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(54) **AUTOMATIC MESSAGE INTERPRETATION AND ROUTING SYSTEM**

(75) Inventors: **Amy Rice**, Ridgefield, CT (US); **Julie Hsu**, Brooklyn, NY (US)

(73) Assignee: **Brightware, Inc.**, Novato, CA (US)

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(51) **Int. Cl.**[7] **G06F 17/00**
(52) **U.S. Cl.** **706/47**; 706/46; 706/49
(58) **Field of Search** 709/206; 706/45, 706/46, 47, 49

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Primary Examiner—Kakali Chaki
Assistant Examiner—Anil Khatri
(74) *Attorney, Agent, or Firm*—Merchant & Gould P.C.

(57) **ABSTRACT**

A method for automatically interpreting an electronic message, including the steps of (a) receiving the electronic message from a source; (b) interpreting the electronic message using a rule base and case base knowledge engine; and (c) classifying the electronic message as at least one of (i) being able to be responded to automatically; and (ii) requiring assistance from a human operator. The method for automatically interpreting an electronic message may also include the step of retrieving one or more predetermined responses corresponding to the interpretation of the electronic message from a repository for automatic delivery to the source.

66 Claims, 3 Drawing Sheets

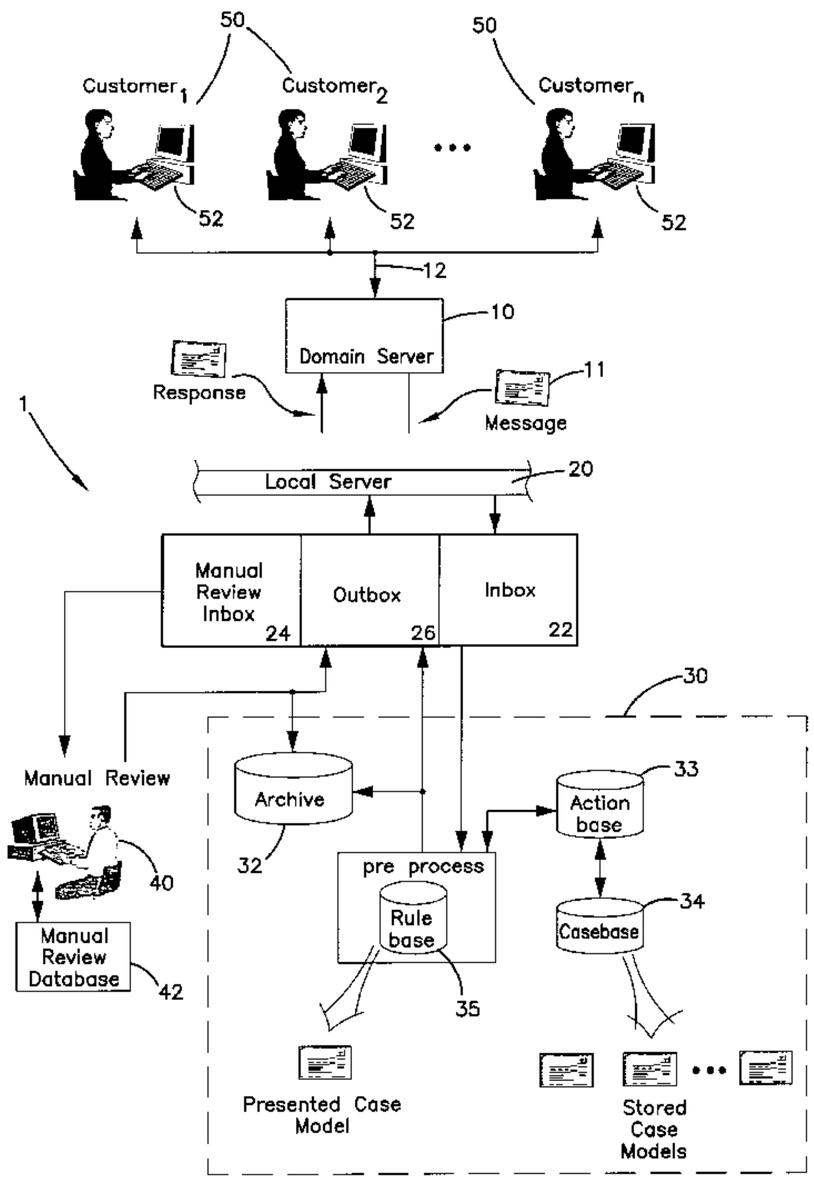


FIG. 1

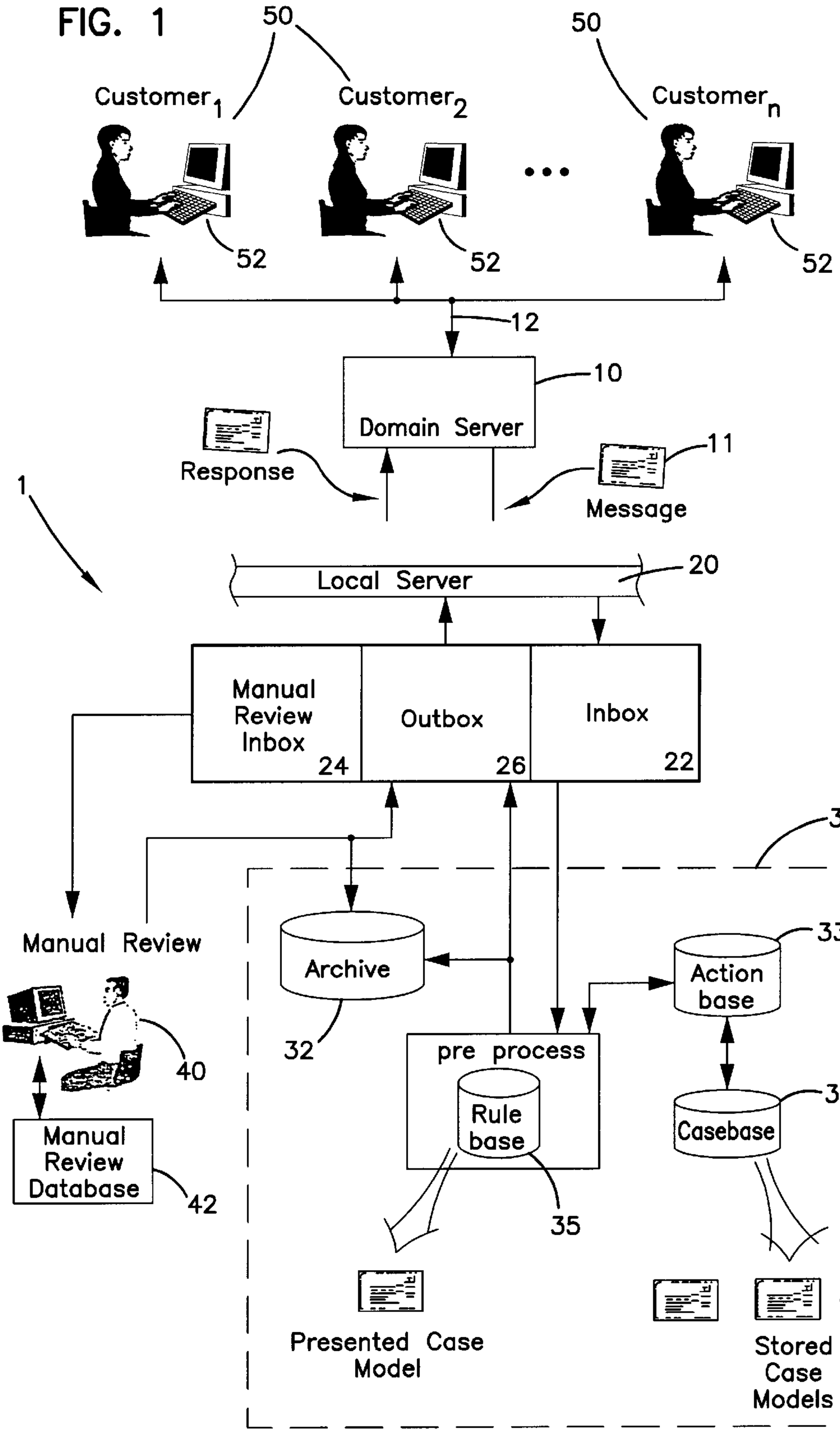

50
50
Customer1
Customer2
Customern
52
52
52
12
10
Domain Server
Response
11
Message
1
20
Local Server
Manual Review Inbox
24
Outbox
26
Inbox
22
30
Manual Review
Archive
32
33
Action base
pre process
Rule base
35
Casebase
34
40
Manual Review Database
42
Presented Case Model
Stored Case Models

