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A6H HMC

(56) Documents Cited:
US 4822050 A **US 4637712 A**
US 4534562 A **US 4082943 A**

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INT CL[7] **A63F**
Other: **Online : WPI, EPODOC, JAPIO, TXTE**

(54) Abstract Title: **Playing card reading device**

(57) A card reading device 7 for a dealing shoe, 6 comprises a card conveyor for conveying a playing card through a reading region of a reader, and a read confirmation input for receiving a read confirmation indicating that information carried by the playing card has been successfully read by the reader, wherein, the card conveyor is operable, upon conveying the playing card through the reading region and the read confirmation input not receiving a read confirmation, to convey the playing card through the read region again.
The playing card may be provided with machine-readable information in the form of a bar code displayed on the identification face of the card. The conveyor may be operable to effect relative motion of the card repeatedly until the card is successfully read or the conveyor may effect a predetermined maximum number of repeated passes.

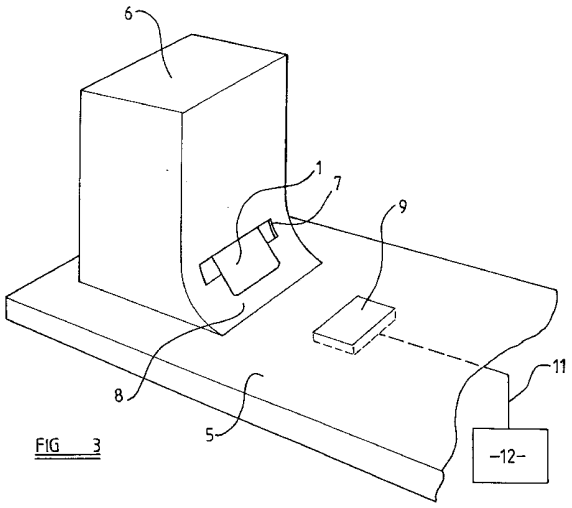

FIG 3

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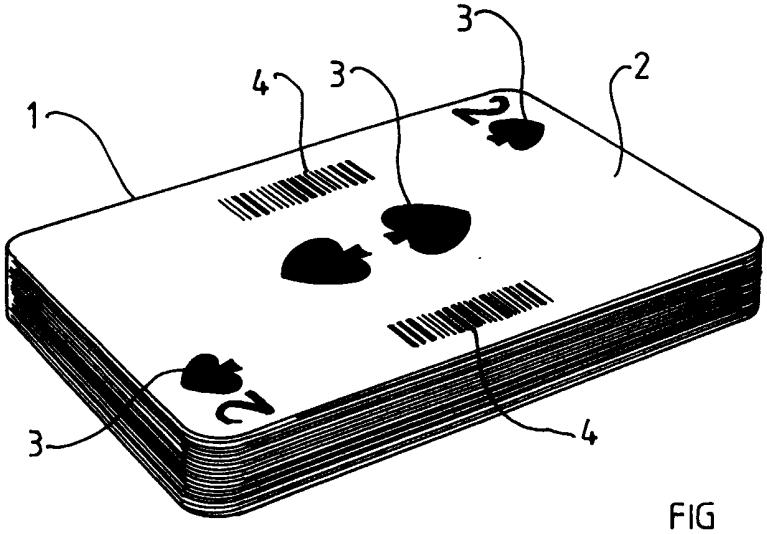

