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Walker et al.

(54) **SYSTEM AND METHOD FOR TRACKING AND ESTABLISHING A PROGRESSIVE DISCOUNT BASED UPON A CUSTOMER'S VISITS TO A RETAIL ESTABLISHMENT**

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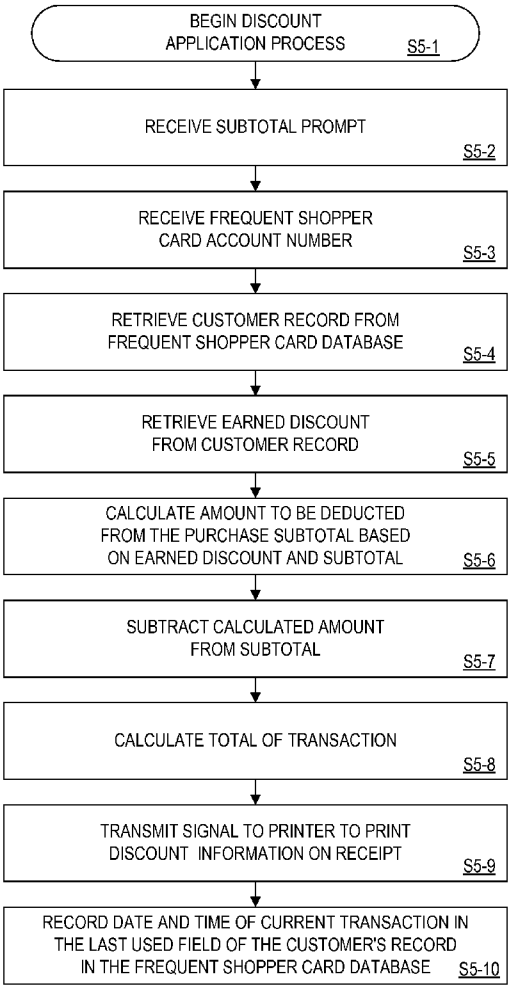
(52) **U.S. Cl.** **705/14**

(57) **ABSTRACT**

Methods, computer readable media and apparatus are disclosed for determining and applying a discount for a customer. In some embodiments, the process includes receiving transaction data that represents a current transaction, receiving a customer identifier of a customer, determining a current transaction time and a last transaction time, determining that a duration between the last transaction time and the current transaction time equals or exceeds a predetermined time period, and determining that the current transaction is a first instance of the customer equaling or exceeding the predetermined time period. Since it was the first time the customer equaled or exceeded the predetermined time period, a discount is applied to the current transaction.



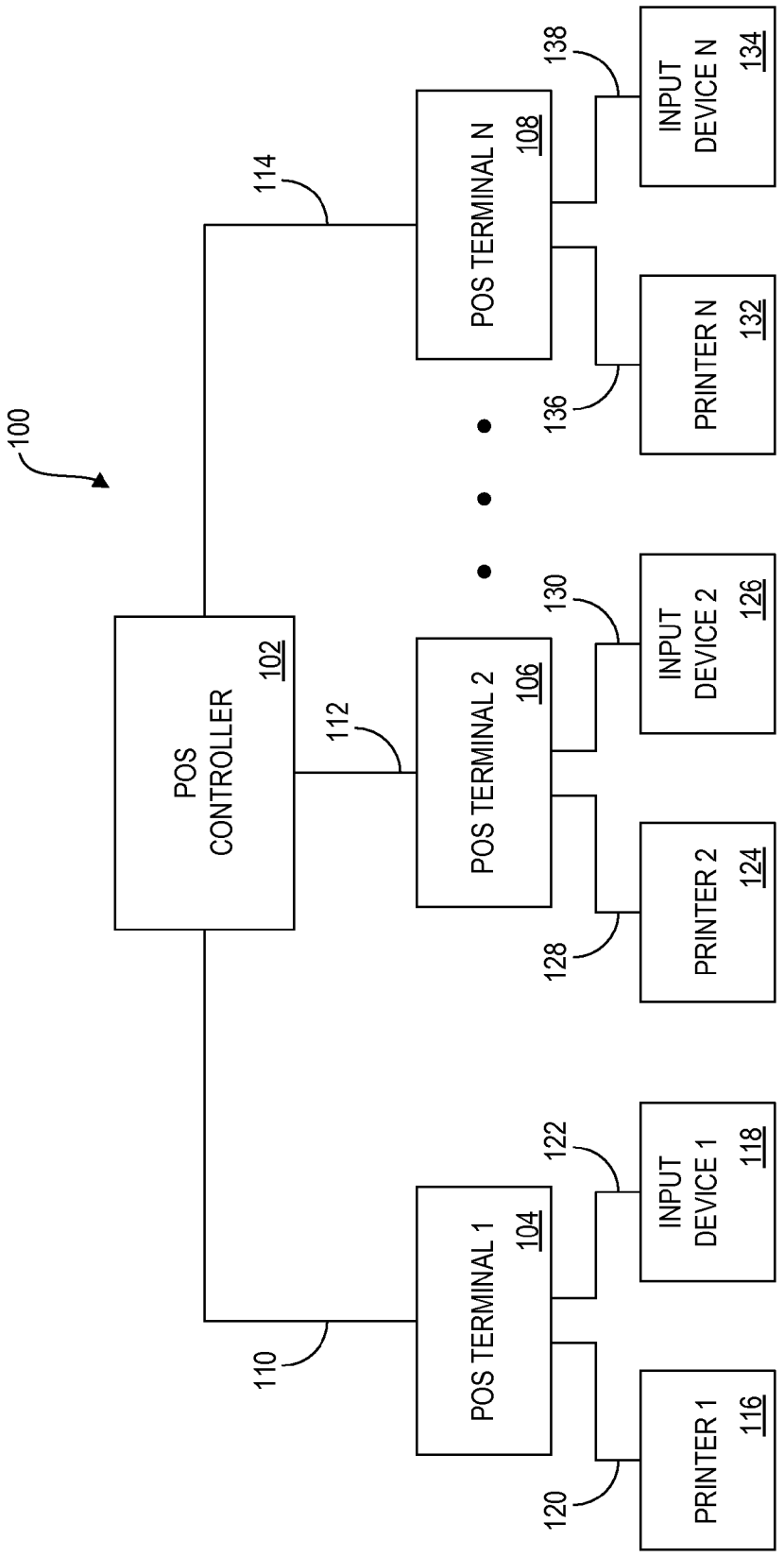

100
POS CONTROLLER 102
110
112
114
POS TERMINAL 1 104
POS TERMINAL 2 106
POS TERMINAL N 108
INPUT DEVICE 1 118
INPUT DEVICE 2 126
INPUT DEVICE N 134
PRINTER 1 116
PRINTER 2 124
PRINTER N 132
120
122
128
130
136
138

FIG. 1

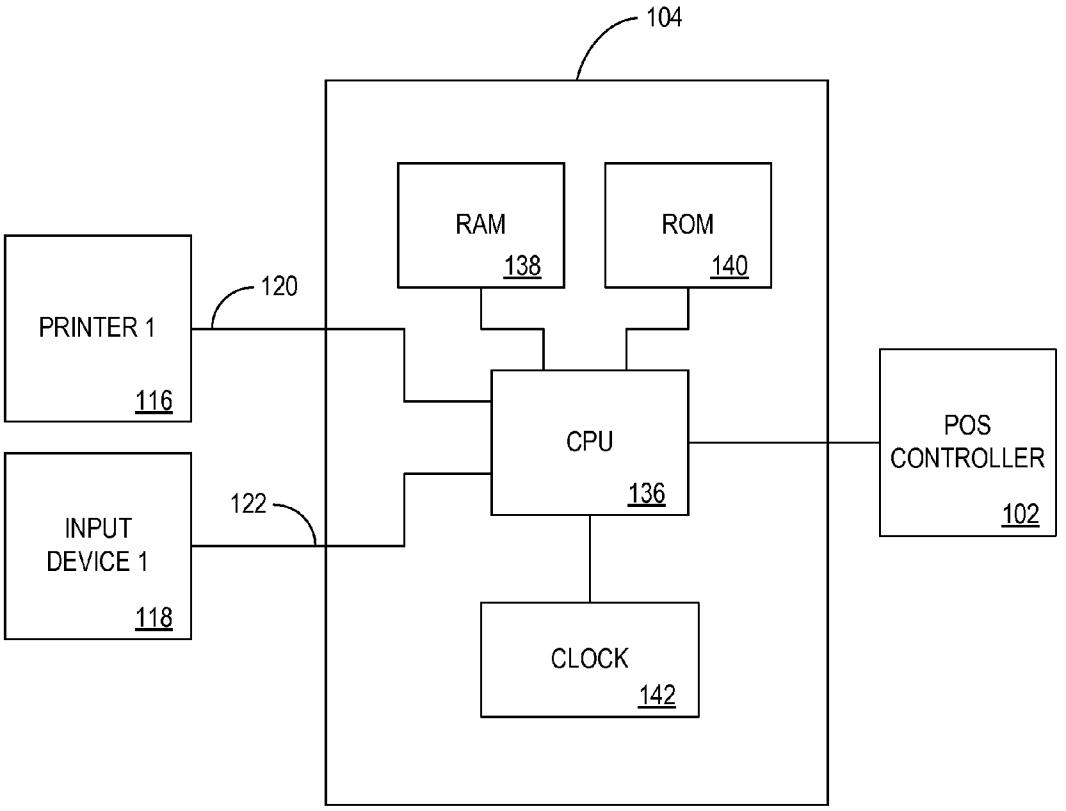

104
RAM
138
ROM
140
PRINTER 1
116
120
CPU
136
POS
CONTROLLER
102
INPUT
DEVICE 1
118
122
CLOCK
142

FIG. 2

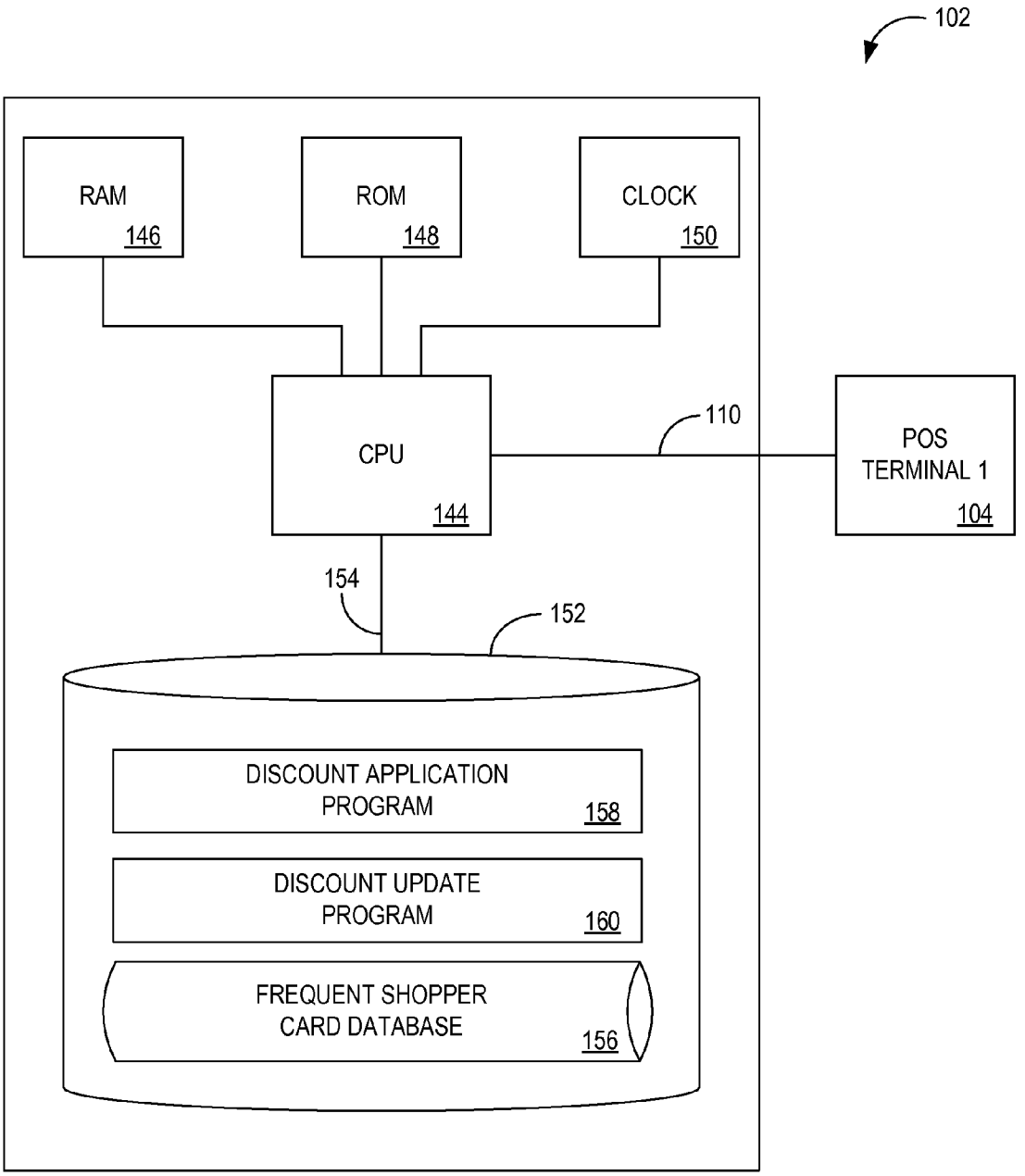

102
RAM
146
ROM
148
CLOCK
150
CPU
144
110
POS
TERMINAL 1
104
154
152
DISCOUNT APPLICATION
PROGRAM
158
DISCOUNT UPDATE
PROGRAM
160
FREQUENT SHOPPER
CARD DATABASE
156

FIG. 3

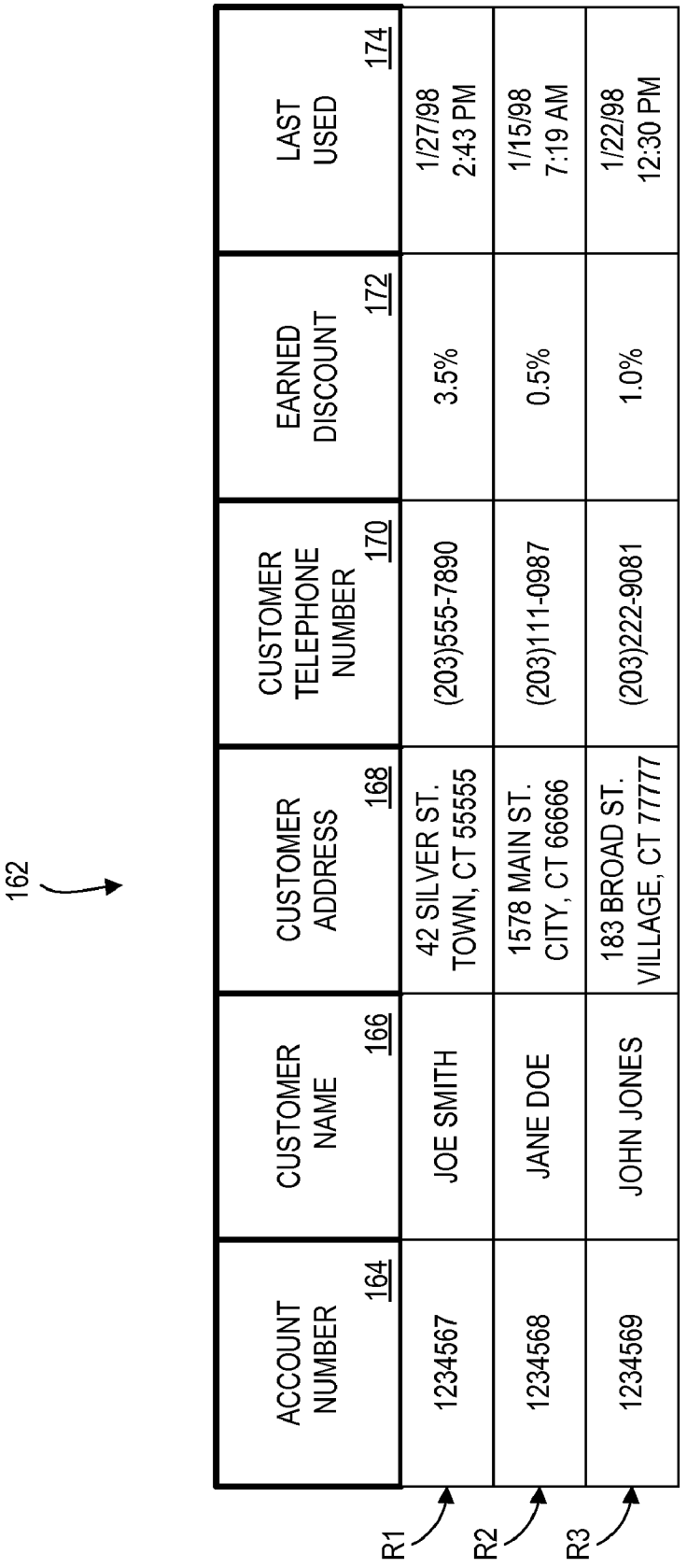

162
ACCOUNT NUMBER 164
CUSTOMER NAME 166
CUSTOMER ADDRESS 168
CUSTOMER TELEPHONE NUMBER 170
EARNED DISCOUNT 172
LAST USED 174
R1
1234567
JOE SMITH
42 SILVER ST. TOWN, CT 55555
(203)555-7890
3.5%
1/27/98 2:43 PM
R2
1234568
JANE DOE
1578 MAIN ST. CITY, CT 66666
(203)111-0987
0.5%
1/15/98 7:19 AM
R3
1234569
JOHN JONES
183 BROAD ST. VILLAGE, CT 77777
(203)222-9081
1.0%
1/22/98 12:30 PM

