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A hand-held sales data processing device, and system therefor.

A handy type sales data processing device (11) has a sales data memory for storing sales data relating to the name, the unit price, and so on, of a commodity, and also a total value memory for storing the total value of sales. The processing device (11) displays the sales data and updates the total value every time a bar code representing a commodity and held on a recording medium is read. The total value stored in the total value memory is transmitted to a sales data collecting device (13) for collecting the sales data.

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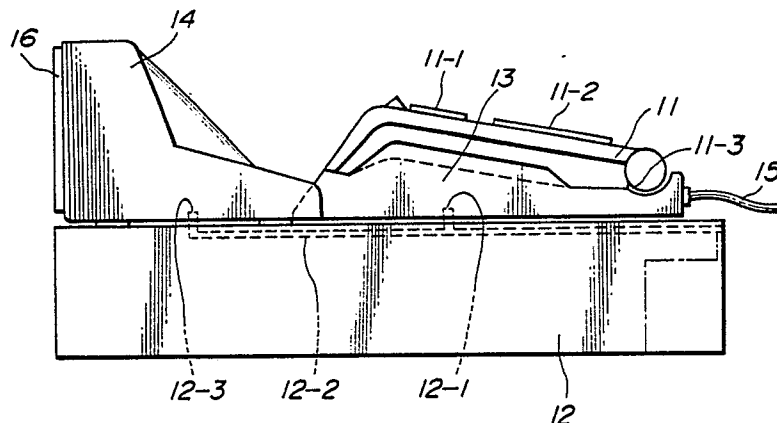


FIG. 1

Handy type sales data processing device and sales data processing system

The present invention relates to a handy type sales data processing device with a reader for optically reading sales data, and to a sales data processing system.

In recent years, electronic cash registers (ECRs) provided with a hand scanner adapted to optically read a bar code (commodity code) from the label of a product have been developed and put into practical use.

An example of an ECR provided with a hand scanner is disclosed in Japanese Laid-Open Patent Publication No. 62-297992 laid open on Dec. 25, 1987. In this prior art ECR, the hand scanner transmits each of read commodity codes to the ECR through a cable, and the ECR performs the registration process on the basis of the transmitted product codes, namely, totaling the sales data for each of the PLU codes (i.e. each of the commodities) recorded in a commodity file, printing the sales data on a receipt, and so on.

In order to enable a customer confirm data, another ECR is provided with a hand scanner having a display section for displaying the unit price, the name, and so on of commodities whose commodity code has been read. With such a type of ECR, the hand scanner transmits each of the optically read commodity codes to the ECR, and the ECR transfers data on the unit price, the name, and so on of the product recorded in a product file to the hand scanner after data processing such as totaling has been performed, and the hand scanner then displays the data transferred from the ECR on its display section.

However, such a hand scanner requires an ECR containing a commodity file and is therefore complex in structure. Moreover, the ECR requires space for installation and is itself costly.

In the case of an ECR with a commodity file, it is required to transmit commodity codes read by the hand scanner to the ECR so as to update the total of the sales data and then to transfer data to be displayed from the ECR to the hand scanner. Hence, the data transfer operation is complex, and the number times data transfer occurs slows down the data processing speed.

Accordingly, it is an object of the present invention to provide a hand scanner which contains a commodity file and can carry out registration and display processes in accordance with read product codes, without the need for any separate equipment containing the commodity file, and is simple in construction and advantageous as regards installation space and cost.

It is another object of the present invention to provide a hand scanner which reduces the number

of data transfers, thereby to speed up data processing by being able to execute record and display processes one immediately after the other, i.e. in an instant.

To attain the above objects, a handy type sales data processing device of the present invention comprises: optical read means for reading recorded information representing a product code from a recording medium; storage means for storing sales data including the name of a product and the unit price corresponding to the product code; converting means for converting the product code read by the optical read means to sales data stored in the storage means; display means for displaying the sales data converted by the converting means; and transmitting means for transmitting the product code to another device.

A sales data processing system of the present invention comprises: a handy type sales data processing device having optical read means for reading recorded information representing a product code from a recording medium, storage means for storing sales data on the basis of the product code read by the optical read means, and transmitting means for transmitting the sales data stored in the storage means; storage means for totaling and storing sales data transmitted from the handy type sales data processing device in respect of each product code read by the optical read means; a sales data collecting device including transmitting means for transmitting the sales data transmitted from the handy type sales data processing device; and a printer device for printing out the sales data transmitted from the transmitting means of the sales data collecting device.

With this arrangement the provision of a body device containing product files like conventional one is unnecessary, and the resulting handy type sales data processing device is simple in construction and advantageous in regard to installation space and cost.

Furthermore, since a hand scanner is portable, an operator can act more freely. Even if the operator stands off from the counter of a shop, he can promptly deal with customers.

Moreover, since the record and display process is performed using product files contained in the hand scanner itself, the data processing speed of the invention is thus considerably faster than that of the conventional device.

This invention can be more fully understood from the following detailed description when taken in conjunction with the accompanying drawings, in which:

Fig. 1 is a side view of an ECR and its associated hand scanner;

Fig. 2 is a conceptual diagram of the internal structure of the controller and hand scanner of Fig. 1;

Fig. 3 is a block diagram of the hand scanner;

Fig. 4 illustrates the contents of a PLU file contained in the hand scanner;

Fig. 5 is a block diagram of the controller;

Fig. 6 illustrates the contents of a PLU file contained in the controller;

Fig. 7 is a flowchart of the operation of the hand scanner;

Fig. 8 shows a format of data transmitted from the hand scanner to the controller; and

Fig. 9 is a flowchart of the operation of the controller.

