Description

This invention relates to an electronic cash register (ECR), and more particularly to an ECR for use with price-look-up table (PLU table) storing item prices.

It is well known that item prices are often changed for various reasons in many retail shops such as supermarkets. For instance, some foods are often discounted unless sold out in short periods of time, because such foods are likely to lose their value. There are also a number of cases in which some designated items are sold at bargain prices during certain intervals during a day.

For this purpose, heretofore, some ECRs have been provided with PLU tables where item prices are changeably stored, while others have been provided with PLU tables storing a plurality of prices with respect to each item so that the item prices are changeable by selecting one of the stored prices.

According to the ECRs as mentioned above, however, the following disadvantages are inevitably incurred.

1. In the former type, operation of the ECRs must be temporarily stopped each time the need for changing the prices stored in the PLU tables takes place, so that the operation efficiency is lowered.
2. In the latter type, each item is required to hold its corresponding price because all the prices are changed at one time irrespective of items, so that extra memory location is required with respect to even such items which are not incurring a change in price.

An electronic cash register according to the preamble of claim 1 is known from US-A-4 180 206. This known cash register needs an inserted external recording medium for being operable.

From GB-A-2 109 972 an electronic cash register is known which is so arranged that commodity data other than sales data can be transmitted to a data collection system.

It is a primary object of this invention to provide an ECR which overcomes the above-mentioned disadvantages.

It is another object to provide an ECR which is capable of changing the item prices without changing the prices stored in the PLU table.

It is still another object to provide an ECR which is capable of changing the item prices without the necessity of stopping operation of the ECR.

It is a further object to provide an ECR which is capable of changing the item prices without providing each item of the PLU table with its corresponding price.

It is a still further object to provide an ECR which is capable of distinguishing the transaction data subject to changed prices from those which involve items with unchanged prices.

It is a still further object to provide an ECR which is capable of changing the item prices during a given interval of time.

The invention is as claimed in claim 1.

Other objects and numerous advantages of the ECR according to this invention will become apparent from the following description when considered in conjunction with the accompanying drawings.

Fig. 1 is a perspective view showing the appearance of all of the components of the ECR of this invention.

Fig. 2 is a plan view showing the key layout of the keyboard of Fig. 1.

Fig. 3 is a block diagram showing the construction of the ECR of Fig. 1.

Fig. 4 is a flowchart illustrating the operation of the ECR of Fig. 1.

In Fig. 1, there is shown a perspective view of an ECR which includes a main body 1 and card reader 6. The main body 1 comprises display 2, printer 3, and keyboard 4. The card reader 6 electrically connected to the main body 1 has an opening 7 into which an IC card 8 is inserted.

As shown in Fig. 2, the keyboard 4 is provided with mode switch 41 for selecting the operation modes of the ECR, department keys 42 for entering the department codes of items, numeral keys 43 for entering numeral data, and various functional keys 44.

A block diagram of Fig. 1 is shown in Fig. 3. The main body 1 includes CPU 11 with which display 2, printer 3, keyboard 4, ROM 12, and RAM 13 are interfaced. The ROM 12 has stored therein a operation program as shown in Fig. 4. The RAM 13 stores various data required for the data processing of the CPU 11, and further includes areas 13a and 13b featuring this embodiment.

The area 13a is used as an IC card update flag which is normally maintained in a reset state, however this flag is switched to a set state at the moment when transaction data are written into the IC card 8. The area 13b is used as a data area for storing therein the transaction data of items. Further, a PLU table containing the prices of various items is stored either in ROM 12 or RAM 13.

The card reader 6 contains CPU 61 and read/write circuit 62 connected thereto. The CPU 61 is interfaced with CPU 11 in main body 1 through data transmission line 5. The CPU 61 directly controls the operation of read/write circuit 62 on the basis of the instructions given by CPU 11.

The IC card 8 contains ROM 81 and RAM 82. The ROM 81 has stored therein the item codes associated with items whose corresponding prices are required to be temporarily changed. Such item

codes are accompanied by the changed prices respectively.

In addition, the ROM 81 has stored therein a "time interval" when the changed prices provided by the IC card can be applied for a transaction.

