third-party terminal while the security is ensured.

[0009] A key information sharing system according to a first aspect of the invention relates to a key information sharing system that allows key information as first information to be shared. The first information is associated with an object equipped with a control device, the control device performing a predetermined control to the object when the control device receives the first information from an external terminal. The key information sharing system according to the first aspect of the invention includes: a delivery device configured to deliver the first information; and a user terminal configured to receive the first information delivered from the delivery device. The delivery device includes an information generation unit configured to add second information to the first information that is delivered to the user terminal, the second information being information that allows the first information to be transferred between the user terminal and the third-party terminal without the delivery device. The user terminal includes a terminal-to-terminal communication unit configured to transmit the first information to the third-party terminal in response to an input operation by a user, when the user terminal receives the first information to which the second information has been added, from the delivery device. The predetermined control comprises a plurality of controls including a lock-unlocking control of locking or unlocking the object. The information generation unit further adds third information to the first information when the information generation unit adds the second information to the first information, the third information being information that restricts a control of the plurality of controls other than the locking-unlocking control that is allowed to be performed to the object when the control device receives the first information.

[0010] In the key information sharing system according to the invention, when the control device equipped in the object receives the first information associated with the object, from the terminal in the exterior of the object, the control device performs the predetermined control to the object. Here, the control device may perform a predetermined authentication process for the first information received from the external terminal. In this case, when the authentication of the first information succeeds, the control device performs the predetermined control to the object. The external terminal is not limited to the user terminal, and even when the control device receives the first information from the third-party terminal, the control device can perform the predetermined control to the object.

[0011] The predetermined control is a control that is allowed to be performed when the control device receives the first information. For example, the predetermined

terminal side, the fifth information may be added to the first information. In this case, the user terminal adds the fifth information to the first information, and transmits the first information only to a particular third-party terminal, when the user terminal receives the first information to which the second information has been added, from the delivery device.

[0028] A delivery device according to a second aspect of the invention includes: an information transmitting unit configured to deliver key information as first information to a user terminal; and an information generation unit configured to add second information to the first information that is delivered to the user terminal, the second information being information that allows the first information to be transferred between the user terminal and a third-party terminal without the delivery device. The first information is associated with an object equipped with a control device, and the control device performs a predetermined control to the object when the control device receives the first information from an external terminal. The predetermined control comprises a plurality of controls including a lock-unlocking control of locking or unlocking the object. The information generation unit further adds third information to the first information when the information generation unit adds the second information to the first information, the third information being information that restricts a control of the plurality of controls other than the locking-unlocking control that is allowed to be performed to the object when the control device receives the first information.

[0029] In the delivery device according to the aspect, the information generation unit may further add third information to the first information when the information generation unit adds the second information to the first information. At this time, the information generation unit may set a restriction content for the predetermined control, based on a function restriction request transmitted from the user terminal, and may add the third information to the first information, the restriction content being contained in the third information.

[0030] In the delivery device according to the aspect, the information generation unit may further add fourth information to the first information when the information generation unit adds the second information to the first information. At this time, the information generation unit may set a restriction content for the first information, based on a use restriction request transmitted from the user terminal, and may add the fourth information to the first information, the restriction content being contained in the fourth information.

[0031] In the delivery device according to the aspect, the information generation

CLAIMS

1. A key information sharing system that allows key information as first information to be shared, the first information being associated with an object equipped with a control device, the control device performing a predetermined control to the object when the control device receives the first information from an external terminal, the key information sharing system characterized by comprising:

a delivery device configured to deliver the first information; and

a user terminal configured to receive the first information delivered from the delivery device, wherein

the delivery device includes an information generation unit configured to add second information to the first information that is delivered to the user terminal, the second information being information that allows the first information to be transferred between the user terminal and a third-party terminal without the delivery device,

the user terminal includes a terminal-to-terminal communication unit configured to transmit the first information to the third-party terminal in response to an input operation by a user, when the user terminal receives the first information to which the second information has been added, from the delivery device,

the predetermined control comprises a plurality of controls including a lock-unlocking control of locking or unlocking the object, and

the information generation unit further adds third information to the first information when the information generation unit adds the second information to the first information, the third information being information that restricts a control of the plurality of controls other than the locking-unlocking control that is allowed to be performed to the object when the control device receives the first information.

2. The key information sharing system according to claim 1, wherein

the user terminal transmits the first information to which the third information has been added from the terminal-to-terminal communication unit to the third-party terminal, when the

user terminal receives the first information to which the second information and the third information have been added, from the delivery device.

3. The key information sharing system according to claim 2, wherein the information generation unit sets a restriction content for the predetermined control, based on a function restriction request transmitted from the user terminal to the delivery device, and adds the third information to the first information, the restriction content being contained in the third information.

4. The key information sharing system according to any one of claims 1 to 3, wherein:

the information generation unit further adds fourth information to the first information when the information generation unit adds the second information to the first information, the fourth information being information that restricts use of the first information by the third-party terminal; and

the user terminal transmits the first information to which the fourth information has been added from the terminal-to-terminal communication unit to the third-party terminal, when the user terminal receives the first information to which the second information and the fourth information have been added, from the delivery device.

5. The key information sharing system according to claim 4, wherein the information generation unit sets a restriction content for the first information, based on a use restriction request transmitted from the user terminal to the delivery device, and adds the fourth information to the first information, the restriction content being contained in the fourth information.

6. The key information sharing system according to any one of claims 1 to 5, wherein:

the information generation unit further adds fifth information to the first information when the information generation unit adds the second information to the first information, the fifth information being information that allows the first information to be transferred only

between the user terminal and a particular third-party terminal belonging to a particular group without the delivery device; and

the user terminal transmits the first information only to the particular third-party terminal, when the user terminal receives the first information to which the second information and the fifth information have been added, from the delivery device.

