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(54) **Title:** METHOD OF GENERATING A TEMPORARILY LIMITED AND/OR USAGE LIMITED MEANS AND/OR STATUS, METHOD OF OBTAINING A TEMPORARILY LIMITED AND/OR USAGE LIMITED MEANS AND/OR STATUS, CORRESPONDING SYSTEM AND COMPUTER READABLE MEDIUM

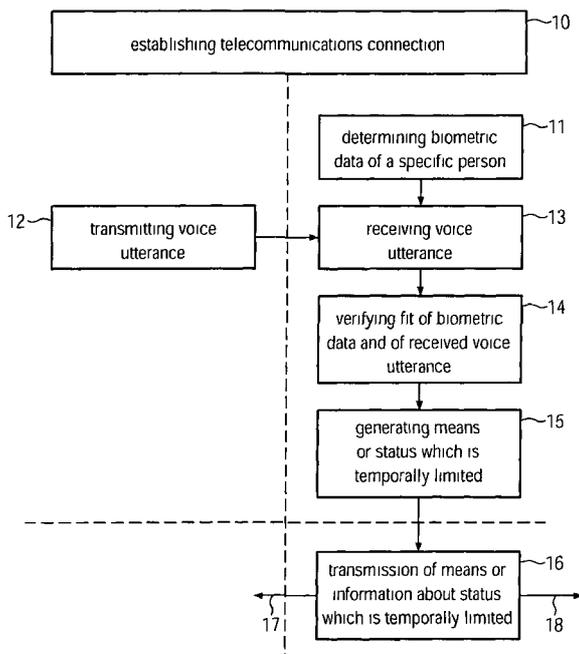


FIG. 1

(57) **Abstract:** The invention refers to a method of generating a means and/or status which is temporarily limited and/or usage limited and allows access to a service which has access restrictions, the method being carried out in a computing system and comprising the steps of establishing a telecommunications connection such that an audio call as for example a telephone call, within the telecommunications connection is preferably initiated by a person; determining biometric data of a specific person such as for example voice information; receiving data such as a voice utterance from the person which is connected by the telecommunications connection; verifying that the received data and the determined biometric data fit; and generating the means and/or status which is temporarily limited and/or usage limited after the verifying step.

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METHOD OF GENERATING A TEMPORARILY LIMITED AND/OR USAGE LIMITED MEANS AND/OR STATUS, METHOD OF OBTAINING A TEMPORARILY LIMITED AND/OR USAGE LIMITED MEANS AND/OR STATUS, CORRESPONDING SYSTEM AND COMPUTER READABLE MEDIUM

The present invention refers to a method for generating a means and/or status which is temporarily limited and/or limited in allowed usage, to a method for obtaining a temporarily limited means and/or status and/or means and/or status limited in allowed usage, to a system for generating a means and/or status which is temporarily limited and/or limited in allowed usage and to a computer-readable medium.

Many services exist which have access restrictions in order to avoid fraud. Examples thereof may be cash machines or online services for buying or selling products or services or for performing financial transactions via a telecommunications system such as the internet.

Further, it is known to have e.g. numerical keys such as personal identification numbers (PIN) in order to access such services.

Since it is relatively easy to steal or copy such PINs or passwords, fraud occurs frequently.

In some cases it is known to use passwords which are to be provided by telephone to an operator in order to access for example a telephone banking service. Here anyone who listens to such a telephone call may obtain the password and use it for fraud.

Further, it is known to use the voice of a person as an access key to services which have access restrictions. This however imposes a difficulty in that only a particular person may access the service which often results in inconvenience since no other person can be authorized to access the service.

The present invention has the object of increasing security of access for services which have access restrictions.

This object is solved by the method of claim 1, the method of claim 14, the system of claim 15 and the computer-readable medium of claim 16.

Preferred embodiments are disclosed in the dependent claims.

According to the method, a means and/or a status which is temporarily limited is generated after having verified the identify of the person who is desiring such temporarily limited means and/or status from its biometric data such as biometric voice data. Since the voice of a person or other biometric data can hardly be falsified and the voice or other biometric data is used for creating a temporarily limited means and/or status, fraud becomes practically impossible. Biometric voice data are for example dependent on the size and shape of the throat or mouth of a person.

Biometric voice data may be data extracted from a frequency analysis of a voice. From a voice recording voice sequences of e. g. 20 or 30 ms may be Fourier-transformed and from the envelope thereof biometric voice data can be extracted. From a multiple of such Fourier-transformed voice sequences a statistical voice model can be generated, named Gaussian mixed model (GMM). However, any other biometric voice data that allow distinguishing one voice from another voice due to voice characteristics may be used.

