information), game token coins in the casino may be used for crimes, including money-laundering, for example, and the solution to the concern is asked for.

[0006]

Therefore, embodiments of the present disclosure seek to provide a game token coin and a management system that may enable additional write of information on an RFID tag, allow the RFID tag of the game token coin to retain the use history of the game token coin, and enable the finding of a fraud game token coin having unusual use history based on the written use history.

[0006a]

An aspect of the present invention provides a management system for a plurality of game token coins that each includes a radio frequency identification (RFID) tag that has (a) a non-rewritable data region configured to store, as constant information, at least one of production information, product information, casino information, value information, and a serial number of the game token coin, and (b) a rewritable data region configured to store, as variable information, location related information of the game token coin that is extractable from the constant information stored in the non-rewritable data region of the RFID tag, the system comprising a writer; a reader; and a management controller. The writer is configured to write the respective location related information of the game token coins to the respective data rewritable regions of the game token coins. The data rewritable regions are each configured to store a plurality of sets of the location related information relating to a plurality of locations, including at least a latest of the sets of location related information of the respective game token coin written by the writer to the respective data rewritable region of the respective game token coin. The reader is configured to collectively read the constant

information stored in the data non-rewritable regions of the plurality of game token coins; and based on the read constant information, read the respective location related information stored in the data rewritable regions that are respectively paired with each of the constant information. The management controller configured to, for each of one or more of the game token coins: determine presence of a first abnormality based on a history of the location related information of the respective game token coin stored in and read by the reader from the RFID tag of the respective game token coin; determine presence of a second abnormality by checking the constant information and the variable information stored in and read by the reader from the RFID tag of the respective game token coin against the constant information and the variable information relating to the respective game token coin stored in a database outside of the game token coins; generate an error signal in response to presence of the determination of the presence of the first or second abnormality; and identify the constant information of the game token coin that corresponds to the first or second abnormality.

[0007]

In a management system for a game token coin according to the present disclosure, one RFID tag having a data non-rewritable region and a data rewritable region is imparted to a game token coin, the data non-rewritable region of the RFID tag is configured to store, as constant information, at least one of production information, product information, casino information, value information, and a serial number of the game token coin, and the data rewritable region is configured to store, as variable information, location relating information (or formation about the whereabouts) of the game token coin, in which from the constant information (or fixed information) stored in the data non-rewritable region of an RFID tag, the variable information stored in the data rewritable region of the same RFID tag is extractable. The system further includes a writer configured to additionally write the location relating information of the

of the game token coins read by the reader and determine the location relating information.

[0018]

A game token coin according to the present disclosure includes one RFID tag having a data non-rewritable region and a data rewritable region. The data non-rewritable region is configured to store, as constant information, at least one of production information, product information, casino information, value information, and a serial number of the game token coin. The data rewritable region is configured to store, as variable information, location relating information of the game token coin written by a writer. The variable information stored in the data rewritable region of the RFID tag is extractable from the constant information stored in the data non-rewritable region of the same RFID tag, and so a pair of the variable information stored in the rewritable data region and the constant information stored in the non-rewritable data region can be determined by reading the RFID tag of the game token coin. Presence of an abnormality is to be determined by checking the constant information and the variable information stored in and read from the RFID tag of the game token coin against the constant information and the variable information relating to the game token coin stored in a database outside of the game token coin.

[0019]

The game token coin may be configured in which a reader collectively reads the constant information stored in the data non-rewritable region of a plurality of the game token coins, and the location relating information stored in the data rewritable region is read based on the read constant information.

[0020]
The foregoing and other objects, features, aspects and advantages of the exemplary embodiments will become more apparent from the following detailed description of the

CLAIMS

1. A management system for a plurality of game token coins that each includes a radio frequency identification (RFID) tag that has (a) a non-rewritable data region configured to store, as constant information, at least one of production information, product information, casino information, value information, and a serial number of the game token coin, and (b) a rewritable data region configured to store, as variable information, location related information of the game token coin that is extractable from the constant information stored in the non-rewritable data region of the RFID tag, the system comprising:

a writer;

a reader; and

a management controller;

wherein:

the writer is configured to write the respective location related information of the game token coins to the respective data rewritable regions of the game token coins;

the data rewritable regions are each configured to store a plurality of sets of the location related information relating to a plurality of locations, including at least a latest of the sets of location related information of the respective game token coin

written by the writer to the respective data rewritable region of the respective game token coin;

the reader is configured to:

collectively read the constant information stored in the data non-rewritable regions of the plurality of game token coins; and

read the respective location related information stored in the data rewritable regions that are respectively paired with each of the constant information; and

the management controller configured to, for each of one or more of the game token coins:

determine presence of a first abnormality based on a history of the location related information of the respective game token coin stored in and read by the reader from the RFID tag of the respective game token coin;

determine presence of a second abnormality by checking the constant information and the variable information stored in and read by the reader from the RFID tag of the respective game token coin against the constant information and the variable information relating to the respective game token coin stored in a database outside of the game token coins;

generate an error signal in response to presence of the determination of the presence of the first or second abnormality; and

identify the constant information of the game token coin that corresponds to the first or second abnormality.

