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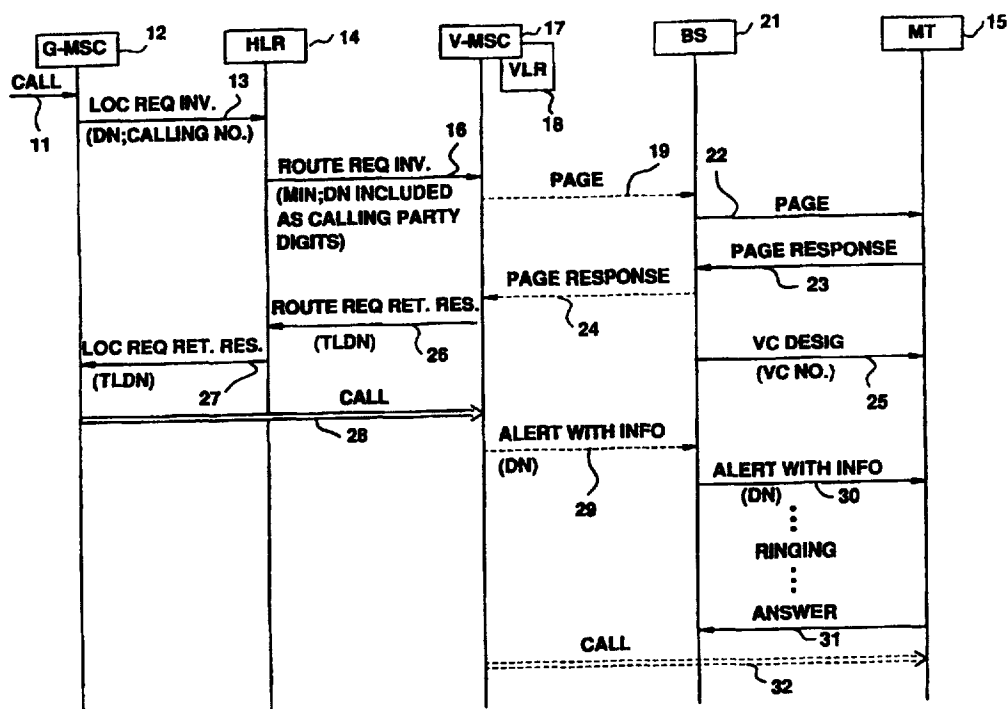
(51) International Patent Classification ⁶ : H04Q 7/22, 7/38, H04M 3/42		A2	(11) International Publication Number: WO 98/05173
			(43) International Publication Date: 5 February 1998 (05.02.98)
(21) International Application Number: PCT/SE97/01247 (22) International Filing Date: 8 July 1997 (08.07.97) (30) Priority Data: 08/686,655 26 July 1996 (26.07.96) US (71) Applicant: TELEFONAKTIEBOLAGET LM ERICSSON (publ) [SE/SE]; S-126 25 Stockholm (SE). (72) Inventor: CAMERON, Duncan, Peter, Craig; Flat 3, 28 Marshall Road, Farncombe Godalming, Surrey GU7 3AS (GB). (74) Common Representative: TELEFONAKTIEBOLAGET LM ERICSSON; Patent and Trademark Dept., S-126 25 Stock- holm (SE).		(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW, ARIPO patent (GH, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG). Published <i>Without international search report and to be republished upon receipt of that report.</i>	

(54) Title: SYSTEM AND METHOD OF CALLING A SINGLE MOBILE TELEPHONE THROUGH MULTIPLE DIRECTORY NUMBERS IN A RADIO TELECOMMUNICATIONS NETWORK

(57) Abstract

A system and method in a radio telecommunications network of utilizing a plurality of telephone numbers with a single mobile telephone (15) by changes to the network rather than the mobile telephone are disclosed. The system provides a mobile subscriber with an indication of the directory number dialed by the calling party. A plurality of directory numbers, a plurality of mobile identification numbers (MINs), and a plurality of alpha-numeric strings are stored in a database in the network such as a home location register (HLR) (14). Several directory numbers are associated with the mobile telephone's MIN, and then each directory number is associated with

an alpha-numeric string. When a directory number is dialed, an associated MIN and alpha-numeric string are identified. The MIN and alpha-numeric string are then transported through the network to the mobile telephone (15) while the mobile telephone is being alerted. The called subscriber is informed of the dialed directory number either by a short message service (SMS) message (54) carrying the alpha-numeric string, or by substituting the dialed directory number for a calling line identification (CLI) number in an Alert With Info signal (30) sent to the mobile telephone.