FIG. 4

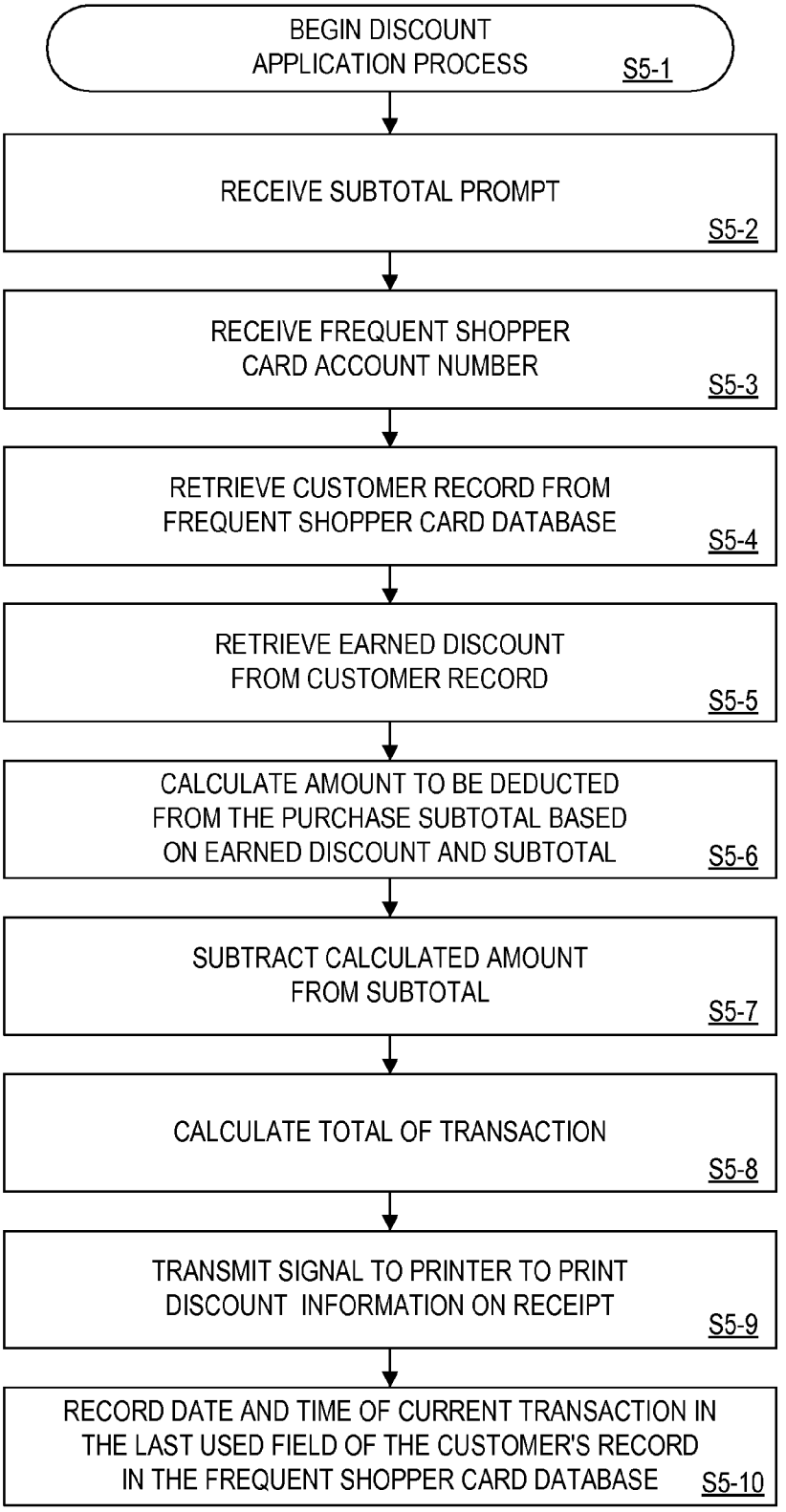

BEGIN DISCOUNT APPLICATION PROCESS
S5-1
RECEIVE SUBTOTAL PROMPT
S5-2
RECEIVE FREQUENT SHOPPER CARD ACCOUNT NUMBER
S5-3
RETRIEVE CUSTOMER RECORD FROM FREQUENT SHOPPER CARD DATABASE
S5-4
RETRIEVE EARNED DISCOUNT FROM CUSTOMER RECORD
S5-5
CALCULATE AMOUNT TO BE DEDUCTED FROM THE PURCHASE SUBTOTAL BASED ON EARNED DISCOUNT AND SUBTOTAL
S5-6
SUBTRACT CALCULATED AMOUNT FROM SUBTOTAL
S5-7
CALCULATE TOTAL OF TRANSACTION
S5-8
TRANSMIT SIGNAL TO PRINTER TO PRINT DISCOUNT INFORMATION ON RECEIPT
S5-9
RECORD DATE AND TIME OF CURRENT TRANSACTION IN THE LAST USED FIELD OF THE CUSTOMER'S RECORD IN THE FREQUENT SHOPPER CARD DATABASE
S5-10

FIG. 5

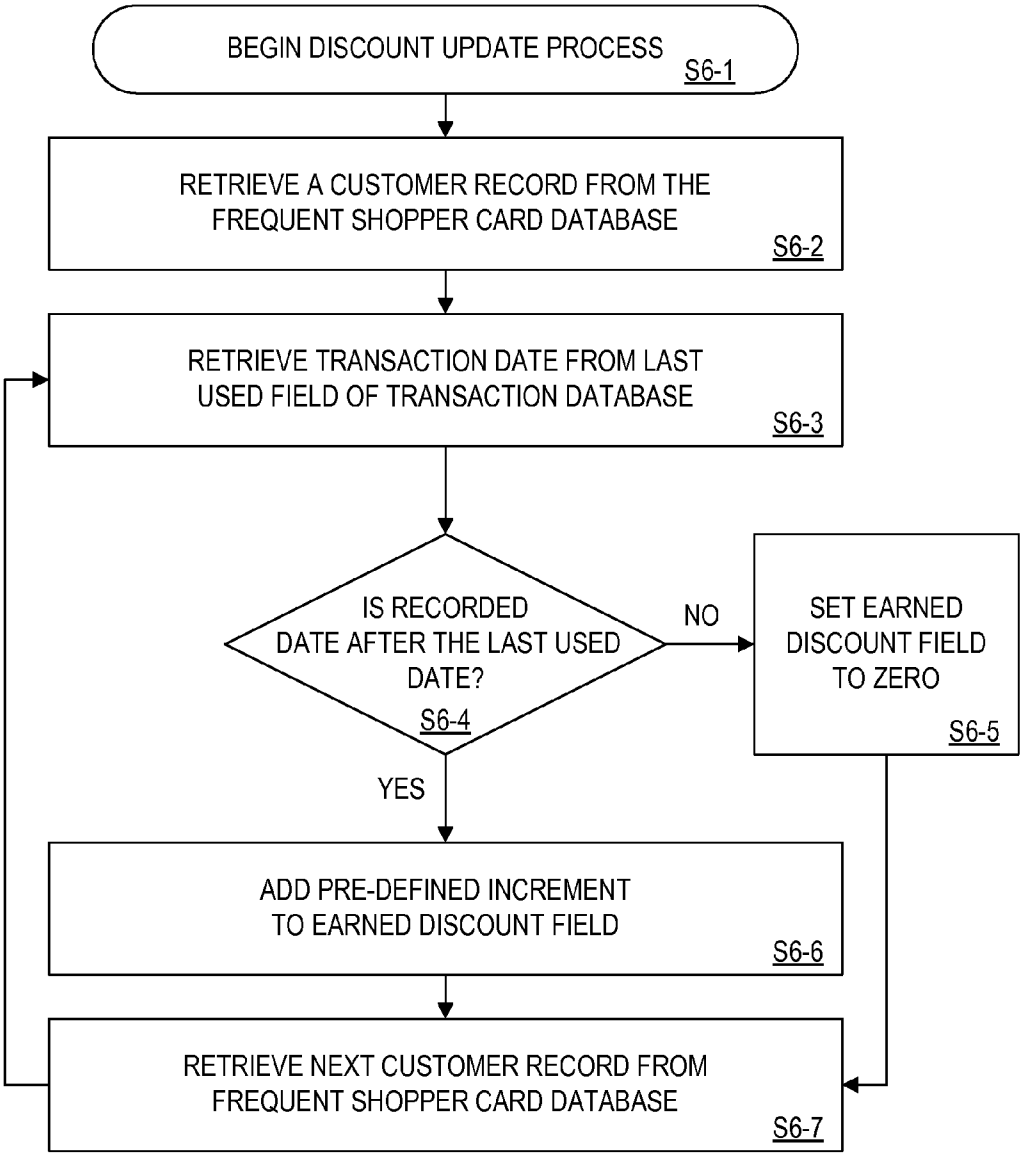

BEGIN DISCOUNT UPDATE PROCESS
S6-1
RETRIEVE A CUSTOMER RECORD FROM THE FREQUENT SHOPPER CARD DATABASE
S6-2
RETRIEVE TRANSACTION DATE FROM LAST USED FIELD OF TRANSACTION DATABASE
S6-3
IS RECORDED DATE AFTER THE LAST USED DATE?
S6-4
NO
SET EARNED DISCOUNT FIELD TO ZERO
S6-5
YES
ADD PRE-DEFINED INCREMENT TO EARNED DISCOUNT FIELD
S6-6
RETRIEVE NEXT CUSTOMER RECORD FROM FREQUENT SHOPPER CARD DATABASE
S6-7

FIG. 6

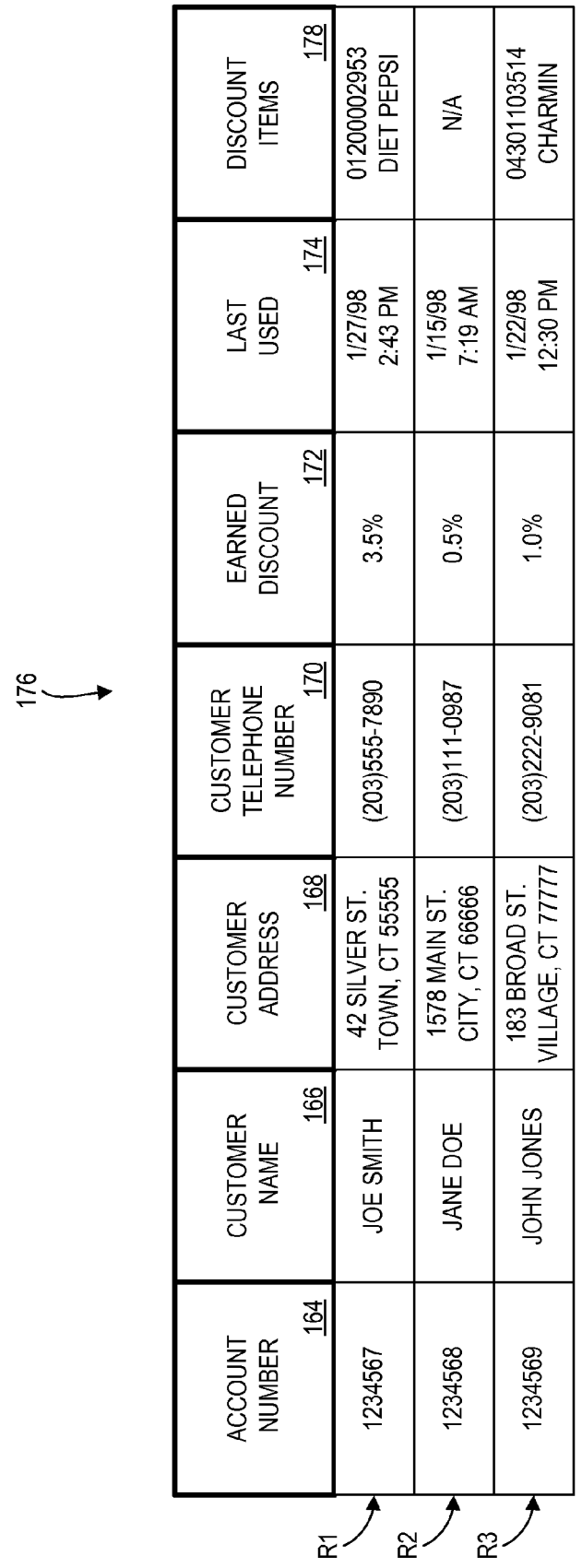

176
ACCOUNT NUMBER 164
CUSTOMER NAME 166
CUSTOMER ADDRESS 168
CUSTOMER TELEPHONE NUMBER 170
EARNED DISCOUNT 172
LAST USED 174
DISCOUNT ITEMS 178
1234567
JOE SMITH
42 SILVER ST. TOWN, CT 55555
(203)555-7890
3.5%
1/27/98 2:43 PM
01200002953 DIET PEPSI
1234568
JANE DOE
1578 MAIN ST. CITY, CT 66666
(203)111-0987
0.5%
1/15/98 7:19 AM
N/A
1234569
JOHN JONES
183 BROAD ST. VILLAGE, CT 77777
(203)222-9081
1.0%
1/22/98 12:30 PM
04301103514 CHARMIN
R1
R2
R3

FIG. 7

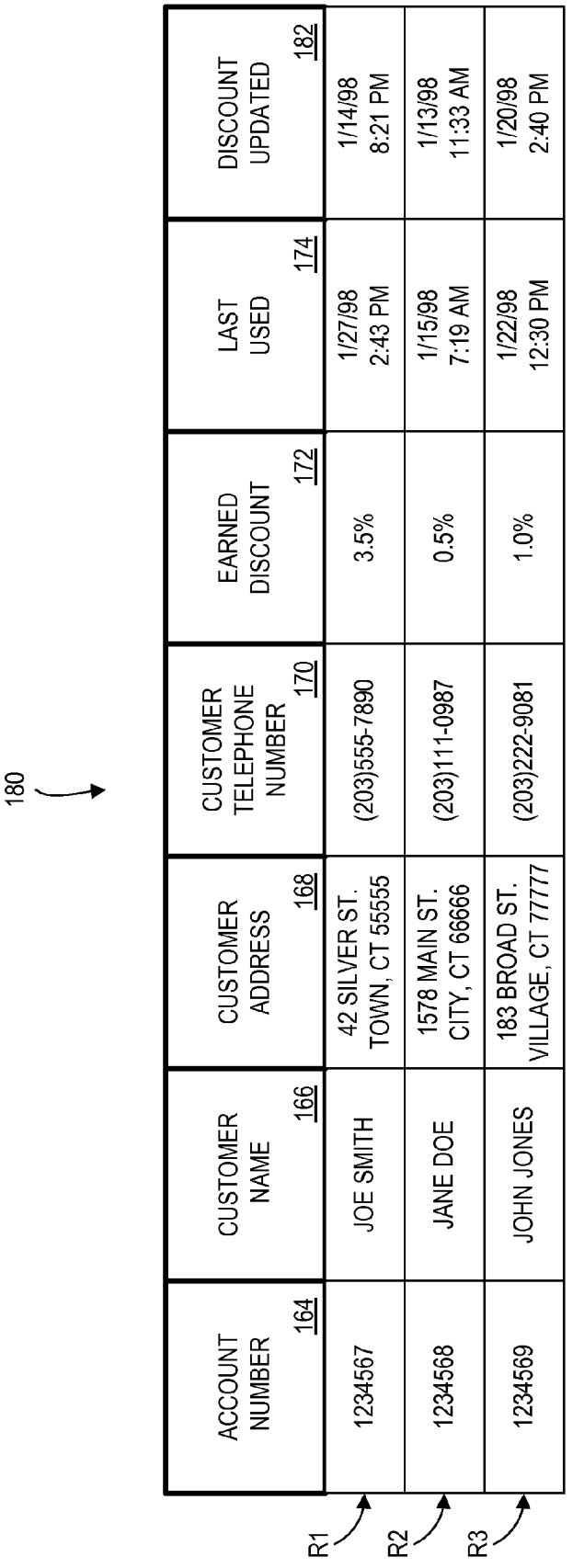

180
ACCOUNT NUMBER 164
CUSTOMER NAME 166
CUSTOMER ADDRESS 168
CUSTOMER TELEPHONE NUMBER 170
EARNED DISCOUNT 172
LAST USED 174
DISCOUNT UPDATED 182
R1
1234567
JOE SMITH
42 SILVER ST. TOWN, CT 55555
(203)555-7890
3.5%
1/27/98 2:43 PM
1/14/98 8:21 PM
R2
1234568
JANE DOE
1578 MAIN ST. CITY, CT 66666
(203)111-0987
0.5%
1/15/98 7:19 AM
1/13/98 11:33 AM
R3
1234569
JOHN JONES
183 BROAD ST. VILLAGE, CT 77777
(203)222-9081
1.0%
1/22/98 12:30 PM
1/20/98 2:40 PM

