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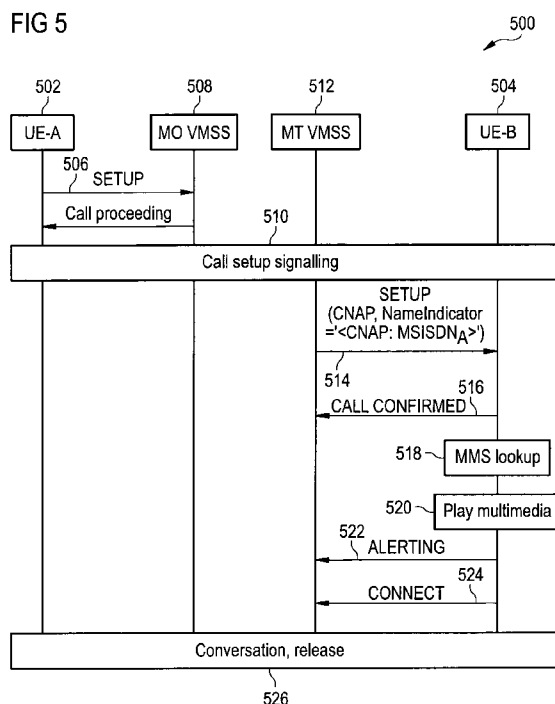
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(54) Title: PROVISION OF INFORMATION



(57) Abstract: A method of handling a call from a calling terminal device (502) to receiving terminal device (504) comprising the steps of: during a call set up operation a network element (512) checking if there is a network-based service in respect of a subscriber of the calling terminal device relevant to caller display of multimedia content; if such a service is found arranging for a command (514) to be sent to the receiving terminal device to cause the receiving terminal device to locate relevant multimedia content within itself (518) which once located is displayed (520) to indicate an incoming call from the subscriber of the calling terminal device.

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PROVISION OF INFORMATION

This invention relates to a method and a system for providing
5 information to a terminal device. It is particularly, but not
exclusively related to a method and a system for providing
information to a terminal device. In one embodiment of the
invention, provision of the information enables a caller to
the terminal device to be identified.

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It is known for a terminal device such as a telephone to be
capable of providing an indication of a caller to the termi-
nal device. The capability exists in a number of forms, for
example Automatic Number Identification (ANI), Calling Line
15 Identification (CLI), and Calling Name Presentation (CNAP).
The terminal device may be capable of providing the display
of a number from which an incoming call is being made or the
identity of a caller. In the latter case, the caller identity
may be obtained by comparing the calling number with a record
20 of telephone numbers and associated names which has been
stored either in a network or in a called terminal device or
it may be provided to the terminal device as a separate piece
of information. Such services may be generally referred to as
caller display or caller identification (caller ID).

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EP1819125 discloses a system in which, at the start of call
setup, a Session Initiation Protocol (SIP) message containing
SIP Uniform Resources Identifiers (URIs) of a calling sub-
scriber and a called subscriber is sent to an IP Multimedia
30 core network Subsystem (IMS) application. The application
creates a SIP message which includes in its body multimedia

content matching both SIP URIs, or address links to retrieve previously stored components of the multimedia content, and then forwards the message to the called subscriber. The called subscriber receives the message and then, having obtained the multimedia content from the body of the message or
5 from the address links, plays the multimedia content.

It is proposed in
<http://www.telcoware.com/product/eng/demo.asp> to provide a
10 system in which, in making a call, multimedia content can be sent from a caller to a called party in order to identify to the called party the originator of the call.

WO/2007/109805 discloses methods of providing video ring-back
15 media during a multimedia "call" between terminals and also methods of providing media during an initial period of a call prior to a session answer from a second device.

US7099457 discloses a system and method in which a sender of
20 a message is able to chose or create a ring tone which is played at a receiver's mobile terminal upon arrival of the sender's message.

EP1221254 discloses a system in which a caller is able to use
25 a calling mobile terminal to send a ringing tone to a called mobile terminal in order that the ringing tone rings at the called mobile terminal and identifies the caller.

According to a first aspect of the invention there is pro-
30 vided a method of handling a call from a calling terminal device to receiving terminal device comprising the steps of:

during a call set up operation a network element checking if there is a network-based service in respect of a subscriber of the calling terminal device relevant to caller display of multimedia content;

- 5 if such a service is found arranging for a command to be sent to the receiving terminal device to cause the receiving terminal device to locate relevant multimedia content within itself which once located is displayed to indicate an incoming call from the subscriber of the calling terminal device.

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- Preferably, the receiving terminal carries out a look-up operation to locate the multimedia content. In the event that the look-up operation fails to locate the multimedia content, the receiving terminal device may request that it is
15 downloaded. In the event that the look-up operation fails to locate the multimedia content, the receiving terminal device may carry out a conventional notification operation to a user. This may happen as a result of a downloading operation failing to provide the multimedia content. In an alternative
20 embodiment, the multimedia content is downloaded to the receiving terminal during the call set up operation. It might be downloaded before completion of call set up between the calling terminal and the receiving terminal.

- 25 The command may be sent to the receiving terminal after the multimedia content has been downloaded. Alternatively, it may be sent before the multimedia content is downloaded.

Preferably, the command is sent after a call has been set up.

30

Preferably, the call set up operation is between the calling terminal and a network. It may be between a network and the receiving terminal. The call set up operation may refer to an operation starting with call initiation from the calling terminal and ending with a call having been set up between the
5 calling terminal and the receiving terminal.

Preferably the command is sent as part of a call set up operation between a network and the receiving terminal. The receiving terminal device may attempt to locate the relevant multimedia content within itself after call set up has been
10 completed but before the call is connected.

Preferably, the command is sent by a switching centre within
15 a network.

Preferably, the network element is a service control function.

Preferably, the multimedia content is sent to the receiving terminal in a multimedia messaging service (MMS) message. The MMS message may be sent by a messaging centre. Preferably, the MMS message contains in a subject field an indication that the message relates to caller display. Preferably, the
20 MMS message contains in a subject field an indication of the calling terminal device, or more particularly, of a subscriber using the calling terminal device. Such a subject field may be interpreted by the receiving terminal device as an indication that multimedia contained within the message is
25 to be played for the purposes of caller display when a call
30 is received from the calling terminal device.

Preferably, the MMS message is silent in the sense that its arrival at the receiving terminal device is not announced.

5 Preferably, the network-based service is CNAP.

Preferably, the command contains an indication that the message relates to caller display. Preferably, the command contains an indication of the calling terminal device, or more
10 particularly, of a subscriber using the calling terminal device. The command may contain a field containing text which is to be presented on a display of the receiving mobile. However, according to the invention, the text in the field may indicate that contrary to its originally intended purpose, it
15 itself is to be interpreted as a command, in this case a command to present multimedia content. In this way, it can be seen that the command is a command to take a known conventional action which it overruled by an embedded command to do something different. Preferably, the command message is a
20 "SETUP" message sent from a network to the receiving terminal.

Preferably, the multimedia content is provided to the receiving terminal device in advance of the call being made. Alternatively,
25 it may be provided to a multimedia content store in advance of the call being made, from which it can be downloaded by the receiving terminal device.

It is envisaged that there are a number of multimedia content
30 delivery possibilities according to the invention including a command to send the multimedia content being issued by the

calling terminal device and the multimedia content being sent from the calling terminal device, a command to send the multimedia content being issued by the calling terminal device but the multimedia content being sent from elsewhere, a command to send the multimedia content being issued by an Internet browsing device which is not the calling terminal device and the multimedia content being sent from the internet browsing device, and a command to send the multimedia content being issued by an internet browsing device which is not the calling terminal device and the multimedia content being sent from elsewhere. In this case, "elsewhere" may be a network-based content database which responds to a command from the calling terminal device or an Internet browsing device to arrange for delivery of the multimedia content to the receiving terminal device but in doing so does not provide it to the calling terminal device or an Internet browsing device.

In one embodiment, an Internet browsing device is used to download the multimedia content from a content portal. The Internet browsing device may send the multimedia content to a network element and instruct the network element to download the multimedia content to the receiving terminal device. Alternatively, it may send the multimedia content to a network element which is configured to store it and then, in response to a request from the receiving terminal device or from some other source, to download the multimedia content to the receiving terminal device. In either case, the Internet browsing device sends the multimedia content together with an identifier that it relates to a subscriber using the calling terminal device and an indication that it relates to caller

display. The Internet browsing device may be the calling terminal device although this does not have to be the case.

It should be noted that in some embodiments of the invention,
5 there are four parts:

- (i) a part in which a network-based caller display service provided in a network can be activated;
- (ii) a part in which modified service logic is employed in the network which converts the activated caller display service into a network-based multimedia caller display service;
10
- (iii) a part in which a subscriber activates the caller display service as a network-based multimedia caller display service; and
- (iv) a part in which multimedia content is stored having a first association with a subscriber who has activated the network-based multimedia caller display service and a second association with the network-based multimedia caller display service.
15

There may be another part in which, during connection of a call to a receiving terminal device, the modified service logic arranges the sending of a command which triggers a network-based multimedia caller display operation in the receiving terminal device.
20

Preferably, in deciding how the multimedia content is to be made available to the receiving terminal device, service logic in a network can refer to a history of multimedia content delivery operations which have been made in respect of the receiving terminal device and select a delivery method based on this history, for example to select one which proved to be successful in the past, to reject one which proved not
25
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to be successful in the past, or a default choice which has not proved to be unsuccessful. This history may be stored, and obtained from, a content store which is used to store multimedia content. The service logic may update the content
5 store with further indications of the success or otherwise of multimedia content delivery operations.

According to a second aspect of the invention there is provided a system for handling a call from a calling terminal
10 device to receiving terminal device, the system comprising:
a first network functionality which is capable of checking during a call set up operation if there is a network-based service in respect of a subscriber of the calling terminal device relevant to caller display of multimedia content;
15 a second network functionality, responsive to the identification of such a service being active, which is capable of arranging for a command to be sent to the receiving terminal device to cause the receiving terminal device to locate relevant multimedia content within itself which once located is
20 displayed to indicate an incoming call from the subscriber of the calling terminal device.

Preferably, the first network functionality and the second network functionality are present in respective network ele-
25 ments. Alternatively, they are present in a common network element. They may be present in a service control function.

According to a third aspect of the invention there is provided a network functionality, responsive to the identifica-
30 tion of an active network-based service in respect of a subscriber of a calling terminal device relevant to caller dis-

play of multimedia content during a call set up operation, which is capable of arranging for a command to be sent to a receiving terminal device to cause the receiving terminal device to locate relevant multimedia content within itself
5 which once located is displayed to indicate an incoming call from the subscriber of the calling terminal device.

The network functionality may be capable of sending the multimedia content to the receiving terminal device in a form
10 which includes a first association with a subscriber using the calling terminal device and a second association with the network-based multimedia caller display service.

According to a fourth aspect of the invention there is provided a terminal device capable of receiving, during a call set up operation to the terminal device from a calling terminal device, a multimedia content related command from a network-based service in respect of the calling terminal device, capable of responding to the multimedia content related command by seeking to locate relevant multimedia content within
20 itself, and in the event of being able to locate the multimedia content, capable of displaying the multimedia content to indicate an incoming call from the calling terminal device.

25 According to a fifth aspect of the invention there is provided a computer program product comprising software code that when executed on a computing system performs a method of handling a call from a calling terminal device to receiving terminal device comprising the steps of:
30 during a call set up operation a network element checking if there is a network-based service in respect of a subscriber

of the calling terminal device relevant to caller display of multimedia content;

if such a service is found arranging for a command to be sent to the receiving terminal device to cause the receiving terminal device to locate relevant multimedia content within it-
5 self which once located is displayed to indicate an incoming call from the subscriber of the calling terminal device.

