 as the communicable target person terminal 10.

[0040]

The operation display unit 25 is, for example, a touch panel type display, and displays various types of information and receives various inputs.

[0041]

The sound input/output unit 26 includes a microphone, a sound input terminal, or the like for inputting a sound, and a speaker, a sound output terminal, or the like for outputting a sound.

[0042]

When the target person terminal 10 is detected by the detection unit 24, the control unit 21 acquires the identification information and the step count information transmitted from the target person terminal 10, and transmits, as a transmission unit, the acquired identification information and step count information to the server 30.

[0043]

Since the detection terminal 20a is a fixed terminal, the information regarding a position of each detection terminal 20a is stored in advance in the storage unit 32 of the server 30 in association with the information for identifying the detection terminal 20a. When the identification information of the target person terminal 10 detected by the detection unit 24 is transmitted to the server 30, the detection terminal 20a also transmits information for identifying the detection terminal 20a to the server 30. As a result, when the identification information of the target person terminal 10 is received from the detection terminal 20a, the server 30 can acquire information regarding a position of the detection terminal 20a from the storage unit 32 using the information for identifying the detection terminal 20a received together.

[0044]

On the other hand, since the detection terminal 20b is a mobile terminal, the information regarding a position of each detection terminal 20b is acquired by the GPS function of each detection terminal 20b based on a signal from the GPS satellite. When the identification information of the target person terminal 10 detected by the detection unit 24 is transmitted to the server 30, the detection terminal 20b also transmits information indicating the position of the detection terminal 20b. As a result, when the identification information of the target person terminal 10 is received from the detection terminal 20b, the server 30 can acquire the information indicating the position of the detection terminal 20b based on the information received together.

[0045]

For example, when the detection terminal 20b, which is a mobile terminal, is configured by a smartphone, a tablet PC, or the like, the detection terminal 20 can also be used as the guardian terminal 40 and the manager terminal 50 described later.

[0046]

The detection terminal 20a also functions as a signage panel (information display terminal) in a spot or a station for the target person to browse various types of information such as identification information and step count information transmitted from the target person terminal 10 of the target person and ranking information of number of steps transmitted from the server 30.

[0047]

In this case, the detection terminal 20a is provided with a seat on which the target person is able to sit, and the seat is provided with an antenna for receiving a radio wave of near field wireless communication from the target person terminal 10. The seat may be any seat as long as the position of the target person can be fixed within a predetermined range by the target person sitting or locating on the seat, and may be, for example, a mat, a panel, a box, an area partitioned by a marker, or an area irradiated with a light or the like.

[0048]

When information such as the identification information is received from the plurality of target person terminals 10, the detection terminal 20a causes the operation display unit 25 to display identification information, step count information, and the like transmitted from the target person terminal 10 having the strongest strength of the received radio wave. As a result, even when there are a plurality of target persons in the vicinity of the detection terminal 20a, information transmitted from the target person terminal 10 of the target person sitting on the seat is reliably displayed, so that the target person can easily and reliably grasp whose information is displayed.

[0049]

<Server 30>

The server 30 is an information processing device, for example, operated by a provider of a service that acquires and provides gait information. In the present embodiment, the server 30 functions as the gait information processing device.

[0050]

Fig. 4 is a block diagram illustrating a schematic configuration of a server. Fig. 5 is a block diagram illustrating a functional configuration of the server.

[0051]

As illustrated in Fig. 4, the server 30 includes a control unit 31, a storage unit 32, and a communication unit 33. The respective components are communicably connected to each other via a bus. Since the configurations of the control unit 31, the storage unit 32, and the communication unit 33 of the server 30 are the same as those of the control unit 21, the storage unit 22, and the communication unit 23 of the detection terminal 20, respectively, the description thereof will be omitted.

[0052]

As illustrated in Fig. 5, the control unit 31 functions as an acquisition unit 311, a specification unit 312, an output unit 313, and an estimation unit 314 by reading a program and executing processing.

[0053]

The acquisition unit 311 acquires the identification information and the step count information transmitted from the detection terminal 20 and information regarding a position of the detection terminal 20.

[0054]

The specification unit 312 specifies a position of the target person terminal 10 based on the identification information acquired by the acquisition unit 311 and the information regarding a position of the detection terminal 20.

[0055]

The output unit 313 outputs the position of the target person terminal 10 specified by the specification unit 312 and step count information acquired at the position in association with each other.

[0056]

The estimation unit 314 estimates an outdoor stay time during which the target person stays outdoors based on information regarding a transition of the position of the target person and the step count information.

[0057]

Note that the output unit 313 may calculate and output the number of steps and time required when the target person moves between a first position and a second position, based on time during which the target person is located at the first position and first step count information acquired at the first position, and time during which the target person is located at the second position and second step count information acquired at the second position.