FIG. 8

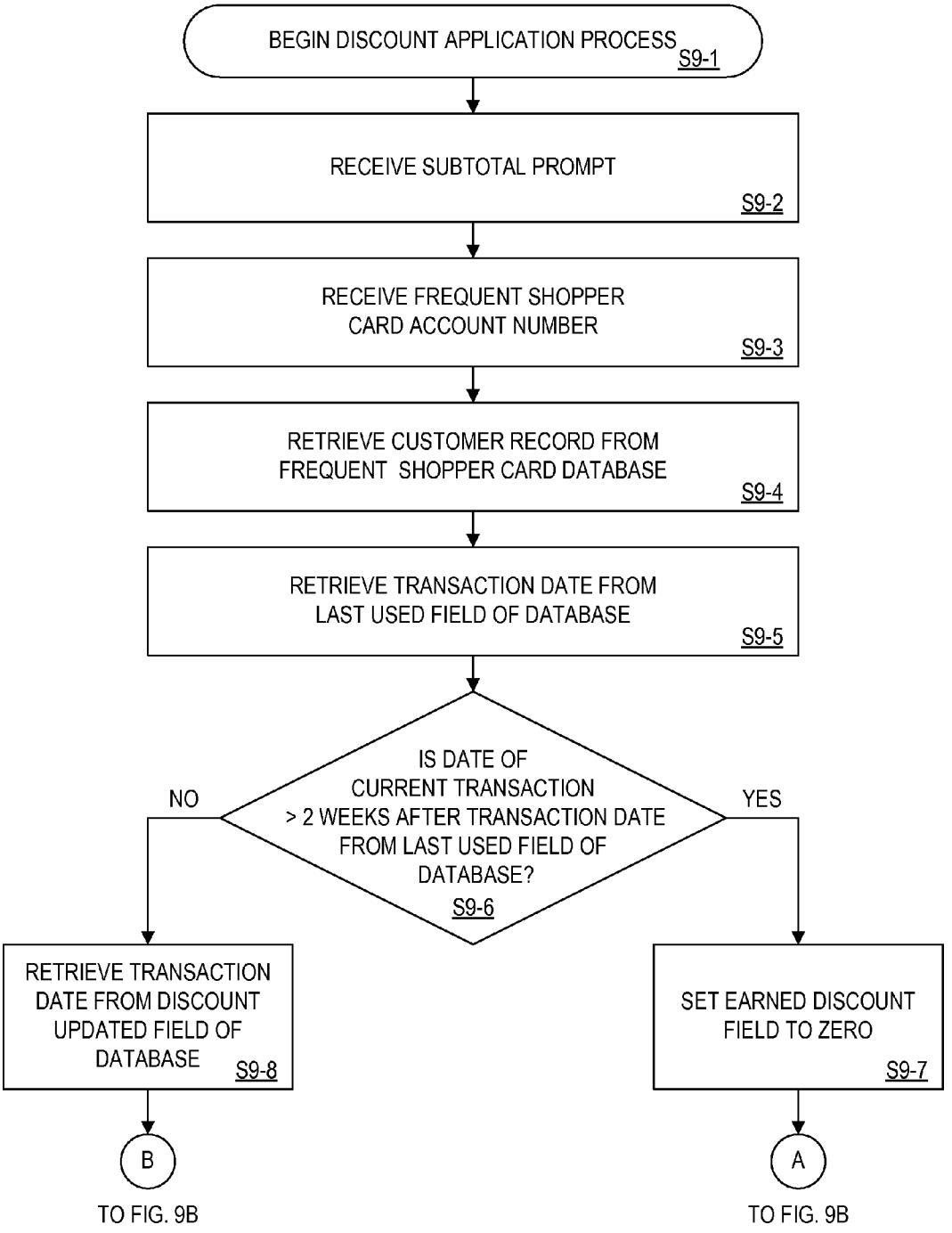

BEGIN DISCOUNT APPLICATION PROCESS
S9-1
RECEIVE SUBTOTAL PROMPT
S9-2
RECEIVE FREQUENT SHOPPER CARD ACCOUNT NUMBER
S9-3
RETRIEVE CUSTOMER RECORD FROM FREQUENT SHOPPER CARD DATABASE
S9-4
RETRIEVE TRANSACTION DATE FROM LAST USED FIELD OF DATABASE
S9-5
IS DATE OF CURRENT TRANSACTION > 2 WEEKS AFTER TRANSACTION DATE FROM LAST USED FIELD OF DATABASE?
S9-6
NO
YES
RETRIEVE TRANSACTION DATE FROM DISCOUNT UPDATED FIELD OF DATABASE
S9-8
SET EARNED DISCOUNT FIELD TO ZERO
S9-7
B
A
TO FIG. 9B
TO FIG. 9B

FIG. 9A

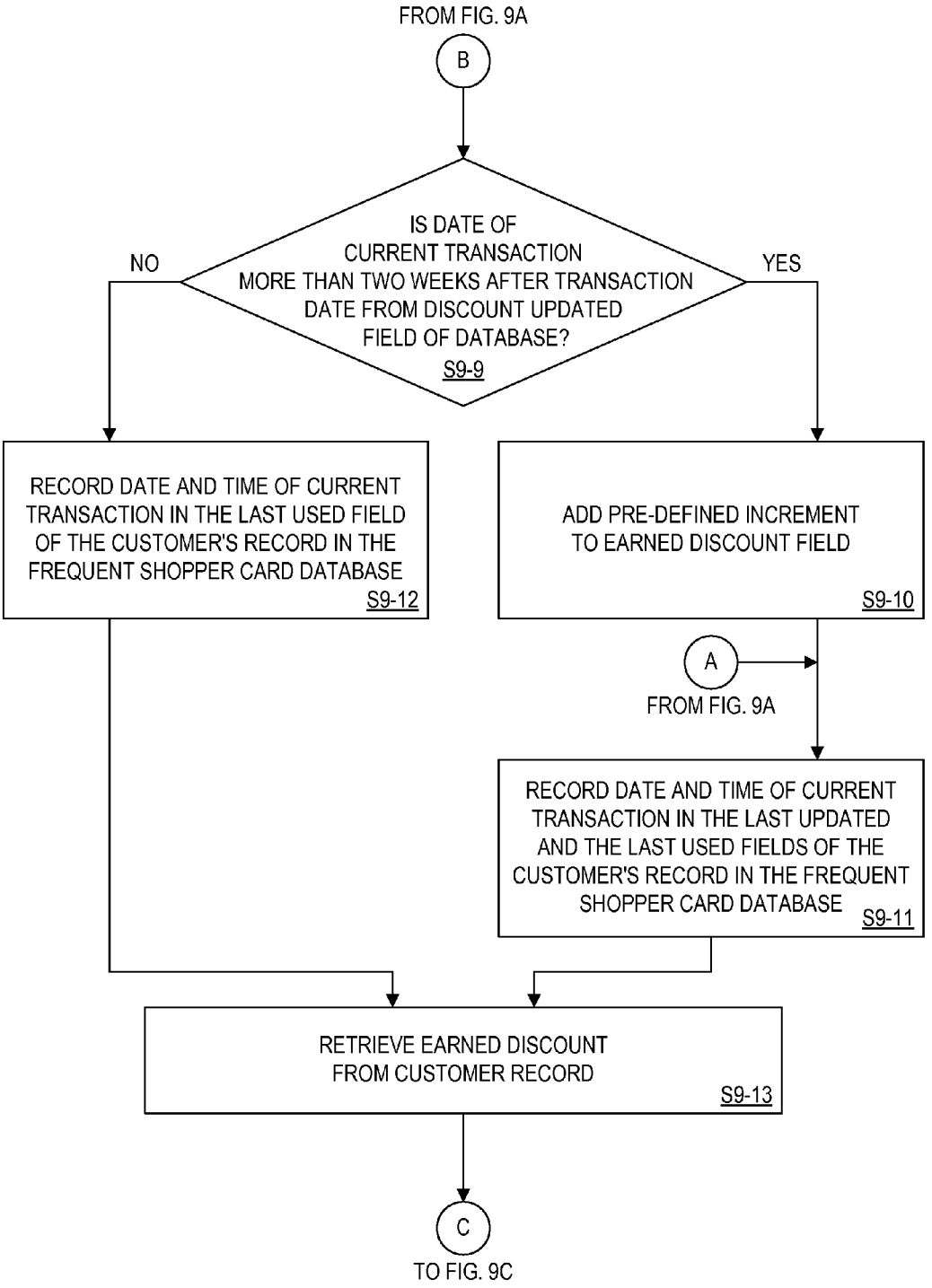

FROM FIG. 9A
B
IS DATE OF CURRENT TRANSACTION MORE THAN TWO WEEKS AFTER TRANSACTION DATE FROM DISCOUNT UPDATED FIELD OF DATABASE?
S9-9
NO
YES
RECORD DATE AND TIME OF CURRENT TRANSACTION IN THE LAST USED FIELD OF THE CUSTOMER'S RECORD IN THE FREQUENT SHOPPER CARD DATABASE
S9-12
ADD PRE-DEFINED INCREMENT TO EARNED DISCOUNT FIELD
S9-10
A
FROM FIG. 9A
RECORD DATE AND TIME OF CURRENT TRANSACTION IN THE LAST UPDATED AND THE LAST USED FIELDS OF THE CUSTOMER'S RECORD IN THE FREQUENT SHOPPER CARD DATABASE
S9-11
RETRIEVE EARNED DISCOUNT FROM CUSTOMER RECORD
S9-13
C
TO FIG. 9C

FIG. 9B

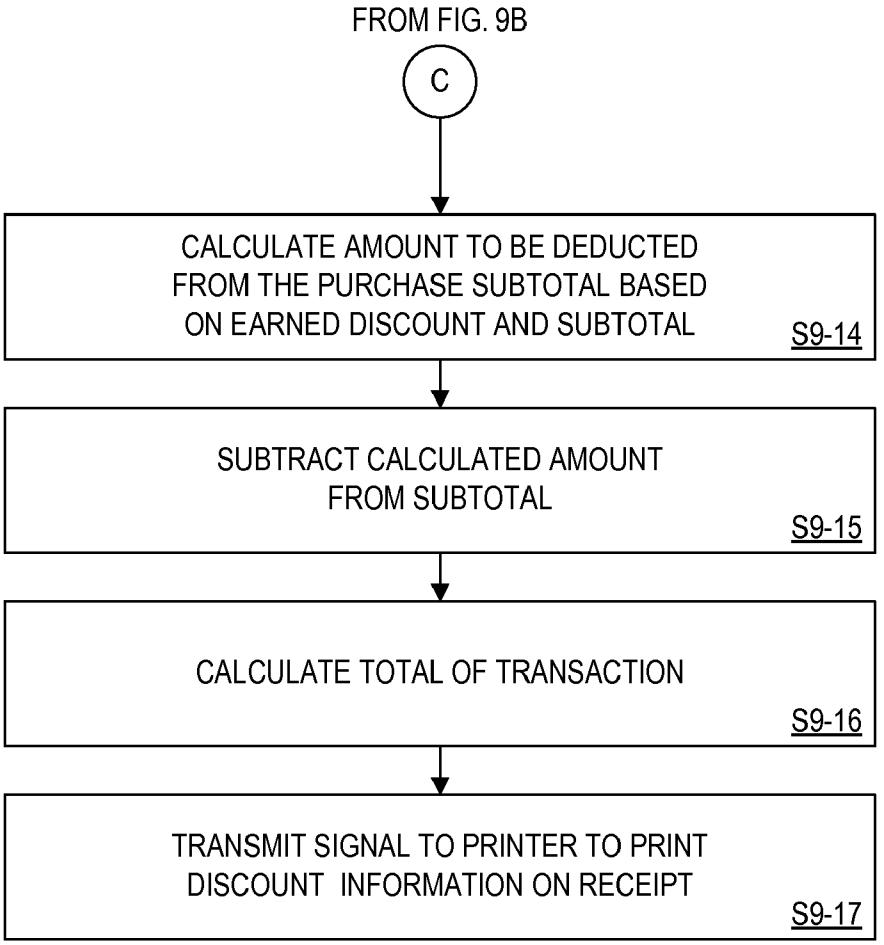

FROM FIG. 9B
C
CALCULATE AMOUNT TO BE DEDUCTED FROM THE PURCHASE SUBTOTAL BASED ON EARNED DISCOUNT AND SUBTOTAL
S9-14
SUBTRACT CALCULATED AMOUNT FROM SUBTOTAL
S9-15
CALCULATE TOTAL OF TRANSACTION
S9-16
TRANSMIT SIGNAL TO PRINTER TO PRINT DISCOUNT INFORMATION ON RECEIPT
S9-17

FIG. 9C

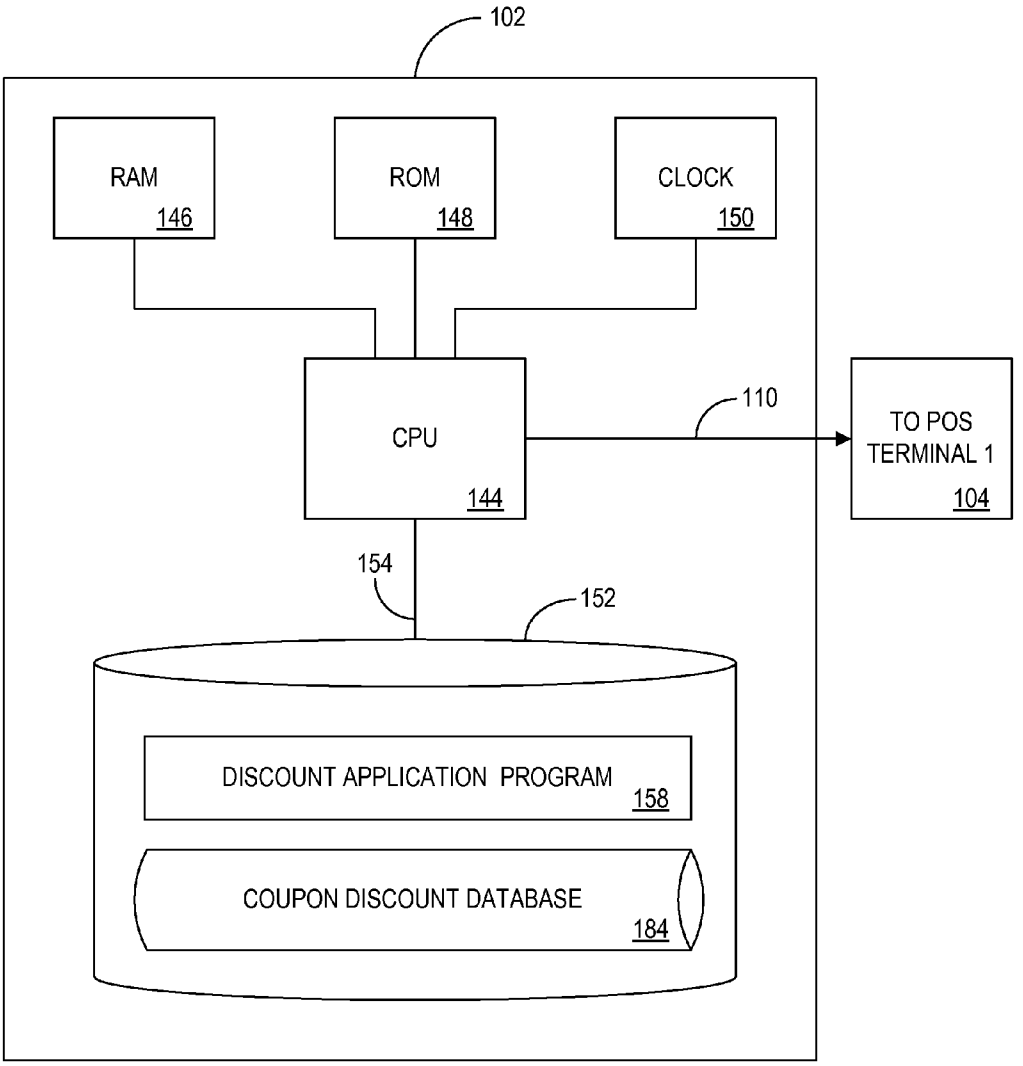

102
RAM
146
ROM
148
CLOCK
150
CPU
144
110
TO POS
TERMINAL 1
104
154
152
DISCOUNT APPLICATION PROGRAM
158
COUPON DISCOUNT DATABASE
184