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**SYSTEM AND METHOD OF CALLING A SINGLE MOBILE TELEPHONE
THROUGH MULTIPLE DIRECTORY NUMBERS IN A RADIO
TELECOMMUNICATIONS NETWORK**

5 BACKGROUND OF THE INVENTION

Technical Field of the Invention

This invention relates to radio telecommunication systems and, more particularly, to a system and method of
10 calling a single mobile telephone through multiple directory numbers without modifying the mobile telephone.

Description of Related Art

Many mobile subscribers utilize their mobile telephones for more than one purpose, and desire to answer
15 incoming calls differently, depending on the nature of the call. They may accept both business and personal calls on the same telephone, or they may have more than one business or more than one source of incoming business calls. A mobile plumber, for example, may have calls
20 coming in on both his own business telephone number as well as on a 800-number from a referral group. The plumber may answer the calls differently, depending on which number was called.

For different callers, or calls to different numbers,
25 the subscriber may wish to answer the call in different ways, ignore the call, or choose to have the call transferred in different ways. Currently, the only way for a subscriber utilizing a standard mobile telephone to distinguish between incoming calls is through a
30 distinctive alerting feature which alerts the subscriber through a series of ringing pulses that an incoming call is, for example, a call to a group of mobile telephones. Other than this limited capability, however, mobile subscribers utilizing standard mobile telephones currently
35 do not have any way to know the nature of an incoming call.

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Although there are no known prior art teachings of a solution to the aforementioned deficiency and shortcoming such as that disclosed herein, there are a number of references that discusses subject matter that bears some relation to matters discussed herein. U.S. Patent Number 4,677,653 to Weiner et al. (Weiner) discloses an adaptor for a cellular mobile telephone unit that converts the unit to include a plurality of telephone numbers. A plurality of ROMs, configured as Number Assignment Modules (NAMs), are connected through a multi-position switch to the unit's microprocessor. Thus, the telephone may be configured to operate, one at a time, with a different telephone number by selecting a different NAM with the multi-position switch. Weiner thus requires modification of the mobile telephone itself, and does not teach or suggest a method of simultaneously utilizing multiple telephone numbers with a single mobile telephone by changes to the cellular network rather than the mobile telephone. In addition, Weiner does not teach or suggest a network implementation that provides the mobile subscriber with an indication of the directory number dialed by the calling party. The present invention discloses a network implementation that associates multiple Directory Numbers (DNs) with a single Mobile Identification Number (MIN) in a Home Location Register (HLR) to enable several directory numbers to reach a single mobile telephone, and then passes the dialed DN to the mobile telephone.

European Patent Application EP 0,378,450 A2 discloses a cellular telephone containing several different telephone numbers. Also described is the transfer of a telephone number from a portable radio telephone to a mobile radio telephone which results in the mobile telephone simultaneously having two or more telephone numbers. However, EP 0,378,450 A2 does not teach or suggest a method of utilizing multiple telephone numbers with a single mobile telephone by changes to the cellular

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network rather than the mobile telephone. In addition, EP 0,378,450 A2 does not teach or suggest a network implementation that provides the mobile subscriber with an indication of the directory number dialed by the calling party. The present invention provides such a network implementation.

U.S. Patent Number 4,742,560 to Arai (Arai) discloses a mobile cellular telephone which has different telephone numbers for different service areas stored in a Number Assignment Module (NAM) in the mobile telephone. The telephone numbers are stored in the telephone in conjunction with the telephone's MIN and with a respective service area identification code. Thus, Arai requires modification of the mobile telephone itself, and does not teach or suggest a method of utilizing multiple telephone numbers with a single mobile telephone by changes to the cellular network rather than the mobile telephone. In addition, Arai does not teach or suggest a network implementation that provides the mobile subscriber with an indication of the directory number dialed by the calling party. The present invention provides such a network implementation.

