wireless IC (RFID) tag to each chip to recognize the amount of the chip.

[0005]

In a card game monitoring system disclosed in WO 2015/107902 A, fraud monitoring is performed by determining through image analysis of movement of chips whether or not the chips placed on a gaming table are collected or redeemed in accordance with a win or lose result.

SUMMARY

[0006]

Embodiments of t~~T~~he invention ~~is~~ seek to provide a new system for detecting fraud in a game in a casino or an error or fraud at the time of wagering chips or doing settlement.

[0007]

An aspect of the present invention provides a system used for a gaming table for playing games by betting chips, the system comprising a camera, wherein the camera is configured to capture an image of the gaming table; a database; and a control device; wherein the control device is configured to recognize an amount of cash paid by a player and placed on the gaming table; recognize an amount of chips placed on the gaming table for being exchanged for the cash even when the chips placed on the gaming table include one or more of chips that are at least partially concealed from view by using an image recognition for the image captured by the camera; or based on signals from a radio frequency identification (RFID) reader of the system that reads IDs embedded in the chips; compare the recognized amount of cash and the recognized amount of chips; and store in the database a history of the exchange of the cash and the chips.

~~According to an aspect of the invention, T~~there is ~~provided~~ also disclosed a fraud detection system in a casino having a plurality of gaming tables, including: a game recording apparatus which records a progress of a game played in the gaming table as an image; an image analyzing apparatus which performs image analysis on the image of the recorded progress of the game; a win/lose result determining apparatus which determines a win or lose result of each game in the gaming table; and a control device which detects fraud practiced in the gaming table by using a result of the image analysis by the image analyzing apparatus and the win or lose result determined by the win/lose result determining apparatus,

determining apparatus may be a card distribution device which distributes the cards in the gaming table or a control device which determines the win or lose result of each game from information of the image analyzing apparatus reading the cards distributed in the gaming table by using a camera.

[0021]

~~According to the fraud detection system of the invention~~As disclosed, it is possible to detect fraud in collection and redemption of chips in accordance with a win or lose result of a game.

[0022]

In addition, ~~according to the system of the invention~~as disclosed, although the cards are slanted by "card squeegee" frequently performed by players in a baccarat game or the like, the rank and suit of the cards can be determined by image analysis, so that the total amount of chips being overlapped or being in a blind spot together with the positions can be recognized. In addition, fraud at the time of exchanging cash and chips can be detected.

BRIEF DESCRIPTION OF DRAWINGS

[0023]

FIG. 1 is a diagram illustrating an overview of a fraud detection system in a casino having a plurality of gaming tables according to a first embodiment of the invention;

FIG. 2A is a perspective diagram of chips illustrating an example of different overlapped states of chips recognized in the first embodiment of the invention;

CLAIMS

~~1. A strange situation detecting system in a casino having a plurality of gaming tables, comprising:~~

~~a game recording apparatus which records a progress of a game played in the gaming table including a dealer and a player as video image through a camera;~~

~~an image analyzing apparatus which performs image analysis on the video image of the recorded progress of the game; and~~

~~a control device which detects strange situation occurred in the gaming table by using a result of the image analysis of the image analyzing apparatus, wherein~~

~~the control device has a structure capable of specifying individual players at each player positions, each of the players being provided with an identity number for specifying the players, and~~

~~the control device has a function to associate the detected strange situation with the identity number of the player who caused the strange situation.~~

~~2. The strange situation detecting system according to claim 1, wherein the function of specifying the player extracts a face image of the player from the image video to specify the individual players.~~

~~3. The strange situation detecting system according to claim 2, wherein the control device has a structure capable~~

~~of detecting the position, type and number of chips bet by the players through the image analyzing apparatus and determining whether or not the behavior of the specified player corresponds to a strange situation set in advance.~~

~~4. The strange situation detecting system according to claim 3, wherein the strange situation set in advance is set using statistical data of a large number of previous games.~~

