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Talati et al.

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[54] **METHOD AND APPARATUS FOR ELECTRONIC COMMERCE**

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[51] **Int. Cl.**[6] **G06F 17/60**

[52] **U.S. Cl.** **705/26**; 705/40; 380/23; 380/24

[58] **Field of Search** 705/26, 40; 380/23, 380/24; 395/226, 200.33, 186, 187, 188

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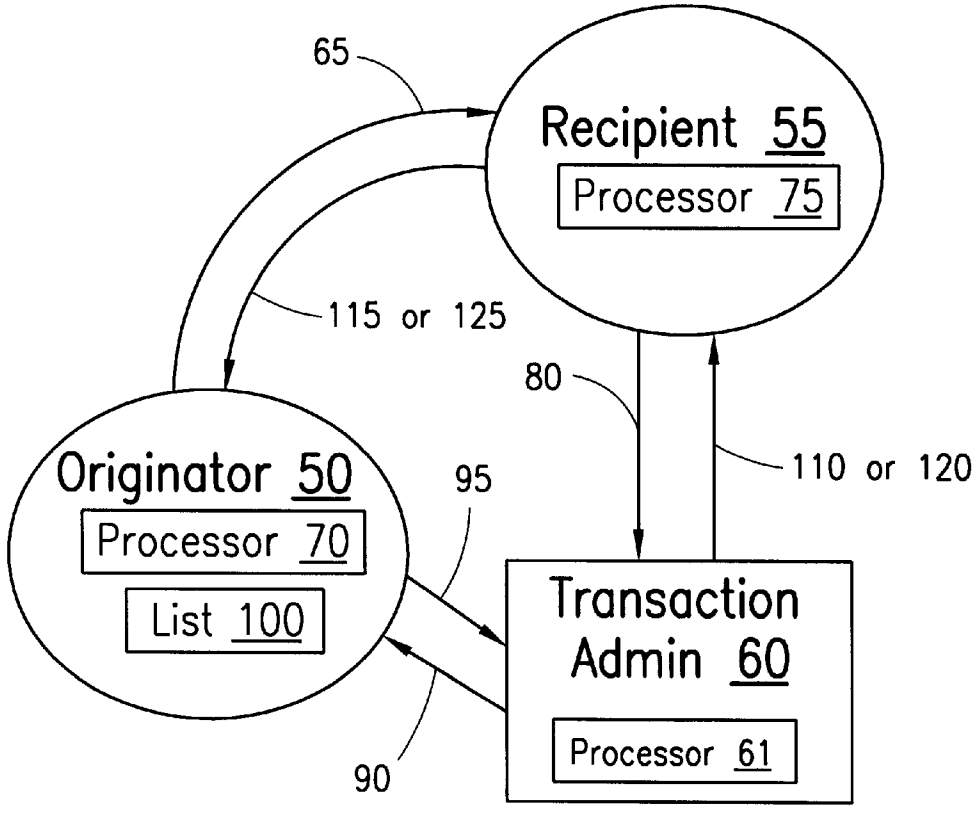
Assistant Examiner—Romain Jeanty
Attorney, Agent, or Firm—Jenkens & Gilchrist, P.C.

[57] **ABSTRACT**

A method for providing validated electronic commerce transactions is disclosed. A transaction order generated by a purchaser has a unique transaction identifier associated therewith and the purchase order is transmitted to a merchant and then to a transaction administrator. The transaction administrator contacts the original purchaser and provides the generated unique transaction identifier to confirm whether or not the transaction order was initially provided by the purchaser. Upon verification of origination of the transaction order by the purchaser and other transaction information, the transaction administrator notifies the merchant and the transaction may be completed.

52 Claims, 11 Drawing Sheets



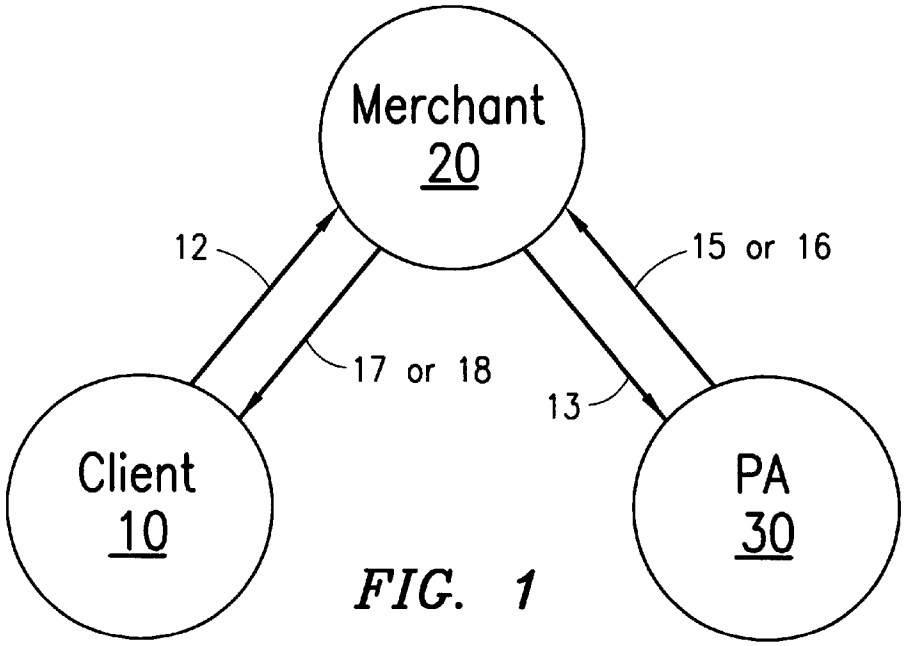

Merchant
20
12
15 or 16
17 or 18
13
Client
10
PA
30

FIG. 1

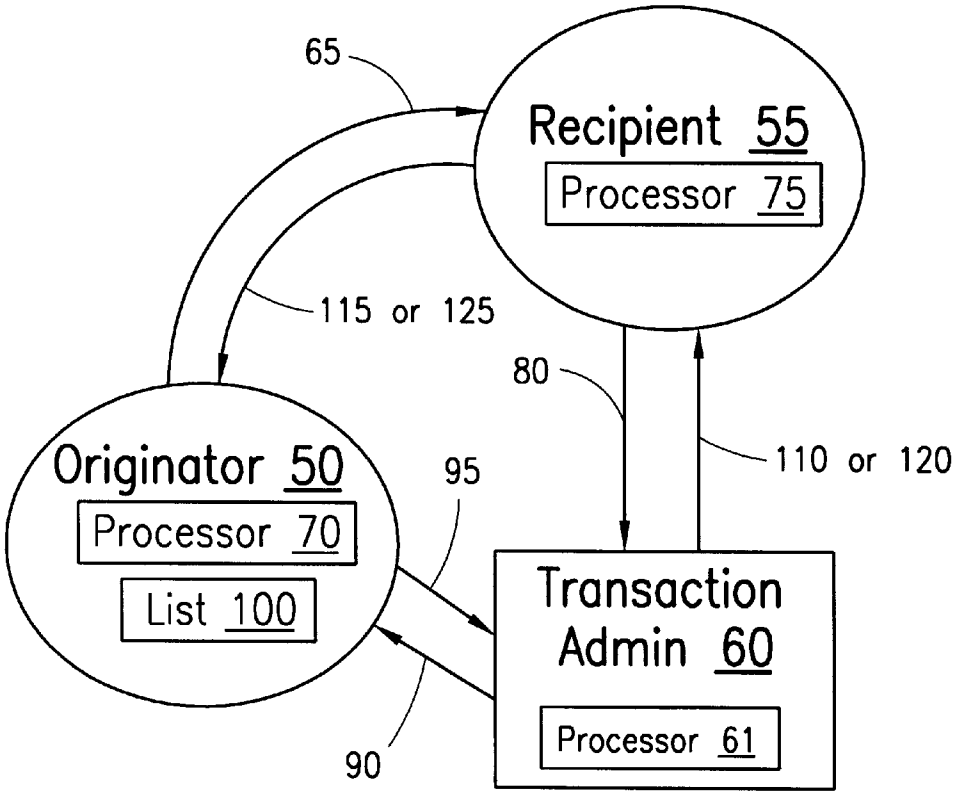

65
Recipient 55
Processor 75
115 or 125
80
110 or 120
Originator 50
Processor 70
List 100
95
Transaction
Admin 60
Processor 61
90

FIG. 3

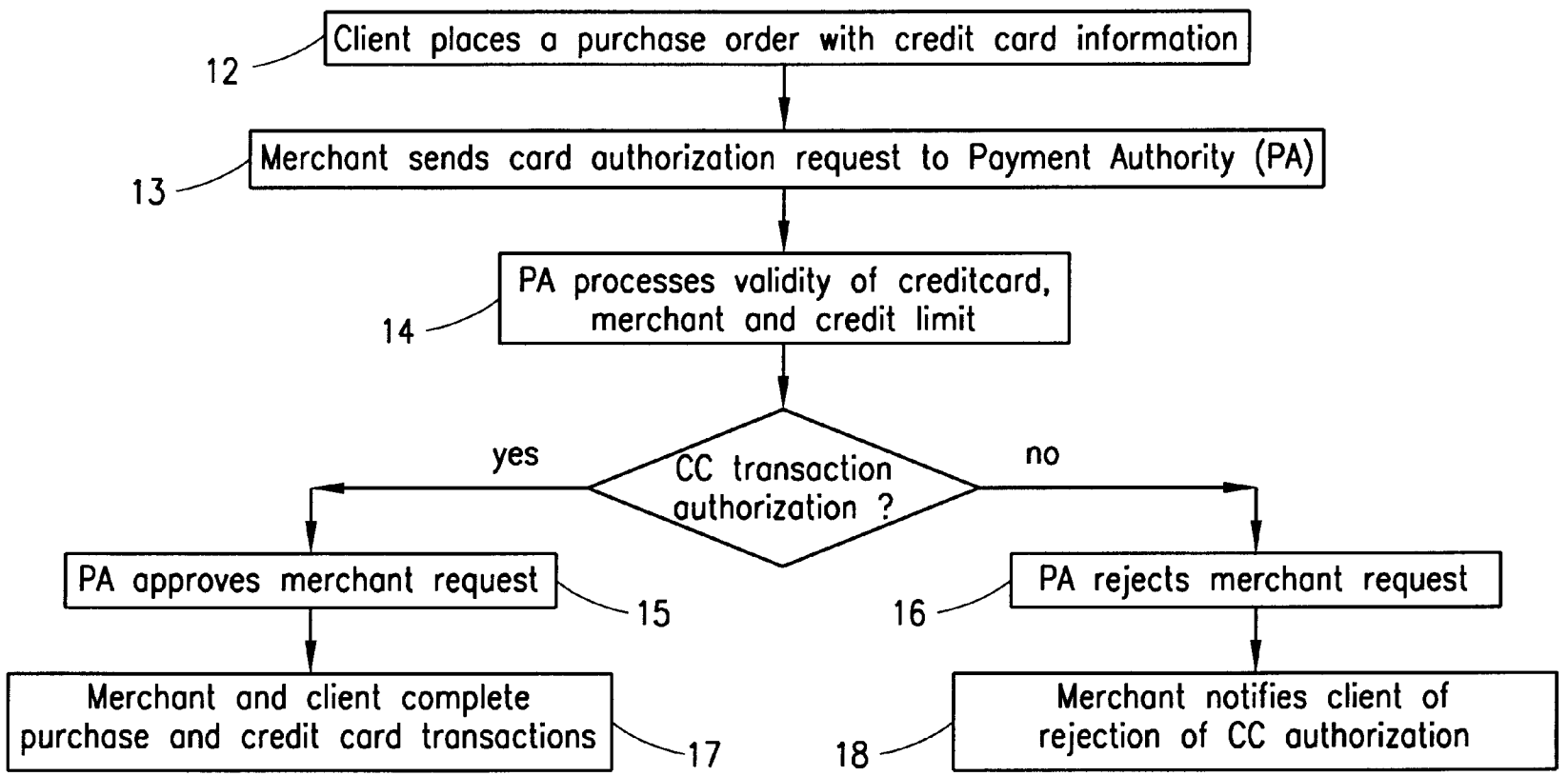

Client places a purchase order with credit card information
12
Merchant sends card authorization request to Payment Authority (PA)
13
PA processes validity of creditcard, merchant and credit limit
14
CC transaction authorization ?
yes
no
PA approves merchant request
15
PA rejects merchant request
16
Merchant and client complete purchase and credit card transactions
17
Merchant notifies client of rejection of CC authorization
18

