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(54) Checkout system

(57) A check-out system (1) is described, for application in for instance a supermarket or the like, comprising:

- at least one recognition station (10) for identifying articles;
- a secure area (40) associated with the at least one recognition station;
- at least one payment machine (50) arranged within the secure area, designed for issuing a payment receipt (59);
- wherein the recognition station (10) has a passage (30) for users, with an entrance (31) for a user who offers articles to the recognition station, and an exit (32) which exclusively leads to the said secure area;
- wherein the secure area has at least one normally closed exit gate (42), wherein each exit gate of the secure area is provided with control means (60) for checking payment receipts (59), which control means are designed for releasing the exit gate concerned in case of an established validity of a payment receipt.

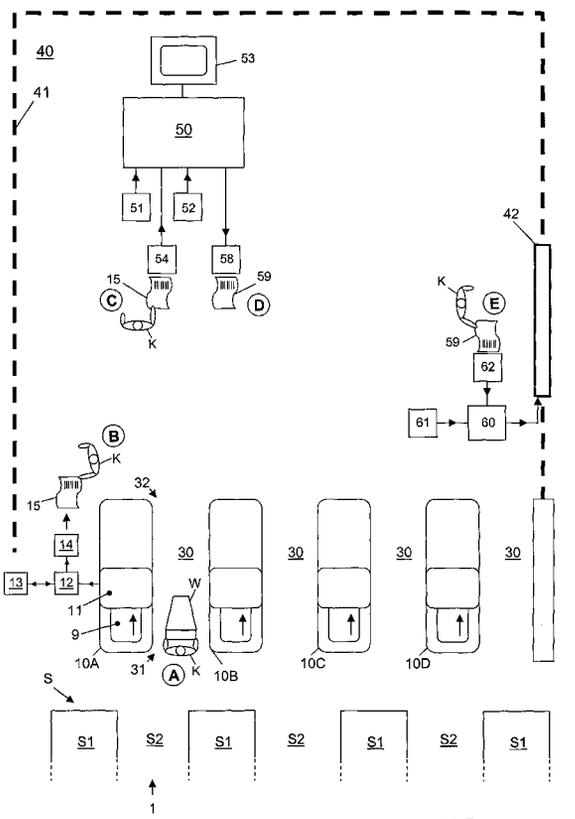

FIG. 1

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Description

[0001] The present invention relates in general to a check-out system, i.e. a system where customers can pay for their purchases.

[0002] Such systems comprise in general a station where the purchases are recognized and the price of the articles to be paid is determined, and a station where the actual payment operation is performed. In the case of conventional manned check-out systems, these two stations are integrated into one station. In the case of automatic check-out systems, a recognition station in general comprises means for reading a code applied on the articles, usually in the form of a bar code. This can be manually operated reading means, which the customer must operate himself, or fully automatic reading means, for instance so-called tunnel systems, in which case the customer puts the articles on a conveyor belt which conveys the articles through a tunnel, which tunnel is provided with one or more scanning apparatus or cameras having image processing software. Since such automatic article recognition stations are known per se, and the design of an automatic recognition station is no subject of the present invention, the design and operation of an automatic article recognition station are not described here in further detail.

[0003] Also in the case of a check-out system with automatic article recognition stations, it is possible that a payment station is integrated with the recognition station. Each recognition station is then for instance provided with a card reader, where one can perform the act of paying by means of for instance a credit card of a pay card, whether in combination with inputting a pin code or not. Of course, it is possible that the manager of the shop in question only wants to have the automatic check-out system used by people who have such card payment facilities. Often, however, it is desired that the automatic check-out system is also usable for people who want to pay with cash. In that case, a service point with one or more manned cash registers is present in the store, as central payment point for multiple automatic recognition stations.

[0004] With a view to fraud control it is a problem then that the customer must leave the recognition station without having paid. Now, a way must be found to ensure that the customer actually performs the correct payment act at the central payment point. In a possible solution, the recognition station is provided with a closed storage space, where the scanned articles are stored while the customer in question leaves the recognition station to perform the payment act at the central payment point. After payment, the storage room is released and the customer can take away his articles.

