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Yao

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(54) **OPERATING ENVIRONMENT SETTING SYSTEM, PORTABLE TERMINA, REPAY DEVICE AND OPERATING ENVIRONMENT SETTING PROGRAM**

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H04W 4/00 (2009.01)
(Continued)

(52) **U.S. Cl.**
CPC ***H04M 3/42*** (2013.01); ***G06K 7/1434*** (2013.01); ***H04L 65/1006*** (2013.01);
(Continued)

(58) **Field of Classification Search**
CPC H04M 3/42; H04M 1/725; G06K 7/1434; H04L 65/1073; H04L 65/1006;
(Continued)

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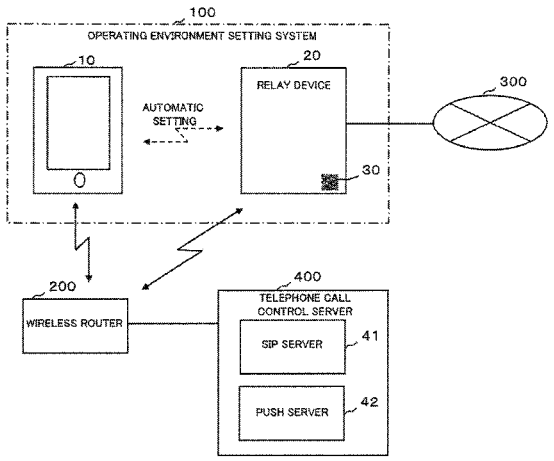
(57) **ABSTRACT**

There are provided a code reading unit for reading a code in a portable terminal, a first terminal side operating environment setting unit for analyzing a code, thereby acquiring first operating environment setting information required for connection to a relay device through Bluetooth and setting the first operating environment setting information to the portable terminal, a setting information generating unit **4** for generating second operating environment setting information required for connection to a telephone call control server through a wireless LAN to make a call, a second terminal side operating environment setting unit for setting the second operating environment setting information thus generated to the portable terminal, and transmitting the second operating environment setting information to the telephone call control server and registering the second operating environment setting information therein.

17 Claims, 9 Drawing Sheets



(51) **Int. Cl.**

H04M 1/725	(2006.01)
H04W 76/02	(2009.01)
H04L 29/08	(2006.01)
H04L 29/06	(2006.01)
G06K 7/14	(2006.01)
H04W 84/12	(2009.01)
H04W 88/04	(2009.01)

(52) **U.S. Cl.**

CPC ***H04L 65/1073*** (2013.01); ***H04L 67/34*** (2013.01); ***H04M 1/725*** (2013.01); ***H04W 4/008*** (2013.01); ***H04W 76/021*** (2013.01); ***H04W 76/023*** (2013.01); *H04W 84/12* (2013.01); *H04W 88/04* (2013.01)

(58) **Field of Classification Search**

CPC H04L 67/34; H04W 88/04; H04W 84/12; H04W 76/023; H04W 76/021; H04W 4/008

See application file for complete search history.

Fig. 1

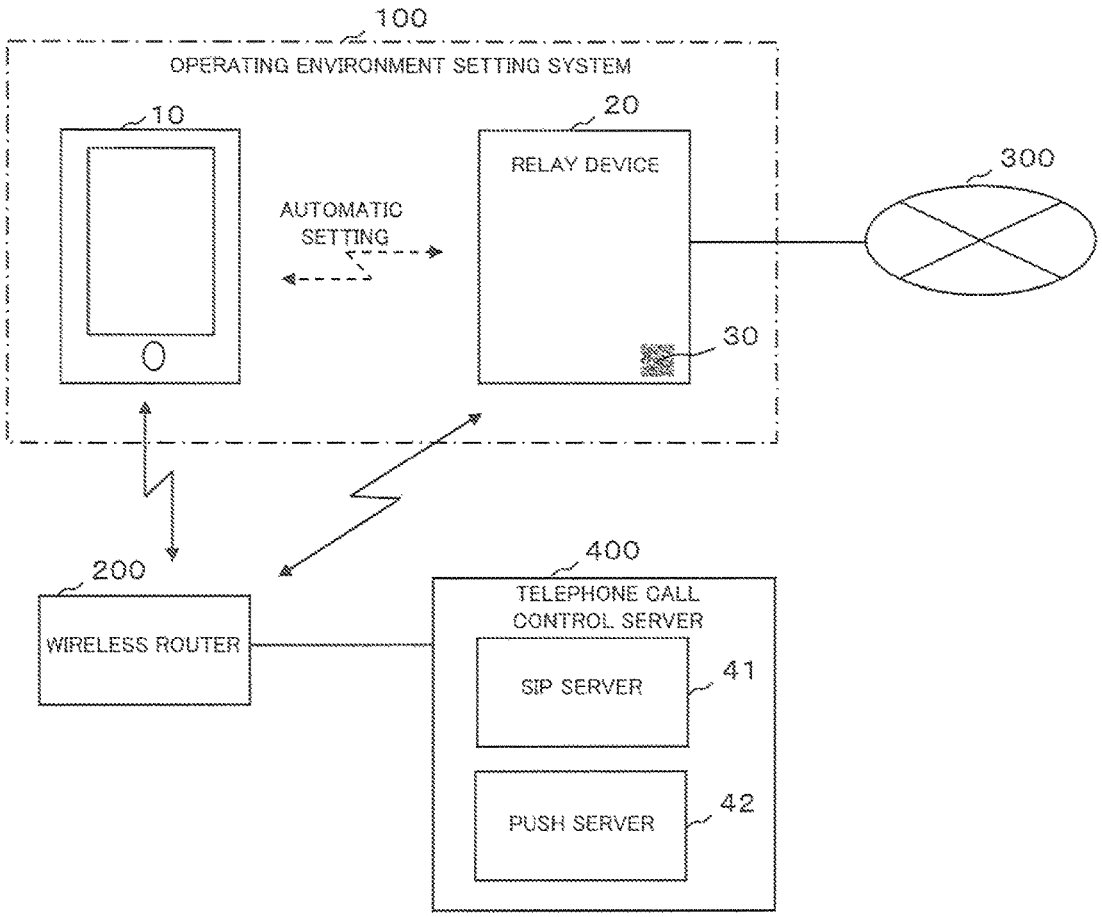

100
OPERATING ENVIRONMENT SETTING SYSTEM
10
20
RELAY DEVICE
300
AUTOMATIC SETTING
30
200
WIRELESS ROUTER
400
TELEPHONE CALL CONTROL SERVER
SIP SERVER
41
PUSH SERVER
42

Fig. 2

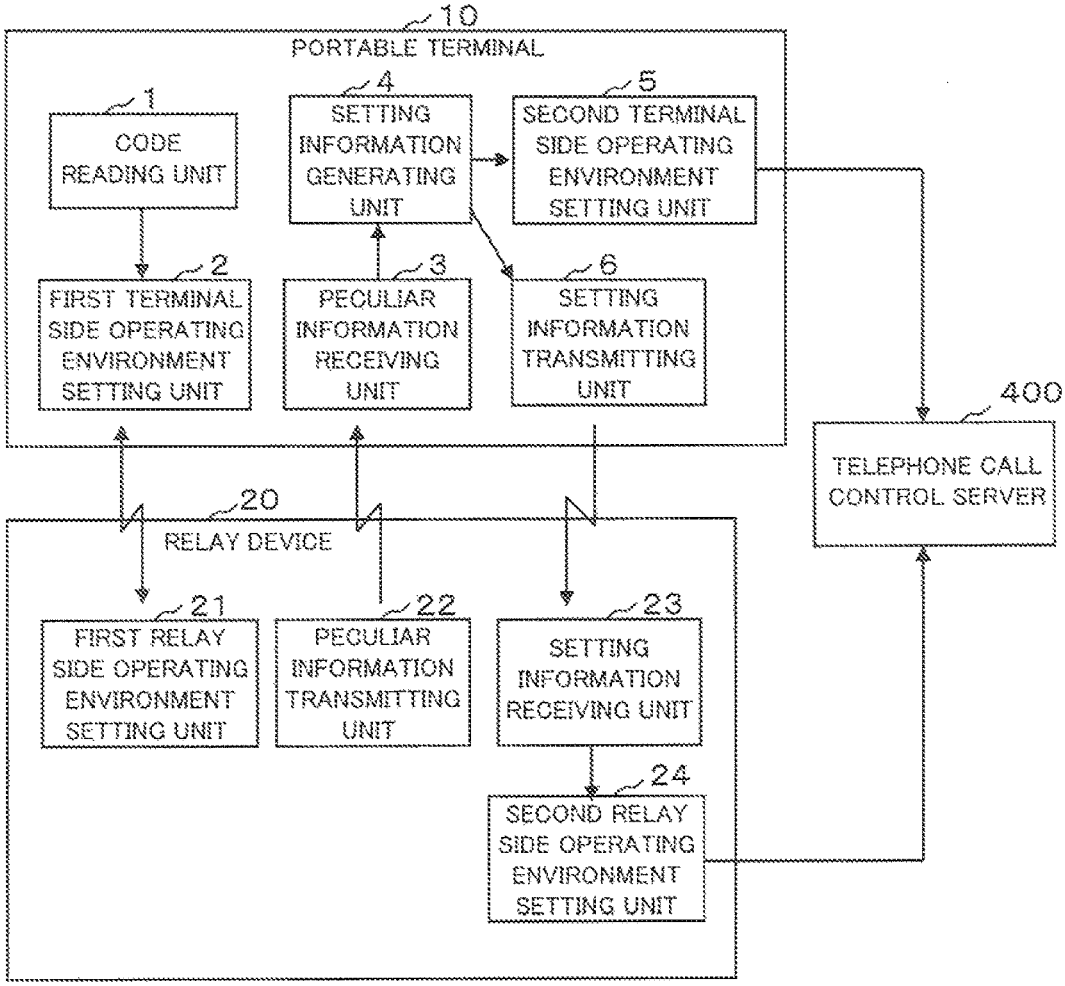

10
PORTABLE TERMINAL
1
CODE READING UNIT
4
SETTING INFORMATION GENERATING UNIT
5
SECOND TERMINAL SIDE OPERATING ENVIRONMENT SETTING UNIT
2
FIRST TERMINAL SIDE OPERATING ENVIRONMENT SETTING UNIT
3
PECULIAR INFORMATION RECEIVING UNIT
6
SETTING INFORMATION TRANSMITTING UNIT
400
TELEPHONE CALL CONTROL SERVER
20
RELAY DEVICE
21
FIRST RELAY SIDE OPERATING ENVIRONMENT SETTING UNIT
22
PECULIAR INFORMATION TRANSMITTING UNIT
23
SETTING INFORMATION RECEIVING UNIT
24
SECOND RELAY SIDE OPERATING ENVIRONMENT SETTING UNIT