FIG. 2

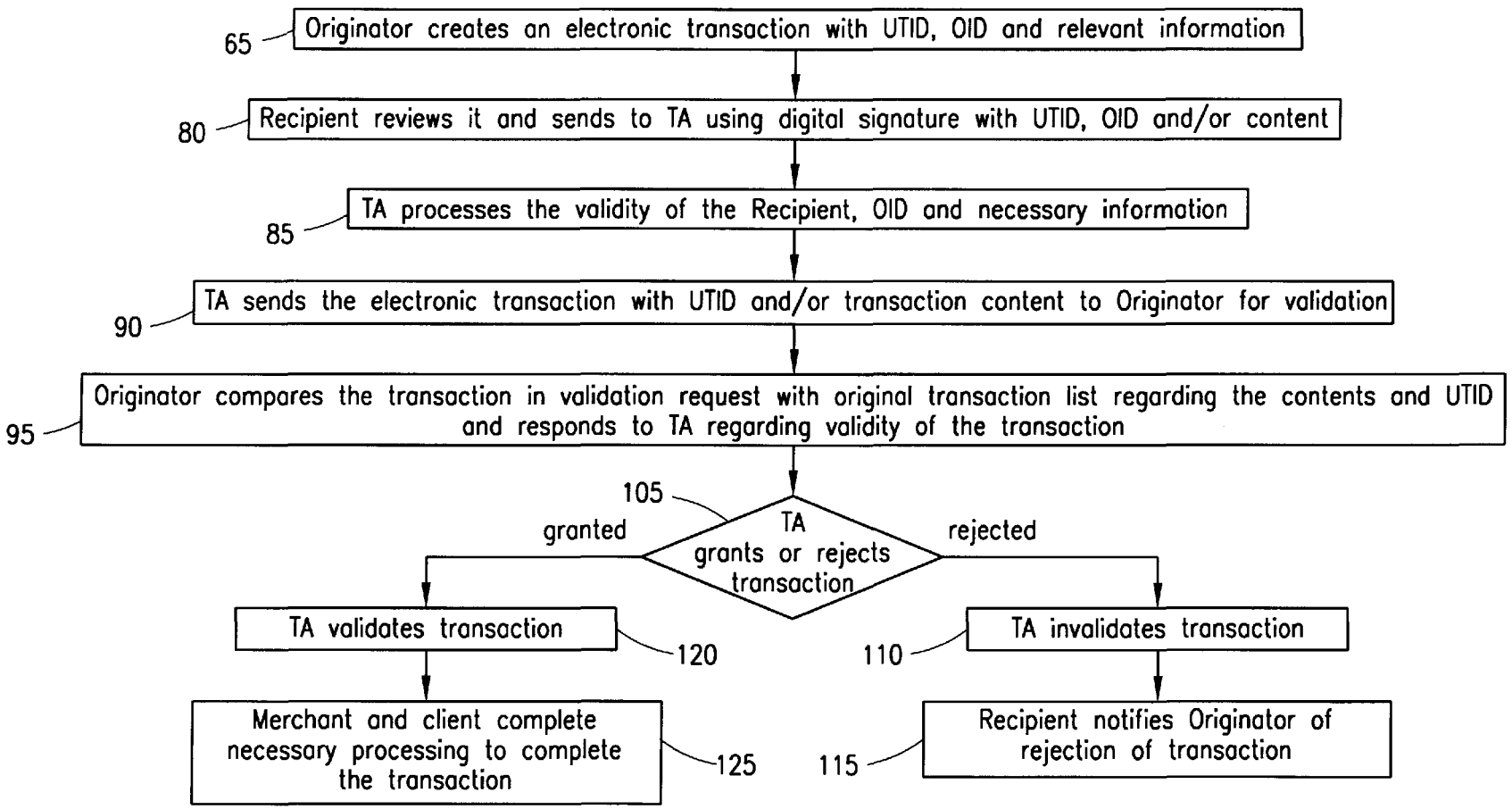

65
Originator creates an electronic transaction with UTID, OID and relevant information
80
Recipient reviews it and sends to TA using digital signature with UTID, OID and/or content
85
TA processes the validity of the Recipient, OID and necessary information
90
TA sends the electronic transaction with UTID and/or transaction content to Originator for validation
95
Originator compares the transaction in validation request with original transaction list regarding the contents and UTID and responds to TA regarding validity of the transaction
105
TA grants or rejects transaction
granted
rejected
TA validates transaction
120
TA invalidates transaction
110
Merchant and client complete necessary processing to complete the transaction
125
Recipient notifies Originator of rejection of transaction
115

FIG. 4

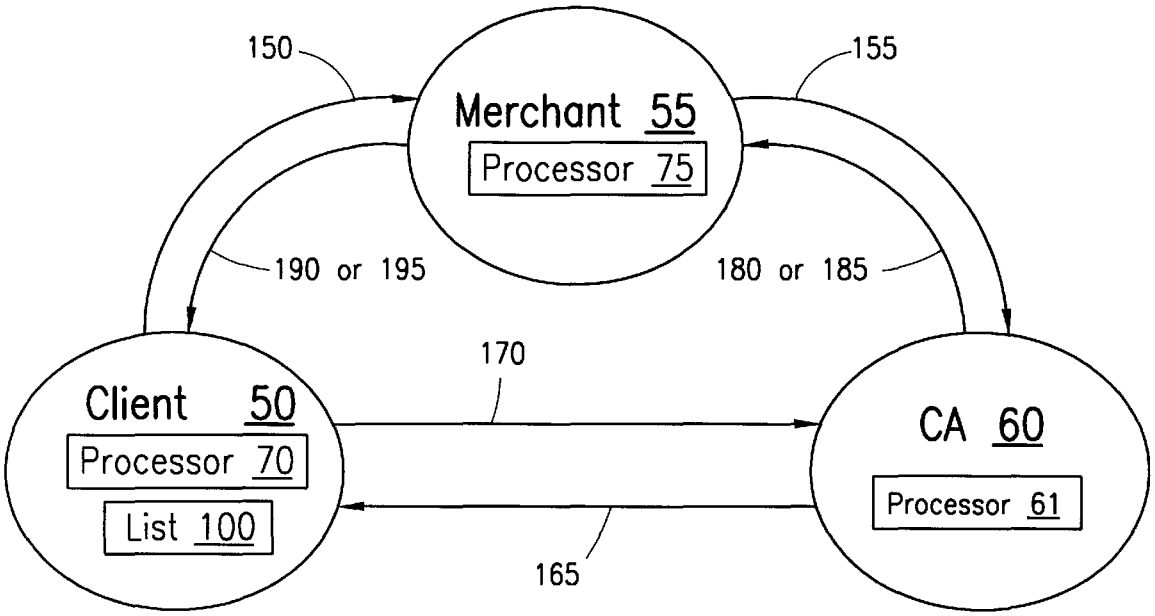

150
155
Merchant 55
Processor 75
190 or 195
180 or 185
170
Client 50
Processor 70
List 100
CA 60
Processor 61
165

FIG. 5

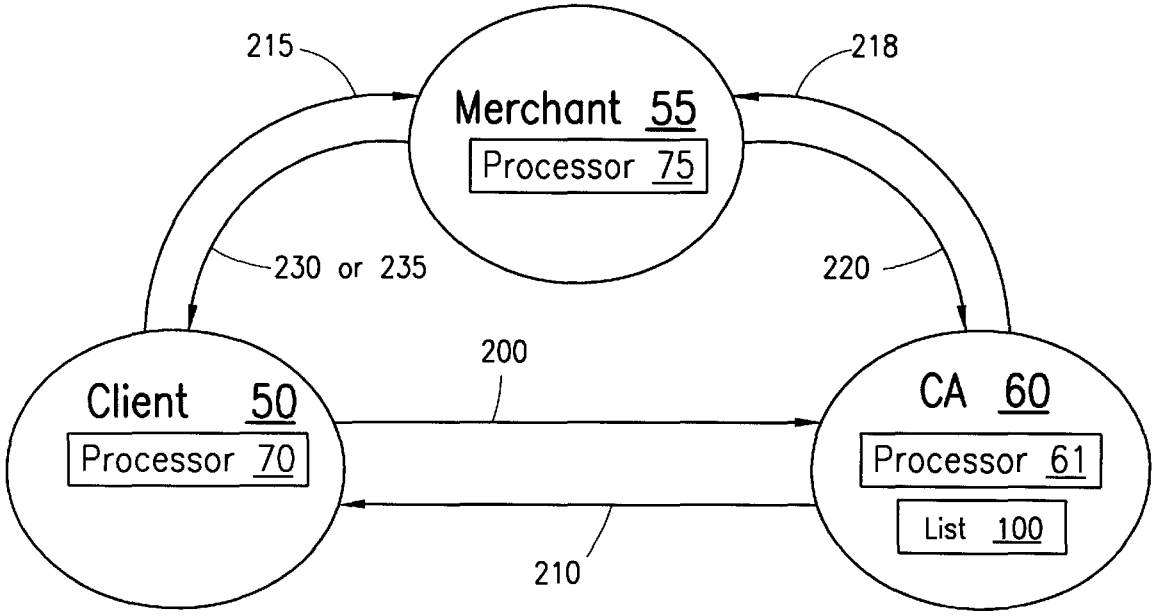

215
218
Merchant 55
Processor 75
230 or 235
220
200
Client 50
Processor 70
CA 60
Processor 61
List 100
210

