GAME MONITORING SYSTEM

CROSS-REFERENCE OF RELATED APPLICATIONS

[0001]

This application claims the benefit of Patent Application No. 2022-130332 filed in Japan on August 18, 2022, the contents of which application are incorporated herein by reference.

TECHNICAL FIELD

[0002]

The present invention relates to a game monitoring system for monitoring a game.

BACKGROUND

[0003]

Previously, in a game played in a casino and the like, a game play by a player is monitored for illicitness detection, patron rating, and the like. It is possible by performing electronically all of the game, betting by the player, and settlement for the betting to grasp a result of the game, the betting by the player, a win and loss of the player, and amount thereof as electronic information. WO2022/085706A1 is an example of references related to the prior art.

SUMMARY OF THE INVENTION

[0004]

Similarly, in a real table game using a physical game table, playing card, and gaming chip, there is also a desire to monitor a game and grasp amounts of betting, win, loss, and the like of a player. For this purpose, in a prior game monitoring system, a movement of the gaming chip at the game table is monitored by building an RFID in the gaming chip and reading the RFID at a betting area or a chip tray of the game table, and a player is identified by that the player presents a membership card.

[0005]

The present invention seeks to provide a game monitoring system for monitoring a game on a real table game.

[0005a]

An aspect of the present invention provides a game monitoring system comprising an imaging unit configured to generate an image including a player playing games and a gaming chip on a gaming table by capturing an image of the player while a game is being played on the gaming table; a player detecting unit configured to detect the player from the image generated by the imaging unit; a chip detecting unit configured to detect the gaming chips on the gaming table from the image generated by the imaging unit; and a first association unit configured to associate the gaming chips detected by the chip detecting unit with a player detected by the player detecting unit as a player who bet the gaming chips, wherein the player detecting unit is configured to extract data indicating a body of the player from the image without identifying the player individually, the imaging unit is configured to generate images including a first image and a second image, the player detecting unit is configured to extract data indicating a body of the player from the first image generated by the imaging unit and extract data indicating a body of the player from the second image generated by the imaging unit, and the first association unit is configured to associate the data indicating the body of the player extracted from the first image and the second image respectively by the player detecting unit with the gaming chips detected by the chip detecting unit.

[0005b]

Another aspect of the present invention provides a game monitoring system comprising an imaging unit configured to generate an image including a player playing games and a gaming chip on a gaming table by capturing an image of the player while a game is being played at the gaming table; a player detecting unit configured to detect the player from the image generated by the imaging unit; a player ID identifying unit configured to identify a player ID of the player; and a chip detecting unit configured to detect the gaming chips on the gaming table from the image generated by the imaging unit; and a first association unit for associating the gaming chips detected by the chip detecting unit with a player ID identified by the player ID identifying unit as a player who bet the gaming chips,

wherein the player detecting unit is configured to extract data indicating a body of the player from the image, the imaging unit is configured to generate images including a first image and a second image, the player detecting unit is configured to extract data indicating a body of the player from the first image generated by the imaging unit and extract data indicating a body of the player from the second image generated by the imaging unit, the player ID identifying unit is configured to identify a player ID of the player in the first image based on data extracted from the first image by the player detecting unit and identify a player ID of the player in the second image based on data extracted from the second image by the player detecting unit, and the first association unit is configured to associate the player IDs identified in the first and second images respectively by the player ID identifying unit with the gaming chips detected by the chip detecting unit.

[0006]

A game monitoring system according to the present disclosure has a configuration comprising: a chip ID identifying means configured to identify, when a gaming chip to which a chip ID is given is in a predetermined area on a game table, the chip ID of the gaming chip; an imaging means configured to image a player playing a game at the game table and the gaming chip on the game table to generate an image; a player detecting means configured to detect the player from the image; a chip detecting means configured to detect the gaming chip from the image; a first associating means configured to associate the player detected by the player detecting means with a first gaming chip detected by the chip detecting means as the player who bet the first gaming chip; a second associating means configured to associate a chip ID of the first gaming chip identified by the chip ID identifying means with the player associated with the first gaming chip by the first associating means; and a recording means configured to record a pair of the chip ID of the first gaming chip and an image of the player associated with the chip ID of the first gaming chip by the second associating means.

[0007]

By this configuration, with respect to the gaming chip in the predetermined area on the game table, the chip ID thereof is associated with the player who bet the gaming chip and it is recorded, and so it is possible to monitor the game on the real table game.

[0008]

The game monitoring system according to the present disclosure may further comprise a storage means configured to store the chip ID of the gaming chip and an owner thereof so as to associate them with each other; and a comparing means configured to compare an owner associated with the chip ID of the first gaming chip in the storage means with the player associated with the chip ID of the first gaming chip by the second associating means, and output, when the owner associated with the chip ID of the first gaming chip in the storage means does not match the player associated with the chip ID of the first gaming chip by the second associating means, a signal

indicating a mismatch.

[0009]

By this configuration, with respect to the gaming chip placed in the predetermined area on the game table, in the case where the person stored as the owner of that gaming chip does not match the person identified based on the image as the player who bet the gaming chip, it is possible to inform that matter.

[0010]

In the game monitoring system according to the present disclosure, the player is given to a player ID, the game monitoring system further comprises a player ID identifying means configured to identify a player ID of the player detected by the player detecting means, the storage means is configured to store the chip ID of the gaming chip and a player ID of the player who is the owner thereof so as to associate them with each other, and the comparing means is configured to compare a player ID of the owner associated with the chip ID of the first gaming chip in the storage means with a player ID identified by the player ID identifying means with respect to the player associated with the chip ID of the first gaming chip by the second associating means, and output, when the player ID of the owner associated with the chip ID of the first gaming chip in the storage means does not match the player ID identified by the player ID identifying means with respect to the player associated with the chip ID of the first gaming chip by the second associating means, a signal indicating a mismatch.

