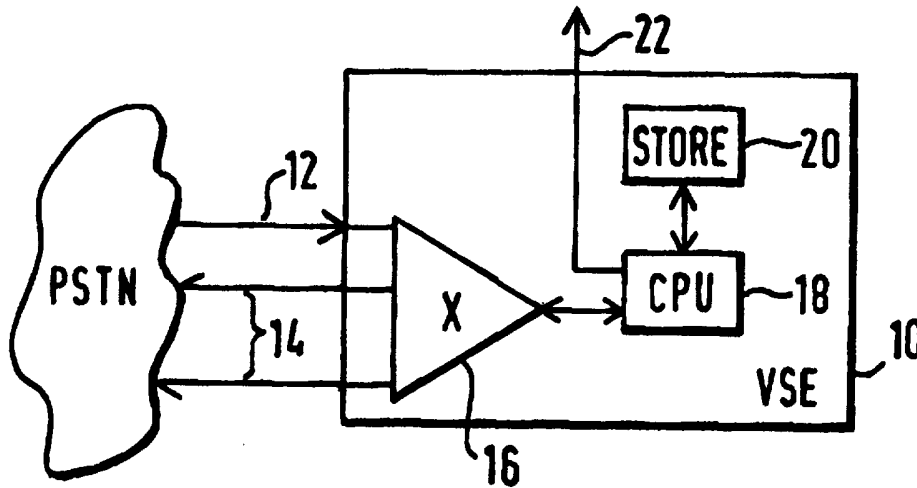




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(54) Title: TELEPHONE CONFERENCING SYSTEMS



(57) Abstract

A telephone conferencing system includes a voice services equipment (VSE) (10) allowing a number of telephone calls to be connected together to form a conferencing function. The initiator of the telephone conference calls in on an incoming line (12) and is asked by the VSE (10) to give the telephone numbers of the desired other participants to the conference. These numbers are then stored in a store (20) and the system dials out to these telephone numbers on outgoing lines (14) with an invitation to join the conference on a reverse charge basis. Each participant can accept the reverse charge call by pressing a key such as "one" on the telephone keypad whereupon the participant is connected to the conference. After termination of the conference, the reverse charge billing information is sent to the charging authority.

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TELEPHONE CONFERENCING SYSTEMS

This invention relates to telephone conferencing systems that enable a number of callers to participate in a conference by means of telephones.

5 Telephone or audio conferencing allows three or more people to participate in a single telephone conversation. Each person is able to hear all the other callers when they speak and the conversation can progress as if all the callers were in the same room.

10 Audio telephone conferencing systems exist for connection to both the analogue and digital telecommunications networks. These systems use either analogue bridges or digital signal processing to combine the audio from three or more callers and play it to all participants in the conference.

15 With the advance of digital systems, more complex algorithms have been employed to improve the quality of the speech heard by each caller. Some of these advances include automatic gain control (AGC), speaker detection and echo cancellation.

20 Existing conferencing systems have two basic market areas, business conferencing and social chatlines. Business conferencing can be provided as a public service by the network operator, or provided locally from a company's PABX. Chatlines are usually provided by independent service providers to callers who pay a premium rate for the call whilst accessing the service. The telephone numbers for chatlines are extensively advertised and there is no restriction on callers wishing to access the service, as long as the telephone being used has not been barred from initiating premium rate calls.

25 At present, there is no system available for residential or domestic use. In theory, the subscription services for business use could be utilised for domestic use, but these have to be booked in advance. Moreover, the initiator of the telephone conference bears the telephone charges for all participants; whereas this is generally acceptable for business use, for 30 domestic use it provides a financial disincentive, particularly with a large number of participants.

According to the invention there is provided a telephone conferencing system comprising a voice services equipment having a processing means and storage means, the processing means being operable:

- 5 (i) to request the telephone numbers of desired other participants to the conference from the initiator of the conference, and store the telephone numbers in the storage means,
- (ii) to initiate telephone calls to the desired participants on the basis of the stored telephone numbers, and request that the participants confirm acceptance of the respective call on a reverse charge basis by means of a predetermined action,
- 10 (iii) in response to the predetermined action, to enable connection of the respective desired participant to the conference, and
- (iv) to forward respective reverse charge billing information to the appropriate charging authority.

15 In a preferred embodiment of the invention, the predetermined action requested of each participant is activation of a specific key (such as "one") or sequence of keys, the processing means responding to this by connecting that participant to the conference.

20 Since the participants to the telephone conference are invited to accept the calls on a reverse charge (collect call) basis, each participant will bear the costs of their contribution to the conference call.

The telephone conferencing system can be utilised to initiate video conferences or data conferences, as well as audio conferences.

25 The invention will now be described by way of example with reference to the accompanying single figure drawing which shows a schematic block diagram of a telephone conferencing system according to an embodiment of the invention.

