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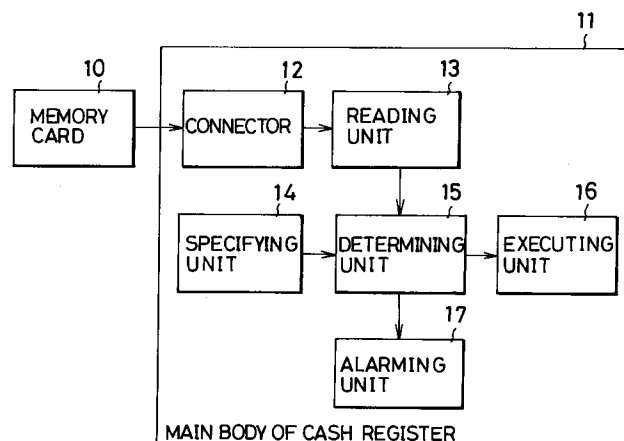
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Cash register capable of switching operation mode.

A cash register (11) having a memory card (10) for storing one or more kinds of operating modes therein as an operating range, the cash register (11) being capable of using the memory card (10) for switching an operation mode and for discriminating a user of the cash register, includes a connector (12) for connecting the memory card (10) therewith, a specifying unit (14) for specifying one or more kinds of the operating modes, a reading unit (13) for reading the operating range from the memory card (10)

through the connector (12), a determining unit (15) for determining whether the specified operating mode by the specifying unit (14) is within the operating range read by the reading unit (13), and an executing unit (16) for executing a cash register process in accordance with the specified operating mode at a time when the specified operating mode is determined to be within the operating range by the determining unit (15).

Fig. 1



BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a cash register, in particular, a point-of-sales electronic cash register having a memory card.

2. Description of the Related Art

The inventors of the present invention know that a cash register which is required a strict management.

The above-mentioned cash register provides keys for the corresponding positions such as a manager and a section chief. Each key has the functional range for the position and functions as discriminating who used the cash register.

In order to switch the operation mode of the cash register, some modes such as "setting mode", "registering mode", "checking mode", and "clearing mode" are assigned to each rotational stage of the key.

The key is turned to the desired stage for selecting the operation mode. Each key has the corresponding turning range according to its function. For example, the manager key is allowed to be turned up to the final mode or the section-chief key is allowed to be turned up to the "registering mode".

In addition, the key contains a plurality of mechanical contacts through which a key is read and coded for discriminating who uses the machine.

A circuit arrangement of the above-mentioned cash register includes a mechanical key switch, an input port connected to the key switch, a keyboard from which various cash registering data is input, a key interface connected to the keyboard, a central processing unit (CPU), a read-only memory (ROM) and a random access memory (RAM), the latter three components of which are connected to the key interface and the input port through a common bus.

An operator can input various money data from the keyboard. The key interface serves to send a key scan signal to the keyboard and to receive a return signal therefrom.

The mechanical key switch is allowed to be turned to each mode of "setting", "registering", "checking" and "clearing". The data specified by the key switch is input to the input port. The CPU receives the specified mode from the input port and supplies an enable signal for the mode to the input port. For example, if the operator is allowed to be turned up to the "registering" mode (not to the "checking" and "clearing" modes), the key for the machine operator is formed to limit the turning range to the "setting" and the "registering" modes.

On the other hand, the key for the manager is formed to set the allowable turning ranges to all the modes.

However, the above-mentioned cash register requires various keys. In case that two or more persons use the above-mentioned cash register, more keys are needed. This results in disadvantageously enhancing the cost and making the key safekeeping more troublesome. As another disadvantage, since the key is formed to have mechanical contacts, the keys to be prepared are limited in number. As a further disadvantage, since it is not a special key, the key can be easily forged. It means that the above-mentioned cash register does not possess high security level.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide a cash register which is capable of switching an operation mode and discriminating a user of the cash register.

