operated with few cases 105 or even no cases to start with, since the application 601 may create new cases 105 when there is no "best" case 204 in the case base 104." (col. 9, lines 21-50). Hence, the electronic message (i) being able to be responded to automatically (e.g. if the match quality is high, the application 601 provides an advice message which is used to advise the customer 604); and (ii) requiring assistance from a human operator (e.g., if no case is similar to the received data, the customer service representative 602 provides the advice message used to advise the customer)); 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 ("In the automated help desk application 601, the user 119 may comprise a customer service representative 602 who may typically be receiving a telephone call 603 from a customer 604. **A set of customer problems 605 and advice to respond with may be stored as cases 105**" (col. 9, lines 7-11); also, "In the case-matching step 202, the application 601 may attempt to match the customer problem 605 to one or more cases in the case base 104 using just the description 606 of the customer problem 605. If the match quality 315 of the case 105 which are matched is high, the application 601 may perform the best-case step 203 and following steps. The action 309 which the application 601 performs is to provide an advice message 607 to the customer service representative 602, who may then provide advice to the customer 604." (col. 9, lines 21-29)).

As per claim 29, Allen demonstrated all the elements as disclosed in claim 28, and further discloses 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 ("To match a problem 311 to the cases 105 in the case base 104, a case template 312 may be constructed for the problem 311 with attribute-value pairs 303 which correspond to notable parameters of the problem 311. The signature functions 304 may be applied to the attributes 310 (and their values 302) of the case template 312. Each attribute value pair 303 for the case template 312 may therefore generate a set of test bits 313 to be matched against the signatures 306 in the signature file 307." (col. 5, lines 3-11); further, "In a preferred embodiment, attributes 301 may be particular to the application field, and values 302 may have data types which vary from one attribute 301 to another. For example, in a case-based reasoning system 101 for loan approval, each case 105 might have an attribute 301 such as 'loan amount' which would have a numeric value 302, an attribute 301 such as 'approved' which would have a boolean value 302, and an attribute such as 'payment history' which would have a value 302 which is a list or array structure." (col. 4, lines 35-44; col. 8, line 61-col. 9, line 50; Fig. 6)). Thus, Allen discloses producing a case model of the electronic message including a set of predetermined attributes for identifying specific features of the electronic message (e.g., constructing a case template 312 for the problem 311

with attribute-value pairs 303 corresponding to notable parameters of the problem 311); and

(b2) detecting at least one of text, combinations of text, and patterns of text of the electronic message using character matching ("In character matching, the words of the text string value 302, as determined for word matching, are broken up into separate trigrams (substrings of length three)." (col. 6, lines 41-43));

(b3) flagging the attributes of the case model which are detected in the electronic message ("In a preferred embodiment, string matching, word matching and character matching are assigned weights, and the evaluation 316 of the text string match may be determined by a weighted sum of the evaluations 316 for each type of match." (col. 6, lines 53-57); also, "To match a problem 311 to the cases 105 in the case base 104, a case template 312 may be constructed for the problem 311 with attribute-value pairs 303 which correspond to notable parameters of the problem 311. The signature functions 304 may be applied to the attributes 301 (and their values 302) of the case template 312. Each attribute-value pair 303 for the case template 312 may therefore generate a set of test bits 313 to be matched against the signatures 306 in the signature file 307. In a preferred embodiment, each signature 306 in the signature file 307 may be logical-AND-ed together with the test bits 313, and may generate a bit whenever a signature 306 in the signature file 307 has all the test bits 313 for a particular attribute-value pair 303 set to logical '1.'" (col. 5, lines 3-15). Assigning a weight to each match and evaluating the text string by summing the evaluation results enables the inference engine to detect which attributes of the case template are found