The temporarily or usage limited means may be e.g. an key such as a sequence of letters or numbers (alphanumeric key). It may be a password or a PIN. Such a key is temporarily limited in the sense it can be used only for a predefined time since the service or device accepting such an key may accept the key in order to overcome the access restrictions only for a predefined time. The predefined time and/or usage limitation may be encoded in the key (or otherwise be connected to or attached to the key) e.g. by including a time period indication during or a time limit indication up to which it may be accepted and/or any other indication of usage limitation.

The temporarily limited or usage limited status may be a status of a communications service, such as a web server in the internet which allows access to particular services in this status, while access is not possible otherwise. This status may be, for example, a bank account service, a financial transaction service or any other service with access restrictions. The status may also be configured to accept the temporarily limited means as a key only during such a time. In this case both a temporarily limited means (e.g. key) and a temporarily limited status (possibility to use/enter key) is generated. During the temporarily limited status it may also be possible to enter a conventional key which is not limited in time in order

to access the service, while such entering of a key is not possible by a status different from the temporarily limited status.

The means and/or status, which is temporarily limited or usage limited allows the access to the service which is related to the person whose biometric data have been determined. If for example the biometric data of a particular person are determined, then the service related to this person becomes accessible by the generated means and/or status but not to that of other persons. For example the access to the bank account of that person becomes possible, but not to the bank accounts of other persons.

A means and/or status which is limited in allowed usage (usage limited means and/or status) imposes certain constraints on the use of the service which is to be accessed with or due to the means and/or status. This constraint may be for example a limited amount of times the service may be accessed. The constraint may be for example that the service can be accessed only once, twice, three or four times. Further constraints may refer to the functionality of the accessed service. For example in online or telephone banking limits in the amount of money which can be manipulated may be imposed by the means and/or status. Further if the service provides different functions (e. g. money transfers, cash withdrawal and bank account information) the means and/or status may be limited such that only parts of the possible functions are usable and the other functions are disabled. A further possible limitation in usage refers to a particular access to the service. For example a cash dispensing service can be limited to only one, two, three or a group of particular cash dispensing machines from all possible cash dispensing machines. Only from a selected group of cash dispensing machines the service is allowed. The selected group is a group with less cash dispensers than all the selectable cash dispensers.

The means and/or information about the status which is temporarily limited and/or limited in usage is preferably communicated to a device for rendering it visible or audible. Thereby it is possible to inform that person of the temporarily limited and/or usage means and/or status. This can be done, for example, by communicating an key (e.g. alphanumeric) by telephone communication, by email, an SMS or internet connection or by instant messaging or the like.

A telecommunications connection may be an audio call which is established by a landline connection, a mobile telephone connection or internet connection.

The telecommunications connection may be established by a person who desires to obtain a certain means and/or status which is temporarily limited and/or usage limited and allows access to a service which has access restrictions. A telecommunications connection however, may also be established by the computing system. This increases security in the sense that the telecommunications connection is established by a predefined telecommunications connection such that fraud is made more difficult since a telephone call to a predefined telephone number, for example, cannot be intercepted or redirected easily.

In the case that the telecommunications connection is established by the computing system then this is preferably done after having received a request for establishing such a telecommunications connection by a person.

Determining a biometric data of a specific person can be, for example, determining a voice information. This may be a stored voice sample or may be a model that describes a voice such as a statistical model. For example, a Gaussian mixed model (GMM) may be used in order to describe parameters characteristic for a particular voice of a particular person.

From a telecommunications connection, typically metadata may be obtained. For example when a telephone call is a landline connection or a mobile telephone connection, it is possible to transmit the telephone number of the caller to the receiver, however not by voice but by the mentioned meta data. The metadata refers to data about the connection and not to data transmitted by the voice transmission. Equally, by a communication over the internet, the IP address of the sender is known to the receiver due to the used protocol. Such information can be used to identify a particular person by obtaining the telephone number of a calling device or an IP address. This information may then be used to determine the biometric data of a specific person.

On the other hand, an established telecommunications connection may be used to receive information from which the identification of a person can be obtained. For example, the user may express or spell his name or identification or a number which identifies him. This data is then transmitted by the telecommunications connection and received at the computing system and evaluated accordingly. Such information may then be used to determine the biometric data.

The generated means may be advantageously transmitted to a service device, such as, for example, a cash dispenser or verification system, verifying an access key entry. This

transmission is done in order for the service device of the verification system to be able to verify any entered access key in order to provide the access to the desired service.