The object of the present invention can be achieved by a cash register having unit for storing one or more kinds of operating modes therein as an operating range, the cash register being capable of using the storage unit for switching an operation mode and for discriminating a user of the cash register, the cash register include a unit for connecting the storage unit therewith, a unit for specifying one or more kinds of the operating modes, a unit for reading the operating range from the storage unit through the connecting unit, a unit for determining whether the specified operating mode by the specifying unit is within the operating range read by the reading unit, and a unit for executing a process of cash registering in accordance with the specified operating mode at a time when the specified operating mode is determined to be within the operating range by the determining unit.

In operation, when the specifying unit serves to specify the operation mode, the reading unit serves to read the operating range of the storage unit. Then, the determining unit serves to determine whether or not the operating mode specified by the specifying unit is included in the operating range read by the reading unit. If yes, the executing unit operates to execute the cash-registering operation. If not, the informing unit gives an alarm of an operation error.

As will be understood from the above description, in case that storage means for each user has the corresponding operating range written therein and is loaded to the cash register when he or she wants to operate it, each user can operate the cash register in the corresponding mode range. The use of the storage means makes it possible to set more operation modes than the known cash register and

to eliminate the mechanical key switch used in the known cash register.

Preferably, the cash register further includes a unit for informing an operation error at a time when the specified operating mode is determined to be not within the operating range by the determining unit.

More preferably, the storage unit is capable of storing operating modes including a setting mode, a registering mode, a checking mode, and a clearing mode.

Further preferably, the storage unit is a memory card having an integrated circuit memory built-in.

The connecting unit is preferably a connector which is capable of receiving the memory card therein.

The reading unit is preferably an input/output buffer which is capable of reading an operating range from the memory card through the connector.

The specifying unit is a keyboard which is capable of specifying each kind of the operating mode such as a setting mode, a registering mode, a checking mode, and a clearing mode, preferably.

The specifying unit further includes a key interface which is capable of sending a key scan signal to the keyboard and receiving a return signal therefrom, preferably.

The determining unit includes a read only memory and a central processing unit, preferably.

The executing unit is preferably a random access memory.

The read only memory, the central processing unit, the random access memory, and the input/output buffer are formed in a microcomputer, preferably.

The informing unit is preferably an alarming device.

Further objects and advantages of the present invention will be apparent from the following description of the preferred embodiment of the invention as illustrated in the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig.1 is a block diagram showing an arrangement of a first embodiment of a cash register according to the present invention;

Fig.2 is a block diagram showing an arrangement of a second embodiment of a cash register according to the present invention;

Fig.3 is an explanatory view showing the content of an operating range written in a memory card shown in Figs.1 and 2; and

Fig.4 is a flowchart showing an operation of the cash register shown in Figs.1 and 2.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to the accompanying drawings, an embodiment of a cash register according to the present invention will be described in details.

Fig.1 is a block diagram showing an arrangement of a first embodiment of a cash register according to the present invention.

As shown in Fig.1, a memory card 10 is provided with a cash register having a main body 11 which includes a connector 12 for receiving the memory card 10. Aside from the connector 12, a main body 11 of the cash register further includes a reading unit 13 connected to the connector 12, a specifying unit 14, a determining unit 15 connected to both of the reading unit 13 and the specifying unit 14, an executing unit 16 connected to the determining unit 15, and an alarming unit 17 connected to the determining unit 15.

The memory card 10 has a kind of an operating mode selected from various modes such as a setting mode, a registering mode, a checking mode, and a clearing mode.

The specifying unit 14 enables to specify each of various operating modes such as a setting mode, a registering mode, a checking mode, and a clearing mode.

The reading unit 13 reads the operating range from the memory card 10 inserted to the connector 12.

The determining unit 15 determines whether or not the operating mode specified by the specifying unit 14 is included in the operating range. If yes, the executing unit 16 executes the cash-registering operation at the specified mode. If not, the alarming unit 17 gives an alarm of indicating an operation error.

The specifying unit 14 may be a keyboard for specifying various operating modes.

The combination of the reading unit 13, the determining unit 15 and the executing unit 16 may be formed in a microcomputer which is arranged to have a central processing unit (CPU), a read only memory (ROM), a random access memory (RAM) and an input/output (I/O) port.

The alarming unit 17 may be any light or sound indicator such as a buzzer or a lamp.

