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 the present disclosure 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]

According to an aspect of the present invention, there is provided a management system of table game in a casino having a plurality of gaming tables, comprising:

at least one 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 and displays a win or lose result of each game in the gaming table; and

an intelligence type 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,

wherein the intelligence type control device has a function that, using an artificial intelligence or machine learning technology, performs image analyzing on the image of the gaming table obtained by the image analyzing apparatus, specifies positions, types, and numbers of chips on the gaming table, recognizes types and numbers of chips wagered by players on each position of banker areas, player areas, and tie areas, and recognizes types and numbers of chips in pair areas as side bet,

wherein the intelligence type control device further has a function that, based on positions, types, and numbers of chips wagered on the banker areas and the player areas by the players and the win or lose result obtained by the win/lose result determining apparatus, determines whether chips wagered on each banker area and player area respectively are chips to be collected based on Baccarat rule and calculates amount of redemption separately for each chips to be redeemed based on Baccarat rule, and further based on positions, types, and numbers of chips wagered on the tie areas and the pair areas by the players and the win or lose result obtained by the win/lose result determining apparatus, determines whether chips wagered on each banker area and player area respectively are chips to be collected based on Baccarat rule and calculates amount of redemption separately for each chips to be redeemed using redemption rate different from that of the banker area and the player area based on Baccarat rule;

wherein the at least one game recording apparatus has an offset viewing angle capturing a plurality of betting areas on which can be recognized the positions, types, and numbers of wagered chips by each player.

There is 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]

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 disclosure, 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 management system of table game in a casino having a plurality of gaming tables, comprising:

at least one 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 and displays a win or lose result of each game in the gaming table; and

an intelligence type 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,

wherein the intelligence type control device has a function that, using an artificial intelligence or machine learning technology, performs image analyzing on the image of the gaming table obtained by the image analyzing apparatus, specifies positions, types, and numbers of chips on the gaming table, recognizes types and numbers of chips wagered by players on each position of banker areas, player areas, and tie areas, and recognizes types and numbers of chips in pair areas as side bet,

wherein the intelligence type control device further has a function that, based on positions, types, and numbers

of chips wagered on the banker areas and the player areas by the players and the win or lose result obtained by the win/lose result determining apparatus, determines whether chips wagered on each banker area and player area respectively are chips to be collected based on Baccarat rule and calculates amount of redemption separately for each chips to be redeemed based on Baccarat rule, and further based on positions, types, and numbers of chips wagered on the tie areas and the pair areas by the players and the win or lose result obtained by the win/lose result determining apparatus, determines whether chips wagered on each banker area and player area respectively are chips to be collected based on Baccarat rule and calculates amount of redemption separately for each chips to be redeemed using redemption rate different from that of the banker area and the player area based on Baccarat rule;

wherein the at least one game recording apparatus has an offset viewing angle capturing a plurality of betting areas on which can be recognized the positions, types, and numbers of wagered chips by each player.

2. The management system of table game according to claim 1, wherein the intelligence type control device further has a function that, based on Baccarat rule, in case of the win/lose result is tie (draw), treats the chips wagered on each of the banker area or each of the player area as chips to be returned back to each player without

any collection or payment as the game was not established.

3. The management system of table game according to claim 1 or 2, wherein the image analyzing apparatus or the intelligence type control device has an artificial intelligence utilizing type structure or a deep learning structure where, although a portion of or the entire chips among a plurality of the chips placed on the gaming table is concealed due to a blind spot of the camera, the information on the type, number, and position of the wagered chips can be obtained.

4. The management system of table game according to claim 1 or 2, wherein the intelligence type control device is capable of performing comparison calculation according to the win or lose result of the game about whether or not the recognized amount of the chips in the chip tray of the dealer of the gaming table is increased/decreased after the end of the game and the settlement according to the collected amount of the lost chips wagered by each player and the paid amount of the winning chips or due to no collection or payment as the game was not established.

5. The management system of table game according to claim 4, wherein the intelligence control device recognizes the amount of the chips in the chip tray of the dealer of the gaming table through the image analyzing apparatus or

by using ID buried in the chip.

6. The management system of table game according to claim 1 or 2, wherein the intelligence type control device is capable of recognizing the position and amount of the chips wagered in each play position of the game table and comparing the history of win and lose of each player obtained from the win or lose result of each game and the amount of the acquired chips and the statistical data to extract a strange situation.

7. The management system of table game according to claim 1 or 2, wherein the intelligence type control device is capable of comparing a state that, at a play position of a certain gaming table, the amount of betting chips at the lost time is smaller than the amount of betting chips at the win time and the statistical data of previous games to extract a strange situation.

8. The management system of table game according to claim 6 or 7, wherein the intelligence type control device is capable of specifying individual players who was extracted as the strange situation through the image analyzing apparatus or has won a predetermined amount or more.

9. The management system of table game according to any

one of claims 1 to 8, wherein the intelligence type control device has a caution function of informing about the existence of the specified player.

10. The management system of table game according to claim 8 or 9, wherein the intelligence type control device is capable of extracting face image of the player using an artificial intelligence technology or a machine learning technology.

11. The management system of table game according to any one of claims 1 to 10, wherein there comprises two game recording apparatus.