FIG. 10

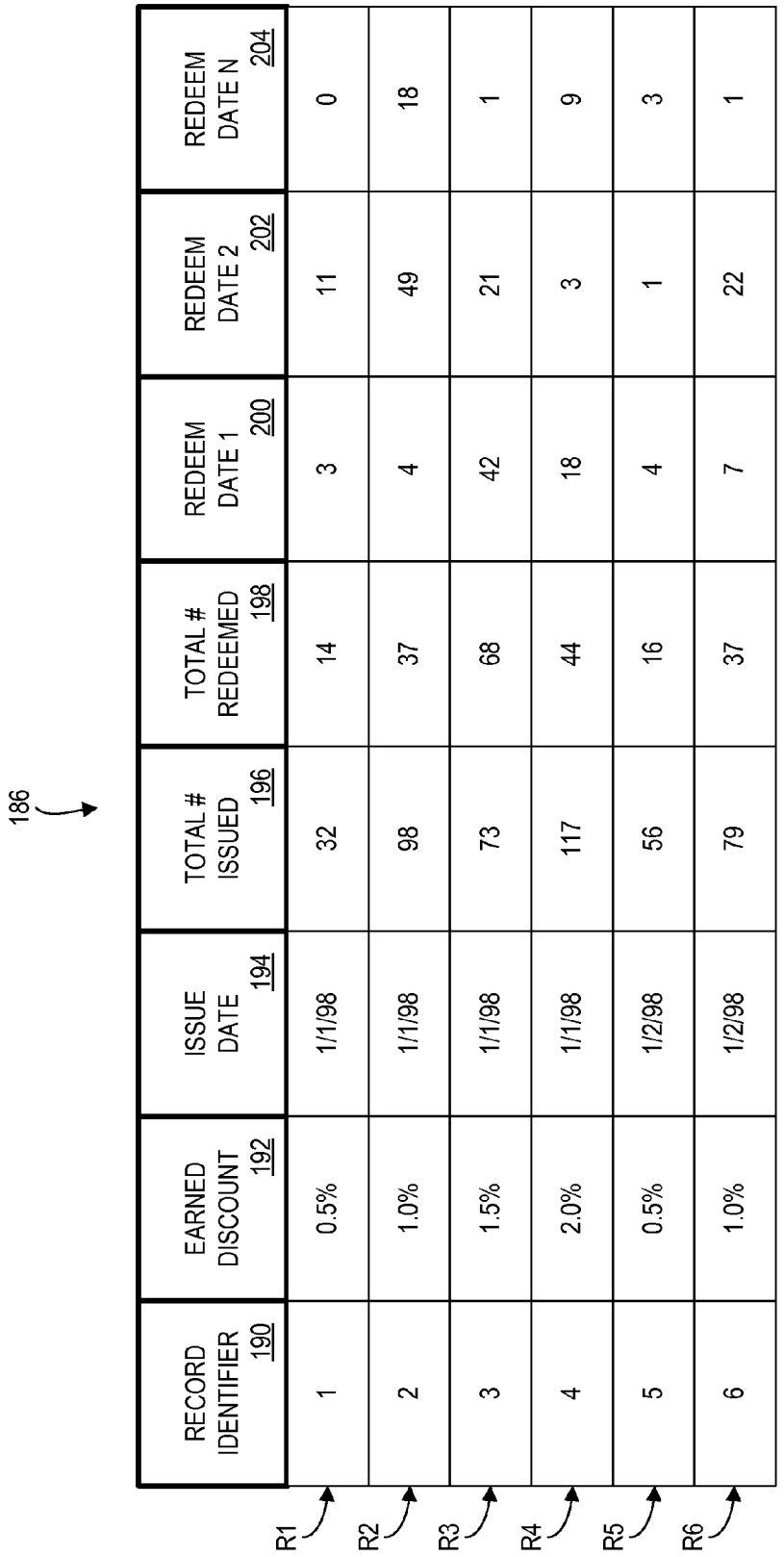

186
RECORD IDENTIFIER 190
EARNED DISCOUNT 192
ISSUE DATE 194
TOTAL # ISSUED 196
TOTAL # REDEEMED 198
REDEEM DATE 1 200
REDEEM DATE 2 202
REDEEM DATE N 204
R1
1
0.5%
1/1/98
32
14
3
11
0
R2
2
1.0%
1/1/98
98
37
4
49
18
R3
3
1.5%
1/1/98
73
68
42
21
1
R4
4
2.0%
1/1/98
117
44
18
3
9
R5
5
0.5%
1/2/98
56
16
4
1
3
R6
6
1.0%
1/2/98
79
37
7
22
1

FIG. 11

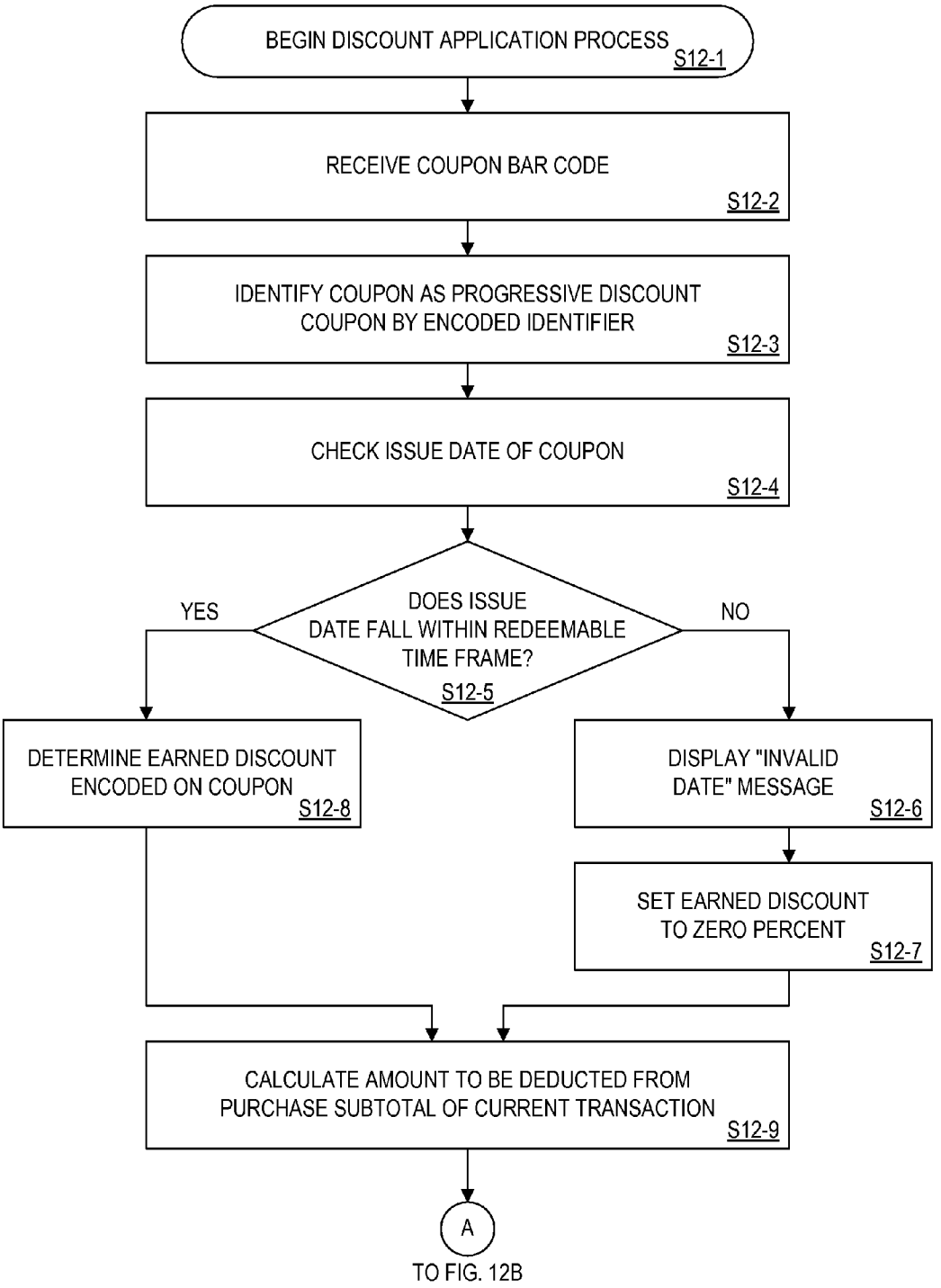

BEGIN DISCOUNT APPLICATION PROCESS
S12-1
RECEIVE COUPON BAR CODE
S12-2
IDENTIFY COUPON AS PROGRESSIVE DISCOUNT COUPON BY ENCODED IDENTIFIER
S12-3
CHECK ISSUE DATE OF COUPON
S12-4
DOES ISSUE DATE FALL WITHIN REDEEMABLE TIME FRAME?
S12-5
YES
NO
DETERMINE EARNED DISCOUNT ENCODED ON COUPON
S12-8
DISPLAY "INVALID DATE" MESSAGE
S12-6
SET EARNED DISCOUNT TO ZERO PERCENT
S12-7
CALCULATE AMOUNT TO BE DEDUCTED FROM PURCHASE SUBTOTAL OF CURRENT TRANSACTION
S12-9
A
TO FIG. 12B

FIG. 12A

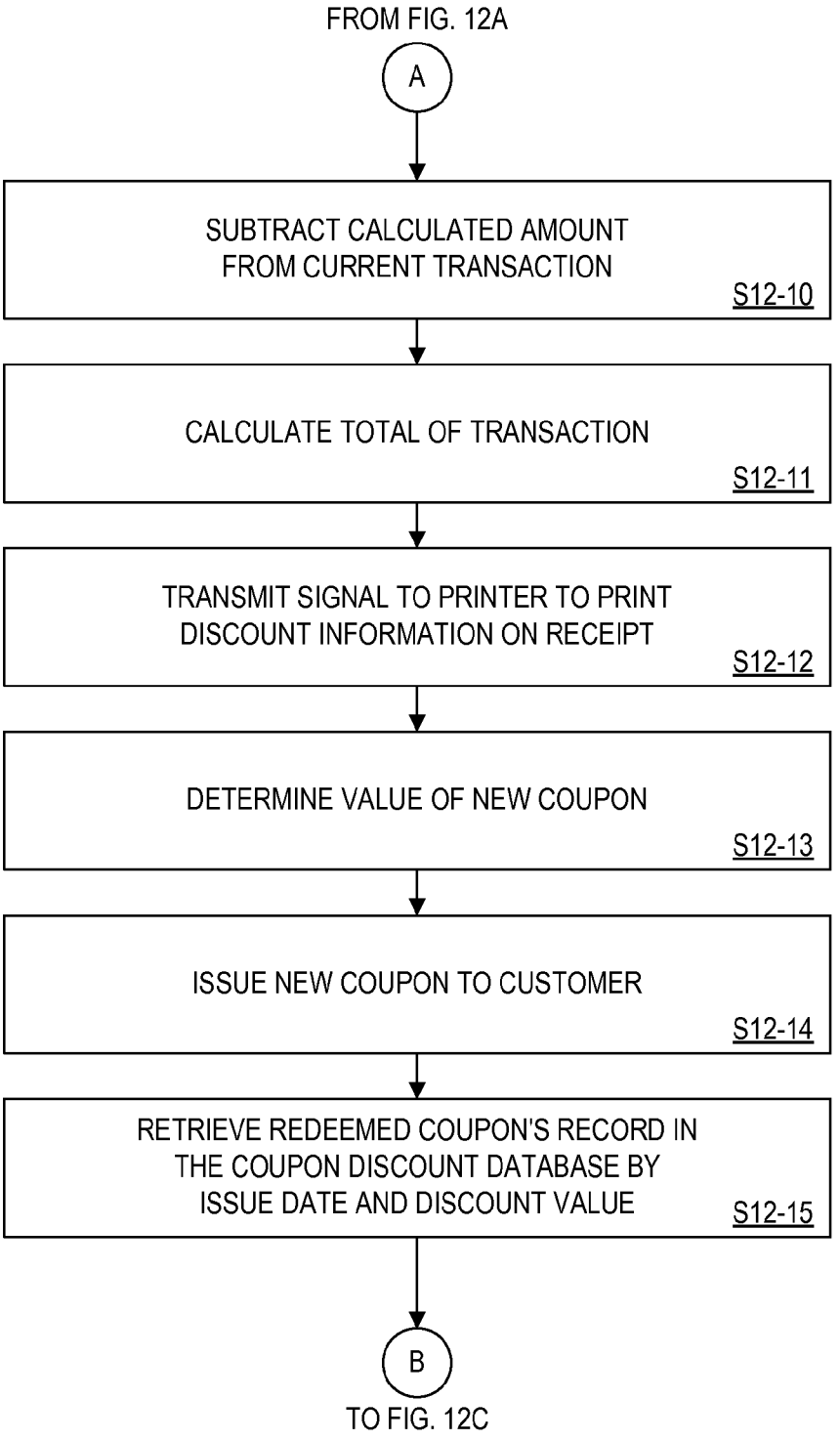

FROM FIG. 12A
A
SUBTRACT CALCULATED AMOUNT FROM CURRENT TRANSACTION
S12-10
CALCULATE TOTAL OF TRANSACTION
S12-11
TRANSMIT SIGNAL TO PRINTER TO PRINT DISCOUNT INFORMATION ON RECEIPT
S12-12
DETERMINE VALUE OF NEW COUPON
S12-13
ISSUE NEW COUPON TO CUSTOMER
S12-14
RETRIEVE REDEEMED COUPON'S RECORD IN THE COUPON DISCOUNT DATABASE BY ISSUE DATE AND DISCOUNT VALUE
S12-15
B
TO FIG. 12C

FIG. 12B

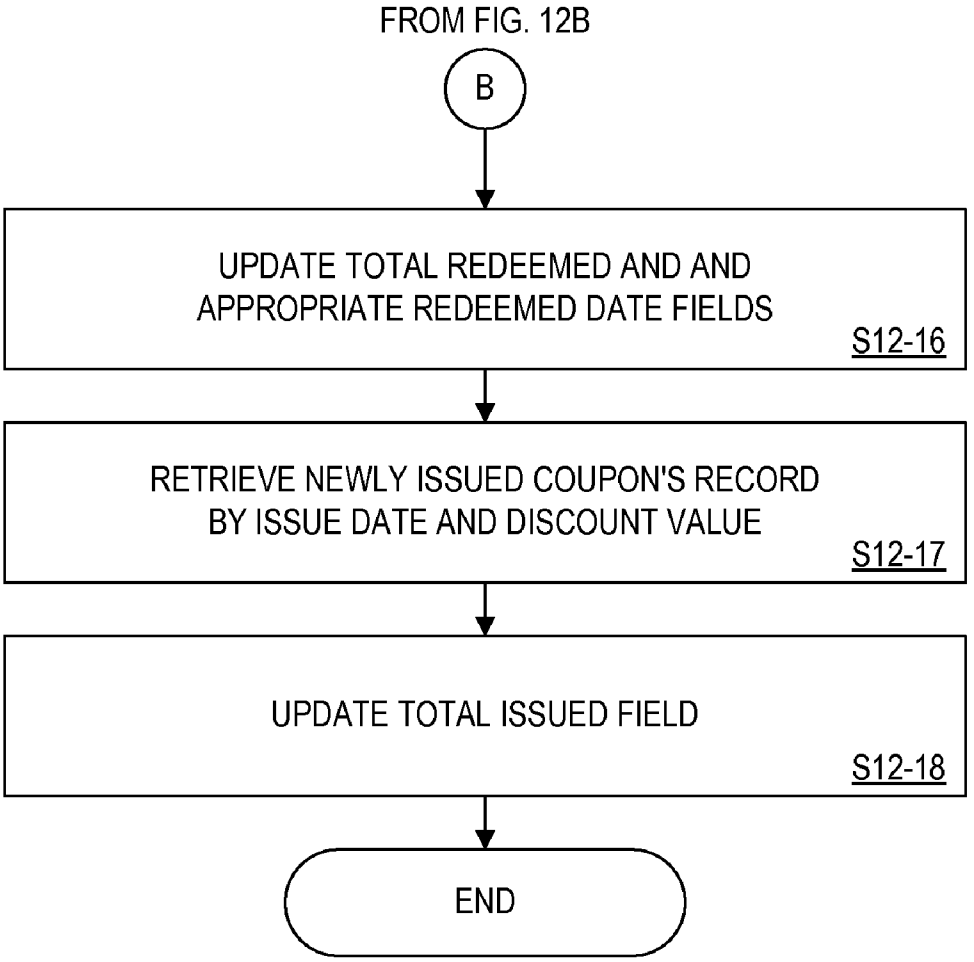

FROM FIG. 12B
B
UPDATE TOTAL REDEEMED AND AND APPROPRIATE REDEEMED DATE FIELDS
S12-16
RETRIEVE NEWLY ISSUED COUPON'S RECORD BY ISSUE DATE AND DISCOUNT VALUE
S12-17
UPDATE TOTAL ISSUED FIELD
S12-18
END

