



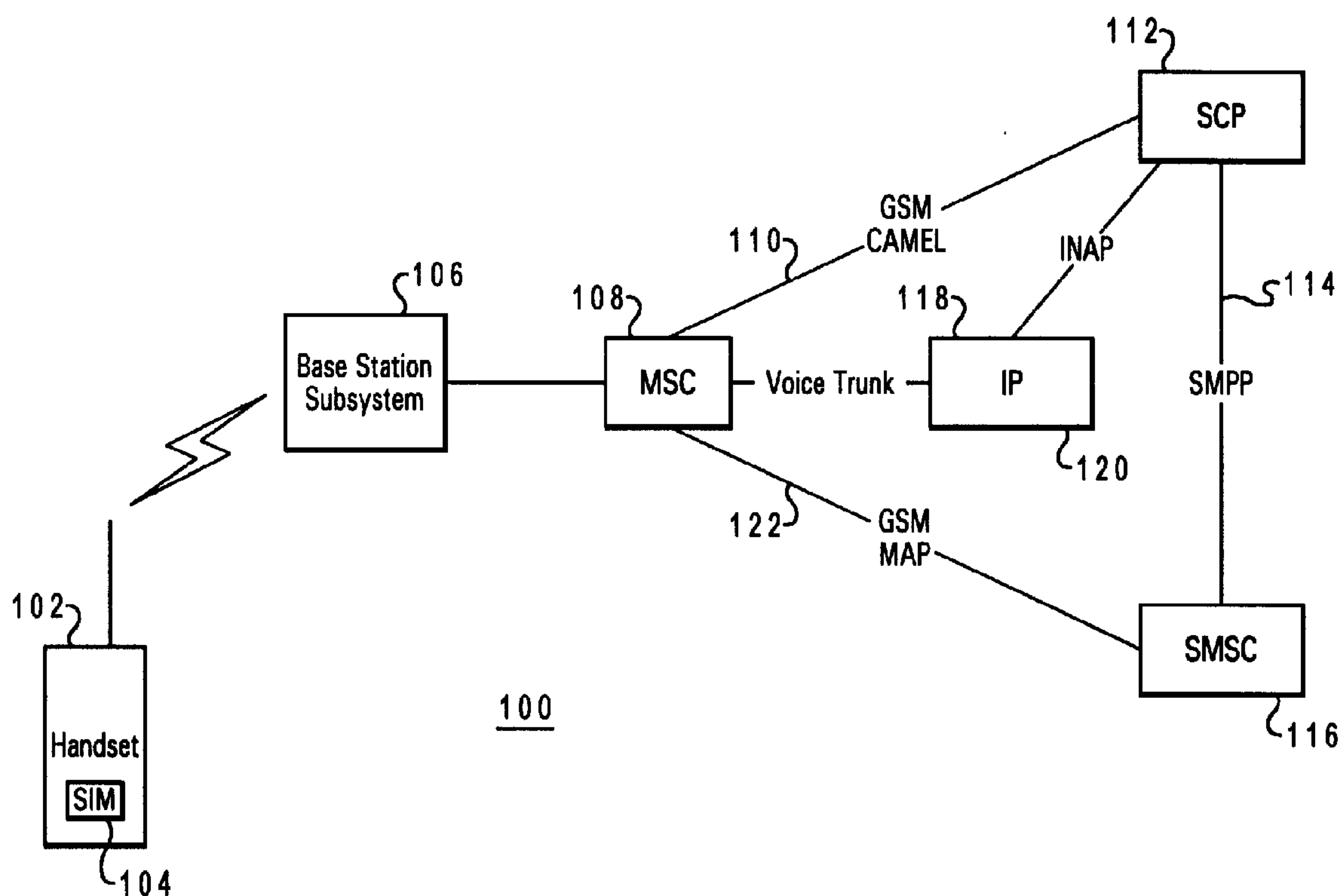
(72) MAXWELL, STEWART HODDE, US
(71) NORTEL NETWORKS CORPORATION, CA

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(54) **METHODE ET APPAREIL DE DIFFUSION SIMULTANEE D'UN
MESSAGE TEXTUEL ET D'UNE ANNONCE PUBLICITAIRE
SONORE POUR DES APPELS COMMANDITES**

(54) **METHOD AND APPARATUS FOR SIMULTANEOUS TEXT AND
AUDIO FOR SPONSORED CALLS**



(57) A combination of Global System for Mobile communications (GSM) capabilities including Short Message Service (SMS), Subscriber Identity Module (SIM) and Customized Applications for Mobile network Enhanced Logic (CAMEL) allows an advertiser to pay a portion of the airtime cost of a call originated by a mobile subscriber after that subscriber has listened to a recorded advertisement. The combination delivers a text message that associates with a recorded audio advertisement. The text message, which may be referred to later, is stored by the subscriber's handset and may be a transcript of the audio advertisement, provide additional details of the audio advertisement or it may contain an electronic coupon associated with the advertisement.