FIG 1

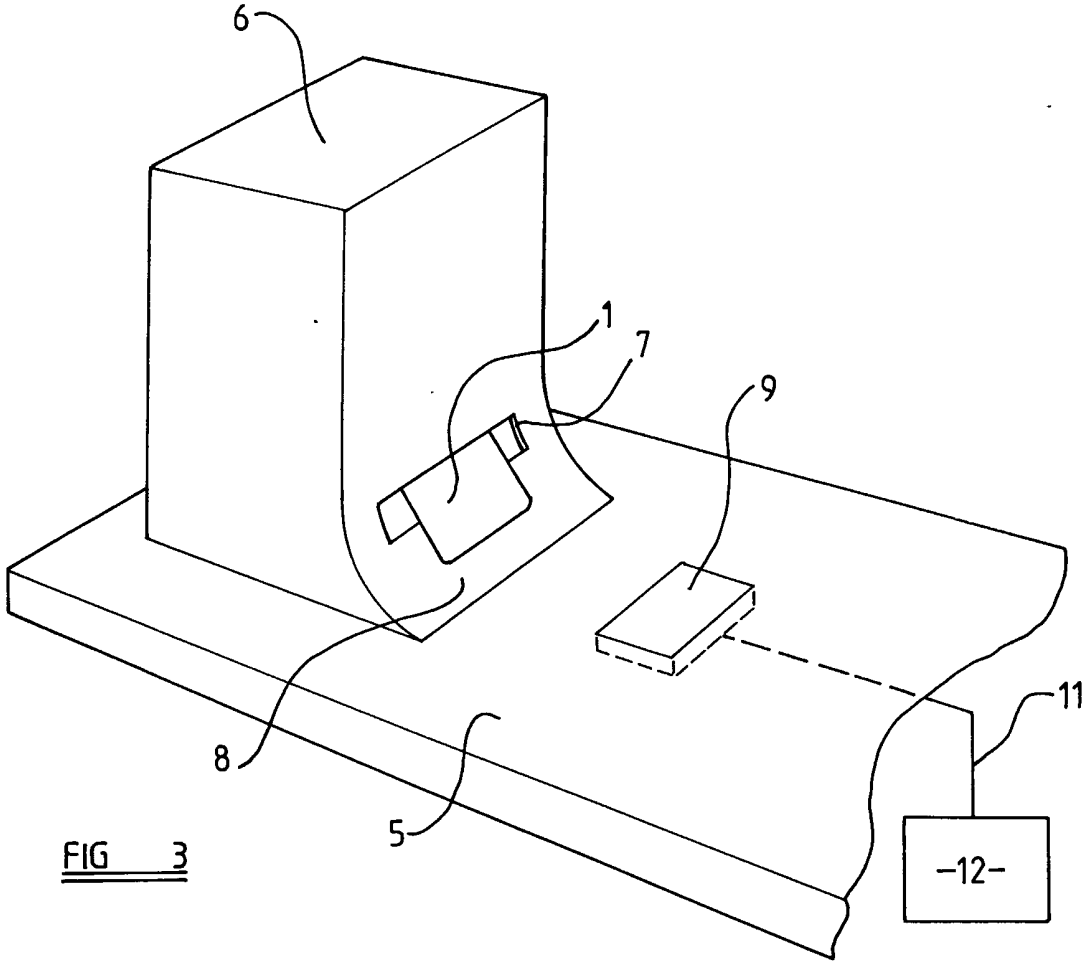

FIG 3

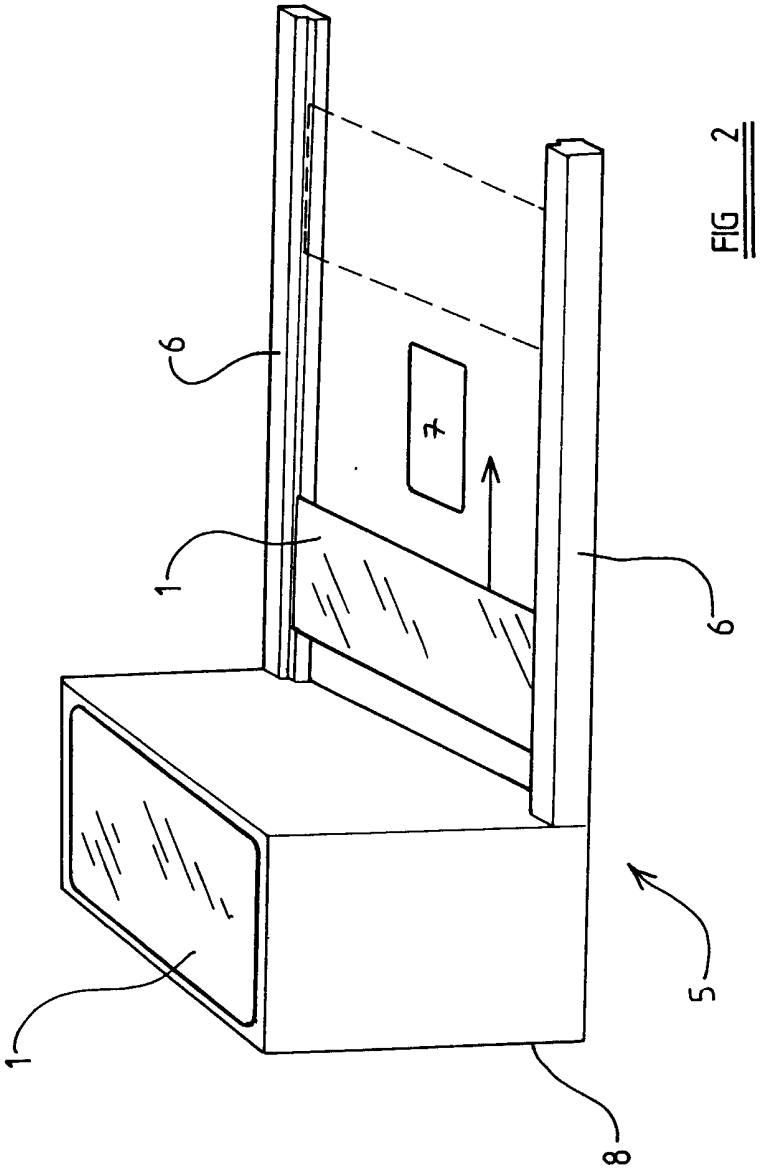

FIG 2

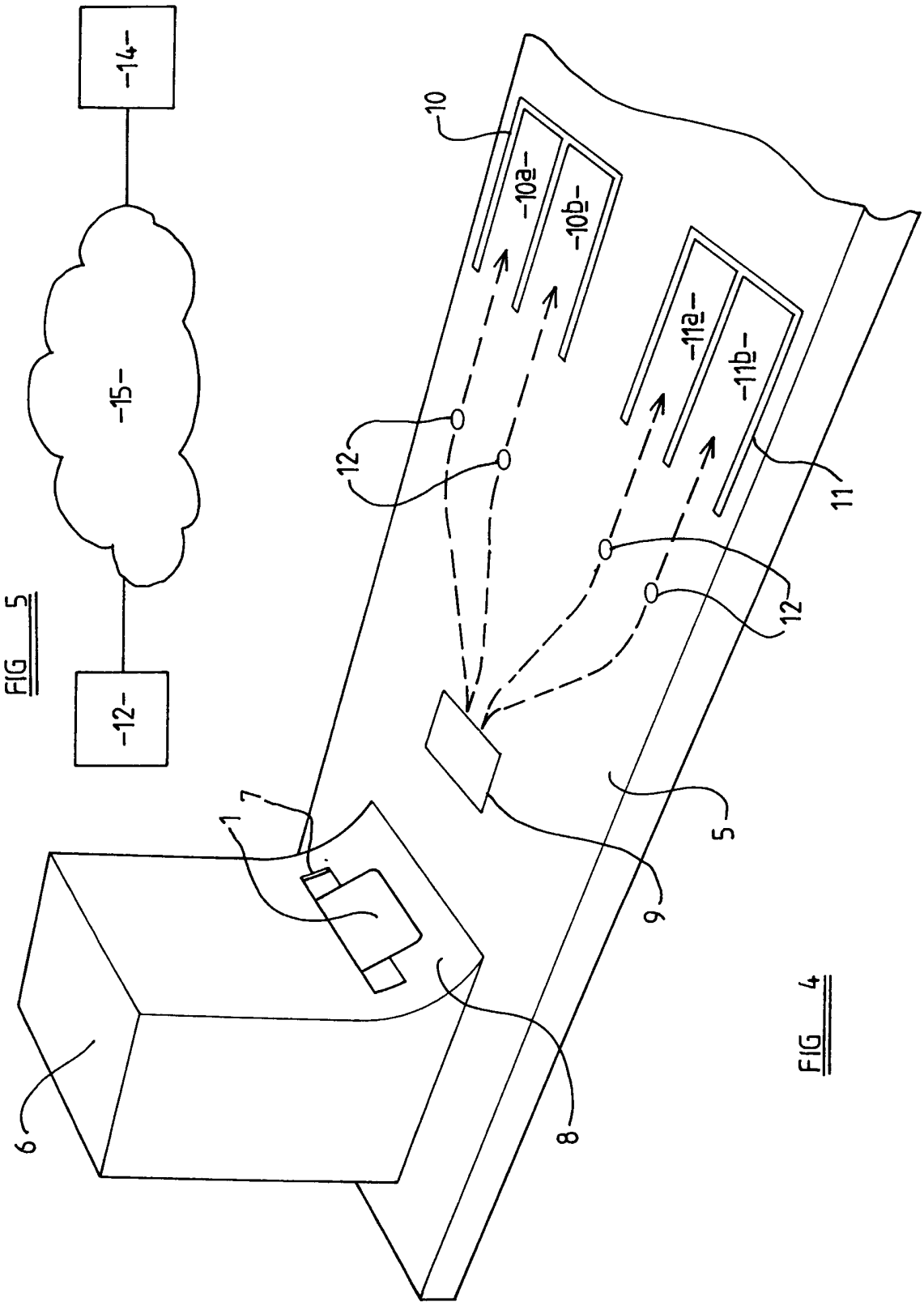

FIG 5

FIG 4

PATENTS ACT 1977

P16973GB-LH

"A Gaming Apparatus"

THIS INVENTION relates to a gaming apparatus, and in particular to a gaming apparatus that allows a number of people to follow the progress of a card game.

