Title: METHOD OF CONTROLLING THE STATUS OF A MOBILE COMMUNICATION TERMINAL

(57) Abstract: The present invention relates to a method of controlling the operating status of mobile communication terminals within a given area. A message containing a set profile is sent when the presence of this mobile communication terminal is detected in the area to be controlled. The invention relates further to a mobile communication terminal provided with means to control its status in a given area. The invention relates also to a device for controlling the operating status of mobile communication terminals within a given area.
METHOD OF CONTROLLING THE STATUS OF A MOBILE COMMUNICATION TERMINAL

The present invention relates to a method of controlling the operating status of mobile communication terminals within a given area. The invention relates further to a mobile communication terminal provided with means to control its status in a given area. Further, invention relates also to a device for controlling the operating status of mobile communication terminals within a given area.

BACKGROUND ART

US 5,479,476 describes the use of profiles in mobile terminals whereby the user by means of a few key presses may change the alerting of the terminal (ringing volume, message alert tone, warning tone, etc.) in order to fit into the requirements of the environment. This is very convenient for the user when he/she moves from a noisy environment, e.g. a factory or a street using a "Loud" profile, into a silent environment, e.g. a meeting room, a theatre, or a restaurant and switches to a "Quiet" profile. The users highly appreciate these profiles.

US 2002/0044149 discloses a mobile phone that has a number of user selectable profiles each including a group of user adjustable operating characteristics. These selectable profiles can be transferred from one communication terminal to another included in a message containing a group of user adjustable operating characteristics. When the mobile phone receives this message transmitted via a communication channel, it analyses the message and saves the group of user adjustable operating characteristics as a profile.
The profiles have however to be set by the user on his/her own initiative, and since mobile phones have become smaller over the years, the likeliness to forget altogether to set to the appropriate profile is not negligible. Further some users may not wish to switch their phone to a "silent" profile during a meeting because of the risk to miss an important call in a more noisy environment after the meeting because the "silent" profile is still active since he/she forgot to change the general profile.

DISCLOSURE OF THE INVENTION

On this background, it is an object of the present invention to provide a method of controlling the operating status of mobile communication terminals within a given area that prevents inadvertent settings.

This object is achieved in accordance with claim 1 by providing a method of controlling the operating status of mobile communication terminals within a given area comprising the steps of providing a signaling device with a range that substantially covers said given area, the signaling device monitoring the area to detect the presence of mobile communication terminals in said area and the signaling device sending a message containing desired operating status data for said area to said mobile communication terminals upon their detection.

Thus, upon entry of the area, the mobile communication terminal is detected and receives a message with the desired status setting data. Upon receipt of the message, the mobile communication may display a request for the user to change the operating status to the desired status. Alternatively, the mobile communication terminal displays upon receipt of the message a request for changing the operating status of the mobile communication terminal,
prompts the user to accept the requested operating status and changes the operating status to the desired status upon acceptance by the user. It is also possible for the mobile communication terminal, upon receipt of said message, to change the operating status of the mobile communication terminal automatically to the desired status.

The mobile communication terminals may at given intervals send messages indicating their presence, to facilitate detection by the signaling device.

The message preferably includes a time value for the desired operating status, after which the mobile communication terminal returns to the previous or a given standard operating status, either automatically or after prompting for user acceptance.

Alternatively, the message may include an end time setting, a local time at which the mobile communication terminal returns to the previous or a given standard operating status, either automatically or after prompting for user acceptance.

The message may also include an identifier, allowing revocation of the desired operating status.

The signaling device is preferably part of a base station of a cellular network, and said mobile terminal is logged onto said base station upon detection. The base station has preferably a relatively small range (micro cell).

The message can be a text message, preferably an SMS message.
The mobile communication terminal may automatically return to the previous or to a given standard operating state when it is logged off from the base station.

The signaling device preferably comprises an RF transceiver, and said mobile communication terminal preferably comprises a matching RF transceiver, both operating according to a short range RF standard, such as the Bluetooth standard.

The mobile communication terminal is preferably a mobile phone and the desired operating status data comprise a ringing volume setting. The desired operating status data may also comprise a profile including a ringing volume setting, a message alert tone setting, a warning tone setting and preferably a keypad tone setting. The operating status data may also comprise a switch-off setting.

