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]

An object of the present disclosure seeks 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 substitute currency for gaming, the substitute currency comprising a body that enables a type of the substitute currency for gaming to be specified at least by a coloring layer, wherein a striped pattern is formed that includes at least the coloring layer and a white or thin-color layer; and a print layer representing the type of the substitute currency for gaming coupled to an upper face or a lower face of the substitute currency, wherein: a side face of the substitute currency is provided with a side identifier (ID) that allows the substitute currency for gaming to be individually identified, a radio frequency identifier (RFID) is embedded in the substitute currency, and the side ID and the RFID are related with each other in a database.

[0006b]

Another aspect of the present invention provides a method of manufacturing substitute currency for gaming, the method comprising forming a stacked structure body comprising a plurality of plastic layers, the plurality of plastic layers comprising a coloring layer and a white layer or a thin-color layer,

each of the coloring layer and white layer or the thin-color layer extend around a side face of the stacked structure body and define at least a portion of the side face; 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 performing thermo-pressing of the plurality of plastic layers 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 round angle processing of upper and lower angles of outer sides of the substitute currency using a mold at the time of performing the punching processing.

[0006c]

Another aspect of the present invention provides a method of manufacturing substitute currency for gaming, the method comprising forming a stacked structure body comprising a plurality of plastic layers, the plurality of plastic layers comprising a coloring layer and a white layer or a thin-color layer, each of the coloring layer and the white layer or the thin-color layer extend around a side face of the stacked structure body and define at least a portion of the side face; using a layer containing metal powder or a metal oxide 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, on the stacked structure body; generating a gaming substitute currency original plate 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.

[0006d]

Another aspect of the present invention provides a substitute currency for gaming, the substitute currency comprising a first layer having a first color, wherein the first color identifies a type of the substitute currency on a side face; and a second layer having a second color independent of the type of the substitute currency; and wherein the side face comprises the second layer interposed between the first layer and an upper face or a lower face of the substitute currency.

[0006e]

Another aspect of the present invention provides a substitute currency for gaming comprising a layered structure comprising a plurality of plastic, layers; and wherein a type of the substitute currency is identifiable based on a side face comprising a first layer having a first color and a second layer having a second color,

the second layer interposed between the first layer and an upper face or a lower face of the substitute currency.

[0006f]

Another aspect of the present invention provides a substitute currency for gaming comprising a side face including inkjet-printed information representing a type of the substitute currency; and wherein the inkjet-printed information comprises a first layer and a second layer, the second layer interposed between the first layer and an upper face or a lower face of the substitute currency.

[0006g]

Another aspect of the present invention provides a substitute currency for gaming, the substitute currency comprising two first layers to which a first color is applied; a second layer to which a second color is applied, the second layer interposed between the two first layers; two transparent outermost layers; and a side surface in which at least one of the two first layers is interposed between and the second layer and at least one of the two transparent outermost layers.

[0007]

Substitute currency for gaming according to the present disclosure 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/lose 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.

# CLAIMS

1. A substitute currency for gaming, the substitute currency comprising:

a body that enables a type of the substitute currency for gaming to be specified at least by a coloring layer, wherein a striped pattern is formed that includes at least the coloring layer and a white or thin-color layer; and

a print layer representing the type of the substitute currency for gaming coupled to an upper face or a lower face of the substitute currency,

wherein:

a side face of the substitute currency is provided with a side identifier (ID) that allows the substitute currency for gaming to be individually identified,

a radio frequency identifier (RFID) is embedded in the substitute currency, and

the side ID and the RFID are related with each other in a database.

2. The substitute currency according to claim 1, wherein the side ID is attached to an outer face of the white or thin-color layer.

3. The substitute currency according to claim 2, wherein

one or more side IDs are attached to at least three or more positions spaced apart in a rotation direction of the side face.

4. The substitute currency according to claim 2, wherein the side ID is printed using ink that is not visible for visible light.

5. The substitute currency according to claim 2, wherein the side ID is printed using ink configured to absorb infrared rays.

6. The substitute currency according to claim 2, wherein the side ID is disposed in a plurality of rows on each of outer faces of two layers of the white or thin-color layer.

7. The substitute currency according to claim 1, wherein round angle processing is performed for outer angles of an upper face or a lower face of the print layer.

8. The substitute currency according to claim 1, wherein the body includes a metal powder, one or more plastic layers, or a combination thereof.

9. The substitute currency according to claim 8, wherein

the metal powder comprises a metal oxide.

10. The substitute currency according to claim 1, wherein white layers or thin-color layers are disposed such that the coloring layer interposed therebetween, and thicknesses of upper and lower layers of the at least one of the white layer or the thin-color layer having the coloring layer interposed therebetween are configured to be different from each other.

11. The substitute currency according to claim 1, wherein the RFID is disposed between at least two plastic layers each forming any one of the coloring layer and the at least one of the white or thin-color layer.

12. The substitute currency according to claim 1, wherein a face code formed using ultraviolet (UV) emission ink or ink configured to absorb infrared rays is disposed on the print layer.

13. The substitute currency according to claim 1, wherein:

a face code formed using UV emission ink or ink configured to absorb infrared rays is disposed on the print layer; and

information of the side ID and information of the RFID are associated with each other, the information of the side ID and information of the face code are associated with each other, or the information of the side ID, the information of the RFID, and the information of the face code are associated with each other.

14. An inspection device for inspecting the substitute currency for gaming according to claim 13, the inspection device comprising:

an RFID reading device configured to read the information of the RFID;

an ID reading device configured to read the side ID disposed on the side face; and

a control device configured to inspect a relation between information acquired by the ID reading device and information acquired by the RFID reading device.

