US 20110289006A1

(19) United States

(12) Patent Application Publication

Hutchison et al.

(10) Pub. No.: US 2011/0289006 A1

(43) Pub. Date: Nov. 24, 2011

(54) **METHOD AND APPARATUS FOR ORDERING GOODS, SERVICES, AND CONTENT OVER AN INTERNETWORK USING A VIRTUAL PAYMENT ACCOUNT**

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(73) Assignee: **ECHARGE CORPORATION**, Seattle, WA (US)

(21) Appl. No.: **13/186,191**

(22) Filed: **Jul. 19, 2011**

Related U.S. Application Data

(60) Division of application No. 11/775,473, filed on Jul. 10, 2007, which is a continuation of application No. 10/663,443, filed on Sep. 16, 2003, now Pat. No. 7,249,097, which is a continuation of application No. 10/338,133, filed on Jan. 6, 2003, now abandoned, which is a continuation of application No. 09/578,395, filed on May 25, 2000, now abandoned, which is a continuation-in-part of application No. 09/370,949, filed on Aug. 9, 1999, now abandoned.

(60) Provisional application No. 60/140,039, filed on Jun. 18, 1999.

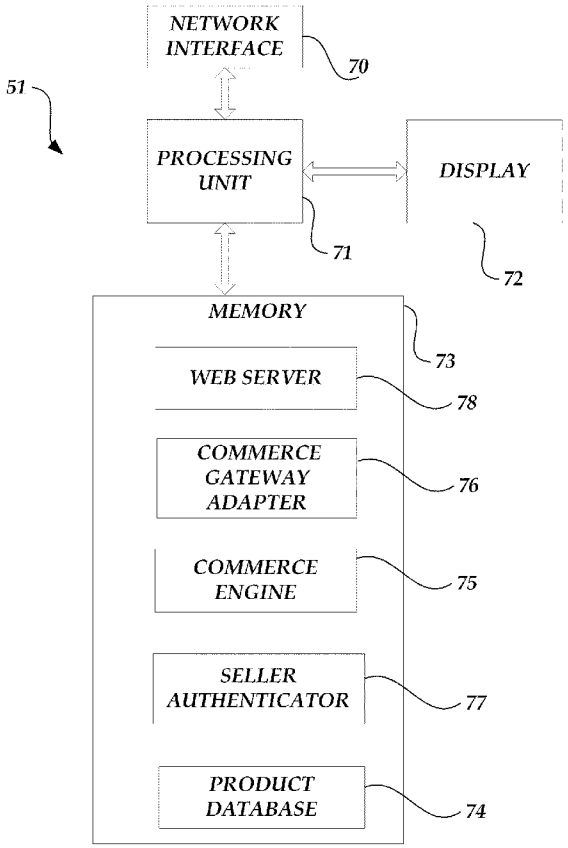
Publication Classification

(51) **Int. Cl.**
G06Q 20/00 (2006.01)

(52) **U.S. Cl.** **705/79**

(57) **ABSTRACT**

A secure, closed virtual payment system comprising registered buyers and sellers for ordering and paying for goods, services, and content over an internetwork is disclosed. A buyer becomes registered by applying for a virtual payment account. A seller becomes registered by applying for a seller account. A credit processing component (**53**) immediately evaluates the buyer's application and assigns a credit limit to the account. Once an account is established, a digital certificate is stored on the registered participant's computer. The buyer can then order goods, services, or content from a seller and charge it to the virtual payment account. When the product is shipped, the seller notifies a commerce gateway component (**52**), which, in turn, notifies the credit processing server, which applies the charges to the buyer's virtual payment account.



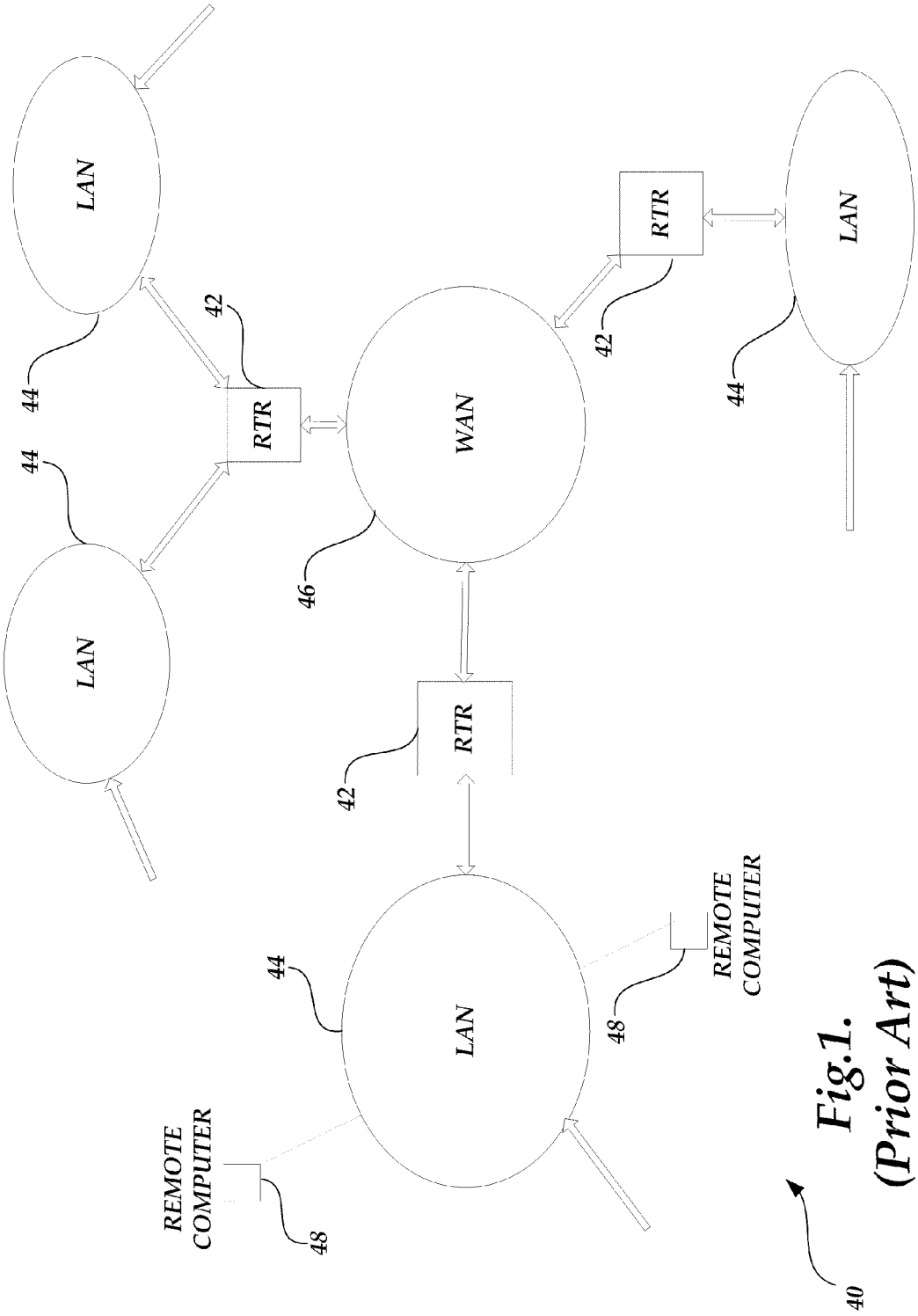


Fig.1.
(Prior Art)

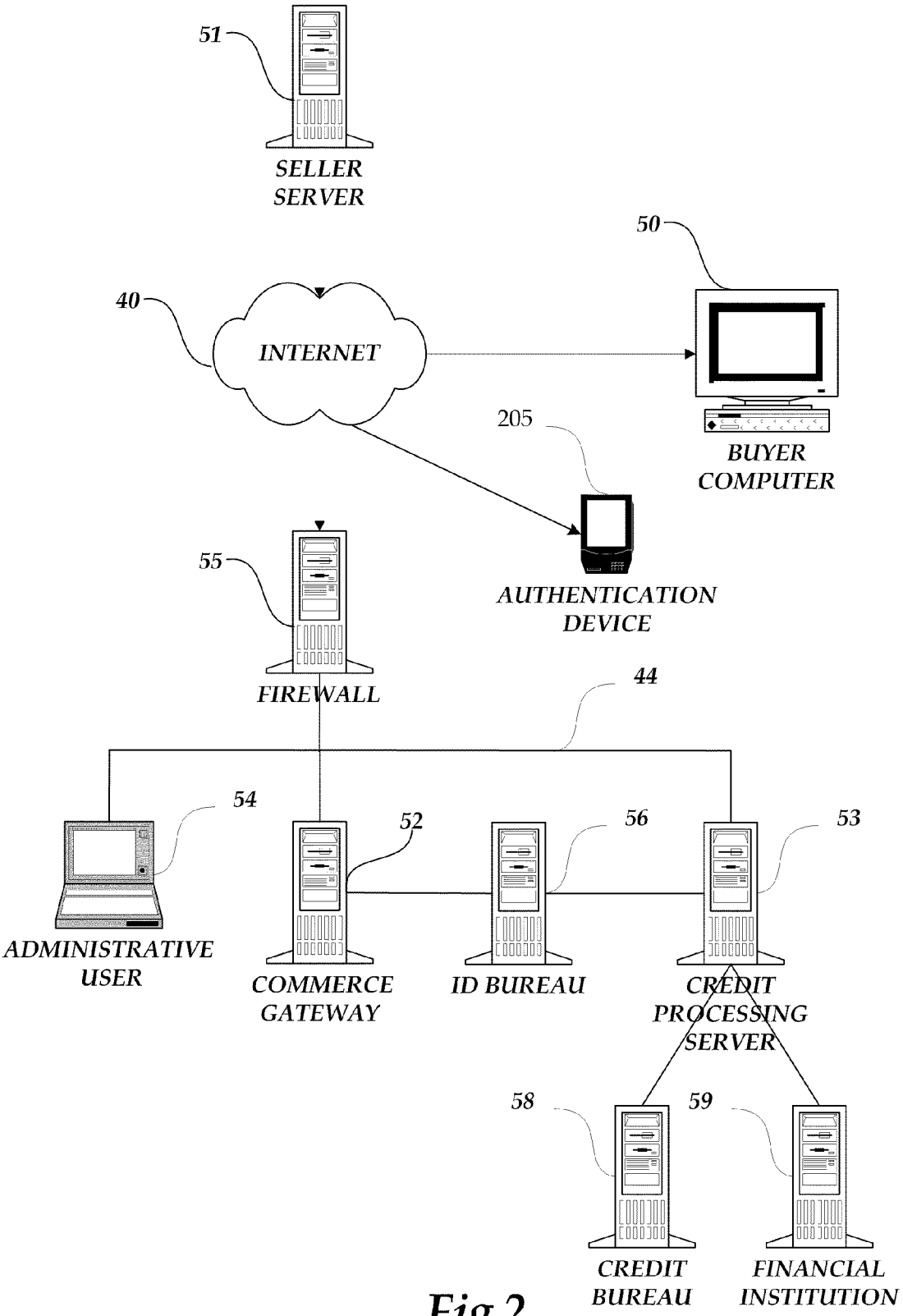

51
SELLER SERVER
50
40
INTERNET
BUYER COMPUTER
205
AUTHENTICATION DEVICE
55
FIREWALL
44
54
52
56
53
ADMINISTRATIVE USER
COMMERCE GATEWAY
ID BUREAU
CREDIT PROCESSING SERVER
58
59
CREDIT BUREAU
FINANCIAL INSTITUTION

Fig.2.

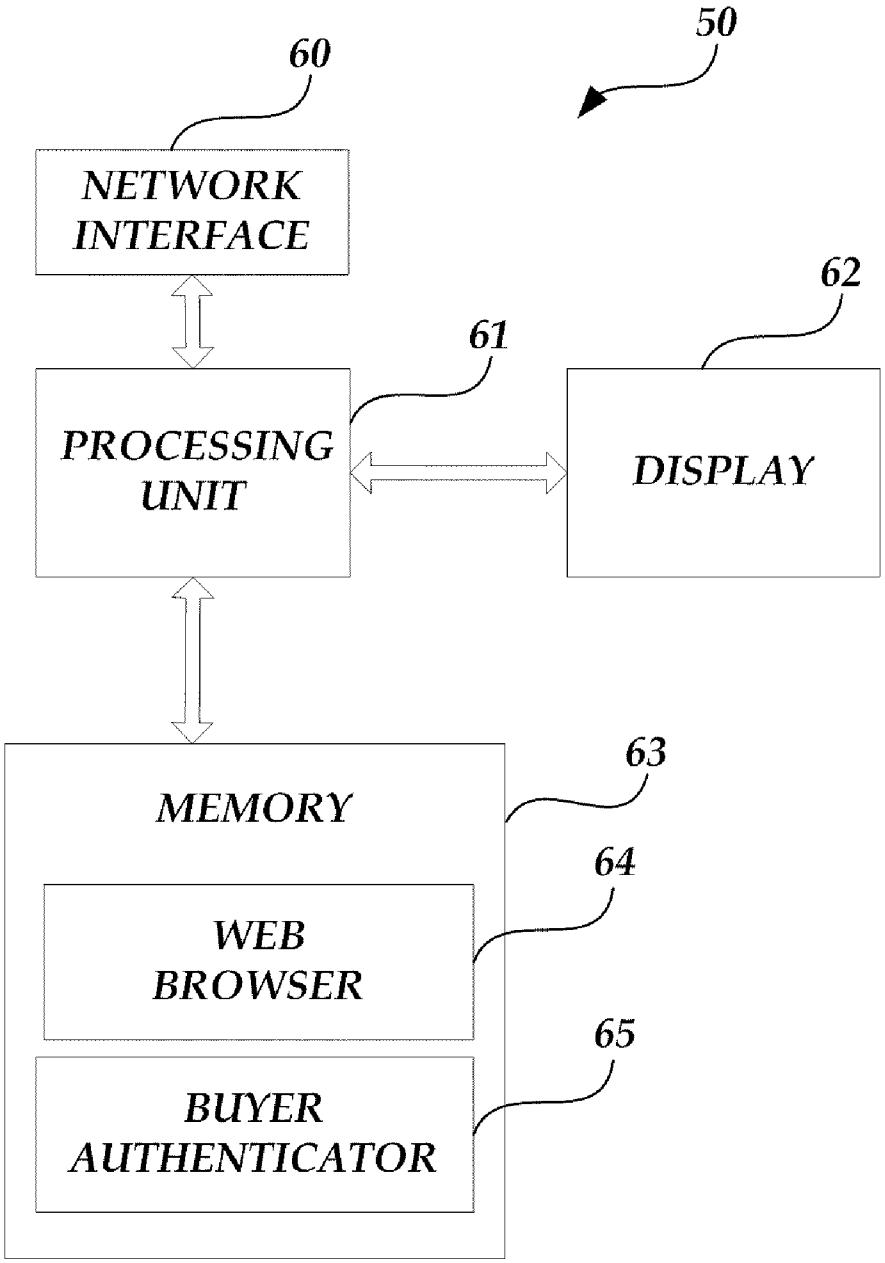

50
60
NETWORK INTERFACE
62
61
PROCESSING UNIT
DISPLAY
63
MEMORY
64
WEB BROWSER
65
BUYER AUTHENTICATOR

Fig.3.

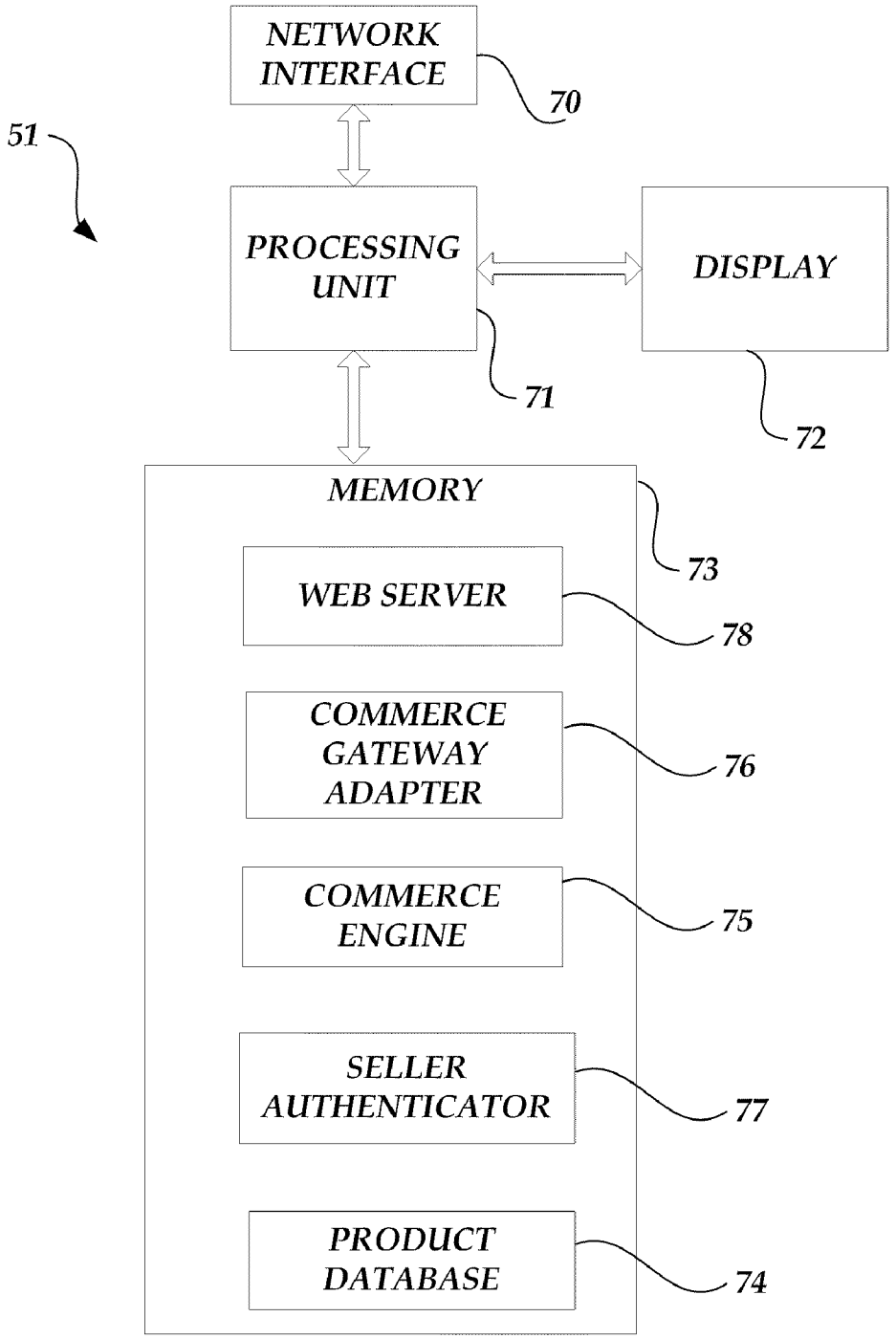

NETWORK INTERFACE
70
51
PROCESSING UNIT
DISPLAY
71
72
MEMORY
73
WEB SERVER
78
COMMERCE GATEWAY ADAPTER
76
COMMERCE ENGINE
75
SELLER AUTHENTICATOR
77
PRODUCT DATABASE
74

Fig.4.

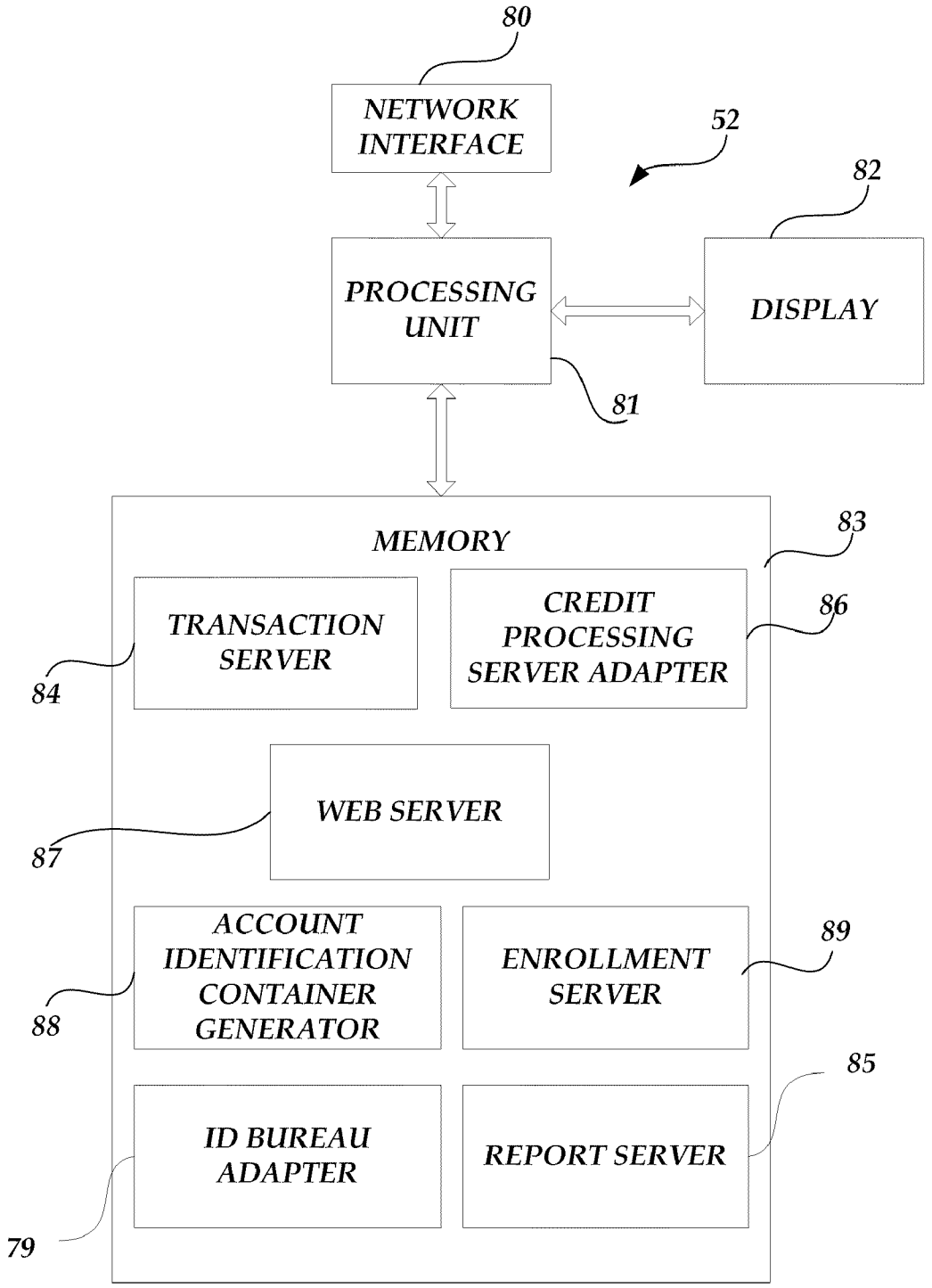

80
NETWORK INTERFACE
52
82
PROCESSING UNIT
DISPLAY
81
MEMORY
83
TRANSACTION SERVER
CREDIT PROCESSING SERVER ADAPTER
86
84
WEB SERVER
87
ACCOUNT IDENTIFICATION CONTAINER GENERATOR
ENROLLMENT SERVER
89
88
85
ID BUREAU ADAPTER
REPORT SERVER
79

Fig.5.

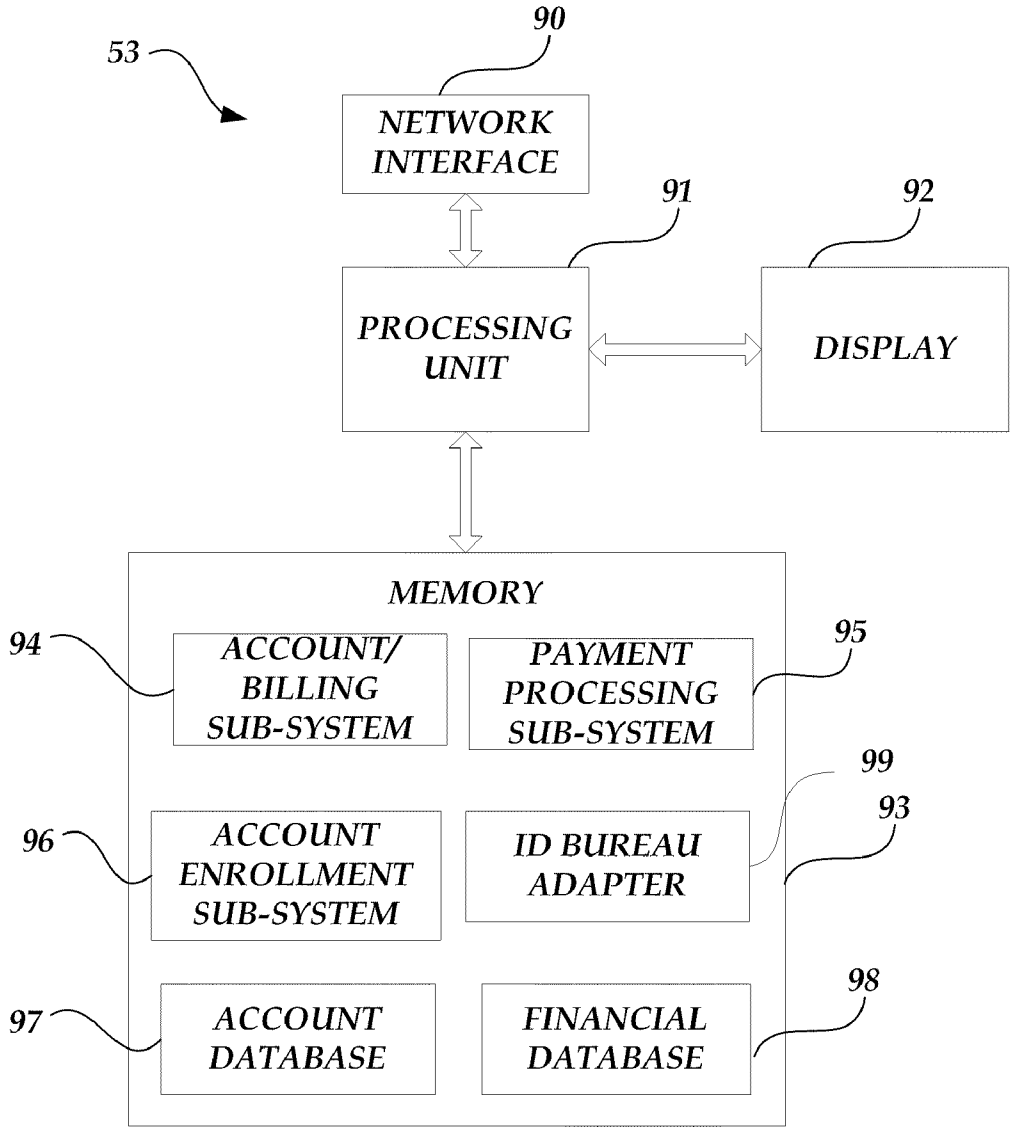

53
90
NETWORK INTERFACE
91
92
PROCESSING UNIT
DISPLAY
MEMORY
94
ACCOUNT/ BILLING SUB-SYSTEM
PAYMENT PROCESSING SUB-SYSTEM
95
99
93
96
ACCOUNT ENROLLMENT SUB-SYSTEM
ID BUREAU ADAPTER
98
97
ACCOUNT DATABASE
FINANCIAL DATABASE

Fig.6.

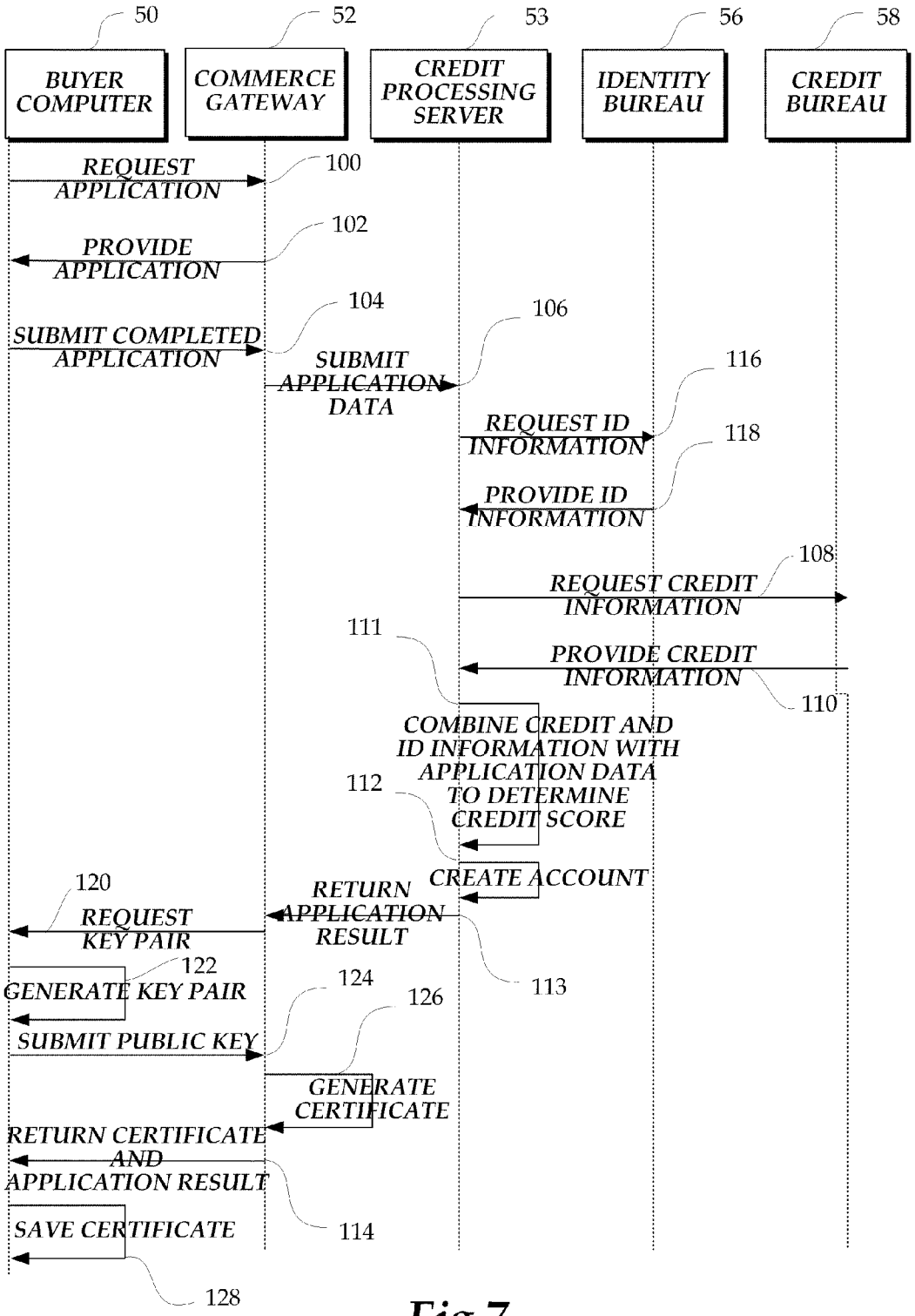

50
52
53
56
58
BUYER COMPUTER
COMMERCE GATEWAY
CREDIT PROCESSING SERVER
IDENTITY BUREAU
CREDIT BUREAU
REQUEST APPLICATION
100
PROVIDE APPLICATION
102
SUBMIT COMPLETED APPLICATION
104
SUBMIT APPLICATION DATA
106
REQUEST ID INFORMATION
116
PROVIDE ID INFORMATION
118
REQUEST CREDIT INFORMATION
108
PROVIDE CREDIT INFORMATION
110
111
COMBINE CREDIT AND ID INFORMATION WITH APPLICATION DATA TO DETERMINE CREDIT SCORE
112
CREATE ACCOUNT
RETURN APPLICATION RESULT
113
REQUEST KEY PAIR
120
GENERATE KEY PAIR
122
SUBMIT PUBLIC KEY
124
GENERATE CERTIFICATE
126
RETURN CERTIFICATE AND APPLICATION RESULT
114
SAVE CERTIFICATE
128

Fig.7.

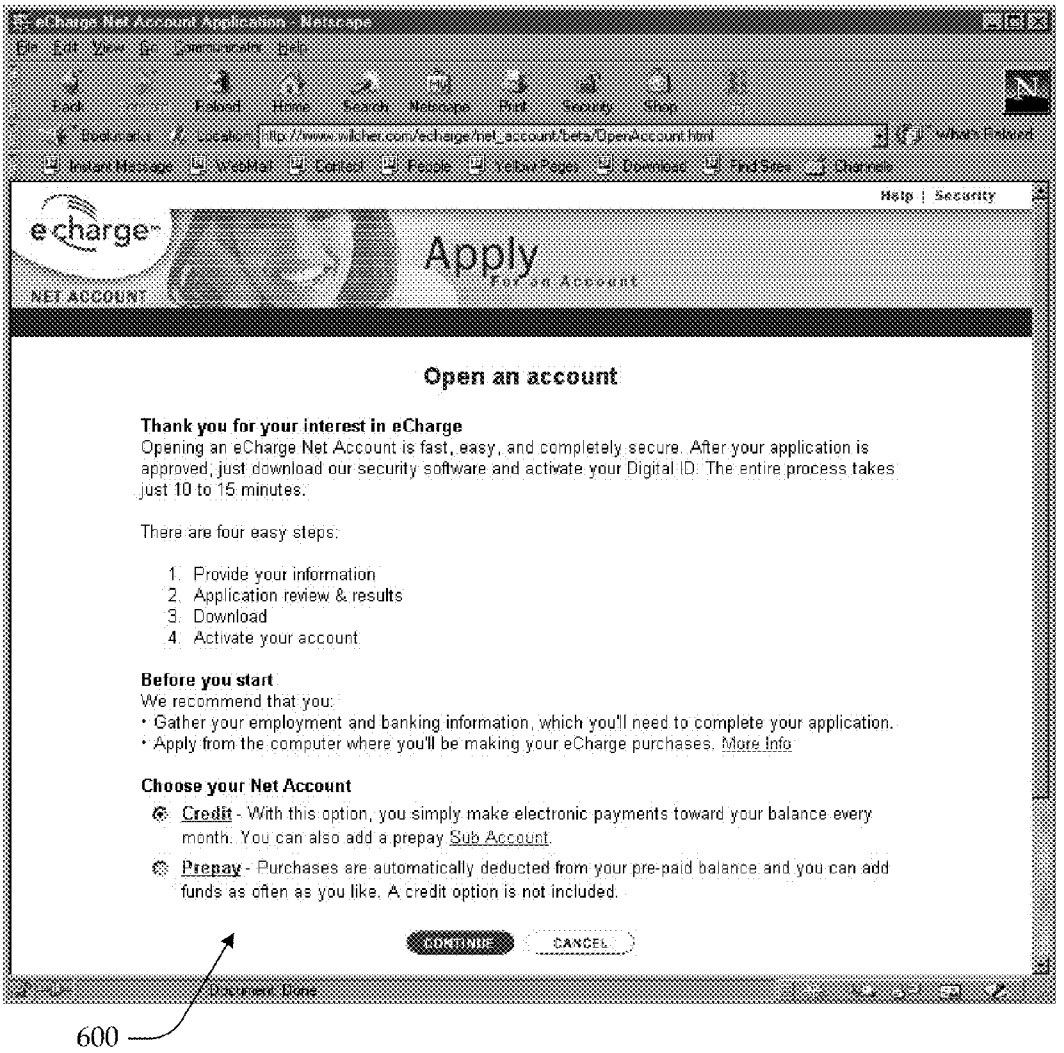

Help | Security
echarge
NET ACCOUNT
Apply
Open an account
Thank you for your interest in eCharge
Opening an eCharge Net Account is fast, easy, and completely secure. After your application is approved, just download our security software and activate your Digital ID. The entire process takes just 10 to 15 minutes.
There are four easy steps:
1. Provide your information
2. Application review & results
3. Download
4. Activate your account
Before you start
We recommend that you:
• Gather your employment and banking information, which you'll need to complete your application.
• Apply from the computer where you'll be making your eCharge purchases. More Info
Choose your Net Account
Credit - With this option, you simply make electronic payments toward your balance every month. You can also add a prepay Sub Account.
Prepay - Purchases are automatically deducted from your pre-paid balance and you can add funds as often as you like. A credit option is not included.
CONTINUE
CANCEL
600

Fig.8A.

