CONTROLLING MESSAGING ON A CELLULAR TELEPHONE NETWORK

A method combining simple modification of manufactured MS handset design and implementing a screening application within the Home Location Register (HLR) to ensure the authenticity of all cellular SMS messages are from specific desired individuals and rejecting all others.
Controlling Messaging on a Cellular Telephone Network

The present invention relates to controlling messaging on a cellular telephone network, and more particularly to a method, apparatus, telecommunications system, mobile station, and associated computer program products for the selective reception and rejection of point-to-point short messages.

With the introduction of Global System for Mobile Communications (GSM) and other digital-based telecommunications systems, a number of progressive features additional to standard speech operations are now available to cellular mobile telephone subscribers. One such facility is that of a point-to-point short messaging service (SMS). A "short message" transmitted in this way is commonly termed as a text message. By employing the SMS mode of communication, a mobile network subscriber may communicate by text messaging with another Mobile Station (MS) or SMS terminal without establishment of a circuit connection.

The term "Mobile Station" (MS) would be most readily understood by a public consumer to refer to a mobile telephone, but it has a slightly broader technical meaning, referring in the case of 2G GSM systems to all of a mobile terminal, terminal equipment, terminal adaptor and Subscriber Identity Module (SIM), which together comprise the mobile "station" for accessing the telecommunications network. The term "MS" is intended in this description to be used interchangeably with the term "UE" (user equipment), as in common use when describing 3G GSM networks, and also to be used interchangeably with other non-GSM equivalents.

An originating mobile subscriber merely enters the content of the required text message via the MS handset keypad, inputs manually (or retrieves
from the MS database/contact list) the directory number affiliated with the destination (receiving) MS, and transmits the SMS message encompassing the required text message.

Current methods employed for screening of SMS messages within cellular networks only limit originator identification to a particular mobile station MS handset or SIM card. Apart from preventing its use by blocking if stolen, no current provision is made for the inappropriate use of one MS handset. For example, any user may pick up another's MS handset and access the contact list within. The consequences of such are obvious.

For example, two shortcomings exist with current SMS message delivery protocol. Firstly, a prevalent inability is inherent to selectively designate from which originating Mobile Stations (MSs) point-to-point SMS messages are to be received by any specific MS, whilst rejecting or blocking all others. Those familiar in the Art shall be aware that such a weakness compels the MS message recipient to personally receive and screen all SMS messages, including those whose content may be malicious or harmful. In the instance of circuit-connection cellular communications, subscribers may designate that calls from specific parties not be accepted; an availability improving both time and financial effectiveness. No comparable facility however, is presently available for application in blocking unwanted SMS messages.

Secondly, the present situation exists whereby only the originating MS handset or sim card identifier is shown to the recipient of an SMS message upon receipt of such, this data being derived from the originating Mobile Station Integrated Services Digital Network (MSISDN) number (or other origin identifier) accompanying an SMS message. A situation therefore
clearly exists for system misuse via falsification of originator identity. In other words, the label or MSISDN identification displayed upon receipt of an SMS message, does not in itself guarantee the authenticity or desirability of the SMS message originator, nor does it prove or indicate they are even known to the recipient. Indeed, the actual mobile subscriber may well be unaware of such a security violation.

It is thus desirable to ensure that the recipient of an SMS message may be assured that the received SMS message is from a particular known individual, rather than simply a particular MS handset.

According to a first aspect of the present invention, there is provided a method for controlling the transmission and reception of short messages over a cellular telephone system; comprising the steps of:

- associating an identifying code with at least one mobile station operable on the system; and
- permitting the reception of a short message at the at least one mobile station only when the identifying code associated with that mobile station is included in the transmission containing the short message.

Optionally,

- a short message originating mobile station transmits a routing enquiry to a network component, said routing enquiry comprising a candidate identifying code together with a mobile station identifier of a target mobile station;
- the network component compares the candidate identifying code with the identifying code that is associated with the mobile station to which the mobile station identifier corresponds; and
- transmission of the short message to the target mobile station is permitted only if the identifying codes match.
Optionally, a user menu of a mobile station requires an identifying code to be entered prior to transmission of a short message.

Optionally, the network component is a home location register (HLR) comprising a database of mobile station identifiers and associated identifying codes.

Optionally, the method comprises the step of generating within said home location register a deliverability status message for said short message.

Optionally, the identifying code comprises a PIN, preferably a 4-digit PIN.

Optionally, the mobile station identifier comprises an MSISDN and/or an MSIMEI number.

