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(54) RECURRENT BILLING MAINTENANCE SYSTEM FOR USE WITH RADIO FREQUENCY PAYMENT DEVICES

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Continuation-in-part of application No. 10/192,488, filed on Jul. 9, 2002.

Continuation-in-part of application No. 10/340,352, filed on Jan. 10, 2003.

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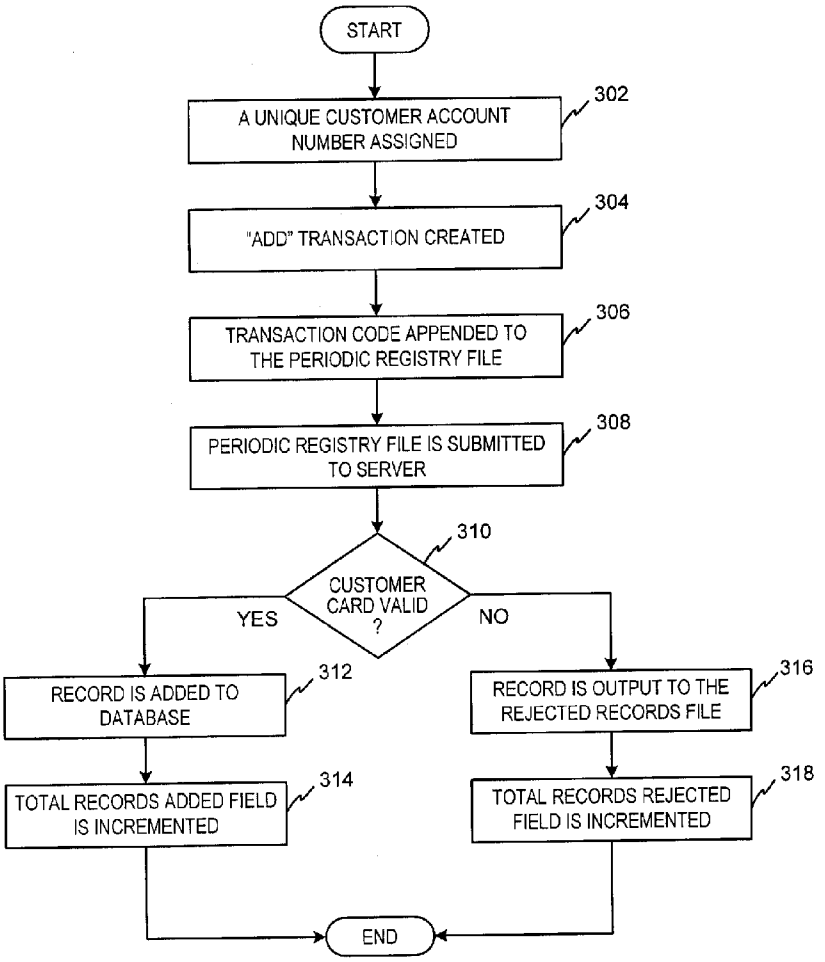
(57) **ABSTRACT**

An RF recurrent billing system in which an account number associated with a recurrent billing account is stored within an RF transaction device. The user of the RF transaction device may present the device for completing a transaction, and the transaction, if successfully completed, is billed to the user's recurrent billing account. The user is billed for the transaction during a billing cycle, typically occurring on a regular basis according to the recurrent billing account.



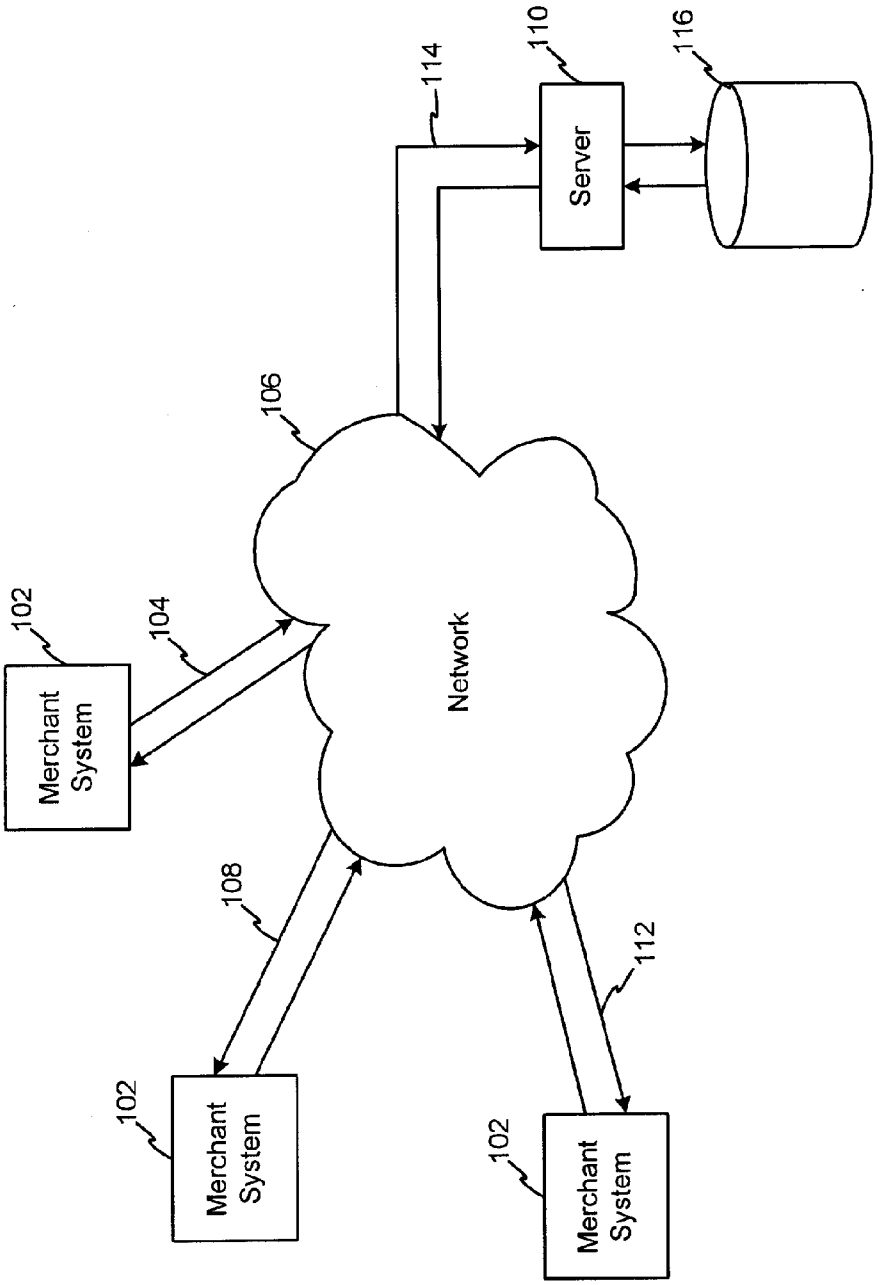

102
Merchant System
104
106
Network
108
102
Merchant System
114
110
Server
116
112
102
Merchant System

FIG. 1

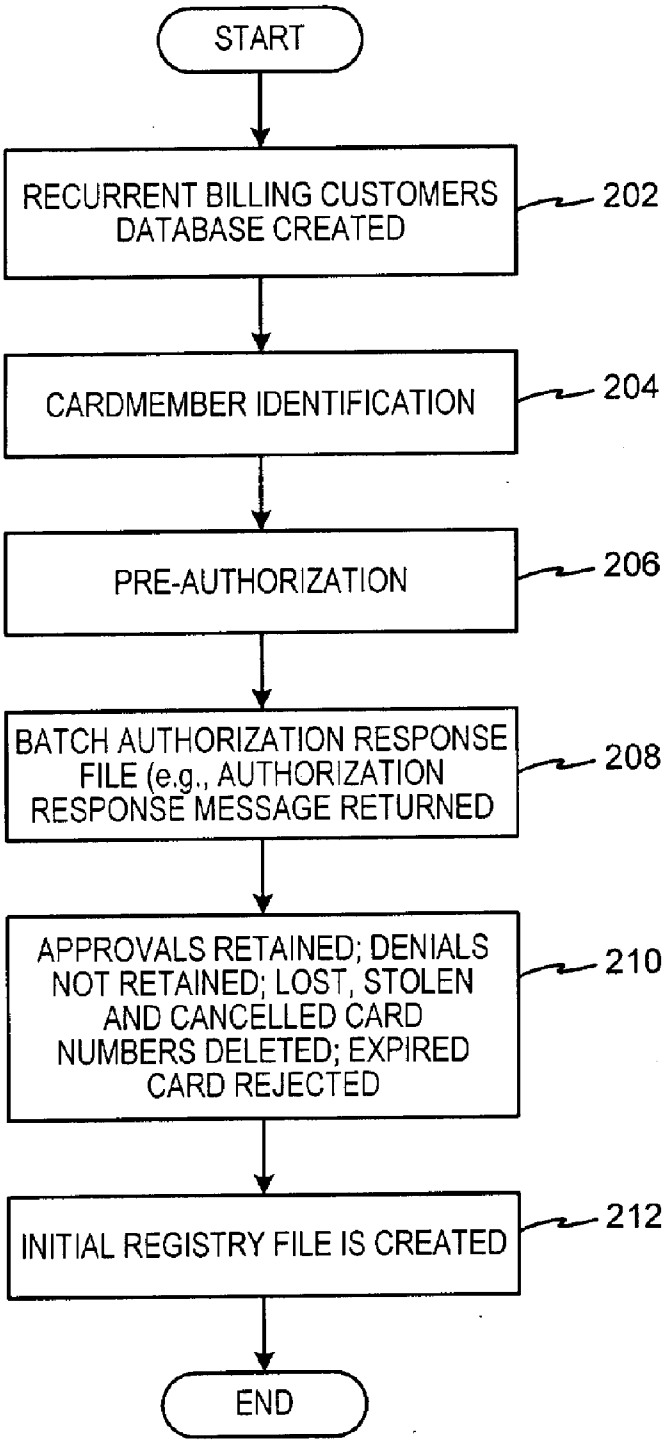

START
RECURRENT BILLING CUSTOMERS DATABASE CREATED
202
CARDMEMBER IDENTIFICATION
204
PRE-AUTHORIZATION
206
BATCH AUTHORIZATION RESPONSE FILE (e.g., AUTHORIZATION RESPONSE MESSAGE RETURNED
208
APPROVALS RETAINED; DENIALS NOT RETAINED; LOST, STOLEN AND CANCELLED CARD NUMBERS DELETED; EXPIRED CARD REJECTED
210
INITIAL REGISTRY FILE IS CREATED
212
END

FIG. 2

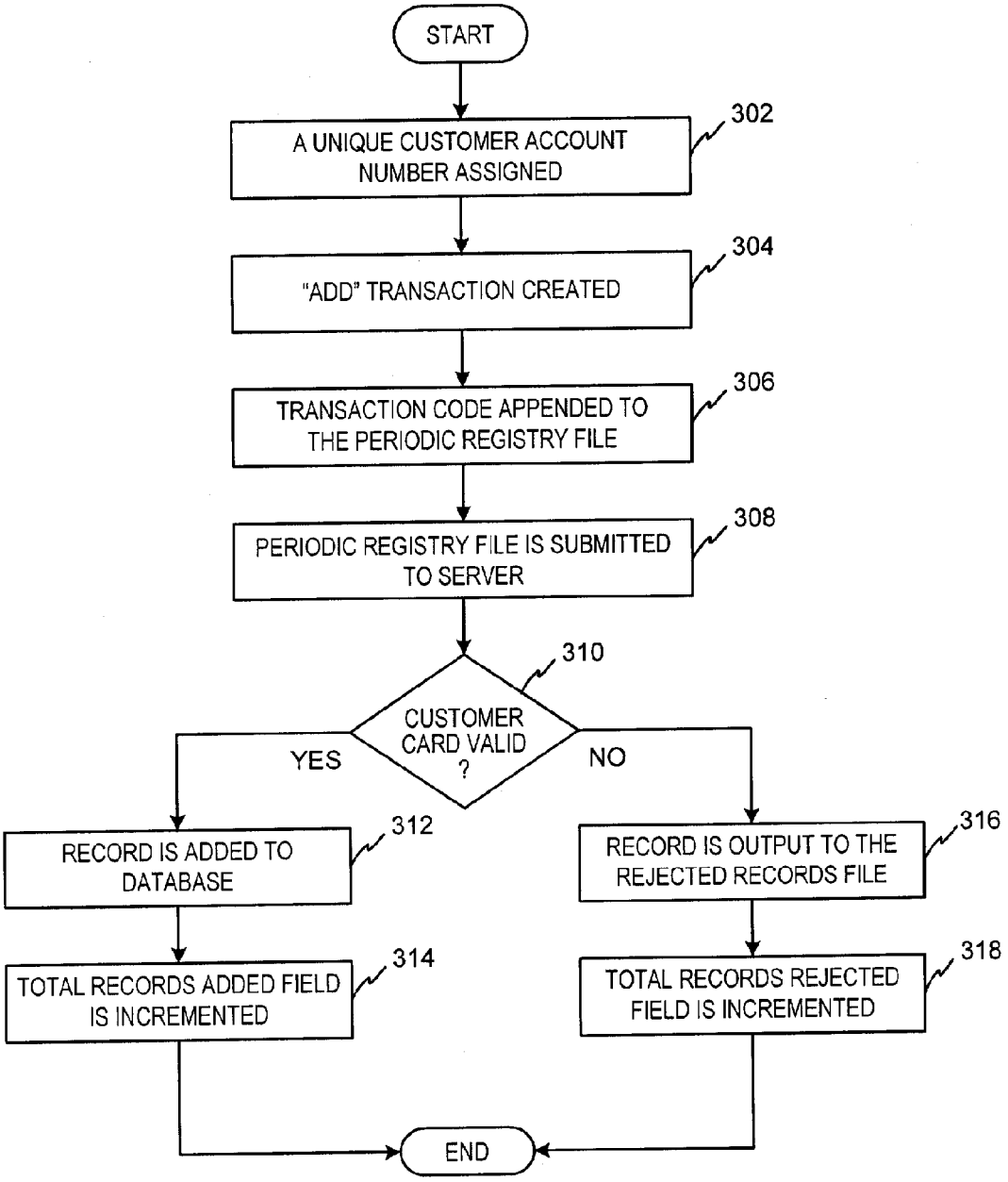

START
A UNIQUE CUSTOMER ACCOUNT NUMBER ASSIGNED
302
"ADD" TRANSACTION CREATED
304
TRANSACTION CODE APPENDED TO THE PERIODIC REGISTRY FILE
306
PERIODIC REGISTRY FILE IS SUBMITTED TO SERVER
308
CUSTOMER CARD VALID ?
310
YES
NO
RECORD IS ADDED TO DATABASE
312
TOTAL RECORDS ADDED FIELD IS INCREMENTED
314
RECORD IS OUTPUT TO THE REJECTED RECORDS FILE
316
TOTAL RECORDS REJECTED FIELD IS INCREMENTED
318
END