FIG. 2A

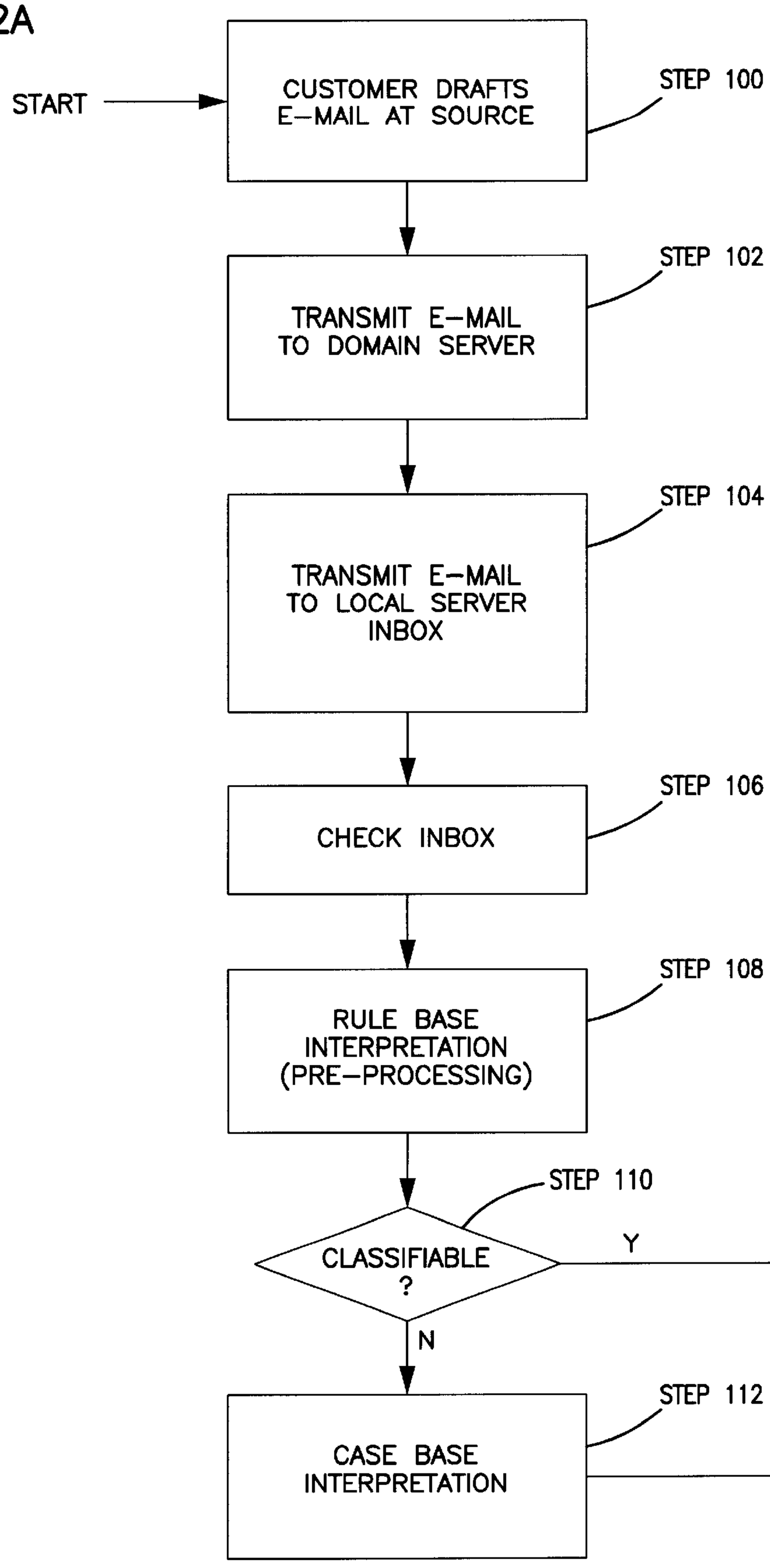
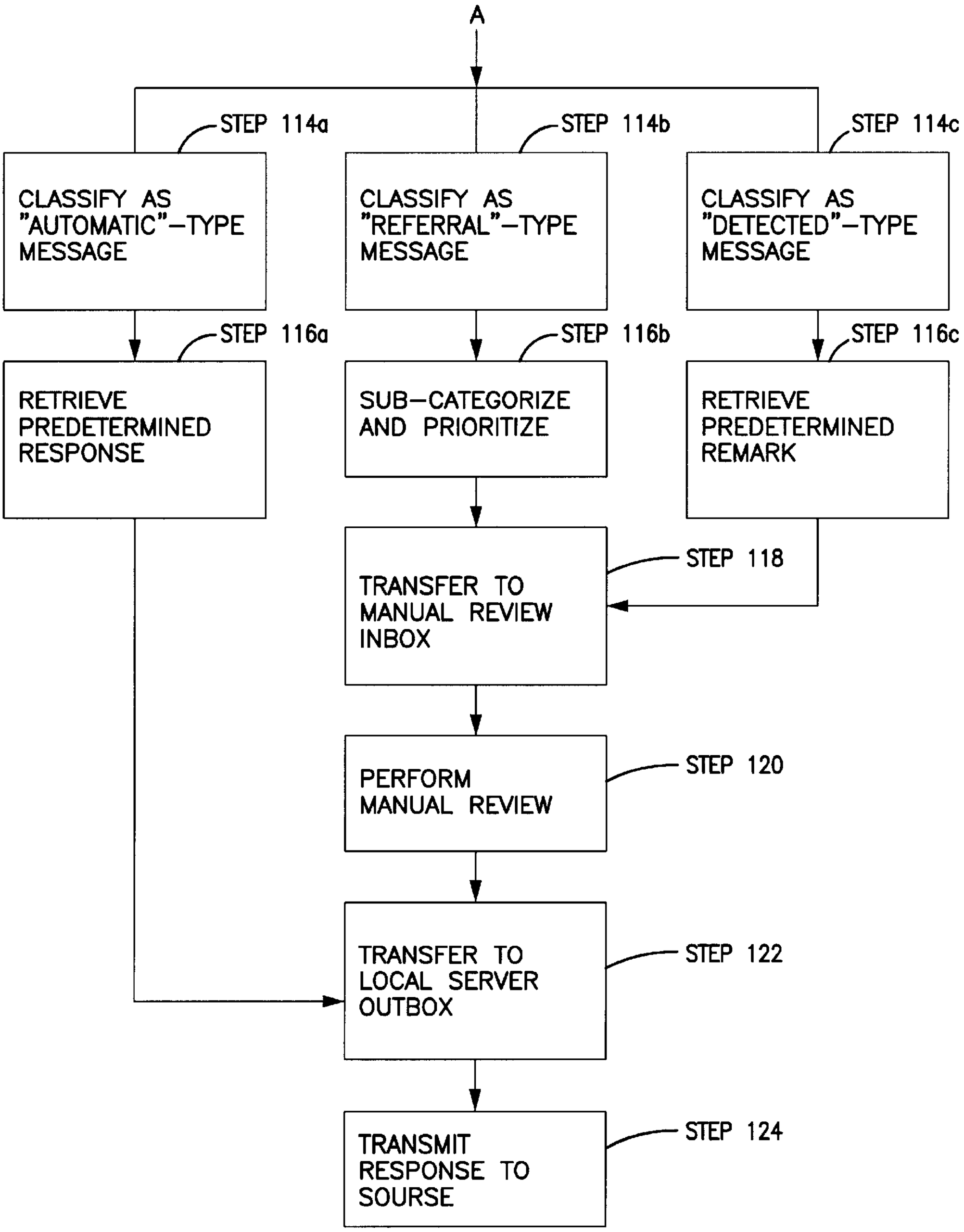

START
CUSTOMER DRAFTS E-MAIL AT SOURCE
STEP 100
TRANSMIT E-MAIL TO DOMAIN SERVER
STEP 102
TRANSMIT E-MAIL TO LOCAL SERVER INBOX
STEP 104
CHECK INBOX
STEP 106
RULE BASE INTERPRETATION (PRE-PROCESSING)
STEP 108
CLASSIFIABLE ?
STEP 110
Y
N
CASE BASE INTERPRETATION
STEP 112
A

FIG. 2B


A
STEP 114a
CLASSIFY AS "AUTOMATIC"–TYPE MESSAGE
STEP 114b
CLASSIFY AS "REFERRAL"–TYPE MESSAGE
STEP 114c
CLASSIFY AS "DETECTED"–TYPE MESSAGE
STEP 116a
RETRIEVE PREDETERMINED RESPONSE
STEP 116b
SUB–CATEGORIZE AND PRIORITIZE
STEP 116c
RETRIEVE PREDETERMINED REMARK
STEP 118
TRANSFER TO MANUAL REVIEW INBOX
STEP 120
PERFORM MANUAL REVIEW
STEP 122
TRANSFER TO LOCAL SERVER OUTBOX
STEP 124
TRANSMIT RESPONSE TO SOURSE

AUTOMATIC MESSAGE INTERPRETATION AND ROUTING SYSTEM

CROSS REFERENCE TO RELATED APPLICATIONS

This application is based on and claims priority from U.S. patent application Ser. No. 08/853,074 filed May 8, 1997 entitled "AUTOMATIC MESSAGE INTERPRETATION AND ROUTING SYSTEM, U.S. Provisional Patent Application No. 60/042,494, filed Apr. 3, 1997, entitled ELECTRONIC ROUTER FOR E-MAIL, and U.S. Provisional Patent Application No. 60/042,656, filed Apr. 4, 1997, entitled ELECTRONIC ROUTER FOR E-MAIL, each of which are incorporated herein by reference for all purposes.