Preferably, the computer program product has executable code
10 portions which are capable of carrying out the steps of the method.

Preferably, the computer program product is stored on a computer-readable medium.
15

According to a sixth aspect of the invention there is provided a multimedia messaging service message intended for receipt by a receiving terminal device, the message comprising multimedia content, a first association with a network-based
20 multimedia caller display service, a second association with a subscriber who has activated the network-based multimedia caller display service, the message being locatable by the receiving terminal device as a result of the receiving terminal device receiving a command from the network-based multimedia caller display service in respect of the subscriber.
25

According to a seventh aspect of the invention there is provided a method of provisioning multimedia content to be used in a network-based caller display service in respect of a
30 subscriber of a calling terminal device comprising the steps of:

providing an association between the subscriber and the multimedia content which is to be used for the purpose of caller display;

5 configuring a command to be sent to a receiving terminal device in the event of a call being made from the calling terminal device to the receiving terminal device to cause the receiving terminal device to locate the multimedia content within itself and once it is so located to display it to indicate an incoming call from the subscriber of the calling
10 terminal device.

According to an eighth aspect of the invention there is provided a method of setting up a multimedia content-based caller display service comprising the steps of:

15 setting up a network-based caller display service in respect of a subscriber of a calling terminal device;
providing an association between the subscriber and the multimedia content which is to be used for the purpose of caller display;
20 configuring a command to be sent to a receiving terminal device in the event of a call being made from the calling terminal device to the receiving terminal device to cause the receiving terminal device to locate the multimedia content within itself and once it is so located to display it to in-
25 dicate an incoming call from the subscriber of the calling terminal device.

According to a ninth aspect of the invention there is provided a method of handling a call from a calling terminal device to receiving terminal device comprising the steps of:
30

during a call set up operation a network element checking if there is a network-based service in respect of a subscriber relevant to caller display of multimedia content; and if such a service is found, locating relevant multimedia content and streaming it to the receiving terminal device.

According to a tenth aspect of the invention there is provided a method of handling a call from a calling terminal device to receiving terminal device comprising the steps of:

10 during a call set up operation a network element checking if there is a network-based service in respect of a subscriber relevant to caller display of multimedia content; and if such a service is found, locating relevant multimedia content and streaming it to the calling terminal device.

15

The multimedia content may be provided by a third party other than a calling or a receiving subscriber. It may be an advertisement provided by a commercial entity. It may be provided as a result of the calling or receiving subscriber having agreed to be provided with such multimedia content in response to receiving a financial benefit, for example the ability to make and/or receive calls at a discounted rate. The network-based service may have been activated by, or established in respect of, the calling subscriber. The network-based service may have been activated by, or established in respect of, the receiving subscriber.

An embodiment of the invention will now be described, by way of example only, with reference to the accompanying drawings in which:

30

Figure 1 shows a system for providing multimedia content to a terminal;

Figures 2(a) to 2(f) show various contact retrieval options;

Figure 3 shows another embodiment of a system for providing
5 multimedia content to a terminal;

Figure 4 shows a system for providing multimedia content to a database;

Figure 5 shows a system for making a call in which multimedia content has previously been delivered to a terminal;

10 Figure 6 shows a system for making a call in which multimedia content is delivered to a terminal during call-making;

Figure 7 shows a system which is capable of providing Service Change and UDI Fallback (SCUDIF) calls;

Figure 8 shows another system which is capable of providing
15 SCUDIF calls;

Figure 9 shows a system for making a call in which multimedia content is delivered to a terminal during call-making; and

Figure 10 shows service logic which uses a history of multimedia ringing tone service delivery operations.

20

The present invention proposes a system, a method and an apparatus for implementing multimedia (MM) content related presentation services during calls in cellular networks (for example 3GPP networks) from a mobile terminal of a subscriber
25 A (a terminal A) to a mobile terminal of a subscriber B (a terminal B). In a cellular system according to the invention, either one of the parties to the call or a third party is able to select the multimedia content that is to be played to either subscriber A or subscriber B during setup and/or connection of the call. In a preferred embodiment of the invention,
30 the subscriber A is able to select the multimedia con-

tent that he would like to be the ring indicator (also referred to as "ring tone") on the terminal B. The cellular system sets up a call between the terminal A and the terminal B in such a manner that instead of the terminal B playing a previously set ring indicator, for example a default one, or one chosen by subscriber B, the multimedia content set by subscriber A will be played as the ring indicator on the terminal B. In the context of the invention, multimedia content refers to audio content (also known as selective ringing tone, SRT), video content, or a combination of both.

In one embodiment, the invention has two main parts. In a first part, multimedia content is provided to a location from which it is retrievable by a called mobile terminal. In a second part, a call is made from a calling mobile terminal to the called mobile terminal, and during the setting up and connection of the call, the called mobile terminal retrieves the multimedia content from the location so that it can be played and/or displayed at the called mobile terminal to indicate to a user of that mobile terminal that a call is incoming from the calling mobile terminal. As will be seen from embodiments described in the following, the multimedia content may be sent by the calling mobile terminal to the location from which it is retrievable, or it may be sent by some other means for example from a Internet browsing type of device. Furthermore, the location may be within the called mobile terminal, or within a network element.

As will be explained, a number of the embodiments in the following are based on originating services. An originating service may be set up by a subscriber to apply in relation to

their own calls in a telecommunications system or may be set up by a network operator on behalf of a subscriber to apply to the subscriber's calls. When such a service is set up, a record is established in a home location register (HLR) relevant to the subscriber that such a service is active and suitable parameters and information relevant to providing the service are stored so that they are accessible by service logic in the network. Accordingly, when the subscriber makes a call, during the setting up of the call, there is a check carried out in the HLR and if the HLR contains an indication that there is an active originating service, the service logic arranges for the provision of the originating service. Providing the service will typically often involve the participation of one or more other network elements.

15

Figure 1 shows an embodiment, referred to as a "sending to terminal" implementation, of a system 100 and associated message flow for providing the multimedia content to a terminal used by a subscriber A. In this embodiment, the subscriber A has access to an Internet browsing device 102 which is able to instruct the subscriber A's available multimedia message service (MMS) centre (MMSC_A) 104 to send out MMS messages. In this case, the MMSC_A 104 has an exposed interface, provided for example by the Simple Object Access Protocol (SOAP) which may be accessed by the Internet browsing device 102 to send MMS messages. The Internet browsing device 102 is provided with a web application such as a widget which is the client side of the SOAP interface. The widget additionally can be connected to a network-based contacts service such as www.phonebookmark.com in which the subscriber A has stored contacts. It should be understood that the Internet browsing

device 102 can be the subscriber A's mobile terminal itself, or can be another device such as the subscriber A's personal computer. In the former of these cases, the widget is able to access a contacts list present in the mobile terminal's contact list, the subscriber's personal computer (assuming a suitable connection is available), and/or via an appropriate portal. In the latter of these cases, the widget is able to access a contacts list present on the subscriber's personal computer and/or via an appropriate portal. In the case of the Internet browsing device 102 being the subscriber's personal computer, the widget is able to use a local interface of any suitable application to gain access to a contacts list. For example, it can use the application programming interface of the Nokia PC Suite application. The web application may be configured to access and use the exposed interface of the MMSC_A 104.

A number of implementations are possible. If the Internet browsing device 102 is a personal computer, it can:

- 1) download a video recording stored on a content portal 106, for example www.youtube.com, and send it to the MMSC_A 104 via a suitable interface; and/or
- 2) have the content locally available (for example a subscriber-generated video stored on the subscriber's personal computer) and send it to the MMSC_A 104 via a suitable interface.

If the Internet browsing device 102 is a mobile terminal, it can:

- 1) download the content from a suitable content portal and send it to the MMSC_A via a suitable interface from a mobile browser/widget;
 - 2) have the content locally available (for example a subscriber-generated video recorded from a mobile terminal's camera and stored in the mobile terminal) and send it to the MMSC_A 104 via a suitable interface from a mobile browser/widget;
 - 3) download the content from the content portal 106 using a mobile browser/widget and send it to the MMSC_A 104 via an in-built MMS application; and/or
 - 4) have the content locally available in its memory and send it to the MMSC_A via an in-built MMS application.
- Various implementations of contact retrieval options are shown in Figures 2(a) to 2(f) showing on the left-hand side, an Internet browsing device of the subscriber A in the form of a widget on a personal computer 20 retrieving contacts from a mobile terminal device 24 of the subscriber A (Figure 2(a)), a network-based contacts service 26 (Figure 2(b)), and from an internal contacts list (Figure 2(c)), and, on the right hand side, an Internet browsing device of the subscriber A in the form of a widget on a mobile terminal device 22 retrieving contacts from a mobile terminal device 24 of the subscriber A (Figure 2(d)), a network-based contacts service 26 (Figure 2(e)), and a personal computer 28 of the subscriber A (Figure 2(f)), for example via an Outlook email application over any suitable connection.
- Accordingly, a web application is able to download content which will be made available to the terminal B for the pur-

pose of caller identification as will be explained in the following and also to access contacts and send an appropriate instruction to the MMSC_A 104 to send out MMS messages. When implemented in the form of a browser various alternatives are possible. For example, a portal webpage is configured to:

- 1) permit access to multimedia content, access contacts from a network-based contacts service, and to send the instruction; and
- 2) allow a user to gather multimedia content and to use another portal with suitable scripting to permit access to contacts in the network-based contacts service and to send the instruction.

These functions may be implemented in the form of a menu to select content from a local drive, a webpage "button" provided to retrieve contacts, and a webpage "button" to send the instruction

It should be understood that the contacts lists include various contacts including the subscriber B and subscriber B's telephone number. In this way, a message can be generated to be sent (perhaps not immediately) to the terminal B.

Returning to Figure 1, in order to send the message, the sender (the subscriber A) may decide to create multimedia content which is to be played and/or displayed as a ring indicator on the terminal B when it is called by the subscriber A. The subscriber A requests downloading of this multimedia content from the content portal 106 by sending a http GET message 108, shown in Figure 1 as "Retrieve multimedia content (http GET)". In response, the multimedia content is sent in a "Send content" message 110 to the Internet browsing de-

vice 102 where it is stored. The subscriber A is able to store various multimedia content files in the Internet browsing device 102. As a result of the multimedia content files being downloaded, an entry in respect of each is made in an attachment database 112 to indicate that a particular multimedia content is provided in order that it be played on the terminal of a called subscriber when that subscriber is called. In this way, a record is kept in the Internet browsing device 102 of different multimedia contents which have been sent to different subscriber Bs, for example one to a partner, one to a family member, and one to a friend.

At this point, the Internet browsing device 102 contains the multimedia content. However, it should be understood that although a corresponding entry is made in the attachment database 112, no association is yet made in that database about the subscriber B(s) to which it is to apply. In the next step, in order to set the multimedia content as the calling name presentation in the terminal B, the sender uses the web application to instruct the MMSC_A 104 to send the multimedia content to the terminal B in the form of an MMS message. This causes a "SendMessage" message 114 to be sent to the MMSC_A 104 which comprises the multimedia content, the telephone number of the subscriber B, and an indication that the term "<CNAP:MSISDN_A>" is to be set as the subject field of an MMS message to be formed with the multimedia content. In an embodiment of the invention in which the MMSC_A 104 is unable to use the origin of the "SendMessage" message to identify the sender as the subscriber A, the widget or browser of the subscriber A adds the subscriber A's MSISDN_A to the message. However, this is not necessary in an alternative embodiment

in which the MMSC_A 104 is able to determine the identity of the subscriber A and thus determine the MSISDN_A, for example as a result of an authentication procedure between the widget and MMSC_A 104 at some point before executing sending of the
5 MMS message towards the subscriber B. The message "SendMessage" 114 is sent to the MMSC_A 104 which uses its contents to form the MMS message containing the multimedia content and having "<CNAP:MSISDN_A>" set as its subject field, and this MMS message is sent 116 on to the terminal B.

