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(71) Applicant *(for all designated States except US)*: **NEC EUROPE LTD.** [DE/DE]; Kurfuersten-Anlage 36, 69115 Heidelberg (DE).

(72) Inventors; and
(75) Inventors/Applicants *(for US only)*: **NICCOLINI, Saverio** [IT/DE]; Carl-Philipp-Fohr-Strasse 4, 69121 Heidelberg (DE). **QUITTEK, Juergen** [DE/DE]; Daimlerweg 15, 69226 Nussloch (DE).

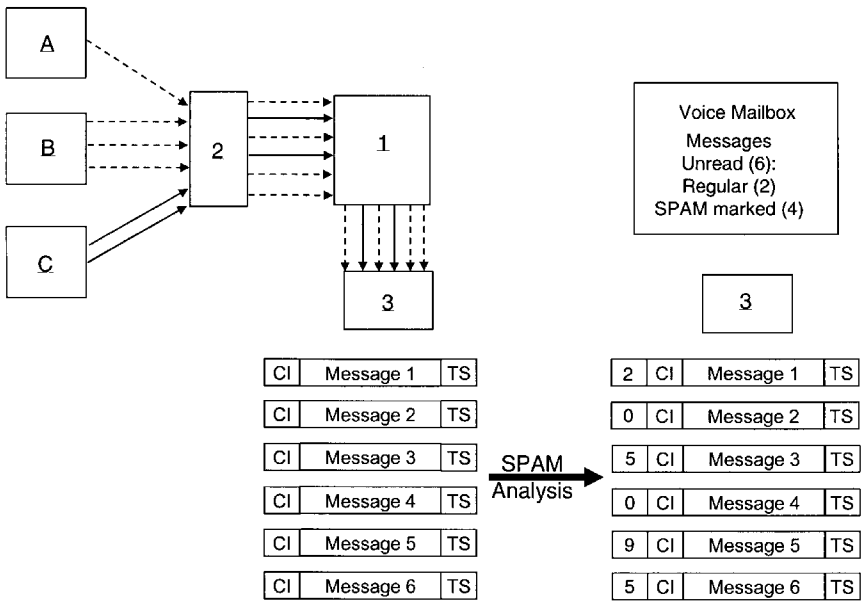
(74) Agent: **ULLRICH & NAUMANN**; Luisenstrasse 14, 69115 Heidelberg (DE).

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(54) **Title:** METHOD AND SYSTEM FOR PROCESSING OF VOICE MAIL MESSAGES TO FILTER OUT SPAM OR SPIT



(57) **Abstract:** A method and a system for processing of voice mail messages in a communication network, wherein voice messages coming in at a voice message processing means are analysed according to predeterminable rules to determine whether the voice message constitutes an unsolicited message or not i.e. is considered SPAM, SPIT; and further processing of each voice message depending on its result of the analysis, for example the message may be moved to a folder depending on whether it is classified as SPAM or not, the sender address may be deleted or the format of the message may be converted from one format to another.

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METHOD AND SYSTEM FOR PROCESSING OF VOICE MAIL MESSAGES TO FILTER OUT SPAM OR SPIT

The present invention relates to a method for processing of voice messages in a communication network, wherein the voice messages coming in at a voice message processing means, preferably a voice message answering machine or a voice mailbox. Furthermore, the invention concerns a system for processing of voice messages in a communication network.

In the area of electronic mail unsolicited bulk email messages – so-called SPAM – have become very common and have turned into a severe problem. Not only companies that require email communication are impacted by SPAM messages, but also private users are very annoyed by SPAM. Many Internet users nowadays receive more SPAM messages than regular emails. For this reason, almost every server for incoming email uses SPAM filters which check incoming mails according to defined rules. They search, for example, actively for key words in the content of an email, they check specific configurations of the server used for sending the email or they search for senders that are often used for sending bulk emails. In case of a matching classification of an email as SPAM, it is marked and/or sorted out.

In the area of – analog or digital – telephony, SPAM also occurs more and more often, as it can be seen, for example, in case of unsolicited commercial calls. These calls are mostly made by automated calling machines. Due to the currently and mainly employed switched telephone networks, such SPAM calls are very complicated and expensive which is the reason for a rather restricted number of SPAM calls. When Internet telephony will be used more commonly, such SPAM calls will become much easier and cheaper, so a tremendous increase of SPAM calls will have to be assumed.

In general, not all calls directed to a user's terminal will reach the callee. If the callee is not available at a phone or if the (mobile) phone is switched off, for example, then calls are normally redirected to a voice mailbox and recorded there. If SPAM calls are generated as massively as email SPAM is generated today, it can be expected that

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many voice mailboxes will get filled with recorded SPAM calls. This makes it inconvenient and time consuming for the owner of the voice mailbox to find recorded regular phone calls among the recorded SPAM calls. Also regular messages may not be recorded when the maximum storage limit of the voice mailbox is reached by a large number of stored SPAM calls. It is to be noted that the expressions "owner" or "user" of a voice mailbox, in general, refer to that person (or that persons) who has (have) the authorisation to listen to the recorded messages.