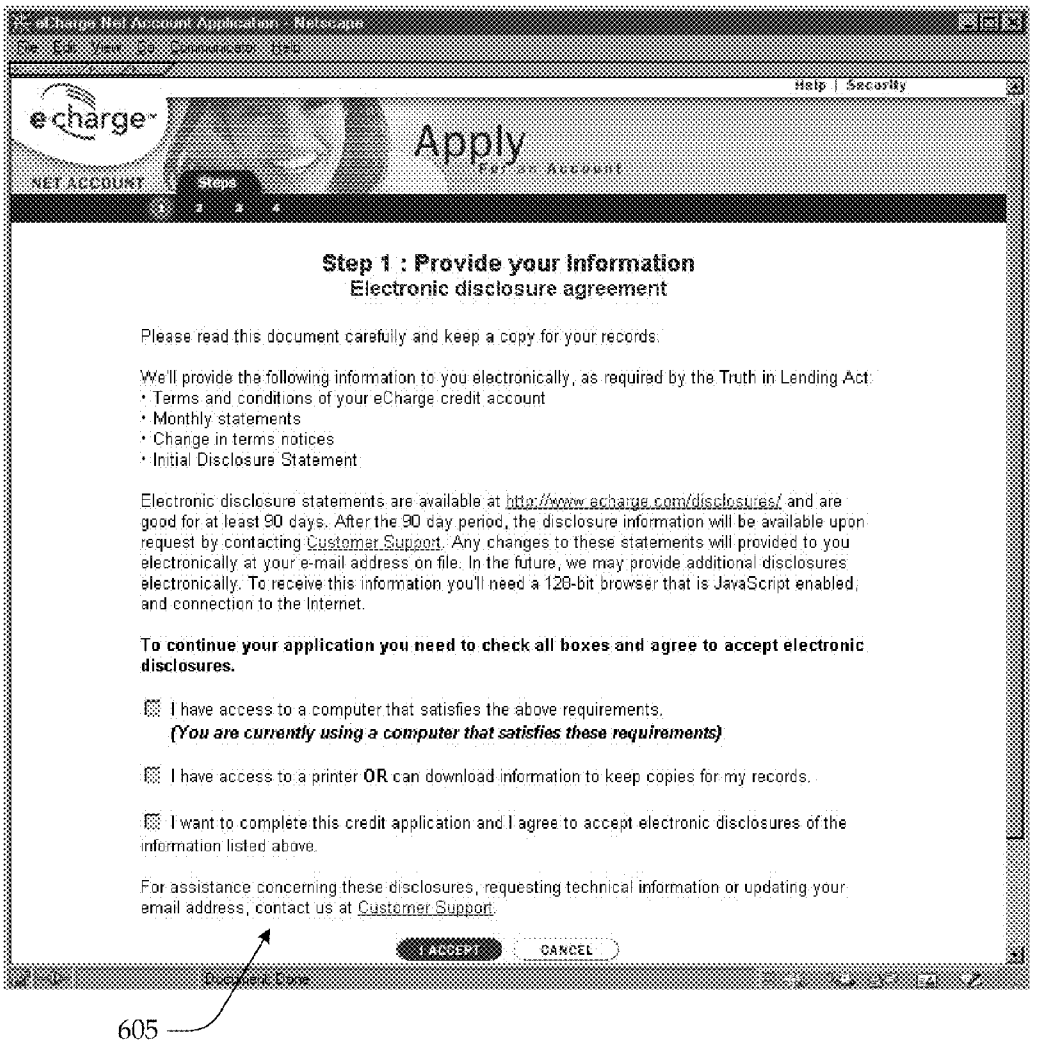

Help | Security
e charge
NET ACCOUNT
Steps
Apply
Step 1 : Provide your information
Electronic disclosure agreement
Please read this document carefully and keep a copy for your records.
We'll provide the following information to you electronically, as required by the Truth in Lending Act:
• Terms and conditions of your eCharge credit account
• Monthly statements
• Change in terms notices
• Initial Disclosure Statement
Electronic disclosure statements are available at http://www.echarge.com/disclosures/ and are good for at least 90 days. After the 90 day period, the disclosure information will be available upon request by contacting Customer Support. Any changes to these statements will provided to you electronically at your e-mail address on file. In the future, we may provide additional disclosures electronically. To receive this information you'll need a 128-bit browser that is JavaScript enabled, and connection to the Internet.
To continue your application you need to check all boxes and agree to accept electronic disclosures.
I have access to a computer that satisfies the above requirements.
(You are currently using a computer that satisfies these requirements)
I have access to a printer OR can download information to keep copies for my records.
I want to complete this credit application and I agree to accept electronic disclosures of the information listed above.
For assistance concerning these disclosures, requesting technical information or updating your email address, contact us at Customer Support.
I ACCEPT
CANCEL
605

Fig.8B.

eCharge Net Account Application - Netscape

File Edit View Go Communicator Help

Help | Security

echarge™ NET ACCOUNT

Apply FOR AN ACCOUNT

Steps

Step 1 : Provide your information

Apply for a credit account

All fields marked with a star (*) must be completed so we can process your eCharge Net Account application. For an explanation of the required information, click on a specific link or Help.

610

Personal information

Name* Initial Last*

E-Mail Address* Date of Birth* (mm/dd/yyyy)

Home Phone* Daytime Phone

Current address

Address*

City* [1]State* Zip Code*

AK

Home Ownership * Time at this address*

- Select One - years months

Financial and employment information

Social Security Number* Employment Status *

- Select one -

Time at Current Employment* [2]Annual Household Income*

years months - Select range -

Making payments

You can pay for your credit account purchases from your checking or savings account.

Account Type* Checking Savings

ABA Routing Number*

Bank Account Number*

Special offers

Please send me notices about special offers from eCharge, online retailers who accept eCharge, and other companies.

Please send me special offer notices only from eCharge.

Please do not send me special offer notices from eCharge or any other company at this time.

CONTINUE CANCEL

[1]Currently, eCharge is only available to U.S. residents, except residents of Alabama and Iowa, with a U.S. billing address.
State Law Disclosures

[2]Alimony, child support, or separate maintenance income need not be revealed if you do not wish to have it considered as a basis for repaying this obligation.

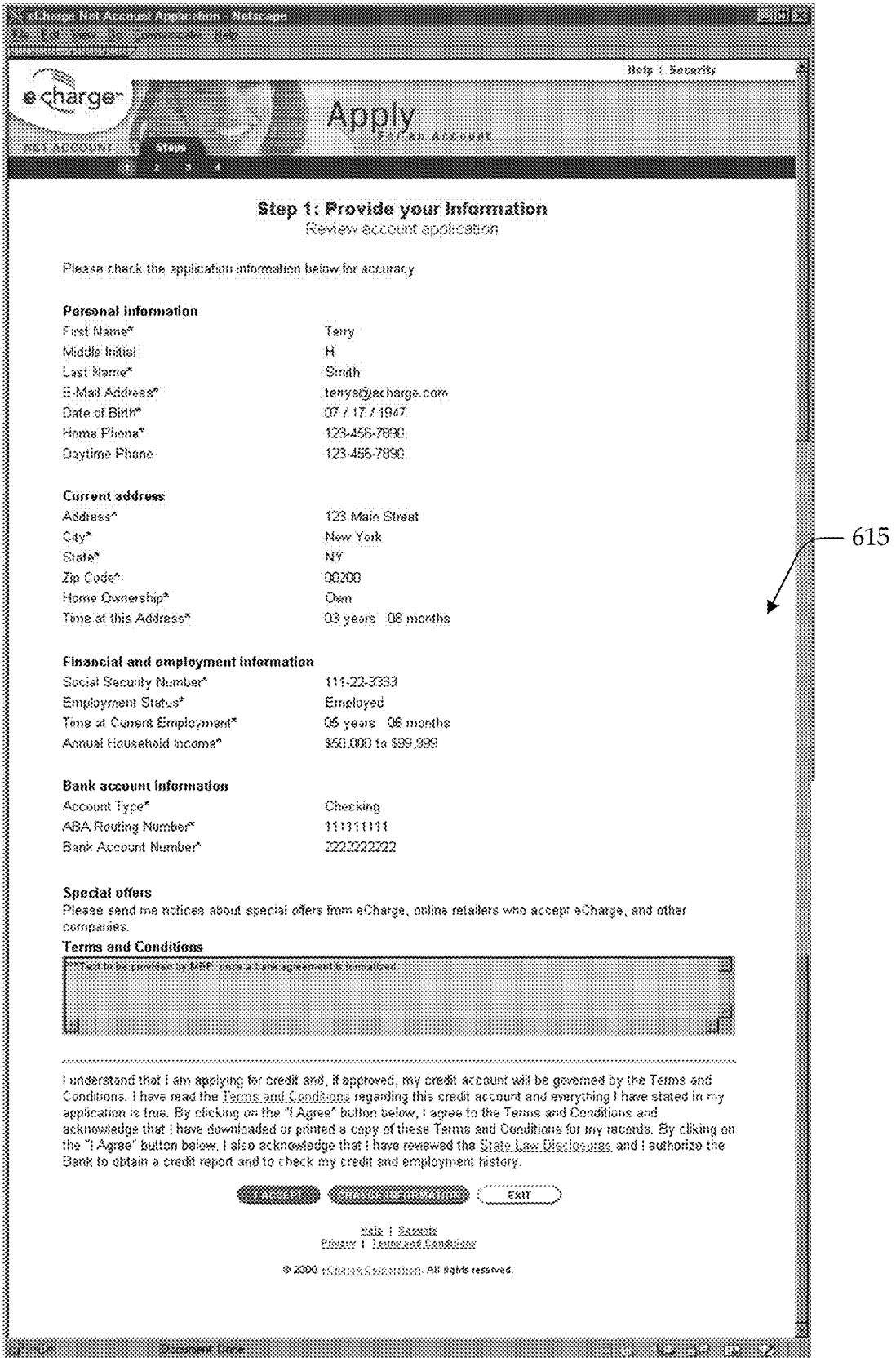
Help | Security
Privacy | Terms and Conditions

©2000 eCharge Corporation. All rights reserved.

Application Error

Document: Done

Fig.8C.


Help | Security
echarge
Apply
NET ACCOUNT
Step
Step 1: Provide your information
Review account application
Please check the application information below for accuracy.
Personal information
First Name* Terry
Middle Initial H
Last Name* Smith
E-Mail Address* terrys@echarge.com
Date of Birth* 07 / 17 / 1947
Home Phone* 123-456-7890
Daytime Phone 123-456-7890
Current address
Address* 123 Main Street
City* New York
State* NY
Zip Code* 00200
Home Ownership* Own
Time at this Address* 03 years 08 months
Financial and employment information
Social Security Number* 111-22-3333
Employment Status* Employed
Time at Current Employment* 05 years 06 months
Annual Household Income* $50,000 to $99,999
Bank account information
Account Type* Checking
ABA Routing Number* 111111111
Bank Account Number* 2222222222
Special offers
Please send me notices about special offers from eCharge, online retailers who accept eCharge, and other companies.
Terms and Conditions
I understand that I am applying for credit and, if approved, my credit account will be governed by the Terms and Conditions. I have read the Terms and Conditions regarding this credit account and everything I have stated in my application is true. By clicking on the "I Agree" button below, I agree to the Terms and Conditions and acknowledge that I have downloaded or printed a copy of these Terms and Conditions for my records. By clicking on the "I Agree" button below, I also acknowledge that I have reviewed the State Law Disclosures and I authorize the Bank to obtain a credit report and to check my credit and employment history.
EXIT
Help | Security
Privacy | Terms and Conditions
© 2000 eCharge Corporation. All rights reserved.

615

Fig.8D.

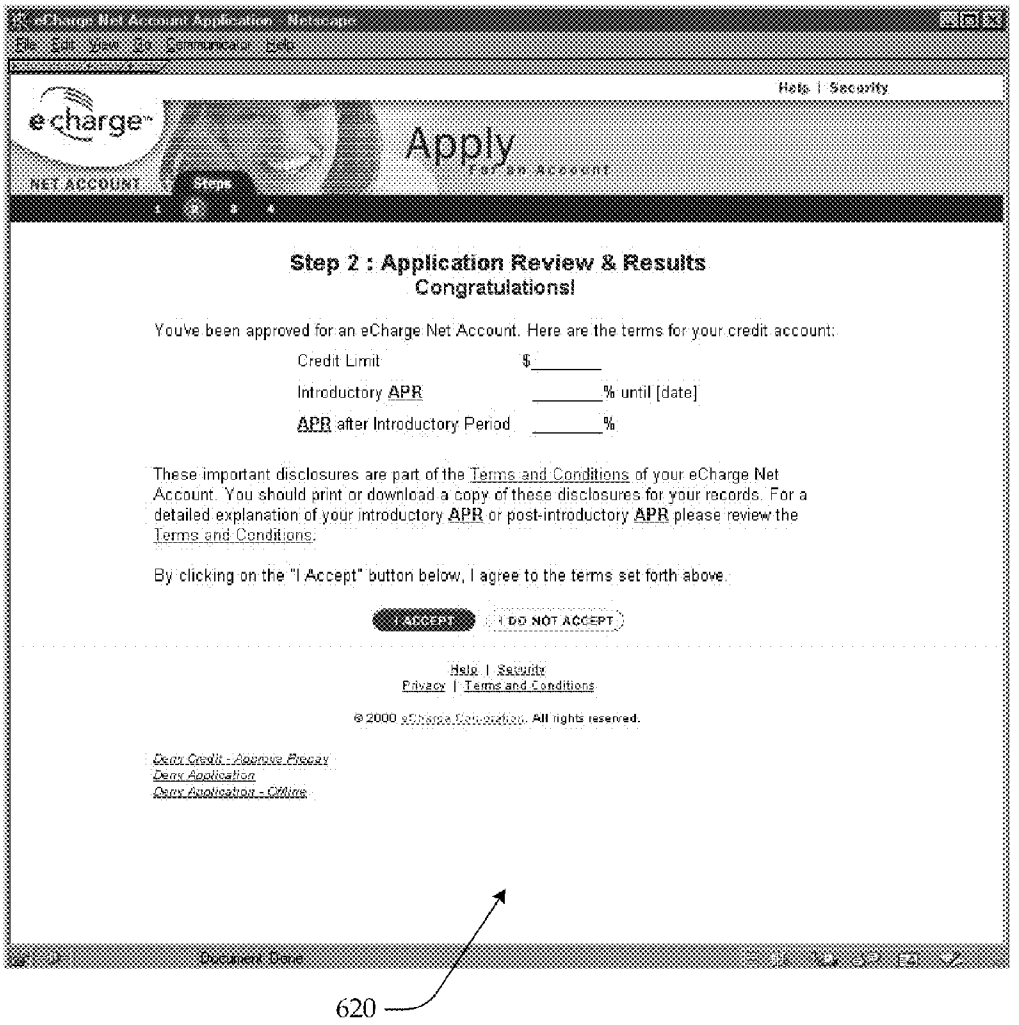

Help | Security
e charge
NET ACCOUNT
Apply
Step 2 : Application Review & Results
Congratulations!
You've been approved for an eCharge Net Account. Here are the terms for your credit account:
Credit Limit $_____
Introductory APR _____% until [date]
APR after Introductory Period _____%
These important disclosures are part of the Terms and Conditions of your eCharge Net Account. You should print or download a copy of these disclosures for your records. For a detailed explanation of your introductory APR or post-introductory APR please review the Terms and Conditions.
By clicking on the "I Accept" button below, I agree to the terms set forth above.
I ACCEPT
I DO NOT ACCEPT
Help | Security
Privacy | Terms and Conditions
© 2000 eCharge Corporation. All rights reserved.
Deny Credit - Approve Prepay
Deny Application
Deny Application - Offline
620

Fig.8E.

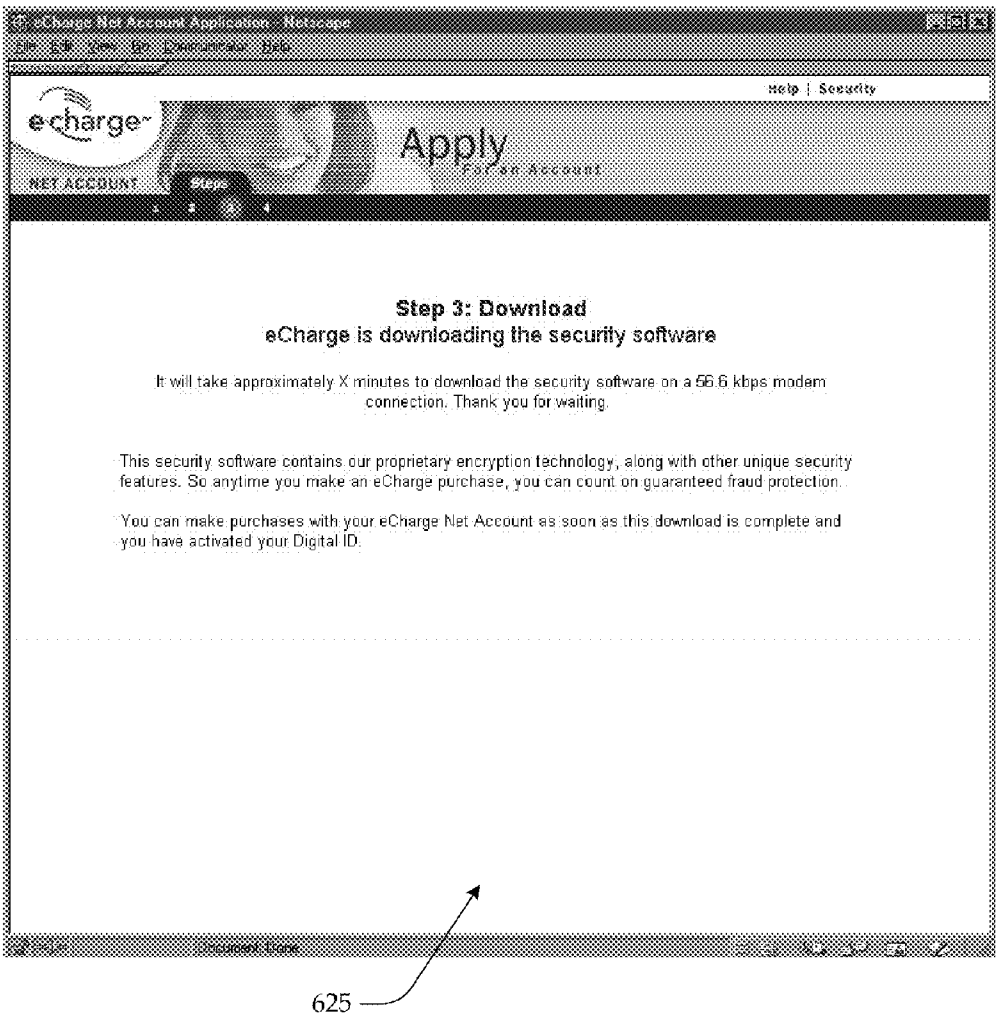

Help | Security
e-charge
NET ACCOUNT
Steps
Apply
For an Account
Step 3: Download
eCharge is downloading the security software
It will take approximately X minutes to download the security software on a 56.6 kbps modem connection. Thank you for waiting.
This security software contains our proprietary encryption technology, along with other unique security features. So anytime you make an eCharge purchase, you can count on guaranteed fraud protection.
You can make purchases with your eCharge Net Account as soon as this download is complete and you have activated your Digital ID.
625

Fig. 8F.

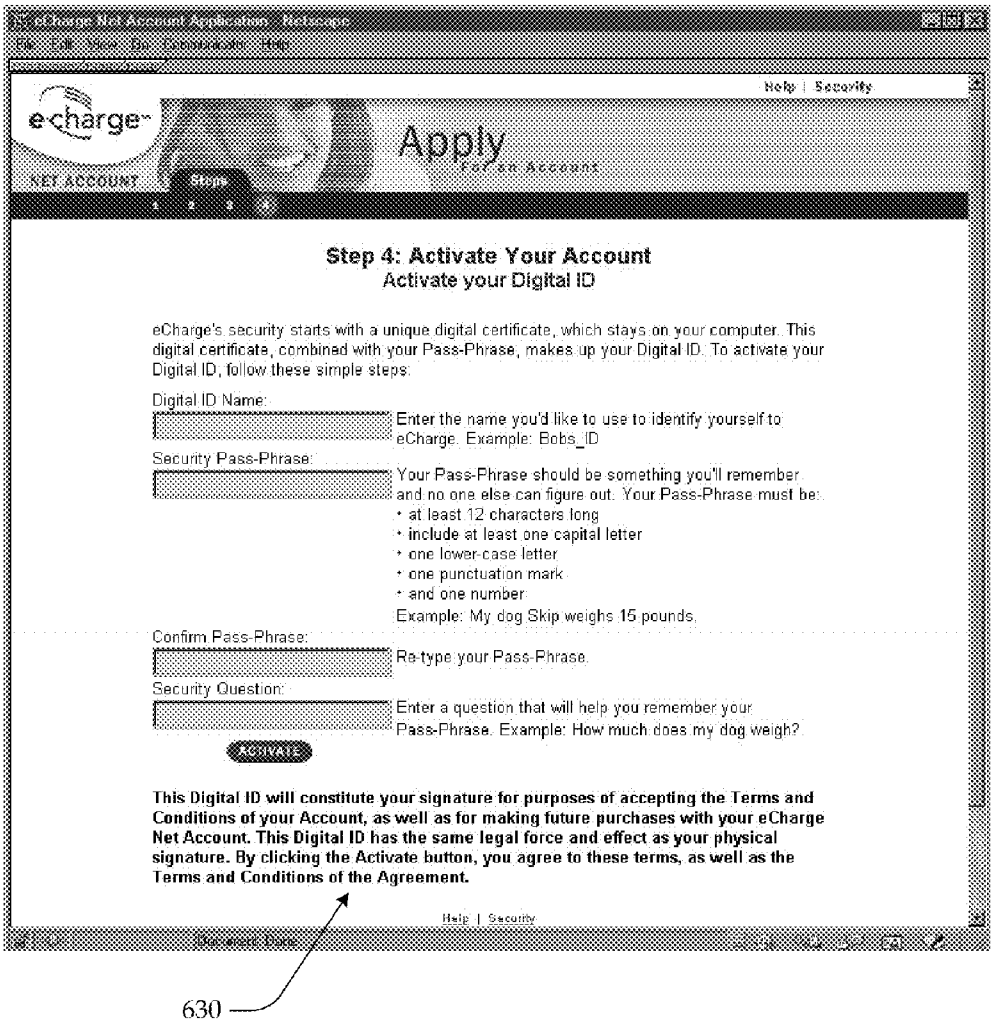

Help | Security
e-charge
NET ACCOUNT
Apply
Step 4: Activate Your Account
Activate your Digital ID
eCharge's security starts with a unique digital certificate, which stays on your computer. This digital certificate, combined with your Pass-Phrase, makes up your Digital ID. To activate your Digital ID, follow these simple steps:
Digital ID Name:
Enter the name you'd like to use to identify yourself to eCharge. Example: Bobs_ID
Security Pass-Phrase:
Your Pass-Phrase should be something you'll remember and no one else can figure out. Your Pass-Phrase must be:
• at least 12 characters long
• include at least one capital letter
• one lower-case letter
• one punctuation mark
• and one number
Example: My dog Skip weighs 15 pounds.
Confirm Pass-Phrase:
Re-type your Pass-Phrase.
Security Question:
Enter a question that will help you remember your Pass-Phrase. Example: How much does my dog weigh?
ACTIVATE
This Digital ID will constitute your signature for purposes of accepting the Terms and Conditions of your Account, as well as for making future purchases with your eCharge Net Account. This Digital ID has the same legal force and effect as your physical signature. By clicking the Activate button, you agree to these terms, as well as the Terms and Conditions of the Agreement.
Help | Security
630

Fig.8G.

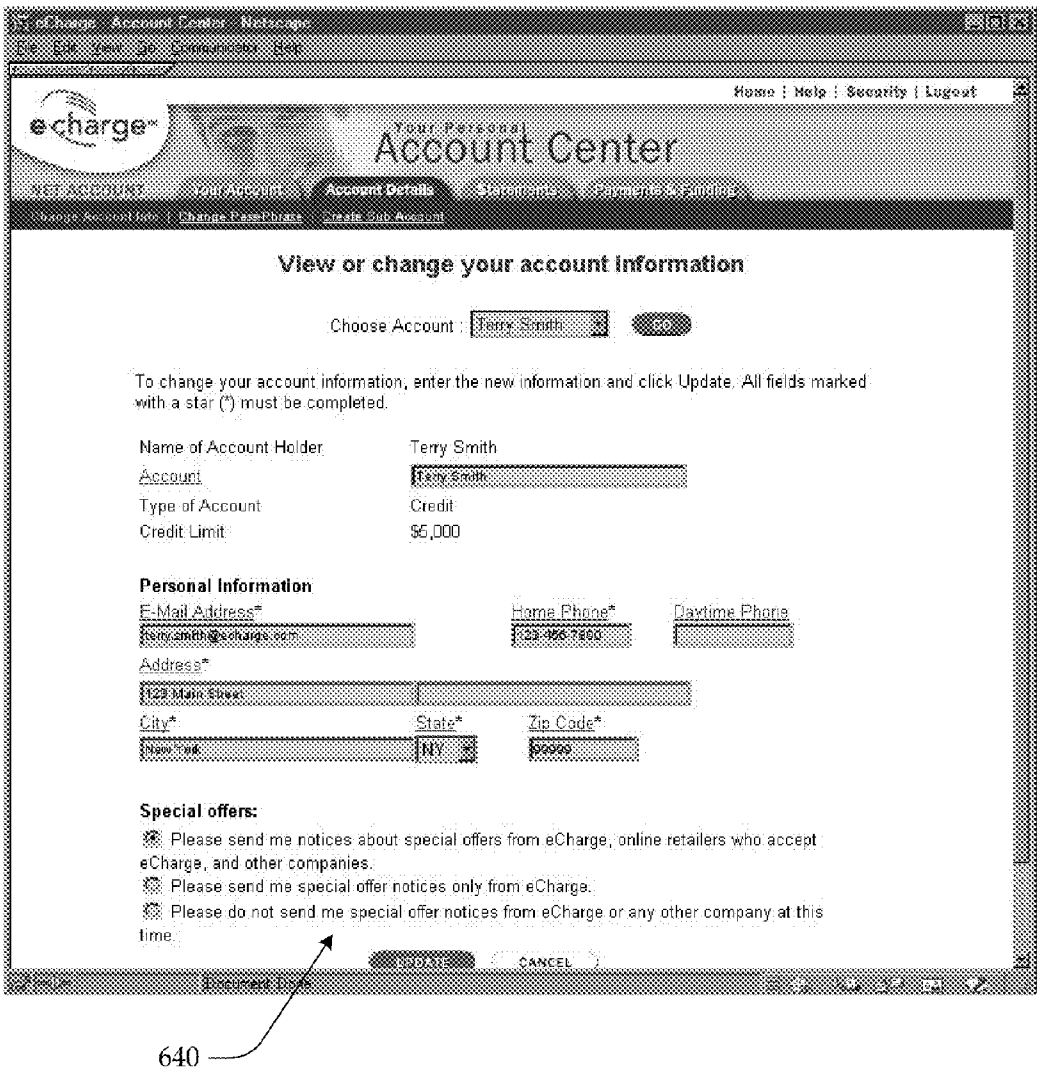
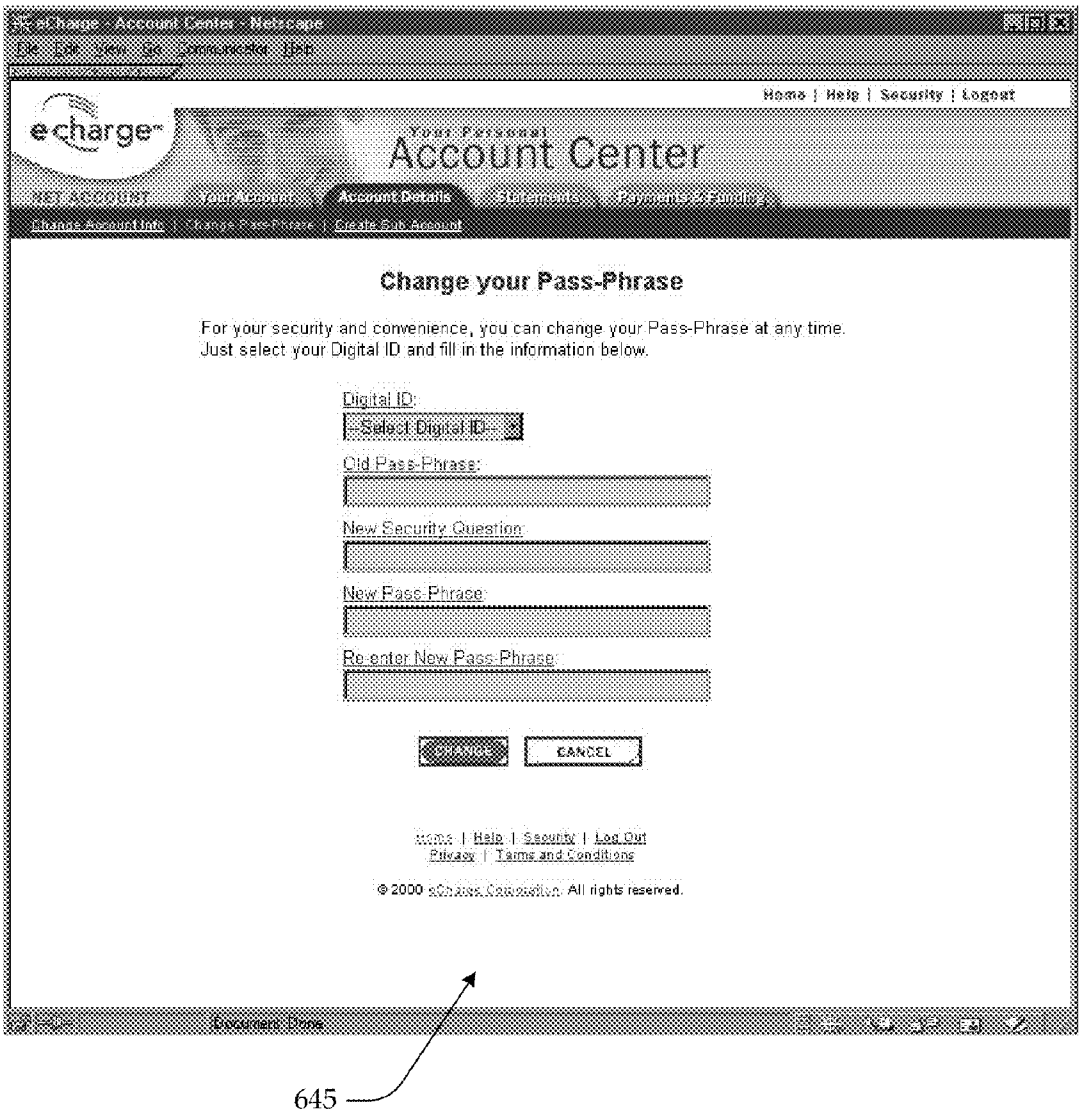

Home | Help | Security | Logout
echarge
Your Personal
Account Center
Account Details
View or change your account information
Choose Account :
To change your account information, enter the new information and click Update. All fields marked with a star (*) must be completed.
Name of Account Holder
Terry Smith
Account
Type of Account
Credit
Credit Limit
$6,000
Personal Information
E-Mail Address*
Home Phone*
Daytime Phone
Address*
City*
State*
Zip Code*
NY
Special offers:
Please send me notices about special offers from eCharge, online retailers who accept eCharge, and other companies.
Please send me special offer notices only from eCharge.
Please do not send me special offer notices from eCharge or any other company at this time.
UPDATE
CANCEL
640

Fig.9A.


Home | Help | Security | Logout
echarge
Your Personal
Account Center
Account Details
Change your Pass-Phrase
For your security and convenience, you can change your Pass-Phrase at any time.
Just select your Digital ID and fill in the information below.
Digital ID:
-- Select Digital ID --
Old Pass-Phrase:
New Security Question:
New Pass-Phrase:
Re-enter New Pass-Phrase:
CANCEL
Home | Help | Security | Log Out
Privacy | Terms and Conditions
© 2000 eCharge Corporation. All rights reserved.
Document: Done

645

Fig.9B.

echarge

Home | Help | Security | Logout

Your Personal Account Center

Account Details

Change Account Info | Change Pass-Phrase | Create Sub Account

650

Create a Sub Account

You can create up to five secure Sub Accounts at no change, giving everyone in your family a separate account. Or set up Sub Accounts for specific types of purchases. Each Sub Account also offers parental controls, which let you set purchasing limits for the kids and restrict the web sites from which they can purchase.

For security reasons, each account holder is assigned a personal Digital ID and Pass-Phrase. As the primary eCharge Net Account holder, you're liable for all charges incurred by the Sub Account holders. If you need more than five Sub Accounts, you can create additional accounts for a small fee. For details, please contact Customer Support.

All fields marked with a star (*) must be completed before we can create your Sub Account.

Sub Account information

Type of Account*

Credit - This account allows you to shares the credit limit of your primary account.

Prepay - Purchases are automatically deducted from your pre-paid balance and you can add funds as often as you like to this Sub Account.

Account Holder First Name*

Account Holder Last Name*

Account*

E-Mail Address*

Set parental controls

Purchasing limits

To set purchasing limits for this Sub Account, fill in one or more of the following options.

Single Transaction $

Daily Total $

Monthly Total (number of transactions)

Web site restrictions

To set purchasing limits on specific web sites, simply type in the monthly dollar amount for each Retail Category. You can also restrict the Retail Categories from which your children can make purchases by checking the categories you want to restrict.

Retail Category	Monthly Limit ($)	Restrict
Cnet	$	
DVD Express	$	
MP3.com	$	

Special offers

Please send me notices about special offers from eCharge, online retailers who accept eCharge, and other companies.

Please send me special offer notices only from eCharge.

Please do not send me special offer notices from eCharge or any other company at this time.

PLEASE NOTE: These settings apply only to this Sub Account. You can change these settings at any time.

CANCEL

Home | Help | Security | Log Out
Privacy | Terms and Conditions

© 2000 eCharge Corporation. All rights reserved.

Fig.9C.

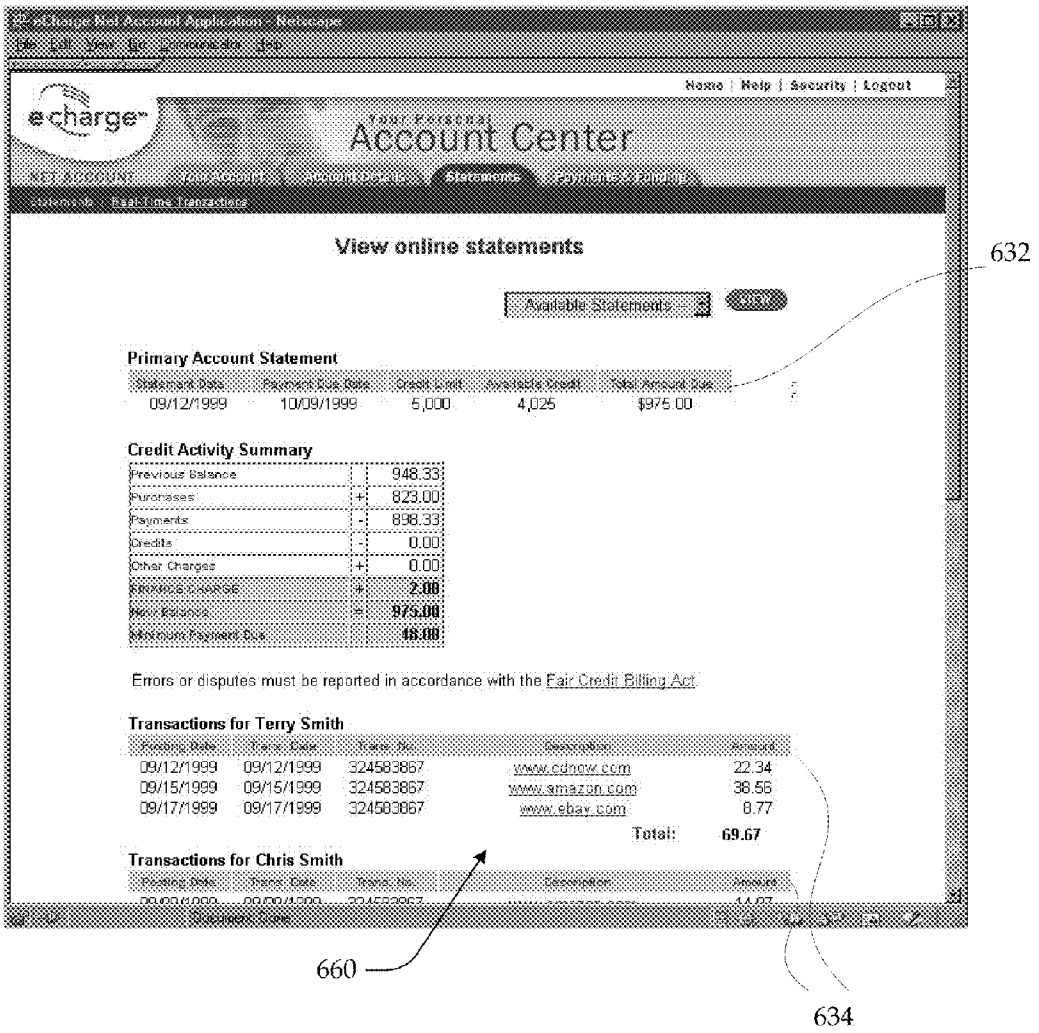

Name | Help | Security | Logout
e-charge
Account Center
Statements
Real-time transactions
View online statements
632
Available Statements
Primary Account Statement
Statement Date
Payment Due Date
Credit Limit
Available Credit
Total Amount Due
09/12/1999
10/09/1999
5,000
4,025
$975.00
Credit Activity Summary
Previous Balance 948.33
Purchases + 823.00
Payments - 898.33
Credits - 0.00
Other Charges + 0.00
Finance Charge + 2.00
New Balance = 975.00
Minimum Payment Due 48.00
Errors or disputes must be reported in accordance with the Fair Credit Billing Act.
Transactions for Terry Smith
Posting Date
Trans. Date
Trans. No.
Description
Amount
09/12/1999 09/12/1999 324583867 www.cdnow.com 22.34
09/15/1999 09/15/1999 324583867 www.amazon.com 38.56
09/17/1999 09/17/1999 324583867 www.ebay.com 8.77
Total: 69.67
Transactions for Chris Smith
660
634

Fig.10A.

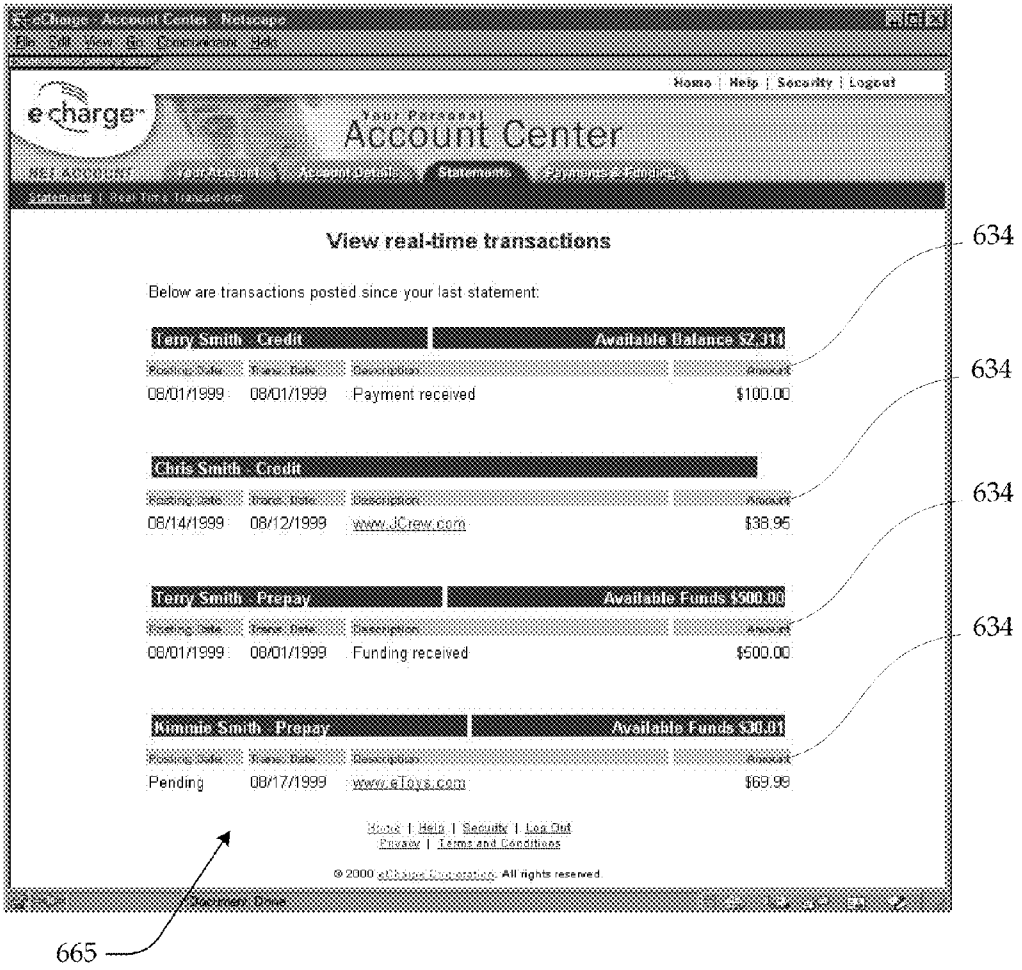

Home | Help | Security | Logout
Account Center
View real-time transactions
Below are transactions posted since your last statement:
Terry Smith - Credit
Available Balance $2,311
08/01/1999 08/01/1999 Payment received $100.00
Chris Smith - Credit
08/14/1999 08/12/1999 www.JCrew.com $38.95
Terry Smith - Prepay
Available Funds $500.00
08/01/1999 08/01/1999 Funding received $500.00
Kimmie Smith - Prepay
Available Funds $30.01
Pending 08/17/1999 www.eToys.com $69.99
Home | Help | Security | Log Out
Privacy | Terms and Conditions
634
634
634
634
665

Fig.10B.