in the stored cases. This identifies (i.e., flags) the detected attributes present in the stored case.); 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 ("To match a problem 311 to the cases 105 in the case base 104, a case template 312 may be constructed for the problem 311 with attribute-value pairs 303 which correspond to notable parameters of the problem 311. The signature functions 304 may be applied to the attributes 301 (and their values 302) of the case template 312. Each attribute- value pair 303 for the case template 312 may therefore generate a set of test bits 313 to be matched against the signatures 306 in the signature file 307. In a preferred embodiment, each signature 306 in the signature file 307 may be logical-AND-ed together with the test bits 313, and may generate a hit whenever a signature 306 in the signature file 307 has all the test bits 313 for a particular attribute-value pair 303 set to logical '1.' Cases 105 which are hits may be noted in a match table 314. The cases 105 in the match table 314 may be evaluated for a match quality 315, and the match quality 315 for each case 105 may be recorded in the match table 314. In a preferred embodiment, the inference engine 111 may determine match quality 315 for each case 105 in the match table 314 by a weighted sum of an evaluation 316 of those attribute-value pairs 303 which are matched. In a preferred embodiment, the weights assigned to each attribute-value pair 303 may be predetermined and may be altered by the user 119." (col. 5, lines 3-26); further, "Some number of cases 105 may be

recorded in the match table 314 by the feature-matching procedure 505, of which one may be the 'best' case 204. As the inference engine 111 is implemented within the rule-based reasoning system 501, it may also apply rules 103 or procedural structures 117 to the case template 312 before matching, and to the matched cases 105 after matching. In a preferred embodiment, the inference engine 111 may add new cases to the case base 104 when it determines that they are needed. In the case-matching step 202 or in the best-case step 203, the inference engine 111 may determine that there is no case 105 which is a good match for the case template 312. The inference engine 111 may create a new case 105 which partly or fully copies the case template 312, and may ask the user 119 (by means of the user interface 118) what the prescribed action 309 for the case 105 should be." (col. 8, lines 12-28). In addition, "In the case-matching step 202, the application 601 may attempt to match the customer problem 605 to one or more cases in the case base 104 using just the description 606 of the customer problem 605. If the match quality 315 of the case 105 which are matched is high, the application 601 may perform the best-case step 203 and following steps. The action 309 which the application 601 performs is to provide an advice message 607 to the customer service representative 602, who may then provide advice to the customer 604. However, it may occur that cases 105 which are matched all have a low match quality 315. The application 601 may collect a set of question-answer pairs 608 from the cases 105 which are matched. The application 601 may present a set of questions 609 from the question-answer pairs 608 to the customer service representative 602, who would provide a set of answers 610 to the application 601 (typically by asking the

customer 604). The application 601 may perform the case-matching step 202 with the question-answer pairs 608 as additional attribute-value pairs 303 to match. In a preferred embodiment, weights may be assigned to the description 606 and to each question-answer pair 608. If no 'best' case 204 can be matched even with the question-answer pairs 608, the application 601 may create a new case 105 which copies the case template 312 and ask the customer service representative 602 for the advice message 607 to include with the case 105. In a preferred embodiment, the application 601 may be operated with few cases 105 or even no cases to start with, since the application 601 may create new cases 105 when there is no 'best' case 204 in the case base 104." (col. 9, lines 21-50; FIG. 6). Hence, Allen discloses classifying the electronic-message as at least one of (i) being able to be responded to automatically (e.g., if the match quality is high, the application provides an advice message which is used to advise the customer); and (ii) requiring assistance from a human operator (e.g., if no case is similar to the received data, the customer service representative provides the advice message used to advise the customer), the classification being performed in accordance with the flagged attributes (e.g., the quality of the match is based on the results of the feature-matching process)).

As per claim 30, Allen demonstrated all the elements as disclosed in claim 28, and further discloses 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 ("To match a problem 311 to the cases 105 in the case base 104, a case template 312 may be constructed for the problem 311 with attribute-value pairs 303 which correspond to notable parameters of the problem 311. The signature functions 304 may be applied to the attributes 310 (and their values 302) of the case template 312. Each attribute-value pair 303 for the case template 312 may therefore generate a set of test bits 313 to be matched against the signatures 306 in the signature file 307." (col. 5, lines 3-11); further, "attributes 301 may be particular to the application field, and values 302 may have data types which vary from one attribute 301 to another. For example, in a case-based reasoning system 101 for loan approval, each case 105 might have an attribute 301 such as 'loan amount' which would have a numeric value 302, an attribute 301 such as 'approved' which would have a boolean value 302, and an attribute such as 'payment history' which would have a value 302 which is a list or array structure." (col. 4, lines 35-44). Hence, Allen discloses 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 (e.g., constructing a case template 312 for the problem with attribute-value pairs corresponding to notable parameters of the problem, an attribute type including text string data));

(b2) detecting at least one of text, combinations of text, and patterns of text of the electronic message using character matching ("an attribute 301 with a text string value 302 may be matched by string matching, word matching and character matching. In string matching, the entire text string value 302 is matched exactly. In

word matching, the text string value 302 is broken up into separate words, by reference to word delimiter characters, as is well known in the art." (col. 6, lines 24-31).