**A METHOD AND APPARATUS TO DELIVER
SIMULTANEOUS TEXT AND AUDIO MESSAGE FOR SPONSORED CALL**

ABSTRACT OF THE DISCLOSURE

5 A combination of Global System for Mobile
communications (GSM) capabilities including Short Message
Service (SMS), Subscriber Identity Module (SIM) and
Customized Applications for Mobile network Enhanced Logic
(CAMEL) allows an advertiser to pay a portion of the airtime
10 cost of a call originated by a mobile subscriber after that
subscriber has listened to a recorded advertisement. The
combination delivers a text message that associates with a
recorded audio advertisement. The text message, which may
be referred to later, is stored by the subscriber's handset
and may be a transcript of the audio advertisement, provide
15 additional details of the audio advertisement or it may
contain an electronic coupon associated with the
advertisement.

BACKGROUND OF THE INVENTION**5 1. Technical Field:**

10 The present invention relates in general to text messaging via mobile telephone communications and in particular to text messaging utilizing Subscriber Identity Module, Global System for Mobile communications and Short Message Service. More particularly, the present invention relates to associating specific recorded text messages with selected recorded audio transmissions to a selected mobile unit (handset) within a mobile telephone communications system.

15 2. Description of the Related Art:

Global System for Mobile Communications ("GSM") was originally designed as a digital cellular network standard to unify many incompatible analog systems in use in Europe. GSM standards are a subset of Integrated Services Data Network ("ISDN") which support speech, data and Group 3 facsimile standard. The standard provides for cell broadcast, where messages may be broadcast to subscribers in specific cells within the network and Short Message Service ("SMS") which allows subscribers to send and receive
25 alphanumeric messages.

GSM architecture may be divided into three parts: a Mobile Station, a Base Station Subsystem ("BSS") and a Network Switching Subsystem ("NSS"). Mobile station is the mobile unit or handset utilized by the subscriber to make

wireless calls and contains a removable Subscriber Identity Module ("SIM"), a "smart card" (a small self-contained computer with its own CPU and memory) containing all data and pertinent information concerning the subscriber.

5 BSS comprises a Base Transceiver Station and a Base
Station Controller ("BSC"). BTS helps define a cell and
handles radio interface protocols with a mobile station.
BSC manages interface channels as well as handovers
(maintaining contact with network as a subscriber travels
10 from cell to cell within the network). BSS interfaces with
a Network Subsystem comprising a Mobile Switching Center
("MSC"), Equipment Identity register (EIR), Home Location
Register ("HLR"), Visitor Location Register ("VLR") and
Authentication Center ("AC").

15 The Network Switching Subsystem (NSS) is anchored by
the MSC. The MSC acts like a switching node of the Public
Switched Telephone Network ("PSTN") or ISDN and functions to
handle a subscriber by authentication, location updating,
MSC handovers and call routing. The MSC, along with
20 multiple intelligent databases, forms the network subsystem
and provides connection with public networks.

Intelligent databases, contained within the NSS, are
stored in registers and contain information regarding
various aspects of the relation of the subscriber and the
25 cellular network. One such database, the Home Location
Register ("HLR"), contains administrative information,
including identity and location of the subscriber's handset
within the network. Another database, Visitor Location
Register ("VLR"), contains information concerning a mobile
30 unit detected in a cell that is home registered in another

5 HLR. Information is retrieved from the SIM in the visitor's mobile unit and the subscriber's profile is downloaded to the VLR from the subscriber's home location HLR and retained during the time the visitor remains in the MSC's area. Also contained within the NSS is a database - Equipment Identity Register - containing a list of all valid mobile handsets on the network and a database - Authentication Center - containing a secret key in each subscriber's SIM, used for authentication and encrypting on the radio channel.

10 Communication with the databases and BSS, MSC and Short Message Service Center ("SMSC") are supported by a protocol described by GSM specifications - Mobility Application Part ("MAP"). SMSC is the GSM network node responsible for routing short messages that may utilize a protocol, Short
15 Message Peer-to-Peer ("SMPP"), through the SMSC to subscribers.

20 Intelligent Networking ("IN") provides service applications for wireless communications. IN is an architecture for telephony networks that employs a Service Control Point ("SCP") and Intelligent Peripherals ("IP") to control handling of calls at a telephony switch. An IP provides voice resources to a SCP and aids in executing subscriber services by playing announcements to a subscriber and collecting digits entered from a subscriber's handset.
25 SCP executes subscriber services that can control certain functions of the MSC, IP and SMSC.

30 Among the various service applications available is a service that enables a business user to play a promotional announcement as a subscriber initiates a call. The business user provides an option for the subscriber to listen to the

announcement and receive a portion of the initiated call for free, because the business user sponsors a portion of the call. The listener has the option of listening, aborting or by-passing the announcement by pressing a designated key. A
5 term for this service is "Sponsored Call." Sponsored Call is a service supported by Customized Applications for Mobile network Enhanced Logic ("CAMEL"). CAMEL, covered in GSM standard 09.78 (version 5.3.0, 1998-01) enhances GSM to provide Intelligent Network services.