FIG. 7

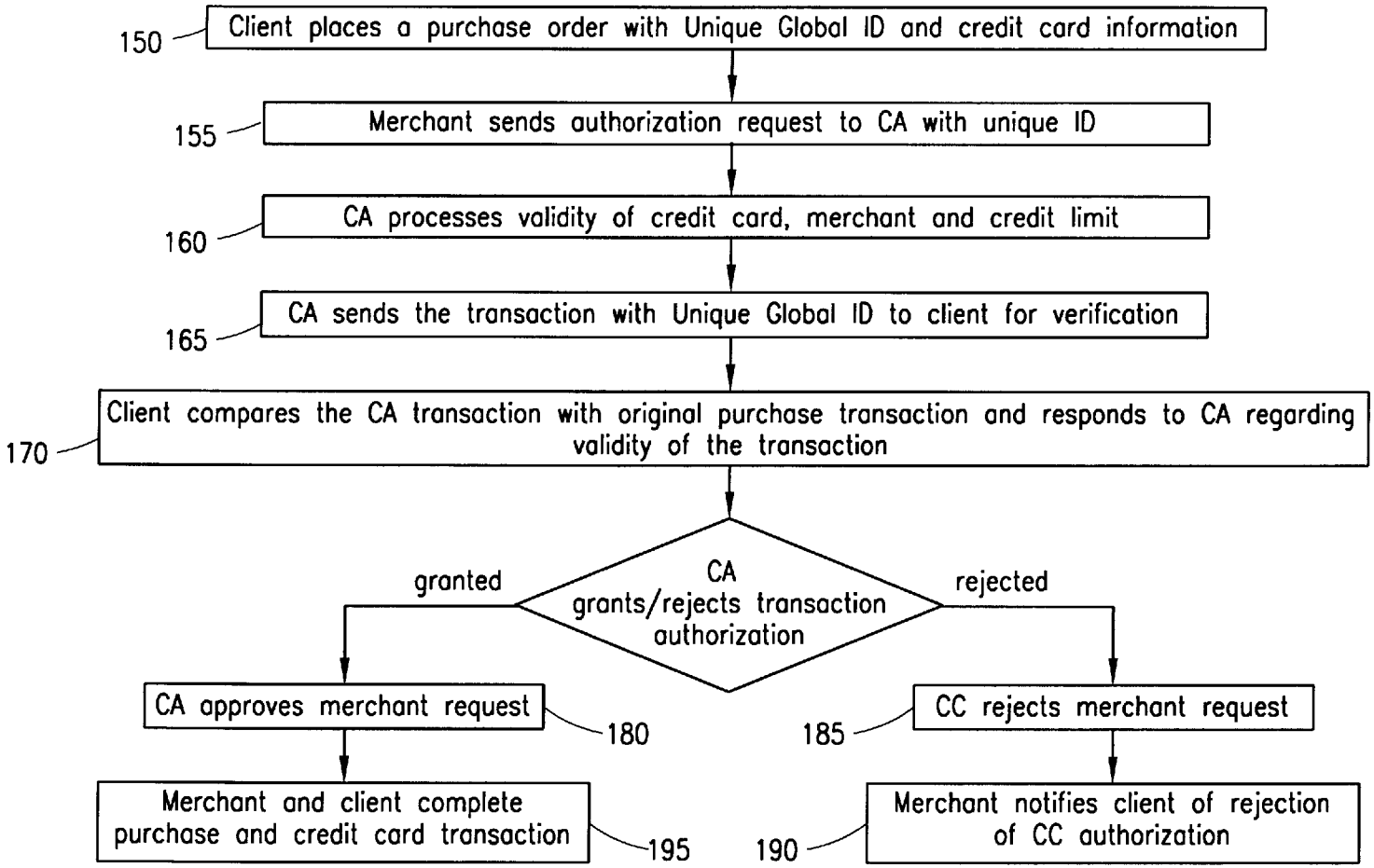

150
Client places a purchase order with Unique Global ID and credit card information
155
Merchant sends authorization request to CA with unique ID
160
CA processes validity of credit card, merchant and credit limit
165
CA sends the transaction with Unique Global ID to client for verification
170
Client compares the CA transaction with original purchase transaction and responds to CA regarding validity of the transaction
CA grants/rejects transaction authorization
granted
rejected
CA approves merchant request
180
CC rejects merchant request
185
Merchant and client complete purchase and credit card transaction
195
Merchant notifies client of rejection of CC authorization
190

FIG. 6

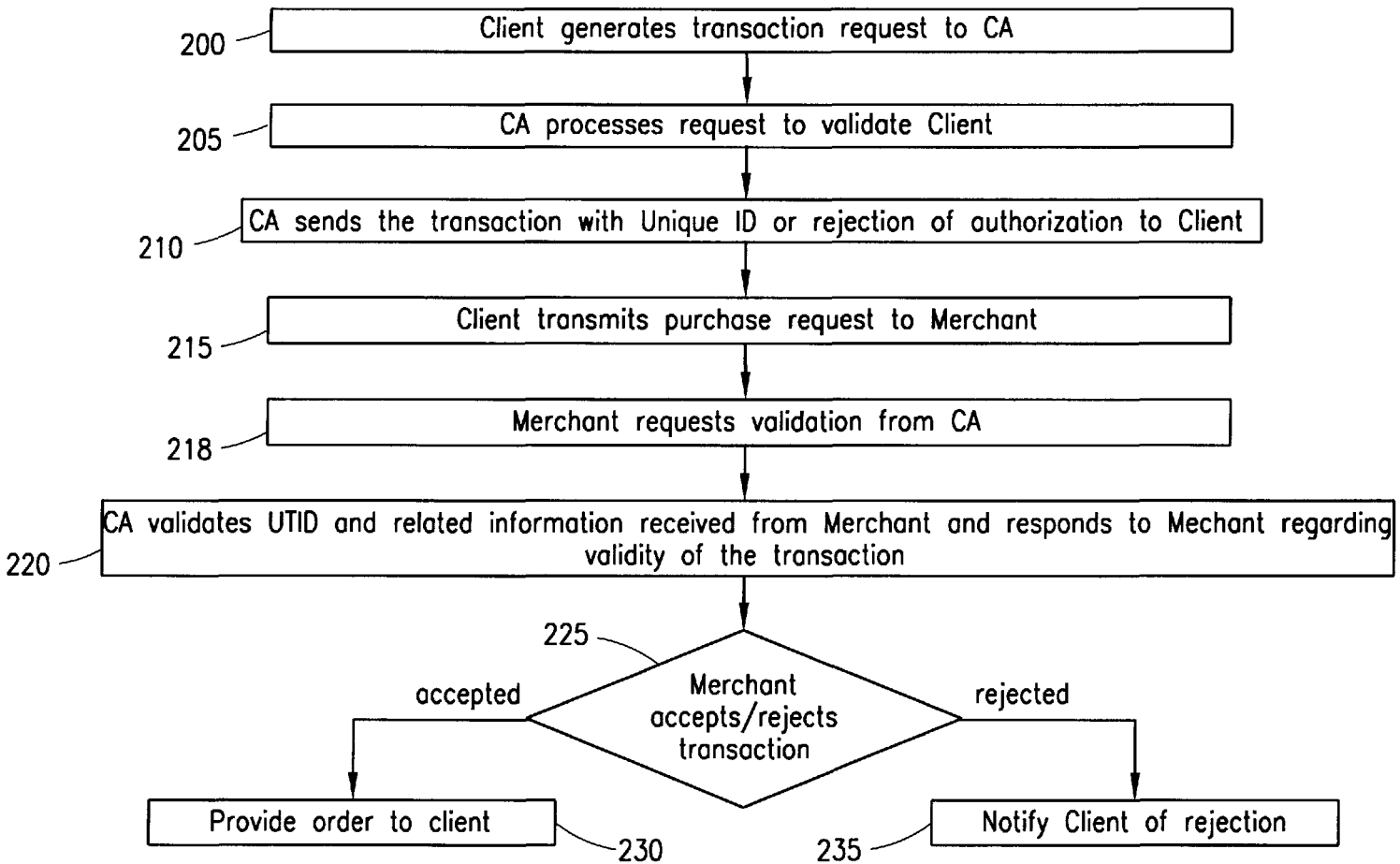

200
Client generates transaction request to CA
205
CA processes request to validate Client
210
CA sends the transaction with Unique ID or rejection of authorization to Client
215
Client transmits purchase request to Merchant
218
Merchant requests validation from CA
220
CA validates UTID and related information received from Merchant and responds to Mechant regarding validity of the transaction
225
Merchant accepts/rejects transaction
accepted
rejected
Provide order to client
230
235
Notify Client of rejection

FIG. 8

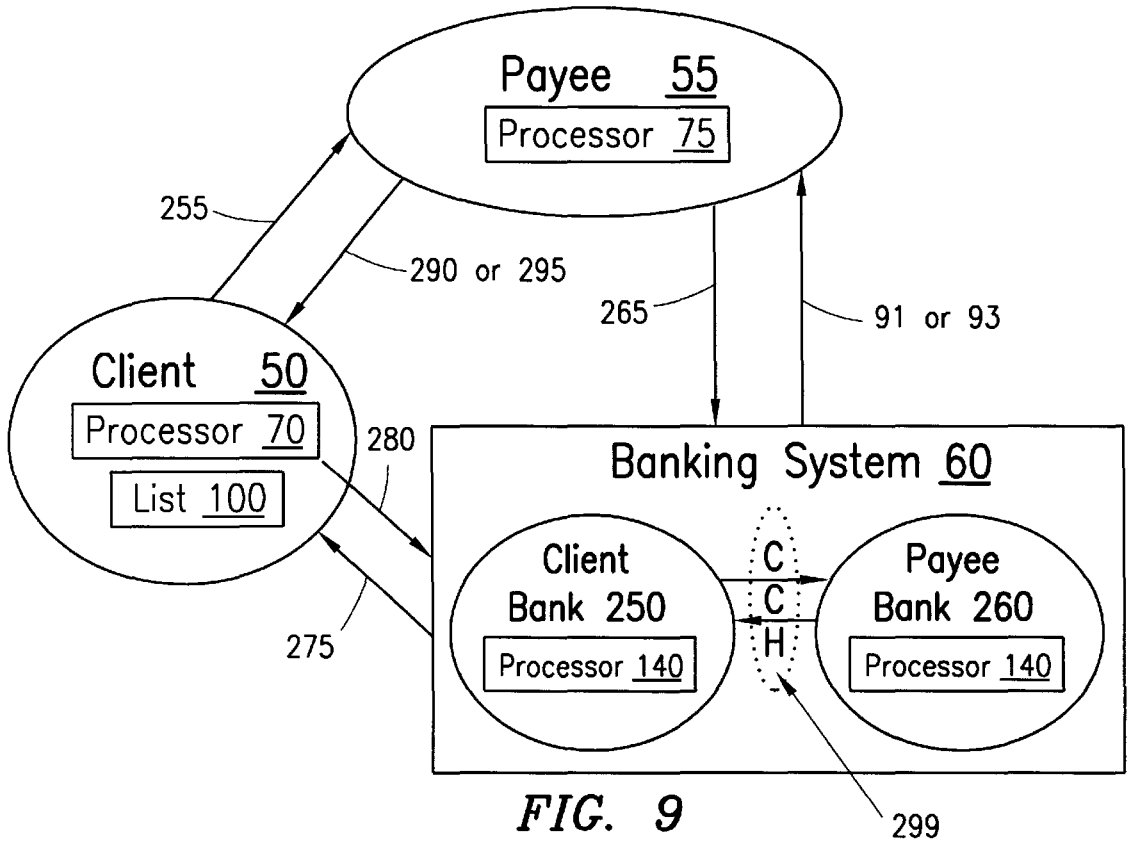

Payee 55
Processor 75
255
290 or 295
265
91 or 93
Client 50
Processor 70
List 100
280
Banking System 60
Client Bank 250
Processor 140
C
C
H
Payee Bank 260
Processor 140
275
299