As can be seen in Fig. 1, a hand scanner 11 is placed on a controller 13 mounted on a drawer unit 12, and which acts as a cradle for hand scanner 11. Hand scanner 11 includes a handy bar-code reader, and retrieves and stores sales data from information read by the bar code reader, and has a liquid-crystal display panel 11-1 and a keyboard 11-2 on its top surface and a sphere switch 11-3 at its rear end. When a force exceeding a predetermined value is applied to the sphere switch 11-3, it is turned on, and in doing so, the hand scanner 11 cuts off the supply of power to a CPU, peripheral circuit, and so on provided in the hand scanner. Thus, when hand scanner 11 is placed, for example, on a desk, the hand scanner to stop the light-emitting operation for bar-code scanning and other circuit operations by turning power off. When the scanner is placed in position on controller 13, the sphere switch 11-3 is received in a recess provided on the controller 13 and disabled. Thus, the circuit operations necessary for data transfers between hand scanner 11 and controller 13 (described later) are assured, and moreover power saving can be achieved.

Drawer unit 12 is a well known type, containing a drawer and a driver for opening and shutting the same. Controller 13 is electrically connected to drawer unit 12, via a drawer connector 12-1, and a printer connector 12-3, via a cable 12-2 connected to drawer connector 12-1. Printer connector 12-3 is connected to a printer 14 mounted on drawer unit 12.

Controller 13 performs various operations as performed by general ECRs; for example, the registration process for each of PLU codes, and transfers data to or from hand scanner 11 by means of, for example, optical signals (i.e. using infrared rays). Controller 13 has a power cable 15 connected to one end, and as will be explained in

detail later, supplies hand scanner 11 with a drive voltage when it is placed on the controller, and also supplies drawer unit 12 and printer 14 with drive voltages via drawer connector 12-1, cable 12-2, and printer connector 12-3.

Printer 14 is of a conventional type which prints sales data transferred from controller 13 onto receipts and journals, and is provided with a large rear display 16, enabling customers to observe.

Fig. 2 shows internal structures of controller 13 and hand scanner 11.

Controller 13 comprises a regulated power supply 13-1 connected to an AC power supply by cable 15, a control circuit 13-3 connected to regulated power supply 13-1 via a magnetic reed switch 13-2, and a pair of charging terminals 13-4 supplied with charging current from the control circuit 13-3. Each charging terminal 13-4 is forced by a coiled spring 13-5 to have its tip permanently exposed.

Hand scanner 11 has an optical system, which comprises a LED 11-21, a mirror 11-22, a lens 11-23, a CCD image sensor 11-24 and so on, constituting a bar code reader, a pair of charging terminals 11-27 connected to resistor 11-25 and second battery 11-26, and a magnet 11-28 which is positioned to oppose magnetic reed switch 13-2 when hand scanner 11 is placed in position on controller 13.

Magnetic reed switch 13-2 is automatically turned on by magnet 11-28 when hand scanner 11 is placed on controller 13, and turned off when hand scanner 11 is removed therefrom. When magnetic reed switch 13-2 is turned on, control circuit 13-3 is powered, and supplies a charging current to charging terminals 13-4. As a result, the second battery 11-26 is charged via the charging terminals 13-4 and resistor 11-25. When, on the other hand, magnetic reed switch 13-2 is off, control circuit 13-3 is disconnected from power supply 13-1, with the result that the supply of current to charging terminals 11-27 is cut off. In this way, even if charging terminals 13-4 are erroneously connected to each other, short-circuiting can be avoided.

Control circuit 13-3 is provided with a short-prevention circuit for preventing short-circuiting which would otherwise result from charging terminal 13-4 coming into contact with each other when hand scanner 11 was placed on controller 13.

Next, the circuit arrangement of hand scanner 11 will be described, with reference to Fig. 3.

A CPU 11-11, which is the core of hand scanner 11, fetches a program stored in a ROM 11-12 via a CPU peripheral circuit 11-13, so as to perform the bar-code read process, the process to retrieve sales data from the read bar-code information and store it, the key entry process, the display process,

and the process of transferring data to and from controller 13. For example, in the case of the bar-code read process, CPU 11-11 activates a read data controller 11-15 via CPU peripheral circuit 11-13 and an input/output controller 11-14, resulting in the light-emitting diodes (LEDs) contained in an optical system 11-16 being lit up. Bar codes optically read by the lens and CCD image sensor (solid-state image pickup device) in optical system 11-16 are recognized by read data controller 11-15 and then supplied to CPU 11-11. CPU 11-11 retrieves PLU codes from a RAM 11-17, in accordance with the recognized bar codes, and updates the number of sales commodities (items) corresponding to the PLU codes. The CPU 11-11 then displays the contents stored in RAM 11-17, accumulates unit prices of commodities being sold, and obtains a sub-total of the prices of these commodities, stores the sub-total in a sub-total register 11-11-1, and displays the sub-total based on the data read by the optical system. The data to be displayed is then delivered to liquid-crystal panel 11-1 via input/output controller 11-14, under the control of CPU 11-11. Thus, as compared with the type of hand scanner which retrieves data from PLU files in an electronic register and displays the retrieved data, the processing of the embodiment can be speeded up.

CPU 11-11 temporarily stores data to be transferred to controller 13 in a buffer 11-17-1 provided in RAM 11-17, and accepts key input signals from keyboard 11-2 via input/output controller 11-14 and CPU peripheral circuit 11-13, and performs the entry process for operated keys. When a finalize key FK, such as a cash key, of keyboard 11-2 is pressed, CPU 11-11 reads out all the sales data retrieved on the basis of bar codes read by optical system 11-16, and transmits the data to a transmitter 11-18 via CPU peripheral circuit 11-13 and input/output controller 11-14. Transmitter 11-18 converts the first block of the data supplied thereto into a wireless signal, such as an optical signal or infrared ray signal, and transmits it to controller 13. Upon receipt of the first block, controller 13 transmits an acknowledgement to a receiver 11-19 of hand scanner 11, in the form of a wireless signal, and the acknowledgement is then read into CPU 11-11 via input/output controller 11-14 and CPU peripheral circuit 11-13. CPU 11-11 then transmits the next data block, and the same operation is repeated until all the data blocks are transmitted. Reference numeral 11-20 denotes a secondary battery which can be charged by a supply voltage supplied from controller 13, to back up RAM 11-17.