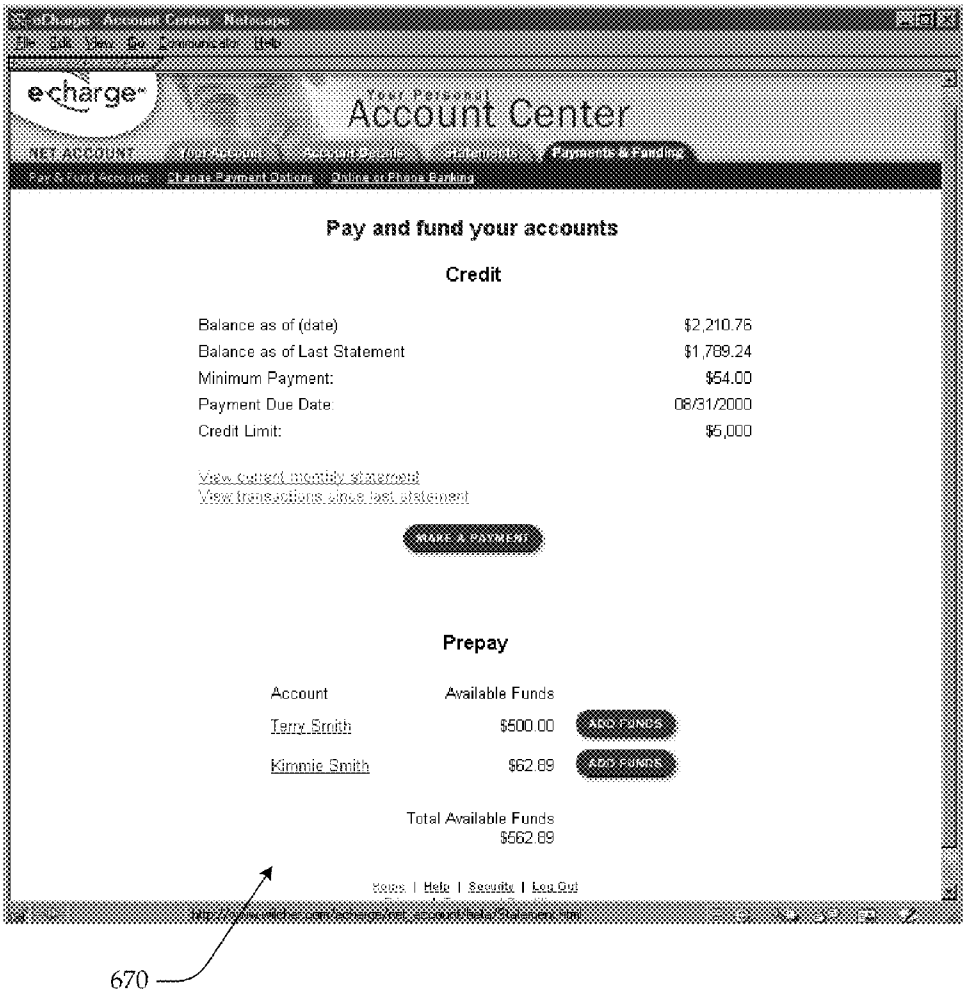

echarge
Your Personal
Account Center
Pay and fund your accounts
Credit
Balance as of (date) $2,210.76
Balance as of Last Statement $1,789.24
Minimum Payment: $54.00
Payment Due Date: 08/31/2000
Credit Limit: $5,000
View current monthly statement
View transactions since last statement
MAKE A PAYMENT
Prepay
Account
Available Funds
Terry Smith $500.00
Kimmie Smith $62.89
Total Available Funds
$562.89
Home | Help | Security | Log Out
670

Fig.10C.

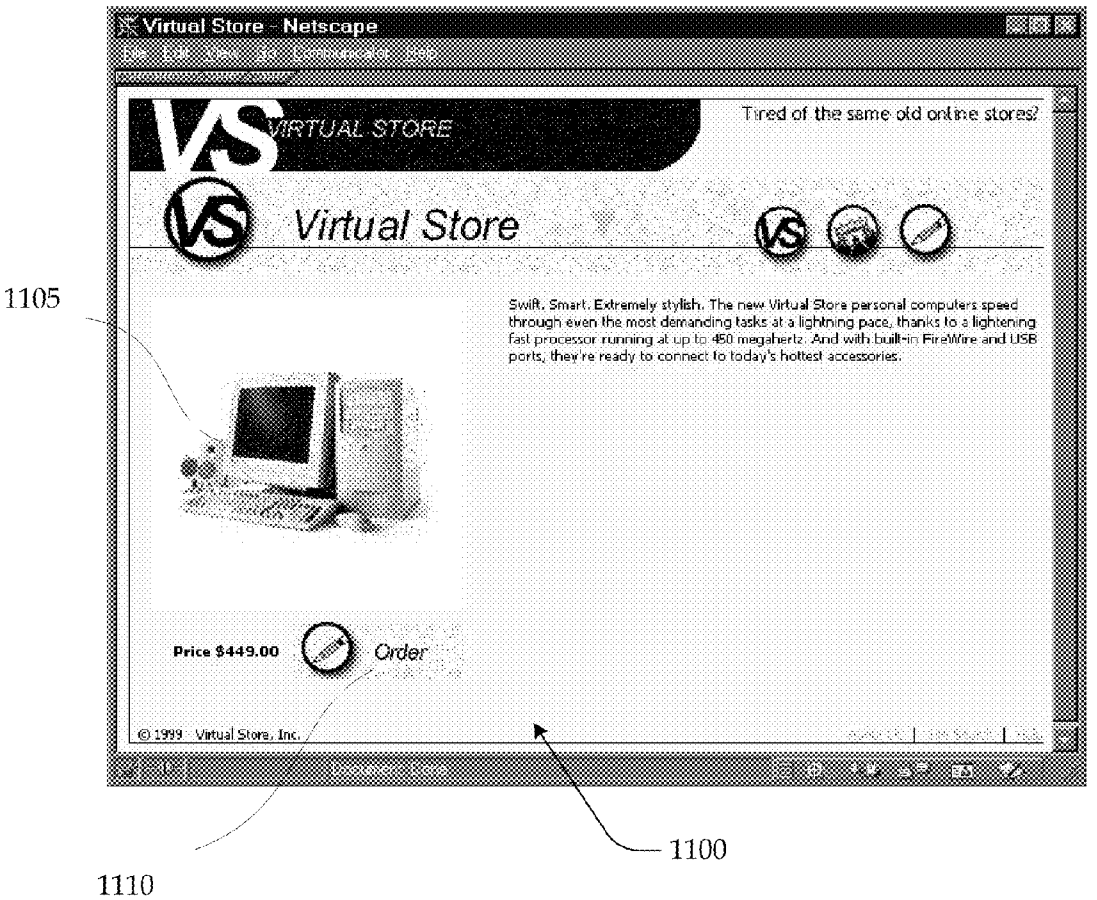

Virtual Store - Netscape
VIRTUAL STORE
Tired of the same old online stores?
Virtual Store
Swift. Smart. Extremely stylish. The new Virtual Store personal computers speed through even the most demanding tasks at a lightning pace, thanks to a lightening fast processor running at up to 450 megahertz. And with built-in FireWire and USB ports, they're ready to connect to today's hottest accessories.
Price $449.00
Order
© 1999 Virtual Store, Inc.
1105
1100
1110

Fig.11A.

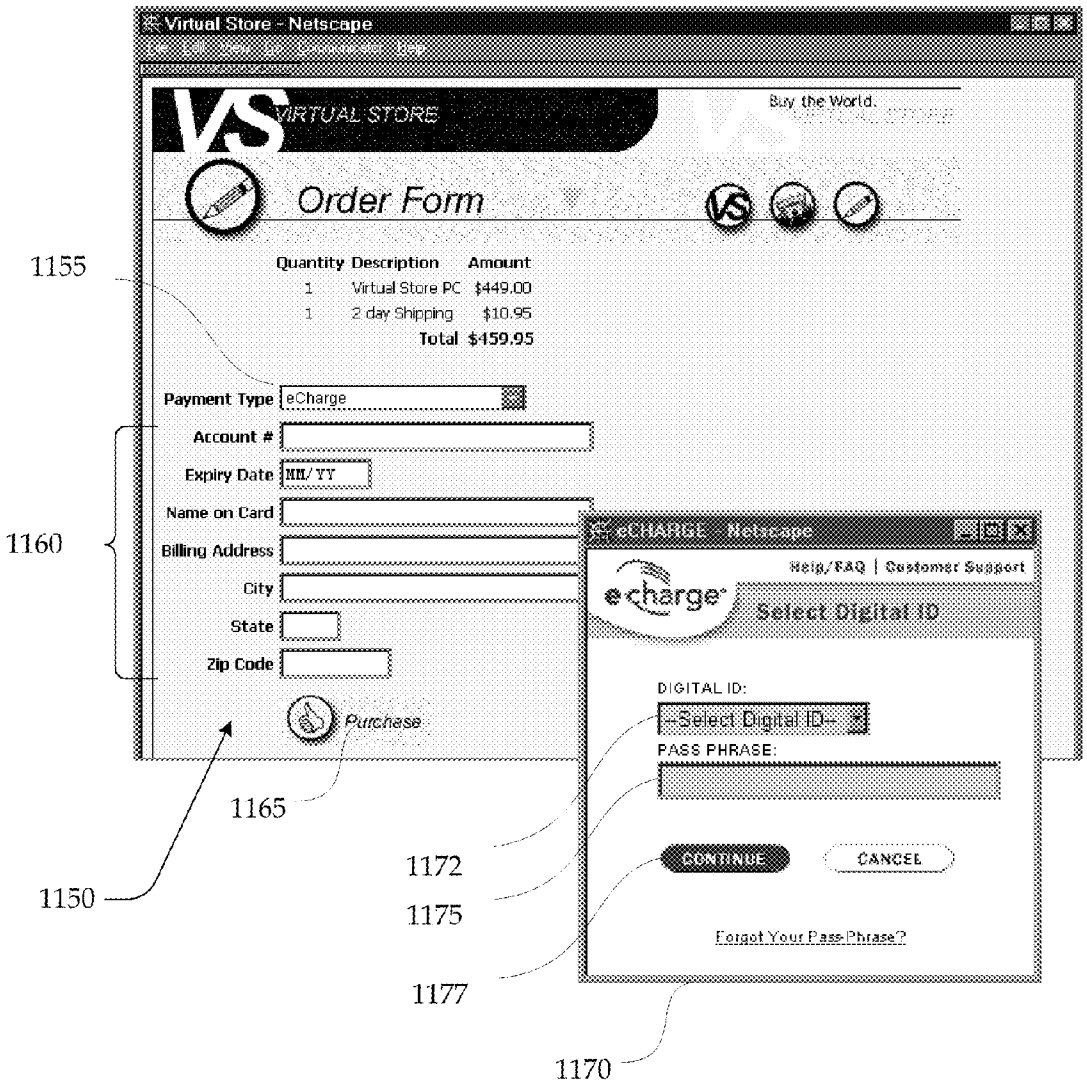

Virtual Store - Netscape
VIRTUAL STORE
Buy the World.
Order Form
Quantity Description Amount
1 Virtual Store PC $449.00
1 2 day Shipping $10.95
Total $459.95
Payment Type eCharge
Account #
Expiry Date MM/YY
Name on Card
Billing Address
City
State
Zip Code
Purchase
eCHARGE - Netscape
Help/FAQ | Customer Support
echarge
Select Digital ID
DIGITAL ID:
--Select Digital ID--
PASS PHRASE:
CONTINUE
CANCEL
Forgot Your Pass-Phrase?
1155
1160
1150
1165
1172
1175
1177
1170

Fig.11B.

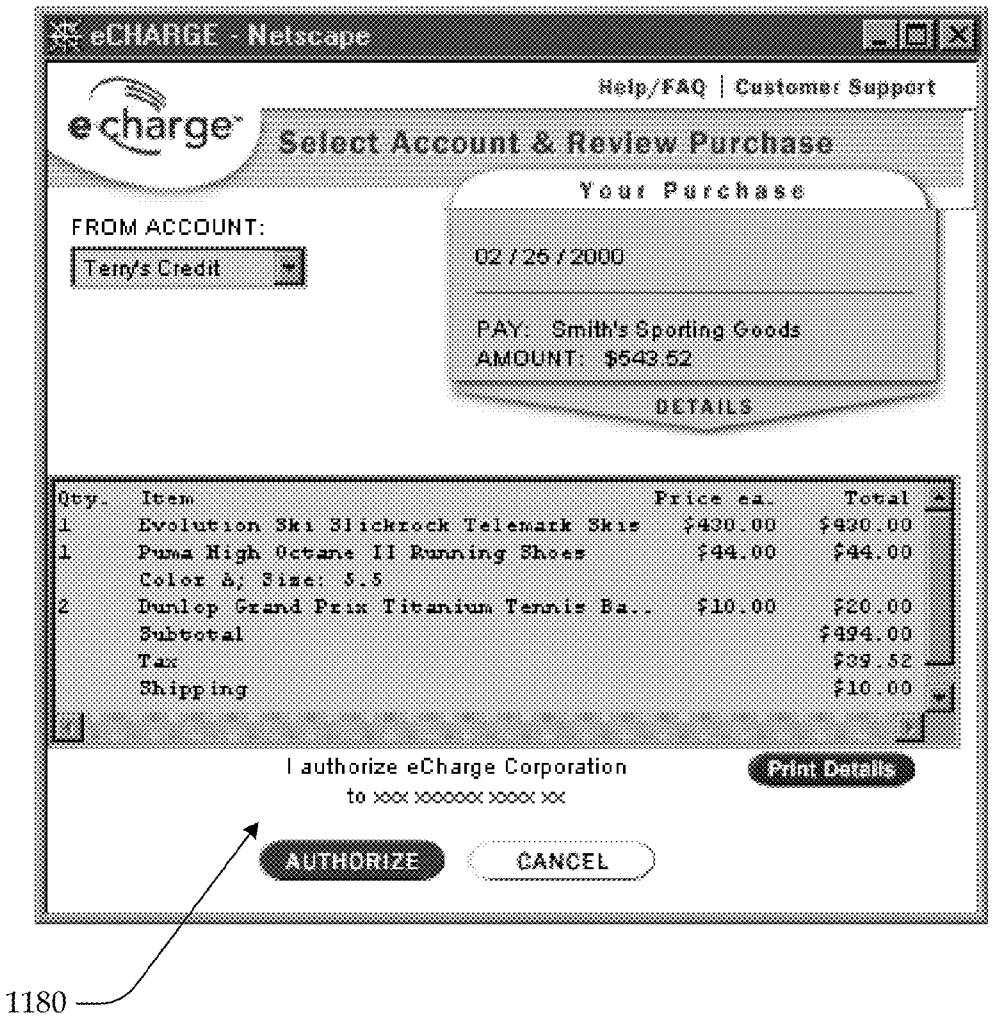

eCHARGE - Netscape
Help/FAQ | Customer Support
e charge
Select Account & Review Purchase
Your Purchase
FROM ACCOUNT:
Terry's Credit
02 / 25 / 2000
PAY: Smith's Sporting Goods
AMOUNT: $543.52
DETAILS
Qty. Item Price ea. Total
1 Evolution Ski Slickrock Telemark Skis $430.00 $430.00
1 Puma High Octane II Running Shoes $44.00 $44.00
Color &, Size: 5.5
2 Dunlop Grand Prix Titanium Tennis Ba.. $10.00 $20.00
Subtotal $494.00
Tax $39.52
Shipping $10.00
I authorize eCharge Corporation
to xxx xxxxxx xxxx xx
Print Details
AUTHORIZE
CANCEL
1180

Fig.11C.

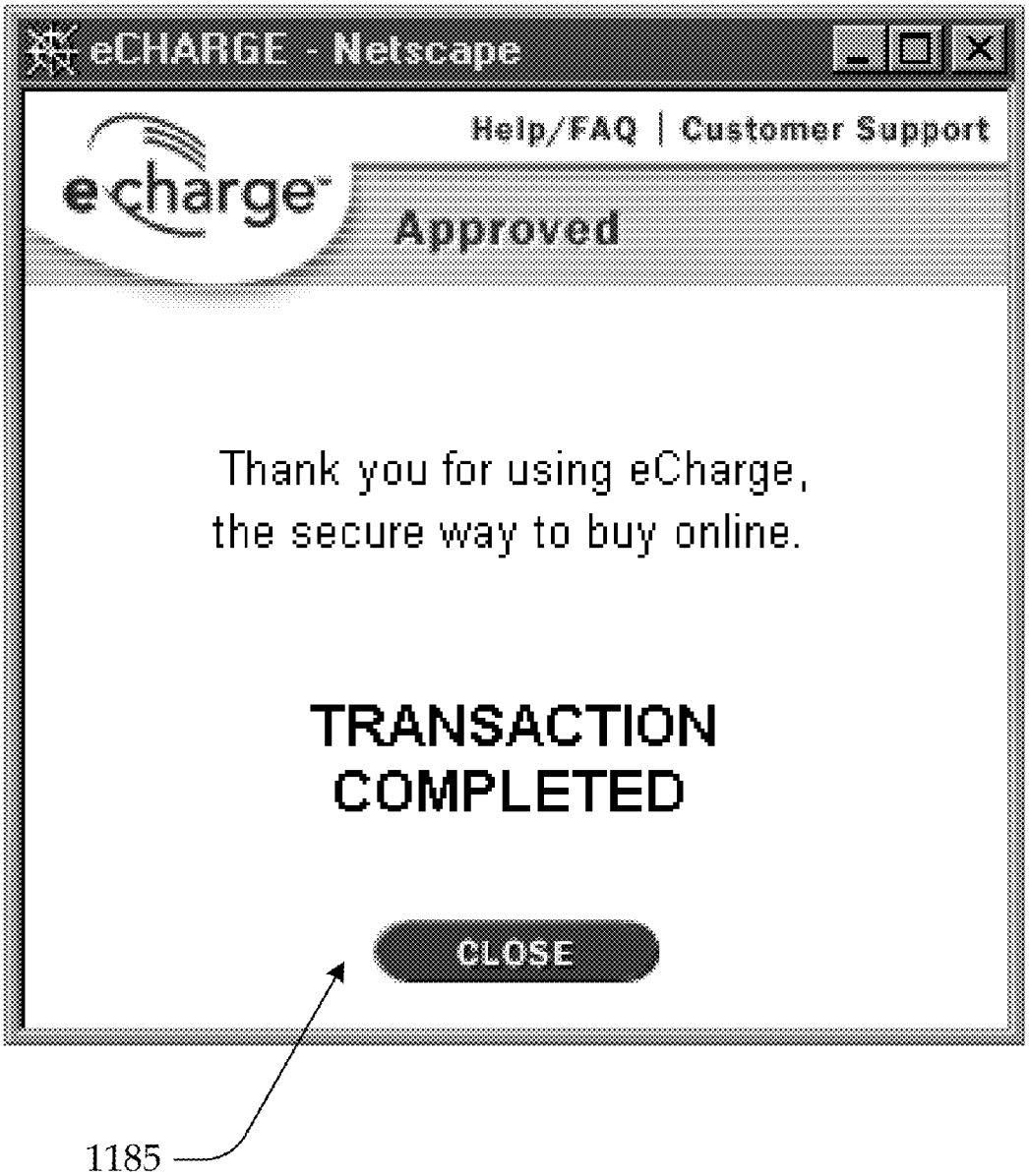
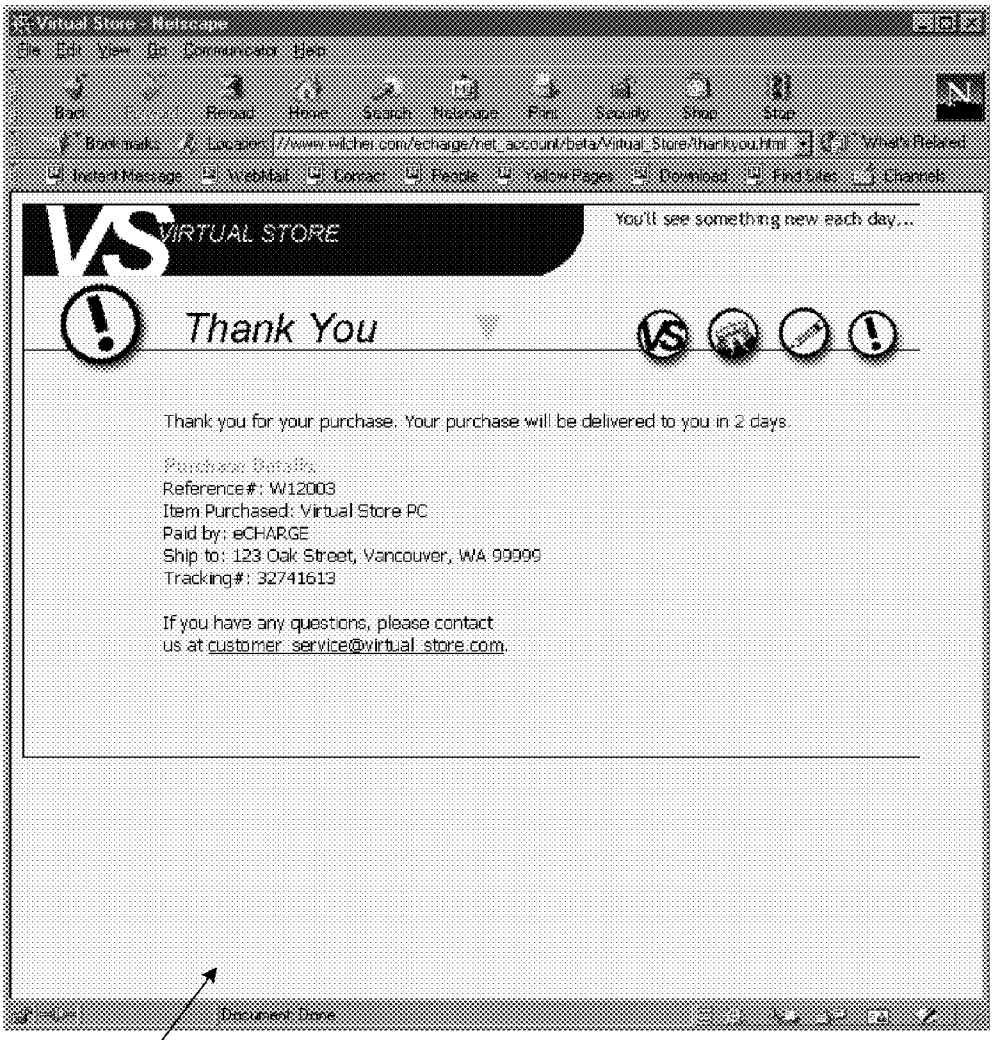

eCHARGE - Netscape
Help/FAQ | Customer Support
echarge
Approved
Thank you for using eCharge,
the secure way to buy online.
TRANSACTION
COMPLETED
CLOSE
1185

Fig.11D.


VIRTUAL STORE
You'll see something new each day...
Thank You
Thank you for your purchase. Your purchase will be delivered to you in 2 days.
Reference#: W12003
Item Purchased: Virtual Store PC
Paid by: eCHARGE
Ship to: 123 Oak Street, Vancouver, WA 99999
Tracking#: 32741613
If you have any questions, please contact
us at customer_service@virtual_store.com.

1190

Fig.11E.

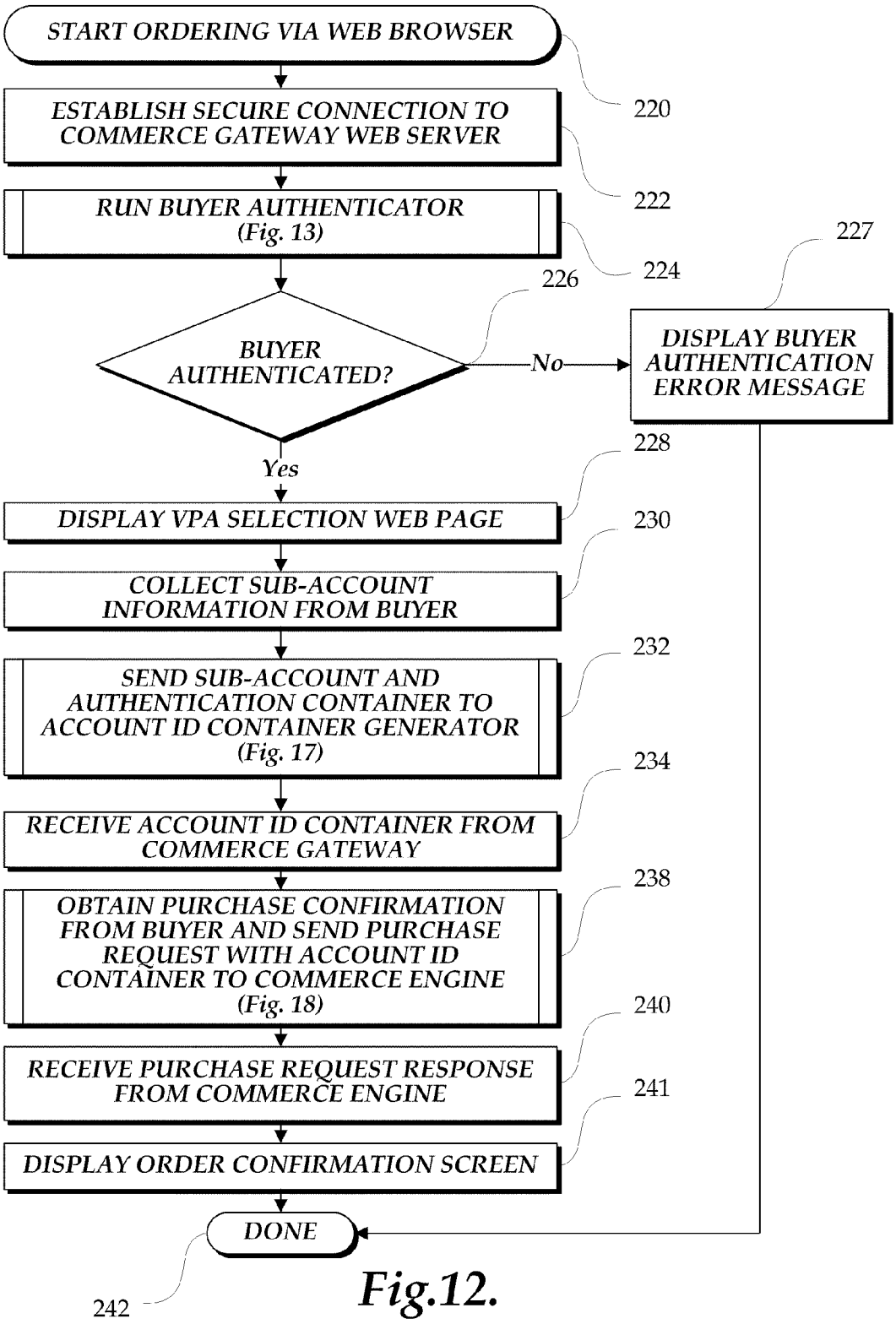

START ORDERING VIA WEB BROWSER
220
ESTABLISH SECURE CONNECTION TO COMMERCE GATEWAY WEB SERVER
222
RUN BUYER AUTHENTICATOR (Fig. 13)
224
226
BUYER AUTHENTICATED?
No
227
DISPLAY BUYER AUTHENTICATION ERROR MESSAGE
Yes
228
DISPLAY VPA SELECTION WEB PAGE
230
COLLECT SUB-ACCOUNT INFORMATION FROM BUYER
232
SEND SUB-ACCOUNT AND AUTHENTICATION CONTAINER TO ACCOUNT ID CONTAINER GENERATOR (Fig. 17)
234
RECEIVE ACCOUNT ID CONTAINER FROM COMMERCE GATEWAY
238
OBTAIN PURCHASE CONFIRMATION FROM BUYER AND SEND PURCHASE REQUEST WITH ACCOUNT ID CONTAINER TO COMMERCE ENGINE (Fig. 18)
240
RECEIVE PURCHASE REQUEST RESPONSE FROM COMMERCE ENGINE
241
DISPLAY ORDER CONFIRMATION SCREEN
DONE
242

Fig.12.

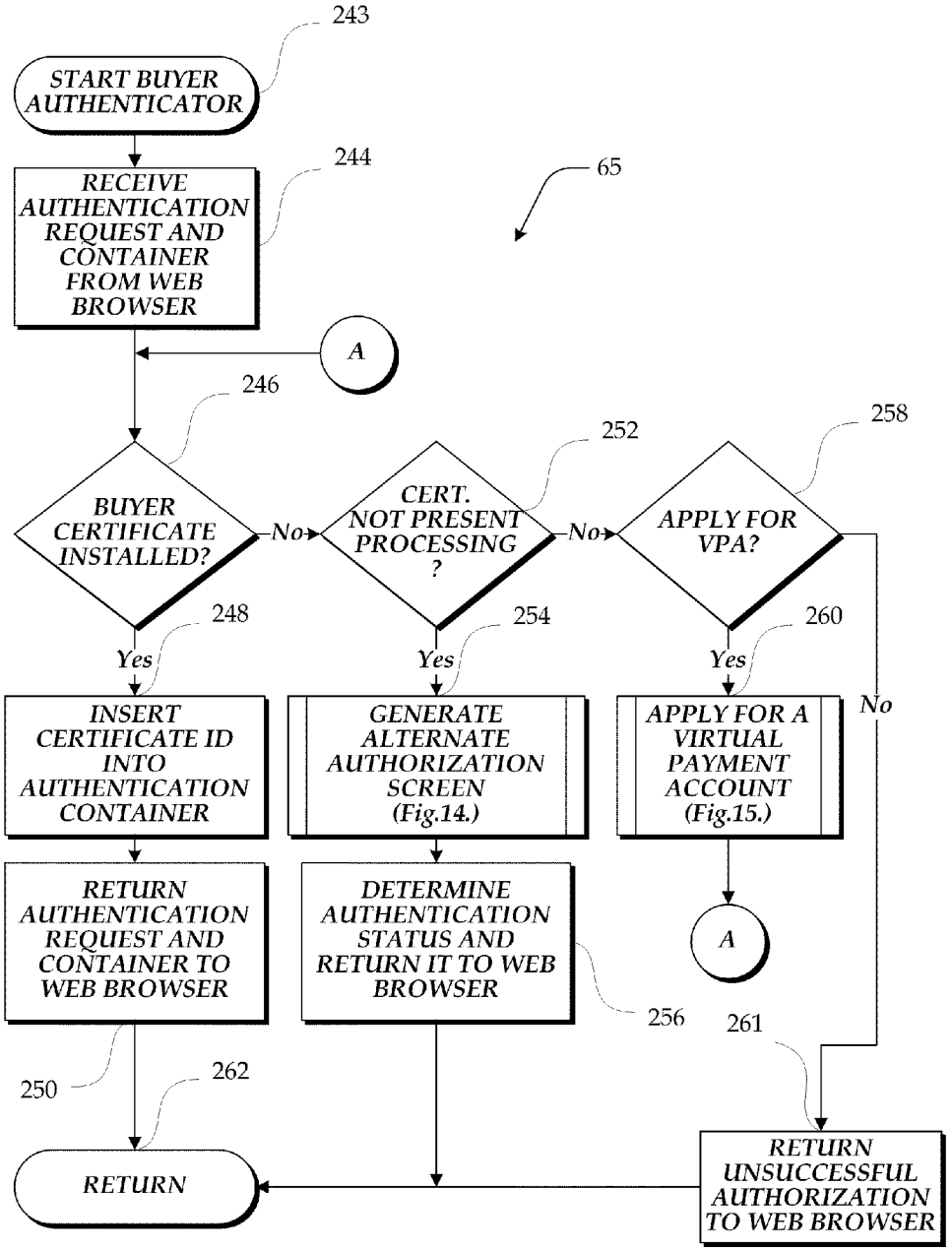

243
START BUYER AUTHENTICATOR
244
RECEIVE AUTHENTICATION REQUEST AND CONTAINER FROM WEB BROWSER
65
A
246
BUYER CERTIFICATE INSTALLED?
No
252
CERT. NOT PRESENT PROCESSING ?
No
258
APPLY FOR VPA?
248
Yes
254
Yes
260
Yes
No
INSERT CERTIFICATE ID INTO AUTHENTICATION CONTAINER
GENERATE ALTERNATE AUTHORIZATION SCREEN (Fig.14.)
APPLY FOR A VIRTUAL PAYMENT ACCOUNT (Fig.15.)
RETURN AUTHENTICATION REQUEST AND CONTAINER TO WEB BROWSER
DETERMINE AUTHENTICATION STATUS AND RETURN IT TO WEB BROWSER
A
256
261
250
262
RETURN
RETURN UNSUCCESSFUL AUTHORIZATION TO WEB BROWSER

Fig.13.

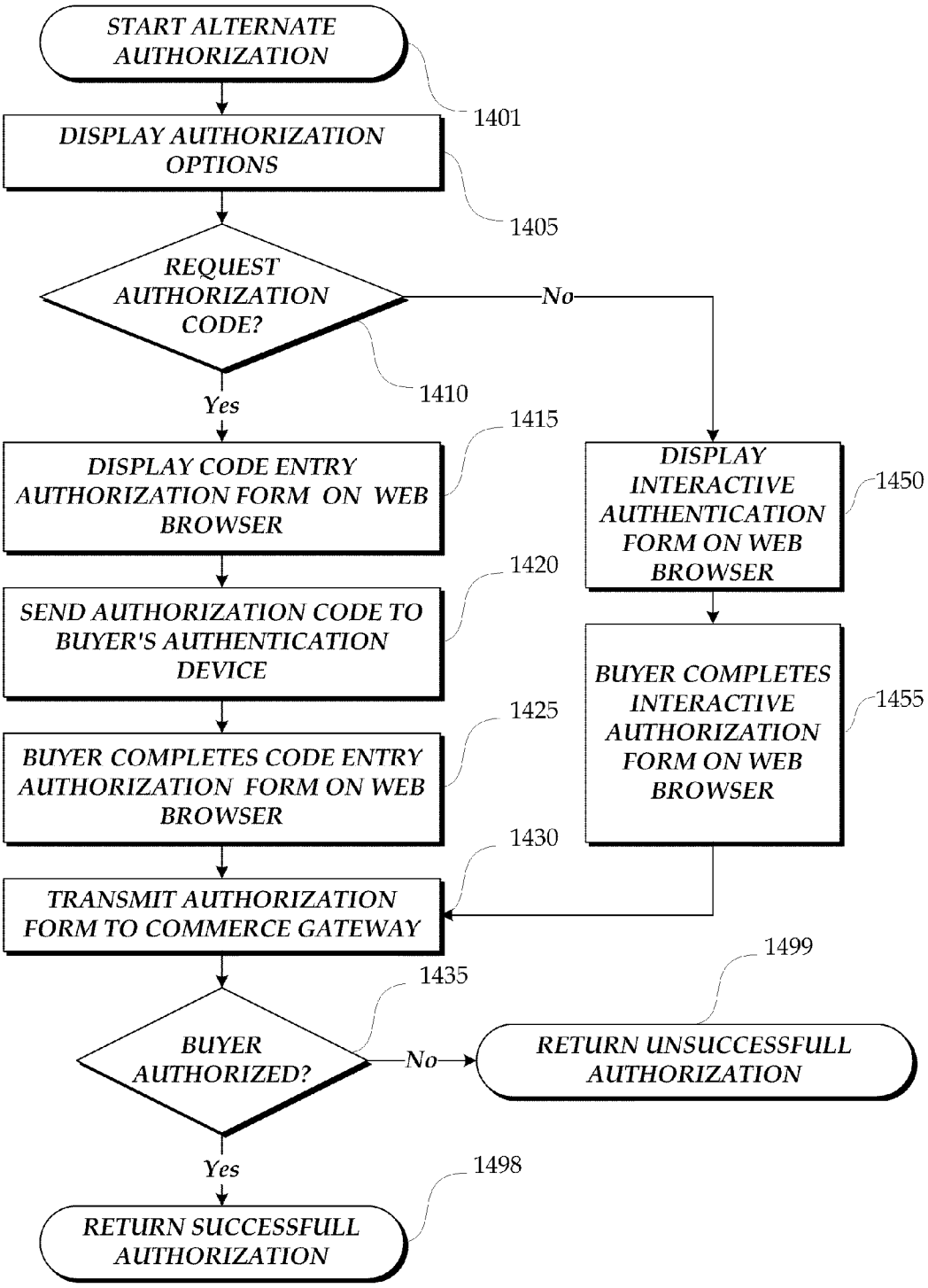

START ALTERNATE AUTHORIZATION
1401
DISPLAY AUTHORIZATION OPTIONS
1405
REQUEST AUTHORIZATION CODE?
1410
No
Yes
1415
DISPLAY CODE ENTRY AUTHORIZATION FORM ON WEB BROWSER
1420
SEND AUTHORIZATION CODE TO BUYER'S AUTHENTICATION DEVICE
1425
BUYER COMPLETES CODE ENTRY AUTHORIZATION FORM ON WEB BROWSER
1450
DISPLAY INTERACTIVE AUTHENTICATION FORM ON WEB BROWSER
1455
BUYER COMPLETES INTERACTIVE AUTHORIZATION FORM ON WEB BROWSER
1430
TRANSMIT AUTHORIZATION FORM TO COMMERCE GATEWAY
1435
BUYER AUTHORIZED?
No
1499
RETURN UNSUCCESSFULL AUTHORIZATION
Yes
1498
RETURN SUCCESSFULL AUTHORIZATION

Fig.14.