In the verifying step the received data can be processed in order to extract data which can be compared to the biometric data or which can be analyzed with help of the biometric data.

In a preferred embodiment, an indication of the desired temporary limitation of the means and/or status is received. The means and/or status which is temporarily limited is generated according to this desired temporary limitation. This is particularly advantageous in order to provide flexibility to a user with respect to the time by which the means and/or status is to be useful and in case a maximum time limit may be indicated which is between 5 minutes and 20 days. In the case that a desired temporary limitation is above a given maximum limitation in time, the means and/or status is generated with this maximum predefined time instead of the desired temporary limitation. The latter in any case is used in case that the desired temporary limitation is less than the predefined temporary limitation.

In a preferred embodiment the method of generating a temporarily limited means and/or status is combined with prior art methods of preventing fraud such as additional use of conventional PINs or passwords which need to be typed in or need to be spoken, cards with digital information thereon, etc..

In case of the generation of a usage limited means and/or status the desired usage limitation may be indicated/received equally.

Further the generated means and/or status may further be a combination of a means and/or status which is temporarily limited and usage limited.

In a method of obtaining a temporarily limited and/or usage limited status and/or means, the following steps are carried out with a user terminal. The user terminal may be, e.g. a telephone, a mobile telephone, a device which may be connected to the internet, a personal computer, a portable computer, a PDA (Personal Digital Assistant) or the like.

In the method a telecommunications connection is established between the user terminal and a computing system. The telecommunications connection may be

initiated by a person who desires to obtain a temporarily limited and/or usage limited means and/or status or may be initiated by the computing system as explained above.

Further in the method, a voice utterance is transmitted with the user terminal to the server. Further information about a temporarily limited and/or usage limited means and/or status is received while this temporarily limited and/or usage limited means and/or status allows access to a service with access restrictions.

The received information is preferably rendered visible or audible. With the user terminal however, it may also be forwarded to another device which renders it visible or audible.

The system comprises different components which are a telecommunication component, a determining component, a data receiving component, a verifying component and a means and/or status generating component.

Preferred embodiments of the invention are disclosed in the following Figures. These Figures are provided in order to show a preferred embodiment of the invention but are not to be understood as limiting the invention. It is shown in:

Fig. 1 method steps of an embodiment of the invention;

Fig. 2 method steps of a preferred example;

Fig. 3 different components used in an embodiment of a method; and

Fid. 4 schematic indication of components of an embodiment of a system.

In Fig. 1, a telecommunications connection is established between a user terminal and a computing system in step 10. The user terminal is supposed to be represented on the left side of the dash line and the computing system on the right side of the dash line. The computing system may be one single computer or a group of computers connected with each other.

The telecommunications connection may be initiated by the user terminal or a computing system on request of a person. If requested by a person by a particular communications system it is preferred to use this same communications system to establish the

telecommunications connection. In other embodiments predefined communications systems or connections or communications systems selected in the request by the person may be used. For example it may be predefined, that the telecommunications connection is only established to a particular land line connection and/or a particular mobile connection. Further the person may request for example in an internet web page one of a plurality of predefined communications system or indicate a particular desired connection, for example to a particular number. For security reasons the use of predefined connections is preferred.

In the computing system, biometric data of a specific person are determined in step 11. In this particular embodiment, the biometric data are supposed to be biometric data concerning the voice of a specific person but in general, any other biometric data may be considered useful as, for example, fingerprints and/or images of the eye or data extracted there from. These other biometric data preferably are available in a digital format such that they can be transmitted digitally.

The user terminal transmits in a specific example a voice utterance (other biometric information may be transmitted instead or additionally). This voice utterance is received in step 13. The voice utterance can have any not predetermined content. Indeed the person can provide any text since only the voice characteristics need to be determined, which are independent of a particular text. This provides the advantage that no personal secret such as a PIN or a password or any other key needs to be pronounced loudly, which could be used for fraud by listening to the utterance.

The determination in step 11 and the reception in step 13 can also be performed in parallel at the same time or the determination is done after reception of the voice utterance. In this case any semantic information provided in the voice utterance can be used to determine the biometric data such as a name, an identification number or the like.

In step 14, the determined biometric data and the voice utterance are used in order to verify whether the voice utterance fits with the determined biometric data.

In case that the verification results positively, namely, that the biometric data and the received voice utterance fit together, then the means and/or status which is temporarily limited and/or usage limited is generated.

In the bottom of Fig. 1, an optional step 16 is shown. In this optional step, the means, or information about the status which is temporarily limited and/or usage limited, are transmitted. This may be done by means 17 to the user terminal or any other way in order to communicate with the person who transmitted the voice utterance and furthermore, the means and/or information may be transmitted by channel 18 to a service or system which is desired to be accessed.