(b3) flagging the attributes of the case model which are detected in the electronic message ("In a preferred embodiment, string matching, word matching and character matching are assigned weights, and the evaluation 316 of the text string match may be determined by a weighted sum of the evaluations 316 for each type of match." (col. 6, lines 53-57); also "To match a problem 311 to the cases 105 in the case base 104, a case template 312 may be constructed for the problem 311 with attribute-value pairs 303 which correspond to notable parameters of the problem 311. The signature functions 304 may be applied to the attributes 301 (and their values 302) of the case template 312. Each attribute-value pair 303 for the case template 312 may therefore generate a set of test bits 313 to be matched against the signatures 306 in the signature file 307. In a preferred embodiment, each signature 306 in the signature file 307 may be logical-AND-ed together with the test bits 313, and may generate a bit whenever a signature 306 in the signature file 307 has all the test bits 313 for a particular attribute-value pair 303 set to logical '1.'" (col. 5, lines 3-15). Assigning a weight to each match and evaluating the text string by summing the evaluation results enables the inference engine to detect which attributes of the case template are found in the stored cases. This identifies (i.e., flags) the detected attributes present in the stored case.);

(b4) comparing the flagged attributes of the case model with stored attributes of stored case models of the case base ("To match a problem 311 to the

cases 105 in the case base 104, a case template 312 may be constructed for the problem 311 with attribute-value pairs 303 which correspond to notable parameters of the problem 311. The signature functions 304 may be applied to the attributes 301 (and their values 302) of the case template 312. Each attribute- value pair 303 for the case template 312 may therefore generate a set of test bits 313 to be matched against the signatures 306 in the signature file 307. In a preferred embodiment, each signature 306 in the signature file 307 may be logical-AND-ed together with the test bits 313, and may generate a bit whenever a signature 306 in the signature file 307 has all the test bits 313 for a particular attribute-value pair 303 set to logical '1.' Cases 105 which are hits may be noted in a match table 314. The cases 105 in the match table 314 may be evaluated for a match quality 315, and the match quality 315 for each case 105 may be recorded in the match table 314. In a preferred embodiment, the inference engine 111 may determine match quality 315 for each case 105 in the match table 314 by a weighted sum of an evaluation 316 of those attribute-value pairs 303 which are matched. In a preferred embodiment, the weights assigned to each attribute-value pair 303 may be predetermined and may be altered by the user 119." (col. 5, lines 3-26). Hence, Allen discloses comparing the flagged attributes of the case model with stored attributes of stored case models of the case base (e.g., each attribute-value pair of the case template is compared to the signatures of the cases and a value is generated whenever the case template attribute-value pair matches a stored value));

(b5) comparing the text of the case model with stored text of the stored case models of the case base ("an attribute 301 with a text string value 302 may be

matched by string matching, word matching and character matching. In string matching, the entire text string value 302 is matched exactly. In word matching, the text string value 302 is broken up into separate words, by reference to word delimiter characters, as is well known in the art." (col. 6, lines 24-31); Also, "In character matching, the words of the text string value 302, as determined for word matching, are broken up into separate trigrams (substrings of length three)." (col. 6, 41- 43) Thus, text from the problem is matched with text strings associated with stored cases); 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 ("Cases 105 which are hits may be noted in a match table 314. The cases 105 in the match table 314 may be evaluated for a match quality 315, and the match quality 315 for each case 105 may be recorded in the match table 314. In a preferred embodiment, the inference engine 111 may determine match quality 315 for each case 105 in the match table 314 by a weighted sum of an evaluation 316 of those attribute-value pairs 303 which are matched. In a preferred embodiment, the weights assigned to each attribute-value pair 303 may be predetermined and may be altered by the user 119." (col. 5, 15-26).