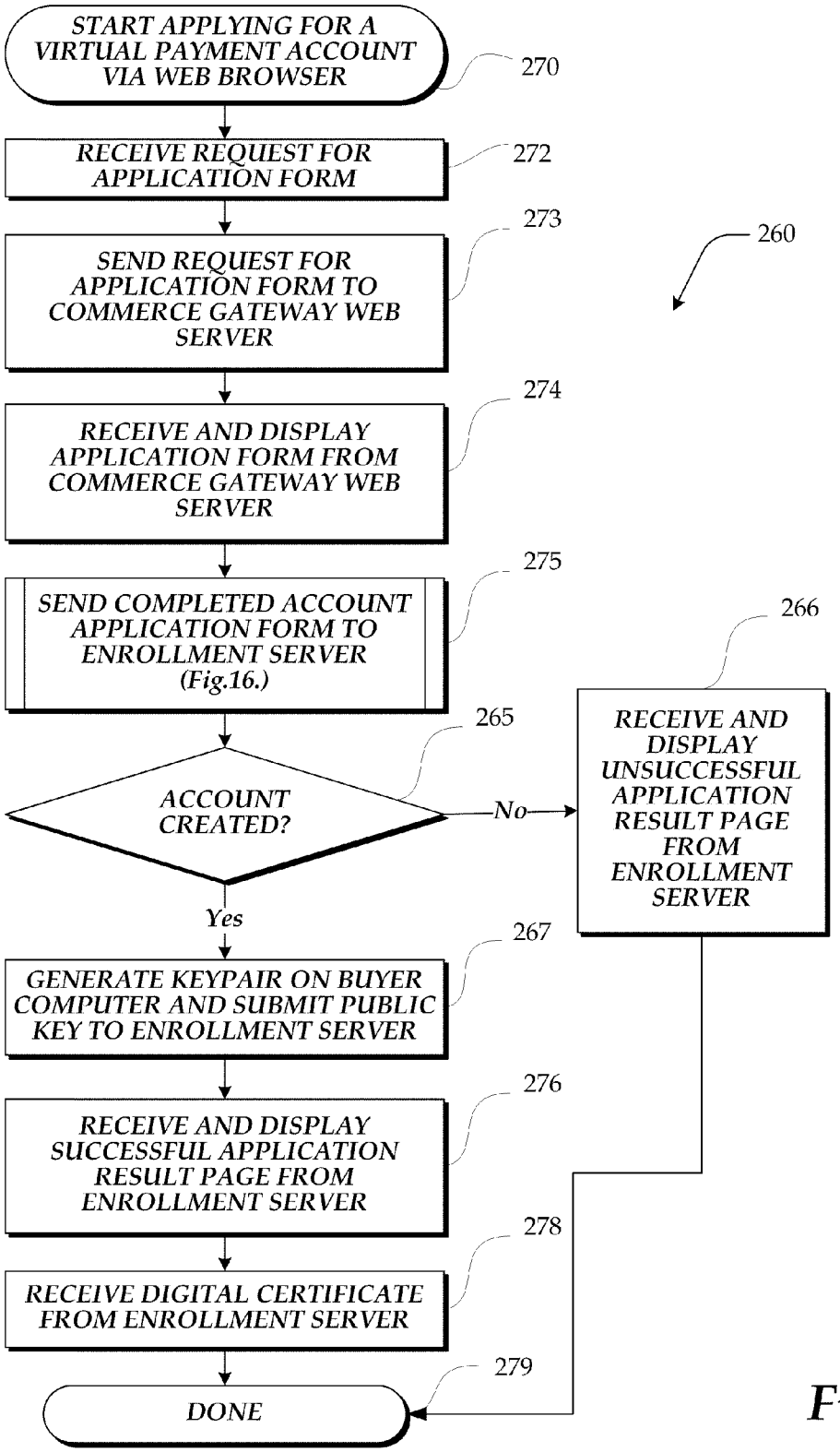

START APPLYING FOR A VIRTUAL PAYMENT ACCOUNT VIA WEB BROWSER
270
RECEIVE REQUEST FOR APPLICATION FORM
272
SEND REQUEST FOR APPLICATION FORM TO COMMERCE GATEWAY WEB SERVER
273
260
RECEIVE AND DISPLAY APPLICATION FORM FROM COMMERCE GATEWAY WEB SERVER
274
SEND COMPLETED ACCOUNT APPLICATION FORM TO ENROLLMENT SERVER (Fig.16.)
275
266
RECEIVE AND DISPLAY UNSUCCESSFUL APPLICATION RESULT PAGE FROM ENROLLMENT SERVER
265
ACCOUNT CREATED?
No
Yes
267
GENERATE KEYPAIR ON BUYER COMPUTER AND SUBMIT PUBLIC KEY TO ENROLLMENT SERVER
276
RECEIVE AND DISPLAY SUCCESSFUL APPLICATION RESULT PAGE FROM ENROLLMENT SERVER
278
RECEIVE DIGITAL CERTIFICATE FROM ENROLLMENT SERVER
279
DONE

Fig.15.

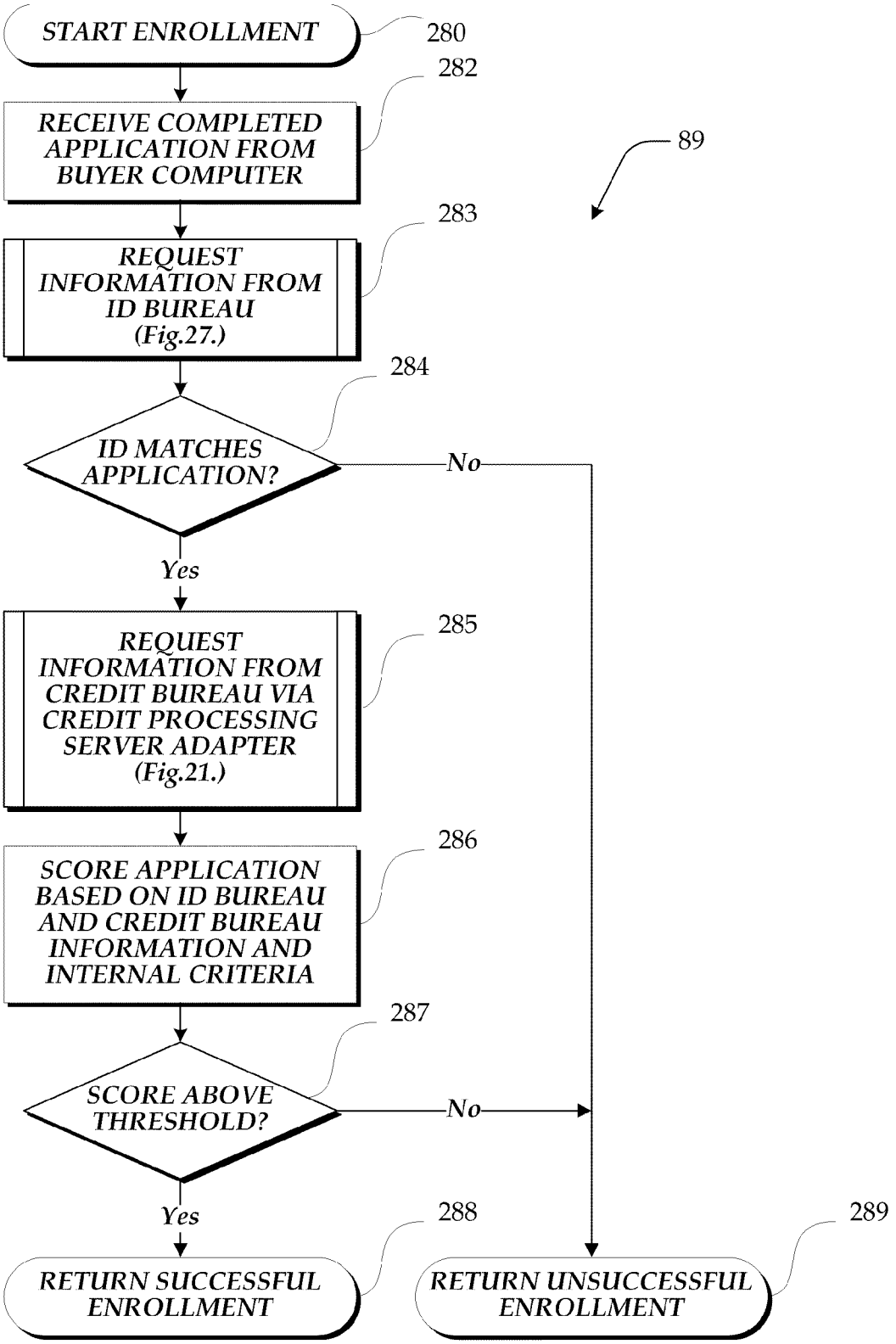

START ENROLLMENT
280
282
RECEIVE COMPLETED APPLICATION FROM BUYER COMPUTER
89
283
REQUEST INFORMATION FROM ID BUREAU (Fig.27.)
284
ID MATCHES APPLICATION?
No
Yes
285
REQUEST INFORMATION FROM CREDIT BUREAU VIA CREDIT PROCESSING SERVER ADAPTER (Fig.21.)
286
SCORE APPLICATION BASED ON ID BUREAU AND CREDIT BUREAU INFORMATION AND INTERNAL CRITERIA
287
SCORE ABOVE THRESHOLD?
No
Yes
288
289
RETURN SUCCESSFUL ENROLLMENT
RETURN UNSUCCESSFUL ENROLLMENT

Fig.16.

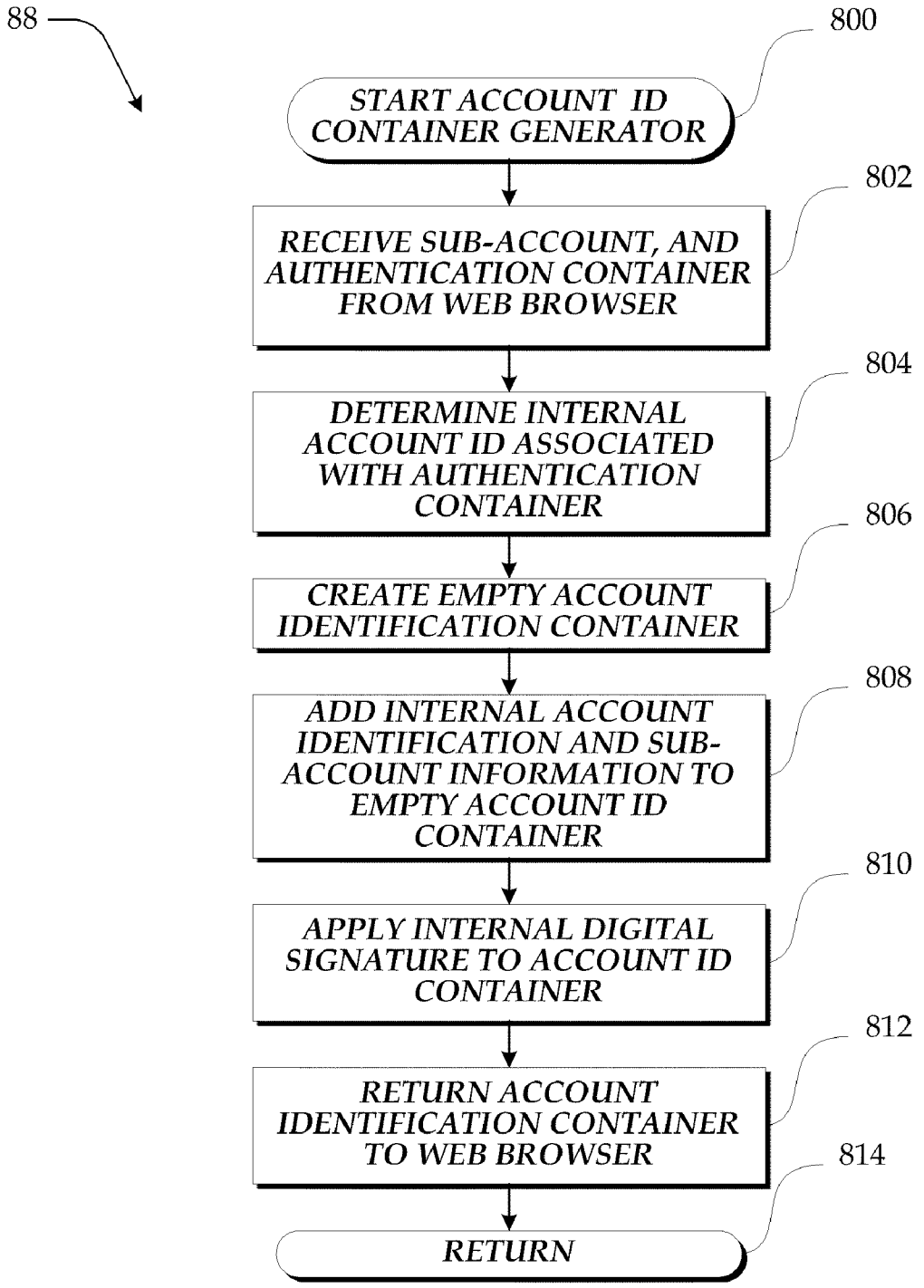

88
800
START ACCOUNT ID CONTAINER GENERATOR
802
RECEIVE SUB-ACCOUNT, AND AUTHENTICATION CONTAINER FROM WEB BROWSER
804
DETERMINE INTERNAL ACCOUNT ID ASSOCIATED WITH AUTHENTICATION CONTAINER
806
CREATE EMPTY ACCOUNT IDENTIFICATION CONTAINER
808
ADD INTERNAL ACCOUNT IDENTIFICATION AND SUB-ACCOUNT INFORMATION TO EMPTY ACCOUNT ID CONTAINER
810
APPLY INTERNAL DIGITAL SIGNATURE TO ACCOUNT ID CONTAINER
812
RETURN ACCOUNT IDENTIFICATION CONTAINER TO WEB BROWSER
814
RETURN

Fig.17.

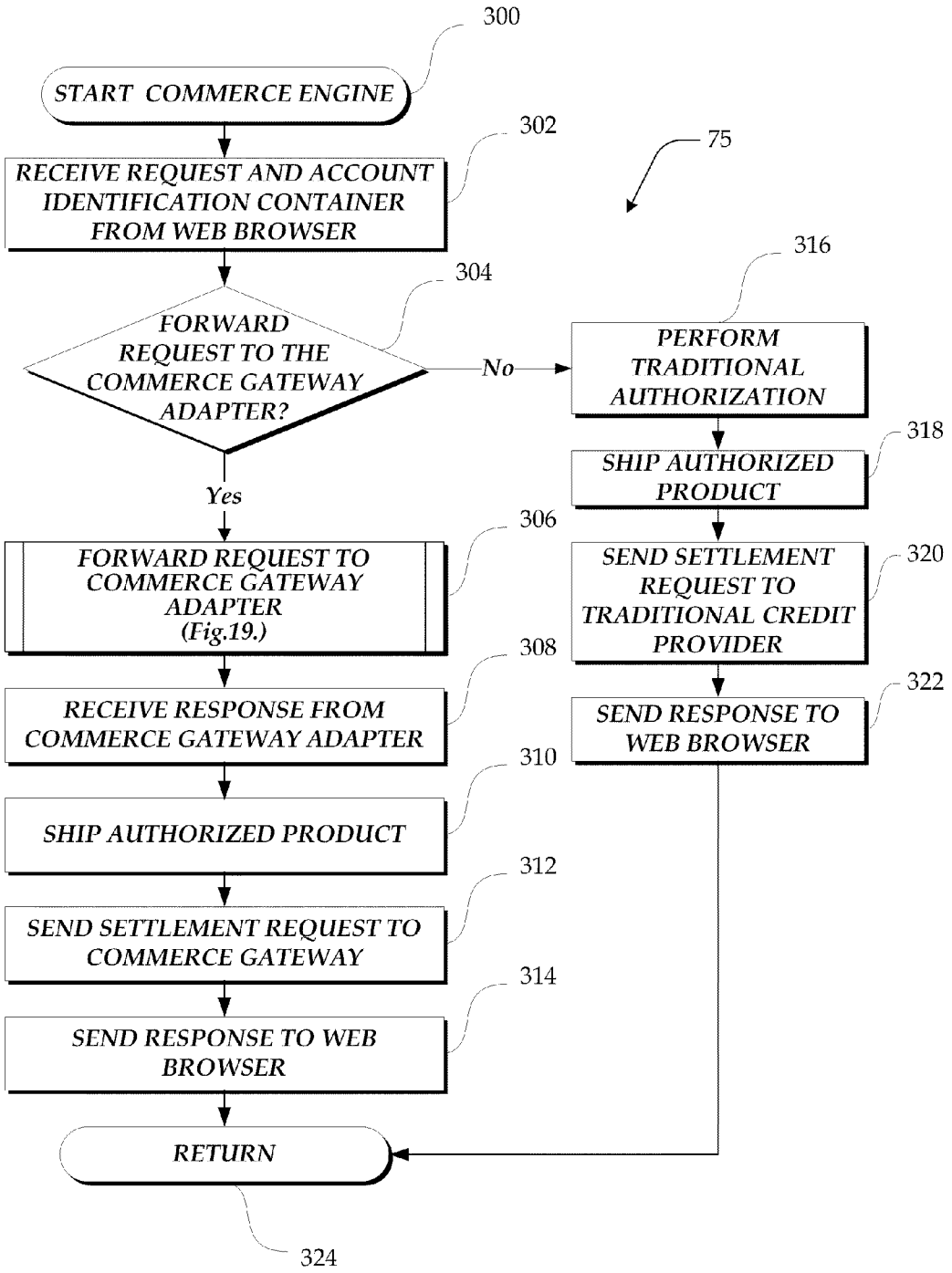

300
START COMMERCE ENGINE
302
RECEIVE REQUEST AND ACCOUNT IDENTIFICATION CONTAINER FROM WEB BROWSER
75
304
FORWARD REQUEST TO THE COMMERCE GATEWAY ADAPTER?
No
316
PERFORM TRADITIONAL AUTHORIZATION
318
SHIP AUTHORIZED PRODUCT
320
SEND SETTLEMENT REQUEST TO TRADITIONAL CREDIT PROVIDER
322
SEND RESPONSE TO WEB BROWSER
Yes
306
FORWARD REQUEST TO COMMERCE GATEWAY ADAPTER (Fig.19.)
308
RECEIVE RESPONSE FROM COMMERCE GATEWAY ADAPTER
310
SHIP AUTHORIZED PRODUCT
312
SEND SETTLEMENT REQUEST TO COMMERCE GATEWAY
314
SEND RESPONSE TO WEB BROWSER
RETURN
324

Fig.18.

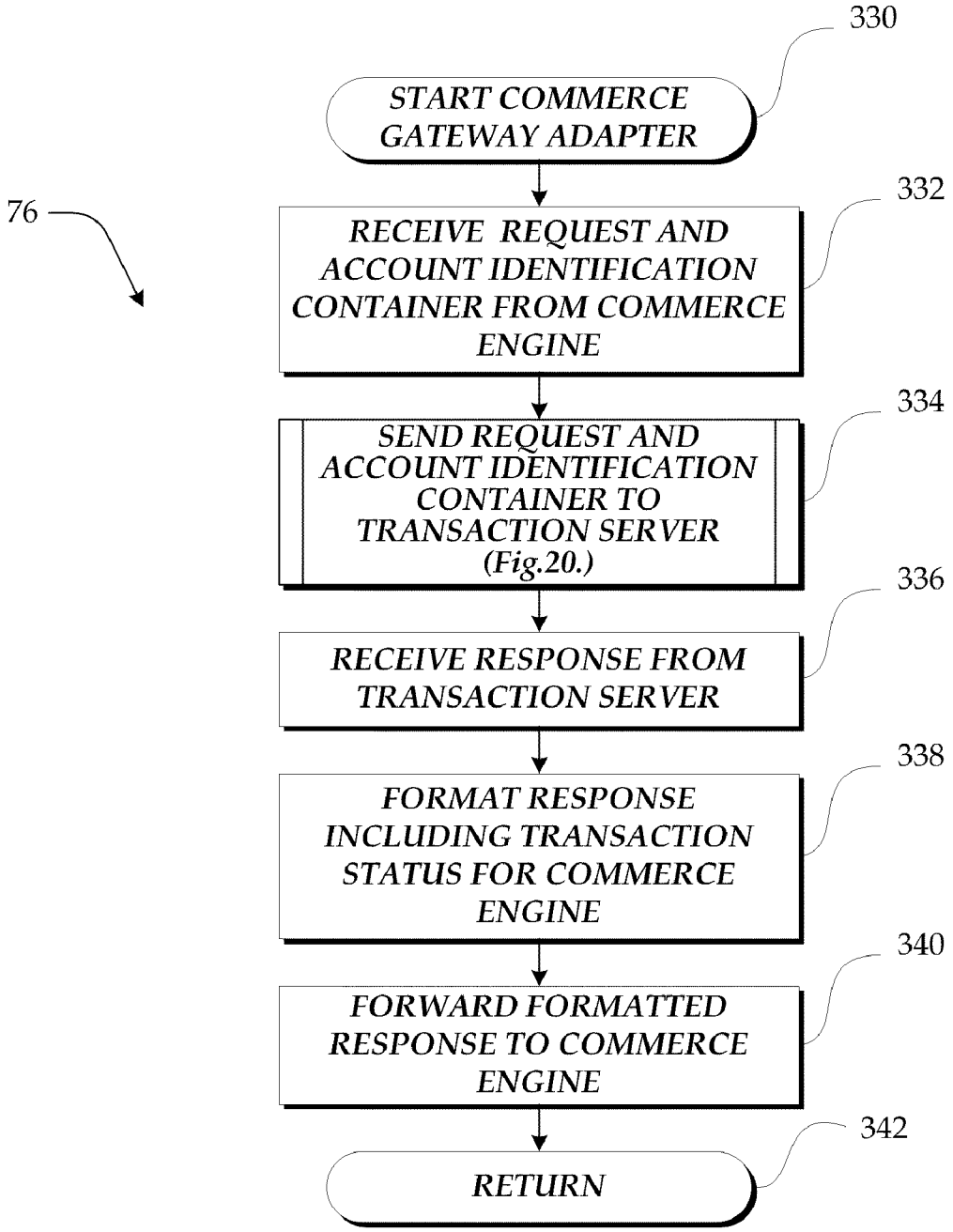

330
START COMMERCE GATEWAY ADAPTER
76
332
RECEIVE REQUEST AND ACCOUNT IDENTIFICATION CONTAINER FROM COMMERCE ENGINE
334
SEND REQUEST AND ACCOUNT IDENTIFICATION CONTAINER TO TRANSACTION SERVER (Fig.20.)
336
RECEIVE RESPONSE FROM TRANSACTION SERVER
338
FORMAT RESPONSE INCLUDING TRANSACTION STATUS FOR COMMERCE ENGINE
340
FORWARD FORMATTED RESPONSE TO COMMERCE ENGINE
342
RETURN

Fig.19.

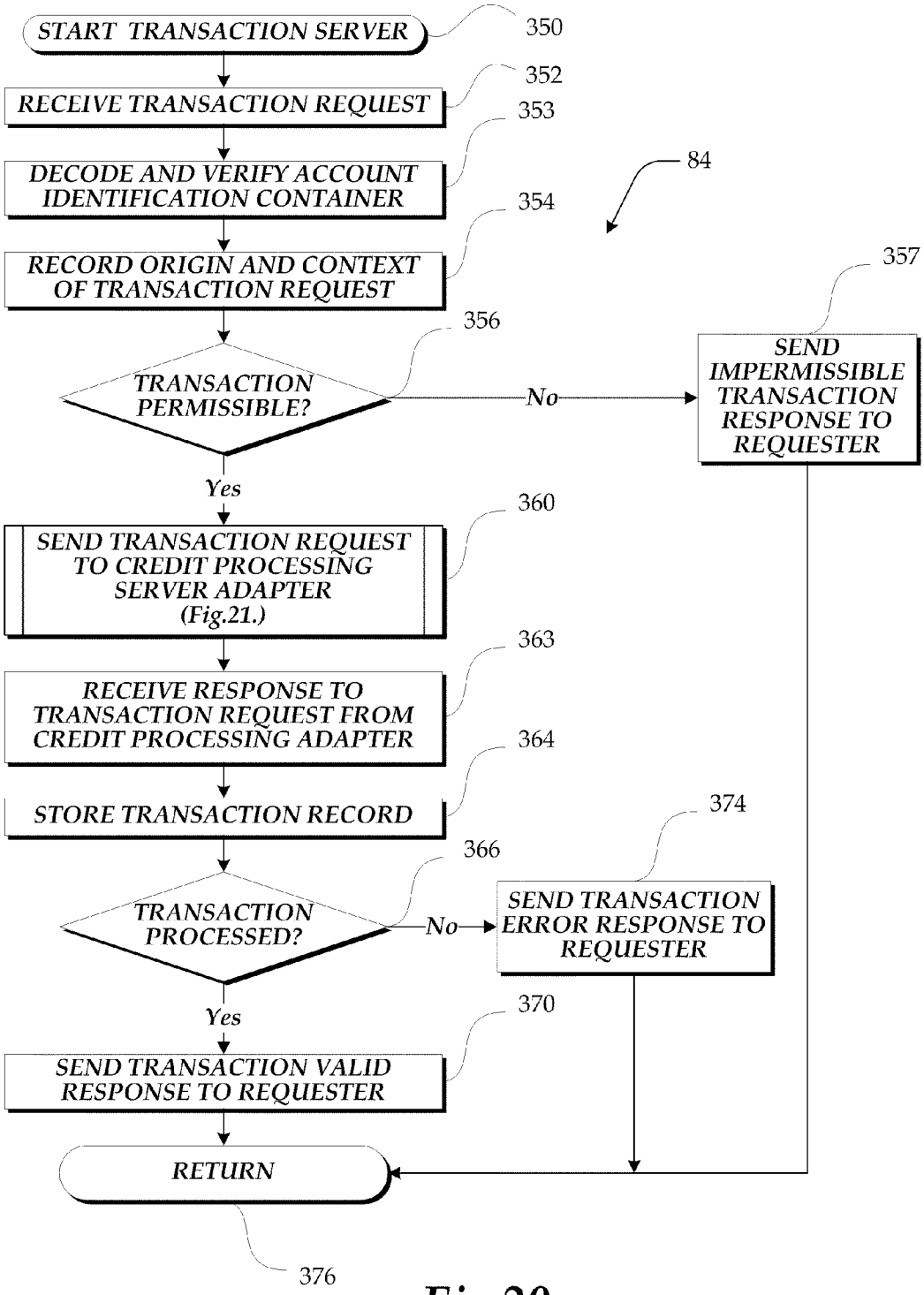

START TRANSACTION SERVER
350
RECEIVE TRANSACTION REQUEST
352
DECODE AND VERIFY ACCOUNT IDENTIFICATION CONTAINER
353
84
RECORD ORIGIN AND CONTEXT OF TRANSACTION REQUEST
354
357
TRANSACTION PERMISSIBLE?
356
No
SEND IMPERMISSIBLE TRANSACTION RESPONSE TO REQUESTER
Yes
SEND TRANSACTION REQUEST TO CREDIT PROCESSING SERVER ADAPTER (Fig.21.)
360
RECEIVE RESPONSE TO TRANSACTION REQUEST FROM CREDIT PROCESSING ADAPTER
363
STORE TRANSACTION RECORD
364
374
TRANSACTION PROCESSED?
366
No
SEND TRANSACTION ERROR RESPONSE TO REQUESTER
Yes
370
SEND TRANSACTION VALID RESPONSE TO REQUESTER
RETURN
376

Fig.20.

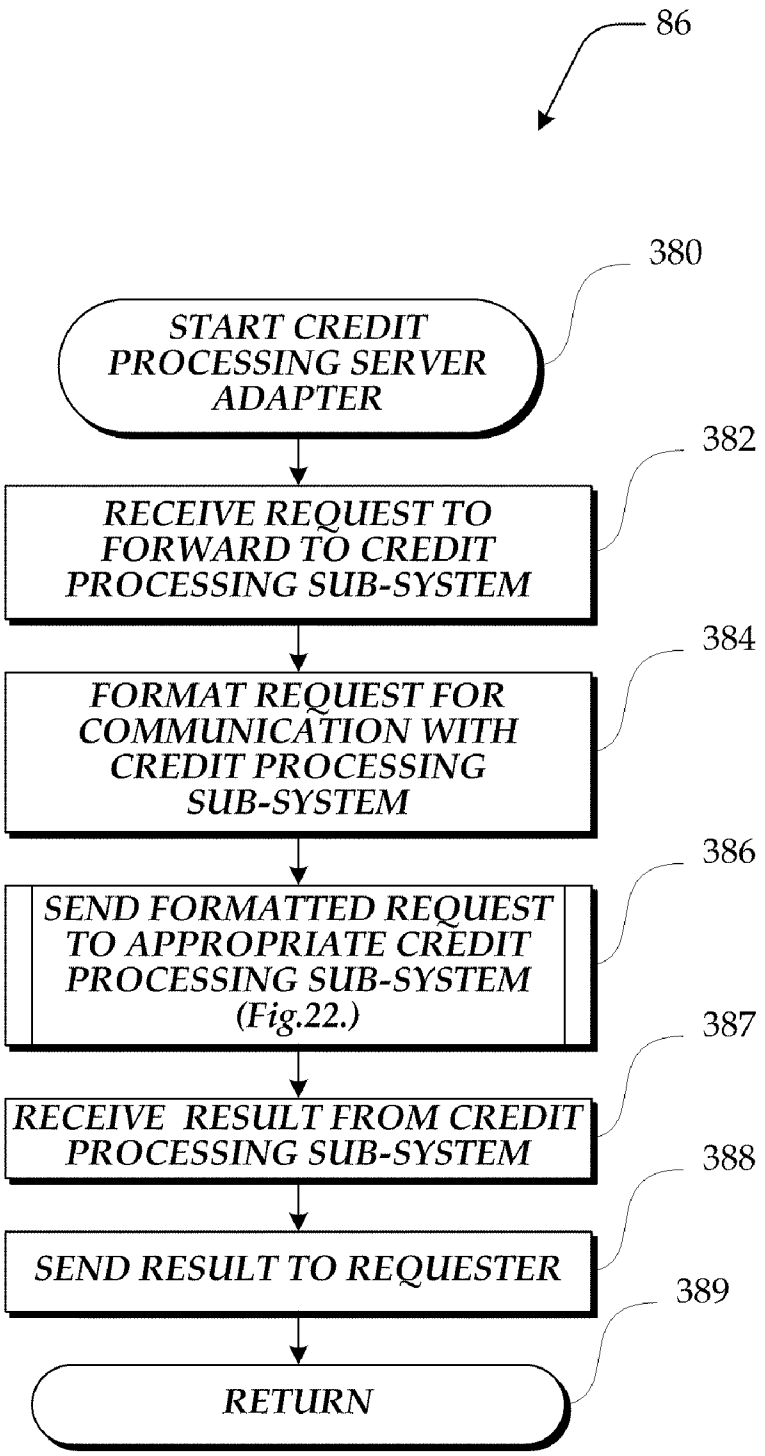

86
380
START CREDIT PROCESSING SERVER ADAPTER
382
RECEIVE REQUEST TO FORWARD TO CREDIT PROCESSING SUB-SYSTEM
384
FORMAT REQUEST FOR COMMUNICATION WITH CREDIT PROCESSING SUB-SYSTEM
386
SEND FORMATTED REQUEST TO APPROPRIATE CREDIT PROCESSING SUB-SYSTEM (Fig.22.)
387
RECEIVE RESULT FROM CREDIT PROCESSING SUB-SYSTEM
388
SEND RESULT TO REQUESTER
389
RETURN

Fig.21.

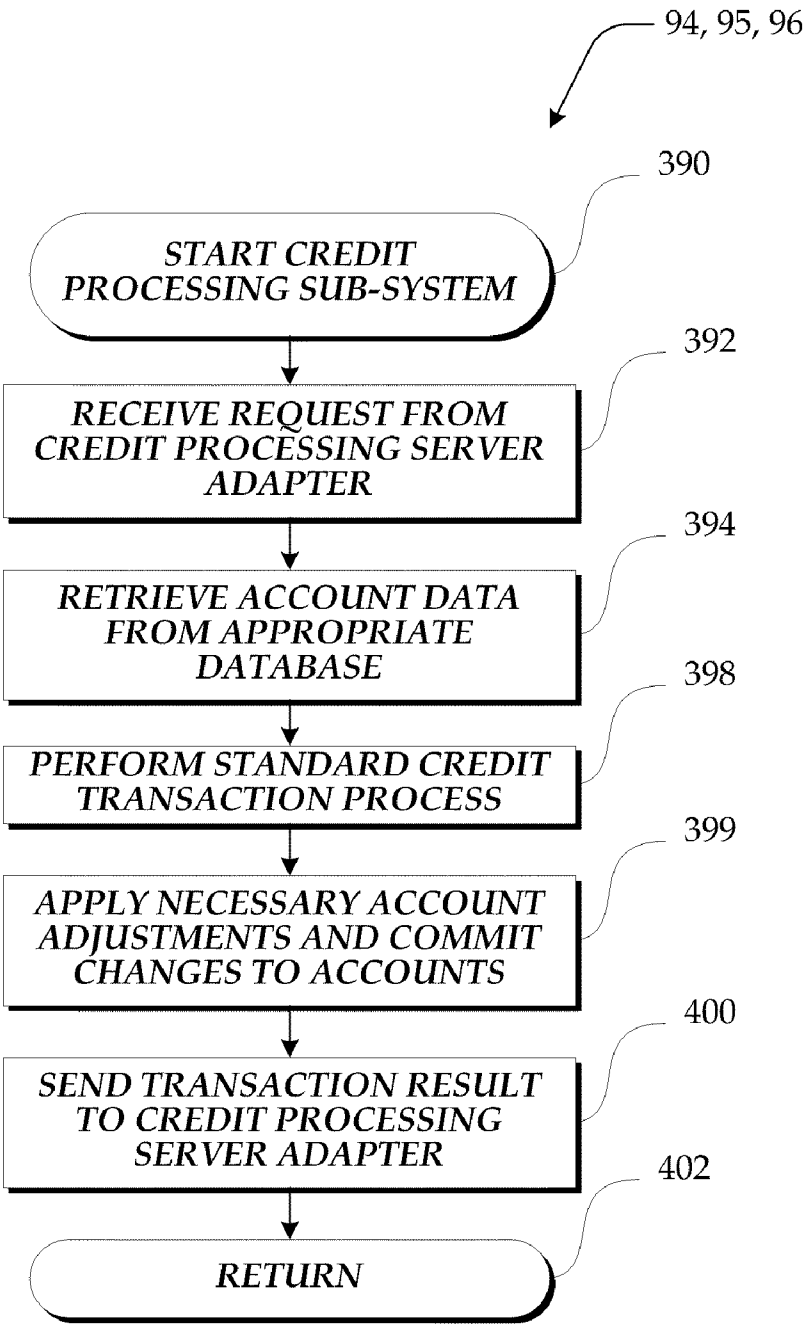

94, 95, 96
390
START CREDIT PROCESSING SUB-SYSTEM
392
RECEIVE REQUEST FROM CREDIT PROCESSING SERVER ADAPTER
394
RETRIEVE ACCOUNT DATA FROM APPROPRIATE DATABASE
398
PERFORM STANDARD CREDIT TRANSACTION PROCESS
399
APPLY NECESSARY ACCOUNT ADJUSTMENTS AND COMMIT CHANGES TO ACCOUNTS
400
SEND TRANSACTION RESULT TO CREDIT PROCESSING SERVER ADAPTER
402
RETURN

Fig.22.