According to a second aspect, there is provided apparatus for controlling the transmission and reception of short messages over a cellular telephone system; comprising

- means for associating an identifying code with at least one mobile station operable on the system; and
- means for permitting the reception of a short message at the at least one mobile station only when the identifying code associated with that mobile station is included in the transmission containing the short message.

Optionally, said apparatus includes a network component which comprises:

- a database comprising a list of mobile station identifiers and corresponding identifying codes;
extraction means for extracting a mobile station identifier and a candidate identifying code from a short message routing enquiry; comparison means for matching the extracted mobile station identifier with a mobile station identifier from the database list; and short message screening means, arranged to deliver the short message to a target mobile station only if the extracted candidate identifying code matches the identifying code for that mobile station identifier which is stored in the database.

Optionally, the network component comprises a home location register (HLR).

Optionally, the mobile station identifier comprises an MSISDN and/or an MSIMEI number.

Optionally, the identifying code comprises a PIN, preferably a 4-digit PIN.

Optionally, said comparison means is arranged to generate a status message after performing said matching the extracted mobile station identifier with a mobile station identifier from the database list.

Optionally, said apparatus further comprises modification means for modifying said list by a transmission from a mobile station.

According to a further aspect, there is provided a mobile station comprising user interface means for the composition and transmission of short messages, said interface being adapted to prompt the user for the entry of an identifying code and a target mobile station identifier during the composition of a short message.
Optionally, the mobile station is arranged to create a routing enquiry for the transmission of a short message, characterised in that said routing enquiry includes said a target mobile station identifier and said identifying code.

As a result of this modification to existing technology within an MS, and more specifically to the non-volatile microprocessor located within, once an MS subscriber has originated a text message and enters the directory number associated with the destination MS, a PIN entry request is initiated and shown on the originator's MS display prior to SMS message transmission. As will become apparent on reading stage two operations described below, whilst inputting any identifying code such as a 4-digit security code on the originating MS keypad shall indeed allow transmission of the SMS message to occur, only the correct combination of MSISDN number and 4-digit security PIN code when compared and compatible with those pre-registered data by the required recipient of this SMS message, will routing and forwarding of the SMS message actually occur.

According to a further aspect, there is provided a telecommunications system comprising the apparatus and one or more mobile stations as set out in previous aspects.

According to still further aspects, various computer program products can be provided that comprise instructions that when executed by suitable machines enable those machines to perform the methods and/or to function as the apparatus of the other aspects.

The present invention will now be described, by way of example only, with reference to the accompanying drawings, in which:
FIGURE 1 is a block diagram of a telecommunications system according to an embodiment of the invention;

FIGURE 2 is a block diagram illustrating a prior art structure of a mobile station (MS);

FIGURE 3 is a flow chart depicting a method of sending a short message according to an embodiment of the invention;

FIGURE 4 is a block diagram of a telecommunications system illustrating the routing of an SMS message between two mobile stations according an embodiment of the present invention;

FIGURE 5 is a signal flow and operation network operation diagram illustrating selective reception of an SMS message in accordance with an embodiment of the present invention;

FIGURE 6 is a block diagram illustrating a Home Location Register (HLR) according to an embodiment of the present invention;

FIGURE 7 is a flow chart illustrating the operation of the HLR of FIGURE 6; and

FIGURE 8 is a block diagram illustrating the routing of an Unstructured Supplementary Service Data (USSD) transmission from a subscriber MS to a network HLR for inputting selective screening data parameters, in accordance with an embodiment of the present invention.
It is to be understood that the following detailed description is for the purposes of describing preferred embodiments of the invention. This invention may however, be embodied in different forms and should not be construed as limited to the embodiments set forth herein. Rather, these embodiments are provided so that this disclosure will be thorough and complete and fully convey the scope of the invention to those skilled in the art.

With reference to FIGURE 1 of the drawings, there is depicted a Public Land Mobile Network (PLMN) 110, such as a cellular network encompassing SMS capability, which comprises a plurality of areas 112, each containing a Mobile Switching Centre (MSC) 114 and integrated Visitor Location Register (VLR) 116 within. The MSCA/LR areas 112 in turn include a plurality of Location Areas (LA) 118. An LA 118 is that part of a designated MSCA/LR area 112 within which a mobile station (MS) 120 may roam freely without requirement to transmit location upgrading information to the MSCA/LR which controls that LA 118. Each Location Area 118 is divided into a number of cells 123. MS 120 is the mobile transceiver equipment, e.g. a car phone or other mobile apparatus used by mobile subscribers to communicate with the cellular network 110. A Base Station (BS) 124 is the physical equipment, illustrated for simplicity as a radio mast, that provides coverage across the geographical area of the cell 123 in which to route radio traffic to and from the MS 120.
In continuance with FIGURE 1, the PLMN Service Area 110 includes a Home Location Register (HLR) 126, which comprises a database of all subscriber information, e.g. user profiles, current location and routing information, and other administrative information. An SMS message screening application XXX can be located on the system HLR 126. The HLR 126 itself may be co-located with a given MSC 114 or may service multiple MSCs; the latter configuration being shown in FIGURE 1.