As per claim 31, Allen demonstrated all the elements as disclosed in claim 30, and further discloses **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 ("Cases 105 which are hits may be noted in a match table 314. The cases 105 in the match table 314 may be evaluated for a match quality 315, and the match quality 315 for each case 105 may be recorded in the match table 314. In a preferred embodiment, the inference engine 111 may determine match quality 315 for each case 105 in the match table 314 by a weighted sum of an evaluation 316 of those attribute-value pairs 303 which are matched. In a preferred embodiment, the weights assigned to each attribute-value pair 303 may be predetermined and may be altered by the user 119" (col. 5, lines 15-26) where the match quality inherently represents an increasing match or decreasing match.)

As per claim 34, Allen demonstrated all the elements as disclosed in 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** ("In the case-matching step 202, the application 601 may attempt to match the customer problem 605 to one or more cases in the case base 104 using just the description 606 of the customer problem 605. If the match quality 315 of the case 105 which are matched is high, the application 601 may perform the best-case step 203 and following steps. The action 309 which the application 601 performs is to provide an advice message 607 to the customer service representative 602, who may then provide advice to the customer 604. However, it may occur that cases 105 which are matched all have a low match quality 315. The application 601 may collect a set of question-answer pairs 608 from the cases 105

which are matched. The application 601 may present a set of questions 609 from the question-answer pairs 608 to the customer service representative 602, who would provide a set of answers 610 to the application 601 (typically by asking the customer 604). The application 601 may perform the case-matching step 202 with the question-answer pairs 608 as additional attribute-value pairs 303 to match. In a preferred embodiment, weights may be assigned to the description 606 and to each question-answer pair 608. **If no 'best' case 204 can be matched even with the question-answer pairs 608, the application 601 may create a new case 105 which copies the case template 312 and ask the customer service representative 602 for the advice message 607 to include with the case 105**. In a preferred embodiment, the application 601 may be operated with few cases 105 or even no cases to start with, since the application 601 may create new cases 105 when there is no "best" case 204 in the case base 104." (col. 9, lines 21-50). Thus, Allen discloses classifying the electronic message as at least one of (i) being able to be responded to automatically (e.g. if the match quality is high, the application 601 provides an advice message which is used to advise the customer 604); and (ii) requiring assistance from a human operator (e.g., if no case is similar to the received data, the customer service representative 602 provides the advice message used to advise the customer), **the classification of the electronic message being performed in accordance with the classification of the stored case model having a highest score** (e.g., if all cases have a low match quality, the application may receive further input, while if cases have a high match quality, advice messages are forwarded to the user.)

As per claim 35, Allen demonstrated all the elements as disclosed in claim 34, and further discloses 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** ("In the automated help desk application 601, the user 119 may comprise a customer service representative 602 who may typically be receiving a telephone call 603 from a customer 604. **A set of customer problems 605 and advice to respond with may be stored as cases 105**" (col. 9, lines 7-11); also, "In the case-matching step 202, the application 601 may attempt to match the customer problem 605 to one or more cases in the case base 104 using just the description 606 of the customer problem 605. If the match quality 315 of the case 105 which are matched is high, the application 601 may perform the best-case step 203 and following steps. The action 309 which the application 601 performs is to provide an advice message 607 to the customer service representative 602, who may then provide advice to the customer 604." (col. 9, lines 21-29)).

As per claim 36, Allen demonstrated all the elements as disclosed in claim 35, and further discloses **the predetermined response is altered in accordance with the interpretation of the electronic message before delivery to the source** ("The action 309 which the application 601 performs is to provide an advice message 607 to the customer service representative 602, who may then provide advice to the customer 604." (Allen, col. 9, lines 26-29). Thus, advice message 607 is provided to customer

service representative 602, and the customer service representative 602 uses the advice message 607 to provide advice to a customer 604).

As per claim 38, Allen demonstrated all the elements as disclosed in claim 26, and further discloses **the predetermined response is altered in accordance the interpretation of the electronic message before delivery to the source** ("The action 309 which the application 601 performs is to provide an advice message 607 to the customer service representative 602, who may then provide advice to the customer 604." (col. 9, lines 26-29) Thus, advice message 607 is provided to customer service representative 602, and the customer service representative 602 uses the advice message 607 to provide advice to a customer 604).