It is therefore an object of the present invention to improve and further develop a method and a system of the initially described type for processing of voice messages in a communication network in such a way that voice messages that came in at a voice message processing means, like for example a voice mailbox, can be handled in a very comfortable, effective, and little time consuming manner.

In accordance with the invention, the aforementioned object is accomplished by a method comprising the features of claim 1. According to this claim, such a method comprises the steps of:

storing incoming voice messages;

analysing stored voice messages in the voice message processing means according to predeterminable rules to determine whether the voice message constitutes an unsolicited message or not; and

further processing of each voice message depending on its result of the analysis.

The problem mentioned above is furthermore solved by the system for processing of voice messages in a communication network according to claim 19. According to this, the system comprises

a voice message processing means, preferably a voice message answering machine or a voice mailbox, comprising a memory for storing incoming voice messages;

an analysing component for analysing stored voice messages in the voice message processing means according to predeterminable rules to determine whether the voice message constitutes an unsolicited message or not; and

a processing unit for further processing of each voice message depending on its result of the analysis.

According to the invention, it has first been recognized that it is very inconvenient for a user to handle voice messages when they are just redirected to the user's voice mailbox. The higher the number of voice messages redirected to the voice mailbox the harder it is for a user to get an overview. Furthermore, according to the invention, it has been recognized that an enormous simplification for the user can be obtained by storing incoming voice messages and analysing them to determine whether the voice message constitutes an unsolicited message, for example a SPAM call, or not. Depending on the result of the analysis each voice message can be further processed making it much easier for the user to look through. Insofar, the danger of regular voice messages getting lost among a bulk of unsolicited SPAM calls is drastically reduced.

As the method and the system according to the invention don't require any special form of signalling, the invention can be applied both for calls in PSTN (Packed Switched Telephone Networks) as well as for voice over IP (VoIP) calls. Furthermore, it doesn't matter whether the arrival of voice messages at the voice message processing means is the result of a redirection of messages that first came in at a user's terminal/phone or whether the caller has directed his call directly to the user's voice mailbox in order to not disturb him. Moreover, the invention applies for voice messages that were redirected to the voice message processing means already in the communication network.

In the simplest form, each voice message can be assigned a status in form of a binary value according to the result of the analysis, wherein the binary value indicates whether the voice message constitutes an unsolicited message or not. For example, the value "0" could indicate that the voice message passed the analysis without any problems, whereas the binary value "1" could indicate that there is strong evidence that the voice message constitutes an unsolicited message.

Regarding a more precise assessment, according to the result of the analysis each voice message can be assigned a status in form of a value indicating a grade for the

voice message that it constitutes an unsolicited message. Concretely, the grade could be, for example, a number between 0 and 9, 0 indicating that the analysis did not provide any hints that the message could be SPAM, and 9, as the highest degree, indicating that the message is very likely SPAM. Alternatively, the grade can be a probability that a message is an unsolicited SPAM message (60 % SPAM call probability, for example). For each voice message the result of the analysis, or, to be more precisely, the assigned binary value, grade, or probability can be stored together with the message.

In both cases – assigning a binary value "1" on the one hand or assigning a grade or probability unequal zero on the other hand – it can be provided that messages are marked as unsolicited messages. Regarding a high degree of flexibility, in case of assigning a grade or probability a configurable threshold can be provided, with only messages exceeding the threshold being marked as unsolicited messages.

Regarding a high lucidity and clearness, marked voice messages and unmarked voice messages can be stored in different folders, making it very easy for a user to handle regular messages and SPAM messages separately. In particular for the marked messages multiple folders can be provided in order to save the messages in different folders depending on the assigned grade or probability of being SPAM. In any case the voice message processing means can be configurable such as to give the user the option to move unmarked messages after listening into a folder of his choice.

In an especially advantageous manner, additional information related to a voice message is stored for each voice message. The additional information stored can include a time stamp and/or information about the sender of the voice message. This additional information can be used within the scope of the analysis of messages because SPAM calls often show, for example, a characteristic distribution in time, which may be due to their generation by automated calling machines. Regarding the information about the sender of the voice message, the analysis can comprise the step of determining the source address of the voice message and/or determining a reverse DNS (Domain Name Server) resolution of the source address of the voice message. If the determined source address is unknown and/or a reverse DNS

resolution fails, the voice message can be considered as a SPAM call. Alternatively or additionally, the analysis of the voice messages can comprise the step of performing a voice analysis and/or can include whitelisting and blacklisting mechanisms. In principal, all known mechanisms for SPAM call detection can be applied.