~~5. The strange situation detecting system according to claim 1 or 2, wherein the control device has a caution function which issues a caution when the specified player leaves the playing position of the gaming table and arrives at the other gaming table.~~

~~6. The strange situation detecting system according to claim 1 or 2, wherein the control device has a structure capable of surveilling whether or not the winner among the player receives wagered chips and paid chips after the end of each game.~~

1. A system used for a gaming table for playing games by betting chips, the system comprising:

a camera, wherein the camera is configured to capture an image of the gaming table;

a database; and

a control device;

wherein:

the control device is configured to:

recognize an amount of cash paid by a player and placed on the gaming table;

recognize an amount of chips placed on the gaming table for being exchanged for the cash even when the chips placed on the gaming table include one or more of chips that are at least partially concealed from view:

by using an image recognition for the image captured by the camera; or

based on signals from a radio frequency identification (RFID) reader of the system that reads IDs embedded in the chips;

compare the recognized amount of cash and the recognized amount of chips; and

store in the database a history of the exchange of the cash and the chips.

2. The system according to claim 1, wherein the control device is configured to recognize the amount of cash paid by the player based on the image captured by the camera.

3. The system according to claim 1, wherein the control device is configured to recognize the amount of cash paid by

the player based on input from a dealer.

4. The system according to claim 1, wherein the control device is configured to assign different values to different types of the chips for recognizing the amount of the chips.

5. The system according to claim 1, wherein the control device is configured to recognize the amount of the chips based on information read by the RFID reader from respective RFID tags embedded in the chips.

6. The system according to claim 1, wherein the control device is compared to compare (a) information read by the RFID reader from respective RFID tags embedded in the chips to (b) user-entered information.

7. The system according to claim 1, wherein the control device is configured to detect that the exchange of the cash and the chips is conducted under a circumstance other than during card dealing based on a result of a game played on the gaming table that is determined by a game result determining device, using the image obtained by the camera, or based on input from a dealer.

8. The system according to claim 1, wherein the control device is configured to identify a player by extracting a face image of the player within the image captured by the

camera and identifying an identification number (ID) associated with the extracted face image.

9. The system according to claim 1, wherein the control device is configured to determine whether a recognized amount of chips in a chip tray of a dealer of the gaming table, after the exchange of the cash and the chips, increases or decreases according to the recognized amount of the chips placed on the gaming table for being exchanged for the recognized amount of cash.

10. The system according to claim 1, wherein the control device is configured to recognize the amount of cash paid by the player based on the image captured by the camera, and is configured to determine whether a payment amount of cash input by a dealer and the amount of cash recognized based on the image captured by the camera match.

11. The system according to claim 1, wherein the control device is configured to detect positions, types, and numbers of the chips wagered by the player in a game based on the image captured by the camera.

12. The system according to claim 1, wherein the control device is configured to perform the recognition of the amount of chips placed on the gaming table by using the image recognition.

13. The system according to claim 12, wherein the using of the image recognition includes executing an artificial intelligence program.

14. The system according to claim 13, wherein the artificial intelligence program is a learning type artificial intelligence program.

15. The system according to claim 1, wherein the control device is configured perform the recognition of the amount of the cash placed on the gaming table even when part of the cash is concealed due to a blind spot of the camera by executing an artificial intelligence program.

16. The system according to claim 15, wherein the artificial intelligence program is a learning type artificial intelligence program.

17. The system according to claim 1, wherein the system comprises the RFID reader and the control device is configured to perform the recognition of the amount of chips placed on the gaming table based on the signals from the RFID reader that reads the IDs embedded in the chips.

18. The system according to claim 1, further comprising a black light configured to irradiate the cash placed on the gaming table with black light, wherein the control device is

configured to perform the recognition of the amount of the cash based on a representation of a mark of the cash that is included in the image captured by the camera in response to the irradiation.