FIG. 3

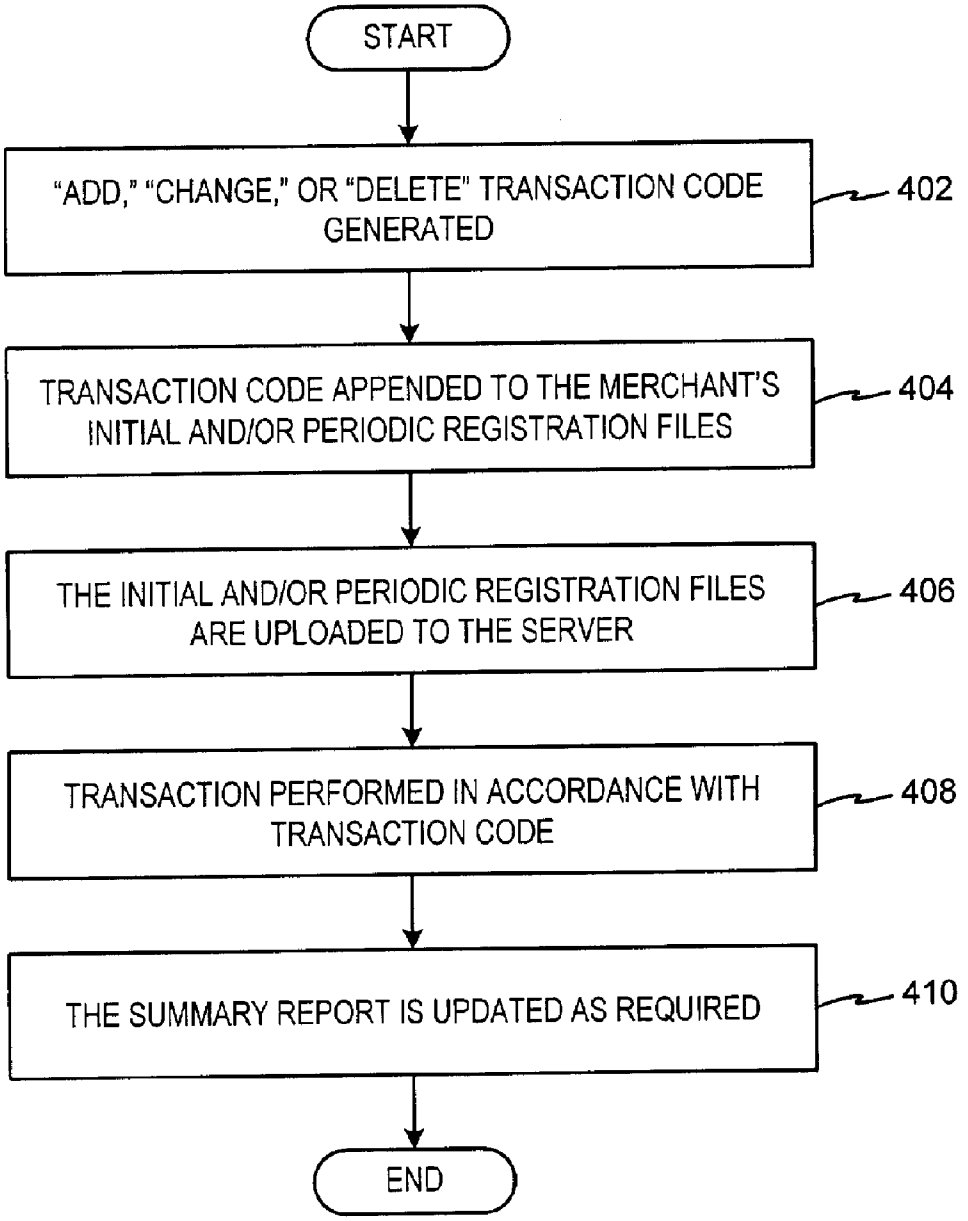

START
"ADD," "CHANGE," OR "DELETE" TRANSACTION CODE GENERATED
402
TRANSACTION CODE APPENDED TO THE MERCHANT'S INITIAL AND/OR PERIODIC REGISTRATION FILES
404
THE INITIAL AND/OR PERIODIC REGISTRATION FILES ARE UPLOADED TO THE SERVER
406
TRANSACTION PERFORMED IN ACCORDANCE WITH TRANSACTION CODE
408
THE SUMMARY REPORT IS UPDATED AS REQUIRED
410
END

FIG. 4

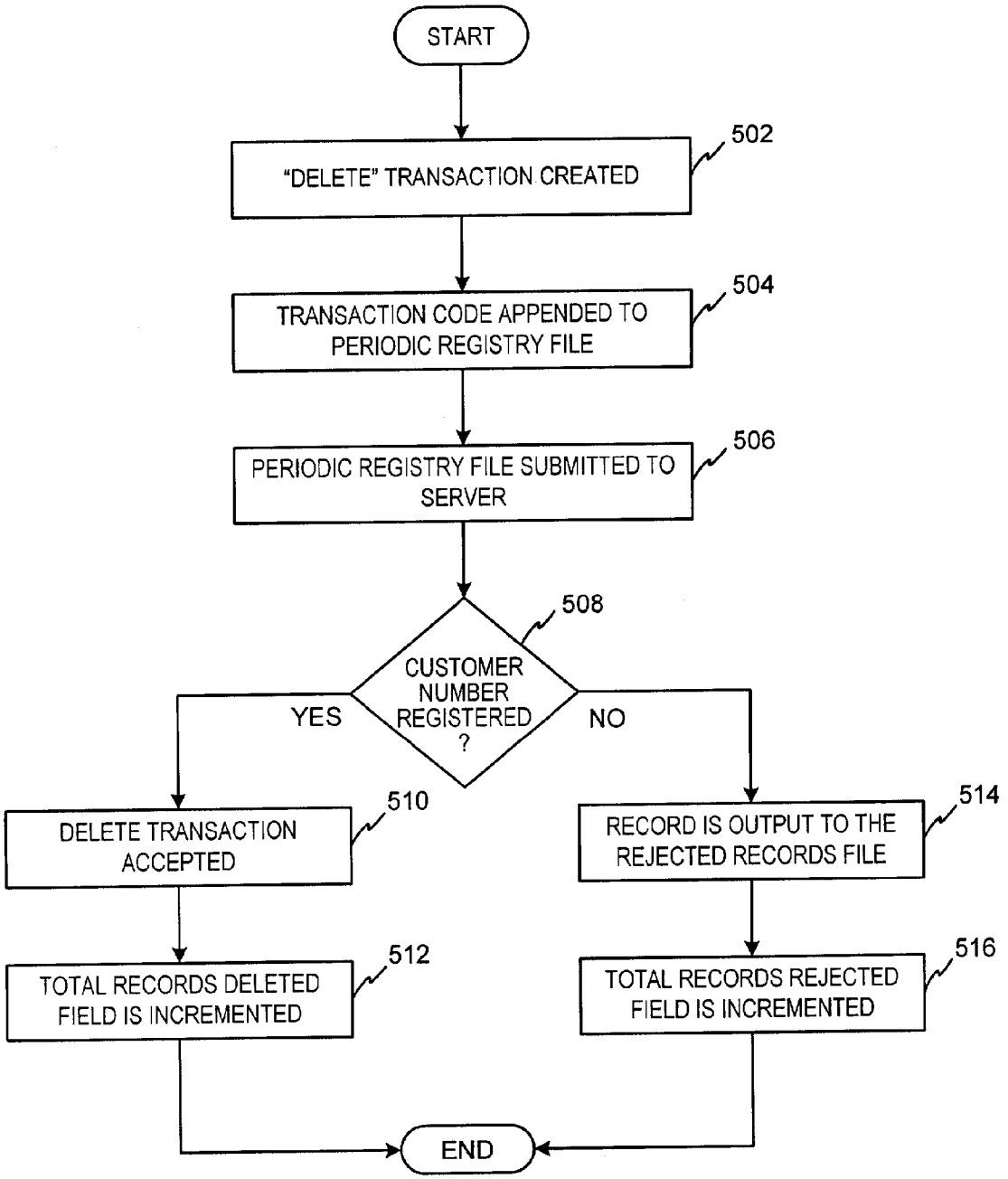

START
"DELETE" TRANSACTION CREATED
502
TRANSACTION CODE APPENDED TO PERIODIC REGISTRY FILE
504
PERIODIC REGISTRY FILE SUBMITTED TO SERVER
506
CUSTOMER NUMBER REGISTERED ?
508
YES
NO
DELETE TRANSACTION ACCEPTED
510
TOTAL RECORDS DELETED FIELD IS INCREMENTED
512
RECORD IS OUTPUT TO THE REJECTED RECORDS FILE
514
TOTAL RECORDS REJECTED FIELD IS INCREMENTED
516
END

FIG. 5

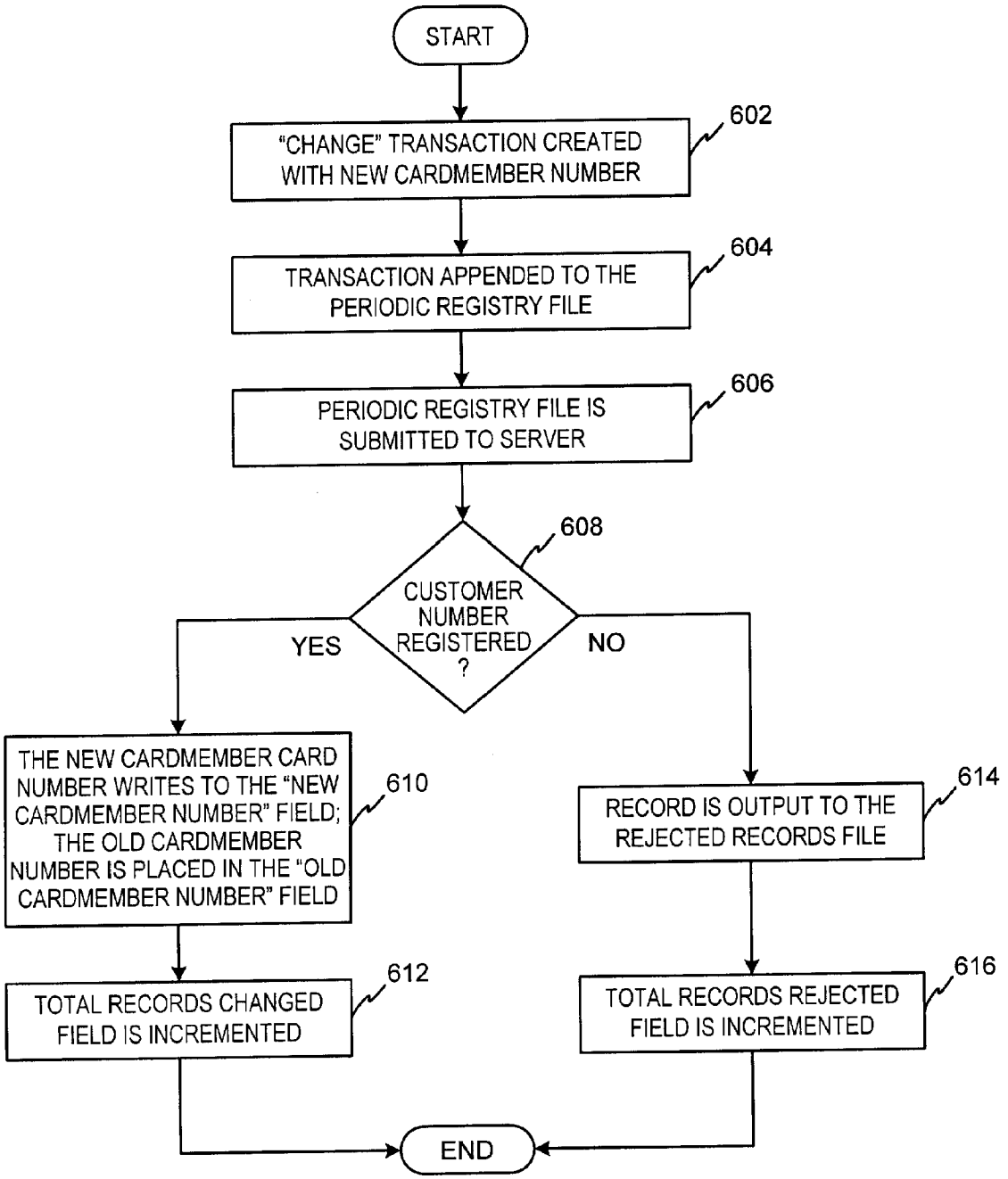

START
"CHANGE" TRANSACTION CREATED WITH NEW CARDMEMBER NUMBER
602
TRANSACTION APPENDED TO THE PERIODIC REGISTRY FILE
604
PERIODIC REGISTRY FILE IS SUBMITTED TO SERVER
606
CUSTOMER NUMBER REGISTERED ?
608
YES
NO
THE NEW CARDMEMBER CARD NUMBER WRITES TO THE "NEW CARDMEMBER NUMBER" FIELD; THE OLD CARDMEMBER NUMBER IS PLACED IN THE "OLD CARDMEMBER NUMBER" FIELD
610
TOTAL RECORDS CHANGED FIELD IS INCREMENTED
612
RECORD IS OUTPUT TO THE REJECTED RECORDS FILE
614
TOTAL RECORDS REJECTED FIELD IS INCREMENTED
616
END

FIG. 6

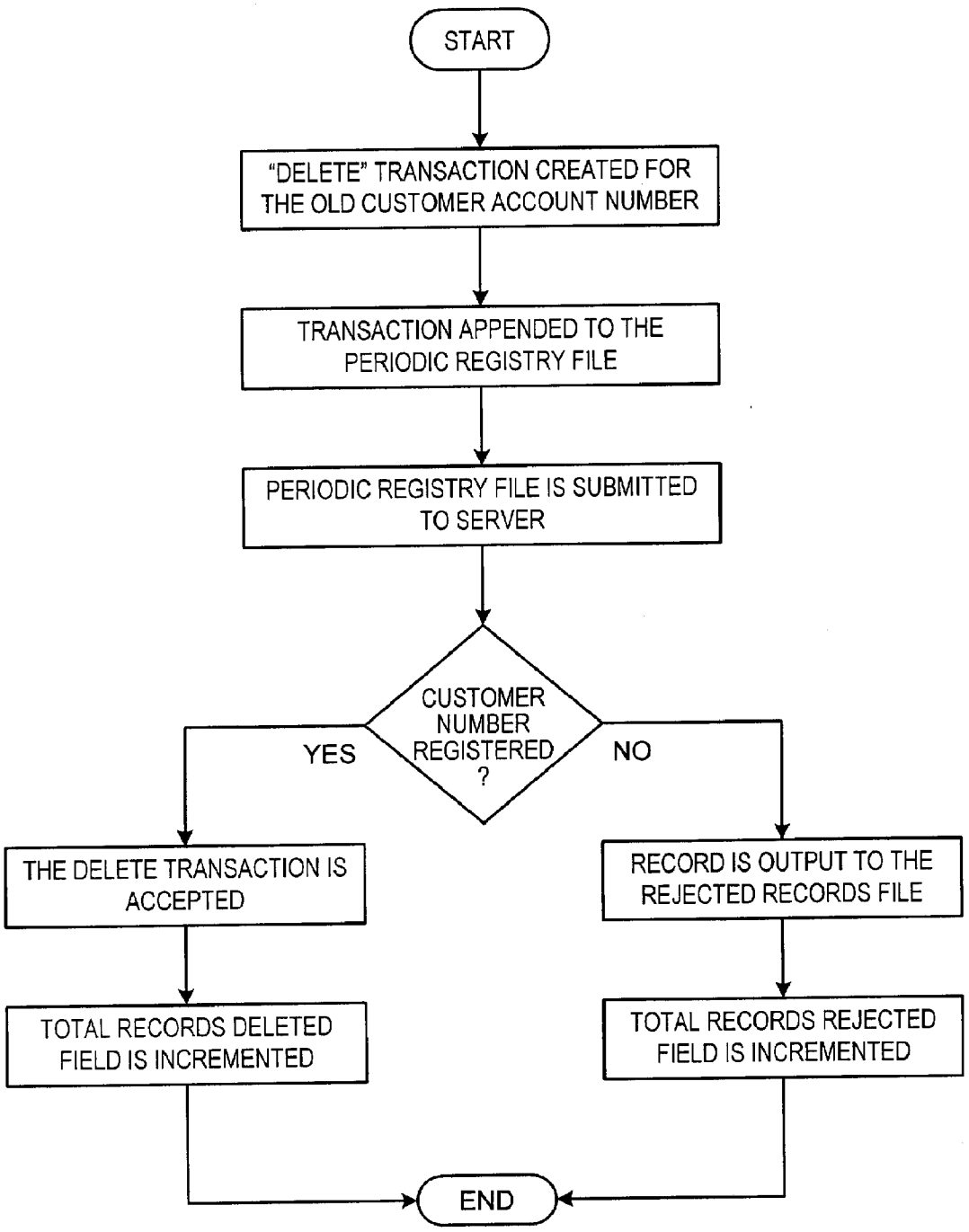

START
"DELETE" TRANSACTION CREATED FOR THE OLD CUSTOMER ACCOUNT NUMBER
TRANSACTION APPENDED TO THE PERIODIC REGISTRY FILE
PERIODIC REGISTRY FILE IS SUBMITTED TO SERVER
CUSTOMER NUMBER REGISTERED ?
YES
NO
THE DELETE TRANSACTION IS ACCEPTED
RECORD IS OUTPUT TO THE REJECTED RECORDS FILE
TOTAL RECORDS DELETED FIELD IS INCREMENTED
TOTAL RECORDS REJECTED FIELD IS INCREMENTED
END