U.S. Patent Number 5,448,622 to Huttunen (Huttunen) discloses a cellular radio telephone converted to operate with a plurality of telephone numbers. All of the telephone numbers may be concurrently enabled for incoming calls, and the telephone may indicate on a visual display, the telephone number which is being called. However, Huttunen requires modification of the mobile telephone itself, and does not teach or suggest a method of utilizing multiple telephone numbers with a single mobile telephone by changes to the cellular network rather than the mobile telephone. In addition, Huttunen does not teach or suggest a network implementation that provides the mobile subscriber with an indication of the directory number dialed by the calling party rather than through

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changes to the mobile telephone. The present invention provides such a network implementation.

Review of each of the foregoing references reveals no disclosure or suggestion of a system or method such as
5 that described and claimed herein.

In order to overcome the disadvantage of existing solutions, it would be advantageous to have a system and method of utilizing multiple telephone numbers with a single mobile telephone by changes to the cellular network
10 rather than the mobile telephone. In addition, it would be advantageous for such a network implementation to provide the mobile subscriber with an indication of the directory number dialed by the calling party without any changes to the mobile telephone. The present invention
15 provides such a system and method.

SUMMARY OF THE INVENTION

The present invention is a system and method of utilizing multiple telephone numbers with a single mobile
20 telephone by changes to the cellular network rather than the mobile telephone. The present invention provides the mobile subscriber with an indication of the directory number dialed by the calling party without any changes to the mobile telephone.

In the network implementation of the system and method of the present invention, several directory numbers are first associated with one MIN, and then each directory number is associated with an alpha-numeric string which is transported through the network to the mobile telephone
30 while the mobile telephone is being alerted.

Thus, in one aspect, the present invention is a system in a radio telecommunications network for utilizing multiple directory numbers with a single mobile telephone. The system comprises a database in the network for storing
35 a plurality of directory numbers, a plurality of mobile identification numbers (MINs), and a plurality of alpha-numeric strings of characters. The system also comprises

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means in the network for associating a plurality of the directory numbers with a single MIN, means in the network for associating each one of the plurality of directory numbers associated with the single MIN with one of the plurality of alpha-numeric strings, and means in the network for transmitting one of the plurality of alpha-numeric strings associated with a dialed directory number to the mobile telephone while the mobile telephone is being alerted.

10 In another aspect, the present invention is a method in a radio telecommunications network of utilizing multiple directory numbers with a single mobile telephone. The method includes the step of storing, in a database in the network, a plurality of directory numbers, a plurality of mobile identification numbers (MINs), and a plurality of alpha-numeric strings of characters. This is followed by the steps of associating a plurality of the directory numbers with a single one of the MINs, the MIN being associated with the mobile telephone, and then associating each one of the plurality of directory numbers associated with the single MIN with one of the plurality of alpha-numeric strings. The method then determines which one of the plurality of associated directory numbers is dialed, and transmits, through the network to the mobile telephone while the mobile telephone is being alerted, the alpha-numeric string associated with the dialed directory number.

BRIEF DESCRIPTION OF THE DRAWINGS

30 The invention will be better understood and its numerous objects and advantages will become more apparent to those skilled in the art by reference to the following drawing, in conjunction with the accompanying specification, in which:

35 FIG. 1 is a message flow diagram illustrating the flow of messages between various nodes of a radio telecommunications network which has been modified to

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perform a first embodiment of the method of the present invention; and

FIG. 2 is a message flow diagram illustrating the flow of messages between various nodes of a radio telecommunications network which has been modified to perform a second embodiment of the method of the present invention.

DETAILED DESCRIPTION OF EMBODIMENTS

The invention provides a network implementation of a system that enables a mobile telephone to simultaneously operate with a plurality of telephone numbers. This enables a mobile subscriber to distinguish between callers that may be calling him on different business lines, a personal telephone number, or a home telephone number, etc. For example, a mobile plumber may have calls coming in on both his own local business telephone number as well as on a 800-number from a referral group. The system of the present invention identifies the number being called and notifies the subscriber while the telephone is ringing, thereby enabling the subscriber to answer the calls differently, depending on the called number.

