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(54) **A CARD MOVING SYSTEM**

(57) A card moving system is provided, the system comprising a conveyor belt adapted to carry one or more cards individually connected the lower side of the conveyor belt and at least one releasing means for releasing the card from the conveyor belt being
o an interruption means to interrupt the connection of the card to the lower side of the conveyor belt and/or
o a gas blowing means to blow the connected card from the conveyor belt.

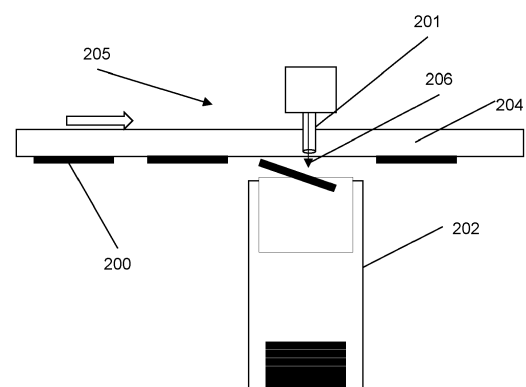


Fig. 2

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Description

Field of the Invention

[0001] The present invention generally relates to card moving systems. The present invention further relates to a system for creating sets of cards, such as playing cards or collectible or trading cards or alike, which system creates sets with the cards ordered in random or in a pre-defined sequence.

Background of the Invention

[0002] Card games are well known nowadays. Often the game is based upon the unpredictability of the order of cards being dealt or drawn from a randomly ordered deck or set of playing cards, wherein a set of playing cards comprises more than one deck of playing cards being randomly ordered at set level.

[0003] As an example, baccarat is played with a randomly ordered set of 8 decks of playing cards, in total 416 randomly ordered cards. For some games, once cards are drawn from the set, the drawn cards cannot be used anymore as such, since the order of drawing and setting aside the drawn cards can be monitored. Players can turn the cards themselves after the bet resulting in compromised, damaged, or destroyed cards. Reusing the used cards may create the opportunity for a player to predict the future sequence of cards, hence cheating.

[0004] Seen the high stakes involved, in fact any source of fraudulent playing or behaviour must be avoided. The handling time between production of a set of playing cards and using it at the playing table needs to be as little as possible to avoid to large extent the possibility for fraudulent actions.

[0005] A system for creating sets of randomly ordered playing cards is described in WO2012042823. This system comprises a plurality of playing cards collecting means to collect playing cards thereby providing a set of playing cards. Playing cards in random order are supplied to the plurality of playing cards collecting means via a route including a plurality of gates and mechanically moving elements.

[0006] Also for other cards, like collectible or trading cards, any source of fraudulent behaviour must be avoided as well. The handling time between production of a set of cards and any handling of the cards by the public needs to be as little as possible to avoid to large extent the possibility for fraudulent actions. Neither should any defect be noticeable on such kind of cards.

[0007] During production in general, it is of importance to manipulate both virgin, new cards and recycled, or reclaimed cards, such that no marks or defects are provided to these cards, such as playing cards. This because any mark to e.g. a playing card can be an origin of recognition of playing cards, and hence to cheating, to having prior knowledge, or fraud. Reclaimed or recycled cards are cards which have been part of a set or deck of

cards, which set or deck has been used for playing at least one card game, e.g. at a card playing table, such as a casino table.

Summary of the invention

[0008] It is an object of the present invention to provide a card moving system which reduces the risk of creating damage or defects to the cards being displaced.

[0009] It is further an object of the present invention to provide a device and a method which is able to provide randomly ordered set of cards. An advantage of the system according to the invention is the use of less moving elements, causing less risk of damaging the cards collected. An advantage of some embodiments of the device and method is that the device and method reduce the amount of waste during the production of the sets of cards, as used or reclaimed cards may be recuperated and reintroduced in newly created sets of cards.

[0010] It is also the object of the present invention to extend the life cycle of cards by providing a possibility to reshuffle cards, from a set of cards which has or has not been dealt during an earlier card game. As such, a card can be used more than once at a casino table.

[0011] In the context of this invention, a card is not to be understood as limitative to playing cards having a face side showing a rank and suit. Cards may also be understood as e.g. game cards, casino cards, collectible cards and trading cards, i.e. cards having identification element or elements on the face side of the cards, different from a rank and suit, which identification element or elements cause the card to have an own identity in the deck of cards to which it may belong.

[0012] According to a first independent aspect of the invention, a card moving system is provided, the system comprising

- a conveyor belt adapted to carry one or more cards individually connected the lower side of the conveyor belt;
- at least one releasing means for releasing the card from the conveyor belt being
 - an interruption means to interrupt the connection of the card to the lower side of the conveyor belt and/or
 - a gas blowing means to blow the connected card from the conveyor belt.

