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54 **Electronic cash register having improved cashier security.**

57 An electronic cash register having greater cashier security is disclosed which uses both an assigned cashier code and a secret code, known only to the cashier, to gain access to use of said cash register for registering transactions. The assigned cashier code serves to identify the cashier using the electronic cash register, while the secret code prevents use of the electronic cash register by someone other than the assigned cashier who has access to the assigned cashier code.

Description**ELECTRONIC CASH REGISTER HAVING IMPROVED CASHIER SECURITY**Background of the Invention**1. Field of the Invention**

This invention relates to an electronic cash register (also referred to as an "ECR"), and more particularly to an electronic cash register in which a cashier code or the like is entered before a registering operation to improve the security of the registering operation.

2. Description of the Prior Art

Fig. 5 is a block diagram showing the arrangement of a conventional ECR, and is useful in explaining the background of the invention.

As shown in Fig. 5, a CPU 1 is connected to a keyboard 2, a RAM 3, a ROM 4, a printer 5, a display unit 6, and a time piece 7.

The keyboard 2, as shown in Fig. 6, has a ten-key pad for entering the code numbers of commodities or amounts of money, and instruction keys for performing various instructions. The RAM 3 is used to temporarily store various data entered through the keyboard 2. The printer 5 is used to print receipts and various reports. The display unit 6 operates to display operating guide messages or symbols and data entered by means of the keyboard 2. The time piece 7 is used to record the time of recurrence of various operations.

As shown in Fig. 6 the keyboard includes the ten-key pad as well as instruction keys, A-key, R-key, Dept., Sub-Total and D/C.

Fig. 7 is a diagram showing an operating sequence carried out by a cashier with a conventional ECR.

The registering operation of the conventional ECR will be described with reference to Figs. 5 through 7.

The manager of a store assigns cashier codes to cashiers responsible for respective ECRs, and the cashiers operate the ECRs by using their assigned cashier code. Before starting a registering operation, each cashier operates the ten-key pad of the keyboard (Fig. 6) to enter the cashier code assigned to him and then operates a "RESPONSIBLE" key (R-key in Fig. 6). If, in this operation, the cashier code thus entered coincides with one preset in the ECR, then the cashier can carry out a registering operation; however, if not, he cannot.

The purpose of the cashier code is to identify the cashier who has carried out the registering operation; i.e., to identify who is responsible for the registering operation, thereby preventing dishonest ECR operation and to monitor the sales of each cashier.

While the above-described conventional ECR can prevent dishonest ECR operation by use of a cashier code, it suffers from the following difficulty. Since the manager knows the cashier code, the ECR is not protected from being dishonestly operated by the manager; that is, the conventional ECR is not totally secure against a dishonest manager.

Summary of the Invention

Accordingly, an object of this invention is to eliminate the above-described security risk accompanying a conventional electronic cash register. More specifically, an object of the invention is to provide an electronic cash register which cannot be dishonestly operated by the manager.

This objective is accomplished in an ECR constructed in accordance with the invention, by allowing a registering operation to occur only when, in addition to the ordinary cashier code, a predetermined secret code, known only to the cashier, is entered by the cashier.

Since the registering operation can only occur when both the cashier code, which is known by the manager, and the secret code, known only by the cashier, are entered, the ECR is prevented from being dishonestly operated by the manager.

The above and other objects, advantages and features of the invention will be more clearly understood from the following detailed description of the invention which is provided in connection with the accompanying drawings.

Brief Description of the Drawings

Figs. 1(a), 1(b), 1(c) and 1(d) are diagrams showing operating sequences carried out in a preferred embodiment of the present invention;

Fig. 2 is a diagram showing the arrangement of cashier files in the preferred embodiment of the invention;

Fig. 3 is a diagram showing the arrangement of a cashier temporary file in the preferred embodiment of the invention;

Fig. 4 is a flow chart for a description of the operation of the preferred embodiment of the invention;

Fig. 5 is a block diagram outlining the arrangement of a conventional ECR (electronic cash register);

Fig. 6 is a diagram of a keyboard used in a conventional ECR; and

Fig. 7 is a diagram showing an operating sequence of the conventional ECR.