FIG. 9

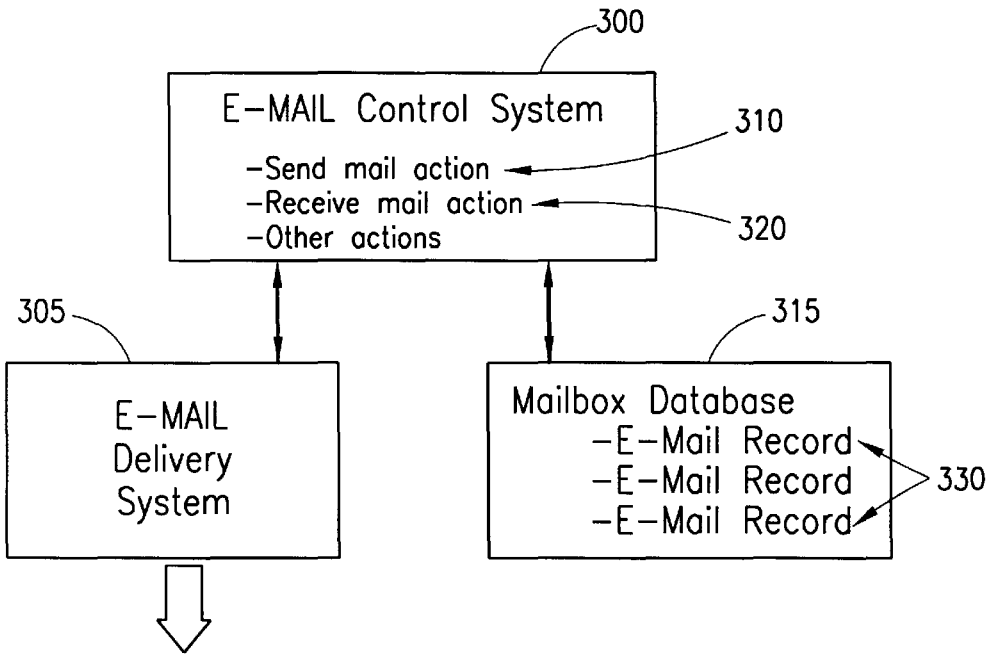

300
E-MAIL Control System
-Send mail action
-Receive mail action
-Other actions
310
320
305
315
E-MAIL Delivery System
Mailbox Database
-E-Mail Record
-E-Mail Record
-E-Mail Record
330

FIG. 11

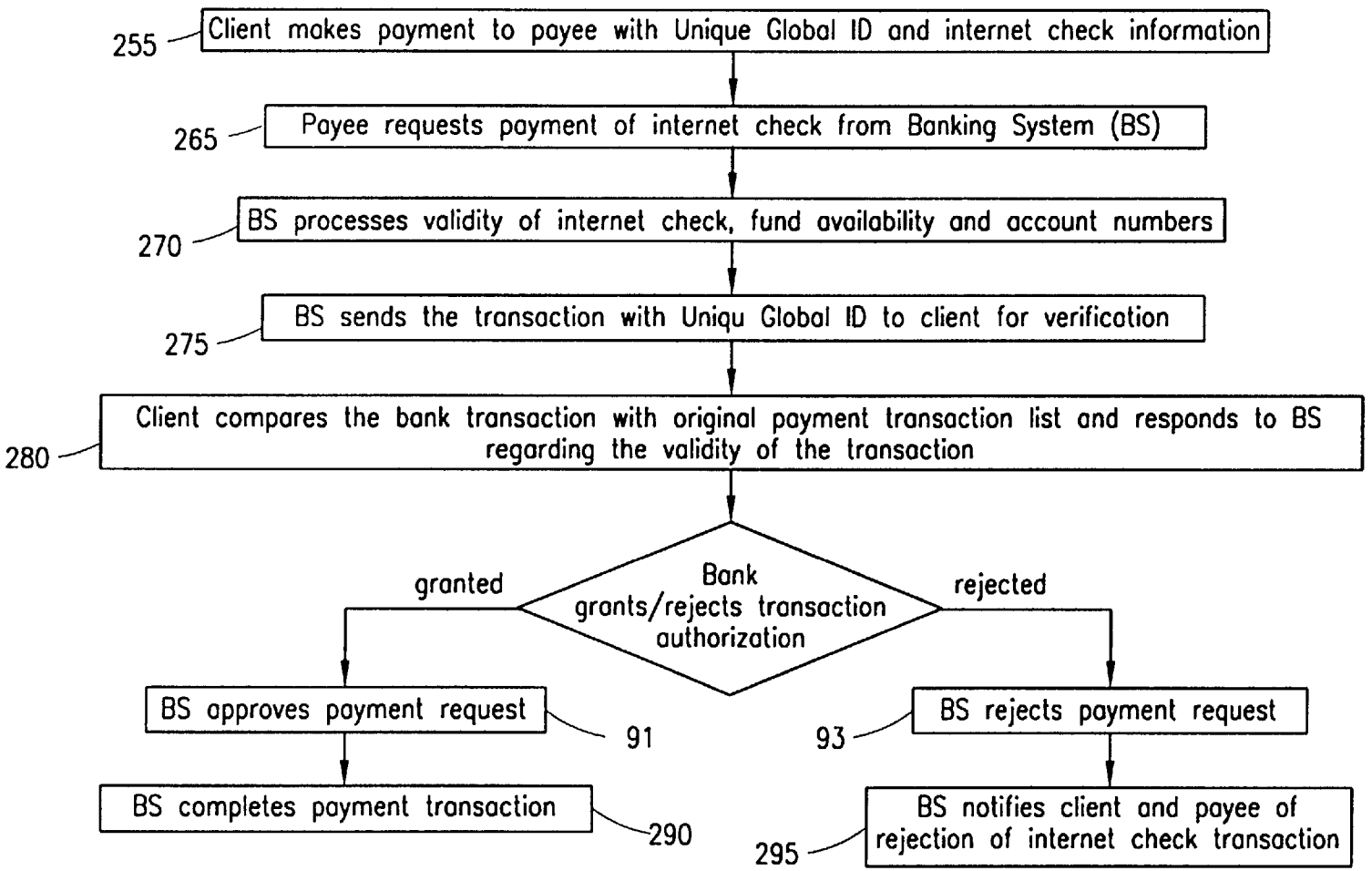

255
Client makes payment to payee with Unique Global ID and internet check information
265
Payee requests payment of internet check from Banking System (BS)
270
BS processes validity of internet check, fund availability and account numbers
275
BS sends the transaction with Uniqu Global ID to client for verification
280
Client compares the bank transaction with original payment transaction list and responds to BS regarding the validity of the transaction
Bank grants/rejects transaction authorization
granted
rejected
BS approves payment request
91
BS completes payment transaction
290
93
BS rejects payment request
295
BS notifies client and payee of rejection of internet check transaction

FIG. 10

Message ID	Mail Type	To	Subject	Mail Contents
Unique Global Transaction ID	1–Outbox 2–Inbox 3–SentItem 4–Transaction	Recipient Addresses		Notes and Attachments
331	335	340	345	348

FIG. 12

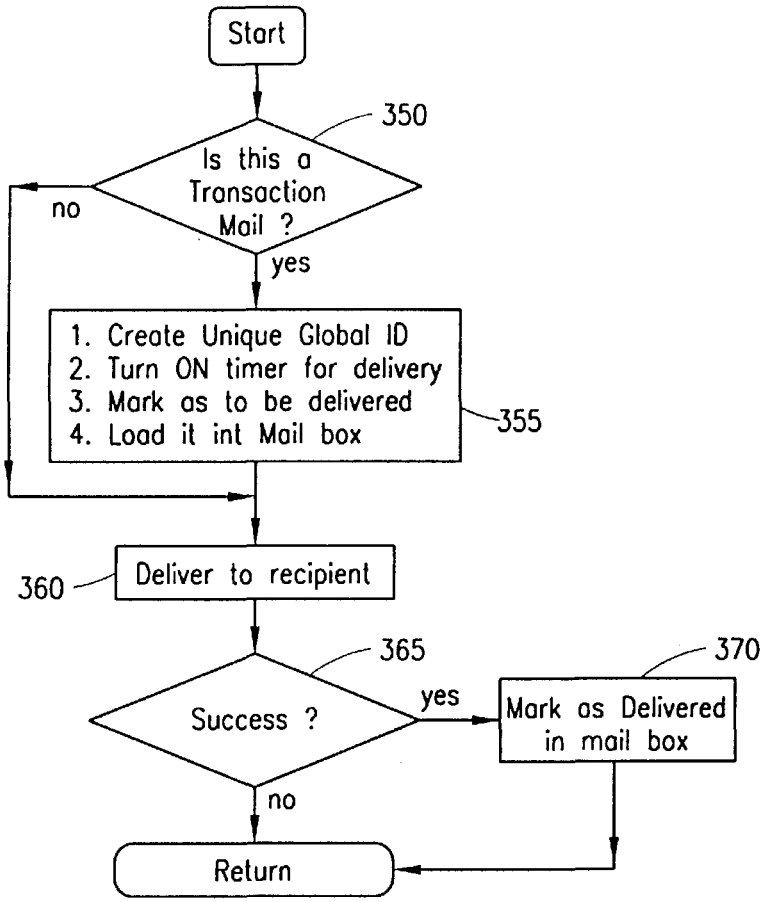

Start
350
Is this a Transaction Mail ?
no
yes
1. Create Unique Global ID
2. Turn ON timer for delivery
3. Mark as to be delivered
4. Load it int Mail box
355
360
Deliver to recipient
365
Success ?
yes
370
Mark as Delivered in mail box
no
Return

FIG. 13

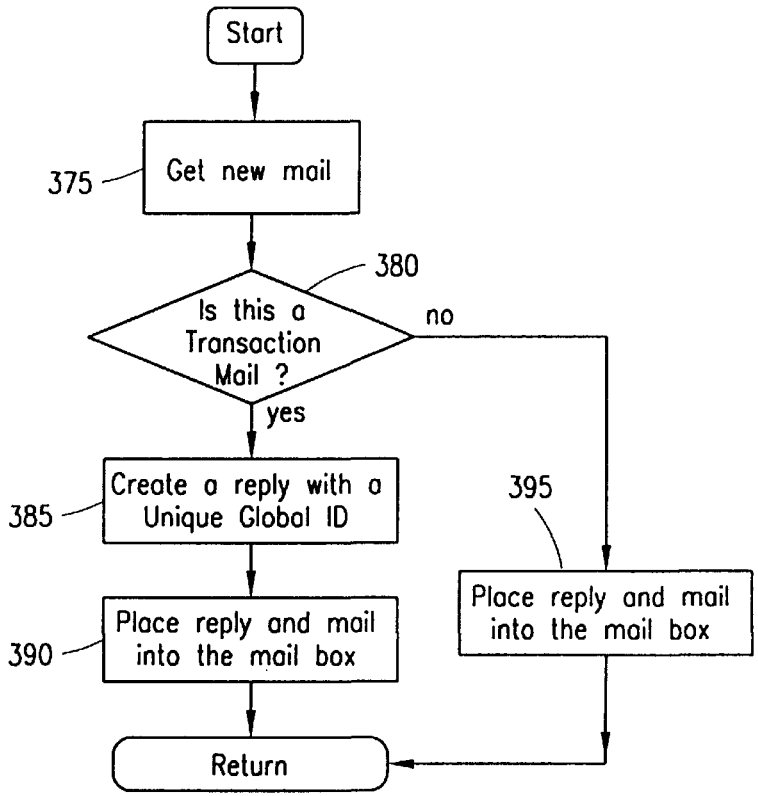

Start
375
Get new mail
380
Is this a Transaction Mail ?
no
yes
385
Create a reply with a Unique Global ID
395
Place reply and mail into the mail box
390
Place reply and mail into the mail box
Return