The voice message processing means can comprise a displaying means for displaying information about the recorded voice messages to the user. For example, on the display the user can be shown the total number of unread messages, the number of unmarked/regular messages, and the number of SPAM marked messages.

When the user listens to recalled messages, a voice mailbox can announce marked messages as marked before the recorded message is replayed to the user. Additionally, the grade assigned to the message can be announced, for example, as probability that the message is a SPAM call. The voice message processing means can be configurable such as to offer the user the option to skip or delete marked voice messages when browsing through or listening to stored messages or to skip or delete only those marked voice messages for which the grade or probability that it is a SPAM call exceeds a certain threshold.

Furthermore, when the user listens to recorded messages, the voice mailbox can play a configurable portion of the marked message as a preview. In many cases the first part of a voice message ("Congratulation! You won...", for example) is sufficient to identify a call as unsolicited SPAM call. Therefore, by playing a preview the user has the opportunity to identify SPAM calls that have not been recognized in the analysis without having to listen to the complete message.

Regarding a high ease of use and comfort, the voice message processing means can be configurable such as to offer the user the option to listen to unmarked voice messages only or to messages up to a certain threshold, for example, up to 50 % SPAM call probability. Alternatively, an option to listen to marked messages or messages above a threshold only can be provided likewise.

Furthermore, the voice message processing means can be configurable such as to offer the user the option to choose the succession, in which the voice messages are replayed, according to the status assigned to the voice message. Concretely, the option can be provided to listen to unmarked messages first and to marked messages afterwards. In the case of grades or probabilities, for example, it can be provided that the messages with the lowest grade or probability are replayed first.

Regarding an economic handling of the storing capacity of the voice message processing means, the voice message processing means can be configured in such a way that it deletes voice messages in case the analysis indicates that it is an unsolicited message. Alternatively, the voice message processing means can start to delete marked voice messages only in the case that the storing capacity is exhausted and new voice messages are coming in. In this regard, it is advantageous to delete messages in a succession according to the grade or probability assigned to the voice messages, starting with the messages with the highest grade or probability. Alternatively, the user can be provided the option to configure the voice message processing means such that it deletes marked messages already in the case that the remaining time for further messages to be stored becomes less than a configurable minimum value. In order to save storing capacity the deletion of a message can even be conducted while the call is being recorded. In such a case, the voice message processing means can terminate the SPAM call by itself and immediately delete the record.

The voice message processing means can be configurable in such a way that the user, when listening to recorded messages, has the option to change the marking of messages, i.e. the user can mark messages as SPAM calls that have not yet been marked due to the analysis and can, vice versa, unmark messages that have been marked as SPAM calls due to the analysis. These changes conducted by the user can be employed as a feedback for the analysis in order to improve the SPAM detection mechanism in the voice message processing means.

Regarding rapid information of the user, notifications can be generated to inform the user about new voice messages, for example, by SMS or email. In an advantageous manner, the notification comprises not only the information about a new message,

but comprises additionally the status assigned to the voice message within the scope of the analysis. Furthermore, the generation of notifications can depend on the assigned status, for example, such that notifications are only generated for messages that are not marked as SPAM calls or for which the SPAM call grades or probabilities are below a certain threshold. To just give the user a quick overlook, it proves to be advantageous to include into the notification only the number of marked messages and the number of unmarked messages.

In case of unified messaging, messages on a voice mailbox may be converted into other message formats, for example, into email. It can be provided that such conversion into other message formats is applied depending on the status assigned to the voice message, for example, the conversion can be applied only if a message is not marked as SPAM or has a grade or probability for being SPAM below a certain threshold. The conditional conversion based on the marking or the grade or probability of messages can also be applied by embodiments that do not offer voice mailbox functions but, for example, just unified messaging functions. In the case of unified messaging, messages on a voice mailbox that are converted to email message format could carry the original message as an attachment and offer the owner a preview of the grade or probability of the marked message.

As already mentioned above, the voice message processing means can be equipped with whitelisting and blacklisting functions. These functions can be used for filtering SPAM calls before they are recorded. The voice message processing means can be configurable such as to offer the user the option to add a sender of a stored voice message to the blacklist or the whitelist, respectively. Also, the voice message processing means can be configurable such as to offer the user the option to transfer marked voice messages to an external SPAM call detection system that may contain blacklists, whitelists and/or other SPAM call prevention functions. The input can be used to configure or improve the function of the external SPAM call prevention system.

All methods and functions mentioned above may be offered to customers by their telecommunication service provider as a value added service or as a service that the customer is charged for either separately or in a bundle with other services.

There are several ways how to design and further develop the teaching of the present invention in an advantageous way. To this end, it is to be referred to the patent claims subordinate to patent claims 1 and 19 on the one hand, and to the following explanation of preferred examples of embodiments of the invention illustrated by the drawings on the other hand. In connection with the explanation of the preferred example of an embodiment of the invention by the aid of the drawings, generally preferred embodiments and further developments of the teaching will be explained.