FIG. 7A

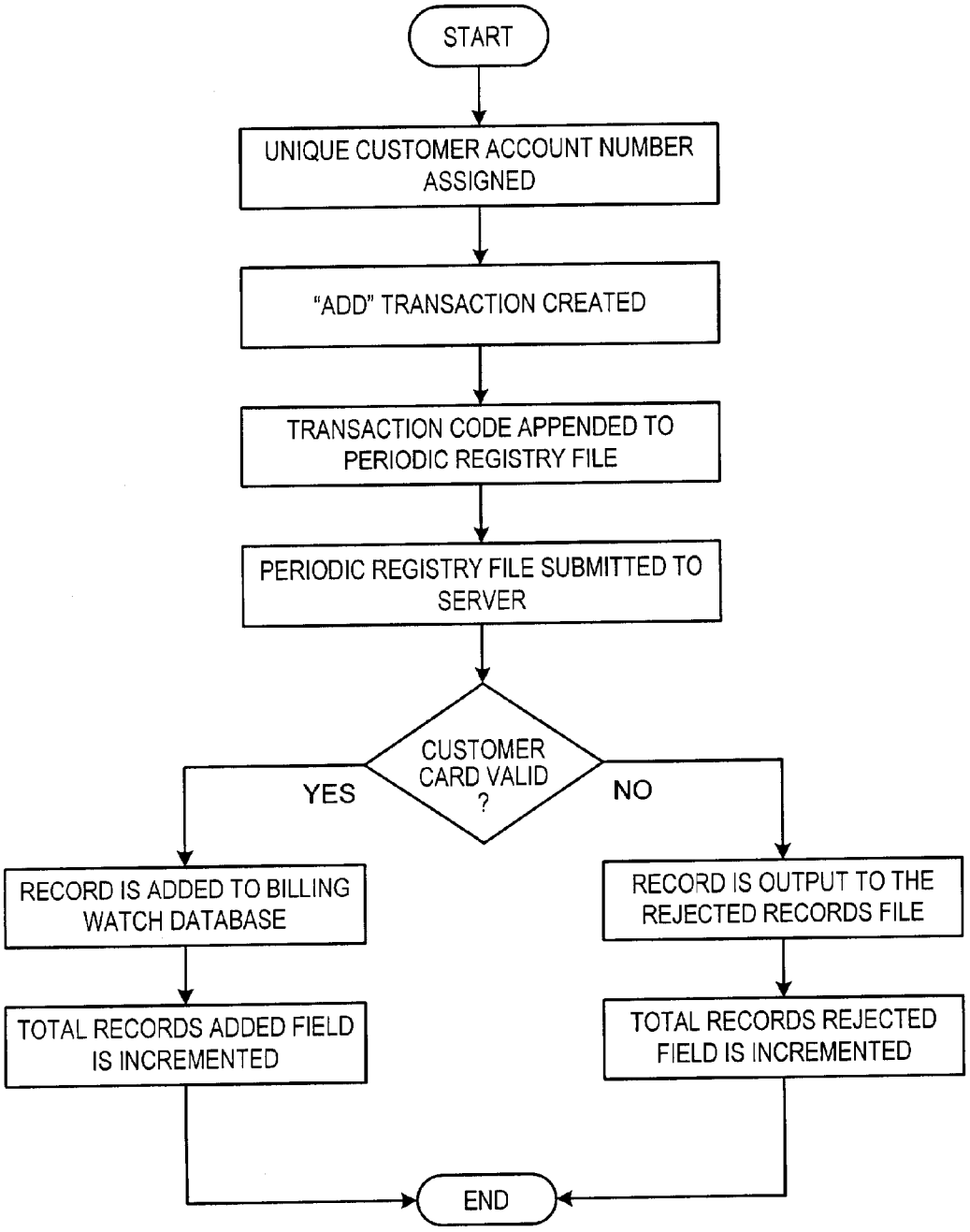

START
UNIQUE CUSTOMER ACCOUNT NUMBER ASSIGNED
"ADD" TRANSACTION CREATED
TRANSACTION CODE APPENDED TO PERIODIC REGISTRY FILE
PERIODIC REGISTRY FILE SUBMITTED TO SERVER
CUSTOMER CARD VALID ?
YES
NO
RECORD IS ADDED TO BILLING WATCH DATABASE
TOTAL RECORDS ADDED FIELD IS INCREMENTED
RECORD IS OUTPUT TO THE REJECTED RECORDS FILE
TOTAL RECORDS REJECTED FIELD IS INCREMENTED
END

FIG. 7B

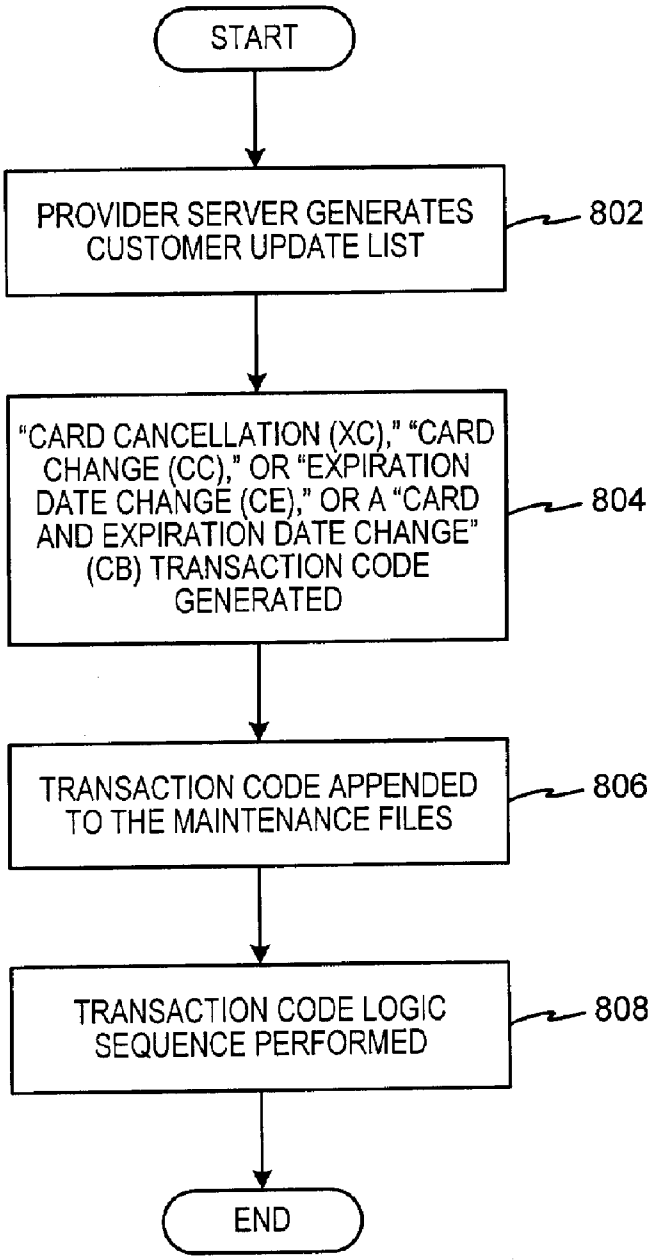

START
PROVIDER SERVER GENERATES CUSTOMER UPDATE LIST
802
"CARD CANCELLATION (XC)," "CARD CHANGE (CC)," OR "EXPIRATION DATE CHANGE (CE)," OR A "CARD AND EXPIRATION DATE CHANGE" (CB) TRANSACTION CODE GENERATED
804
TRANSACTION CODE APPENDED TO THE MAINTENANCE FILES
806
TRANSACTION CODE LOGIC SEQUENCE PERFORMED
808
END

FIG. 8

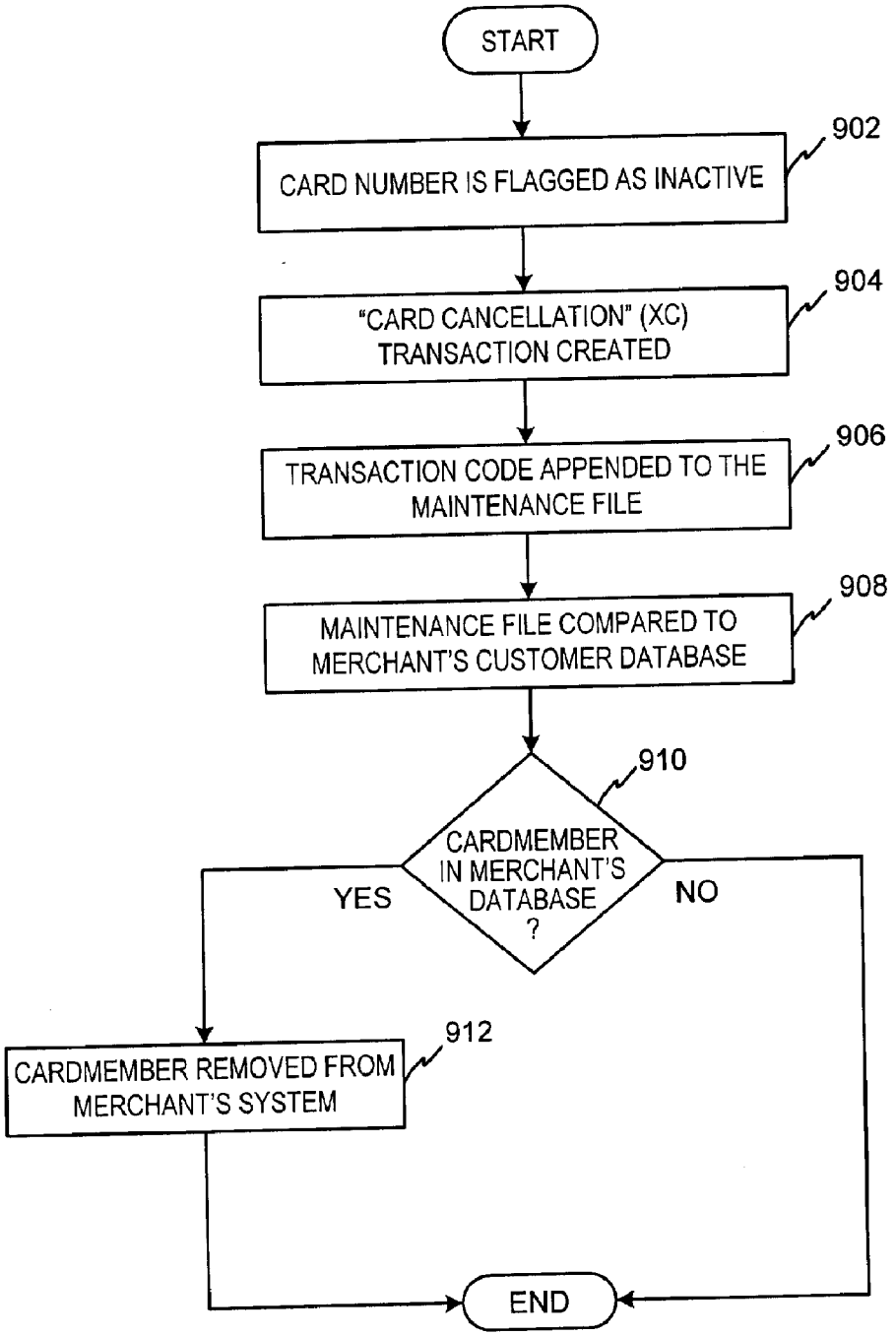

START
CARD NUMBER IS FLAGGED AS INACTIVE
902
"CARD CANCELLATION" (XC) TRANSACTION CREATED
904
TRANSACTION CODE APPENDED TO THE MAINTENANCE FILE
906
MAINTENANCE FILE COMPARED TO MERCHANT'S CUSTOMER DATABASE
908
CARDMEMBER IN MERCHANT'S DATABASE ?
910
YES
NO
CARDMEMBER REMOVED FROM MERCHANT'S SYSTEM
912
END

FIG. 9

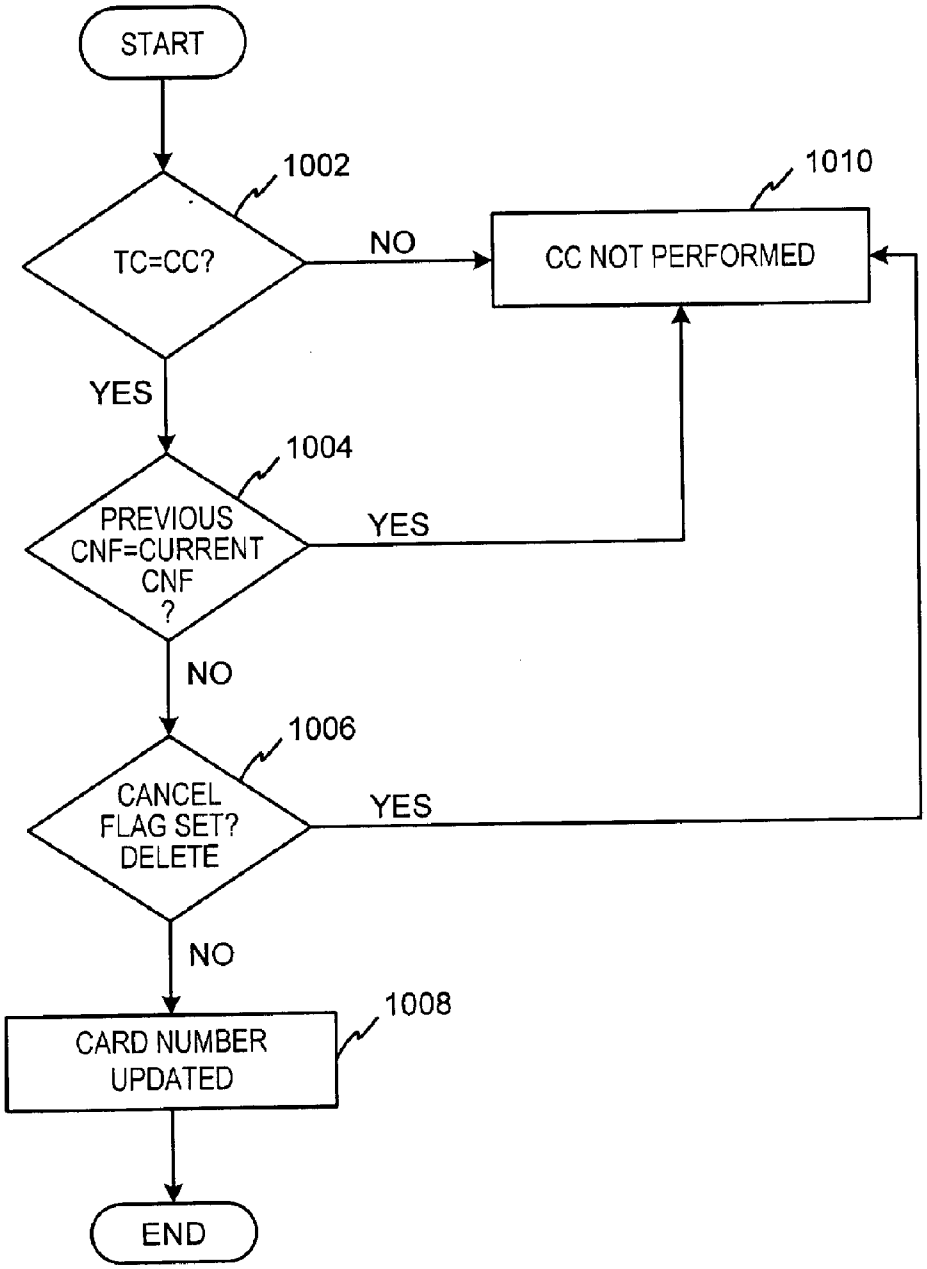

START
1002
TC=CC?
NO
1010
CC NOT PERFORMED
YES
1004
PREVIOUS CNF=CURRENT CNF ?
YES
NO
1006
CANCEL FLAG SET? DELETE
YES
NO
1008
CARD NUMBER UPDATED
END