When a given force is applied thereto, sphere switch 11-3 (Fig. 1) is turned on, and an ON signal is supplied to CPU 11-11 via input/output circuit 11-14 and peripheral circuit 11-13. In response to

the ON signal, CPU 11-11 stops the LED lighting-up operation, as well as its own operation. When the switch 11-3 is turned off, an OFF signal is supplied to the CPU 11-11, whereupon CPU 11-11 begins to operate and performs the LED lighting-up operation.

Fig. 4 shows a PLU file 11-31 contained in RAM 11-17. PLU file 11-31 indicates the structure of sales data retrieved by CPU 11-11 from bar codes read by optical system 11-16, and stores the sales data according to categories, such as characters representing the commodity name, the unit price and the number sold in respect of each PLU code (for example, codes classified by commodities). When the contents of the PLU file are transmitted from transmitter 11-18, all the data relating to the number of products sold is cleared. Though not shown, RAM 11-17 can also contain memory areas for storing the sales and the number of commodities sold for each department, or each commodity number which is linked with the PLU code.

Next, the circuit arrangement of controller 13 will be described, with reference to Fig. 5.

Controller 13 includes a CPU 13-11 serving as its core and performs the process of transmitting and receiving data in accordance with a program stored in a ROM 13-12, the registration processes classified by PLU codes on the basis of received data and so on. More precisely, CPU 13-11 transfers data to and from hand scanner 11 by means of a transmitter 13-13 and a receiver 13-14. Upon receipt of data transmitted from hand scanner 11, CPU 13-11 accepts the data via an input/output control circuit 13-15 and a CPU peripheral circuit 13-16, and performs the registration processes by PLU codes using RAM 13-17. If need be, CPU 13-11 transmits the received and stored data to printer 14 to print, through I/O circuit 13-15 and CPU peripheral circuit 13-16. Reference numeral 13-18 denotes a power supply and 13-19 a charging circuit adapted to charge secondary battery 11-20 (see Figs. 2 and 3) in hand scanner 11.

Fig. 6 shows the structure of a PLU file 13-20 stored in RAM 13-17. PLU file 13-20 is structured to store sales data classified by kinds, such as the characters, the unit price, the number sold, the amount sold and the total stock for each of PLU codes, like the PLU file contained in general ECRs. The number of kinds of sales data in the PLU file of controller 13 is larger than that of kinds of sales data in the PLU file in hand scanner 11. Sales data which is not in PLU file 11-29 of hand scanner 11 can be obtained by calculation based on sales data in the PLU file of hand scanner 11. Since the kinds of the sales data in the PLU file of hand scanner 11 may be small in number, the memory capacity of hand scanner 11 can be saved.

Next, the operation of the embodiment will be described.

According to the embodiment, the registration process by PLU codes may be performed by the normal key operation procedure through keyboard 11-2 on hand scanner 11 with the hand scanner placed on the controller, or by scanning the labels of commodities with the hand scanner in hand. Hand scanner 11 performs operations shown in the flowchart of Fig. 7.

Hand scanner 11 is placed in the wait state first until the scanning or key operation is performed while checking as to whether the label of a product is scanned (step A1) or keyboard 11-2 is operated (step A2).

When a key is pressed in this state, CPU 11-11 responds to the key operation to carry out the key entry process (step A3) and then decides whether the operated key is finalizing key FK or not in step A4. When the finalizing key FK is operated, the finalize flag is set on (step A5). However, if a PLU key (not shown) is pressed during the registration process, then the control operation proceeds to step A6 without setting the finalize flag on. Since in this case the off state of the finalize flag is detected in step A6, the normal registration operation, such as the subtotal calculating operation, is carried out and the results of the operation are stored in RAM 11-17 in step A7, and then the sold number in PLU file 11-31 corresponding to the entered PLU code is updated in step A8. In this case, if he need, the sold number of each department or article number linked with the PLU codes is also updated. And, the operation returns to step A1 so that the above process is repeated each time a PLU code is entered through the keyboard. Consequently, the sold number of each commodity in PLU file 11-31 is updated.

When a PLU code is optically read by scanning the label of a product with the hand scanner, on the other hand, the fact is detected in step A1 so that the operation proceeds to step A9. In step A9, PLU file 11-31 is retrieved on the basis of the read PLU code, the unit price corresponding to the PLU code is read from the file. Subsequently the normal registration operation such as the subtotal calculation is carried out and the result of the operation is stored in RAM 11-17 in step A10. The sold number corresponding to the PLU code in PLU file 11-31 is updated in step A11. The operation then returns to step A1 to repeat the above operation each time the scanning is performed. As a result, the sold number for each commodity in PLU file 11-31 is updated.

When the registration process of a sale is completed, finalizing key FK is pressed. This is detected in step and then the process proceeds through steps A5 and A6 to step A12 in which the

finalize operation, for example, the calculation of change is carried out. Data to be transmitted to controller 13 is prepared and stored in buffer 11-17-1 in step A13.

5 CPU 11-11 monitors the charging of secondary battery 11-20. When the charging of secondary battery 11-20 is initiated, CPU 11-11 decides that the hand scanner has been placed on controller 13. As a result, the CPU transmits the data stored in
10 buffer 11-17-1 through transmitter 11-18 to the controller 13 in step A14, clears all the sold number data and the subtotal data stored in subtotal memory in PLU file 11-31, and clears data stored in buffer 11-17-1 in step A15, and clears the finalize flag in step A16.

