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(54) METHOD AND APPARATUS FOR EXCHANGE OF INFORMATION IN A COMMUNICATION EXCHANGE

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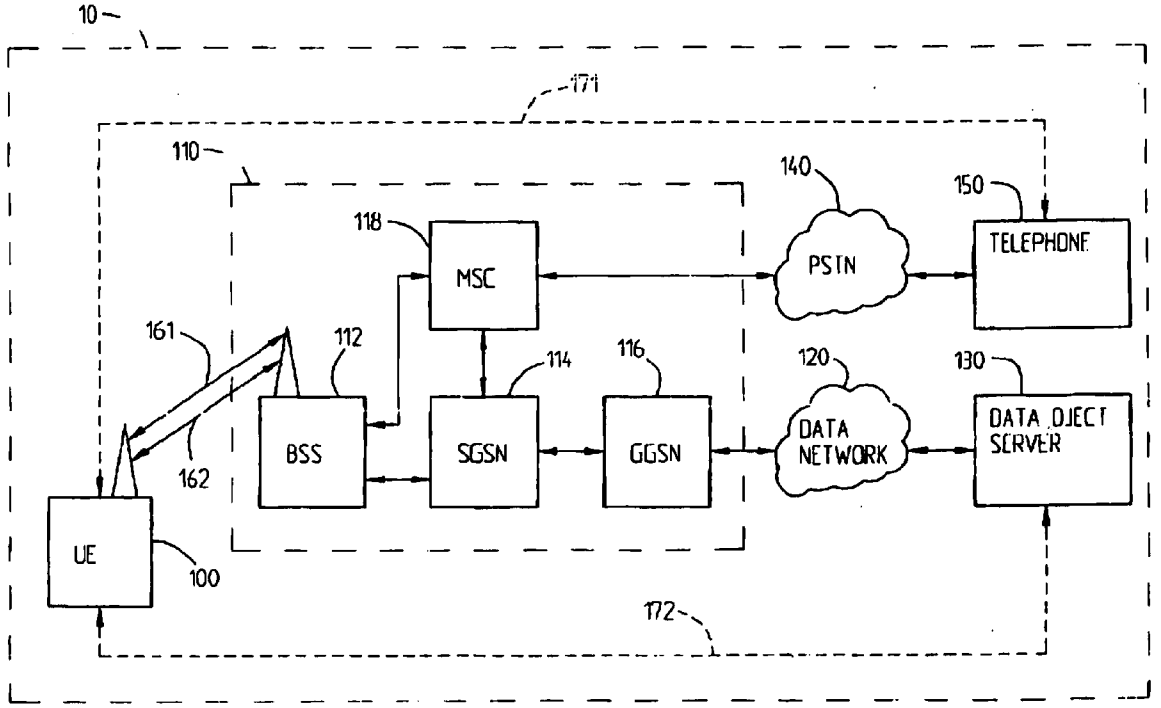
(57) **ABSTRACT**

A technique for connecting a dialed B-party number to a data object is described. The connecting of a B-party number to a specific data object, hereafter referred to as phonepage, will allow an A-party direct access to information that a B-party wishes to display to a calling party. The phonepage resides in a memory in a telecommunications network, or in a memory in a data-communications network connected thereto. The phonepage may have a similar appearance to an Internet web page, but may also take other appearances. The displaying of tile phonepage may be made dependent upon the capabilities of the A-party user equipment.



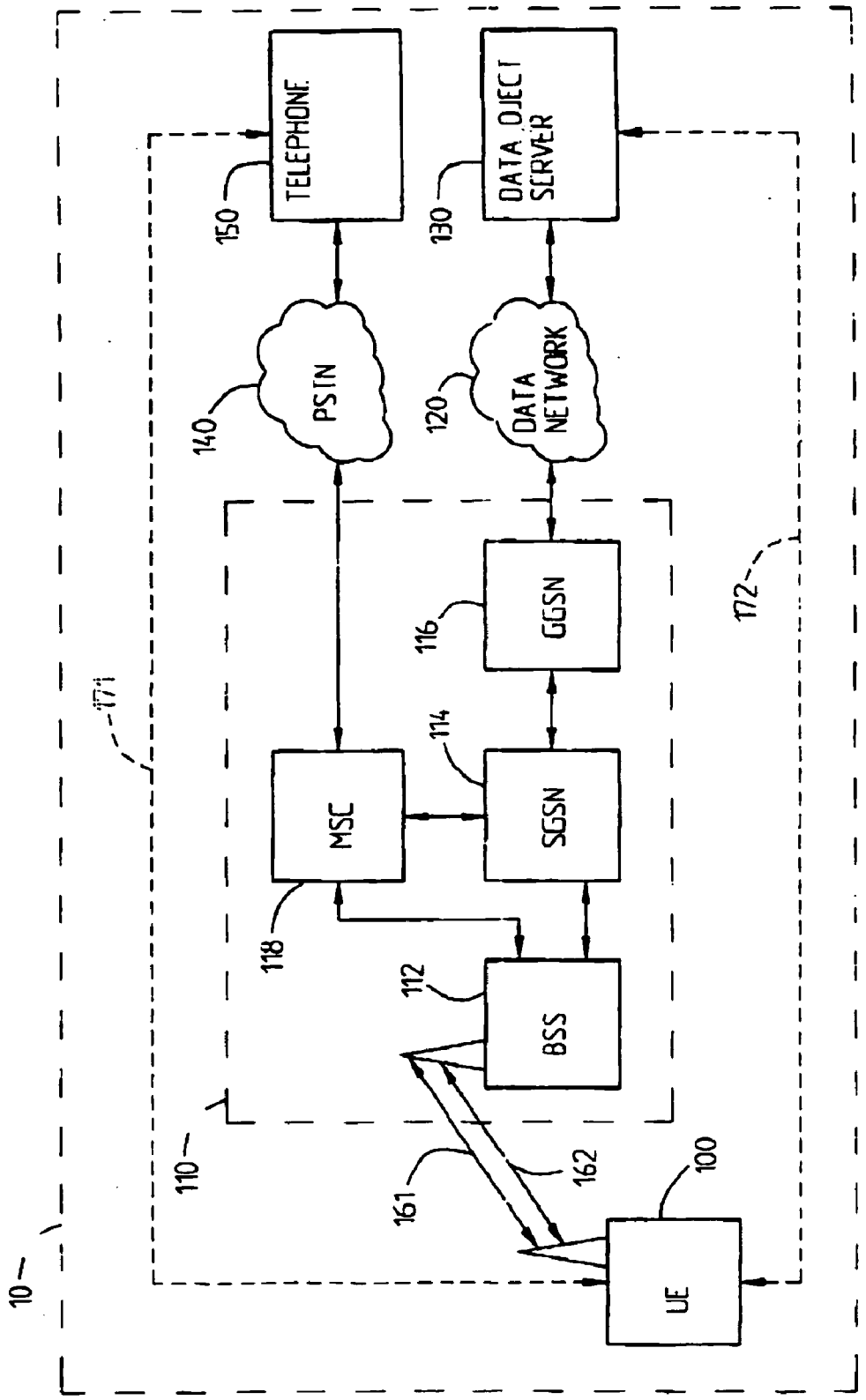

TELEPHONE
DATA OBJECT SERVER
150
130
PSTN
DATA NETWORK
140
120
GGSN
116
MSC
SGSN
114
118
BSS
112
161
162
UE
100
110
171
172
10