In the drawings:

Fig. 1 illustrates an embodiment of an application scenario of a method for processing a voice messages in accordance with the teachings of the present invention,

Fig. 2 shows several options regarding the listening to analysed voice messages in accordance with the teachings of the present invention, and

Fig. 3 illustrates some further options regarding the processing of voice messages in accordance with the teachings of the present invention.

Referring to Fig. 1, an embodiment of an application scenario of the method for processing of voice messages in a communication network is shown. In the embodiment depicted in Fig. 1, three callers A, B, and C direct telephone calls towards a user's terminal 1. In the special case shown, the telephone calls are voice over IP (VoIP) calls, which are forwarded to the user's terminal 1 by a SIP Proxy 2. As the user is not available during the time interval the telephone calls are coming in, the phone calls are redirected to a voice mailbox 3, which is connected to the user's terminal 1.

The messages redirected to the voice mailbox 3 are stored in a memory device of the voice mailbox 3. In the concrete embodiment shown, a total of six messages,

message 1 to message 6, are stored in the voice mailbox 3. Each message is assigned a call information CI comprising information like the callee's user name, the callee's proxy server, the callee's IP address, etc. Furthermore, each message is assigned a timestamp TS indicating the time the message came in at user terminal 1. In general, the messages are stored in a chronological order according to the information contained in the timestamp TS.

In accordance with the invention, each of the stored messages is analysed according to predeterminable rules to determine whether the voice message constitutes an unsolicited messages ore not. Concerning the analysis, each known SPAM detection mechanism can be employed, first and foremost the source address of the voice message is determined, a reverse DNS (Domain Name Server) resolution of the source address of the voice message is performed, a voice analysis is performed, and/or whitelisting and blacklisting mechanisms are applied.

The result of the analysis is shown in the right part of Fig. 1. In the concrete embodiment, each message is assigned a number between 0 and 9. This number indicates a grade for each voice message that it constitutes an unsolicited SPAM message. The number "0" indicates that the analysis did not provide any hints that the message could be SPAM. In the example of Fig. 1 message 2 and message 4 are assigned the grade "0" and, consequently, are considered as regular messages. The higher the number assigned to a message the higher is the probability that the message is a SPAM call, with the number "9" indicating the highest degree. In the example of the Fig. 1 a high grade ("9") of being a SPAM call is assigned to message 5, a medium grade ("5") of being a SPAM call is assigned to messages 3 and 6 and a low grade ("2") of being a SPAM call is assigned to message 1.

It is to be understood that instead of assigning each message a grade of being SPAM, each message could be assigned a concrete probability value. Alternatively, a binary assignment is possible and within the scope of the present invention, i.e. a message could be either marked as being SPAM or could be unmarked as constituting a regular, non SPAM call. A binary assignment is shown in Fig. 2 and 3.

Fig. 2 is a schematic illustration of several options the system of the present invention provides to a user regarding the listening to recorded voice messages. In Fig. 2a the voice mailbox 3 is configured in such a way that it offers a user the possibility to listen to messages in a chronological order, whereby the marking of voice messages as SPAM calls is announced. In Fig. 2a the same messages as in Fig. 1 are shown. The only difference is that instead of the assignment of a grade, as in Fig. 1, a binary assignment is applied in the embodiment shown in Fig. 2.

In Fig. 2b the user is given the option to listen to unmarked messages only. Consequently, the list of messages, which comprises the messages to be replayed, comprises only the messages 2 and 4. Referring to Fig. 2c, the user is given the option to listen to unmarked messages first. Consequently, the list of messages, which comprises the messages to be replayed, comprises all six messages 1 to 6. However, the order of the messages is chanced compared to Fig. 2a, with the unmarked messages 2 and 4 appearing at the first positions. In the case of assigning a grade or probability, the order of the messages within the list can be chosen according to the assigned grades or probabilities, beginning with the lowest grades or probabilities.

Fig. 3 is a schematic illustration of two further options provided to a user. Referring to Fig. 3a, the voice mailbox is configured in such a way that it gives the user the option to chance the marking of the last message. This option is especially useful in the case the user listens to a message marked as SPAM, like message 1, for example, and realizes that the message is a regular message, which was marked as SPAM erroneously. In this case the user can delete the marking and store the message, for example, in a folder containing only unmarked messages. It is to be understood that the reverse case is possible as well, i.e. the user can be given the option to mark a message as SPAM that has erroneously passed the analysis without being marked.

Fig. 3b illustrates the case in which the user is given the option to delete SPAM marked messages as soon as the marking process is finished. This option proves to be especially advantageous with regard to an efficient handling of the storing capacity of the voice mailbox 3 connected to the user's terminal 1. It is to be noted that in this case a re-ordering of the messages occurs, i.e. the initially unmarked

messages 2 and 4 become messages 1 and 2 due to the deletion of the marked messages.