FIG. 10

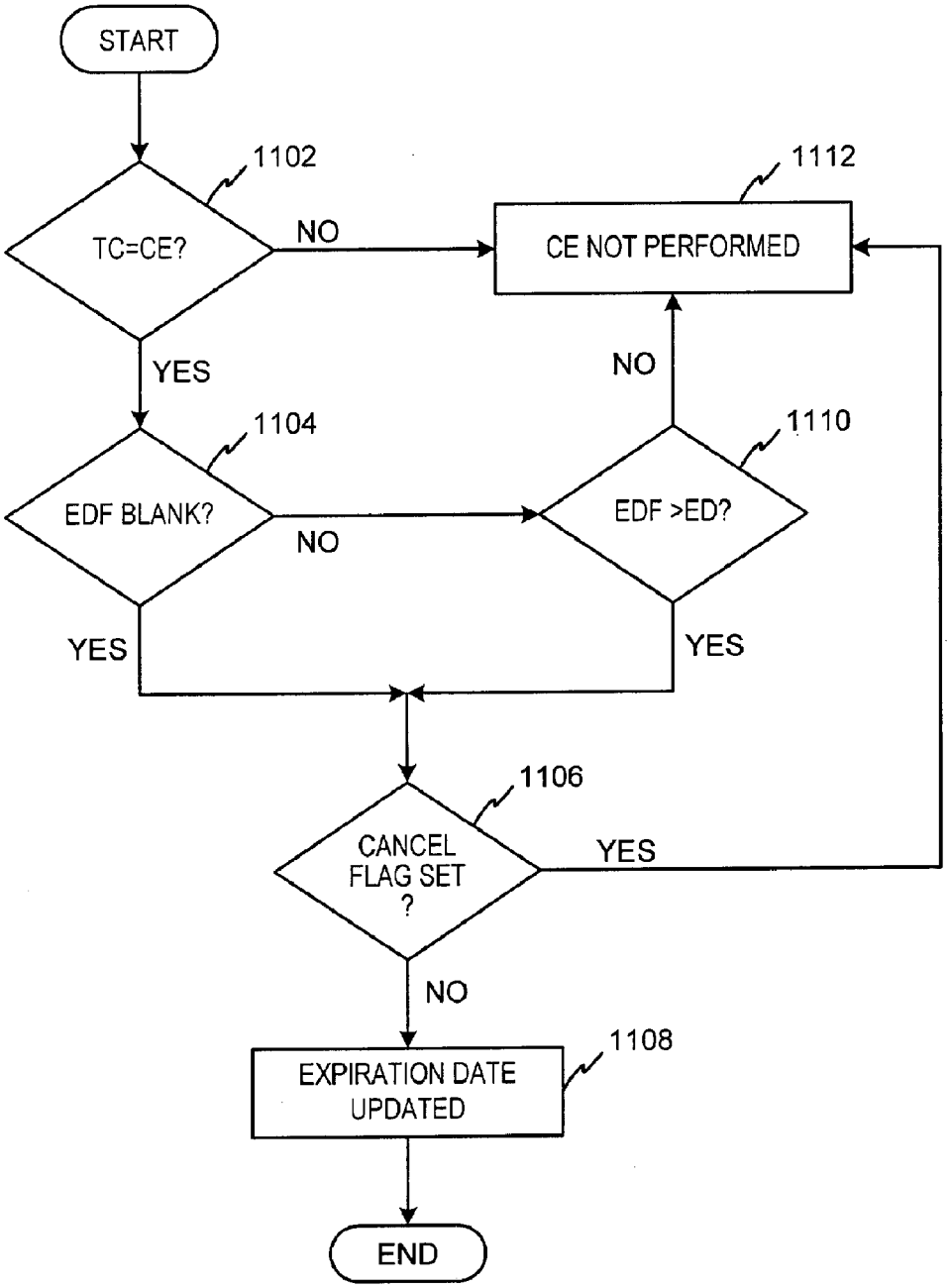

START
1102
TC=CE?
NO
1112
CE NOT PERFORMED
YES
NO
1104
1110
EDF BLANK?
NO
EDF >ED?
YES
YES
1106
CANCEL FLAG SET ?
YES
NO
1108
EXPIRATION DATE UPDATED
END

FIG. 11

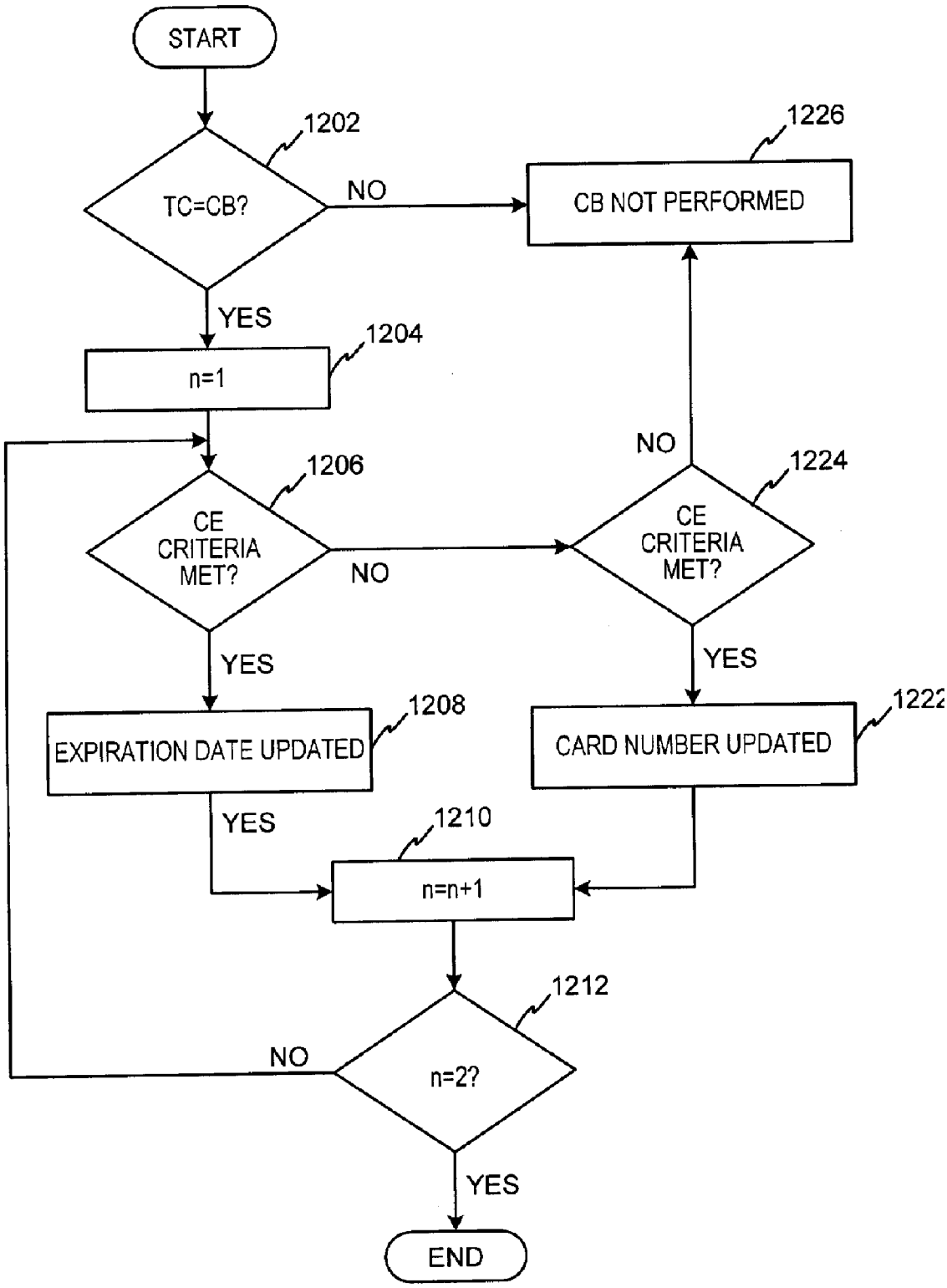

START
1202
TC=CB?
NO
1226
CB NOT PERFORMED
YES
1204
n=1
1206
CE CRITERIA MET?
NO
1224
CE CRITERIA MET?
NO
YES
YES
1208
EXPIRATION DATE UPDATED
1222
CARD NUMBER UPDATED
YES
1210
n=n+1
1212
n=2?
NO
YES
END

FIG. 12

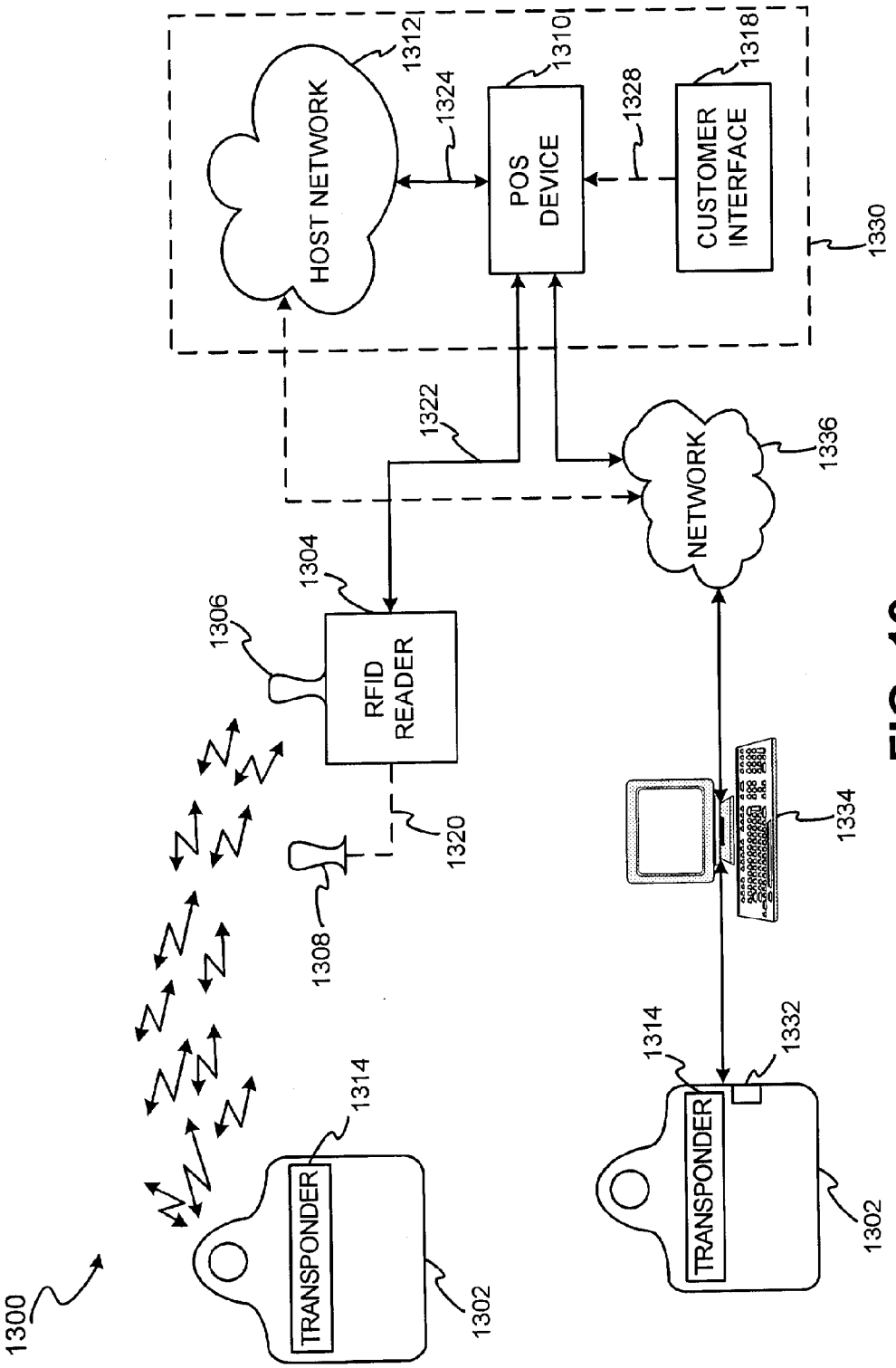

1300
TRANSPONDER
1314
1302
1308
1320
RFID READER
1306
1304
1322
HOST NETWORK
1312
1324
POS DEVICE
1310
1328
CUSTOMER INTERFACE
1318
1330
NETWORK
1336
1334
TRANSPONDER
1314
1332
1302

FIG. 13

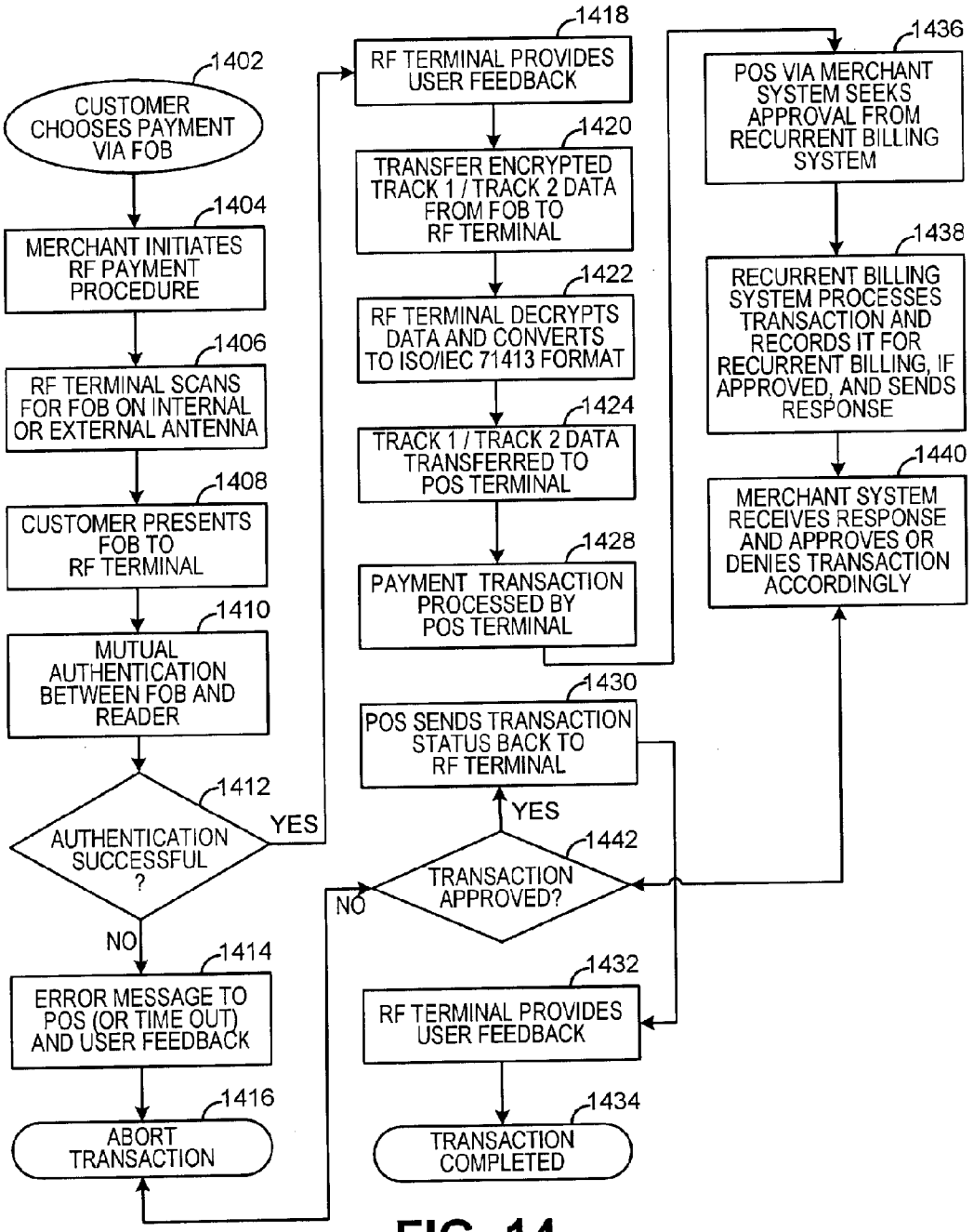

1402
CUSTOMER CHOOSES PAYMENT VIA FOB
1404
MERCHANT INITIATES RF PAYMENT PROCEDURE
1406
RF TERMINAL SCANS FOR FOB ON INTERNAL OR EXTERNAL ANTENNA
1408
CUSTOMER PRESENTS FOB TO RF TERMINAL
1410
MUTUAL AUTHENTICATION BETWEEN FOB AND READER
1412
AUTHENTICATION SUCCESSFUL ?
YES
NO
1414
ERROR MESSAGE TO POS (OR TIME OUT) AND USER FEEDBACK
1416
ABORT TRANSACTION
1418
RF TERMINAL PROVIDES USER FEEDBACK
1420
TRANSFER ENCRYPTED TRACK 1 / TRACK 2 DATA FROM FOB TO RF TERMINAL
1422
RF TERMINAL DECRYPTS DATA AND CONVERTS TO ISO/IEC 71413 FORMAT
1424
TRACK 1 / TRACK 2 DATA TRANSFERRED TO POS TERMINAL
1428
PAYMENT TRANSACTION PROCESSED BY POS TERMINAL
1430
POS SENDS TRANSACTION STATUS BACK TO RF TERMINAL
YES
1442
TRANSACTION APPROVED?
NO
1432
RF TERMINAL PROVIDES USER FEEDBACK
1434
TRANSACTION COMPLETED
1436
POS VIA MERCHANT SYSTEM SEEKS APPROVAL FROM RECURRENT BILLING SYSTEM
1438
RECURRENT BILLING SYSTEM PROCESSES TRANSACTION AND RECORDS IT FOR RECURRENT BILLING, IF APPROVED, AND SENDS RESPONSE
1440
MERCHANT SYSTEM RECEIVES RESPONSE AND APPROVES OR DENIES TRANSACTION ACCORDINGLY

FIG. 14

RECURRENT BILLING MAINTENANCE SYSTEM FOR USE WITH RADIO FREQUENCY PAYMENT DEVICES

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] The present application is a continuation-in-part of U.S. patent application Ser. No. 09/865,878, entitled "RECURRENT BILLING MAINTENANCE SYSTEM," filed on May 25, 2001; this invention claims priority to U.S. patent application Ser. No. 10/192,488, entitled "SYSTEM AND METHOD FOR RFID PAYMENT USING RADIO FREQUENCY IDENTIFICATION IN CONTACT AND CONTACTLESS TRANSACTIONS," filed on Jul. 9, 2002 (which itself claims priority to U.S. Provisional Patent Application No. 60/304,216, entitled "SYSTEM AND METHOD FOR RFID PAYMENTS," filed Jul. 10, 2001), to U.S. Provisional Patent Application No. 60/396,577, entitled "SYSTEM AND METHOD FOR PAYMENT USING RADIO FREQUENCY IDENTIFICATION IN CONTACT AND CONTACTLESS TRANSACTIONS" filed on Jul. 16, 2002, and to U.S. patent application Ser. No. 10/340,352, entitled "SYSTEM AND METHOD FOR INCENTING PAYMENT USING RADIO FREQUENCY IDENTIFICATION IN CONTACT AND CONTACTLESS TRANSACTIONS," filed Jan. 10, 2003, all of which are incorporated herein by reference.