15 Fig. 8 shows the format of transmission data. The transmission data comprises a start code, a drawer open command which is set when change needs to be given, a PLU code, the subtotal, a
20 code for each sale, a receipt printing command which is set when an operator presses a receipt issue key in response to the request of a customer to issue a receipt, and an end code. The PLU code may involve any one of PLU codes in which the
25 sold number in PLU file 11-31 is one or more. Namely, the PLU code in which the sold number is zero is excluded. In the case of a sale of a plurality of products the number of the PLU code corresponding to the sold number is set. Since all the
30 sold numbers in PLU file 11-31 are cleared each time the registration of a sale of a sale is completed, that the sold number in the PLU file 11-31 is one or more represents the record of the present sale. The sales data on the department and article
35 number is also transmitted in the same manner.

In response to the data thus transmitted from hand scanner 11, controller 13 performs the process according to the flowchart of Fig. 9. When
40 hand scanner 11 is placed on controller 13 (in this case erroneous transmission of data decreases and data transmission speed improves as compared with the case where they are separated from each other), the transmission of data from hand scanner
45 11 is detected in step B1 and then a check is made as to whether the drawer open command is received or not in step B2. When the drawer open command is received, a drive signal is applied to drawer body 12 in step B3 so as to open the
50 drawer and then the process returns to step B1. On the other hand, when the drawer open command is not received, CPU 13-11 retrieves the PLU file 13-20 and performs an operation for updating the sold number, the amount of sales in PLU file 13-20 and the total stock in accordance with the sold number
55 in step B4. Subsequently the result of the operation is transferred to PLU file 13-20 to update the sold number, the amount of sales and the total stock corresponding to the PLU code in step B5. When a

printing command is received in step B6, a drive signal is applied to printer 14 to print out the sales data on a receipt and a journal in step B7. And then the process returns to step B1. Similarly, when no receipt print command is received in step B7, the process returns to step B1. The sales data on the department and article number are also subjected to the same process.

The registration per PLU codes are performed on the basis of data transmitted from hand scanner 11 in such a way as described above. CPU 13-11 also performs the registrations per sales on files by sales (not shown) in RAM 13-17 and various registration processes including registrations by persons on duty as required. As described above, according to the sales data processing system of the present invention, registration of sales are performed using a hand scanner, the sales data is transmitted to a controller for data collection, and the contents are printed out by a printer. Therefore, a plurality of hand scanners may be used with a controller and a printer with economy. Moreover, since the registration process is performed by the hand scanner sale by sale, the controller is not required to control the timing of data transfers and the interference of data will not occur.

In the above embodiment, whenever finalizing key FK is operated, hand scanner 11 needs to be placed on controller 13 for data transmission. However, when the next registration process is performed without placing hand scanner 11 on controller 13, sales data may be accumulated by adding data of the former sales data without cancelling the former sales data.

In the above embodiment, when the receipt print command is received, the registration per PLU codes are performed. However, customers sometimes require no issue of a receipt. In such a case, a check is made as to whether the receipt print command is present or absent after the records by PLU codes are performed and a receipt needs not to be issued in the absence of the receipt print command.

In the embodiment, the LED is used as a light source of the optical reader. Alternatively, a lamp or a laser device may be used instead.

The embodiment uses a hand scanner having a plurality of light-emitting devices for a light source of the optical reader. Alternatively, a pen-type scanner may be used which uses one light-emitting device to read information.

Transmitting members for transmitting sales data to the sales data collecting device may be a wireless device utilizing electromagnetic waves. In addition, the light source of the optical reader may be turned on and off to transmit sales data to the data collecting device.

Even if the hand sales data processing device

is not placed on the data collecting device, the transmission of sales data to the data collecting device will be made possible by utilizing electromagnetic waves.

Claims

1. A handy type sales data processing device comprising:
 optical read means (11-16) for reading recorded information representing a commodity code from a recording medium;
 storage means (11-17) for storing sales data including the name of a commodity and the unit price corresponding to the commodity code;
 converting means (11-11) for converting the commodity code read by said optical read means to sales data stored in said storage means;
 display means (11-1) for displaying the sales data converted by said converting means; and
 transmitting means (11-19) for transmitting the commodity code to another device (13).

2. A handy type sales data processing device comprising:
 optical read means (11-16) for reading recorded information representing a commodity code from a recording medium;
 storage means (11-17) for storing sales data including the name of a commodity, and a unit price corresponding to the commodity code;
 total value storage means (11-17) for storing a total value of the number sold per commodity;
 updating means (11-17) for updating the total value in said total value storage means each time recorded information is read by said optical read means;
 display means (11-11) for displaying the sales data corresponding to the commodity code read by said optical read means; and
 transmitting means (11-18) for transmitting the commodity code and the total value in said total value storage means updated by said updating means.

3. A handy type sales data processing device comprising:
 optical read means (11-16) for reading recorded information representing a commodity code from a recording medium;
 storage means (11-17) for storing commodity codes and total values of numbers sold corresponding to the commodity code;
 retrieving means (11-11) for retrieving data stored in said storage means in accordance with corresponding the code read by said optical read means;
 totaling means (11-11) for obtaining the total value of the number sold of a commodity corresponding

to the commodity code retrieved by said retrieving means;
 specifying means (11-12) for specifying the end of a sale;
 transmitting means (11-18) for transmitting the commodity codes and the total value of the number sold totaled by said totaling means when the end of a sale is specified by said specifying means; and
 clearing means (11-11) for clearing the total value in said storage means after the transmission operation of said transmitting means is completed.

4. A sales data processing system comprising:
 a handy type sales data processing device having optical read means (11-16) for reading recorded information representing a commodity code from a recording medium,
 storage means (11-17) for storing sales data on the basis of the commodity code read by said optical read means;
 a secondary battery (11-20) for backing up said storage means,
 transmitting means (11-18) for transmitting the sales data in said storage means, and
 charging terminals (11-17) connected to said secondary battery; and
 a main body device having
 a case on which said handy type sales data processing device is placed,
 terminals (13-4) exposed from said case so as to be connected to said charging terminals when said handy type sales data processing device is placed on said case,
 detecting means (13-2) for detecting the placement of said handy type sales data processing device on said case,
 means responsive to the detection of said detecting means, for supplying power to said charging terminals via said terminals for charging said secondary battery, and
 receiving means (13-14) for receiving the sales data transmitted from said transmitting means.