Fig. 3

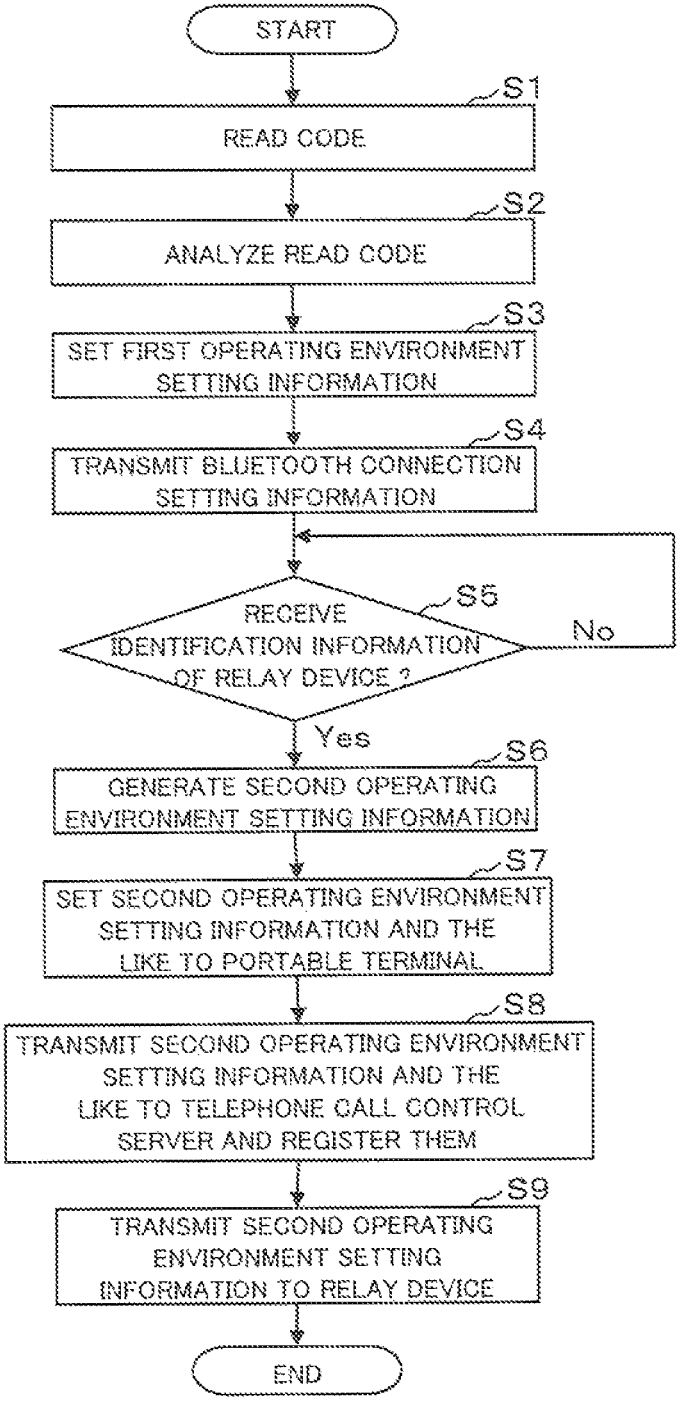

START
S1
READ CODE
S2
ANALYZE READ CODE
S3
SET FIRST OPERATING ENVIRONMENT SETTING INFORMATION
S4
TRANSMIT BLUETOOTH CONNECTION SETTING INFORMATION
S5
RECEIVE IDENTIFICATION INFORMATION OF RELAY DEVICE ?
No
Yes
S6
GENERATE SECOND OPERATING ENVIRONMENT SETTING INFORMATION
S7
SET SECOND OPERATING ENVIRONMENT SETTING INFORMATION AND THE LIKE TO PORTABLE TERMINAL
S8
TRANSMIT SECOND OPERATING ENVIRONMENT SETTING INFORMATION AND THE LIKE TO TELEPHONE CALL CONTROL SERVER AND REGISTER THEM
S9
TRANSMIT SECOND OPERATING ENVIRONMENT SETTING INFORMATION TO RELAY DEVICE
END

Fig. 4

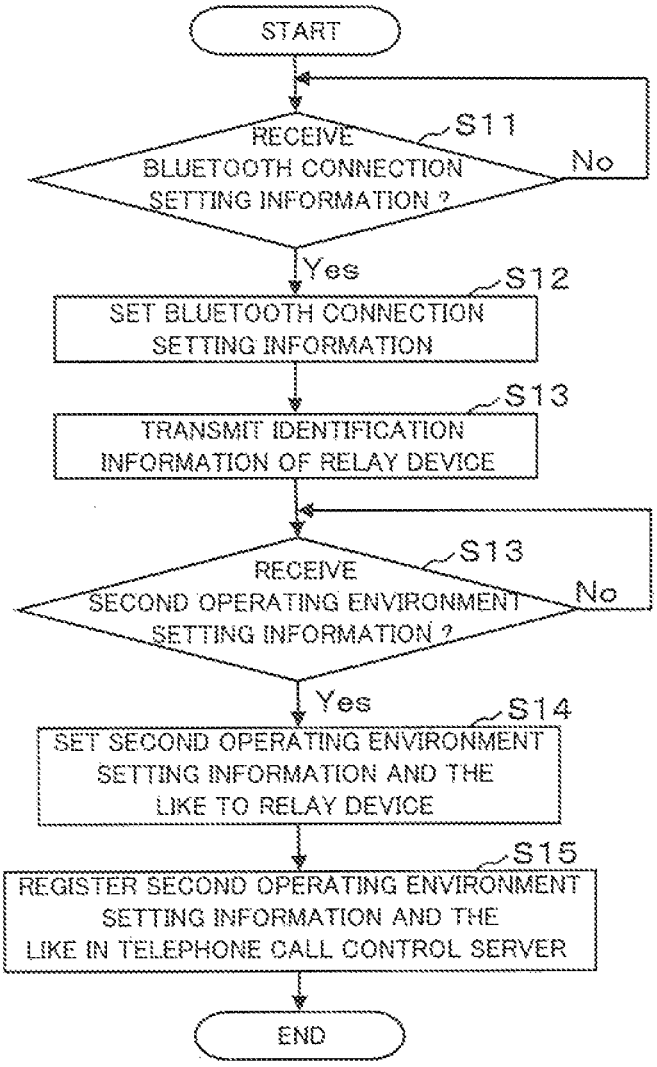

START
RECEIVE BLUETOOTH CONNECTION SETTING INFORMATION ?
S11
No
Yes
SET BLUETOOTH CONNECTION SETTING INFORMATION
S12
TRANSMIT IDENTIFICATION INFORMATION OF RELAY DEVICE
S13
RECEIVE SECOND OPERATING ENVIRONMENT SETTING INFORMATION ?
S13
No
Yes
SET SECOND OPERATING ENVIRONMENT SETTING INFORMATION AND THE LIKE TO RELAY DEVICE
S14
REGISTER SECOND OPERATING ENVIRONMENT SETTING INFORMATION AND THE LIKE IN TELEPHONE CALL CONTROL SERVER
S15
END

Fig. 5

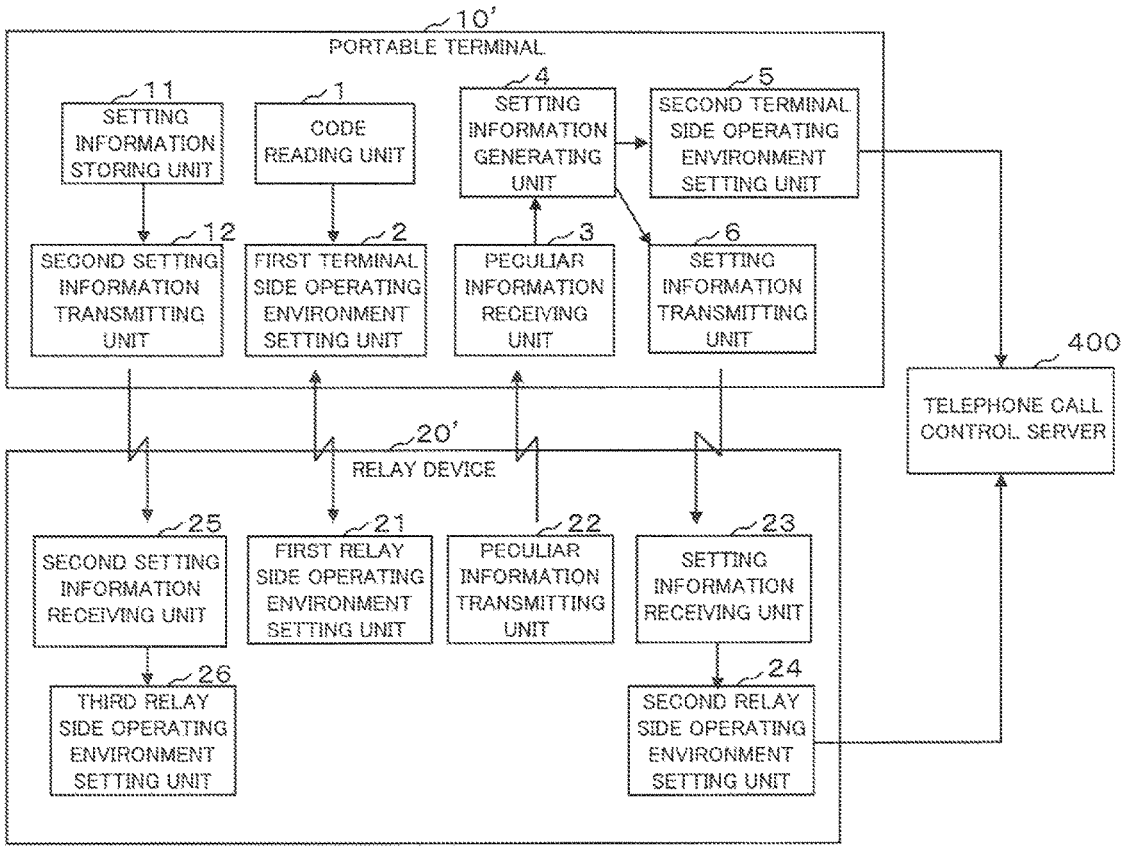

10'
PORTABLE TERMINAL
11
SETTING INFORMATION STORING UNIT
1
CODE READING UNIT
4
SETTING INFORMATION GENERATING UNIT
5
SECOND TERMINAL SIDE OPERATING ENVIRONMENT SETTING UNIT
12
SECOND SETTING INFORMATION TRANSMITTING UNIT
2
FIRST TERMINAL SIDE OPERATING ENVIRONMENT SETTING UNIT
3
PECULIAR INFORMATION RECEIVING UNIT
6
SETTING INFORMATION TRANSMITTING UNIT
400
TELEPHONE CALL CONTROL SERVER
20'
RELAY DEVICE
25
SECOND SETTING INFORMATION RECEIVING UNIT
21
FIRST RELAY SIDE OPERATING ENVIRONMENT SETTING UNIT
22
PECULIAR INFORMATION TRANSMITTING UNIT
23
SETTING INFORMATION RECEIVING UNIT
26
THIRD RELAY SIDE OPERATING ENVIRONMENT SETTING UNIT
24
SECOND RELAY SIDE OPERATING ENVIRONMENT SETTING UNIT