It is yet another object of the present invention to provide a mobile communication terminal that can automatically respond to a desired operating status for a given area.

This object is achieved in accordance with claim 16 by providing a mobile communication terminal comprising means to receive messages incorporating desired operating status data, means to identify messages incorporating desired operating status data, and means to respond to messages incorporating desired operating status data.

Thus, the mobile communication terminal can respond to messages incorporating desired operating status data sent to mobile communication terminals in a particular area.

Preferably, the means to respond to messages incorporating desired operating status data comprises an application for
displaying a request for the user to change the operating status to the desired status upon receipt of said message. Alternatively, the means to respond to messages incorporating desired operating status data may comprise an application for prompting the user to accept the requested operating status and said mobile communication terminal changing automatically the operating status to the desired status upon acceptance by the user. It is also possible that the means to respond to messages incorporating desired operating status data comprises an application for changing the operating status of the mobile communication terminal automatically to the desired status upon receipt of the message.

The mobile communication terminal can further comprise user controlled means to activate and deactivate said application for automatically changing the operating status of the mobile communication terminal.

The mobile communication terminal is preferably a mobile phone.

It is another object of the invention to provide a signaling device for controlling the operating status of mobile communication terminals.

This object is achieved in accordance with claim 22, by providing a signaling device for controlling the operating status of mobile communication terminals within an area substantially corresponding to the range of said signaling device, comprising:

- means to the detect presence of mobile communication terminals in said area; and
- means for sending a message containing desired operating status data for said area to said mobile communication terminals upon their detection.
Thus, the operating status of mobile phones in a given area can be controlled.

The signaling device may comprise an RF transceiver, operating according to a short range RF standard, such as the Bluetooth standard.

It is another object of the invention to provide a base station of a cellular network that comprises a signaling device. The base station is preferably a base station with a relatively small range (micro cell).

Further objects, features, advantages and properties of the method, mobile communication terminal, signaling device and base station according to the invention will become apparent from the detailed description.

BRIEF DESCRIPTION OF THE DRAWINGS

In the following detailed portion of the present description, the invention will be explained in more detail with reference to the exemplary embodiments shown in the drawings, in which

Fig. 1a diagrammatically shows a wireless cellular communication network,

Fig. 1b shows a detail of a micro cell of the wireless cellular communication network,

Fig. 2a illustrates a preferred embodiment of a communication terminal according to the invention,

Fig. 2b schematically shows the relevant parts of a mobile phone for use with the cellular network,

Fig. 2c schematically shows the relevant parts of a base station for use with the present invention,

Fig. 3.1 - 3.4 show a sequence of displays upon receipt of a set profile message, and
Fig. 4 shows a building plan with a Bluetooth based signaling device.

**DETAILED DESCRIPTION**

With reference to Fig. 1a a wireless cellular network is described. The network comprises a great plurality of cells 10 (only a few are shown in Fig. 1) each having a base station 12 covering the cell. An example of a suitable wireless infrastructure includes GSM networks, UMTS (Universal Mobile Telephone System) networks and 3rd Generation wireless networks based on GSM (Global System for Mobile communications). The network is suitable for use with mobile phones 1, or other mobile terminals equipped with the appropriate transmitting and receiving capacities.

The network comprises a number of micro cells 20. The micro cells 20 are identical to cells 10 apart from their range, which is significantly smaller. Typically, micro cells are deployed in locations with a high mobile phone density, such as e.g. in a shopping mall.

With reference to Fig. 1b a micro cell is illustrated in more detail. Each micro cell 20 comprises a base station 11. Base station 11 is provided with conventional means for handling mobile phone communications and is connected to the a mobile switching centre (not shown). Each of the base stations has its own control channel frequency (control channel frequencies can be reused for distant cells).

When a mobile phone is powered up, it scans for a control channel. When the mobile phone detects a control channel with sufficient strength it transmits a registration request, and after verification, it is registered with the associated base station 12 / cell 10. The mobile switching center (not shown) keeps track of the location of the
mobile phones in a database so that the mobile switching center knows in which cell a mobile phone is located when it wants to transmit a call or message to the mobile phone.