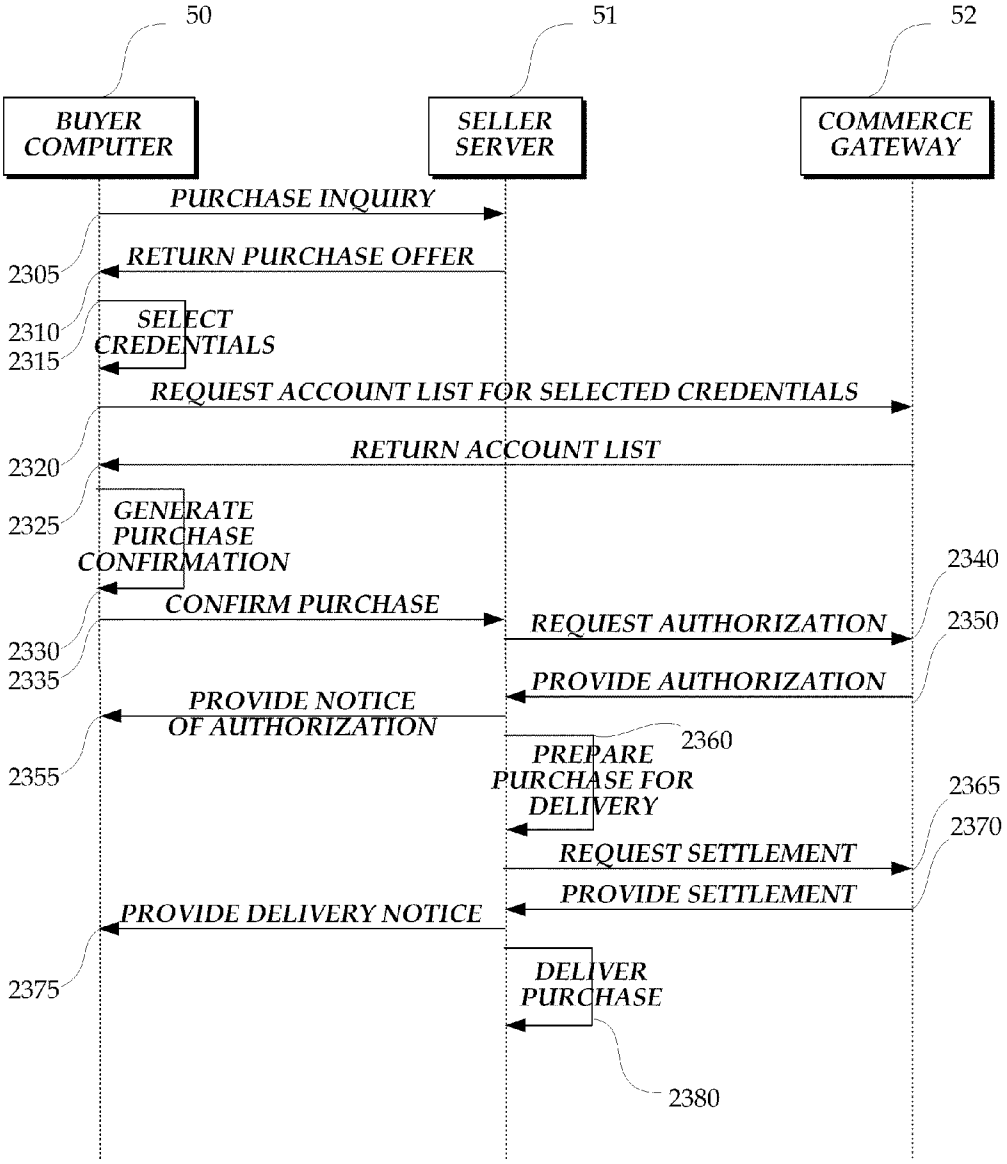

50
51
52
BUYER COMPUTER
SELLER SERVER
COMMERCE GATEWAY
PURCHASE INQUIRY
2305
RETURN PURCHASE OFFER
2310
SELECT CREDENTIALS
2315
REQUEST ACCOUNT LIST FOR SELECTED CREDENTIALS
2320
RETURN ACCOUNT LIST
2325
GENERATE PURCHASE CONFIRMATION
2340
CONFIRM PURCHASE
REQUEST AUTHORIZATION
2350
2330
2335
PROVIDE AUTHORIZATION
PROVIDE NOTICE OF AUTHORIZATION
2360
2355
PREPARE PURCHASE FOR DELIVERY
2365
2370
REQUEST SETTLEMENT
PROVIDE SETTLEMENT
PROVIDE DELIVERY NOTICE
2375
DELIVER PURCHASE
2380

Fig.23.

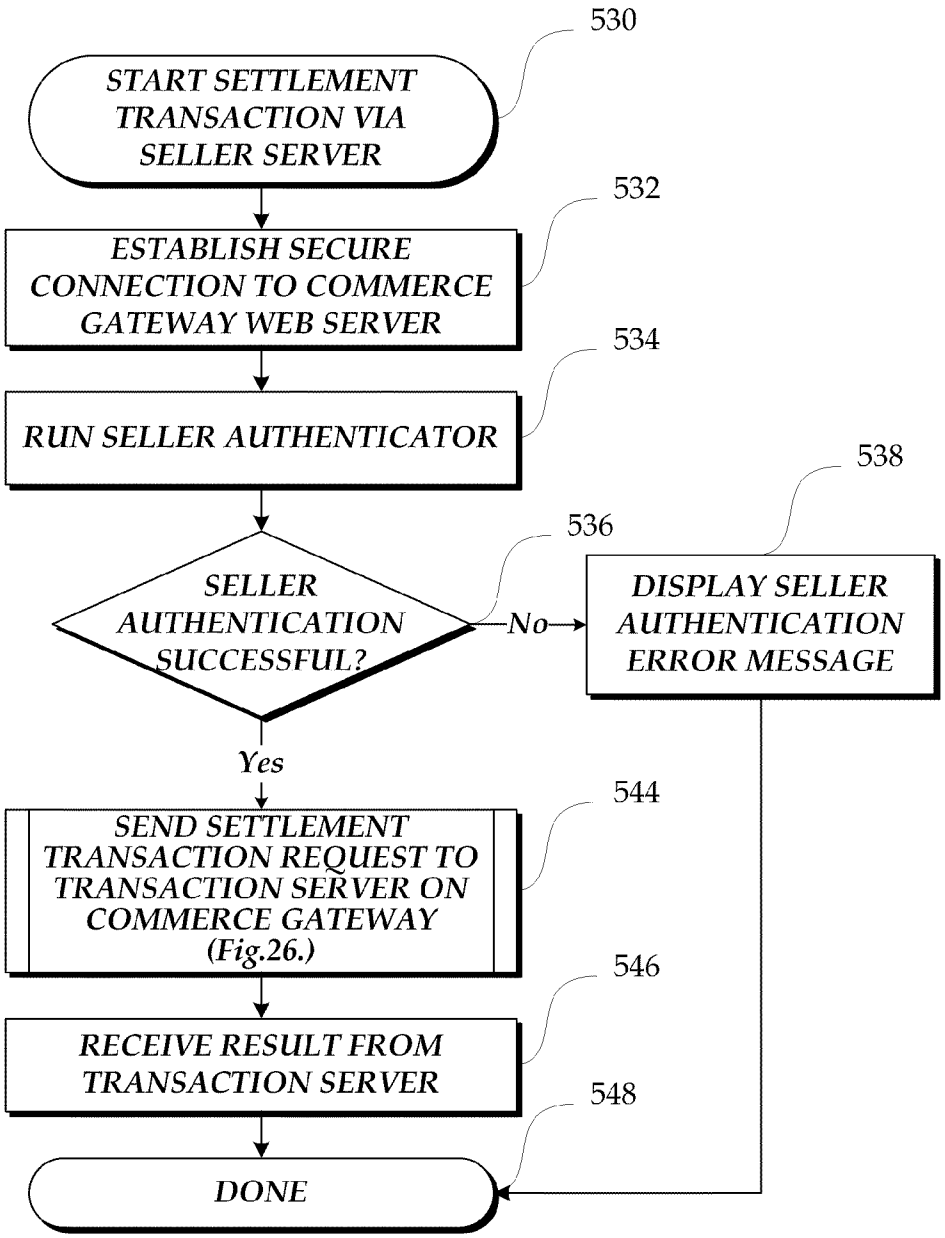

530
START SETTLEMENT TRANSACTION VIA SELLER SERVER
532
ESTABLISH SECURE CONNECTION TO COMMERCE GATEWAY WEB SERVER
534
RUN SELLER AUTHENTICATOR
538
536
SELLER AUTHENTICATION SUCCESSFUL?
No
DISPLAY SELLER AUTHENTICATION ERROR MESSAGE
Yes
544
SEND SETTLEMENT TRANSACTION REQUEST TO TRANSACTION SERVER ON COMMERCE GATEWAY (Fig.26.)
546
RECEIVE RESULT FROM TRANSACTION SERVER
548
DONE

Fig.24.

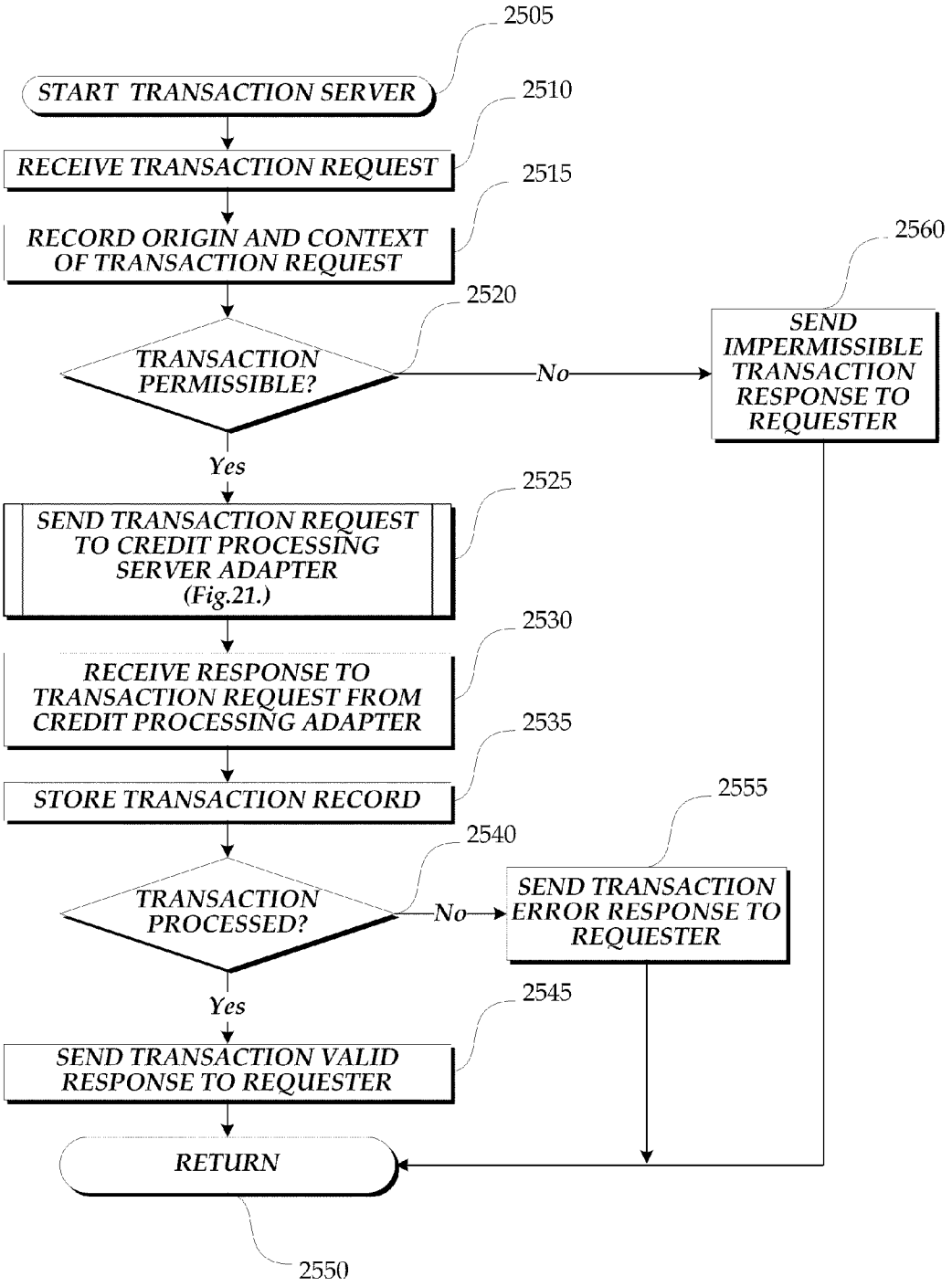

2505
START TRANSACTION SERVER
2510
RECEIVE TRANSACTION REQUEST
2515
RECORD ORIGIN AND CONTEXT OF TRANSACTION REQUEST
2520
TRANSACTION PERMISSIBLE?
No
2560
SEND IMPERMISSIBLE TRANSACTION RESPONSE TO REQUESTER
Yes
2525
SEND TRANSACTION REQUEST TO CREDIT PROCESSING SERVER ADAPTER (Fig.21.)
2530
RECEIVE RESPONSE TO TRANSACTION REQUEST FROM CREDIT PROCESSING ADAPTER
2535
STORE TRANSACTION RECORD
2540
TRANSACTION PROCESSED?
No
2555
SEND TRANSACTION ERROR RESPONSE TO REQUESTER
Yes
2545
SEND TRANSACTION VALID RESPONSE TO REQUESTER
RETURN
2550

Fig.25.

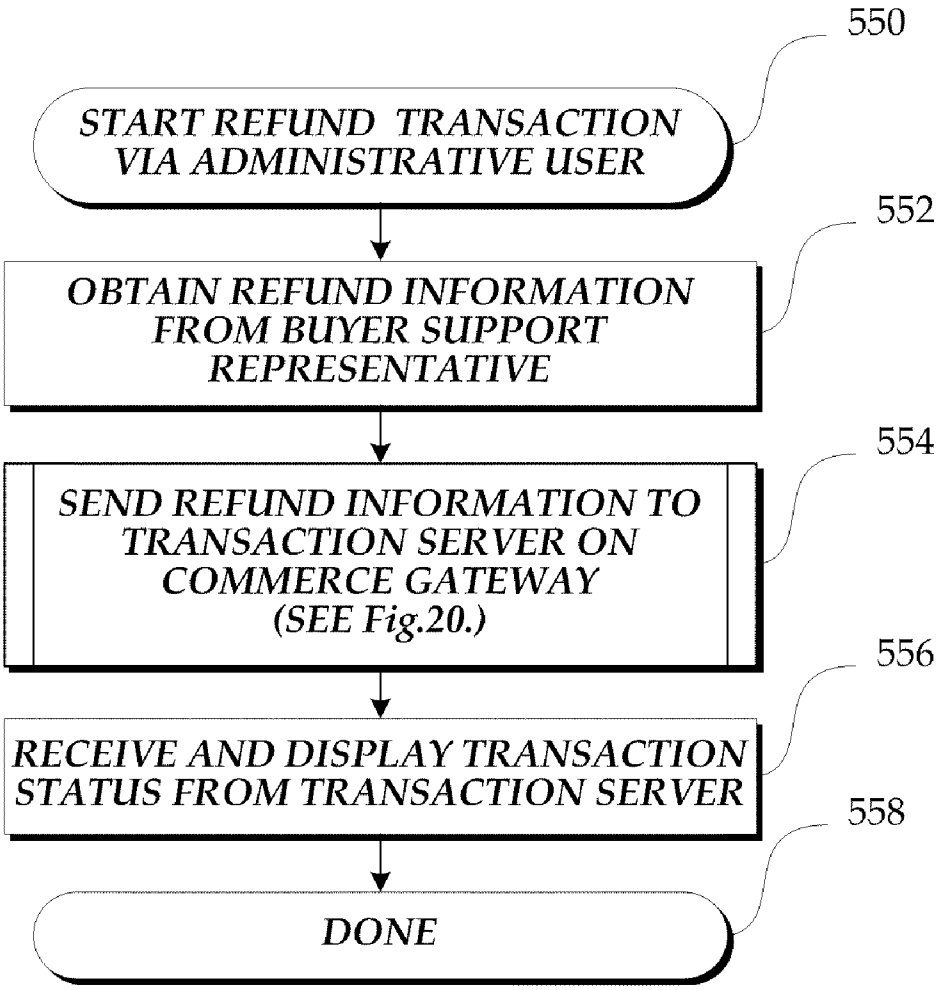

550
START REFUND TRANSACTION VIA ADMINISTRATIVE USER
552
OBTAIN REFUND INFORMATION FROM BUYER SUPPORT REPRESENTATIVE
554
SEND REFUND INFORMATION TO TRANSACTION SERVER ON COMMERCE GATEWAY (SEE Fig.20.)
556
RECEIVE AND DISPLAY TRANSACTION STATUS FROM TRANSACTION SERVER
558
DONE

Fig.26.

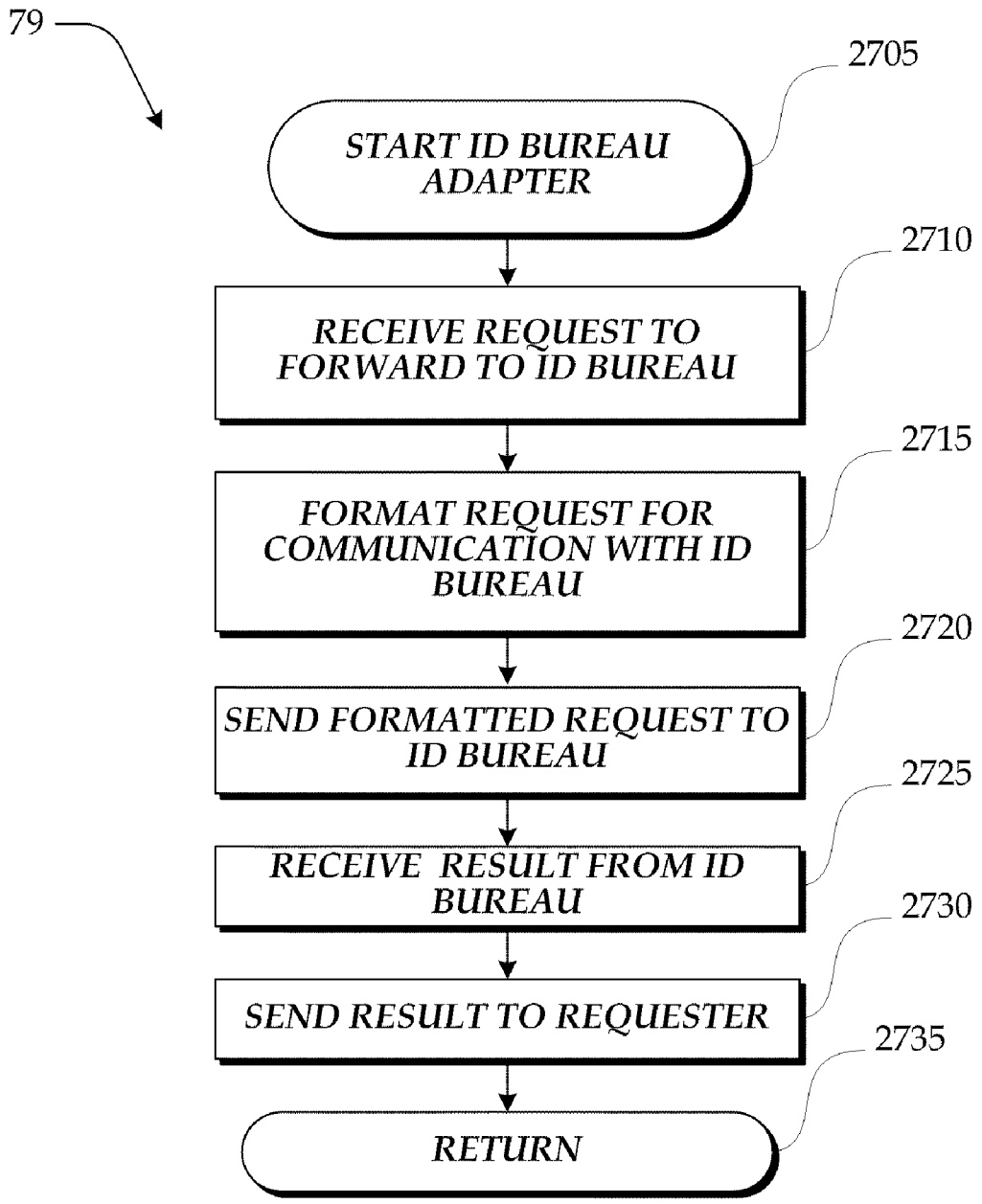
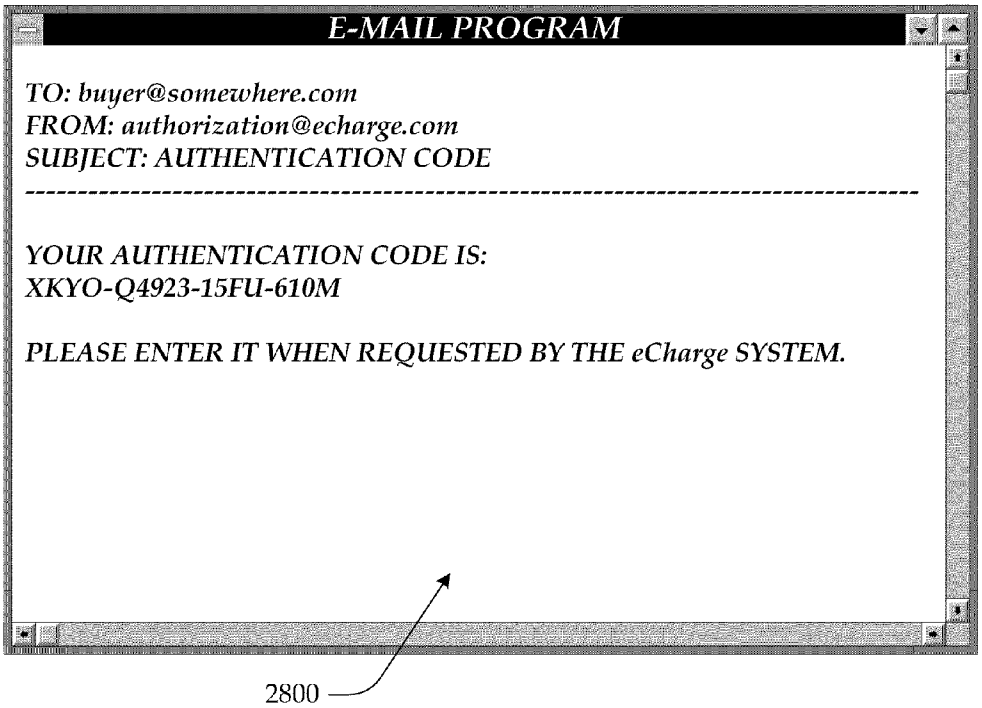

79
2705
START ID BUREAU ADAPTER
2710
RECEIVE REQUEST TO FORWARD TO ID BUREAU
2715
FORMAT REQUEST FOR COMMUNICATION WITH ID BUREAU
2720
SEND FORMATTED REQUEST TO ID BUREAU
2725
RECEIVE RESULT FROM ID BUREAU
2730
SEND RESULT TO REQUESTER
2735
RETURN

Fig.27.


E-MAIL PROGRAM
TO: buyer@somewhere.com
FROM: authorization@echarge.com
SUBJECT: AUTHENTICATION CODE

YOUR AUTHENTICATION CODE IS:
XKYO-Q4923-15FU-610M
PLEASE ENTER IT WHEN REQUESTED BY THE eCharge SYSTEM.
2800

Fig.28.

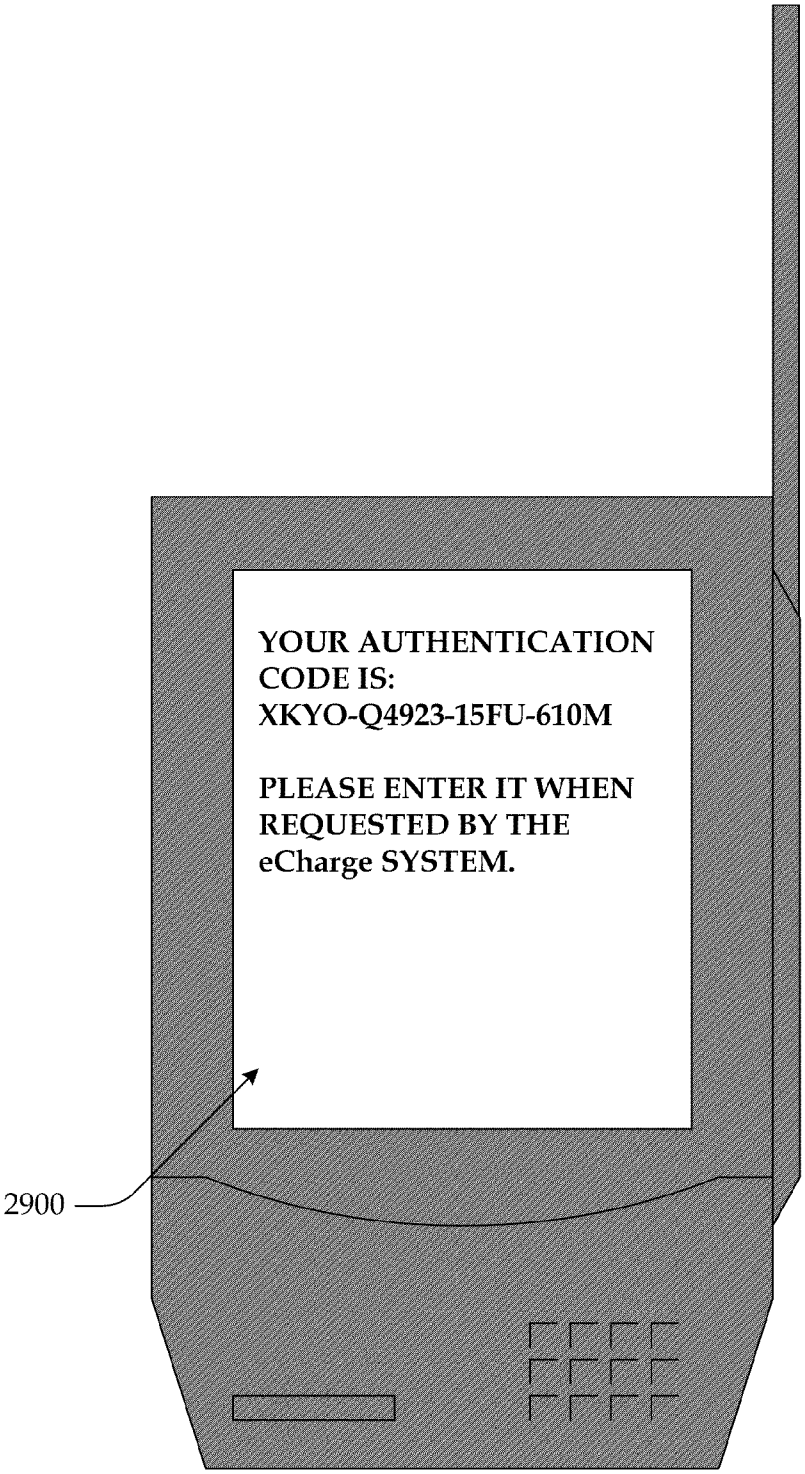

YOUR AUTHENTICATION CODE IS:
XKYO-Q4923-15FU-610M
PLEASE ENTER IT WHEN REQUESTED BY THE eCharge SYSTEM.
2900

Fig.29.

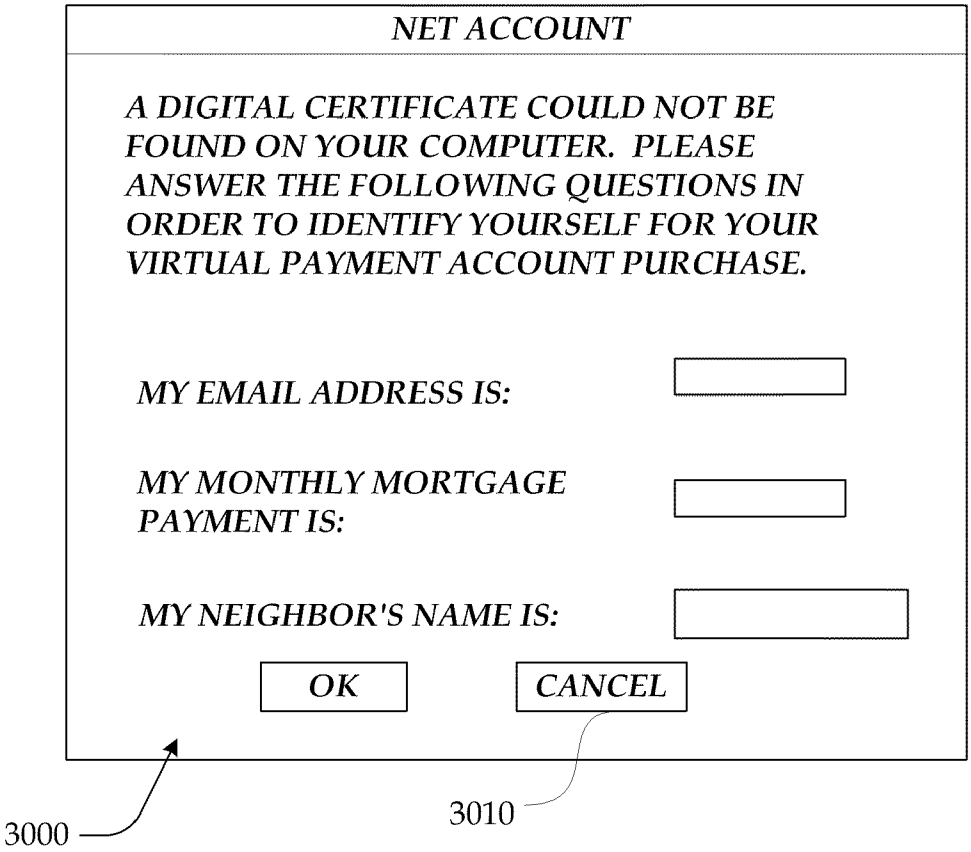
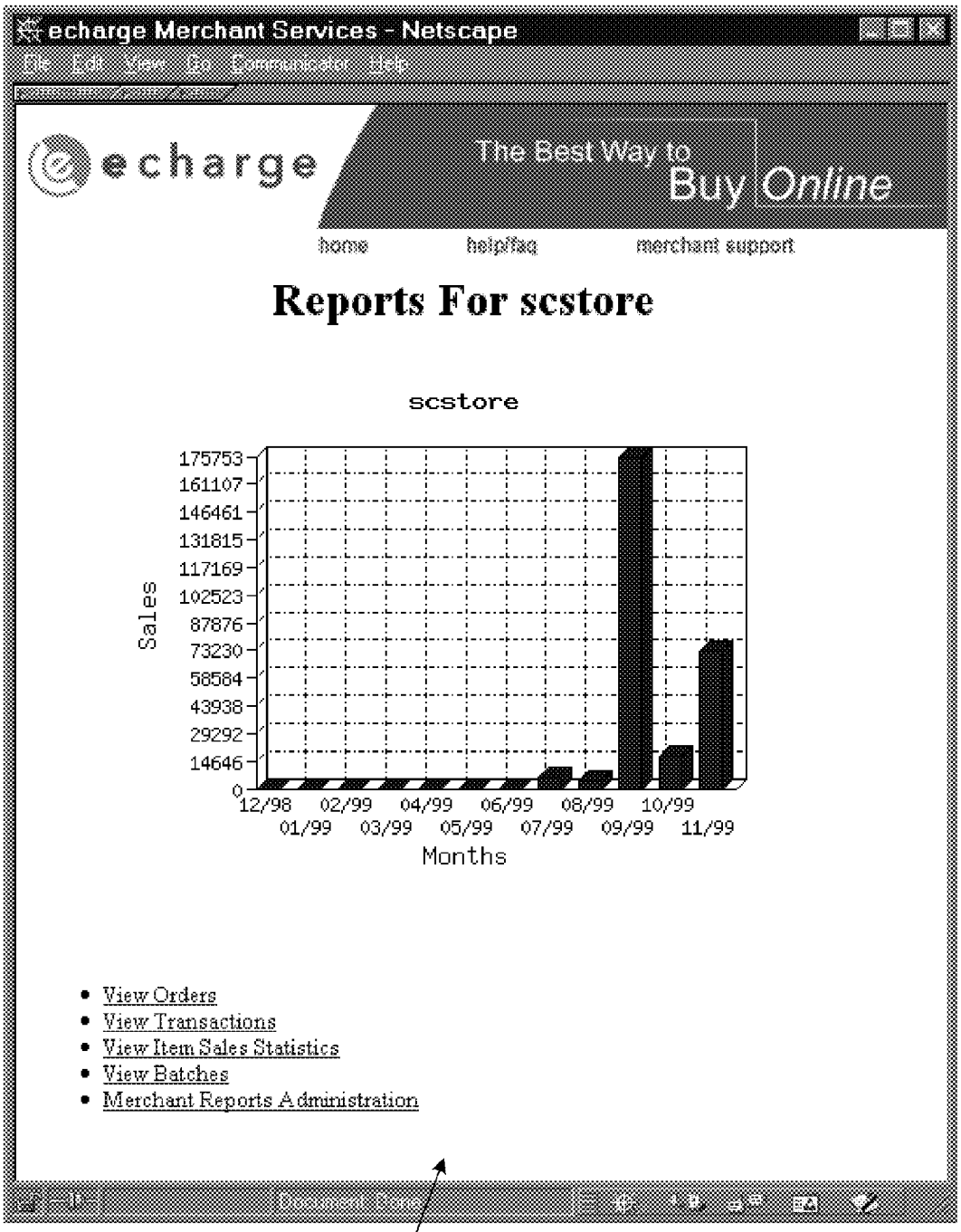

NET ACCOUNT
A DIGITAL CERTIFICATE COULD NOT BE FOUND ON YOUR COMPUTER. PLEASE ANSWER THE FOLLOWING QUESTIONS IN ORDER TO IDENTIFY YOURSELF FOR YOUR VIRTUAL PAYMENT ACCOUNT PURCHASE.
MY EMAIL ADDRESS IS:
MY MONTHLY MORTGAGE PAYMENT IS:
MY NEIGHBOR'S NAME IS:
OK
CANCEL
3000
3010

Fig.30.


echarge Merchant Services - Netscape
File Edit View Go Communicator Help
echarge
The Best Way to Buy Online
home
help/faq
merchant support
Reports For scstore
scstore
Sales
175753
161107
146461
131815
117169
102523
87876
73230
58584
43938
29292
14646
0
12/98 02/99 04/99 06/99 08/99 10/99
01/99 03/99 05/99 07/99 09/99 11/99
Months
View Orders
View Transactions
View Item Sales Statistics
View Batches
Merchant Reports Administration
Document: Done

3100

Fig.31.

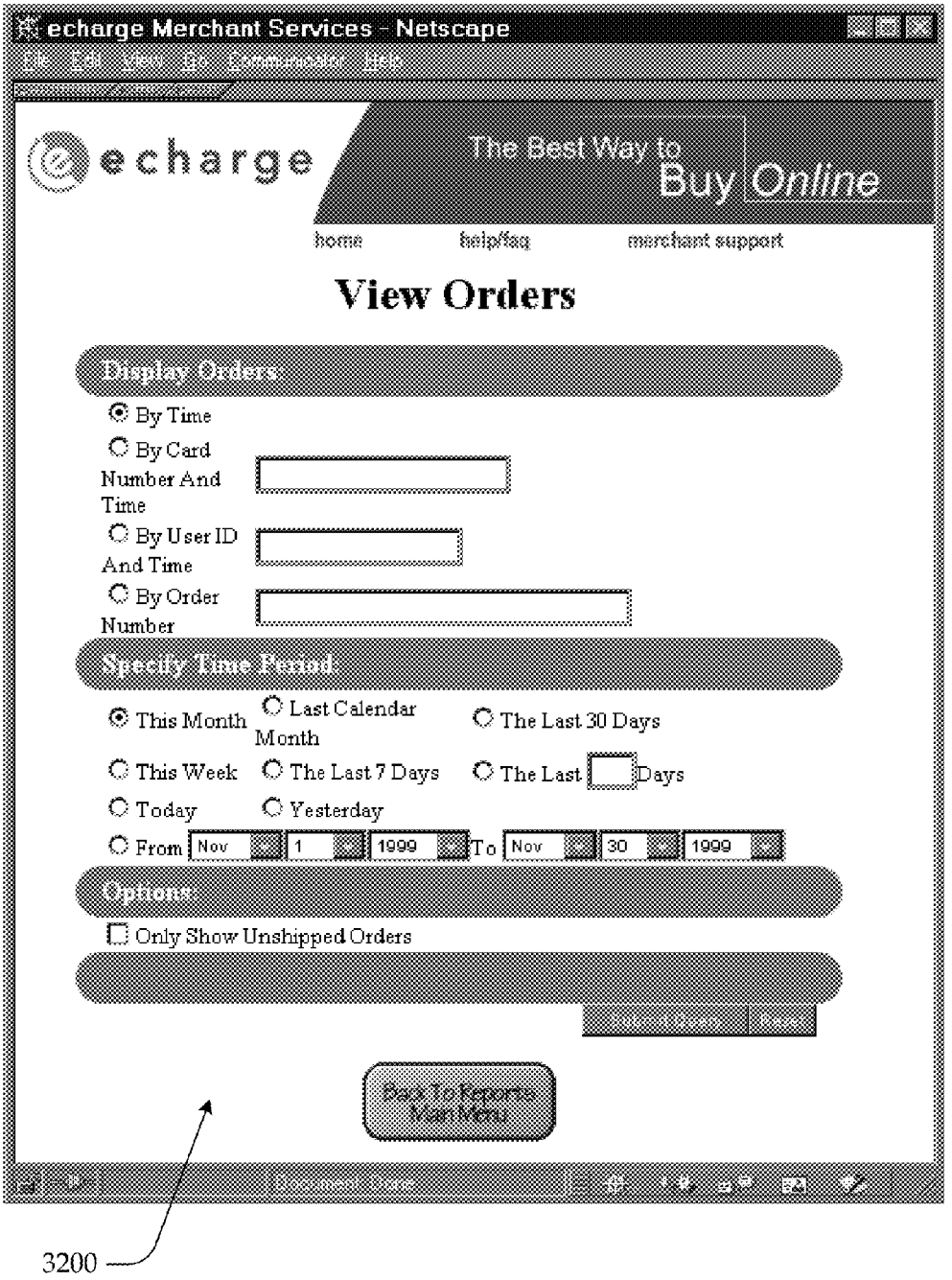

echarge Merchant Services - Netscape
echarge
The Best Way to Buy Online
home
help/faq
merchant support
View Orders
Display Orders:
By Time
By Card Number And Time
By User ID And Time
By Order Number
Specify Time Period:
This Month
Last Calendar Month
The Last 30 Days
This Week
The Last 7 Days
The Last Days
Today
Yesterday
From Nov 1 1999 To Nov 30 1999
Options:
Only Show Unshipped Orders
Back To Reports Main Menu
3200

Fig.32.

echarge Merchant Services - Netscape

echarge

The Best Way to Buy Online

home help/faq merchant support

Orders Received

11/01/1999 - 11/30/1999

Select	Shipped	Order #	User ID	Date	Name	Amount
☐	Y	63.17.30.226-942207186-5906-2685-7	Steve Atherton	11/09/99 22:13	Steve Atherton	0.00
☐	Y	127.0.0.1-942207097-3581-2685-6	nobody	11/09/99 22:11	John O. Public	35.74
☐	Y	63.17.30.226-942206630-776811-2685-8	Steve Atherton	11/09/99 22:03	Steve Atherton	0.00
☐	N	63.17.30.226-942206586-522348-2685-3	Steve Atherton	11/09/99 22:03	Steve Atherton	25.60
☐	Y	63.17.30.226-942206317-108643-2685-6	Steve Atherton	11/09/99 21:58	Steve Atherton	0.00
☐	Y	127.0.0.1-942206199-23603-2685-4	nobody	11/09/99 21:56	John O. Public	35.74
☐	Y	63.17.30.226-942206028-628577-2685-8	Steve Atherton	11/09/99 21:53	Steve Atherton	0.00
☐	N	63.17.30.226-942205792-640233-2685-7	Steve Atherton	11/09/99 21:49	Steve Atherton	28.90
☐	Y	63.17.30.226-942205528-554830-2685-5	Steve Atherton	11/09/99 21:45	Steve Atherton	0.00
☐	Y	127.0.0.1-942205291-403501-2685-7	nobody	11/09/99 21:41	John O. Public	35.74
☐	Y	127.0.0.1-942204377-503866-2685-8	nobody	11/09/99 21:26	John O. Public	35.74
☐	Y	127.0.0.1-942203485-563787-2685-8	nobody	11/09/99 21:11	John O. Public	35.74
☐	Y	127.0.0.1-942202556-613326-2685-5	nobody	11/09/99 20:55	John O. Public	35.74
☐	N	216.35.6.208-942201709-186714-2685-5		11/09/99 20:41	Eric M Link	55.91
☐	Y	127.0.0.1-942201636-945709-2685-8	nobody	11/09/99 20:40	John O. Public	35.74
☐	Y	127.0.0.1-942200756-873895-2685-8	nobody	11/09/99 20:25	John O. Public	35.74
☐	Y	127.0.0.1-942199856-523583-2685-6	nobody	11/09/99 20:10	John O. Public	35.74
☐	Y	127.0.0.1-942198956-603539-2685-5	nobody	11/09/99 19:55	John O. Public	35.74
☐	Y	127.0.0.1-942198056-633587-2685-4	nobody	11/09/99 19:40	John O. Public	35.74
☐	Y	127.0.0.1-942197156-523538-2685-5	nobody	11/09/99 19:25	John O. Public	35.74
☐	Y	127.0.0.1-942196256-923570-2685-7	nobody	11/09/99 19:10	John O. Public	35.74
☐	Y	127.0.0.1-942195356-503526-2685-5	nobody	11/09/99 18:55	John O. Public	35.74
☐	Y	127.0.0.1-942194456-522613-2685-5	nobody	11/09/99 18:40	John O. Public	35.74
☐	Y	127.0.0.1-942193557-854163-2685-5	nobody	11/09/99 18:25	John O. Public	35.74
☐	Y	127.0.0.1-942192666-764198-2685-8	nobody	11/09/99 18:11	John O. Public	35.74
25 Order(s) out of 1594 Listed						717.99
Total						73352.65

Tax and Shipping

Tax:	52.45
Shipping:	150.90

Email All Customers Listed

1 2 3 4 5 6 7 8 9 10 [Next >>]

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3300

Fig.33.