As per claim 39, Allen demonstrated all the elements as disclosed in claim 26, and further discloses **the electronic message includes fixed data** ("In a case-matching step 202, the inference engine 111 attempts to match the problem to one or more cases 105 in the case base 104." (col. 3, line 66 - col. 4, line 1); additionally, "[The automated 'help desk' application 610 may perform a flow diagram like that disclosed with FIG. 2, with some modifications. In the description step 201, the application 601 may retrieve a **text string description 606 of the customer problem 605**. In the case-matching step 202, the application 601 may attempt to match the customer problem 605 to one or more cases in the case base 104 using just the description 606 of the customer problem 605. If the match quality 315 of the case 105 which are matched is high, the application 601 may perform the best-case step 203 and following steps. The action 309 which the application 601 performs is to provide an

advice message 607 to the customer service representative 602, who may then provide advice to the customer 604." (col. 9, lines 16-29).

As per claim 40, Allen demonstrated all the elements as disclosed in claim 26, and further discloses wherein **the electronic message includes variable data** ("the inference engine 111 may present a sequence of questions to the user 119 and retrieve answers from the user 119 about the problem and the cases 105 which were found." (col. 4, lines 7-10); also, "**The application 601 may present a set of questions 609 from the question-answer pairs 608 to the customer service representative 602, who would provide a set of answers 610 to the application (typically by asking the customer 604)**. The application 601 may perform the case-matching step 202 with the question-answer pairs 608 as additional attribute-value pairs 303 to match. In a preferred embodiment, weights may be assigned to the description 606 and to each question-answer pair 608." (col. 9, lines 33-41).

As per claim 41, Allen discloses 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 ("In a preferred embodiment, the automated processor may comprise a system having a processor, memory comprising a stored program, memory comprising data, and input/output devices, as is well known in the art." (col. 3, lines 36-39); further, "In a description step 210, the inference engine 111 retrieves a description of the facts of a particular situation (the 'problem'). In a preferred embodiment, the user 119 may enter data relating to the problem by means of the user interface 118. For

example, the user 119 may complete an on-screen form, or may answer a set of questions provided by data-gathering software in the inference engine 111. In a case-matching step 202, the inference engine 111 attempts to match the problem to one or more cases 105 in the case base 104." (col. 3 line 59 to col. 4, line 1); in addition, "In the automated help desk application 601, the user 119 may comprise a customer service representative 602, who may typically be receiving a telephone call 603 from a customer 604. A set of customer problems 605 and advice to respond with may be stored as cases 105. Attributes 301 of the cases 105 may include features of the customer problems 605. In addition to matching on the description 606, the application 601 may ask questions and obtain answers which allow it to determine which case 105 is the 'best' case 204, and thus to provide appropriate advice." (col. 9, lines 7-16). Thus, automated help desk application 601 receives telephone call 603 from a customer and may ask questions and obtain answers to determine which case is 'best');

an inbox storage device for storing incoming electronic messages ("In a preferred embodiment, the automated processor may comprise a system having a processor, memory comprising a stored program, memory comprising data, and input/output devices, as is well known in the art." (col. 3, lines 36-39) where the memory storing data is considered inbox storage device);

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 case-based reasoning system which is smoothly integrated into a rule-

based reasoning system, thus coordinating case-based reasoning techniques and rule-based reasoning techniques in a unified automated reasoning system, in which an automated processor may proceed by inferential reasoning on the facts of the problem and the cases by means of rule-based reasoning techniques or based on procedural directives supplied by a human programmer, and may select the case which is the best match for the problem, but may act differently from the precise action prescribed for that case." (Abstract); further, "a case-based reasoning system which is smoothly integrated into a rule-based reasoning system, thus coordinating case-based reasoning techniques and rule-based reasoning techniques in a unified automated reasoning system. In addition to matching a problem template to a case base, an automated processor may proceed by inferential reasoning on the facts of the problem and the cases by means of rule-based reasoning techniques (or based on procedural directives supplied by a human programmer). Thus, the processor may select the case which is the best match for the problem, but may act differently from the precise action prescribed for that case." (col. 1, line 58- col. 2, line 2); also, "case-based reasoning system 101 for a particular application field may comprise a rule base 102 of inferential rules 103 suited to that field, a case base 104 of exemplar cases 105 which are notable in that field, and a data base 106 of relevant problem data 107 for that field." (col. 2, lines 45-49; Fig. 1) Allen further discloses "An automated processor 110 may execute a software inference engine 111 for reasoning using the case base 104 and rule base 102." (Allen, col. 2, lines 61-63). Allen also describes "the inference engine 111 retrieves a description of the facts of a particular situation (the 'problem'). In a preferred