[0058]

The acquisition unit 311 may acquire a plurality of pieces of identification information and a plurality of pieces of step count information transmitted from a plurality of target person terminals 10. In this case, the output unit 313 may generate and output ranking information indicating ranking of the number of steps of the target person in a predetermined group including a plurality of the target persons corresponding to the plurality of pieces of identification information.

[0059]

The acquisition unit 311 may further acquire weather information regarding weather or a weather forecast. In this case, the estimation unit 314 may estimate the amount of ultraviolet light that the target person has been exposed to sunlight based on the outdoor stay time and the weather information.

[0060]

The output unit 313 may output notification information for notifying the target person when the amount of ultraviolet light estimated by the estimation unit 314 is less than a predetermined threshold value.

[0061]

The output unit 313 may set the notification information in association with the identification information of the target person. In this case, the detection terminal 20 checks whether the notification information is set in association with the identification information when the identification information is acquired from the target person terminal 10, and may output the notification information to the target person when the notification information is set.

[0062]

The acquisition unit 311 may further acquire location information regarding an address or residence of the target person. In this case, the estimation unit 314 may estimate whether or not the target person is going out based on the location information, information regarding a position of the target person, and the step count information.

[0063]

The storage unit 32 stores, as information regarding the target person and the target person terminal 10, the identification information of the target person terminal 10, attribute information such as a name and an age of the target person who holds the target person terminal 10, attribute information such as a name and a contact address of a guardian of the target person, and the like, in association with one another.

[0064]

The storage unit 32 stores, as information regarding the detection terminal 20, the identification information of the detection terminal 20, attribute information indicating, for example, whether the detection terminal 20 is a fixed terminal or a mobile terminal, information regarding a position of the detection terminal 20 in the case of a fixed terminal, and the like, in association with one another.

[0065]

The storage unit 32 also stores various types of information acquired by the acquisition unit 311, information regarding a position specified by the specification unit 312, step count information acquired at the position, the ranking information generated by the output unit 313, various types of information estimated by the estimation unit 314, and the like.

[0066]

<Guardian terminal 40>

The guardian terminal 40 is a terminal that acquires information regarding a position of the target person terminal 10 by causing the target person to carry the target person terminal 10, and is used by a guardian who protects or manages the target person. The guardian terminal 40 receives a notification from the server 30 to notify the guardian, and accesses the server 30 to acquire and display information stored in the server 30. The guardian terminal 40 is also used as the detection terminal 20b, for example, by installing a dedicated application.

[0067]

Fig. 6 is a block diagram illustrating a schematic configuration of a guardian terminal.

[0068]

As illustrated in Fig. 6, the guardian terminal 40 includes a control unit 41, a storage unit 42, a communication unit 43, an operation display unit 44, and a sound input/output unit 45. The respective components are communicably connected to each other via a bus. Since the configurations of the control unit 41, the storage unit 42, the communication unit 43, the operation display unit 44, and the sound input/output unit 45 of the guardian terminal 40 are the same as those of the control unit 21, the storage unit 22, the communication unit 23, the operation display unit 25, and the sound input/output unit 26 of the detection terminal 20, respectively, the description thereof will be omitted.

[0069]

<Manager terminal 50>

The manager terminal 50 is a terminal used by a manager of a service that acquires and provides gait information.

[0070]

Fig. 7 is a block diagram illustrating a schematic configuration of a manager terminal.

[0071]

As illustrated in Fig. 7, the manager terminal 50 includes a control unit 51, a storage unit 52, a communication unit 53, an operation display unit 54, and a sound input/output unit 55. The respective components are communicably connected to each other via a bus. Since the configurations of the control unit 51, the storage unit 52, the communication unit 53, the operation display unit 54, and the sound input/output unit 55 of the manager terminal 50 are the same as those of the control unit 41, the storage unit 42, the communication

unit 43, the operation display unit 44, and the sound input/output unit 45 of the guardian terminal 40, respectively, the description thereof will be omitted.

[0072]

Note that each of the target person terminal 10, the detection terminal 20, the server 30, the guardian terminal 40, and the manager terminal 50 may include a component other than the above-described components, or may not include part of the above-described components.

[0073]

<Outline of Processing>

Next, a flow of processing in the gait information processing system will be described.

[0074]

Fig. 8 is a sequence chart illustrating a flow of processing executed in the gait information processing system. Fig. 9 is a view illustrating an example of a screen for displaying information output by the server.

[0075]

<Processing in target person terminal 10>

First, processing of the target person terminal 10 will be described.

[0076]

As illustrated in Fig. 8, the target person terminal 10 measures the number of steps of the target person based on the output of the sensor unit 14 (step S101). The number of steps can be measured by a known method using an acceleration sensor, a gyro sensor, or the like.

[0077]

Subsequently, the target person terminal 10 determines whether or not a predetermined time has elapsed (step S102). As the predetermined time, for example, a time of about several seconds can be appropriately set according to the frequency at which the target person terminal 10 transmits information by near field wireless communication.

[0078]

When the predetermined time has not elapsed (step S102: NO), the target person terminal 10 continues the step count measurement processing in step S101.