FIG. 12C

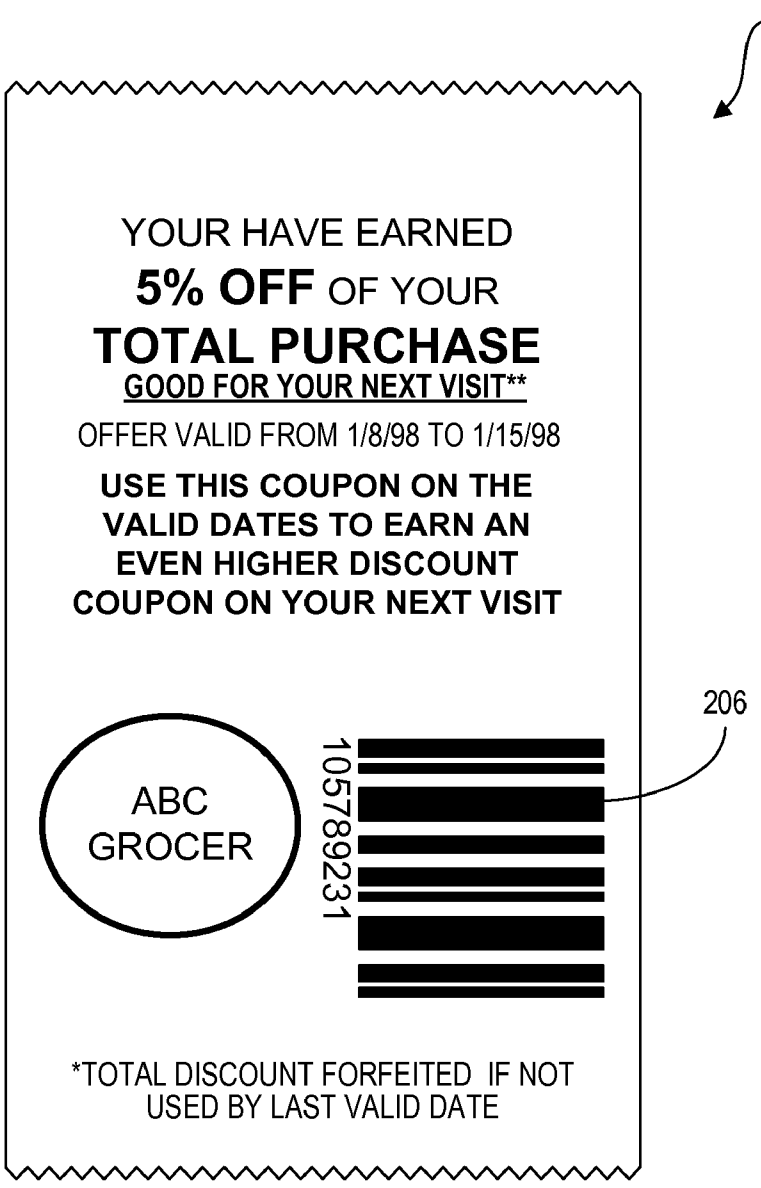

183
YOUR HAVE EARNED
5% OFF OF YOUR
TOTAL PURCHASE
GOOD FOR YOUR NEXT VISIT**
OFFER VALID FROM 1/8/98 TO 1/15/98
USE THIS COUPON ON THE VALID DATES TO EARN AN EVEN HIGHER DISCOUNT COUPON ON YOUR NEXT VISIT
206
ABC GROCER
105789231
*TOTAL DISCOUNT FORFEITED IF NOT USED BY LAST VALID DATE

FIG. 13

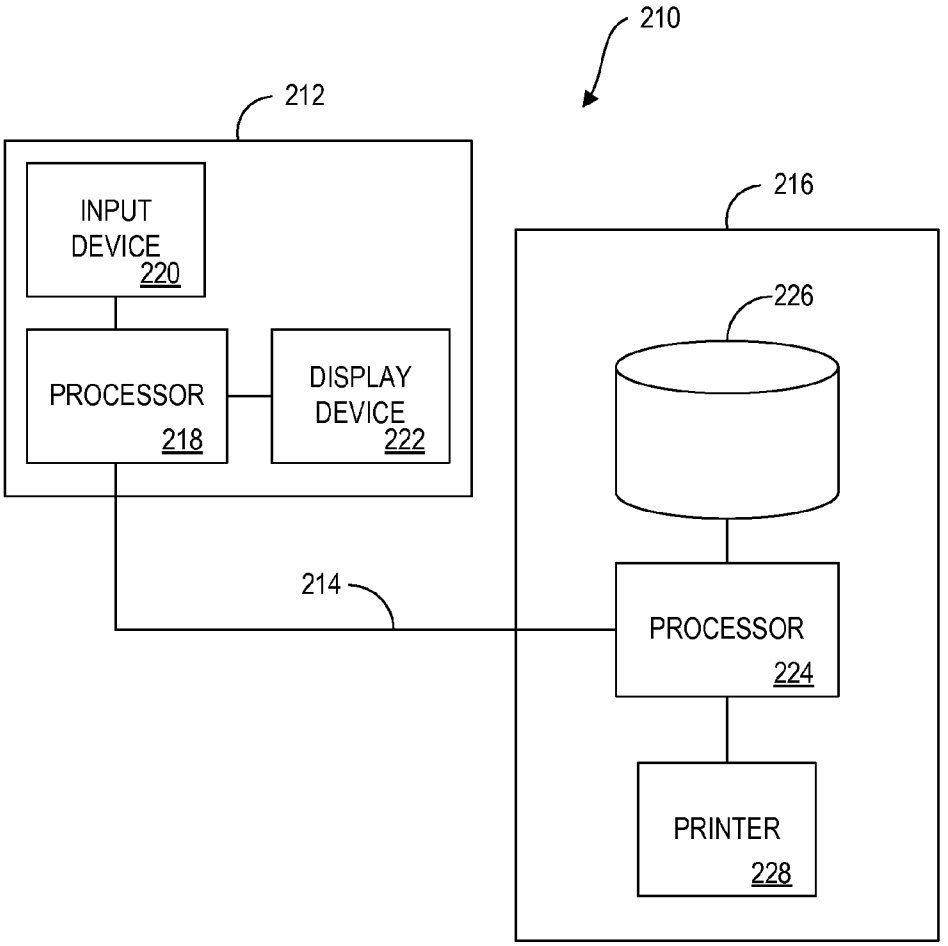

210
212
INPUT DEVICE 220
PROCESSOR 218
DISPLAY DEVICE 222
216
226
214
PROCESSOR 224
PRINTER 228

FIG. 14

SYSTEM AND METHOD FOR TRACKING AND ESTABLISHING A PROGRESSIVE DISCOUNT BASED UPON A CUSTOMER'S VISITS TO A RETAIL ESTABLISHMENT

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] The present application is a continuation of U.S. patent application Ser. No. 11/668,967, entitled "SYSTEM AND METHOD FOR TRACKING AND ESTABLISHING A PROGRESSIVE DISCOUNT BASED UPON A CUSTOMER'S VISITS TO A RETAIL ESTABLISHMENT", filed Jan. 30, 2007, which is a continuation of U.S. patent application Ser. No. 09/049,297, entitled "SYSTEM AND METHOD FOR TRACKING AND ESTABLISHING A PROGRESSIVE DISCOUNT BASED UPON A CUSTOMER'S VISITS TO A RETAIL ESTABLISHMENT", filed Mar. 27, 1998, and issued as U.S. Pat. No. 7,240,021 on Jul. 3, 2007.

[0002] The present application is also related to U.S. patent application Ser. No. 11/673,300, entitled "METHOD AND APPARATUS FOR DETERMINING A PROGRESSIVE DISCOUNT FOR A CUSTOMER BASED ON THE FREQUENCY OF THE CUSTOMER'S TRANSACTIONS", filed Feb. 9, 2007; which is a continuation of U.S. patent application Ser. No. 10/728,226, entitled "METHOD AND APPARATUS FOR DETERMINING A PROGRESSIVE DISCOUNT FOR A CUSTOMER BASED ON THE FREQUENCY OF THE CUSTOMER'S TRANSACTIONS", filed Dec. 4, 2003, and issued as U.S. Pat. No. 7,194,423 on Mar. 20, 2007; which is a continuation of U.S. patent application Ser. No. 09/166,267, entitled "METHOD AND APPARATUS FOR DETERMINING A PROGRESSIVE DISCOUNT FOR A CUSTOMER BASED ON THE FREQUENCY OF THE CUSTOMER'S TRANSACTIONS", filed on Oct. 5, 1998 and issued as U.S. Pat. No. 6,687,679 B1 on Feb. 3, 2004; which is a continuation-in-part application of U.S. patent application Ser. No. 09/049,297, entitled "SYSTEM AND METHOD FOR TRACKING AND ESTABLISHING A PROGRESSIVE DISCOUNT BASED UPON A CUSTOMER'S VISITS TO A RETAIL ESTABLISHMENT filed on Mar. 27, 1998, and issued as U.S. Pat. No. 7,240,021 on Jul. 3, 2007.

[0003] The above-referenced applications are incorporated by reference herein in their entirety.

BACKGROUND OF THE INVENTION

[0004] 1. Field of the Invention

[0005] The present invention relates to frequent shopper systems and more particularly, to frequent shopper systems that reward loyal customers with increasing discounts for regularly visiting a retail establishment.

[0006] 2. Description of the Related Art

[0007] The grocery store industry is a lucrative and highly competitive one. There are approximately 75 large supermarket chains in the United States. The large variety of supermarket chains provides many choices from which to choose from, thus forcing each supermarket chain to aggressively pursue marketing strategies to attract customers and induce customer loyalty to their chain. In an attempt to attract consumers, the grocery store industry has employed a number of different promotions. Despite the supermarkets efforts, customer loyalty is no longer inherent due to the increased competition.

[0008] The conventional methods of attracting and developing customer loyalty used by a supermarket chain include television and radio advertising to promote their stores. In addition, some stores offer free standing inserts (FSIs), coupons, and loss leaders in order to attract consumers. These strategies, however, erode the gross margin without retaining the stores best customers. Furthermore, weekly advertised specials and coupons by their very nature only attract customers for a given time period. Since the specials or discounts vary from week to week, there is no guarantee or likelihood that a store will be discounting exactly what the consumer is interested in buying every grocery trip. Most consumers, therefore, scan the weekly advertisement of every grocery store in their area before doing their weekly grocery shopping and choose to go to the store that most meets their needs.

[0009] Many supermarket chains also have established "superstores" to provide increased convenience for the customers with at least the intent to attract more consumers. These superstores attempt to provide one-stop shopping for consumers by providing a greater variety of goods and services typically not found in conventional supermarkets, such as bakeries, video rental, banking services, automotive parts and recreational equipment. The advantage that these superstores have to attract customers, however, has been tempered by the increased popularity of these type of stores among the different supermarket chains.

[0010] Another attempt to attract customers is the implementation of a frequent shopper card program. This program provides a customer with a frequent shopper card that is presented at the time of purchase. Presentation of the card enables the customer to receive special weekly discounts on specific items purchased. Essentially, these programs act as a paperless coupon redemption system.

[0011] The frequent shopper card programs are also used to track a customer's shopping habits. The frequent shopper card includes a customer identifier that enables the retailer to identify, record and track a frequent shopper's purchases. The customer's shopping history is then used to perform targeted marketing functions, such as compiling mailing lists and sending out advertising material or printing out point-of-sale (POS) coupons to the customer.

[0012] While the frequent shopper card program may succeed in attracting the consumer to the store on an occasional basis, the program does not successfully ensure the loyalty of the consumers. Since most stores have a frequent shopper card program, consumers simply acquire one of these cards for every chain in their area and go to the one that offers the better specials on any particular week or is the most convenient at any given time. The program does not provide any incentive (i.e., reward or penalty) for visiting the store on a consistent basis.

[0013] With the considerable number of supermarket stores in any given area, there exists a need for systems and processes which provide a supermarket the ability to reward a customer for consistent patronage to the supermarket and to promote and reinforce the customer's loyalty.

SUMMARY OF THE INVENTION

[0014] It is a principle object of the present invention to provide new and improved systems and methods for retail establishments to reward customer loyalty and encourage a regular frequency of consumer visits by offering a progressive discount on their purchase.

[0015] In accordance with the present invention, a system for determining a discount for a customer of a retail establishment comprises an input device and a signal processing system. The input device generates an identifier signal indicative of a customer's identification, and the signal processing system is responsive to the identifier signal. The signal processing system has memory that stores a program. The program directs the processing system to calculate a second discount based on a first discount and a predefined time period defined by a date of a last visit of the customer to the retail establishment.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016] The present invention is described in detail below with reference to the following drawing figures of which:

[0017] FIG. **1** is a block diagram of a progressive discount system provided in accordance with the present invention;

[0018] FIG. **2** is a block diagram of a point-of-sale (POS) terminal configured in accordance with a preferred embodiment of the present invention;

[0019] FIG. **3** is a block diagram of a point-of-sale (POS) controller configured in accordance with a preferred embodiment of the present invention;

[0020] FIG. **4** is an illustration of a database table referred to as the FREQUENT SHOPPER CARD database in FIG. **3**;

[0021] FIG. **5** is a flowchart that illustrates the operations carried out for determining and applying an earned discount to a customer's current purchase according to a preferred embodiment of the present invention;

[0022] FIG. **6** is a flowchart that illustrates the operations carried out for updating the earned discount of the customers' records stored in the FREQUENT SHOPPER CARD database according to a preferred embodiment of the present invention;

[0023] FIG. **7** is an illustration of another embodiment of a database table referred to as the FREQUENT SHOPPER CARD database in FIG. **3**;

[0024] FIG. **8** is an illustration of another embodiment of a database table referred to as the FREQUENT SHOPPER CARD database in FIG. **3**;

[0025] FIGS. **9**A-**9**C are a flowchart that illustrates alternative operations carried out for determining and applying an earned discount to a customer's current purchase, and updating the earned discount of the customer's records stored in the FREQUENT SHOPPER CARD database at the time of purchase according to a preferred embodiment of the present invention;

[0026] FIG. **10** is a block diagram of another embodiment of a point-of-sale (POS) controller for a progressive discount system configured in accordance with the present invention;

[0027] FIG. **11** is an illustration of a database table referred to as the COUPON DISCOUNT database in FIG. **10**;

[0028] FIGS. **12**A-**12**B are a flowchart that illustrates operations carried out for determining and applying an earned discount provided on a coupon to a customer's current purchase, and updating records stored in the FREQUENT SHOPPER CARD database for tracking the redemption and issuance of discount coupons according to a preferred embodiment of the present invention of FIG. **10**;

[0029] FIG. **13** is a diagram of a discount coupon according to the present invention of FIG. **10**; and

[0030] FIG. **14** is a block diagram of an alternative embodiment of a point-of-sale (POS) terminal configured in accordance with a preferred embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0031] In accordance with the present invention, there are provided new and improved systems and methods that enable stores to keep track of the consumer's visits via their frequent shopper card and provide them with a discount that is incremented by a pre-defined amount if the customer visits at least once in every pre-defined time period. The discount may only be incremented once in every pre-defined time period and would be negated if the consumer did not visit at all during the pre-defined time period.

[0032] In this section, the present invention is described with regard to the drawing figures briefly described above.

[0033] As such, the following terms are used throughout the remainder of this section. For purposes of construction, such terms shall have the following meanings:

[0034] The terms "item", "product", "goods", and "services", unless otherwise specified, are intended to refer to anything sold or offered by a retailer. Accordingly, for purposes of construction, the terms "item", "product", "goods" or "services" shall be treated as synonyms.