For many years it has been customary for legalised gambling to take place in casinos. Typically, a casino will operate a number of games, such as roulette and various card games, in which one or more players may take part and place bets on the outcome of the game. In addition to the individuals actually involved in the playing of each game, people (either at the casino or remote therefrom) also wish to follow and place bets upon the performance of these individuals. Such people take no active part in the conduct of the game and must accept any decisions taken by the individual that he or she has backed.

However, in some card games played in casinos, the rules of the game dictate that cards are dealt to players face-down, so that a bystander or person attempting to follow the game is unable to establish the identity of the card. While the concealment of the identity of the card from some or all of the individuals actually involved in the playing of the game may be crucial to the correct playing of the game itself, certain people who have placed bets upon the performance of these individuals may well be interested in knowing the identity of cards that have been dealt to the individuals face-down.

It has been proposed to provide playing cards marked with machine-readable indicia, for instance bar codes, in addition to the conventional markings. The machine-readable indicia are read automatically as a card is

dealt, and this information may be presented, for instance on a computer screen, to people who have placed bets on the performance of individuals participating in the card game (who remain, of course, unaware of the suit or value of the card until they are allowed to look at the card under the normal rules of the game).

It is an object of the present invention to seek to provide a more reliable apparatus and method for allowing one or more observers to follow the progress of a card game, even if some of the cards dealt during the playing of the game are dealt face-down.

Accordingly, one aspect of the present invention provides card reading device for a dealing shoe, the device comprising: a conveyor for effecting relative motion of a playing card and a reader so that a readable portion of the playing card carrying information identifying the card passes through a reading region of the reader; and a read confirmation input for receiving a read confirmation indicating that the identification information carried by the playing card has been successfully read by the reader, wherein, the conveyor is operable, upon effecting the relative motion of the playing card and the reader and the read confirmation input not receiving a read confirmation, to effect further relative motion between the playing card and the reader so that the readable region of the playing card passes through the read region again.

Advantageously, the conveyor is a card conveyor, operable to convey the playing card.

Alternatively, the conveyor is a reader conveyor, operable to convey the reader.

Preferably, the conveyor is operable to effect the relative motion repeatedly until a read confirmation is received by the read confirmation input.

Conveniently, the conveyor is operable to effect the relative motion a predetermined maximum number of times.

Advantageously, the card reading device further comprises a card ejector for ejecting cards from the device.

Preferably, the conveyor comprises the card ejector.

Conveniently, the card reading device further comprises a feeder operable to store a plurality of playing cards and feed playing cards to the conveyor.

Advantageously, the conveyor comprises a pair of parallel tracks.

Another aspect of the present invention provides a dealing shoe comprising a card reading device according to the above.

Preferably, the dealing shoe further comprises a reader.

Conveniently, when the conveyor is a card conveyor, the dealing shoe comprises an open or transparent bottom to allow a card conveyed by the conveyor to be read by a reader on a surface on which the dealing shoe is placed.

A further aspect of the present invention provides a gaming apparatus comprising: at least one deck of playing cards, each card having a back and an identification face, the identification face having conventional information, displaying the identity of the card, and machine-readable information, the machine-readable information identifying the card and being supplementary to the conventional information; and a dealing shoe according to the above.

Advantageously, the gaming apparatus further comprises at least one sensor operable to detect the presence of a playing card.

Preferably, the gaming apparatus further comprises a destination area associated with a sensor, the arrangement being such that, if a playing card is dealt from the dealing shoe to the destination area, the passage of the card into the destination area is detectable by the sensor.

Conveniently, the gaming apparatus comprises a plurality of destination areas, each of the destination areas being associated with a respective sensor.

Another aspect of the present invention provides a method of reading information carried on a playing card, comprising the steps of: automatically effecting relative motion of a playing card and a reader so that a readable portion of the playing card passes through a reading region of the reader; and upon not receiving a read confirmation indicating that information carried by the playing card has been successfully read by the reader, effecting further relative motion between the playing card and the reader so that the readable portion of the playing card passes through the read region again.

Advantageously, the method further comprises the step of ejecting the playing card once a read confirmation has been received.

In order that the present invention may be more readily understood, embodiments thereof will now be described, by way of example, with reference to the accompanying drawings, in which:

Figure 1 shows a deck of playing cards marked with machine-readable indicia;

Figure 2 shows a card ejecting device embodying the present invention;

Figure 3 shows a first gaming apparatus embodying the present invention;

Figure 4 shows a second gaming apparatus embodying the present invention; and

Figure 5 shows an arrangement suitable for allowing remote bettors to follow the progress of a game played on the gaming apparatus of Figures 1 and 2.