Fig. 2 shows another portion of a method which may be carried out instead of steps 12 and 13 of Fig. 1.

In step 20, a text is generated by the computing system. In step 21, this text is transmitted to the user terminal which is received there in step 22. In step 23, the text is rendered making it readable or audible. In step 24, a voice utterance is transmitted which is received in the computing system in step 25. In step 26, the received voice utterance is processed.

With these steps the expected semantic content of the voice utterance is known in advance and can be taken into account in the processing of the voice utterance. Thereby it is possible to use improved methods for voice recognition, for example using a Hidden Markow Model which takes into account transition probabilities between the different Gaussian Mixed Models each of which refers to a sound or letter within a word. Since furthermore the text is generated dynamically i.e. during the method of generation, it is assured that the received voice utterance is not a previously recorded one, which is used for fraud. The generated text is preferably a random text which is composed of randomly selected text components which may be letters, numbers or words or combinations thereof. The text components are preferably selected from a predefined set of text components such as for example the single digits from 0 to 9, and/or the single letters from a to z.

In case that the text is rendered audible only it is preferable that not more than three, four or five text portions are provided in one rendering step since with more text portions it turns out to lead to difficulties since more than three, four or five text portions may not be memorized. In this case it is preferable to have more than one, two three or four texts transmitted to the user for rendering such that more voice utterances are available for processing.

In case that the text is rendered readable it is preferred that more than four, six, eight, ten or twelve text portions are provided in the text. The longer the voice utterance the more secure is the verification.

The following steps in Fig. 2 are optional. In steps 27 and 28, the next text is generated, transmitted and received by the user terminal in step 29. In step 30 this next text is rendered and the next voice utterance is transmitted in step 31 which is received in the computing system in step 32. Then in step 33, this next voice utterance is processed. The steps of steps 27 to 33 may be repeated one, two, three, four, five, six or more times.

By carrying out the steps 27 to 33, one or more times, at least two or more voice utterances are received which can be processed. This allows verification of the fit in step 14 of Fig. 1 more accurately.

The processing step 26 in Fig. 2 is optional and the processing may also be carried out after having received the next voice utterance in step 32. The received voice utterance of step 25 and step 32 may be processed together in one step 33.

While in Fig. 2, the text is generated and transmitted by the computing system it is also thinkable that a certain text is generated by the user terminal and then the voice utterance is transmitted and the generated text is transmitted to the computing system.

It is however preferred that the text is generated dynamically on the computing system side in order to ensure that the voice utterance is generated in the particular moment in order to avoid fraud by having the voice recorded.

Once the identify of the specific person is verified, the established telecommunication can be used to exchange further information. For example, further services which require verification of an identify can be conducted or offered afterwards. This may, e.g. be any online or telephone banking activity.

In Fig. 3, different devices used during the method are shown. A person 40 has a user terminal 41 which may be a mobile telephone or a landline telephone which preferably has a display, a PDA, a computer or the like. Device 41 needs at least a microphone which is

capable of recording a voice utterance. In a preferred embodiment the device has a display capable of displaying text received by the device 41.

A voice utterance 43 may be transmitted to computing system 44 by a telecommunications connection 42.

A 4-digit PIN ("3789") with reference sign 45 can be transmitted to the user terminal 41. Further, a copy of the 4-digit PIN 46 may be communicated by another telecommunications connection to a device 48 such as e.g. a cash dispenser 48.

On the other hand, the device 48 may also transmit an entered key 46 to the computing system 44 which verifies the key and transmits corresponding information to the device 48 allowing access to the service of device 48.

In Fig. 4, a schematic computing system 44 is shown. The system has a telecommunications component 50 which may receive or establish a telecommunications connection by line 55. Data about this telecommunications connection may be passed by connection 56 to a determining component 51 which determines corresponding biometric data of a specific person. Here, a database may be consulted by the determining component 51.

Further, with the telecommunications component 50 or another telecommunications component (not shown), a voice utterance or any other data suitable for identifying a person can be received by the data receiving component 52. A verifying component 53 verifies that the received data passed by connection 58 and the determined biometric data passed by connection 59 fit.

In case that the verification results positively, a means and/or status generating component 54 generates the desired temporarily limited and/or usage limited means and/or status. The means and/or the status may be communicated by the telecommunications component 50 or any other telecommunications component to a user terminal with help of connection 61. The generated means and/or information about the generated status may also be communicated by line 62 to other devices such as a cash dispenser, a web server or the like.