[0079]

When the predetermined time has elapsed (step S102: NO), the target person terminal 10 outputs a signal for performing the near field wireless communication, and transmits, via near field wireless communication, the identification information for identifying the target person terminal 10 and step count information indicating the measured number of steps to the surroundings (step S103). The step count information includes information indicating the number of steps within a predetermined period, information indicating the cumulative number of steps from a predetermined starting point, and the like.

[0080]

The target person terminal 10 repeatedly executes the processing of steps S101 to S103.

[0081]

<Processing of information acquisition and information transmission in detection terminal 20>

Next, processing of information acquisition and information transmission in the detection terminal 20 will be described.

[0082]

The detection terminal 20 detects the communicable target person terminal 10, and determines whether or not information (identification information and step count information) is acquired from the target person terminal 10 (step S201). When the information is not acquired from the target person terminal 10 (step S201: NO), the detection terminal 20 continues the processing for detecting the target person terminal 10 and acquiring the information until the information can be acquired.

[0083]

When the identification information and the step count information transmitted from the target person terminal 10 are acquired (step S201: YES), the detection terminal 20 transmits the acquired information to the server 30 (step S202). Note that the detection terminal 20 acquires only the identification information from the target person terminal 10, and may transmit only the identification information to the server 30 when the step count information cannot be acquired.

[0084]

Here, when the detection terminal 20 is a fixed terminal (detection terminal 20a), the detection terminal 20a transmits information for identifying the detection terminal 20a to the server 30 together with the identification information. Here, this is because the information regarding a position of each detection terminal

20a is stored in advance in the storage unit 32 of the server 30 in association with the information for identifying the detection terminal 20a. As a result, when the identification information of the target person terminal 10 is received from the detection terminal 20a, the server 30 can acquire information regarding a position of the detection terminal 20a from the storage unit 32 using the information for identifying the detection terminal 20a received together.

[0085]

On the other hand, when the detection terminal 20 is a mobile terminal (detection terminal 20b), the detection terminal 20b uses the GPS function to acquire information regarding a position of each detection terminal 20b based on a signal from the GPS satellite, and transmits the information to the server 30 together with the identification information. As a result, when the identification information of the target person terminal 10 is received from the detection terminal 20b, the server 30 can acquire the information indicating the position of the detection terminal 20b based on the information received together.

[0086]

<Processing in server 30>

Next, processing in the server 30 will be described.

[0087]

The server 30 determines whether or not information such as the identification information of the target person terminal 10 is received from the detection terminal 20 (step S301).

[0088]

When information is not received (step S301: NO), the server 30 waits until information is received.

[0089]

When information is received (step S301: YES), the server 30 specifies a position of the target person terminal 10 corresponding to the identification information based on the acquired information, and outputs gait information regarding gait of the target person (step S302).

[0090]

Specifically, the server 30 registers the acquired identification information of the target person terminal 10, position information indicating the specified position, step count information acquired at the position, time information indicating time when each piece of information is acquired, time when each piece of information is registered, and the like in the storage unit 32 in association with each other. The server 30 checks information

registered in the storage unit 32 in association with the identification information, and when there is information registered within a predetermined period, the server executes processing of calculating the number of steps and time required for movement. Specifically, the server 30 acquires time during which the target person is located at a certain position (first position) and step count information (first step count information) acquired at the position, and time during which the target person is located at another position (second position) and step count information (second step count information) acquired at the position. For example, the server 30 can calculate the number of steps required when the target person moves from the first position to the second position by calculating a difference between the first step count information and the second step count information, and output the number of steps as the gait information. Similarly, the server 30 can calculate the time required when the target person moves between the first position and the second position by calculating a difference between the time during which the target person is located at the first position and the time during which the target person is located at the second position, and output the time as the gait information. As the gait information, the server 30 may calculate an average speed of gait of the target person based on a moving distance and a moving time, may calculate an average pitch of the target person based on step count information and a moving time, or may calculate an average stride of the target person based on a moving distance and step count information.

[0091]

The server 30 outputs gait information using, for example, a screen as illustrated in Fig. 9(a). On the screen of Fig. 9(a), a moving distance, a moving time, the number of steps, an average speed, an average pitch, an average stride, and the like when Mr. A who is the target person moves from a certain point to a certain point are output as the gait information. A proposal such as “LET'S WALK A LITTLE FASTER NEXT TIME” may also be displayed according to the result of comparing the predetermined threshold value with the calculated gait information.

[0092]

Subsequently, the server 30 executes processing of generating ranking information of the number of steps (step S303). Specifically, the server 30 acquires a plurality of pieces of identification information and a plurality of pieces of step count information transmitted from the plurality of target person terminals 10. The server 30 generates and outputs ranking information indicating ranking of the number of steps of the target person in a predetermined group including a plurality of the target persons corresponding to the plurality of pieces of identification information. Here, as the predetermined group, for example, various types of groups can be set, for example, for each region such as prefecture, city, ward, town, or village where a target person lives or locates, each attribute such as age group, each affiliation destination such as workplace, school, team, or hobby circle, and the like. For example, in the storage unit 32, group identification information indicating

which group the target person belongs to is stored in association with each identification information of the target person. A plurality of pieces of group identification information may be associated with one piece of identification information. The ranking information is, for example, information in which a plurality of target persons belonging to each group are arranged in descending order of the number of steps measured within a predetermined period.