FIGURE 2 is a block diagram illustrating a simplified structure of a mobile station MS. For those skilled in the art, it is evident that each unit block may be implemented in several ways. A radio unit 21 embraces structural components such as a radio transceiver, a modulator/demodulator, channel coding and decoding etc. connected with transmission and reception operations required for propagation over the radio path. A signalling and control unit 22 controls the entire function of the mobile station. When receiving short messages, the said signalling and control unit 22 releases the short message received by the radio unit 21 and directs it to be shown on the display 25. Correspondingly, when transmitting a short text message, the signalling and control unit 22 forms a short message based on message and address information provided from a keypad 23 of the subscriber and routes this through the radio unit 21. The mobile station MS also comprises a memory 24 typically generated from the terminal memory and the SIM card memory, used as the MS identification unit.

FIGURES 2 and 3 explain the operation of a mobile station (MS). When a short message requires to be sent, the originating subscriber accesses the messages menu from signalling and control unit 22 via keypad 23, and display 25 is clear for display of generated message content in
accordance with step 31. Once complete, the originator either selects the required destination subscriber's MSISDN at step 32 from memory 24 via signalling and control unit 22 or enters this manually on keypad 23. The originator relays a send SMS message instruction to the signalling and control unit 22 from keypad 23 at step 33. At this point the signalling and control unit 22 requests the entry of an identifying code, which can for example be a 4-digit PIN, in which case it routes an 'ENTER 4-DIGIT PIN' request to display 25 at step 34. The destination subscriber's 4-digit security PIN, known only to select individuals, is entered on keypad 23 at step 34. The originator sends a final transmission command at step 35 to the signalling and control unit 22, which routes the message to radio unit 21 and displays a successful transmission on display 25 at step 36. As will become clear in subsequent descriptions, only entry of the correct 4-digit security PIN will result in successful delivery of the transmitted SMS message, although any 4-digit PIN entered would allow transmission to occur.

With reference now to FIGURE 4, there is depicted a block diagram of a telecommunications system illustrating the routing of an SMS message between two mobile stations. An originating MS 121 transmits an SMS message (reference identifier A) toward an SMS-Interworking MSC (SMSIWMSC) 130 of the MSCA/LR area 112 in which it is located. Accompanying the transmitted SMS message is an origin identifier, which is datum, such as an MSISDN number that uniquely identifies the transmitting MS but not the individual originating the SMS message. Also accompanying the SMS message is a destination MSISDN identifying the target recipient MS 122 and the designated 4-digit security PIN code required to access the target MS 122, also illustrated in FIGURE 4. The SMS message is then transmitted (reference identifier B) from the SMS-IWMSC 130 to a Service Centre (SC) 135, which buffers the short
message and then transmits (reference identifier C) the short message to an SMS Gateway Mobile Switching Centre (SMS-GMSC) 140, also referred to herein as gateway 140, corresponding to the SMS message destination number.

The SC 135 includes the originating MS identifier, target MSISDN and 4-digit security PIN code when the short message is sent to gateway 140. With further reference to FIGURE 1, there is illustrated another gateway 140A, connected to the gateway 140 and outside the PLMN 110. In this manner, MSs in adjacent networks can be serviced, as is understood in the art.

To determine the current location of the target MS 122, the gateway 140 interrogates (reference identifier D) a corresponding HLR 126. In this illustration, it is assumed that screening application XXX, the operation of which is explained more fully below, approves message delivery. The SMS gateway 140 communicates with the HLR 126 to ascertain the particular destination MSC 114 (see FIGURE 1) and 150 (see FIGURE 4) that is serving the target MS 122. The serving MSC 150 identity is then transmitted (reference identifier E) back to the gateway 140, which uses it to reroute (reference identifier F) the SMS message from the gateway 140 to a particular destination MSC/VLR 150. The destination MSC/VLR 150, upon receipt of the SMS message, then forwards (reference identifier G) the SMS message to the intended recipient MS 122, and sends an acknowledgement signal (reference identifier H) back to gateway 140 indicating successful delivery. The gateway 140 then forwards (reference identifier I) the acknowledgement signal back to the SC 135.