[0005] A disadvantage of such system with a manned service point for central payment is that for processing cash payment personnel is required after all.

[0006] A general disadvantage of systems where cash payment is possible at a manned payment point, whether this is a central payment point for multiple recognition stations or a recognition point belonging to one recognition station (human-operated cash register) is that the change on human errors is higher.

[0007] Further, systems where the purchases are locked in a closed storage room until the payment operation has been performed have several disadvantages. The storage room, with the closing means, and the computer controlled operation thereof, coupled to the payment system, makes the system bulky, complicated, and relatively expensive. Further, such system is rather customer unfriendly: when people are shopping with two persons, the second person already wants to pack while the first person transfers the purchases from the shopping cart to the recognition station, and in the case of this type of systems one can only start packing when the payment operation has been performed. Caused by this, one also occupies the recognition station during a relatively long time, so that the recognition station is operating non-effectively during a relatively long time. This worsens if one is going to perform the payment operation at a distance from the recognition station. Further, a subsequent customer can only start when the previous customer is ready.

[0008] It is a general objective of the present invention to reduce such disadvantages.

[0009] More particularly, the present invention aims to allow for further-reaching computerization in check-out systems.

[0010] According to an important aspect of the present invention, a central payment point, belonging to multiple recognition stations, is provided with a cash payment machine which, after payment of the required amount, returns a coded payment receipt to the customer with which he can prove that he has paid. Thus, it is no longer necessary that the central payment point is provided with manned cash registers.

[0011] According to a further important aspect of the present invention, the central payment point is arranged in a secure area, which is provided with one or more exit gates, each exit gate being provided with payment receipt reading means. Customers can only leave this secure area when they can show a valid payment receipt to the payment receipt reading means.

[0012] Then, it is no longer necessary that the purchases of the customer are retained in a storage space until the customer has paid. At the recognition station, the customer can start packing immediately after the shopping cart has been emptied (or the person who accompanies the customer can start packing while the customer is still occupied with emptying the shopping cart). After packing, the customer, without having to hurry, can go and pay at the central payment point. Fraud by non-paying customers is counter acted because the customers can not leave the secure area without payment receipt.

[0013] Now, it is even possible that the recognition station themselves have no payment facilities at all any

more: this stimulates the flow at the recognition stations.

[0014] Preferably, the cash payment machine is designed for returning money when the customer enters too much cash. Preferably, the cash payment machine is also provided with a pin machine, such that the customer can withdraw cash from his account.

[0015] The code given by the cash payment machine can comprise a printed, human-readable numeral code, and the payment receipt reading means can comprise a keyboard where the customer must input the numeral code. The code given by the cash payment machine can also comprise a machine-readable code, for instance a bar code, and the payment receipt reading means can comprise a code reader, in this example a bar code reader, for instance a scanner.

[0016] These and other aspects, features and advantages of the present invention will be further explained by the following description of an embodiment of a check-out system according to the present invention with reference to the drawings, in which same reference numerals indicate same or similar parts, and in which:

figure 1 schematically shows a layout for a store.

[0017] Figure 1 schematically shows a layout for a store which is provided with a check-out system 1 according to the present invention. The store has a shopping space S, with shelves S1 along aisles S2, in which shelves articles are displayed, which for the sake of simplicity is not shown separately. The articles are provided with readable codes, such as known per se and for sake of simplicity also not shown. A common code in this context is a bar code.

[0018] The check-out system 1 comprises a plurality of recognition stations 10, which are each designed for recognizing the code applied on the articles. In the embodiment shown, each recognition station 10 is an automatic recognition station of the tunnel type. Such recognition station 10 comprises a tunnel 11, which is provided with code reading means, such as known per se. The recognition station 10 further comprises a conveyor belt 9, onto which customers place the articles to be recognized, which are then conveyed through the tunnel 11 by the conveyor belt 9 in order to be recognized. The code reading means in the tunnel 11 are associated with a processor 12, which is coupled to a price memory 13. On the basis of the code read by the code reading means, the processor 12, by consulting the information in the memory 13, determines the price of the articles concerned, adds up these prices, and thus calculates the total amount which the customer must pay. Since fully automatic recognition stations are known per se and are usable in implementing the present invention, while the present invention does not relate to improving such recognition stations, it is not necessary to describe the design and operation of the recognition stations 10 in further detail.