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a system for automatically interpreting an incoming data message and, more particularly, the invention relates to a system using combined rule based and case based reasoning in interpreting, classifying, categorizing, prioritizing and responding to electronic messages.

2. Related Art

Many businesses have recently sought to expand access to their products and services by using the Internet and other on-line information channels to reach current and potential customers. Indeed, marketing campaigns which solicit customers over on-line information channels using electronic messages are becoming increasingly popular. These marketing campaigns have become very successful and often customers also contact a business concern using electronic messages (for example, E-mail) to request, among other things, product information, account status, and access to products and services.

Businesses have experienced problems in adapting their business practices to respond to large volumes of incoming electronic messages transmitted over a variety of communications channels (e.g., the Internet, telecommunications channels, and the like). These businesses have had to develop methods for quickly, accurately and efficiently responding to the increased volume of incoming electronic messages in order to meet the demands of their customers. In the case of the banking industry, electronic commerce laws may require a bank to respond to certain types of electronic correspondence within a specified period.

The problems imposed on businesses in formulating methods to quickly respond to electronic messages will only be exacerbated as the use of on-line information channels and electronic messaging increases in the future.

Some businesses have responded to increases in incoming electronic messages by having employees work longer hours or employing more people to review and respond to the messages. These methods have the drawbacks of significantly increasing the business costs associated with hiring, training and/or compensating personnel as well as requiring an increase in capital equipment and office space.

An event driven rule based messaging system, see U.S. Pat. No. 5,555,346 to Gross et al., has been described which employs user specified "when-if-then" rules to manage incoming E-mail messages. The system provides a user with such features as a tickler (permitting the user to put off dealing with the E-mail for a specified period), an automatic forwarding feature, and an automatic replying feature. The forwarding and replying features are triggered by one or more of the form of the message, the source of the message and key words used in the body of the message. For example, when a recipient of E-mail will be out of the office, he or she may specify that any E-mail received from T. Jones should be automatically responded to with the message "I'm out of the office until June 1, see L. White if you need something immediately."

Unfortunately, the rule based messaging system described in U.S. Pat. No. 5,555,346 has several drawbacks. For example, that system requires that the recipient of the E-mail know the identity of the sender (i.e., the sender is predetermined by the user) and, therefore, would be non-responsive to E-mail coming from new customers. Further, because the so-called automatic response is not capable of being altered in accordance with the message content of each incoming E-mail, the response must be overly simple, overly broad or require that a further response be formulated by another individual.

Software coded systems for executing procedural rules using well known computer languages, for example, COBOL are not well suited for implementing a knowledge-based system for interpreting incoming electronic messages. Indeed, such procedural rules would require impractically large and complicated branched coding structures to respond to the unpredictable and intricate content of the incoming electronic messages.

Natural language processing products such as SRA or Logicon or augmented transition network in custom developed applications such as the Intelligent Banking System (see Sahin, K. and Sawyer, K. THE INTELLIGENT BANKING SYSTEM: NATURAL LANGUAGE PROCESSING FOR FINANCIAL COMMUNICATIONS. Innovative Applications of Artificial Intelligence, AAAI Press. 1989) are unsuited for producing a response to an incoming electronic message. Indeed, such systems have relatively limited sets of key linguistic clues which are expressible in rule form. Consequently such systems might only provide a pre-processor function to a classification or reasoning task at great expense and complexity.

A help desk application utilizing a case based reasoning system, see U.S. Pat. No. 5,581,664 to Allen et al., has been described which compares an incoming set of facts (a "Problem") with a stored set of exemplar cases (a case base). The system then performs the same action for the problem as was performed in connection with the stored case. The case base is stored in the form of case attributes representing past "problems." The case attributes are compared to the facts of the incoming problem using trigram character matching to obtain a set of prior cases which may be useful in formulating an appropriate action.

Unfortunately, the help desk application described in U.S. Pat. No. 5,581,664 has several drawbacks. For example, a user must interact with the system to narrow down the results of the case base search to obtain the "best" case match. Consequently, the system would not provide satisfactory results if the input to the system was an electronic message and no user interaction was provided. Further, the system is not capable of automatically responding to the sender of an electronic message. Indeed, a representative or the user must interactively interpret the set of cases retrieved from the case base to obtain a response to the "problem."

Accordingly, there is a need in the art for a system which overcomes the shortcomings of the prior art by receiving electronic messages, classifying and categorizing the messages, and automatically responding to the messages without the intervention of a human operator.

SUMMARY OF THE INVENTION

The process of reviewing electronic messages involves complex reasoning which is distinctly knowledge specific. The present invention was developed in a banking industry context and was based on domain specific knowledge of banking products and services. It is understood that the present invention is not limited to the banking industry context and that one skilled in the art could readily adapt the teachings herein to other industries.

It is understood that a manual process for classifying and formulating responses to ambiguous and/or new electronic messages requires experience and often the collective experience of several members of a business team. Human electronic message reviewers read each message from beginning to end while continuously evolving a final interpretation by recursively applying business knowledge to the content of the message.

Therefore, the method and system of the present invention emulates the recursive nature of evolving interpretation by utilizing a knowledge base to execute reasoning tasks which automatically classify incoming electronic messages and automatically obtain responses to the messages.

In order to overcome the disadvantages of the prior art, the method of the present invention includes a method for automatically interpreting an electronic message including the steps of (a) receiving the electronic message from a source; (b) interpreting the electronic message using a rule base and case base knowledge engine; and (c) classifying the electronic message as at least one of (i) being able to be responded to automatically; and (ii) requiring assistance from a human operator.

According to another aspect, the present invention includes a method for automatically interpreting an electronic message including the steps of (a) receiving the electronic message from a source; (b) interpreting the electronic message using a rule base and case base knowledge engine; and (c) retrieving one or more predetermined responses corresponding to the interpretation of the electronic message from a repository for automatic delivery to the source.

Other features and advantages of the present invention will become apparent from the following description of the invention which refers to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

For the purpose of illustrating the invention, there is shown in the drawing a form which is presently preferred, it being understood, however, that the invention is not limited to the precise arrangement and instrumentality shown.

FIG. **1** is a block diagram showing the automatic message interpreting and routing system of the preferred embodiment of the present invention; and

FIGS. **2**A and **2**B are flow diagrams showing the high level process flow of the automatic message interpreting and routing system of FIG. **1**.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings wherein like numerals indicate like elements, there is shown in FIG. **1** a block diagram of the automatic message interpreting and routing system **1** of the preferred embodiment of the present invention. The system includes a domain server **10**, a local server **20**, and an automatic message reader **30**.

The automatic message interpreting and routing system **1** also includes a manual reviewer (or human operator) **40** having access to a manual review data base **42**. A plurality of customers **50** transmit electronic messages **11** to the automatic message interpreting and routing system **1** via source computers **52** coupled to the domain server **10**. The domain server **10** preferably communicates with the local server **20** which communicates with an inbox storage device **22** for receiving the electronic messages **11** and an outbox **26**. It is preferred that the electronic messages **11** are E-mail messages and are so referred to herein, it being understood, however, that other types of electronic messages **11** are contemplated as being within the scope of the invention.

The automatic message reader **30** includes a an archive **32**, an action base **33**, a case base **34**, and a rule base **35**. The action base **33**, case base **34** and rule base **35** communicate via an appropriate software control program (described below) which executes the steps necessary to achieve the routing and interpretation of incoming E-mail messages **11**.