2. The management system according to claim 1, wherein:

the data rewritable region is configured to additionally store information on time at which the writer writes to the game token coin; and

the management controller is configured to determine, as the first abnormality, passage of at least a predetermined period of time from a latest write of the location related information to the data rewritable region of the respective game token coin.

3. The management system according to claim 1, wherein:

the location related information includes at least one of information indicating a cage, information indicating an entry or exit, and information indicating a backyard;

the data rewritable region is configured to additionally store information on time at which the writer writes to the game token coin;

the management controller is configured to determine, as the first abnormality, passage of at least a

predetermined period of time from a predefined write event of the location related information to the data rewritable region of the respective game token coin without any further location related information being written to the data rewritable region of the respective game token coin; and

the predefined write event is any of an event group that consists of one or more of the following:

(1) a writing of the information indicating the cage to the data rewritable region;

(2) a writing of the information indicating the entry; and

(3) a writing of the information indicating the exit.

4. The management system according to claim 1, wherein:

the data rewritable region is configured to additionally store information on time at which the writer writes to the game token coin; and

the management controller is configured to determine, as the first abnormality, a failure of new location related information to be written to the data rewritable region of the game token coin upon occurrence of a predefined event.

5. The management system according to claim 4, wherein

the location related information includes at least one of information indicating a cage, information

indicating an entry or exit, and information indicating a backyard;

the data rewritable region is configured to additionally store information on time at which the writer writes to the game token coin;

the management controller is configured to determine, as the first abnormality, a writing failure;

the writing failure is any of a group consisting of one or more of the following:

(1) after an entry of a player into a gaming house indicated in a latest written location related information, a failure to write further location related information indicating an exit of the player from the gaming house;

(2) after a use of the game token coin at a cage indicated in the latest written location related information, a failure to write further location related information indicating a backyard; and

(3) after an exit of a player from the gaming house indicated in the latest written location related information, a failure to write further location related information indicating a cage or a backyard.

6. The management system according to claim 1, wherein the location related information includes information relating to an owner who owns the game token coin.

7. The management system according to claim 6, wherein:

the management controller is configured to determine, as the first abnormality based on the information relating to the owner, occurrence of a predefined event; and

the predefined event is any of an event group consisting of one or both of the following:

(1) a person different from a final owner stored in the data rewritable region (a) converts the game token coin into money, (b) conducts an exchange, using the game token coin, in a gaming house, and/or (c) leaves the gaming house with the game token coin; and

(2) a person different from an owner indicated in the location related information of the game token coin upon an exit from the gaming house brings the game token coin into the gaming house.

8. The management system according to claim 6, wherein the information relating to the owner is identified by face recognition or by reading an identification (ID) card.

9. The management system according to claim 1, wherein the location related information includes:

information indicating a place of a chip tray of a specific game table;

information indicating a place of a bet area; or

information indicating a payment area.

10. The management system according to claim 9, wherein the management controller is configured to determine, as the first abnormality, occurrence of a predefined event of any of an event group that consists of one or more of the following:

(1) a person who is different from a final owner stored in the data rewritable region uses the game token coin at a game table;

(2) a person who is different from a person who purchases the game token coin at a cage converts the game token coin into money at the cage, without there being any record indicating use of the game token coin at a game table;

(3) a game token coin having no location related information indicating a cage or a backyard is used in a gaming house; and

(4) a latest location related information of the game token coin is information indicating a bet area or a payment area, and the game token coin is not converted into money at the cage or used at the game table until after lapse of at least a predetermined period of time from a time of the latest location related information.

11. The management system according to claim 1, wherein at least some of the information on the RFID tag is

encrypted.

12. The management system according to claim 1, wherein the non-rewritable data region is configured without a data write functionality or is locked to prevent data writes.

13. The management system according to claim 1, wherein:

the reader is configured to collectively read the constant information stored in the non-rewritable data region and the location related information stored in the rewritable data region of an RFID tag; and

the management controller is configured to, for each of the plurality of game token coins, extract and determine the location related information stored in the rewritable data region of the RFID tag of the respective game token coin from the constant information of the respective game token coins read by the reader.

14. A game token coin that is used in the management system according to claim 1.

15. A reader for a game token coin used in the management system according to claim 1.

16. A game token coin comprising a radio frequency identification (RFID) tag that includes a non-rewritable data region and a rewritable data region, wherein:

the non-rewritable data region is configured to store, as constant information, at least one of production information, product information, casino information, value information, and a serial number of the game token coin;

the rewritable data region is configured to store, as variable information, location related information of the game token coin written by a writer;

the variable information stored in the rewritable data region of the RFID tag is extractable from the constant information stored in the non-rewritable data region of the RFID tag, and so a pair of the variable information stored in the rewritable data region and the constant information stored in the non-rewritable data region can be determined by reading the RFID tag of the game token coin; and

presence of an abnormality is to be determined by checking the constant information and the variable information stored in and read from the RFID tag of the game token coin against the constant information and the variable information relating to the game token coin stored in a database outside of the game token coin.

17. The game token coin according to claim 16, wherein the game token coin is configured such that the location related information stored in the rewritable data region is readable based on the constant information in association with the game token coin, even when a reader collectively

reads the constant information stored in the data non-rewritable region of the game token coin along with constant information stored in a data non-rewritable regions of one or more other game token coins.