10

It is expected that there will be a number of subscribers sending requests to the MMSC_A 104 for it to send multimedia content to various subscriber Bs. To deal with this, the MMSC_A 104 generates a unique identifier (ID) which is associ-
15 ated with each "SendMessage" message 114 to enable the MMSC_A 104 to discriminate between the requests and responds to the "SendMessage" message 114 with a "Message ID" message 118. This can apply to situations in which widgets might be disconnected or the Internet browsing device 102 might connect
20 using different IP addresses.

Following sending of the "SendMessage" message 114, the widget of the Internet browsing device 102 sends a "GetStatus" message 120 which includes the Message ID to check whether an
25 MMS message including the multimedia content has been delivered at the terminal B. The response from the MMSC_A 104 can either be a "Pending" message 122 to indicate delivery has not yet occurred or a "Success" message 124 to indicate delivery has occurred. The Internet browsing device 102 might
30 send multiple "Pending" messages 122 until it receives a "Success" indication. When the Internet browsing device 102

receives a "Success" indication, the widget then makes an association between the terminal B and the multimedia content in the attachment database 112. As a result, the multimedia message has been received by the terminal B and stored.

5

In the example shown in Figure 1, an asynchronous implementation is used to confirm the delivery status of the message at terminal B from the MMSC_A. A synchronous exchange of messages could be used instead although this would require more resources from the MMSC_A 104 because it would be necessary to maintain an open connection.

10

The widget provides a convenient way to select a subscriber B from a list of contacts and select the multimedia content to be sent to the subscriber B in an multimedia message in order that it will be presented as part of a calling name presentation operation towards this particular subscriber B. It does this in a way which is independent of making a call. The multimedia content can be sent to the terminal B without a call being made.

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The interface of the MMSC_A 104 can be provided in a RESTful-compatible implementation rather than rather than a SOAP-compatible one. The term "RESTful" refers to Representational State Transfer capable. In other implementations of the invention, there does not need to be a dedicated interface provided since the multimedia content could also be sent as an attachment of an email, or by using any suitable transfer mechanism such as the file transfer protocol (ftp) over a secure channel or the secure copy protocol (scp).

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Figure 3 shows a second embodiment of a "sending to terminal" system implementation and associated message flow. In the system 300 of Figure 2, multimedia content which is present on a terminal A 302 is sent from the terminal A 302 to a terminal B. In this case, the subscriber A uses a MMS user agent in the terminal A 302 to select (i) the called number to which this is to apply (the number of the subscriber B), and (ii) the multimedia content from the terminal A 302 which is desired to be presented as a call identifier at the terminal B. The MMS user agent then creates a multimedia message which is addressed to the terminal B, which contains the selected multimedia content, and which is formulated in a way such that when the subscriber A calls the subscriber B, the multimedia content can be located and played at the terminal B to identify the subscriber A. In one embodiment, this involves introducing a string "CNAP" into the subject field of the MMS header. If a conventional MMS user agent is used, the string "CNAP" is included manually by the subscriber A. However, in order to provide a more user friendly implementation, the terminal A includes a modified version of the MMS user agent via which the subscriber A is able to specify that the MMS message being composed is the purpose of caller identification and as a result the string "CNAP" is added automatically by the MMS user agent.

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The MMS message is sent by the terminal A to an MMSC_A 304 in a "Send MMS" message 306. The MMSC_A 304 receives the MMS message, identifies the presence of the string "CNAP" in the subject field, determines that this MMS message is related to the calling name presentation feature and that it should add the MSISDN_A automatically to the subject field of the MMS

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message, and, as a result, modifies the subject field by replacing "CNAP" with "<CNAP:MSISDN_A>". The MMSC_A 304 then sends the MMS message to a terminal B 308. The content of the string "<CNAP:MSISDN_A>" is understood by the terminal B to mean that this MMS message is not to be played directly on delivery, but rather when there is an incoming call from the subscriber A. In an alternative implementation of this embodiment, the "Send MMS" message 306 contains as a subject "<CNAP:MSISDN_A>".

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It should be noted that in Figure 3 since the terminal A has a built-in MMS client, there is no need for SOAP or any other interface to be present. This provides a convenient implementation for cases in which subscribers use video cameras present in their terminal As to make user-generated video content rather than downloading multimedia content from the Internet.

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It should be understood that both in the embodiment described in relation to Figure 1 and the embodiment described in relation to Figure 3, up to the point at which the MMS message has been received and stored in the terminal B, the subscriber B does not have to be aware of any of the preceding steps. The MMS message can arrive and be stored without there being any notification, in which case it will be a silent MMS message.

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Although Figures 1 and 3 take place independently of a call, they can in fact be incorporated into a call setup operation. In this case, the subscriber A is able to use a menu choice provided by the terminal A as part of a call setup operation

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to send multimedia content (which has been selected by the subscriber A for this purpose) to the terminal B as a caller identifier in respect of the terminal A. This may be done by providing the terminal A with a capability which, on activation, automatically invokes the sending of multimedia content to a receiving terminal whenever a call is made. In this case, it is advantageous for the network to contain intelligence of which multimedia content files have been sent to which receiving terminals so that when a particular terminal is called a second time, the network knows not to send the same multimedia content again. Furthermore, it is advantageous for the terminal A to be configured to keep a record of a particular called subscriber to which multimedia content for the purpose of caller identification has been sent so that the terminal A does not resend such multimedia content or does not send different multimedia content to that subscriber without checking with the subscriber A. In such an embodiment, a supporting originating service may have been activated by the subscriber A beforehand or may be activated when the multimedia content is first sent as a result of the menu choice and a call being made.

In the "sending to terminal" implementation, it is not necessary to provide a dedicated content database within the network for storing multimedia content to be specifically available to be downloaded as ring indicators.

In both the first and second embodiments of the "sending to terminal" system implementations, the location to which the multimedia content is sent by the subscriber A is the terminal B. However, this does not necessarily have to be the case

as will now be described. In a "sending to database" implementation, although the multimedia content eventually reaches the terminal B, it is stored for a period of time in a database from which it is retrieved by the terminal B. This is described with reference to Figure 4 which shows a system 400 which is capable of creating an association between a multimedia content and a calling party and a called party in order that the association can be used in conjunction with an originating service for multimedia-based caller presentation.

In this case, the MMS sending procedure is automated as an originating service (such as Intelligent Network Application Part (INAP), Customised Application for Mobile Enhanced network Logic (CAMEL), or in another embodiment, a routing category) in which the process of "multimedia content selection towards the subscriber B" and the effective process of MMS sending for the particular call between the subscriber A and the subscriber B are separated. This is pre-loading without immediate delivery and can be done prior to a call. This involves the subscriber A using a widget or browser (which may be present in the terminal A or in an Internet browsing device 402) to access an operator portal 404 and to submit content via a "Submit multimedia (<MSISDN_A, MSISDN_B>) & activate service" message 406 to an MM content database 408 which is under the control of an operator. The message includes the multimedia content which is to be stored in the MM content database 408 and it causes the database to store the multimedia content and to associate it with the subscriber A as a calling subscriber and the subscriber B as a called subscriber. As a consequence of the association being created an appropriate record is created in a network element, which may

actually be the MM content database 408. From time to time, if the subscriber A wants to update the system with a different multimedia content to be played when he calls the subscriber B, then sending a new "Submit multimedia (<MSISDN_A, MSISDN_B>) & activate service" message 404 causes the old multimedia content to be replaced by the newly submitted multimedia content in the MM content database 408. An acknowledgment message "Ack" 410 is returned to confirm that the multimedia content has been stored in the MM content database 408. Accordingly, the subscriber A has submitted the multimedia content for storage in the MM content database 408. Activating the originating service may have been done beforehand or may be done after the preceding steps have been carried out.

The second part of the invention will now be described in which, following delivery of the multimedia content to the location, a call is made from a terminal A to a terminal B, and during the connection of the call, the terminal B retrieves the multimedia content from the location so that it can be played and/or displayed at the terminal B to indicate to a subscriber B that that a call is incoming from a subscriber A.

As will be described in the following, it can be seen that the invention is implemented in one embodiment by the terminal B performing a lookup and/or download operation to locate multimedia content in an MMS message to be played as a result of a call being made from the terminal A. This may involve the multimedia content being downloaded by the terminal B when an incoming call is received from the terminal A, that

is a SETUP message is received by the subscriber B's terminal. This is effectively a "pull" mode.

Figure 5 shows an embodiment of a system 500 and associated message flow in which the multimedia content has previously been delivered to a terminal B 504. It should be understood that the multimedia content may have previously been delivered to the terminal B 504 in a separate operation which can have taken place independently of a call being made from a terminal A 502 to the terminal B 504, for example by the methods described in relation to Figures 1 or 3. The terminal A 502 sends a "SETUP" message 506 (which is part of the call control protocol defined in 3GPP TS 24.008) to a mobile originating (MO) visited mobile switching centre server (MSS) (MO VMSS) 508 to establish a voice call. The "SETUP" message 506 contains the called telephone number and other information needed for call establishment. When the MO VMSS 508 receives the "SETUP" message, it checks whether there is a mobile originating service activated for the terminal A 502 in making calls to the terminal B 504. It should be understood that because in this embodiment of the invention the MMS message is already present in the terminal B 504, service logic present in the system 500 will indicate that there is an originating service which is to apply but that there is no MMS message waiting to be downloaded. As a result of determining that an originating service for MMS-based caller indication is to apply, the MO VMSS 508 responds to the terminal A 502 with a "call proceeding" message. Call setup signalling 510 then takes place between the terminal A 502, the MO VMSS 508, a mobile terminating VMSS (MT VMSS) 512, and the terminal B 504. As part of the call being made to the terminal B

504, the MT VMSS 512 sends a "SETUP (CNAP, NameIndicator='<CNAP:MSISDN_A>')" message 514 to the terminal B 504. The terminal B 504 responds to the MT VMSS 512 with a "CALL CONFIRMED" message 516.

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The "SETUP" message 514 contains a name indicator identifier in the form of a string "CNAP: MSISDN_A". This is present in an 80 character name indicator field of the "SETUP" message 514. The terminal B 504 receives the "SETUP" message 514, identifies the string "CNAP" and interprets it to mean that the caller name presentation feature is to be invoked. In invoking this feature, the terminal B 504 uses the name indicator identifier to identify the action to be taken. Assuming that the terminal B is provided with suitable software according to the invention, having located and interpreted the string "CNAP:MSISDN_A", it carries out a look-up operation 518 to locate an MMS message which corresponds to the subscriber A which has been sent for the purpose of calling name presentation.

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The terminal B 504 identifies the relevant MMS message by looking at the subject field of the MMS messages which are stored in the portion of its memory dedicated to MMS message storage and identifying the one which has as its subject field the string "CNAP: MSISDN_A". It and identifies this as the MMS message which is associated with terminal A 502 in respect of the calling name presentation feature. Once the relevant MMS message has been identified, the terminal B 504 plays and/or displays 520 the multimedia content of the MMS message to notify the subscriber B that there is an incoming call from the subscriber A.

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Once the terminal B 504 has played and/or displayed the multimedia content to identify the call as coming from the terminal A 502, it sends an "ALERTING" message 522 and then
5 sends a "CONNECT" message 524. At this point, the connection between terminal A 502 and terminal B 504 is complete and a conversation between subscriber A and subscriber B can take place 526.