CLAIMS

1. Method of generating a means and/or status which is temporarily limited and/or usage limited and allows access to a service which has access restrictions, the method being carried out in a computing system and comprising the steps of:

establishing (10) a telecommunications connection (42) such as an audio call as for example a telephone call, wherein the telecommunications connection is preferably initiated by a person (40);

determining (11) biometric data of a specific person such as for example voice information;

receiving (13) data such as a voice utterance (43) from the person (40) which is connected by the telecommunications connection (42);

verifying (14) that the received data and the determined biometric data fit; and

generating (15) the means and/or status which is temporarily limited and/or usage limited after the verifying step.
2. Method of claim 1, wherein the means comprises a key (45) such as for example a sequence of letters and/or numbers.
3. Method of claim 1 or 2, wherein the status comprises the status of a communications server, such as a web server, which in this status allows access to a particular service such as for example a bank account service.
4. Method of any of claims 1 to 3, wherein the means and/or information about the status, which is temporarily limited or usage limited, is transmitted or communicated to a device (41) for rendering it visible or hearable.
5. Method of any of claims 1 to 4, wherein the audio call is established by a landline connection, a mobile telephony connection or internet connection.

6. Method of any of claims 1 to 5, wherein from data concerning the telecommunications connection an identification of a person is obtained such as a telephone number of a calling device and/or an IP address.
7. Method of any of claims 1 to 6, wherein by means of the telecommunications connection (42) information is received from which the identification of a person is obtained such as by receiving information of a name, an identification or a number.
8. Method of claim 6 or 7, wherein based on the obtained identification the biometric data are determined.
9. Method of any of claims 1 to 8, wherein the generated means (46) is transmitted to a service device such as a cash dispenser (48) or a verification system verifying an access key entry.
10. Method of any of claims 1 to 9, wherein in the verifying step the received data is processed in order to extract data which can be compared to the biometric data or which can be analyzed with help of the biometric data.
11. Method of any of claims 1 to 10, wherein an indication of a desired temporal limitation and/or desired usage limitation of the means and/or status is received and the means and/or status which is temporarily limited and/or usage limited is generated according to this desired temporal limitation and/or usage limitation.
12. Method of any of claims 1 to 11, wherein the means and/or status which is temporarily limited is temporarily limited to not more than 5 min, 10 min, 20 min, 30 min, 45 min, 1 hour, 2 hours, 3 hours, 6 hours, 12 hours, 1 day, 2 days, 4 days, 10 days, 14 days or 20 days.
13. Method of any of claims 1 to 12, wherein the means and/or status which is usage limited has one, two or three of the following limitations:
 - the number of times the service can be accessed is limited to less than two, three, four, five, six, ten or twenty times;
 - of all the available functions of the service only a reduced set of functions can be used;

- of all the different ways of access to the service only a reduced set of ways can be used.
14. Method of obtaining a temporarily limited and/or usage limited means and/or status, the method being carried out in a user terminal and comprising the steps of:
- establishing a telecommunications connection between the user terminal and a computing system;
- transmitting a voice utterance with the user terminal to the computing system; and
- receiving information about a temporarily limited and/or usage limited means and/or status which allows access to a service with access restrictions.
15. System for generating a means and/or status which is temporarily limited and/or usage limited and allows access to a service which has access restrictions, comprising the components:
- a telecommunications component (50) for establishing a telecommunications connection (42) such as an audio call as for example a telephone call, wherein the telecommunications connection is preferably initiated by a person (40);
- a determining component (51) for determining (11) biometric data of a specific person such as for example voice information;
- a data receiving component (52) for receiving (13) data such as a voice utterance (43) from the person (40) which is connected by the telecommunications connection (42);
- a verifying component (53) for verifying (14) that the received data and the determined biometric data fit; and
- a means and/or status generating component for generating (15) the means and/or status which is temporarily limited and/or usage limited after the verifying step.
16. Computer readable medium having instructions stored thereon which have a computer execute the method of any of claim 1 to 14, when loaded into the computer.