Referring to the drawing, a telephone conferencing system comprises a voice services equipment (VSE) 10 having one incoming line 12 and a plurality of outgoing lines 14, each line being connected to the public switched telephone network (PSTN). All the lines 12, 14 are connected via

30

a telephone switch 16 to a central processing unit (CPU) 18 of the VSE 10. The telephone switch 16 allows programmed switching between one or more selected lines and/or functions of the VSE 10, these functions being known in the art and so not shown specifically in the drawing. The VSE 10
5 may, for example, be a Telsis Hi-Call, some aspects of which are described in International Patent Application Publication No. WO92/22165. As shown in Figure 1, a temporary store 20 is connected to the CPU 18. The store 20 can be external to the VSE 10 or can, as shown, be constituted by internal memory of the VSE 10.

10 In operation, the initiator of the telephone conference calls in on the incoming line 12 by dialling a particular telephone number. A voice message from the VSE 10 greets the caller and requests the telephone numbers of the desired other participants to the telephone conference and also the caller's name. Following the necessary prompts, the initiator can enter these
15 telephone numbers by using the number keys on the telephone, or possibly by voice if the system has voice recognition capability. The CPU 18 stores the telephone numbers in the temporary store 20 and the caller's name in the usual disc store. The system then dials out to these numbers on the outgoing lines 14, gives the (recorded) name of the initiator, invites those
20 answering to join the conference and requests confirmation that the particular invited party is prepared to joint the conference on a reverse charge (collect call) basis, for example by pressing a specific key such as "one" on the telephone keypad. The CPU 18 responds to receipt of the signal corresponding to "one" to set the respective call as a reverse charge
25 call. As an alternative, the invitee may be asked to press a particular sequence of keys rather than a single key.

Thus each participant call to the conference can be set up on a reverse charge basis (apart, of course, from the conference initiator's call) and so the charges for the conference are spread amongst the participants,
30 rather than all being born by the conference initiator as with the existing business-type conference call facilities.

The charging information for the conference can, upon termination of the conference, be sent from the CPU 18 via a line 22 to the corresponding charging authority. Alternatively, the system can dial out on one of the lines 14 and send the charging information that way.

5 In order to increase the flexibility of the service, different systems could be provided for different area codes such that, for example, the conference initiator could choose the optimum system. Thus, for example, it may be preferable for the initiator to call a system at a different area code if all or most of the other participants are in that area code. Most
10 participants may then only be charged at local reverse-charge call rates.

The telephone conferencing system may provide the ability to predefine groups of telephone numbers which can be accessed easily, such as by the use of short codes to be input by the conference initiator. Thus, if telephone conferences are often arranged between the same (or at least
15 some of the same) participants, this facility will significantly simplify the setting-up operation.

The single figure drawing illustrates a simple system suitable for handling a single conference call. More complex systems can include a plurality of incoming lines 12 with the switch 16, CPU 18 and store 20 being
20 provided with the capacity to handle a plurality of conferences.

The service provider can select the operational modes in respect of different eventualities, such as the system receiving no reply when dialling out, or receiving an engaged signal, or not receiving confirmation of acceptance of the reverse charge call. Likewise, the system may provide for
25 people being added to the conference once it has started, if the participants so desire, such as on receipt by the system of a predetermined key input from one of the participants.

The drawing shows the system connected to the public switched telephone network. However, it will be clear that the system could
30 alternatively or additionally be connected to other types of network, such as private or mobile networks.

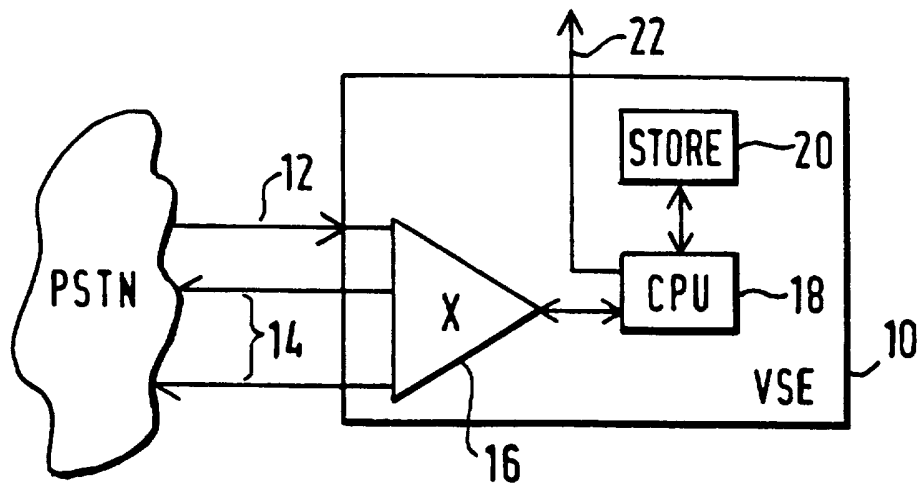
Although the system has been described in the context of audio conferencing, the principles of the invention can similarly be applied to video conferencing and data conferencing.