10 IN expands service options of cellular communication and Sponsored Call is a potentially profitable option. A sponsored call may be a personal call, to any party, by the subscriber, unrelated to an advertisement. However, the advertisement is an audio message and if the subscriber
15 wants to take advantage of the product or service offered by the advertising sponsor, the subscriber must remember the specifics of the offer during the sponsored phone call which follows the advertisement. A long phone call by the subscriber would increase the probability that the
20 subscriber would forget important details of the advertisement.

It would be desirable therefore, to provide a method and apparatus for text messaging, utilizing Subscriber
25 Identity Module, Global System for Mobile communications and Short Message Service that would enhance and supplement recorded audio transmissions. It would further be desirable to provide specific recorded text messages to associate with selected recorded audio transmissions to a selected mobile unit (handset) within a mobile telephone communications
30 system to insure the subscriber retains details of an audio transmission.

SUMMARY OF THE INVENTION

5 It is therefore one object of the present invention to provide a method and apparatus for sending and receiving text messages within a cellular communications network utilizing Subscriber Identity Module, Global System for Mobile communications and Short Message Service to enhance and supplement audio transmissions.

10 It is another object of the present invention to provide a method and apparatus for associating a text message with an audio message.

It is yet another object of the present invention to provide a method and apparatus for delivering an audio message and an associated text message simultaneously to a subscriber's handset.

15 The foregoing objects are achieved as is now described. A combination of Global System for Mobile communications (GSM) capabilities including Short Message Service (SMS), Subscriber Identity Module (SIM) and Customized Applications for Mobile network Enhanced Logic (CAMEL) allows an
20 advertiser to pay a portion of the airtime cost of a call originated by a mobile subscriber after that subscriber has listened to a recorded advertisement. The combination delivers a text message that associates with a recorded audio advertisement. The text message, which may be
25 referred to later, is stored by the subscriber's handset and may be a transcript of the audio advertisement, provide additional details of the audio advertisement or it may contain an electronic coupon associated with the

Docket No. RR2370

advertisement.

The above as well as additional objects, features, and advantages of the present invention will become apparent in the following detailed written description.

BRIEF DESCRIPTION OF THE DRAWINGS

The novel features believed characteristic of the invention are set forth in the appended claims. The invention itself however, as well as a preferred mode of use, further objects and advantages thereof, will best be understood by reference to the following detailed description of an illustrative embodiment when read in conjunction with the accompanying drawings, wherein:

Figure 1 depicts a high-level diagram of network connections in a communications system in which a preferred embodiment of the preferred invention may be implemented;

Figure 1A illustrates a high-level block diagram of a portion of a cellular network in which a preferred embodiment of the present invention may be implemented; and

Figure 2 is a high level flow chart of the process for delivering a text message to a mobile phone display, simultaneously with an audio message in accordance with a preferred embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

5 With reference now to the figures, and in particular
with reference to **Figure 1**, a high-level diagram of network
connections in a communications system, in which a preferred
embodiment of the preferred invention may be implemented, is
depicted. Network 100 is a cellular network operating as
described by GSM specifications. Connections and signalling
between each element within the network are governed and
described by GSM specifications. Subscriber Identity Module
10 ("SIM") 104 is a "smart card" device which is a self-
contained computer with its own CPU and memory. It plugs
into the mobile unit ("handset") 102 and identifies a mobile
subscriber to the GSM network. SIM 104 is compliant with
"Specification of the SIM Application Toolkit for the
15 Subscriber Identity Module-Mobile Equipment (SIM-ME)
Interface," GSM standard 11.14 (version 7.0.0, release
1998), and has the capability to store and execute
applications that interact with the handset 102. Base
Station 106 receives and transmits text and audio to handset
20 102.

Mobile Switching Center 108 is similar to a traffic cop
directing incoming and outgoing transmissions to Base
Station 106. As the subscriber moves into a new location
area (a specified group of cells within the network that
25 have a common location address within the network), handset
102 retrieves subscriber information from SIM 102 and
automatically transmits through MSC 108 to Service Control
Point 112. If the subscriber moves from one cell to another
within the same location area, handset 102 does not send a
30 location update message. Handset 102 only sends a location

update to MSC 108 when the subscriber moves from a cell in one location area to a cell in a different location area.

5 SCP 112 executes service logic for subscriber services that may control certain functions of MSC 108, Intelligent Peripheral 120 and Short Message Service Center 116. SCP 112 is connected to SMSC 116 through a protocol such as those described in "Interface Protocols for the connection of Short Message Service Centers to Short Message Entities," GSM 03.39 (version 5.0.0, November 1996). IP 120 is a well known Intelligent Network concept. It provides interactive voice resources to SCP 112 and aids SCP 112 in executing subscriber services by playing announcements to a subscriber and collecting numbers entered from a subscriber's handset. SCP 112 controls IP 120 using a protocol such as Intelligent Network Application Part ("INAP"). IP 120 is connected to MSC 108 by a standard telephony voice trunk.