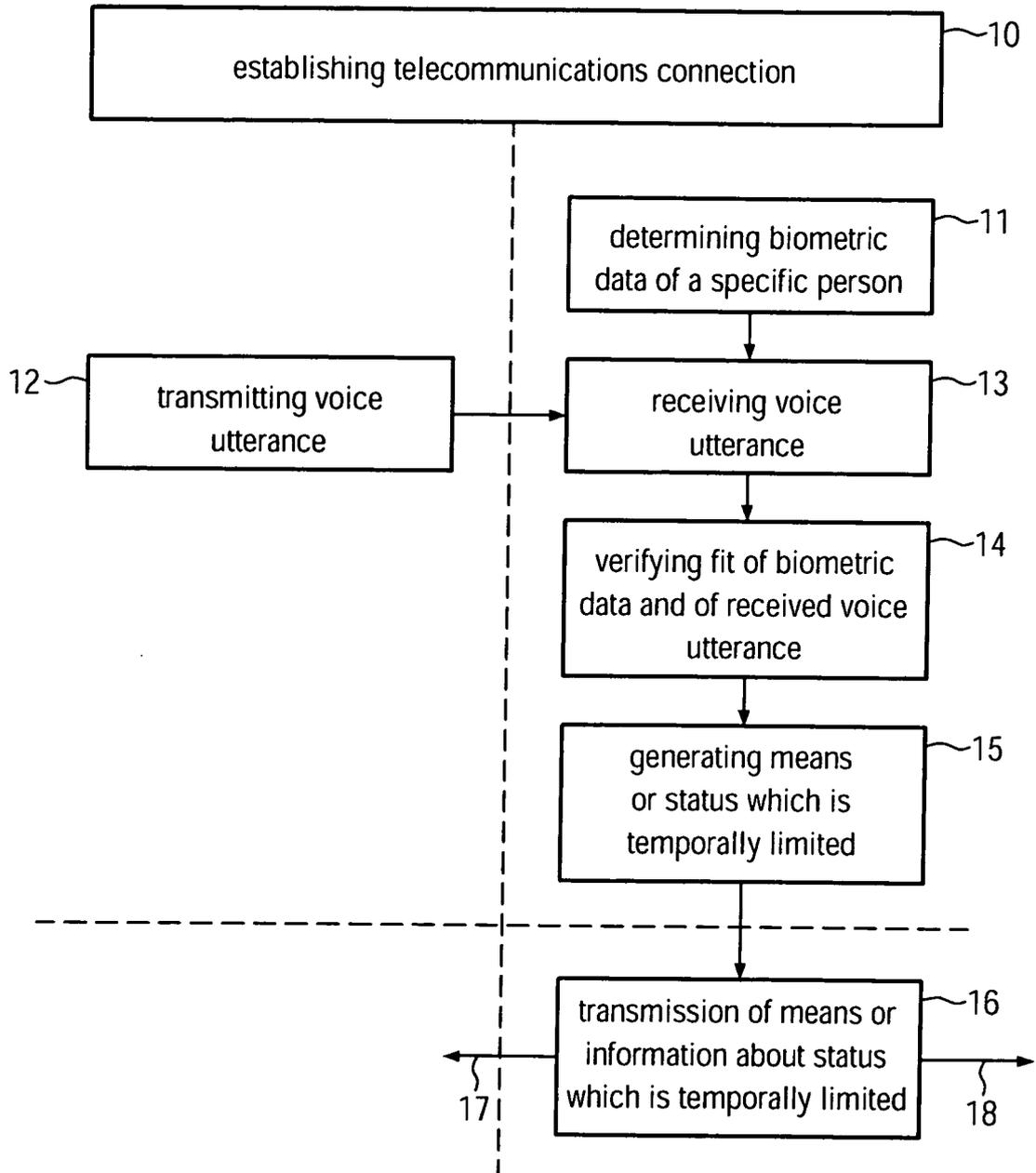


FIG. 1