The mobile telephone retains a single mobile identification number (MIN), and a plurality of telephone numbers are associated with the MIN. The network routes any calls placed to any of the plurality of telephone numbers to the subscriber's mobile telephone. The network distinguishes which of the plurality of telephone numbers has been dialed, and sends an indication to the mobile telephone which may then display the called number to the subscriber on the mobile telephone display. The information may be displayed on the display as simply Line 1, Line 2, or Line 3, or the called telephone number may be displayed.

The telephone has a single mobile identification number (MIN) and a plurality of directory numbers (DNs) associated with the MIN in the subscriber's home location

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register (HLR). An alpha-numeric string is associated with each dialed directory number in the subscriber's HLR. The action is passed to the mobile telephone through the network. The subscriber is capable of changing the action associated with each dialed telephone number.

5 An association is made in the HLR between a plurality of directory numbers, an equal plurality of alpha-numeric strings, and a single MIN. The MIN is then passed in a routing request (RouteReq) invoke message to a visited
10 mobile switching center (V-MSC) where the called subscriber is located. The RouteReq invoke message may also contain a parameter with an alpha-numeric string associated with the directory number that was called. There may be some sharing of data between the HLR and the
15 visitor location register (VLR) associated with the V-MSC so that this parameter does not have to be transmitted with each call to the same number. The V-MSC then associates the alpha-numeric string with a display message for the subscriber, and causes its base stations to page
20 for the subscriber's mobile telephone. The display message is passed to the mobile telephone where it is displayed to the subscriber. The display message may be sent on a voice channel or across a digital control channel, for example by short message service (SMS)
25 message.

While the above description has indicated that the alpha-numeric strings are stored in the HLR and are associated with the dialed directory numbers therein, it should be understood that this information may be stored
30 elsewhere in the network and be passed to different nodes as needed. Likewise, the above description has indicated that the alpha-numeric strings are associated with the display messages in the V-MSC, but this association may be performed elsewhere with the required data passed to
35 different nodes as needed.

The mobile telephone may display the called number itself, or some other associated word such as, for

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example, Home or Line 1. These functions may be performed either before or after a trunk is established between the G-MSC and the V-MSC.

5 The addition of the message parameter indicating an alpha-numeric string is an extension of IS-41 for signaling between the G-MSC, the HLR, and the V-MSC. The addition of the message parameter is an extension of IS-45 for signaling between the V-MSC and the base station, and is an extension of IS-54 or IS-136 for signaling between
10 the base station and the mobile telephone. All of these standards are hereby incorporated by reference herein.

 Thus, in the network implementation of the system and method of the present invention, several directory numbers are first associated with one MIN, and then each directory
15 number is associated with an alpha-numeric string which is transported through the network to the mobile telephone while the mobile telephone is being paged. FIG. 1 is a message flow diagram illustrating the flow of messages between various nodes of a radio telecommunications
20 network which has been modified to perform a first embodiment of the method of the present invention. An incoming call 11 for a mobile telephone (MT) 15 may be received in a Gateway Mobile Switching Center (G-MSC) 12. The G-MSC then sends a Location Request Invoke (LocReq
25 Inv) message 13 to a Home Location Register (HLR) 14 to obtain location information and subscriber profile information for the called mobile telephone 15. The LocReq Inv message 13 includes the dialed DN of the called MT 15 and the calling party's telephone number. The HLR
30 14 includes a database of directory numbers, MINs, and alpha-numeric strings. The HLR may associate a dialed directory number with one of a plurality of alpha-numeric strings, and may associate a plurality of directory numbers with a single MIN.

35 After making its associations, the HLR 14 sends a Routing Request Invoke (RouteReq Inv) message 16 to a Visited Mobile Switching Center (V-MSC) 17 and includes

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the MIN for the called mobile telephone and the dialed directory number (DN) in place of the calling party digits in a standard RouteReq Inv message. The V-MSC may have an associated Visitor Location Register (VLR) 18. The V-MSC 17 then sends a page request 19 to the base station 21. The base station, in turn, pages the mobile telephone at 22.