[0093]

The server 30 outputs ranking information using, for example, a screen as illustrated in Fig. 9(b). On the screen of Fig. 9(b), the name and the number of steps of the target person are displayed in a ranking format in descending order of the number of steps measured on that day for each predetermined group such as the whole country, the region, and the group. For example, the target person can transmit a message to another target person displayed in the ranking via the screen of Fig. 9(b). Description or proposal such as “THE NUMBER OF STEPS OF MR. A IS XXX STEPS AND IS RANKED XXXTH NATIONWIDE. THERE ARE XXX STEPS LEFT TO XXXTH PLACE” may also be displayed.

[0094]

Subsequently, the server 30 executes estimation processing of estimating the outdoor stay time of the target person, the amount of ultraviolet light that the target person has been exposed to sunlight, whether or not the target person is going out, and the like (step S304).

[0095]

Specifically, the server 30 estimates the outdoor stay time, which is the time during which the target person stays outdoors, based on information regarding a transition of the position of the target person acquired from the information regarding a position of the target person, and the step count information. For example, the server 30 may determine whether or not the target person stays outdoors basically based on information regarding a position of the target person or a transition of the position, and may further utilize the step count information in order to reinforce the accuracy of the determination. For example, when the position of the target person moves from one place to another place, if the number of steps corresponding to the moving distance is recorded as the step count information, it can be estimated that the target person has moved by walking outdoors, and the moving time can be estimated as the outdoor stay time. On the other hand, if the number of steps corresponding to the moving distance is not recorded as the step count information, it can be estimated that the target person has moved by a vehicle such as an automobile, a bus, or a train, and the moving time can be estimated as not the outdoor stay time.

[0096]

The server 30 acquires weather information regarding weather or a weather forecast from an external server or the like connectable via a network, and estimates the amount of ultraviolet light that the target person has been exposed to sunlight based on the outdoor stay time estimated as described and the weather information. For example, when the weather is fine during the outdoor stay time, the amount of ultraviolet light that the target person has been exposed to sunlight can be estimated by multiplying the amount of ultraviolet light taken per unit time by the outdoor stay time. When it is rainy or cloudy in a certain time zone of the outdoor stay time, the amount of ultraviolet light that the target person has been exposed to sunlight can be estimated, for example, by multiplying the amount of ultraviolet light taken per unit time in a time zone of fine weather, by excluding a time zone of rainy weather from the outdoor stay time, or by performing calculation with applying a predetermined multiplication coefficient or the like in a time zone of cloudy weather.

[0097]

When the amount of ultraviolet light estimated as described above is less than a predetermined threshold value, the server 30 may output notification information for notifying the target person. In this case, the server 30 sets the notification information in association with the identification information of the target person, and stores the notification information in the storage unit 32. As described later, the detection terminal 20 accesses the server 30 and checks whether the notification information is set in association with the identification information when an instruction to display information from the target person is received and the identification information is acquired from the target person terminal 10, and outputs the notification information to the target person when the notification information is set.

[0098]

The server 30 outputs information regarding the amount of ultraviolet light estimated using a screen as illustrated in Fig. 9(c), for example. On the screen of Fig. 9(c), the outdoor stay time of Mr. A of the target person on that day and the estimated value of the time of exposure to sunlight are displayed. A value obtained by converting the time during which Mr. A has been exposed to sunlight into the amount of ultraviolet light that Mr. A has been exposed to sunlight may be displayed. In the example of Fig. 9(c), since the amount of ultraviolet light that Mr. A has been exposed to is less than a predetermined threshold value, the notification information for Mr. A is generated and displayed. Specifically, a value (XX minutes) obtained by converting the insufficient amount of ultraviolet light into the time of exposure to sunlight, that is, the outdoor stay time is generated as notification information and is displayed as guidance of “WALK OUTDOORS FOR XX MORE MINUTES”.

[0099]

The server 30 may further acquire location information regarding an address or residence of the target person, and estimate whether or not the target person is going out based on the location information, information regarding a position of the target person, and the step count information. For example, the server 30 can estimate that the target person is going out from a predetermined place such as home when the position indicated by the information regarding the position is away from the place indicated by the location information of the target person, or when it is detected that the target person walks with shoes based on the step count information. As a result, for example, a staff member or the like who performs home-visit nursing care can check in advance whether or not the target person is at home, and it is possible to avoid a situation in which the target person is out and the care cannot be performed even though the nursing staff member has visited.

