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 invention 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 invention, there is provided 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, wherein the control device recognizes a position, type, and number of the chips wagered by each player through

the image analyzing apparatus and recognizes a total amount of chips in a chip tray of a dealer of the gaming table, performs addition/subtraction calculation of an increased/decreased amount of the chips in the game calculated from the position, type, and number of the chips wagered by all the players in the game and the win or lose result of the game obtained from the win/lose result determining apparatus from the total amount of the chips in the chip tray before the settlement of each game and compares a correct total amount of the chips in the chip tray after end of the game and settlement and an actual total amount of the chips in the chip tray at the time of the end of the game obtained through the image analyzing apparatus to determine whether or not there is difference between the correct total amount and the actual total amount.

[0007a]

According to another aspect of the invention, there is provided a system for detecting fraud 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 tables including a dealer and a player as an image through a camera; an image analyzing apparatus which performs image analysis on the image of the recorded progress of the game; a card distribution device which determines and displays a win or lose result of each game in the gaming tables; and an intelligence type control device which detects fraud practiced in the gaming tables by using a result of the image analysis by the image analyzing apparatus and the win or lose result

determined by the card distribution device.

[0007b]

According to another aspect of the invention, there is provided a system for detecting fraud 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 tables including a dealer and a player as an image through a camera; a card distribution device which determines and displays a win or lose result of each game in the gaming tables; an image analyzing apparatus which performs image analysis on the image of the recorded progress of the game; and an intelligence type control device capable of detecting cash and chips in the gaming tables by using a result of the image analysis by the image analyzing apparatus, wherein the image analyzing apparatus or the intelligence type control device has an artificial intelligence utilizing type structure or a deep learning structure capable of detecting exchange of cash and chips in the gaming tables in a situation other than a card reading state based on information obtained by the card distribution device or the dealer, capable of recognizing a total amount of the cash which is genuine cash verified by black light and recognizing the total amount of the chips even in a state that a portion of or entire one chip among a plurality of the chips placed on the gaming tables as an exchange object is concealed due to a blind spot of the camera, and capable of comparing the total amount of cash placed on the gaming tables by the player and the total amount of chips placed by the dealer

to determine whether or not the two amounts match with each other.

[0007c]

According to another aspect of the invention, there is provided a fraud detection system of a game, comprising: a game monitoring device which monitors a progress of a game played on a gaming table by using a camera; an image analyzing apparatus which performs image analysis on an image obtained from the camera; a card distribution device which determines and displays a win or lose result of each game in the game table; and a control device which specifies positions of chips placed on the gaming table by game participants by using a result of the analysis of the image analyzing apparatus in each game and determines a winner and losers among the participants of each game by using the win or lose result, wherein the control device has at least one of functions of determining as to: 1) whether or not there is movement of chips during a time interval from a start of extraction of cards or from a game start operation of a dealer before the win or lose result of the game is displayed by the card distribution device in each game; 2) whether or not a chip is received by the losers during a time interval when the dealer collects chips wagered by the losers among the game participants after end of each game; 3) whether or not a chip is added during a time interval when the dealer collects chips wagered by the losers among the game participants after end of each game; 4) whether or not the dealer performs payment for a position of chips wagered by the winner among the game

participants after end of each game; and 5) whether or not the winner among the game participants receives wagered chips and paid chips after end of each game.

[0008]

In the above fraud detection system, the control device may recognize the position, type, and number of the chips wagered by each player through the image analyzing apparatus, recognize the actual total amount of the chips in the chip tray at the time when the collection of all the amount of the lost chips wagered by each player is ended, and compare the correct total amount of the chips in the chip tray added with the increased amount of the chips in the chip tray in the game from the position, type, and number of the chips wagered by the lost player from the total amount of the chips in the chip tray before the settlement of each game and the actual total amount of the chips in the chip tray to determine whether or not there is