Fig. 6

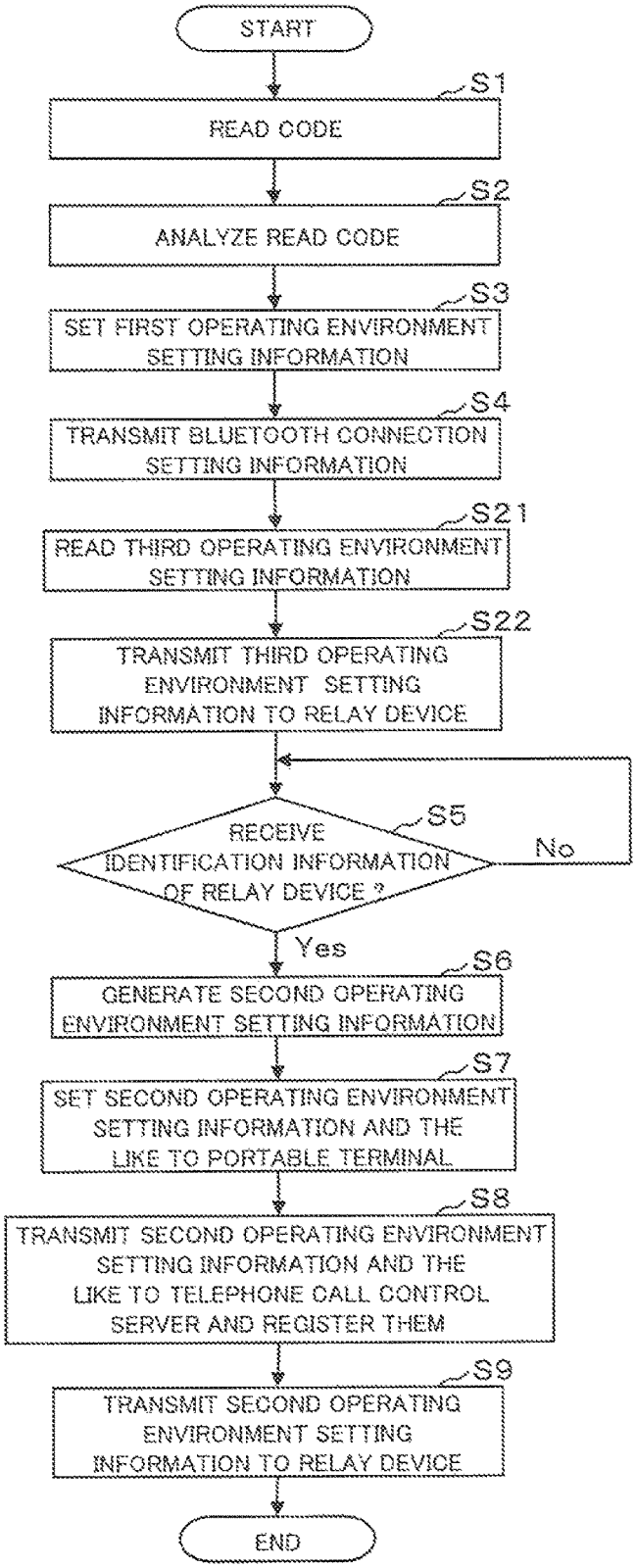

START
S1
READ CODE
S2
ANALYZE READ CODE
S3
SET FIRST OPERATING ENVIRONMENT SETTING INFORMATION
S4
TRANSMIT BLUETOOTH CONNECTION SETTING INFORMATION
S21
READ THIRD OPERATING ENVIRONMENT SETTING INFORMATION
S22
TRANSMIT THIRD OPERATING ENVIRONMENT SETTING INFORMATION TO RELAY DEVICE
S5
RECEIVE IDENTIFICATION INFORMATION OF RELAY DEVICE ?
No
Yes
S6
GENERATE SECOND OPERATING ENVIRONMENT SETTING INFORMATION
S7
SET SECOND OPERATING ENVIRONMENT SETTING INFORMATION AND THE LIKE TO PORTABLE TERMINAL
S8
TRANSMIT SECOND OPERATING ENVIRONMENT SETTING INFORMATION AND THE LIKE TO TELEPHONE CALL CONTROL SERVER AND REGISTER THEM
S9
TRANSMIT SECOND OPERATING ENVIRONMENT SETTING INFORMATION TO RELAY DEVICE
END

Fig. 7

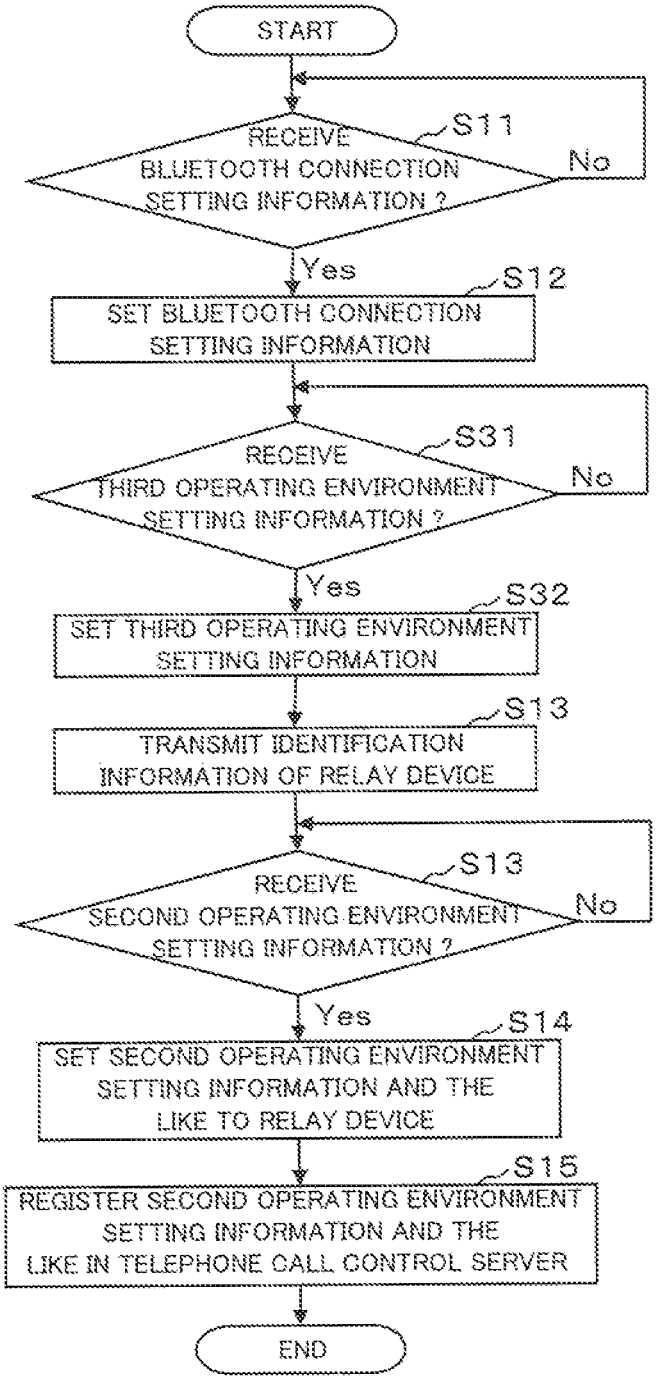

START
RECEIVE BLUETOOTH CONNECTION SETTING INFORMATION ?
S11
No
Yes
SET BLUETOOTH CONNECTION SETTING INFORMATION
S12
RECEIVE THIRD OPERATING ENVIRONMENT SETTING INFORMATION ?
S31
No
Yes
SET THIRD OPERATING ENVIRONMENT SETTING INFORMATION
S32
TRANSMIT IDENTIFICATION INFORMATION OF RELAY DEVICE
S13
RECEIVE SECOND OPERATING ENVIRONMENT SETTING INFORMATION ?
S13
No
Yes
SET SECOND OPERATING ENVIRONMENT SETTING INFORMATION AND THE LIKE TO RELAY DEVICE
S14
REGISTER SECOND OPERATING ENVIRONMENT SETTING INFORMATION AND THE LIKE IN TELEPHONE CALL CONTROL SERVER
S15
END

