using the roller or the like and inspects the cards, and thus cannot inspect that the predetermined number of cards (416 cards in eight decks) are prepared with the plurality of cards being in the card shooter apparatus.

[0005]

If cards in which an IC chip or the like is embedded and that can be remotely identified are used, a plurality of cards can be remotely inspected while being in a card shooter apparatus. However, such remote reading of information may have a possibility of theft of information by an advanced hacking technique, and cannot be used for table games.

Citation list

Patent Literature

[0006]

Patent Literature 1: International Publication No. WO02/064225

Patent Literature 2: Japanese Patent Laid-Open No. 2006-271596

Summary of Invention

Technical Problem

[0007]

Embodiments of t~~The present invention is achieved under the above described background. T~~he present invention seek~~has an object~~ to provide a card shooter apparatus and a table

game system that may allow inspection that a predetermined number of cards (416 cards in eight decks) are prepared with a plurality of cards being in the card shooter apparatus. Embodiments of tThe present invention also seekhas another object to provide a card shooter apparatus and a table game system that can determine mixing of a fraudulent card with a plurality of cards being in the card shooter apparatus.

Solution to Problem

[0008]

An aspect of the present invention is a card shooter apparatus including: a card shooter unit including a card storage unit that stores a plurality of cards in a horizontal stack, and an opening through which the cards can be slid from the card storage unit and taken out onto a game table; a card reading unit that reads the number of cards taken out from the card shooter unit; a win/loss determination unit that determines win/loss of a card game based on information on the number of the plurality of cards from the card reading unit; a communication unit that transmits the information on the number of cards read by the card reading unit; an optical sensor that receives reflected lights of lights applied to end surfaces of the plurality of cards stored in the card storage unit; a playing card counting unit that receives a signal from the optical sensor and counts the number of the plurality of cards stored in the card storage unit;

Claims

[Claim 1]

A card shooter apparatus comprising:

a card shooter unit including a card storage unit that stores a plurality of cards in a horizontal stack, and an opening through which the cards can be slid from the card storage unit and taken out onto a game table;

a card reading unit that reads the number of cards taken out from the card shooter unit;

a win/loss determination unit that determines win/loss of a card game based on information on the number of the plurality of cards from the card reading unit;

a communication unit that transmits the information on the number of cards read by the card reading unit;

an optical sensor that receives reflected lights of lights applied to end surfaces of the plurality of cards stored in the card storage unit;

a playing card counting unit that receives a signal from the optical sensor and counts the number of the plurality of cards stored in the card storage unit; and

a count determination unit that determines from an output of the playing card counting unit whether the number of the plurality of cards stored in the card storage unit is a predetermined number,

wherein the optical sensor is placed so as to receive reflected lights from end surfaces of all of the plurality of cards stored in the card storage unit, or configured to be movable across a predetermined section by a sensor scanning unit so as to receive reflected lights from end surfaces of all of the plurality of cards stored in the card storage unit.

[Claim 2]

The card shooter apparatus according to claim 1, wherein the playing card counting unit is configured to decide the number of the plurality of cards based on information obtained from the optical sensor on a minute clearance between the plurality of cards stored and stacked in the card storage unit or a black portion present in the cards, or both the minute clearance and the black portion.

[Claim 3]

The card shooter apparatus according to claim 1 or 2, further comprising a display unit that displays a win/loss determination result of a card game by the win/loss determination unit.

[Claim 4]

The card shooter apparatus according to any one of claims 1 to 3, further comprising a second display unit that displays a determination result by the count determination unit.

[Claim 5]

The card shooter apparatus according to any one of claims 1 to 4, further comprising a number registration unit that previously registers a predetermined number of cards to be stored in the card storage unit, and the count determination unit determines whether the number of the plurality of cards stored in the card storage unit is the predetermined number set by the number registration unit.

[Claim 6]

The card shooter apparatus according to claim 1, wherein the communication unit is capable of wireless transmission, and further has a function of wirelessly transmitting the determination result by the count determination unit.