A page response 23 is sent back to the base station 21 when the mobile telephone is successfully located. The base station, in turn, relays the page response to the V-MSC at 24 and designates a voice channel 25 from the base station to the mobile telephone. The V-MSC 17 then sends a Routing Request Return Result (RouteReq R.R.) message 26 to the HLR 14 and includes a routing number such as a Temporary Location Directory Number (TLDN). The HLR then sends a Location Request Return Result (LocReq R.R.) message 27 to the G-MSC 12 and includes the TLDN. A trunk 28 is then established between the G-MSC and the V-MSC. In other embodiments, the trunk 28 may be established between the G-MSC and the V-MSC prior to paging for the mobile telephone.

The V-MSC 17 then sends an Alert With Info signal 29 to the base station 21. This signal is similar to the Alert With Info signal utilized to transmit a calling party's telephone number to a called party subscribing to the Calling Line Identification (CLI) feature. However, in the present invention, the V-MSC includes the called DN in place of the calling party's telephone number. The Alert With Info, including the DN, is sent to the mobile telephone at 30, and the called DN is displayed for the subscriber on the display of the mobile telephone during the ringing period. The subscriber may then answer the call at 31 in a manner suitable for the called DN. The call is then completed to the mobile telephone at 32.

FIG. 2 is a message flow diagram illustrating the flow of messages between various nodes of the radio telecommunications network of FIG. 1 which has been

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modified to perform a second embodiment of the method of the present invention. An incoming call 41 for the mobile telephone (MT) 15 may be received in the G-MSC 12. The G-MSC then sends a Location Request Invoke (LocReq Inv) message 42 to the HLR 14 to obtain location information and subscriber profile information for the called mobile telephone 15. The LocReq Inv message 42 includes the DN of the called MT 15. The HLR 14 includes a database of directory numbers, MINs, and alpha-numeric strings. The HLR may associate the DN with one of a plurality of alpha-numeric strings, and may associate a plurality of DNs with a single MIN.

After making its associations, the HLR 14 sends a Routing Request Invoke (RouteReq Inv) message 43 to the V-MSC 17 and includes the MIN for the called mobile telephone and an alpha-numeric string associated with the dialed DN. The V-MSC 17 then sends a page request 44 to the base station 21. The base station, in turn, pages the mobile telephone at 45.

A page response 46 is sent back to the base station 21 when the mobile telephone is successfully located. The base station, in turn, relays the page response to the V-MSC at 47 and designates a voice channel 48 from the base station to the mobile telephone. The V-MSC 17 then sends a Routing Request Return Result (RouteReq R.R.) message 49 to the HLR 14 and includes a routing number such as a TLDN. The HLR then sends a Location Request Return Result (LocReq R.R.) message 51 to the G-MSC 12 and includes the TLDN. A trunk 52 is then established between the G-MSC and the V-MSC. In other embodiments, the trunk 52 may be established between the G-MSC and the V-MSC prior to paging for the mobile telephone.

At 53, the V-MSC 17 sends a short message service (SMS) message to the base station 21 with the alpha-numeric string which the HLR associated with the dialed DN and transmitted to the V-MSC in the RouteReq Inv message 43. When shown on the display of the mobile

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telephone, the string identifies the called telephone number. The base station then sends the SMS message with the string to the mobile telephone on the voice channel at 54. This is followed very shortly by an alert message
5 55 from the V-MSC to the base station and from the base station to the mobile telephone at 56. Thus, to the called subscriber, the SMS message string appears on the display of the mobile telephone nearly simultaneously with the beginning of the ringing. At 57, the subscriber may
10 choose to answer the call in a manner appropriate for the called number, and the call is completed at 58.

It is thus believed that the operation and construction of the present invention will be apparent from the foregoing description. While the method,
15 apparatus and system shown and described has been characterized as being preferred, it will be readily apparent that various changes and modifications could be made therein without departing from the spirit and scope of the invention as defined in the following claims.

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WHAT IS CLAIMED IS:

1. A system in a radio telecommunications network
5 for utilizing a plurality of directory numbers with a
single mobile telephone and informing a subscriber
utilizing said mobile telephone which one of said
plurality of directory numbers was dialed, said system
comprising:

10 a database in said network for storing said plurality
of directory numbers, a plurality of mobile identification
numbers (MINs), and a plurality of alpha-numeric strings
each of which identifies a different directory number when
displayed to said subscriber;

15 means in said network for associating a plurality of
said directory numbers with a single one of said MINs;

means in said network for associating each one of the
plurality of directory numbers associated with the single
MIN with one of said plurality of alpha-numeric strings;
20 and

means in said network for transmitting one of said
plurality of alpha-numeric strings associated with a
dialed directory number to said mobile telephone while
said mobile telephone is being alerted.