The automatic message reader **30** preferably includes an embedded artificial intelligence (AI) application operating between an E-mail system and a customer service department. The customer service department, for example, provides new products and services to current and potential customers and maintains existing products and services by interacting with current customers. The automatic message reader **30** is a tool to more efficiently process incoming E-mail messages **11** in the customer service department.

The AI reasoning component (or knowledge engine) of the automatic message reader **30** uses a hybrid approach, i.e., a data-driven forward chaining rule parser operating in conjunction with a case based reasoner. This hybrid reasoning approach reflects the actual interpretation process used by human message reviewers in a customer service department.

The AI application emulates the recursive nature of human interpretation by first detecting combinations of prominent words (or text) and patterns of text within an electronic message **11** using a character matcher (preferably including a trigram character matching algorithm). As discussed in more detail below, predetermined attributes (or features) may be detected in the electronic message **11** during the character matching process. When certain attributes are detected, corresponding flags are set which (i) may directly lead to the classification of the electronic message **11**; and/or (ii) may be subsequently used in a case base search.

The high level process flow for the system of FIG. **1** for automatically interpreting and routing an electronic message **11** is now described with further reference to FIGS. **2**A and **2**B. At step **100**, the customer so drafts an E-mail message **11** on the source computer **52** for transmission to a business concern employing the automatic message interpreting and routing system **1** of the present invention. The E-mail message **11** may include an inquiry and/or a statement for which the customer desires a response.

Unlike the help desk application of U.S. Pat. No. 5,581,664 described above, in the instant invention the data of the electronic message **11** is delivered to the automatic message interpreting and routing system **1** in a non-interactive manner. Specifically, the customer **50** transmits a non-interactive electronic message **11** to the system **1**. This non-interactive transmission of electronic messages **11** prescribes that the customer **50** need not later provide additional input to assist the system **1**.

It is noted that defining an electronic message **11** as being non-interactive prescribes only that the message content

need not be supplemented. Thus, as described in more detail below, the form of the non-interactive electronic message **11** may be altered by the system **1** after the customer **50** sends it; however, the customer **50** is not required to provide supplemental information to assist the system **1**.

At step **102** the customer transmits the E-mail message **11** from the source **52** to the domain server **10** over a communications channel **12**. The domain server **10** communicates with the local server **20** (step **104**) for routing the E-mail message **11** to the inbox storage device **22**. A local server **20** suitable for use in the present invention is the Lotus Notes™ mail database system.

At step **106**, the automatic message reader **30** periodically checks the inbox **22** for new E-mail messages **11**. The automatic message reader **30** preferably includes an application programming interface (API) which is a rule based program (employing phase rules). The API facilitates data communications between the automatic message reader **30** (which, for example, runs with a Windows™ operating system) and the local server **20** (which, for example, runs with an OS2 operating system). Specifically, the API provides the following functions:

1. transferring data between the local server **20** and the automatic message interpreting and routing system **1**;

2. retrieving E-mail messages **11** from the inbox **22** and delivering same to the automatic message reader **30**;

3. delivering the E-mail messages **11** and any attachments (predetermined response and/or remarks) to the manual review inbox **24** and/or the outbox **26**; and

4. marking a processed E-mail message **11** as having been processed by the automatic message reader **30**.

The above processing steps and others will now be discussed in more detail. At step **106** the API of the automatic message reader **30** continuously monitors the inbox **22** for received E-mail messages **11** using a program loop. When a new E-mail message **11** has arrived, the automatic message reader **30** retrieves the E-mail message **11** and interprets it using a knowledge base capable of performing rule based parsing and case based retrieval (described in more detail below).

The interpretation of the E-mail message **11** by the automatic message reader **30** includes classifying the E-mail message **11** into (i) E-mail which is capable of being automatically responded to, called an "automatic" type E-mail message **11**; and/or (ii) E-mail which is not capable of being automatically responded to and requires the assistance of the human operator **40**, called a "referral" type E-mail message **11**. Referral type E-mail messages **11** may also be of the "detected" type, which type of messages imply a particular manual handling procedure or require an interpretive aid for delivery to the human operator **40**.

At step **108**, a new E-mail message **11** is passed to the pre-processing block containing the rule base **35** of the knowledge engine. Preferably, the rule base **35** (and case base **34**) are realized using the ART*Enterprise® tool, a knowledge-based application development tool, available from Brightware, Inc. of Stamford, Conn. The ART*Enterprise® tool employs a text pattern matcher having a Rete algorithm which provides the interpretation power necessary to process the highly complex message content of the E-mail message **11**.

The rule base **35** of the automatic message reader **30** contains "question" rules which take the form of IF-THEN statements with a left hand side of the statement containing a condition (or set of conditions) and a right hand side of the statement containing conclusion(s) (or actions). For example, a typical rule will take the following form:

$condition_1$?, $condition_2$? . . . =>$action_1$, $action_2$ . . . .

When the condition(s) on the left hand side of the rule are satisfied (or true) then the rule "fires" and the action(s) are executed. It is noted that the condition(s) will be deemed satisfied regardless of the order in which they are found true (i.e., the sequencing of conditions is irrelevant). This more closely parallels the recursive nature of the message review process of a human and, therefore, it is preferred that the automatic message reader **30** employs this technique.

The left hand side conditions of the IF-THEN question rules contain the key linguistic clues that directly imply interpretive conclusions. These linguistic clues include literals, wild card patterns (e.g. text patterns), variables and segments, or choices of pattern sets. For example, if the business concern, ABC, Corp., employing the automatic message interpreting and routing system **1** of the present invention, were going to merge with XYZ Corp., any text reciting a "merger," and/or the "XYZ Corp" in a received E-mail message **11** is a linguistic clue as to the subject matter content of the E-mail message **11**.

Question rules in the preferred embodiment of the present invention take on at least one of three forms, namely, (i) action setting rules, (ii) attribute setting rules, and (iii) action/attribute setting rules. Action rules are preferably received from the action base **33**.

An action setting rule will cause a specific action to occur when the rule condition(s) are met. Depending on the detected conditions, the resulting action may include the final classification of the E-mail message **11** as "automatic" "referral" and/or "detected" (step **114**, discussed in detail below). For example, when the condition that the body of the E-mail message **11** is blank is satisfied, then the action is preferably that the E-mail message **11** be classified as "automatic." Such an action rule would have the following form:

BLANK RULE:
  body contains no text?
  =>classify E-mail as "automatic."

An attribute setting rule is used when a satisfied condition is useful in subsequently matching the E-mail message **11** to stored case models of the case base **34** (step **112**, described in more detail below). From the example above, one attribute of the E-mail message **11** could be assigned as any reference to the merger between ABC Corp. and XYZ Corp. Thus, an attribute setting question rule in the rule base **35** might be represented as follows:

MERGER RULE:
  text include "merger," or "XYZ Corp."?
  =>flag (set) merger attribute.

The application of the attribute setting rules produces a case model of the E-mail message **11** (i.e., an index of features useful in comparing the E-mail message **11** to the stored case models of the case base **34**). Specifically, when attribute setting rules fire, specific attributes of the case model of the E-mail message **11** are flagged (i.e., set true). Thus, when a search of the case base **34** is required, the flagged attributes of the case model are used to search the stored case models of the case base **34**.

An action/attribute setting rule is used when a satisfied condition indicates that the E-mail message **11** may be directly classified into one of the "automatic," "referred" and/or "detected" classifications and that one or more attributes should be set to aid in subsequently matching the E-mail message **11** to the stored case models of the case

base. For example, if the customer sending the E-mail message **11** does not wish to be called on the telephone, then the classifying step should result in a "detected" type classification of the E-mail message **11** and that attribute should be set for aiding in searching the case base **34** (step **112**, discussed below).

The following table lists a set of preferred question rules and the form (action, attribute or action/attribute) of each.

TABLE 1

(Question Rules)

Question Rule Detects	Action Type: Classification
customer's address	attribute/action: detected
blank body	action: automatic
service cancellation	action: referral
change address	action: referral
no call back	attribute/action: detected
facsimile number	action: detected
phone number	action: detected
request for service	attribute
reference to error	attribute
investments	attribute
foreign country	attribute/action: detected
lengthy message	attribute
specific product	attribute
multiple questions	attribute
specific employee	attribute/action: detected
lost product	action: referral
sensitive info	action: refer, auto, detected

At step **110**, if the pre-processing interpretation using only the rule base **35** results in a classification of the E-mail message **11**, then the process flow proceeds to step **114**.

When the subject matter of the E-mail message **11** is substantially ambiguous and the pre-processing step using the rule base **35** alone does not result in a classification of the E-mail message **11**, then at step **110** the automatic message reader **30** accesses the case base **34** (step **112**).