FIG. 14

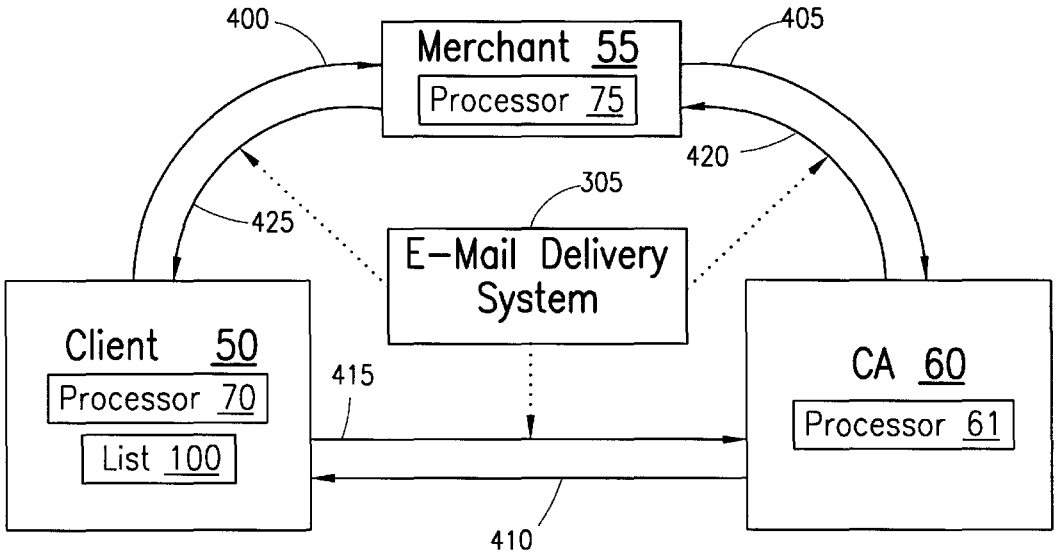

400
Merchant 55
Processor 75
405
420
305
425
E-Mail Delivery System
Client 50
Processor 70
List 100
415
CA 60
Processor 61
410

FIG. 15

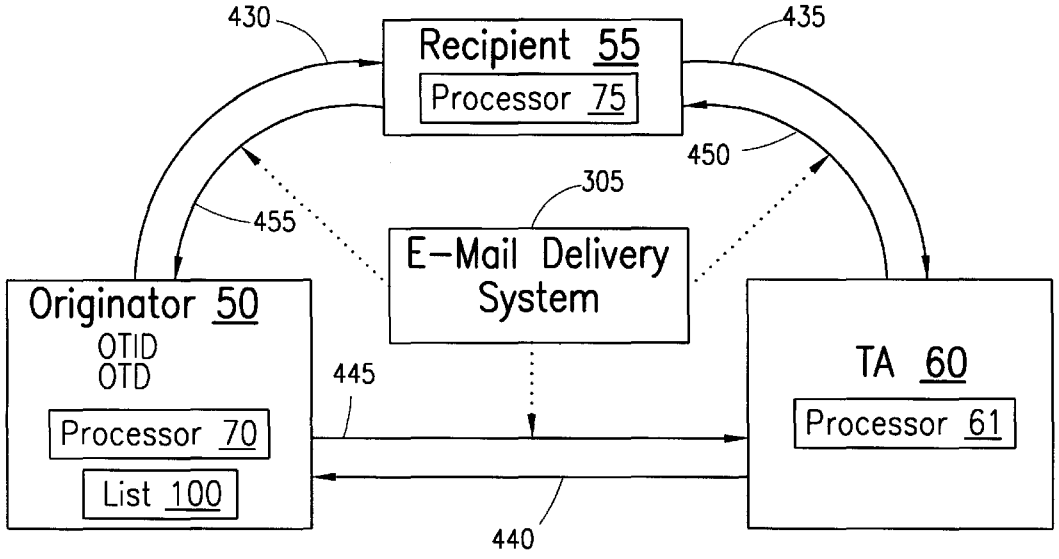

430
Recipient 55
Processor 75
435
450
305
455
E-Mail Delivery System
Originator 50
OTID
OTD
Processor 70
List 100
445
TA 60
Processor 61
440

FIG. 16

METHOD AND APPARATUS FOR ELECTRONIC COMMERCE

BACKGROUND OF THE INVENTION

1. Technical Field of the Invention

The present invention relates to electronic commerce transactions, and more particularly, to a method and apparatus enabling validated electronic commerce transactions between an originator, a recipient and a transaction administrator.

2. Description of Related Art

The increasing use of electronic media, such as the Internet, smart phones, screen phones and television with World Wide Web access, have expanded the opportunities for electronic commerce. In electronic commerce two or more entities electronically process specific tasks related to commerce ranging from purchase and payment to real estate transactions. Financial examples of electronic commerce include purchase and payment transactions. Purchase transactions are performed using credit and debit cards. Payment transactions are performed in paying bills, sending refunds on return merchandise, sending awards, etc.

A common set-up for commercial (including electronic) transactions is illustrated in FIG. **1**. The transaction includes processing steps taking place between three entities, namely, a client **10**, a merchant **20** and a payment authority (PA) **30**. A delivery system between the client **10**, merchant **20** and a PA **30** exists so that the steps required for transactions can be performed properly.

FIG. **2** is a flow diagram generally illustrating the steps involved in a commercial transaction. In step **12**, the client **10** places a purchase order to the merchant **20**. The purchase order will include the item(s) the client desires to purchase and payment information on an account from which to purchase the item. This purchase order may be for goods, services or any other item normally involved in commercial transactions. When a purchase order is received by the merchant **20**, the merchant sends at step **13** a request for payment authorization to the payment authority (PA) **30**.

Inquiry step **14** determines whether or not the purchase is authorized at the PA **30**. This step is performed by the processing equipment **35** associated with the PA **30**. The PA **30** responds at step **15** with a confirmation and authorization for the payment amount once the payment information regarding the client **10** checks out. If the payment information is not confirmed with the PA **30**, the PA transmits a rejection at step **16** for the requested purchase authorization transaction. Upon confirmation of the transaction, the merchandise is delivered to the client **10** at step **17**. Upon rejection of the transaction, the merchant **20** notifies the client **10** of the denial of authorization by CCA **30** at step **18**. The sequence of steps **12**, **13**, **14**, **15**, **16**, **17** and **18** must occur within some type of traceable delivery system.

The delivery system between the client **10** and the merchant **20** can be a regular mail system, telephone system, computer network or any other delivery system like UPS or Federal Express. The delivery system between the client **10** and the merchant **20** must also have some tracking capability. The delivery system between the merchant **20** and the CCA **30** is typically a private network providing Point-Of-Sale (POS) processing. All necessary information is transferred between two or more points in this network with a tracking mechanism that can follow the transactions. All of the above steps can also be executed within electronic commerce transactions.

However, in electronic commerce it is not possible to properly authenticate entities and transactions. In order to properly authenticate entities such as a client **10** and the merchant **20** performing a transaction, there is proposed a standard SET (Secure Electronic Transactions) in which each entity obtains a Certificate of Authentication from a Certificate Authority (CA) whereby clients and merchants can authenticate each other before performing any transaction by digitally signing the contents of the transaction and having the digital signature authenticated by the CA. This open exchange of digital signatures increases the potential of fraud. Thus, there is also a need for secure electronic commerce where the exchange of digital signatures between entities is eliminated.

An unauthorized client can send in a purchase order with an address to which to deliver the goods and no proper tracking can be established to validate whether or not an authorized client has initiated the purchase order. The PA **30** cannot establish whether the request from merchant **20** is initiated by the true client **10** or an unauthorized client. It is possible that a purchase order was never actually generated by an authorized client **10** but by someone else at the merchant's place of business. Additionally, the amount of the authorization can be changed or inflated by the merchant **20** and thus become an invalid request. The PA **30** does not know the real amount requested by the authorized client **10** and does not have any mechanism to confirm this information. Finally, the delivery address could be different from the actual address of the client **10**, and the true client would not receive the merchandise, just the bill. Furthermore, there is no tracking system for automatically validating electronic transactions. Because of these issues, electronic commerce is a risky proposition.

In today's electronic banking, payment transactions take place by sending payment requests to a bank or third party to create electronic checks. The bank then makes payment to the client's payee or third party then sends the electronic check to the client payee. However, since the client's name, bank A.B.A. number and account number are easily accessible, it is easy for an unknown third party to create fund transfers even though data can be exchanged securely between the client and the bank. Furthermore, electronic check processing still has to be carried out as shown in FIG. **12** where PA **30** is a Banking System. Electronic commerce on the Internet is still a risky business because by federal statute, the bank is liable for this kind of fraudulent transaction. There is therefore a need to provide validated banking transactions over the Internet.

SUMMARY OF THE INVENTION

The present invention overcomes the foregoing and other problems with a method and apparatus enabling verification and validation of original "electronic commerce transactions" between one or more originators, recipients, and transaction administrators (TA). The originator is a party who originates the transaction for exchanging information documents or for initiating a payment via an electronic check or a payment transaction for goods and services from the recipient. The originator is synonymous with "client", "purchaser", "user", "requester" and "account holder". The recipient is the entity receiving the information document or payment for a provided service such as a utility bill or a merchant who provides goods and services. Recipient is synonymous with "merchant", "service provider", "vendor" and "payee". The transaction administrator (TA) is an entity which authenticates entities and validates the content of the transaction by the originator. Transaction administrator is

synonymous with "Credit Card Authority (CCA)", "Government Authority", "Financial Network", or "Banking system (BS)".

A validated transaction is a transaction in which the TA validates the entities, facilitates the transaction and/or validates the contents of the transaction by the originator. In a validated electronic commerce transaction, either the client, merchant or transaction administrator can initiate the transaction. In a purchase transaction, the client initiates a transaction requesting particular items of merchandise or services from a merchant via the Internet, a dial-up-network, or any suitable network. The electronic transaction includes details of the transaction such as descriptions of the item(s) that the client desires to purchase, credit card or check payment information, information on other types of payment by means of which the item(s) will be purchased, and a unique transaction identifier that has been generated by the originator and is uniquely associated with the particular purchase transaction.

This information is transmitted to the merchant over the network. In response to the purchase order, the merchant generates a payment authorization request for transmission to the TA. The payment authorization request will have attached to it the unique transaction identifier initially provided by the client along with transaction information. Upon receipt of the payment authorization request the TA will validate the client and the merchant using the information provided. The TA then generates a validation request to the client that includes the unique transaction identifier. This communication between the TA and the client may be encrypted using a suitable encryption method or a set of virtual keys known only to the TA and each individual purchaser.

Upon receipt of the validation request, the client decodes, if necessary, the encrypted validation request and extracts the unique transaction identifier therefrom. The identifier is compared to a listing of generated transaction identifiers at the client to confirm that the client authorized the transaction order with which the transaction identifier is associated. Confirmation or denial of the validation is transmitted back to the TA by the originator. This confirmation may be encrypted using a suitable encryption method, if necessary. To provide additional security, a query or group of queries may be included within the validation requests between the TA and the originator. These queries are randomly generated and directed to information known solely by the originator, such as mother's maiden name, social security number, driver's license number, birth date, etc.

Upon receipt of validation or non-validation from the originator, the TA confirms or aborts the transaction by notifying the recipient whether or not the transaction is valid based upon the originator's validation response and the accuracy of the information contained in the transaction request. If the information in the transaction request checks out, the item(s) ordered may be delivered to the originator by the recipient. The delivery and communication systems between the client, merchant and TA preferably consists of some type of computer network such as the Internet, private Intranet or any suitable network.