[0013] The conveyor belt can be any belt to which a card can be hung. It may be a conveyor belt having a lower side provided with non-permanent glue or any type of similar adhesive. Alternatively the conveyor belt can be a vacuum belt, air being sucked through the belt and the cards being sucked to the lower side of the belt. In the latter case, an interruption means may be a means to local interrupt the vacuum applied to the card being carried.

[0014] The conveyor belt, being a continuous belt or band for transporting material from one place to another, may be an endless belt or may be a continuous belt provided from a strip of a belt, the 2 ends of this strip being connected one to the other to form a continuous belt, e.g. by thermal welding, by means of staples, or alike.

[0015] Such card moving system causes no moving mechanical element or part to touch the cards during movement of the card in the card moving system. No mechanical element or part will grip or manipulate the cards carried. The cards are only moved by adhesion or air suction and air flows, which is gentler to the card surface and cause insignificant to no damage or traces to the cards surface. The contact surface between the conveyor belt and each card face- or backside can be made relatively large, due to which low adhesion forces or low air pressure differences can be used to carry the cards.

[0016] According to some embodiments, the releasing means may be an activatable releasing means. Several of such releasing means can be installed along the length of the conveyor belt. The activation or non-activation of the releasing means may be used to disconnect the card carried at the location along the conveyor belt where the card needs to be deposited. It provides the possibility to deliver the cards at various positions along the conveyor belt.

[0017] According to some embodiments, the width of the conveyor belt may be less than length of the carried cards. The length of the card is the distance between the upper and lower edge of a card. The width of the card is the distance between left and right side of the card. The length and width being measured in the plane of the cards face- and backside.

[0018] When the width of the conveyor belt is less than length of card, the cards may be carried by the conveyor belt such that at one or both sides of the conveyor belt, a part of the length of the card extends beyond the rim of the conveyor belt. This extending part of the card can be used to decouple the card from the conveyor belt by the releasing means.

[0019] According to some embodiments, the card moving system may comprise a card providing means. This card providing means may comprise a card printing means, such as a digital or offset printing device, printing cards in a defined sequence or in random order. This card providing means may comprise a card reclaiming means, providing cards which has already been used or been part of an earlier set of cards. This card providing means may comprise a special card provision means, providing at regular or random time a card with a special function or imprint, like a cut card in a sequence of playing cards. This card providing means may comprise combinations of the above, i.e. one or more card printing means, one or more card reclaiming means and/or one or more special card provision means.

[0020] According to some embodiments, the card moving system may comprise a card providing means, providing the cards to be displaced with the length of the

card perpendicular to the direction of movement of the conveyor belt.

[0021] When the width of the conveyor belt is less than length of card, the cards may be carried by the conveyor belt such that at one or both sides of the belt, a length of the card extends beyond the rim of the belt. This extending part of the card can be used to decouple the card from the conveyor belt by e.g. applying the air streams of air knives on this extending part of the card, which is pushed away from the conveyor belt. When the force of the air knives on the cards is larger than the suction or adhesion force, the card will fall down, driven by the jet of air from the air knives.

[0022] According to some embodiments, the releasing means may be a gas blowing means. According to some embodiments, the gas blowing means may be an air blowing means, e.g. comprising a first air knife. According to some embodiments, the gas blowing means may be an air blowing means comprising a first pair of air knives, the first and second air knife of this pair of air knives being positioned at opposite sides of the conveyor belt and at the same position along the direction of movement of the conveyor belt. According to some embodiments, the gas blowing means may be an air blowing means comprising a plurality of pairs of air knives, the first and second air knife of each pair of air knives being positioned at opposite sides of the conveyor belt and at the same position along the direction of movement of the conveyor belt.

[0023] The advantage of air knives is that these air knives can be activated and deactivated promptly and accurately. As such, a high displacement speed of a series of cards can be applied, while the decoupling of the cards may take place precisely. This is particularly the case when various cards need to be decoupled at various places along the length of the conveyor belt.

[0024] According to a second aspect of the invention, a system for creating sets of cards is provided, the system comprising:

- a card supply means providing a plurality of cards;
- a card moving system according to the first aspect of the invention, comprising at least one releasing means being an activatable releasing means;
- a plurality of card collecting means to collect a set of cards, each card collecting means of the plurality of card collecting means being provided under said conveyor belt at different positions along the direction of movement of the conveyor belt;
- a card identifying means to identify the cards carried by the card moving system;
- a controlling means to assign each of the identified cards carried by the card moving system to a card collecting means;

wherein for each card collecting means, a releasing means is positioned at the same position along the direction of movement of the conveyor belt, the controlling means being adapted to activate the releasing means

positioned at the card collecting means when a card passes the card collecting means it is assigned to.