[0100]

The server 30 stores, in the storage unit 32, various types of information calculated, generated, and estimated in the processing of steps S302 to S304, and outputs the stored various types of information based on a request from the detection terminal 20, the guardian terminal 40, the manager terminal 50, or the like (step S305). As a result, for example, a family member who uses the guardian terminal 40 or the manager terminal 50 at a distant place, a nursing staff member, a manager of a system service, or the like can grasp the gait state, the activity state, the going-out state, the health state, or the like of the target person in more detail.

[0101]

<Processing of information display in detection terminal 20>

Next, processing of information display in the detection terminal 20 will be described.

[0102]

The detection terminal 20 determines whether or not an instruction to display information is received (step S203). The instruction to display information is automatically received, for example, when the detection terminal 20 acquires the identification information and the step count information transmitted from the target person terminal 10. Alternatively, the instruction to display information may be received by an operation of the operation display unit 25 or a voice input to the sound input/output unit, or may be transmitted from another terminal or the like via the communication unit 23 or the like.

[0103]

When the instruction to display information is not received (step S203: NO), the detection terminal 20 returns to the processing of step S201.

[0104]

When the instruction to display information is received (step S203: YES), the detection terminal 20 specifies target identification information that is a target for displaying information (step S204). For example, when the detection terminal 20 acquires the identification information of one target person terminal 10 within a predetermined processing time, the identification information is specified as the identification information of the target for displaying information. Alternatively, when the detection terminal 20 acquires the identification information of the plurality of target person terminals 10 within a predetermined processing time, the identification information transmitted from the target person terminal 10 having the strongest strength of the radio wave received by the detection terminal 20 is specified as the identification information of the target for displaying information.

[0105]

The detection terminal 20 acquires, from the server 30, various types of information such as gait information, ranking information, estimation information of the amount of ultraviolet light taken, and notification information for the identification information of the target for displaying information (steps S205 to S207).

[0106]

The detection terminal 20 causes the operation display unit 25 to display various types of information based on the information acquired from the server 30 (step S208). Specifically, the detection terminal 20 causes the operation display unit 25 to display screens illustrated in Figs. 9(a) to 9(c). As a result, the target person can check detailed information regarding his/her gait, various rankings regarding gait, the time of exposure to sunlight, various advices regarding gait and health, and the like only by standing in the vicinity of the detection terminal 20a set as, for example, a spot, a station, or the like, and for example, the daily walk can be made more enjoyable and meaningful, and health can be further improved.

[0107]

The information as illustrated in Figs. 9(a) to 9(c) and information regarding whether or not the target person is going out can also be displayed on the guardian terminal 40, the manager terminal 50, and the like having appropriate access authority. Therefore, a family member in a distant place, a staff member in charge of nursing care, or the like can also check the situation of the target person such as gait, exercise, or life in detail, and thus can lead to an appropriate response to the target person, and can also promote communication with the target person.

[0108]

Note that the present invention is not limited only to the above-described embodiments, and various modifications can be made within the scope of claims.

[0109]

For example, in the above embodiment, an example in which each component of the server 30 and the like included in the gait information processing system is configured as one independent device has been described, but the configuration of the device is not limited thereto. Each component may include a plurality of devices, or may be included in a device having another function. For example, the server 30 may be configured to be distributed on a cloud server that includes a large number of servers. Alternatively, an application having the function of the server 30 may be installed in each device such as the detection terminal 20, the guardian terminal 40, and the manager terminal 50, and the processing of the server 30 may be executed in each device.

[0110]

The processing in the gait information processing system according to the embodiment described above may include steps other than the steps described above, or may not include some of the steps described above. The order of the steps is not limited to the above-described embodiment. Each step may be combined with another step and executed as one step, may be included in another step and executed, or may be divided into a plurality of steps and executed.

[0111]

Means and methods for performing various processes in the gait information processing system according to the above-described embodiment can be implemented by either a dedicated hardware circuit or a programmed computer. The program may be provided by, for example, a computer-readable recording medium such as a flexible disk and a CD-ROM, or may be provided online via a network such as the Internet. In this case, the program recorded in the computer-readable recording medium is usually transferred to and stored in a storage unit such as a hard disk. The program may be provided as independent application software, or may be incorporated in software of the device as one function of the gait information processing system.

[0112]

The gait information processing system of the present embodiment configured as described above includes a shoe wearable by a target person, a target person terminal 10 embedded in a sole portion of the shoe, a detection terminal 20 detecting the target person terminal 10 with which communication is possible via near field wireless communication, and a server 30 registering information transmitted from the detection terminal 20. The target person terminal 10 measures the number of steps of the target person based on a detection result

of the acceleration sensor, and transmits, via near field wireless communication, identification information for identifying the target person and step count information regarding the number of steps measured within a predetermined period. The detection terminal 20 acquires the identification information and the step count information transmitted from the target person terminal 10 and transmits the acquired identification information and step count information to the server 30 when the communicable target person terminal 10 is detected. The server 30 acquires the identification information and the step count information transmitted from the detection terminal 20 and information regarding a position of the detection terminal 20, specifies a position of the target person terminal 10 based on the acquired identification information and information regarding a position of the detection terminal 20, and outputs the specified position of the target person terminal 10 and step count information acquired at the position in association with each other.