[0019] As an alternative, the recognition stations can be recognition stations to be operated by the customer, or manned recognition stations, comparable to manned cash registers, where personnel moves the articles to be recognized along a scanner. In these cases, too, a processor will be present, which calculates a total of the amount to be paid.

[0020] Each recognition station 10 is provided with a passage 30 for customers. A customer who wants to offer articles to the recognition station 10 enters an entrance 31 of the passage 30 and puts the articles to be recognized on the conveyor system 9 of the recognition station 10. At Ⓐ figure 1 shows schematically such customer K with a shopping cart W, which are located at the entrance 31 of the passage 30 of a recognition station 10 A. When the customer K has put all articles from the shopping cart W onto the conveyor belt 9, the customer K issues a command to the recognition station 10, for instance by pressing a button (not shown for sake of simplicity), after which the processor 12 controls the printer 14 to print a sales slip 15, onto which among others a code is printed which represents the total amount to be paid. Then, the customer K leaves the recognition station 10 via an exit 32 of the passage 30, which exit 32 leads to a secure area 40. The secure area 40 may be surrounded by a fencing, a wall, or the like, schematically indicated by a broken line 41, with at least one exit gate 42 provided therein. Although the secure area 40 can have multiple exit gates 42, only one exit gate 42 is present in the embodiment shown in figure 1. The exit gate 42 is a controllable exit gate, which is normally closed but can be opened by control means 60.

[0021] At least one payment machine 50 is arranged in the secure area 40. The payment machine 50 is designed for issuing a payment receipt 59. The said control means are designed for checking payment receipts, and for releasing the exit gate 42 concerned in response to receiving a valid payment receipt.

[0022] The payment receipts 59 may comprise a human-readable code, and the control means may comprise a keyboard 61 for inputting such code. In a possible embodiment, this code is communicated to the customer K via a display, but it is of course preferred that the payment machine 50 has a printer 58 for being able to print the payment receipts.

[0023] Preferably, the printed payment receipt comprises a machine-readable code, for instance a bar code, as sketched, and the control means 60 preferably comprise code reading means 62, for instance a scanner or a camera provided with image processing software, for automatically reading the code.

[0024] The payment machine 50 is common to the recognition stations 10 associated with the secure zone 40. In the embodiment of figure 1, four recognition stations 10A, 10B, 10C, 10D are shown of which the corresponding passages 30 always leads to the secure zone 40, but the number of recognition stations which is associated with the one secure zone 40 may also be more or less than four. Also, the number of payment ma-

chines in the secure zone 40 may be more than one.

[0025] It is also possible that each recognition station 10 is provided with its own payment machine, designed for issuing a payment receipt, in the same way as described in the foregoing with respect to the central payment machine 50. This also applies in the case that the recognition station 10 is a manned cash register. In all these cases, the payment receipt will also be used by the control means 60 to release the exit gate 42 of the secure zone 40.

[0026] Preferably, the payment machine 50 in the secure zone 40 is suitable for accepting cash, and preferably the payment machine 50 is also suitable for accepting payment cards, credit cards, or the like, in which case the payment machine 50 may in the usual way be provided with a keyboard 51 for inputting a pin code.

[0027] Preferably, the payment machine 50 is also suitable for issuing cash. This is to say that the payment machine 50 can give back cash in case too much money has been paid, but it is also possible that the payment machine 50 is provided with a pin machine 52 such that a customer can withdraw cash from his account. Since cash payment machines as well as pin machines are known per se and are usable for implementing the present invention, while the present invention does not relate to improving such machines, it is not necessary here to describe the design and operation of such machines in more detail.

[0028] The operation of the system 1 is as follows. When a customer K has scanned (or has had scanned) his purchases at the recognition station 10 and indicates that he is ready, the processor 12 controls the printer 14 to print onto the sales slip 15 a code which represents the total amount to be paid. The code to be printed may comprise a bar code, or numerals readable to the human eye, or both. The code to be printed may also comprise a transaction number. In the case that the recognition station 10 is provided with a corresponding payment facility, the processor 12 controls the printer 14 to also print a payment receipt. Now, the customer K can first pack his purchases, which are collected in a collecting space 20 of the recognition station 10. This packing may also be done already during scanning, by an accompanying person. A next customer can start scanning immediately, when the recognition station 10 is for instance provided with a second collecting space (not shown).