[0035] The terms "store", "retailer", "supermarket", and "retail establishment", unless otherwise specified, are intended to refer to any entity that allows customers to purchase products. Retail establishments may be, for example, a retail store such as a warehouse, a supermarket or grocery store, a department store, or any other retail or merchandising establishment. Accordingly, for purposes of construction, the terms "store", "retailer", "supermarket", and "retail establishment" shall be treated as synonyms.

[0036] The terms "customer", "consumer" and "shopper", unless otherwise specified, are intended to refer to any person, group of people, or other entity that visits or otherwise patronizes a retailer and who purchases products from the retailer.

[0037] The term "purchase", unless otherwise specified, is intended to refer to any product or group of products that a customer buys from a retail establishment during a visit.

[0038] The aforementioned and defined terms are used below to describe the preferred embodiments of the present invention. Where appropriate, like terms are referred to with like reference numerals.

[0039] The following paragraphs illustrate the structural and operational aspects of the present invention. The structural aspects are illustrated first and are followed by discussions of the operational aspects.

[0040] In terms of structure, reference is now made to FIG. **1**. Therein depicted is a block diagram representing a purchasing system **100** for a retail establishment equipped to record and tally a customer's transaction, apply an appropriate discount to the customer's transaction, and determine the customer's discount in accordance with the customer's last visit. The purchasing system includes a point of sale (POS) controller **102** and a plurality of POS terminals (i.e., POS terminal **1** **104**, POS terminal **2** **106** and POS terminal N **108**). POS terminal N **108** is intended to indicate that purchasing system **100** may include any number of POS terminals. Each POS terminal is in communication with the POS controller **102** via a respective data link such as data link **110**, data link **112** and data link **114**.

[0041] In addition, each POS terminal also communicates with a printer and an input device. As shown in FIG. **1**, printer **1 116** and input device **1 118** are coupled to POS terminal **1 104** via data links **120**, **122**, respectively. Printer **2 124** and input device **2 126** are coupled to POS terminal **2 106** via data links **128**, **130**, respectively. Printer N **132** and input device N **134** are coupled to POS terminal N **108** via data links **136**, **138**, respectively. Printer N **132** and input device N **134** are intended to indicate that the purchasing system may include any number of printers and input devices. Each POS terminal and associated printer and input device are substantially the same and therefore, POS terminal **1 104**, printer **1 116** and input device **1 118** are described with the understanding that the other POS terminals **106**, **108**, printers **124**, **132** and input devices **126**, **134** are the same.

[0042] A link such as link **110** preferably comprises a network connection and/or a serial connection between POS terminal **1 104** and POS controller **102**. For example, link **110** may be a 10BaseT connection enabling communications between POS terminal **1 104** and POS controller **102**. Of course, many other forms of communication links may be incorporated into the actual implementation for the present invention. Such other data links may include network connections, wireless connections, radio based communications, telephony based communications, and other network-based communications such as via wide area networks distributed via open architectures such as by the Internet.

[0043] Referring now to FIG. **2**, POS terminal **104** is a data processing system including a central processing unit (CPU) **136**, a random access memory unit (RAM) **138**, a read-only memory unit (ROM) **140**, and an internal clock **142**. The POS terminal **104** is adapted to receive data signals from the input device and process the information in combination with data signals received from the POS controller **102** via link **110**.

[0044] Input device **118** generates signals that identify the item being purchased and the identity of the customer. Input device **118** may be an optical scanning device similar to the type found in grocery stores. These scanning devices are capable of reading a coded UPC bar code provided on the item to be purchased and a coded UPC bar code provided on a customer's Frequent Shopper Card (not shown) which provides the identity or account number of the customer. The scanning device transmits this coded information to POS terminal **104**.

[0045] In addition the input device may be adapted to read information stored in a magnetic storage medium (i.e., a magnetic strip) or a smart card having an integrated circuit containing erasable memory.

[0046] CPU **136** transmits data across link **110** representative of the items being purchased to the POS controller **102** to determine the price of the scanned item. POS terminal **104** receives the price of the item from the POS controller and transmits data of the name and price of each item to printer **116** via data link **120**. Upon receipt of such data, printer **116** prints the information to generate the customer's sales receipt of the transaction. In addition, POS terminal **104** maintains a subtotal of the transaction as each purchased item is scanned through input device **118**. After the discount is determined by the POS controller **102**, according to the present invention, the POS controller **102** deducts the discount from the subtotal and any applicable taxes are then added to generate a total purchase amount for the transaction. The POS terminal **104** receives this information and transfers the data to printer **116** for printing on the receipt that may include the item purchased, item price, manufacturer's coupon discount, time/date, subtotal of purchase, applicable taxes, progressive discount, total of purchase.

[0047] In accordance with the present invention, POS terminal **104** also transmits an identifier or account number of the customer to the POS controller **102**, which determines the amount of the discount in accordance with a discount application program and provides the discount amount to the POS terminal **104**. POS terminal **104** completes the transaction and transmits data representative of the subtotal of the transaction, the discount, applicable taxes and the final total of the transaction to printer **116** for printing on the receipt.

[0048] Referring to FIG. **3**, therein depicted is a block diagram of POS controller **102** as originally depicted in FIG. **1**. The POS controller **102** is a data processing system such as a computer-equipped automatic data processing system including a central processing unit (CPU) **144**, a random access memory unit (RAM) **146**, a read-only memory unit (ROM) **148**, a clock **150**, and a data storage device **152**. The CPU **144** communicates with POS terminal **104** via data link **110**.

[0049] CPU **144** is coupled to the data storage device **152** via a bus **154** or other well-known, high-speed data communications vehicle or channel. CPU **144** is a computer system of the typical variety adapted to run software programs. Additionally, CPU **144** is configured with communications equipment such as telephony communications and network communications equipment to communicate with POS terminals such as POS terminal **104**.

[0050] Data storage device **152** is an appropriate combination magnetic, semiconductor and/or optical memory. Of course, it will be appreciated that data storage device **152** may be one that consists of multiple disk sub-systems, possibly dispersed geographically and coupled via a network architecture. There is no requirement that data storage sub-system be maintained in one facility; to the contrary, the volume of information stored therein may dictate geographical dispersion. Data storage device **152** need only be logically addressable as a consolidated data source across a distributed environment, such as a network system. The implementation of local and wide-area database management systems to achieve the functionality of data storage device **152** will be readily understood by those skilled in the art.

[0051] As noted above, CPU **144** and data storage device **152** are coupled together in a conventional way via communications link **154**. Communications link **154** may be a bus or network architecture as indicated above. Communications link **154** will be readily understood by those skilled in the art.

[0052] The data storage device **152** stores a FREQUENT SHOPPER CARD DATABASE **156**, a DISCOUNT APPLICATION PROGRAM **158**, and DISCOUNT UPDATE PROGRAM **160**. The FREQUENT SHOPPER CARD DATABASE **156** maintains a record for each customer including information relating to the customers earned discount and the customer's last visit to the retail establishment. CPU **144**, in accordance with the DISCOUNT APPLICATION PROGRAM **158**, retrieves the earned discount from the customer's record in the FREQUENT SHOPPER CARD DATABASE **156** and applies the earned discount to the customer's current transaction. CPU **144** also, in accordance with the DISCOUNT APPLICATION PROGRAM, records the time and date of the current transaction in the customer's record stored in the FREQUENT SHOPPER CARD DATABASE **156**.

[0053] At pre-defined time periods (e.g. every two weeks), CPU **144**, in accordance with DISCOUNT UPDATE PROGRAM **160**, reviews each customer's record in the FREQUENT SHOPPER CARD DATABASE **156** and updates the earned discounts accordingly. If a customer has visited the store within the pre-defined time period, the customers discount is increased by a pre-defined amount (e.g. 0.5%). If not, the customer's earned discount is reset to zero. For example, the earned discounts for each record in the FREQUENT SHOPPER CARD DATABASE **156** were updated on Jan. 1, 1998 and Jan. 15, 1998 (assuming a two week pre-defined time period). If a frequent shopper visited the store during this time (i.e., Jan. 10, 1998), the customer's earned discount is incremented accordingly. If not (i.e., Dec. 25, 1998), the earned discount is reset to zero.

[0054] The following paragraphs describe a preferred embodiment of the FREQUENT SHOPPER CARD DATABASE **156** as depicted in database table **162**, shown in FIG. **4**, that is used in the present invention to record the last visit of a customer to a retail establishment and provide an earned discount to the customer's present transaction. Of course, many changes and alterations may be made to such tables to effectuate certain functionality depending on particular design and implementation details. Such changes and alterations will be apparent to those skilled in the art.

[0055] Referring now to FIG. **4**, therein is a database table **162** for storing records relating to a customer's loyalty to a particular establishment that maintains a progressive discount system that manages such data. Database **162** (hereinafter referred to as "table **162**") is a preferred implementation of FREQUENT SHOPPER CARD DATABASE **156** as originally illustrated in FIG. **3**. Table **162** has a column and row arrangement whereby columns define fields and rows define records R**1**-R**3** stored according to the fields defined by the columns. In table **162** there are six columns. Such columns store data related to ACCOUNT NUMBER **164**, CUSTOMER NAME **166**, CUSTOMER ADDRESS **168**, CUSTOMER TELEPHONE NUMBER **170**, EARNED DISCOUNT **172**, and LAST USED **174**. In table **162** record R**1** contains information related to an earned discount assigned to a shopper having an ACCOUNT NUMBER of 1234567 among other specified data.

[0056] Each record R**1**-R**3** is representative of each customer that has a Frequent Shopper Card account at the retail establishment. Each record R**1**-R**3** maintains the customers present earned discount, in the EARNED DISCOUNT field **172**, and the date and time the customer last purchased goods at the retail establishment in the LAST USED field **174**. For example, with regard to record R**1**, Joe Smith having an ACCOUNT NUMBER of 1234567 presently has an EARNED DISCOUNT of 3.5% and his last purchase at the retail establishment was at 2:43 pm on Jan. 27, 1998. Accordingly, Joe Smith will receive a 3.5% discount of his next purchase provided his next purchase is prior to the next update of table **162**.

[0057] Records R**2**-R**3** have the same record format as record R**1** and indicates similar information related to other customers that are identified as frequent shoppers. Accordingly, for purposes of brevity, a detailed review and discussion of records R**2**-R**3** are omitted.

[0058] It is important to note that the structure and arrangement of table **162**, including its columns and fields, may change to suit particular design requirements. Many columns may be added to table **162** to carry out certain functionality control within a data processing system employing a database table like table **162**. Such additions and changes will be apparent to those skilled in the art.

[0059] The aforementioned discussions were concerned with the structural aspects of a preferred embodiment and corresponding components of the present invention. Accordingly, it should be understood that the POS controller **102** and POS terminals **104**, **106**, **108** of purchasing system **100** shown in FIGS. **1**-**3** and the database table **156** illustrated in FIG. **4** have been designed to operate and function together. The flowcharts depicted in FIGS. **5** and **6** and described below, illustrate how such structures operate together. In particular, described below are the steps carried out by purchasing system **100** within a retail establishment to discount a customer's transaction by a pre-defined percentage and to periodically update the customer's earned discount.

[0060] With the aforementioned comments in mind, reference is now made to FIG. **5**. Depicted therein is a flowchart that illustrates the steps of a preferred process performed by a data processing system, such as purchasing system **100**, for identifying a frequent shopper and applying the appropriate earned discount to the shopper's transaction. The computer programming necessary to carry out many of the functions stated below will be readily apparent to those skilled in the art of computer programming and will not require undue design and implementation effort. The flow charts of FIGS. **5** and **6** along with the discussions of the same found herein are sufficient and adequate to enable one skilled in the art to make and use the present invention.

[0061] Processing starts at Step S**5**-**1** and proceeds to Steps S**5**-**2** and S**5**-**3** where the POS controller **102** receives the account number encoded on the Frequent Shopper Card and the subtotal of the current customer's transaction from POS terminal **104**, respectively. As described above, the customer's Frequent Shopper Card, having a UPC coded information, is swiped through input device **118** which scans the encoded information on the card, including the customer's account number. The encoded information is transmitted to POS terminal **104** and provided to the POS controller **102** accordingly.

[0062] Thereafter, processing proceeds to Step S**5**-**4**, where CPU **144** retrieves the customer record R**1**, identified by the account number in field **164** of the FREQUENT SHOPPER CARD DATABASE **156**.

[0063] At Step S**5**-**5**, CPU **144** retrieves the discount percentage from the EARNED DISCOUNT field **172** of the customer's record R**1**. At Step S**5**-**6**, the dollar amount of the discount is calculated by multiplying the percentage of the earned discount and the subtotal of the current purchase. At Step S**5**-**7**, the dollar amount of the discount is subtracted from subtotal of the purchase and, at Step S**5**-**8**, the final total of the transaction is calculated, for example by adding any applicable taxes to the discounted subtotal calculated in Step S**5**-**7**.

[0064] At Step S**5**-**9**, POS terminal **104** transmits a signal to printer **116** which prints information relating to the discount of the customer's transaction onto the sales receipt. This information may include the amount of the discount, the discounted subtotal, applicable taxes and final total of the transaction.

[0065] At Step S**5**-**10**, CPU **144** updates the LAST USED field **174** of the customer's record in the FREQUENT SHOP-

PER CARD DATABASE **156**, as shown in database table **162** of FIG. **4**, to include the current time and date provided by the internal time clock **150**.

[0066] It should be noted that while CPU **144** updates the LAST USED field **172** of the customer's record R**1** for every visit, the present invention contemplates the concept of applying a weight to each visit in order to determine whether the visit to the retail establishment is sufficient to be deemed a "true" visit. A "true" visit is defined as a visit that the retail establishment considers to be representative of a loyal customer, not a visit by one who occasionally frequents the retail establishment to purchase a few items. For example, the discount system would not recognize a purchase of less than a pre-defined dollar amount (i.e., ten (10) dollars) as a "true" visit to the retail establishment. As a consequence, the LAST USED field **174** of the database table **162** is not updated with the date of the current transaction, and therefore may result in the customer's earned discount being reset if this visit is the customer's only visit to the retail establishment within the pre-defined time period.

[0067] The concept of applying a weight to a customer's visit may also be used in determining whether a customer's transaction is discounted. For example, the discount system would not discount the current transaction unless the subtotal of the purchase is at least a pre-defined dollar amount (i.e., ten (10) dollars).

[0068] Accordingly, the operations carried out in FIG. **5** illustrates steps for discounting a loyal customer's purchase in accordance with the discount earned by the customer.

[0069] Reference is now made to FIG. **6**. Depicted is a flowchart that illustrates the steps of a preferred process performed by a data processing system, such as purchasing system **100**, for updating the EARNED DISCOUNT field **172** of each record R**1**-R**3** of the FREQUENT SHOPPER CARD DATABASE **156** in accordance with the last date, stored in the LAST USED field **174**, that each respective customers has made a purchase at the retail establishment. The retail establishment executes this process at pre-defined time periods (i.e. every two weeks). One will recognize that this time period may be set for any desired length of time, however, the time period should be representative of the typical frequency that a loyal customer would visit the retail establishment. The computer programming necessary to carry out many of the functions stated below will be readily apparent to those skilled in the art of computer programming and will not require undue design and implementation effort.

[0070] Processing starts at Step S**6-1** and immediately proceeds to Step S**6-2** where CPU **144** of the POS controller **102** retrieves a customer record from the FREQUENT SHOPPER CARD DATABASE **156** depicted in database table **162** of FIG. **4**. In Step S**6-3** the POS controller **102** retrieves the transaction date from the LAST USED field **174** of the retrieved customer record R**1**.

[0071] Thereafter, processing proceeds to Step S**6-4**, where CPU **144** compares the last transaction date of the customer stored in the LAST USED field **174** with the date of the previous update of the records of the FREQUENT SHOPPER CARD DATABASE **156**. In other words, the previous update corresponds to the date that the DISCOUNT UPDATE PROGRAM **160** was last executed. If the customer's last transaction date was before the previous update of the FREQUENT SHOPPER CARD DATABASE **156**, the EARNED DISCOUNT field **172**, at Step S**6-5**, is set to zero percent. The harshness of resetting the earned discount to zero percent is intended to provide greater incentive for the customer to visit the retail establishment on a regular basis. This harshness may be tempered by reducing the earned discount in accordance with any number of criteria. For example, the earned discount may be decreased by a pre-defined value each time the customer fails to visit the store within the pre-defined time period. Alternatively, the updating process may not penalize the customer after a first instance in which the customer fails to visit the retail establishment in the pre-defined period, but instead postpone the penalty for a subsequent failure. This alternative may be used to prevent a loyal customer who, for instance, may have been away on vacation from being penalized. As one skilled in the art will appreciate that the penalty for not visiting the retail establishment may be determined in a number of different ways.