[0113]

As a result, it is possible to detect and output the position and gait state of the target person with high power efficiency and accuracy without causing the target person to carry a portable information terminal or operate a portable information terminal. Conventionally, there is a device that can check the number of steps and position information. However, for example, in the case of a device such as a smartphone or a GPS tracker equipped with a GPS function or the like, there is a problem in that it is difficult to set and operate the device, and it is difficult for an elderly person or a child to handle the device. Charging is required frequently, and there is a problem in that it is troublesome to perform operations such as installation of a charger, loading of a charger at home, and removal from a charger when going out. Since it is necessary to carry the device consciously when going out or the like, when the target person forgets to go out with the device, there is a problem in that neither the gait information nor the position of the target person can be checked. This problem is remarkable, for example, in the case of an elderly person who frequently forgets things and in the case of a child who frequently forgets things. In the gait information processing system of the present embodiment, the position information and the gait information are detected only by the target person wearing the shoes in which the target person terminal 10 is embedded and going out. Therefore, it is possible to accurately detect and output the position and gait state of the target person without causing the target person to carry a portable information terminal or operate a portable information terminal. Since the target person terminal 10 does not have a GPS function and a long-range wireless communication function, the power efficiency is good, and the position and gait state of the target person can be detected and output without charging for a long period of time.

[0114]

The target person terminal 10 does not have a GPS function and a long-range wireless communication function, and is operable for one year or more by a battery having a capacity of 200 mAh to 300 mAh. As a result, the target person terminal 10 can be used for a long period of time simply by wearing shoes without

performing charging work of the target person terminal 10 or turning on and off work of a power source, and various types of information and the like are provided by the gait information processing system. Therefore, the target person can easily and continuously utilize the gait information processing system.

[0115]

The server 30 calculates and outputs the number of steps and time required when the target person moves between a first position and a second position, based on time during which the target person is located at the first position and first step count information acquired at the first position, and time during which the target person is located at the second position and second step count information acquired at the second position. As a result, the situation of gait of the target person can be grasped in detail. More specifically, a walking distance, a walking time, the number of steps, an average speed, an average pitch, an average stride, and the like of the target person can be grasped as the gait information. In addition to normal gait, for example, when the target person participates in a marathon race, a long-distance road relay, a walk race, or the like, or jogging or walking as training, it is possible to check a detailed situation of running or walking, which can be effective in analysis of the current situation and improvement of ability, performance, and the like.

[0116]

The detection terminal 20 is installed at a predetermined indoors or outdoors location, and causes information transmitted from the target person terminal 10 to be displayed. As a result, the detection terminal 20 can also function as a signage panel in a spot or station where the target person gathers to check information regarding gait. As a result, it is possible to create a place where people gather in a region for a healthy purpose such as checking and sharing of gait information and the like, leading to the activation of the region and the construction of a healthy society.

[0117]

The server 30 acquires a plurality of pieces of identification information and a plurality of pieces of step count information transmitted from the plurality of target person terminals 10, and generates and outputs ranking information indicating ranking of the number of steps of the target person in a predetermined group including a plurality of the target persons corresponding to the plurality of pieces of identification information. The detection terminal 20 acquires the ranking information from the server 30, and causes the ranking in a predetermined group of the target person corresponding to the identification information to be displayed when the identification information is received from the target person terminal 10. As a result, even when each target person is walking alone, for example, taking a walk, walking, or the like, the target person can check the ranking among users all over the country, users in the region, users of the same age, and users having different attributes, and thus can actively approach walking with a sense of competition and a sense of goal. A sense of achievement

can be obtained by, for example, increasing the ranking. Since the situation of gait can be shared with other users, feeling alone is suppressed, and communication regarding gait between users can also be promoted. Since users can check gait information of each other, it is possible to stimulate each other or promote competition, and as a result, it is possible to promote walking. Walking becomes a common approach or topic, and for example, communication between elderly persons can be promoted or enriched. As a result, it is possible to solve problems such as enrichment of life, worth living, connection with society, loneliness, and health, which are major concerns and anxiety of elderly persons.

[0118]

The detection terminal 20 includes a seat on which the target person is able to sit, and the seat includes an antenna for receiving a radio wave of near field wireless communication from the target person terminal 10. When the identification information is received from the plurality of target person terminals 10, the detection terminal 20 causes information regarding the identification information transmitted from the target person terminal 10 having the strongest strength of the received radio wave to be displayed. As a result, the target person can easily check the information regarding his/her gait only sitting on the seat provided in the detection terminal 20. Even when there are a plurality of target persons in the vicinity of the detection terminal 20, it is clear that the information of the target person sitting on the seat is displayed, so that each target person can immediately grasp whose information is displayed.