As a subscriber moves into a new location area, handset 102 sends a location update message to MSC 106. GSM CAMEL Intelligent Network (IN) trigger processing logic in MSC 108 sends notification of a location update to SCP 112. Location update notification triggers sponsored call service logic at SCP 112 to send a short message, utilizing GSM Short Message Service, to subscriber's handset 102. SCP 112 must send a message to SMSC 116 requesting SMSC 116 to send the short message. The short message contains: a special character string indicating the short message is to be processed by a SIM 104 application; advertisement text; a correlation identifier corresponding to an audio advertisement stored in IP 120 and an expiration date and time. The short message is received and processed by the Sponsored Call Application in SIM 104. It is stored as a

normally received short message that may be displayed at a later time.

The message is not visible to the subscriber and the subscriber is unaware of the short message reception.
5 Several short messages may be sent to the subscriber's handset and stored in SIM 104. As the subscriber makes a call, additional digits are attached to the original dialed number that include the sponsored call code and a correlation identifier. The code initiates the sponsored
10 call feature and the identifier causes the IP to play an audio advertisement associated with the stored short message identifier.

Referring to **Figure 1A**, a high-level block diagram of a portion of a cellular network in which a preferred
15 embodiment of the present invention may be implemented, is illustrated. Cellular network 120 includes electronically defined land areas for handling cellular transmissions to and from a larger wireless/cellular telephony network. Cell 122 is supported by a Base Station Subsystem (not shown)
20 that connects with Network Switching Subsystem (NSS) 124. NSS 124 utilizes various components and protocols including MSC, SCP, IP, etc., to provide communication services between mobile units or between mobile units and Public Switched Telecommunication Network (PSTN) 128 (regular wire
25 and cable telephone service).

Referring now to **Figure 2**, a high level flow chart of the process for delivering a text message, to a mobile phone display, simultaneously with an audio message in accordance with a preferred embodiment of the present invention, is
30 illustrated. The process begins with step 200, which

illustrates a subscriber to a mobile telephone service turning on the subscriber's handset. The process proceeds to step 202, which illustrates the subscriber moving from one cell to another within the mobile telephone service area. The process next proceeds to step 204, which depicts a determination of whether or not the handset has moved into a cell within the same location area. If the handset has moved into a new cell in the same location area, the process passes to step 206, which illustrates handset not sending a location update message to the service provider's mobile switching center (MSC).

If the handset has moved into a new cell that is located in a new location area, the process then proceeds to step 208, which depicts the MSC sending a location update to the Service Control Point (SCP). Other methods to signal the SCP to transmit sponsored call short messages may be to automatically send messages to target subscribers based on time of day or subscriber information provided when signing up or a subscriber dialing a sponsored call code (subscriber intentionally invokes service to receive an advertisement to receive free call time). The process then proceeds to step 210, which illustrates the SCP requesting the Short Message Service Center to send a short message to the subscriber's handset. The short message is sent to the handset if the handset is powered on. If the handset is not powered on, the SM is stored at the HLR of the subscriber. After the handset powers up the short message is sent to the subscriber's handset.

Transmitting this short message may be triggered by any of several methods including a GSM CAMEL intelligent Network Location Update Trigger. The short message contains: a

special character string indicating the short message is to be processed by a SIM application; advertisement text; a correlation identifier corresponding to an audio advertisement stored in the intelligent peripheral (IP) and a message expiration time and date. The short message is received by the subscriber's handset and is processed by the Sponsored Call Application ("SCA") in the Subscriber Identity Module (SIM) within the subscriber's handset. The short message is not visible to the subscriber and the subscriber is not aware of its reception. Several messages may be stored in the SIM.

After the short message has been stored in the SIM, the process then passes to step 214, which depicts the subscriber dialing a number and pressing the send key on the handset. The process next passes to step 216, which illustrates the SCA logic, in the SIM, intercepting the digits that were entered when the subscriber pressed the send key. The process continues to step 217, which depicts the SIM determining if the stored text message has expired. As discussed previously, the SIM receives the message from the SMSC with an expiration period attached. The SIM checks the message expiration and if the message date and time has expired, the process proceeds to step 219, which illustrates the SIM allowing the call to originate from the handset without attaching a sponsored call feature code. This will prevent the Sponsored Call Service from being activated. If the text message date and time has not expired, the process instead passes to step 218, which depicts the SCA logic attaching a sponsored call feature code (for activating a CAMEL supported Detection Point at the MSC) to the dialed number and the call is originated. The process then passes to step 220, which illustrates the SCA preparing to display

text of the previously received short message on the handset display.

5 The process next proceeds to step 222, which depicts the sponsored call application originating the call after attaching the advertisement correlation code to the dialed number. The process then continues to step 224 which illustrates a Detection Point 3 (CAMEL supported sponsored call feature) trigger being sent to the SCP to initialize Sponsored Call service logic. The process passes to step 10 226, which depicts the SCP instructing the Intelligent Peripheral (IP) to play an audio advertisement associated with the text message currently displayed on the subscriber's handset. Next, the process proceeds to step 228, which illustrates the IP transmitting the audio message 15 to the handset and the SIM simultaneously displaying the text message previously received. For example, the audio message may be an advertisement by a restaurant near or within the subscriber's location area - "Have plans for lunch? Come to Pizza House today and get a large pepperoni 20 for \$2.00. Press 7 to receive 5 minutes on this call." At the same time a text message could be displayed on the terminal display of the hand set - "Today's lunch special is a large pepperoni pizza for \$2 at Pizza House 222 E. Main st. 555-2222." The SIM displays the stored text 25 advertisement, corresponding to the audio message transmitted to the handset.