The RAM 82 is used as a data area for storing the transaction data of items. The transaction data storing areas such as 13b and 82 are divided into a multiple number of partitions corresponding to the items, each of which is provided with the item code, an item title, status, a totalizer for storing the total monetary sale amount of the item, and a counter for counting the number of unit sales of the item as shown in Fig. 3.

Fig. 4 is a flowchart illustrating the operation of the CPU 11 as shown in Fig. 3. In step S1, it is inquired whether the transaction operation is carried out with keyboard 4 referring to the PLU table. Unless such operation is carried out, the CPU will advance to other jobs which are irrelevant to this invention and not described here.

If an operation referring to the PLU table takes place, the CPU advances to step S2 in which it is inquired whether the IC card 8 is inserted in card reader 6. Unless the IC card 8 is inserted, a generally known PLU transaction of conventional ECRs is carried out, which is well-known and not described herein.

If the IC card 8 is inserted in step S2, the CPU advances to step S3 where it is inquired whether the present time is within the time interval provided by the IC card.

If yes, the ROM 81 of IC card 8 is searched as to whether the item code involved in the transaction is preset in the IC card in steps S4 and S5. If the item in question is found in the ROM 81, the IC card update flag 13a is sat in step S6 and the corresponding price also stored in the ROM 81 is read out through read/write circuit 62. The price is shown at display 2 (step S7). The transaction data such as the item title and price are printed out by printer 3 (step S8).

In step S9, it is inquired whether the IC card update flag is set. In this case, the flag has been set in step 6, so that the transaction data are updated in transaction data area 82 of IC card 8. More specifically, the total monetary sale amount stored in the totalizer is increased by the item price, while the item counter is incremented by one (step 10). It is noted that such transaction data are not updated in transaction data area 13b of RAM 13.

In step 3, unless the present time is within the time interval provided by the IC card, the following operations are the same as those carried out by conventional ECRs.

Namely, the PLU table of ECR main body 1 is searched to determine whether the item code involved in the transaction is located therein (steps 11 and 12). If the item code is found, the corresponding price is displayed (step S7) and printed out by printer 3 together with the item title (step S8), as previously described.

In this case, the IC card update flag is not set, so that the transaction data are updated in transaction data area 13b of ECR main body 1 (step S13). If the item code cannot be found in steps 11 and 12, the CPU advances to an error routine (not shown).

Further, in step S5, if the item code cannot be found in ROM 81 of the IC card, the transaction is carried out by using the PLU table of ECR main body 1 (step S11).

In this way, the price of any item can be temporarily changed by inserting the IC card into the card reader 6 without changing the PLU table of the ECR main body 1. Moreover, the transaction data which are handled by the use of the price data preset in the card are updated in the transaction data area 82 of the card, so that the transaction data on the basis of the temporarily changed item prices can be distinguished during data management from transaction data not subject to changed prices.

With regard to the medium for providing the temporarily changed item prices and transaction data area, other media such as a floppy disk and cassette tape can be also used, provided that such media are detachably connectable with respect to the ECR main body and can hold data to enable rending therefrom and writing thereinto.

It should be understood that the above description is merely illustrative of this invention and that many changes and modifications may be made without departing from the scope of the appended claims.

Claims

1. An electronic cash register comprising:
   - an external recording medium (8) for storing an item code and its price, said recording medium including an area for storing registration data of the item,
   - read/write means (6) for writing and reading data in and out of said recording medium (8), said recording medium being detachably connected to said read/write means (6),
   - a keyboard (4) for entering item data to be registered,
   - check means for checking whether or not said recording medium is connected to said read/write means in a registration and
   - a first control means for, responding to

codes are accompanied by the changed prices respectively.

In addition, the ROM 81 has stored therein a "time interval" when the changed prices provided by the IC card can be applied for a transaction.

The RAM 82 is used as a data area for storing the transaction data of items. The transaction data storing areas such as 13b and 82 are divided into a multiple number of partitions corresponding to the items, each of which is provided with the item code, an item title, status, a totalizer for storing the total monetary sale amount of the item, and a counter for counting the number of unit sales of the item as shown in Fig. 3.