[0029] The customer K receives the sales slip 15, and leaves the recognition station 10 and enters the secure space 40, as sketched at Ⓑ . In order to be able to leave this secure space 40, the customer must show a valid payment receipt to the control means of the exit gate 42. In case that payment at the recognition station 10 is possible, and the customer has made use of this possibility, this concerns a payment receipt printed by the printer 14. Otherwise, the customer goes to the payment machine 50, as sketched at ©, with the sales slip 15. The payment machine 50 is provided with sales slip reading means 54, for instance a scanner or a camera provided with image processing software, such that the payment machine 50 can read the code of the sales slip 15. Then, the payment machine 50 determines how high the amount to be paid is. This can happen immediately, if the code to be read comprises the amount. It is also possible that the recognition station 10 has informed the payment machine 50 of the amount via a communication line (not shown), in conjunction with a transaction number printed on the sales slip 15, in which case the payment machine 50 determines how high the amount to be paid is, on the basis of the transaction number.

[0030] Via a display 53, the payment machine 50 communicates to the customer K the height of the amount to be paid. Then, the customer can pay with a pin code, or with cash (coins and/or bank notes). When he inputs too much cash, he receives back change. Also when he indicates that he wishes to withdraw money from his account by means of his pin code, he receives cash from the payment machine 50.

[0031] When the full amount of the said sales slip 15 has been paid, the payment machine 50 issues the payment receipt 59, as sketched at Ⓓ . When the customer K lets the code of this payment receipt 59 be read by the control means 60, as sketched at Ⓔ , the exit gate 42 is opened by the control means 60 and the customer K can leave the secure area 40.

Claims

1. Check-out system (1), for application in for instance a supermarket or the like, comprising:
   - at least one recognition station (10) for identifying articles;
   - a secure area (40) associated with the at least one recognition station;
   - at least one payment machine (50) arranged within the secure area, designed for issuing a payment receipt (59);
   - wherein the recognition station (10) has a passage (30) for users, with an entrance (31) for a user who offers articles to the recognition station, and an exit (32) which exclusively leads to the said secure area;
   - wherein the secure area has at least one normally closed exit gate (42), wherein each exit gate of the secure area is provided with control means (60) for checking payment receipts (59), which control means are designed for releasing the exit gate concerned in case of an established validity of a payment receipt.

2. Check-out system (1) according to claim 1, wherein a recognition station (10) is provided with code reading means, for instance bar code reading means, for instance a scanner or an image pickup

device provided with image recognition software.

3. Check-out system (1) according to claim 1 or 2, wherein a plurality of recognition stations (10) is associated with the secure zone (40) .

4. Check-out system (1) according to any of the previous claims, wherein the payment receipt (59) comprises a human-readable code, and wherein said control means (60) comprise a keyboard (61) for inputting the code.

5. Check-out system (1) according to any of the previous claims, wherein the payment receipt comprises a machine-readable code, for instance a bar code, and wherein said control means (60) comprise code reading means (62), for instance a scanner or a camera provided with image processing software, for reading the code.

6. Check-out system (1) according to any of the previous claims, wherein each recognition station (10) is provided with a payment machine associated therewith, always corresponding, designed for issuing a payment receipt.

7. Check-out system (1) according to any of the previous claims, wherein the payment machine (50) in the secure area (40) is designed for accepting a payment by means of a payment card or credit card or the like, possibly in conjunction with inputting a pin code.

8. Check-out system (1) according to any of the previous claims, wherein the payment machine (50) in the secure area (40) is designed for accepting a payment by means of cash.

9. Check-out system (1) according to any of the previous claims, wherein the payment machine (50) is provided with a pin machine, such that a customer can withdraw cash from his account.