BRIEF DESCRIPTION OF THE DRAWINGS

For a more complete understanding of the present invention, reference is made to the following detailed description taken in conjunction with the accompanying drawings wherein:

FIG. **1** is a diagram of a commercial transaction between a client, merchant and credit card authority;

FIG. **2** is a flow diagram describing the transaction of FIG. **1**;

FIG. **3** is a diagram of a validated commercial transaction using the present invention between an originator, a recipient and a transaction administrator;

FIG. **4** is a flow diagram describing the transaction of FIG. **3**;

FIG. **5** is a diagram of an electronic commerce transaction using a credit card according to the method of the present invention;

FIG. **6** is a flow diagram describing the transaction of FIG. **5**;

FIG. **7** is a diagram of an electronic commerce transaction according to an alternative embodiment of the method of the present invention;

FIG. **8** is a flow diagram describing the transaction of FIG. **7**;

FIG. **9** is a diagram of an electronic commerce banking transaction to a payee for goods and services according to the method of the present invention;

FIG. **10** is a flow diagram describing the transaction of FIG. **9**;

FIG. **11** is an illustration of an e-mail control system architecture enabling electronic commerce transactions according to the present invention;

FIG. **12** is an illustration of an e-mail record stored within an e-mail database;

FIG. **13** is a flow diagram of a "send" mail action of an electronic commerce transaction using an e-mail delivery system;

FIG. **14** is a flow diagram of a "receive" mail action of an electronic commerce transaction using an e-mail delivery system;

FIG. **15** is an illustration of an electronic transaction between an originator, recipient and transaction administrator using an e-mail delivery system; and

FIG. **16** is an illustration of an originator and a recipient exchanging information documents via an e-mail delivery system where the originator, the recipient and the information documents are validated directly by the transaction administrator.

DETAILED DESCRIPTION OF THE INVENTION

Referring now to drawings and more particularly to FIGS. **3** and **4**, there is illustrated a system and method for improved electronic transactions. An originator **50** initiates a transaction at step **65** using processor **70**. The transaction may comprise a purchase, payment or request for an information document from recipient **55**. The transaction request includes a unique transaction identifier (UTID) associated with the specific transaction request and originator identity (OID) to identify the originator **50** to a transaction administrator **60**. The originator identity may comprise a credit card number, account number, etc.

The processor **70** referenced above is any suitable processor capable of handling transaction processing systems such as a personal computer (e.g. PC, Mac, Hand held PC), a point of sales (POS) device, a POS device with a Smart Card, a work station, a server or any other suitable hardware/software combination. The merchant **55** and TA **60** also include suitable processors at their facilities to run the electronic commerce transaction.

Recipient **55** first reviews the transaction request using a processor **75** and generates a request for authentication of

the originator **50** using the OID, UTID and the information content of the transaction request such as an amount or document name at step **80** to the transaction administrator. The transaction administrator **60** first validates the identity of recipient **55** and then the OID at step **85**. If the OID is invalid, the transaction administrator **60** notifies the recipient **55** of the invalidity and the transaction is denied. If the OID is valid, the transaction administrator **60** determines the originator associated with the OID, transmits the transaction request and associated data to the originator **50** and requests that the originator validate the transaction request containing the UTID at step **90**. The transaction administrator **60** may also validate transaction amounts and credit limits at this time or upon receiving a response for the originator **50**.

The originator **50** validates the transaction by comparing at step **95** the UTID with a list **100** generated by the processor **70** of the originator listing the UTID associated with each transaction generated by the originator and notifying the transaction administrator **60** of the results. The list **100** also includes the details of the transaction (amount; parties, etc.) associated with the UTID which must also be validated by the originator **50**. The transaction is granted or rejected by the transaction administrator **60** based on the comparison results at step **105**. If the originator **50** does not validate the transaction at step **95**, the transaction administrator **60** rejects the transaction at step **110** which invalidates the transaction. The originator is notified at step **115** of the invalidation of the transaction. Upon receipt of the transaction validation status from the originator **50**, the transaction administrator **60** validates the originator **50** and the transaction request at step **120**, and notifies the recipient **55**. The originator **50** and recipient **55** then complete the transaction at step **125**.

Validation of the originator **50**, recipient **55** and transaction administrator **60** may be validated by the use of digital signatures transmitted along with the various transmissions between parties in a known manner. Additionally, the identity of the originator **50** may be validated by requiring the originator to answer a series of questions that only the originator would know, such as mother's maiden name, social security number, etc. This configuration may be used to carry out a variety of different types of electronic commerce transactions. For example, if the originator **50** requests a document, the recipients **55** can send the document to the originator **50**. An originator may also pay bills or purchase merchandise. There are several variations of this embodiment in which a transaction administrator **60**, originator **50** and recipient **55** can initiate transactions and several, but not all, of these variations are illustrated in the following examples.

For purposes of discussion, entities and components related to those disclosed in the embodiment described in FIGS. **3** and **4** will be given similar reference numbers in the remainder of the FIGURES. Referring now to FIGS. **5** and **6**, these are illustrated diagrams for a particular embodiment of the invention for a credit card transaction between a client **50**, merchant **55** and credit authority (CA) **60**. A client **50** places a purchase order to the merchant **55** at step **150**. The purchase order is generated by an electronic transaction processor **70** associated with the client **50**. The purchase order includes a UTID **60** generated by the processor **70** that is uniquely associated with the transaction, an amount and a credit card number. Once the purchase order is received, the merchant **55** transmits at step **155** a request for payment authorization to the CA **60** over the Internet or a private network. Along with the confirmation request, the merchant **55** transmits the UTID, credit card number and data concerning the purchase order to the CA **60**.

Upon receipt of the payment authorization request from the merchant **55**, a CA processor **61** determines if the purchase order is authorized at step **100** by attending to the validity of the credit card number, merchant, amount of purchase, etc., and determine the client identity. The CA **60** transmits at step **165**, the purchase order and the associated UTID **60** and purchase order data to the client processor **70**. The UTID **60** and purchase order data are processed at the client **50** to determine if they are valid. The transmission from the CA **60** to the client **50** may be encoded using some type of virtual encryption key or any suitable encryption technology. The client processor **70** decodes the transmission (if encrypted) using knowledge of the virtual encryption key method between the client **50** and the CA **60** and compares the received unique transaction identifier to a unique transaction identifier list **100** of identifiers transmitted from the client at step **170** to determine whether to validate the transaction. The results of the validation is then forwarded to the CA **60**. If the UTID **60** matches an entry within the client list **100** and the purchase order data checks out with what the client **50** expects, the requested transaction is identified as valid. If no match for the UTID is found or if the purchase order data is incorrect the requested transaction is identified as invalid or fraudulent.

As an additional protection, the CA **60** may query the client processor **70** for various items of information that only the client **50** would know, such as mother's maiden name, driver's license number, etc. This query may be constantly changed, such that an unauthorized user would not be able to predict what information the CA **60** might ask for. Additionally, digital signatures may be used to help identify parties.

The CA **60** responds at step **180**, with an authorization for the transaction if the client **50** transaction and credit limit have been approved by the CA processor **61** and if there is a confirmation by client **10** of transaction validity. If the transaction is not validated by either the CA **60** or client **50**, the CA transmits a rejection of the requested transaction to the merchant at step **185**, and the client is notified by the merchant of the rejection at step **190**. Upon confirmation of the purchase order, the merchandise may be delivered to the client **50** and a credit card transaction can be completed between client **50** and merchant **55** at step **195**.

Communication between the client **50** and the CA **60** guarantees that an unauthorized purchase order is not issued by an unauthorized client or merchant **55** and that a merchant does not change the amount on the purchase order issued by the client. Furthermore, the delivery address may be confirmed by the client **50** prior to receipt of the goods. The use of the UTID in all communications between the client **50**, merchant **55** and the CA **60**, and the verification and validation of the purchase order by the client reduces fraudulent transactions. The system provides a mechanism for consumers to ensure the validity of transactions and thus enhances the overall security of electronic commerce. The UTID ties together all three delivery systems. The virtual keys used in communications between client **50** and the CA **60** not only prohibits unauthorized clients from performing a transaction but verifies that the current transaction has been initiated from the true client.

In an alternative embodiment parties other than the originator **50** may create the UTID, for example the TA **60**. A system and method for this type of transaction are illustrated in FIGS. **7** and **8**. Initially, client **50** generates at processor **70**, a credit authorization request including an originator identifier and relevant information to credit authority (CA) **60** at step **200**. The CA **60** processes the credit request to

determine the validity of the client **50** requesting credit based on the originator identifier and the associated amount at step **205**. The CA **60** then sends the credit transaction information along with an associated UTID or a rejection of authorization back to client **50** at step **210**. Upon receipt of credit approval and the UTID, the client **50**, transmits a purchase request with the provided UTID to the merchant **55** at step **215**. The merchant **55** sends a request for transaction validation of the UTID to the CA **60** at step **218**. The CA **60** compares the transaction information, including UTID, with the original credit transaction and UTID in a list **100** of credit transactions and associated UTIDs generated by the CA and responds to the merchant **60** regarding the validity of the transaction at step **220**. The comparison at the CA **60** uses a processor **61**. The list **100** comprises credit transactions and associated UTIDs created by the processor **61**. The merchant **55** accepts or rejects the transaction at step **225** based on the comparison performed at step **220** by the CA **60**. If the merchant **55** accepts the transaction at step **225**, the order is provided to the client **50** at step **230**. If the merchant **55** rejects the transaction at step **225**, it notifies the client **50** of the rejection at step **235**. Each transaction is tracked by a corresponding UTID, and is verified by the CA **60** with reference to the originator **50** and the issuance of the UTID.

FIGS. **9** and **10** illustrate another example of the proposed method and apparatus to enable validated banking transactions between an account holder or client **50** and any third party payee **55**. This time a validation is performed between the client **50** and a client bank **250** in the banking system **60** to guarantee that a valid client **50** requested a payment transaction. Initially, a client **50** initiates a payment transaction to the payee **55** at step **255** in the form of, for example, an electronic check. The electronic check includes a UTID and associated electronic check information such as amount, account number, etc. In response to the electronic check, the payee **55** requests payment of the electronic check from the banking system **60** or deposits the electronic check into payee bank **260** at step **265**. Upon receipt of the request or deposit, the payee bank **260** in conjunction with the client bank **250** in the banking system **60** determines the validity of the electronic check including bank number, fund availability, account number, etc. at step **270** and identifies the associated client or account holder **50** that initiated the transaction.

The banking system **60** then sends the electronic check along with the associated UTID to the client **50** for validation at step **275**. The client **50** compares the information on the transaction with the original payment transactions and associated UTIDs and other relevant payment information at step **280** from a list **100**. The list **100** will include all original electronic check transactions and the related information and UTIDs generated by the client **50**. The client **50** then notifies the client bank **250** in the banking system **60** with a verdict on the validity of the transaction. Based on the validity determination provided by the client **50** and the client bank's **250** validity checks, the payee bank **260**/banking system **60** grants or rejects the payment transaction at step **285**. If the banking system **60** approves the payment transaction request at step **91**, the payment transaction is then completed at step **290** by transferring funds to the proper accounts. If the transaction is rejected at step **93**, the banking system **60** notifies the client **50** and the payee **55** of the rejection of the electronic check payment transaction at step **295**.