10 In the embodiment described in relation to Figure 5, it is assumed that the terminal B 504 has already received the MMS message. However, in other cases, for example the embodiment of Figure 4, the multimedia content is present in a MM content database waiting to be downloaded. In a variation in the
15 system 500, after the "CALL CONFIRMED" message 516 is sent by the terminal B 504, it will carry out a look-up operation 518 but will indicate a "not found" result. As a consequence, it will make a connection to its serving MMSC_B (where the MM content database resides or via which it can be reached) re-
20 questing downloading of waiting MMS messages and the MMSC_B, in cooperation with the MM content database, will construct an MMS message incorporating the multimedia content and send it to the terminal B 504.

25 The terminal B 504 then has the relevant MMS message, and the method shown in Figure 5 can resume at the point "Play multimedia" 518. Once the multimedia content has been downloaded to, and stored in, the terminal B 504, it does not have to be downloaded for subsequent calls from the terminal A 502 to
30 the terminal B 504.

In an alternative embodiment of the system 500, the multimedia content may be sent from the MM content database as an MMS message towards the terminal B 504 when the subscriber A makes the call and service logic in the system 500 checks
5 whether a relevant originating service of the subscriber A is activated. This is effectively a push mode.

In the embodiments described in relation to Figure 5, if the MMS message cannot be found in the terminal B 504 or cannot
10 be obtained as a result of a downloading operation, conventional caller name presentation is used, for example the calling number is displayed or if a contact relating to it is locatable in a contacts list, a contact name from that entry may be displayed.

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It should be noted that in a system according to the prior art, the presence of the string associated with the name indicator field would instruct the terminal B 504 to display the string present in the name indicator field on the display
20 of the terminal B 504. However, as will be understood from the embodiments described in the foregoing, the terminal B 504 is provided with an application or a capability configured in software to enable it to recognise that it is to perform steps according to the invention rather than to simply
25 display the string associated with the name indicator field. This may be the same application or a capability referred to in the foregoing in relation to the terminal A which is capable of arranging the sending of a silent MMS in the systems 100 and 300 of Figures 1 and 3.

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In a variant of the invention, the identity of the subscriber A is presented on the display of the terminal B in addition to the multimedia content being played. Although this can simply be the telephone number of the subscriber A, as an alternative, this number, when received by the terminal B, is used in order to interrogate a contact list in the terminal B in order that a contact name may be presented instead of a contact telephone number. In this way, the subscriber B may have presented on the terminal B both the multimedia content and the source of the call in a recognisable form.

Figure 5 shows an embodiment in which the multimedia content has been downloaded to the terminal B 504 before a call from the terminal A 502 is initiated. A variation of this has been described in which the terminal B 504 recognises that it needs certain multimedia content and arranges for it to be downloaded. However, in a further embodiment of the invention shown in Figure 6, an originating service present in a system 600 is used to arrange for a terminal B 604 to be provided with multimedia content during the set up of a call from a terminal A 602.

The originating service provides for MMS-based calling name presentation which is supported by the system 600. As can be seen from Figure 6, when a call is made from the terminal A 602 to the terminal B 604, a call "SETUP" message 606 is sent by the terminal A 602 to an MO VMSS 608 which returns a "CALL PROCEEDING" message 610 and then checks with its HLR whether an originating service is active in respect of the subscriber A. If the HLR contains an indication that there is an active originating service, the MO VMSS 608 sends a request 612 for

service logic in the system, which is typically executed by a service control function (SCF) 614, to arrange for the provision of the originating service. The SCF 614 determines:

- 1) whether an originating service has previously been activated by the subscriber A in respect of multimedia caller presentation; and
- 2) whether a database associated with an MMSC 616 contains multimedia content for this call. The database may be attached to the MMSC 616 or it may be the MMSC 616 itself. In either case it may be an MM content database.

Assuming such an originating service has previously been activated by the subscriber A in respect of multimedia caller presentation and that there is associated multimedia content, the SCF 614 obtains the multimedia content and overwrites a string contained in an entry in a CNAP database with an overwriting string. The CNAP database may be part of an MM content database although this does not have to be the case. The overwritten string is usually provided to the terminal B 604 in respect of CNAP calls going from the subscriber A to the subscriber B in order to be presented on a display of the terminal B 604. The overwriting string, when received by the terminal B, will be interpreted by the terminal B 604 as a command to download/play multimedia content instead of showing the CNAP string. If such an originating service has not been activated, the overwriting operation will not take place and, on being called by the terminal A 602, the terminal B 604 will display a string and not play the multimedia content. It should be noted that this operation of overwriting the string in the CNAP database with an overwriting string which is interpreted by the terminal B as a command to

download/play multimedia content instead of showing the string itself is an operation which is part of activating originating services in general and as such would be a precursor operation applicable to any of the Figures in which an
5 originating service is invoked.

The SCF 614 then sends a "Send MMS" command 618 including the string "<CNAP:MSISDN_A>" indicated as "subject" and the intended recipient (the subscriber B) to the MMSC_A 616. In Figure 6, simply including the string "CNAP" is indicated as an alternative in which case the MMSC_A 616 modifies it to be
10 "<CNAP:MSISDN_A>". The MMSC_A 616 examines the "Send MMS" command 618 and determines that it is to send an MMS message having a subject field of "<CNAP:MSISDN_A>" and incorporating
15 the multimedia content that the subscriber A has defined as being presented when the subscriber B is called. The MMSC_A then sends a "MT forwards MMS" message 620 containing the multimedia content in the format defined by the "Send MMS" command 618 to an MT VMSS/SGSN 622 in order for the MMS message to be delivered to the terminal B 604. The MT VMSS 622 then notifies 624 the terminal B 604 that there is an MMS message intended for it, the terminal B responds 626 to this notification, and then requests 628 retrieval of the MMS message which leads to it being delivered in a retrieval response message 630. During this exchange, the SCF sends a
20 "CONNECT" message 632 to the MO VMSS 608 which leads, following notification to the SCF of successful delivery of the MMS message, to call setup signalling 640 being arranged.

30 It should be noted that the network element 622 comprises two elements, an MT VMSS and a serving gateway support node

(SGSN). The messages 624, 626, 628, and 630 are exchanged between the terminal B 604 and the SGSN, and the messages 642 and 644 are exchanged between the terminal B 604 and the MT VMSS.

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Shortly before the connection between the terminal A 602 and the terminal B 604 is to be established, the MT VMSS 622 sends a "SETUP (CNAP, NameIndicator='<CNAP:MSISDN_A>')" message 642 to the terminal B 604. The terminal B 604 responds to the MT VMSS 622 with a "CALL CONFIRMED" message 644. At the point, the procedure described in the foregoing in relation to Figure 5 is followed.

In another embodiment of the invention shown in Figure 7, a system 700 and associated message flow is shown which is capable of providing a 3GPP feature referred to as Service Change and UDI Fallback (SCUDIF). This feature is used to transfer multimedia content to a terminal B 704 which is used for the purpose of calling name presentation. SCUDIF is a function which applies to multimedia calls and allows users to achieve successful call establishment when end-to-end circuit switched (CS) multimedia is not possible (fallback to speech) or when signalling of the feature is not possible in the network (fallback to preferred service or speech). In the embodiment of Figure 7, a subscriber A 702 has activated an originating service (INAP/CAMEL, or in another embodiment, a routing category), which determines how mobile originating calls are served by a service node (SN) 706. When the subscriber A makes a call, the terminal A 702 sends a "SETUP" message 708 to an MO VMSS 710, which sends an initial detection point (IDP) message 712 to trigger the service to a

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gsmSCF 714 which contains service logic 716 associated with network services. The gsmSCF 714 determines:

1) whether an originating service has been activated by the subscriber A in respect of multimedia caller presentation;

5 and

2) whether a database associated with an MMSC contains multimedia content for this call. In this embodiment, the database is an MM content database 718.

10 The gsmSCF 714 sends a "CONNECT" message 720 or a CONTINUE message to the MO VMSS 710 to continue call setup. If the gsmSCF 714 changes the called number (for example by inserting a routing prefix to the beginning of the called number), the CONNECT message is used. The MO VMSS 710 then sends an
15 "IAM" message 722 to the service node 706. This "IAM" message 722 is used to seize a circuit and transfer addressing and call handling or routing information. It includes the address and other information relating to routing and call handling. The service node 706 checks 724 with the MM content database
20 718 whether there is an associated multimedia content which is to apply to this call. This operation involves a database search based on the called number, and since there might be several different multimedia contents associated with that number, the calling number. If there is an associated multimedia
25 content, this is provided to the service node 706. During this interrogation of the MM content database 718, the call initiated by the subscriber A is put in a "parking" status for a period of time and a ring-back tone is played to the subscriber A. After a successful interrogation of the MM
30 content database 718, resulting in an indication that the multimedia content has been found 726, the service node 706,

gsmSCF 714, MM content database 718, and an MT VMSS 728, carry out call setup signalling 730, following which the MT VMSS 728 sends a "SETUP (RI, {<preferred service: MM>, <less preferred service speech>})" message 732 to the terminal B 704 and receives in return a "CALL CONFIRMED" message 734. The service node 706 then initiates a SCUDIF call 736 towards the terminal B 704 with the parameter "{<preferred service: MM>, <less preferred service speech>}" set. In this 'Active call' phase 736 the multimedia content is streamed to the terminal B 704, as if a video call is being made. Up until this point, there are two calls in the system: one between the service node 706 and the terminal B 704 and one under establishment between the terminal A 702 and the terminal B 704. After the multimedia content is streamed to the terminal B 704, the two calls are merged and the call is connected.

In the case of Figure 7, since the subscriber B/terminal B 704 supports SCUDIF calls, the service node 706 played the multimedia content to the terminal B 704 and then switched the call from multimedia content playback to speech, and connected the subscriber A and the subscriber B. However, other outcomes are possible:

- (i) If the subscriber B/terminal B 704 supports SCUDIF calls, but the preference order of services is modified, then the service node 706 connects the terminal A 702 with the terminal B 704 but does not play the multimedia content to the terminal B 704.
- (ii) If the subscriber B/terminal B 704 does not support SCUDIF calls and there is fallback to speech, the service node connects the terminal A 702 with the terminal B 704 and the multimedia content is not played.

(ii) If the subscriber B/terminal B 704 does not support SCUDIF calls and falls back to multimedia, the service node 706 plays the multimedia content and connects the terminal A 702 with the terminal B 704. In this case the call A-B will most probably be unsuccessful, if we assume that the calling party initiated a voice call. Alternatively, if the subscriber B/terminal B 704 does not support SCUDIF calls and falls back to multimedia, the service node 706 plays the multimedia content and cancels the call towards the terminal B. Then it routes the call from the terminal A towards the terminal B. In this case, the terminal B will ring twice, firstly to play the multimedia content and secondly to connect the voice call.

If there is no multimedia content associated with the call, the service node 706 simply routes the call towards the terminal B 704.