Turning firstly to Figure 1, a deck of playing cards is shown, with one representative playing card 1 at the front of the deck. In common with conventional playing cards, each playing card 1 comprises a back (not shown) and an identification face 2.

The back of the playing card 1 shows a design which is, preferably, also displayed on the backs of each of the other playing cards which, together with the playing card 1, make up the full deck of playing cards. Hence, no

information which might identify the suit or value of the playing card 1 is displayed on the back thereof.

Conventional information 3 identifying the suit and value of the playing card 1 is displayed on the identification face 2 thereof. The conventional information 3 may include, but is not limited to, numbers and letters to represent the value of the card, and pips to designate the suit of the card. It will be appreciated that an enormous variety of different designs of playing card are available, and the conventional information 3 displayed on the identification face 2 of the playing card 1 may include any information readily recognised by a human player as designating the value and suit of the playing card 1.

In addition to the conventional information 3 displayed on the identification face 2 of the card 1, machine-readable information 4 is also displayed on the identification face 2 thereof. The machine-readable information 4 comprises information in addition to the conventional information 3, which additional information may be optically read by a machine to allow the machine to determine the value and suit of the playing card 1, and preferably comprises at least one bar code.

The machine-readable information 4 displayed on the playing card 1 is not limited to bar codes, and a skilled person will immediately understand that there are a large number of alternative machine-readable information 4 that may be displayed on the identification face 2 of the playing card 1 in addition to the conventional information 3 displayed thereon. While the machine-readable information 4 is supplementary to the conventional information 3, the machine-readable information 4 may be provided as part of the conventional information 3. For example, the machine-readable information 4 may comprise a digital

watermark imposed on one of the pips or numbers of a playing card 1, and a skilled person will really appreciate how such marking may be achieved.

Figure 2 shows a card ejection device 5 embodying the present invention. The card ejection device 5 comprises a pair of parallel tracks 6, which are operable to hold opposing ends of a playing card 1 so that the playing card 1 is extended between the tracks 6. The tracks 6 are provided with wheels (not shown) or an alternative conveying means, so that the playing card 1 may be conveyed along the length of the tracks 6. The operation of the conveying means is controlled by a controller (not shown), which preferably comprises a processor which is operable to control one or more motors.

The tracks 6 are arranged so that, as a playing card 1 held thereby moves from one end of the tracks 6 to the other, the playing card 1 passes over a reader 7 which is arranged so that the playing card 1 (or at least a portion thereof carrying machine-readable indicia 4) passes through a reading region of the reader 7. The reader 7 is configured to read the machine-readable indicia 4 marked on the playing card 1, and a skilled person will appreciate how this may be achieved. For instance, if the machine readable indicia 4 comprise a bar code, then the reader will comprise a bar code reader

The reader 7 is configured to provide the controller with a read confirmation signal upon successful reading of the machine-readable information 4 provided on a playing card 1.

The card ejection device 5 also comprises a card feeder 8, which is operable to retain a quantity of playing cards 1, and to feed these playing cards 1 into the tracks 6, preferably one at a time.

In use of the card ejection device 5, a stack of playing cards 1 are placed into the feeder 8 face down. One of these cards (preferably the lowest playing card 1 in the stack) is fed into the tracks 6, and the controller causes the card 1 to be conveyed along the tracks 6, and hence through the reading region of the reader 7.

If the reader 7 provides a read confirmation signal to the controller, this indicates that the machine-readable information 4 on the playing card 1 has been successfully read at the first attempt, and the playing card 1 ejected from the tracks 6, for instance on to a dealing area where the card may be passed by a dealer to a player of a card game.

If, however, the tracks 6 convey the playing card 1 past the reading region of the reader 7 and no read confirmation signal is provided to the controller, this indicates that the reader 7 has failed to read the machine-readable information 4 on the playing card 1 at the first attempt. In this instance, the controller will cause the tracks 6 to convey the card back through the reading region of the reader 7, to give the reader 7 a further opportunity to read the machine-readable information 4 on the playing card 1 correctly.

In one embodiment of the invention, the controller causes the tracks 6 to shuttle the playing card 1 back and forth through the reading region of the reader 7 until a read confirmation signal is received by the controller.

Alternatively, the number of times the playing card 1 is passed through the reading region of the reader 7 may be limited to a predetermined fixed amount, before the playing card 1 is ejected from the tracks 6. At this point, the controller may provide an indication that the playing card 1 could not be read,

alerting casino staff to the fact that the card has been placed in the feeder 8 face-up, the card is unreadable, or that the card ejection device 5, or at least the reader 7, requires maintenance.

In an alternative embodiment, the device may be configured to hold the playing card 1 in place and move the reader 7 so that the reading region of the reader 7 passes through the playing card 1 (or at least a portion thereof carrying machine-readable indicia 4), so that the indicia 4 can be read. A skilled reader will readily appreciate how this may be achieved.