Fig. 8

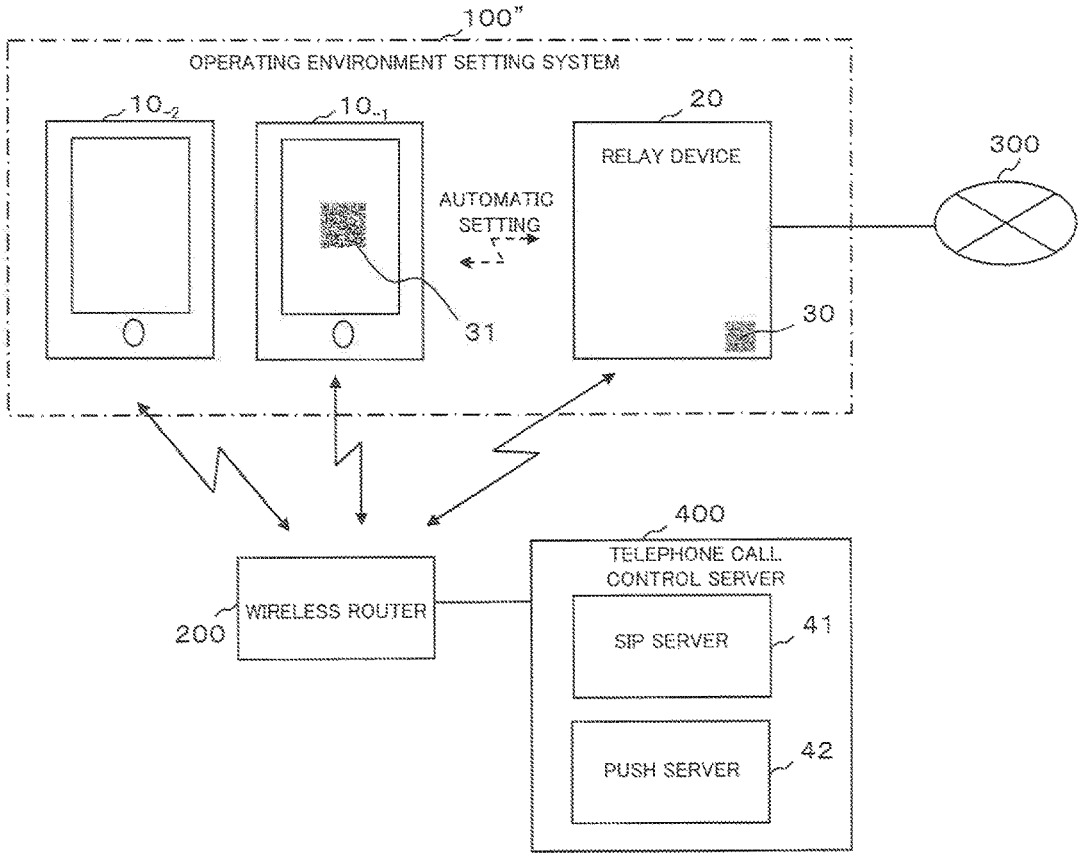
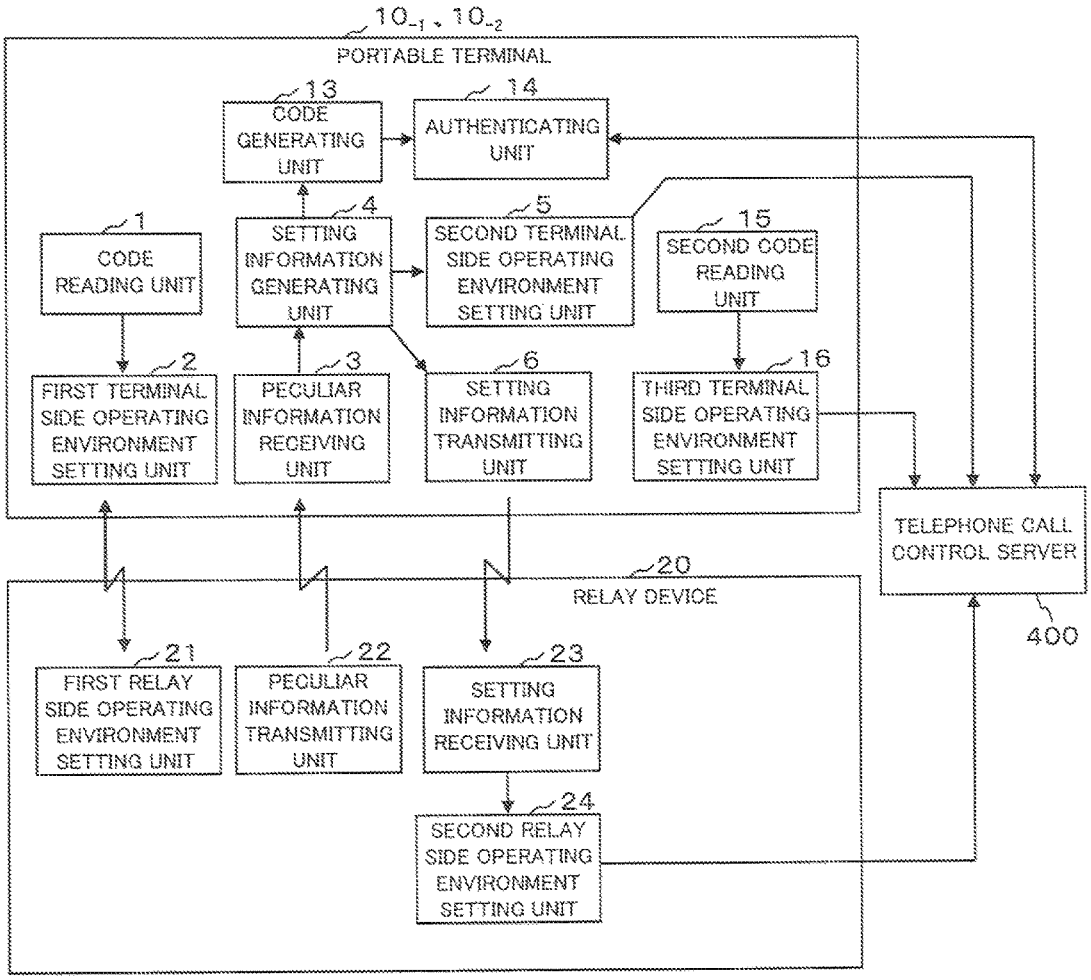

100"
OPERATING ENVIRONMENT SETTING SYSTEM
10-2
10-1
AUTOMATIC SETTING
31
20
RELAY DEVICE
30
300
400
TELEPHONE CALL CONTROL SERVER
SIP SERVER
41
PUSH SERVER
42
200
WIRELESS ROUTER

Fig. 9


10-1、10-2
PORTABLE TERMINAL
13
CODE GENERATING UNIT
14
AUTHENTICATING UNIT
1
CODE READING UNIT
4
SETTING INFORMATION GENERATING UNIT
5
SECOND TERMINAL SIDE OPERATING ENVIRONMENT SETTING UNIT
15
SECOND CODE READING UNIT
2
FIRST TERMINAL SIDE OPERATING ENVIRONMENT SETTING UNIT
3
PECULIAR INFORMATION RECEIVING UNIT
6
SETTING INFORMATION TRANSMITTING UNIT
16
THIRD TERMINAL SIDE OPERATING ENVIRONMENT SETTING UNIT
TELEPHONE CALL CONTROL SERVER
400
20
RELAY DEVICE
21
FIRST RELAY SIDE OPERATING ENVIRONMENT SETTING UNIT
22
PECULIAR INFORMATION TRANSMITTING UNIT
23
SETTING INFORMATION RECEIVING UNIT
24
SECOND RELAY SIDE OPERATING ENVIRONMENT SETTING UNIT

OPERATING ENVIRONMENT SETTING SYSTEM, PORTABLE TERMINA, REPAY DEVICE AND OPERATING ENVIRONMENT SETTING PROGRAM

CROSS REFERENCE TO RELATED APPLICATIONS

This application is a National Phase filing under 35 U.S.C. §371 of PCT/JP2015/064056 filed on May 15, 2015, the entire contents of which are hereby incorporated by reference.

TECHNICAL FIELD

The present invention relates to an operating environment setting system, an operating environment setting device and an operating environment setting program, and more particularly, is suitably used for a system for setting an operating environment of a cordless telephone system which can utilize a portable terminal such as a smartphone as a cordless extension unit of a cordless telephone.

BACKGROUND ART

Conventionally, there is known the technique for utilizing a smartphone as a cordless extension unit of a fixed telephone (for example, see Patent Document 1). The Patent Document 1 discloses the technique related to an SIP (Session Initiation Protocol) client application. The SIP client application is operated on the smartphone, and the smartphone is extension accommodated as an SIP terminal in an SIP control unit incorporated in a network termination device such as a home gateway and an outgoing call, an incoming call, a telephone call or the like can be performed by the smartphone.

A smartphone in which the SIP client application is operated is registered as a cordless extension unit of a house telephone in the SIP control unit. The SIP control unit transmits an incoming call signal to the SIP client application on the smartphone when a call arrives. The SIP client application receiving the incoming call signal presents the incoming call to a user, and the user starts a telephone call. In order to use the smartphone as the cordless extension unit, thus, it is necessary to install the SIP client application into the smartphone, thereby performing various setting required for the SIP control unit.

Patent Document 1: Japanese Laid-open Patent Publication No. 2014-3363

DISCLOSURE OF THE INVENTION

In the related art, however, it is necessary for a user to manually carry out various setting for an SIP control unit. For this reason, there is a problem in that the user should perform a work for the setting, which is troublesome. Moreover, there is also a problem in that a user having no sufficient knowledge about setting of SIP is hard to perform the setting.

The present invention has been made to solve the problems and has an object to enable automatic execution or necessary setting for utilizing a portable terminal such as a smartphone as a cordless extension unit of a cordless telephone.

In order to attain the object, in the present invention, a code recording first operating environment setting information required for connecting a portable terminal and a relay device by wireless under a first wireless standard is read and analyzed in the portable terminal, and the first operating environment setting information is set to the portable terminal and the relay device. Moreover, second operating environment setting information required for connection of the portable terminal and the relay device to a telephone call control server under a second wireless standard is generated in the portable terminal and the second operating environment setting information thus generated is sat to the portable terminal, and the second operating environment setting information is transmitted to the telephone call control server and is registered therein. By utilizing the wireless connection set as described above, furthermore, the second operating environment setting information thus generated is transmitted from the portable terminal to the relay device and the second operating environment setting information is set to the relay device, and the second operating environment setting information is transmitted to the telephone call control server and is registered therein.

According to the present invention having the structure described above, if the code is read by the portable terminal including a code reader, the wireless connection under the first wireless standard is automatically set between the portable terminal and the relay device by reading the code. By utilizing the set wireless connection, furthermore, setting required for connection of the portable terminal and the relay device to the telephone call control server under the second wireless standard is continuously performed automatically. Consequently, it is possible to automatically perform setting required for utilizing the portable terminal as a cordless extension unit of a cordless telephone through the relay device and the telephone call control server.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a diagram showing a schematic structure of a cordless telephone system including an operating environment setting system according to a first embodiment.

FIG. **2** is a block diagram showing an example of functional structures of a portable terminal and a relay device which configure the operating environment setting system according to the first embodiment.

FIG. **3** is a flowchart showing an example of an operation of the portable terminal according to the first embodiment.

FIG. **4** is a flowchart showing an example of an operation of the relay device according to the first embodiment.

FIG. **5** is a block diagram showing an example of functional structures of a portable terminal and a relay device configuring an operating environment setting system according to a second embodiment.

FIG. **6** is a flowchart showing an example of an operation of the portable terminal according to the second embodiment.