[Claim 7]

A table game system comprising:

cards each having a molecular sequence for encoding deck information indicating a deck of cards; and

a card shooter apparatus including a card shooter unit including a card storage unit that stores a plurality of cards in a stack, and an opening through which the cards can be slid from the card storage unit and taken out onto a game table,

wherein the card shooter apparatus further includes

a card reading unit that reads the number of cards taken out from the card shooter unit,

a win/loss determination unit that determines win/loss of a card game based on information on the number of the plurality of cards from the card reading unit,

a communication unit that transmits the information on the number of cards read by the card reading unit,

an optical sensor that receives reflected lights of lights applied to end surfaces of the plurality of cards stored in the card storage unit,

a molecular sequence sensor that reads molecular sequences of the plurality of cards stored in the card storage unit and obtains molecular sequence information,

a playing card counting unit that receives a signal from the optical sensor and counts the number of the plurality of cards stored in the card storage unit,

a deck information obtaining unit that receives a signal from the molecular sequence sensor and obtains deck information on the plurality of cards stored in the card storage unit,

a count determination unit that determines from an output of the playing card counting unit whether the number of the plurality of cards stored in the card storage unit is a predetermined number, and

a deck information determination unit that determines from an output of the deck information obtaining unit whether the plurality of cards stored in

the card storage unit each have predetermined deck information and outputs a result,

the optical sensor and the molecular sequence sensor are placed so as to receive reflected lights from end surfaces of all of the plurality of cards stored in the card storage unit and the molecular sequence information, or configured to be movable across a predetermined section by a sensor scanning unit so as to receive reflected lights from end surfaces of all of the plurality of cards stored in the card storage unit and the molecular sequence information.

[Claim 8]

The table game system according to claim 7, wherein the playing card counting unit is configured to decide the number of the plurality of cards based on information obtained from the optical sensor on a minute clearance between the plurality of cards stored and stacked in the card storage unit or a black portion present in the cards, or both the minute clearance and the black portion.

[Claim 9]

The table game system according to claim 7 or 8, further comprising a display unit that displays a win/loss determination result of a card game by the win/loss determination unit.

[Claim 10]

The table game system according to any one of claims 7 to 9, further comprising a second display unit that

displays a determination result by the count determination unit.

[Claim 11]

The table game system according to any one of claims 7 to 10, further comprising a third display unit that displays a determination result by the deck information determination unit.

[Claim 12]

The table game system according to any one of claims 7 to 11, wherein the communication unit can transmit the determination result by the deck information determination unit.

[Claim 13]

The table game system according to any one of claims 7 to 12, wherein the communication unit is capable of wireless transmission, and further has a function of wirelessly transmitting the determination result by the count determination unit and the determination result by the deck information determination unit.

[Claim 14]

The table game system according to any one of claims 7 to 13, further comprising a number registration unit that previously registers a predetermined number of cards to be stored in the card storage unit, and the count determination unit determines whether the number of the plurality of cards stored in the card storage unit is the predetermined number set by the number registration unit.

[Claim 15]

The table game system according to any one of claims 7 to 14, wherein the deck information determination unit further determines whether the plurality of cards stored in the card storage unit have entirely equal deck information and outputs a result.

[Claim 16]

The table game system according to any one of claims 7 to 15, wherein the molecular sequence includes an amino acid sequence of protein or a DNA base sequence, and the DNA includes naturally-derived DNA or artificial DNA.

Claims

1. A card shooter apparatus comprising:

a card shooter unit including a card storage unit that stores a plurality of cards, and an opening through which the cards can be slid from the card storage unit and taken out onto a game table;

a card reading unit that reads the number of cards taken out from the card shooter unit;

a win/loss determination unit that determines win/loss of a card game based on information on the number of the plurality of cards from the card reading unit;

a communication unit that transmits the information on the number of cards read by the card reading unit;

an optical sensor that receives reflected light of light applied to end surfaces of the plurality of cards stored in the card storage unit;

a playing card counting unit that receives a signal from the optical sensor and counts the number of the plurality of cards stored in the card storage unit; and

a count determination unit that determines from an output of the playing card counting unit whether the number of the plurality of cards stored in the card storage unit is a predetermined number,

wherein the optical sensor is placed so as to receive reflected light from end surfaces of all of the plurality of cards stored in the card storage unit, or configured to be movable across a predetermined section by a sensor scanning unit so as to receive reflected light from end surfaces of all of the plurality of cards stored in the card storage unit.