Fig. 4 is a flowchart illustrating the operation of the CPU 11 as shown in Fig. 3. In step S1, it is inquired whether the transaction operation is carried out with keyboard 4 referring to the PLU table. Unless such operation is carried out, the CPU will advance to other jobs which are irrelevant to this invention and not described here.

If an operation referring to the PLU table takes place, the CPU advances to step S2 in which it is inquired whether the IC card 8 is inserted in card reader 6. Unless the IC card 8 is inserted, a generally known PLU transaction of conventional ECRs is carried out, which is well-known and not described herein.

If the IC card 8 is inserted in step S2, the CPU advances to step S3 where it is inquired whether the present time is within the time interval provided by the IC card.

If yes, the ROM 81 of IC card 8 is searched as to whether the item code involved in the transaction is preset in the IC card in steps S4 and S5. If the item in question is found in the ROM 81, the IC card update flag 13a is sat in step S6 and the corresponding price also stored in the ROM 81 is read out through read/write circuit 62. The price is shown at display 2 (step S7). The transaction data such as the item title and price are printed out by printer 3 (step S8).

In step S9, it is inquired whether the IC card update flag is set. In this case, the flag has been set in step 6, so that the transaction data are updated in transaction data area 82 of IC card 8. More specifically, the total monetary sale amount stored in the totalizer is increased by the item price, while the item counter is incremented by one (step 10). It is noted that such transaction data are not updated in transaction data area 13b of RAM 13.

In step 3, unless the present time is within the time interval provided by the IC card, the following operations are the same as those carried out by conventional ECRs.

Namely, the PLU table of ECR main body 1 is searched to determine whether the item code involved in the transaction is located therein (steps 11 and 12). If the item code is found, the corresponding price is displayed (step S7) and printed out by printer 3 together with the item title (step S8), as previously described.

In this case, the IC card update flag is not set, so that the transaction data are updated in transaction data area 13b of ECR main body 1 (step S13). If the item code cannot be found in steps 11 and 12, the CPU advances to an error routine (not shown).

Further, in step S5, if the item code cannot be found in ROM 81 of the IC card, the transaction is carried out by using the PLU table of ECR main body 1 (step S11).

In this way, the price of any item can be temporarily changed by inserting the IC card into the card reader 6 without changing the PLU table of the ECR main body 1. Moreover, the transaction data which are handled by the use of the price data preset in the card are updated in the transaction data area 82 of the card, so that the transaction data on the basis of the temporarily changed item prices can be distinguished during data management from transaction data not subject to changed prices.

With regard to the medium for providing the temporarily changed item prices and transaction data area, other media such as a floppy disk and cassette tape can be also used, provided that such media are detachably connectable with respect to the ECR main body and can hold data to enable rending therefrom and writing thereinto.

It should be understood that the above description is merely illustrative of this invention and that many changes and modifications may be made without departing from the scope of the appended claims.

Claims

1. An electronic cash register comprising:
   - an external recording medium (8) for storing an item code and its price, said recording medium including an area for storing registration data of the item,
   - read/write means (6) for writing and reading data in and out of said recording medium (8), said recording medium being detachably connected to said read/write means (6),
   - a keyboard (4) for entering item data to be registered,
   - check means for checking whether or not said recording medium is connected to said read/write means in a registration and
   - a first control means for, responding to

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determination by said check means that said recording medium is connected to said read/write means, reading said price data stored in said recording medium through said read/write means, registering said read price data, and writing the registration data into the registration area of said recording medium through said read/write means, characterized by

- an internal storing means (12, 13) for storing an item code and its price and including an area for storing registration data of the item, and
- a second control means for, responding to determination by said check means that said external recording medium is disconnected from said read/write means, performing a registration using price data stored in said internal storing means.

2. An electronic cash register according to claim 1, wherein said recording medium (8) is further provided with means for storing data indicating an interval of time when the price stored in said recording medium is available in said transaction operation.