[0025] An activatable releasing means means that the release means is subjected to controlled activation.

[0026] Possibly, the card collecting means comprises a container in which the cards are dropped when the releasing means is activated. As such, the cards from a series of cards provided by the card supply means can be separated into a number of sets of cards, and this without intervention of a person or a mechanical manipulation of the cards. This may reduce or even avoid damage made to the cards.

[0027] According to some embodiments, the system may comprise a defect detection unit to detect defective cards. According to some embodiments, the system further may comprise a card extraction bin being provided under said conveyor belt at a given positions along the direction of movement of the conveyor belt, a releasing means is positioned at the same given position along the direction of movement of the conveyor belt. The controlling means is adapted to activate the releasing means at the position along the direction of movement of the conveyor belt when the defective card passes the card extraction bin.

[0028] The card is extracted from the sequence of cards by guiding the card to this card extraction bin. In a next stage, it may be decided what to do with the extracted card, e.g. dispose the card or use it for another purpose.

[0029] The card extraction bin may be one of the card collecting means. Preferably, card extraction bin, or the card collecting means functioning as card extraction bin, is provided upstream the other card collecting means or is the first card collecting means in the sequence of card collecting means.

[0030] According to some embodiments, for each releasing means, a first card detecting means may be provided before, upstream, the releasing means, a second card detecting means being provided after, downstream, the releasing means in the direction of movement of the conveyor belt. When the upstream card detecting means detects the presence of a card, and the downstream card detecting means does not at the corresponding moment in time, this means that the card is removed from the vacuum belt between the two card detecting means.

[0031] As such the system for creating sets of cards has a cross check if each card has been released from the conveyor belt at the correct card collecting means.

[0032] For each card on the carrying belt, a card collecting means is assigned. The controlling means may check if the card detecting means upstream (i.e. before) the assigned card collecting means detects a card at a predetermined moment in time. The controlling means may check if the card detecting means downstream (i.e. after) the assigned card collecting means fails to detect a card at a predetermined moment in time. If this is the case, the card has been delivered in the correct assigned card collecting means.

[0033] According to a third aspect of the invention, a method to provide a set of randomly shuffled cards is provided, the method comprises the steps of

- 5 - providing a system for creating sets of cards according to the second aspect of the present invention;
- providing a series of randomly ordered cards to said system for creating sets of cards;
- 10 - identifying each of the cards sucked by the conveyor belt and assigning a card collecting means to each of the identified cards;
- displacing said identified cards along the conveyor belt to the plurality of card collecting means;
- 15 - for each identified card, activate the releasing means at the same position along the direction of movement of the conveyor belt when a card passes the card collecting means it is assigned to;

wherein the controlling means assigns a card collecting means to each card such that in each card collecting means, a set of one or more decks of cards is created.

[0034] Preferably the cards are carried by the conveyor belt with the backside facing the belt, the face side being open for visual inspection. Possibly the rank and suit - in case of playing cards - or one or more identification elements in case of other cards can be detected. Hence the card being inspected may be identified

[0035] Optionally, the face side of each card may show a unique card identity, provided (e.g. printed) once or several times on this face side of the card. The card identity may be provided with visible ink, or with an ink being only visible under certain illumination conditions, e.g. visible under UV- or IR-light only.

[0036] The card identification means will identify the card by its rank and suit and/or one or more identification elements and/or the card identity, and assign this information to the position of the card in the sequence of cards passing through the card identification means, hence in the stream of cards within the conveyor belt. Each card passing the card identification means will generate a data set comprising the position of the card in the string of cards and the rank and suit and/or one or more identification elements and/or card identity of this card. The controlling means will assign a cards collecting means to which the card is to be provided, and adds this to the data set. The controlling means will activate the releasing means for each of the cards passing its assigned card collecting means.

[0037] While identifying the cards, the card identification means may detect defects in the cards being detected. cards with defects cannot be part of any set of cards and need to be removed from the system. The defective cards may all be assigned to a card extraction means, optionally being one particular cards collecting means, which will function as card extraction means.

[0038] Alternatively, the system for creating sets of cards comprises a card defect identification means, preferably positioned upstream the card identification

means. The system may comprise a card removal means to remove defective cards, also preferably upstream the card identification means.

[0039] Alternatively, the card identification means may get signals from the card defect identification means on the presence or non-presence of defects for each card. The card identification means may assign all defective cards to a card extraction means, optionally being one particular cards collecting means.