30 The process then passes to step 230, which depicts the IP transmitting a randomly generated acknowledgement code announcement at the end of the advertisement. The code must be entered to confirm the subscriber has listened to the audio advertisement. Otherwise, the subscriber will receive

no free call time. After the text message is displayed by the handset, the process continues to step 232, which illustrates the IP, having transmitted the advertisement, detecting whether or not the subscriber has sent the acknowledgment code. If the wrong code is transmitted or no code is transmitted, the process then passes to step 234, which depicts the no free time being credited to the call in progress. The process then continues to step 238, which illustrates the SIM storing the text message for possible later retrieval by the subscriber.

If the subscriber does send the proper acknowledgment code, the process instead proceeds to step 236, which depicts a specified amount of time being credited to the subscriber's call. The process next proceeds to step 238 and the text message is stored for possible recall.

The present invention delivers a text message that accompanies a pre-recorded advertisement transmitted to a subscriber's handset. A portion of a wireless call made by a subscriber may be paid for by an advertiser whose audio message is transmitted to the subscriber's handset. The invention associates and displays a text message with the audio advertisement. The text message may be a transcript of the audio advertisement, it may include additional details or it may contain an electronic coupon associated with the audio advertisement. The text message may be referred to later, by the subscriber, as the text message is stored in the handset.

Existing standard GSM capabilities are enhanced by coordinating SIM-based applications, GSM CAMEL intelligent network capabilities and Short Message Service to

simultaneously provide a text message and an associated pre-recorded audio message to a subscriber. This improves the existing Sponsored Call service by making the service more appealing and easier to use.

- 5 While the invention has been particularly shown and described with reference to a preferred embodiment, it will be understood by those skilled in the art that various changes in form and detail may be made therein without departing from the spirit and scope of the invention.

CLAIMS:

What is claimed is:

- 1 1. A method for simultaneously transmitting text and audio
2 calls to a selected mobile unit within a cellular telephony
3 network, comprising the steps of:
4 transmitting a trigger signal from said selected mobile
5 unit to a mobile switching center;
6 sending a short text message to said mobile unit;
7 receiving a call from said selected mobile unit;
8 transmitting a recorded audio message to said mobile
9 unit;
10 said mobile unit receiving said text message prior to
11 reception of said audio message or during reception of said
12 audio message; and
13 said mobile unit simultaneously displaying said short
14 text message with said recorded audio message.
- 1 2. The method of claim 1, wherein transmitting an
2 electronic trigger from said selected mobile unit to said
3 mobile switching center, further comprises;
4 said mobile unit automatically transmitting a location
5 update message to said mobile service center.
- 1 3. The method of claim 1, wherein the step of sending a
2 short text message to said mobile unit via said switching
3 center, further comprises:
4 notifying a Service Control Point of a location update
5 from said mobile unit;
6 triggering call service logic within said Service
7 Control Point to send said short text message;
8 sending said short text message to Subscriber Identity
9 Module in said mobile unit: and

10 storing said short text message in said Subscriber
11 Identity Module.

1 4. The method of claim 3, wherein said Subscriber Identity
2 Module functions comprise:
3 intercepting a dialed number;
4 attaching a sponsored call feature code prefix to an
5 original dialed number, wherein said prefix includes a
6 correlation identifier;
7 uploading said dialed number to said mobile unit;
8 receiving a text message; and
9 displaying said text message on a display screen of
10 said mobile unit.

1 5. The method of claim 1, wherein sending a recorded audio
2 message to said mobile unit via said switching center,
3 further comprising:
4 triggering Sponsored Call logic at a Service Control
5 Point;
6 instructing an Intelligent Peripheral to play an audio
7 message associated with said text message; and
8 sending a message acknowledgment code to said mobile
9 unit for subscriber to enter.

1 6. The method of claim 1, wherein said mobile unit
2 receiving and displaying said short text message, further
3 comprises:
4 retrieving a message from SIM memory; and
5 displaying said message on said mobile unit display
6 screen.

1 7. The method of claim 1, wherein said mobile unit

2 simultaneously displaying short text message and playing
3 said recorded audio message, further comprises:

4 triggering Service Control Point Sponsored Call logic
5 to instruct an Intelligent Peripheral to transmit an audio
6 message to said mobile unit that correlates to previously
7 received text message;

8 displaying said text message while playing said audio
9 message; and

10 transmitting an acknowledgment code that said
11 subscriber must send at the end of said audio message to
12 acknowledge receipt of said audio message.

1 8. The method of claim 1, wherein said mobile unit
2 receiving said text message prior to reception of said audio
3 message or during reception of said audio message, further
4 comprises

5 transmitting said short text message in same data
6 stream with said audio message.