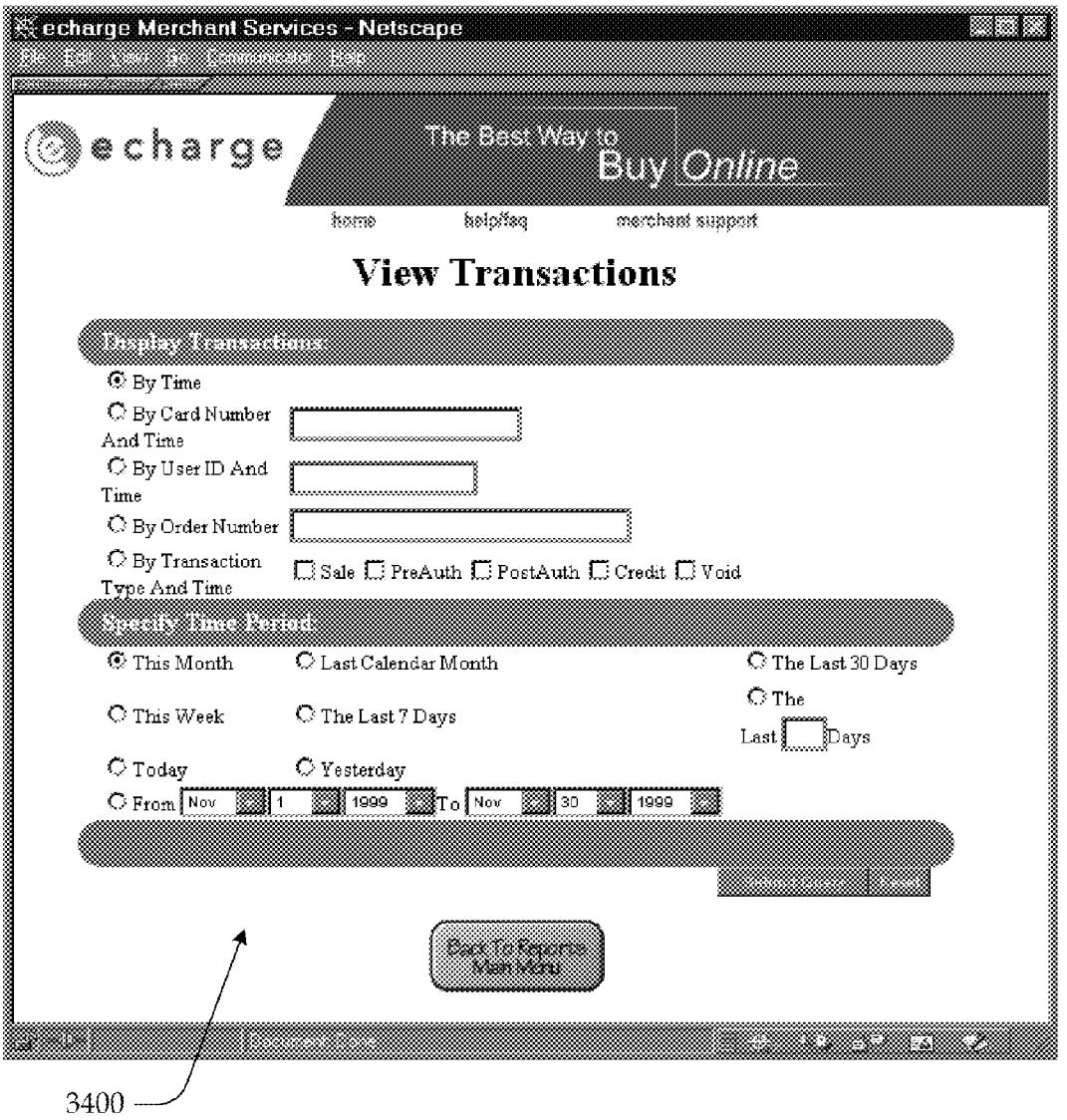
echarge Merchant Services - Netscape
echarge
The Best Way to Buy Online
home
help/faq
merchant support
View Transactions
Display Transactions
By Time
By Card Number And Time
By User ID And Time
By Order Number
By Transaction Type And Time
Sale
PreAuth
PostAuth
Credit
Void
Specify Time Period
This Month
Last Calendar Month
The Last 30 Days
This Week
The Last 7 Days
The Last Days
Today
Yesterday
From
Nov
1
1999
To
Nov
30
1999
Back To Reports Main Menu
3400

Fig.34.

echarge Merchant Services - Netscape

echarge — The Best Way to Buy Online

home help/faq merchant support

Transactions Processed

11/01/1999 - 11/30/1999

Order#	Date	Merch	Type	Card Number	Exp Date	Approval	Amount
63.17.30.226-942207186-5606-2685-7	11/09/99 22:13	Steve Atherton	Void	4111...1111	12/2001	Y:Accepted	25.60
63.17.30.226-942207186-5606-2685-7	11/09/99 22:13	Steve Atherton	Credit	4111...1111	12/2001	Y:Accepted	25.60
63.17.30.226-942207186-5606-2685-7	11/09/99 22:13	Steve Atherton	PostAuth	4111...1111	12/2001	Y:Accepted	25.60
63.17.30.226-942207186-5606-2685-7	11/09/99 22:13	Steve Atherton	PreAuth	4111...1111	12/2001	Y:06TEST0a9d00007f:YNA:501002319459089TESTV01:	25.60
127.0.0.1-942207097-3581-2685-6	11/09/99 22:11	nobody	Sale	4111...1111	12/2001	Y:37TEST0a9d00007e:YNA:501001318567004TESTV01:	35.74
63.17.30.226-942206630-776811-2685-8	11/09/99 22:04	Steve Atherton	Void	4111...1111	12/2001	Y:Accepted	25.60
63.17.30.226-942206630-776811-2685-8	11/09/99 22:04	Steve Atherton	Credit	4111...1111	12/2001	Y:Accepted	25.60
63.17.30.226-942206630-776811-2685-8	11/09/99 22:04	Steve Atherton	PostAuth	4111...1111	12/2001	Y:Accepted	25.60
63.17.30.226-942206630-776811-2685-8	11/09/99 22:03	Steve Atherton	PreAuth	4111...1111	12/2001	Y:51TEST0a9d00007c:YNA:501001313905091TESTV01:	25.60
63.17.30.226-942206506-522348-2685-5	11/09/99 22:03	Steve Atherton	PreAuth	4111...1111	12/2001	Y:13TEST0a9d00007b:YNA:501002313522020TESTV01:	25.60
63.17.30.226-942206317-108643-2685-6	11/09/99 21:59	Steve Atherton	Void	4111...1111	12/2001	Y:Accepted	25.60
63.17.30.226-942206317-108643-2685-6	11/09/99 21:59	Steve Atherton	Credit	4111...1111	12/2001	Y:Accepted	25.60
63.17.30.226-942206317-108643-2685-6	11/09/99 21:58	Steve Atherton	PreAuth	4111...1111	12/2001	Y:38TEST0a9d000077:YNA:501001310770103TESTV01:	25.60
127.0.0.1-942206199-23805-2685-4	11/09/99 21:56	nobody	Sale	4111...1111	12/2001	Y:39TEST0a9d000076:YNA:	35.74
63.17.30.226-942206028-638577-2685-9	11/09/99 21:54	Steve Atherton	Void	4111...1111	12/2001	Y:Accepted	28.90
63.17.30.226-942206028-638577-2685-9	11/09/99 21:54	Steve Atherton	Credit	4111...1111	12/2001	Y:Accepted	28.90
63.17.30.226-942206028-638577-2685-9	11/09/99 21:54	Steve Atherton	PostAuth	4111...1111	12/2001	Y:Accepted	28.90
63.17.30.226-942206028-638577-2685-9	11/09/99 21:53	Steve Atherton	PreAuth	4111...1111	12/2001	Y:49TEST0a9d000074:YNA:501001307888061TESTV01:	28.90
63.17.30.226-942205792-640233-2685-7	11/09/99 21:49	Steve Atherton	PreAuth	4111...1111	12/2001	Y:53TEST0a9d000073:YNA:501002305522039TESTV01:	28.90
63.17.30.226-942205528-554830-2685-5	11/09/99 21:46	Steve Atherton	Void	4111...1111	12/2001	Y:Accepted	28.90
63.17.30.226-942205528-554830-2685-5	11/09/99 21:45	Steve Atherton	Credit	4111...1111	12/2001	Y:Accepted	28.90
63.17.30.226-942205528-554830-2685-5	11/09/99 21:45	Steve Atherton	PostAuth	4111...1111	12/2001	Y:Accepted	28.90
63.17.30.226-942205528-554830-2685-5	11/09/99 21:45	Steve Atherton	PreAuth	4111...1111	12/2001	Y:29TEST0a9d000071:YNA:501002302881019TESTV01:	28.90
127.0.0.1-942205291-473501-2685-7	11/09/99 21:41	nobody	Sale	4111...1111	12/2001	Y:32TEST0a9d000070:YNA:501001300512016TESTV01:	35.74
Page total							161.72
Total							75319.63

25 Transaction(s) out of 2450 listed

1 2 3 4 5 6 7 8 9 10 [Next >>]

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3500

Fig.35.

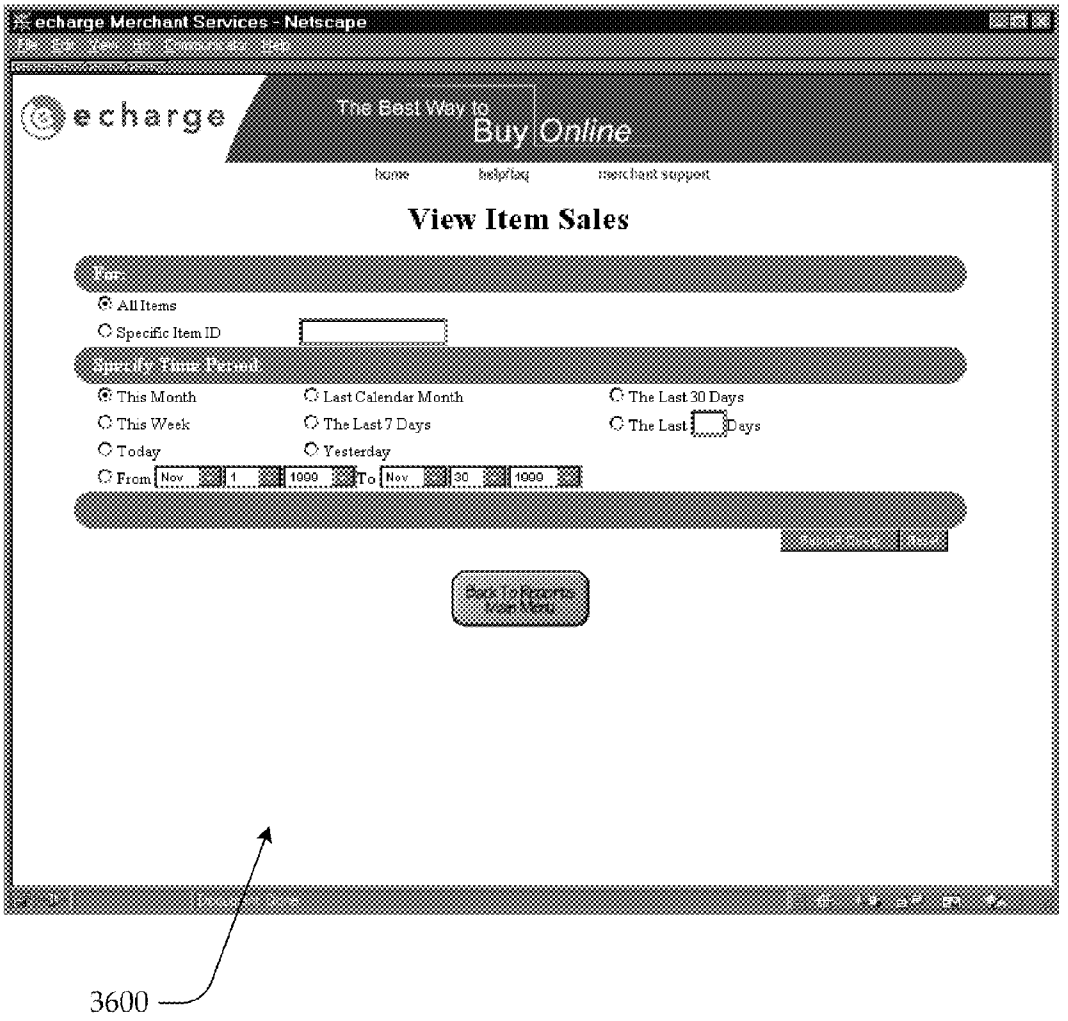
echarge Merchant Services - Netscape
echarge
The Best Way to Buy Online
home
help/faq
merchant support
View Item Sales
For:
All Items
Specific Item ID
Specify Time Period
This Month
Last Calendar Month
The Last 30 Days
This Week
The Last 7 Days
The Last Days
Today
Yesterday
From Nov 1 1999 To Nov 30 1999
3600

Fig.36.

echarge Merchant Services - Netscape

echarge

The Best Way to Buy Online

home help/faq merchant support

Item Sales

11/01/1999 - 11/30/1999

Item ID	Item Name	# of Items	% of Units	% of Sales	Total Sales
100037	MSFT FrontPage 98 Upgrade	1	0.04	0.03	49.00
100070	HP LaserJet Paper, 8.5"x11", ream	6	0.24	0.03	47.94
100071	Hammermill Laser Print Paper	19	0.75	0.11	163.21
100076	Hitachi Monitor MC6215	0	0.00	0.00	0.00
102521	Pizza and Baking Stone, 14x16	3	0.12	0.05	78.00
103900	Chrome Premium Belgian Waffle Iron, 2-c.	1	0.04	0.03	49.95
105613	Prankster s Red Hot Sauce, 5-oz.	1	0.04	0.00	4.95
105734	Blueberries n Cream Muffin Mix, 16-oz.	1	0.04	0.00	3.95
107960	Blue Oval Baking Dish, 14-in.	5	0.20	0.12	177.50
111352	Nonstick Cookware Set, 8-pc.	2	0.08	0.27	399.90
112567	Chocolate Raspberry Truffle Cake Baking Kit	1	0.04	0.01	9.95
117413	Smoky Chipotle Tomato Grilling Sauce, 12-oz.	1	0.04	0.00	5.95
119349	Corn Cheddar Cayenne Cheese Wafers, 8-oz.	1	0.04	0.00	5.95
119622	Hellfire & Damnation Hot Sauce, 5-oz.	1	0.04	0.00	4.95
126349	Nonstick Bakeware Set, 4-pc.	1	0.04	0.04	59.95
127123	Hi-Density Hard Anodized Cookware Set, 7-pc.	1	0.04	0.31	469.95
128127	Red Chili Chipotle Cheddar Popcorn Seasoning, 5-oz.	1	0.04	0.00	5.95
130885	Bakeware Set for Kids, 5-pc.	19	0.75	0.22	322.05
132633	Wasabi Lime Mustard, 1.9-oz.	1	0.04	0.00	2.95
20-FILE-001	Kron 7z	0	0.00	0.00	0.00
20100	Jimi Hendrix Interactive CD ROM	2	0.08	0.03	49.90
20130	Eric Clapton Interactive CD ROM	6	0.24	0.10	149.70
20131	Alanis Morisette Interactive CD ROM	1	0.04	0.02	24.95
20150	The Wallflowers Interactive CD ROM	0	0.00	0.00	0.00
20160	Classical Guitar Standards Volume 1 CD ROM	1	0.04	0.02	24.95
20170	Classical Guitar Standards Volume 2 CD ROM	0	0.00	0.00	0.00
300-DA-001	Rubbermaid Pencil Palace[tm]	7	0.28	0.04	53.55
400-PA-001	HP Laser Black Toner Cartridge	772	30.50	25.76	38561.40
400-PC-03	TEK Pentium 133	0	0.00	0.00	0.00
A21000	THIS IS the description for the second item.	133	5.25	58.75	87942.26
CTV99221	High-Back Executive Chairs with Arms	0	0.00	0.00	0.00
GAME-033	Blast Em Game Software	727	28.72	7.29	10905.00
GAME-033	Blast Em Game Software	17	0.67	0.17	255.00
R21000	THIS IS product description	19	0.75	1.42	2127.43
T-Shirt-001	T-Shirt of ClearCommerce Logo	729	28.80	4.87	7292.62
T-Shirt-001	T-Shirt with the cool ClearCommerce Logo	17	0.67	0.05	79.90
abc	test item description	24	0.95	0.16	240.00
def	test item description	6	0.24	0.02	24.00
pokemon fossil	Blast Em Game Software	4	0.16	0.06	88.00
Totals:		2531	100.00	100.00	149680.71

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3700

Fig.37.

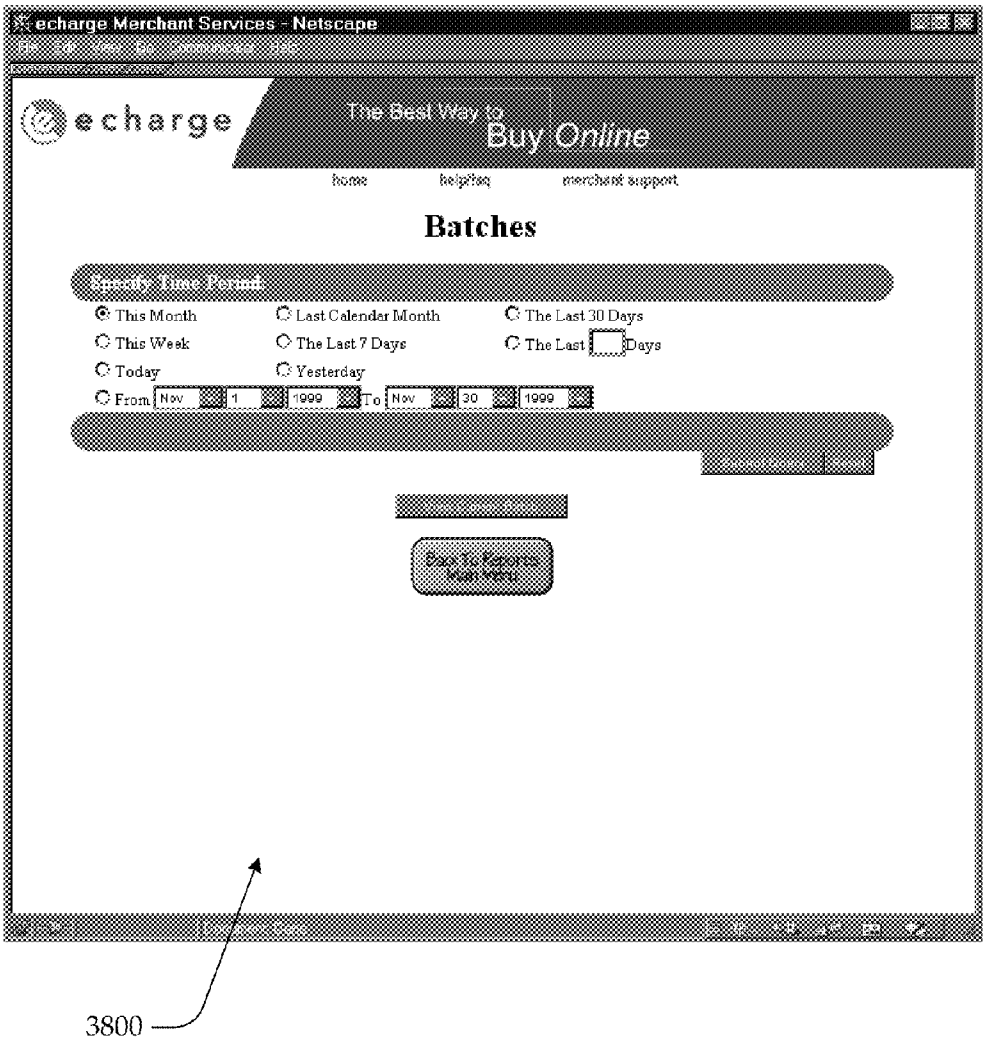
echarge Merchant Services - Netscape
echarge
The Best Way to
Buy Online
home
help/faq
merchant support
Batches
Specify Time Period
This Month
Last Calendar Month
The Last 30 Days
This Week
The Last 7 Days
The Last Days
Today
Yesterday
From Nov 1 1999 To Nov 30 1999
3800

Fig.38.

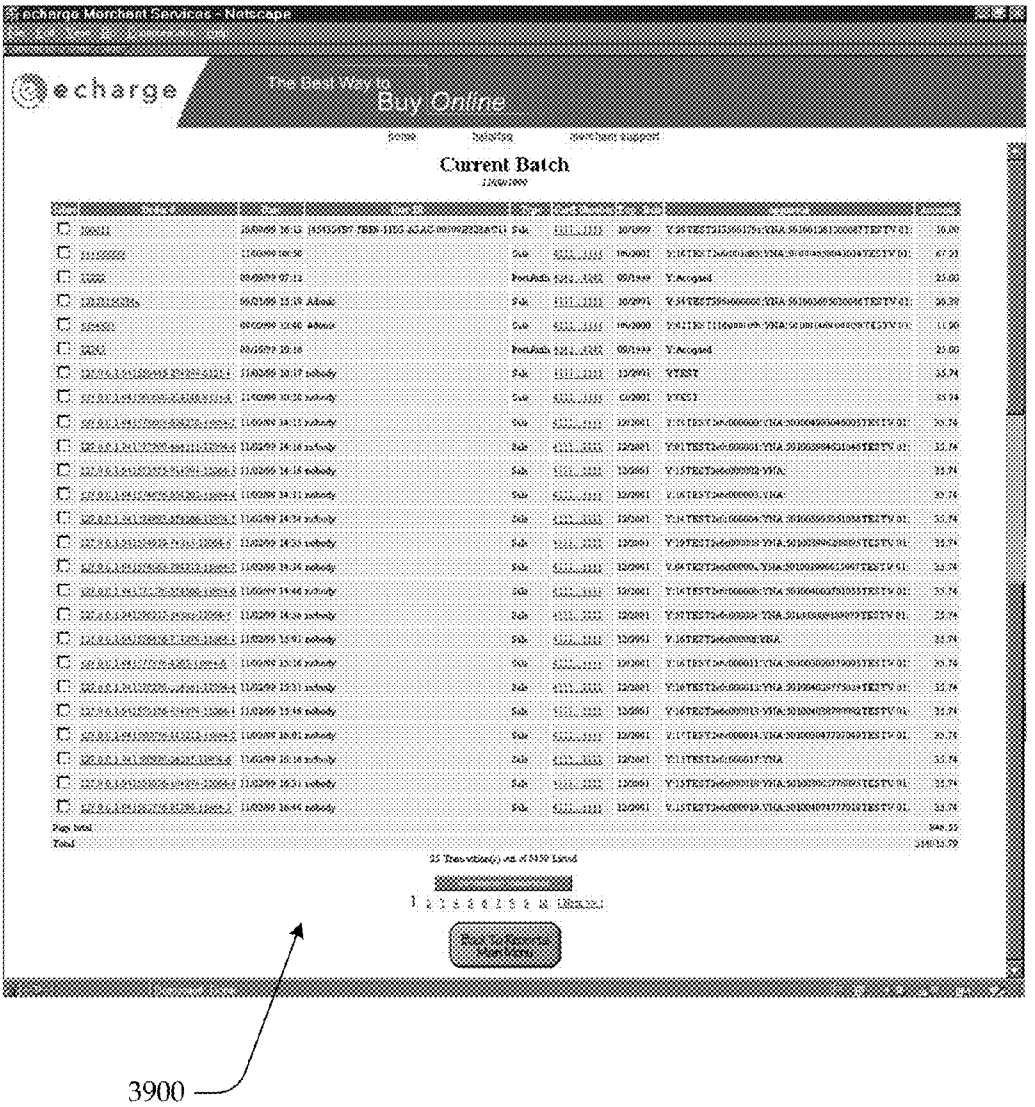

Fig.39.

echarge Merchant Services - Netscape
echarge
The Best Way to
Buy Online
home
help/faq
merchant support
Merchant Reports Administration
Back To Reports Main Menu
4000

Fig.40.

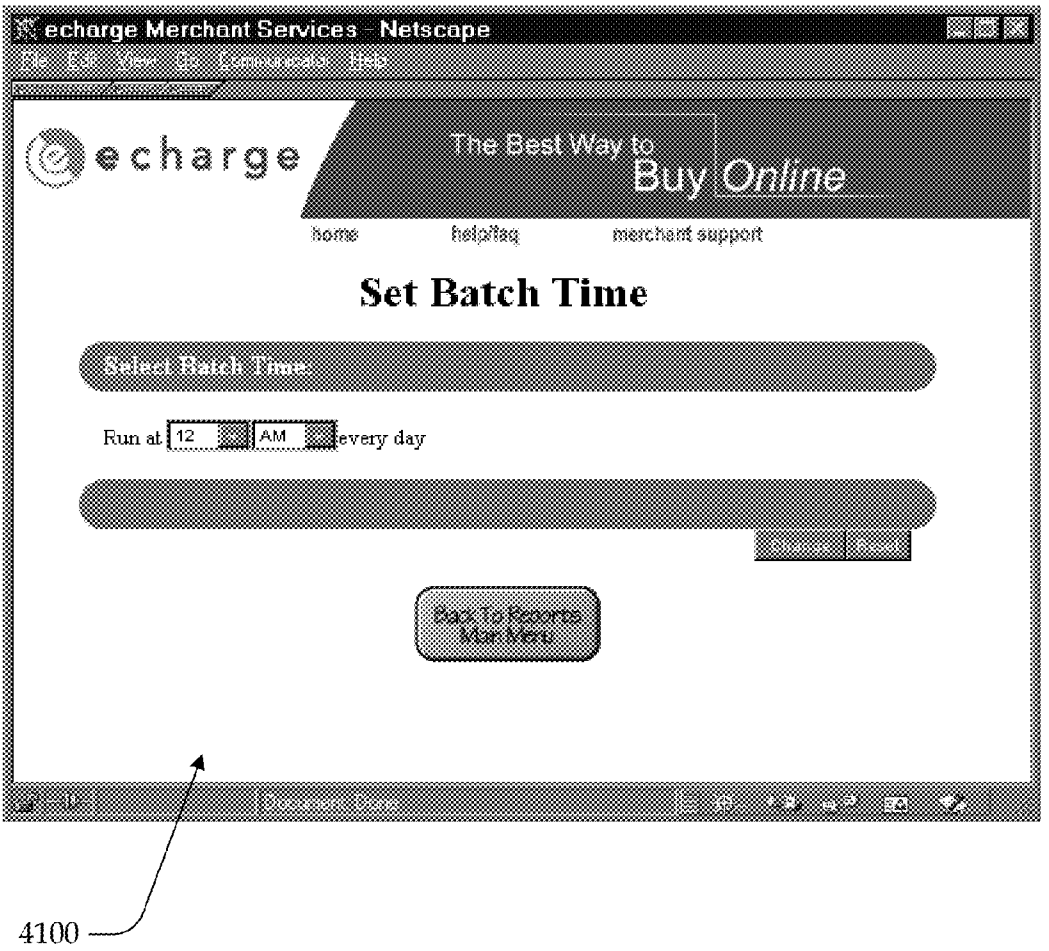
echarge Merchant Services - Netscape
echarge
The Best Way to
Buy Online
home
help/faq
merchant support
Set Batch Time
Select Batch Time
Run at 12 AM every day
Back To Reports Main Menu
4100

Fig.41.

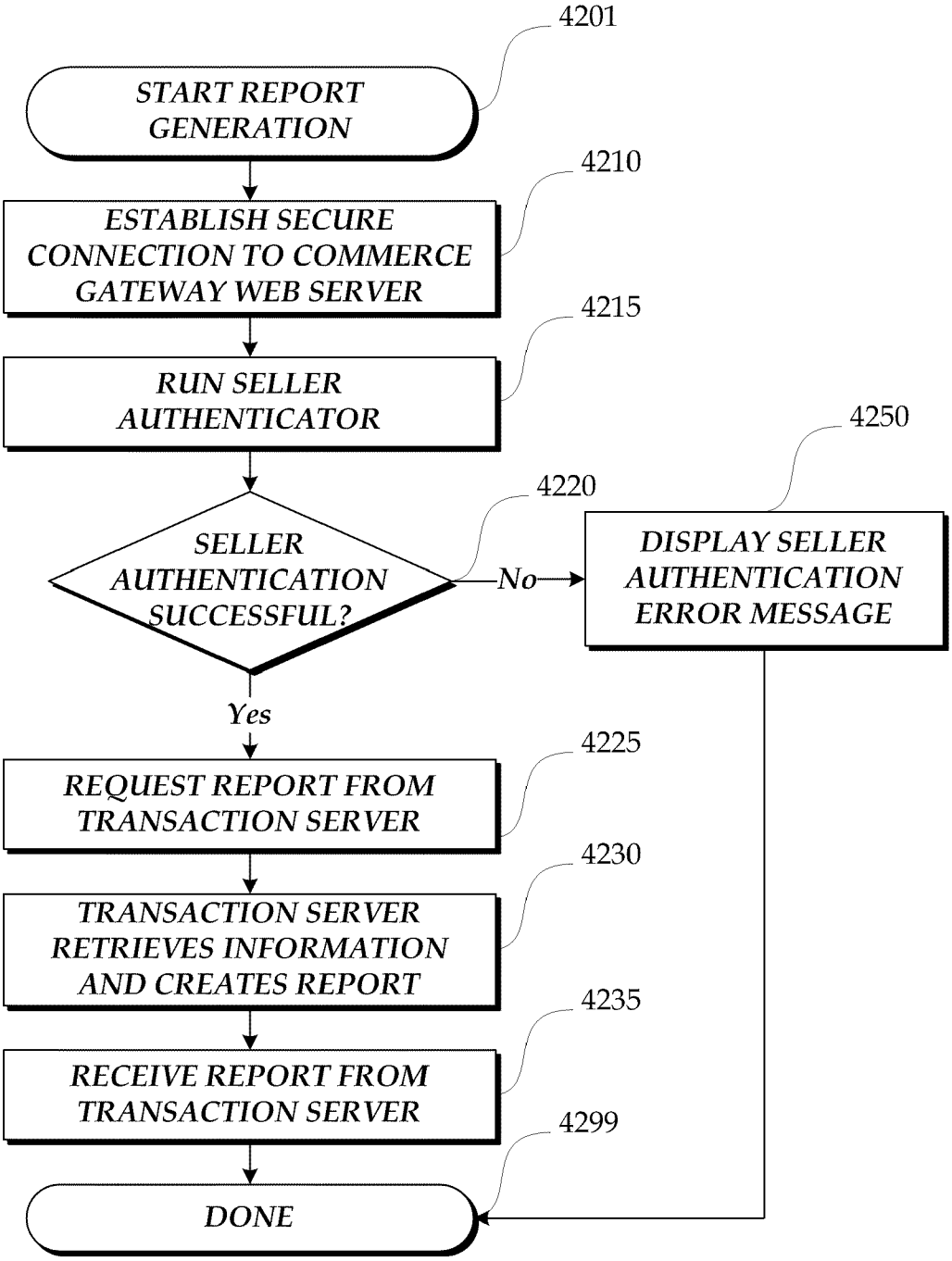
4201
START REPORT GENERATION
4210
ESTABLISH SECURE CONNECTION TO COMMERCE GATEWAY WEB SERVER
4215
RUN SELLER AUTHENTICATOR
4220
SELLER AUTHENTICATION SUCCESSFUL?
No
4250
DISPLAY SELLER AUTHENTICATION ERROR MESSAGE
Yes
4225
REQUEST REPORT FROM TRANSACTION SERVER
4230
TRANSACTION SERVER RETRIEVES INFORMATION AND CREATES REPORT
4235
RECEIVE REPORT FROM TRANSACTION SERVER
4299
DONE

Fig.42.

METHOD AND APPARATUS FOR ORDERING GOODS, SERVICES, AND CONTENT OVER AN INTERNETWORK USING A VIRTUAL PAYMENT ACCOUNT

CROSS-REFERENCES TO RELATED APPLICATIONS

[0001] This application is a division of U.S. patent application Ser. No. 11/775,473, filed Jul. 10, 2007, which is a continuation of U.S. patent application Ser. No. 10/663,443, filed Sep. 16, 2003 (now U.S. Pat. No. 7,249,097), which is a continuation of U.S. patent application No. 10/338,133, filed Jan. 6, 2003, which is a continuation of U.S. patent application No. 09/578,395, filed May 25, 2000, which in turn is a continuation-in-part of U.S. application Ser. No. 09/370,949, filed Aug. 9, 1999, priority from the filing date of which is hereby claimed under 35 U.S.C.§120. U.S. patent application Ser. No. 09/370,949 claims the benefit of provisional Application No. 60/140,039, filed Jun. 18, 1999, the benefit of which is hereby claimed under 35 U.S.C.§119. All of said applications are expressly incorporated herein by reference.

FIELD OF THE INVENTION

[0002] This invention generally relates to a method and apparatus for ordering goods, services, and content from one or more other computers connected via common communications links and, more particularly, to a method and apparatus for ordering goods, services, and content from computers connected to the Internet using a virtual payment account.

BACKGROUND OF THE INVENTION

[0003] Communication networks are well known in the computer communications field. By definition, a network is a group of computers and associated devices that are connected by communications facilities or links. Network communications can be of a permanent nature, such as via cables, or can be of a temporary nature, such as connections made through telephone or radio links. Networks may vary in size from a local area network (LAN), consisting of a few computers or workstations and related devices; to a wide area network (WAN), which interconnects computers and LANs that are geographically dispersed, to a remote access service (RAS), which interconnects remote computers via temporary communication links. An internetwork, in turn, is the joining of multiple computer networks, both similar and dissimilar, by means of gateways or routers that facilitate data transfer and conversion from various networks. A well-known abbreviation for the term internetwork is "Internet." As currently understood, the capitalized term "Internet" refers to the collection of networks and routers that use the

[0004] Transmission Control Protocol/Internet Protocol (TCP/IP) to communicate with one another.

[0005] A representative section of the Internet **40** is shown in FIG. **1** (Prior Art) in which a plurality of local area networks (LANs) **44** and a wide area network (WAN) **46** are interconnected by routers **42**. The routers **42** are generally special purpose computers used to interface one LAN or WAN to another. Communication links within the LANs may be twisted wire pair, or coaxial cable, while communication links between networks may utilize 56 Kbps analog telephone lines, or 1 Mbps digital T-1 lines and/or 45 Mbps T-3 lines. Further, computers and other related electronic devices can be remotely connected to either the LANs **44** or the WAN **46** via a modem and temporary telephone link. Such computers and electronic devices **48** are shown in FIG. **1** as connected to one of the LANs **44** by a dotted line. It will be appreciated that the Internet comprises a vast number of such interconnected networks, computers, and routers, and that only a small, representative section of the Internet **40** is shown in FIG. **1**.

[0006] The Internet has recently seen explosive growth by virtue of its ability to link computers located throughout the world. As the Internet has grown, so has the World Wide Web (WWW). The WWW is a vast collection of interconnected or "hypertext" documents (also known as "Web pages") written in HyperText Markup Language (HTML) that are electronically stored at "Web sites" throughout the Internet. A Web site is a server connected to the Internet that has mass storage facilities for storing hypertext documents and that runs administrative software for handling requests for those stored hypertext documents. A hypertext document normally includes a number of hyperlinks, i.e., highlighted portions of text that link the document to another hypertext document possibly stored at a Web site elsewhere on the Internet. Each hyperlink is associated with a Uniform Resource Locator (URL) that provides the exact location of the linked document on a server connected to the Internet. Thus, whenever a hypertext document is retrieved from any Web server, the document is considered to be retrieved from the WWW.

[0007] A user is allowed to retrieve hypertext documents from the WWW, i.e., a user is allowed to "surf the Web," via a Web browser. A Web browser, such as NETSCAPE NAVIGATOR® or MICROSOFT® Internet Explorer, is a software program implemented by a Web client, i.e., a user's computer, to provide a graphical user interface to the WWW. Upon request from the user via the Web browser, the Web client accesses and retrieves the desired hypertext document or Web page from the appropriate Web server using the URL for the document and a protocol known as HyperText Transfer Protocol (HTTP). HTTP is a higher-level protocol than TCP/IP and is designed specifically for the requirements of the WWW. It is used on top of TCP/IP to transfer hypertext documents between servers and clients.