FIELD OF INVENTION

[0002] This invention generally relates to a recurrent billing maintenance system, and more particularly, to a system for automatically providing updates to a customer billing account information via a computer network.

BACKGROUND OF INVENTION

[0003] An increasing number of service organizations, stores, merchants, utilities, banks, Internet merchants and others (collectively "merchants") are enrolling repeat customers in a recurrent billing program, where a customer's transaction card (e.g., credit card) is automatically billed on a periodic basis. If a customer agrees to the recurrent billing feature, the customer provides the merchant with a credit card account number to which the billing amount is applied. The merchant may then establish a customer database of account numbers or customer numbers with additional information for charging the customer account.

[0004] Over time, authorization for some of the established recurrent billing accounts may be declined because the information in the merchant database is outdated. For example, a credit card provider may change a credit card account number or expiration date or simply cancel the customer's credit card privileges. Upon receiving the "authorization declined" response from the transaction card company (e.g., the provider), the merchant typically contacts the customer to determine the cause of the decline. Alternatively, a merchant may continuously try to re-authorize the charge, hoping that the discrepancy which led to the "authorization declined" is removed and that the charge will eventually be accepted by the provider.

[0005] However, where the merchant attempts to contact the customer, several problems may arise. For example, the customer may not be available or may not be aware that his credit card privilege status has changed. Further, the customer may be unwilling to provide the merchant with a supplemental or secondary transaction card suitable for recurrent billing. Moreover, for the merchant, updating of the information by attempting to contact the customer may be inefficient and costly. The merchant may be faced with allotting additional workforce for carrying out a customer contact program which returns little in the way of answers and revenues. Further, where the customer's charge privileges have been revoked by a provider, it is often a difficult task for the merchant to secure another form of payment when the customer may just as well cancel the customer's enrollment in the merchant's recurrent billing program. That is, the declined authorization may provide the customer the opportunity to cancel the order or cancel the merchant's access to the transaction card. Consequently, a need exists for a system which would allow a merchant to update the merchant's recurrent billing database as changes to a customer's transaction card information occurs.

[0006] Presently, no known sufficient system or method for automatically providing updated recurrent billing customer database information to a merchant exists. There are various systems and methods described in the prior art, however, which address a similar problem. One such system which teaches a Distributed Information Logistics Service (DILS) that automatically retrieves updated files from a remote server for delivery to local client programs is disclosed in U.S. Pat. No. 6,029,175, issued Feb, 22, 2000, to Chow et al., herein incorporated by reference. The system disclosed in Chow et al., uses a software agent called a Revision Manager which aids in insuring that a merchant may retrieve the most recent version of a document the merchant has previously accessed over a network.

[0007] The Revision Manager software disclosed in Chow et al., acts as a kind of client connected to a network server, which is capable of sending updated documents to a merchant who has previously accessed an older version of the document. In Chow et al., the merchant is able to identify for storage in a cache managed by the Revision Manager, frequently used individual network retrievable documents. In one embodiment, the merchant is able to designate the frequency at which the Revision Manager notifies the merchant of changes to the identified documents. In another embodiment, the merchant will be automatically notified of changes when the merchant attempts to access a document's older version.

[0008] While the Chow et al. system may be adequate for automatically receiving updated documents over a network, the system is insufficient for use in updating a recurrent billing customer database. For example, the Chow et al. system does not enable a merchant to make changes to the documents stored in the Revision Manager Cache. Consequently, where a merchant wishes make a change to a recurrent billing customer's information (e.g., the customer account number), the Chow et al. system is insufficient for providing a means to make the change.

[0009] Moreover, the Chow et al. system provides update services for only those documents specified by the Revision Manager system user. For a merchant who wishes to add a customer to a customer update database, Chow et al. offers no way of ensuring that the customer (e.g., document) maintains a valid transaction account. That is, where a

merchant wishes to pre-authorize a customer transaction account prior to adding the customer to a system for providing updates, the Chow et al. system would be insufficient to accomplish the pre-authorization task.

[0010] It is therefore desired to create a system which will update a merchant's customer recurrent billing database in response to changes made to the customer billing information, particularly for Radio Frequency (RF) payment devices. It is preferred to have a system providing convenience and control by reducing or eliminating the need to contact each merchant for a change in an account. A system of great advantage to the merchant may be able to update the merchant's customer database in response to changes made by the transaction account provider or by the merchant. It is also desired, more particularly, to provide a system which allows an account holder to "charge" transactions to the accountholder's recurrent billing account without the need to use a conventional "charge card" system. This type of desired system may be useful for customers who do not have a charge card account or would prefer to having multiple billings on one bill, for example.

SUMMARY OF INVENTION

[0011] The present invention provides a method and system for updating a merchant's recurrent billing customer database which addresses many of the shortcomings of the related art. In accordance with various aspects of the present invention, a merchant's recurrent billing customer database update system is provided, wherein the system may be used to update the merchant's customer database in response to changes made to an account (e.g., transaction account) information or privilege status for transactions involving RF payment devices. In particular, a merchant may create a customer database storing the billing or credit card information of customers enrolled in the merchant's recurrent billing program. In addition, a corresponding database may be stored on a server managed and maintained by a customer's credit card or RF payment device provider. The credit card provider is preferably one selected by the customer to receive the merchant's recurrent bills. In accordance with this invention, updates which are made to the merchant customer database or to the provider customer database may be duplicated on the corresponding merchant or provider database. This feature can provide for reduced costs, and increased charge volume and retention.

[0012] In accordance with one aspect of the invention, an update system is provided wherein a file containing information pertaining to customers enrolled in a merchant's recurring billing program is stored in a predetermined location on a credit card or RF payment device provider's database. The customer file is managed, updated and maintained by the provider. The provider is further able to update the customer information stored in the customer file in response to actions taken by the provider which alter the customer credit card information or privilege status. The provider is then able to provide updated credit card information or status to the merchant for use in updating a corresponding merchant customer database for transactions by the customer involving RF payment devices. In accordance with this invention, the updated credit card or RF payment device information or status may be provided to the merchant on a fixed periodic basis (e.g., daily, weekly, monthly, etc.) or upon request by the merchant.

[0013] In accordance with another aspect of the invention, an update system is provided wherein a merchant may update the customer information stored on a merchant system database and further have the updated information checked against an existing provider customer database. In response to actions taken by the merchant to alter the customer credit card or RF payment device information, the provider is then able confirm the merchant's changes and update a customer database located on the provider server to reflect the changes made to the corresponding merchant customer database on the merchant system.

[0014] With an RF recurrent billing system, consistent with the present invention, an account number associated with a recurrent billing account is stored within an RF transaction device. The user of the RF transaction device may present the device for completing a transaction, and the transaction, if successfully completed, is billed to the user's recurrent billing account. The user is billed for the transaction during a billing cycle, typically occurring on a regular basis according to the recurrent billing account.

BRIEF DESCRIPTION OF DRAWINGS

[0015] A more complete understanding of the present invention may be derived by referring to the various exemplary embodiments of the present invention which are described in conjunction with the appended drawing Figures in which like numerals denote like elements, and in which:

[0016] **FIG. 1** is a block diagram of an exemplary embodiment of the merchant recurrent billing customer database update system in accordance with the present invention;

[0017] **FIG. 2** is a block diagram of an initial registry process in accordance with the present invention;

[0018] **FIG. 3** is an exemplary embodiment of a process for performing a merchant "add" transaction in response to a merchant "add" transaction code in accordance with the present invention;

[0019] **FIG. 4** is an exemplary embodiment of a process for updating a merchant billing database and generating a Summary Report in accordance with the present invention;

[0020] **FIG. 5** is an exemplary embodiment of a process for performing a merchant "delete" transaction in response to a merchant "delete" transaction code in accordance with the present invention;

[0021] **FIG. 6** is an exemplary embodiment of a process for performing a merchant "change" transaction in response to a merchant "change" transaction code in accordance with the present invention;

[0022] **FIGS. 7A** and 7B are another exemplary embodiment of a process for performing a merchant "change" transaction in response to a merchant "change" transaction code in accordance with the present invention;

[0023] **FIG. 8** is an exemplary embodiment of a process for updating a merchant billing database location and generating a periodic maintenance report for updating a corresponding merchant recurrent billing customer database in response to a provider transaction code in accordance with the present invention;

[0024] **FIG. 9** is an exemplary embodiment of a process for performing a provider "card cancellation" transaction in

response to a provider "card cancellation" transaction code in accordance with the present invention;

[0025] **FIG. 10** is an exemplary embodiment of a process for performing a provider "change card number" transaction in response to a provider "change card number" transaction code in accordance with the present invention;

[0026] **FIG. 11** is an exemplary embodiment of a process for performing a provider "change expiration date" transaction in response to a provider "change expiration date" transaction code in accordance with the present invention;

[0027] **FIG. 12** is an exemplary embodiment of a process for performing a provider "change both" transaction in response to a provider "change both" transaction code in accordance with the present invention;

[0028] **FIG. 13** is a diagram illustrating a system for providing transactions using RF payment devices; and

[0029] **FIG. 14** is a flow chart of a method to provide for recurrent billing for transactions occurring via RF payment devices.

DETAILED DESCRIPTION

[0030] The present invention may be described herein in terms of functional block components and various processing steps. It should be appreciated that such functional blocks may be realized by any number of hardware and/or software components configured to perform the specified functions. For example, the present invention may employ various integrated circuit (IC) components, (e.g., memory elements, processing elements, logic elements, look-up tables, and the like), which may carry out a variety of functions under the control of one or more microprocessors or other control devices. Similarly, the software elements of the present invention may be implemented with any programming or scripting language such as C, C++, Java, COBOL, assembler, PERL, or the like, with the various algorithms being implemented with any combination of data structures, objects, processes, routines or other programming elements. Further, it should be noted that the present invention may employ any number of conventional techniques for data transmission, signaling, data processing, network control, and the like. Still further, the invention could be used to detect or prevent security issues with a scripting language, such as JavaScript, VBScript or the like. For a basic introduction of cryptography, please review a text written by Bruce Schneider which is entitled "Applied Cryptography: Protocols, Algorithms, And Source Code In C," published by john Wiley & Sons (second edition, 1996), which is hereby incorporated by reference.

[0031] It should be appreciated that the particular implementations shown and described herein are illustrative of the invention and its best mode and are not intended to otherwise limit the scope of the present invention in any way. Indeed, for the sake of brevity, conventional data networking, application development and other functional aspects of the systems (and components of the individual operating components of the systems) may not be described in detail herein. Furthermore, the connecting lines shown in the various Figures contained herein are intended to represent exemplary functional relationships and/or physical couplings between the various elements. It should be noted that many alternative or additional functional relationships or physical connections may be present in a practical electronic transaction or file transmission system.

[0032] To simplify the description of the exemplary embodiment, the invention is described as pertaining to a system for updating an individual credit cardholder's account information using a system running over a computer network such as the Internet. It will be appreciated, however, that many applications of the present invention could be formulated. For example, the system could be used to automatically update a group membership information database, any relevant demographic database, or any other purpose. Further, it should be appreciated that the network described herein may include any system for exchanging data or transacting business, such as the Internet, an intranet, an extranet, WAN, LAN, satellite communications, and/or the like. That is, communication between the parties to the transaction and the system of the present invention is accomplished through any suitable communication means, such as, for example, a telephone network, intranet, Internet, point-of-interaction device (point-of-sale device, personal digital assistant, cellular phone, kiosk, etc.), online communications, off-line communications, wireless communications, and/or the like. The users may interact with the system via any input device such as a keyboard, mouse, kiosk, personal digital assistant, handheld computer (e.g., Palm Pilot®), cellular phone and/or the like. Similarly, the invention could be used in conjunction with any type of personal computer, network computer, workstation, minicomputer, mainframe, or the like, running any operating system such as any version of Windows, Windows NT, Windows 2000, Windows 98, Windows 95, MacOS, OS/2, BeOS, Linux, UNIX, or the like. Moreover, although the invention is frequently described herein as being implemented with TCP/IP communications protocols, it will be readily understood that the invention could also be implemented using IPX, Appletalk, IP-6, NetBIOS, OSI or any number of existing or future protocols. Further, the present invention might employ any number of conventional techniques for data transmission, signaling, data processing, network control, and the like. For example, radio frequency (RF) or other wireless techniques could be used in place of any network technique described herein.

[0033] Further still, the terms "Internet" or "network" may refer to the Internet, any replacement, competitor or successor to the Internet, or any public or private internetwork, intranet or extranet that is based upon open or proprietary protocols. Specific information related to the protocols, standards, and application software utilized in connection with the Internet may not be discussed herein. For further information regarding such details, see, for example, DILIP NAIK, INTERNET STANDARDS AND PROTOCOLS (1998); JAVA 2 COMPLETE, various authors, (Sybex 1999); DEBORAH RAY AND ERIC RAY, MASTERING HTML 4.0 (1997); LOSHIN, TCP/IP CLEARLY EXPLAINED (1997). All of these texts are hereby incorporated by reference.

[0034] Furthermore, the merchant and the provider, described herein, may represent individual people, entities, or businesses, and while reference is made to American Express@, or any other credit card provider, this is by way of example and the financial authorization entity may represent various types of card-issuing institutions, such as banks, credit card companies, card sponsoring companies, or

third-party issuers under contract with financial institutions. The payment network includes existing proprietary networks that presently accommodate transactions for credit cards, debit cards, and other types of financial/banking cards, such as, for example, the American Express®, and VisaNet® network.

[0035] **FIG. 1** is a block diagram of an exemplary merchant data file transfer and update system **100** in accordance with this invention. With reference to **FIG. 1**, in general, a number of merchant systems **102** communicate with a server system **110** via a network **106** to send and/or receive database files containing information related to individual customer credit card accounts. In an exemplary embodiment, server **110** suitably maintains distinct data file groupings for each individual merchant system **102** and retrieves the distinct data files to perform updating as requested by merchant systems **102**. While the terms "credit card accounts" or "credit card" may be used in the exemplary embodiments, the invention contemplates the use of any type of financial or transaction account, whether or not associated with a physical card, such as, for example, debit card, charge card, smart card, bar coded card, magnetic stripe card, temporary use account number, brokerage account, **401** K plan, stock account, telephone account, utility account, loyalty point account, and/or the like. One such transaction account which is suitable for use with this invention is described by Bishop et al., in the U.S. patent application Ser. No. 09/652,899, entitled "METHODS AND APPARATUS FOR CONDUCTING ELECTRONIC TRANSACTIONS," filed Aug. 31, 2000, incorporated herein in its entirety by reference.