Detailed Description of the Invention

Fig. 1 is a diagram showing the operating sequence carried out with a preferred embodiment of this invention, while Fig. 2 is a diagram showing the arrangement of a cashier file in the preferred embodiment, Fig. 3 is a diagram showing the arrangement of a cashier temporary file in the preferred embodiment, and Fig. 4 is a flow chart showing the operation of the preferred embodiment.

The operation of the preferred embodiment of the invention will now be described with reference to Figs. 1 through 4.

Fig. 1(a) shows an operating sequence for setting a cashier code in the ECR. A new setting operation for a cashier code is carried out as follows: The

operating keys of the keyboard of the ECR are operated to enter the cashier code (for example a three digit code), and then the "RESPONSIBLE" key (R) is operated. Thereafter, in this case, because the cashier secret code will be added, the digit "1" is entered by operating the ten-key pad, and then "SUB TOTAL" and "ALTERNATION" (A) keys are operated. This data entry sequence causes the ECR to search the cashier files (shown in Fig. 2) provided, for instance, in an external master unit, to check the cashier codes set in the cashier files for the existence of the entered cashier code. If the cashier code which has been entered is not found, a cashier file for a new cashier (consisting of a cashier code area, secret code area and sales area) is established, and the entered cashier code is then set in the cashier code area of the newly established cashier file. If, on the other hand, the same code as the newly entered cashier code is found, then it is determined that the entered cashier code is in error. A message indicating an erroneous entry operation is transmitted to the ECR and is displayed on the display unit, thus requesting that the entered cashier code be corrected.

Fig. 1(b) shows an operating sequence for setting a secret code. This is carried out after the cashier code has been correctly set according to the operating sequence of Fig. 1(a). First, the keyboard of the ECR is operated to enter a secret code (for example a three digit code), and then the cashier code, the "RESPONSIBLE" (R) key and the "ALTERNATION" (A) key are operated successively. The cashier code areas of the cashier files are then searched for the entered cashier code. When the same cashier code is found, the entered secret code is then set in the secret code area of that cashier file containing the cashier code. When the same cashier code is not found, it is determined that the entered cashier code is in error, and it is requested that the cashier code be corrected.

The cashier code and the secret code are set as described above. And they can be removed as described below.

When it is required to remove a cashier code which has been set, the cashier code is entered and the "RESPONSIBLE" (R) key is operated, and then the digit "0" is entered by operating the ten-key pad. In succession, the "SUB TOTAL" and "ALTERNATION" (A) keys are then operated. Accordingly, all of the cashier codes of the cashier files are then checked for a match with the entered cashier code. If the same code is found, the cashier file of the code is removed. If the same code is not found, then the fact that the same code is not found is displayed to advise the operator of it.

A secret code which has been set can be removed according to the operating sequence shown in Fig. 1(b). In order to remove a secret code, "000" is entered as the secret code. The operation is similar to the above-described secret code setting operation. When the same cashier code is found, the secret code in the secret code area of that file is erased; that is, the secret code area is cleared. Accordingly, the operator's cashier file for the cashier code remains as it is. Therefore, in setting a

new secret code, it is unnecessary to set the cashier code; that is, the new secret code can be set according to the operating sequence shown in Fig. 1(b).

Fig. 1(c) shows a so-called "cashier-on" operating sequence for starting the use of the ECR. In the "cashier-on" operation, the keyboard of the ECR is operated to enter a cashier code and secret code, and the "RESPONSIBLE" (R) key is operated. The operation of the ECR which occurs after the "cashier-on" operation will be described with reference to the flow chart of Fig. 4.

All the cashier codes and secret codes set in the cashier files are searched according to the entered cashier code and secret code (step 101). When the same codes as the two entered codes are not found, it is determined (step 103) that the entry operation is in error, and the erroneous entry operation is displayed (step 105). The "cashier-on" operation is then ended, and no registering operation is permitted. When the same codes are found (step 103), the contents of the operator's cashier file thereof are transferred to the cashier temporary file (shown in Fig. 3) set in the RAM of the ECR (step 107). When this occurs, the usual registering operation of the ECR is permitted (step 109), and the registering data are updated in the cashier temporary file as registering operations occur.