Fig. 1

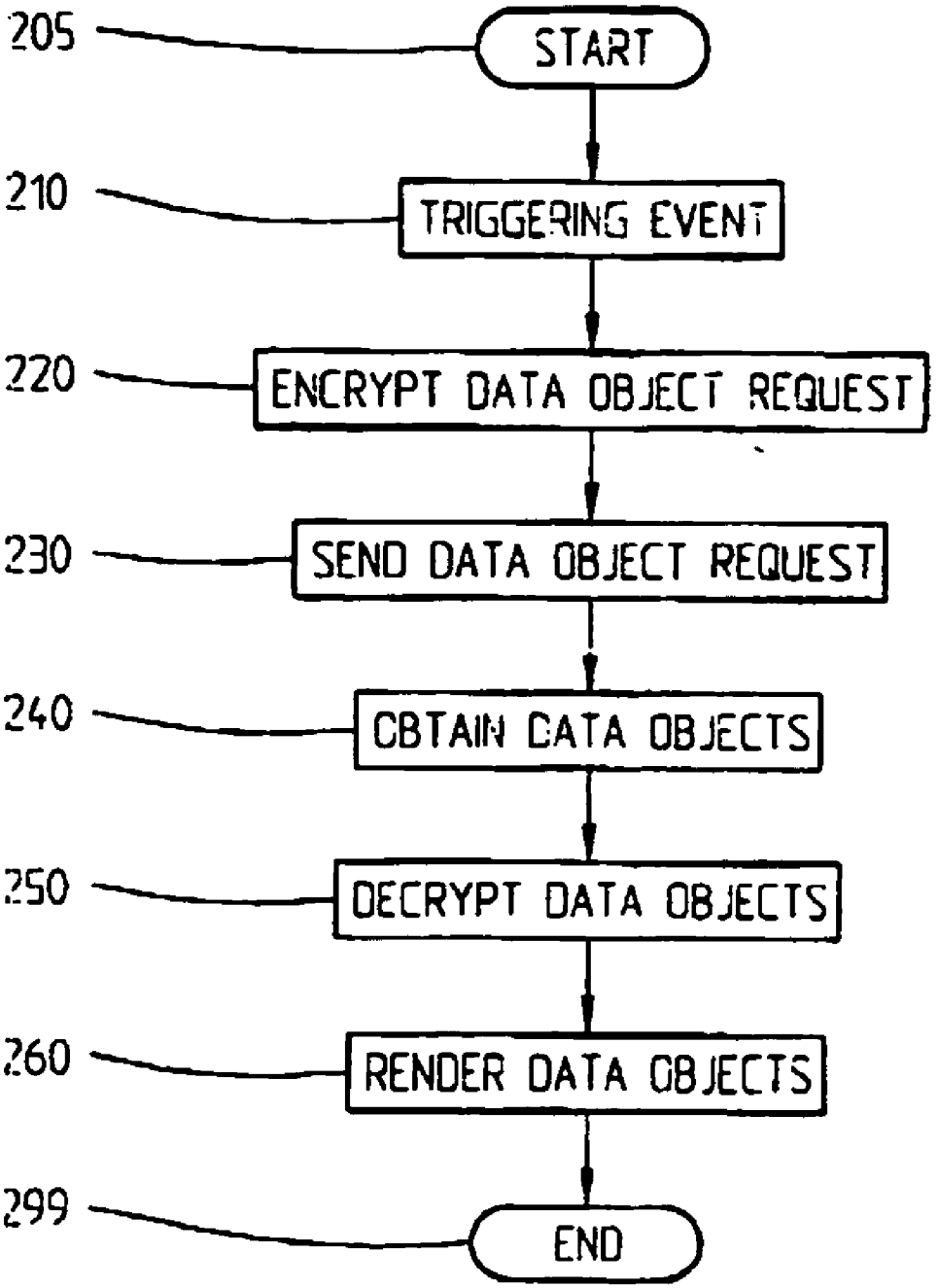

205
START
210
TRIGGERING EVENT
220
ENCRYPT DATA OBJECT REQUEST
230
SEND DATA OBJECT REQUEST
240
OBTAIN DATA OBJECTS
250
DECRYPT DATA OBJECTS
260
RENDER DATA OBJECTS
299
END

Fig. 2

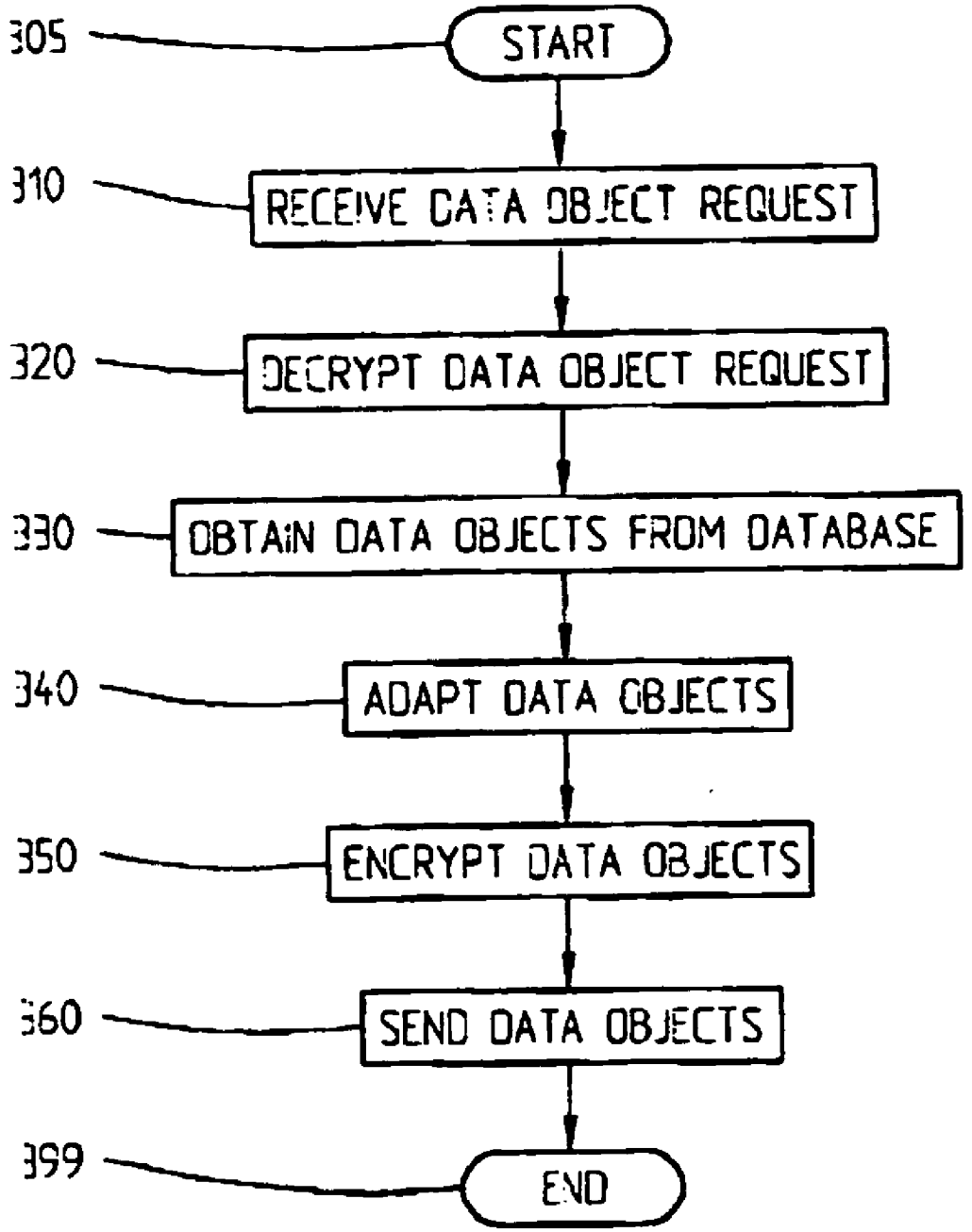

305
START
310
RECEIVE DATA OBJECT REQUEST
320
DECRYPT DATA OBJECT REQUEST
330
OBTAIN DATA OBJECTS FROM DATABASE
340
ADAPT DATA OBJECTS
350
ENCRYPT DATA OBJECTS
360
SEND DATA OBJECTS
399
END

Fig. 3

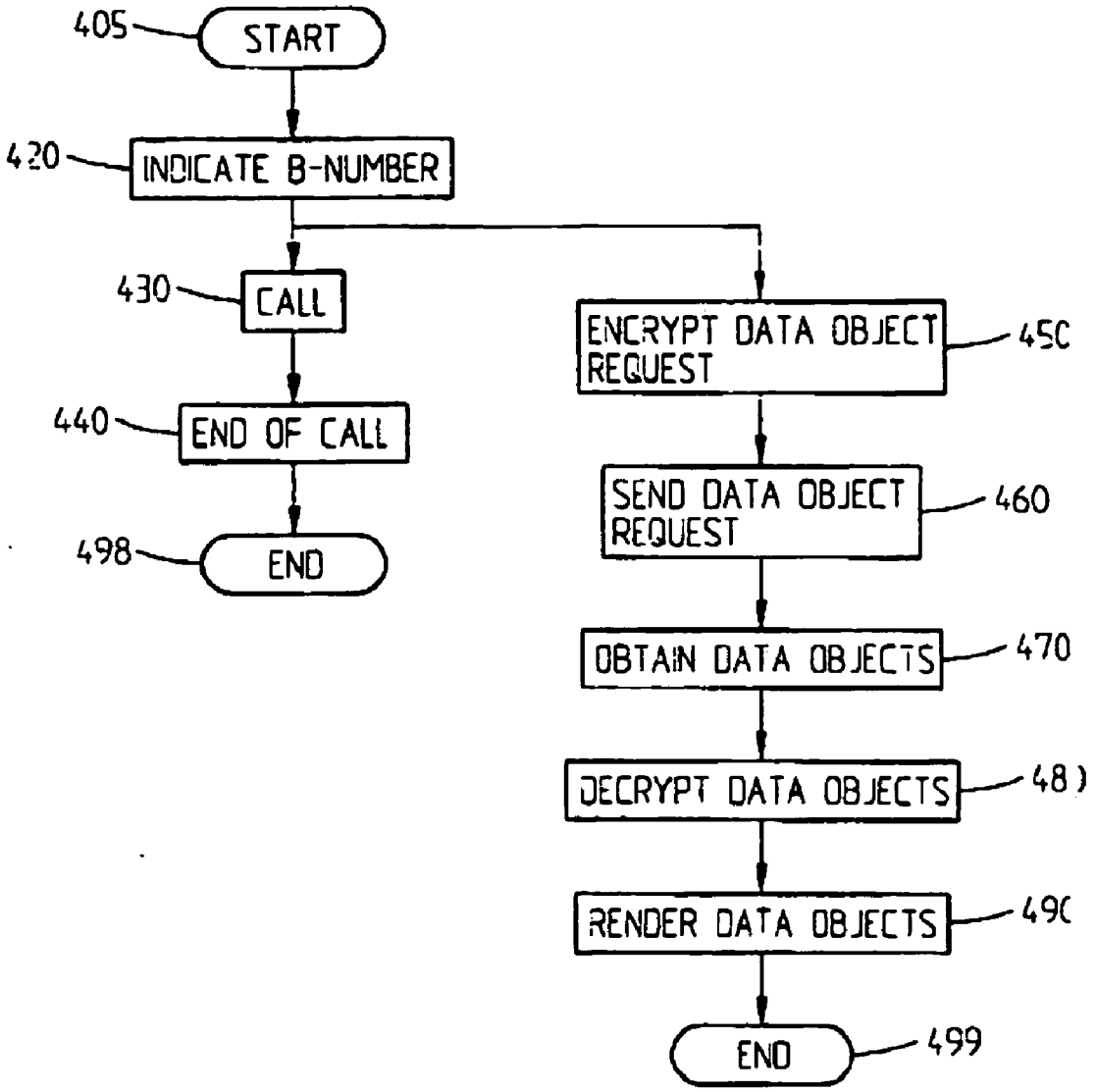

405
START
420
INDICATE B-NUMBER
430
CALL
440
END OF CALL
498
END
ENCRYPT DATA OBJECT REQUEST
45C
SEND DATA OBJECT REQUEST
460
OBTAIN DATA OBJECTS
470
DECRYPT DATA OBJECTS
48)
RENDER DATA OBJECTS
49C
END
499