[0040] The cards, being identified and having a known position in the sequence of cards, will be brought to the assigned cards collecting means. The controlling means, knowing which identified card at what position in the sequence of cards is brought to which cards collecting means, can generate a sequence of rank and suit and/or one or more identification elements and/or card identities, per cards collecting means. As such, for each set of cards generated by the system, the sequence of the cards in the set is known.

[0041] The controlling means can keep track of the number of cards with given rank and suit and/or one or more identification elements having been sent to each of the cards collecting means. As such the controlling means will be able to generate sets of cards which contain, even consist of a given number of complete decks, shuffled to random at set level.

[0042] One of the card collecting means may function as a card evacuation bin. The cards for which the controlling means cannot assign a card collecting means because all card collection means comprises a threshold number of cards with the same card identification element(s), the cards are assigned and are guided to this card evacuation bin. These evacuated cards may later be reintroduced by one of the card supply means again to enable these cards to become part of a set of cards. Also, in case a card cannot be identified or in case of any error in identification, recognition or handling of a card, this card may be directed to the overflow card evacuation bin.

[0043] The system for creating sets of cards may comprise a set removal means to remove complete sets of cards from the cards collecting means.

[0044] According to some embodiments, the card supply system may provide cards with the face side of the cards facing away from the conveyor belt. This way, an easy identification of the cards by its rank and suit and/or one or more identification elements and/or card identity is facilitated.

[0045] The card supply means may get its cards from a printing device, such as a digital printing device or an offset printing device, and/or may comprise a recycling means where cards which have been used in other sets of cards, are included in the card stream. The card supply means may generate a train of cards which cards are individualised (i.e. do not contact another card during transportation of the cards).

[0046] According to some embodiments, the at least part of the cards provided to the system for creating sets of cards may be reclaimed cards.

[0047] According to some embodiments, the cards provided to the system for creating sets of cards may be randomly ordered.

[0048] According to some embodiments, the controlling means may create a sequence of the identities of the cards for each set of cards created in each card collecting means.

[0049] The controlling means knows for each card to which of the card collecting means it is to be and was provided. As such, the controlling means can provide for each set of cards the sequence of cards presents in the set of cards.

[0050] This sequence of the cards in each of the sets of cards can be used to verify if the sequence of cards has been manipulated during transport of stockage of the set of cards. The sequence of cards shown during the of a game may be compared with the sequence known for the set of cards. An incompatibility of the sequences is an indication on fraud.

Brief Description of the Drawings

[0051]

Fig. 1 illustrates schematically a system for creating sets of cards according to the invention.

Fig. 2 and 3 show a detail of a card moving system being part of the system for creating sets of cards of figure 1.

[0052] The same reference figures refer to the same of identical features.

Detailed Description of Embodiment(s)

[0053] A system for creating sets of cards 100 is shown in figures 1 and 2. The system 100 comprises three card supply means 101, 102, 103 providing a plurality of cards 200. It is understood that the system may comprise only one card supply means, two card supply means or more than three card supply means. The card supply means may comprise a system to recuperate reclaimed cards, e.g. cards from a cartridge comprising playing cards having been used to play a card game at a card game table. The card supply means may comprise a printing unit, e.g. a digital printing unit, printing virgin cards.

[0054] Cards, new or reclaimed, may be provided by these card supply means 101, 102, 103. The card supply means 101, 102, 103 organise the cards with the face side down as a train of cards on a conveyor belt 104. The conveyor belt 104 brings the train of cards to a vacuum conveyor belt 105, being a card moving system according to the first aspect of the invention. The cards sucked by the vacuum belt 105 may extend over the belt at both rims of the vacuum belt, in case the width of the belt 105 is less than the length of the card.

[0055] The system 100 comprises a plurality of card

collecting means, in this embodiment five card collecting means 106, 107, 108, 109, 110, to collect a set of cards. The card collecting means 106, 107, 108, 109, 110 are provided under said vacuum conveyor belt 105 at different positions along the direction of movement of the conveyor belt 105. Other number of card collecting means may be provided.