Many modifications and other embodiments of the invention set forth herein will come to mind the one skilled in the art to which the invention pertains having the benefit of the teachings presented in the foregoing description and the associated drawings. Therefore, it is to be understood that the invention is not to be limited to the specific embodiments disclosed and that modifications and other embodiments are intended to be included within the scope of the appended claims. Although specific terms are employed herein, they are used in a generic and descriptive sense only and not for purposes of limitation.

Claims

1. A method for processing of voice messages in a communication network, wherein voice messages coming in at a voice message processing means (3), preferably a voice message answering machine or a voice mailbox, the method comprising the steps of:

storing incoming voice messages;

analysing stored voice messages in the voice message processing means (3) according to predeterminable rules to determine whether the voice message constitutes an unsolicited message or not; and

further processing of each voice message depending on its result of the analysis.

2. The method according to claim 1, wherein according to the result of the analysis each voice message is assigned a status in form of a binary value indicating that the voice message constitutes an unsolicited message or not.

3. The method according to claim 1 or 2, wherein according to the result of the analysis each voice message is assigned a status in form of a value indicating a grade for the voice message that it constitutes an unsolicited message.

4. The method according to claim 3, wherein the value assigned to a voice message represents the probability – SPAM call probability – that the voice message constitutes an unsolicited message.

5. The method according to one of the claims 2 to 4, wherein voice messages which are assigned a binary value indicating that the voice message constitutes an unsolicited message or which are assigned a grade or probability exceeding a configurable threshold are marked as unsolicited messages.

6. The method according to claim 5, wherein marked voice messages and unmarked voice messages are stored in different folders.

7. The method according to any of claims 1 to 6, wherein for each voice message additional information related to that voice message is stored.

8. The method according to claim 7, wherein the additional information stored includes a time stamp and/or information about the sender of the voice message.

9. The method according to any of claims 1 to 8, wherein the analysis of the voice messages comprises the step of determining the source address of the voice message.

10. The method according to any of claims 1 to 9, wherein the analysis of the voice messages comprises the step of determining a reverse DNS resolution of the source address of the voice message.

11. The method according to any of claims 1 to 10, wherein the analysis of the voice messages comprises the step of performing a voice analysis.

12. The method according to any of claims 2 to 11, wherein the voice message processing means (3) announces the status assigned to a voice message before the voice message is replayed to the user.

13. The method according to any of claims 1 to 12, wherein the voice message processing means (3) replays a configurable portion of the voice message as a preview.

14. The method according to any of claims 5 to 13, wherein the voice message processing means (3) starts to delete marked voice messages in case its storing capacity is exhausted and new voice messages are coming in.

15. The method according to claim 14, wherein the voice messages are deleted in a succession according to the grade assigned to the voice messages.

16. The method according to any of claims 2 to 15, wherein notifications are generated to inform the user about new voice messages, and wherein the notification comprises the status assigned to the voice message.

17. The method according to claim 16, wherein notifications are generated for unmarked voice messages only.

18. The method according to any of claims 5 to 17, wherein unmarked voice messages are converted into another message format.

19. A system for processing of voice messages in a communication network, preferably for performing a method according to one of the claims 1 to 18, comprising

a voice message processing means, preferably a voice message answering machine or a voice mailbox, comprising a memory device for storing incoming voice messages;

an analysing component for analysing stored voice messages in the voice message processing means (3) according to predeterminable rules to determine whether the voice message constitutes an unsolicited message or not; and

a processing unit for further processing of each voice message depending on its result of the analysis.

20. The system according to claim 19, wherein according to the result of the analysis the voice message processing means (3) assigns each voice message a status in form of a binary value indicating that the voice message constitutes an unsolicited message or not.

21. The system according to claim 19 or 20, wherein according to the result of the analysis the voice message processing means (3) assigns each voice message a status in form of a value indicating a grade for the voice message that it constitutes an unsolicited message.

22. The system according to any of claims 19 to 21, wherein the voice message processing means (3) is configured to mark voice messages for which the analysis indicates that it is an unsolicited message.

23. The system according to any of claims 19 to 22, wherein the voice message processing means (3) is configured in such a way that it deletes voice messages in case the analysis indicates that it is an unsolicited message.

24. The system according to any of claims 19 or 23, wherein the voice message processing means (3) comprises a displaying means for displaying information about the stored voice message to the user.

25. The system according to claim 22 or 24, wherein the voice message processing means (3) is configurable such as to offer the user the option to skip or delete marked voice messages when browsing through or listening to stored messages.

26. The system according to any of claims 22 to 25, wherein the voice message processing means (3) is configurable such as to offer the user the option to listen to unmarked voice messages only.