FIG. **7** is a flowchart showing an example of an operation of the relay device according to the second embodiment.

FIG. **8** is a diagram showing a schematic structure of a cordless telephone system including an operating environment setting system according to a third embodiment.

FIG. **9** is a block diagram showing an example of functional structures of a portable terminal and a relay device configuring the operating environment setting system according to the third embodiment.

BEST MODE FOR CARRYING OUT THE INVENTION

First Embodiment

A first embodiment according to the present invention will be described below with reference to the drawings. FIG. **1** is

a diagram showing a schematic structure of a cordless telephone system including an operating environment setting system according to the first embodiment.

As shown in FIG. **1**, an operating environment setting system **100** according to the first embodiment includes a portable terminal **10** and a relay device **20** and can automatically set an operating environment of a cordless telephone system by reading a code **30**. The operating environment to be set in the first embodiment relates to Bluetooth connection between the portable terminal **10** and the relay device **20** and SIP registration information to be registered in an SIP server **41**.

Referring to the cordless telephone system to be a target for setting the operating environment according to the first embodiment, the portable terminal **10** having a telephone call application installed therein can be used as a cordless extension unit of a cordless telephone by connection of the portable terminal **10** to a fixed telephone line **300** through the relay device **20** and a telephone call control server **400**.

The portable terminal **10** is a smartphone or a tablet, for example, and has a wireless communication function through Bluetooth and a wireless communication function through a wireless LAN such as Wi-Fi. Moreover, the portable terminal **10** has a camera and can read the code **30**.

In the first embodiment, it is assumed that necessary information for performing wireless communication by the wireless LAN through a wireless router **200** has already been set to the portable terminal **10**. In other words, necessary connection setting information (SSID, a cipher mode, a password or the like) for connection through the wireless LAN has already been registered as a profile of the wireless router **200** in the portable terminal **10**. This connection setting of the wireless LAN can be performed manually by a user.

The relay device **20** has a wireless communication function through Bluetooth and a wireless communication function through a wireless LAN such as Wi-Fi. However, the relay device **20** includes neither a camera nor a code reader. It is assumed that necessary information for performing wireless communication by the wireless LAN through the wireless router **200** is also set to the relay device **20**. The relay device **20** is connected to the fixed telephone line **300**.

The code **30** is stuck or printed on the relay device **20**. Although the code **30** is a bar code or a two-dimensional code as an example, it is not restricted thereto. In other words if the code **30** can be input/output as digital information which is obtained by conversion in accordance with a fixed rule and can easily be read by a camera or a reading device such as a code reader, it may take a configuration other than the bar code or the two-dimensional code.

In the present embodiment information (first operating environment setting information) required for setting to perform wireless connection between the portable terminal **10** and the relay device **20** through Bluetooth (a first wireless standard) is recorded on the code **30**. Herein, the first operating environment setting information includes a name and a serial number of the relay device **20** and the like. The portable terminal **10** acquires these information to carry out setting so that connection setting (pairing) through the Bluetooth is performed together with the relay device **20**.

The telephone call control server **400** serves to manage and control an IP telephone utilizing SIP and includes the SIP server **41** and a PUSH server **42**. The SIP server **41** mediates call origination information between the fixed telephone line **300** and the portable terminal **10**. The PUSH server **42** transmits a request message for a callback to the portable terminal **10** in response to a message transmission request given from the SIP server **41**.

When a caller makes a phone call via the fixed telephone line **300**, specifically, an incoming call notification signal is sent from the fixed telephone line **300** to the SIP server **41** through the relay device **20** and the wireless router **200**. The SIP server **41** receiving the incoming call notification signal once brings an incoming call line into a holding state and supplies a message transmission request to the PUSH server **42**.

Upon receipt of the message transmission request from the SIP server **41**, the PUSH server **42** accesses the portable terminal **10** and transmits a callback request signal. The SIP server **41** is connected to the held incoming call line upon receipt of a callback to be performed by the portable terminal **10** in response to the callback request signal. Consequently, the portable terminal **10** is connected to the fixed telephone line **300** to set a call enabling state.

In the first embodiment, there is automatically set information (second operating environment setting information) required for setting to connect the portable terminal **10** and the relay device **20** to the SIP server **41** by wireless through the wireless LAN (a second wireless standard) and to then make a call. The second operating environment setting information to be set herein is a password to be used in the connection of the portable terminal **10** and the relay device **20** to the SIP server **41**.

In other words, in the first embodiment, the Bluetooth connection setting (pairing) using the first operating environment setting information is performed between the portable terminal **10** and the relay device **20** as described above and the second operating environment setting information is then registered automatically in the portable terminal **10**, the relay device **20** and the SIP server **41** through data exchange utilizing the Bluetooth.

FIG. **2** is a block diagram showing an example of functional structures of the portable terminal **10** and the relay device **20** configuring the operating environment setting system **100** according to the first embodiment. FIG. **2** illustrates only a main functional structure related to setting of the operating environment of the cordless telephone system.

As shown in FIG. **2**, the portable terminal **10** includes, as a functional structure thereof, a code reading unit **1**, a first terminal side operating environment setting unit **2**, a peculiar information receiving unit **3**, a setting information generating unit **4**, a second terminal side operating environment setting unit **5** and a setting information transmitting unit **6**. Moreover, the relay device **20** includes, as a functional structure thereof, a first relay side operating environment setting unit **21**, a peculiar information transmitting unit **22**, a setting information receiving unit **23** and a second relay side operating environment setting unit **24**.

Each of function blocks **1** to **6** of the portable terminal **10** is configured from a telephone call application installed in the portable terminal **10**, for example. In this case, the respective function blocks **1** to **6** actually include a CPU, an RAM, an ROM and the like in a computer and are implemented by an operation of a program of the telephone call application stored in a recording medium such as the RAM, the ROM, a hard disk or a semiconductor memory. A part or whole of one function blocks **1** to **6** can also be configured from hardware or a DSP (Digital Signal Processor).

Moreover, each of the function blocks **21** to **24** of the relay device **20** can also be configured from all of the hardware, the DSP and software. For example, in the case in which each of the function blocks **21** to **24** is configured

from the software, it actually includes the CPU, the RAM, the ROM and the like in the computer and is implemented by an operation of a program stored in a recording medium such as the RAM, the ROM, the hard disk or the semiconductor memory.

The code reading unit **1** of the portable terminal **10** corresponds to a reading unit according to claims and serves to read the code **30** (an example of a medium) stuck or printed on the relay device **20** through a camera (not shown) provided in the portable terminal **10**.

The first terminal side operating environment setting unit **2** of the portable terminal **10** analyzes the code **30** read by the code reading unit **1**, and acquires the first operating environment setting information (information including the name and serial number of the relay device **20** and the like) required for setting the wireless connection (pairing) through the Bluetooth and sets the first operating environment setting information to the portable terminal **10**.

Moreover, the first terminal side operating environment setting unit **2** transmits, to the relay device **20**, information (the information including the name and serial number of the portable terminal **10** and the like) required for the relay device **20** to set the wireless connection (pairing) through the Bluetooth together with the portable terminal **10**. Thus, the necessary information for both the portable terminal **10** and the relay device **20** is set so that the pairing through the Bluetooth is performed. The portable terminal **10** and the relay device **20** once subjected to the pairing are connected automatically from the next time.

When the wireless connection through the Bluetooth is to be set by the first terminal side operating environment setting unit **2** of the portable terminal **10**, the first relay side operating environment setting unit **21** of the relay device **20** acquires the information (the information including the name and serial number of the portable terminal **10** and the like) required for setting the wireless connection from the portable terminal **10** and sets the information to the relay device **20**. Consequently, the pairing through the Bluetooth is performed between the portable terminal **10** and the relay device **20**.

The peculiar information transmitting unit **22** of the relay device **20** transmits peculiar identification information to the relay device **20** (for example, the serial number or an MAC address of the relay device **20** or the like) to the portable terminal **10** by utilizing the wireless connection through the Bluetooth set by the first terminal side operating environment setting unit **2** and the first relay side operating environment setting unit **21**.

The peculiar information receiving unit **3** of the portable terminal **10** receives the identification information of the relay device **20** transmitted from the relay device **20** by utilizing the wireless connection through the Bluetooth set by the first terminal side operating environment setting unit **2** and the first relay side operating environment setting unit **21**.

The setting information generating unit **4** of the portable terminal **10** encrypts the identification information of the relay device **20** received by the peculiar information receiving unit **3** to generate the second operating environment setting information required for connecting the portable terminal **10** and the relay device **20** to the SIP server **41** by wireless through the wireless router **200** via the Wi-Fi (the second wireless standard) and then making a call. The second operation environment setting information generated herein is a password to be used in access to the SIP server **41**. The setting information generating unit **4** supplies the generated second operating environment setting information (the password) to the second terminal side operating environment setting unit **5** and the setting information transmitting unit **6**.

The second terminal side operating environment setting unit **5** of the portable terminal **10** sets the second operating environment setting information (the password) generated by the setting information generating unit **4** to the portable terminal **10**, and furthermore, transmits the second operating environment setting information to the telephone call control server **400** and registers the second operating environment setting information therein. At this time, the second terminal side operating environment setting unit **5** generates a registration ID of the portable terminal **10**, and furthermore, acquires an IP address of the portable terminal **10**. Then, the second terminal side operating environment setting unit **5** sets the registration ID of the portable terminal **10** and a password to the portable terminal **10**, and furthermore, registers the registration ID and the IP address of the portable terminal **10** and the password in the telephone call control server **400**.

The registration ID and the password set to the portable terminal **10** are used when the portable terminal **10** makes a callback to the SIP server **41** in response to a callback request signal transmitted from the PUSH server **42**. The IP address of the portable terminal **10** registered in the telephone call control server **400** is used when the PUSH server **42** transmits a callback request signal to the portable terminal **10**. Moreover, the registration ID of the portable terminal **10** and the password registered in the telephone call control server **400** are used for authentication processing to foe executed when the callback is made from the portable terminal **10** to the SIP server **41**.

The setting information transmitting unit **6** of the portable terminal **10** transmits the second operating environment setting information (the password) generated by the setting information generating unit **4** to the relay device **20** by utilizing the wireless connection through the Bluetooth set by the first terminal side operating environment setting unit **2**. The setting information receiving unit **23** of the relay device **20** receives the second operating environment setting information transmitted by the setting information transmitting unit **6**.