[0008] At the advent of the WWW, the information stored on the Internet was freely transferred back and forth between those parties interested in the information. However, the WWW is quickly becoming a channel of commercial activity, whereby a vast number of companies have developed their own Web sites for advertising and selling their goods and services. Commercial activity that takes place by means of connected computers is known as electronic commerce, or e-commerce, and can occur between a buyer and a seller through an on-line information service, the Internet, a bulletin board system (BBS), or between buyer and seller computers through electronic data interchange (EDI). A buyer (also referred to as a user, consumer, or purchaser in the context of e-commerce) may "visit the Web site" of a company or seller, i.e., retrieve the hypertext documents located on the Web server of a particular seller, and order any good or service that the seller has to offer. If that good or service is in the form of electronically stored information, such as a book, a video, a computer game, etc., the buyer may simply download the good or service from the company's Web site to his or her computer for immediate consumption and use. If the good or service is of a more tangible nature, such as an appliance or

article of clothing ordered from an on-line catalog, a more conventional method of delivery, e.g., the postal service or a common carrier, is used.

[0009] A common method of payment for e-commerce purchases is electronic credit, or e-credit. E-credit is a form of electronic commerce often involving credit card transactions carried out over the Internet. Traditional e-credit purchases are paid for by a major credit card, wherein the buyer is required to transmit his or her credit information, for example, an account number and expiration date, over the Internet to the company's Web site. Many buyers are concerned about the security and confidentiality of such electronic transmissions. Furthermore, many buyers do not have a major credit card with which to make such purchases. Alternative billing systems, such as providing credit information by facsimile or postal service, are much less convenient and often prove enough of a barrier to prohibit the sale altogether. Finally, the traditional methods of billing and payment do not adequately protect the seller or buyer from fraudulent purchases.

[0010] Accordingly, a more effective method and apparatus for ordering and billing for goods, services, and content over a network, and ultimately the Internet, is needed. The method and apparatus should protect the seller and buyer from fraudulent purchases. Additionally, the method and apparatus should provide an element of non-repudiation to all transactions. The method and apparatus should also prevent buyers with histories of nonpayment from purchasing additional goods, services and/or content. Finally, the method and apparatus should allow a buyer without a major credit card to purchase goods, services, and content over the network.

SUMMARY OF THE INVENTION

[0011] This summary is provided to introduce a selection of concepts in a simplified form that are further described below in the Detailed Description. This summary is not intended to identify key features of the claimed subject matter, nor is it intended to be used as an aid in determining the scope of the claimed subject matter.

[0012] The present invention provides a computer program for ordering products from computers connected to the Internet, wherein the buyer is automatically billed for the ordered good, service, or content based on a virtual payment account maintained by a commerce gateway.

[0013] In accordance with other aspects of the present invention, a commerce gateway interfaces with a credit processing server to handle the monetary aspects involved in purchasing goods, services, and/or content. The credit processing server interfaces with one or more financial institutions that physically handle the buyer's account. For example, a buyer can pay for purchases electronically by transferring funds from a bank account held by the buyer at a financial institution or by prepaying for the purchases by sending a check to the provider of the commerce gateway. Alternatively, reward points earned by using the virtual payment account can be applied towards purchases.

[0014] In accordance with still other aspects of the present invention, the credit processing server or commerce gateway communicates with one or more identity bureaus in order to determine a buyer's identity before creating a virtual payment account.

[0015] In accordance with still other aspects of the present invention, the credit processing server communicates with one or more credit bureaus in order to determine a credit limit for a buyer's virtual payment account.

[0016] In accordance with yet other aspects of the present invention, a virtual payment account can have associated sub-accounts. A sub-account can have a credit limit that is less than the main account credit limit. A sub-account can limit the seller sites from which goods, services, and/or content can be purchased.

[0017] In accordance with further aspects of the present invention, purchases must be made by a registered buyer from a registered seller. Security is ensured via authentication of the parties to a transaction. Authentication can be performed by verification of a digital certificate, or a digital signature, or by alternate authentication methods.

DESCRIPTION OF THE DRAWINGS

[0018] The foregoing aspects and many of the attendant advantages of this invention will become more readily appreciated as the same become better understood by reference to the following detailed description, when taken in conjunction with the accompanying drawings, wherein:

[0019] FIG. **1** (Prior Art) is a block diagram of a representative portion of the Internet;

[0020] FIG. **2** is a pictorial diagram of a local area network (LAN) connected to the Internet which supplies goods, services, and/or content ordered by a buyer using a computer located elsewhere on the Internet in accordance with the present invention;

[0021] FIG. **3** is a block diagram of the several components of the buyer's computer shown in FIG. **2** that is used to order goods, services, and/or content from the Internet in accordance with the present invention;

[0022] FIG. **4** is a block diagram of the several components of a seller server shown in FIG. **2** that provides the ordered goods, services, and/or content in accordance with the present invention;

[0023] FIG. **5** is a block diagram of the several components of a commerce gateway shown in FIG. **2** that is used to interface between the Internet and a credit processing server in accordance with the present invention;

[0024] FIG. **6** is a block diagram of the several components of a credit processing server shown in FIG. **2** that provides for the payment of the ordered goods, services, and/or content in accordance with the present invention;

[0025] FIG. **7** is a diagram illustrating the actions taken by a buyer's computer, the commerce gateway, the credit processing server, an identity bureau, and a credit bureau to create a virtual payment account for a buyer;

[0026] FIGS. **8**A-**8**G are exemplary Web pages displayed on a buyer's computer when applying for a virtual payment account in accordance with the present invention;

[0027] FIGS. **9**A-**9**C are exemplary Web pages used by a buyer to customize the virtual payment account applied for in accordance with the present invention;

[0028] FIGS. **10**A-**10**C are exemplary Web pages displayed on a buyer's computer containing account statements and reports for a buyer's virtual payment account in accordance with the present invention;

[0029] FIGS. **11**A-**11**E are exemplary Web pages used by a buyer to purchase goods, services, and/or content in accordance with the present invention;

[0030] FIG. **12** is a flow diagram illustrating the logic used by the buyer's computer to order goods, services, and/or content from the Internet using the Web browser;

[0031] FIG. **13** is a flow diagram illustrating the logic used by a buyer authenticator of the buyer's computer to validate that the buyer is a registered virtual payment account participant;

[0032] FIG. **14** is a flow diagram illustrating the logic used by an alternate buyer authenticator of the buyer's computer to validate that the buyer is a registered virtual payment account participant;

[0033] FIG. **15** is a flow diagram illustrating the logic used by the buyer's computer to apply for a virtual payment account using the Web browser;

[0034] FIG. **16** is a flow diagram illustrating the logic used by an enrollment server of the commerce gateway shown in FIG. **5** to establish a new buyer account in accordance with the present invention;

[0035] FIG. **17** a flow diagram illustrating the logic used by an account identification container generator of the commerce gateway shown in FIG. **5** to generate an account identification for a given transaction;

[0036] FIG. **18** is a flow diagram illustrating the logic used by a commerce engine of a seller computer shown in FIG. **4** to provide for the ordering, shipment, and payment of goods, services, and/or content over the Internet;

[0037] FIG. **19** is a flow diagram illustrating the logic used by a commerce gateway adapter of the seller server shown in FIG. **4** to allow a commerce engine to communicate with a transaction server on the commerce gateway;

[0038] FIG. **20** is a flow diagram illustrating the logic used by the transaction server of the commerce gateway shown in FIG. **5** to process an order for goods, services, and/or content over the Internet using a virtual payment account;

[0039] FIGS. **21** and **22** are flow diagrams illustrating the logic used by various sub-systems of the credit processing server shown FIG. **6** to provide for payment of goods, services, and/or content ordered over the Internet using a virtual payment account;

[0040] FIG. **23** is a diagram illustrating the actions taken by the buyer's computer, the seller server and the commerce gateway to order goods, services, and/or content using the virtual payment account;

[0041] FIG. **24** is a flow diagram illustrating the logic used by the seller's computer to perform a settlement transaction, i.e., initiate transfer of funds;

[0042] FIG. **25** is a flow diagram illustrating the logic used by the transaction server of the commerce gateway shown in FIG. **5** to process a settlement transaction;

[0043] FIG. **26** is a flow diagram illustrating the logic used by the administrator's computer to initiate a refund to be applied to a virtual payment account in accordance with the present invention;

[0044] FIG. **27** is a flow diagram illustrating the logic used by a commerce gateway to process a request for information from an identity bureau;

[0045] FIG. **28** is an exemplary window of an e-mail computer program containing an alternate authentication message;

[0046] FIG. **29** is an exemplary device showing an alternate authentication message;

[0047] FIG. **30** is an exemplary Web page showing an alternate authentication dialog;

[0048] FIGS. **31-41** are exemplary Web pages used by a seller to view transactions, status of payments, and reports;

[0049] FIG. **42** is a flow diagram illustrating the logic used to authenticate a seller and generate a report for seller.

DETAILED DESCRIPTION

Detailed Description of the Preferred Embodiment

[0050] As previously described and shown in FIG. **1**, the Internet **40** is a collection of local area networks (LANs) **44**, wide area networks (WANs) **46**, remote computers **48**, and routers **42** that use the Transmission Control Protocol/Internet Protocol (TCP/IP) to communicate with each other. The World Wide Web (WWW), on the other hand, is a vast collection of interconnected, electronically stored information located on servers connected throughout the Internet **40**. Many companies are now selling goods, services, and access to their premium content over the Internet using the WWW. In accordance with the present invention, a buyer orders goods, services, and/or content (referred to interchangeably herein as "products") over the Internet **40** via a Web browser and is automatically billed for the purchase using his or her virtual payment account without transferring sensitive account information, such as account number and expiration date, over the Internet **40**. The virtual payment account allows a buyer to settle transactions of the virtual payment account using a prepaid or credit account. In one actual embodiment of the present invention, the virtual payment account uses bank electronic funds transfers, for example, using the Automated Clearing House (ACH) standard, which is maintained by the National Automated Clearing House Association (NACHA)—the standards group promoting electronic commerce standards. In another embodiment, the virtual payment account can be funded using a traditional paper check, with the buyer mailing a check, e.g., via the postal service, to the providers of the virtual payment account system. Alternatively, funds transfer services and electronic bill payment services, such as CHECKFREE®, may be used. Reward points earned through use of the virtual payment account can also be applied to the buyer's virtual payment account to pay for products.

[0051] More specifically, as shown in FIG. **2**, the buyer purchases goods, services, and/or premium content from a seller server **51**, i.e., a computer owned by the seller that sponsors or sells the product, by placing an order with the seller server from a computer **50** connected to the Internet **40**. The order is processed and confirmed by a commerce gateway **52** connected to a LAN **44** located elsewhere in the Internet **40**. The commerce gateway **52** is also connected to a credit processing server **53** via the LAN **44**. The credit processing server **53** communicates with one or more identity bureaus **56** to verify the identity of the buyer. After verifying the identity of the buyer the credit processing server **53** communicates with one or more credit bureaus **58** in order to determine the credit worthiness of a buyer.

[0052] In one actual embodiment of the present invention described herein, the identity bureau **56** is a server provided and maintained by an agency for verifying the identity of the buyer, and the credit bureau **58** is a server provided and administrated by a credit agency for processing credit reports for buyers. The identity bureau **56** and credit bureau **58** can be located on the LAN **44** or elsewhere on the Internet **40**.

[0053] In yet another embodiment, the credit processing server can establish a point-to-point connection with a remote identity bureau or credit bureau that is not connected to either the LAN **44** or the Internet **40**. It will be appreciated that other

methods of communication between the credit processing server **53** and identity bureau **56** or credit bureau **58** may be used, for example, a secure Virtual Private Network (VPN) maintained and operated by the identity bureau or credit bureau exclusively for the purpose of identity checking or credit rating, respectively.

[0054] Finally, in yet other embodiments, the identity and credit bureaus may not actually offer a server at all. Rather, a customer service representative for the identity or credit bureaus may process the identity or credit report and manually provide the report to an administrator of the present invention who manually enters the report to the credit processing server **53**.

[0055] The credit processing server **53** also communicates with one or more financial institutions **59** for the purpose of obtaining the buyer's payment, i.e., a transfer of funds for the purchase of products. As is the case with the identity and credit bureaus **58**, the financial institutions **59** may be other servers in electronic communication with the credit processing server **53**, customer service representatives in more traditional communication with the credit processing server **53**, or some combination thereof.

[0056] Finally, in addition to the commerce gateway **52**, the LAN **44** includes an administrative computer **54** used to administer buyer and seller information and services provided by the commerce gateway **52** and credit processing server **53**.

[0057] In the exemplary embodiment of the present invention shown in FIG. **2**, the LAN **44** is insulated from the Internet **40** by a firewall **55** that tracks and controls the flow of all data passing through it. The firewall **55** protects the LAN **44** from malicious inbound data traffic. The LAN **44** is a bus network interconnecting the various computers and servers. The LAN **44** shown in FIG. **2** can be formed of various coupling media such as glass or plastic fiberoptics cables, coaxial cables, twisted wire pair cables, ribbon cables, etc. In addition, one of ordinary skill in the art will appreciate that the coupling medium can also include a radio frequency coupling media or other intangible coupling media. Any computer system or number of computer systems, including but not limited to workstations, personal computers, laptop computers, personal data assistants, servers, remote computers, etc., that is equipped with the necessary interface hardware may be connected temporarily or permanently to the LAN **44** and, thus, the Internet **40**. However, if temporarily connected via a telephone link to another device connected to the LAN **44**, the interface hardware of both the remote computer **48** and the device to which it is connected must contain a modem.

[0058] Also shown in FIG. **2** is an exemplary authentication device **205** whose purpose will be described in more detail below. In one embodiment of the current invention, the authentication device may be a personal data assistant (PDA) with a wireless modem. However, those of ordinary skill in the art will appreciate that the authentication device may be a laptop computer, a cellular telephone, a pager, or any device capable of receiving a remote message.

[0059] Finally, those of ordinary skill in the art will recognize that while only one buyer computer **50** and one seller server **51** are depicted in FIG. **2**, numerous buyer computers and seller servers equipped with the hardware and software components described below may be connected to the Internet **40**. It will also be appreciated that the term "buyer" used herein can be applied to any purchaser of goods and/or services and can be applied equally to an individual, non-commercial purchaser, a business, or a commercial purchaser. In other words, the term "buyer" can apply to any purchaser and the term "seller" can apply to any vendor or merchant, be they on individual, non-commercial seller, a business, or a commercial seller.

Relevant Buyer Computer, Seller Server, Commerce Gateway, and Credit Processing Server Components

[0060] FIG. **3** depicts several of the important components of the buyer's computer **50**. Those of ordinary skill in the art will appreciate that the buyer's computer **50** could be any computer used by the buyer to utilize the buyer's virtual payment account. Additionally, those of ordinary skill in the art will appreciate that the buyer's computer **50** may include many more components then those shown in FIG. **3**. However, it is not necessary that all of these generally conventional components be shown in order to disclose an illustrative embodiment for practicing the present invention. As shown in FIG. **3**, the buyer's computer includes a network interface **60** for connecting to a LAN **44** or WAN **46** or for connecting remotely to a LAN or WAN. Those of ordinary skill in the art will appreciate that the network interface **60** includes the necessary circuitry for such a connection and is also constructed for use with the TCP/IP protocol, the particular network configuration of the LAN or WAN it is connecting to, and a particular type of coupling medium.

[0061] The buyer's computer **50** also includes a processing unit **61**, a display **62**, and a memory **63**. The memory **63** generally comprises a random access memory (RAM), a read-only memory (ROM), and a permanent mass storage device, such as a disk drive. The memory **63** stores the program code and data necessary for ordering and paying for a product over the Internet **40** in accordance with the present invention. More specifically, the memory **63** stores a Web browser component **64**, such as NETSCAPE NAVIGATOR® or MICROSOFT® Internet Explorer, and a buyer authenticator component **65** formed in accordance with the present invention for authenticating a buyer as a registered participant of the virtual payment system prior to performing any virtual payment account transactions. It will be appreciated that these components may be stored on a computer-readable medium and loaded into memory **63** of the buyer computer **50** using a drive mechanism associated with the computer-readable medium, such as a floppy or DVD/CD-ROM drive.

[0062] As will be described in more detail below, the products ordered by the buyer are supplied by a seller server **51**, described next, following authorization from a remote server, i.e., a commerce gateway **52** described later, located elsewhere on the Internet, e.g., on LAN **44** illustrated in FIG. **2**. FIG. **4** depicts several of the important components of the seller server **51**. Those of ordinary skill in the art will appreciate that the seller server **51** includes many more components than those shown in FIG. **4**. However, it is not necessary that all of these generally conventional components be shown in order to disclose an illustrative embodiment of practicing the present invention. As shown in FIG. **4**, the seller server **51** includes a network interface **70** for connecting to a LAN **44** or WAN **46** or for connecting remotely to a LAN or WAN. Those of ordinary skill in the art will appreciate that the network interface **70** includes the necessary circuitry for such a connection and is also constructed for use with the TCP/IP protocol, the particular network configuration of the LAN or WAN it is connecting to, and a particular type of coupling medium.

[0063] The seller server **51** also includes a processing unit **71**, a display **72**, and a memory **73**. The memory **73** generally comprises a random access memory (RAM), read-only memory (ROM), and a permanent mass storage device, such as a hard disk drive, tape drive, optical drive, floppy disk drive, or combination thereof. In one actual embodiment of the present invention, the memory contains a product database **74** that includes the electronically stored good or service ordered by the buyer. In other embodiments of the present invention, the product database **74** stores the premium content ordered by the buyer, i.e., the hypertext documents or other electronically stored information considered of monetary value by the seller. In yet other embodiments of the present invention, the goods may be tangible goods not capable of being electronically stored, in which case the product database includes descriptive information of the products.

[0064] The memory **73** also contains a commerce engine component **75** for purchasing a product from a seller Web site. The commerce engine component **75** may be an existing commerce engine, such as MICROSOFT® Site Server, which allows for the payment of products ordered over the Internet using a major credit card, e.g., VISA® or MASTERCARD®. A commerce gateway adapter component **76** is also provided to allow the commerce engine component **75** to interface with the commerce gateway **52**. The commerce gateway adapter component uses and provides application programming interface (API) calls to interface with the commerce engine **75**. Also included in memory is a seller authenticator component **77** for verifying that the seller is an authorized or registered seller of the virtual payment system of the present invention. It will be appreciated that the product database **74**, the commerce engine component **75**, the commerce gateway adapter component **76**, and the seller authenticator component **77** may be stored on a computer-readable medium and loaded into memory **73** of the seller server **51** using a drive mechanism associated with the computer-readable medium, such as a floppy or CD-ROM drive. Finally, memory **73** stores a Web server component **78** for handling requests for stored information received via the Internet and the WWW.

[0065] FIG. **5** depicts several of the important components of the commerce gateway **52**. Those of ordinary skill in the art will appreciate that the commerce gateway **52** includes many more components than those shown in FIG. **5**. However, it is not necessary that all of these generally conventional components be shown in order to disclose an illustrative embodiment for practicing the present invention. As shown in FIG. **5**, the commerce gateway **52** is connected to the LAN **44** via a network interface **80**. Those of ordinary skill in the art will appreciate that the network interface **80** includes the necessary circuitry for connecting the commerce gateway **52** to the LAN **44** and the firewall **55** and is constructed for use with the TCP/IP protocol, the particular network configuration of the LAN **44**, and the particular type of coupling medium.

[0066] The commerce gateway **52** also includes a processing unit **81**, a display **82**, and a memory **83**. The memory **83** generally comprises a random access memory (RAM), a read-only memory (ROM), and a permanent mass storage device, such as a hard disk drive, tape drive, optical drive, floppy disk drive, or combination thereof. The memory **83** stores the program code and data necessary for authorizing a seller server **51** to supply products to buyers and obtaining payment for the products via a credit processing server **53** in accordance with the present invention. More specifically, the memory **83** stores a transaction server component **84** formed in accordance with the present invention for authorizing a seller to supply the ordered product and obtaining payment for the ordered product from the credit processing server **53**. Memory **83** also contains an identity bureau adapter **79** formed in accordance with the present invention for verifying a buyer or seller's identity. Also stored in memory **83** is an enrollment server component **89** formed in accordance with the present invention for determining the credit worthiness of an applicant. An account identification container generator component **88** is also stored in memory **83** for determining an internal account identification. A report server **85** is also stored in memory **83** for processing request for reports and consolidating information for requested reports. Also stored in the memory **83** is a credit processing server adapter component **86** for communicating with a credit processing server **53** described below. It will be appreciated that the transaction server component **84**, the credit processing server adapter component **86**, the account identification container generator component **88**, and the enrollment server component **89** may be stored on a computer-readable medium and loaded into memory **83** of the commerce gateway **52** using a drive mechanism associated with the computer-readable medium, such as floppy or CD-ROM drive. The memory **83** also stores a Web server component **87** for handling requests for stored information received via the Internet **40** and the WWW.

[0067] FIG. **6** depicts several of the important components of the credit processing server **53**. Those of ordinary skill in the art will appreciate that the credit processing server **53** includes many more components than those shown in FIG. **6**. However, it is not necessary that all of these generally conventional components be shown in order to disclose an illustrative embodiment for practicing the present invention. As shown in FIG. **6**, the credit processing server **53** is connected to the LAN **44** via a network interface **90**. Those of ordinary skill in the art will appreciate that the network interface **90** includes the necessary circuitry for connecting the credit processing server **53** to the LAN **44** and the firewall **55**, and is constructed for use with the TCP/IP protocol, the particular network configuration of the LAN **44**, and the particular type of coupling medium.

[0068] The credit processing server **53** also includes a processing unit **91**, a display **92**, and a memory **93**. The memory **93** generally comprises a random access memory (RAM), a read-only memory (ROM), and a permanent mass storage device, such as a hard disk drive, tape drive, optical drive, floppy disk drive, or combination thereof. The memory **93** stores the program code and data necessary for authorizing and securing payment for products purchased using a virtual payment account in accordance with the present invention. More specifically, the memory **93** of the credit processing server stores credit processing sub-systems including: an account/billing sub-system **94** for billing a buyer for products purchased using a virtual payment account; a payment processing sub-system **95** for communicating with a financial institution **59** in order to process payments received for purchases made using a virtual payment account; and an account enrollment sub-system **96** for determining the credit limit for an applicant as determined by information received from one or more credit bureaus **58**.

[0069] Also stored in memory **93** are an account database **97** and a financial database **98** used to store data required for the account/billing sub-system **94**, the payment processing sub-system **95**, identity bureau adapter **99** and the account

enrollment sub-system **96** to perform their required functions. It will be appreciated that the account/billing sub-system **94**, the payment processing sub-system **95**, the account enrollment sub-system **96**, the account database **97**, identity bureau adapter **99**, and the financial database **98** may be stored on a computer-readable medium and loaded into memory **93** of the credit processing system using a drive mechanism associated with the computer-readable medium, such as floppy or DVD/CD-ROM drive. It will also be appreciated that the account/billing sub-system **94**, the payment processing sub-system **95**, and the account enrollment sub-system **96** can comprise, either in full or in part, existing, traditional credit card payment systems.

[0070] FIGS. **3-6** depict important components of the buyer computer **50**, seller server **51**, commerce gateway **52**, and credit processing server **53** shown in FIG. **2** of one embodiment of the present invention. It will be appreciated that many other implementations and variations are possible. For example, one or more of the credit processing sub-systems **94**, **95**, **96** could be included in the commerce gateway **52** instead of in the credit processing server **53**. Alternatively, each of the credit processing sub-systems **94**, **95**, **96** of the credit processing server could be in a separate server. Further, additional commerce gateways **52** and credit processing servers **53** may be located on the LAN **44** or elsewhere on the Internet **40**.

Applying for A Virtual Payment Account

[0071] Once a VPA is set up, the virtual payment system of the present invention is a closed system that provides buyers a secure method for purchasing products over the Internet. The closed system includes only a registered buyer's computer **50**, a registered seller server **51**, the commerce gateway **52** (administered by the provider of the virtual payment system), and the credit processing server **53** (which can also be administered by the provider of the virtual payment system). Since the account information necessary for charging the buyer for the purchase is already in the possession of the commerce gateway **52** and the credit processing server **53**, the closed system of the present invention allows registered buyers to purchase products from registered sellers without transferring sensitive account information to the sellers over the Internet. In order to become a member of the virtual payment system of the present invention, a buyer becomes a registered user by obtaining a virtual payment account. FIG. **7** illustrates the actions taken by the buyer's computer **50**, the commerce gateway **52**, the credit processing system **53**, and the credit bureau **58** to create a virtual payment account for a buyer. The interactions of the various components are illustrated and described in detail later for various transactions performed by the present invention with reference to the diagrams shown in FIGS. **12**, **27**, and **42**. As shown in FIG. **7**, the process of applying for a virtual payment account is initiated when a buyer requests **100** an application form via the Internet using the Web browser **64** installed on the buyer's computer **50**. The buyer may apply for a virtual payment account directly from a virtual payment account Web site located at the commerce gateway **52** or indirectly from a registered seller site located at the seller server **51**. Once the request **100** for the application form is received by the commerce gateway **52**, the commerce gateway **52** provides buyer computer **50** the application form **102** so that the buyer can complete the form displayed in the Web browser **64** of the buyer computer **50**.

[0072] Upon completion of the application form, the buyer computer **50** submits the completed application form **104** to the commerce gateway **52**. The commerce gateway **52** then submits the application data **106** from the completed form to the credit processing server **53** for account and credit limit authorization. The credit processing server **53** verifies the application data by requesting identity information **116** from an identity bureau **56**. The identity bureau provides the requested identity information **118** and, if the provided identity information corresponds to the application data, then the credit processing server **53** requests credit information **108** about the buyer from a credit bureau **58**. However, in one actual embodiment of the present invention, if the application data does not conform to the identity information from the identity bureau **56**, then no virtual payment account is created, and the application is forwarded to customer service for review for possible fraud detection. As noted above, in the actual embodiment of the present invention, the identity bureau **56** is a server provided and maintained by a agency for verifying identity, and the credit bureau **58** is a server provided and administrated by a credit agency for processing credit reports. Hence, the credit processing server **53** requests the desired identity and credit information electronically, e.g., via appropriate database queries, etc., from the identity bureau **56** and credit bureau **58**.

[0073] Returning to the illustrated embodiment, the credit bureau **58** provides the requested credit information **110** to the credit processing server **53** via the connection with the credit processing server **53**. The credit processing server **53** then evaluates the application, identity, and credit information by combining the identity information from the identity bureau and the credit information received from the credit bureau **58** with application data in order to determine a credit score **111**. If the score exceeds a certain threshold, a credit limit is set and the virtual payment account is created **112**. If the score falls below the threshold, a virtual payment account may still be created **112**, however, all purchases must be prepaid, and the account information is forwarded to a customer service representative for review for a possible later grant of credit.

[0074] Once the virtual payment account is created, the credit processing server **53** returns the result of the evaluation **113**, e.g., approval/denial, prepaid account only, credit limit, etc., to the commerce gateway **52**. The commerce gateway then requests **120** that the buyer authenticator **65** on the buyer computer generate a public key encryption key pair **122** comprising a secret key and a public key. The buyer authenticator **65** then submits the public key to the commerce gateway **124**. The commerce gateway **52** digitally signs the public key to generate a digital certificate **126**. As will be appreciated by those of ordinary skill in the art, a digital certificate comprises a public key digitally signed by a trustworthy entity. The commerce gateway **52** sends the digital certificate and an application result page **114** to the buyer computer **50** for display via the buyer computer's Web browser **64**. Finally, the buyer computer stores the digital certificate **128** for use later with the virtual payment account.

[0075] It will be appreciated that the digital certificate may be stored in the memory **63** of the buyer computer **50** or on some form of device capable of interfacing with the buyer computer such as, but not limited to, a secure token, smart card, or as an encrypted file on some other computer readable medium. It will be appreciated by those of ordinary skill in the art that the order of the operations in FIG. **7** may be altered

without substantially affecting the operation of the present invention. For example, the buyer may be notified of the application results before generating the public key encryption pairs.

[0076] FIGS. **8**A-**8**G are exemplary Web pages provided to the buyer by the Web browser **64** of the buyer computer **50** in connection with applying for a virtual payment account as described above. Using the Web page **600** shown in FIG. **8**A, the buyer selects the type of virtual payment account they desire to apply for, e.g., credit or prepaid, and submits the information by clicking "continue." Next, the Web pages **605**, **610**, and **615** shown in FIGS. **8**B-**8**D for the application form are displayed to the buyer via the Web browser **64**. In one actual embodiment of the present invention, the buyer fills out the application form with the appropriate application data on-line. Alternatively, the buyer can request the application on a printed form and submit the printed form via facsimile or regular mail, in which case a customer service representative will enter the information into the account database **97** of the credit processing server **53** via the administrative user computer **54**. The application data includes information such as social security number and income that will be used to determine a credit limit for the buyer. Information entered by the buyer in the application form is also used for demographic purposes. For example, banner advertisements can be displayed via the Web browser **64** on the buyer computer **50** and can be targeted to the buyer based on demographic information, such as the buyer's age and geographic location.

[0077] After the buyer completes the application form contained in the Web pages **605**, **610**, and **615** shown in FIGS. **8**B-**8**D and the application is processed by the credit processing server **53**, a Web page **620** as shown in FIG. **8**E is transferred to and displayed by the buyer computer's Web browser **64**, which notifies the buyer of the results of the application process, i.e., account approval and details of his or her virtual payment account, including the account credit limit. Once the account approval is complete and the account accepted by the buyer, the commerce gateway **52** then transmits the buyer authenticator component **65** (which, as described above, generates a public key encryption key pair) to the buyers computer for installation as shown in FIG. **8**F. FIG. **8**G shows an exemplary Web page **630** that allows the buyer to activate their virtual payment account.

Customizing and Modifying A Virtual Payment Account

[0078] Once a virtual payment account has been approved and a credit limit set as described above, the account can be customized by the buyer. Account information is then stored in the account database **97** of the credit processing server **53**. FIGS. **9**A-**9**C illustrate an exemplary set of Web pages downloaded from the commerce gateway **52** and displayed by the Web browser **64** of the buyer's computer **50** for customizing the buyer's virtual payment account. FIGS. **9**A-**9**B illustrate Web pages **640** and **645** for main account customization. As shown in FIG. **9**A, the buyer may customize his or her virtual payment account contact information and preferences. FIG. **9**B illustrates that the main account holder is able to configure access controls for their account and all sub-accounts as shown in Web page **645**.

[0079] As shown in FIG. **9**C, the buyer may also customize sub-accounts for his or her own use or for use by a business partner, spouse, and/or children. As will be described in more detail below, the buyer may then impose his or her own spending limits on the sub-accounts. In one actual embodiment, reward points accrue in the main account so that the buyer can transfer the reward points to sub-accounts. It will be appreciated that, in other embodiments, reward points could accrue to individual sub-accounts if the buyer so desires. Reward or reward points can later be used, for example, to make a payment for a purchase, to receive seller discounts, to purchase frequent flyer miles, etc. It will be appreciated by those of ordinary skill in the art that reward points can be earned by the buyer and applied to his or her virtual payment account in a myriad of different ways.

[0080] It will also be appreciated that a similar process is performed for a seller to become an authorized or registered seller. In one embodiment, a seller can apply to become a participant by completing an application form on-line. In another embodiment, a seller applies to become a participant of the system using a more traditional manual application procedure. In yet another embodiment, some combination of an on-line and manual process is used. It will be appreciated that if the seller application process is performed in whole or in part on-line, a Web browser component (not shown in FIG. **4**) is used to display Web pages on the seller's computer display **72**. The seller forms a contract with the provider of the commerce gateway **52**. In one exemplary embodiment, this contract includes terms such as the billing period and the fee that will be paid to the commerce gateway provider. Since a seller is selling a product to a buyer who has a virtual payment account, the seller will not have sub-accounts in the same sense that a buyer has sub-accounts. However, a seller selling different types of data can have different accounts. For example, a book store may have a general account and one or more restricted accounts, for example, the restricted accounts may prohibit sales of adult products to minors. This can be in the form of a rating system (e.g., G, PG, PG13, NC17, R, etc.). In a similar manner to the buyer application process, once a seller has been approved and the seller account customized, a digital certificate is installed on the seller's computer **51** to identify the seller as a registered seller in the virtual payment system. The digital certificate is used in combination with a secret key generated by the seller server **51** and a public key generated by the seller server and sent to the gateway **52** to encrypt/decrypt messages for greater security.

[0081] It will be appreciated, as described earlier, that a seller can apply for a "buyer" account. In other words, a seller can purchase products as the owner of a virtual payment account.

Digital Security

[0082] The illustrated embodiment also allows a buyer to create a custom package of sub-accounts. As will be readily recognized by those of ordinary skill in the art, the buyer may be provided with any number, type or combination of sub-accounts depending on the desires of those providing and administrating the virtual payment system of the present invention.

[0083] The buyer can add sub-accounts (e.g., supplemental users, young shoppers, etc.) via the Web pages **650** shown in FIG. **9**C. Sub-accounts can be customized for young shoppers as shown in FIG. **9**C, for example, by setting spending limits for the young shopper and identifying only those seller Web sites from which the young shopper can purchase products.

[0084] As will be described in more detail below, once the virtual payment account has been authorized **114** and customized, a digital certificate is transferred by the commerce gate-

way **52** and installed **128** on the buyer computer **50**. The digital certificate is then used in subsequent transactions as a unique credential to identify the buyer as a registered holder of a virtual payment account. In an actual embodiment of the present invention, a buyer or seller is identified as a registered user of the virtual payment system by the commerce gateway **52** verifying the commerce gateway's digital signature on the digital certificate associated with the buyer's virtual payment account

[0085] It will be appreciated that several levels of security can be imposed on on-line transactions. Moving from the lowest level to the highest level, there can be: (1) no security restrictions imposed; (2) minimal security, such as account name and password verification; (3) intermediate security, such as a digital certificate or secret key; (4) high security, such as a transaction signed with a digital signature using the buyer's secret key; or (5) maximum security, such as a digital signature and additional access controls, such as an account number, a last purchase verification, smart cards, secure tokens or some combination thereof. As will be described later, in the actual embodiment of the virtual payment system described herein, the term "digital certificate" is used to describe the authorization used; however, it will be appreciated that a higher level of security such as a digital signature, or a digital signature with additional access controls may be desired in order to ensure the highest level of security for all parties involved (i.e., the buyer, the seller, the commerce gateway, and the credit processing server) in virtual payment account transactions.

[0086] In one exemplary embodiment of the security transaction, the seller server **51** digitally signs a purchase offer with a certificate issued by the commerce gateway **52** and sends it to the buyer computer **50**; the buyer computer **50** digitally signs the purchase offer with a certificate issued by the commerce gateway **52** and sends it back to the seller server **51**; the seller server **51** then forwards the doubly signed purchase offer to the commerce gateway **52**; the commerce gateway **52** verifies both signatures, and if they are both valid and the transaction is permissible, then signs the doubly signed offer and returns the resulting triply signed purchase offer to the seller server **51**; the seller server verifies the commerce gateway's **52** signature and, if it is valid, then the purchase transaction is complete. In the aforementioned example, the seller server **51** may notify the buyer computer **50** or they may not.

Ordering Products

[0087] Once a buyer has created and customized his or her virtual payment account, he or she can immediately order products via the Internet if he or she was granted credit during the account application process. If, however, the buyer's virtual payment account is only a prepaid account, prepayment must be made before the buyer can order products. In an alternate embodiment, the buyer with only a prepaid account can order products, however, shipment of the product will be held until the prepaid account is sufficiently funded to cover the purchase. More specifically, this would allow any registered buyer to have a form of "digital layaway" and by ordering products directly from the Web site of any registered seller. It will be appreciated that in yet another embodiment, buyer and seller will use the same type of virtual payment accounts and that any buyer can therefore act as a seller and vice versa. Additionally, it will be appreciated that a seller can be an auction Web site, in which a buyer uses his or her virtual payment account to pay for the goods, services and/or content purchased from the auction Web site.

[0088] In one actual embodiment of the present invention depicted in FIGS. **11**A-**11**C, the buyer may "surf the Web" and visit a registered seller's Web site, such as "Virtual Store," **1100** using the Web browser **64**. Once the buyer visits a registered seller's Web site, the buyer may order and pay for products offered from that Web site using his or her virtual payment account. More specifically, a buyer using buyer computer **50** and Web browser **64** may retrieve the Web page **1100** shown in FIG. **11**A from the seller Web site fictitiously known as "Virtual Store." The buyer makes a selection of a particular product **1105** by manipulating a graphics cursor with a pointing device, such as a mouse above the selection **1110** and "single-clicking." It will be appreciated that other pages, for example, a query page in which the buyer requests products by a keyword, may be displayed. It will also be appreciated that the Web page **1100** shown in FIG. **11**A is a simplified example. It is common for a seller site to allow a buyer to select multiple products and place them in a "shopping cart." The buyer can then view the items in the cart and, if desired, remove items from the cart. Once the buyer has selected the desired items for purchase, the buyer indicates a desire to purchase the selected items, for example, by clicking an "OK" or a "Buy" button. In the simplified example shown in FIG. **11**A, the buyer selects an item, such as the Virtual Store Personal Computer **1105** and presses the "Order" button **1110** to initiate the purchase transaction.

[0089] After initiating the purchase transaction, the seller server **51** provides the Web browser **64** of the buyer's computer **50** with the Web page **1150** shown in FIG. **11**B, which requests shipping information **1160**, such as a street address, from the buyer. Additionally the Web Page **1150** includes various payment options, i.e., major credit cards, such as VISA® or MASTERCARD®, with electronic transmission of credit information. In accordance with the present invention, a virtual payment account option is also displayed as a payment option for registered sellers. After entering the shipping and payment information **1160** and selecting the virtual payment option **1155**, the buyer can continue by clicking on the "Purchase" option **1165**. In an actual embodiment of the present invention, the buyer authenticator **65** displays a window **1170** requesting the buyer to select their choice of accounts **1172** along with an authenticating pass phrase **1175**. After selecting an account and entering the correct pass phrase, the buyer clicks "Continue" **1177** to proceed with the purchase. In response, the seller server **51** calculates the total cost of the order, including tax, shipping, and handling, and the buyer is presented with a confirmation screen **1180** as shown in FIG. **11**C. After authorizing the purchase, the buyer may be presented with a payment confirmation screen **1185** as shown in FIG. **11**D. Additionally, the buyer may be presented with an order confirmation screen **1190** as shown in FIG. **11**E.