5. A sales data processing system comprising:
 a handy type sales data processing device having optical read means (11-16) for reading recorded information representing a commodity code from a recording medium,
 storage means (11-17) for storing sales data on the basis of the commodity code read by said optical read means, and
 first transmitting means (11-18), for transmitting the sales data stored in said storage means;
 a sales data collecting device having
 totaling means (13-21) for totaling sales data transmitted from said handy type sales data processing device for each commodity codes;
 storage means for storing sales data totaled by said totaling means; and

second transmitting means (13-13, 14) for transmitting the sales data transmitted from said handy type sales data processing device; and
 a printer device (14) for printing out the sales data transmitted from said second transmitting means of said sales data collecting device.

6. A sales data processing system according to claim 5, characterized in that said first transmitting means (11-18) transmits print specifying data as well as the sales data, the print specifying being input when means (11-2) provided in said handy type sales data processing device specifies the printing out of the sales data; and characterized in that said second transmitting means (13-13) of said sales data collecting device (13) transmits the sales data and the print specifying data to said printer device (14), and said printer device (14) prints out the sales data in response to receiving presence of the print specifying data.

7. A sales data processing system according to claim 5, characterized in that said handy type sales data processing device (11) includes detecting means (11-11) for detecting that said handy type sales data processing device is placed on said sales data collecting device (13), and said handy type sales data processing device (11) responds to the detection by said detection means (11-11), to transmit the sales data in said storage means (13-21).

8. A handy type sales data processing device comprising:
 optical read means (11-16) including light-emitting means for reading recorded information representing a commodity code from a recording medium;
 a light-emission stopping switch including a protruding portion protruding from a body and responsive to application of pressure to said protruding portion for stopping the operation of said light-emitting means of said optical read means; and
 transmitting means (11-18) for transmitting the commodity code read by said optical read means.

9. A handy type sales data processing device according to claim 8, characterized in that said handy type sales data processing device includes control means (11-11) for controlling various operations and stops the supply of power to said control means, to stop the operation of said control means, in response to the actuation of said light-emission stopping switch (11-13).