10. Check-out system (1) according to any of the previous claims, wherein each recognition station (10) is designed for issuing a sales slip (15) having the total amount to be paid thereon in a machine-readable code, for instance a bar code, and wherein the payment machine (50) in the secure area (40) comprises sales slip reading means (54) for reading the code of sales slips, for instance a scanner or a camera provided with image processing software.

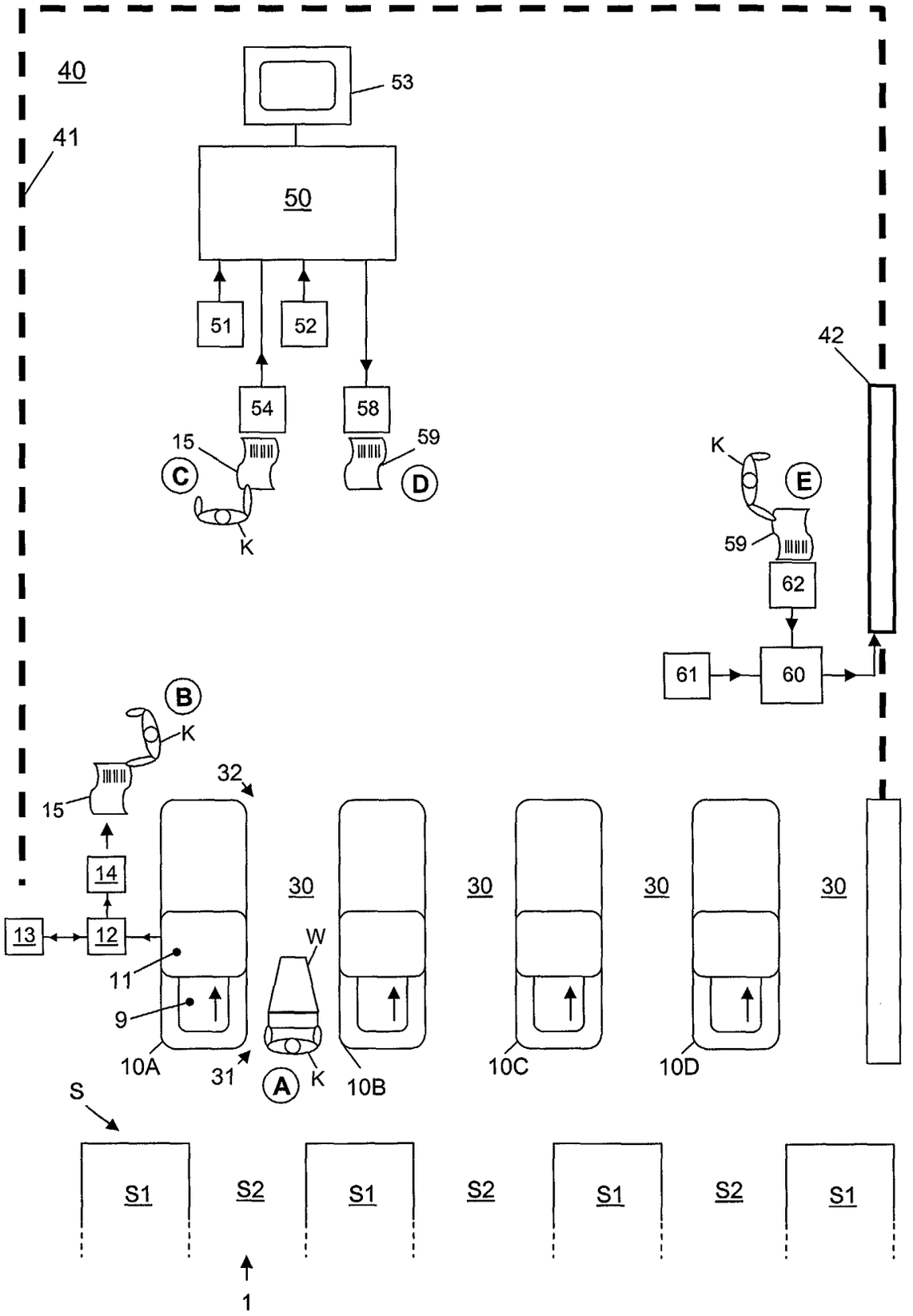
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FIG. 1