27. The system according to any of claims 20 to 26, wherein the voice message processing means (3) is configurable such as to offer the user the option to choose the succession, in which the voice messages are replayed, according to the status assigned to the voice message.

28. The system according to any of claims 22 to 27, wherein a means is provided to allow for a change of the marking of the voice messages on behalf of the user.

29. The system according to any of claims 19 to 28, wherein the voice message processing means (3) is equipped with whitelisting and blacklisting functions.

30. The system according to any of claims 19 to 29, wherein the voice message processing means (3) is configurable such as to offer the user the option to add a sender of a stored voice message to the blacklist or the whitelist, respectively.

31. The system according to any of claims 22 to 30, wherein the voice message processing means (3) is configurable such as to offer the user the option to transfer

information about marked voice messages or entire marked voice messages to an external SPAM call detection system.

32. The method or the system according to any of the preceding claims, wherein a telecommunication service provider offers the functions to its customers as a value added service or as a service that the customer is charged for either separately or in a bundle with other services.

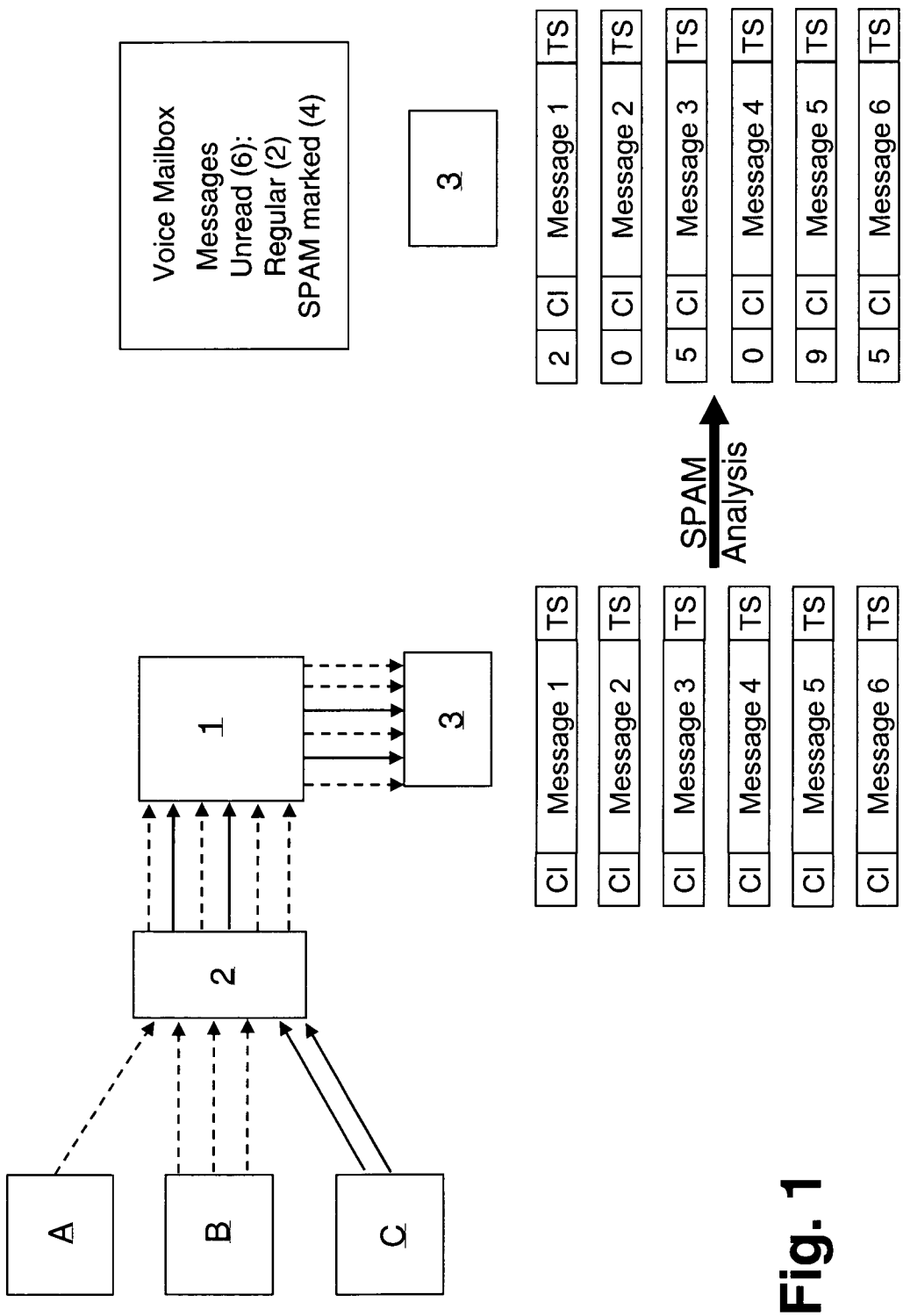

A
B
C
2
1
3
Cl Message 1 TS
Cl Message 2 TS
Cl Message 3 TS
Cl Message 4 TS
Cl Message 5 TS
Cl Message 6 TS
SPAM Analysis
2 Cl Message 1 TS
0 Cl Message 2 TS
5 Cl Message 3 TS
0 Cl Message 4 TS
9 Cl Message 5 TS
5 Cl Message 6 TS
3
Voice Mailbox
Messages
Unread (6):
Regular (2)
SPAM marked (4)