Fig. 4

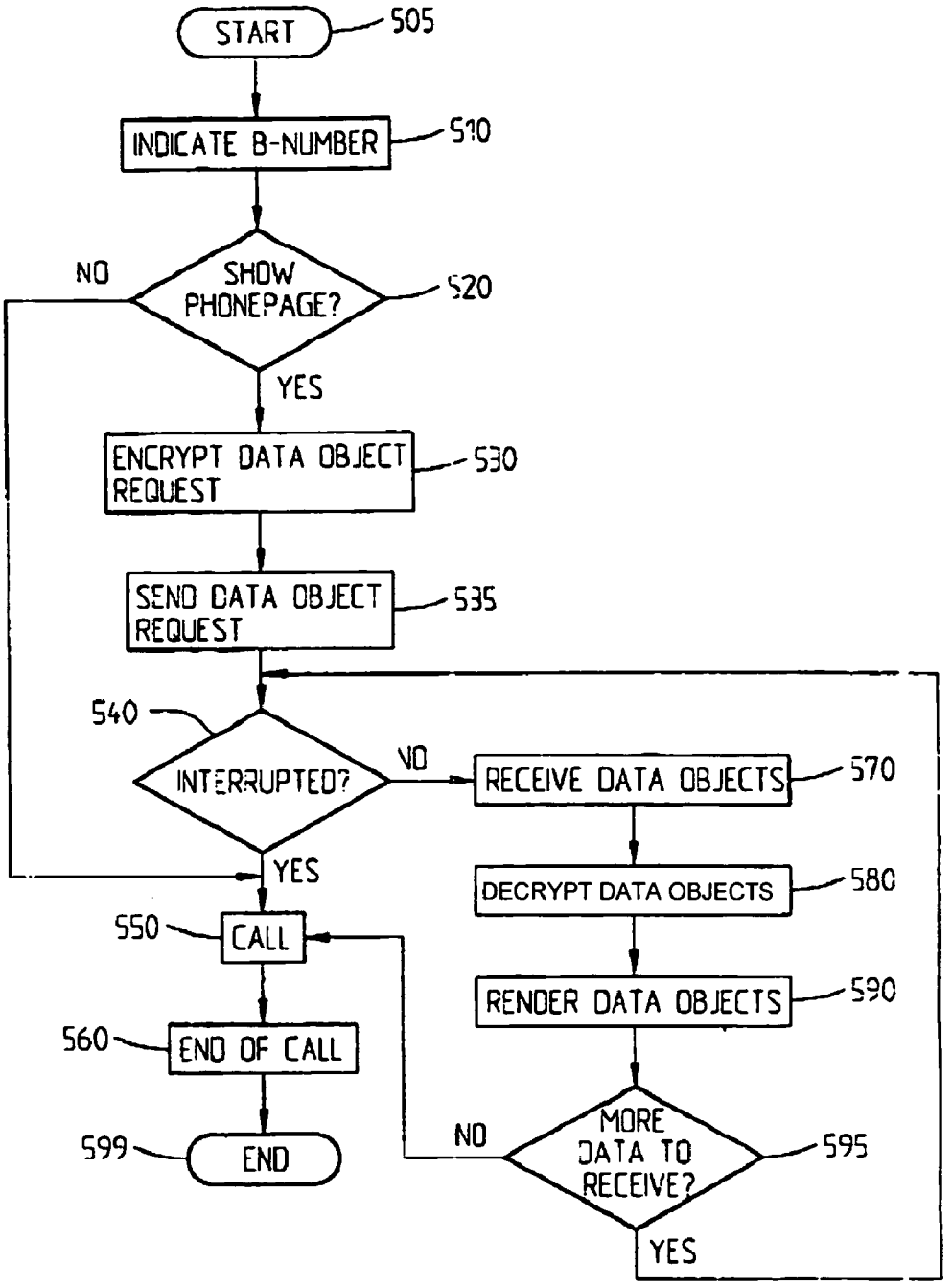

START
505
INDICATE B-NUMBER
510
NO
SHOW PHONEPAGE?
520
YES
ENCRYPT DATA OBJECT REQUEST
530
SEND DATA OBJECT REQUEST
535
540
INTERRUPTED?
NO
RECEIVE DATA OBJECTS
570
YES
DECRYPT DATA OBJECTS
580
550
CALL
RENDER DATA OBJECTS
590
560
END OF CALL
599
END
NO
MORE DATA TO RECEIVE?
595
YES

Fig. 5

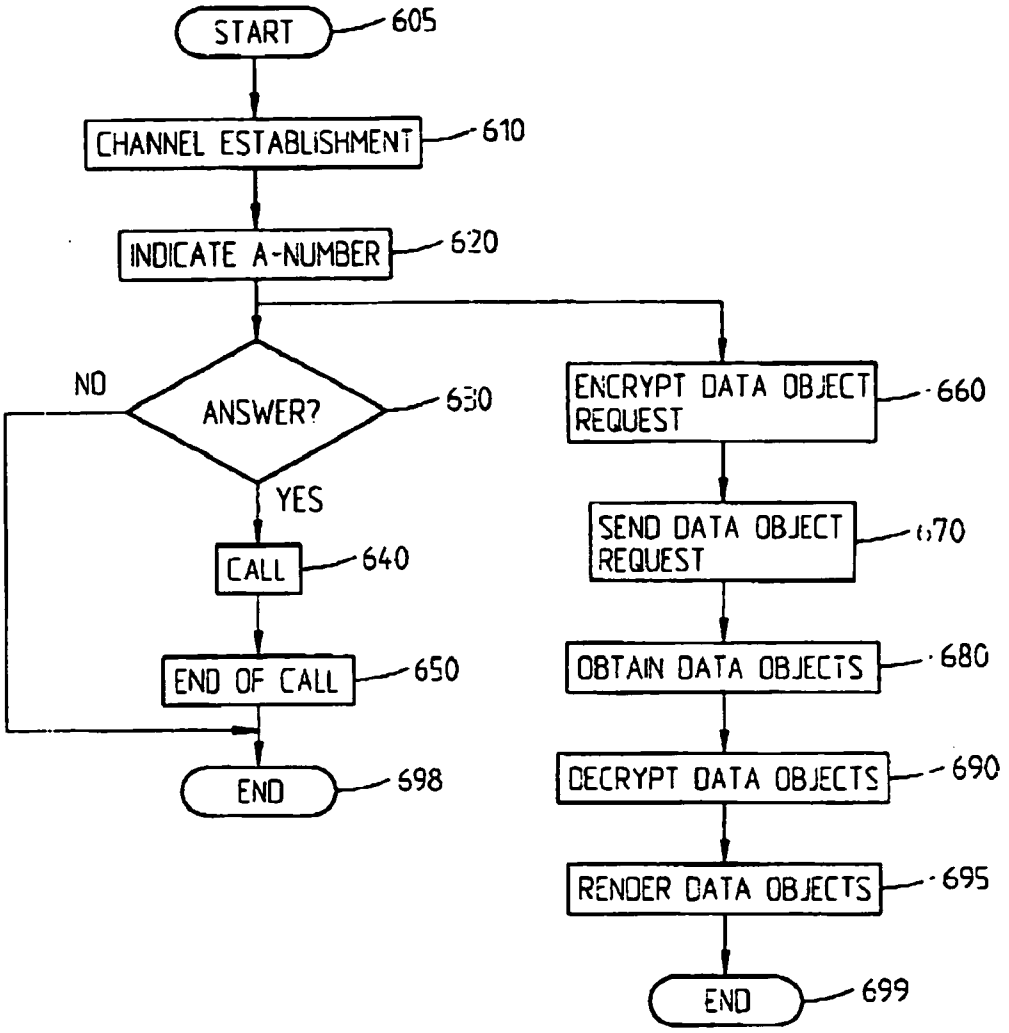

START
605
CHANNEL ESTABLISHMENT
610
INDICATE A-NUMBER
620
NO
ANSWER?
630
YES
CALL
640
END OF CALL
650
END
698
ENCRYPT DATA OBJECT REQUEST
660
SEND DATA OBJECT REQUEST
670
OBTAIN DATA OBJECTS
680
DECRYPT DATA OBJECTS
690
RENDER DATA OBJECTS
695
END
699