Generally, the payee **55** deposits the electronic check in his/her account at payee bank **260** within the banking system **60**. The payee bank **260** confirms the client's identity, account number and relevant information. The payee bank **260** next sends the electronic check for the payment to the client bank **250** of the client **50** via check clearing house (CCH) **299**. Check clearing house **299** debits client's bank account and credits payee's bank account subject to client's bank validation of checks received from the payee **55**. When the client's bank **250** receives an electronic check from the Check Clearing House **299** it validates the check (authenticates the check with the client **50** signature and available funds in the client's account). If the client's bank **250** does not validate the check, it rejects the check for the payment, and the check clearing house **299** reverses the transaction and notifies the payee bank **260**. The payee's bank **260** then notifies the payee **55** that the check is "bounced" or returned back for insufficient amount or whatever else is the cause. All these processing steps may be performed in electronic transactions.

The communications between the originator **50** and TA **60** or between the recipient **55** and the TA **60** can be established with any traceable delivery system, such as a point-to-point tunneling protocol (PPTP) which is equivalent to a telephone virtual circuit. However, an e-mail system also provides a traceable delivery system in an alternative embodiment an e-mail delivery system may be used not only to exchange information, but to process complex transactions and safely share information between multiple entities. Referring now to FIG. **11**, there is illustrated an e-mail control system (ECS) **300** enabling electronic commerce transactions on the Internet between an originator **50**, recipient **55**, and transaction administrator **60**. The system guarantees the validity of the electronic commerce transaction by validating that the client owning a presented credit card number, unique transaction identifier, transaction amount, etc., has initiated the transaction. There exists a traceable delivery system on computer networks such as the Internet, Intranet or private network, namely e-mail. An existing e-mail system may be extended so that an originator **50** can openly use payment numbers, such as credit card numbers and account numbers, over the Internet. The terms E-mail and e-mail are synonymous. In this example an ECS **300** interfaces with an e-mail delivery system **305** using the SMTP protocol to send mail and the POP3 protocol to receive mail. The ECS **300** enforces the new behavior of the e-mail delivery system **305** to perform transactions between the originator **50**, the recipient **55** and the transaction administrator **60**. The ECS **300** may be implemented in single or multiple processors wherein separate processors control transaction e-mails and normal e-mails.

The ECS **300** uses the e-mail delivery system **305** (or suitable applications or functions) in conjunction with a mailbox database **315** to create, reply to or view e-mail messages. The ECS **300** sends and receives e-mail messages to/from the e-mail delivery system **305** using send mail **310** and receive mail **320** actions/functions of the e-mail system. The ECS **300** includes information such as UTID, OID and transaction data within a transaction e-mail and enables extraction of this information at a receiving part for further transaction processing such as validation. The mailbox database **315** includes a plurality of e-mail records **330**, each having a unique transaction identifier **331** (FIG. **12**) associated therewith that has been generated by the e-mail control system **300**.

A format of an e-mail record **330** is more fully described in FIG. **12** wherein there is shown an e-mail record **330** including the unique transaction identifier or message ID **331**; a mail type identification **335** indicating whether the record is to be transmitted, was just received, has already been transmitted, or comprise a transaction e-mail; the

recipient's address **340**; the subject matter of the e-mail **345**; and the contents of the e-mail **348**. For simplicity, the mail type identification **335** identifies the state of the e-mail record as it relates to the state of the e-mail delivery system **305**. For example, when a user creates an e-mail record, the ECS **300** deposits this e-mail record into the mailbox database **315** with mail "type" equal to 1 indicating that the e-mail record is ready to be delivered to the recipients. The recipient address **340**, subject matter **345** and contents **348** provide routing and content information to the e-mail delivery system **305**.

When e-mail messages are utilized to provide electronic commerce transactions various parts of the e-mail record **330** will have a specific format to enable identification of an electronic commerce transaction and extraction of relevant data from the e-mail record. For example, when an electronic check is used, the subject **345** of the e-mail message may be formatted to read in one of the following manners to enable recognition by the e-mail control system **300**:

1. "CheckNumber"—identifies a transaction e-mail requesting an electronic commerce transaction by the originator to the recipient.
2. "Val:#CheckNumber"—identifies validation requests from the transaction administrator to the originator.
3. "Re:#CheckNumber"—identifies a reply from the transaction administrator to the recipient.
4. "ACK;#CheckNumber"—identifies positive validation from the originator.
5. "NACK;#CheckNumber[code]"—identifies a negative validation and a code indicating the reason for the negative validation from the originator.

In the case of an electronic check transaction, the mail contents **348** of the e-mail may comprise a number of items, depending on who the e-mail is from, and the data required to be extracted by the e-mail control system **300** of the receiving party. A transaction request from the originator **50** may include an account number, amount of the transaction, account reference, transaction reference, and originator's personal information. A response from a recipient **55** may include account number information, account references, transaction references, and recipient's personal information. An e-mail message from the transaction administrator **60** may contain query information for the originator to obtain validation.

There may be several variations of this mail content **348** information. For example, a party may use the message I.D. field of the e-mail services delivery system **305** to create a unique transaction identifier. This message I.D. field may act as a UTID and identify a transaction type. For example, a message I.D. type of the form #[TYPE][UNIQUE SEQUENCE NUMBER][ORIGINATOR E-MAIL ADDRESS] identifies the type of transaction, a unique sequence number generated by the e-mail control system **300** and the originator's e-mail address. In the case of a check transaction, the UTID would appear as follows:

#c0000001originator@joe.doe

#c0000002originatorat@joe.doe.

This information would notify the ECS **300** how a transaction was to be processed.

The subject field may contain a transaction data identifier, such as a purchase order number of the originator **50**, and an invoice number of the recipient **55** such that the transaction can be related to a prior transaction or another message processing system processing the transaction data. For example, upon successful transfer of fund deposits from a transaction administrator, the recipient can use an invoice number to credit the originator's account.

As noted above, the ECS **300** sends and receives e-mail via send **310** and receive **320** mail actions defined within the e-mail system. When a user selects an action from the user interface (not shown), preferably by pointing and clicking on the icon identifying the action, the ECS **300** executes the action. A send mail action **310** sends all e-mail marked "Type 1" to the e-mail delivery system **305** via an SMTP interface and a receive mail action **320** receives all new mail from the e-mail delivery system **305** using a POP3 or similar interface. When the ECS **300** receives a new e-mail message, it loads the e-mail message into the mailbox database **315** as an e-mail record **330** and notifies the client **50**. If the client **50** has any new mail and selects a "view new mail" action, the ECS **300** starts the "display mail" using a graphical user interface to display the new mail.

FIGS. **13** and **14** describe the Send **310** and Receive **320** 3-mail actions, respectively, of the e-mail control system **300** shown in FIG. **11**. The send mail action **310** first checks if an e-mail record **330** contains a transaction at inquiry step **350**. If a transaction is indicated, a series of tasks are performed at step **355**. Initially a UTID is created. A delivery timer is initiated and the e-mail is marked for delivery. The e-mail record **330** is then loaded into the mail box database **315**. The e-mail record is then ready for delivery to the recipient at step **360**. Inquiry step **365** determines whether or not the delivery was a success. If so, the e-mail record is marked as delivered to the mail box database **315** at step **370** and the procedure is completed. Otherwise, no indication of delivery is provided.

The receive e-mail action **320** gets new e-mail from the e-mail delivery system **305** at step **375** and determines if the e-mail comprises transaction mail at step **380**. If the e-mail comprises transaction mail, then the receive mail action **320** creates a proper reply with an attached UTID at step **385** and places the reply into the mail box database **315** for delivery at step **390**. If the e-mail does not comprise transaction mail, the e-mail is placed directly in the mail box database **315** at step **395**. These two actions allow the e-mail control system to properly process e-mail transactions to enable electronic commerce.

Referring now also to FIG. **15**, there is illustrated an application of the present invention whereby an electronic commerce transaction may occur between a client **50**, a merchant **55** and a CA **60** utilizing an e-mail delivery system **305** to enable confirmation of the validity of the transaction. As discussed previously, the client **50** generates a purchase order which is formatted and transmitted to the merchant **55** via an e-mail message at **400**. The ECS **300** causes the unique transaction identifier to be generated and attached to the e-mail message record **330** from the client **50** and formats transaction data within the message. The e-mail record **330** may be of the form of the records discussed previously. The merchant **55** receives and processes this e-mail message to extract relevant data and generates another e-mail message at **405** to the CA **60** requesting verification and authorization of the charge amount and the credit card number provided by the client **50**. This e-mail message is also formatted by the ECS **300** to include the UTID and relevant transaction data initially transmitted by the client **50**.

The CA **60** formats and generates yet another e-mail message which may be encoded using some type of virtual key encryption (or other type of encryption) for transmission to the client **50** at **410**. Included within the e-mail message by the ECS **300** are the unique transaction identifier; purchase order data such as item, amount and delivery address; and optionally randomly generated questions on which only

the client **50** has knowledge, such as birth date, mother's maiden name, social security number, etc. The client **50** utilizing its knowledge of the virtual key decrypts the e-mail message, extracts the relevant transaction data and compares the UTID provided in the e-mail message to the unique transaction identifier list **100** at the client **50** to determine whether or not the requested transaction has been initiated by the client.

If a match on the list **100** is found, the purchase order data is checked against the transaction data associated with the match. If the data matches, the client **50** generates an e-mail message to the CCA at **415** indicating that the requested transaction originated with the client (transaction valid) and provides responses to the random questions generated by the CA **60**. This e-mail message could be encrypted if the client **50** so desires.

The CA **60**, upon confirmation of the answer to the random questions and verification of the transaction by the client, transmits an e-mail message to the merchant **55** at **420** enabling delivery of the requested merchandise or services to the client at **425**. If the transaction is not validated by either the client **50** or the credit authority **60** due to an improper UTID, improper query response or lack of authorization for the claimed credit limit amounts by the credit card authority, completion of the transaction is denied at **420** in an e-mail message.

Each of the e-mail messages transmitted by the e-mail delivery system **305** are responsive to queries to the e-mail control system **300** generated by a transaction request. The transaction request causes the e-mail control system **300** to generate the e-mail record **330** having the unique global transaction identifier or message identifier **331**, a mail type identification **335** indicating a transaction, and the mail content **348**, including all information necessary to perform the validation and authorization procedures at the credit authorities or transaction administrator and the transaction originating party.

Referring now to FIG. **16**, there is illustrated an exchange of information between an originator **50** and a recipient **55** using an e-mail delivery system **305**. Information is synonymous with document, software, classified data, transaction data or a database query and responses. The invention provides a method to securely exchange and process information between originator **50** and recipient **55**, where an originator and recipient can be client or server on the Internet/Intranet or private network. Please note that currently, it is not possible to perform transaction processing between two clients on the Internet or Intranet. The present invention not only provides a method to perform transaction processing between two clients but also creates an automated secure information exchange firewall. While the following is described with respect to an e-mail delivery system it should be realized that any type of delivery system would be useful. The originator **50** sends a document including a UTID and originator identifier (OID) to recipient **55** within an e-mail message at **430**. Upon receipt of the e-mail message, the recipient **55** forwards another e-mail message to the transaction administrator (TA) **60** at **435**. The e-mail message includes the OID, UTID and document name. The TA **60** authenticates the OID of originator so a message can be transmitted to the originator. If OID does not authorize, the TA **60** sends a negative response to recipient **55** at **450**. Otherwise, the TA **60** requests originator **50** to validate the transaction via another e-mail message at **440**. The e-mail message includes the UTID.

The originator **50** validates transactions by comparing UTID with a list **100**, including UTIDs generated by the originator along with associated information. The originator **50** sends a negative acknowledgment due to failure to match a UTID or associated information if the transaction is invalid or a positive acknowledgment if the transaction is valid and the UTID and associated information matches at **445**. The TA **60** upon receipt of a positive or negative validation of the transaction with the associated UTID notifies the recipient of a positive status at **450**.