Fig. 1

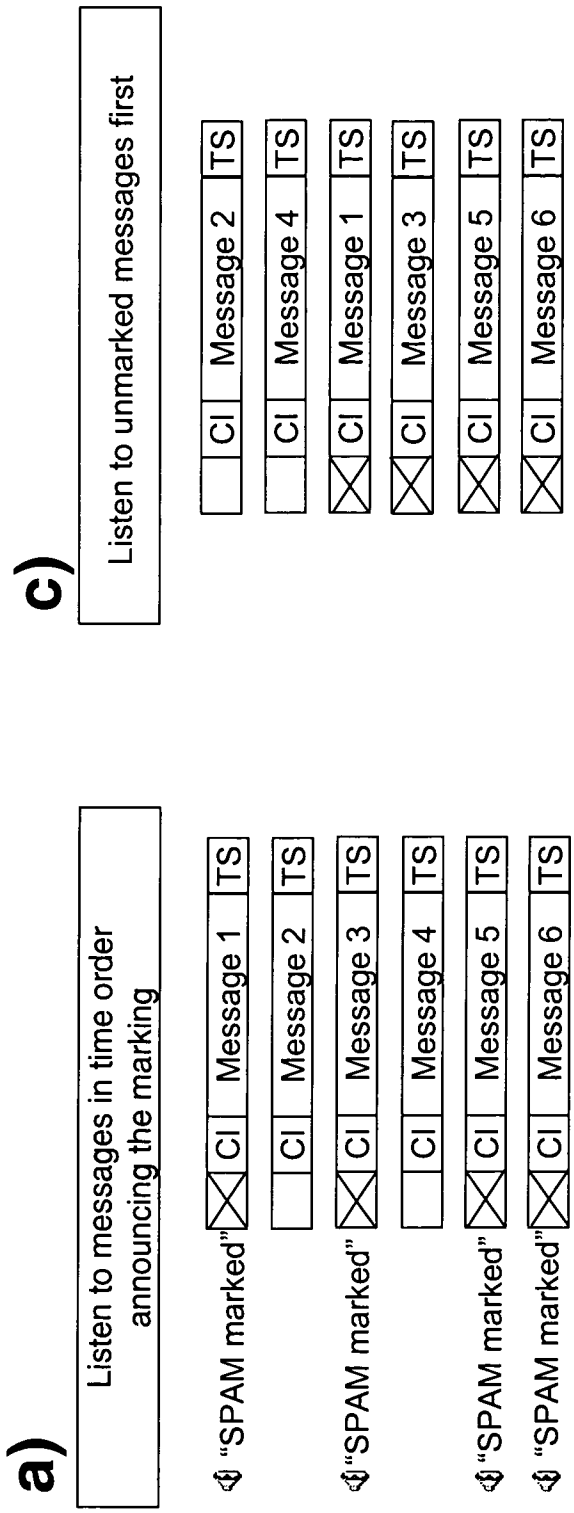

a)
Listen to messages in time order announcing the marking
"SPAM marked" CI Message 1 TS
CI Message 2 TS
"SPAM marked" CI Message 3 TS
CI Message 4 TS
"SPAM marked" CI Message 5 TS
"SPAM marked" CI Message 6 TS
b)
Listen to unmarked messages only
CI Message 2 TS
CI Message 4 TS
c)
Listen to unmarked messages first
CI Message 2 TS
CI Message 4 TS
CI Message 1 TS
CI Message 3 TS
CI Message 5 TS
CI Message 6 TS