[0072] If, at Step S**6-4**, the customer's last transaction was after the previous update of the FREQUENT SHOPPER CARD DATABASE **156**, the EARNED DISCOUNT field **172**, at Step S**6-6**, is incremented by a pre-defined percentage value (i.e., 0.5%). For example, if the present earned discount is 2.0 percent, the earned discount is incremented to 2.5 percent (assuming the percentage value increment is 0.5%). The earned discount that can be earned by any frequent customer may be limited to a pre-defined percent, such as 5.0%. Once the earned discount has achieved this maximum discount value, the earned discount field will not be incremented and will, at best, remain at the maximum discount value.

[0073] At Step S**6-7**, after the earned discount of a customer's record is updated, CPU **144** retrieves the next customer record R**2** from the FREQUENT SHOPPER CARD DATABASE **156**. CPU **144** then updates the EARNED DISCOUNT field **172** for the next customer record R**2** in accordance with Steps S**6-3** through S**6-6**. Steps S**6-3** to S**6-7** are repeated until all of the customer records of the FREQUENT SHOPPER CARD DATABASE **156** are updated, at which time the update of the database **156** is complete.

[0074] Accordingly, by performing the steps of FIG. **6**, the earned discount defined in the EARNED DISCOUNT field **172** of each customer record R**1**-R**3** is updated.

[0075] It should be noted that while the reward to the loyal customer is a discount applied to the customer's current transaction, the present invention is not so limited. To the contrary, the present invention contemplates that the discount may be in the form of a dollars off each transaction with the amount of dollars off increasing with continued loyalty to the retail establishment. Further, instead of the reward being a discount to the customer's transaction, the reward may be in other forms unrelated to the purchase or retail establishment, such as frequent flier miles, free time for long distance calling, or other reward incentives.

[0076] It should be further noted that while the discount is applied to the entire transaction, the present invention contemplates that the earned discount may be applied to a specific item purchased. For example, the discount system may reward a customer's loyalty to a brand of product. If the customer purchases a defined product within a pre-defined time period, the customer discount is incremented. The customer's discount on the product will continue to be incremented to a maximum discount value, provided the customer purchases the product within each successive pre-defined time period. If the purchaser fails to purchase the product in the pre-defined time period, the discount may be reset to zero percent.

[0077] Referring now to FIG. **7**, therein is a database table **176** for storing records R**1**-R**3** relating to a customer's loyalty to a particular product that is an alternative embodiment of the table **162** of FIG. **4**, as described above. Table **176** has a column and row arrangement whereby columns define fields and rows define records R**1**-R**3** stored according to the fields defined by the columns. In table **176** there are seven columns. Such columns store data related to ACCOUNT NUMBER **164**, CUSTOMER NAME **166**, CUSTOMER ADDRESS **168**, CUSTOMER TELEPHONE NUMBER **170**, EARNED DISCOUNT **172**, DATE LAST USED **174**, and DISCOUNT ITEMS **178**.

[0078] Database table **176** includes the columns of the table **162** of FIG. **4**, and table **176** further includes an additional field **178**, DISCOUNT ITEMS, for each record. The DISCOUNT ITEMS field **178** includes the UPC code numeric code to identify the product and the alphanumeric name of the product. The DISCOUNT ITEMS field **178** identifies the product that receives the discount stored in the EARNED DISCOUNT field **172**. In table **176** record R**1** contains information related to an earned discount for a DISCOUNT ITEMS **178** of DIET PEPSI assigned to a shopper having an ACCOUNT NUMBER **164** of 1234567 among other specified data.

[0079] Records R**2**-R**3** have the same record format as record R**1** and indicates similar information related to other customers that are identified as frequent shoppers. Accordingly, for purposes of brevity, a detailed review and discussion of records R**2** and R**3** are omitted.

[0080] An alternative embodiment to the process of applying the earned discount and updating the FREQUENT SHOPPER CARD DATABASE **156** is depicted in FIGS. **9**A-**9**C. This embodiment updates the FREQUENT SHOPPER CARD DATABASE **156** in real time and thereby eliminates the process of updating all the records R**1**-R**3** of the database **156** at pre-defined time periods, as described in the embodiment of FIGS. **1**-**6**. In other words, the earned discount of each customer record R**1**-R**3** of the database **156** is updated accordingly at the time of each customer transaction. The structure of the system is substantially the same as that shown in FIGS. **1**-**4**. The data storage device **152**, shown in FIG. **3**, of this embodiment combines the process of the DISCOUNT APPLICATION PROGRAM **158** and the DISCOUNT UPDATE PROGRAM **160**. In addition, the database table **180** of FIG. **8** is an alternative embodiment of the table **162** (see FIG. **4**) as described hereinabove, except table **180** includes an additional field **182**, DISCOUNT UPDATED, for each record R**1**-R**3**. The DISCOUNT UPDATED field **182** includes the time and date that the EARNED DISCOUNT field **172** was last changed. The data stored in DISCOUNT UPDATED field **182** provides the measuring period for determining when the earned discount should be changed or remain the same. The importance and function of the data provided in the DISCOUNT UPDATED field **182** will become apparent in the description of the process of the system as shown in the flowcharts of FIG. **9**A-**9**C.

[0081] Each record R**1**-R**3** is representative of a customer that has used a Frequent Shopper Card at the retail establishment. Each record R**1**-R**3** maintains the customers present earned discount at field **172**, the date and time the customer last purchased goods at the retail establishment at field **174**, and the date that the earned discount was last updated at field **182**. For example, with regard to record R**1**, Joe Smith having an ACCOUNT NUMBER of 1234567 presently has an EARNED DISCOUNT of 3.5%, his last purchase at the retail establishment was at 2:43 pm on Jan. 27, 1998, and the EARNED DISCOUNT field was last updated (from 3.0% to 3.5%, assuming an increment of 0.5%) at 8:21 pm on Jan. 14, 1998.

[0082] The flowcharts depicted in FIGS. **9**A-**9**C illustrate the process of updating and applying the earned discount of the system shown in FIGS. **1**-**3** and **7** at the time of the customer's transaction.

[0083] With the aforementioned comments in mind, reference is now made to FIG. **9**A. Depicted is a flowchart that illustrates the steps of a preferred process performed by a data processing system, such as purchasing system **100**, for discounting a customers transaction and updating the customer's earned discount in real time in accordance with the loyalty of the customer to the retail establishment. The computer programming necessary to carry out the functions described below will be readily apparent to those skilled in the art. The flowcharts of FIGS. **9**A-**9**C along with the discussions of the same found herein after are sufficient and adequate to enable one skilled in the art of computer programming to make and use the present invention.

[0084] Processing starts at Step S**9**-**1** and immediately proceeds to Step S**9**-**2** and S**9**-**3** where the POS controller **102** receives the subtotal of the customer's transaction, and the account number in field **164** encoded on the Frequent Shopper Card from POS terminal **104**.

[0085] Thereafter, processing proceeds to Step S**9**-**4**, where CPU **144** retrieves the customer record R**1**, identified by the account number in field **164**, from the FREQUENT SHOPPER CARD DATABASE **156**.

[0086] At Step S**9**-**5**, CPU **144** retrieves the transaction date from the LAST USED field **174** of the FREQUENT SHOPPER CARD DATABASE **156**.

[0087] Thereafter, processing proceeds to Step S**9**-**6**, where CPU **144** compares the date of the current transaction with the transaction date from the LAST USED **174** field of the database **156**. If the current transaction date is more than a first pre-defined time period (i.e. two weeks) after the transaction date from the LAST USED field **174** of the database, CPU **144** sets the discount from the EARNED DISCOUNT field **172** of the customer's record R**1** to zero percent (0%) at Step S**9**-**7**. At Step S**9**-**11**, the time and date of the current transaction is recorded in the DISCOUNT UPDATED and LAST USED fields **180**, **174**, respectively, of the customer's record R**1** in the FREQUENT SHOPPER CARD DATABASE **156**.

[0088] At Step S**9**-**6**, if the current transaction date is less than the first pre-defined time period after the transaction date from the LAST USED field **174** of the database, the transaction date from the DISCOUNT UPDATED field **182** of the database, at Step S**9**-**8**, is retrieved.

[0089] At Step S**9**-**9**, the date of the current transaction is compared to the transaction date from the DISCOUNT UPDATED field **182** of the FREQUENT SHOPPER CARD DATABASE **156**. This step is to determine whether the customer's current transaction is later than a second pre-defined time period (i.e. two weeks) since the last time the EARNED DISCOUNT field **172** has been updated. If so, the customer's discount is incremented. If not, the customer's discount remains the same.

[0090] Accordingly, if the current transaction date, at Step S**9**-**9**, is later than the second pre-defined period after the transaction date of the DISCOUNT UPDATED field **182**, a pre-defined increment, at Step S**9**-**10** is added to the

EARNED DISCOUNT field **172** of the database. At Step S**9**-**11**, the time and date of the current transaction is recorded in the DISCOUNT UPDATED and LAST USED fields **182**, **174**, respectively, of the customer's record R**1** in the FREQUENT SHOPPER CARD DATABASE **156**. This step effectively resets the time period (i.e., two weeks) for updating the earned discount.

[0091] At Step S**9**-**9**, if the current transaction date is less than the second pre-defined time period (i.e., two weeks) after the transaction date of the DISCOUNT UPDATE field **182** of the database, the EARNED DISCOUNT and DISCOUNT UPDATE fields **182**, **174**, respectively, remains unchanged, and the time and date of the current transaction is recorded in the LAST USED field **174** of the customer's record R**1** in the FREQUENT SHOPPER CARD DATABASE **156**.

[0092] At Step S**9**-**13** after the EARNED DISCOUNT, DISCOUNT UPDATED and LAST USED fields **172**, **174**, **182**, respectively, of the customer's record R**1** is updated, the discount percentage from the EARNED DISCOUNT field of the customer's record is retrieved. At Step S**9**-**14**, the dollar amount of the discount is calculated by multiplying the percentage of the earned discount and the subtotal of the current transaction. At Step S**9**-**15**, the dollar amount of the discount is subtracted from subtotal of the current transaction and at Step S**9**-**16**, the final total of the transaction is calculated, for example by adding any applicable taxes to the discounted subtotal calculated in Step S**9**-**15**.

[0093] At Step S**9**-**17**, POS terminal **104** transmits a signal to printer **116** which in turn prints information relating to the discount to the customer's transaction onto the sales receipt. This information may include the amount of discount, the discounted subtotal, the applicable taxes and the final total of the transaction.

[0094] Accordingly, FIGS. **9**A-**9**C illustrate steps that are carried out according to the present invention to discount a loyal customer's purchase in accordance with the discount earned by the customer, and to update the earned discount of each individual customer.

[0095] The following description provides an example of the process illustrated in FIGS. **9**A-**9**C in reference to the customer records R**1**-R**3** shown in FIG. **8**. First, it is assumed that date of the current transaction is Feb. 1, 1998, the pre-defined time period to update the earned discount is two weeks, and the pre-defined discount increment is 0.5%. For record R**1** having an ACCOUNT NUMBER of 1234567, the EARNED DISCOUNT would be increment from 3.0% to 3.5% because Joe Smith's last transaction was less than two weeks ago and the last discount update was longer than two weeks ago. Further, both the DISCOUNT UPDATED and LAST USED fields **182**, **174**, respectively would be updated to Feb. 1, 1998. For record R**2** having an ACCOUNT NUMBER of 1234568, the EARNED DISCOUNT would be reset from 0.5% to 0.0% because Jane Doe's last transaction was more than two weeks ago. Further, both the DISCOUNT UPDATED and LAST USED fields **182**, **174**, respectively, would be updated to Feb. 1, 1998. For record R**3** having an ACCOUNT NUMBER of 1234569, the EARNED DISCOUNT would remain at 1.0% because John Jones' last transaction and the previous discount update were both less than two weeks ago. Further, only the data of the LAST USED field **174** would be updated to Feb. 1, 1998.

[0096] Another embodiment of the POS Controller **102** of a purchasing system **100** is illustrated in FIG. **10** wherein the discount is offered in the form of a coupon **183** (similar to that shown in FIG. **13**). This system **100** eliminates the need to provide a record R**1** of each customer as required in the previous embodiments of the present invention. The structural features of the purchasing system **100** that issues discount coupons **183** to loyal customers are substantially similar to the embodiment of the present invention described in connection with FIGS. **1**-**3**, with the exception that the data storage device **152** does not include a FREQUENT SHOPPER CARD DATABASE **156**. This embodiment may, however, include a COUPON DISCOUNT DATABASE **184** which records data relating to the issuance and redemption of coupons to track the success of the redemption of the coupons **183**.

[0097] Referring now to FIG. **11**, database table **186** (hereinafter referred to as "table **186**") is a preferred implementation of COUPON DISCOUNT DATABASE **184** as originally illustrated in FIG. **10**. Table **186** has a column and row arrangement whereby columns define fields and rows define records R**1**-R**6** stored according to the fields defined by the columns. In table **186** there are eight columns shown. The columns store data related to RECORD IDENTIFIER **190**, EARNED DISCOUNT **192**, ISSUE DATE **194**, TOTAL # ISSUED **196**, TOTAL # REDEEMED **198**, REDEEM DATE **1** **200**, REDEEM DATE **2** **202** and REDEEM DATE N **204**. Field REDEEM DATE N **204** is intended to indicate that table **186** may include any number of REDEEM DATE fields. In table **186** record R**1**, identified by a RECORD IDENTIFIER of "1", contains information related to the coupons **183** issued on Jan. 1, 1998 having an earned discount value of 0.5%.

[0098] Each record R**1**-R**6** is representative of the information relating to the redemption and issuance of coupons **183** issued on a given date stored in ISSUE DATE field **194** having a common discount value stored in EARNED DISCOUNT field **192**. Each record R**1**-R**6** maintains the total number of coupons **183** issued on the given day, stored in the TOTAL # ISSUED field **196** having a common earned discount value, and the total number of these coupons that were redeemed, stored in the TOTAL # REDEEMED field **198**, and the total number of coupons redeemed on each date, stored in the respective REDEEM DATE fields **200**, **202**, **204**. For example, with regard to record R**1**, thirty-two (32) coupons having a 0.5% discount value were issued on Jan. 1, 1998. Of the thirty-two (32) coupons issued, three (3) coupons were redeemed on date 1, eleven (11) coupons were redeemed on date 2 and zero (0) coupons redeemed on date N.

[0099] Records R**2**-R**6** have the same record format as record R**1** and indicates similar information relating to the total number of coupons of a specific discount value that were issued on a given day and information relating to the redemption of these coupons. Accordingly, for purposes of brevity, a detailed review and discussion of records R**2**-R**6** is omitted.

[0100] The relationship of table **186** to other data processing systems and databases utilized in the preferred embodiment will be clear from the description regarding FIGS. **12**A-**12**B. It is important to note, however, that the structure and arrangement of table **186**, including its columns and fields, may change to suit particular design requirements. Many columns may be included in table **186** to carry out certain functionality and control within a data processing system employing a database table like table **186**. Such additions and changes will be apparent to those skilled in the art.

[0101] The aforementioned descriptions were concerned with the structural aspects of the preferred embodiments and corresponding components of the present invention. Accord-

ingly, it should be understood that the POS controller **102**, POS terminal **104**, input device **118** and printer **116** of FIGS. **2** and **10** and the database table **186** illustrated in FIG. **11** operate and function together. The flowcharts depicted in FIGS. **12**A and **12**B and described below illustrate how such structures operate together. In particular, described below are the steps carried out by purchasing system **100** within a retailer to redeem a discount coupon **183** and issue another wherein the discount value of the new coupon is determined in accordance with the loyalty of the customer to the retail establishment.

[0102] With the aforementioned comments in mind, reference is now made to FIGS. **12**A and **12**B. Depicted therein is a flowchart that illustrates the steps of a process performed by a data processing system, such as purchasing system **100** as depicted in FIGS. **2** and **10**, for redeeming a discount coupon and issuing a new coupon in accordance with the loyalty of the customer to the retail establishment. The computer programming necessary to carry out many of the functions stated below will be readily apparent to those skilled in the art.

[0103] Processing starts at Step S**12-1** and immediately proceeds to Step S**12-2** where the coupon bar code **206** (described in detail in FIG. **13**) is scanned by input device **118** as the coupon **183** is swiped therethrough. Input device **118** then transmits the encoded bar code to POS terminal **104**. The POS controller **102** then receives the bar code from POS terminal. In Step S**12-3**, the POS controller **102** decodes the coupon bar code **206** to identify the coupon **183** as a progressive discount coupon by an encoded identifier.

[0104] Thereafter, processing proceeds to Step S**12-4**, where CPU **144** retrieves the issue date of the coupon **183** provided in the bar code on the coupon, and, in Step S**12-5** compares the issue date of the coupon with the present transaction date. If the time period therebetween is greater than a pre-defined time period (i.e., 2 weeks), the coupon, at Step S**12-6**, is deemed to have expired and a message is provided to the customer. At Step S**12-7**, the earned discount is set to zero percent.