Figure 8 shows a system 800 and associated message flow in which service logic corresponding to that described in relation to Figure 7 is applied to offer multimedia content to a subscriber A at a terminal A 802 during the call setup phase. In this case, the subscriber A/terminal A 802 supports SCUDIF calls and an outgoing call from the terminal A 802 is set up as a SCUDIF call. In addition to the subscriber A having a first originating service to check multimedia content to be served as calling name presentation towards a subscriber B at a terminal B 804, the subscriber A also has a second originating service to check whether there is any multimedia content which is to be served towards the subscriber A during call setup. The second originating service, in which mobile

originating calls are served by a service node 806, is provided by INAP/CAMEL (or in another embodiment, a routing category). In common with the embodiment described in relation to Figure 7, during call setup from the terminal A 802 to the terminal B 804, service logic 808 in a gsmSCF 810 arranges for the service node 806 to interrogate an MM content database 812 to check if there is any multimedia content associated with the call which is to be downloaded to, and streamed by, the service node 806. The service node 806 carries out a database search 814 based on the telephone number of the subscriber A for relevant multimedia content which applies to the subscriber B. If such multimedia content is found 816, and assuming that the terminal A 802 is making a voice call, then the service node 806 downloads the multimedia content 816, answers the call from the terminal A 802, switches it from a voice call to a multimedia call and streams the multimedia content to the terminal A as a SCUDIF call 818 for it to be played there during at least part of the call setup procedure. At the moment when the call leg towards the terminal B is established 820, the service node 806 switches back the SCUDIF call towards the terminal A 802 from playing multimedia content to a voice call and connects 822 the terminal A 802 with the terminal B 804.

In this embodiment of the invention, the multimedia content could be a third party advertisement or content defined by the subscriber B such as an announcement to be played to callers to the subscriber B so that they are presented with something personal which has been defined by the subscriber B rather than a standard ringing indication.

Naturally, the second originating service can be provided by itself without the first originating service being provided.

As described in the foregoing, Figure 8 describes an embodiment for content delivery towards the subscriber A via a SCUDIF call. Figure 9 shows an alternative embodiment of a system 900, and associated message flow, in which, during a call from a terminal A 902 to a terminal B 904, delivery of multimedia content to the terminal A 902 takes place using MMS for the case when, for example, the subscriber A/the terminal A does not support SCUDIF calls. As can be seen in this Figure, call setup 906 triggers an originating service 908, 910 embodied in service logic that looks up content related to this particular call in an MM content database 912. A service node 914 (present as the element gsmSCF in this particular embodiment) triggers an MMS delivery process 916, 918 in which an MMSC_A 920 sends an MMS message to the terminal A. During the time interval of call setup signalling 922 being carried out, the terminal A 902 plays the multimedia content to the subscriber A. Playing of the multimedia content is stopped when the terminal A 902 sends a "Connect ACK" message 924. After this, the call can take place 926.

Therefore, Figures 8 and 9 relates to embodiments of the invention which are capable of to providing multimedia content to a subscriber A during a call setup phase. In one implementation of the invention, the multimedia content is provided by a third party. It may be provided in exchange for a discount in the price of the call.

In the foregoing embodiments, the originating service may be activated by an operator when the user calls an operator call centre which provides assistance to its subscribers. Alternatively, or additionally, it can be activated by the subscriber sending an USSD activation message. It will be appreciated that both of these activation methods are independent of a call being made. Furthermore, in certain implementations, the resulting originating service applies to all calls. However, implementations of the invention may be provided in which a specific separate activation operation on the part of the subscriber is not necessary and the originating service may be set up as a result of carrying out a related operation such as that described in Figures 1, 3, and 4.

Figure 10 shows service logic 1000 which can be applied to embodiments of the invention described in the foregoing. In this case, when a gsmSCF (or an SCF) 1002 is operating to provide an originating service, it can refer to a history of multimedia ringing tone service delivery operations which have been made in respect of a subscriber B and select a method (for example via MMS look-up, MMS download, or SCUDIF) that has proved to be successful in the past. Referring to Figure 10, in a first call 1004 from a subscriber A to a subscriber B, since an originating service for multimedia CNAP has been activated, the gsmSCF 1002 checks 1006 with an MM content database 1008 whether there is a historical record of previous delivery of multimedia content to the subscriber B to be used as a ringing tone. In this case, since there has been no previous delivery, whether successful or attempted and failed, the MM content database 1008 responds with a

"NAK" message 1010. As a result, the gsmSCF 1002 as a default first choice instructs the terminal B to carry out an MMS look-up operation 1012. In this case, because the relevant multimedia content was not present in the terminal, the MMS look-up operation fails and therefore, the gsmSCF 1002 updates the MM content database 1008 with an indication "MMS look-up, failed" 1014. As a result, when a call notification arrives at terminal B it will be a conventional notification and not one which relies on playing multimedia content to indicate that the subscriber A is calling.

Subsequently, in a second call 1016 from another subscriber, in this case subscriber A', to the subscriber B, an originating service active in respect of the subscriber A' causes the gsmSCF 1002 to check 1018 with the MM content database 1008 whether there is a historical record of previous delivery of multimedia content to the subscriber B to be used as a ringing tone. In this case, since there has been a previous delivery attempt which failed, the MM content database 1008 responds with a "MMS look-up failed" message 1020. As a result, the gsmSCF 1002 does not attempt to invoke an MMS look-up operation but instead employs a default second choice, MMS download 1022, to cause the subscriber B to connect to a relevant MMSC and download the multimedia content in the form of an MMS. In this case, the MMS download operation succeeds and therefore, the gsmSCF 1002 updates the MM content database 1008 with an indication "MMS download, success" 1024 in respect of the subscriber B. In the case of any further calls to the subscriber B from any subscribers having the multimedia CNAP originating service activated, the gsmSCF 1002 checks with the MM content database 1008 about previous de-

livery of multimedia content to the subscriber B to be used as a ringing tone. In this case, since there has been a previous delivery attempt which succeeded, the MM content database 1008 responds with a "MMS download succeeded" message
5 1020. As a result, the gsmSCF 1002 attempts to deliver the content by MMS download.

Therefore, it should be understood that a network element, in this case the MM content database 108, keeps a record of the
10 history of multimedia ringing tone service delivery operations which is made available so that all incoming calls to the terminal B which use the relevant originating service are arranged according to an indication based on the history.

15 It is preferred that when a call is made to a terminal B, multimedia will only be played at that terminal to indicate the origin of the call if the subscriber B has provided permission for this to occur. In the event that the subscriber B has not given such permission, service logic in conjunction
20 with an SCF will not arrange for delivery of relevant multimedia content to the terminal B and/or will not arrange for a serving MSS to send a specially modified SETUP message to the terminal B.

25 Although in the foregoing, the MMS header is modified by including "<CNAP:MSISDN_A>", in other embodiments of the invention, other fields of the MMS header can be used to indicate that an MMS message has relevance in the context of CNAP calls originated by this subscriber A". It could be a separate MM element part of the MMS, encoded in a valid MIME type
30 such as text/xml or application/json. For example

"{"CNAP":"MSISDN_A"}" (json-encoded) or "<?xml version="1.0"?><cnap>MSISDN A</cnap>" (xml-encoded).

5 It should be noted in the foregoing that when reference is made to including "MSISDN_A" or "MSISDN_B" in any message, this is a reference to including the relevant digits as applicable to a subscriber and not the text "MSISDN_A" or "MSISDN_B".

10 The invention takes advantage of current mobile terminal devices generally being provided with the capability to play videos. It also encourages the adoption of calling name information services.

15 While preferred embodiments of the invention have been shown and described, it will be understood that such embodiments are described by way of example only. Numerous variations, changes and substitutions will occur to those skilled in the art without departing from the scope of the present invention. Accordingly, it is intended that the following claims
20 cover all such variations or equivalents as fall within the spirit and the scope of the invention.

Claims

- 1 A method of handling a call from a calling terminal de-
5 vice to receiving terminal device comprising the steps of:
during a call set up operation a network element checking if
there is a network-based service in respect of a subscriber
of the calling terminal device relevant to caller display of
multimedia content;
- 10 if such a service is found arranging for a command to be sent
to the receiving terminal device to cause the receiving ter-
minal device to locate relevant multimedia content within it-
self which once located is displayed to indicate an incoming
call from the subscriber of the calling terminal device.
- 15
2. A method according to claim 1 in which the receiving
terminal carries out a look-up operation to locate the multi-
media content.
- 20 3. A method according to claim 1 or claim 2 in which the
receiving terminal carries out a downloading operation to ob-
tain the multimedia content so that it can be located.
4. A method according to claim 1 or claim 2 in which the
25 command is sent to the receiving terminal after the multime-
dia content has been downloaded.
5. A method according to any preceding claim in which the
command is sent as part of a call set up operation between a
30 network and the receiving terminal.

6. A method according to any preceding claim in which the receiving terminal device attempts to locate the relevant multimedia content within itself after call set up has been completed but before the call is connected.

5

7. A method according to any preceding claim in which the multimedia content is sent to the receiving terminal in an MMS message.

10 8. A method according to claim 7 in which the MMS message contains in a subject field an indication that the message relates to caller display.

9. A method according to claim 7 or claim 8 in which the
15 MMS message contains in a subject field an indication of a subscriber using the calling terminal device.

10. A method according to claim 8 or claim 9 in which the subject field is interpretable by the receiving terminal de-
20 vice as an indication that multimedia contained within the message is to be played for the purposes of caller display when a call is received from the calling terminal device.

11. A method according to any of claims 7 to 10 in which the
25 MMS message is silent in the sense that its arrival at the receiving terminal device is not announced .

12. A method according to any preceding claim in which the command contains an indication that the message relates to caller display.

30

13. A method according to any preceding claim in which the command contains an indication of a subscriber using the calling terminal device.

5 14. A method according to any preceding claim in which the command contains a field containing text which is to be presented on a display of the receiving mobile but the text indicates that contrary to its originally intended purpose, it itself is to be interpreted as a command to present multimedia content.
10

15. A method according to any preceding claim in which the multimedia content is provided to a multimedia content store in advance of the call being made from which it can be downloaded by the receiving terminal device.
15

16. A system for handling a call from a calling terminal device to receiving terminal device, the system comprising:
a first network functionality which is capable of checking
20 during a call set up operation if there is a network-based service in respect of a subscriber of the calling terminal device relevant to caller display of multimedia content;
a second network functionality, responsive to the identification of such a service being active, which is capable of arranging for a command to be sent to the receiving terminal
25 device to cause the receiving terminal device to locate relevant multimedia content within itself which once located is displayed to indicate an incoming call from the subscriber of the calling terminal device.

17. A network functionality, responsive to the identification of an active network-based service in respect of a subscriber of a calling terminal device relevant to caller display of multimedia content during a call set up operation, which is capable of arranging for a command to be sent to a receiving terminal device to cause the receiving terminal device to locate relevant multimedia content within itself which once located is displayed to indicate an incoming call from the subscriber of the calling terminal device.

10

18. A terminal capable of receiving, during a call set up operation to the terminal device from a calling terminal device, a multimedia content related command from a network-based service in respect of the calling terminal device, capable of responding to the multimedia content related command by seeking to locate relevant multimedia content within itself, and in the event of being able to locate the multimedia content, capable of displaying the multimedia content to indicate an incoming call from the calling terminal device.

20

19. A computer program product comprising software code that when executed on a computing system performs a method of handling a call from a calling terminal device to receiving terminal device comprising the steps of:

25 during a call set up operation a network element checking if there is a network-based service in respect of a subscriber of the calling terminal device relevant to caller display of multimedia content;

if such a service is found arranging for a command to be sent

30 to the receiving terminal device to cause the receiving terminal device to locate relevant multimedia content within it-

self which once located is displayed to indicate an incoming call from the subscriber of the calling terminal device.

20. A computer program product according to claim 19 in
5 which computer program product is stored on a computer-readable medium.