3. An electronic cash register according to claim 1 or 2, wherein said recording medium is an IC card (8).

Patentansprüche

1. Elektronische Registrierkasse mit

einem externen Aufzeichnungsmedium (8) zum Speichern eines Artikelcodes und seines Preises, wobei das Aufzeichnungsmedium einen Bereich zum Speichern von Registrierdaten des Artikels enthält,

Lese/Schreibmitteln (6) zum Schreiben und Lesen von Daten in das und aus dem Aufzeichnungsmedium (8), wobei das Aufzeichnungsmedium an die Lese/Schreibmittel (6) lösbar angeschlossen ist,

einer Tastatur (4) zum Eingeben von zu registrierenden Artikeldaten,

Prüfmitteln zum Prüfen, ob das Aufzeichnungsmedium an die Lese/Schreibmittel bei einer Registrierung angeschlossen ist, und

ersten Steuermitteln, zum, ansprechend auf die Feststellung durch die Prüfmittel, daß das Aufzeichnungsmedium an die Lese/Schreibmittel angeschlossen ist, Lesen der in dem Aufzeichnungsmedium gespeicherten Preisdaten über die Lese/Schreibmittel, Registrieren der gelesenen Preisdaten und Schreiben der Registrierdaten in den Registrierbereich des Aufzeichnungsmediums über die Lese/Schreibmittel, gekennzeichnet durch

interne Speichermittel (12, 13) zum Speichern eines Artikelcodes und seines Preises und enthaltend einen Bereich zum Speichern von Registrierdaten des Artikels, und

zweite Speichermittel zum, ansprechend auf die Feststellung der Prüfmittel, daß das externe Aufzeichnungsmedium an die Lese/Schreibmittel nicht angeschlossen ist, Durchführen einer Registrierung unter Verwendung von in den internen Speichermitteln gespeicherten Preisdaten.

2. Elektronische Registrierkasse nach Anspruch 1, bei welcher das Aufzeichnungsmedium (8) ferner mit Mitteln zum Speichern von Daten, die ein Zeitintervall angeben, in dem der im Aufzeichnungsmedium gespeicherte Preis in dem Transaktionsvorgang zur Verfügung steht, versehen ist.

3. Elektronische Registrierkasse nach Anspruch 1 oder 2, bei welcher das Aufzeichnungsmedium eine IC-Karte (8) ist.

Revendications

1. Caisse enregistreuse électronique comprenant:

- un support d'enregistrement (8) externe pour mémoriser un code d'article et son prix, ledit support d'enregistrement comportant une zone de mémorisation des données d'enregistrements de l'article,
- des moyens (6) de lecture/écriture pour écrire et lire des données dans et à partir du support d'enregistrement (8), ledit support d'enregistrement étant relié de manière détachable auxdits moyens (6) de lecture/écriture,
- un clavier (4) pour entrer des données d'article à enregistrer,
- des moyens de contrôle pour contrôler si oui ou non le support d'enregistrement est relié aux moyens de lecture/écriture suivant un mode d'enregistrement et
- un premier moyen de commande pour lire, en réponse à la détermination par les moyens de contrôle que le support d'enregistrement est relié auxdits moyens de lecture/écriture, les données de prix mémorisées sur le support d'enregistrement par l'intermédiaire des moyens de lecture/écriture, enregistrer les données de prix ainsi lues, et écrire les données d'enregistrement dans la zone d'enregistrement du support d'enregistrement par l'intermédiaire des

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moyens de lecture/écriture, caractérisé en ce qu'il comporte :

- un moyen (12, 13) de mémorisation interne pour mémoriser un code d'article et son prix et comportant une zone de mémorisation de données d'enregistrement d'un article et,
- un second moyen de commande pour réaliser, en réponse à la détermination par les moyens de contrôle que le support d'enregistrement externe est déconnecté des moyens de lecture/écriture, un enregistrement utilisant des données de prix mémorisées dans les moyens de mémorisation interne.

2. Caisse enregistreuse électronique selon la revendication 1, dans laquelle ledit support d'enregistrement (8) comporte en outre des moyens de mémorisation de données indiquant un intervalle de temps pendant lequel le prix mémorisé dans le support d'enregistrement est disponible pour ladite opération de transaction.

3. Caisse enregistreuse électronique selon la revendication 1 ou 2, dans laquelle ledit support d'enregistrement est une carte à circuit intégré (8).

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