It is envisaged that the card ejection device 5 will be housed in a housing to form a dealing shoe which may be put to use in a casino or elsewhere.

Turning to Figure 3, a first gaming apparatus embodying the present invention is shown. On a gaming surface 9, a dealing shoe 10 embodying the invention as described above is placed. The dealing shoe 10 is used to dispense playing cards face-down on to the gaming surface 9.

In a preferred embodiment of the present invention, a connection 11 is provided between the reader 7 and a processing machine 12 such as a lap-top computer or server. Hence, as the playing card 1 is passed over the reader 7 and the machine-readable information 4 displayed thereon is read by the reader 7, information identifying the playing card 1 can be passed from the reader 7 via the connection 11 to the processing machine 12.

If reader 7 is provided integrally with the dealing shoe 10, the processing machine 12 may also be provided within the dealing shoe 10. Alternatively, the dealing shoe 10 may be positioned over a reader 7 provided in the gaming surface 9, in which case the dealing shoe 10 is preferably provided with an

open or transparent bottom to allow the reader 7 to read the machine-readable information 4 on playing cards 1 passing through the dealing shoe 10

Turning now to a game that may be played using the gaming apparatus depicted in Figure 3, the game of baccarat will be used as an example. Baccarat is a relatively simple game, and once initial cards have been dealt the game proceeds according to fixed rules, with no decisions to be taken by the players of the game.

At the start of the game of baccarat, hands of two cards each are dealt to a banker and to a player, in a fixed order. Playing cards 1 are ejected from the dealing shoe 10, and before this occurs they are passed over the reader 7 as many times as is necessary for the machine-readable information 4 to be read. The processing machine 12 (which is programmed in accordance with the rules of baccarat) is able to determine which of the playing cards 1 have been dealt to the banker and which to the player. In a preferred embodiment of the present invention, the reader 7 may emit an audible noise to confirm to the dealer, the players and any observers that a playing card 1 ejected from the dealing shoe 10 has been successfully read.

Depending upon the playing cards 1 that have been dealt in these hands, one of the player or the banker will emerge victorious, or the game will be a draw. However, further playing cards 1 may need to be drawn from the dealing shoe 10, and whether any further playing cards 1 are dealt to the player or to the banker is determined entirely by the initial playing cards 1 drawn. The processing machine 12 is able to establish, from the initial dealing, whether any further playing cards 1 will need to be dealt during the game, and will correctly interpret these playing cards 1 as being allocated to the dealer or the banker as part of the present game, and not as part of a new game.

In an advantageous variation of the above-described embodiment in which the processing machine 12 is provided integrally with the dealing shoe 10, one or more indicators (for instance lights) are provided on an outer surface of the dealing shoe 10, and these indicators are controlled by the processing machine 12. The indicators are operable, if the dealer deals the cards incorrectly, to indicate this fact to the dealer. The indicators may be able to provide several different types of indication (for instance by lighting up in different colours or sequences) to call the dealer's attention to different types of mis-deal, for instance the dealing of too many or too few cards.

As mentioned above, a third party may wish to place a bet upon the outcome of the game of baccarat. Such a bet may be that the banker will win, that the player will win, or that the game will result in a tie. As the game progresses, the hands dealt to the banker or player may not be immediately visible to a bystander, and it is likely to be a more engaging experience for a third party betting on the outcome of the game if the identities of the playing cards 1 dealt to the banker and the player can be known as soon as they are dealt. Since the playing cards 1 dealt are identified by the processing machine 12, this information may be displayed to a third party as soon as the initial deal has occurred. In an advantageous embodiment of the invention, the identities of the playing cards 1 that have been dealt to the player and banker are displayed on a screen, which screen is not visible to the player or the banker. However, the mode of display of the identities of the playing cards 1 that have been dealt is not limited to a screen, and a skilled person will appreciate that the identities of the playing cards 1 may be made known to a third party, or to a number of third parties, in a wide variety of ways.

Turning to Figure 4, a second gaming apparatus embodying the present invention is shown.

In common with the first gaming apparatus depicted in Figure 3, the second gaming apparatus comprises a gaming surface 9, a dealing shoe 10 and a reader 7 positioned to read machine-readable information 4 displayed on playing cards 1 before they are ejected from the dealing shoe 10. However, in addition, the second gaming apparatus comprises two "boxes" 13, 14, which are regions marked on the gaming surface 9 and allocated to first and second individual players. Each of the boxes 13, 14 is sub-divided into first and second bays 13a, 14a, 13b, 14b.