21. A multimedia messaging service message intended for receipt by a receiving terminal device, the message comprising
10 multimedia content, a first association with a network-based multimedia caller display service, a second association with a subscriber who has activated the network-based multimedia caller display service, the message being locatable by the
receiving terminal device as a result of the receiving terminal device receiving a command from the network-based multimedia caller display service in respect of the subscriber.
15

FIG 1

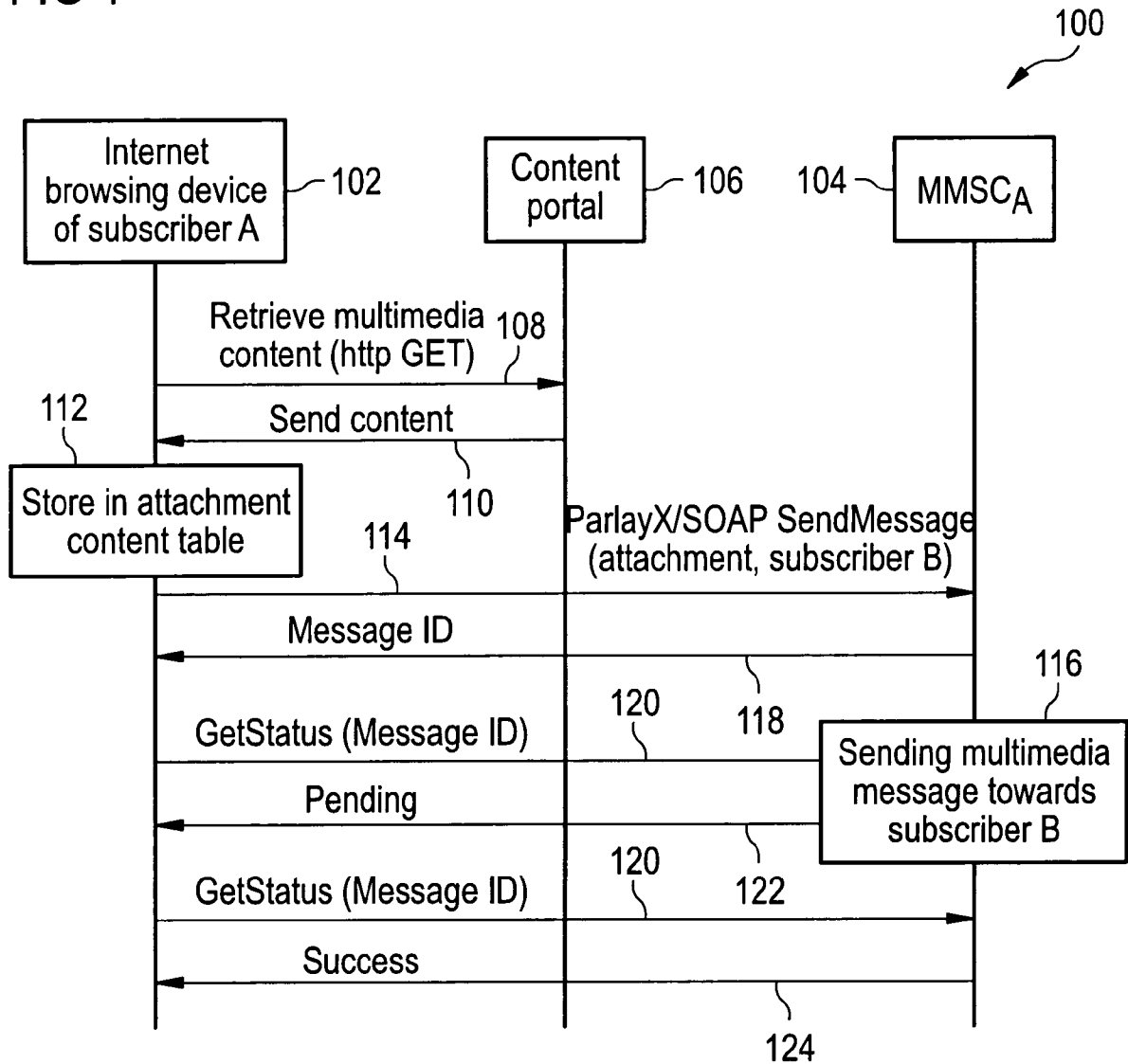


FIG 2A

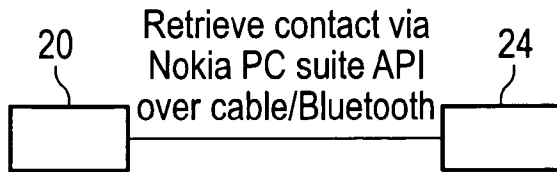


FIG 2D

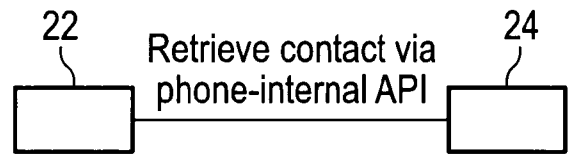


FIG 2B



FIG 2E



FIG 2C

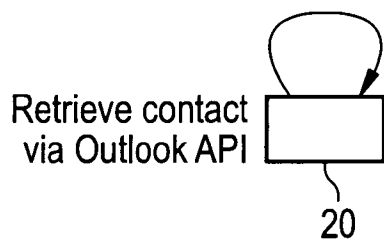
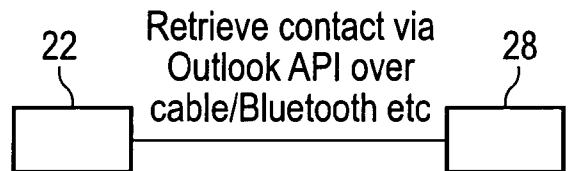