[0011]

By this configuration, with respect to the gaming chip placed in the predetermined area on the game table, in the case where the ID of the person stored as the owner of the gaming chip does not match the ID of the person identified based on the image as the player who bet the gaming chip, it is possible to inform that matter.

[0012]

In the game monitoring system according to the present disclosure, the storage means is configured to store the chip

ID of the gaming chip and face information of the owner thereof so as to associate them with each other, and the comparing means is configured to compare face information associated with the chip ID of the first gaming chip in the storage means with face information extracted from the image with respect to the player associated with the first gaming chip by the second associating means, and output, when the face information associated with the chip ID of the first gaming chip in the storage means does not match the face information extracted from the image with respect to the player associated with the first gaming chip by the second associating means, a signal indicating a mismatch.

[0013]

By this configuration, with respect to the gaming chip placed in the predetermined area on the game table, in the case where the face information of the person stored as the owner of the gaming chip does not match the face information of the person identified based on the image as the player who bet the gaming chip, it is possible to inform that matter.

[0014]

The game monitoring system according to the present disclosure may further comprise a controlling means configured to rewrite, when the comparing means determines that the owner associated with the chip ID of the first gaming chip in the storage means does not match the player associated with the chip ID of the first gaming chip by the second associating means, the owner associated with the chip ID of the first gaming chip in the storage means to the player associated with the chip ID of the first gaming chip by the second associating means.

[0015]

By this configuration, it is possible to rewrite the owner stored in association with the chip ID of the gaming chip to the correct owner.

[0016]

The game monitoring system according to the

present disclosure may further comprise an updating means configured to rewrite an owner associated with a chip ID of a payout gaming chip paid out by a dealer in the storage means to a player associated with the payout gaming chip by the second associating means.

[0017]

By this configuration, it is possible to rewrite the owner stored in association with the gaming chip paid out from the dealer to the player who received that payout gaming chip.

[0018]

The game monitoring system according to the present disclosure may further comprise an updating means configured to rewrite an owner associated with a chip ID of a payout gaming chip paid out by a dealer in the storage means to a player associated with a first gaming chip moved from the predetermined area together with the payout gaming chip by the second associating means.

[0019]

By this configuration, it is possible to rewrite the owner stored in association with the chip ID of the gaming chip paid out by the dealer to the player who bet the gaming chip which was the subject to which that gaming chip was paid out.

[0020]

In the game monitoring system according to the present disclosure, the gaming chip includes an RFID tag storing the chip ID, and the chip ID identifying means is configured to identify the chip ID of the gaming chip by reading the chip ID from the RFID tag.

[0021]

By this configuration, it is possible to identify the chip ID by the RFID.

[0022]

In the game monitoring system according to the present disclosure, the gaming chip includes an expression of the chip ID on a side surface, and the chip ID

identifying means is configured to identify the chip ID of the gaming chip by detecting the gaming chip from the image in which the gaming chip is imaged and decoding the chip ID on the side surface of the detected gaming chip.

[0023]

By this configuration, it is possible to identify the chip ID by the expression on the side surface.

[0024]

In the game monitoring system according to the present disclosure, the player detecting means is configured to detect a hand of the player, and the first associating means is configured to associate, based on a positional relationship between the hand of the player detected by the player detecting means and the gaming chip detected by the chip detecting means, both of them with each other.

[0025]

By this configuration, it is possible to associate the chip ID of the gaming chip with the player based on the positional relationship between the hand and the gaming chip.

[0026]

In the game monitoring system according to the present disclosure, the chip ID identifying means is configured to detect a gaming chip from a first image generated by the imaging means and identify the chip ID of the detected gaming chip, the chip detecting means is configured to detect a gaming chip from a second image generated by the imaging means and different from the first image, and the second associating means is configured to identify, based on a relationship between a position of the gaming chip in the first image, detected by the chip ID identifying means and a position of the gaming chip in the second image, detected by the chip detecting means, as the first gaming chip the gaming chips in same positions.

[0027]

By this configuration, it is possible to identify the gaming chips in the same positions from the two images as the same gaming chip.

[0028]

In the game monitoring system according to the present disclosure, the imaging means includes a first camera configured to generate the first image and a second camera different from the first camera and configured to generate the second image, and the second associating means is configured to convert the position of the gaming chip in the first image detected by the chip ID identifying means and the position of the gaming chip in the second image detected by the chip detecting means into a common coordinate space to identify as the first gaming chip the gaming chips in the same positions.

[0029]

By this configuration, it is possible by mapping the gaming chip in the one image of the two images to the other image to identify the gaming chips in the same positions as the same gaming chip.

[0030]

In the game monitoring system according to the present disclosure, the chip ID identifying means is configured to identify a position of the gaming chip whose chip ID is identified, on the game table, the chip detecting means is configured to identify a position of the gaming chip detected from the image, on the game table, and the second associating means is configured to identify, based on the position identified by the chip ID identifying means and the position identified by the chip detecting means, as the first gaming chip the gaming chips in same positions.

[0031]

By this configuration, it is possible to identify the same gaming chips in the same positions as the same gaming chip based on the positions of the gaming chips on the game table in the two images.

[0032]

In the game monitoring system according to the present disclosure, the chip ID identifying means is configured to identify a timing when the gaming chip whose chip ID is identified