Fig.2 is a block diagram showing an arrangement of a second embodiment of a cash register according to the present invention.

The cash register shown in Fig.2 is a point-of-sales electronic cash register (hereinafter, referred as POS.ECR).

As shown in Fig.2, a memory card 20 is provided with a main body 21 of POS.ECR which includes a connector 22 for receiving the memory card 20. Aside from the connector 22, the main

body 21 of the POS.ECR further includes an input/output (I/O) buffer 23 connected to the connector 22, a keyboard 24, a key interface 25 connected to the keyboard 24, a central processing unit (CPU) 26 connected to both of the I/O buffer 23 and the key interface 25, a read only memory (ROM) 27 connected to both of the I/O buffer 23 and the key interface 25, and a random access memory (RAM) 28 connected to both of the I/O buffer 23 and the key interface 25.

The memory card 20 has an integrated circuit (IC) memory built therein and also has a kind of operating mode written as its operating range. The operating mode is selected from various modes such as a setting mode, a registering mode, a checking mode, and a clearing mode.

The main body 21 of the POS.ECR has the connector 22 to which the memory card 20 is inserted.

The keyboard 24 is provided in the main body 21. The keyboard 24 provides keys (not shown) for various operating modes such as a setting mode, a registering mode, a checking mode, and a clearing mode.

The key interface 25 serves to send a key scan signal to the keyboard 24 and to receive a return signal therefrom.

The I/O buffer 23 is provided for temporarily storing the data at a time when it is performing the I/O of the data to and from the memory card 20 through the connector 22.

The control program is written in the ROM 27. The CPU 26 operates to process various kind of data under the control of the program written in the ROM 27.

The RAM 28 enables to load the program which is written in the ROM 27 and to execute the loaded program therein in accordance with the information and/or instructions input either from the memory card 20 or the keyboard 24.

The CPU 26 serves to read the operating range from the memory card 20 through the connector 22. By pressing the keys on the keyboard 24, the operating mode is specified. Then, the CPU 26 determines whether or not the specified operating mode is included in the read operating range. If yes, the cash-registering operation is executed at the specified operating mode. If not, an operation error is indicated through a buzzer (not shown).

Fig.3 is an explanatory view showing the content of the operating range written in the memory card 20 of Fig.2.

The memory card 20 contains operating range flags having the data arrangement. If each flag has risen, that is, has a value of one, the flag indicates that the operation is allowed at the flag mode. If it has a value of zero, the flag indicates that the operation is disabled at the flag mode.

Hence, in an example shown in Fig.3, the memory card 20 enables to perform the registering and the checking operations through the cash register for the holder of the memory card 20.

Next, the description will be directed to the operation of the CPU 26 of Fig.2 referring to the flowchart shown in Fig.4.

In case that the operation is executed at a certain mode, an operator presses a key for the mode on the keyboard 24.

When the proper key on the keyboard 24 is pressed (step S1), the CPU 26 reads the operating range flag stored in a predetermined area of the memory card 20 (step S2) and determines whether or not the operation specified by the key is enabled, that is, whether the operating range flag is 1 or not (step S3). If it is 1, the specified operation is enabled. The later process is executed at the mode (step S4). If it is not 1, the specified operation is disabled. Then, the operation error is indicated (step S5).

As set forth above, the embodiment of the present invention is arranged to prepare one kind of memory card 20 even if two or more persons may use the cash register.

By writing some factors such as an operating range flag, a user code, and a transaction limit card in a predetermined area of the memory card 20, it is possible to properly manage the cash register for a point of sale without using the key switches.

Many widely different embodiments of the present invention may be constructed without departing from the spirit and scope of the present invention. It should be understood that the present invention is not limited to the specific embodiments described in the specification, except as defined in the appended claims.

Claims

1. A cash register having means (10) for storing one or more kinds of operating modes therein as an operating range, said cash register being capable of using said storage means (10) for switching an operation mode and for discriminating a user of said cash register, characterized in that said cash register includes:
 - means (12) for connecting said storage means (10) therewith;
 - means (14) for specifying one or more kinds of said operating modes;
 - means (13) for reading said operating range from said storage means (10) through said connecting means (12);
 - means (15) for determining whether said specified operating mode by said specifying means (14) is within said operating range read by said reading means (13); and

means (16) for executing a process of cash registering in accordance with said specified operating mode at a time when said specified operating mode is determined to be within said operating range by said determining means (15).