25 2. The system in a radio telecommunications network
for utilizing a plurality of directory numbers with a
single mobile telephone of claim 1 wherein said database
comprises a home location register (HLR).

30 3. The system in a radio telecommunications network
for utilizing a plurality of directory numbers with a
single mobile telephone of claim 2 wherein said means in
said network for associating said plurality of said
35 directory numbers with a single one of said MINs, and said
means in said network for associating each one of the
plurality of directory numbers associated with the single

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MIN with one of said plurality of alpha-numeric strings are included in said HLR.

4. The system in a radio telecommunications network for utilizing a plurality of directory numbers with a single mobile telephone of claim 3 wherein said means in said network for transmitting one of said plurality of alpha-numeric strings associated with a dialed directory number to said mobile telephone includes:

10 a mobile switching center (MSC) serving said mobile telephone;

a base station serving said mobile telephone; and

a plurality of communications protocols for transmitting said alpha-numeric string from said HLR to

15 said mobile telephone via said MSC and said base station.

5. The system in a radio telecommunications network for utilizing a plurality of directory numbers with a single mobile telephone of claim 4 wherein said plurality of communications protocols includes:

20 a first communications protocol for transmitting said alpha-numeric string from said HLR to said MSC;

a second communications protocol for transmitting said alpha-numeric string from said MSC to said base

25 station; and

a third communications protocol for transmitting said alpha-numeric string from said base station to said mobile telephone.

6. The system in a radio telecommunications network for utilizing a plurality of directory numbers with a single mobile telephone of claim 5 wherein said first communications protocol is based upon IS-41.

30

7. The system in a radio telecommunications network for utilizing a plurality of directory numbers with a

35

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single mobile telephone of claim 5 wherein said third communications protocol is based upon IS-54.

5 8. The system in a radio telecommunications network for utilizing a plurality of directory numbers with a single mobile telephone of claim 5 wherein said third communications protocol is based upon IS-136.

10 9. The system in a radio telecommunications network for utilizing a plurality of directory numbers with a single mobile telephone of claim 4 wherein said means in said network for transmitting one of said plurality of alpha-numeric strings associated with a dialed directory number to said mobile telephone includes means for sending
15 a short message service (SMS) message from said MSC to said mobile telephone.

20 10. A system in a radio telecommunications network for displaying a dialed directory number (DN) to a mobile subscriber while said subscriber's mobile telephone is being alerted, said system comprising:

 a database in said network for storing a plurality of directory numbers and a plurality of mobile identification numbers (MINs);

25 a mobile switching center (MSC) serving said mobile telephone;

 means within said database for including said dialed DN in a routing request message sent to said serving MSC; and

30 means within said serving MSC for including said dialed DN in an alerting message sent to said mobile telephone.

35 11. The system in a radio telecommunications network for displaying a dialed DN to a mobile subscriber of claim 10 wherein said database comprises a home location register (HLR).

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12. The system in a radio telecommunications network for displaying a dialed DN to a mobile subscriber of claim 11 wherein said means within said database for including said dialed DN in a routing request message sent to said serving MSC includes means for substituting said dialed DN for a calling party number in said routing request message.

13. The system in a radio telecommunications network for displaying a dialed DN to a mobile subscriber of claim 12 wherein said means within said serving MSC for including said dialed DN in an alerting message sent to said mobile telephone includes means for substituting said dialed DN for a calling party number in said alerting message.

14. The system in a radio telecommunications network for displaying a dialed DN to a mobile subscriber of claim 13 wherein said alerting message is an Alert With Info signal utilized to transmit a calling party's telephone number to a called party subscribing to a Calling Line Identification (CLI) feature.