[0119]

The server 30 estimates an outdoor stay time during which the target person stays outdoors based on information regarding a transition of the position of the target person and the step count information. The server 30 further acquires weather information regarding weather or a weather forecast, and estimates the amount of ultraviolet light that the target person has been exposed to sunlight based on the outdoor stay time and the weather information. As a result, the target person can clearly grasp the time during which the target person stays outdoors as a numerical value. The guardian or the like of the target person can also grasp the time during which the target person stays outdoors, and even when the guardian or the like is far away, the guardian or the like can grasp that the target person is out, the time during which the target person stays outdoors, or the like, and can grasp the state of the target person. The target person can grasp an estimated value of the amount of ultraviolet light that the target person has been exposed to sunlight. It is known that exposure to sunlight greatly contributes to the production of vitamin D, the secretion of serotonin, and the like in the human body, and has various favorable effects on the mental and physical health of human beings. For example, it is known that the amount of ultraviolet light taken from sunlight affects bone density. Therefore, when the amount of ultraviolet light taken from sunlight can be estimated, it can be useful for prevention and improvement of osteoporosis, which is a major problem in elderly persons, for example. It is known that the production of vitamin D by

exposure to sunlight is also effective for improvement of brain function, prevention of dementia, improvement of immunity, prevention of depression, prevention of insomnia, and the like. Therefore, when the amount of ultraviolet light taken from sunlight can be estimated, it can also be useful for prevention and improvement of dementia, depression, insomnia, and the like, which are major problems in elderly persons, for example.

[0120]

When the amount of ultraviolet light estimated is less than a predetermined threshold value, the server 30 outputs notification information for notifying the target person. Then, the server 30 sets the notification information in association with the identification information of the target person. The detection terminal 20 accesses the server 30 and checks whether the notification information is set in association with the identification information when an instruction to acquire the identification information from the target person terminal and display information is received, and outputs the notification information to the target person when the notification information is set. As described above, the amount of ultraviolet light taken from sunlight affects bone density, brain function, mental health, and the like, and when the amount of ultraviolet light taken from sunlight is small, there is a risk that various adverse effects may occur on the mental and physical health. Therefore, for example, when the amount of ultraviolet light that is estimated to have been taken by the target person in a certain one day is less than a predetermined threshold value, by notifying the target person to promote sunbathing, the risk of occurrence of various adverse effects on the mental and physical health can be reduced.

[0121]

The server 30 further acquires location information regarding an address or residence of the target person, and estimates whether or not the target person is going out based on the location information, information regarding a position of the target person, and the step count information. As a result, for example, a staff member or the like who performs home-visit nursing care can check in advance whether or not the target person is at home, and it is possible to avoid a situation in which the target person is out and the care cannot be performed even though the nursing staff member has visited.

[0122]

The present application is based on Japanese Patent Application No. 2023-183046 filed on October 25, 2023, the disclosure content of which is incorporated herein by reference in its entirety.

Reference Signs List

[0123]

10	Target person terminal
11	Control unit
12	Storage unit
13	Near field wireless communication unit
14	Sensor unit
20, 20a, 20b	Detection terminal
21	Control unit
22	Storage unit
23	Communication unit
24	Detection unit
25	Operation display unit
26	Sound input/output unit
30	Server
31	Control unit
311	Acquisition unit
312	Specification unit
313	Output unit
314	Estimation unit
32	Storage unit
33	Communication unit
40	Guardian terminal
41	Control unit
42	Storage unit
43	Communication unit

44	Operation display unit
45	Sound input/output unit
50	Manager terminal
51	Control unit
52	Storage unit
53	Communication unit
54	Operation display unit
55	Sound input/output unit

CLAIMS

[Claim 1]

A gait information processing system comprising:

a shoe wearable by a target person;

a target person terminal embedded in a sole portion of the shoe;

a detection terminal detecting the target person terminal with which communication is possible via near field wireless communication; and

a server registering information transmitted from the detection terminal, wherein

the target person terminal includes:

an acceleration sensor;

a step counting unit measuring the number of steps of the target person based on a detection result of the acceleration sensor; and

a near field wireless communication unit transmitting, via near field wireless communication, identification information for identifying the target person and step count information regarding the number of steps measured within a predetermined period by the step counting unit,

the detection terminal includes:

a detection unit detecting the target person terminal with which communication is possible; and

a transmission unit acquiring the identification information and the step count information transmitted from the target person terminal and transmitting the acquired identification information and step count information to the server when the target person terminal is detected by the detection unit, and

the server includes:

an acquisition unit acquiring the identification information and the step count information transmitted from the detection terminal and information regarding a position of the detection terminal;

a specification unit specifying a position of the target person terminal based on the identification information and the position of the detection terminal acquired by the acquisition unit; and

an output unit outputting the position of the target person terminal specified by the specification unit and the step count information acquired at the position in association with each other.