[0036] Merchant system **102** may include any convenient combination of hardware and software components configured to allow a merchant to communicate over network **106**. For example, merchant system **102** might include a standard personal computer (PC) comprising a CPU, monitor, storage, keyboard, mouse, and communication hardware appropriate for the given data link **104** (e.g., V.90 modem, network card, cable modem, etc.). In alternate embodiments, merchant system **102** is a personal data assistant (PDA) capable of manipulating images and communicating with server **110**. Merchant system **102** typically includes an operating system (e.g., Windows 95/98/2000, Linux, Solaris, MacOS, and/or the like) as well as various conventional support software modules and drivers typically associated with computers. Merchant system **102** may also include application software configured to communicate over network **106** with server **110**, for example, a world wide web (WWW) browser or any other communication software. In an exemplary embodiment, merchant system **102** includes a conventional Internet browser application that operates in accordance with HTML and HTTP protocols such as Netscape Navigator (available from the Netscape Corporation of Mountain View, Calif.) or Microsoft Internet Explorer (available from the Microsoft Corporation of Redmond, Wash.).

[0037] Merchant system **102** and server **110** are suitably coupled to network **106** via data links **104**, **108**, **112** and **114**, respectively. A variety of conventional communications media and protocols may be used for data links **104**, **108**, **112** and **114**. Such links might include, for example, a connection to an Internet Service Provider (ISP) over the local loop as is typically used in connection with standard modem communication, cable modem, Dish networks, ISDN, Digital Subscriber Line (DSL), or various wireless communication methods. Merchant system **102** might also reside within a local area network (LAN) which interfaces to network **106** via a leased line (Ti, D3, etc.). Such communication methods are well known in the art, and are covered in a variety of standard texts. See, e.g., GILBERT HELD, UNDERSTANDING DATA COMMUNICATIONS (1996), hereby incorporated by reference.

[0038] Server **110** comprises any number of hardware, software, and networking components suitable to provide a user interface to a network that is accessible by users, and which provides the functionality described in further detail below. In one embodiment, Sun Ultra SPARC Enterprise **250** and **450** servers are used in conjunction with a Sun Solaris 7 or Linux operating system, Apache web server software, and an Oracle 8 or MySQL database system. Of course particular hardware and software components used in server **110** will vary widely from embodiment to embodiment. Furthermore, server **110** may represent a "cluster" or group of separate computer systems providing the functionalities described herein.

[0039] The merchant database locations maintained on database **116** by server **110** are provided a distinct merchant identifier. Database **116** may be a graphical, hierarchical, relational, object-oriented or other database, and may be maintained on a local drive of server **110** or on a separate computer coupled to server **110** via a local area or other network (not shown). In one embodiment, database **116** is a collection of ASCII or other text files stored on a local drive of server **110**. Merchant database information is suitably retrieved from database **116** and provided to user systems **102** upon request via a server application, as described more fully below.

[0040] In one embodiment, the server **110** is managed by a credit card provider with which the merchant has established a billing account. The billing account may be associated with any suitable credit card service such as Visa®, MasterCard®, American Express®, Discover®, or the like. Further, the billing account may additionally allow the merchant to recover payment for charges made through the merchant by an individual customer who is a subscriber of the credit card service. It should be noted that although the present invention is described with relation to a credit card service, the invention is not so limited. That is, the invention is suitable for use with any system wherein the customer is billed on a periodic basis.

[0041] Within each merchant database location on database **116**, there is stored a plurality of individual data locations corresponding to the credit card accounts of credit cardholders who have elected to enroll in the merchant's recurrent billing program. For example, a merchant may have a plurality of American Express® cardmembers who have elected to subscribe to the merchant's recurrent billing program. Where American Express® manages the credit card server **110**, American Express® establishes a unique database location on database **116**, which houses current information related to the merchant's recurrent billing customers (e.g., merchant-assigned customer number, credit card number and expiration date) who are using their American Express for recurrent billings. The database location will be assigned an identifier which can be recognized as belonging to a particular merchant. However, in order for

American Express® to maintain a database location for a particular merchant, the merchant database information (e.g., customer number, credit card number and expiration date) is first provided to the database **116**. That is, in an exemplary embodiment, a merchant performs an "initial registry" process for providing the information to the credit card provider.

[**0042**] **FIG. 2** is an exemplary initial registry process for obtaining merchant database information from merchant system **102** for storage on database **116** via network **106**. As shown, the merchant creates a customer data base of all customers enrolled in the merchant's recurrent billing program (step **202**). Typically, this database will have varying customers using different recurrent credit card services for billing purposes. That is, the merchant system **102** database may comprise a database where a first plurality of customers are using Visa®, a second plurality of customers are using MasterCard®, a third plurality of customers are using American Express®, and so on.

[**0043**] The merchant further creates a cardmember working file of those customers who are using one particular credit card provider as their credit card for recurrent billing (for example, American Express®) (step **204**). The American Express® cardmember working file contains cardmember information such as merchant-assigned customer number, corresponding cardmember credit card number and card expiration date which are used to identify the cardmember at the merchant location on database **116**. However, prior to storing the cardmember information on database **116**, the cardmember information may be pre-authorized (step **206**) to insure that the information being provided by the customer is valid.

[**0044**] In an exemplary pre-authorization process (step **206**), the merchant creates a batch authorization request in the form of an Authorization Request Message for forwarding to the credit card service provider. **FIG. 3** is a flowchart of an exemplary process which may be used by a merchant for creating an addition to their registry file (i.e. the Authorization Request Message). The merchant further assigns a unique customer number to customer credit card information to aid in identifying the customer credit card information throughout the initial registry and update process (step **302**). Further, the merchant creates an "add" transaction for the customer credit card information (step **304**) by appending a merchant "add" transaction code to the customer account number and related customer credit card information (step **306**). The customer account information and customer credit card information with the appended merchant "add" transaction code is then forwarded to the credit card provider server **110** (step **308**) where the customer credit card information (e.g., credit card and expiration date, etc.) is compared to the credit card provider's own database of current cardmember credit card information (step **310**). If a merchant provides customer credit card information which is also found on (e.g., matches) the credit card provider's own database of current cardmembers, the customer credit card information is deemed valid and is then added to the merchant's database location (also called "billing database" location) on the credit card provider's database **116** (step **312**). If the customer credit card information is not found on the credit card provider's database of current cardmembers, the specific customer credit card information is rejected and is then placed in a rejected records file (step **316**) for later reporting to the merchant.

[**0045**] In order to assist the merchant in determining which files are accepted and which files are rejected, the credit card provider's server **110** generates an Authorization Response Message (also called a "Summary Report") containing the decision codes appended to each customer account operated on by the server **110** (step **208**). The Authorization Response Message may contain a numerical tally of the number of customer accounts which are deemed valid and which are rejected (steps **314** and **318**). In one embodiment, the number of rejected files may be placed in a rejected records file and included in the Summary Report provided to the merchant. In another embodiment the rejected Records file may be provided to merchant independently of the Summary Report.

[**0046**] The decision codes which are appended to the customer accounts in the Authorization Response Message may aid the merchant in determining whether a particular customer credit card information has been accepted or rejected, and further, what the appropriate action should be for the merchant with regards to the particular customer credit card information. Table 1 below shows typical decision codes which may be used in an Authorization Response Message in accordance with this invention.

TABLE 1

Decision Codes

Decision Code	Decision Code Description	Eligible for Update Service
ab	Approved	Yes
cd	Please Call Credit Card Issuer	Yes
ef	Approved - Authorization Plus Program	Yes
gh	Deny-New Card Issued	No
ij	Deny Confiscate Card	No
kl	Deny	No
mn	Deny - Account Cancelled	No
op	Approve with Positive ID	Yes
qr	Please Wait	N/A
st	Edit Error	N/A

[**0047**] Once the Authorization Response Message is received by the merchant, the merchant may create a registry file on the merchant system **102** containing all customer credit card information which has been accepted by the credit card server **110** in step **208** (step **210**). Further, the information contained in the merchant registry file may be duplicated in the form of an initial registry file in the merchant database location on database **116** using the customer account numbers and customer credit card information (steps **312** and **220**). In one embodiment, the initial registry file may be created when all accepted customer information is stored on the merchant location in database **116**. In another embodiment, the initial registry file may be created prior to providing the Authorization Response Message back to the merchant. In yet another embodiment, the merchant may create the initial registry file by compiling a duplicate file including the customers the merchant currently has stored on the merchant's recurring customer database.

This should be done after going through pre-authorization process. Merchant sends Initial Registry file to BillingWatch (server **110**) to be added to database **116**.

[**0048**] As previously mentioned, it may be desirable for a merchant to update the initial registry file in response to the merchant's daily activities. For example, where a merchant wishes to add a customer to his initial registry file, change a customer's credit card information, or delete a customer from his initial registry file, the merchant may submit a batch file to the credit card server comprising the relevant customer's or customers' information. Such a file, called a periodic registry file, may be submitted periodically (e.g., daily, weekly, monthly, etc.) to the server **110**. In addition, the periodic registry file may contain a plurality of individual customer numbers and related customer credit card information, appended with a merchant transaction code used to indicate what action should be taken with the customer file. One method of submitting the periodic registry file to the server **110** involves placing the periodic registry file on a drop-off location on the server where it may be later accessed and retrieved by the merchant. In one embodiment, the server monitors the frequency at which a merchant submits periodic registry files to aid in determining the value of the server **110** service to the merchant, or to assist in determining the amount of database storage space to allot the merchant on database **116**, and the like.

[**0049**] In this instance, the merchant transaction code identifies for the server **110** the appropriate action to be performed with respect to a particular customer information stored in the merchant billing database location on the database **116**. For example, where a merchant wishes to "add" a new customer to his billing database location, the merchant appends merchant transaction code "A" to the customer number and customer credit card information. Other possible merchant transaction codes may be used, and are shown below in Table 2.

TABLE 2

Merchant Transaction Codes		
Transaction Type	Transaction Code	Events or Actions That Might Warrant this Transaction
Add	A	New customer enrolling in recurrent billing Existing customer enrolling in recurrent billing
Change	C	Customer notifies merchant of change in credit card information
Delete	D	Customer cancels enrollment in recurring billing program Merchant wants to change merchant-assigned customer number associated with a recurring billing enrollee. This delete transaction may be followed up with an "add" transaction to add new merchant assigned customer account number.

[**0050**] It should be understood that the above list of merchant transactions is not exhaustive, and as such, other merchant transaction codes may exist. For example, a merchant transaction code "NC" may exist for a transaction which changes an enrollee's billing card from a personal to a corporate card, or the like. Further, while not shown above, the merchant transaction codes may be used in combination for instance where a merchant may wish to perform more than one transaction on a customer account. That is, it should be understood that other possible combinations of merchant transaction codes may exist, and the ones listed in Table 2 are used herein merely for illustrative purposes.

[**0051**] As noted, a merchant who wishes to update its billing database location will engage in a periodic registry process. Illustrated in **FIG. 4** are the steps of an exemplary periodic registry process for use with this invention. The merchant may generate a periodic registry file as described above (step **402**). The periodic registry file may append a merchant transaction to the individual customer accounts indicating the appropriate server transaction to be taken (step **404**). The periodic registry file is then uploaded on the server **110** (step **406**) and the server **110** performs the appropriate action as indicated (step **408**). As with the initial registry process, the server prepares a Summary Report enumerating for the merchant which transaction requests were performed and which were rejected (step **410**).

[**0052**] As noted above, the server **110** performs the appropriate transaction as indicated by the merchant transaction code (step **408**). **FIGS. 5-7B** illustrate the exemplary steps which may be performed for a given merchant transaction. For example, the steps shown in **FIG. 5** may be performed by database **116** where a merchant wants to "delete" a cardmember from the merchant's billing database location (e.g., card holder dis-enrolls in recurrent billing service). In this exemplary process, the merchant creates a "delete" transaction by appending the transaction code to a customer number and customer credit card information file (step **502**). The merchant may append the "delete" transaction to the periodic registry file and submit the file to the credit card provider server **110** (step **506**). The database **116** may then be checked to determine if the customer number or customer credit card information is included on the merchant files stored on the merchant's billing database location (step **508**). That is, with respect to database **116**, the server **110** may compare the customer number and/or related customer credit card information with those stored in the merchant's billing database location to determine if the customer may be found on the database. If the customer number and/or information is found on the billing database, then the server will accept the merchant's "delete" transaction (e.g., delete the customer from the billing database location) and increment the Summary Report accordingly (steps **510** and **512**). In one embodiment, the Summary Report may contain a data field for use by the server **110** to note which record has been deleted. In addition, Summary Report may contain a counter for incrementing in accordance with the number of merchant "delete" transactions which were accepted on database **116**.

[**0053**] It should be noted, that in the instance where the customer number and/or information is not found on the billing database location by the server **110**, the merchant "delete" transaction request is placed in a rejected records file (step **514**) in similar fashion as was done in the initial registry process described above. In addition, the rejected records file may contain a counter which may be incremented in accordance with the number of merchant "delete" transactions rejected on the database **116**.

[**0054**] **FIG. 6** shows an exemplary merchant "change" transaction process which may be used with the present invention. Where a merchant wishes to make a "change" to

a customer's information stored on the billing database location, the merchant may create a "change" transaction by appending the transaction code to a customer number and customer credit card information file (step **602**). The merchant may then append the "change" transaction to the periodic registry file (step **604**) and submit the file to the server **110** (step **606**). The server **110** may then check the customer number or customer credit card information against the merchant files stored on the merchant's billing database location (step **608**). That is, the server **110** may compare the customer number and/or related customer credit card information with those stored in the billing database location to determine if the customer may be found on the database. If the customer number and/or information is found on the billing database location, then the server will accept the merchant's "change" transaction (e.g., change the customer information in the billing database location) and increment the Summary Report accordingly (steps **610** and **612**). In one embodiment, the Summary Report may contain a data field for use in noting which record has been changed. In addition, the Summary Report may contain a counter for incrementing in accordance with the number of merchant "change" transactions which were accepted on database **116**.

[**0055**] Similar to the action taken with the merchant "delete" command described above, in the instance where the customer number and/or information is not found on the billing database location, the merchant "change" transaction request may be placed in a rejected records file (step **614**) in similar fashion as was done in the initial registry process. The rejected records file may contain a counter which may be incremented in accordance with the number of merchant "change" transactions which were rejected on database **116**.

[**0056**] Where a merchant has a new enrollee in his recurring billing system, the merchant may wish to "add" the customer to his billing database location for management by the server **110**. In this instance, the merchant would create a merchant "add" transaction in substantially similar manner as was done during the initial registry process. That is, a new enrollee to the merchant recurrent billing system may be added to the merchant billing database location in much the same way as was illustrated and described in **FIG. 2**. As such, the description will not be repeated here in the interest of brevity.

[**0057**] In addition to the above transactions, it may be desirable for a merchant to perform two merchant transactions for the same customer number, such as, where the merchant may wish to submit a new customer number when the merchant has reassigned the customer's merchant-assigned customer number (e.g., account number). In this case, the merchant will want to change only the account number associated with the customer on the billing database location. As noted with respect to Table 2 above, this transaction may be performed in two parts. **FIGS. 7A and 7B** illustrate how the two functions may be performed on the database. In particular, the merchant may first create a merchant "delete" transaction (**FIG. 7A**) followed closely by an "add" transaction (**FIG. 7B**). As can be seen, the merchant "delete" transaction of **FIG. 7A** and the "add" transaction of 7B are such that they may be performed in substantially the same way as similar steps of **FIGS. 3 and 5**. As such, the descriptions of **FIGS. 7A and 7B** will not be repeated here in the interest of brevity. That is, it should be understood that a server **110** which changes a customer's number in accordance with a merchant's request may perform the steps associated with the merchant's "delete" and "add" commands as described above.

[**0058**] With reference now to **FIG. 4**, at the completion of the merchant transaction request, a Summary Report is generated by server **110** (step **410**). The Summary Report includes a compilation of information related to the actions performed on the database **116** in accordance with the merchant request. Accordingly, the Summary Report may have a listing of all files which were added, deleted, or changed as a result of the submission of the periodic report. The listing may include a string field wherein each accepted transaction is shown as having been accepted or performed. In addition, the Summary Report may have a counter for each one of the merchant grouped transactions (e.g., "add , ""delete" or "change") indicating the number of times the grouped transaction was performed. For example, where the server **110** has added to database **116** five files as a result of the periodic registry report, the counter may indicate under the "add" field that indeed five files were added. In this way, the merchant may discern the percentage of accepted "add" transactions to rejected "add" transactions.