[0090] FIG. **12** illustrates the logic implemented by the Web browser **64** installed on the buyer computer **50** when the virtual payment account option **1155** is selected. The logic begins in a block **220** and proceeds to a block **222** where a secure connection between the buyer computer **50** and commerce gateway **52** is established. In an actual embodiment of the present invention, the Secure Socket Layer (SSL) protocol is used for establishing a secure connection. SSL uses public key encryption incorporated into a Web browser, such as NETSCAPE NAVIGATOR® Web browser and Netscape's

commerce servers, to secure the information being transferred over the Internet. The logic then proceeds to a block **224** where a buyer authenticator component **65** on the buyer computer **50** is executed. It will be appreciated that the buyer authenticator component **65** can also be included, in part or in whole, in the Web browser **64**. The buyer authenticator component **65** is shown in more detail in FIG. **13** and described next.

[0091] The buyer authenticator **65** determines whether a buyer is a registered holder of a virtual payment account or, put another way, a registered participant in the closed virtual payment system of the present invention. The logic of FIG. **13** begins in a block **243** and proceeds to a block **244**, where an authentication request and container are received from the Web browser **64**. The container includes: transaction information, such as purchase detail; identification of the parties, such as a buyer identification that identifies the buyer, e.g., the digital certificate previously issued to the buyer when he or she created the virtual payment account as described above; and a seller identification, e.g., the digital certificate issued to the seller upon creation of a seller account; and context, such as transaction date and time. It will be appreciated that the container is initially empty, and data is then added to the container by various components. As stated earlier, embodiments of the invention implement the buyer authenticator **65** in the Web browser **64**. In one actual embodiment, the buyer authenticator **65** is an applet operating from within the Web browser **64**.

[0092] Next, in decision block **246**, a test is made to determine if a digital certificate is installed on the buyer computer **50**. The digital certificate may be stored in the buyer computer **50** memory **63** or one some other device associated with the buyer computer such as a secure token, a smart card, or encrypted on some computer readable medium. It will be appreciated that other methods of digital identification can be used. If the digital certificate is installed, the digital certificate identification is inserted into the authentication container and the authentication request and container are returned to the Web browser in blocks **248** and **250**. The container can be any one of a variety of data formats, for example, in one embodiment of the present invention a proprietary protocol is used. In an actual embodiment of a present invention, a public key generated by the buyer's computer and signed by the commerce gateway (thereby forming a digital certificate) is also inserted into the container. The secret key is never transmitted anywhere in the virtual payment system of the present invention. The combination of the secret key and the digital certificate provides a heightened level of security to the buyer authentication process. A digital signature is generally a document that has been encrypted by the secret key of a public key pair. Only the public key of the same key pair will be able to decrypt the document to its original form. This is particularly useful in demonstrating that only the holder of the secret key is able to sign (encrypt) the document. In practical terms, signing a large document using public key cryptography can be very time consuming. Almost equally effective is creating a cryptographic message digest of the document and then encrypting the digest with the secret key. Therefore those of ordinary skill in the art will appreciate that anyone knowing the corresponding public key and the digest algorithm will be able to verify that the message was not altered and that it originated from the holder of the corresponding secret key. It will be appreciated that the digital certificate as used herein refers to an authentication identifier that is recognized by the provider of the virtual payment account that adheres to the provider's non-repudiation purchase policies.

[0093] If, however, in decision block **246** it is determined that a digital certificate is not installed on the buyer computer **50**, the logic proceeds to a decision block **252** where a test is made to determine if "certificate not present" processing should be performed. "Certificate not present" processing allows a buyer to manually enter identification information when a digital certificate is not present. The identification information can include information such as an e-mail address, a password, and personal information, for example, a mortgage payment amount. If the result of decision block **252** is positive, the logic proceeds to an alternate authentication in block **254**. The alternate authentication is shown in more detail in FIG. **14** and described next.

[0094] The logic of FIG. **14** begins at a block **1401** and proceeds to block **1405** where the authorization options are displayed to the buyer. Next, it is determined in a block **1410** if the buyer requested an authorization code as the alternate authorization mechanism. If the buyer did choose to receive an authorization code, then the Web browser **64** on the buyer computer is sent an authorization code entry form in a block **1415**, and the authorization code is sent to an authentication device in a block **1420**. Exemplary authentication devices **2800** or **2900** are shown in FIGS. **28** and **29**, respectively. After receiving the authorization code, the buyer enters the code in the authorization code entry form in a block **1425**.

[0095] If, however, at block **1405** the buyer decides not to request an authorization code, then from block **1410** the logic flows to a block **1450** where an interactive authentication Web form **3000** is sent to the Web browser **64** on the buyer's computer **50**. An exemplary interactive authentication Web form **3000** is shown in FIG. **30**. Next in a block **1455** the buyer completes the interactive authentication Web form **3000**.

[0096] Next, the completed authorization entry form from block **1425** or **1455** is transmitted to the commerce gateway **52** in a block **1430**. The logic then proceeds to a block **1435** where it is determined whether the authentication was successful. If the authentication was successful the logic ends at a block **1498**, returning a successful authentication. If the authentication was unsuccessful the logic ends at a block **1499**, returning an unsuccessful authentication.

[0097] Returning to FIG. **13**, the logic then moves to a block **256** where the information from the alternate authentication process is passed back through the buyer authenticator **65** and the logic ends at block **262**. If there is no digital certificate installed ("No" in decision block **246**) and certificate not present processing is not going to be performed, for example by a user selecting "cancel" **3010** in the certificate not present authorization Web page **3000** shown in FIG. **30** (or "No" in decision block **252**), the buyer likely does not have a virtual payment account. Accordingly, the logic of FIG. **13** proceeds to a decision block **258**, where a test is made to determine if the buyer wishes to apply for a virtual payment account. If the buyer wishes to apply for a virtual payment account, the logic proceeds to a block **260**, in which the buyer is allowed to apply for a virtual payment account as shown in FIG. **15** and described next. Otherwise, the buyer authenticator **65** returns an unsuccessful authorization message to the Web browser **64** in a block **261**, and the logic ends in block **262**.

[0098] FIG. **15** illustrates the logic implemented by the Web browser **64** when a buyer applies for a virtual payment

account. It will be appreciated that applying for a virtual payment account can be invoked by a buyer requesting an account directly from the commerce gateway **52** or by a buyer who is not registered attempting to order a product from a registered seller. In either case, the logic for applying for a virtual payment account via a Web browser **64** begins in a block **270** and proceeds to a block **272**, where a request for an application form is received by the Web browser **64**. Next, in a block **273** the request for an application form is sent to the Web server component **87** of the commerce gateway **52**. The requested application form is then received from the Web server component **87** of the commerce gateway **52** and displayed in the buyer's Web browser in a block **274**.

[0099] Next, in a block **275**, the completed account application form is sent to the commerce gateway **52** and processed by an enrollment server component **89**, as shown in FIG. **16** and described next. In another embodiment, the account application is sent to the transaction server component **84** that handles financial transactions and also handles non-financial transactions, such as enrollment.

[0100] The logic of the enrollment server **89** shown in FIG. **16** begins in a block **280** and proceeds to a block **282** where a completed application form is received from the Web browser. Next, in a block **283** identity information, such as name, employer, current residence, etc., is requested from an identity bureau **56** via the identity bureau adapter **79** whose logic is shown in FIG. **27** and described next.

[0101] Accordingly, the logic of FIG. **27** begins in a block **2705** and proceeds to a block **2710** where the identity request is received. The request is then formatted to be compatible with the particular identity bureau in a block **2715**. Next, the logic proceeds to a block **2720** where the formatted request is then sent to identity bureau **56**. The result of the request is received from the identity bureau in a block **2725**. Next, in a block **2730**, the result is then returned to requester. The logic of FIG. **27** then ends in a block **2735**.

[0102] Returning to FIG. **16**, if in a block **284**, which in this case is the enrollment server **89**, it is determined that the identity information received from the identity bureau **56** via the identity bureau adapter **79** corresponds to the information in the application received in block **282**, then processing continues to a block **285** where the enrollment server requests credit information, such as income, length of time with current employer, length of time at current residence, etc., from a credit bureau **58** via the credit processing server adapter **86**, as shown in FIG. **21** and described later with reference to a purchase authorization request.

[0103] Upon receipt of the credit information, the logic proceeds to a block **286**, where the application is scored based on the identity bureau information and credit bureau information in combination with internal criteria. The internal criteria provide a score for the various pieces of credit information. For example, incomes will be broken down into ranges, with a point value assigned to each range. Similarly, point values will be assigned based on the time the applicant has lived at his or her current residence, etc. The points for each piece of credit information are combined to determine a score for the applicant. The score equates to the credit worthiness of the buyer and is used to determine if the applicant will receive a credit account or, if the score falls in an intermediate range, a prepaid account and, if so, to establish a credit limit for the applicant, i.e., buyer. Next, if the score is above a threshold logic ends with a successful enrollment result returned to the Web browser in a block **288**. However, if the score is below a certain threshold, or if the identity information provided by the identity bureaus **56** does not correspond to that of the buyer's application, then an unsuccessful result is returned in a block **289**. Processing then returns to FIG. **15**.

[0104] In FIG. **15**, once a response is received from the enrollment server **89** a block **265** examines whether an account was created. If it was, a request is sent to the buyer computer **50** to generate a public key encryption pair in block **267** and to submit the public key to the enrollment server **89** on the commerce gateway **52**. The enrollment server then signs the public key to create a digital certificate and returns a successful enrollment Web page **620**, as shown in FIG. **8**E, which is received in a block **276** along with the and the digital certificate in a block **278**. If at block **265** it was determined that an account was not created, then an unsuccessful application Web page is displayed (not shown) at a block **266**. In the case of applying for a virtual payment account, the result page **620** provides details of the new account for the buyer or contains a message informing the buyer that there was an error creating the account. The logic of FIG. **15** of applying for a virtual payment account then ends in a block **279** and processing returns to FIG. **13**.

[0105] Referring again to FIG. **13**, after the buyer has applied for a virtual payment account, the logic returns to decision block **246** where the test to determine if a digital certificate is installed on the buyer computer **50** is repeated. Depending on the results of decision block **246**, either blocks **248-250** or blocks **252-256** are repeated for the recent applicant of a virtual payment account. The logic then ends in a block **262**.

[0106] While the logic of authenticating a buyer as shown in FIG. **13** and described herein uses a digital certificate as the primary means for authenticating a buyer, it will be appreciated that other methods are possible. For example, a lesser level of security could be employed, whereby a user could be required to enter identifying information, such as the information entered in alternate authentication shown in FIG. **14**. Alternatively, a greater degree of security could be employed whereby a digital certificate is required, and "certificate not present" processing is not allowed. Or an even greater level of security could be used requiring a digital signature and other verifying information from the buyer.

[0107] Returning to FIG. **12**, after buyer authentication is completed in block **224**, the logic proceeds to a decision block **226**, where a test is made to determine if the buyer authentication was successful. If not, the logic proceeds to a block **227** where an error message is displayed on the buyer computer **50** by the Web browser **64** notifying the buyer of the failed authentication. The logic of FIG. **12** ends in a block **242**.

[0108] However, if the buyer was successfully authenticated, the logic proceeds to a block **228** where a virtual payment account selection Web page **1170** as shown in FIG. **11**B is displayed. Included in the requested information of the virtual payment account selection Web page **1170** is an identification of the applicable account or sub-account to which the purchase should be applied. Next, in a block **230**, sub-account and password information (used to unlock the buyer's digital certificate) are obtained from the buyer from the information entered in the virtual payment account selection Web page **1170** of FIG. **11**B when the buyer indicates that the information has been entered by selecting "Continue" **1177**. The logic of FIG. **12** then proceeds to a block **232**, where the sub-account and an authentication container are sent to the

commerce gateway **52** and processed by the account identification container generator **88** shown in FIG. **17** and described next.

[0109] The logic of FIG. **17** begins in a block **800** and proceeds to a block **802**, where the sub-account and authentication container are received from Web browser **64** of the buyer computer **50**. The logic then proceeds to a block **804** where an internal account identification associated with authentication container is determined. An empty account identification container is then created in a block **806**. Next, in a block **808** internal account identification and sub-account information are added to the empty account identification container. The logic then proceeds to a block **810** where an internal digital signature is applied to the account identification container. For example, message digest logic can be used by applying an algorithm that takes a variable length message and produces a fixed length digest as output using a one-way hashing algorithm that establishes the message as cryptographically secure. Finally, the account identification container is returned to the Web browser **64** in a block **812**. The logic of FIG. **17** then ends at a block **814** and processing returns to FIG. **12**.

[0110] Returning to FIG. **12**, after the sub-account and authentication container are sent to the commerce gateway **52**, the logic then proceeds to a block **234** where the logic waits to receive the account identification container from the account identification container generator component **88** of the commerce gateway **52**. Once the account identification container is received from the commerce gateway **52**, the logic proceeds to a block **238**, where a purchase request is sent to the commerce engine **75** in the form of a request and account identification container for processing as shown in FIG. **18** and described next.

[0111] The commerce engine **75** is the component of the seller server **51** that determines whether or not the order will be processed and whether the requested product will ultimately be provided to the buyer. It will be appreciated that commerce engines are well known in the art. The commerce engine component **75** used in conjunction with the commerce gateway adapter component **76** allows the virtual payment system of the present invention to expand existing technology that is currently used for traditional credit systems to encompass the virtual payment account of the present system. It will be further appreciated that while the embodiment shown and described modifies the commerce engine to achieve this functionality (which may be possible through existing API calls of the commerce engine), other embodiments are possible. This expanded commerce engine functionality is shown in FIG. **18**.

[0112] The logic of FIG. **18** begins in a block **300** and proceeds to a block **302**, where a purchase request and account identification container are received from the Web browser **64** of the buyer computer **50**. The logic then proceeds to a decision block **304** where a test is made to determine whether the purchase request should be forwarded to the commerce gateway adapter **76**. If the purchase request is to purchase products using a virtual payment account, the request should be forwarded to the commerce gateway adapter **76** for processing in accordance with the virtual payment system of the present invention. In another embodiment, only the request (without the account identification container) is received from the Web browser in block **302** and, if it is determined in decision block **304** that the purchase request should be forwarded to the commerce gateway adapter **76**, the account identification is then obtained from the Web browser **64**. In either case, if it is determined in decision block **304** that the purchase request should be forwarded to the commerce gateway adapter **76**, the logic proceeds to a block **306** where the request is forwarded to the commerce gateway adapter. The commerce gateway adapter **76** is shown in more detail in FIG. **19** and described next.

[0113] The commerce gateway adapter **76** is a component residing on the seller server **51** that allows the seller server to communicate directly with the transaction server component **84** of the commerce gateway **52** in order to expand the authorization function of the commerce engine **75** to include virtual payment account transactions. Accordingly, the logic of FIG. **19** begins in a block **330** and proceeds to a block **332** where the forwarded purchase request and account identification container are received from the commerce engine **75**. Next, in a block **334** the purchase request and account identification container are sent to the transaction server **84** in the form of a transaction request for further processing as shown in FIG. **20** and described next.

[0114] The transaction server component **84** of the commerce gateway **52** is responsible for interfacing with the other components of the system and determining whether or not a requested transaction should be applied to a buyer's virtual payment account. The logic of FIG. **20** begins in a block **350** and proceeds to a block **352** where the transaction request is received. Next, in a block **353** the account identification container is decoded and verified. The origin or source of the request as well as the context, i.e., date and time, of the request are then recorded in memory **83** of the commerce gateway **52** in a block **354**. Next, the logic proceeds to a decision block **356** where a test is made to determine whether the requested transaction is permissible. A variety of factors can be considered in making the determination of whether a requested transaction is permissible. For example, spending limit cannot be exceeded, and user-imposed limitations, such as those put on a young shopper account, e.g., sites from which the young shopper can make purchases and hours during which the young shopper can make purchases as shown in FIG. **9**C, cannot be violated.

[0115] If the transaction is not permissible, the logic proceeds to a block **357** where an impermissible transaction message is sent to the requester (e.g., the commerce gateway adapter **76** in the context of a purchase request). The logic of FIG. **20** then ends in a block **376**. If, however, the transaction is permissible, the logic proceeds from decision block **356** to a block **360**, where the transaction request is sent to a credit processing server adapter **86** for further processing as shown in FIG. **21** and described next.

[0116] The credit processing server adapter **86** is the component residing on the commerce gateway **52** that allows commerce gateway **52** components, such as the transaction server **84** and the enrollment server **89**, to communicate directly with the various sub-systems of the credit processing server **53**, which provide for the application of the requested transaction to the buyer's actual payment account. Accordingly, the logic of FIG. **21** begins in a block **380** and proceeds to a block **382**, where the request is received. For example, a purchase authorization request or a refund request is received from the transaction server **84** and a credit information request is received from the enrollment server **89**. The request is then formatted to be compatible with the appropriate credit processing sub-system, i.e., the account/billing sub-system **94**, the payment processing sub-system **95**, and/or the

account enrollment sub-system **96**, on the credit processing server **53** in a block **384**. Next, the logic proceeds to a block **386** where the formatted request is then sent to credit processing server **53** for processing by the appropriate credit processing sub-system, as shown in FIG. **22** and described next.

[0117] For any credit processing sub-system, the logic of FIG. **22** begins in a block **390** and proceeds to a block **392** where the transaction request is received from the credit processing server adapter **86**. Next, account data and sub-account data are retrieved in blocks **394** and **396**, respectively, from the appropriate database, e.g., account database **97** and financial database **98**. Standard credit transaction processing is then performed in a block **398**. Examples of standard transactions for the account/billing sub-system **94** include: creating and maintaining accounts, including holding account information and account holder information, such as name and address; calculating interest; calculating minimum monthly payments; generating electronic monthly statements; and calculating other charges, known as discounts. The discount is the portion of the transaction amount that will go to the provider of the commerce gateway **52** and can be determined on a fixed amount per transaction basis or a percentage of transaction amount basis. Examples of standard transactions for the payment processing sub-system **95** include collecting payments from buyers and applying the payments to the buyer's account and transferring funds between sellers and buyer, for example, by interfacing with financial institutions **59** for ACH transactions. Examples of standard transactions for the account enrollment sub-system include: obtaining credit information from credit bureaus; providing the credit information to the commerce gateway **52** for scoring; determining a credit score based on the credit information, and providing the score to the commerce gateway; and providing scoring information to the account/billing sub-system **94** for account creation.

[0118] The logic then proceeds to a block **399** where necessary account adjustments are applied, if applicable. For example, the account balance will be reduced by the amount of an authorized purchase transaction. In one embodiment of the present invention, reward points are accrued at the time of purchase but committed later, for example, during the periodic, e.g., monthly, statement preparation process. Alternatively, reward points may not accrue until payment is made for the product to which the points are attributed. Next, the transaction result, such as the credit information or the purchase authorization, is sent to the credit processing server adapter **86** in a block **400**. The logic of FIG. **22** then ends in a block **402** and processing returns to FIG. **21**.

[0119] Returning to FIG. **21**, the result of the transaction request is received from the credit processing sub-system **94**, **95**, or **96** in a block **387**. Next, in a block **388**, the result is then returned to requester, e.g., the result of a purchase authorization request is returned to the transaction server **84** and credit information, for example, a credit limit, is returned to the enrollment server **89** in response to request for a credit information request to be used for establishing a buyer's account. The logic of FIG. **21** then ends in a block **389** and processing returns to the requester, e.g., transaction server **84** (FIG. **20**) or enrollment server **89** (FIG. **16**).

[0120] Returning to FIG. **20**, once the transaction server receives the response to its transaction request, e.g., authorization result of a purchase request, from the credit processing adapter in a block **363**, the logic proceeds to a block **364** where the transaction record, for example, purchase information including amount of purchase, is stored in memory **83** of the commerce gateway **52**. The logic then proceeds to a decision block **366** where a test is made to determine if the transaction was successfully processed. If so, the logic proceeds to a block **370** where a transaction response with a valid status is then sent to the requester (e.g., the commerce gateway adapter **76** or the Web browser **64**, whichever the case may be). If the transaction was not successfully processed, the logic proceeds from decision block **366** to a block **374** where a transaction response with an error status is then returned to the requester in a block **376**.

[0121] After a valid transaction response **370**, an error transaction response **374** or an impermissible transaction response **357** is sent to the requester, the logic of FIG. **20** ends in block **376**, and processing returns to the requester. In the case of a purchase request, the requester is the commerce gateway adapter **76**. In one exemplary embodiment, a record of all transactions is stored in the financial database **98**.

[0122] Returning to FIG. **19**, after the response to the purchase request made by the commerce gateway adapter **76** is received from the transaction server in a block **336**, the logic proceeds to a block **338** where the response including the transaction status is formatted to be compatible with the commerce engine **75**. The formatted response is then forwarded to the commerce engine in a block **340**. The logic of FIG. **19** then ends in a block **342** and processing returns to the commerce engine **75** in FIG. **18**.

[0123] Returning to FIG. **18**, once a response is received by the commerce engine **75** from the commerce gateway adapter **86** in a block **308**, the authorized and ordered product is shipped to the buyer in a block **310**. It will be appreciated by those of ordinary skill in the art that if the ordered product is capable of being downloaded, e.g., the product is an electronically stored good, a URL for a premium content Web site, etc., the product will simply be transferred by the seller server **51** to the buyer computer **50**. Otherwise, the product will be shipped or provided by more traditional methods, e.g., regular mail, hand delivery, etc. Once shipment is complete, the logic then proceeds to a block **312** where a settlement request is sent to the commerce gateway **52** in order to initiate movement of funds. In an actual embodiment of the present invention, the seller submits the transaction into a settlement batch for payment when the settlement batch for that seller is next processed. The timing of the processing could be that night or at a later date based on the contract, i.e., terms of the purchase transaction. FIG. **41** illustrates an exemplary Web page **4100** for designate when batches should be processed. Settlement transactions are described in FIG. **24** in more detail below with reference to FIG. **24**.

[0124] Returning to FIG. **18**, in a block **314**, a response confirming fulfillment of the order is sent to the Web browser **64** of the buyer's computer **50**. The logic of FIG. **18** then ends in a block **324**.

[0125] However, if at decision block **304**, it is determined that the purchase request should not be forwarded to the commerce gateway **52**; the logic proceeds to a block **316** where standard commerce engine processing is performed. More specifically, in block **316** traditional credit or debit card authorization is performed, such as approval or denial for the use of a credit card, e.g., VISA® or MASTERCARD®, for the specified purchase amount. Next, the authorized goods are shipped in a block **318**. The logic then proceeds to a block **320** where a settlement request is sent to the traditional credit

provider, e.g., VISA® or MASTERCARD®. A response confirming fulfillment of the order is then sent to the Web browser **64** of the buyer computer **50** in a block **322**. The logic of FIG. **18** then ends in block **324** and processing returns to FIG. **12**.

[0126] Returning to FIG. **12**, once the Web browser **64** of the buyer computer **50** receives a response to its purchase request in a block **240**, the logic proceeds to a block **241** where an order confirmation Web page **1190** is displayed as shown in FIG. **11**E. The logic of FIG. **12** then ends in block **242**.

[0127] FIG. **23** is a diagram illustrating the actions taken by the buyer's computer **50**, the seller server **51** and the commerce gateway **52** for ordering products using a virtual payment account system. This diagram presents a high-level view of the detailed processing shown in the flow charts described above. In response to an inquiry into purchasing a product **2305**, a seller returns a purchase offer **2310** to the buyer's computer **50**. At this point, the buyer has the option of beginning the purchasing process as shown in FIG. **12**. To continue the buyer authenticator **65** checks to see which credentials, e.g. certificates, are available to the buyer and selects all available credentials to be used by the commerce gateway **2315** to authenticate the buyer. The buyer computer **50** then requests a list of all accounts or sub-accounts **2320** for these credentials from the commerce gateway **52**. The commerce gateway **52** returns only those accounts that are usable by the buyer **2325** using the selected credentials. The buyer computer **50** then generates a purchase confirmation **2330** using one of the accounts on the list returned from the commerce gateway **52**. Buyer computer **50** then sends the purchase confirmation **2335** to the seller server **51**. The seller server **51** requests authorization **2340** from the commerce gateway to verify that the purchase confirmation is valid. The commerce gateway then returns an authorization **2350** that the purchase confirmation is valid. The seller server **51** may then notify **2355** the buyer computer **50** that the purchase confirmation was authorized. The seller server then prepares the purchase for delivery **2360**. At this point, the seller may request a settlement transaction **2365** from the commerce gateway **52**, which would then provide a settlement transaction **2370** back to the seller server **51**. The seller server **51** may then notify **2375** the buyer computer **50** of delivery details. Finally, the good(s) or service(s) that the buyer purchased are delivered **2380**.

[0128] If the seller is an auction Web site, the authorization **2340** sent by the commerce gateway **52** to the seller server **51** includes information such as a buyer account identification, a seller identification, a seller sale offering, a buyer authentication, a seller authentication, and a master identification, i.e., identification of the commerce gateway **52** provider. Particular to this type of response is an expiration date/time that is used to signal the shorter of the maximum times that the buyer and the seller are willing to "reserve" funds associated with this transaction. If the transaction, i.e., settlement request **2365**, is not received by the commerce gateway **52** before the expiration date/time of the transaction, the products and/or funds will be released back to their owners. At a later time, once the buyer has committed to the purchase, the buyer releases an authorization to the provider of the commerce gateway **52** knowing that the seller has proven ability to ship the products on demand without delay. This initiates the actual settlement of funds and triggers payment to the seller in the next settlement batch, without any further interaction with the seller. This payment method supports buyer-initiated, pre-approved purchases with expiration date/time, such as auction and gift-certificate purchases.

[0129] It will be appreciated that FIG. **23** illustrates processing of a valid purchase transaction. If there is an error at any time during the processing, e.g., buyer is not authorized because he or she is not a registered buyer, has exceeded his or her spending limit, etc., processing will terminate after an appropriate error response has been returned to the buyer computer **50** for display to the buyer via the Web browser **64**.

Settlement Transaction

[0130] When a seller establishes a seller account, a contract is formed defining the relationship between the seller and the commerce gateway provider. That contract defines the terms, such as when payments will be funded and what fee shall be given to the commerce gateway provider. The commerce gateway fee can be a per transaction fee or a percentage fee based on the amount of a transaction. The logic for settlement transactions for a virtual payment account is similar to the logic used for processing standard credit card settlement transactions. After the seller ships the product, the seller sends a settlement transaction to the commerce gateway **52** as shown in FIG. **24**. It will be appreciated that the logic performed by the seller server **51** can be performed by the commerce engine component **75** or some other component, for example, a Web browser (not shown) residing on the seller server **51**.

[0131] FIG. **24** illustrates the logic implemented by seller server **51** when the seller wishes to perform a settlement transaction. The logic begins in a block **530** and proceeds to a block **532** where a secure connection between the seller computer **51** and commerce gateway **52** is established using the same logic shown and described with reference to the buyer in block **222** of FIG. **12**. The logic then proceeds to a block **534** where the seller authenticator process is run. The seller authenticator process is similar to the buyer authenticator process shown in FIG. **13** and described above. Next, in a decision block **536** a test is made to determine if the seller is a registered participant (i.e., seller's digital certificate was issued by the commerce gateway provider, seller's digital certificate has not expired and seller's digital certificate has not been revoked). If not, the logic proceeds to a block **538** where a seller authentication error message is displayed on the seller server display **72**, for example, via a Web browser. The logic of FIG. **24** then ends in a block **548**.

[0132] If the seller authenticator process is successful, the logic proceeds from decision block **536** to a block **544** where a settlement request is sent to the transaction server **84** on the commerce gateway **52**. As shown and described in FIG. **25**, the transaction server **84** forwards the request to the credit processing server adapter **86**, which in turn forwards the transaction request to the appropriate credit processing subsystem. In the case of a settlement transaction request, the payment processing sub-system **95** processes the transaction. The payment processing sub-system forwards the settlement request to the financial institution **59**. The financial institution funds the transactions into the commerce gateway provider's account. The commerce gateway provider takes its percentage and pays the sellers their portion. The financial institution **59** waits for their billing cycle, e.g., monthly, and then charges the buyers for their purchases plus interest charges. The financial institution waits for the buyer payments. If the buyer does not pay, standard late payment processing, such as late notices, finance charges, etc. is performed.

[0133] The logic of FIG. **25** begins in a block **2505** and proceeds to a block **2510** where the settlement request is received. The origin or source of the settlement request as well as the context, i.e., date and time, of the request are then recorded in memory **83** of the commerce gateway **52** in a block **2515**. Next, the logic proceeds to a decision block **2520** where a test is made to determine whether the requested settlement is permissible. A variety of factors can be considered in making the determination of whether a requested settlement is permissible. Some factors might include a settlement request for a transaction that did not have a purchase confirmation from a buyer, that had a purchase confirmation from a buyer whose account did not hold sufficient funds, for an auction settlement whose time had expired or whose credentials were no longer valid. It will be appreciated that yet other factors may cause a settlement transaction to be impermissible. If the transaction is not permissible, the logic proceeds to a block **2560** where an impermissible settlement request message is sent to the requester, i.e., the seller, in this case. If, however, the transaction is permissible, the logic proceeds from decision block **2520** to a block **2525** where the transaction request is sent to a credit processing server adapter **86** for further processing as shown in FIG. **21** and described above. Continuing in FIG. **20**, once the transaction server receives the response to its transaction request, e.g., authorization result of a settlement request, from the credit processing adapter in a block **2530**, the logic proceeds to a block **2535** where a transaction record, for example purchase information including amount of purchase, is stored in memory **83** of the commerce gateway **52**. The logic then proceeds to a decision block **2540**, where a test is made to determine if the transaction was successfully processed. If so, the logic proceeds to a block **2545** where a transaction response with a valid status is then sent to the requester, i.e., the seller in this case. If the transaction was not successfully processed, the logic proceeds from decision block **2540** to a block **2555** where a transaction response with an error status is then returned to the requester.

[0134] After a valid transaction response **2545**, an error transaction response **2555**, or an impermissible transaction response **2560** is sent to the requester, the logic of FIG. **25** ends in block **2550** and processing returns to the requester.

[0135] Referring back to FIG. **24**, after the transaction server **84** has processed the settlement transaction and provided the results of the settlement transaction to the seller's computer **51**, the result of the settlement transaction is displayed on the seller's display **73**, for example, via the seller server's Web browser. The logic of FIG. **24** then ends in block **548**.

Refund Transaction

[0136] FIG. **26** illustrates the logic implemented by the present invention when a refund transaction is initiated, for example, when a buyer disputes a charge on his or her virtual payment account. As with any payment dispute, it must be determined whether the buyer will receive all or a portion of the disputed amount. This process is external to the virtual payment system of the present invention. The determination of whether the dispute has merit is determined by the seller. If the seller determines that the dispute has merit, the seller notifies a customer service representative and a refund transaction is initiated. In the embodiment shown in FIG. **26** and described herein, if it is determined that an amount disputed by a buyer is subject to a refund, a customer service representative initiates the refund, or chargeback transaction via the administrative computer **54** shown in FIG. **2**. In one actual embodiment, the administrative computer is a "dumb terminal" by which the customer service representative enters information directly into the transaction server **84** on the commerce gateway **52**. In another embodiment, the administrative computer may have a Web browser that allows the administrator to enter the information using Web pages available only on the LAN **44** behind the firewall **55**, i.e., the buyer and seller do not have access to these administrative Web pages.

[0137] Referring to FIG. **26**, the logic begins in a block **550** and proceeds to a block **552** where the refund information including account, sub-account and amount is obtained. The refund transaction information is then sent to the transaction server **84** by the administrative computer **54** in a block **554** in the form of a refund request. Transaction server **84** processing is shown and described with reference to FIG. **20**.

[0138] As also noted above, in processing the refund request, the transaction server **84** will forward a transaction request to the credit processing server **53** for processing by the account/billing sub-system **94** as shown in FIG. **22**. A refund applied to a buyer's virtual payment account causes the buyer's balance to decrease by the amount of the payment. Still referring to FIG. **26**, after the transaction server **84** has processed the refund transaction, the result of the transaction processing is received and displayed by the administrative computer **54**. The logic of FIG. **26** then ends in a block **558**. Unlike the purchase transaction, the refund transaction is not initiated by the buyer via the Web browser **64**; therefore, the buyer is notified by other means, for example by sending an e-mail message to the buyer's computer **50**. It will also be appreciated that in yet other embodiments of the present invention, the seller server **51** may initiate the refund request as opposed to the administrative computer **54**.

Buyer Account Management

[0139] Other transactions normally associated with an account such as a standard credit card account are also applicable to the virtual payment account of the present invention. FIGS. **10A-10C** illustrate some examples of Web pages used by a buyer with a virtual payment account. Processing of these transactions is similar to other transaction processing as illustrated in flow diagrams and described above, and therefore will not be discussed in further detail herein. FIG. **10A** illustrates a Web page **660** containing details of a primary account **632** along with sub-accounts **634**. FIG. **10B** illustrates an exemplary Web page **665** summarizing the sub-accounts for a master account **634**. FIG. **10C** illustrates a transaction summary Web page **670** for the sub-accounts for a given master account.

Seller Reports

[0140] It is often desirable for seller's to have detailed reports available to judge the current state of their business. Accordingly, the present invention maintains records of transactions in readily retrievable formats. It is also desirable that competitors not have access to the same reports on the details of a seller's business. Accordingly, the present invention provides for secure authenticated access to a seller's reports. FIG. **42** illustrates the logic for generating seller reports. The logic starts at a block **4201** and proceeds to a block **4210** that establishes a secure connection between the

seller computer **51** and the commerce gateway **52**. The logic then proceeds to a block **4215** where the seller is authenticated much as the buyer authenticator illustrated in FIG. **13**. The flow continues to a block **4220** where a test is performed to see if the seller has been authenticated. If the authentication was successful, the logic continues to a block **4225** where the seller requests the transaction server **84** to generate a report. At a block **4230** the transaction server retrieves relevant information and generates a report, which in a block **4235** is received by the seller computer for viewing by the seller. The logic ends in a block **4299**.

[0141] In one actual embodiment of the present invention, the commerce gateway **52** requests report information from the credit processing server **53**, in particular from the financial database **98** stored on the credit processing server. It will be appreciated by those of ordinary skill in the art, that a financial database may be used to store information for report generation, yet may also store information relevant for other purposes.

[0142] FIGS. **31**, **33**, **35**, **37**, and **39** illustrate exemplary Web pages **3100**, **3300**, **3500**, **3700** and **3900** illustrating exemplary reports available to a seller. FIG. **31** shows an exemplary Web page **3100** with a graph charting the number of sales occurring each month during a year-long period. FIG. **33** shows an exemplary Web page **3300** with a table indicating the status and information on particular orders received. FIG. **35** shows an exemplary Web page **3500** with a table listing transactions that have already been processed for each order, and the result of that processing. FIG. **37** shows an exemplary Web page **3700** with a table listing item sales and along with relevant statistics such as number of units sold, what percentage of units have been sold, and what percent of overall sales does that item account for. FIG. **39** shows an exemplary Web page **3900** with a table listing transactions that have yet to be processed and are still wait for the next batch of transaction to be run.

[0143] FIGS. **32**, **34**, **36**, **38** and **40** illustrate exemplary Web page **3200**, **3400**, **3600**, **3800** and **4000** for customizing seller reports.

[0144] While the preferred embodiment of the invention has been illustrated and described, it will be appreciated that various changes can be made therein without departing from the spirit and scope of the invention. For example, it will also be appreciated that there are other transactions applicable to a virtual payment account of the present invention, e.g., account closure, credit limit modification, overdue account notification, etc. It will be appreciated that these transactions can be initiated by various components of the system, for example a financial institution may institute a change in a credit limit by sending a request to one of the sub-systems on the credit processing server. One of ordinary skill in the art will recognize that the requests for such transactions are processed by the virtual payment system of the present invention in a manner similar to the processing of the purchase settlement, and refund transactions described in detail above.

1. A method for purchasing a product from a seller computer using a virtual payment account associated with a buyer computer, the method comprising:

in response to receiving a purchase request from a buyer computer to purchase a product from a seller computer, the purchase request identifying a virtual payment account as a payment source for said products, transmitting an authentication request from the buyer computer to a commerce gateway;

determining at the commerce gateway whether the virtual payment account is associated with the buyer computer;

transmitting an account identification container to the buyer computer in response to determining that the buyer computer is associated with a valid virtual payment account;

transmitting the purchase request, including the account identification container, from the buyer computer to the seller computer;

transmitting the purchase request from the seller computer to the commerce gateway;

receiving the purchase request at the commerce gateway and determining whether said virtual payment account may be used to pay for the product;

in response to determining that the virtual payment account may be used to pay for the product, transmitting a valid transaction authorization from the commerce gateway to the seller computer and the buyer computer;

charging the virtual payment account for a cost associated with the product; and

providing the product to a buyer associated with the buyer computer.

2. The method of claim **1**, wherein the virtual payment account comprises a credit account.

3. The method of claim **1**, wherein the virtual payment account comprises a pre-paid account.

4. The method of claim **1**, wherein determining whether the virtual payment account may be used to pay for the product comprises determining whether a spending limit has been exceeded.

5. The method of claim **4**, wherein the virtual payment account comprises a credit account.

6. The method of claim **4**, wherein the virtual payment account comprises a pre-paid account.

7. The method of claim **1**, wherein said virtual payment account comprises a main account and at least one sub-account.

8. The method of claim **7**, wherein the at least one sub-account comprises a credit account.

9. The method of claim **7**, wherein the at least one sub-account comprises a pre-paid account.

10. The method of claim **7**, wherein determining whether the virtual payment account may be used to pay for the product comprises determining whether a spending limit set for the at least one sub-account has been exceeded.

11. The method of claim **10**, wherein the at least one sub-account comprises a credit account.

12. The method of claim **10**, wherein the at least one sub-account comprises a pre-paid account.

13. The method of claim **7**, wherein charging said virtual payment account for a cost associated with said product comprises charging said at least one sub-account for a cost associated with said product.

14. The method of claim **8**, wherein the at least one sub-account comprises a credit account.

15. The method of claim **8**, wherein the at least one sub-account comprises a pre-paid account.

16. The method of claim **8**, wherein determining whether the virtual payment account may be used to pay for said product comprises determining whether a spending limit set for the at least one sub-account has been exceeded.

17. The method of claim **16**, wherein the at least one sub-account comprises a credit account.

18. The method of claim **16**, wherein the at least one sub-account comprises a pre-paid account.

19. The method of claim **13**, further comprising:

determining whether said sub-account is authorized to receive a charge from the seller computer; and

charging said sub-account for a cost associated with said product in response to determining that said sub-account is authorized to receive a charge from the seller computer.

20. The method of claim **19**, wherein determining whether the virtual payment account may be used to pay for said product comprises determining whether a spending limit set for the at least one sub-account has been exceeded.

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