In this manner, short text messages can be sent from one MS to another 10 without the necessity of establishing an actual circuit connection. It
should also be noted that since the message can be buffered, as explained in more detail below, the corresponding MSs do not even require to be simultaneously activated for eventual reception by the target MS to occur.

Reference is now made to FIGURE 5, which is a signal flow and network operation diagram illustrating a method for selectively delivering point-to-point SMS messages. The SMS message, designated by the reference numeral 500, as generated by the originating MS 121 is the first transmitted to the SMS-IWMSC 130 of the MSCA/LR area where the MS 121 is currently located, as described in connection with FIGURE 4. The SMS-IWMSC 130 then routes the SMS transmission to the network SC 135, which buffers the message until delivery occurs or until delivery is rejected, or until a predetermined time interval has elapsed. Upon the occurrence of the appropriate event, the SC 135 then transfers the message to the SMS-GMSC 140. The SMS-GMSC 140 then queries the HLR 126 for the present location of the intended SMS recipient MS 122 by transmitting a Send-Routing-Information-for-SMS request, represented by reference numeral 510, which contains both the intended recipient's MSISDN and chosen 4-digit security PIN.

The screening application XXX in HLR 126, upon receiving a query from the gateway 140, may extract the aforementioned destination identifier MSISDN and 4-digit security PIN numerical data from the SMS message, designated in FIGURE 5 as reference numeral 511. The screening application XXX then determines whether the SMS incoming message should be accepted or rejected, by means of comparison of received numerical data against that previously registered by the intended recipient, as explained more fully below. If the acceptance criteria is met and a full and perfect match is found within the screening application on comparison
of received MSISDN and 4-digit security PIN against those stored within the screening application XXX database, then the screening application sends a delivery-acceptance signal, represented by reference numeral 512 to the HLR 126. In turn, the HLR 126 sends a Send-Routing-Information-for-SMS-ACK message represented by reference numeral 513, notifying the gateway 140 of the target MS 122's location. Based on this location information, the gateway 140 then transfers the SMS message, represented by reference numeral 530, preferably via Mobile Application Part (MAP) MAP-Forward-Short-Message signal, to the appropriate destination MSC 150 for delivery to the MS 122.

The destination MSCA/LR 150 serving the MS 122 then pages (PAGE) the MS 122 and upon reception of a PAGE-RESPONSE, forwards the short message to the MS 122. Upon completion, the MS 122 sends an SM-ACK signal back to the MSCA/LR 150, which then sends a MAP Forward-SM-ACK, represented by the reference numeral 540, back to the gateway 140 which in turn, forwards the acknowledgement (delivery report) back to the SC 135, represented by the reference numeral 545.

If however, the MS 122 is unavailable, e.g. turned off or out of range, then the incoming SMS message 500 from the originating MS 121 remains buffered for later delivery, e.g. on the external media or buffer 136. If the buffered SMS message 500 cannot be delivered after a predetermined delivery-delay period, then it may be deleted.

With further reference to FIGURE 5, if the screening application XXX in the 25 HLR 126 determines that delivery criteria are not met, i.e. that those MSISDN and 4-digit security PIN numerical data do not match those
pre-registered by the intended recipient, then the screening application XXX within the HLR 126 sends a delivery rejection signal 515 back to gateway 140 instead of the acceptance signal 512. Gateway 140 then forwards to the SC135 a rejection (failure report) signal 580. The SC 135 then deletes the SMS message 500 from its SMS message external media or buffer 136.

FIGURE 6 is a block diagram depicting an HLR 126 containing within it the aforementioned screening application XXX. The screening application may include a comparator unit (comparison mechanism) X01 and database X02 containing all individual subscribers' pre-registered data, which are used for comparison against that MSISDN and 4-digit security PIN code extracted from the originated SMS message transmission and reference identifier 511 in FIGURE 5. When the gateway 140 interrogates the HLR 126 by transmitting the aforementioned Send-Routing-Information-for-SMS 510, the screening application comparator unit conducts a comparison between the requested MSISDN and 4-digit security PIN transmitted by the originating MS 121 and that pre-registered by the intended destination MS 122 subscriber (not shown in FIGURES 1 and 6) by extracting the aforedescribed destination identifier 511, shown in FIGURE 5, from the query transmission 510. The screening application comparator unit X01 then compares the destination subscriber's data as transmitted by the originator, with that pre-registered by the destination subscriber, to determine whether the SMS message should be delivered or rejected.

