of a game, fraud according to collection or repayment of substitute currency for gaming that is different from the result of win/loose, and the like based on an image acquired from the monitoring camera.

[0004]

Meanwhile, in order to perceive the number or a total amount of bet substitute currency for gaming, it has been proposed to perceive the amount of substitute currency for gaming by attaching a radio IC (RFID) tag to each substitute currency for gaming.

[0005]

In a card game monitoring system disclosed in WO 2015/107902 A, it is determined whether or not substitute currency for gaming placed on a game table is collected or re-payed according to a result of win/loose by performing an image analysis of the movement of substitute currency for gaming, whereby fraud is monitored.

Summary of Invention

Technical Problem

[0006]

Embodiments of the present invention seek to provide new substitute currency for gaming, an inspection device, and a management system for table gates that can detect fraud in a game in a game house or a mistake or fraud when substitute currency

for gaming is bet or is paid off.

Solution to Problem

[0006a]

An aspect of the present invention provides a management system of substitute currency for gaming comprising:

substitute currency for gaming to which a unique ID that is individually identifiable is attached;

an ID management control device managing the unique ID associated with the substitute currency for gaming in a database;

a card distributing device determining and displaying a result of winning/losing of each game in a game table;

a chip tray holding the substitute currency for gaming on the game table;

a measurement device measuring an amount and a quantity of the substitute currency for gaming placed on the game table by using a camera;

a management control device specifying and storing a position, an amount, and a quantity of the substitute currency for gaming by using a result of the measurement performed by the measurement device in each game; and

the management control device having a calculation function of calculating a balance of a casino side in the game table by using the result of winning/losing acquired by the card distributing device and a result of the measurement of the position, the amount, and the quantity of the substitute

currency for gaming for each game,

a chip determining device specifying the amount and the quantity of the substitute currency for gaming held in the chip tray by using the unique ID and determining an abnormality in the substitute currency for gaming based on a result of the calculation of the balance of the casino side in the game table and the unique ID.

[0006b]

Another aspect of the present invention provides a management system of substitute currency for gaming comprising:

substitute currency for gaming to which a unique ID that is individually identifiable is attached;

an ID reading device reading the unique ID attached to the substitute currency for gaming;

a chip tray holding the substitute currency for gaming on a game table;

a storage means holding the substitute currency for gaming outside the chip tray;

a chip determining device specifying an amount and a quantity of the substitute currency for gaming held in the chip tray and the storage means by using the ID reading device; and

a management control device managing the unique ID attached to the substitute currency for gaming in a database in the game house,

wherein the management control device has a function of managing the unique ID of the substitute currency for gaming present in the chip tray inside the game house and the storage means in the database together with presence information and specifying a total amount of the amount and the quantity of the substitute currency for gaming present in the chip tray inside the game house and the storage means at predetermined timing.

[0006c]

Another aspect of the present invention provides a management system of substitute currency for gaming comprising:

substitute currency for gaming to which a unique ID that is individually identifiable is attached;

an ID reading device reading a unique ID attached to the substitute currency for gaming;

a chip tray holding the substitute currency for gaming on a game table;

a storage means holding the substitute currency for gaming outside the chip tray;

a chip determining device specifying an amount and a quantity of the substitute currency for gaming held in the chip tray and the storage means by using the ID reading device; and

a management control device managing the unique ID attached to the substitute currency for gaming in a database

in the game house,

wherein the management control device stores the unique ID of the substitute currency for gaming used in a game house in the database in advance and, by using the database, at least, has a function of managing the unique ID of the substitute currency for gaming present in the chip tray and the storage means in the database together with presence information, specifying the substitute currency for gaming present in the chip tray and the storage means at predetermined timing by using the unique ID, determining following events by using the database, and generating an error signal when there is a situation of:

1) an ID that has not been present in the database is newly present or

2) two or more same IDs are present.

[0006d]

Another aspect of the present invention provides a management system of substitute currency for gaming comprising:

substitute currency for gaming to which a unique ID that is individually identifiable is attached;

an ID reading device reading the unique ID attached to the substitute currency for gaming;

a chip tray holding the substitute currency for gaming on a game table;

a chip determining device specifying and totaling an amount and a quantity of the substitute currency for gaming

held in the chip tray by using the ID reading device;

a card distributing device determining and displaying a result of winning/losing of each game in a game table;

a measurement device measuring an amount and a quantity of the substitute currency for gaming placed on the game table by using a camera; and

a control device specifying and storing a position, an amount, and a quantity of the substitute currency for gaming placed on the game table by using a result of the measurement performed by the measurement device in each game,

wherein the management control device further has a function of specifying an amount and a quantity of the substitute currency for gaming bet on a bet area of the game table and calculating a balance for each game table by using the result of winning/losing of each game acquired by the card distributing device, and

the management control device further has a function of performing addition/subtraction of an increased/decreased amount of the substitute currency for gaming in each game for a total amount of the substitute currency for gaming held in the chip tray before a settlement of the game calculated based on the position, the amount and the quantity of the substitute currency for gaming bet by a player in the game and the result of winning/losing of the game acquired by the card distributing device, comparing a total amount of the substitute currency for gaming in the chip tray after the calculation of the balance for each game table to be present

with a real total amount of the substitute currency for gaming in the chip tray at the time of end of the game specified by using the result of the measurement performed by the measurement device, and determining whether or not the total amount to be present matches the real total amount.