Four sensors 15 are positioned on or beneath the gaming surface 9, a sensor 15 being located adjacent each of the bays 13a, 13b, 14a, 14b along the path on the gaming surface 9 between the dealing shoe 10 and each of the bays 13a, 13b, 14a, 14b.

The sensors 15 are operable to detect the presence of a playing card. For instance, each of the sensors 15 may comprise a light-sensitive element, which detects the presence of a playing card 1 thereon due to a drop in the level of light gathered by the light-sensitive element. Alternatively, the sensors 15 may comprise pressure-sensitive elements, which detect the presence of a playing card 1 by the downward force exerted on the sensor 15 by the playing card when it rests thereon or passes thereover. The nature of the sensors 15 is not limited to these examples, and a skilled person will readily appreciate that there are many types of sensor which may be used to detect the presence or passing of a playing card 1.

Connections 16 are provided between the sensors 15 and the processing machine 12, and the sensors 15 are operable to pass information to the processing machine 12 regarding the detection of playing cards 1.

The second gaming apparatus is suitable for, for example, the playing of a game of black-jack, as will be explained. At the start of a game of black-jack, the banker and each player are dealt two playing cards 1. Initially, a first playing card 1 will be dealt to the first player, and positioned in the first bay 13a of the first box 13 before this first playing card 1 is ejected from the dealing shoe 10, it will be passed over the reader 7, as many times as necessary and the machine-readable information 4 displayed thereon will be read and passed to the processing machine 12, allowing the processing machine 12 to identify the first playing card 1, as described above. The first playing card 1 will then be slid along the gaming surface 9 (face-down) toward the first bay 13a of the first box 13. As the first playing card 1 enters this bay 13a, it will pass over the sensor 15 positioned adjacent the entrance to the bay 13a, and this sensor 15 will detect the passage of the first playing card 1 thereover. The detection of the first playing card 1 by this sensor 15 will be relayed to the processing machine 12.

Hence, the processing machine 12 is provided with sufficient information to establish the identity of a playing card 1 that has been dealt from the dealing shoe 10, and to establish the bay 13a, 13b, 14a, 14b and box 13, 14 on the gaming surface 9 (and hence establish the player) to which the playing card 1 has been dealt.

In a similar fashion, the second playing card 1 will be dealt to the first bay 14a of the second box 14, and will pass over the sensor 15 adjacent the entrance of this bay 14. Again, the processing machine 12 is able to establish

the identity of the second playing card 1 and the location on the gaming surface 9 to which the card has been dealt.

As the game progresses, decisions may be taken by the players associated with the first and second boxes 13, 14, and the processing machine 12 would not have been able, using the first apparatus embodying the present invention, to determine the bay 13a, 13b, 14a, 14b or box 13, 14 on the gaming surface 9 to which playing cards 1 will be dealt after the initial cards have been dealt to the players in accordance with the fixed rules of the game being played. However, because of the provision of the sensors 15, this problem is solved, allowing the apparatus to determine dealt card locations after an initial fixed dealing pattern.

In a preferred embodiment, the processing machine 12 is programmed with the rules of black-jack, and will be able to establish, from the information gathered by the reader 7 and the sensors 15, the outcome of each hand dealt to a box 13, 14.

As discussed above, third parties may wish to place bets upon the performance of any of the players or the banker and, in a similar manner to that described above, the playing cards 1 that have been dealt to each player and to the banker may be displayed on the screen in such a way that the players and the banker involved in the game are not able to see the screen or be informed of its content.

The present invention also finds application in the field of Internet betting. A game of baccarat or black-jack such as those described above may be presented to a remote better via, for example, television or the Internet, and the remote better may choose to place a bet on the performance of one or more

of the players. To place such a bet, the remote gambler may enter the amount of the bet and the identity of the player or players in question, as well as the nature of his bet, on to a suitable website, and submit this information to a server, which is either the processing machine or is connected thereto. An arrangement suitable for allowing such betting is shown in Figure 5. Information is carried between the processing machine 12 and a remote user terminal 16 via the Internet 17.

Once the processing machine 12 has accepted the remote gambler's bet, the processing machine 12 is able to track the progress of the game and establish whether or not the remote gambler has won his or her bet.

Using such a setup, many remote gamblers may place bets upon the outcome of the same game, and in this way a large number of people may participate in the game. It is envisaged that participation in a card game of this type may be particularly popular if a televised game were to be played amongst celebrities, with viewers being able to back the celebrity of their choice to win, or alternatively to lose, the game.

It will be appreciated that the present invention provides a useful tool for allowing any number of people to follow the progress of a card game, and to place bets upon the performance of individuals participating in the game.

In the present specification "comprises" means "includes or consists of" and "comprising" means "including or consisting of".