2. A cash register according to claim 1, wherein said cash register further comprises means (17) for informing an operation error at a time when said specified operating mode is determined to be not within said operating range by said determining means (15). 5
10
3. A cash register according to claim 1 or 2, wherein said storage means (10) is capable of storing operating modes including a setting mode, a registering mode, a checking mode, and a clearing mode. 15
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4. A cash register according to claim 3, wherein said storage means (10) is a memory card (20) having an integrated circuit memory built-in. 25
5. A cash register according to claim 1 or 4, wherein said connecting means (12) is a connector (22) which is capable of receiving said memory card (20) therein. 30
6. A cash register according to claim 1 or 5, wherein said reading means (13) is an input/output buffer (23) which is capable of reading an operating range from said memory card (20) through said connector (22). 35
7. A cash register according to claim 1 or 6, wherein said specifying means (14) is a keyboard (24) which is capable of specifying each kind of said operating mode such as a setting mode, a registering mode, a checking mode, and a clearing mode. 40
8. A cash register according to claim 7, wherein said specifying means (14) further comprises a key interface (25) which is capable of sending a key scan signal to said keyboard (24) and receiving a return signal therefrom. 45
9. A cash register according to claim 1 or 8, wherein said determining means (15) includes a read only memory (27) and a central processing unit (26). 50
10. A cash register according to claim 1 or 9, wherein said executing means (16) is a random access memory (28). 55
11. A cash register according to claim 10, wherein

said read only memory (27), said central processing unit (26), said random access memory (28), and said input/output buffer (23) are formed in a microcomputer.