[Claim 2]

The gait information processing system according to claim 1, wherein the target person terminal does not have a GPS function and a long-range wireless communication function, and is operable for one year or more by a battery having a capacity of 200 mAh to 300 mAh.

[Claim 3]

The gait information processing system according to claim 1 or 2, wherein the output unit calculates and outputs the number of steps and time required when the target person moves between a first position and a second position, based on time during which the target person is located at the first position and first step count information acquired at the first position, and time during which the target person is located at the second position and second step count information acquired at the second position.

[Claim 4]

The gait information processing system according to claim 1 or 2, wherein the detection terminal is installed at a predetermined indoors or outdoors location, and

further includes a display unit displaying information transmitted from the target person terminal.

[Claim 5]

The gait information processing system according to claim 4, wherein the acquisition unit acquires a plurality of pieces of the identification information and a plurality of pieces of the step count information from a plurality of the target person terminals,

the output unit generates and outputs ranking information indicating ranking of the number of steps of the target person in a predetermined group including a plurality of the target persons corresponding to the plurality of pieces of the identification information, and

the detection terminal acquires the ranking information from the server, and causes the display unit to display ranking of the target person corresponding to the identification information in the predetermined group when the identification information is received from the target person terminal.

[Claim 6]

The gait information processing system according to claim 5, wherein the detection terminal includes a seat on which the target person is able to sit,

the seat includes an antenna for receiving a radio wave of near field wireless communication from the target person terminal, and

the detection terminal causes the display unit to display information regarding the identification information transmitted from the target person terminal having the strongest strength of the received radio wave when the identification information is received from the plurality of the target person terminals.

[Claim 7]

The gait information processing system according to claim 1 or 2, wherein the server further includes an estimation unit estimating an outdoor stay time during which the target person stays outdoors based on information regarding a transition of the position of the target person and the step count information.

[Claim 8]

The gait information processing system according to claim 7, wherein the acquisition unit further acquires weather information regarding weather or a weather forecast, and

the estimation unit estimates an amount of ultraviolet light that the target person has been exposed to sunlight based on the outdoor stay time and the weather information.

[Claim 9]

The gait information processing system according to claim 8, wherein the output unit outputs notification information for notifying the target person when the amount of ultraviolet light estimated by the estimation unit is less than a predetermined threshold value.

[Claim 10]

The gait information processing system according to claim 9, wherein the output unit sets the notification information in association with the identification information of the target person, and

the detection terminal accesses the server and checks whether the notification information is set in association with the identification information when an instruction to acquire the identification information from the target person terminal and display information is received, and outputs the notification information to the target person when the notification information is set.

[Claim 11]

The gait information processing system according to claim 7, wherein the acquisition unit further acquires location information regarding an address or residence of the target person, and

the estimation unit estimates whether or not the target person is going out based on the location information, information regarding a position of the target person, and the step count information.

[Claim 12]

A gait information processing device being applied to a gait information processing system including: a target person terminal embedded in a sole portion of a shoe wearable by a target person and including an acceleration sensor, a step counting unit measuring the number of steps of the target person based on a detection result of the acceleration sensor, and a near field wireless communication unit transmitting, via near field wireless communication, identification information for identifying the target person and step count information regarding the number of steps measured within a predetermined period by the step counting unit; and a detection terminal including a detection unit detecting the target person terminal with which communication is possible via near field wireless communication, and a transmission unit acquiring the identification information and the step count information transmitted from the target person terminal and transmitting the acquired identification information and step count information to the server when the target person terminal is detected by the detection unit, the gait information processing device comprising:

an acquisition unit acquiring the identification information and the step count information transmitted from the detection terminal and information regarding a position of the detection terminal;

a specification unit specifying a position of the target person terminal based on the identification information and the position of the detection terminal acquired by the acquisition unit; and

an output unit outputting the position of the target person specified by the specification unit and the step count information acquired at the position in association with each other.

[Claim 13]

A gait information processing program for causing an information processing device to function as the gait information processing device according to claim 12.

[Claim 14]

A shoe for gait information processing, the shoe being wearable by a target person and comprising a target person terminal embedded in a sole portion, wherein

the target person terminal includes:

an acceleration sensor;

a step counting unit measuring the number of steps of the target person based on a detection result of the acceleration sensor; and

a near field wireless communication unit transmitting, via near field wireless communication, identification information for identifying the target person and step count information regarding the number of steps measured within a predetermined period by the step counting unit,

the identification information and the step count information transmitted via near field wireless communication are acquired by a detection terminal for detecting the target person terminal and are transmitted to a server, and

a position of the target person terminal is specified based on the identification information and the step count information transmitted to the server and information regarding a position of the detection terminal, and the specified position of the target person terminal and the step count information acquired at the position are output in association with each other.

[Claim 15]

The shoe for gait information processing according to claim 14, wherein the target person terminal does not have a GPS function and a long-range wireless communication function, and is operable for one year or more by a battery having a capacity of 200 mAh to 300 mAh.