1 9. The method of claim 1, wherein said mobile unit
2 receiving said text message prior to reception of said audio
3 message or during reception of said audio message, further
4 comprises

5 transmitting said short text message in parallel data
6 stream concurrently with said audio message.

1 10. An apparatus for simultaneously transmitting text and
2 audio calls to a selected mobile unit within a cellular
3 telephony network, comprising:
4 means for transmitting a trigger signal from said
5 selected mobile unit to a mobile switching center;
6 means for sending a short text message to said mobile
7 unit;
8 means for receiving a call from said selected mobile
9 unit;
10 means for transmitting a recorded audio message to said
11 mobile unit;
12 means for said mobile unit receiving said text message
13 prior to reception of said audio message or during reception
14 of said audio message; and
15 means for said mobile unit simultaneously displaying
16 said short text message with said recorded audio message.

1 11. The apparatus of claim 10, wherein means for
2 transmitting an electronic trigger from said selected mobile
3 unit to said mobile switching center, further comprises:
4 means for said mobile unit automatically transmitting a
5 location update message to said mobile service center.

1 12. The apparatus of claim 10, wherein means for sending a
2 short text message to said mobile unit via said switching
3 center, further comprises:
4 means for notifying a Service Control Point of a
5 location update message from said mobile unit;
6 means for triggering call service logic within said
7 Service Control Point to send said short text message;
8 means for sending said short text message to Subscriber
9 Identity Module in said mobile unit; and
10 means for storing said short text message in said

11 Subscriber Identity Module.

1 13. The apparatus of claim 12, wherein said Subscriber
2 Identity Module functions, comprise:
3 means for intercepting a dialed number;
4 means for attaching a sponsored call feature code
5 prefix to an original dialed number, wherein said prefix
6 includes a correlation identifier;
7 means for uploading said dialed number to said mobile
8 unit;
9 receiving a text message; and
10 displaying said text message on a display screen of
11 said mobile unit.

1 14. The apparatus of claim 10, wherein means for sending a
2 recorded audio message to said mobile unit via said
3 switching center, further comprising:
4 means for triggering Sponsored Call logic at a Service
5 Control Point;
6 means for instructing an Intelligent Peripheral to play
7 an audio message associated with said text message; and
8 means for sending a message acknowledgment code to said
9 mobile unit for subscriber to enter.

1 15. The apparatus of claim 10, wherein means for said
2 mobile unit receiving and displaying said short text
3 message, further comprises:
4 means for retrieving a message from SIM memory; and
5 means for displaying said message on said mobile unit
6 display screen.

1 16. The apparatus of claim 1, wherein means for said mobile

2 unit simultaneously displaying short text message and
3 playing said recorded audio message, further comprises:
4 means for triggering Service Control Point Sponsored
5 Call logic to transmit an audio message to said mobile unit
6 that correlates to previously received text message;
7 means for displaying said text message while playing
8 said audio message; and
9 means for transmitting an acknowledgment code that said
10 subscriber must send at the end of said audio message to
11 acknowledge receipt of said audio message.

1 17. The apparatus of claim 1, wherein means for said mobile
2 unit receiving said text message prior to reception of said
3 audio message or during reception of said audio message,
4 further comprises
5 means for transmitting said short text message in same
6 data stream with said audio message.

1 18. The apparatus of claim 1, wherein means for said mobile
2 unit receiving said text message prior to reception of said
3 audio message or during reception of said audio message,
4 further comprises
5 transmitting said short text message in parallel data
6 stream concurrently with said audio message.