[**0059**] In addition, the Summary Report may have a separate file for returning to the merchant the files which were rejected on the database. These files may be stored in a rejected file and provided to the merchant independent of the Summary Report or the file may be appended to the Summary Report indicating which files were rejected on the database. Upon receipt of the rejected files information the merchant may check and correct any transaction on the rejected file as desired and resubmit the corrected transactions with the next periodic registry report to be submitted by the merchant.

[**0060**] As with the merchant transactional groupings, the rejected file may contain a rejected counter for enumerating the number of files rejected on the database. It should be noted that in one embodiment of the present invention, the rejected counter may be used to control the quality of the periodic registry files provided to the server **110** by the merchant system **102**. That is, where a merchant's registry file causes the server **110** to perform multiple rejects with respect to database **116**, the server **110** may notify the merchant system that the registry file may be unacceptable for processing by the server **110**. Such a situation may arise when the registry file is corrupt, contains a proliferation of errors, or is incompatible with the database **116** processing system, and the like. To aid in notifying the merchant that the registry file is unacceptable for processing, the server **110** may include a rejection threshold. The rejection threshold may be a predetermined number of rejections after which the server **110** will no longer attempt to process the merchant's periodic registry file. Upon reaching or surpassing the rejection threshold, the server **110** may take some action to notify the merchant that a problem has occurred with his periodic registry file. Typical actions may include placing all of the merchant's requests in a rejection file and appending the file to the Summary Report which may be downloaded by the merchant system **102**.

[**0061**] The providing of the Summary Report may typically be done periodically (e.g., daily, weekly, or monthly, etc.). In accordance with one embodiment, the server **110** places the Summary Report on a pick-up directory on server

110 on a periodic basis (e.g., daily, weekly or monthly, etc.). The merchant system 102 then is able to access the pick-up directory and retrieve the Summary Report in accordance with any of the accepted file retrieval protocols. In one aspect of this embodiment, the server 110 may include a predetermined time period during which a Summary Report will be allowed to be stored in the pick-up directory. For example, a Summary Report which has been stored in the pick up directory for more than five days may be removed from that directory entirely. In another aspect of the embodiment, where five successive days of Summary Reports are stored in the pick-up directory, the server 110 may remove all five days of Summary Reports from the pick-up directory and notify the merchant accordingly.

[0062] In another embodiment, the Summary Report may be delivered to the merchant system 102 once its compilation is complete (e.g., daily, weekly or monthly), eliminating the need for the merchant system 102 to sign onto the server 110 and download a waiting file.

[0063] Another embodiment of the invention addresses the case where the customer credit card information or status is altered unbeknownst to the merchant system 102. For example, the credit card provider may cancel a customer's credit card privileges, or change a customer's credit card number or expiration date, and the like. In that instance, the credit card provider may alter the customer information on the provider customer database independent of any action taken by the merchant. The server 110 may then generate a maintenance file containing the new customer information to be provided to the merchant system 102. To insure accuracy and consistency between the merchant customer recurrent billing database stored on the merchant system 102 and the merchant billing database location on the database 116, the maintenance file may preferably be downloaded periodically (e.g., daily, weekly, monthly, etc.) by the merchant. The merchant may further use the daily maintenance file to update the merchant's recurrent billing customer database on the merchant system 102. FIG. 8 is a flowchart of an exemplary process enabling the server 110 to generate a maintenance file in accordance with the present invention. It should be noted that the server may generate the maintenance file on a periodic basis (e.g., daily, monthly, weekly, etc.) or any other basis as necessary (e.g., on request of the card provider or the merchant).

[0064] As shown in FIG. 8, where a credit card provider has altered a credit card customer's information (e.g., card status, card number or expiration date), the provider may generate a file containing the altered credit card information (step 802). The server 110 may then generate a transaction code for use by the server 110 and/or by the merchant in updating the customer information stored in the merchant's billing database location (step 804). The server 110 may then append the customer information and related transaction code to the maintenance file which may be downloaded to the merchant system 102 (step 806). Upon downloading the maintenance file, the merchant may perform a sequence of steps designed to insure that the merchant's recurrent billing customer database is updated in accordance with the information contained on the periodic maintenance report (step 806).

[0065] In one embodiment, the merchant may submit a periodic registry report containing the updated information appended with the appropriate merchant transaction code, which in turn may prompt the server 110 to perform the desired sequence of steps for updating the merchant billing database location (e.g., "change" sequence performed by server 110 for change transaction). In another embodiment, the customer information is updated on the merchant billing database location subsequent to, or simultaneous with, the alteration of the customer information on the provider database by the credit card provider.

[0066] Table 3 is a list of typical provider transaction codes which may be used with the present invention.

TABLE 3

Provider Transaction Code

Transaction Type	Transaction Code	Event That Initiates This Transaction
Card Cancellation	XC	Cardmember/Provider cancels card
Card Change	CC	New credit card number issued
Expiration Date Change	CE	The credit card expiration date changed. (Card numbers do not change when only the Card Expiration Date changes)
Card Number and Expiration Date Changes	CB	New card number and expiration date issued to card holder

[0067] As previously noted, each provider transaction code is appended to the customer information provided to the merchant in the periodic maintenance report. Each provider transaction code may further prompt the merchant system to perform a sequence of steps for updating the merchant customer database to reflect the changes made by the provider. FIGS. 9-12 depict typical sequences of steps which may be performed by the merchant system 102 in response to the above exemplary transactions.

[0068] With reference to FIG. 9, what is shown are process steps which may be performed in an exemplary "card cancellation" transaction ("XC") in accordance with this present invention. As shown, the provider may indicate that a particular card number is now inactive and should be purged from the billing database location after 180 days (step 902). For example, a marker card number (e.g., a digital flag or other indicator) may be appended to the card number identifying the card number for cancellation. The server 110 may then create a "card cancellation" transaction by appending to the card number a cancellation ("XC") transaction code (TC) (step 904). The server may then append the transaction to the daily maintenance file for downloading to the merchant system 102 (step 906). The merchant system 102 may then execute a program file comparing the maintenance file to the merchant customer database (steps 908 and 910). If the cardmember is found on the merchant customer database, the merchant system 102 removes the cardmember information from the merchant system files. If the cardmember information is not found on the merchant system 102 customer database, then the merchant system 102 does not perform the removal action.

[0069] Referring now to FIG. 10, what is shown is an exemplary process sequence which may be performed by merchant system 102 in response to "change card number" ("CC") provider transaction. Upon receiving the periodic maintenance report from database 116 via server 110, mer-

chant system **102** may check to see if the provider transaction code for a particular customer number corresponds to the "change card number" transaction (e.g., "CC") (step **1002**). If the provider transaction code corresponds to the change card number transaction "CC", the process may require the merchant system **102** to evaluate whether the existing credit card number and the proposed credit card number provided by server **110** are the same (e.g., card number file (CNF)) (step **1004**). In one embodiment, where the numbers are not equal, then the system may check to ensure that the credit card number corresponding to the "CC" transaction has not been targeted for cancellation (step **1006**). Where the card number has not been targeted for cancellation by server **110**, the merchant system **102** may update the card number on the merchant system **102** as required by the maintenance file (step **1008**).

[**0070**] It should be noted, however, that the process disclosed in **FIG. 10** may be further designed to ensure that the "change card number" transaction is performed only when desired. For example, the transaction may not be performed if the transaction code does not initiate the change card number sequence (step **1002**), the previous card number and the proposed card number are the same (e.g., the change has already been made) (step **1004**), or if the card is marked for cancellation (step **1006**).

[**0071**] **FIG. 11** shows an exemplary process which may be performed by merchant system **102** in response to a "change expiration date" ("CE") provider transaction code (TC). As with the "change card number" transaction ("CC"), the "change expiration date" transaction ("CE") may call for the merchant system **102** to ensure that the change expiration "CE" transaction code is present on the maintenance file (step **1102**). Where the "change expiration date" transaction code exists, the merchant system **102** may determine whether the expiration date for the customer information as it is stored in the merchant customer database is blank (step **1104**). That is, the merchant system **102** may determine whether an expiration date exists for a particular customer credit card number on the merchant system **102**. If no expiration date exists, the merchant system **102** may determine whether the customer number file has been targeted for cancellation by server **110** (step **1106**). If the customer file is not to be cancelled, then the expiration date corresponding to the customer file may be updated (step **1108**).

[**0072**] Notably, in accordance with the process steps of **FIG. 4**, the expiration date corresponding to a customer number may be updated when the file already contains an expiration date. For example, upon evaluating whether the expiration date field (EDF) of a customer information file is targeted for the "CE" transaction (step **1104**) the merchant system **102** may further evaluate whether the proposed new EDF is greater (e.g., later in time) than the existing expiration date (ED) (step **1110**). If the proposed EDF is greater than the existing expiration date, then the merchant system may determine if the customer number has been targeted for cancellation (step **1106**) and change the expiration date if the customer file is not to be cancelled (step **1108**).

[**0073**] However, as with the change number ("CC") process shown in **FIG. 11**, the process disclosed in **FIG. 11** may be further designed to ensure that the change expiration date transaction is performed only when desired. For example, the "CE" transaction may not be performed if the transaction code does not initiate the change expiration date sequence (step **1102**), the proposed expiration date is less than the existing expiration date (e.g., the proposed expiration date is earlier in time than the existing expiration date) (step **1110**), or if the card is targeted for cancellation (step **1106**).

[**0074**] In addition to the aforementioned provider transactions described above, it may also be desired to change both the credit card number and the expiration date corresponding to a customer number in a merchant customer database. Such a situation may arise when the customer has lost or misplaced his card and the provider issues the customer a replacement credit card having a new credit card number and expiration date. In that instance, it may be advantageous for the merchant to be able to perform a process capable of changing his customer database to reflect the information contained on the replacement credit card.

[**0075**] **FIG. 12** illustrates an exemplary process which may be performed by the merchant to change both the credit card number and the expiration date corresponding (e.g., "CB" transaction) to a recurrent billing customer on merchant system **102**. As shown in **FIG. 12**, the merchant system **102** may first determine if the "CB" transaction is present on the maintenance file (step **1202**). Where the "CB" transaction is present, the "CB" transaction may be performed in two sequences where the merchant system **102** may determine if the criteria exist for changing the expiration date (step **1206**) and also if the criteria exist for changing the credit card number (step **1224**). Consequently, merchant system **102** may establish a counter n for tracking the number of times the "CB" transaction sequence is performed. For example, since the "CB" sequence is to be performed twice (e.g., one time for "CE" transaction and a second time for "CC" transaction), the counter may be initially set at one "**11**" (step **1204**) and later incremented by one until the counter n indicates that the sequence has been performed twice (e.g., n=2) (steps **1210** and **1212**). Once the "CB" sequence has been performed for the second time, then the counter may be reset to zero prior to performing subsequent "CB" transactions.

[**0076**] Once the merchant system **102** determines that a "CB" transaction exists on the periodic maintenance report (step **1202**), the merchant system **102** may then evaluate whether the "change expiration date" criteria are satisfied (step **1206**) such that the system **102** would perform a "change expiration date" process and update the expiration date in the merchant customer database (step **1208**). An exemplary "change expiration date" process may be substantially similar to that described with respect to **FIG. 11**.

[**0077**] As noted, at the completion of the "change expiration date" process, the merchant system may increment the counter n (step **1210**) and determine if the "CB" process is complete. That is, the system **102** may determine whether the "CB" process has been performed twice (n=2) such that the system is made aware that the criteria for both the "change expiration date" ("CE") and the "change credit card number" ("CC") have been evaluated. Where the counter n does not indicate that the merchant system **102** has evaluated both the "CE" and the "CC" criteria, the system **102** may then perform the criteria that has yet to be performed (step **1212**). For example, where the system **102** has evaluated whether the "CE" criteria are met, but has not evaluated whether the "CC" criteria are met, the system **102** may seek

to evaluate the "CC" criteria. Similarly, where the system **102** has evaluated whether the "CC" criteria are met, but has not evaluated whether the "CE" criteria are met, the system **102** may seek to evaluate the "CE" criteria. In particular, where the "CC" criteria has not been evaluated, the system **102** will evaluate the "CC" criteria (step **1224**) and, if the "CC" criteria are met, the merchant system **102** may update the card number (step **1222**) on the merchant customer database.

[**0078**] **FIG. 13** is a diagram illustrating a system **1300** for providing transactions using RF payment devices, wherein exemplary components for use in completing a fob transaction are depicted. In general, the operation of system **1300** may begin when fob **1302** is presented for payment, and is interrogated by RFID reader **1304** or, alternatively, interface **1334**. Fob **1302** and RFID reader **1304** may then engage in mutual authentication after which the transponder **1302** may provide the transponder identification and/or account identifier to the RFID reader **1304** which may further provide the information to the merchant system **1330** POS device **1310**. In this context, mutual authentication means that reader **1304** verifies that the fob **1302** is authorized to complete a transaction on system **1300**, and the fob **1302** verifies that the reader **1304** is also authorized to complete a transaction on system **1300**. The system, in certain embodiments, can operate independent of an RFID.

[**0079**] System **1300** may include a fob **1302** having a transponder **1314** and a RFID reader **1304** in RF communication with fob **1302**. Although the present invention is described with respect to a fob **1302**, the invention is not to be so limited. Indeed, system **1300** may include any device having a transponder which is configured to communicate with a RFID reader **1304** via RF communication. Typical devices may include, for example, a key ring, tag, card, cell phone, wristwatch or any such form capable of being presented for interrogation.

[**0080**] The RFID reader **1304** may be configured to communicate using a RFID internal antenna **1306**. Alternatively, RFID reader **1304** may include an external antenna **1308** for communications with fob **1302**, where the external antenna may be made remote to the RFID reader **1304** using a suitable cable and/or data link **1320**. RFID reader **1304** may be further in communication with a merchant system **1330** via a data link **1322**. The system **1300** may include a transaction completion system including a point-of-interaction device such as, for example, a merchant point-of-sale (POS) device **1310** or a computer interface (e.g., user interface) **1334**. In one exemplary embodiment the transaction completion system may include a merchant system **1330** including the POS device **1310** in communication with a RFID reader **1304** (via data link **1322**). As described more fully below, the transaction completion system may include the user interface **1334** connected to a network **1336** and to the transponder via a USB connector **1332**.

[**0081**] Although the point-of-interaction device is described herein with respect to a merchant point-of-sale (POS) device, the invention is not to be so limited. Indeed, a merchant POS device is used herein by way of example, and the point-of-interaction device may be any device capable of receiving fob account data. In this regard, the POS may be any point-of-interaction device enabling the user to complete a transaction using a fob **1302**. POS device **1310** may be in further communication with a customer interface **1318** (via data link **1328**) for entering at least a customer identity verification information. In addition, POS device **1310** may be in communication with a merchant host network **1312** (via data link **1324**) for processing any transaction request. In this arrangement, information provided by RFID reader **1304** is provided to the POS device **1310** of merchant system **1330** via data link **1322**. The POS device **1310** may receive the information (and alternatively may receive any identity verifying information from customer interface **1318** via data link **1328**) and provide the information to host system **1312** for processing.

[**0082**] A variety of conventional communications media and protocols may be used for data links **1320**, **1322**, **1324** and **1328**. For example, data links **1320**, **1322**, **1324** and **1328** may be an Internet Service Provider (ISP) configured to facilitate communications over a local loop as is typically used in connection with standard modem communication, cable modem, dish networks, ISDN, Digital Subscriber Lines (DSL), or any wireless communication media. In addition, the merchant system **1330** including the POS device **1310** and host network **1312** may reside on a local area network which interfaces to a remote network (not shown) for remote authorization of an intended transaction. The merchant system **1330** may communicate with the remote network via a leased line, such as a T1, D3 line, or the like. Such communications lines are described in a variety of texts, such as "Understanding Data Communications, " by Gilbert Held, which is incorporated herein by reference.

[**0083**] An account number, in accordance with this exemplary embodiment, may include any identifier correlated to a recurring billing account. The recurring billing account may be any account in which the accountholder receives periodic bills where the recurring billing account is not primarily a credit, charge debit, checking, savings, reward, loyalty, or the like. For example, the recurring billing account may be maintained by a transaction account provider (e.g., payment authorization center) such as, for example, a utility company, members only club, or the like. A typical account number in accordance with this embodiment may be formatted in a similar format as a continual credit or debit account, loyalty account, or rewards account, maintained and serviced by such entities as American Express, Visa and/or MasterCard, or the like. For ease in understanding, the present invention may be described with respect to a utility account, such as a monthly cellular phone bill provided to a cellular phone bill account provider. However, it should be noted that the invention is not so limited and other recurring billing which provide a monthly or regular recurring bill (not a credit, debit, or charge account) is contemplated to be within the scope of the present invention.