Fig. 2

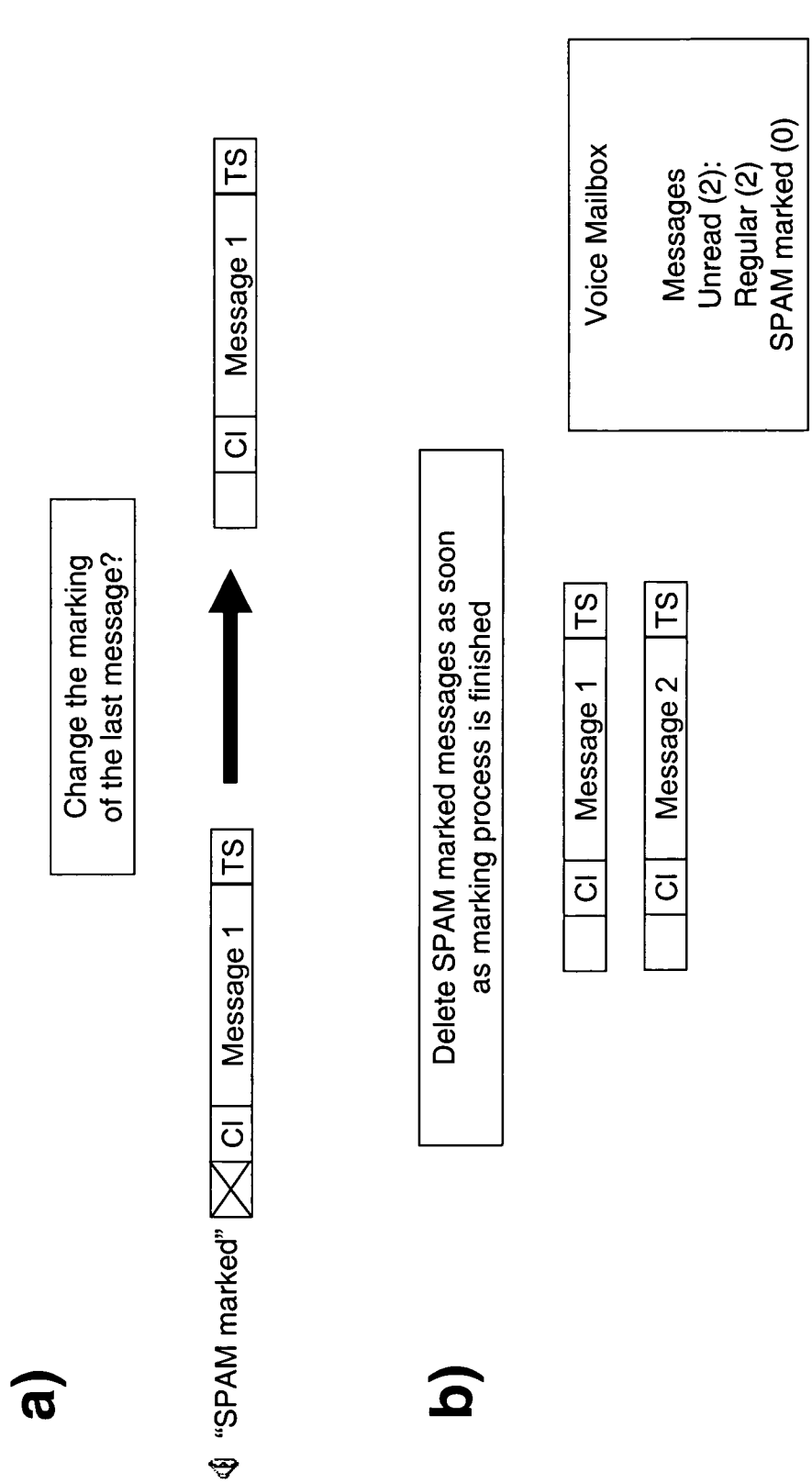

a)
Change the marking of the last message?
"SPAM marked"
CI
Message 1
TS
CI
Message 1
TS
b)
Delete SPAM marked messages as soon as marking process is finished
CI
Message 1
TS
CI
Message 2
TS
Voice Mailbox
Messages
Unread (2):
Regular (2)
SPAM marked (0)

Fig. 3

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2006/010042

A. CLASSIFICATION OF SUBJECT MATTER
INV. H04M3/533 H04M3/436 H04M7/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
H04M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2006/072473 A (SIEMENS AG [DE]; HOEGE HARALD [DE]; ANDRASSY BERNT [DE]) 13 July 2006 (2006-07-13) page 1, line 10 - page 9, line 24	1-32
X	EP 1 351 475 A (DEUTSCHE TELEKOM AG [DE]) 8 October 2003 (2003-10-08) paragraph [0001] - paragraph [0012] claim 9	1-32
X	DE 103 38 237 A1 (DEUTSCHE TELEKOM AG [DE]) 10 March 2005 (2005-03-10) the whole document	1-32
X	US 6 035 017 A (FENTON FRANCIS MICHAEL [US] ET AL) 7 March 2000 (2000-03-07) column 1, line 12 - column 5, line 45	1-32

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

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Date of the actual completion of the international search	Date of mailing of the international search report
6 June 2007	19/06/2007

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31–70) 340–2040, Tx. 31 651 epo nl, Fax: (+31–70) 340–3016	Nash, Michael

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/EP2006/010042

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WO 2006072473 A	13-07-2006	DE 102005009793 A1	13-07-2006
EP 1351475 A	08-10-2003	DE 10214842 A1	23-10-2003
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