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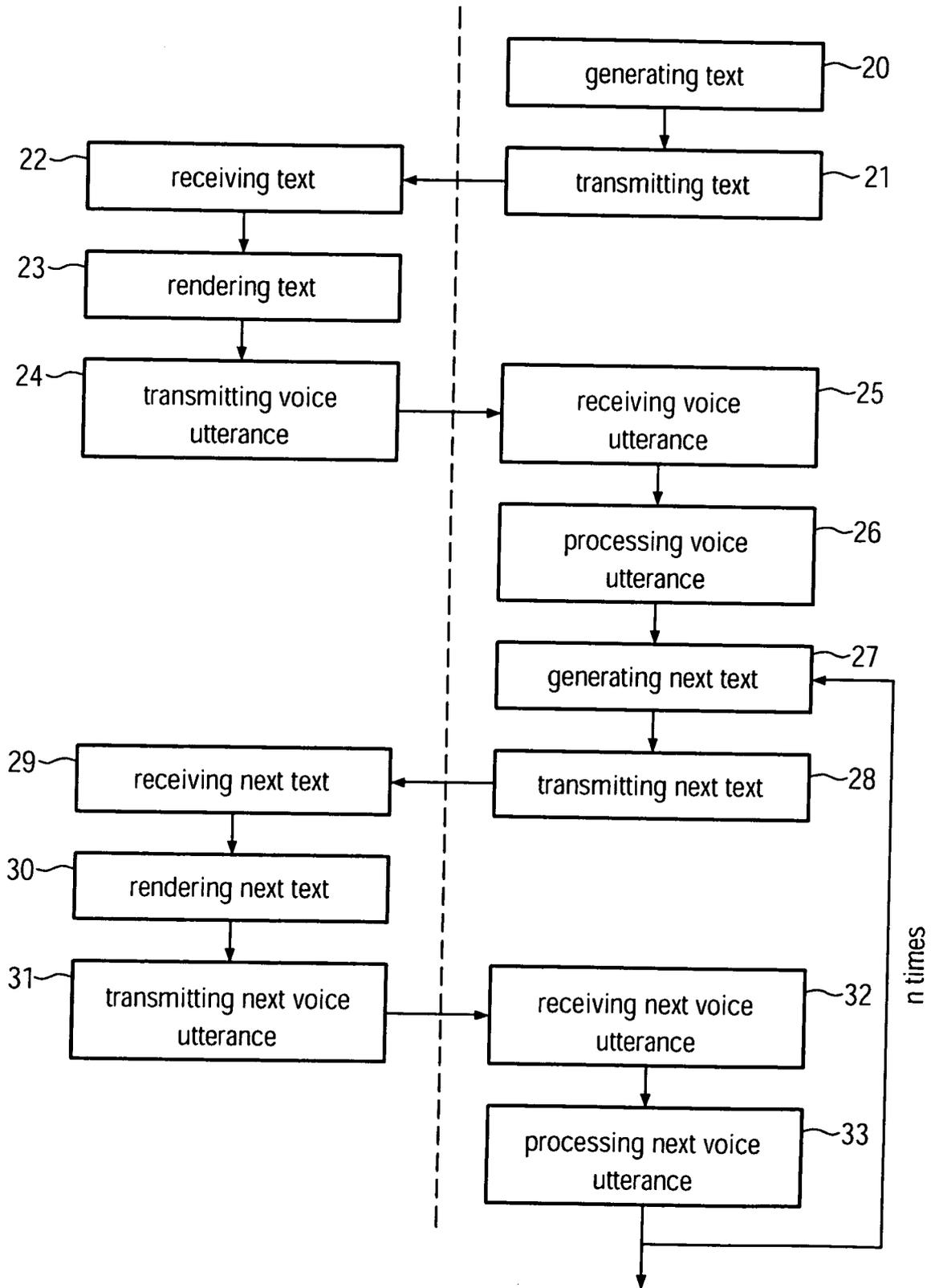