The second relay side operating environment setting unit **24** of the relay device **20** sets the second operating environment setting information received by the setting information receiving unit **23** to the relay device **20**, and furthermore, transmits the second operating environment setting information to the telephone call control server **400** and registers the second operating environment setting information therein. At this time, the second relay side operating environment setting unit **24** generates a registration ID of the relay device **20**, and furthermore, acquires an IP address of the relay device **20**. Then, the second relay side operating environment setting unit **24** sets the registration ID of the relay device **20** and a password to the relay device **20**, and furthermore, registers the registration ID and the IP address of the relay device **20** and the password to the telephone call control server **400**.

The registration ID and the password set to the relay device **20** are used when the relay device **20** accesses the SIP server **41**. The IP address of the relay device **20** registered in the telephone call control server **400** is used when the SIP server **41** accesses the relay device **20**. Moreover, the registration ID of the relay device **20** and the password registered in the telephone call control server **400** are used for authentication processing to be executed when access is gained from the relay device **20** to the SIP server **41**.

The telephone call control server **400** registers a parent-child relationship based on the registration ID or the IP address to be registered from each of the portable terminal **10** and the relay device **20**. In other words, the relay device **20** is registered as a base unit of a cordless telephone and the portable terminal **10** is registered as a cordless extension unit of the cordless telephone.

FIG. **3** is a flowchart showing an example of an operation of the portable terminal **10** according to the first embodiment having the structure described above. Moreover, FIG. **4** is a flowchart showing an example of an operation of the relay device **20** according to the first embodiment having the structure described above. Flowcharts shown in FIGS. **3** and **4** are started when power supplies of the portable terminal **10** and the relay device **20** are turned ON and the Bluetooth function of the portable terminal **10** is activated, for example.

In FIG. **3**, in the portable terminal **10**, the code reading unit **1** first reads the code **30** stuck or printed on the relay device **20** (Step S**1**). Next, the first terminal side operating environment setting unit **2** analyses the code **30** read by the code reading unit **1** (Step S**2**) and the first operating environment setting information (the information including the name and serial number of the relay device **20** and one like) required for the portable terminal **10** to set the wireless connection through the Bluetooth together with the relay device **20** is acquired and is set to the portable terminal **10** (Step S**3**).

Moreover, the first terminal side operating environment setting unit **2** transmits, to the relay device **20**, the information (the information including the name and serial number of the portable terminal **10** and the like) required for the relay device **20** to set the wireless connection through the Bluetooth together with the portable terminal **10** (Step S**4**). In the relay device **20**, the first operating environment setting information acquired from the portable terminal **10** is set to the relay device **20** as will be described below with reference to FIG. **4**. Consequently, the pairing is performed between the portable terminal **10** and the relay device **20**.

Thereafter, the peculiar information receiving unit **3** decides whether the identification information of the relay device **20** transmitted from the peculiar information transmitting unit **22** of the relay device **20** is received or not by utilizing the wireless connection through the Bluetooth set as described above (Step S**5**). If the identification information is not received, the decision of the Step S**5** is repeated.

On the other hand, if the peculiar information receiving unit **3** receives the identification information of the relay device **20** transmitted from the relay device **20**, the setting information generating unit **4** encrypts the received identification information of the relay device **20** to generate a password (Step S**6**). Next, the second terminal side operating environment setting unit **5** generates the registration ID of the portable terminal **10** to set the generated registration ID and password to the portable terminal **10** (Step S**7**).

Furthermore, the second terminal side operating environment setting unit **5** acquires the IP address of the portable terminal **10**, and transmits the registration ID and the IP address of the portable terminal **10** and the password to the telephone call control server **400** and registers them therein (Step S**8**). Then, the setting information transmitting unit **6** transmits the second operating environment setting information (the password) generated by the setting information generating unit **4** to the relay device **20** by utilizing the wireless connection through the Bluetooth set in the Step S**4** (Step S**9**). Consequently, the processing of the flowchart shown in FIG. **3** is ended.

In FIG. **4**, in the relay device **20**, the first relay side operating environment setting unit **21** first decides whether the information (the information including the name and serial number of the portable terminal **10** and the like transmitted in the Step S**4**) required for setting the wireless connection through the Bluetooth is received from the portable terminal **10** or not (Step S**11**). If the information is not received, the decision of the Step S**11** is repeated.

On the other hand, if the information required for setting the wireless connection through the Bluetooth is received from the portable terminal **10** by the first relay side operating environment setting unit **21**, the first relay side operating environment setting unit **21** sets the received information to the relay device **20**, thereby performing the pairing through the Bluetooth between the portable terminal ID and the relay device **20** (Step S**12**).

Next, the peculiar information transmitting unit **22** transmits peculiar identification information to the relay device **20** to the portable terminal **10** by utilizing the wireless connection through the Bluetooth which is set (Step S**13**). Then, the setting information receiving unit **23** decides whether the second operating environment setting information (the password) transmitted by the setting information transmitting unit **6** of the portable terminal **10** is received or not (Step S**14**). If the second operating environment setting information is not received, the decision of the Step S**14** is repeated.

On the other hand, if the setting information receiving unit **23** receives the second operating environment setting information, the second relay side operating environment setting unit **24** generates the registration ID of the relay device **20** and sets the generated registration ID and the password to the relay device **20** (Step S**14**). Furthermore, the second relay side operating environment setting unit **24** acquires the IP address of the relay device **20**, and transmits the registration ID and the IP address of the relay device **20** and the password to the telephone call control server **400** and registers them therein (Step S**15**). Consequently, the processing of the flowchart shown in FIG. **4** is ended.

As described above in detail, according to the first embodiment, if the code **30** is read by the portable terminal **10** including a camera, the wireless connection through the Bluetooth is set automatically between the portable terminal **10** and the relay device **20** by reading the code **30**. Furthermore, the SIP registration information required for the portable terminal **10** and the relay device **20** to be connected to the telephone call control server **400** by a wireless LAN to make a call is continuously set automatically by utilizing the wireless connection through the Bluetooth which is thus set automatically. Consequently, it is possible to automatically perform the setting required for utilizing the portable terminal **10** as a cordless extension Unit of a cordless telephone through the relay device **20** and the telephone call control server **400**.

Second Embodiment

Next, a second embodiment according to the present invention will be described with reference to the drawings. In the second embodiment, an operating environment related to connection through a wireless LAN between second electronic equipment **20** and a wireless router **200** can also be set automatically in addition to setting of wireless connection through Bluetooth between a portable terminal **10** and a relay device **20** and setting of SIP registration information to a telephone call control server **400**.

FIG. **5** is a block diagram showing an example of functional structures of a portable terminal **10'** and a relay device **20'** provided in an operating environment setting system according to the second embodiment. In FIG. **5**, components having the same reference numerals as those shown in FIG. **2** have the same functions and repetitive description will be therefore omitted.

As shown in FIG. **5**, the portable terminal **10'** according to the second embodiment further includes, as a functional structure thereof, a setting information storing unit **11** and a second setting information transmitting unit **12**. Moreover, the relay device **20'** further includes, as a functional structure thereof, a second setting information receiving unit **25** and a third relay side operating environment setting unit **26**.

The setting information storing unit **11** of the portable terminal **10'** stores third operating environment setting information required for performing wireless connection through a wireless LAN (for example, Wi-Fi). In the second embodiment, the third operating environment setting information implies necessary information for the relay device **20'** to perform the wireless communication through the Wi-Fi via the wireless router **200**. This is connection setting information including SSID to be transmitted from the wireless router **200** and a cipher mode and a password defined in the wireless router **200**, and is information in which the portable terminal **10'** has already been registered as a profile of the wireless router **200**.

The second setting information transmitting unit **12** of the portable terminal **10'** transmits third operating environment setting information stored in the setting information storing unit **11** to the relay device **20'** by utilizing the wireless connection through the Bluetooth set by a first terminal side operating environment setting unit **2** and a first relay side operating environment setting unit **21**.

When the portable terminal **10'** is to set the wireless connection through the Wi-Fi together with the wireless router **200**, it is predetermined that the third operating environment setting information (connection setting information) is stored in a specific storage region of a flash memory serving as the setting information storing unit **11**. Accordingly, the second setting information transmitting unit **12** can acquire the third operating environment setting information by accessing the specific storage region of the setting information storing unit **11**.

The second setting information receiving unit **25** of the relay device **20'** receives the third operating environment setting information transmitted by the second setting information transmitting unit **12** with use of the wireless connection through the Bluetooth set by the first terminal side operating environment serving unit **2** and the first relay side operating environment setting unit **21**.

The third relay side operating environment setting unit **26** of the relay device **20'** acquires the third operating environment setting information received by the second setting information receiving unit **25** (information such as SSID, a cypher mode and a password required for the relay device **20'** to perform wireless communication through Wi-Fi via the wireless router **200**) and sets the third operating environment setting information to the relay device **20'**. Consequently, the relay device **20'** is brought into a state in which it can be connected by wireless to the same Wi-Fi network as the portable terminal **10'** through the wireless router **200**.

A second relay side operating environment setting unit **24** of the relay device **20'** transmits second operating environment setting information received by a setting information receiving unit **23** to the telephone call control server **400** and registers the second operating environment setting information therein by utilizing wireless connection through a wireless LAN set based on the setting of the third operating environment setting information by the third relay side operating environment setting unit **26**.

FIG. **6** is a flowchart showing an example of an operation of the portable terminal **10'** according to the second embodiment having the structure described above. Moreover, FIG. **7** is a flowchart showing an example of an operation of the relay device **20'** according to she second embodiment having the structure described above. Flowcharts shown in FIGS. **7** and **8** are started when power supplies of the portable terminal **10'** and the relay device **20'** are turned ON and the Bluetooth function of the portable terminal **10'** is activated, for example.

In FIG. **6**, portions having the same step numbers as the step numbers shown in FIG. **3** serve to execute the same processing and repetitive description will be therefore omitted. In FIG. **7**, similarly, portions having the same step numbers as the step numbers shown in FIG. **4** serve to execute the same processing and repetitive description will be therefore omitted.

In FIG. **6**, after the first terminal side operating environment setting unit **2** of the portable terminal **10'** transmits the first operating environment setting information to the relay device **20'** to perform pairing through Bluetooth in Step S**4**, the second setting information transmitting unit **12** reads the third operating environment setting information (the SSID, the cypher mode and the password of the wireless router **200** and the like) stored in the setting information storing unit **11** (Step S**21**). Thereafter, the third operating environment setting information thus read is transmitted to the relay device **20'** by utilizing the wireless connection through the Bluetooth set in the Step S**4** (Step S**22**). Subsequently, the processing proceeds to Step S**5**.