FIG 2F



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FIG 3

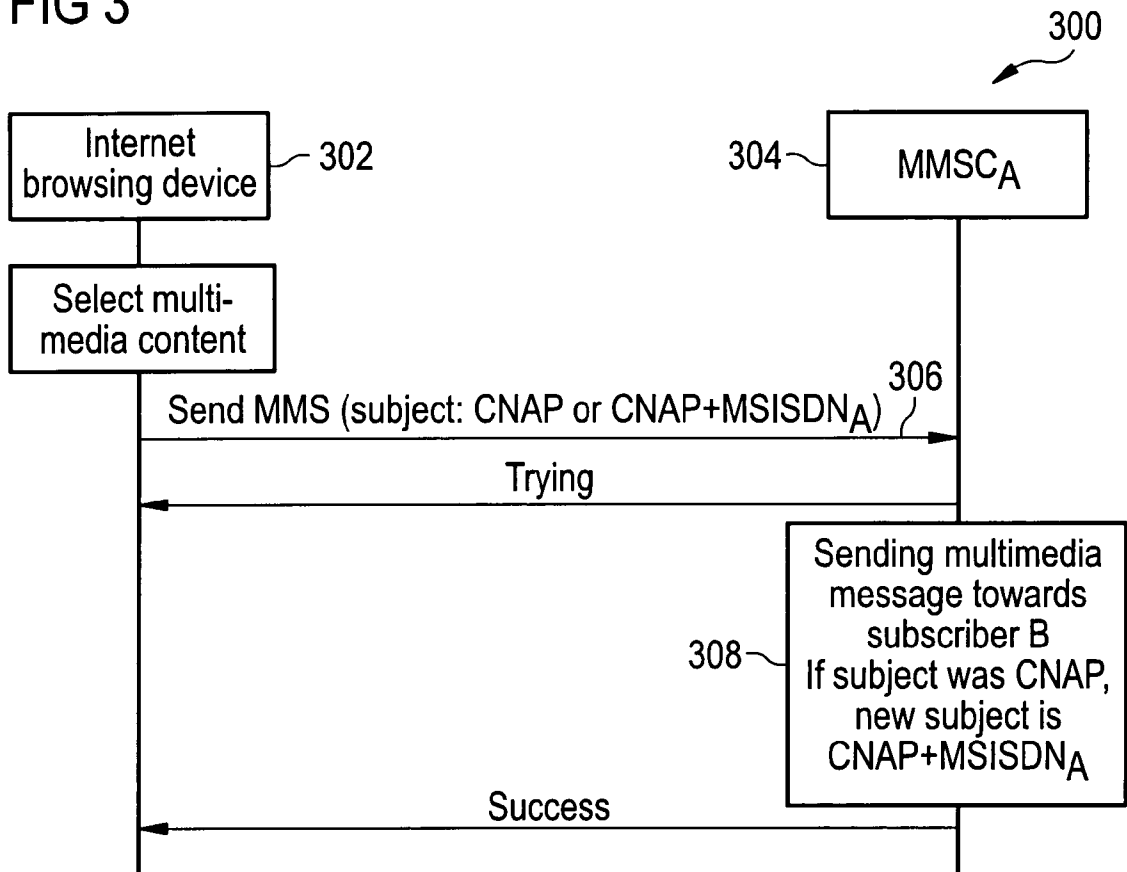


FIG 4

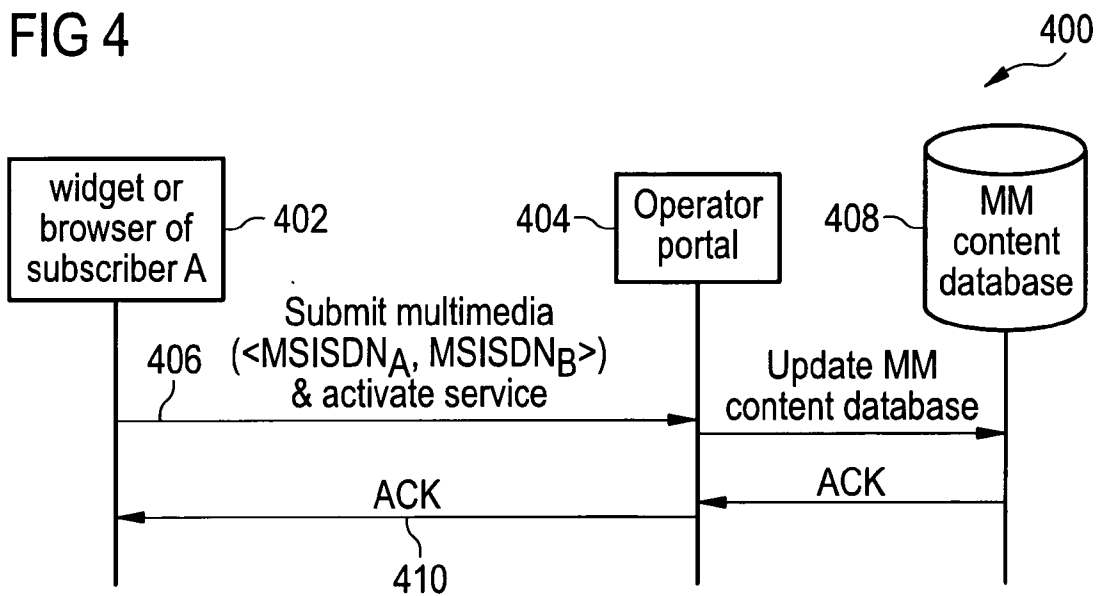
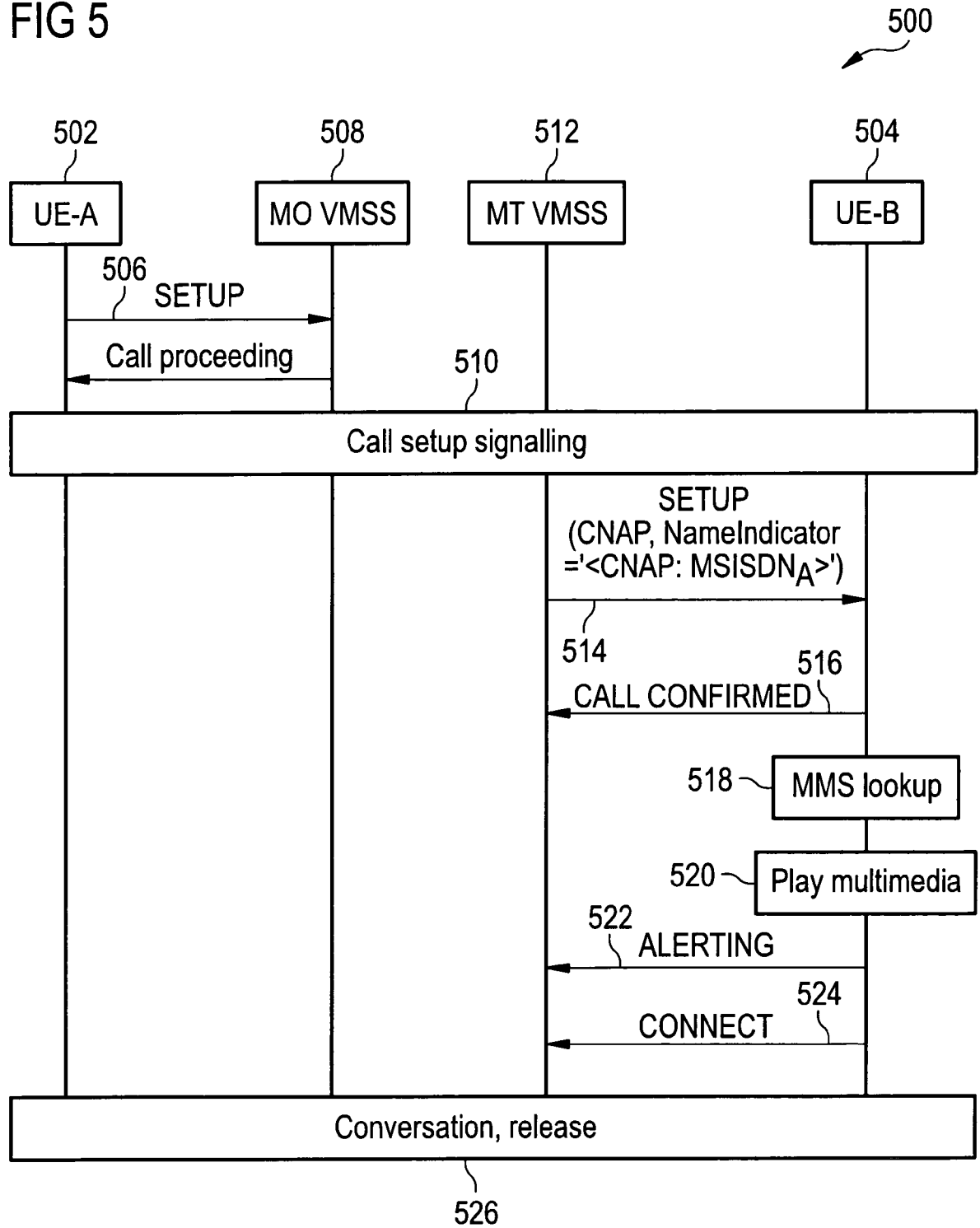


FIG 5



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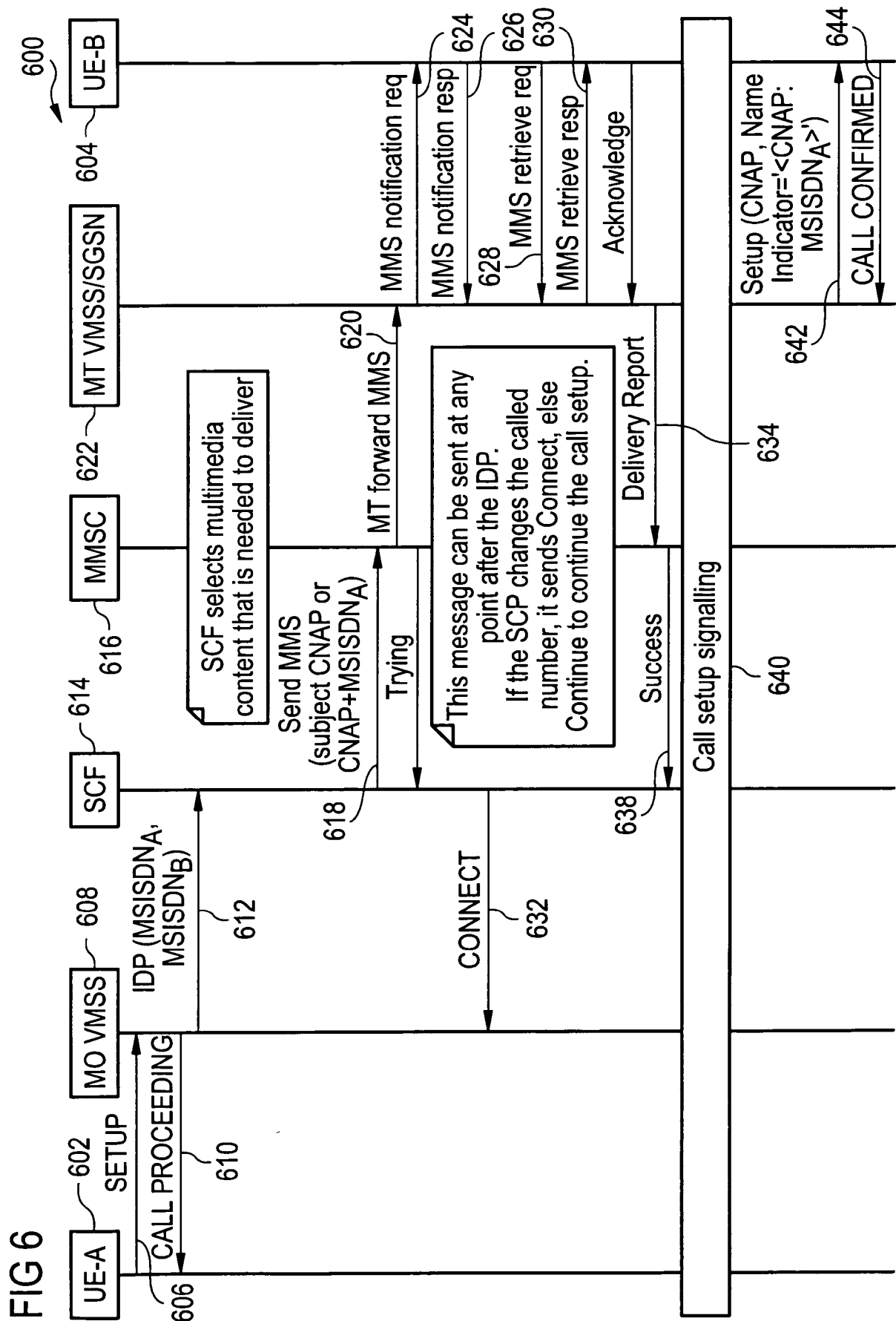
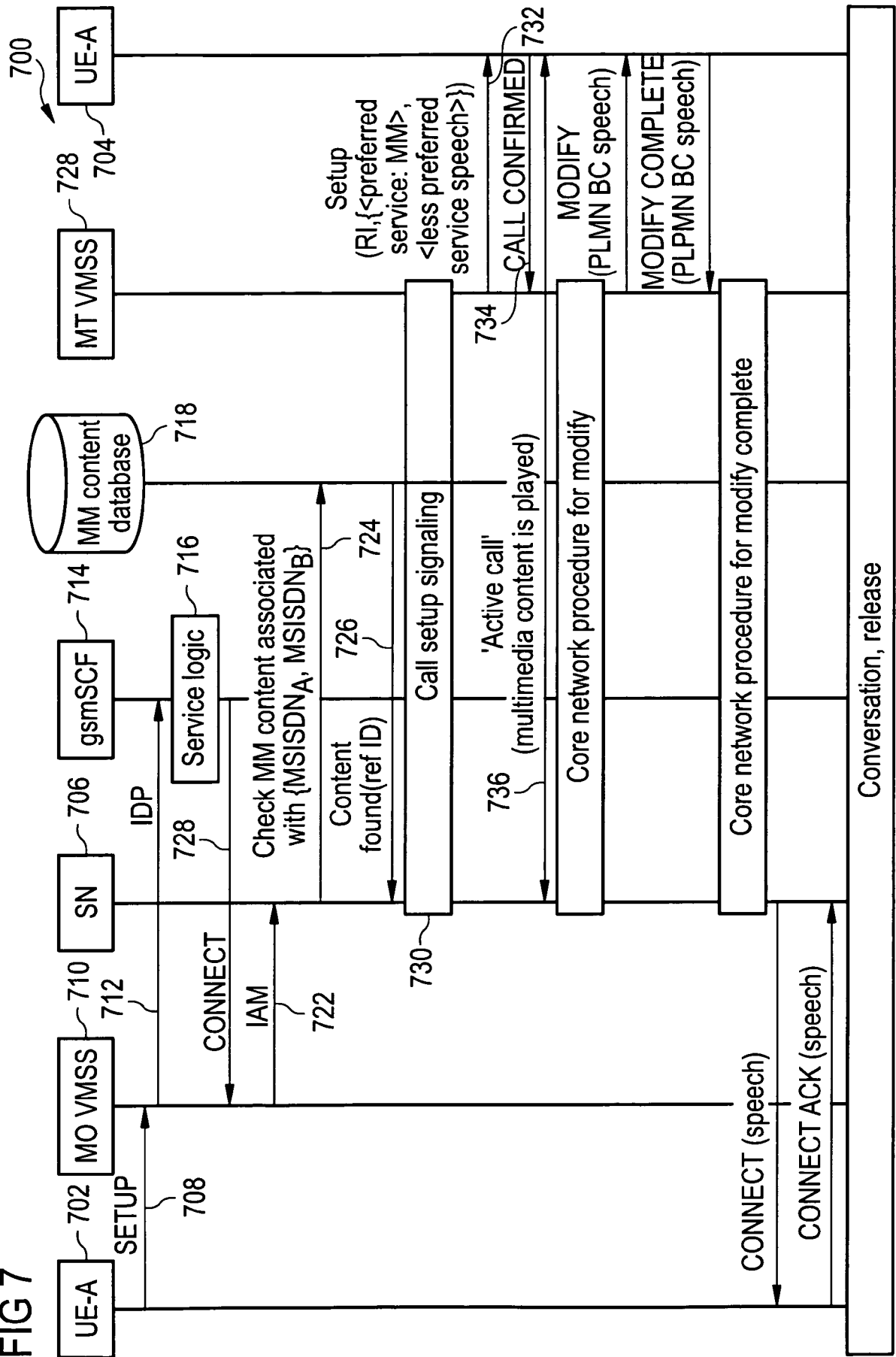
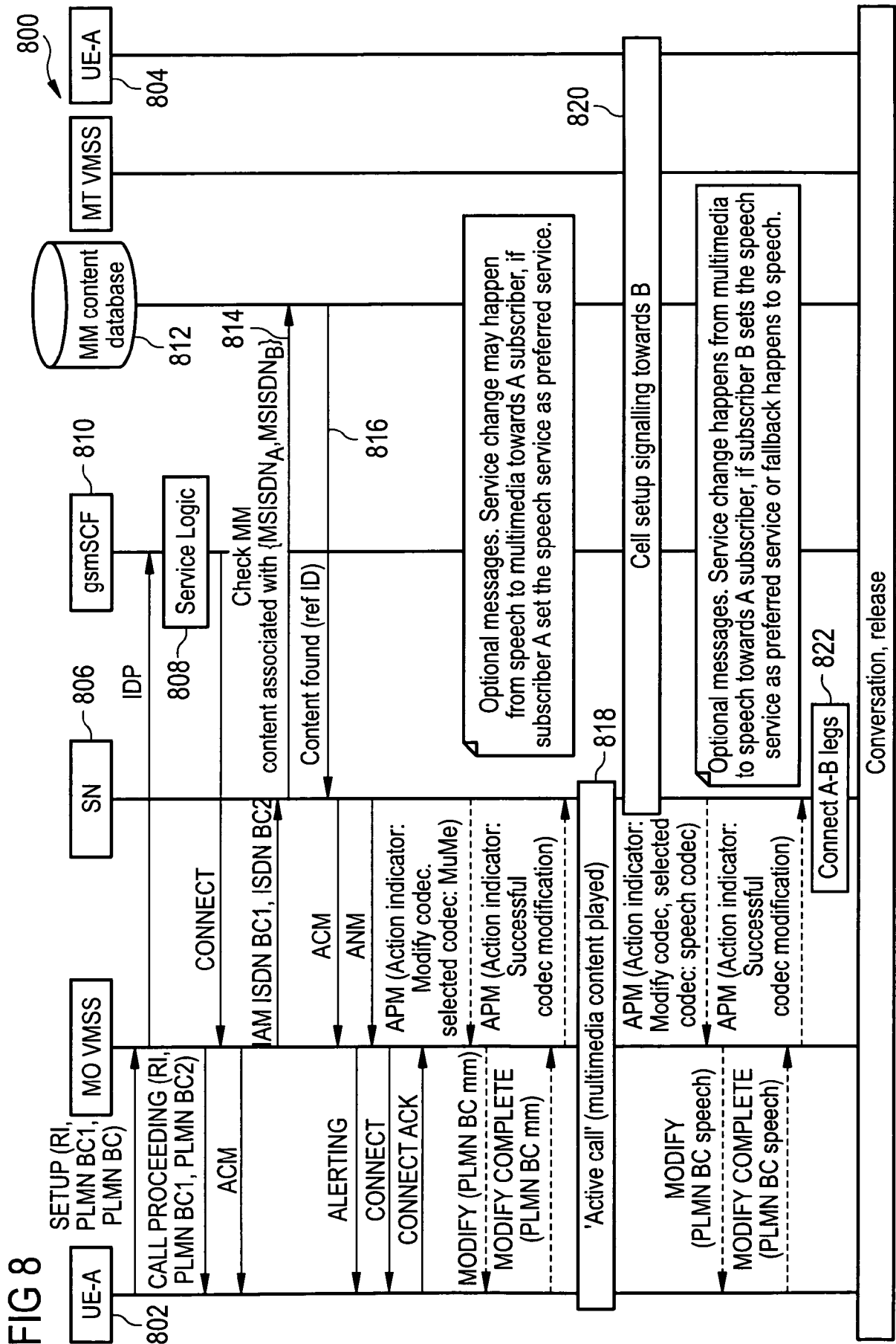