15. In a radio telecommunications network, a method of utilizing a plurality of directory numbers with a single mobile telephone and informing a subscriber utilizing said mobile telephone which one of said plurality of directory numbers was dialed, said method comprising the steps of:

storing, in a database in said network, said plurality of directory numbers, a plurality of mobile identification numbers (MINs), and a plurality of alphanumeric strings each of which identifies a different directory number when displayed to said subscriber;

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associating a plurality of said directory numbers with a single one of said MINs, said MIN being associated with said mobile telephone;

5 associating each one of the plurality of directory numbers associated with the single MIN with one of said plurality of alpha-numeric strings; determining which one of said plurality of associated directory numbers is dialed; and

10 transmitting, through said network to said mobile telephone while said mobile telephone is being alerted, the alpha-numeric string associated with the dialed directory number.

15 16. The method of utilizing a plurality of directory numbers with a single mobile telephone of claim 15 wherein said step of storing, in a database in said network, said plurality of directory numbers, a plurality of mobile identification numbers (MINs), and a plurality of alpha-numeric strings includes storing said directory numbers, 20 said MINs, and said alpha-numeric strings in a home location register (HLR).

25 17. The method of utilizing a plurality of directory numbers with a single mobile telephone of claim 16 wherein said step of associating a plurality of said directory numbers with a single one of said MINs, and said step of associating each one of the plurality of directory numbers associated with the single MIN with one of said plurality of alpha-numeric strings are performed in said HLR.

30 18. The method of utilizing a plurality of directory numbers with a single mobile telephone of claim 17 wherein said step of transmitting one of said plurality of alpha-numeric strings associated with a dialed directory number 35 through said network to said mobile telephone includes:
identifying a mobile switching center (MSC) serving said mobile telephone;

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identifying a base station serving said mobile telephone; and

transmitting said alpha-numeric string from said HLR to said mobile telephone via said MSC and said base station utilizing a plurality of communications protocols.

19. The method of utilizing a plurality of directory numbers with a single mobile telephone of claim 18 wherein said step of transmitting said alpha-numeric string from said HLR to said mobile telephone via said MSC and said base station utilizing a plurality of communications protocols includes the steps of:

transmitting said alpha-numeric string from said HLR to said MSC utilizing a first communications protocol;

transmitting said alpha-numeric string from said MSC to said base station utilizing a second communications protocol; and

transmitting said alpha-numeric string from said base station to said mobile telephone utilizing a third communications protocol.

20. The method of utilizing a plurality of directory numbers with a single mobile telephone of claim 19 wherein said step of transmitting said alpha-numeric string from said HLR to said MSC utilizing a first communications protocol includes transmitting said alpha-numeric string utilizing a communications protocol based upon IS-41.

21. The method of utilizing a plurality of directory numbers with a single mobile telephone of claim 20 wherein said step of transmitting said alpha-numeric string from said base station to said mobile telephone utilizing a third communications protocol includes transmitting said alpha-numeric string utilizing a communications protocol based upon IS-54.

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22. The method of utilizing a plurality of directory numbers with a single mobile telephone of claim 20 wherein said step of transmitting said alpha-numeric string from said base station to said mobile telephone utilizing a
5 third communications protocol includes transmitting said alpha-numeric string utilizing a communications protocol based upon IS-136.

23. In a radio telecommunications network, a method
10 of displaying a dialed directory number (DN) to a mobile subscriber while said subscriber's mobile telephone is being alerted, said method comprising the steps of:

storing, in a database in said network, a plurality of directory numbers and a plurality of mobile
15 identification numbers (MINs);

identifying a mobile switching center (MSC) serving said mobile telephone;

transmitting a routing request message from said database to said serving MSC, said routing request message
20 including said dialed DN; and

transmitting an alerting message from said serving MSC to said mobile telephone, said alerting message including said dialed DN.

24. The method of displaying a dialed DN to a mobile subscriber of claim 23 wherein said step of storing, in a database in said network, a plurality of directory numbers and a plurality of mobile identification numbers (MINs) includes storing said plurality of directory
30 numbers and said plurality of mobile identification numbers (MINs) in a home location register (HLR).

25. The method of displaying a dialed DN to a mobile subscriber of claim 24 wherein said step of transmitting a routing request message from said database to said
35 serving MSC includes substituting said dialed DN for a calling party number in said routing request message.

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26. The method of displaying a dialed DN to a mobile subscriber of claim 24 wherein said step of transmitting an alerting message from said serving MSC to said mobile telephone includes substituting said dialed DN for a calling party number in said alerting message.