[0105] If the determined time period is within the predefined time period, the earned discount that is encoded on the coupon **183** and provided in the bar code **206** is received at Step S**12-8**.

[0106] At Step S**12-9**, the dollar amount of the discount is calculated by multiplying the percentage of the earned discount and the subtotal of the current transaction provided to POS terminal **104**. At Step S**12-10**, the dollar amount of the discount is subtracted from subtotal of the current transaction, and at Step S**12-11**, the final total of the transaction is calculated, for example by adding any applicable taxes to the discounted subtotal calculated in Step S**1 2-10**.

[0107] At Step S**12-12**, POS terminal **104** transmits a signal to printer **116**, which in turn prints information relating to the discount to the customer's transaction onto the sales receipt. This information may include the amount of discount, the discounted subtotal, the applicable taxes and the final total of the transaction.

[0108] At Step S**12-13**, the earned discount value of the new coupon **183** is determined. A process for determining the new coupon value is illustrated in FIGS. **9**A-**9**C at Steps S**9-8** to S**9-10**. The encoded data on the coupon **183** would include a date when the earned discount value of the coupon was last changed, similar to the date stored in the DISCOUNT UPDATED field **182** of Table **180** of FIG. **8**. If the time period between the current transaction and the transaction when the earned discount was last changed is greater than a pre-defined time period (e.g., 2 weeks), the earned discount is increased by a pre-determined increment (e.g., 0.5%). If not, the earned discount remains the same as the current coupon value. For expired coupons, the coupon is reset to be a pre-defined discount (e.g., 0.5%).

[0109] Another process for determining the earned discount value would be to increase the current earned discount by a predetermined amount each time a coupon is redeemed within a predefined time period. For example, a coupon currently having an earned discount of 2.5% will be increased to 3.0% (assuming the pre-defined amount is 0.5%). For expired coupons, the coupon value of 0.0% would be increased to 0.5%.

[0110] At Step S**12-14**, a new coupon is issued to the customer. The coupon may be a paper form that is issued by a point of pickup unit which may be one similar to an automatic coupon dispensers commonly found in grocery stores. In this way, a customer can immediately receive another coupon for immediate use. Of course, coupons could also be mailed or sent via other communication vehicles such as electronic mail and via the Internet to a particular customer. Furthermore, the coupons could even be printed at the bottom of the sales receipts.

[0111] Thereafter, at Step S**12-15** the POS controller **102** retrieves the redeemed coupon's record R**2** in the COUPON DISCOUNT DATABASE **184** according to the issue date and the discount value of the coupon. For example, referring to FIG. **11**, the POS controller **102** would retrieve record R**2** having a RECORD IDENTIFIER value of "2" for a redeemed coupon having an EARNED DISCOUNT of 1.0% that was issued on Jan. 1, 1998.

[0112] At Step S**12-16**, the TOTAL # REDEEMED and appropriate REDEEM DATE fields **198**, **200**, **202**, **204**, respectively, of the originally issued record are incremented by one. Again using record R**2** as an example, TOTAL # ISSUED field **196** and appropriate redeem date (assuming REDEEM DATE **1 200**) are incremented from "37" to "38" and from "4" to "5", respectively.

[0113] At Step S**12-17**, the record R**6** for the newly issued coupon **183** is retrieved from the COUPON DISCOUNT DATABASE **184** according to the issue date and discount value of the new coupon. For example, POS controller **102** would receive record R**6** having a RECORD IDENTIFIER value of "6" for a new coupon and a new earned discount value of 1.0% that was issued on Jan. 2, 1998.

[0114] At Step S**12-16**, the TOTAL # ISSUED field **196** of the newly issued record R**6** is incremented by one. Again using record R**6** as an example, TOTAL # ISSUED is incremented from "79" to "80".

[0115] Accordingly, the operations carried out in FIGS. **12**A and **12**B illustrate the steps that are carried out according to the present invention to discount a loyal customer's purchase in accordance with the discount coupon earned by the customer, and updating and issuing another discount coupon to the customer.

[0116] Referring now to FIG. **13**, therein depicted is a discount coupon **183** representative of the percentage discount the customer will receive off his next purchase at the retail establishment. In particular, the coupon **183** provides a discount of 5% off the customer's next purchase at ABC grocer, provided the visit is made between the dates of Jan. 8, 1998 and Jan. 15, 1998 along with the incentive that redemption of

the coupon within the defined time period will result in an even higher discount. Otherwise, the discount coupon is invalid.

[0117] Additionally, the coupon **183** includes an identification number **206** corresponding to the coupon identifier and among other information. That item number may be in the form of a UPC or other bar code, or may be a string of alpha and/or numeric characters that are to be scanned or keyed into an input device. The bar code may include an identifier, the issue date of the coupon, the discount value of the coupon, last date a coupon was used, and the previous date the earned discount value was changed. This type of information could be encoded using the UCC/EAN code **128**. Code **128** is a bar code that uses various compression techniques and is capable of encoding the full ASCII character set and encoding data can be of any length. Alternatively, the information on the coupon may be encoded using a two-dimensional ("2D") bar code format. The 2D bar code format enables a substantial amount of information to be provided on the coupon in a very small area.

[0118] The embodiment of the present invention illustrated by FIGS. **10-13** provides a coupon including the data used to apply a discount and issue a new coupon in accordance with the date of the customer's last visit. One skilled in the art, however, will appreciate that the data encoded (i.e., identifier, discount, issue date, etc.) on the coupon may be stored within an alternate embodiment of the FREQUENT SHOPPER CARD DATABASE as shown in FIGS. **4**, **7** and **8**. In this alternative, the coupon may simply include an identifier, such as an account number, to retrieve a customer's record in the database. The identifier may be a pointer which is used to access the appropriate record in the database.

[0119] The POS controller **102** then retrieves and updates the data stored in the record identified by the coupon. The coupon value (earned discount) for all records may be simultaneously updated periodically, as illustrated in FIG. **6**, or each coupon value may be updated individually at the time of each customer's visit as illustrated in FIGS. **9A-9C**.

[0120] Referring to FIG. **14**, another embodiment of a POS terminal **210** includes a control device **212** which is in communication via a communication medium **214** with a system **216** for printing receipts and/or coupons. The control device **212** comprises a processor **218** that is in communication with an input device **220** and a display device **222**. The system **216** for printing comprises a processor **224** in communication with a storage device **226** and a printer **228**. In this embodiment, the control device **212** may be a cash register, and the system **216** may be an electronic device for printing coupons in accordance with data received from the cash register. Other configurations of POS terminals will be understood by those skilled in the art.

[0121] Accordingly, having fully described the present invention by way of example with reference to the attached drawing figures, it will be readily appreciated that many changes and modifications may be made to the invention and to any of the exemplary embodiments shown and/or described herein without departing from the spirit or scope of the invention which is defined in the appended claims.

What is claimed is:

1. A method, comprising:
- receiving transaction data that represents a current transaction;
- receiving a customer identifier of a customer participating in the current transaction;
- determining a current transaction time and a last transaction time associated with the customer;
- determining that a duration between the last transaction time and the current transaction time equals or exceeds a predetermined time period;
- determining that the current transaction comprises a first instance of the customer equaling or exceeding the predetermined time period;
- determining a discount that was applied to the last transaction associated with the customer; and
- applying the discount to the current transaction.

2. The method of claim **1**, further comprising, prior to applying the discount:
- determining, based on the transaction data, that a value of the current transaction exceeds a predetermined dollar amount; and
- increasing the discount by a predetermined amount.

3. The method of claim **1**, further comprising, prior to applying the discount:
- determining, based on the transaction data, that a value of the current transaction is less than a predetermined dollar amount;
- determining a penalty amount; and
- decreasing the discount amount by the penalty amount.

4. The method of claim **1**, in which applying the discount further comprises:
- determining that the current transaction includes a purchase of a predetermined product; and
- applying a discount amount to the predetermined product.

5. The method of claim **1**, in which applying the discount comprises providing a discount amount at a retail establishment.

6. The method of claim **1**, in which applying the discount comprises generating a coupon comprising a discount amount.

7. The method of claim **1**, in which applying the discount comprises at least one of decreasing a current transaction amount by a dollar amount, awarding frequent flyer miles, providing long distance call time, or providing a reward incentive.

8. The method of claim **1**, further comprising:
- receiving second transaction data that represents a transaction of the customer occurring after the current transaction;
- determining that the second transaction equals or exceeds the predetermined time period when a second transaction time is measured from the current transaction time;
- determining a penalty amount; and
- applying the discount less the penalty amount to the second transaction.

9. The method of claim **8**, wherein the penalty amount resets the discount to zero.

10. A computer readable medium storing instructions configured to direct a processor to:
- receive transaction data that represents a current transaction;
- receive a customer identifier of a customer participating in the current transaction;
- determine a current transaction time and a last transaction time associated with the customer;
- determine that a duration between the last transaction time and the current transaction time equals or exceeds a predetermined time period;

determine that the current transaction comprises a first instance of the customer equaling or exceeding the predetermined time period;

determine a discount that was applied to the last transaction associated with the customer; and

apply the discount to the current transaction.

11. The computer readable medium of claim **10**, further comprising instructions configured to direct the processor to, prior to applying the discount:

determine, based on the transaction data, that a value of the current transaction exceeds a predetermined dollar amount; and

increase the discount by a predetermined amount.

12. The computer readable medium of claim **10**, further comprising instructions configured to direct the processor to, prior to applying the discount:

determine, based on the transaction data, that a value of the current transaction is less than a predetermined dollar amount;

determine a penalty amount; and

decrease the discount amount by the penalty amount.

13. The computer readable medium of claim **10**, in which the instructions for applying the discount further comprises instructions configured to direct the processor to:

determine that the current transaction includes a purchase of a predetermined product; and

apply a discount amount to the predetermined product.

14. The computer readable medium of claim **10**, in which the instructions for applying the discount further comprises instructions configured to direct the processor to provide a discount amount at a retail establishment.

15. The computer readable medium of claim **10**, in which the instructions for applying the discount further comprises instructions configured to direct the processor to generate a coupon comprising a discount amount.

16. The computer readable medium of claim **10**, in which the instructions for applying the discount further comprises instructions configured to direct the processor to at least one of decrease a current transaction amount by a dollar amount, award frequent flyer miles, provide long distance call time, or provide a reward incentive.

17. The computer readable medium of claim **10**, further comprising instructions configured to direct the processer to:

receive second transaction data that represents a transaction of the customer occurring after the current transaction;

determine that the second transaction equals or exceeds the predetermined time period when a second transaction time is measured from the current transaction time;

determine a penalty amount; and

apply the discount less the penalty amount to the second transaction.

18. The computer readable medium of claim **17**, in which the instructions for determining the penalty amount comprise instructions configured to direct the processor to calculate the penalty amount such that the discount is reset to zero.

19. An apparatus, comprising:

a processor; and

a storage device operatively coupled to the processor, the storage device storing instructions configured to direct the processor to:

receive transaction data that represents a current transaction;

receive a customer identifier of a customer participating in the current transaction;

determine a current transaction time and a last transaction time associated with the customer;

determine that a duration between the last transaction time and the current transaction time equals or exceeds a predetermined time period;

determine that the current transaction comprises a first instance of the customer equaling or exceeding the predetermined time period;

determine a discount that was applied to the last transaction associated with the customer; and

apply the discount to the current transaction.

20. A method, comprising:

receiving transaction data that represents a current transaction;

receiving a customer identifier of a customer participating in the current transaction;

determining, based on the customer identifier, a greatest transaction duration for the customer;

calculating a current transaction duration based on the current transaction data and last transaction data associated with a last transaction of the customer;

determining that the greatest transaction duration exceeds a predetermined time period;

determining that the current transaction duration is less than the predetermined time period;

determining a discount applied to the last transaction of the customer; and

applying the discount to the current transaction.

21. The method of claim **20**, further comprising, prior to applying the discount:

determining that a value of the current transaction exceeds a predetermined dollar amount; and

increasing the discount by a predetermined amount.

22. The method of claim **20**, further comprising, prior to applying the discount:

determining that a value of the current transaction is less than a predetermined dollar amount;

determining a penalty amount; and

decreasing the discount amount by the penalty amount.

23. The method of claim **20**, in which applying the discount further comprises:

determining that the current transaction includes a purchase of a predetermined product; and

applying a discount amount to the predetermined product.

24. The method of claim **20**, further comprising:

determining that the date of occurrence of the greatest transaction duration exceeds a predetermined time period from a date of the current transaction; and

resetting the greatest transaction duration to equal the current transaction duration.

25. The method of claim **20**, further comprising:

determining that the date of occurrence of the greatest transaction duration exceeds a predetermined time period from a date of the current transaction; and

resetting the greatest transaction duration to equal the next longest transaction duration that occurred within the predetermined time period.

26. The method of claim **20**, in which applying the discount comprises providing a discount amount at a retail establishment.

27. The method of claim 20, in which applying the discount comprises generating a coupon comprising a discount amount.

28. The method of claim 20, in which applying the discount comprises at least one of decreasing a current transaction amount by a dollar amount, awarding frequent flyer miles, providing long distance call time, or providing a reward incentive.

29. The method of claim 20, further comprising:

receiving second transaction data that represents a second transaction of the customer occurring after the current transaction;

determining that the second transaction equals or exceeds the predetermined time period when a second transaction time is measured from the current transaction time;

determining a penalty amount; and

applying the discount less the penalty amount to the second transaction.

30. The method of claim 29, wherein the penalty amount resets the discount to zero.

31. A computer readable medium storing instructions configured to direct a processor to:

receive transaction data that represents a current transaction;

receive a customer identifier of a customer participating in the current transaction;

determine, based on the customer identifier, a greatest transaction duration for the customer;

calculate a current transaction duration based on the current transaction data and last transaction data associated with a last transaction of the customer;

determine that the greatest transaction duration exceeds a predetermined time period;

determine that the current transaction duration is less than the predetermined time period;

determine a discount applied to the last transaction of the customer; and

apply the discount to the current transaction.

32. The computer readable medium of claim 31, further comprising instructions configured to direct the processor to, prior to applying the discount:

determine that a value of the current transaction exceeds a predetermined dollar amount; and

increase the discount by a predetermined amount.

33. The computer readable medium of claim 31, further comprising instructions configured to direct the processor to, prior to applying the discount:

determine that a value of the current transaction is less than a predetermined dollar amount;

determine a penalty amount; and

decrease the discount amount by the penalty amount.

34. The computer readable medium of claim 31, in which the instructions for applying the discount further comprise instructions configured to direct the processor to:

determine that the current transaction includes a purchase of a predetermined product; and

apply a discount amount to the predetermined product.

35. The computer readable medium of claim 31, further comprising instructions configured to direct the processor to:

determine that the date of occurrence of the greatest transaction duration exceeds a predetermined time period from a date of the current transaction; and

reset the greatest transaction duration to equal the current transaction duration.

36. The computer readable medium of claim 31, further comprising instructions configured to direct the processor to:

determine that the date of occurrence of the greatest transaction duration exceeds a predetermined time period from a date of the current transaction; and

reset the greatest transaction duration to equal the next longest transaction duration that occurred within the predetermined time period.

37. The computer readable medium of claim 31, in which the instructions for applying the discount comprise instructions configured to direct the processor to provide a discount amount at a retail establishment.

38. The computer readable medium of claim 31, in which the instructions for applying the discount comprise instructions configured to direct the processor to generate a coupon comprising a discount amount.

39. The computer readable medium of claim 31, in which the instructions for applying the discount comprise instructions configured to direct the processor to at least one of decrease a current transaction amount by a dollar amount, award frequent flyer miles, provide long distance call time, or provide a reward incentive.

40. The computer readable medium of claim 31, further comprising instructions configured to direct the processor to:

receive second transaction data that represents a second transaction of the customer occurring after the current transaction;

determine that the second transaction equals or exceeds the predetermined time period when a second transaction time is measured from the current transaction time;

determine a penalty amount; and

apply the discount less the penalty amount to the second transaction.

41. The computer readable medium of claim 40, in which the instructions for determining the penalty amount comprise instructions configured to direct the processor to calculate the penalty amount such that the discount is reset to zero.

42. An apparatus, comprising:

a processor; and

a storage device operatively coupled to the processor, the storage device storing instructions configured to direct the processor to:

receive transaction data that represents a current transaction;

receive a customer identifier of a customer participating in the current transaction;

determine, based on the customer identifier, a greatest transaction duration for the customer;

calculate a current transaction duration based on the current transaction data and last transaction data associated with a last transaction of the customer;

determine that the greatest transaction duration exceeds a predetermined time period;

determine that the current transaction duration is less than the predetermined time period;

determine a discount applied to the last transaction of the customer; and

apply the discount to the current transaction.

* * * * *