FIGURE 7 is a flow chart depicting an operation of the screening application XXX, which may be resident within the HLR 126 of the PLMN 110 (as shown in FIGURES 1 and 6). Here, it is assumed that the subscriber using the target MS 122 has already pre-registered an SMS
selective-delivery criteria in the form of MSIMEI, MSISDN and 4-digit security PIN code. As described hereinbefore and further illustrated in FIGURE 7, the HLR receives the Send-Routing-Information-for-SMS signal 510 at step 700 and extracts the destination identifier 511, e.g. an MSISDN and 4-digit security PIN code at step 705. Assuming the destination identifier 511 comprises the correct number of digits in all respects, i.e. numerical data associated with an MSISDN and 4-digit security PIN code, the screening application XXX next determines at step 710 which SMS selection criteria has been met. The destination MSISDN and 4-digit security PIN code are compared to the screening mechanism database X02 at step 715. If the destination identifiers extracted from the originating transmission match exactly 30 those data registered by the target subscriber (step 720), then SMS delivery in the usual manner is permitted (step 730). If however, a perfect match between data is not found on comparison (step 735), then delivery is rejected (step 740). Following completion of the aforedescribed SMS message screening, an appropriate message may be generated and returned to the originating MS 121, e.g. rejection signal 580 (shown in FIGURE 5).

Reference is now made to FIGURE 8, which is a block diagram showing components involved in the screening application XXX update procedure. A user may wish to update the screening application XXX for a variety of reasons. Typical examples of this are acquisition of a new or additional SIM card (Additional database entry with original MSIMEI, new MSISDN and new or original PIN); following the desire to abandon contact with a previous contactee (PIN only requires to be re-registered); acquisition of a new MS whilst retaining original SIN card (new IMEI only requires to be re-registered); or routine change of PIN for security or other reasons.
To perform any of these tasks, a subscriber simply initiates an update routine directly from the MS 120. The update routine can be accomplished using an Unstructured Supplementary Service Data (USSD) procedure to interactively transmit the update information from the MS 120 to the BS 124 (step J) and thence to the MSCA/LR 114 (step K) currently serving the MS 120, as depicted in FIGURE 1. As shown in FIGURE 8, the MSC/VLR 114 then sends (step L) the USSD update transmission on to the HLR 126. The HLR 126 can then generate an acknowledgement signal (steps M-O) for transmission back to the MS 120, indicating the success or failure of the update procedure. Alternatively, the update procedure could be performed as a series of steps initiated by the subscriber, who then responds to a series of enquiries from the HLR 126. As a further alternative, the SMS acceptance criteria could simply be added to the HLR 126 along with other subscriber information when service is initiated, for example based on information provided by the new subscriber.

Whilst the HLR 126 has been described thusfar as comprising one database or screening list associated with a particular mobile station, it is also possible for more than one screening list to be employed, and for such list or lists to be associated with more than one mobile station. For example, an organisation supplying mobile phones to numerous employees may wish to restrict delivery of short messages to those originated at its own Internet site, or to those originated from the organisation's mobile stations, or to restrict use to differing status levels with e.g. senior management 4-digit security PIN codes only being known to certain individuals within the organisation. Additionally, the security criteria stored onto the HLR 126 screening application database could be something other than MSISDN or IMEI numbers associated with a single target entity.
Although embodiments of the invention have been illustrated in the accompanying drawings and described in the foregoing detailed description, it will be understood that the invention is not limited to the embodiments disclosed, but is capable of numerous rearrangements, modifications and substitutions without departing from spirit and scope of the invention as set forth and defined by the following claims.

In particular, while emphasis has been place herein on the GSM network, it is to be appreciated that the same principles can apply in non-GSM networks and the specification is intended to embrace functional equivalents in other networks where appropriate.

Also, the identifying code does not have to a 4-digit PIN, but can take other forms, such as a number or alphanumeric string of different lengths.

It is further to be appreciated that the methods disclosed herein can be used in combination with standard, unsecured, short message delivery. In that case, a user can effectively have separate secure and a non-secure short message inboxes in their mobile station.