The originator and the recipient then completes the information transaction at **455**. For example, if recipient receives a positive acknowledgment for transaction, it accepts the information. Since the OID is authenticated by the TA **60**, the recipient **55** is guaranteed that the information is received from the desired originator. In this example, since the originator **50** has validated the transaction and information, the originator is guaranteed that recipient **55** has received the information. The transaction administrator **60** may be any entity, such as a Government authority, U.S. Post Office, etc.

Following is an example, according to FIG. **16**, of a client to client information exchange where the information comprises transaction data processing. In this example, an originator **50** sends an e-mail containing transaction data including SQL statements asking for database records from the recipient **55**. Upon receiving an e-mail from the originator **50** recipient **55** sends an e-mail containing relevant data to the TA **60** to validate the transaction. The TA **60** validates the recipient **55** and originator **50**. The TA **60** then sends a validation request via e-mail to the originator **50**. The originator **50** validates the transaction by comparing UTID and transaction contents with the list **75** of transactions and responds to TA **60** regarding the validity of the transaction. TA **60** validates the transaction based on the response from the originator and notifies recipient **55** regarding the validity of the transaction.

If the transaction is valid, recipient processes the transaction data request using processor **75** (or another associated processor) and formats the data into an e-mail or sends the transaction data request to another processor (not shown) which processes the request and returns the transaction data into an e-mail for transmission to the originator **50**. Requested information could be formatted into an ASCII document or an ASCII title with suitable delineation for data separation or into an Internet browser HTML document. When the originator **50** receives transaction data from the recipient **55**, it then displays or processes the data.

Although preferred embodiments of the method and apparatus of the present invention have been illustrated in the accompanying Drawings and are described in the foregoing Detailed Description, it is understood that the invention is not limited to the embodiments disclosed, but is capable of numerous rearrangements, modifications, and substitutions without departing from the spirit of the invention as set forth and defined by the following claims.

What is claimed is:

1. A method for providing a validated electronic commerce transaction between an originator, a recipient and a transaction administrator, comprising the steps of:

generating an electronic commerce transaction including at least a unique transaction identifier associated therewith;

transmitting the electronic commerce transaction from the originator to the transaction administrator through the recipient;

transmitting the electronic commerce transaction from the transaction administrator to the originator for validation;

validating the electronic commerce transaction at the originator based on the unique transaction identifier;

notifying the transaction administrator of a validation status of the electronic commerce transaction based on the validation; and

completing the electronic commerce transaction based on the validation status.

2. The method of claim **1** wherein the electronic commerce transaction further includes an originator identification associated with the originator and further including the step of authenticating the originator based on the originator identification.

3. The method of claim **2** wherein the step of transmitting further includes the step of transmitting the electronic commerce transaction to the authenticated originator.

4. The method of claim **2** further including the step of authenticating the originator based on the originator identification at the transaction administrator.

5. The method of claim **1** further including the steps of:

providing a recipient identifier; and

authenticating an identity of the recipient at the transaction administrator based on the recipient identifier.

6. The method of claim **1** wherein the step of completing further comprises the steps of:

transmitting the validation status to the recipient; and

completing the transaction with the originator based on the transmitted validation status.

7. The method of claim **1** wherein the electronic commerce transaction further includes an originator identifier and the step of validating further includes the step of validating the electronic commerce transaction at the transaction administrator based on the originator identifier.

8. The method of claim **7** wherein the originator identifier further includes a transaction data.

9. The method of claim **1** wherein the validation is further based on a transaction data.

10. The method of claim **1** where the electronic commerce transaction includes a plurality of transactions.

11. A method for providing a validated electronic commerce transactions between an originator, a recipient and a transaction administrator, comprising the steps of:

requesting an electronic commerce transaction from the originator to the recipient, the electronic commerce transaction including a unique transaction identifier, an originator identifier and transaction data;

requesting validation of the originator identifier and the transaction data from the transaction administrator;

requesting validation of the unique transaction identifier and the transaction data from the originator;

completing the electronic commerce transaction if the unique transaction identifier, the originator identifier and the translation data are validated by both the originator and the transaction administrator.

12. The method of claim **11** further including the step of validating the originator identifier and the transaction data at the transaction administrator.

13. The method of claim **11** further includes the step of validating the unique transaction identifier and the transaction data at the originator.

14. The method of claim **13** wherein the step of validating further comprises the step of comparing the unique transaction identifier and transaction data with a list including all unique transaction identifiers and associated transaction data at the originator.

15. A method for providing electronic commerce, comprising the steps of:

transmitting a payment transaction for items from an originator to a recipient, said request including at least an originator identifier;

transmitting a first verification request from the recipient to a transaction administrator to verify the originator identifier;

verifying the identifier for the originator at the transaction administrator;

transmitting a second verification request from the transaction administrator to the originator to determine if the originator generated the payment transaction;

verifying if the originator generated the payment transaction; and

completing the payment transaction in response to answers on the first and the second verification requests.

16. The method of claim **15** wherein the step of completing further comprises the steps of:

transmitting from the originator to the transaction administrator, a response to the second verification request indicating if the originator generated the payment transaction

transmitting from the transaction administrator to the recipient, a response to the first verification request verifying the identifier of the originator; and

transferring the item to the originator.

17. The method of claim **15** further including the step of encrypting transmissions between the originator and the transaction administrator.

18. The method of claim **15** further including the steps of:

generating a unique identifier associated with the payment transaction and

attaching the unique identifier with the transaction order, the first verification request and the second verification request.

19. The method of claim **18** wherein the unique identifier further includes a transaction amount.

20. The method of claim **19** wherein the step of verifying further includes the step of comparing the unique identifier attached to the second verification request to a unique identifier list of the client to determine if the originator generated the request.

21. The method of claim **15** wherein the steps of transmitting further includes the step of transmitting via e-mail messages over a computer network.

22. The method of claim **15** further including the step of querying the originator from the transaction administrator with randomly generated questions relating to the originator.

23. The method of claim **15** wherein the identifier for the originator comprises an account number.

24. The method of claim **15** wherein the identifier for the originator comprises a credit card number.

25. The method of claim **15** wherein the electronic commerce transaction further includes an originator identifier and the step of validating further includes the step of validating the electronic commerce transaction at the transaction administrator based on the originator identifier.

26. The method of claim **25** wherein the originator identifier further includes transaction amount.

27. A method for providing electronic commerce, comprising the steps of:

transmitting a transaction for an item from an originator to a recipient, the purchase order including an originator identifier;

associating a unique transaction identifier with the transaction order;

transmitting a first verification request including the unique transaction identifier from the recipient to a transaction administrator to verify the originator identifier;

transmitting the unique transaction number from the transaction administrator to the originator;

comparing the unique transaction identifier to other unique transaction identifiers generated by the originator to determine if the originator generated the unique transaction identifier; and

completing the transaction if the originator generated the unique transaction identifier.

28. The method of claim **27** wherein the step of completing further comprises:

notifying the transaction administrator if the originator generated the unique transaction number based on the results of the comparison;

generating a response to the first verification request from the transaction administrator to the recipient, the response indicating if the originator identifier is valid; and

transferring the item to the originator.

29. The method of claim **27** wherein the steps of transmitting further includes the step of transmitting via e-mail messages over a computer network.

30. The method of claim **27** wherein the electronic commerce transaction further includes an originator identifier and the step of validating further includes the step of validating the electronic commerce transaction at the transaction administrator based on the originator identifier.

31. A method for providing electronic commerce transactions over a computer network between an interconnected originator, recipient, and a transaction administrator, comprising the steps of:

generating a first e-mail message from the originator to the recipient containing a transaction order for an item, the transaction order containing a unique transaction identifier, an originator identifier and transaction data;

generating in response to the first e-mail message a second e-mail message from the recipient to the transaction administrator requesting validation of the originator identifier, the second e-mail message including the unique transaction identifier and the originator identifier;

generating in response to the second e-mail message a third e-mail message from the transaction administrator to the originator requesting validation of the unique transaction identifier, the third e-mail message including the unique transaction identifier;

comparing the unique transaction number from the third e-mail message to other unique transaction numbers generated by the originator to determine if the originator generated the transaction order; and

completing the transaction order based upon the results of the comparison.

32. The method of claim **31** wherein the step of completing further comprises the steps of:

notifying the transaction administrator if the originator generated the unique transaction number based on the results of the comparison;

generating a response to the authorization request from the transaction administrator to the recipient, the response indicating if the originator is valid; and

transferring the item to the originator.

33. The method of claim **32** further including the step of encrypting transmissions between the originator and the transaction administrator.

34. The method of claim **32** further including the step of querying the originator from the transaction administrator with randomly generated questions relating to the originator.

35. The method of claim **31** further including the step of extracting the unique transaction identifier from the third e-mail message prior to the comparison.

36. The method of claim **31** further including the step of extracting the originator identifier from the second e-mail message.

37. The method of claim **31** wherein the unique transaction identifier further includes the transaction data.

38. The method of claim **31** wherein the originator identifier further includes the transaction data.

39. A system for providing secure electronic commerce transactions between an originator, a recipient and a transaction administrator, comprising:

first processing means associated with the originator for generating an electronic commerce transaction having a unique transaction identifier and an originator identifier, associated therewith;

second processing means associated with the recipient responsive electronic commerce transaction from the originator for generating validation requests on the originator identifier to the transaction administrator;

third processing means associated with the transaction administrator for forwarding the unique transaction identifier to the originator to determine the validity of the electronic commerce transaction and

fourth processing means for comparing a unique transaction identifier received from the transaction administration to the unique transaction identifier generated by the second processing means to determine the validity of the transaction order.

40. The system of claim **39** further including a delivery system interconnecting the originator, the recipient, and the transaction administrator to enable transmission of information therebetween.

41. The system of claim **40** wherein the delivery system comprises a computer network.

42. The system of claim **41** wherein the computer network comprises the Internet.

43. The system of claim **41** further including an e-mail delivery system to enable communications between the originator, the recipient and the transaction administrator.

44. The system of claim **39**, further including means for encrypting transmissions between the purchaser and the transaction administrator.

45. The system of claim **39** wherein the means associated with the transaction administrator further includes means for generating random queries to the purchasers, said queries only concerning questions of which the purchaser has knowledge.

46. The system of claim **39** wherein the means for generating transaction orders and the means for comparing are incorporated within at least one processor to automatically perform processes associated with the transaction order.

47. The system of claim **39** wherein the third processing means further validates the originator identifier responsive to the request from the second processing means.

48. The system of claim **42** wherein the origination identifier further includes transaction information.

49. The system of claim **39** wherein the transaction identifier further includes transaction data.

50. A method for enabling electronic commerce transactions between a first party, a second party and a transaction administrator, comprising the steps of:

generating a request for processing of an electronic commerce transaction;

associating a unique transaction identifier with the electronic commerce transaction, the unique transaction identifier indicating a valid transaction;

determining the validity of the electronic commerce transaction by comparison of the unique transaction identifier with a list of valid unique transaction identifiers; and

completing the electronic commerce transaction based upon the results of the determination of the validity of the unique transaction identifier.

51. The method of claim **50** further including the steps of:

associating an originator identifier with the electronic commerce transaction; and

validating an identity of the originator based on the originator identifier at the transaction administrator.

52. The method of claim **51** further including the step of validating transaction data at the transaction administrator.

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