In FIG. **7**, after the first relay side operating environment setting unit **21** sets the first operating environment setting information received from the portable terminal **10'** to the relay device **20'** to perform the pairing through the Bluetooth in Step S**12**, the second setting information receiving unit **25** decides whether the third operating environment setting information transmitted by the second setting information transmitting unit **12** of the portable terminal **10'** is received or not (Step S**31**).

If the third operating environment setting information is not received, the decision of the Step S**31** is repeated. On the other hand, if the second setting information receiving unit **25** receives the third operating environment setting information, the third relay side operating environment setting unit **26** acquires the third operating environment setting information thus received from the second setting information receiving unit **25** and sets the third operating environment setting information to the relay device **20'** (Step S**32**). Then, the processing proceeds to Step S**13**.

As described above in detail, according to the second embodiment, if a code **30** is read by the portable terminal **10'** including a camera, the wireless connection through the Bluetooth is set automatically between the portable terminal **10'** and the relay device **20'** by reading the code **30**. Moreover, information required for setting to perform wireless LAN communication through Wi-Fi by the relay device **20'** is transmitted from the portable terminal **10'** to the relay device **20'** by utilizing the wireless connection through the Bluetooth thus set automatically, and the wireless connection setting of the relay device **20'** is performed automatically. Furthermore, SIP registration information required for connection of the portable terminal **10'** and the relay device **20'** to the telephone call control server **400** to make a call is

automatically set by utilizing the wireless connection through the wireless LAN thus set automatically. Also in a state in which the connection through the wireless LAN is not set to the relay device **20'**, consequently, it is possible to automatically perform setting required for utilizing the portable terminal **10'** as a cordless extension unit of a cordless telephone through the relay device **20'** and the telephone call control server **400**.

Third Embodiment

Next, a third embodiment according to the present invention will be described with reference to the drawings. In the third embodiment, a second portable terminal **10** can be further registered as a cordless extension unit of a cordless telephone.

FIG. **8** is a diagram showing a specific structure of a cordless telephone system including an operating environment setting system **100'** according to the third embodiment. In FIG. **8**, components having the same reference numerals as those shown in FIG. **1** have the same functions and repetitive description will be therefore omitted. Although the third embodiment will be described as a variant of the first embodiment, the third embodiment can also be applied as a variant of the second embodiment.

As shown in FIG. **8**, the operating environment setting system **100"** according to the third embodiment includes two portable terminals $\mathbf{10}_{-1}$ and $\mathbf{10}_{-2}$, and a relay device **20**. The portable terminals $\mathbf{10}_{-1}$ and $\mathbf{10}_{-2}$ are smartphones or tablets, for example, and have a wireless communication function through Bluetooth and a wireless communication function through a wireless LAN such as Wi-Fi. Moreover, the portable terminals $\mathbf{10}_{-1}$ and $\mathbf{10}_{-2}$ include a camera and can read a code **30** stuck or printed on the relay device **20** or a second code **31** displayed on a screen of the portable terminal $\mathbf{10}_{-1}$.

In the third embodiment, it is assumed that information required for performing wireless communication through a wireless LAN via the wireless router **200** has already been set to the portable terminals $\mathbf{10}_{-1}$ and $\mathbf{10}_{-2}$. In the third embodiment, it is assumed that the first portable terminal $\mathbf{10}_{-1}$ is first registered as a first cordless extension unit of the cordless telephone and the second portable terminal $\mathbf{10}_{-2}$ is then registered as a second cordless extension unit of the cordless telephone. An operation for registering the first portable terminal $\mathbf{10}_{-1}$ as the first cordless extension unit is the same as that in the first embodiment or the second embodiment.

When the second portable terminal $\mathbf{10}_{-2}$ is to be registered as a second cordless extension unit, the second code **31** displayed on the screen of the first portable terminal $\mathbf{10}_{-1}$ is read in the second portable terminal $\mathbf{10}_{-2}$ to start processing for registration. The second code **31** is a code recording second operating environment setting information generated by a setting information generating unit **4** when registering the first portable terminal $\mathbf{10}_{-1}$ as the cordless extension unit and is issued by the first portable terminal $\mathbf{10}_{-1}$.

FIG. **9** is a block diagram showing an example of functional structures of a portable terminal **10"** and the relay device **20** provided in the operating environment setting system **100"** according to the third embodiment. In FIG. **9**, components having the same reference numerals as those shown in FIG. **2** have the same functions and repetitive description will be therefore omitted.

As shown in FIG. **9**, the portable terminal **10"** according to the third embodiment further includes, as a functional structure thereof, a code generating unit **13**, an authenticating unit **14**, a second code reading unit **15** and a third terminal side operating environment setting unit **16**. The code generating unit **13** and the authenticating unit **14** are functions to be executed by the first portable terminal $\mathbf{10}_{-1}$, and the second code reading unit **15** and the third terminal side operating environment setting unit **16** are functions to be executed by tee second portable terminal $\mathbf{10}_{-2}$. A structure of the relay device **20** is the same as that in the first embodiment shown in FIG. **2**.

The code generating unit **13** generates the second code **31** recording the second operating environment setting information generated by the setting information generating unit **4** (a password generated by encrypting identification information of the relay device **20** by the first portable terminal $\mathbf{10}_{-1}$). The second code **31** to be generated herein is a code acting as image data which can be displayed on a display of the first portable terminal $\mathbf{10}_{-1}$.

The second code reading unit **15** reads the second code **31** generated by the code generating unit **13** and displayed on the display of the first portable terminal $\mathbf{10}_{-1}$ via a camera (not shown) provided in the second portable terminal $\mathbf{10}_{-1}$.

The third terminal side operating environment setting unit **16** analyses the second code **31** read by the second code reading unit **15** and acquires the second operating environment setting information (the password). Moreover, the third terminal side operating environment setting unit **16** adds a registration ID of the second portable terminal $\mathbf{10}_{-2}$ to the password and sets them to the second portable terminal $\mathbf{10}_{-2}$, and transmits the registration ID and an IP address of the second portable terminal $\mathbf{10}_{-2}$ and a password to a telephone call control server **400**, thereby giving a registration request.

When the registration request is given from the second portable terminal $\mathbf{10}_{-2}$ to the telephone call control server **400** as described above, the telephone call control server **400** gives an authentication request to the first portable terminal $\mathbf{10}_{-1}$. The authentication request is given by transmitting a password sent from the second portable terminal $\mathbf{10}_{-2}$ to the first portable terminal $\mathbf{10}_{-1}$ and confirming validity of the password, for example.

The authenticating unit **14** performs authentication related to the validity of the password described above. Then, the telephone call control server **400** is notified of a result of the authentication. If the authentication is successful, the telephone call control server **400** formally registers the registration ID, the IP address and the password which are transmitted from the second portable terminal $\mathbf{10}_{-2}$ and returns, to the second portable terminal $\mathbf{10}_{-2}$, that the registration was performed. On the other hand, if the authentication is unsuccessful, the telephone call control server **400** returns, to the second portable terminal $\mathbf{10}_{-2}$, that the registration was not performed.

As described above, in the third embodiment, the second code **31** generated by the code generating unit **13** provided in the first portable terminal $\mathbf{10}_{-1}$ which has already set the second operating environment setting information is read by the second code reading unit **15** provided in the second portable terminal $\mathbf{10}_{-2}$ which has not set the second operating environment setting information. Consequently, the second code **31** is analyzed by the third terminal side operating environment setting unit **16** provided in the second portable terminal $\mathbf{10}_{-2}$ to set the second operating environment setting information to the second portable terminal $\mathbf{10}_{-2}$, and furthermore, the second operating environment setting information is transmitted to the telephone call control server **400** and is thus registered therein. At this time, the registration ID and the IP address of the second portable terminal $\mathbf{10}_{-2}$ are also registered together. By such an operation, it is possible

to automatically perform setting required for utilizing the second portable terminal **10**$_{-2}$ as a cordless extension unit of a cordless telephone by simply reading the second code **31** through the second portable terminal **10**$_{-2}$ including a camera.

Although the description has been given by taking the smartphone or the tablet as an example of the portable terminals **10**, **10'**, **10**$_{-1}$ and **10**$_{-2}$ in the first to third embodiments, the present invention is not restricted thereto. If the portable terminals **10**, **10'**, **10**$_{-1}$ and **10**$_{-2}$ have a wireless communication function through Bluetooth, a wireless LAN communication function through Wi-Fi and a code reading function, electronic equipment other than the smartphone or the tablet may be used.

If the relay devices **20** and **20'** described in the first to third embodiments have the wireless communication function through the Bluetooth and the wireless LAN communication function through the Wi-Fi, any electronic equipment can be used. For example, the relay devices **20** and **20'** may be wearable equipment of a spectacle type, a watch type, a wristband type or the like.

Although the description has been given to the example in which the portable terminals **10**, **10'**, **10**$_{-1}$ and **10**$_{-2}$ and the relay devices **20** and **20'** are connected through the Bluetooth in the first to third embodiments, moreover, it is also possible to apply a wireless communication technology other than the Bluetooth (for example, ZigBee or the like).

Although the description has been given to the example in which the code **30** (an example of a medium) of the relay device **20** is read by the cameras of the portable terminals **10**, **10'**, **10**$_{-1}$ and **10**$_{-2}$ to automatically perform the connection setting through the Bluetooth in the first to third embodiments, moreover, the present invention is not restricted thereto. For example, it is also possible to automatically perform the connection setting through the Bluetooth by reading a tag (another example of the medium) provided in the relay device **20** with use of NFC readers (corresponding to a reading unit in claims) of the portable terminals **10**, **10'**, **10**$_{-1}$ and **10**$_{-2}$ utilizing short-distance wireless communicating means such as: NFC (Near Field Communication).

In addition, all of the first to third embodiments are only illustrative for concreteness to carry out the present invention and the technical scope of the present invention should not be thereby construed to be restrictive. In other words, the present invention can be carried out in various configurations without departing from the gist or main features thereof.