[0056] For each card collecting means 106, 107, 108, 109, 110, a releasing means 112, 113, 114, 115, 116 is positioned at the position along the direction of movement of the conveyor belt identical to the position of the related card collecting means 106, 107, 108, 109, 110. The release means 112, 113, 114, 115, 116 are activatable releasing means, more particularly air knives, which blow a stream of compressed air downward to the edges of the cards extending beyond the rim of the vacuum belt 105. The release means 112, 113, 114, 115, 116 are positioned at the front end of the card collecting means 106, 107, 108, 109, 110. The card to be removed from the belt is blown of the vacuum belt 105 and falls down. At the opposite rim of the vacuum belt, at the same position in the direction of movement of the vacuum belt 105, for each release means 112, 113, 114, 115, 116, a second pairing release means is positioned (not shown on figures 1 and 2). The release means works synchronically in pairs, the pairs being the release means at the same position in the direction of movement of the vacuum belt 105. As such, both sides of the card hanging to the vacuum belt 105, the extending part of the card is blown down. Due to its velocity in the direction of the vacuum belts moving direction, the card will fall obliquely downwards into the card collecting means 106, 107, 108, 109, 110.

[0057] This provision of a vacuum belt 105 and release means 112, 113, 114, 115, 116 cause the cards to be manipulated without any mechanical element to grip or hit the surfaces or edges of the card. As such this vacuum belt 105 and release means 112, 113, 114, 115, 116 handles the cards gentler and avoids damage to cards being sorted in the card collecting means 106, 107, 108, 109, 110.

[0058] The system 100 further comprises a card identifying means 117 to identify the cards carried by the vacuum belt 105. The card identifying means 117 may comprise at least one, and optionally more than one, cameras. The images of the face sides captured by the camera or cameras, are converted and/or analysed, such that card identification element or elements on the face side of the cards are identified. These card identification element or elements may be the rank and suit in case of playing cards. Optionally the card identifying means 117 may obtain the card identity code which is readable on the face side of the card. Optionally the card identifying means 117 may read the card identity code by means of UV light only. The card identifying means 117 may be a UV sensible camera, or may cooperate with a UV lighting device. The system 100 may comprise a defect detection unit 118 to detect defective cards, which may optionally

form a whole with the card identifying means 117. The defect detection unit 118 may be adapted to detect defects both on the face and backside of the cards. The card identifying means 117 and the defect detection unit 108 may be united in one and the same means. The card identifying means 117 and the defect detection unit 108 may be one and the same camera. To check for defects on the backside of the cards, optionally a further camera (not shown) is provided above the conveyor belt 104 immediately before the point where the cards are passed from the conveyor belt 104 to the vacuum belt 105. The system 100 further comprises a controlling means 120 being adapted to assign each of the identified cards carried by the card moving system 105 to a card collecting means 106, 107, 108, 109, 110 and to activate the releasing means 112, 113, 114, 115, 116 positioned at the card collecting means when a card passes the card collecting means 106, 107, 108, 109, 110 it is assigned to.

[0059] One of the card collecting means 106, 107, 108, 109, 110 may function as a card extraction bin (or discard bin or removal bin). The defective cards are assigned and are guided to this card extraction bin by the controlling means 120. The defective cards may be removed, disposed or used for another purpose.

[0060] One of the card collecting means 106, 107, 108, 109, 110 may function as a card evacuation bin. The cards for which the controlling means 120 cannot assign a card collecting means 106, 107, 108, 109, 110 in which a set of cards is compiled or gathered, the cards are assigned and are guided to this card evacuation bin by the controlling means 120. This may occur in case all card collecting means 106, 107, 108, 109, 110 already comprise a threshold number of cards with the same card identification element or elements (like rank and suit). These evacuated cards may later be reintroduced in the card train again to enable these cards to become part of a set of cards.

[0061] Optionally a first card detecting means is provided before each releasing means 112, 113, 114, 115, 116, and a second card detecting means being provided after the releasing means 112, 113, 114, 115, 116 in the direction of movement of the vacuum conveyor belt 105. As such, the controlling means 120 may check if a card, assigned to a given card collecting means 106, 107, 108, 109, 110, is deposited in the assigned card collecting means 106, 107, 108, 109, 110. This can be checked by verifying if the card detecting means upstream the releasing means 112, 113, 114, 115, 116 detects a card, while the card detecting means downstream the releasing means 112, 113, 114, 115, 116 does not detect a card.

[0062] The controlling means 120 may keep track of the number of cards with given card identification element or elements (like rank and suit) which are stacked in each of the card collecting means 106, 107, 108, 109, 110. When a given threshold number of cards with given card identification element or elements is already provided to a given card collecting means 106, 107, 108, 109, 110, a next card with this card identification element or ele-

ments will no longer be assigned to this card collecting means 106, 107, 108, 109, 110. When for each card with given card identification element or elements, a threshold number of such cards is collected in the given card collecting means 106, 107, 108, 109, 110, a set of cards, with a given (threshold) number of decks of cards, is created. The cards in this set of cards will be randomly ordered at set level. the controlling means may also generate a data set comprising the card identities in the order the cards are present in the set of cards.