It is also to be understood that the embodiments may also be used in such instances as improvement of e-mail security, incorporation into BT landlines so as to prevent nuisance telesales calls in addition to many other uses.
CLAIMS

1. A method for controlling the transmission and reception of short messages over a cellular telephone system; comprising the steps of:

   - associating an identifying code with at least one mobile station operable on the system; and
   - permitting the reception of a short message at the at least one mobile station only when the identifying code associated with that mobile station is included in the transmission containing the short message.

2. The method of claim 1, wherein

   - a short message originating mobile station transmits a routing enquiry to a network component, said routing enquiry comprising a candidate identifying code together with a mobile station identifier of a target mobile station;
   - the network component compares the candidate identifying code with the identifying code that is associated with the mobile station to which the mobile station identifier corresponds; and
   - transmission of the short message to the target mobile station is permitted only if the identifying codes match.

3. The method of any preceding claim, wherein a user menu of a mobile station requires an identifying code to be entered prior to transmission of a short message.

4. The method of claim 2 or claim 3, wherein the network component is a home location register (HLR) comprising a database of mobile station identifiers and associated identifying codes.
5. The method of claim 4, comprising the step of generating within said home location register a deliverability status message for said short message.

6. The method of any preceding claim, wherein the identifying code comprises a PIN, preferably a 4-digit PIN.

7. The method of any of claims 2 to 6, wherein the mobile station identifier comprises an MSISDN and/or an MSIMEI number.

8. Apparatus for controlling the transmission and reception of short messages over a cellular telephone system; comprising
   means for associating an identifying code with at least one mobile station operable on the system; and
   means for permitting the reception of a short message at the at least one mobile station only when the identifying code associated with that mobile station is included in the transmission containing the short message.

9. Apparatus according to claim 8, including a network component which comprises:
   a database comprising a list of mobile station identifiers and corresponding identifying codes;
   extraction means for extracting a mobile station identifier and a candidate identifying code from a short message routing enquiry;
   comparison means for matching the extracted mobile station identifier with a mobile station identifier from the database list; and
   short message screening means, arranged to deliver the short message to a target mobile station only if the extracted candidate...
identifying code matches the identifying code for that mobile station identifier which is stored in the database.

10. The apparatus of claim 9, wherein the network component comprises a home location register (HLR).

11. The apparatus of claim 9 or claim 10, wherein the mobile station identifier comprises an MSISDN and/or an MSIMEI number.

12. The apparatus of any of claims 8 to 11, wherein the identifying code comprises a PIN, preferably a 4-digit PIN.

13. The apparatus of any of claims 9 to 12, wherein said comparison means is arranged to generate a status message after performing said matching the extracted mobile station identifier with a mobile station identifier from the database list.

14. The apparatus of any of claims 9 to 13, further comprising modification means for modifying said list by a transmission from a mobile station.

15. A computer program product comprising instructions that when executed by a suitable machine enable it to perform the method of any of claims 1 to 7 or to function as the apparatus of any of claims 8 to 14.

16. A mobile station comprising user interface means for the composition and transmission of short messages, said interface being adapted to prompt the user for the entry of an identifying code and a target mobile station identifier during the composition of a short message.
17. The mobile station of claim 16, being arranged to create a routing enquiry for the transmission of a short message, characterised in that said routing enquiry includes said a target mobile station identifier and said identifying code.

18. A computer program product comprising instructions that when executed by a mobile station enable said mobile station to function as the mobile station of claim 16 or claim 17.

19. A telecommunications system comprising the apparatus of any of claims 8 to 14 in combination with one or more mobile stations according to claim 16 or 17.
**Fig. 2**

- Display
- Radio Unit
- Signaling and Control unit
- Keypad
- Database/Memory

**Fig. 3**

1. Start
2. Create Text Message
3. Enter Destination MSISDN
4. Press Send
5. PIN Entry Request
6. Press Send
7. Message Sent
8. End
Fig. 7

1. Receive routing information for SMS
2. Extract Destination MSISDN and 4-digit PIN
3. Determine selection criteria by comparison
4. Is complete data match found?
   - Yes → PERMIT DELIVERY
   - No → REJECT DELIVERY
INTERNATIONAL SEARCH REPORT

International application No
PCT/GB2008/050104

A. CLASSIFICATION OF SUBJECT MATTER
INV. H04Q7/22

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
H04Q 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, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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<th>Relevant to claim No.</th>
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<td>X</td>
<td>US 2005/278620 A1 (BALDWIN PATRICIA A [US]) ET AL 15 December 2005 (2005-12-15) paragraphs [0002], [0008], [0048], [0051], [0075], [0101] claims 1,10</td>
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<td>X</td>
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