Recall that the rule base (step **108**) produces a case model of the E-mail message **11**. The case model of the E-mail message **11** is called a "presented" case model and is compared with a set of stored case models in the case base **34**. These stored case models are created from previously received E-mail messages **11** and associated responses. The case base **34** preferably contains over 300 stored case models.

Referring to TABLE 2 below, each stored case model of the case base **34** preferably includes a title section, a subject section, a description section, an action section, and an attribute section.

TABLE 2

Example: Stored Case Model	
TITLE:	Lengthy Inquiry From lmnop.com
SUBJECT:	New Account
DESCRIPTION:	Dear Sirs, I recently saw your advertisement in the newspaper. I am interested in learning whether or not your system would work for me. Please E-mail me back and let me know the details of your system. Thanks,
ACTIONS:	1. type: referral 2. sub-class: sales 3. priority: 3

TABLE 2-continued

Example: Stored Case Model	
ATTRIBUTES:	1. address: yes 2. lengthy: yes

The title and subject sections generally identify the stored case model. The description section of the stored case model contains the body of the previously sent E-mail messages **11** for comparison to the body of the presented case model.

It is noted that certain superfluous literals such as the author's address are removed from the description section of the stored case model. Instead, the attribute "address" is set to "yes" which indicates that an address was received. The proper removal of certain literals and the setting of attributes is very important in automatically interpreting the E-mail messages **11**. Indeed, properly formed stored case models obviate the need to exactly match the presented case model and the stored case model.

The set of attributes (or slots) of the stored case model contain some important features of the prior received E-mail messages **11**. For example, the attributes of the stored case model may include (1) a source's address; (2) a do not call request; (3) a request for service; (4) a reference to a foreign country; (5) a lengthy message; (6) a reference to a specific product and/or service; (7) a reference to multiple questions; and/or (8) a reference to a specific employee.

The attributes and description of the stored case model are searched vis-a-vis the attributes and description of a presented case model with the goal of finding a stored case model which has attributes and a description substantially matching the attributes and description of the presented case model. The automatic message reader **30** of the preferred embodiment of the present invention uses a trigram character matching algorithm which is available using the ART*Enterprise® tool.

In selecting the best stored case model vis-a--vis the presented-case model, the automatic message reader **30** searches each stored case model of the case base **34** and assigns a raw score to each stored case model. Each instance in which a piece of text, a combination of text, and/or a pattern of text of the presented case model matches the stored case model, the raw score of the stored case model is increased. When a piece of text, a combination of text, and/or a pattern of text of the presented case model does not match the stored case model, the raw score of the stored case model is not increased, and may be decreased.

The raw score of a stored case model may increase or decrease in differing amounts depending on the particular feature (i.e., attribute) being searched. Thus, if $feature_1$ matches, the raw score may increase by match-weight, while if $feature_2$ matches, the raw score may increase by match-$weight_2$. Similarly, if $feature_1$ does not match, the raw score may decreased by mismatch-$weight_1$, while if $feature_2$ does not match, the raw score may decrease by mismatch-$weight_2$. It is preferred that the match-weight of each feature is a positive number and that the mismatch-weight is zero.

The weight that any matched feature contributes to the raw score is most meaningful when the maximum possible match score between a particular presented case model and the stored case model is considered. This is so because different stored case models may contain different numbers of features. Accordingly, it is preferred that the automatic message reader **30** of the preferred embodiment of the present invention normalize the raw score by dividing the raw score by the maximum possible match score. Thus, the normalized scores of each stored case model vis-a-vis the

presented case model are compared to select the "best" stored case model.

Preferably, a global absence weight (for example, −1) is also assigned to the stored case models of the case base **34**. The contribution of the absence weight to the raw score of a stored case model is determined by multiplying the global absence weight by the number of features (or attributes) which are present in the presented case model but are absent from the stored case model. The raw score is then normalized as described above.

Once a best stored case model has been identified, the automatic message reader **30** infers that the same or similar action that was taken on the E-mail of the stored case model should be taken on the E-mail message **11** which produced the presented case model. For example, the classification of the stored case model may be assigned to the E-mail message **11** of the present case model.

At step **114**, the E-mail message **11** is classified into at least one of an "automatic" (step **114***a*), a "referral" (step **114***b*), and/or a "detected" (step **114***c*) classification. As discussed above, the classification is achieved either through accessing only the rule base **35**, or accessing both the rule base **35** and the case base **34**.

When the automatic message reader **30** has classified the E-mail message **11** as being of the "automatic" type (step **114***a*), one or more predetermined responses (or prepared responses) are retrieved from a repository (or database), preferably the archive **32** (step **116***a*), of the automatic message reader **30** for automatic delivery to the source **52**. As is evident from the discussion herein, the predetermined response is an appropriate response to the inquiry of the customer **50**. It is understood that the predetermined response may be modified and/or altered in accordance with the interpretation of the E-mail message **11** if required to properly respond to a customer **50**.

At step **122**, the original E-mail message **11** and the predetermined response are routed from the automatic message reader **30** to the outbox **26** which communicates with the local server **20**. The local server **20** then transfers the predetermined response to the domain server **10** for transmission to the source **52** over the communications channel **12** (step **124**).

When the automatic message reader **30** is not capable of automatically responding to the E-mail message **11**, the E-mail message **11** must be transferred to the human operator **40** for review. Thus, when the automatic message reader **30** classifies the E-mail message **11** as being of the "referral" type (step **114***b*), the automatic message reader **30** sub-categorizes the E-mail message **11** according to its subject matter content (step **116***b*) prior to transferring the E-mail message **11** to the human operator **40**. The sub-categories are preferably related to specific business categories, such as (i) sales; and/or (ii) service.

At step **116***b*, the automatic message reader also assigns a priority (preferably including a priority number) to the sub-categorized E-mail message **11** where a higher priority indicates that the human operator **40** should process the associated E-mail message **11** before processing lower prioritized E-mail messages **11**.

For example, through the rule based and case based reasoning discussed above, the automatic message reader **30** may interpret the subject matter content of an E-mail message **11** as being related to the product service sub-category. Within the product service sub-category, inquiries may be made relating to: (1) fraud and lost sensitive equipment (i.e., lost/stolen bank cards); (2) sensitive information (i.e., bank account information); (3) general information; and/or (4) user comments. It is preferred that a human operator **40** (dealing with the product service business sub-category) process a customer's inquiry into a fraud before other types of inquiries and, therefore, the fraud inquiry is assigned a highest level of priority. Conversely, a user comment is preferably given a lowest level of priority and may be processed last.

Alternatively, the automatic message reader **30** may interpret the subject matter content of an E-mail message **11** as being related to the product sales sub-category. Within the product sales sub-category, inquiries may be made relating to: (1) promotional content; (2) requests for services; and (3) general questions and/or lengthy messages. It is preferred that a human operator **40** (dealing with the product sales business sub-category) process a customer's inquiry into a promotional effort before other types of inquiries and, therefore, the promotional inquiry is assigned a highest level of priority. Conversely, a general question is preferably given a lowest level of priority and may be processed last.

It is noted that when the automatic message reader **30** has invoked a case base **34** search in classifying the E-mail message **11**, and the best stored case model indicates that the E-mail message **11** is of the referral type, then the sub-categorization and priority of the stored case model will also be assigned to the E--mail message **11** of the presented case model. Further, if the best case model identifies a particular predetermined response, such response (or a modification thereof) may be utilized in responding to the E-mail message **11** of the presented case model.

After the referral type E-mail message **11** has been sub-categorized and prioritized, the automatic message reader **30** routs the E-mail message **11** to the manual review inbox **24** (step **118**) for subsequent retrieval by the human operator **40**. If possible, one or more predetermined responses for proposed release and delivery to the source **52** are retrieved from the repository of the automatic message reader **30** and routed to the manual review inbox **24** along with the E-mail message **11**.

At step **120**, the human operator **40** (preferably assigned to a specific business sub-category) first reviews and processes the highest priority E-mail messages **11** followed by the lower prioritized E-mail messages **11**. When the human operator **40** deems that a predetermined response is appropriate and may be released to the customer **50**, the response is routed to the outbox **26** (step **122**) for delivery to the domain server **10**. The response is then transmitted over the data communications channel **12** to the source **52** (step **124**).

Preferably, all outgoing responses are archived in an archive database **32** for subsequent review and use if desired.