When the operation of the ECR is finished, for instance when the store is closed, or when the cashier is relieved by another cashier; i.e., when it is required to change the cashier code, a so-called "cashier-off" operation (step 111) shown in Fig. 1(d) is executed. The keyboard of the ECR is operated to enter the digit "0", and then the "RESPONSIBLE" (R) key is operated. As a result, the contents of the cashier temporary file set in the RAM of the ECR are transferred, as they are, to the corresponding area of the cashier file (step 113) and the "cashier-off" operation is then ended.

The registering operation of the ECR can be started again according to the above-described procedure.

In the above-described preferred embodiment, in the secret code setting operation, and in the "cash-on" operation, the order of entering the secret code and the cashier code and the numbers of digits of the codes have been specified in detail; however, the invention is not so limited; that is, the technical concept of the invention is applicable where the cashier and secret codes are entered in other sequences and where a fewer or greater number of digits are used for the secret and cashier codes.

In the above-described embodiment, the cashier file is separate from the cashier temporary file, which is a working file; however, it is not always necessary that the former be separate from the latter. That is, the entered ECR registration data can be updated directly in the cashier file.

As is apparent from the above description, the ECR cannot be operated without using the cashier's secret code which the manager does not know. Therefore, the ECR cannot be dishonestly operated by the manager. Furthermore, as in the conventional ECR, in the ECR of the invention the person

responsible for the registering operation is identified. Thus, the ECR of the invention has a much higher security than conventional ECR's.

While a preferred embodiment of the invention has been described and illustrated, it should be apparent that many modifications can be made thereto without departing from the spirit and scope of the invention. Accordingly, the invention is not limited by the foregoing description, but is only limited by the scope of the appended claims.

Claims

1. An electronic cash register comprising:
memory means for storing a first preset code
and a second secret code;
cashier operated input means for entering a
third code and a fourth code prior to commencing
a registration operation and corresponding
to said first and second codes;
means for comparing said entered third and
fourth codes with said first and second codes
stored by said memory means, to determine
whether or not there is correspondence between
first and third and second and fourth
codes; and
enabling means for permitting a registering
operation of said cash register in response to
an output provided by said determining means
indicating a correspondence of said first and
third and second and fourth codes. 15
2. An electronic cash register as in Claim 1,
wherein said first code and said third code are a
code identifying said cashier. 20
3. An electronic cash register as in Claim 1,
wherein said memory means stores a plurality
of cashier files, each containing a cashier code
area for storing a first preset code for an
assigned cashier, a second secret code known
by said assigned cashier, and a cashier registration
operation data area for said assigned
cashier, said comparing means comparing said
entered third and fourth codes with the first and
second codes of said plurality of cashier files for
said correspondence. 25
4. An electronic cash register as in Claim 3,
further comprising means for indicating an error
when no correspondence is found between
said entered third and fourth codes and the first
and second codes of said plurality of cashier
files. 30
5. An electronic cash register as in Claim 3,
further comprising means for transferring the
contents of a cashier's file having first and
second codes which correspond to said entered
third and fourth codes to a temporary file
for use during a registering operation. 35
6. An electronic cash register as in Claim 5,
further comprising means for transferring the
contents of said temporary file to a corresponding
cashier file when an assigned cashier
associated with said corresponding cashier file
ceases using said electronic cash register. 40

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FIG. 1(a)

SET CASHIER CODE

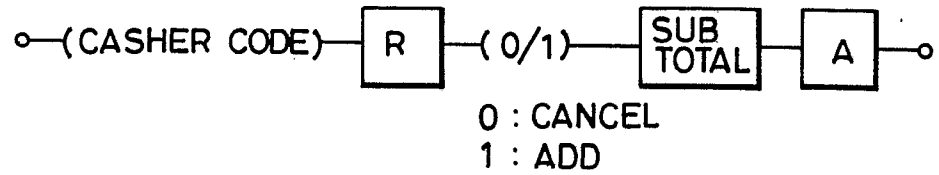


FIG. 1(b)