[0063] Figure 2 and 3 show schematically some details of a card moving system. The system comprises a conveyor belt adapted to carry one or more cards individually connected the lower side of the conveyor belt. This conveyor belt is the vacuum belt 105. The system comprises a plurality of releasing means, being the activatable releasing means 205 in figure 2 and 3. Figure 2 is a schematic side view of such release means 205, figure 3 shows schematically a top view of such release means 205.

[0064] Each of the release means 112, 113, 114, 115, 116 of figure 1 may be such activatable releasing means 205, more particularly air knives 201. These air knives are gas blowing means to blow the connected card from the conveyor belt, in this embodiment the vacuum belt 105. Each air knife 201 blows a stream or pulse 206 of compressed air downward to the edges 203 of the cards 200 extending beyond the rim 204 of the vacuum belt 105. Due to the force applied by the air streams, the card 200 will detach from the vacuum belt 115 and fall into the corresponding card collecting means 202.

[0065] Although the present invention has been illustrated by reference to specific embodiments, it will be apparent to those skilled in the art that the invention is not limited to the details of the foregoing illustrative embodiments, and that the present invention may be embodied with various changes and modifications without departing from the scope thereof. The present embodiments are therefore to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description, and all changes which come within the meaning and range of equivalency of the claims are therefore intended to be embraced therein. In other words, it is contemplated to cover any and all modifications, variations or equivalents that fall within the scope of the basic underlying principles and whose essential attributes are claimed in this patent application. It will furthermore be understood by the reader of this patent application that the words "comprising" or "comprise" do not exclude other elements or steps, that the words "a" or "an" do not exclude a plurality, and that a single element, such as a computer system, a processor, or another integrated unit may fulfil the functions of several means recited in the claims. Any reference signs in the claims shall not be construed as limiting the respective claims concerned. The terms "first", "second", "third", "a", "b", "c", and the like, when used in the description or in

the claims are introduced to distinguish between similar elements or steps and are not necessarily describing a sequential or chronological order. Similarly, the terms "top", "bottom", "over", "under", and the like are introduced for descriptive purposes and not necessarily to denote relative positions. It is to be understood that the terms so used are interchangeable under appropriate circumstances and embodiments of the invention are capable of operating according to the present invention in other sequences, or in orientations different from the one(s) described or illustrated above.

Claims

1. A card moving system comprising
 - a conveyor belt adapted to carry one or more cards individually connected the lower side of the conveyor belt;
 - at least one releasing means for releasing the card from the conveyor belt being
 - an interruption means to interrupt the connection of the card to the lower side of the conveyor belt and/or
 - a gas blowing means to blow the connected card from the conveyor belt.
2. A card moving system according to claim 1, wherein the releasing means is an activatable releasing means.
3. A card moving system according to claim 1 or 2, wherein the width of the conveyor belt is less than length of the carried cards.
4. A card moving system according to claim 3, wherein the card moving system comprises a card providing means, providing the cards to be displaced with the length of the card perpendicular to the direction of movement of the conveyor belt.
5. A card moving system according to claim 4, wherein the releasing means is a gas blowing means.
6. A card moving system according to claim 5, wherein the gas blowing means is an air blowing means comprising a first air knife.
7. A card moving system according to claim 5 or 6, wherein the gas blowing means is an air blowing means comprising a first pair of air knives, the first and second air knife of this pair of air knives being positioned at opposite sides of the conveyor belt and at the same position along the direction of movement of the conveyor belt.

8. A card moving system according to claim 7, wherein the gas blowing means is an air blowing means comprising a plurality of pairs of air knives, the first and second air knife of each pair of air knives being positioned at opposite sides of the conveyor belt and at the same position along the direction of movement of the conveyor belt.

9. A system for creating sets of cards, the system comprising:

- A card supply means providing a plurality of cards;
- A card moving system according to any one of the claims 1 to 8, comprising at least one releasing means being an activatable releasing means;
- A plurality of card collecting means to collect a set of cards, each card collecting means of the plurality of card collecting means being provided under said conveyor belt at different positions along the direction of movement of the conveyor belt;
- A card identifying means to identify the cards carried by the card moving system;
- A controlling means to assign each of the identified cards carried by the card moving system to a card collecting means;

wherein for each card collecting means, a releasing means is positioned at the same position along the direction of movement of the conveyor belt, the controlling means being adapted to activate the releasing means positioned at the card collecting means when a card passes the card collecting means it is assigned to.

10. A system for creating sets of cards according to claim 9, wherein said system comprises a defect detection unit to detect defective cards.