The features disclosed in the foregoing description, or the following claims, or the accompanying drawings, expressed in their specific forms or in terms of a means for performing the disclosed function, or a method or process

for attaining the disclosed result, as appropriate, may, separately, or in any combination of such features, be utilised for realising the invention in diverse forms thereof.

CLAIMS:

1. A card reading device for a dealing shoe, the device comprising:

a conveyor for effecting relative motion of a playing card and a reader so that a readable portion of the playing card carrying information identifying the card passes through a reading region of the reader; and

a read confirmation input for receiving a read confirmation indicating that the identification information carried by the playing card has been successfully read by the reader, wherein,

the conveyor is operable, upon effecting the relative motion of the playing card and the reader and the read confirmation input not receiving a read confirmation, to effect further relative motion between the playing card and the reader so that the readable region of the playing card passes through the read region again.

2. A card reading device according to Claim 1, wherein the conveyor is a card conveyor, operable to convey the playing card.

3. A card reading device according to Claim 1, wherein the conveyor is a reader conveyor, operable to convey the reader.

4. A card reading device according to any preceding claim, wherein the conveyor is operable to effect the relative motion repeatedly until a read confirmation is received by the read confirmation input.

5. A card reading device according to any one of Claims 1 to 3, wherein the conveyor is operable to effect the relative motion a predetermined maximum number of times.

6. A card reading device according to any preceding claim, further comprising a card ejector for ejecting cards from the device.

7. A card reading device according to Claim 6, wherein the conveyor comprises the card ejector.

8. A card reading device according to any proceeding claim, further comprising a feeder operable to store a plurality of playing cards and feed playing cards to the conveyor.

9. A card reading device according to any preceding claim, wherein the conveyor comprises a pair of parallel tracks.

10. A dealing shoe comprising a card reading device according to any preceding claim.

11. A dealing shoe according to Claim 10, further comprising a reader.

12. A dealing shoe according to Claim 10, wherein the conveyor is a card conveyor, comprising an open or transparent bottom to allow a card conveyed by the conveyor to be read by a reader on a surface on which the dealing shoe is placed.

13. A gaming apparatus comprising:

at least one deck of playing cards, each card having a back and an identification face, the identification face having conventional information, displaying the identity of the card, and machine-readable information, the

machine-readable information identifying the card and being supplementary to the conventional information; and

a dealing shoe according to any one of Claims 10 to 12.

14. A gaming apparatus according to Claim 13, further comprising at least one sensor operable to detect the presence of a playing card.

15. A gaming apparatus according to Claim 14, further comprising a destination area associated with a sensor, the arrangement being such that, if a playing card is dealt from the dealing shoe to the destination area, the passage of the card into the destination area is detectable by the sensor.

16. A gaming apparatus according to Claim 15, comprising a plurality of destination areas, each of the destination areas being associated with a respective sensor.

17. A method of reading information carried on a playing card, comprising the steps of:

automatically effecting relative motion of a playing card and a reader so that a readable portion of the playing card passes through a reading region of the reader; and

upon not receiving a read confirmation indicating that information carried by the playing card has been successfully read by the reader, effecting further relative motion between the playing card and the reader so that the readable portion of the playing card passes through the read region again.

18. A method according to Claim 17 further comprising the step of ejecting the playing card once a read confirmation has been received.

19. A card reading device substantially as hereinbefore described, with reference to Figures 2 to 5 of the accompanying drawings.

20. A dealing shoe substantially as hereinbefore described, with reference to Figures 3 to 5 of the accompanying drawings.

21. A gaming apparatus substantially as hereinbefore described, with reference to Figures 4 and 5 of the accompanying drawings.

22. A method substantially as hereinbefore described, with reference to Figures 2 to 5 of the accompanying drawings.

23. Any novel feature or combination of features disclosed herein.

Application No:	GB 0226259.0	**Examiner:**	Paul Makin
Claims searched:	1-22	**Date of search:**	28 February 2003

Patents Act 1977 : Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance	
Y	1-11, 13-17	US 4637712	(ARNOLD) see column 5 lines 23-37
Y	1-11, 13-17	US 4082943	(JENSEN) see column 18 lines 11-38
Y	1-11, 13-17	US 4534562	(CUFF) whole document
Y	1-11, 13,14,17	US 4822050	(NORMAND) whole document

Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art
Y	Document indicating lack of inventive step if combined with one or more other documents of same category	P	Document published on or after the declared priority date but before the filing date of this invention
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC[V].

A6H

Worldwide search of patent documents classified in the following areas of the IPC[7]:

A63F

The following online and other databases have been used in the preparation of this search report:

WPI, EPODOC, JAPIO, TXTE