Fig. 6

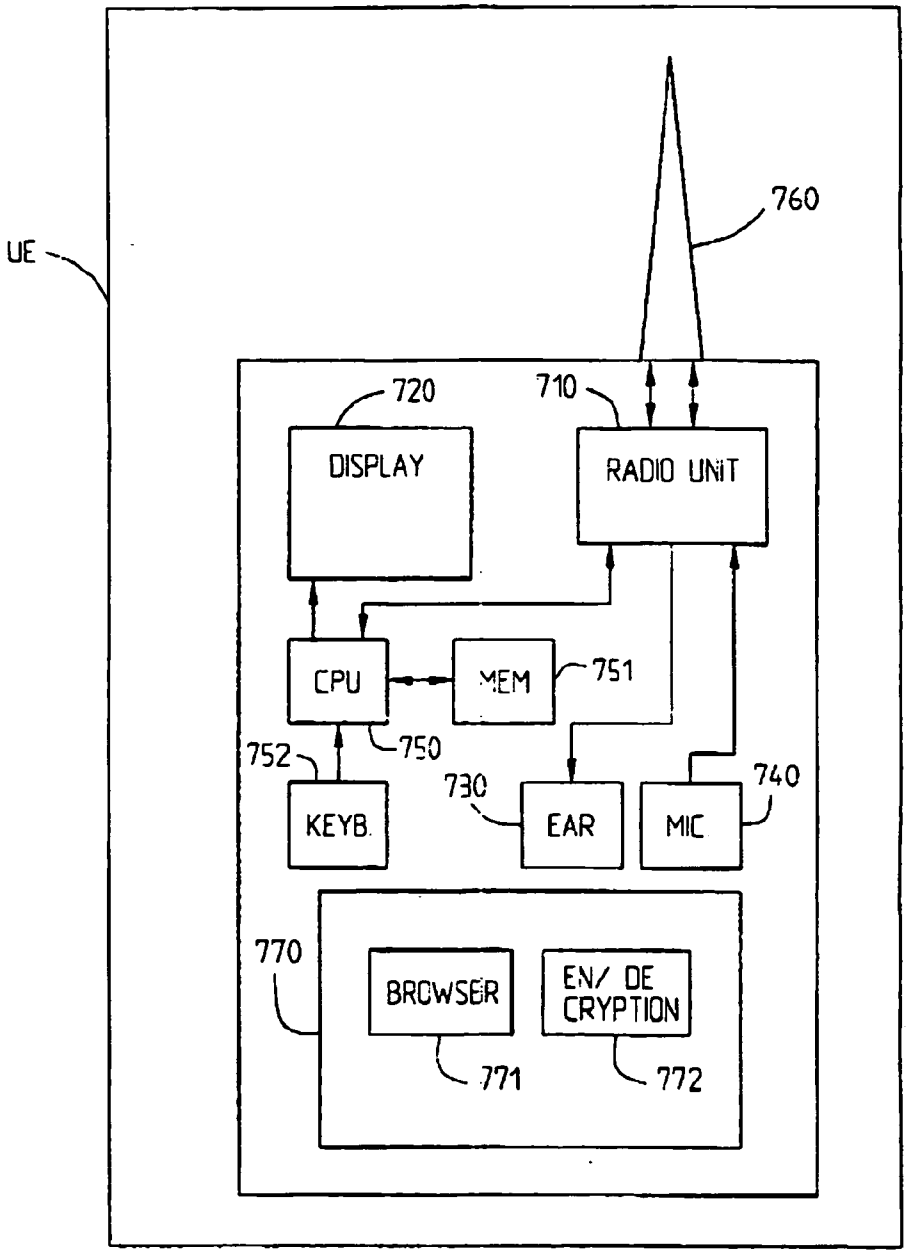

UE
760
720
710
DISPLAY
RADIO UNIT
CPU
MEM
751
752
750
730
740
KEYB.
EAR
MIC
770
BROWSER
EN/ DE
CRYPTION
771
772

Fig. 7

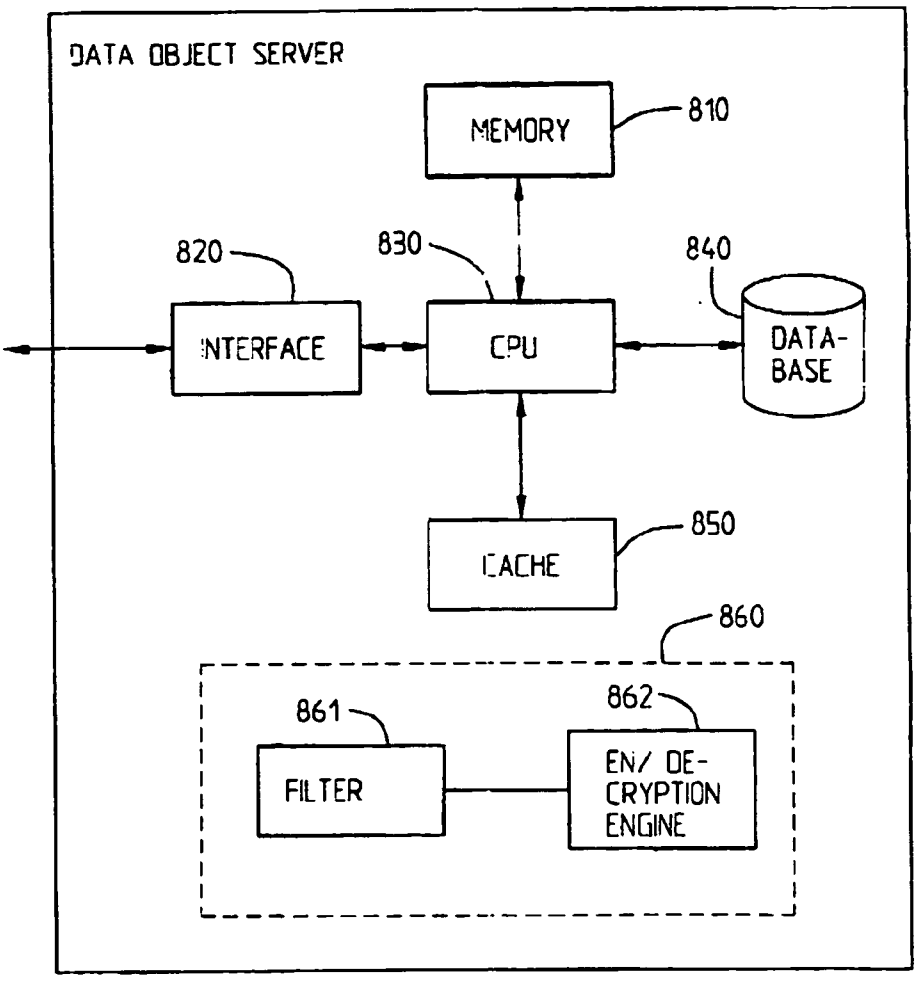

DATA OBJECT SERVER
MEMORY
810
820
830
840
INTERFACE
CPU
DATA-
BASE
CACHE
850
860
861
862
FILTER
EN/ DE-
CRYPTION
ENGINE

Fig. 8

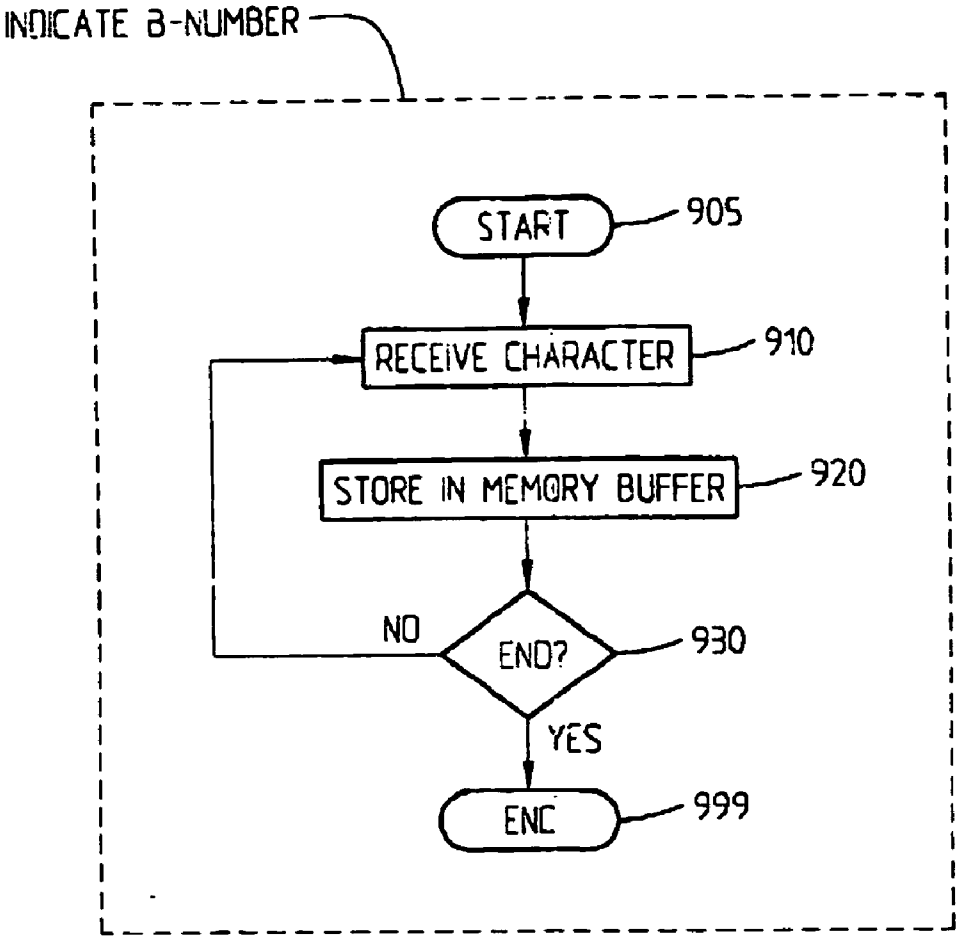

INDICATE B-NUMBER
START
905
RECEIVE CHARACTER
910
STORE IN MEMORY BUFFER
920
NO
END?
930
YES
END
999

Fig. 9

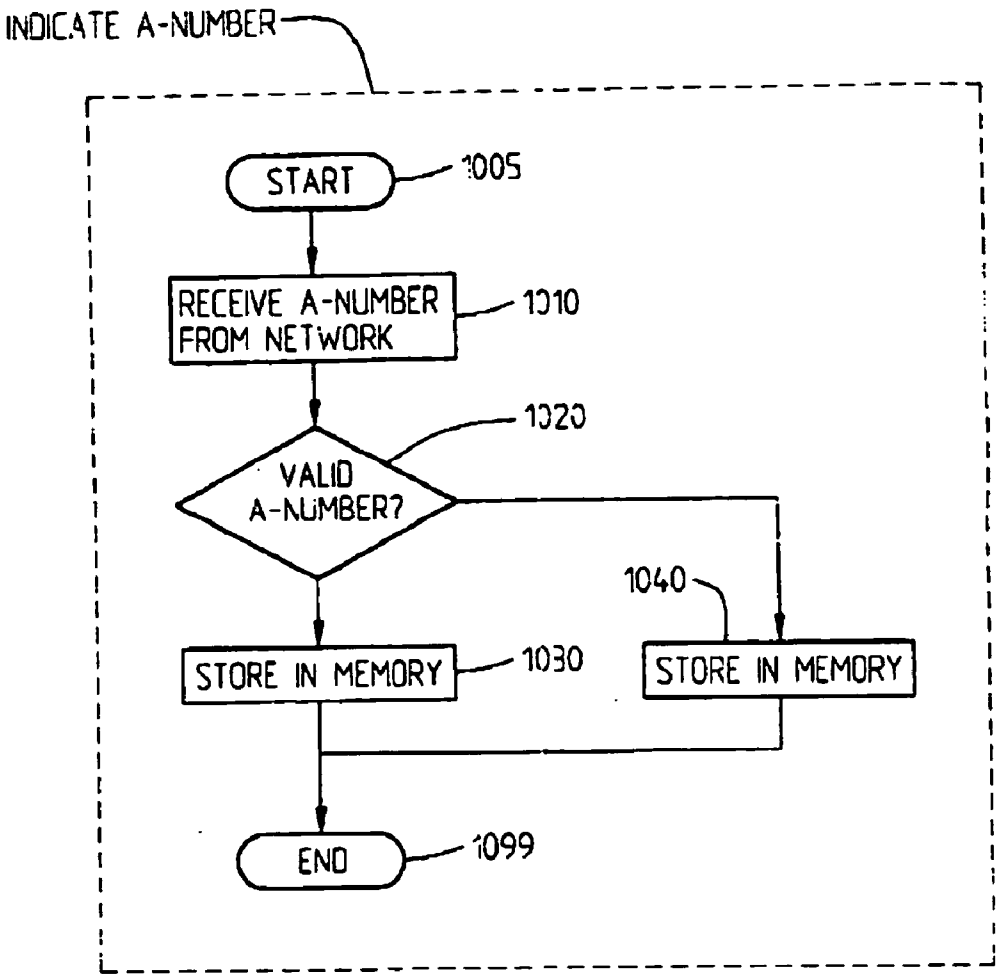

INDICATE A-NUMBER
START
1005
RECEIVE A-NUMBER FROM NETWORK
1010
1020
VALID A-NUMBER?
1040
STORE IN MEMORY
1030
STORE IN MEMORY
END
1099

Fig. 10

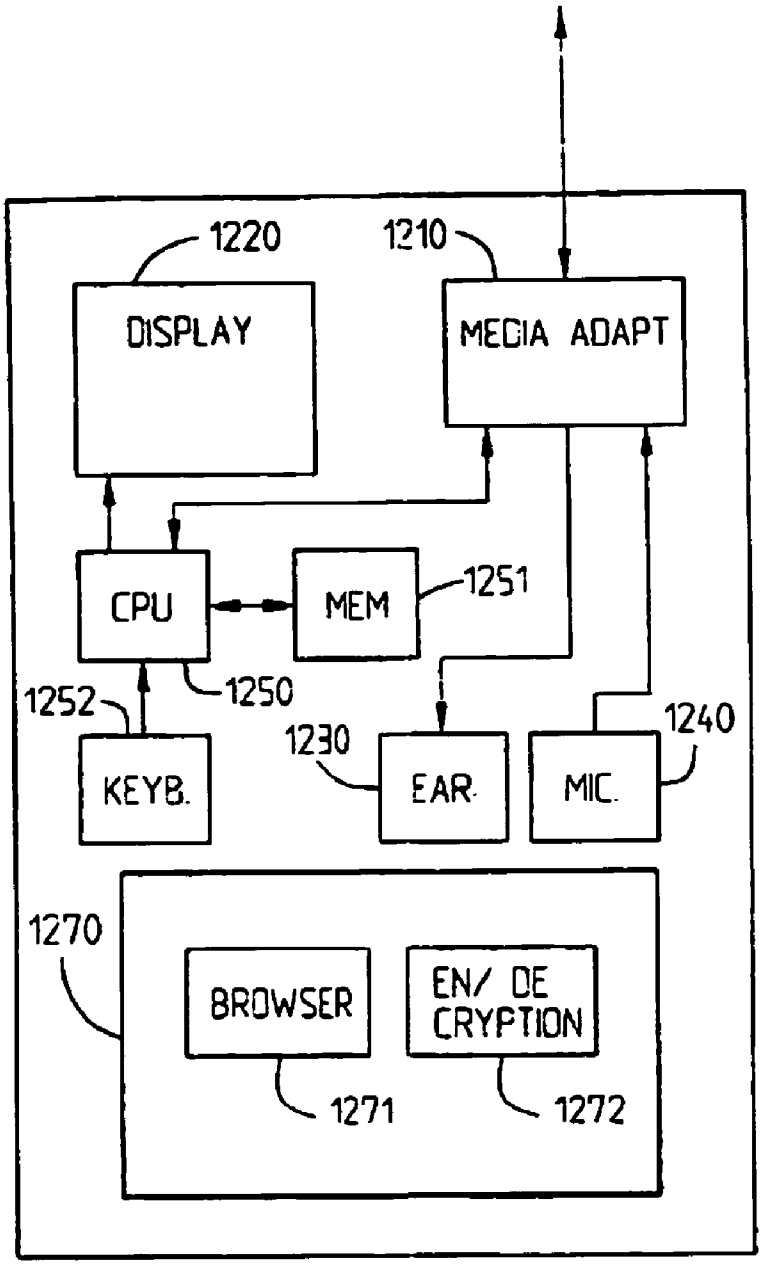

1220
1210
DISPLAY
MEDIA ADAPT
CPU
MEM
1251
1252
1250
1230
1240
KEYB.
EAR
MIC.
1270
BROWSER
EN/ DE CRYPTION
1271
1272

Fig. 11

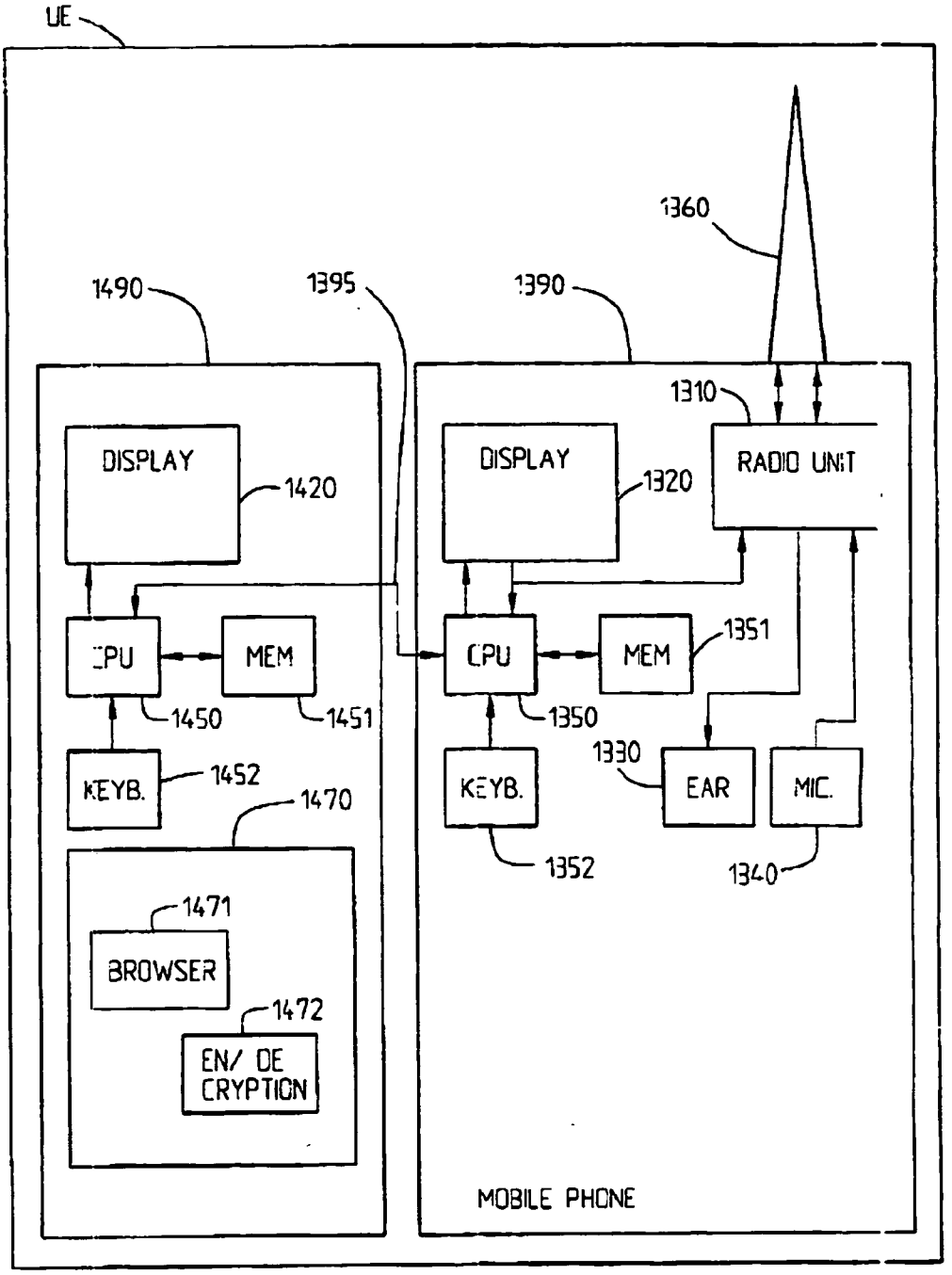

UE
1360
1490
1395
1390
1310
DISPLAY
1420
DISPLAY
1320
RADIO UNIT
CPU
MEM
1450
1451
CPU
MEM
1351
1350
KEYB.
1452
1470
KEYB.
1330
EAR
MIC.
1352
1340
1471
BROWSER
1472
EN/ DE CRYPTION
MOBILE PHONE

Fig. 12

METHOD AND APPARATUS FOR EXCHANGE OF INFORMATION IN A COMMUNICATION EXCHANGE

BACKGROUND

[0001] The present invention relates generally to a method and apparatus for exchanging information in a communication system. More specifically the invention relates to a communication system, which connects to a private or public data communication network and to a public or private telecommunication network

[0002] The present evolution of data-communication is such that more and more users gain access to the Internet worldwide. The Internet has become both a source of knowledge but also a marketplace for business, arid it is attracting more and more users. Currently there is a high pressure on the data-communications industry to provide solutions that allow everyone to gain access to Internet. Broadband solutions are continuously developed and both local as well as national access networks are planned and launched. The presently most common method of modem access through the telecommunications network (e.g., the Public Switched Telecommunication Network PSTN provider) is being replaced by other ways of access with a possibility to higher data rates, e.g., through electric power and cable TV providers.

