SUMMARY OF THE INVENTION

TECHNICAL PROBLEM

[0004]

Embodiments of the present invention provide a home delivery box, a home delivery system, a portable terminal, a communication method, and an information processing method that enable managing service conditions of the home delivery box via an information terminal such as a server device.

SOLUTION TO PROBLEM

[0005]

According to a first aspect of the present invention, there is provided a home delivery box including a housing unit configured to house a package, a locking device configured to lock and unlock a door of the housing unit, a detecting unit configured to detect opening and closing of the door, a control unit configured to perform control to cause the locking device to lock the door when closing of the door is detected, and a wireless communication unit configured to transmit, through short-distance wireless communication, one of package arrival information and package receipt information to a portable terminal when closing of the door is detected, the package arrival information indicating that a package has been housed in the housing unit, and the package receipt information indicating that a package housed in the housing unit has been received.

[0006]

According to a second aspect of the present invention, there is provided a home delivery system including a storage unit configured to store management information indicating whether or not a home delivery box is available, a receiving unit configured to receive a permission-to-use request asking for use of the home delivery box from a first portable terminal, a transmission unit configured to transmit first authentication information for unlocking a door of the home delivery box to the first portable terminal when the home delivery box is determined to be available based on the management

information, and an information processing unit configured to update the management information when the receiving unit has received, via a wide-area communication network, package arrival information transmitted from the home delivery box to the first portable terminal through short-distance wireless communication, and indicating that a package has been housed in the home delivery box from the first portable terminal after transmission of the first authentication information.

[0007]

According to a third aspect of the present invention, there is provided a portable terminal including a first communication unit configured to receive authentication information transmitted from a server device, the authentication information being information for unlocking a door of a home delivery box, a second communication unit configured to transmit the authentication information received, to the home delivery box, and a terminal control unit configured to, when the second communication unit has received, through short-distance wireless communication, one of package arrival information and package receipt information from the home delivery box, the package arrival information indicating that a package has been housed in the home delivery box, and the package receipt information indicating that a package housed in the home delivery box has been received, cause the first communication unit to transmit via a wide-area communication network, to the server device, information corresponding to the one of the package arrival information and the package receipt information that has been received.

[0008]

According to a fourth aspect of the present invention, there is provided a communication method that includes detecting opening and closing of a door of a housing unit of a home delivery box, and locking the door when closing of the door is detected, and transmitting via a wide-area communication network one of package arrival information and package receipt information to a portable terminal, the package arrival information indicating that a package has been housed in the housing unit, and the package receipt information

indicating that a package housed in the housing unit has been received, through short-distance wireless communication.

[0009]

According to a fifth aspect of the present invention, there is provided a program for causing a computer to execute the communication method described above.

[0010]

According to a sixth aspect of the present invention, there is provided an information processing method that includes receiving a permission-to-use request asking for use of a home delivery box from a first portable terminal, when the home delivery box is determined to be available based on management information, transmitting via a wide-area communication network first authentication information for unlocking a door of the home delivery box to the first portable terminal, the management information indicating whether or not the home delivery box is available, and updating the management information when package arrival information indicating that a package has been housed in the home delivery box has been received, through short-distance wireless communication, from the first portable terminal after transmission of the first authentication information.

[0011]

According to a seventh aspect of the present invention, there is provided a program for causing a computer to execute the information processing method described above.

[0012]

According to an eighth aspect of the present invention, there is provided a communication method that includes receiving authentication information transmitted from a server device, the authentication information being information for unlocking a door of a home delivery box, transmitting the authentication information received, to the home delivery box, and when one of package arrival information and package receipt information has been received through short-distance wireless communication from the home delivery box,

transmitting via a wide-area communication network, to the server device, information corresponding to the one of the package arrival information and the package receipt information that has been received, the package arrival information indicating that a package has been housed in the home delivery box, and the package receipt information indicating that the package housed in the home delivery box has been received.

[0013]

According to a ninth aspect of the present invention, there is provided a program for causing a computer to execute the communication method described above.

ADVANTAGEOUS EFFECT OF INVENTION

[0014]

According to embodiments of the present invention, it is possible to manage service conditions of the home delivery box via an information terminal such as a server device.

BRIEF DESCRIPTION OF DRAWINGS

[0015]

FIG. 1 is a diagram illustrating an overview of a home delivery system according to an embodiment.

FIG. 2 is a block diagram illustrating a functional configuration of the home delivery system according to the embodiment.

FIG. 3 is a diagram showing one example of management information.

FIG. 4 is a diagram showing one example of customer information.

FIG. 5 is a sequence diagram of exemplary operation 1 of the home delivery system according to the embodiment.

FIG. 6 shows one example of an image that indicates the position of a

CLAIMS

1. A home delivery box, comprising:

a housing unit configured to house a package;

a locking device configured to lock and unlock a door of the housing unit;

a detecting unit configured to detect opening and closing of the door;

a control unit configured to perform control to cause the locking device to lock the door when closing of the door is detected; and

a wireless communication unit configured to transmit, through short-distance wireless communication, one of package arrival information and package receipt information to a portable terminal when closing of the door is detected, the package arrival information indicating that a package has been housed in the housing unit, and the package receipt information indicating that a package housed in the housing unit has been received.