SET SECRET CODE

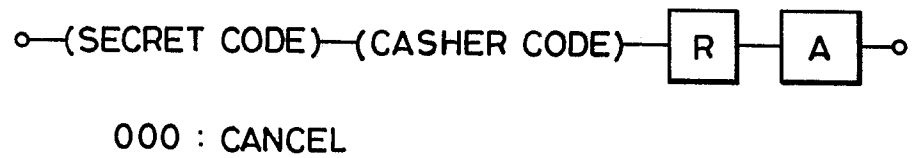


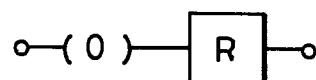
FIG. 1(c)

CASHER-ON



FIG. 1(d)

CASHER-OFF



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FIG. 2

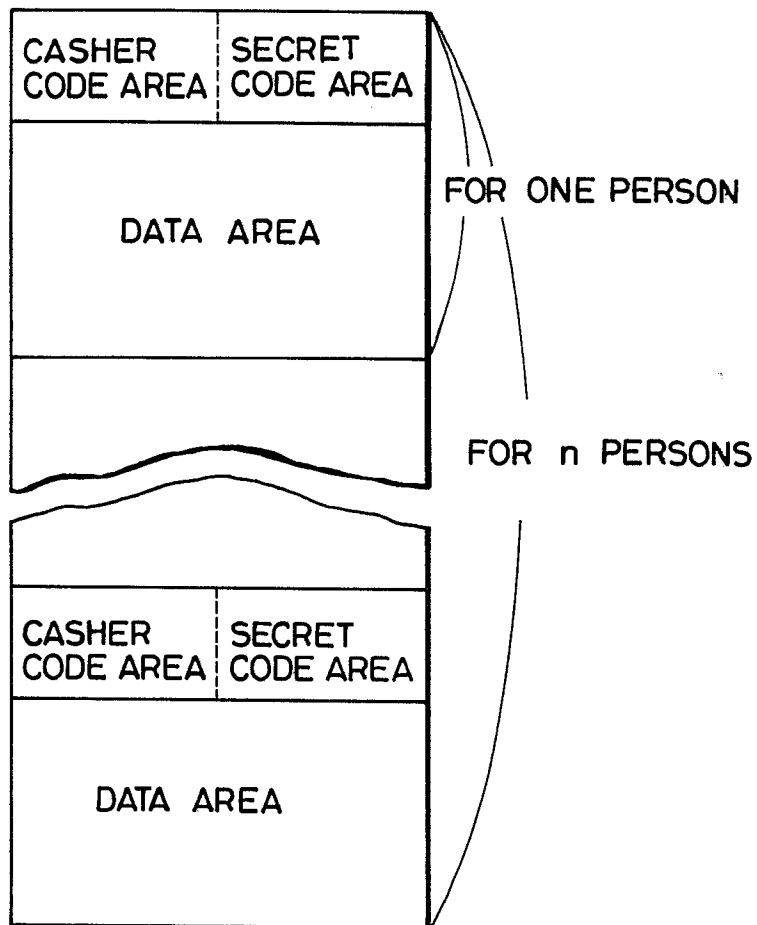


FIG. 3