When the automatic message reader **30** interprets that the referral type E-mail message **11** is also of the "detected" type (step **114***c*), a particular manual handling procedure for a referred E-mail message **11** has been interpreted from the subject matter of the E-mail. In such a case, one or more remarks (i.e., an explicative aid or advice) for presentation to the human operator **40** may be extracted from the repository of the automatic message reader **30** (step **116***c*) and routed to the manual review inbox **24** along with the E-mail message **11** (step **118**) to assist the human operator **40** in processing the E-mail message **11** in a more efficient manner.

For example, when the automatic message reader **30** interprets a do not call request, a phone number, a facsimile-number or a foreign address, in the E-mail message **11**, it is preferred that a remark indicating a specific manual procedure (e.g., not calling the customer) be forwarded with the

E-mail message **11** to the human operator **40**. Other types of "detected" features of E-mail messages **11** include, specific employee requests, inclusion of sensitive information, and/or inclusion of other information which dictates a specific manual procedure.

Such "detected" E-mail messages **11** often contain information which is useful in customizing and improving customer service vis-a-vis the responses to the E-mail messages **11**.

In some instances the response to the customer's **50** E-mail message **11** may not be affected by such "detected" information. However, a human operator **40** might otherwise miss the "detected" information in a strictly manual review process. Thus, a business concern benefits from the classification of "detected" type E-mail messages **11** in that valuable business tools for servicing customers **50** may be developed using the detected information.

Advantageously, the automatic message interpreting and routing system **1** of the preferred embodiment of the present invention can properly process electronic messages **11** from any number of unknown sources (i.e., the sources need not be predetermined). Indeed, since the automatic message reader **30** employs a knowledge engine to automatically interpret the subject matter content of the electronic message **11**, the specific source of the electronic message **11** does not limit the set of electronic messages **11** which may be automatically responded to provided only that they arrive in a recognized format, like ASCII, etc.

The electronic message **11** is preferably an E--mail message in ASCII text data format, it being understood that the invention is not so limited. Indeed, the electronic message **11** may take on a variety of data formats including digital formats, voice data, dual tone multi-frequency (DTMF) tones, or the like. When the electronic message **11** is in the voice data format or DTMF data format, a receiving device (not shown) suitable for receiving the voice data and/or DTMF tones is included in the automatic message interpreting and routing system **1**.

Further, the message data of the electronic message **11** may be converted from one data format to another prior to transferring the electronic message **11** to the inbox **22**. For example, a customer **50** may transmit a printed document (message data) to the automatic message interpreting and routing system **1** by way of a facsimile machine. In that case, the facsimile format file would be converted using, for example, a character recognition process (not shown) which converts the facsimile formatted text into an ASCII data format electronic message **11** prior to transferring the electronic message **11** to the inbox **22**.

The customer SO may also transmit an electronic message **11** in a voice data format to the automatic message interpreting and routing system **1** by way of known methods (e.g., dictation software such as is currently offered commercially from IBM). In such a case, the voice data is preferably converted into a digital text format electronic message **11**, for example ASCII, prior to transferring the electronic message **11** to the inbox **22**.

The system for automatically interpreting an incoming electronic message **1** is capable of interpreting electronic messages **11** which contain data in a predetermined arrangement, so-called fixed data electronic messages. An electronic message having fixed data may have the message content (i.e., the customer name, address, message content, etc.) in predetermined positions in the message.

The system for automatically interpreting an incoming electronic message **1** is also capable of interpreting electronic messages **11** which contain data in variable arrangements, so-called variable data. Such electronic messages having variable data may have the message content in any arrangement.

It is noted that a business concern may not wish to automatically send a predetermined response to a source **52** without first manually reviewing the response. In such a case, the system for automatically interpreting an incoming electronic message **1** of FIG. **1** would be modified such that all predetermined responses and/or remarks from the automatic message reader **30** are transferred to the manual review inbox **24**. Thus, the process flow of FIG. **2**B would be likewise modified such that the output from step **116***a* (retrieving a predetermined response) is directed to step **118** (transferring to the manual review inbox).

A working model of the system for automatically interpreting an incoming electronic message of the present invention has been developed which has significantly reduced costs of processing such messages. Specifically, about 5 to 80 percent (depending on the size and structure of the case base) of all incoming electronic messages were automatically processed while the processing time of those messages requiring manual intervention was reduced by about 50 percent.

The working system utilized the ART*Enterprise® version 2.0b, the Microsoft Win32s library, Visual C/C++1.5, and Lotus Notes™ version 3.OC running on a Windows 3.1 platform. The system employed an Intel-based 486/66 Mhz, 500 MB hard disk and 32 MB RAM computer.

Although the present invention has been described in relation to particular embodiments thereof, many other variations and modifications and other uses will become apparent to those skilled in the art. It is preferred, therefore, that the present invention be limited not by the specific disclosure herein, but only by the appended claims.

What is claimed is:

1. A method for automatically processing a non-interactive electronic message using a computer, comprising the steps of:

(a) receiving the electronic message from a source;

(b) interpreting the electronic message using a rule base and case base knowledge engine; and

(c) classifying the electronic message as at least one of (i) being able to be responded to automatically; and (ii) requiring assistance from a human operator.

2. The method of claim **1**, further comprising the step of:

(d) retrieving one or more predetermined responses from a repository for automatic delivery to the source when the classification step indicates that the electronic message can be responded to automatically.

3. The method of claim **1**, further comprising the steps of:

(d) retrieving one or more predetermined responses from a repository, the predetermined responses being proposed for delivery to the source;

(e) forwarding the electronic message and the predetermined response to the human operator when the classification step indicates that a response to the electronic message requires assistance from a human operator; and

(f) delivering the predetermined response to- the source when the human operator deems the response appropriate.

4. The method of claim **3**, further comprising the step of:

(c1) further categorizing the electronic message into at least one of a plurality of sub-categories based on subject matter content of the electronic message.

5. The method of claim **4**, wherein the sub-categories include product service subject matter and product sales subject matter.

6. The method of claim 4, further comprising the step of:

(c2) prioritizing the sub-categorized electronic message into at least one of a plurality of priorities based on the subject matter content of the electronic message wherein a higher priority indicates that the human operator should process the associated electronic message before processing lower prioritized electronic messages.

7. The method of claim 6, wherein the plurality of priorities of a product service sub-category include at least one of (i) fraud and lost products; (ii) sensitive information; (iii) general information; and (iv) user comments.

8. The method of claim 7, wherein the listed priorities are in order from highest to lowest priority.

9. The method of claim 6, wherein the plurality of priorities of a product sales sub-category include promotional content, request for services, and general questions and lengthy messages.

10. The method of claim 9, wherein the listed priorities are in order from highest to lowest priority.

11. The method of claim 1, wherein the step of classifying includes:

(c) classifying the electronic message as at least one of (i) being able to be responded to automatically; (ii) requiring a first level of assistance from a human operator; and (iii) requiring a second level of assistance from a human operator.

12. The method of claim 11, wherein:

when the classification step indicates that the electronic message requires a first level of assistance from a human operator, the method further comprises the steps of:

(d) retrieving one or more predetermined responses from a repository, the predetermined responses being proposed for delivery to the source;

(e) forwarding the electronic message and the predetermined response to the human operator; and

(f) delivering the predetermined response to the source when the human operator deems the response appropriate.

13. The method of claim 11, wherein:

when the classification step indicates that the electronic message requires a second level of assistance from a human operator, the method further comprises the steps of:

(d) retrieving one or more predetermined remarks from a remarks repository to assist the human operator in processing the electronic message manually; and

(e) forwarding the electronic message to the human operator.

14. The method of claim 13, wherein the classification step indicates that the electronic message requires a second level of assistance from a human operator when at least one of a phone number, a foreign address, a do not call request, a facsimile number, a specific employee request, sensitive information, and a specific manual procedure is interpreted in the electronic message.

15. The method of claim 1, wherein the electronic message is received over an electronic data communications channel.

16. The method of claim 15, wherein the electronic data communications channel is the Internet.

17. The method of claim 15, wherein the electronic message is an electronic mail (E-mail) message.

18. The method of claim 1, further comprising the steps of:

(a1) receiving the electronic message from the source in a first data format; and

(a2) converting the electronic message from the first data format to an electronic message having a second data format.

19. The method of claim 18, wherein the first data format is one of a printed document format, a voice data format, a dual tone multi-frequency (DTMF) format, and a first digital data format.

20. The method of claim 19, wherein the second data format is a second digital data format.

21. The method of claim 20, wherein the first and second digital data formats are ASCII.

22. The method of claim 1, wherein the predetermined response is altered in accordance the interpretation of the electronic message before delivery to the source.