embodiment, the user 119 may enter data relating to the problem by means of the user interface 118. For example, the user 119 may complete an on-screen form, or may answer a set of questions provided by data-gathering software in the inference engine 111. In a case-matching step 202, the inference engine 111 attempts to match the problem to one or more cases 105 in the case base 104. In a preferred embodiment, the inference engine 111 may use a feature-matching technique like that described with FIGS. 3A and 3B. In a best-case step 203, the inference engine 111 attempts to evaluate the cases 105 which were found in the case-matching step 202, and determine a 'best' case 204 to match the problem. In a preferred embodiment, the inference engine 111 may present a sequence of questions to the user 119 and retrieve answers from the user 119 about the problem and the cases 105 which were found. In a note-action step 205, the inference engine 111 determines the action prescribed by the "best" case 204, and attempts to determine if that action is a correct action to perform. If so, the inference engine 111 proceeds to a do-action step 206. Otherwise, the inference engine 111 proceeds to a new-case step 207." (col. 3, line 58-co1.4, line 16) Allen also discloses "The inference engine 111 may perform a flow diagram with the data interface 503 like that disclosed with FIG. 2. Facts about the problem 311 may be gleaned from the user 119 by means of the user interface 118 and recorded in the case template 312. The case template 312 may be matched against the case base 104 using the case index 504 with a feature-matching procedure 505 like that disclosed with FIG. 3A or 3B. Some number of cases 105 may be recorded in the match table 314 by the feature-matching procedure 505, of which one

may be the 'best' case 204. As the inference engine 111 is implemented within the rule-based reasoning system 501, it may also apply rules 103 or procedural structures 117 to the case template 312 before matching, and to the matched cases 105 after matching." (Allen, col. 8, lines 5-18). Therefore, Allen discloses 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 (e.g., the inference engine 111 may be implemented within a rule-based reasoning system 510));

a pre-processor for receiving the electronic message and interpreting the electronic message using the rule base ("The inference engine 111 may also execute a flow diagram for rule-based reasoning like those which are well known in the art, including known aspects of rule-based reasoning such as attribute inheritance, hypothetical reasoning, and retraction." (col. 2, lines 12-16, FIG. 1); further, "the inference engine 111 for the case-based reasoning system 101 may be implemented within a rule- based reasoning system 510, such at the ART-IM rule-based reasoning system, manufactured by Inference Corporation of El Segundo, Calif. In the rule-based reasoning system 510, rules 103 may be matched against software objects 112, including a set of facts 502, cases 105, and the case template 312, and may perform procedural actions on them." (col. 7, lines 8-16). Thus, Allen discloses a pre-processor for receiving the electronic message and interpreting the electronic message using the rule base (e.g., the inference engine 111 is implemented within a rule based reasoning system 510 and executes rule-based reasoning);

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 ("In a case-matching step 202, the inference engine 111 attempts to match the problem to one or more cases 105 in the case base 104. In a preferred embodiment, the inference engine 111 may use a feature-matching technique like that described with FIGS. 3A and 3B." (col. 3, line 66 to Col. 4, line 3); further, "In a best-case step 203, the inference engine 111 attempts to evaluate the cases 105 which were found in the case matching step 202, and determine a 'best' case 204 to match the problem." (col. 4, lines 4-7); in addition, "The inference engine 111 may perform a flow diagram with the data interface 503 like that disclosed with FIG. 2. Facts about the problem 311 may be gleaned from the user 119 by means of the user interface 118 and recorded in the case template 312. The case template 312 may be matched against the case base 104 using the case index 504 with a feature-matching procedure 505 like that disclosed with FIG. 3A or 3B. Some number of cases 105 may be recorded in the match table 314 by the feature-matching procedure 505, of which one may be the "best" case 204. As the inference engine 111 is implemented within the rule-based reasoning system 501, it may also apply rules 103 or procedural structures 117 to the case template 312 before matching, and to the matched cases 105 after matching." (col. 8, lines 5-18). Hence, Allen discloses 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 (e.g., inference engine 111