[**0084**] In addition, the account number (e.g., account data) may be associated with any device, code, or other identifier/indicia suitably configured to allow the consumer to interact or communicate with the system, such as, for example, authorization/access code, personal identification number (PIN), Internet code, digital certificate, biometric data, and/or other identification indicia. The account number may be optionally located on an RF device (as described more fully below), a rewards card, charge card, credit card, debit card, prepaid card, telephone card, smart card, magnetic stripe

card, bar code card, and/or the like. In one exemplary embodiment, the account number may be distributed and stored in any form of plastic, electronic, magnetic, and/or optical device capable of transmitting or downloading data to a second device.

[**0085**] As noted, the account number may take similar form as a continual credit or charge card account number. A customer account number may resemble, for example, a sixteen-digit credit card number, although each account provider may have its own numbering system. Thus, the account number may use the fifteen-digit numbering system used by American Express. To ensure that the account numbers may be by merchant system POS **1310**, each account number preferably complies with that company's standardized format such that the company using a sixteen-digit format will generally use four spaced sets of numbers, as represented by the number "0000 0000 0000 0000". In a typical example, the first five to seven digits are reserved for processing purposes and identify the issuing recurrent billing system, etc. In this example, the last sixteenth digit is used as a sum check for the sixteen-digit number. The intermediary eight-to-ten digits are used to uniquely identify the customer. The account number stored as Track 1 and Track 2 data as defined in ISO/IEC 7813, and further may be made unique to fob **1302**. In one exemplary embodiment, the account number may include a unique fob serial number and user identification number, as well as specific application applets. The account number may be stored in fob **1302** inside a database **1314**, as described more fully below. Database **1314** may be configured to store multiple account numbers issued to the fob **1302** user by the same or different account providing institutions. Where the account data corresponds to a loyalty or rewards account, the database **1314** may be configured to store the attendant loyalty or rewards points data.

[**0086**] RF payment devices and associated systems are described in more detail in U.S. patent application Ser. No. 10/192,488, entitled "SYSTEM AND METHOD FOR PAYMENT USING RADIO FREQUENCY IDENTIFICATION IN CONTACT AND CONTACTLESS TRANSACTIONS," and filed Jul. 9, 2002, which is incorporated herein by reference. The process for adding distinct account numbers to a database **1314** is described in U.S. patent application Ser. No. 10/708,585, entitled "SYSTEMS AND METHODS FOR MANAGING MULTIPLE ACCOUNTS ON AN RF TRANSACTION INSTRUMENT," and filed Mar. 12, 2004, which is also incorporated herein by reference.

[**0087**] **FIG. 14** is a flow chart of a method for the operation of system **1300** to provide for recurrent billing for transactions occurring via RF payment devices. This method can be implemented within, for example, software modules for execution by a corresponding network and computer system to process transactions occurring via RF payment devices.

[**0088**] The operation may be understood with reference to **FIG. 13**, which depicts the elements of system **1300** which may be used in an exemplary transaction. The process is initiated when a customer desires to present a fob **1302** for payment (step **1402**). Upon presentation of the fob **1302**, the merchant initiates the RF payment procedure via an RFID reader **1304** (step **1404**). In particular, the RFID reader sends out an interrogation signal to scan for the presence of fob **1302** (step **1406**). The RF signal may be provided via the RFID reader antenna **1306** or optionally via an external antenna **1308**. The customer then may present the fob **1302** for payment (step **1408**) and the fob **1302** is activated by the RF interrogation signal provided.

[**0089**] The fob **1302** and the RFID reader **1304** may then engage in mutual authentication (steps **1410** and **1412**). Where the mutual authentication is unsuccessful, an error message may be provided to the customer via the RFID optical and/or audible indicator (step **1414**) and the transaction may be aborted (step **1416**). Where the mutual authentication is successful (steps **1412** and **1414**), the RFID reader **1304** may provide the customer with an appropriate optical and/or audible message (e.g., "transaction processing" or "wait") (step **1418**). The fob protocol/sequence controller **1308** may then retrieve from database **1314** an encrypted fob account number and provide the encrypted account number to the RFID reader **1304** (step **1420**).

[**0090**] The RFID reader **1304** may then decrypt the account number and convert the account number into magnetic stripe (ISO/IEC **7813**) format (steps **1422** and **1424**) and provide the unencrypted account number to the merchant system **1330** (step **1428**). In particular, the account number may be provided to the POS **1310** device for transmission to the merchant network **1312** for processing under known business transaction standards. The POS device **1310** via the merchant system **1330** seeks approval from the recurrent billing system, as described above, for the transaction (step **1436**). The recurrent billing system processes the transaction and records it for recurrent billing, if approved, and sends a response (step **1438**). This processing may occur using, for example, the recurrent billing system described above. For example, the account number is received, and the recurring billing system correlates the account number to the user's recurring billing account. The recurring billing system attempts to approve the transaction and, if successful, it adds the amount of the transaction to the user's recurring bill, which the user will see upon receiving the bill according to regular issuance of the recurring bill. If unsuccessful, the recurring billing system denies the transaction.

[**0091**] The merchant system **1330** receives the response from the recurrent billing system and approves or denies the transaction accordingly (step **1440**). If the transaction is denied, then it is aborted (step **1416**). If the transaction is approved (step **1442**), the POS device **1310** may then send an optical and/or audible transaction status message to the RFID reader **1304** (step **1430**) for communication to the customer (step **1432**), and the transaction is completed (step **1434**).

[**0092**] It should be noted that the transaction account associated with the fob **1302** may include a restriction, such as, for example, a per purchase spending limit, a time of day use, a day of week use, certain merchant use and/or the like, wherein an additional verification is required when using the fob outside of the restriction. The restrictions may be personally assigned by the fob **1302** user, or the account provider. For example, in one exemplary embodiment, the account may be established such that purchases above $X (i.e., the spending limit) must be verified by the customer. Such verification may be provided using a suitable personal identification number (PIN) which may be recognized by the

RFID reader **1304** or a payment authorization center (not shown) as being unique to the fob **1302** holder (e.g., customer) and the correlative fob **1302** transaction account number. Where the requested purchase is above the established per purchase spending limit, the customer may be required to provide, for example, a PIN, biometric sample and/or similar secondary verification to complete the transaction.

[**0093**] Where a verification PIN is used as secondary verification the verification PIN may be checked for accuracy against a corroborating PIN which correlates to the fob **1302** transaction account number. The corroborating PIN may be stored locally (e.g., on the fob **1302**, or on the RFID reader **1304**) or may be stored on a database (not shown) at the payment authorization center. The payment authorization center database may be any database maintained and operated by the fob **1302** transaction account provider.

[**0094**] The verification PIN may be provided to the POS device **1310** using a conventional merchant (e.g., POS) PIN key pad **1318** in communication with the POS device **1310** as shown in **FIG. 13**, or a RFID keypad in communication with the RFID reader **1304**. PIN keypad may be in communication with the POS device **1310** (or alternatively, RFID reader **1304**) using any conventional data link described above. Upon receiving the verification PIN, the RFID reader **1304** may seek to match the PIN to the corroborating PIN stored on the RFID reader **1304** at database **1310** or **1320**. Alternatively, the verification PIN may be provided to a payment authorization center to determine whether the PIN matches the PIN stored on the payment authorization center database which correlates to the fob **1302** account. If a match is made, the purchase may no longer be restricted, and the transaction may be allowed to be completed.

[**0095**] It should be understood that the present invention has been described above with reference to various exemplary embodiments and process steps as they concern database updating. Those skilled in the art, however, will recognize that changes and modifications may be made to the exemplary embodiments and process steps without departing from the scope of the present invention. For example, the various processing steps, as well as the components for carrying out the processing steps, may be implemented in alternate ways depending upon the particular application or in consideration of any number of cost functions associated with the operation of the system (e.g., various of the steps may be deleted, modified, or combined with other steps), such as providing that a blank expiration date field (EDF) is acceptable in applications involving in a predetermined processing. In particular, updates to the merchant billing database location may take place before the periodic maintenance report is provided to the merchant system. Alternatively, the merchant billing database location may be updated after the maintenance file has been provided to the merchant system and in response to the merchant's periodic registry report. In addition, the rejected records file may be provided to the merchant as a sub-file of the Summary Report, or it may be provided to the merchant as a file independent of any other provided files. Moreover, it should be understood that although the database updates are described herein as being updated automatically using the provider server or merchant system, updates and alterations to the merchant customer database and the merchant billing database location may be performed manually.

[**0096**] Further, it should be understood that the merchant billing database location may be updated in response to either a merchant transaction code provided with the periodic (e.g., daily, weekly, monthly, etc.) registry or in response to an alteration made to the credit card provider's main database. That is, where the provider has altered his main database (e.g., cancelled a customer's credit card privileges or issued a replacement card) the server **110** may update the merchant billing database location in response to a provider transaction code.

[**0097**] Further, it should be noted that other merchant or provider transactions may be performed for the purpose of updating the merchant billing database location. For example, where a merchant submits an outdated credit card number as a part of an "add" transaction, the provider may add the credit card number to the merchant BillingWatch Database location and retain the number as a record which may be ineligible for updating.

[**0098**] Further still, it should be noted that while the merchant recurrent billing credit card information update system described above is suitable for use by any suitable credit card provider, the system is not limited to use with credit card databases. For example, the system may be used with any system wherein a merchant has established a recurrent billing database, such as, recurrent billing to a checking or savings account. In this instance, the system described above may be used to update customer checking account numbers and billing addresses stored in a merchant customer database as the need arises.

[**0099**] Furthermore, while the present invention has been described with respect to a provider server for managing a database of provider customer subscribers, the invention is not to be so limited. For example, a server which manages a database containing customer information provided by multiple transaction card providers, is contemplated to be within the scope of the invention. In this embodiment, a server managing the multiple transaction card providers may operate in substantially a similar way as the provider server described herein.

[**0100**] These and other changes or modifications are intended to be included within the scope of the present invention, as set forth in the following claims.

What is claimed is:

1. A computer implemented service for updating a merchant customer account database over a network for RF payment devices, comprising:

a first database of information having a plurality of merchant customer records;

a remote merchant customer database having a first plurality of customer account records, each of the account records being associated with a corresponding recurring billing account record;

a merchant process server for appending a merchant processing request to at least one of said first plurality of customer accounts to produce a merchant processing request data file for seeking approval of a transaction, the merchant process server receiving the transaction from an RF payment device, identifying one of the account records corresponding with the RF payment

device, correlating the one account record with the corresponding recurring billing account record; and

a process server for receiving said first database of information and said merchant processing request data file, said process server configured to compare said first database of information and said merchant processing request data file to produce a first comparison data file, said first comparison data file comprising a first record including a compilation of said merchant processing requests accepted for processing by said process server for the requested transaction, said first comparison data file further comprising a second record including a compilation of said merchant processing requests rejected for processing by said process server, said process server further configured to update said first database of information in accordance with said merchant processing request data file to include approved transactions from the RF payment device on the corresponding recurring billing record.

2. A computer implemented service according to claim 1 wherein, said service further comprises a second database of information having a second plurality of customer transaction accounts records.

3. A computer implemented service according to claim 2 wherein, said process server is configured to receive said second database of information, said process server configured to compare said first database of information and said second database of information to produce a second comparison data file, said second comparison file comprising a plurality of updated customer transaction account records, said process server further configured to update said first database of information in accordance with said second database of information.

4. A computer implemented service according to claim 3, wherein, said process server is further configured to append a provider processing instruction to at least one of said plurality of updated customer transaction account records to produce a provider processing request data file.

5. A computer implemented service, according to claim 4, wherein said process server is configured to provide an update summary file, said update summary comprising at least one of said first comparison data file and said provider processing request data file.

6. A computer implemented service according to claim 5, wherein said update summary report is provided to said merchant process server periodically.

7. A computer implemented service according to claim 5 wherein, said merchant process server is configured to retrieve said update summary file.

8. A computer implemented service according to claim 7 wherein, said merchant server is further configured to update said remote merchant customer database in accordance with said update summary file.

9. A computer implemented service according to claim 1 wherein, said at least one of said first plurality of customer transaction account records is pre-authorized.

10. A computer implemented service according to claim 1 wherein, said at least one of said first plurality of distinct customer transaction account records is provided a merchant processing request indicating that said at least one of said first plurality of customer transaction account records is to be removed from at least one of said plurality of merchant customer records.

11. A computer implemented service according to claim 1, wherein said at least one of said first plurality of customer transaction account records is provided a merchant processing request indicating that said at least one of said first plurality of distinct customer transaction card records requires alteration by said process server.

12. A computer implemented service according to claim 1, wherein said remote merchant customer database is configured to be updated manually.

13. A computer implemented service according to claim 7, wherein said merchant server is configured to update said remote merchant customer database in accordance with said provider processing instruction.

14. A computer implemented service according to claim 1, wherein said rejected merchant process request is verified.

15. A computer implemented service according to claim 13, wherein said merchant process server appends said verified rejected merchant process request to said merchant process request data file.

16. A computer implemented service according to claim 13, wherein said merchant process request data file includes said verified rejected merchant process request.

17. A computer implemented service according to claim 1, wherein said process server is configured to tally the number of rejected merchant processing requests.

18. A computer implemented service according to claim 17, wherein said process server comprises a predetermined rejection threshold.

19. A computer implemented service according to claim 18, wherein said process server compares the rejection threshold to said tally of the number of rejected merchant process request, said process server further configured reject said merchant process request data file when the rejection threshold is reached.

20. A computer implemented service according to claim 5, wherein said process server is configured to tally said accepted merchant processing request, in accordance with a merchant process request grouping.

21. A computer implemented service according to claim 20, wherein said update summary file comprises said tally of said accepted merchant processing request.

22. A computer implemented service according to claim 1, wherein at least one of said first plurality of customer transaction accounts is outdated, said process server being configured to add said outdated at least one of said first plurality of customer transaction account records to said first database of information, said outdated one of said first plurality of customer transaction account records remaining permanently fixed.

23. A method of updating a merchant customer transaction account database using a computer network for RF payment devices, comprising:

receiving a first plurality of customer transaction account records, each of the account records being associated with a corresponding recurring billing account record;

pre-authorizing said first plurality of customer transaction account records for transactions requesting approval by a merchant system, storing said pre-authorized said first plurality of customer transaction account records on a local database, said local database being maintained by a local process server;

receiving by the merchant process server the transactions from an RF payment device, identifying one of the

account records corresponding with the RF payment device, and correlating the one account record with the corresponding recurring billing account record;

storing said pre-authorized said first plurality of customer transaction account records in a remote database, said remote database being accessed through a remote process server;

providing a periodic registry file to said remote process server, said periodic registry file comprising a update request to said pre-authorized plurality of customer transaction account records for the requested transactions, said process server comparing said periodic registry file to said pre-authorized said first plurality of customer transaction account record, and updating said pre-authorized said first plurality of customer transaction account records according to a predetermined order of process steps, said remote process server generating a maintenance file in response to said comparison of said periodic registry file to said pre-authorized said first plurality of customer transaction account records;

providing said maintenance file to said local process server, said local process server comparing said maintenance file to said pre-authorized said first plurality of customer transaction account records on a local database; and

updating said pre-authorized said first plurality of customer transaction account records on a local database in response to said maintenance file to include approved transactions from the RF payment device on the corresponding recurring billing record.

24. A method of updating a merchant customer transaction account database using a computer network for RF payment devices, comprising:

receiving a first plurality of customer transaction account records, each of the account records being associated with a corresponding recurring billing account record;

storing said first plurality of customer transaction account records on a local database, said local database being maintained by a local process server;

storing said first plurality of customer transaction account records in a remote database, said remote database being accessed through a remote process server;

receiving by a merchant process server the transactions from an RF payment device, identifying one of the account records corresponding with the RF payment device, and correlating the one account record with the corresponding recurring billing account record;

providing a periodic registry file to said remote process server, said periodic registry file comprising a update request to said plurality of customer transaction account records for transactions requesting approval by the merchant system, said process server comparing said plurality registry file to said first plurality of customer transaction account record, and updating said first plurality of customer transaction account records according to a order of process steps, said remote process server generating a maintenance file in response to said comparison of said periodic registry file to said first plurality of customer transaction account records;

providing said maintenance file to said local process server, said local process server comparing said maintenance file to said first plurality of customer transaction account records on a local database; and

updating said pre-authorized said first plurality of customer transaction account records on a local database in response to said maintenance file to include approved transactions from the RF payment device on the corresponding recurring billing record.

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