[0003] At the same time, the telecommunications industry is struggling another battle; that of providing mobility to each and every user. Traditionally, telecommunication has been focused on voice communication. With the increase of data communication however, other demands are arising (e.g., higher data rate transfer), but also new possibilities. Evolutions of mobile systems are presently in a period when more and more packet-based systems will be deployed. Packet switched Systems have, in contrast to circuit switched systems, certain advantages when it comes to transfer of data-communication. In a packet switched system, a user is only utilizing a transmission resource when system control signaling or user information is transmitted. In a circuit switched system, a user is allocated a transmission resource continuously, even though no current transfer is active. Circuit switched systems have some obvious advantages in real-time voice communication, since it is difficult to predict the communication. For data-communication, it is not as important to predict the transmission resources required, since the demands on delay and delay variations are not as crucial to the communication quality as for voice. It is therefore possible to allow more users onto the transmission resources by allowing usage thereof-only-when there is something to transmit and leave the channel available for additional users otherwise.

[0004] One such system is the packet data evolution of the mobile communication system pursuant to the ETSI GSM specification, called General Packet Radio Service (GPRS). With GPRS, higher bit rates and more users may be allowed than what is possible today, when data communication is deployed on a circuit switched channel. GPRS is a step towards mobility for data communication users, in contrast to GSM, which is optimized for mobility for "traditional" telecommunication users, i.e., real-time voice communication users.

[0005] The data-communication run over the telecommunications networks today is usually initiated by an access to an Internet- or a mail server. A user logs on to a distant server arid accesses the data-communications network through, e.g., modem pools. The user dials up the modem pool and is therefrom connected to a server, from which access can be made to both local as well as global networks. Browsers like, e.g., Microsoft Explorer or Netscape Navigator are used to navigate on the Internet and switch between Internet pages or addresses. Users and institutions usually design their own data objects, or homepages, on an internal or external network that provides personal information or any other kind of information. Once connected to the data network a user may access these data objects by entering the correct address. The address is often selected by combining a node name in the network (e.g., server name) and an arbitrary text-string. Typically, it is not trivial to find a desired data object, since the text strings and server names are not obvious.

[0006] Addressing in a telecommunications network, e.g., when engaging in a voice communication, is usually performed by entering a telephone number on a User Equipment (UE), like a mobile telephone. A telephone number is a world-wide, unique addressing string. A calling party (A-party) dials the addressing string (B-number) to the called party (B-Party). Dependent on what type of network the A-party is a Subscriber on, the call request is routed through one or several Public telecommunication networks to the correct addressee and the communication may begin.

[0007] The above principle also applies when a user wishes to connect to the Internet from a computer connected to a telecommunications network. The user connects to a data-communications network by dialing a B-number to a modem pool, from which accessing the data-communications network is possible. There are no information or interaction possibilities with the called server other than this access opportunity.

[0008] Applicants have identified that there is a problem in the present way of accessing the Internet for specific data objects because of the non-obvious way of addressing data objects. There is further a need in the telecommunications industry to provide a simpler way of accessing the Internet and to guide a user by other means than a modem number to call, from where the user is left on her own to be further guided to the desired homepage or data object.

SUMMARY

[0009] The present invention overcomes the above identified deficiencies of identifying and finding a data object and navigating between a set of data objects by applying a novel connection between a data-communications network and a telecommunications network.

[0010] In one aspect of the present invention a technique for connecting a dialed B-party number to a data object is described. The connecting of a B-party number to a specific data object, hereafter referred to as phonepage, will allow an A-party direct access to information that a B-party wishes to display to a calling party. The phonepage resides in a memory in a telecommunications network, or in a memory in a data-communications network connected thereto. The phonepage may have a similar appearance to an Internet web page but may also take other appearances. The displaying of the phonepage may be made dependent upon the capabilities of the A-party user equipment.

[0011] Dependent on the type of equipment used by the A-party, the node storing the phonepages may, upon detection of type of equipment, select the most advantageous way of displaying a selected data object.

[0012] Also, dependent on the A-party user equipment, the phonepage may provide different levels of interaction possibilities, i.e., only display information, or be a fully interactive data object with a duplex communication between the A-party and the node housing the memory in which the phonepage is stored.

[0013] The phonepages may be configured to be displayed automatically or by indication from the A-party. In a variant of the invention also a B-party has the same capabilities of obtaining phonepages upon reception of an A-number in conjunction with an incoming call.

[0014] In another aspect of the present invention, a node in a data-communication or telecommunication system is described. The node consists of at least a data base memory including at least indications of the phonepages and upon access from a remote request, respond with said indication.

[0015] The transfer of the indication to a calling A-party may be dependent on type of connection and access technology used in the connection. For example in a connection where both circuit switched and packet switched communication is simultaneously possible, the indication may be transferred on a packet switched communication resource and, e.g., voice communication may be initiated on the circuit switched communication resource. In other types of connections, two data flows may be set-up on one or several simultaneous packet switched communication resources, e.g., speech and data transfer. Another example is when voice communication is initiated over a circuit switched communication resource and the phonepage indications are transferred over a packet switched channel with limited performance such as an SMS channel.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016] The invention will now be more thoroughly described and features and advantages will become readily apparent by reading the following detailed description, where references will be made to the accompanying figures, where:

[0017] **FIG. 1** illustrates an overview of a communication infrastructure overview according to one embodiment of the invention;

[0018] **FIG. 2** illustrates a first flow diagram of a subscriber interaction in an A-party UE according to one embodiment of the present invention;

[0019] **FIG. 3** illustrates a first flow diagram of a subscriber interaction in a data server according to one embodiment of the present invention;

[0020] **FIG. 4** illustrates a second flow diagram of a subscriber interaction in an A-party UE according to an embodiment of the present invention, when data and voice communications can be conducted simultaneously;

[0021] **FIG. 5** illustrates a third flow diagram of a subscriber interaction in an A-party UE according to another embodiment of the present invention, when data and voice communications can not be conducted simultaneously;

[0022] **FIG. 6** illustrates a flow diagram of a subscriber interaction in a B-party UE according to an embodiment of the present invention;

[0023] **FIG. 7** illustrates an exemplary block diagram of a UE according to one embodiment of the invention;

[0024] **FIG. 8** illustrates a block diagram of a data object server in a data network according to one embodiment of the invention;

[0025] **FIG. 9** illustrates a flow diagram of B-number indication procedure according to one embodiment of the present invention;

[0026] **FIG. 10** illustrates a flow diagram of A-number indication procedure according to one embodiment of the present invention;

[0027] **FIG. 11** illustrates an exemplary block diagram of a UE where the UE is connected to a fixed network according to one embodiment of the invention;

[0028] **FIG. 12** illustrates an exemplary block diagram of a UE where the UE consists of a PDA and a mobile phone according to one embodiment of the invention.

DETAILED DESCRIPTION

[0029] The present invention will now be described with references to a telecommunications system based on GSM as a circuit switched communication system and GPRS as a packet switched communications system. It should however be noted that the embodiments described are to be considered exemplary and that other packet and circuit switched systems may equally well be considered, both fixed- as well as mobile- and with any access technology, e.g., Time Division Multiple Access (TDMA), Code Division Multiple Access (CDMA), Frequency Division Multiple Access (FDMA), Orthogonal Frequency Division Multiple Access (OFDMA), Time Division Duplex (TDD), Frequency Division Duplex (FDD) or any combinations thereof. The invention is not restricted to any specific type of communications network or access technology

[0030] **FIG. 1** illustrates a communication infrastructure overview, **10**, where a number of different communication networks are interconnected. **FIG. 1** includes both nodes included in a Circuit Switched (CS) mobile communication network, e.g., a Mobile Switching Center (MSC), **118**, and Base Station Subsystem (BSS), **112**, as well as nodes included in a Packet Switched (PS) mobile communication network, e.g., Serving GPRS Support Node (SGSN), **114** and a Gateway GPRS Support Node (GCSN), **116**. Typically the SGSN includes functionality such as re-segmenting data packets according to one protocol into data packets according to protocols used over the air interface. The SGSN also includes control mechanisms for one or several BSS, **112** as well as Quality of Service (QoS) mechanisms. The GCSN includes functionality required to maintain communication between a mobile packet data network and other packet data networks, e.g., data network **120**. The CS part of the network connects to a PSTN network, **140**, and the PS part of the network connects to a data network, **120**. The data network may be both an external or internal network, i.e., with global or limited access possibilities. As shown, the PS and CS parts of the network may also be interconnected by way of an interface between the MSC, **118** and the SGSN, **114**. The

BSS, **112**, may serve both the PS as well as the CS part of the network with packet switched (**161**) as well as circuit switched (**162**) communication resources over the air, to provide mobility to both PS and CS service users and their User Equipment (UE), **100**. The UE, **100**, may for example be a mobile telephone or a mobile telephone connected to any kind of data equipment, e.g., Personal Digital Assistance Devices (PDA) or Laptop computer. The PSTN, **140**, provide users (user devices) connected to the fixed network with service, e.g., to "plain old telephones" (POTs), facsimile- or data modem devices, **150**. Other examples of devices connected directly or indirectly to the PSTN, **140**, are ISDN terminals and communication devices connected via a Digital Subscriber line (DSL) (e.g., ADSL, HDSL and XDSL).