Ottawa, Canada
Patent Agents

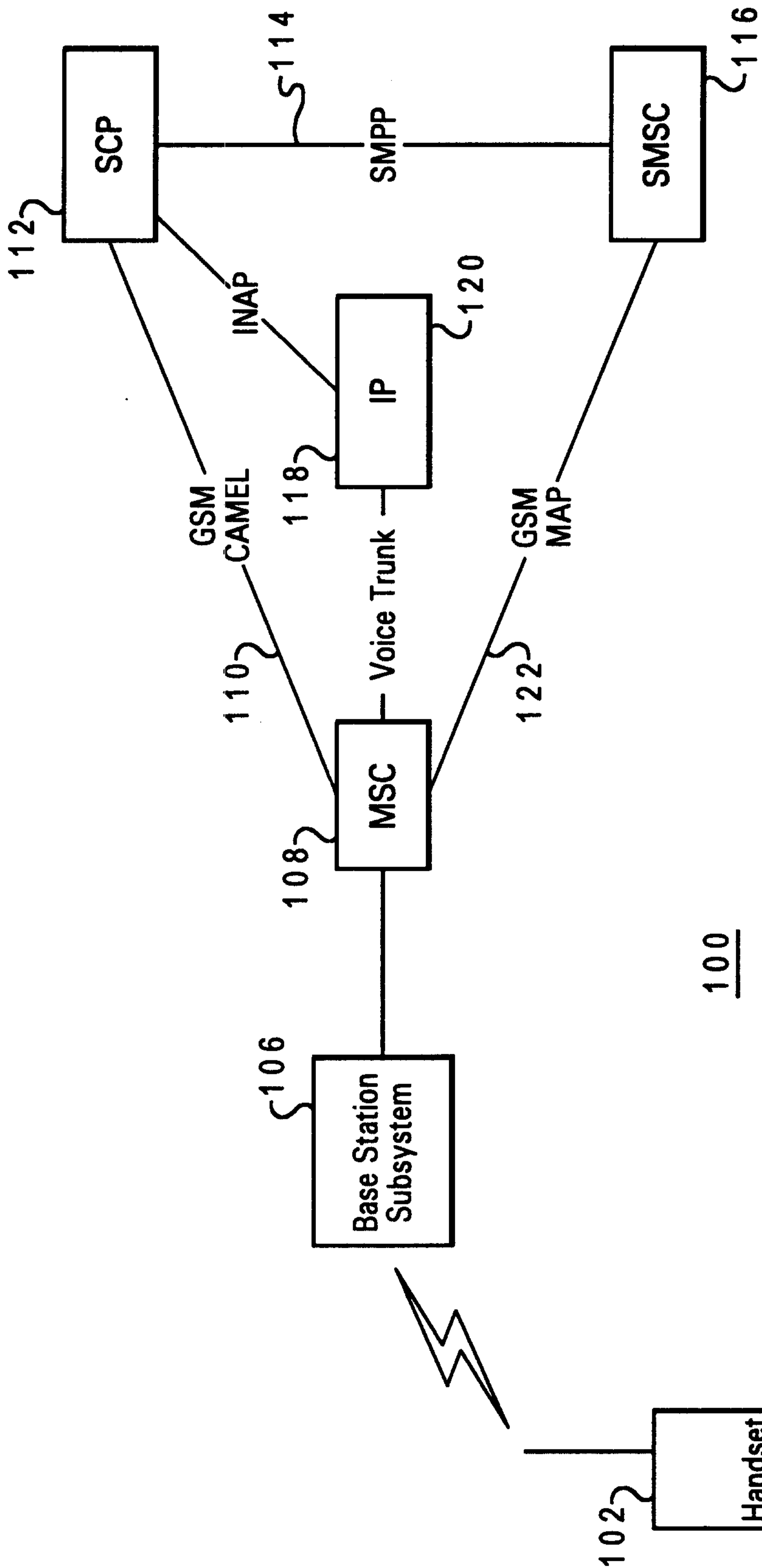
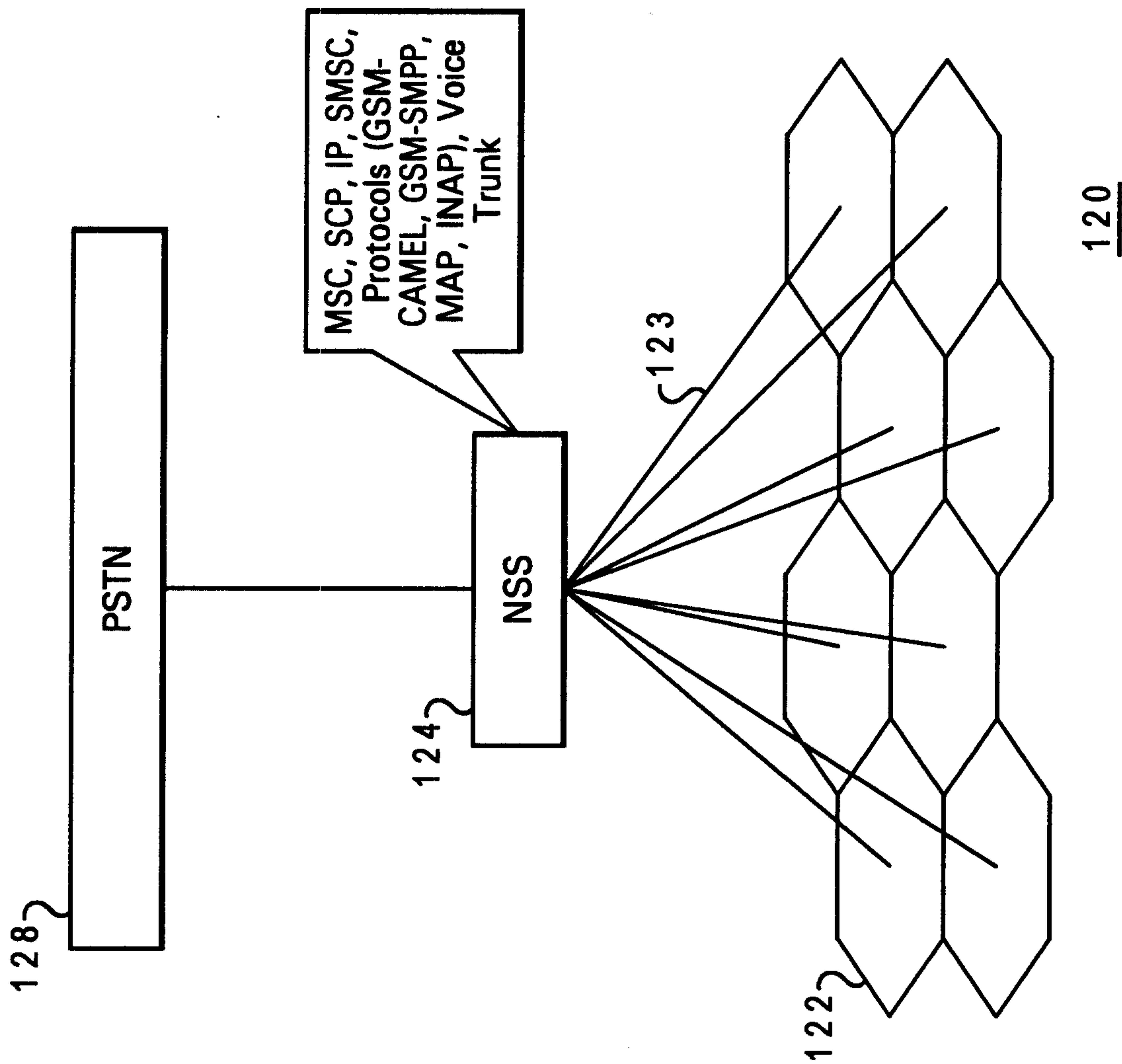