11. A system for creating sets of cards according to claim 10, wherein said system further comprises a card extraction bin being provided under said conveyor belt at a given positions along the direction of movement of the conveyor belt, a releasing means is positioned at the same given position along the direction of movement of the conveyor belt, the controlling means being adapted to activate the releasing means at the position along the direction of movement of the conveyor belt when the defective card passes the card extraction bin.

12. A system for creating sets of cards according to any one of the claims 9 to 11, wherein for each releasing means, a first card detecting means is provided before the releasing means, a second card detecting means being provided after the releasing means in

the direction of movement of the conveyor belt.

13. A method to provide a set of randomly shuffled cards, the method comprises the steps of

- providing a system for creating sets of cards according to any one of the claims 9 to 12;
- providing a series of randomly ordered cards to said system for creating sets of cards;
- identifying each of the cards sucked by the conveyor belt and assigning a card collecting means to each of the identified cards;
- displacing said identified cards along the conveyor belt to the plurality of card collecting means;
- for each identified card, activate the releasing means at the same position along the direction of movement of the conveyor belt when a card passes the card collecting means it is assigned to;

wherein the controlling means assigns a card collecting means to each card such that in each card collecting means, a set of one or more decks of cards is created.

14. A method according to claim 13, wherein the card supply system provides cards with the face side of the cards facing away from the conveyor belt.

15. A method according to claim 13 or 14, wherein at least part of the cards provided to the system for creating sets of cards are reclaimed cards.

16. A method according to any one of the claims 13 to 15, wherein the cards provided to the system for creating sets of cards are randomly ordered.

17. A method according to any one of the claims 13 to 16, wherein the controlling means creates a sequence of the identities of the cards for each set of cards created in each card collecting means.