12. A cash register according to claim 2 or 10, wherein said informing means (17) is an alarming device (17).

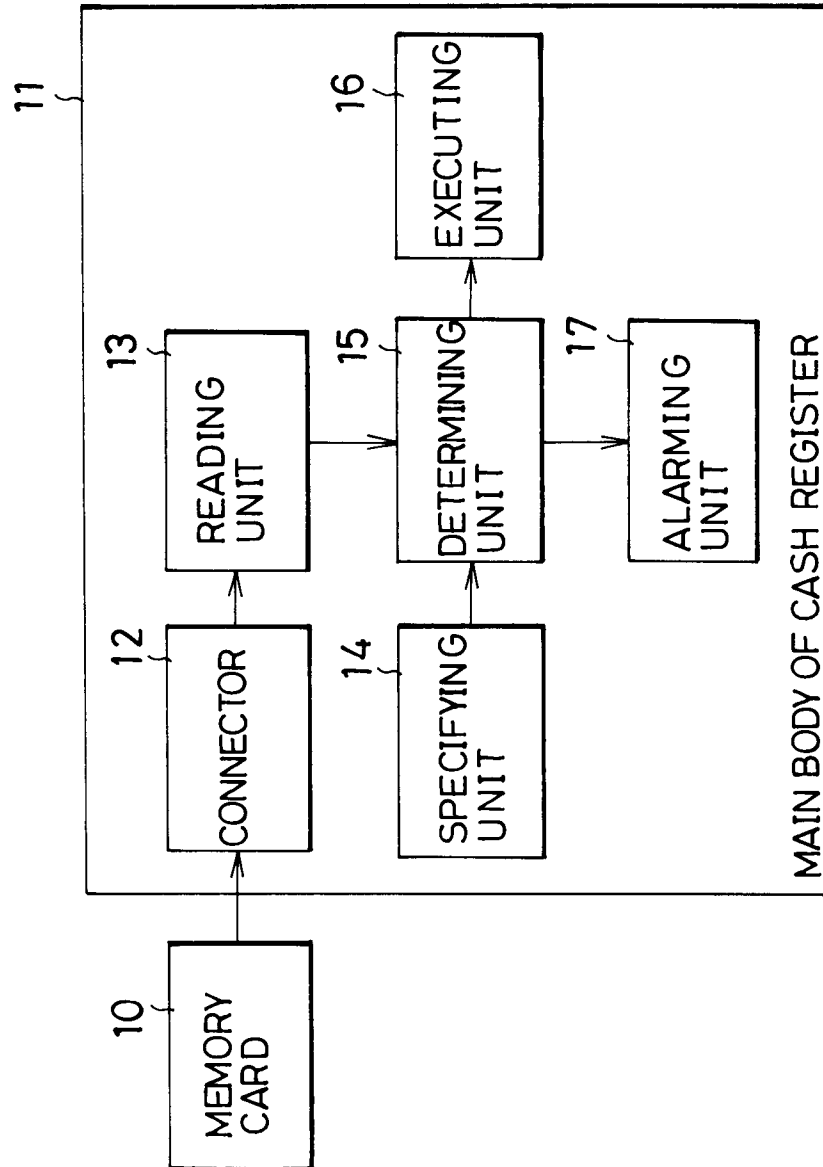
Fig. 1

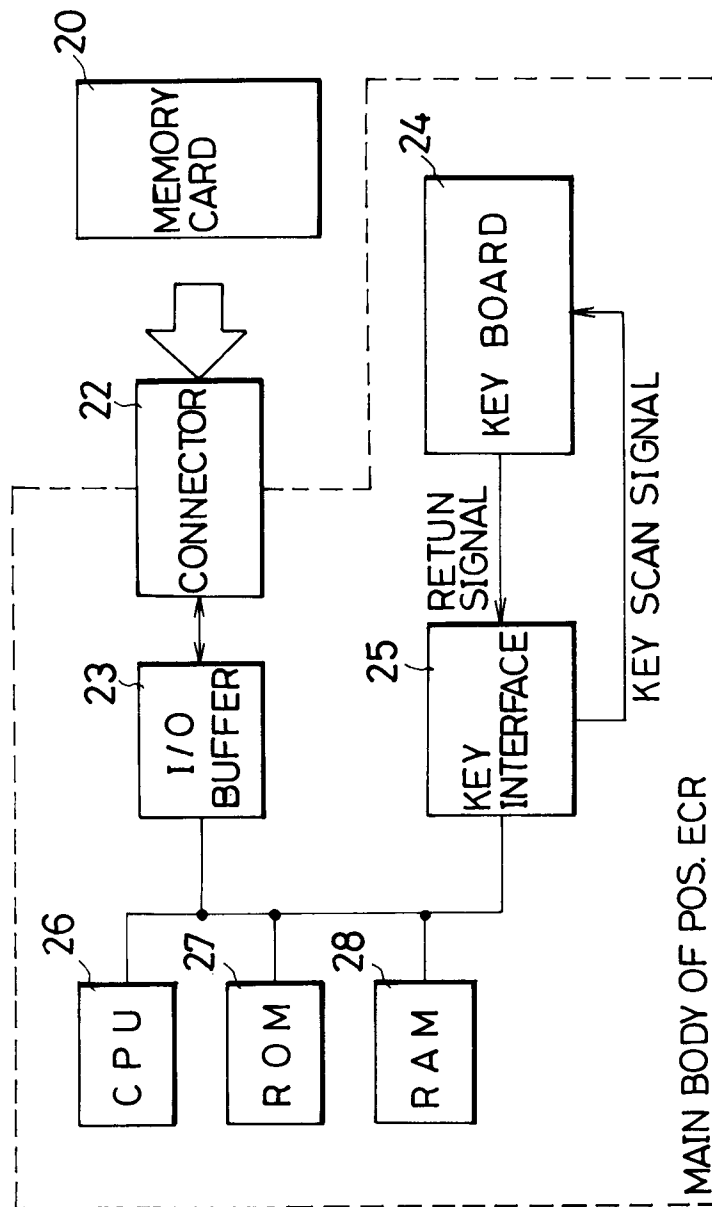
Fig. 2

Fig. 3

(SETTING)(REGISTERING)(CHECKING)(CLEANING)

0	1	1	0		
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Fig. 4