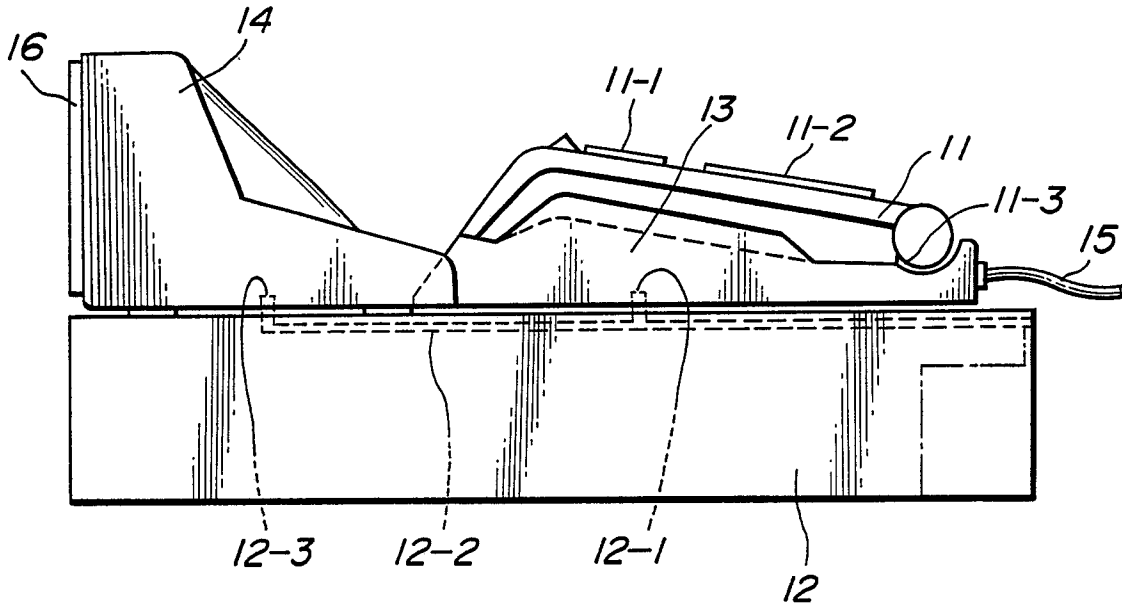


FIG. 1

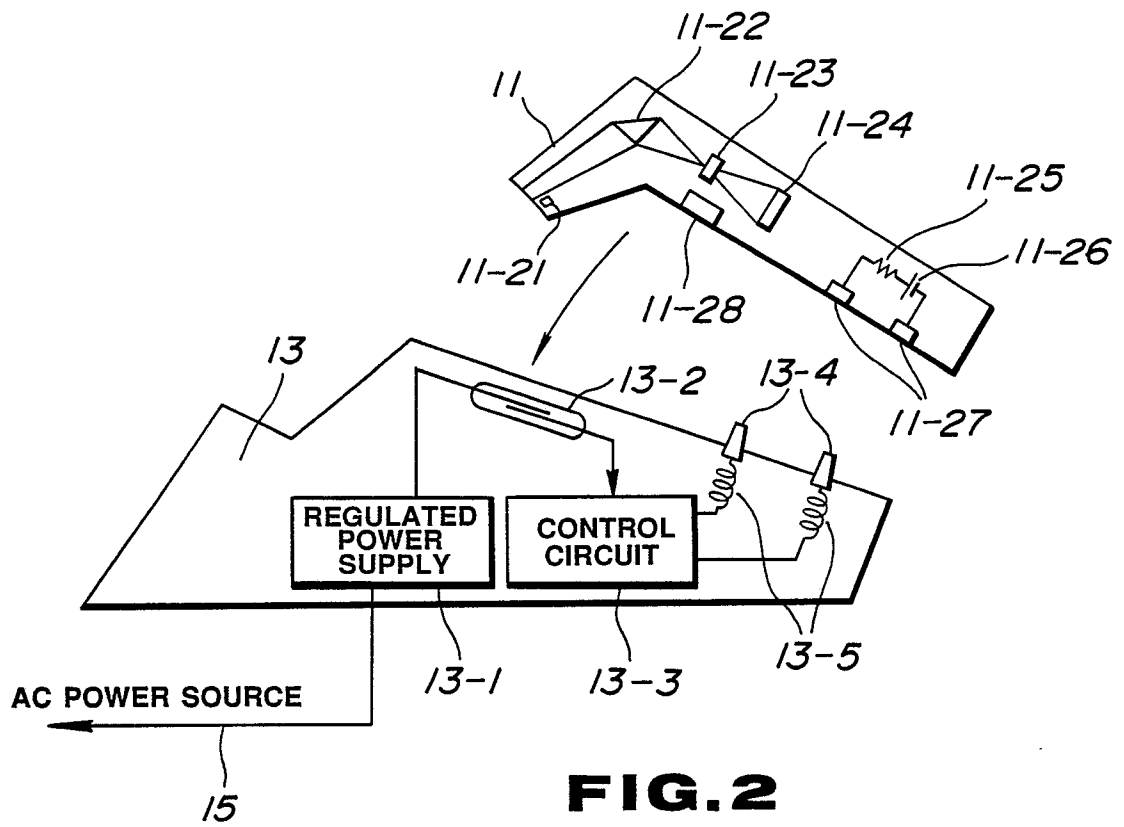


FIG. 2

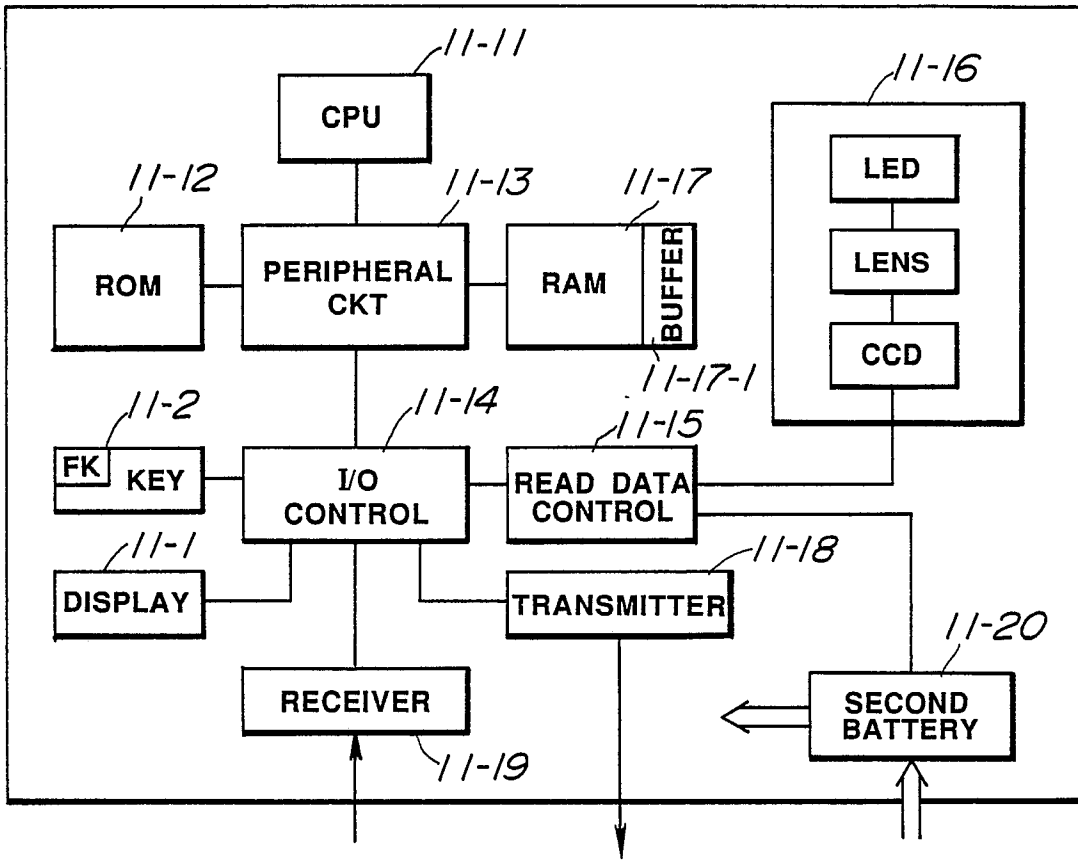


FIG. 3

PLU FILE 11-29