[0006e]

Another aspect of the present invention provides a management system of substitute currency for gaming comprising:

substitute currency for gaming to which a unique ID that is individually identifiable is attached;

a winning/losing determining device determining and displaying a result of winning/losing of each game in a game table;

a chip tray holding the substitute currency for gaming in the game table;

a measurement device measuring an amount and a quantity of the substitute currency for gaming placed on the game table by using a camera; and

a management control device perceiving a total amount of the substitute currency for gaming in the chip tray holding the substitute currency for gaming based on the unique ID of the substitute currency for gaming and specifying and storing a position, an amount, and a quantity of the substitute currency for gaming on the game table by using a result of the measurement performed by the measurement device in each game,

wherein the management control device having a

calculation function of calculating a balance of a casino side in the game table by using the result of winning/losing acquired from the winning/losing determining device and a result of the measurement of the position, the amount, and the quantity of the substitute currency for gaming for each game and determining presence of fraud or a mistake in collection or payment of the substitute currency for gaming in each game by acquiring a result of the calculation of the balance of the casino side in the game table and a total amount of the substitute currency for gaming in the chip tray.

[0007]

Substitute currency for gaming according to an aspect of the present invention is substitute currency for gaming in which a stacked structure body formed by a plurality of plastic layers is configured by stacking at least a coloring layer and a white layer or a thin-color layer, a stripe pattern is formed on a side face in a stacking direction, a configuration enabling a type of substitute currency for gaming to be specified by the coloring layer is included, a print layer representing a type of the substitute currency for gaming is applied to a further upper and lower faces of the stacked structure body, and a layer structure is formed by thermo-compressing each interlayer.

[0008]

In the substitute currency for gaming described above, a side ID that can be individually identified may be attached to an outer face of the white layer or the thin-color layer.

[0009]

In the substitute currency for gaming described above, the side IDs may be attached to at least three or more positions spaced apart in a rotation direction of the side face of the substitute currency for gaming.

[0010]

ID, the information of the RFID, and the information of the face code may be associated with each other.

[0020]

An inspection device according to the present disclosure is an inspection device inspecting the substitute currency for gaming and includes: an RFID reading device that reads information of the RFID of the substitute currency for gaming; an ID reading device that reads the side ID disposed on the side face; and a control device. A relation between information of the side ID acquired by the ID reading device and information acquired by the RFID reading device is configured to be inspected.

[0021]

An inspection device according to the present disclosure is an inspection device inspecting the substitute currency for gaming and includes: a face code reading device that reads the face code formed using UV emission ink or ink absorbing infrared rays disposed on the surface of the substitute currency for gaming; an ID reading device that reads the side ID disposed on the side face; and a control device. The control device is configured to inspect a relation between information of the side ID acquired by the ID reading device and information acquired by the face code reading device.

[0022]

An inspection device according to

the present disclosure is an inspection device inspecting the substitute currency for gaming and includes: a face code reading device that reads the face code formed using UV emission ink or ink absorbing infrared rays disposed on the surface of the substitute currency for gaming; an ID reading device that reads the side ID disposed on the side face; an RFID reading device that reads information of the RFID of the substitute currency for gaming; and a control device. A relation among information of the side ID acquired by the ID reading device, information acquired by the face code reading device, and information acquired by the RFID reading device is configured to be inspected.

[0023]

In the inspection device described above, the side ID may be printed using at least one or a combination of ink that is visible for visible light and ink absorbing infrared rays, and the ID reading device may include one or a plurality of visible-light cameras or infrared-ray cameras corresponding to the ink used for printing the side ID or a camera capable of performing switching among a plurality of functions of a visible-light camera and an infrared-ray camera corresponding to the ink.

[0024]

In the inspection device described above, a determination device of a type of the substitute currency for gaming that images the side face of the substitute currency for gaming and determines

a color of a stripe pattern of the side face in a stacking direction or a print inspecting device that reads a print of a print layer arranged in the substitute currency for gaming may be further included, and a relation between the type of the substitute currency for gaming and a print content of the print layer may be inspected.