FIG 7





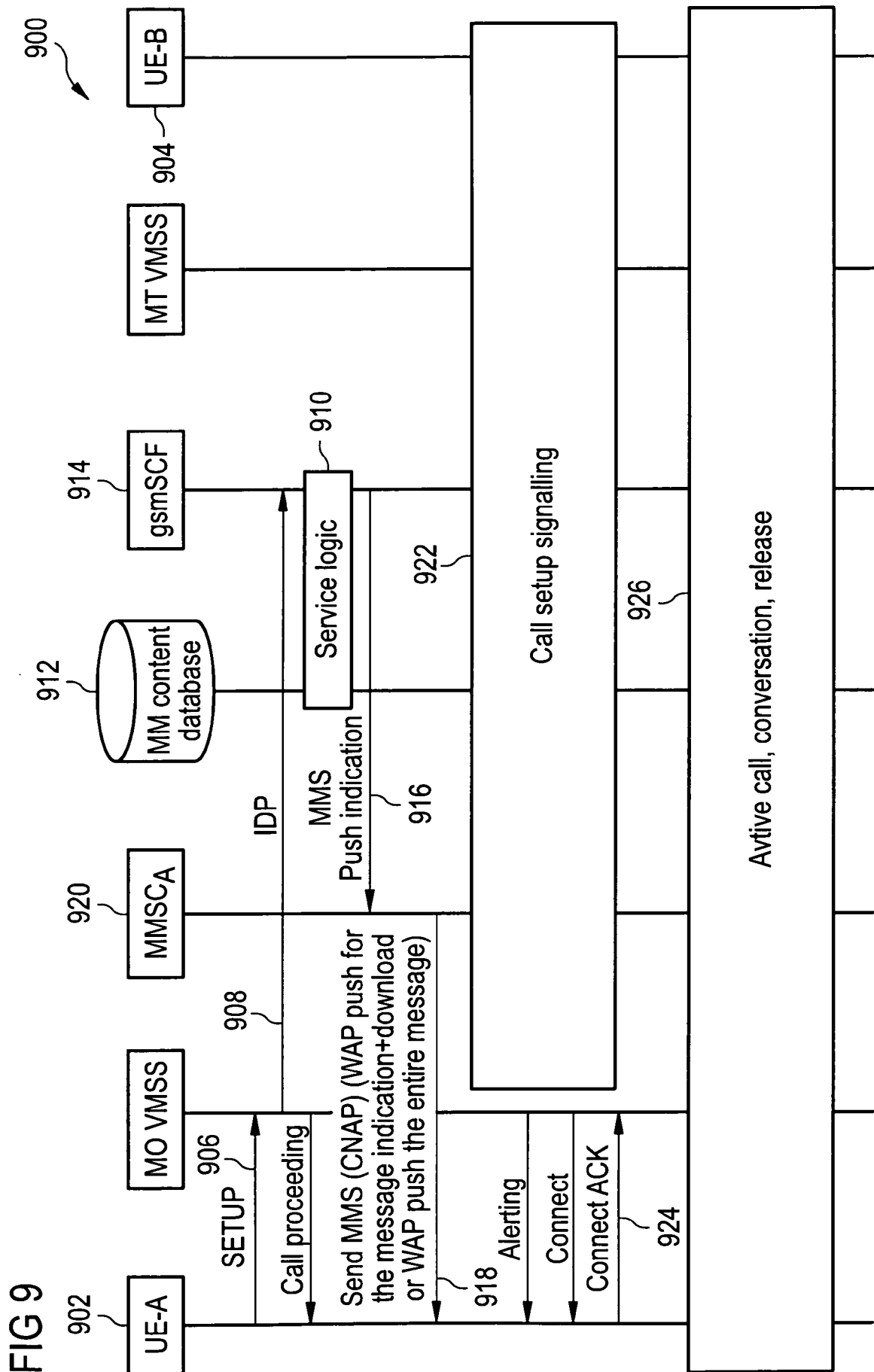
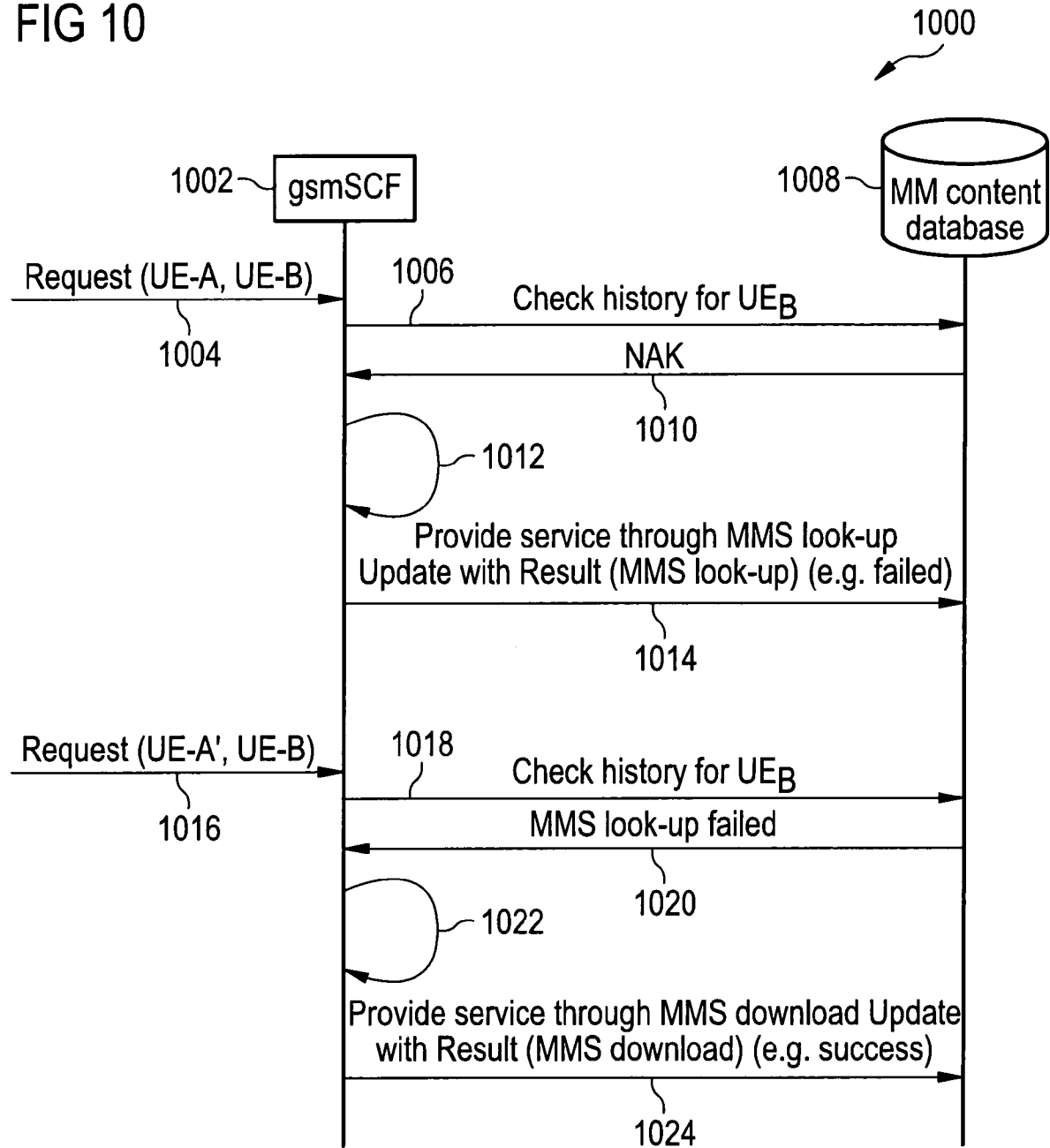


FIG 10



INTERNATIONAL SEARCH REPORT

International application No

PCT/EP2009/058195

A. CLASSIFICATION OF SUBJECT MATTER

INV. H04M3/42 H04M3/53 H04L29/08 H04L29/06

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

H04M H04L

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 2007/047523 A1 (JIANG JOHN Y J [US]) 1 March 2007 (2007-03-01) abstract paragraph [0039] - paragraph [0220] figures 1-21	1-21
X	EP 1 583 376 A1 (ORANGE S A [FR]) 5 October 2005 (2005-10-05) abstract paragraph [0021] - paragraph [0041] figures 1-9	1-21
A	WO 01/54441 A1 (PHONE PAGES OF SWEDEN AB [SE]; MINBORG PER AAKE [SE]; MINBORG LARS MAT) 26 July 2001 (2001-07-26) abstract page 7 - page 26 figures 1, 5 - 18	1-21

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

☒ See patent family annex.

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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

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Date of the actual completion of the international search

1 October 2009

Date of mailing of the international search report

08/10/2009

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Manthey, Axel

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2009/058195

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