[**0031**] The data network, **120**, typically includes one or several routers (not illustrated) and data bridges such that several nodes may be interconnected and communicate with each other. The data network used in connection with the present invention also includes a data object server, **130**. Typically, pluralities of data object servers are included in a data network, although, for reasons of explanation and clarity, only one data object server, **130**, is illustrated in **FIG. 1**. Examples of data networks are Internet and Intranet networks. The UE, **100**, may obtain a complete logical connection **171** to an indicated B-party telephone, **150**, connected to the PSTN, **140**, through the CS communication channel, **162**, provided between the UE, **100**, and the BSS, **112**, and further via the MSC node, **118**, over which conversation may be conducted between either party UE **100** and telephone **150**. Similarly, the UE **100**, may obtain a complete logical connection **172** to equipment, e.g., data object server, **130**, connected to the data network, **120**, through the PS communication channel, **161**, provided between the UE, **100** and the BSS, **112**, and further via the SGSN, **114** and GCSN, **116**, node, over which data may be sent between either party UE **100** and data object server **130**.

[**0032**] According to one aspect of the present invention a data object server, **130**, includes graphical information objects, i.e., phonepages, associated to a telephone number. The telephone number is identical to a subscriber number, i.e., an A- or B-number, addressing an originating user equipment or a terminating user equipment, respectively. The A-party, upon dialing a B-number, connects to a data object server, **130**, by way of PS communication channel and receives a data object, i.e., a "phonepage" stored in a memory position in the data object server, with a memory address corresponding to the B-number dialed. The phonepage may consist of information about the B-party, or it may simply provide an immediate access to an internal or external data network as maintained by the B-party subscriber. Alternatively, the B-party phonepage may consist of information regarding a B-party user, e.g., phone number, address and other information. After having received the B-party phonepage, one or several procedures may follow. If the B-number is addressing a POT, **150**, a circuit switched voice connection may be setup. If the B-number is addressing another device, other events may occur. This is of course also dependent upon the A-party device, UE, **100**, used.

[**0033**] In a variant of the present invention, the UE, **100**, does not support the use of a PS communication channel whereby data objects can be retrieved by other means, such as a Short Message Service (SMS) or a temporary CS communication channel. In a variant of the present invention, a PS communication channel, for example having a particular QoS, is used for conveying speech within the communication system **10** whereby the PSTN, **140**, and the data network, **120**, is interconnected by some means (not shown in **FIG. 1**).

[**0034**] **FIG. 2** illustrates a flow diagram of a procedure in a UE (like the UE, **100**) for communicating a phonepage to an A-party using the UE, according to one embodiment of the present invention. In step **205**, the procedure starts by an initiation from the A-party, (e.g. a UE is switched on). In step **210**, a trigger of a phonepage request is indicated, either automatically (e.g., a call is terminated by the other party) or manually by the A-party (e.g., the dialing of a B-number). The triggering event, **210**, may be at least one of a number of events, e.g.:

[**0035**] An outgoing call is or is about to be initiated.

[**0036**] An addressed B-party answers a call.

[**0037**] An addressed B-party is busy.

[**0038**] An addressed B-party does not answer.

[**0039**] An addressed B-party rejects a call.

[**0040**] An addressed B-party is unavailable (e.g., an addressed mobile phone is out of coverage).

[**0041**] An incoming call is imminent or has just started.

[**0042**] A conference call is or is about to be initiated.

[**0043**] A call is disconnected.

[**0044**] A call is conducted (under which several triggering events can be generated).

[**0045**] A subscriber is put on hold.

[**0046**] A new cell in the Public Land Mobile Network (PLMN) has been selected.

[**0047**] The location of a subscriber has changed.

[**0048**] A new PLMN operator is selected.

[**0049**] A new country of registration is made.

[**0050**] A UE is about to be switched off.

[**0051**] A UE has been switched on.

[**0052**] When a designated button on a UE is pressed.

[**0053**] In response to a talk spurt received by a UE.

[**0054**] A voice mail has been left to a subscriber.

[**0055**] An SMS has been sent to a subscriber.

[**0056**] The A-party initiates a request in step **230**, possibly after encryption in step **220**, and sends this request via a communication channel (e.g., packet switched as illustrated in **FIG. 1**) to a data object server. The data object request may include at least one of a number of different parameters, e.g.:

[**0057**] A requested protocol to be used for transmission (e.g., WAP, WML, HDML, HTML)

[**0058**] An identification of a data object server (e.g., a server name or a plain IP address)

[0059] A code denoting what kind of event triggered the data object request (e.g., outgoing call setup).

[0060] The indicated B-number associated with at least one B-party equipment.

[0061] An A-party identity, e.g., an A-number of a mobile station.

[0062] A network address of the A-party (e.g., IP address) used by the data object server when returning a requested data object.

[0063] A capability code indicating the displaying capabilities of the A-patty (e.g., screen resolution, audio etc.)

[0064] A code indicating an encryption scheme or encryption key used.

[0065] A code indicating in what country the mobile station is registered (country code).

[0066] A code identifying the current PLMN (V-PLMN) operator or the PLMN where the A-party has a subscription (H-PLMN) or both.

[0067] A code indicating the vendor of the mobile station and the type of the mobile station.

[0068] A code indicating an equipment unique identity.

[0069] A validation code (e.g., a checksum) of the parameters.

[0070] The data object request in **230** may, according to a variant of the invention, be answered by the data object server in an encrypted format, in which case a decryption in step **250** follows the reception of the response in the user equipment.

[0071] In the next step follows a rendering procedure in step **260**, where the data objects are displayed according to the capability of the UE after which the procedure is ended in step **299**. Typically after step **299**, there will follow one or several procedures according to the capability of the A-party UE or the type of equipment addressed by a B-number. For example, a call may be setup or a call may be disconnected. According to one of the above mentioned embodiments, where a continuous triggering event is that a call is conducted, special advantages may be relevant (e.g., commercial information may be sold in response to a dialed B-number allowing easy payment for such information).

[0072] **FIG. 3** illustrates the corresponding procedures in a data object server (like the data object server **130**), wherein, in step **305**, the procedure starts and in step **310**, the data object server receives a request for a data object. The request may typically include at least an indication corresponding to an A- or B-number and what kind of action triggered the request. If the request is encrypted, decryption will be made in step **320**, before interpreting the content. The address indication (e.g. A- or B-number) in the request received in step **310** will be mapped with a memory address in the data object server, or to an address in the data object server, connected memory and the data object, i.e., phonepage will be retrieved in step **330**. The request in step **310** may also include an indication of a UE display capability, in which case the data object may be adapted in the data object server to a specific rendering capability, step **340**, of a receiving UE. If the request was encrypted, or if requested for some other reason, the data object will be encrypted in step **350** before it is returned to the requesting UE, in step **360** and then the procedure is ended in the data object server in step **399**.

[0073] The above described general solution to obtain a data object connected to an address indication may of course be varied in a number of different ways, depending on, e.g., the capabilities of communication of the UEs involved. For example, a method of simultaneously requesting, encrypting, obtaining, decrypting and rendering a sequence of data objects can also be applied in a variant of the present invention.

[0074] User equipment, like mobile stations, are today developed to handle both packet switched and circuit switched communication simultaneously. These are generally referred to as class A mobile stations. Other mobile station designs allow packet switched and circuit switched communication alternatively, i.e., no simultaneous PS and CS transmission and reception. These are generally referred to as class B mobile stations.

[0075] In **FIG. 4** is illustrated a flow diagram of procedures included when a circuit switched connection is initiated from a UE which is a class A mobile station according to one aspect of the present invention. In step **405**, the procedure is started when a class A mobile station is not involved in a call session and when a user, e.g., starts to indicate a B-number to a B-party, step **420**, by pressing a digit, a button or by activating voice recognition means. During step **420** the entire B-number is obtained. The mobile station now starts to set up two different connections, a circuit switched connection for a voice communication channel in step **430-440-498**, and a packet switched communication channel for retrieval of a phonepage in step **450-499**. These procedures may in a class A mobile station be simultaneous.

[0076] For the circuit switched procedures, a voice connection with a B-party is initiated in step **430**, a communication recourse is assigned by a mobile network over which a telephone conversation may take place. The telephone conversation is ended in step **440** as any ordinary voice call, for example by pressing a designated button on the mobile station or hanging up a handheld part of a fixed network telephone. Ending the call also involves de-allocation of relevant communication resources within the circuit switched part of the mobile communication network as well as, e.g., any PSTN resources involved in the connection.

[0077] The packet switched procedures basically follow the procedures described in connection to **FIG. 3**, where a data object request is sent, possibly after encryption, steps **450** and **460** and a response is received and the phonepage displayed, possibly after proper decryption thereof, steps **470-490**, after which the packet switched connection also ends, in step **499**.

[0078] As mentioned above, a class B type mobile station cannot handle two simultaneous connections, one packet and one circuit switched, so another approach to retrieve a phonepage is then necessary when setting up a circuit switched voice connection.

[0079] **FIG. 5** illustrates a similar procedure to that explained with reference to **FIG. 4**, but with a mobile station of a class B type used in the A-party, call originating end. In

step **505** the procedure starts and in step **510**, the B-number is indicated as described above in reference to **FIG. 4**. In this embodiment, a step **520** is introduced where it is possible to select if a phonepage is to be requested or not. This can typically be a selection made by the user, and/or indicated by the B-number dialed by appropriate setting. According to one embodiment of the current invention double clicking on a designated SEND button indicates that the phone page is to be requested. If it is indicated that a phonepage is not desired, then follows in step **550-560** and **599** a circuit switched call connection and termination as explained in relation to **FIG. 4**, steps **430**, **440** and **498**.