2. The home delivery box according to claim 1,

wherein the wireless communication unit is further configured to receive an unlock request that includes authentication information from the portable terminal, and

the control unit is further configured to perform control to cause the locking device to unlock the door when the authentication information included in the unlock request received is determined to be correct.

3. The home delivery box according to claim 2, further comprising:

an operation accepting unit configured to accept operation from a user of the portable terminal,

wherein when the operation accepting unit has accepted operation from the user, communication for receiving the unlock request starts between the wireless communication unit and the portable terminal.

4. The home delivery box according to any one of claims 1 to 3, further comprising:

a battery housing unit,

wherein the locking device operates using a battery housed in the battery housing unit as a power source.

5. A home delivery system, comprising:

a storage unit configured to store management information indicating whether or not a home delivery box is available;

a receiving unit configured to receive a permission-to-use request asking for use of the home delivery box from a first portable terminal;

a transmission unit configured to transmit first authentication information for unlocking a door of the home delivery box to the first portable terminal when the home delivery box is determined to be available based on the management information; and

an information processing unit configured to update the management information when the receiving unit has received, via a wide-area communication network, package arrival information transmitted from the home delivery box to the first portable terminal through short-distance wireless communication, and indicating that a package has been housed in the home delivery box from the first portable terminal after transmission of the first authentication information.

6. The home delivery system according to claim 5,

wherein the transmission unit is configured to transmit second authentication information for unlocking the door of the home delivery box to a second portable terminal different from the first portable terminal when the receiving unit has received the package arrival information from the first portable terminal, and

the information processing unit is configured to update the management information when the receiving unit has received package receipt information from the second portable terminal after transmission of the first authentication information, the package receipt information indicating that a package housed in the home delivery box has been received.

7. The home delivery system according to claim 6,

wherein the transmission unit is configured to transmit third authentication information for unlocking the door of the home delivery box to the first portable terminal when the receiving unit has received authorization information indicating permission for multiple storage from the second portable terminal after receipt of the package arrival information and before receipt of package receipt information indicating that the package housed in the home delivery box has been received.

8. The home delivery system according to claim 6 or 7,

wherein the transmission unit is configured to, when the receiving unit has not received package receipt information indicating that a package housed in the home delivery box has been received, even after a lapse of a predetermined period of time since the receipt of the package arrival information, transmit a collection-request notice that demands collection of the

package housed in the home delivery box to the second portable terminal.

9. The home delivery system according to any one of claims 5 to 8,

wherein the transmission unit is configured to, when the receiving unit has not received package receipt information indicating that a package housed in the home delivery box has been received, even after a lapse of a predetermined period of time since the receipt of the package arrival information, transmit, to the first portable terminal, fourth authentication information for unlocking the door of the home delivery box and a collection-request notice that demands collection of the package housed in the home delivery box.

10. The home delivery system according to any one of claims 5 to 9,

wherein the management information includes reserved-period information indicating a reserved period during which a user of the first portable terminal is able to put in a package, and

the information processing unit is configured to determine a length of the reserved period according to a delivery company to which the user belongs.

11. A portable terminal, comprising:

a first communication unit configured to receive authentication information transmitted from a server device, the authentication information being information for unlocking a door of a home delivery box;

a second communication unit configured to transmit the authentication information received, to the home delivery box; and

a terminal control unit configured to, when the second communication unit has received, through short-distance wireless communication, one of

package arrival information and package receipt information from the home delivery box, the package arrival information indicating that a package has been housed in the home delivery box, and the package receipt information indicating that a package housed in the home delivery box has been received, cause the first communication unit to transmit via a wide-area communication network, to the server device, information corresponding to the one of the package arrival information and the package receipt information that has been received.

12. A communication method, comprising:

detecting opening and closing of a door of a housing unit of a home delivery box; and

locking the door when closing of the door is detected, and transmitting via a wide-area communication network one of package arrival information and package receipt information to a portable terminal, the package arrival information indicating that a package has been housed in the housing unit, and the package receipt information indicating that a package housed in the housing unit has been received, through short-distance wireless communication.

13. A program for causing a computer to execute the communication method according to claim 12.

14. An information processing method, comprising:

receiving a permission-to-use request asking for use of a home delivery box from a first portable terminal;

when the home delivery box is determined to be available based on

management information, transmitting via a wide-area communication network first authentication information for unlocking a door of the home delivery box to the first portable terminal, the management information indicating whether or not the home delivery box is available; and

updating the management information when package arrival information indicating that a package has been housed in the home delivery box has been received, through short-distance wireless communication, from the first portable terminal after transmission of the first authentication information.

15. A program for causing a computer to execute the information processing method according to claim 14.

16. A communication method, comprising:

receiving authentication information transmitted from a server device, the authentication information being information for unlocking a door of a home delivery box;

transmitting the authentication information received, to the home delivery box; and

when one of package arrival information and package receipt information has been received through short-distance wireless communication from the home delivery box, transmitting via a wide-area communication network, to the server device, information corresponding to the one of the package arrival information and the package receipt information that has been received, the package arrival information indicating that a package has been housed in the home delivery box, and the package receipt information indicating that the package housed in the home delivery box has been received.

17. A program for causing a computer to execute the communication method according to claim 16.