7. The key information sharing system according to claim 6, wherein the information generation unit generates the fifth information based on information about the particular third-party terminal that is transmitted from the user terminal to the delivery device, and adds the fifth information to the first information.

8. The key information sharing system according to claim 3, wherein:

the user terminal further includes a registration unit configured to register a plurality of the third-party terminals while grouping the plurality of the third-party terminals into a plurality of groups, and the user terminal sets the restriction content in the function restriction request for each of the groups and transmits the function restriction request to the delivery device; and

the information generation unit adds the third information corresponding to the function restriction request set for each of the groups, to the first information.

9. The key information sharing system according to claim 5, wherein:

the user terminal further includes a registration unit configured to register a plurality of the third-party terminals while grouping the plurality of the third-party terminals into a plurality of groups, and the user terminal sets the restriction content in the use restriction request for each of the groups and transmits the use restriction request to the delivery device; and

the information generation unit adds the fourth information corresponding to the use restriction request set for each of the groups, to the first information.

10. The key information sharing system according to claim 1, wherein the user terminal adds third information to the first information, and transmits the first information to which the third information has been added, to the third-party terminal, when the user terminal receives the first information to which the second information has been added, from the delivery device, the third information being information that restricts the predetermined control that is allowed to be performed to the object when the control device receives the first information.

11. The key information sharing system according to claim 1 or 10, wherein the user terminal adds fourth information to the first information, and transmits the first information to which the fourth information has been added, to the third-party terminal, when the user terminal receives the first information to which the second information has been added, from the delivery device, the fourth information being information that restricts use of the first information in the control device.

12. The key information sharing system according to any one of claims 1, 10 and 11, wherein the user terminal adds fifth information to the first information, and transmits the first information only to a particular third-party terminal belonging to a particular group, when the user terminal receives the first information to which the second information has been added, from the delivery device, the fifth information being information that allows the first information to be transferred only between the user terminal and the particular third-party terminal without the delivery device.

13. The key information sharing system according to claim 10, wherein the user terminal includes a registration unit configured to register a plurality of the third-party terminals while grouping the plurality of the third-party terminals into a plurality of groups, and the user terminal sets a restriction content that is contained in the third information, for each of the groups.

14. The key information sharing system according to claim 11, wherein the user terminal

includes a registration unit configured to register a plurality of the third-party terminals while grouping the plurality of the third-party terminals into a plurality of groups, and the user terminal sets a restriction content that is contained in the fourth information, for each of the groups.

15. The key information sharing system according to any one of claims 4, 5, 9, 11 and 14, wherein the fourth information contains information that restricts a use period or the number of times of use in which the third-party terminal is allowed to validly use the first information.

16. The key information sharing system according to any one of claims 4, 5, 9, 11, 14 and 15, wherein:

the object is a movable body; and

the fourth information contains information that restricts a region in which the third-party terminal is allowed to validly use the first information.

17. The key information sharing system according to any one of claims 1 to 16, wherein:

the object is a vehicle; and

the predetermined control includes a locking-unlocking control for the vehicle and a control of putting a driving source of the vehicle into a drivable state.

18. A delivery device characterized by comprising:

an information transmitting unit configured to deliver key information as first information to a user terminal, the first information being associated with an object equipped with a control device, the control device performing a predetermined control to the object when the control device receives the first information from an external terminal; and

an information generation unit configured to add second information to the first information that is delivered to the user terminal, the second information being information that allows the first information to be transferred between the user terminal and a third-party

terminal without the delivery device, wherein

the predetermined control comprises a plurality of controls including a lock-unlocking control of locking or unlocking the object, and

the information generation unit further adds third information to the first information when the information generation unit adds the second information to the first information, the third information being information that restricts a control of the plurality of controls other than the locking-unlocking control that is allowed to be performed to the object when the control device receives the first information.

19. The delivery device according to claim 18, wherein the information generation unit sets a restriction content for the predetermined control, based on a function restriction request transmitted from the user terminal, and adds the third information to the first information, the restriction content being contained in the third information.

20. The delivery device according to claim 18 or 19, wherein the information generation unit further adds fourth information to the first information when the information generation unit adds the second information to the first information, the fourth information being information that restricts use of the first information by the third-party terminal.

21. The delivery device according to claim 20, wherein the information generation unit sets a restriction content for the first information, based on a use restriction request transmitted from the user terminal, and adds the fourth information to the first information, the restriction content being contained in the fourth information.

22. The delivery device according to claim 20 or 21, wherein the fourth information contains information that restricts a use period or the number of times of use in which the third-party terminal is allowed to validly use the first information.

23. The delivery device according to any one of claims 20 to 22, wherein:

the object is a movable body; and

the fourth information contains information that restricts a region in which the third-party terminal is allowed to validly use the first information.

24. The delivery device according to any one of claims 18 to 23, wherein the information generation unit further adds fifth information to the first information when the information generation unit adds the second information to the first information, the fifth information being information that allows the first information to be transferred only between the user terminal and a particular third-party terminal belonging to a particular group without the delivery device.

25. The delivery device according to claim 24, wherein the information generation unit generates the fifth information based on information about the particular group that is transmitted from the user terminal, and adds the fifth information to the first information.

26. The delivery device according to any one of claims 18 to 25, wherein:

the object is a vehicle; and

the predetermined control includes a locking-unlocking control for the vehicle and a control of putting a driving source of the vehicle into a drivable state.

27. A user terminal characterized by comprising a terminal-to-terminal communication unit configured to transmit the first information to the third-party terminal in response to an input operation by a user, when the user terminal receives the first information to which the second information has been added, from the delivery device according to any one of claims 18 to 26.