2. The card shooter apparatus according to claim 1, wherein the playing card counting unit is configured to decide the number of the plurality of cards based on information obtained from the optical sensor on a minute clearance between the plurality of cards stored and stacked in the card storage unit or a black portion present in the cards, or both the minute clearance and the black portion.

3. The card shooter apparatus according to claim 1, further comprising a display unit that displays a win/loss determination result of a card game by the win/loss determination unit.

4. The card shooter apparatus according to claim 1, further comprising a second display unit that displays a determination result by the count determination unit.

5. The card shooter apparatus according to claim 1, further comprising a number registration unit that previously registers a predetermined number of cards to be stored in the card storage unit, and the count determination unit determines whether the number of the plurality of cards stored in the card storage unit is the predetermined number set by the number registration unit.

6. The card shooter apparatus according to claim 1, wherein the communication unit is capable of wireless transmission, and further has a function of wirelessly transmitting the determination result by the count determination unit.

7. A table game system comprising:

cards each having a molecular sequence for encoding deck information indicating a deck of cards; and

a card shooter apparatus including a card shooter unit including a card storage unit that stores a plurality of cards in a stack, and an opening through which the cards can be slid from the card storage unit and taken out onto a game table,

wherein the card shooter apparatus further includes

a card reading unit that reads the number of cards taken out from the card shooter unit,

a win/loss determination unit that determines win/loss of a card game based on information on the number of the plurality of cards from the card reading unit,

a communication unit that transmits the information on the number of cards read by the card reading unit,

an optical sensor that receives reflected light of light applied to end surfaces of the plurality of cards stored in the card storage unit,

a molecular sequence sensor that reads molecular sequences of the plurality of cards stored in the card storage unit and obtains molecular sequence information,

a playing card counting unit that receives a signal from the optical sensor and counts the number of the plurality of cards stored in the card storage unit,

a deck information obtaining unit that receives a signal from the molecular sequence sensor and obtains deck information on the plurality of cards stored in the card storage unit,

a count determination unit that determines from an output of the playing card counting unit whether the number of the plurality of cards stored in the card storage unit is a predetermined number, and

a deck information determination unit that determines from an output of the deck information obtaining unit whether the

plurality of cards stored in the card storage unit each have predetermined deck information and outputs a result,

the optical sensor and the molecular sequence sensor are placed so as to receive reflected light from end surfaces of all of the plurality of cards stored in the card storage unit and the molecular sequence information, or configured to be movable across a predetermined section by a sensor scanning unit so as to receive reflected light from end surfaces of all of the plurality of cards stored in the card storage unit and the molecular sequence information.

8. The table game system according to claim 7, wherein the playing card counting unit is configured to decide the number of the plurality of cards based on information obtained from the optical sensor on a minute clearance between the plurality of cards stored and stacked in the card storage unit or a black portion present in the cards, or both the minute clearance and the black portion.

9. The table game system according to claim 7, further comprising a display unit that displays a win/loss determination result of a card game by the win/loss determination unit.

10. The table game system according to claim 7, further comprising a second display unit that displays a determination result by the count determination unit.

11. The table game system according to claim 7, further comprising a third display unit that displays a determination result by the deck information determination unit.

12. The table game system according to claim 7, wherein the communication unit can transmit the determination result by the deck information determination unit.

13. The table game system according to claim 7, wherein the communication unit is capable of wireless transmission, and further has a function of wirelessly transmitting the determination result by the count determination unit and the determination result by the deck information determination unit.

14. The table game system according to claim 7, further comprising a number registration unit that previously registers a predetermined number of cards to be stored in the card storage unit, and the count determination unit determines whether the number of the plurality of cards stored in the card storage unit is the predetermined number set by the number registration unit.

15. The table game system according to claim 7, wherein the deck information determination unit further determines whether the plurality of cards stored in the card storage unit have entirely equal deck information and outputs a result.

16. The table game system according to claim 7, wherein the molecular sequence includes an amino acid sequence of protein or a DNA base sequence, and the DNA includes naturally-derived DNA or artificial DNA.