[0025]

A method of manufacturing substitute currency for gaming according to the present disclosure includes: forming a stacked structure body formed by a plurality of plastic layers by stacking at least a coloring layer and a white layer or a thin-color layer; arranging a print layer in which a drawing pattern is printed on at least an upper face or a lower face of the stacked structure body of the plurality of plastic layers; generating a gaming substitute currency original plate by heating and welding the layers by performing thermo-pressing of the layers of the stacked structure body and the print layer; and acquiring a plurality of substitute currencies for gaming having a predetermined shape by performing punching processing of the gaming substitute currency original plate using a mold and performing R processing of upper and lower angles of outer sides of the substitute currency for gaming using a mold at the time of performing the punching processing.

[0026]

A method of manufacturing substitute currency for gaming

according to the present disclosure includes: forming a stacked structure body formed by a plurality of plastic layers by including a coloring layer at least in the middle and stacking a white layer or a thin-color layer on upper and lower sides of the coloring layer disposed in the middle; using a layer containing metal powder or a metal oxide used for increasing the weight inside the layer as at least one layer of the plurality of plastic layers; arranging a print layer in which a drawing pattern is printed on at least an upper face or a lower face of the stacked structure body; generating a gaming substitute currency original plate by heating and welding the layers by performing thermo-pressing of the layers of the stacked structure body and the print layer; and acquiring a plurality of substitute currencies for gaming having a predetermined shape by performing punching processing of the gaming substitute currency original plate using a mold.

[0027]

In the method of manufacturing substitute currency for gaming described above, a side ID may be attached through inkjet printing.

[0028]

In the method of manufacturing substitute currency for gaming described above, an RFID may be interposed between the layers of the stacked structure body, and the layers having the RFID interposed therebetween may be heated and welded when the

layers are thermos-compressed, and a periphery of the RFID may be tightly fixed by the plastic layers.

[0029]

In the method of manufacturing substitute currency for gaming described above, one or a plurality of face codes, security marks, optical variable devices (OVD) may be printed in the print layer.

[0030]

A management system of a table game according to the present disclosure includes: a card distributing device that determines and displays a result of winning/losing of each game in a game table; a camera device that images and records substitute currency for gaming placed on the game table by using a camera; a management control device that specifies and stores a position, types, and quantities of the substitute currency for gaming placed on the game table by a game participant by using a result of the imaging performed by the camera device in each game. The substitute currency for gaming is formed as a structure body including a coloring layer and a white layer or a thin-color layer at least in an outer appearance to form a stripe pattern on a side face in an axial direction and has a configuration enabling the type of the substitute currency for gaming to be specified using the coloring layer, and the management control device has a calculation function of calculating a balance of a casino side on the game table for

each game by using the result of winning/losing acquired from the card distributing device and the result of the imaging of the position, the types, and the quantities of the substitute currency for gaming placed by a game participant.

[0031]

In the management system of a table game described above, the management control device may have a function of determining the types and an amount of the substitute currency for gaming by using colors of coloring layers by measuring the numbers of the coloring layers or white layers or thin-color layers of the substitute currency for gaming placed by each game participant.

[0032]

In the management system of a table game described above, while the management control device images the position, the types, and the quantities of the substitute currency for gaming placed by each game participant in each game, it is performed when the card distributing device detects drawing of a first card, before and after the drawing, or after recognition of a dealer's signal representing an end of betting in the management control device.

[0033]

A management system of a table game according to the present disclosure includes: a gaming substitute currency tray that is disposed on a game table and holds substitute currency for gaming for each type; a camera device that images

visible-light camera and an infrared-ray camera corresponding to the ink.

[0042]

In the management system of a table game described above, the camera device imaging and recording substitute currency for gaming disposed on the game table may be configured to image the substitute currency for gaming by using one or a plurality of cameras having different heights arranged at predetermined positions.

Advantageous Effects of Invention

[0043]

According to a system of the present disclosure, fraud in collecting and repaying substitute currency for gaming according to a result of win/loose of a game can be detected.

[0044]

In addition, according to a system of the present disclosure, even when a card is bent according to player's squeeze of the card that is frequently performed in a Baccarat game or the like, the rank and the suit of the card can be determined through an image analysis, and a total amount of substitute currency for gaming that is in a blind area or overlaps each other can be perceived together with the position. In addition, fraud at the time of exchange of bills and substitute currency for gaming can be detected as well.

has a function of managing the unique ID of the substitute currency for gaming present in the chip tray and the storage means in the database together with presence information, specifying the substitute currency for gaming present in the chip tray and the storage means at predetermined timing by using the unique ID, determining following events by using the database, and generating an error signal when there is a situation of:
1) an ID that has not been present in the database is newly present or
2) two or more same IDs are present.

9. The management system of substitute currency for gaming according claim 8, wherein the unique ID is stored in an RFID built in the substitute currency for gaming.

10. The management system of substitute currency for gaming according to claim 8 or 9, wherein the management control device further has a function of, when there is a change in presence of the substitute currency for gaming at least in the chip tray and the storage means, recording time and/or a place at which there is the change in the database in association with the unique ID.

11. A management system of substitute currency for gaming comprising: