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(54) **Electronic cash register.**

(57) An electronic cash register includes a scanner (2) reading out a bar code attached to a commodity. A central processing unit (7) is responsive to an identification code included in the bar code as read out, the identification code indicating a kind of the bar code, to read out a department code number or destination-to-be-registered, which is stored in advance in areas (100 through 109) of a random access memory (9) and corresponds to the identification code. The central processing unit (7) registers amount data of the commodity included in the read bar code in any of areas (91 through 9n) of the random access memory (9) corresponding to a department number of destination to be registered as read out.

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FIG. 9A

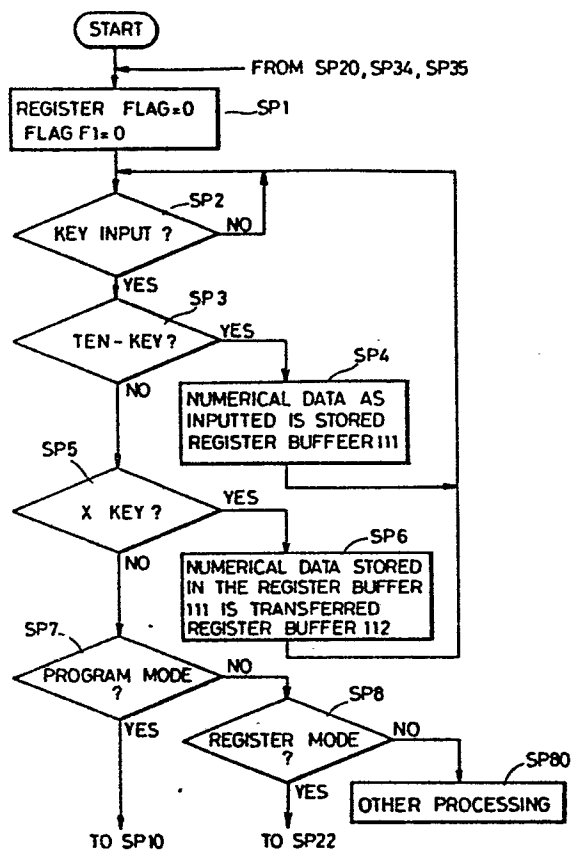


FIG. 9B

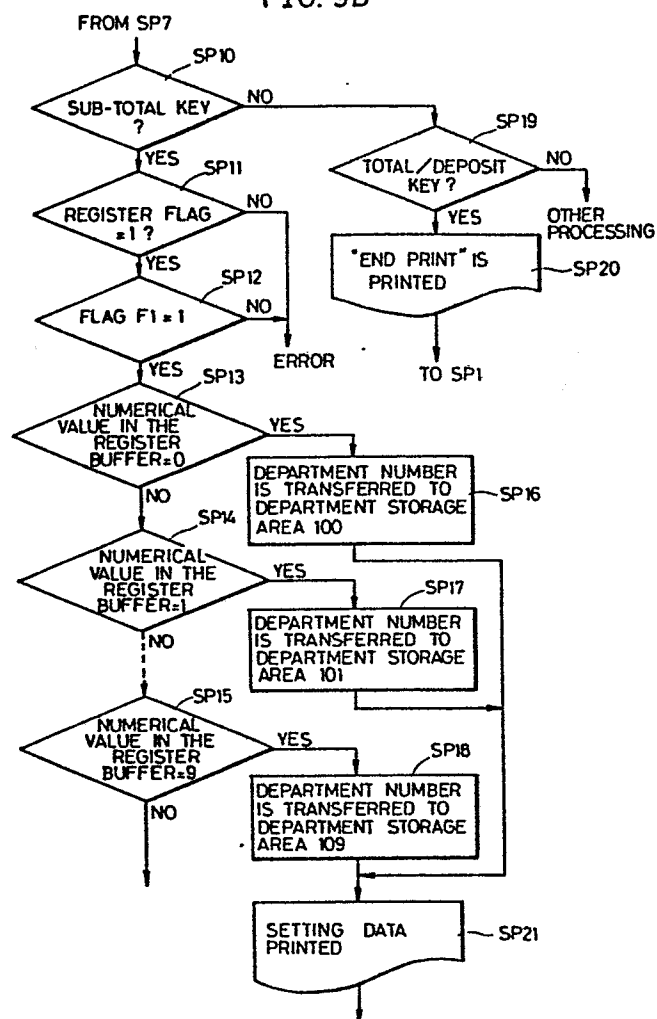


FIG. 9C

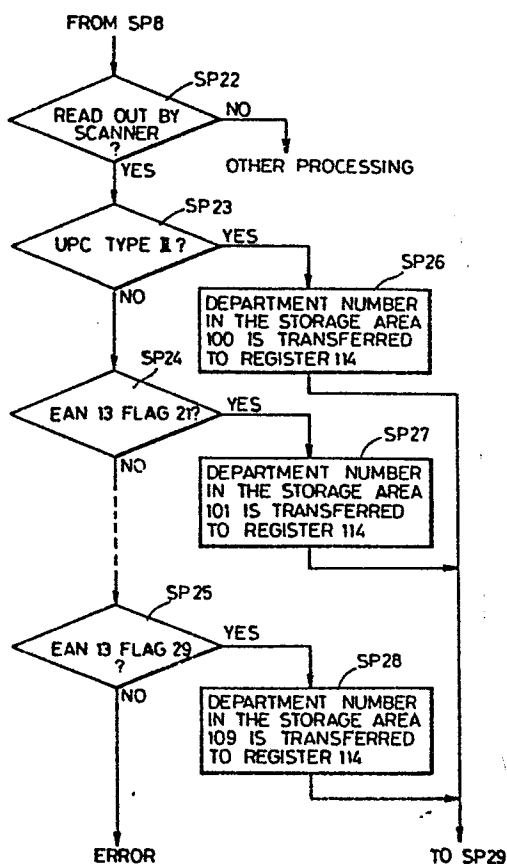
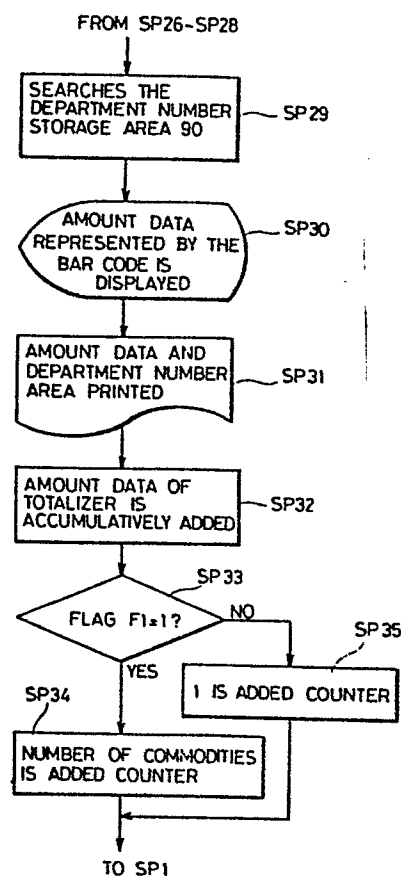


FIG. 9D



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Field of the Invention

5 The present invention relates to an electronic cash register (ECR). More particularly, the present invention relates to an electronic cash register in which a bar code attached to a commodity is read out by a scanner so that the data concerning the commodity can be registered.

10 Description of the Prior Art

There are some electronic cash registers in which an operator operates a keyboard so that the data concerning a commodity can be registered and there are other electronic cash registers in which a bar code recorded in advance in
15 a commodity or a bar code recorded in a label attached to a commodity is read out by a scanner so that the data concerning the commodity can be registered. The ECR in which a bar code is read out by a scanner so that the data concerning the commodity can be registered has an
20 advantage that efficiency in registering operation by an operator can be enhanced.

Regarding a bar code, there is one kind of bar code, which is a so-called source marking which is printed in advance in a package for a commodity by a maker who
25 produces the commodity and there is another kind of bar

code, which is a so-called instore marking, in which a store selling commodities prints a bar code on a label which is attached to a commodity. The bar code of the source marking includes only a commodity code of the commodity as recorded and the bar code of the instore marking includes an amount data of a commodity as coded and recorded, as well as the commodity code.

In case where a registering operation is performed using a bar code of a source marking, there need be provided in an electronic cash register a PLU (Price Look Up) file storing amount data corresponding to each of commodity codes, because the bar code includes only commodity code. If and when the data concerning commodity is to be registered, a bar code is first read out by a scanner and then in response to the commodity code recorded in the bar code as read out, the amount data corresponding to the commodity code is read out from the PLU file and registered. However, in a store, such as a supermarket handling many kinds of commodities, amount data corresponding to all of the commodity codes should be stored in the PLU file, which presents a disadvantage that memory capacity should be extremely large.

On the other hand, in the bar code of the instore marking, amount data of commodities, as well as commodity codes corresponding to the commodities, are coded and

recorded, and hence the data concerning the commodities can be registered without using any PLU file.

However, a PLU file is actually provided in most of conventional electronic cash registers, so that when a bar
5 code of instore marking is read out, the PLU file is searched based on the commodity code recorded in the bar code as read out so that the department-to-be-registered can be identified. However, as described in the foregoing, in stores handling many kinds of commodities,
10 PLU file used in an electronic cash register requires a large scale capacity of memory. In addition, in an electronic cash register with a PLU file, the amount data of commodities stored in the PLU file must be changed each time the amount of the commodities varies. For this
15 reason, it is usual that PLU file is not required for a store requiring only bar codes of instore marking to be read out.

SUMMARY OF THE INVENTION

Accordingly, a primary object of the present
20 invention is to provide an electronic cash register which can register data concerning commodities by reading out the bar code of an instore marking, without needing any PLU file.

Briefly stated, in accordance with the present
25 invention, a bar code attached to a commodity is read out

by a bar code reading means and, based on an
identification code contained in the bar code,
representing a kind of the bar code,
department-of-destination-to-be-registered storing means
5 is searched, so that a department number of
destination-to-be-registered corresponding to the
identification code stored in advance is determined. An
amount data of the commodity recorded in the bar code as
read out is registered in each department storing region
10 of department storing means corresponding to the
determined department.

Accordingly, in accordance with the present
invention, the kind of bar code of instore marking
recording a commodity code and an amount data is
15 determined so that the department of destination-to-
be-registered of that commodity can be searched, and
hence, the data concerning the commodity can be registered
in the corresponding department storing region, without
referring to a PLU file, after reading out the bar code.
20 Accordingly, in a situation where only a bar code of
instore marking is read out and registered, there is no
need to provide a PLU file of a large scale memory and
hence a cost of an electronic cash register can be
reduced. In addition, even if a price of a commodity

changes, there is no need to alter the amount data in the PLU file at each time.

These objects and other objects, features, aspects and advantages of the present invention will become more
5 apparent from the following detailed description of the present invention when taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a perspective view of one embodiment of the
10 present invention;

Fig. 2 is a key arrangement in a keyboard shown in Fig. 1;

Fig. 3 is a schematic block diagram showing an electrical structure of one embodiment of the present
15 invention;

Fig. 4 and Fig. 5 are diagrams showing data stored in a random access memory shown in Fig. 3;

Fig. 6 is a diagram showing kinds of bar code;

Fig. 7A is a diagram showing a procedure of key
20 operation for setting a department of destination-to-be-registered;

Fig. 7B is a diagram showing a procedure of key operation for registering;

Fig. 8A is a diagram showing an example of a printed receipt when a department of destination-to-be-registered is set;

5 Fig. 8B is a diagram showing an example of a printed receipt for registering; and

Figs. 9A to 9D are flow diagrams for explaining a specific operation of one embodiment of the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

10 Fig. 1 is a perspective view of one embodiment of the present invention and Fig. 2 is a key arrangement of a keyboard included in an electronic cash register shown in Fig. 1.

Referring to Figs. 1 and 2, a structure of an
15 electronic cash register will be explained. A scanner 2, a bar code reading means, connected to an electronic cash register main body 1 through a cable 3. The scanner 2 reads out a bar code recorded in a commodity or a bar code recorded in a label attached to a commodity. The
20 electronic cash register main body 1 is provided with a keyboard 4 on a vertical operating surface, and with a display 5 and a printer 6 on a vertical operating surface thereof.

As shown in Fig. 2, the keyboard 4 is provided with a
25 mode selection switch 41, department keys 42, a ten-key 43

and function keys 44. The mode selection switch 41 selects one of a program mode (P), a power supply-off mode (OFF), a register mode (R), an inspection mode (X) and an adjustment mode (Z). The department keys 42 designate a department number of a commodity to be registered. The ten-key 43 is adapted to input the data concerning the number of commodities. The ten-key 43 includes an X-key 431. The X-key 431 is adapted to specify that the numerical data inputted from the ten-key 43 is the number of commodities.

The function keys 44 are operated for providing various kinds of processing instructions and comprise a sub-total key 441 and a cash total/deposit key 442. The sub-total key 441 is operated when an operation of the total data of the commodities registered so far is instructed, and the cash total/deposit key 442 is operated or depressed when an operation of total of amount data concerning all of the commodities that a customer purchased is instructed or when operation for calculating a change is instructed. The sub-total key 441 and the cash total/deposit key 442 are also operated or depressed when the department of destination to be registered, as described subsequently, is set.

Fig. 3 is a schematic block diagram of one embodiment of the present invention and Figs. 4 and 5 are diagrams

showing the data stored in a random access memory 9 shown in Fig. 3.

Now, referring to Figs. 3, 4 and 5, an electric structure of one embodiment of the present invention will be described. The scanner 2, the keyboard 4, the display 5 and the printer 6 as shown in Fig. 1, are connected to a central processing unit 7. A read only memory (ROM) 8 and a random access memory (RAM) 9 are connected in association with the central processing unit 7. The read only memory 8 stores in advance a program based on a flow diagram shown in Figs. 9A through 9D described subsequently. The random access memory 9 includes storage areas 91, 92, ... 9n, 100, 101, ... 109, and 111 through 114 for storing each kind of data, as shown in Figs. 4 and 5.

The storage areas 91, 92, ... 9n constitute a department file 90 as department storing means and each of the areas includes, as shown in Fig. 6, a totalizer 901, a counter 902, a descriptor area 903 and a setting area 904. The totalizer 901 stores the amount sold for each department, the counter 902 is an area for storing accumulatively the number of registering commodities for each department, the descriptor area 903 is an area for storing a descriptor for each department and the setting area 904 is an area for storing a status, such as presence

or absence of tax, and presence or absence of authorization printing.

The storage areas 100, 101, 109 constitutes department-number-of-destination-to-be-registered storing means which stores department number of destination to be registered, corresponding to the kind of the bar code. The storage areas 111, 112 are used as a register buffer for temporarily storing numerical data inputted from the ten-key 43. The storage areas 113 stores a register flag indicating an operation of the ten-key 43 and flag F1 indicating an operation of the X-key 431. The storage area 114 is used as a work register for temporarily storing the data necessary for processing by the central processing unit 7.

Fig. 6 is a diagram showing bar codes.

Now, bar codes used in one embodiment of the present invention will be briefly described. The bar code shown in Fig. 6 is a type of an instore marking as described in the foregoing, the instore marking including UPC TYPE II and EAN 13. The EAN 13 includes 21 through 29 recorded in the top of the code indicating each of bar codes and also includes nine kinds of EAN 13 FLAG 21 through EAN 13 FLAG 29 as used. In case where a label is attached to each commodity in an instore marking, it may be attached

corresponding to any one of these format types for each department.

Meanwhile, X_1 through X_5 of the UPC TYPE II and X_1 through X_4 of the EAN 13 represent commodity code and P_1 through P_4 of the UPC TYPE II and P_1 through P_5 of the EAN 13 represent amount data. C/P is a check digit for amount data and C is a check digit for the whole bar code.

Fig. 7A is a diagram showing a procedure of key operation when the department of destination to be registered is set, Fig. 7B is a diagram showing a procedure of key operation for registering, Fig. 8A is an example of a printed receipt when the department of destination to be registered is set, and Fig. 8B is an example of a printed receipt for registering. Figs. 9A through 9D are flow diagrams for explaining a specific operation of one embodiment of the present invention.

Now, referring to Figs. 1 to 9D, a specific operation of one embodiment of the present invention will be described. First of all, a department number of destination to be registered is set in the storage areas 100, 101, ... 109. More particularly, an operator operates a mode selection switch 41 for selecting a preset mode. Then, in accordance with a procedure of key operation shown in Fig. 7A, a number representing the kind of bar code is inputted from the ten-key 43. That is, if

and when a kind of bar code is of the UPC TYPE II, "0" is inputted, and if the kind of bar code is of the EAN 13 FLAG 21, "1" is inputted, if EAN 13 FLAG 22, "2", , and if EAN 13 FLAG 29, "9" is inputted. Then, the X-key
5 431 is operated so that it can be specified that the numerical data inputted from the ten-key 43 is the kind of the bar code. Thereafter, the operator provides, by using the ten-key 43, the numerical data showing a department number and again operates the X-key 431 so that it can be
10 specified that the inputted numerical data is a department number. In such a way, the kind of bar code and the department number are inputted and when the next department number of destination to be registered is set, a sub-total key 41 is operated. After completion of all
15 of the department numbers of destination to be registered, a cash total/deposit key 442 is operated.

Thus, if and when the department number of destination to be registered is key-inputted, the central processing unit 7 sets such department number as inputted
20 in the storage areas 100, 101, ... 109. More particularly, the central processing unit 7 clears the register flag and flag F1 in the step SP1. In the step SP2, the central processing unit 7 waits until any key input is applied and if and when it is determined that any
25 key input is applied, the program proceed to the step SP3.

In the step SP3, it is determined whether numerical data from the ten-key 43 is applied or not, and if applied, in the step SP4, the numerical data as inputted is stored in the register buffer 111. If and when the X-key 431 is
5 operated for the purpose of specifying that the numerical data inputted from the ten-key 43 is the kind of bar code, in the step SP5, it is determined whether the X-key 431 is operated and if operated, in the step SP6, the numerical data stored in the register buffer 111 is transferred to
10 the register buffer 112. As a result, in the register buffer 112, the identification code representing the kind of the bar code comes to be stored.

After inputting the numerical data representative of the kind of bar code, an operator inputs a department
15 number by using a ten-key 43, and then, in the step SP2, the central processing unit 7 determines that any key operation was made, and if and when it is determined in the step SP3, that the numerical data from the ten-key 43 is inputted, the inputted numerical data is stored in the
20 register buffer 111 in the step SP4. The operator operates the X-key 431 for the purpose of specifying that the numerical data inputted from the ten-key 43 is a department number, and then in the step SP5, the central processing unit 7 determines that the X-key 431 was
25 operated and the numerical data stored in the register

buffer 111 is transferred to the register buffer 112. As
a result, in the register buffer 112, the identification
code representing the kind of the bar code and the
department number corresponding to the bar code come to be
5 stored.

The program again returns to the step SP2 in which
any key operation is determined and, if and when no
ten-key 43 is operated in the step SP3, and no X-key 431
is operated in the step SP5, the mode set by the mode
10 selection switch 41 is determined in the steps SP7 and
SP8. If and when the program mode is determined in the
step SP7, the program proceeds to the programming
processing operation of the step SP10 and the steps
subsequent thereto. If and when it is determined that the
15 mode is not a program mode in the step SP7, it is
determined whether the mode is a register mode or not in
the step SP8. If it is a register mode, the program
proceed to the registering operation defined in the step
SP22 and the steps subsequent thereto, and if it is not a
20 register mode, other processing is made in the step SP80.

If and when a sub-total key 441 is operated, the
central processing unit 7 determines whether the
sub-total key 441 is operated or not in the step SP10. If
and when it is determined that the sub-total key 441 is
25 operated, it is determined whether the register flag is

set in the step SP11. Since the register flag has been set in the storage area 113 when the ten-key 43 is operated, the central processing unit 7 makes a decision, depending on the fact that the register flag is set in the storage area 113 or not. If the register flag is set, an error processing is made.

The central processing unit 7 determines whether the flag F1 is set in the storage area 113 or not in the step SP12. The flag F1 is set when the X-key 431 is operated. If and when the flag F1 is set, it is determined in the step SP13, whether the numerical value representing the kind of the bar code stored in the register buffer 112 is "0" or not. If it is "0", which means that the kind of the bar code is of the UPC TYPE II, the department number stored in the register buffer 112 is transferred to the department storage area 100 in the step SP16.

If and when, in the step SP13, the content of the register buffer 112 is not "0", it is determined in the step SP14 whether the numerical value representing the kind of the bar code stored in the register buffer 112 is "1" or not. If and when "1" is stored in the register buffer 112, the department number stored in the register buffer 112 is transferred to the storage area 101 in the step SP17. Similarly, based on the numerical value representing the kind of the bar code stored in the

register buffer 112, department numbers as sequentially inputted are set in the storage area 109.

After completion of setting department numbers in the storage area 109, the central processing unit 7 applies to the printer 6 the data as set respectively in the storage areas 100, 101, ... 109 in the step SP21, so that the printed form as shown in Fig. 8A can be obtained.

Finally, if and when the operator depresses the cash total/deposit key 442, it is determined in the step SP19 whether the cash total/deposit key 442 is operated or not and if and when it is determined that such key 442 is operated, the character "end print" is printed by the printer 6 in the step SP20.

Now, an operation of a register mode will be described. In the register mode, an operator selects a register mode through the mode selection switch 41 and the bar code attached to the commodity the customer purchased is read out by the scanner 2.

In the step SP8, it is determined whether the register mode is set or not and if set, it is determined whether such registration is made by the scanner 2 or not in the step SP22. If it is determined that such registration is made by the scanner 2, and then it is determined whether the bar code as read out is of the UPC TYPE II or not in the step SP23. If it is the UPC TYPE II

bar code, in the step SP26, the department number stored in the department number storage area 100 is stored in the register 114. If and when the bar code as read out is not UPC TYPE II, it is determined whether it is a bar code of
5 EAN 13 FLAG 21 in the step SP24. If it is a bar code of EAN 13 FLAG 21, in the step SP27, the department number stored in the department number storage area 101 is stored in the register 114. Subsequently, the similar processing is made and if and when in the step SP25, it is a bar code
10 of EAN 13 FLAG 29, the department number stored in the department number storage area 109 is stored in the register 114 in the step SP28.

In the step SP29, the central processing unit 7 searches the department number storage area 90 based on
15 the department number stored in the register 114. Then, in the step SP30, amount data represented by the bar code is displayed in the display 5. Furthermore, in the step SP31, the descriptor of the department is read out from the storage area of the corresponding department and
20 descriptor, the amount data and the department number are printed by the printer 6 in a manner as shown in Fig. 8B. In addition, in the step SP32, the amount data of the totalizer of the corresponding department number is accumulatively added. Furthermore, in the step SP33, the
25 central processing unit 7 determines whether the flag F1

is set or not. If and when the flag F1 is set, which indicates that a plurality of identical commodities are purchased, the number of commodities as stored in the register buffer 112 is added to the counter and if the
5 flag F1 is not set, in the step SP34, 1 is added to the counter and the program returns to the initial state.

As described in the foregoing, since departments of destination to be registered can be set in accordance with kind of bar codes, the department corresponding to the
10 kind of bar code as read out can be retrieved in accordance with the kind of the bar code read out by the scanner 2 and hence it becomes possible to make a registration by a scanner 2, without providing any PLU file. Therefore, necessity of providing a large scale
15 random access memory can be eliminated and a cost of an electronic cash register can be reduced and in addition, even if a price of an electronic cash register varies, no operation for setting new price after changing of the price is required.

20 Although the present invention has been described and illustrated in detail, it is clearly understood that the same is by way of illustration and example only and is not to be taken by way of limitation, the spirit and scope of the present invention being limited only by the terms of
25 the appended claims.

WHAT IS CLAIMED IS:

1. An electronic cash register capable of registering data concerning commodity to which a bar code is attached in advance, the bar code including identification code representing kind of bar code and
5 amount data of the commodity, comprising:
 - bar code reading means (2) for reading out the bar code attached to said commodity;
 - department storing means for storing (91 - 9n), for each of a plurality of departments, the data concerning
10 commodities belonging to each of the departments;
 - department number-of-destination-to-be-registered setting means (43, 431, 441, 442; 100 - 109) for setting in advance, for each identification code, department number representing a department to be registered;
 - 15 determining means (SP23 - SP25) responsive to reading out of the bar code by said bar code reading means for retrieving said setting means based on the identification code included in the bar code as read out for determining the department corresponding to the identification code;
 - 20 and
 - means (7) for providing the amount data of the commodity as read out by said bar code reading means to the department storage region of said department storing

(continued)

means corresponding to the department determined by said
25 determining means.

2. An electronic cash register in accordance with
claim 1, wherein

said setting means includes

input means (43, 431, 441, 442) for inputting
5 said identification code and said department number; and
department number-of-destination-to-be-
registered storing means (100 - 109) responsive to the
identification code inputted from said inputting means for
storing the inputted department number.

FIG. 1

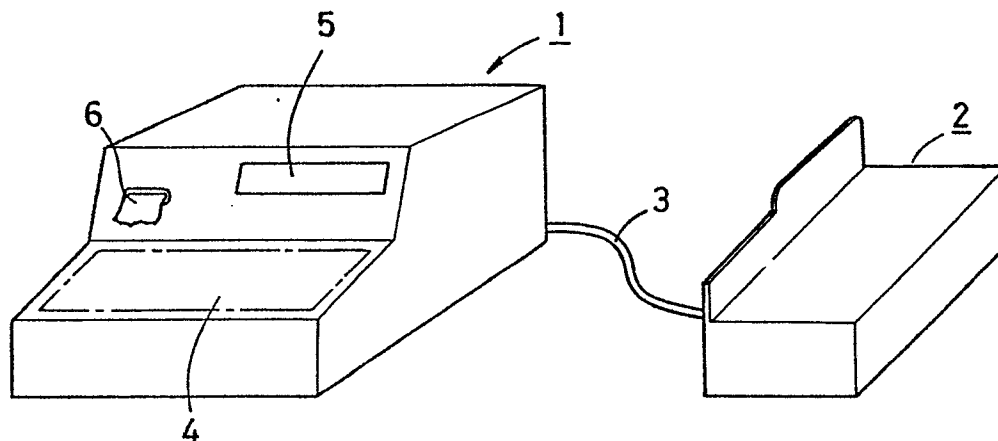


FIG. 2

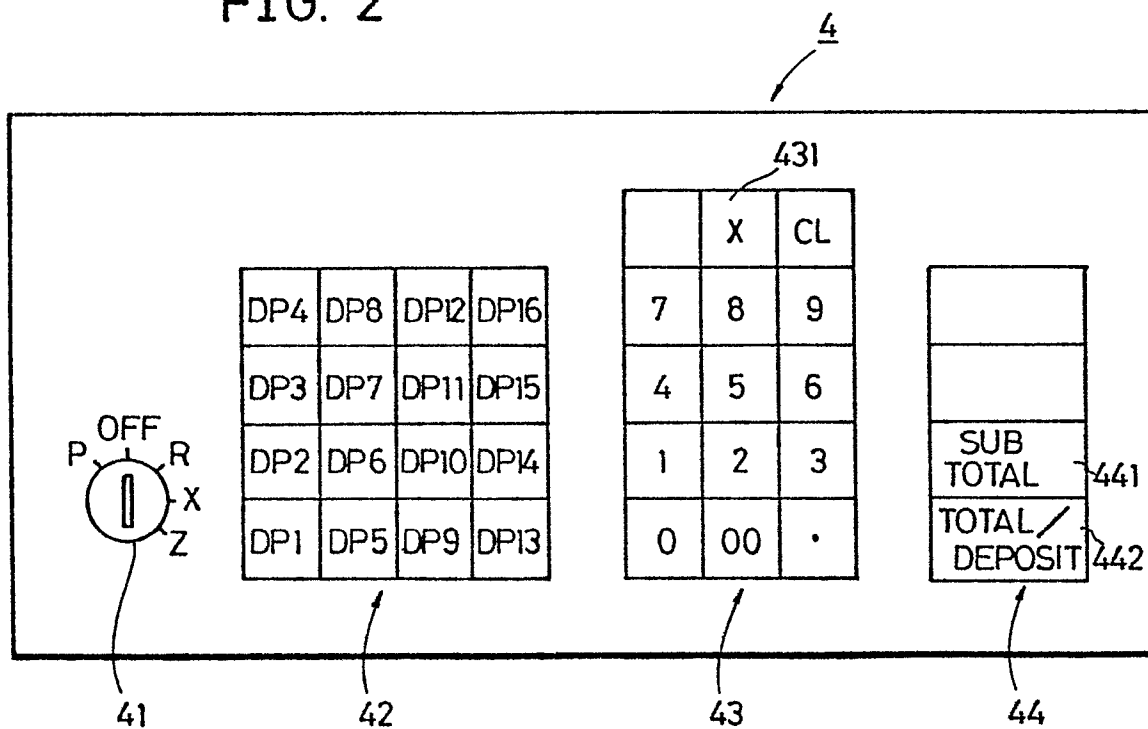


FIG. 3

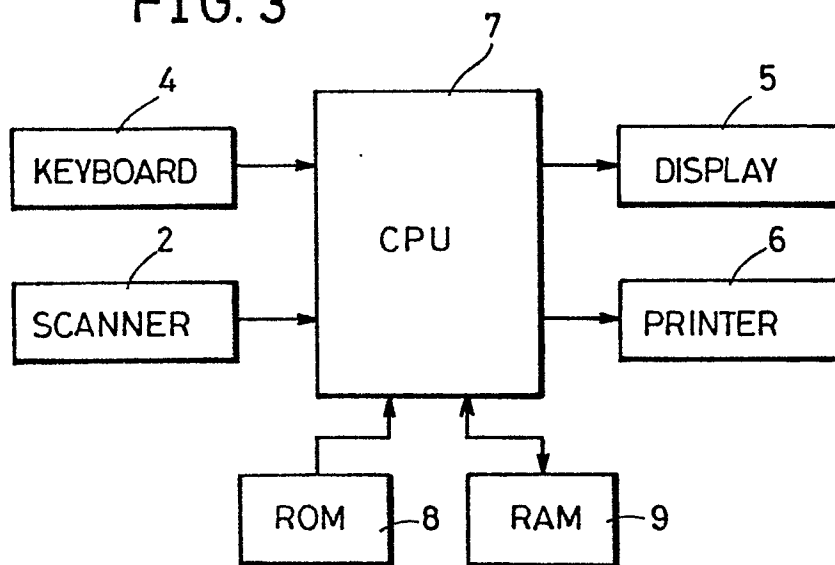


FIG. 4

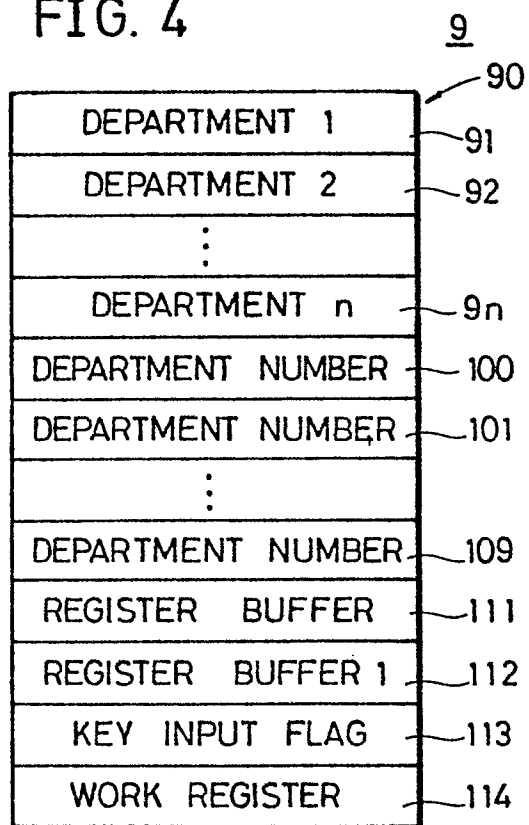


FIG. 5

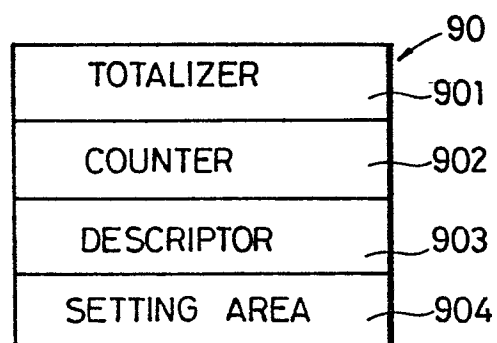


FIG. 6

UPC	TYPE II	2	X_1	X_2	X_3	X_4	X_5	C/P	P_1	P_2	P_3	P_4	C
EAN13	FLAG 21-29	2	1	X_1	X_2	X_3	X_4	C/P	P_1	P_2	P_3	P_4	C

FIG. 7A

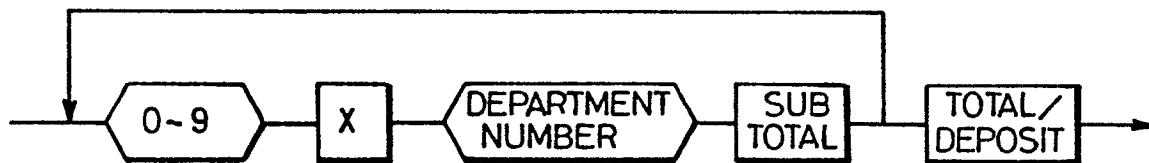


FIG. 7B

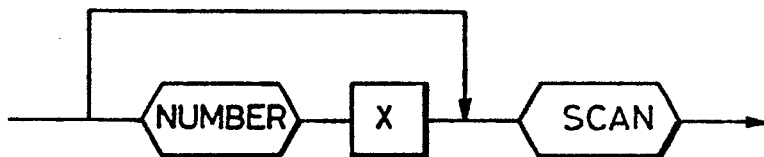


FIG. 8A

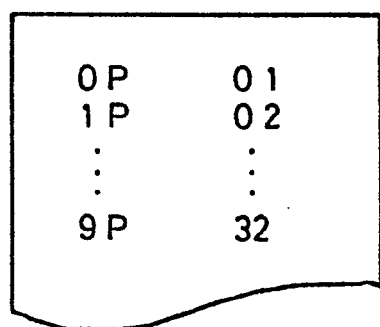


FIG. 8B

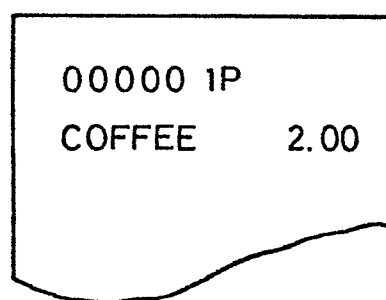


FIG. 9A

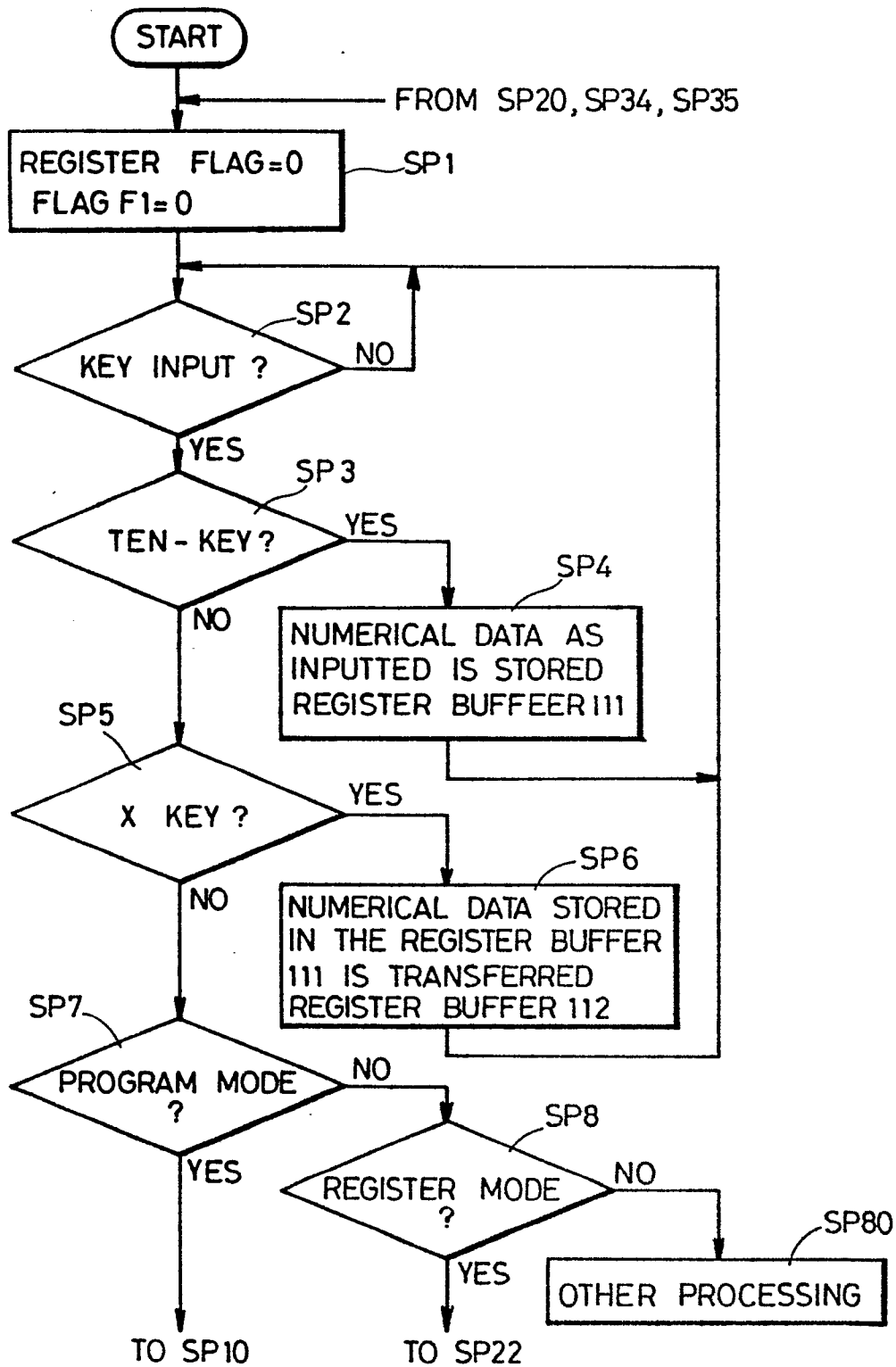


FIG. 9B

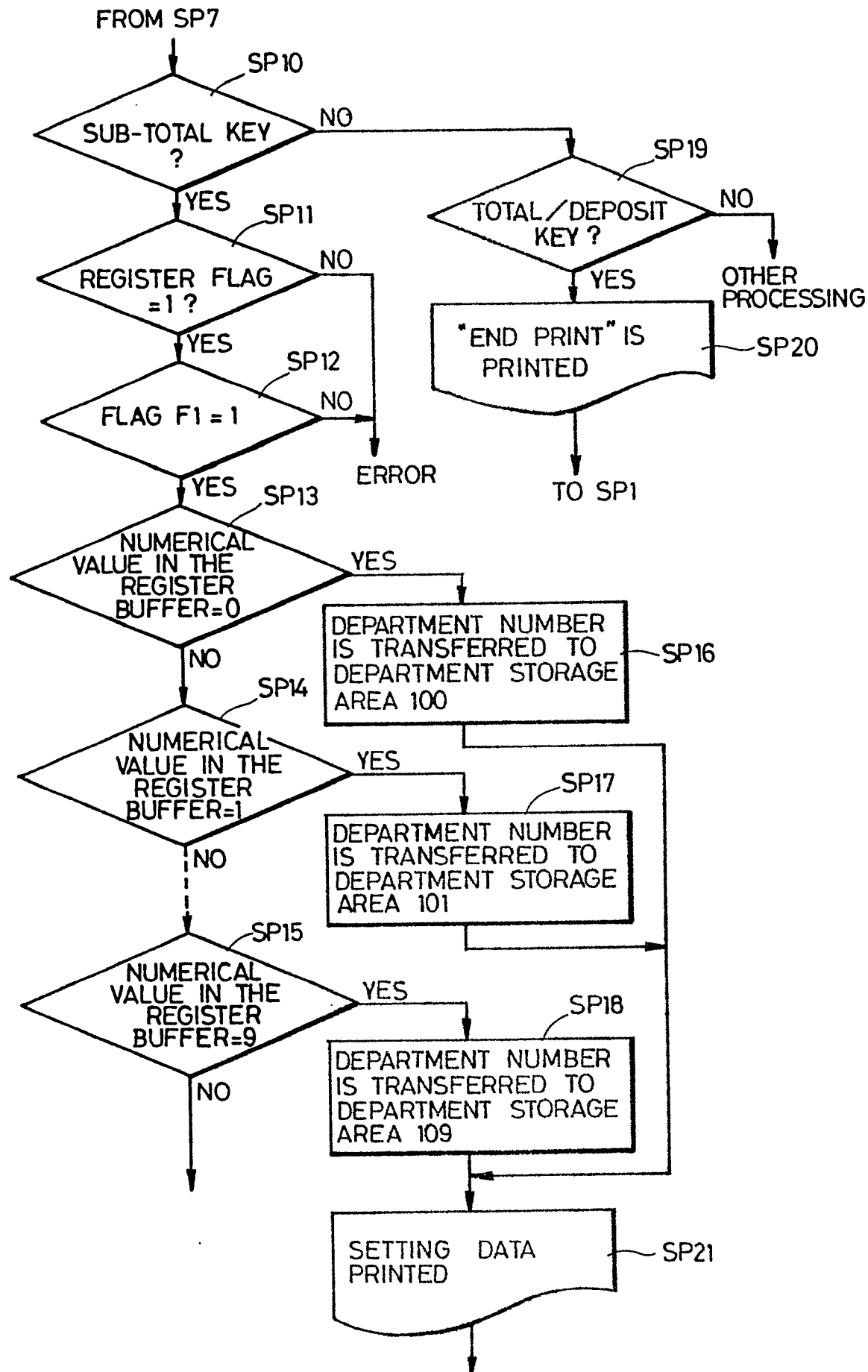


FIG. 9C

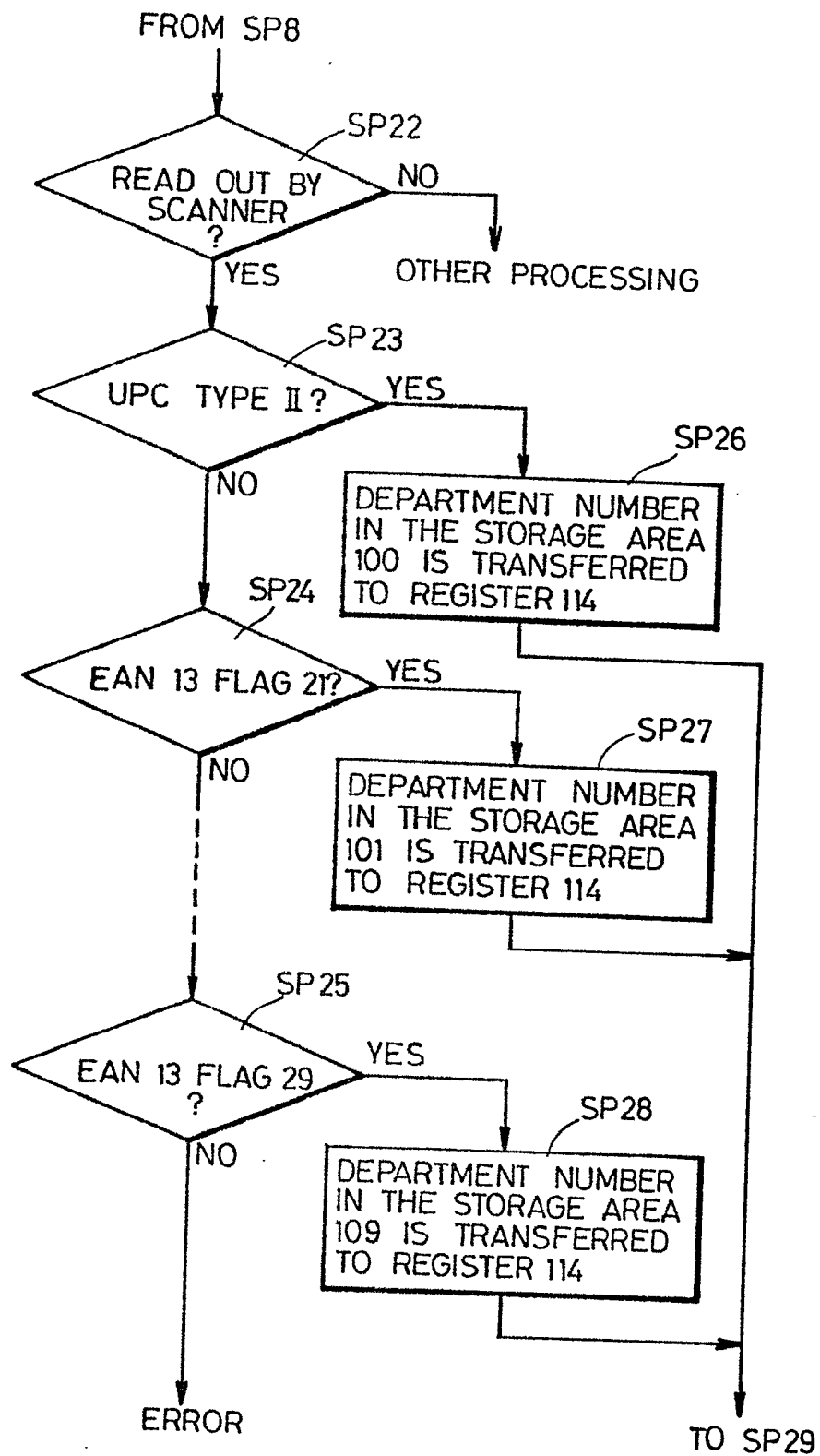


FIG. 9D