23. The method of claim 1, wherein the electronic message includes fixed data.

24. The method of claim 1, wherein the electronic message includes variable data.

25. A method for automatically processing an electronic mail (E-mail) message, comprising the steps of:

(a) receiving the E-mail from a source over an electronic data communications channel;

(b) interpreting the E-mail using a rule base and case base knowledge engine; and

(c) classifying the E-mail as at least one of (i) being able to be responded to automatically; and (ii) requiring assistance from a human operator; wherein when the classification indicates that the E-mail can be responded to automatically, the method further includes the steps of:

(d) retrieving one or more predetermined responses from a repository;

(e) formulating an E-mail response from the predetermined response; and

(f) transmitting the E-mail response to the source over the data communications channel.

26. A method for automatically processing a non-interactive electronic message using a computer, comprising the steps of:

(a) receiving the electronic message from a source;

(b) interpreting the electronic message using a rule base and case base knowledge engine; and

(c) retrieving one or more predetermined responses corresponding to the interpretation of the electronic message from a repository for automatic delivery to the source.

27. The method of claim 26, wherein the source of the electronic message is not predetermined.

28. The method of claim 26, further comprising the steps of:

(b1) classifying the electronic message as at least one of (i) being able to be responded to automatically; and (ii) requiring assistance from a human operator; and

(c) retrieving one or more predetermined responses corresponding to the interpretation of the electronic message from a repository for automatic delivery to the source when the classification step indicates that the electronic message can be responded to automatically.

29. The method of claim 28, wherein the step of interpreting the electronic message further includes the steps of:

(b1) producing a case model of the electronic message including a set of predetermined attributes for identifying specific features of the electronic message;

(b2) detecting at least one of text, combinations of text, and patterns of text of the electronic message using character matching;

(b3) flagging the attributes of the case model which are detected in the electronic message; and

(b4) classifying the electronic-message as at least one of (i) being able to be responded to automatically; and (ii) requiring assistance from a human operator, the classification being performed in accordance with the flagged attributes.

30. The method of claim **28**, wherein the step of interpreting the electronic message further includes the steps of:

(b1) producing a case model of the electronic message including (i) a set of attributes for identifying specific features of the electronic message; and (ii) message text;

(b2) detecting at least one of text, combinations of text, and patterns of text of the electronic message using character matching;

(b3) flagging the attributes of the case model which are detected in the electronic message;

(b4) comparing the flagged attributes of the case model with stored attributes of stored case models of the case base;

(b5) comparing the text of the case model with stored text of the stored case models of the case base; and

(b6) assigning a score to each stored case model which is compared with the case model, the score increasing when at least one of the attributes and the text match the stored case model and the score not increasing when at least one of the attributes and the text do not match the stored case model.

31. The method of claim **30**, wherein:

when at least one of the attributes and the text match the stored case model, the score is increased by a predetermined match weight; and

when at least one of the attributes and the text does not match the stored case model, the score is decreased by a predetermined mismatch weight.

32. The method of claim **31**, wherein the match weight has an absolute value greater than zero and the mismatch weight is zero.

33. The method of claim **31**, wherein each score is normalized by dividing the score by a maximum possible score for the stored case model, where the maximum possible score is determined when all of the attributes and text of the case model and the stored case model match.

34. The method of claim **30**, further comprising the step of:

(b7) classifying the electronic message as at least one of (i) being able to be responded to automatically; and (ii) requiring assistance from a human operator, the classification of the electronic message being performed in accordance with the classification of the stored case model having a highest score.

35. The method of claim **34**, further comprising the step of:

(c) retrieving one or more predetermined responses corresponding to the interpretation of the electronic message from a repository for automatic delivery to the source when the classification step indicates that the electronic message can be responded to automatically.

36. The method of claim **35**, wherein the predetermined response is altered in accordance with the interpretation of the electronic message before delivery to the source.

37. The method of claim **30**, wherein the attributes include at least one of a source's address, a do not call request, a request for service, a reference to a foreign country, a long message, a reference to a specific product, a reference to multiple questions, and a reference to a specific employee.

38. The method of claim **26**, wherein the predetermined response is altered in accordance the interpretation of the electronic message before delivery to the source.

39. The method of claim **26**, wherein the electronic message includes fixed data.

40. The method of claim **26**, wherein the electronic message includes variable data.

41. A system for automatically processing a non-interactive electronic message received from a source, the system comprising:

a server for transmitting and receiving electronic messages over a communications channel;

an inbox storage device for storing incoming electronic messages;

a knowledge engine including a rule base and a case base, the case base having a plurality of stored cases representing past received electronic messages;

a pre-processor for receiving the electronic message and interpreting the electronic message using the rule base;

a searching device for searching the electronic message and the case base to retrieve a stored case from the case base which most closely matches the electronic message;

a classifier for classifying the electronic message into at least one of (i) being able to be responded to automatically; and (ii) requiring assistance from a human operator.

42. The system of claim **41**, further comprising:

a repository of predetermined responses, at least one of the responses being selected from the repository by the knowledge base for automatic delivery to the source when the classifier indicates that the electronic message can be responded to automatically.

43. The system of claim **42**, wherein the predetermined response is altered in accordance the interpretation of the electronic message before delivery to the source.

44. The system of claim **41**, further comprising:

a repository of predetermined responses, one or more of the predetermined responses being selected by the knowledge base for proposed delivery to the source; and

an electronic router for forwarding the electronic message to the human operator when the classifier indicates that a response to the electronic message requires assistance from a human operator, the router delivering the predetermined response to the source when the human operator deems the response appropriate.

45. The system of claim **44**, wherein the classifier categorizes the electronic message into at least one of a plurality of sub-categories based on subject matter content of the electronic message.

46. The system of claim **45**, wherein the sub-categories include product service subject matter and product sales subject matter.

47. The system of claim **45**, wherein the classifier prioritizes the sub-categorized electronic message into at least one of a plurality of priorities based on the subject matter content of the electronic message wherein a higher priority indicates that the human operator should process the associated electronic message before processing lower prioritized electronic messages.

48. The system of claim **47**, wherein the plurality of priorities of a product service sub-category include at least one of (i) fraud and lost products; (ii) sensitive information; (iii) general information; and (iv) user comments.

49. The system of claim **48**, wherein the listed priorities are in order from highest to lowest priority.

50. The system of claim **47**, wherein the plurality of priorities of a product sales sub-category include promotional content, request for services, and general questions and lengthy messages.

51. The system of claim **50**, wherein the listed priorities are in order from highest to lowest priority.

52. The method of claim **41**, wherein the electronic message includes fixed data.

53. The method of claim **41**, wherein the electronic message includes variable data.

54. A method for automatically processing a non-interactive electronic message using a computer, comprising the steps of:

(a) receiving the electronic message from a source;

(b) interpreting the electronic message using a rule base and case base knowledge engine;

(c) retrieving one or more predetermined responses from a repository, the predetermined responses being proposed for delivery to the source;

(d) forwarding the electronic message and the predetermined response to a human operator; and

(e) delivering the predetermined response to the source when the human operator deems the response appropriate.

55. The method of claim **54**, further comprising the step of:

(b1) categorizing the electronic message into at least one of a plurality of sub-categories based on subject matter content of the electronic message.

56. The method of claim **55**, wherein the sub-categories include product service subject matter and product sales subject matter.

57. The method of claim **56**, further comprising the step of:

(b2) prioritizing the sub-categorized electronic message into at least one of a plurality of priorities based on the subject matter content of the electronic message wherein a higher priority indicates that the human operator should process the associated electronic message before processing lower prioritized electronic messages.

58. The method of claim **57**, wherein the plurality of priorities of a product service sub-category include at least one of (i) fraud and lost products; (ii) sensitive information; (iii) general information; and (iv) user comments.

59. The method of claim **58**, wherein the listed priorities are in order from highest to lowest priority.

60. The method of claim **57**, wherein the plurality of priorities of a product sales sub-category include promotional content, request for services, and general questions and lengthy messages.

61. The method of claim **60**, wherein the listed priorities are in order from highest to lowest priority.

62. The method of claim **54**, wherein the step of interpreting the electronic message further includes the steps of:

(b1) producing a case model of the electronic message including a set of predetermined attributes for identifying specific features of the electronic message;

(b2) detecting at least one of text, combinations of text, and patterns of text of the electronic message using character matching; and

(b3) flagging the attributes of the case model which are detected in the electronic message.