[**0080**] If it is indicated that a phonepage is desired, then the following steps are to encrypt, **530**, and send, **535**, a data object request on a packet switched communication channel. As long as the packet session is not interrupted, **540**, the download of data object continues to the A-party. Data objects are received in step **570**, decrypted, if encrypted, in step **580** and rendered in step **590**. In step **595** the data objects are detected and as long as there is more information to receive, step **595**, and there are no interruptions in step **540**, the data download continues. A possible interrupt may occur, e.g., when a user wishes to no longer wait for a complete download of a phonepage and instead initiates the circuit switched communication in step **550**. This may be initiated by a time expiring or by manually indicating this on a man-machine interface (MMI). At the latest, the circuit switched communication is initiated when there is no more phonepage data to download. According to another embodiment of the present invention the phonepages for a class B UE are obtained from the data object server, **130**, upon call completion or whenever the UE is not involved in a call, and are stored locally in the UE being readily available upon a next triggering event.

[**0081**] So far, the retrieval of phonepages to display in A-party equipment has been addressed. It should be recognized that a B-party may similarly also display a phonepage related to a connection, preferably a phonepage identified with the A-party number. In **FIG. 6** is illustrated a flow diagram of the procedures in B-party user equipment for retrieval of A-party phonepages according to one embodiment of the present invention when the B-party has the capabilities corresponding to that of a class A mobile station. The procedure start in step **605**, e.g., by an incoming call to a B-party UE. In step **610** a communication channel is allocated between the UE and the network, **110**, it is connected to. In step **620** an indication of the call originating identity, i.e., the A-party identity, preferably, an A-number, is revealed to the B-party. Then in step **660** and **670**, a request is sent, subsequent to encryption thereof, to a data object server. The request is, when received in the server, treated similar as the requests received from the A-party, i.e., decrypted if necessary, and responded to in transmission-of a data object related w the A-party identity. The UE receives the data objects, i.e., phonepage in step **680** and after decryption in step **690**, if necessary, the phonepage can be displayed to the B-party user in step **695**.

[**0082**] If the call is answered in **630**, the voice connection may follow the same procedures as those described in relation to **FIG. 3** and **4**. If the call is not answered the voice part sequence ends in **698**.

[**0083**] For reasons of clarification, several steps in the signaling between the UE **100** and the communication infrastructure **110**; between the UE **100** and the data object server **130**; have been omitted, in several embodiments above, and focus has been put on the necessary and novel steps according to the invention, in the aforementioned signaling. It should be understood that other procedures (e.g., authentication, channel assignment and charging) might occur in addition to what has been described in the aforementioned signaling.

[**0084**] **FIG. 7** illustrates a UE according to be used in one embodiment of the present invention, where the UE is a mobile telephone or a PDA with mobile telephone capabilities. A Central Processing Unit (hereafter CPU) **750** is connected to at least one memory unit **751**, and at least one display **720**. The CPU **750** may also be connected to a keyboard device or area **752** to allow subscribers to enter, for example, digits. The memory unit **751** may be non-volatile (e.g. EEPROM or SIM card) in order to retain stored information, should power be temporarily unavailable. The CPU **750** is further connected to a radio unit **710** that may convert incoming and outgoing data to RF modulated signals. The radio unit **710** also connects to an antenna **760** allowing the RE modulated signals to be received/transmitted to an RF compatible media (e.g., air). The radio unit **710** may also directly or indirectly be connected to an earphone **730** and a microphone **740** in order to allow voice communication. The UE may further comprise a plurality of programs **770**, e.g., a browser, **771**, that can render at least one type of data object and an encryption/decryption engine **772** allowing data object requests to be encrypted and data objects to be decrypted. The UE may optionally be equipped with a cache memory in which it is possible to store and retrieve data objects without occupying transmission resources within the communication network **10**.

[**0085**] **FIG. 8** illustrates a data object server **130**, according to one embodiment of the present invention. The data object server comprises at least one CPU **830** connected to at least one memory device **810**, a cache memory **850**, at least one database **840** and at least one interface **820**. Memory devices **810** and databases **840** may be non-volatile. The interface **820** enables the CPU **830** to send and receive data to/from the data network **120**. The cache memory **850** allows storage of frequently used data objects so that the CPU **830** may obtain them readily. The database **840** contains the actual data objects that can be requested by the UE **100** via a communication infrastructure **110** and a data network **120**. The data object server may also further comprise a number of programs **860** including, but not limited to, a filter **861** allowing the data objects to be optimized according to the rendering capabilities of the UE **100**; and an encryption/decryption engine **862** allowing data object requests to be decrypted and data objects to be encrypted.

[**0086**] According to a variant of the invention the blocks **810**, **820**, **830840**, **850** and **860** may be implemented on a plurality of computers. According to another variant of the present invention, the said plurality of computers may be located at a substantial distance.

[**0087**] B-number indication involves any means of indicating a B-number in an A-party UE. A first example of. B-number indication procedure is described with reference to **FIG. 9** where the B-number indication comprises a start step at **905** and the step **910** of receiving a character from a

keyboard arrangement. In response to step **910**, the character is stored in a memory buffer in the UE in step **920** and it is checked if the B-number is complete in step **930**. If the number is incomplete steps **910**, **920** and **930** are repeated. If the B-number is complete the B-number indication procedure is concluded in **999**. Determination of B-number completion **930** may or may not involve the use of timers supervising the indication procedure; a short key combination in order to minimize the number of keys pressed; designated buttons to indicate number completion (e.g., pressing SEND or CALL buttons once) or by analyzing the digits in the memory buffer for B-number completeness.

[**0088**] A second example of B-number indication is by means of voice detection whereby an incoming talk spurt is successfully matched with an entry in an internal database contained in a UE **100**, whereby a valid B-number could be obtained in response to the aforementioned talk spurt.

[**0089**] A-number indication involves any means of indicating an A-number to a said UE **100**. A first example of A-number indication procedure is described with reference to **FIG. 10** where the A-number indication comprises the step **1005** of starting the procedure and **1010** of receiving an A-number from a communication infrastructure **110**. In response to step **1010** the A-number is checked if it was valid (e.g., not blocked, secret or misinterpreted) and if it was valid, the A-number is stored in a memory in the UE **100** in step **1030**. If the A-number was not valid a flag indicating a non valid A number is stored in a memory of UE **100** at **1040**. The procedure is ended in **1099**.

[**0090**] A second example of A-number indication is by means of sending an A-number or data objects in response to an A-number directly on a logical data communication link **161**.

[**0091**] **FIG. 11** illustrates a UE **100** according to a second variant of the invention when the UE **100** is a fixed telephone with graphic capabilities. According to this second variant, the UE **100** is equal to a mobile telephone as described in **FIG. 7** but with the exception that the radio unit **710** and antenna **760** are replaced with a media adapter **1210** that converts incoming and outgoing signals to and from a particular media standard including but not limited to ISDN, ADSL, HDSL, VDSL and Cable networks and any combination thereof.

[**0092**] **FIG. 12** illustrates a UE **100** according to another embodiment of The invention when the UE **100** is a mobile telephone **1390** possibly without data object rendering capabilities, with an antenna **1360**; connected to a PDA **1490** via a communication link **1395**. The communication link may for example be realized with an infrared, radio (e.g., Bluetooth) or wire communication arrangement. The PDA **1490** further comprises a CPU **1450** connected to at least one memory unit **1451**, and at least one display **1420**. The CPU **1350** may also be connected to a keyboard device or area **1452** to allow subscribers to enter, for example, digits. The memory unit **1451** may be non-volatile (e.g., EEPROM or SIM card) in order to retain stored information, should power be temporarily unavailable. The PDA **1490** further comprises a collection of programs **1470** including but not limited to a browser **1471** that can render at least one type of data object and an encryption/decryption engine **1472** allowing data object requests to be encrypted and data objects to be decrypted. The mobile phone **1390** is further described in **FIG. 7** where **1320** corresponds to **720**, **1310** corresponds to **710**, **1350** corresponds to **750**, **1351** corresponds to **751**, **1352** corresponds to **752**, **1330** corresponds to **730** and **1340** corresponds to **740**.

1. A method for providing data objects to be rendered in connection with a voice communication channel between an A-party having a first communication device and a B-party having a second communication device and being addressed by a B-number, comprising:

determining the occurrence of a trigger event associated with a voice communication channel established or sought to be established between said A-party and said B-party, said B-party being addressed by a B-number;

preparing a data object request including at least information of (a) an address indicia of the A-party and/or B-party, and (b) the determined trigger event;

sending the data object request to a data object server remotely located from both the A-party and the B-party;

receiving a data object response based on the data object request;

processing the data object response to render a data object to at least one of the A-party and the B-party.

2. The method of claim 1, wherein the information of the determined trigger event comprises an indicia of the trigger event type.

3. The method of claim 1, wherein the data object server stores data objects, or addresses to data objects stored at another location, there further being a plurality of data objects that are associated with different trigger events.

4. The method of claim 3, wherein the data object server provides a data object, or provides an address to a data object, that is specific to the trigger event type.

5. The method of claim 1, wherein the voice communication channel is on a first packet-switched communication channel and the data object request is on a second packet-switched communication channel.

6. The method of claim 1, wherein the voice communication channel is on a first packet-switched communication channel, and the data object request and the data object response is on a second packet-switched communication channel.

7. The method of claim 1, wherein one or both of the communication device comprises one or more of a mobile phone, a standard telephone (POTs), a personal data assistant (PDA) device, a computer, a facsimile device, and a data modem device.

8. The method of claim 1, wherein the voice communication channel includes a connection to a Digital Subscriber Line (DSL).

9. The method of claim 8, wherein the voice communication channel includes a connection to ADSL, HDSL or XDSL.

10. The method of claim 1, wherein the data object is rendered to the calling A-party.

11. The method of claim 1, wherein the data object is rendered to the called B-party.

12. The method of claim 10, wherein the data object rendered to the calling A-party is based on the called number of the called B-party.

13. The method of claim 11, wherein the data object rendered to the called B-party is based on the calling number of the calling A-party.

14. The method of claim 1, wherein the data object request includes encrypted information.

15. The method of claim 1, wherein the data object response includes encrypted information.

16. The method of claim 1, wherein each of the data object request and the data object response includes encrypted information.

17. The method of claim 1, wherein data objects are rendered at each of the calling A-party and the called B-party associated with the voice communication channel.

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