PLU CODE	CHARACTERS	UNIT PRICE	NUMBER SOLD

FIG. 4

PLU FILE 13-20

PLU CODE	CHARACTERS	UNIT PRICE	NUMBER SOLD	AMOUNT SOLD	STOCK

FIG. 6

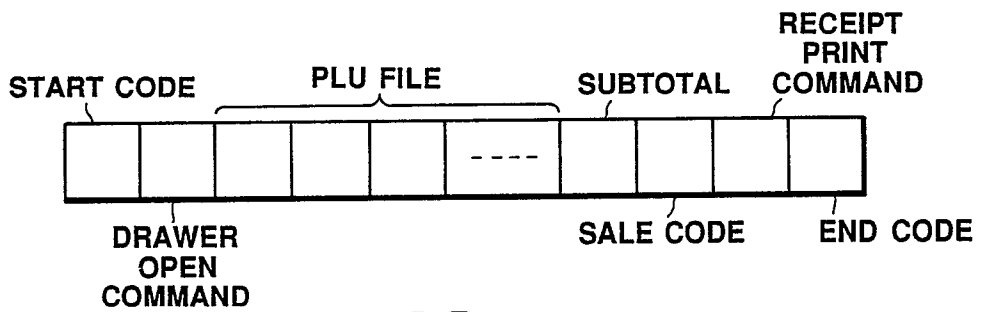