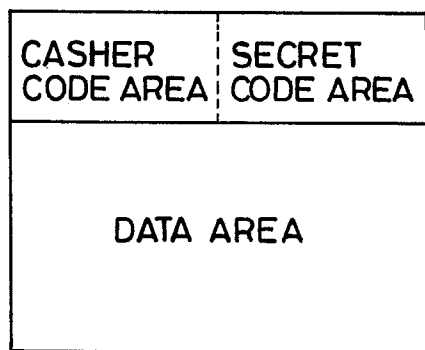
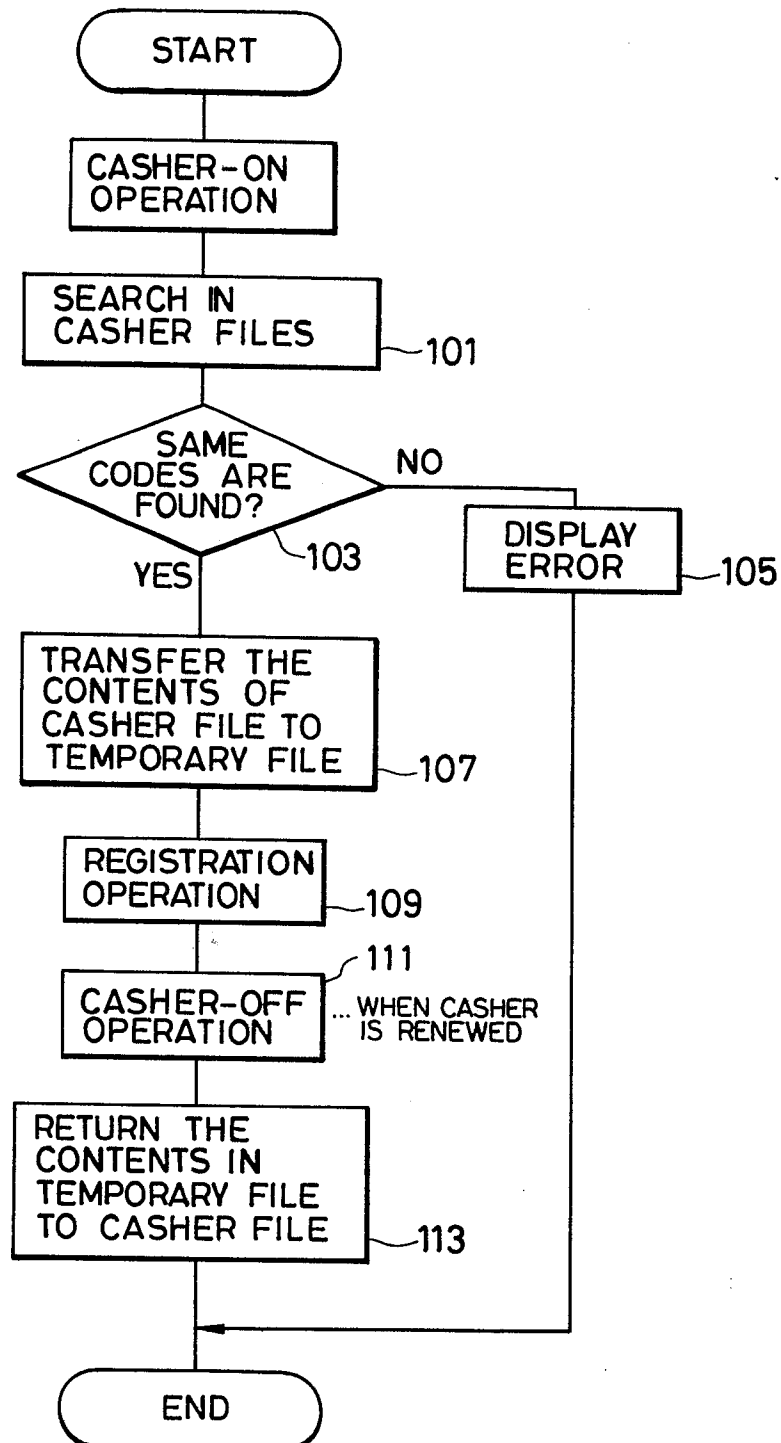


FIG. 4



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FIG. 5

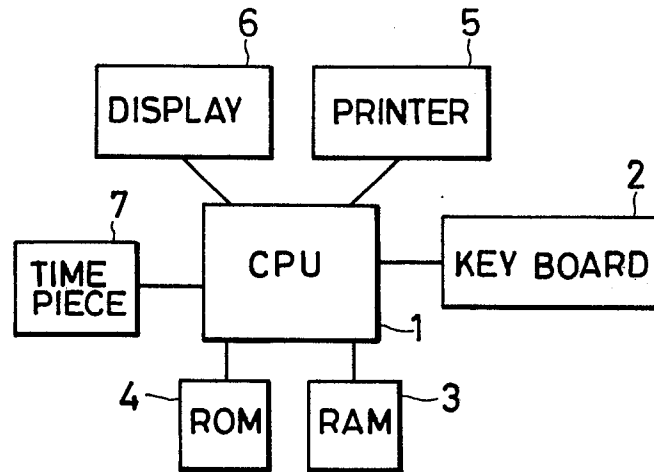


FIG. 6

X	CLEAR		A-KEY	R-KEY
7	8	9	DEPT	
4	5	6		
1	2	3	SUB TOTAL	
0	00		D/C	

FIG. 7