Fig. 1



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Fig. 1A

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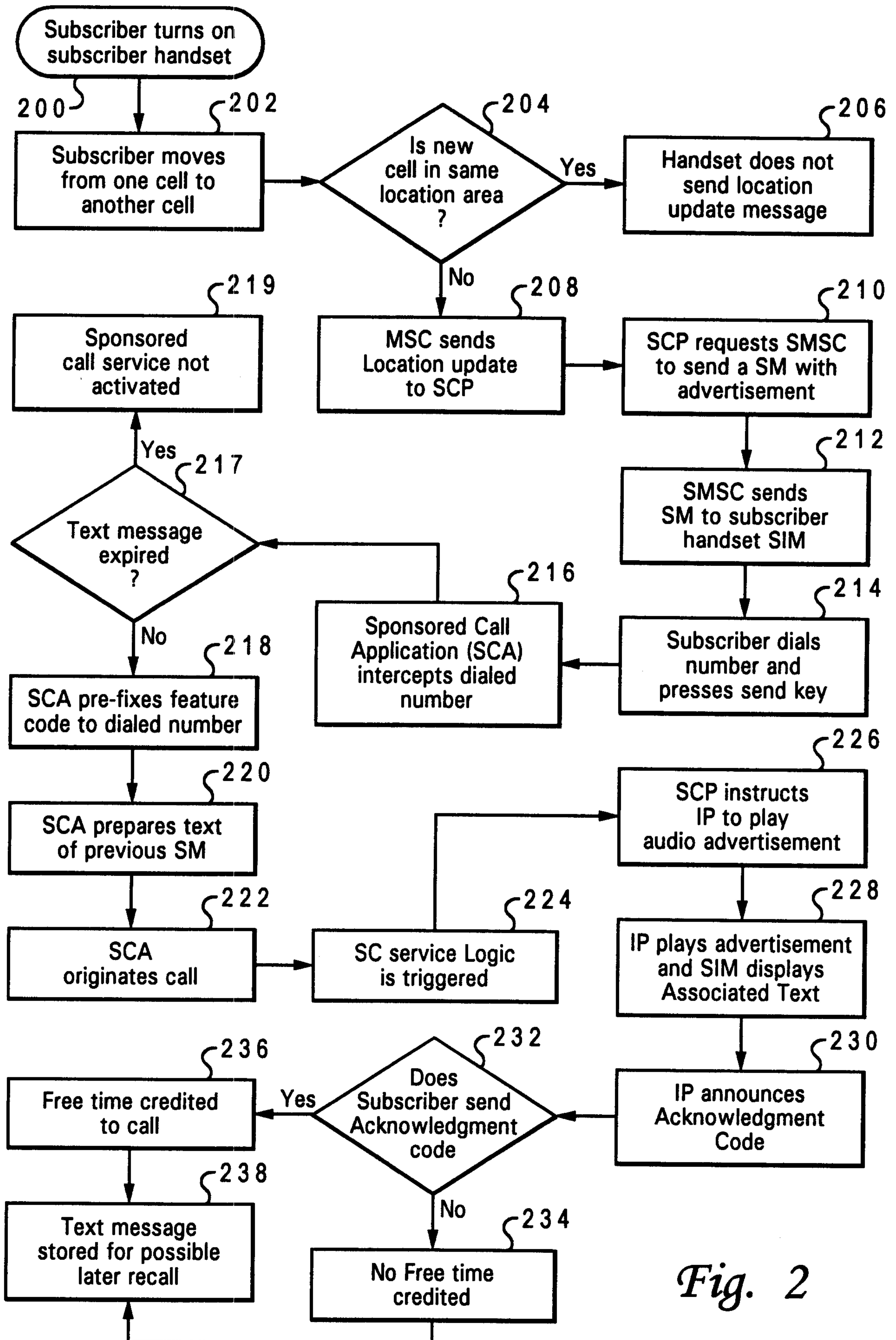


Fig. 2