FIG. 8

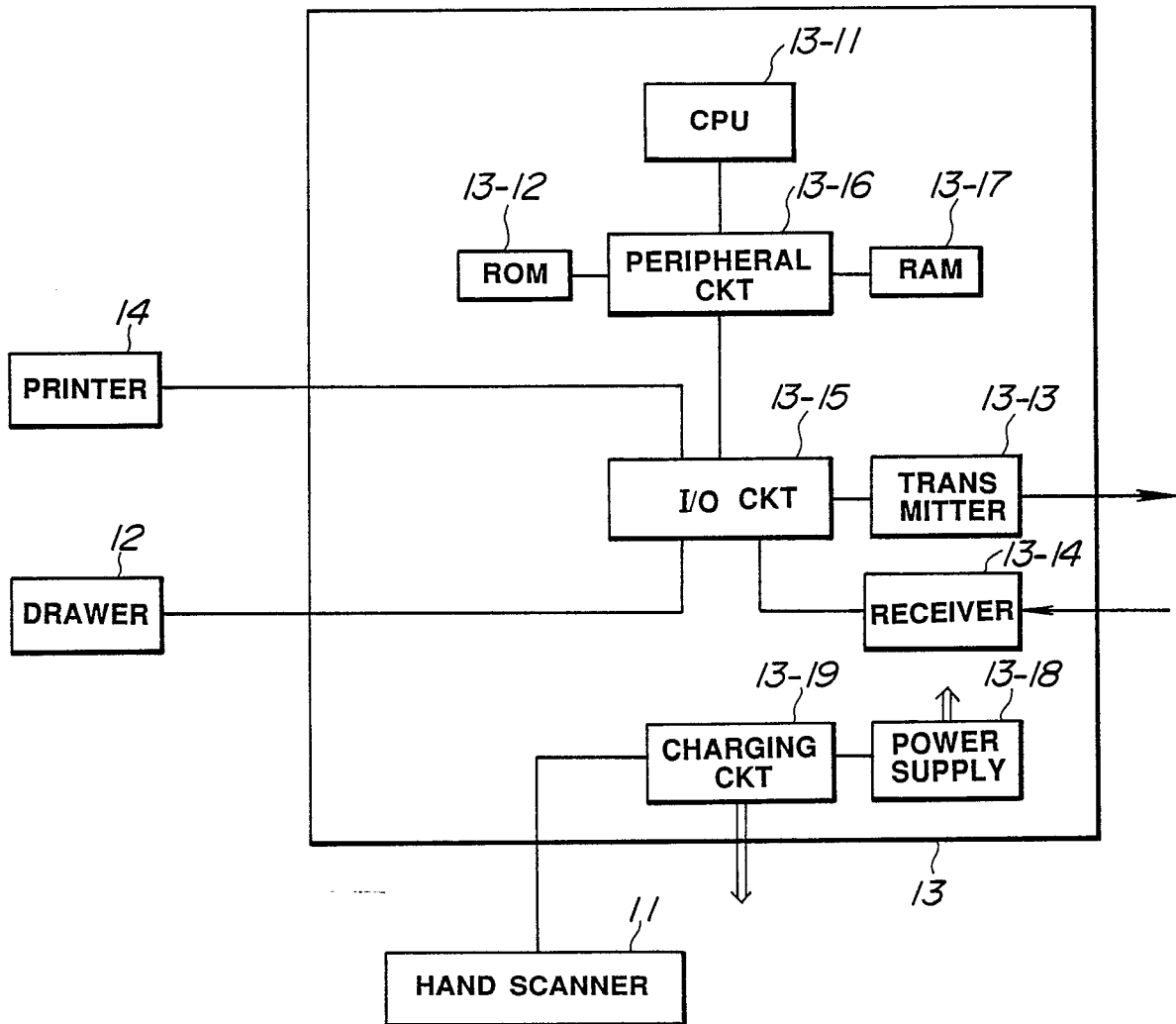


FIG. 5

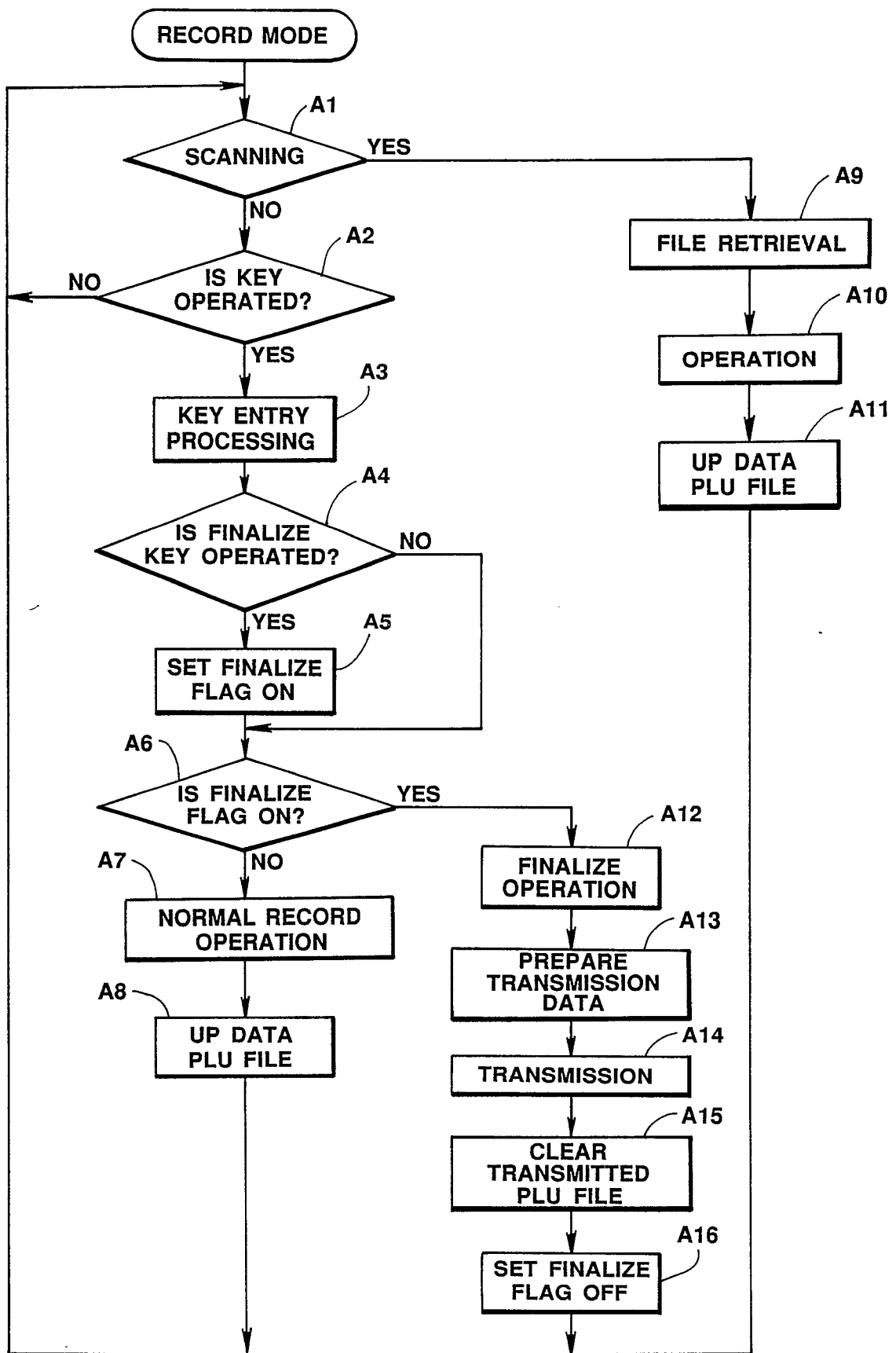


FIG. 7

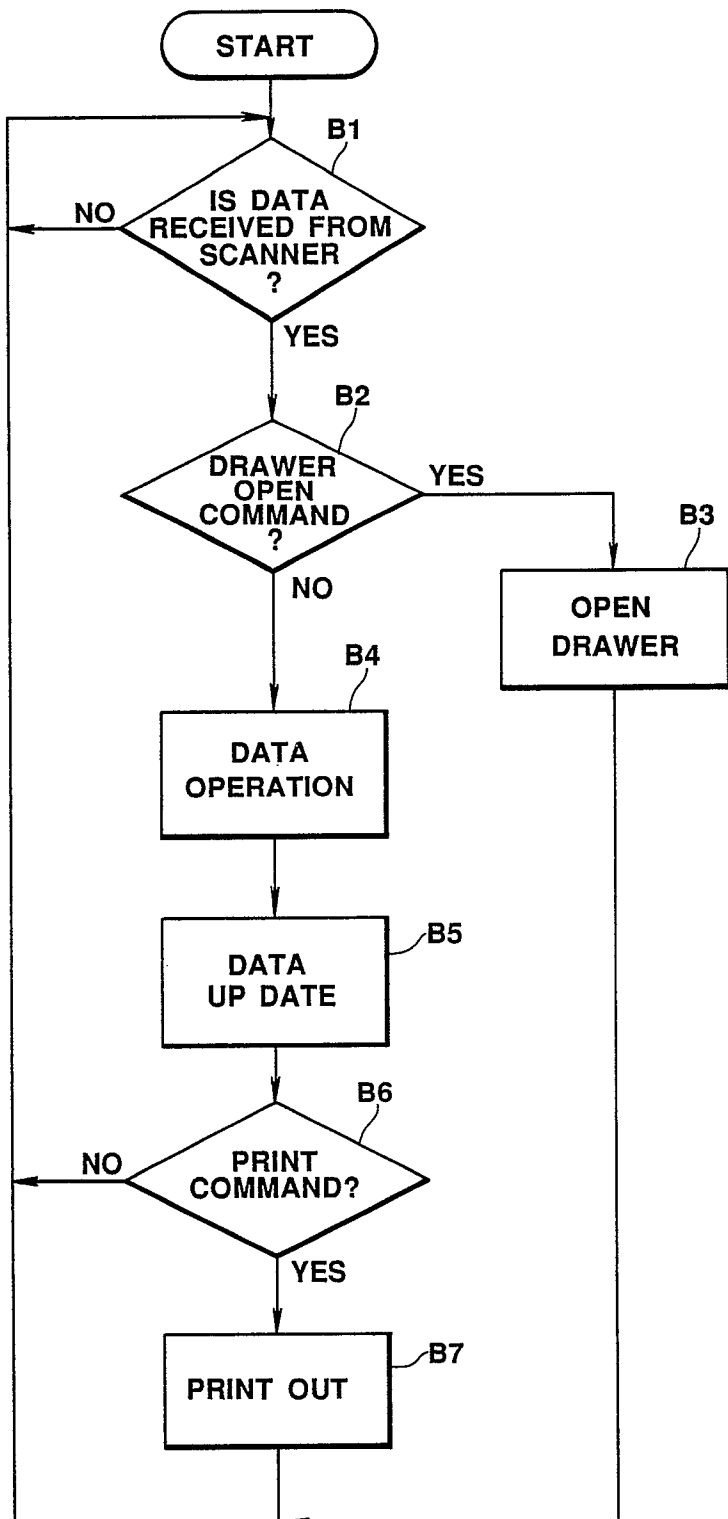


FIG. 9