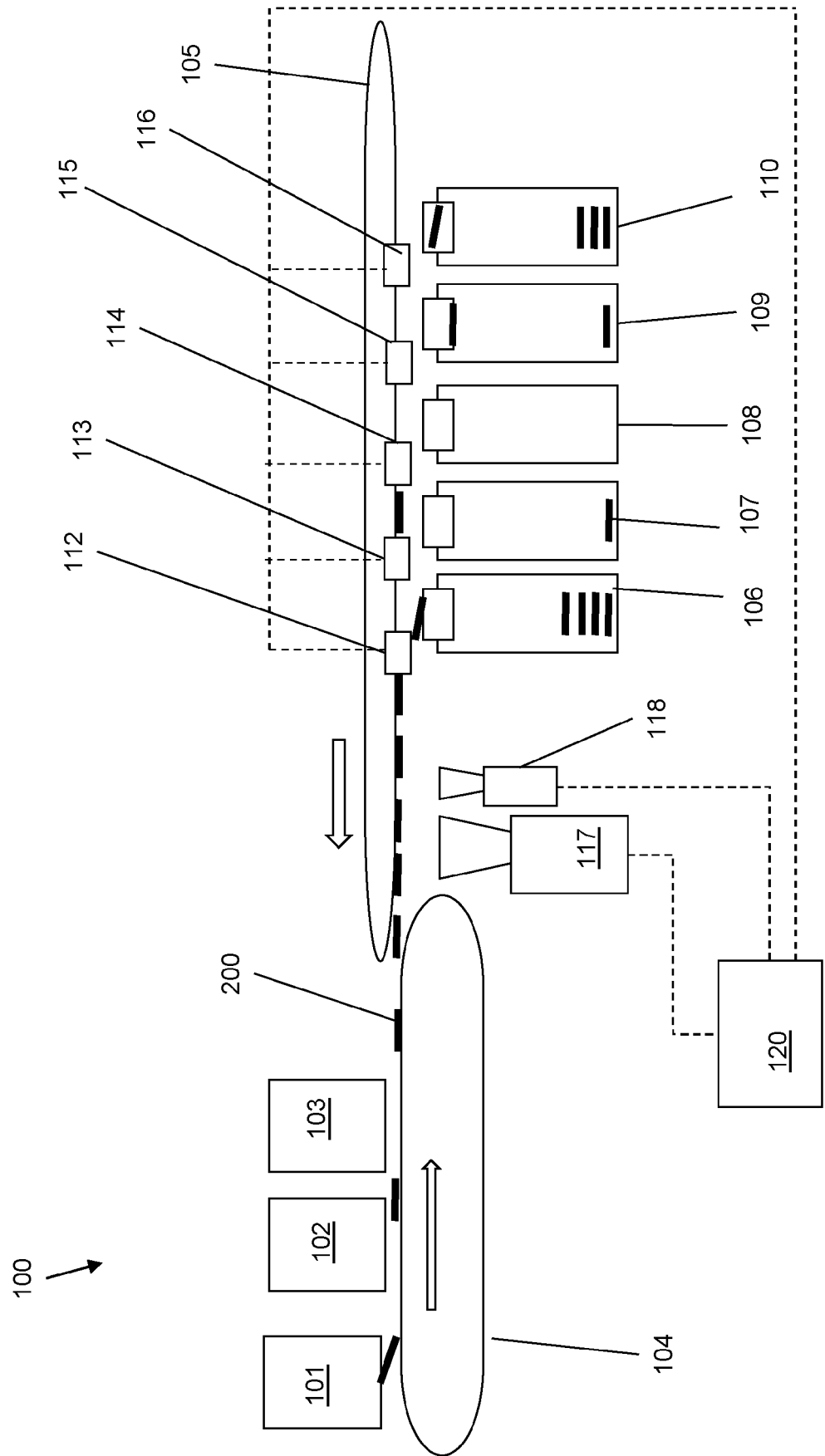


Fig. 1

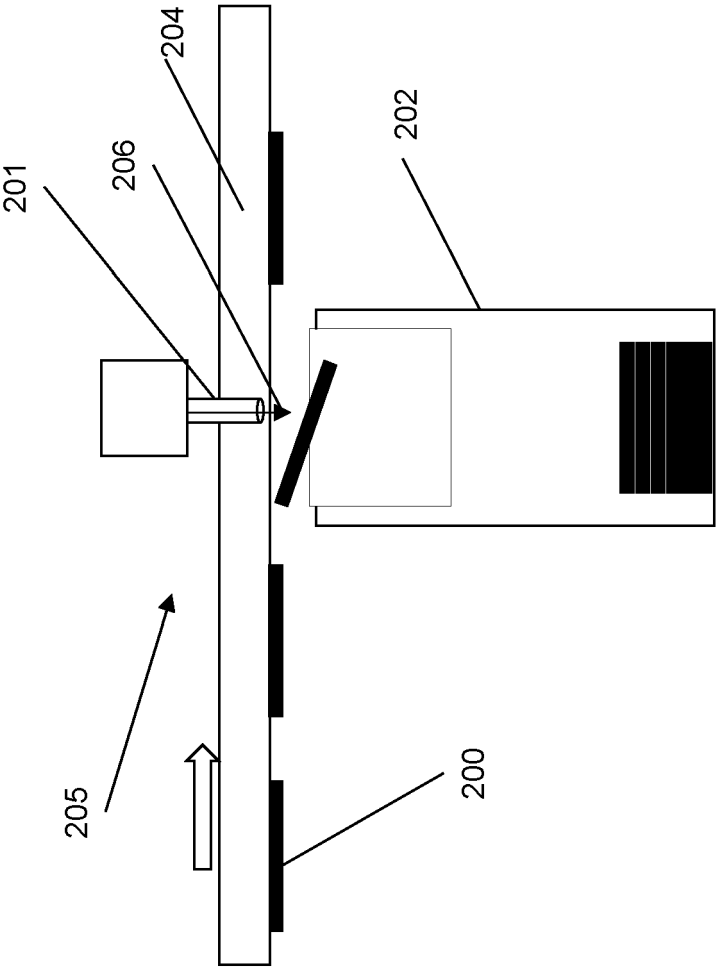


Fig. 2

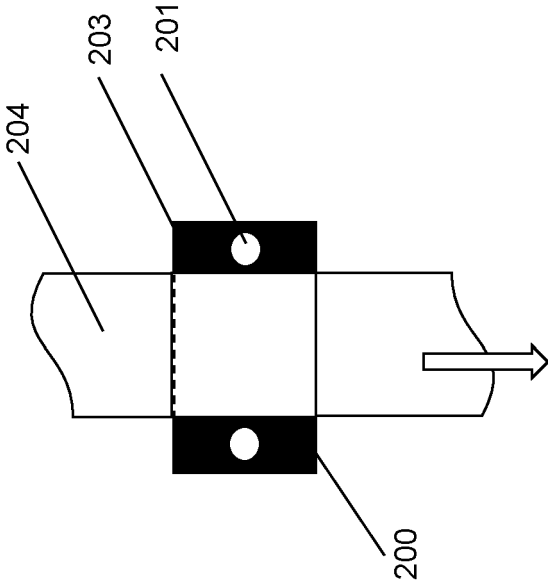


Fig. 3



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Place of search Munich		Date of completion of the search 23 June 2022	Examiner Bagarry, Damien
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