FIG. 2

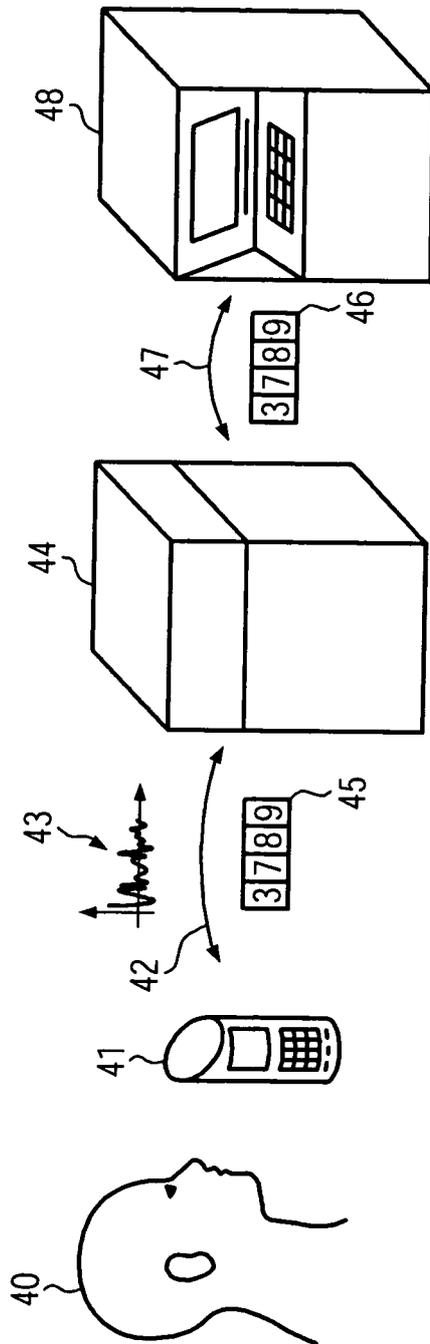


FIG. 3

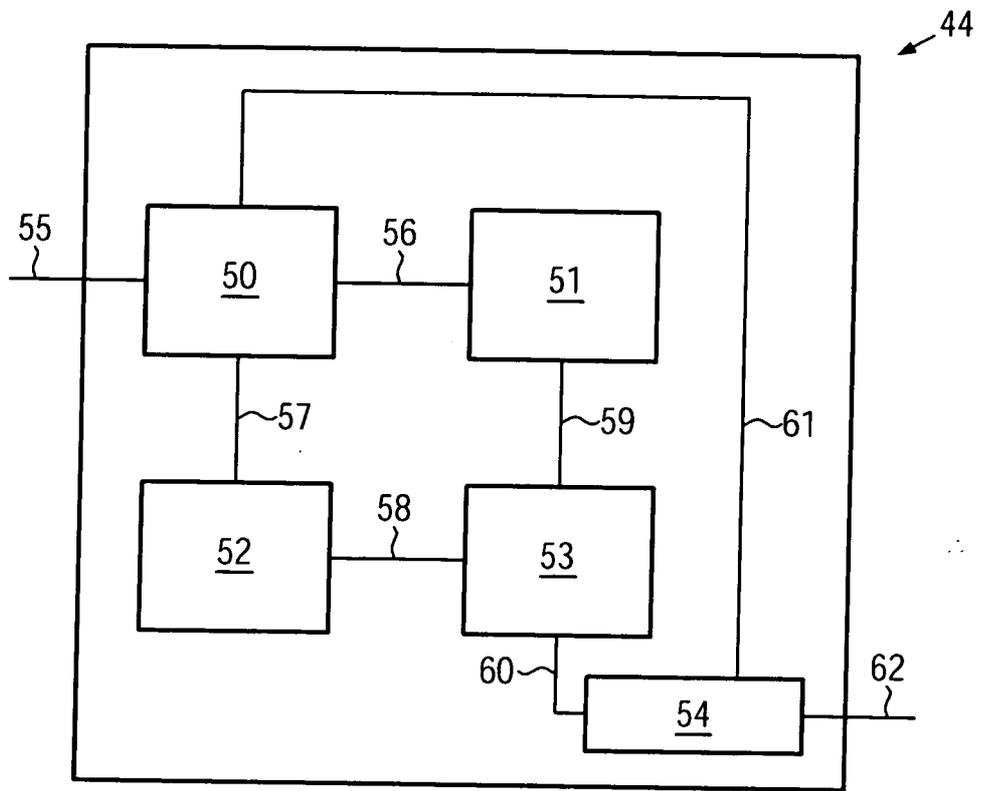


FIG. 4

INTERNATIONAL SEARCH REPORT

International application No

PCT/EP2008/002777

A. CLASSIFICATION OF SUBJECT MATTER

INV. G07C9/00
ADD. G10L17/00

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)
GIOL C07C G07C G06F

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 303 299 A (HUNT ALAN K [US] ET AL) 12 April 1994 (1994-04-12) abstract; claim 1; figures column 2, line 20 - line 25 column 2, line 61 - column 3, line 43	1-16
X	WO 98/10412 A (VOICE CONTROL SYSTEMS INC [US]) 12 March 1998 (1998-03-12) abstract; claims 1-5,16; figures 1,2a, 2b page 4, line 2 - page 5, line 4 page 6, line 20 - page 7, line- 12 page 8, line 1 - page 11, line 3	1-16
A	US 5 365 574 A (HUNT ALAN K [US] ET AL) 15 November 1994 (1994-11-15) abstract; claim 1; figures 1,2 column 2, line 14 - column 3, line 66 column 4, line 32 - column 5, line 41	1-16
	-/-	

Further documents are listed in the continuation of Box C.

See patent family annex.

Special categories of cited documents :

- 'A' document defining the general state of the art which is not considered to be of particular relevance
- 'E' earlier document but published on or after the international filing date
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- 'X' document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- 'Y' document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
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Date of the actual completion of the International search

Date of mailing of the International search report

, 4 July 2008

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Name and mailing address of the ISA/

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Fax: (+31-70) 340-3016

Authorized officer

Rother, Stefan

INTERNATIONAL SEARCH REPORT

International application No

PCT/EP2008/002777

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2007/055517 A1 (SPECTOR BRIAN [US]) 8 March 2007 (2007-03-08) the whole document	1-16
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