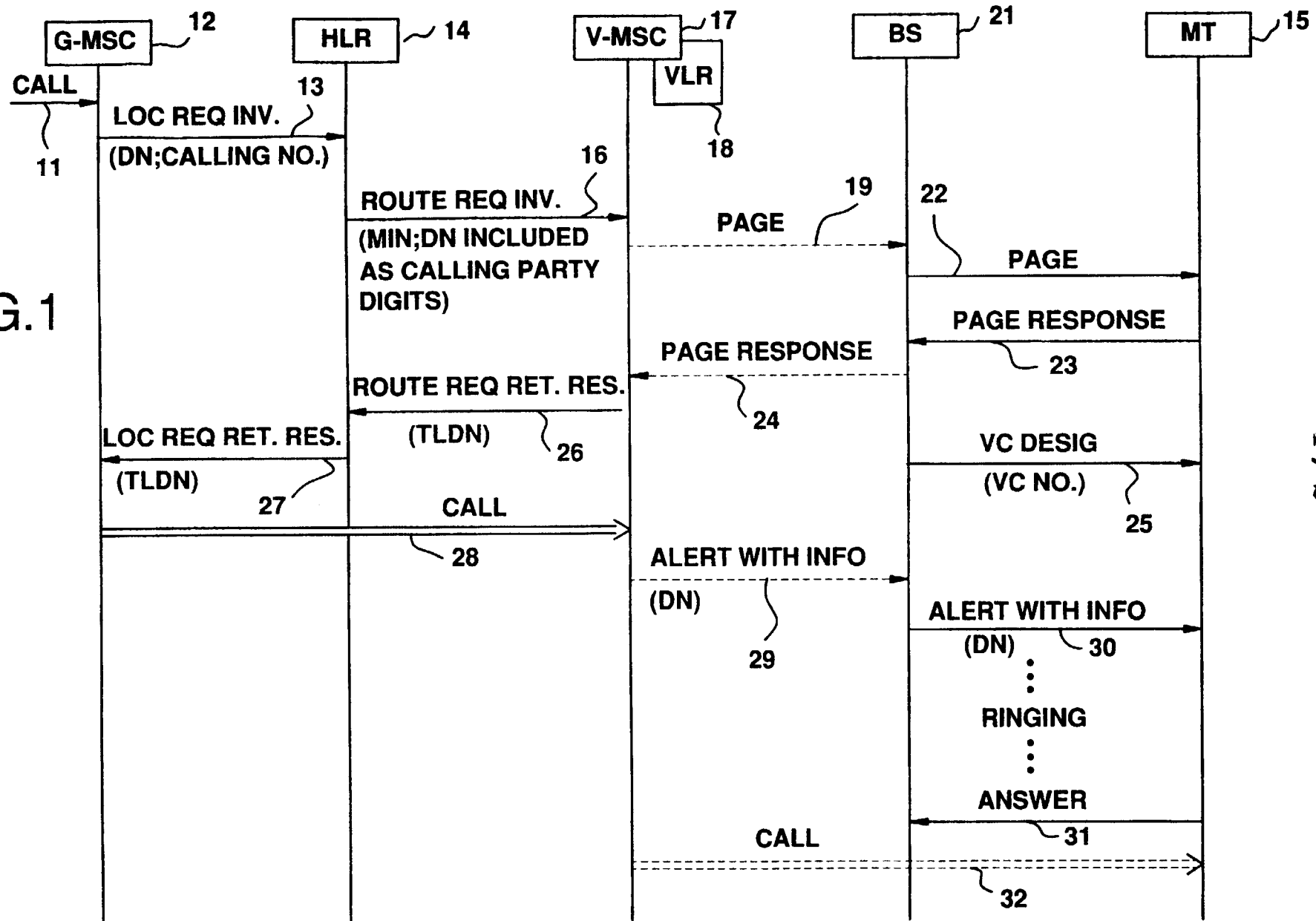
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27. The method of displaying a dialed DN to a mobile subscriber of claim 24 wherein said step of substituting said dialed DN for a calling party number in said alerting message includes substituting said dialed DN for a calling party number in an Alert With Info signal utilized to transmit a calling party's telephone number to a called party subscribing to a Calling Line Identification (CLI) feature.

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FIG. 1



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