EXPLANATION OF DESIGNATION

10, **10'**, **10**$_{-1}$, **10**$_{-2}$ portable terminal
1 code reading unit (reading unit)
2 first terminal side operating environment setting unit
3 peculiar information receiving unit
4 setting information generating unit
3 second terminal side operating environment setting unit
6 setting information transmitting unit
11 setting information storing unit
12 second setting information transmitting unit
13 code generating unit
14 authenticating unit
15 second code reading unit
16 third terminal side operating environment setting unit
20, **20'** relay device
21 first relay side operating environment setting unit
22 peculiar information transmitting unit
23 setting information receiving unit
24 second relay side operating environment setting unit
25 second setting information receiving unit
26 third relay side operating environment setting unit
30 code (medium)
31 second code
41 SIP server
42 PUSH server
100, **100"** operating environment setting system
200 wireless router
300 fixed telephone line
400 telephone call control server

The invention claimed is:

1. An operating environment setting system for setting an operating environment of a cordless telephone system in which a portable terminal having a telephone call application installed therein is connected to a fixed telephone line through a relay device and a telephone call control server, thereby enabling the portable terminal to be used as a cordless extension unit of a cordless telephone,

wherein the portable terminal includes:

a reading unit for reading a medium recording first operating environment setting information required for connecting the portable terminal and the relay device by wireless under a first wireless standard;

a first terminal side operating environment setting unit for analyzing the medium read by the reading unit, and acquiring the first operating environment setting information required for setting wireless connection under the first wireless standard and setting the first operating environment setting information to the portable terminal;

a setting information generating unit for generating second operating environment setting information required to connect the portable terminal and the relay device to the telephone call control server under a second wireless standard and to then make a call;

a second terminal side operating environment setting unit for setting the second operating environment setting information generated by the setting information generating unit to the portable terminal, and transmitting the second operating environment setting information to the telephone call control server and registering the second operating environment setting information therein; and

a setting information transmitting unit for transmitting the second operating environment setting information generated by the setting information generating unit to the relay device by utilizing the wireless connection set by the first terminal side operating environment setting unit, and

the relay device includes:

a first relay side operating environment setting unit for acquiring the first operating environment setting information from the portable terminal and setting the first operating environment setting information to the relay device when setting the wireless connection under the first wireless standard by the first terminal side operating environment setting unit of the portable terminal;

a setting information receiving unit for receiving the second operating environment setting information transmitted by the setting information transmitting unit; and

a second relay side operating environment setting unit for setting the second operating environment setting information received by the setting information receiving unit to the relay device, and transmitting the second operating environment setting information to the tele-

phone call control server and registering the second operating environment setting information therein.

2. The operating environment setting system according to claim 1, wherein the portable terminal further includes:

a setting information storing unit for storing third operating environment setting information required for performing wireless connection under the second wireless standard; and

a second setting information transmitting unit for transmitting the third operating environment setting information stored in the setting information storing unit to the relay device by utilizing the wireless connection set by the first terminal side operating environment setting unit,

the relay device further includes:

a second setting information receiving unit for receiving the third operating environment setting information transmitted by the second setting information transmitting unit; and

a third relay side operating environment setting unit for setting the third operating environment setting information received by the second setting information receiving unit to the relay device, and

the second relay side operating environment setting unit of the relay device transmits the second operating environment setting information received by the setting information receiving unit to the telephone call control server and registers the second operating environment setting information therein by utilizing the wireless connection under the second wireless standard set based on the setting of the third operating environment setting information by the third relay side operating environment setting unit.

3. The operating environment setting system according to claim 2, wherein the third operating environment setting information is information required for setting to connect the relay device to a wireless LAN.

4. The operating environment setting system according to claim 2, wherein the reading unit reads a code or a tag as the medium recording the first operating environment setting information,

the portable terminal includes:

a code generating unit for generating a second code recording the second operating environment setting information generated by the setting information generating unit;

a second code reading unit for reading the second code generated by the code generating unit; and

a third terminal side operating environment setting unit for analyzing the second code read by the second code reading unit, acquiring the second operating environment setting information and setting the second operating environment setting information to the portable terminal, and transmitting the second operating environment setting information to the telephone call control server and registering the second operating environment setting information therein, and

the second code generated by the code generating unit provided in the portable terminal to which the second operating environment setting information has already been set is read by the second code reading unit provided in the portable terminal to which the second operating environment setting information has not been set yet so that the second code is analyzed to set the second operating environment setting information to the portable terminal and the second operating environment setting information is transmitted to the telephone call control server and is registered therein by the third terminal side operating environment setting unit provided in the portable terminal to which the second operating environment setting information has not been set yet.

5. The operating environment setting system according to claim 4, wherein the setting information generating unit of the portable terminal acquires peculiar identification information of the relay device from the relay device by utilizing the wireless connection set by the first terminal side operating environment setting unit, and encrypts the identification information to generate the second operating environment setting information.

6. The operating environment setting system according to claim 4, wherein the first operating environment setting information is information required for setting to perform wireless connection between the portable terminal and the relay device through Bluetooth.

7. The operating environment setting system according to claim 2, wherein the setting information generating unit of the portable terminal acquires peculiar identification information of the relay device from the relay device by utilizing the wireless connection set by the first terminal side operating environment setting unit, and encrypts the identification information to generate the second operating environment setting information.

8. The operating environment setting system according to claim 2, wherein the first operating environment setting information is information required for setting to perform wireless connection between the portable terminal and the relay device through Bluetooth.

9. The operating environment setting system according to claim 1, wherein the reading unit reads a code or a tag as the medium recording the first operating environment setting information,

the portable terminal includes:

a code generating unit for generating a second code recording the second operating environment setting information generated by the setting information generating unit;

a second code reading unit for reading the second code generated by the code generating unit; and

a third terminal side operating environment setting unit for analyzing the second code read by the second code reading unit, acquiring the second operating environment setting information and setting the second operating environment setting information to the portable terminal, and transmitting the second operating environment setting information to the telephone call control server and registering the second operating environment setting information therein, and

the second code generated by the code generating unit provided in the portable terminal to which the second operating environment setting information has already been set is read by the second code reading unit provided in the portable terminal to which the second operating environment setting information has not been set yet so that the second code is analyzed to set the second operating environment setting information to the portable terminal and the second operating environment setting information is transmitted to the telephone call control server and is registered therein by the third terminal side operating environment setting unit provided in the portable terminal to which the second operating environment setting information has not been set yet.

10. The operating environment setting system according to claim 9, wherein the setting information generating unit of the portable terminal acquires peculiar identification information of the relay device from the relay device by utilizing the wireless connection set by the first terminal side operating environment setting unit, and encrypts the identification information to generate the second operating environment setting information.

11. The operating environment setting system according to claim 9, wherein the first operating environment setting information is information required for setting to perform wireless connection between the portable terminal and the relay device through Bluetooth.

12. The operating environment setting system according to claim 1, wherein the setting information generating unit of the portable terminal acquires peculiar identification information of the relay device from the relay device by utilizing the wireless connection set by the first terminal side operating environment setting unit, and encrypts the identification information to generate the second operating environment setting information.

13. The operating environment setting system according to claim 1, wherein the first operating environment setting information is information required for setting to perform wireless connection between the portable terminal and the relay device through Bluetooth.

14. A computer readable operating environment setting program mounted on a portable terminal having a telephone call application installed therein in a cordless telephone system having a relay device and the portable terminal and capable of using the portable terminal as a cordless extension unit of a cordless telephone by connection of the portable terminal to a fixed telephone line through the relay device and a telephone call control server, the operating environment setting program for causing a computer of the portable terminal to function as:

reading means for reading a medium recording first operating environment setting information required for connecting the portable terminal and the relay device by wireless under a first wireless standard;

first terminal side operating environment setting means for analyzing the medium read by the reading means, and acquiring the first operating environment setting information required for setting wireless connection under the first wireless standard and setting the first operating environment setting information to the portable terminal;

setting information generating means for generating second operating environment setting information required to connect the portable terminal and the relay device to the telephone call control server under a second wireless standard and to then make a call;

second terminal side operating environment setting means for setting the second operating environment setting information generated by the setting information generating means to the portable terminal, and transmitting the second operating environment setting information to the telephone call control server and registering the second operating environment setting information therein; and

setting information transmitting means for transmitting the second operating environment setting information generated by the setting information generating means to the relay device by utilizing the wireless connection set by the first terminal side operating environment setting means.

15. A computer readable operating environment setting program mounted on a relay device and operated in cooperation with the program according to claim 7 mounted on a portable terminal having a telephone call application installed therein in a cordless telephone system having the relay device and the portable terminal and capable of using the portable terminal as a cordless extension unit of a cordless telephone by connection of the portable terminal to a fixed telephone line through the relay device and a telephone call control server, the operating environment setting program for causing a computer of the relay device to function as:

first relay side operating environment setting means for acquiring the first operating environment setting information from the portable terminal and setting the first operating environment setting information to the relay device when setting the wireless connection under the first wireless standard by the first terminal side operating environment setting means of the portable terminal;

setting information receiving means for receiving the second operating environment setting information transmitted by the setting information transmitting means; and

second relay side operating environment setting means for setting the second operating environment setting information received by the setting information receiving means to the relay device, and transmitting the second operating environment setting information to the telephone call control server and registering the second operating environment setting information therein.

16. A portable terminal having a telephone call application installed therein which is used in a cordless telephone system capable of utilizing the portable terminal as a cordless extension unit of a cordless telephone by connection of the portable terminal to a fixed telephone line through a relay device and a telephone call control server, comprising:

a reading unit for reading a medium recording first operating environment setting information required for connecting the portable terminal and the relay device by wireless under a first wireless standard;

a first terminal side operating environment setting unit for analyzing the medium read by the reading unit, and acquiring the first operating environment setting information required for setting wireless connection under the first wireless standard and setting the first operating environment setting information to the portable terminal;

a setting information generating unit for generating second operating environment setting information required to connect the portable terminal and the relay device to the telephone call control server under a second wireless standard and to then make a call;

a second terminal side operating environment setting unit for setting the second operating environment setting information generated by the setting information generating unit to the portable terminal, and transmitting the second operating environment setting information to the telephone call control server and registering the second operating environment setting information therein; and

a setting information transmitting unit for transmitting the second operating environment setting information generated by the setting information generating unit to the relay device by utilizing the wireless connection set by the first terminal side operating environment setting unit.

17. A relay device used in a cordless telephone system capable of utilizing a portable terminal having a telephone call application installed therein as a cordless extension unit of a cordless telephone by connection of the portable terminal to a fixed telephone line through the relay device and a telephone call control server and operated in cooperation with the portable terminal according to claim 16, comprising

a first relay side operating environment setting unit for acquiring the first operating environment setting information from the portable terminal and setting the first operating environment setting information to the relay device when setting the wireless connection under the first wireless standard by the first terminal side operating environment setting unit of the portable terminal;

a setting information receiving unit for receiving the second operating environment setting information transmitted by the setting information transmitting unit; and

a second relay side operating environment setting unit for setting the second operating environment setting information received by the setting information receiving unit to the relay device, and transmitting the second operating environment setting information to the telephone call control server and registering the second operating environment setting information therein.

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