63. The method of claim **54**, wherein the step of interpreting the electronic message further includes the steps of:

(b1) producing a case model of the electronic message including (i) a set of attributes for identifying specific features of the electronic message; and (ii) message text;

(b2) detecting at least one of text, combinations of text, and patterns of text of the electronic message using character matching;

(b3) flagging the attributes of the case model which are detected in the electronic message;

(b4) comparing the flagged attributes of the case model with stored attributes of stored case models of the case base;

(b5) comparing the text of the case model with stored text of the stored case models of the case base; and

(b6) assigning a score to each stored case model which is compared with the case model, the score increasing when at least one of the attributes and the text match the stored case model and the score not increasing when at least one of the attributes and the text do not match the stored case model.

64. The method of claim **63**, wherein:

when at least one of the attributes and the text match the stored case model, the score is increased by a predetermined match weight; and

when at least one of the attributes and the text does not match the stored case model, the score is decreased by a predetermined mismatch weight.

65. The method of claim **64**, wherein the match weight has an absolute value greater than zero and the mismatch weight is zero.

66. The method of claim **64**, wherein each score is normalized by dividing the score by a maximum possible score for the stored case model, where the maximum possible score is determined when all of the attributes and text of the case model and the stored case model match.

* * * * *

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

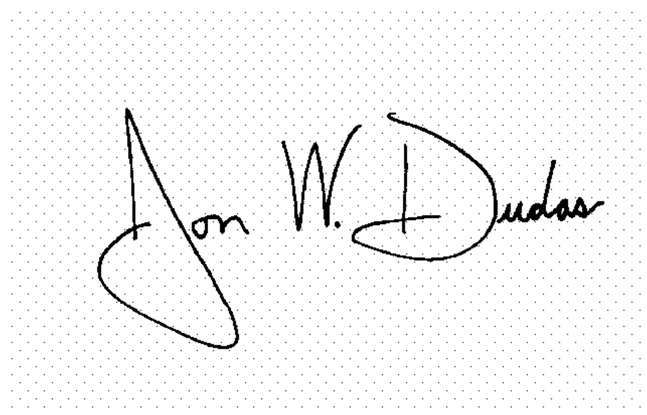
PATENT NO. : 6,411,947 B1
DATED : June 25, 2002
INVENTOR(S) : Rice et al.

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Title page,
Item [75], Inventors, please insert -- **Anthony M. Angotti**, Marcellus, NY (US); **Rosanna M. Piccolo**, Bayside, NY (US); **Fred R. Cohen**, New York, NY (US); --.
Item [60], **Related U.S. Application Data**, please insert -- Continuation of Serial No. 08/853,074, filed May 8, 1997, now issued as 6,189,059, which claims the benefit of --.

Signed and Sealed this

Eighth Day of November, 2005



JON W. DUDAS
Director of the United States Patent and Trademark Office

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(12) EX PARTE REEXAMINATION CERTIFICATE (8106th)

United States Patent

Rice et al.

(10) Number: US 6,411,947 C1

(45) Certificate Issued: Mar. 22, 2011

(54) **AUTOMATIC MESSAGE INTERPRETATION AND ROUTING SYSTEM**

(75) Inventors: **Amy Rice**, Ridgefield, CT (US); **Julie Hsu**, Brooklyn, NY (US); **Anthony M. Angotti**, Marcellus, NY (US); **Rosanna M. Piccolo**, Bayside, NY (US); **Fred R. Cohen**, New York, NY (US)

(73) Assignee: **Bright Response, LLC**, Indian Wells, CA (US)

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(63) Continuation of application No. 08/853,074, filed on May 8, 1997, now Pat. No. 6,189,059.

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G06F 5/02 (2006.01)

(52) **U.S. Cl.** **706/47**; 706/46; 706/49

(58) **Field of Classification Search** ..... None
See application file for complete search history.

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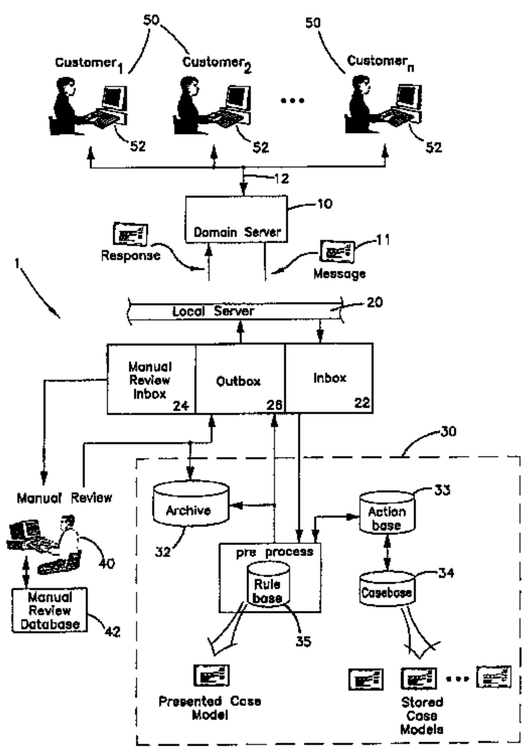
Defendants' Google Inc. et al. Invalidity Contentions of Bright Response, *LLC F/K/A Polaris IP, LLC* v. *Google Inc., et al.* Civil Action No. 2:07–cv–371–TSW–CE (pp. 1–86, including Exhibit A).

(Continued)

Primary Examiner—M. Steelman

(57) **ABSTRACT**

A method of automatically interpreting an electronic message, including the steps of (a) receiving the electronic message from a source; (b) interpreting the electronic message using a rule base and case base knowledge engine; and (c) classifying the electronic message as at least one of (i) being able to be responded to automatically; and (ii) requiring assistance from a human operator. The method for automatically interpreting an electronic message may also include the step of retrieving one or more predetermined responses corresponding to the interpretation of the electronic message from a repository for automatic delivery to the source.



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EX PARTE REEXAMINATION CERTIFICATE ISSUED UNDER 35 U.S.C. 307

THE PATENT IS HEREBY AMENDED AS INDICATED BELOW.

Matter enclosed in heavy brackets [ ] appeared in the patent, but has been deleted and is no longer a part of the patent; matter printed in italics indicates additions made to the patent.

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **9**, **10**, **14**, **30-37**, **50-51**, **57-61**, **63-65** and **66** is confirmed.

Claims **1-8**, **11-13**, **15-29**, **38-49**, **52-56** and **62** are cancelled.

New claims **67-92** are added and determined to be patentable.

67. The method of claim 31, further comprising categorizing the electronic message.

68. The method of claim 67, wherein the further categorizing the electronic message categorizes the electronic message into at least one of a plurality of sub-categories based on content of the electronic message.

69. The method of claim 68, wherein the sub-categories include product subject matter.

70. The method of claim 69, wherein the product subject matter includes product service subject matter and product sales subject matter.

71. The method of claim 31, further comprising prioritizing a sub-categorized electronic message into at least one of a plurality of priorities based on content of the electronic message.

72. The method of claim 31, wherein receiving the electronic message receives the electronic message over an electronic data communications channel.

73. The method of claim 72, wherein the electronic data communications channel is the Internet.

74. The method of claim 31, further comprising transmitting the one or more predetermined responses over an electronic data communications channel.

75. The method of claim 74, wherein the electronic data communications channel is the Internet.

76. The method of claim 31, further comprising altering the one or more predetermined responses in accordance with the interpretation of the electronic message before delivery to the source.

77. The method of claim 31, wherein the electronic message includes fixed data.

78. The method of claim 31, wherein the electronic message includes variable data.

79. The method of claim 31, wherein the interpreting comprises detecting combinations of words in the electronic message.

80. The method of claim 31, wherein the interpreting comprises detecting patterns of text in the electronic message.

81. The method of claim 31, wherein the interpreting comprises detecting combinations of text in the electronic message.

82. The method of claim 31, wherein the interpreting comprises detecting attributes in the electronic message.

83. The method of claim 31, wherein the interpreting comprises detecting predetermined attributes in the electronic message.

84. The method of claim 83, further comprising classifying the electronic message based on the detected predetermined attributes.

85. The method of claim 31, wherein the receiving receives a non-interactive message wherein the interpreting and retrieving are performed without further input from the source.

86. The method of claim 31, wherein the interpreting comprises performing rule base parsing.

87. The method of claim 31, wherein the interpreting comprises performing case based retrieval.

88. The method of claim 31, wherein the interpreting comprises identifying a case model with substantially matching attributes.

89. The method of claim 31, wherein the interpreting comprises interpreting the electronic message as being related to a product category.

90. The method of claim 31, wherein the interpreting comprises interpreting the electronic message as being related to promotional content.

91. The method of claim 90, wherein the electronic message includes an inquiry related to the promotional content.

92. The method of claim 31, wherein the receiving includes receiving the electronic message from a domain server.

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