15. An inspection device for inspecting the substitute currency according to claim 13, the inspection device comprising:

a face code reading device configured to read the face code formed using ultraviolet (UV) emission ink or ink configured to absorb infrared rays disposed on at least one surface of the substitute currency;

an ID reading device configured to read the side ID disposed on the side face; and

a control device configured to inspect a relation between information acquired by the ID reading device and information acquired by the face code reading device.

16. An inspection device for inspecting the substitute currency according to claim 13, the inspection device comprising:

a face code reading device configured to read the face code formed using UV emission ink or ink configured to absorb infrared rays disposed on at least one surface of the substitute currency;

an ID reading device configured to read the side ID disposed on the side face;

an RFID reading device configured to read the information of the RFID; and

a control device configured to inspect a relation among information acquired by the ID reading device, information acquired by the face code reading device, and information acquired by the RFID reading device.

17. The inspection device according to claim 14, wherein:

the side ID comprises ink that is visible for visible light, ink configured to absorb infrared rays, or both; and

the ID reading device includes one or a plurality of visible-light cameras or infrared-ray cameras corresponding to the ink of 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.

18. The inspection device according to claim 14, further comprising:

a determination device of a type of the substitute currency that is configured to image the side face of the substitute currency and determine a color of a stripe pattern of the side face of the substitute currency, the side face comprising the coloring layer interposed between the printed layer and the at least one of the white or thin-color layer; and

a print inspecting device configured to:

read print content of the print layer; and

inspect a relation between the type and the print content.

19. A method of manufacturing substitute currency for gaming, the method comprising:

forming a stacked structure body comprising a plurality of plastic layers, the plurality of plastic layers comprising a coloring layer and a white layer or a

thin-color layer, each of the coloring layer and white layer or the thin-color layer extend around a side face of the stacked structure body and define at least a portion of the side face;

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 performing thermo-pressing of the plurality of plastic layers 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 round angle processing of upper and lower angles of outer sides of the substitute currency using a mold at the time of performing the punching processing.

20. A method of manufacturing substitute currency for gaming, the method comprising:

forming a stacked structure body comprising a plurality of plastic layers, the plurality of plastic layers comprising a coloring layer and a white layer or a thin-color layer, each of the coloring layer and the white layer or the thin-color layer extend around a side face of

the stacked structure body and define at least a portion of the side face;

using a layer containing metal powder or a metal oxide 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, on the stacked structure body;

generating a gaming substitute currency original plate 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.

21. The method according to claim 19, wherein a side identifier (ID) is attached through inkjet printing.

22. The method according to claim 19, wherein a radio frequency identifier (RFID) is interposed between at least two layers of the stacked structure body, and the at least two layers having the RFID interposed therebetween are heated and welded when the layers are thermo-compressed, and a periphery of the RFID is fixed by the plastic layers.

23. The method according to claim 19, wherein one or a plurality of face codes, security marks, optical variable devices (OVD) are printed on the print layer.

24. A substitute currency for gaming, the substitute currency comprising:

a first layer having a first color, wherein the first color identifies a type of the substitute currency on a side face; and

a second layer having a second color independent of the type of the substitute currency; and

wherein the side face comprises the second layer interposed between the first layer and an upper face or a lower face of the substitute currency.

25. A substitute currency for gaming comprising:

a layered structure comprising a plurality of plastic, layers; and

wherein a type of the substitute currency is identifiable based on a side face comprising a first layer having a first color and a second layer having a second color, the second layer interposed between the first layer and an upper face or a lower face of the substitute currency.

26. A substitute currency for gaming comprising:

a side face including inkjet-printed information representing a type of the substitute currency; and

wherein the inkjet-printed information comprises a first layer and a second layer, the second layer interposed between the first layer and an upper face or a lower face of the substitute currency.

27. A substitute currency for gaming, the substitute currency comprising:

two first layers to which a first color is applied;

a second layer to which a second color is applied, the second layer interposed between the two first layers;

two transparent outermost layers; and

a side surface in which at least one of the two first layers is interposed between and the second layer and at least one of the two transparent outermost layers.

28. The substitute currency according to claim 1, wherein the coloring layer and the at least one of the white or thin-color layer are thermo-pressed together.

29. The substitute currency according to claim 9, wherein the metal oxide comprises zinc oxide, titanium oxide, or

both.

30. The substitute currency according to claim 24, wherein one or more of the first layer and the second layer extend around the side face and define at least a portion of the side face.

31. The substitute currency according to claim 24, wherein the first layer defines a ring around the side face.

32. The substitute currency according to claim 24, wherein the second layer defines a ring around the side face.

33. The substitute currency according to claim 25, wherein each of the first layer and the second layer define a corresponding a ring around the side face.

34. The substitute currency according to claim 25, wherein the first layer and the second layer are thermo-pressed together.

35. The substitute currency according to claim 25, wherein the first color is different from the second color.

36. The substitute currency according to claim 25, wherein the second layer is interposed between the first layer and the upper face of the substitute currency.

37. The substitute currency according to claim 26, wherein the second layer is interposed between the first layer and the lower face of the substitute currency.

38. The substitute currency according to claim 26, wherein the first layer comprises a first color and the second layer comprises a second color distinct from the first color.

39. The substitute currency according to claim 26, wherein the second layer defines a ring around the side face.

40. The substitute currency according to claim 27, wherein the first color is different from the second color, and wherein the second layer or at least one of the two first layers defines a ring on the side surface.