CLAIMS

1. A telephone conferencing system comprising a voice services equipment (10) having a processing means (18) and storage means (20), the processing means (18) being operable:
- 5 (i) to request the telephone numbers of desired other participants to the conference from the initiator of the conference, and store the telephone numbers in the storage means (20),
- 10 (ii) to initiate telephone calls to the desired participants on the basis of the stored telephone numbers, and request that the participants confirm acceptance of the respective call on a reverse charge basis by means of a predetermined action,
- (iii) in response to the predetermined action, to enable connection of the respective desired participant to the conference, and
- 15 (iv) to forward respective reverse charge billing information to the appropriate charging authority.
2. A telephone conferencing system according to claim 1, wherein the predetermined action requested of each participant is activation of a specific key or sequence of keys on the participant's telephone, the processing means (18) being operable on receipt of a signal corresponding to that key or that key sequence to invoke a reverse charge billing mode.
- 20
3. A telephone conferencing system according to claim 1 or claim 2, wherein the voice services equipment (10) includes a voice store, and the initiator is asked to speak his/her name which is recorded in the voice store and then forms part of the spoken request to the desired other participants.
- 25
4. A telephone conferencing system according to claim 1, claim 2 or claim 3, wherein the processing means (18) is responsive upon receipt of a signal corresponding to a predetermined key input to add one or more further
- 30

participants to the telephone conference.

5. A telephone conferencing system according to any one of claims 1 to 4, including means for predefining groups of telephone numbers of desired participants.
6. A telephone conferencing system according to any one of claims 1 to 5, wherein the telephone conference to be initiated is an audio conference.
- 10 7. A telephone conferencing system according to any one of claims 1 to 5, wherein the telephone conference to be initiated is a video conference.
8. A telephone conferencing system according to any one of claims 1 to 5, wherein the telephone conference to be initiated is a data conference.



INTERNATIONAL SEARCH REPORT

Int. onal Application No
PCT/GB 97/00584

A. CLASSIFICATION OF SUBJECT MATTER
 IPC 6 H04M3/56 H04M15/00

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)
 IPC 6 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)

C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	EP 0 649 266 A (SEL ALCATEL AG) 19 April 1995 see column 4, line 32 - column 5, line 6 ---	1,2
Y	US 5 381 467 A (ROSINSKI RICHARD R ET AL) 10 January 1995 see column 2, line 55 - line 60; figures 5,6 ---	1,2
A	WO 92 22165 A (TELSIS HOLDINGS LIMITED) 10 December 1992 cited in the application see the whole document ---	2,3
A	EP 0 604 047 A (AT & T CORP) 29 June 1994 see abstract ---	4
	-/--	

Further documents are listed in the continuation of box C. Patent family members are listed in annex.

* Special categories of cited documents :

<p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p>	<p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"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</p> <p>"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.</p> <p>"&" document member of the same patent family</p>
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Date of the actual completion of the international search 6 June 1997	Date of mailing of the international search report 16.06.97
Name and mailing address of the ISA 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	Authorized officer Megalou, M

INTERNATIONAL SEARCH REPORT

Int'l Application No
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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 4 481 383 A (MADON JAMES J) 6 November 1984 see abstract see column 4, line 50 - column 5, line 5 ---	1-3,6,8
P,A	EP 0 713 319 A (AT & T CORP) 22 May 1996 see column 4, line 32 - line 45 see column 8, line 9 - line 33 ---	1,2,5
A	TELETRAFFIC SCIENCE FOR NEW COST EFFECTIVE SYSTEMS, NETWORKS AND SERVICES, TORINO, JUNE 1 - 8, 1988, vol. VOL. 1, no. CONGRESS 12, 1 June 1988, BONATTI M, pages 433-439, XP000279777 GIACOBBO SCAVO G ET AL: "DESIGN OF VIDEOCONFERENCE NETWORKS CONSIDERING USER FLEXIBILITY" see the whole document -----	7

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INTERNATIONAL SEARCH REPORT

information on patent family members

International Application No

PCT/GB 97/00584

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0649266 A	19-04-95	DE 4335031 A AU 673763 B AU 7291694 A FI 944818 A NZ 264418 A	20-04-95 21-11-96 04-05-95 15-04-95 28-10-96
US 5381467 A	10-01-95	CA 2101305 A,C	01-05-94
WO 9222165 A	10-12-92	AU 670910 B AU 1781892 A EP 0587629 A JP 6510402 T	08-08-96 08-01-93 23-03-94 17-11-94
EP 0604047 A	29-06-94	CA 2108740 A JP 6237305 A US 5475747 A	24-06-94 23-08-94 12-12-95
US 4481383 A	06-11-84	NONE	
EP 0713319 A	22-05-96	US 5631904 A	20-05-97