When a mobile phone 1 moves from cell 10 in which it is registered (Fig. 1b) towards the edge of the cell, the cell's base station 12 notes that the mobile phone's signal strength is diminishing. The base station in the cell, in this case the micro cell 20, that the mobile phone is moving towards (which is scanning and measuring signal strength on all frequencies) notices that the mobile phone’s signal strength is increasing. The two base stations 11,12 coordinate with each other through the mobile call center, and at the point where the signal strength on the control frequency of the micro cell 20 is higher than the signal strength of cell 10, the mobile phone 1 receives a signal on the present control channel instructing it to change frequencies. Thus, the mobile phone 1 is registered in the micro cell 20, and the micro cell records the presence of the mobile phone in its cell register.

The base station 11 of the micro cell is provided with an SMS/MMS message controller 53 and an SMS/MMS message transmission driver 55. Upon detection of a new mobile phone 1 in its register, the micro cell 20 sends a command to the processor 58 to send an SMS incorporating a set profile and a request to adopt the set profile to the mobile phone 1. Hereto, the processor 58 forms a message including a standard message header and the content of the message data line has a sequence of characters forming an identifier at the beginning of the line followed by a sequence of bits representing the profile including the elements of the profile.
The profile concept has been discussed in detail in the applicant’s U.S. Pat. No. 5,479,476. According to the preferred embodiment of the invention it will be possible to set the phone tones and eventually the profile graphic to work in a desired manner by selecting the desired setting group which is in this document referred to as a “profile.” This makes it easy to adjust the phone for different events and environments.

The processor 58 comprises character transformation functions, which have been implemented as software, and by means of which the processor 58 processes the characters. The processor 58 transfers the line of characters formed to an SMS transmission controller 51, which adds to the message header including message address information, i.e. the information on the destination on the basis of the newly registered mobile phone 1. The transformation of the profile and its individual elements into characters is preferably implemented as an application program that is run by the processor 58.

When the address information has been added at the SMS transmission controller 51, the message is transferred into an outbox 52, which sends the message, and which has access to a buffer, in which the message is stored until a successful transmission has been reported. If the transmission fails, the outbox 52 re-transmits the message. When the transmitter/receiver circuit 59 has network coverage and is idle, the message is transferred to an SMS transmission driver circuit 55 by the controller 52 which adds the header to the message information relating to the mobile communications system in question, such as validity information (which indicates in which direction the message is going, i.e., from a mobile station to a mobile phone), processes the address information into a form required by the mobile communications system, and adds to the message.
the short message identifier, and forms the information to be transmitted, e.g. a digital signal for the transmitter 59.

It is also possible to let the mobile switching centre handle the sending of the SMS with the set profile to the mobile phone 1. The mobile switching center registers the location of the mobile phones in the location register anyway. The switching center sends an SMS incorporating a set profile when it detects that a mobile phone gets registered in a cell for which the set profile has been set for mobile phones present in the area of the cell. In this case, the operations provided by the processor 58, the SMS transmission control unit 51, the SMS outbox 52 and the SMS transmission driver 55 are performed by the mobile switching center.

Fig. 2a shows a preferred embodiment of a phone according to the invention, and it will be seen that the phone, which is generally designated by 1, comprises a user interface having a keypad 2, a display 3, an on/off button 4 (present in the top of the phone and therefore not visible in the present view), a speaker 5, and a microphone 6 (openings present in the bottom of the phone and therefore not visible in the present view). The phone 1 according to the preferred embodiment is adapted for communication via a cellular network, such as the GSM 900/1800 MHz network.

According to the preferred embodiment the keypad 2 has a first group 7 of keys as alphanumeric keys, one softkey 8, a cursor navigation key 10 (scroll up/down), and a "clear"-key 9 for erasing letters in a text on the display 3, jumping steps down in the menu structure and rejecting calls. The present functionality of the soft key 8 is shown in separate fields (softkey-label) in the display 3 just above the softkey 8. The softkey 8 is a multifunction key
and its present function depends on the state of the phone 1. The softkey 8 gives access to the menu, the phonebook and call handling.

Fig. 2b schematically shows the most important parts of a preferred embodiment of the phone, said parts being essential to the understanding of the invention. The processor 18 controls the communication with the network via the transmitter/receiver circuit 19 and an internal antenna 20.

The microphone 6 transforms the user's speech into analogue signals, the analogue signals formed thereby are A/D converted in an A/D converter (not shown) before the speech is encoded in a digital signal processing unit 14 (DSP). The encoded speech signal is transferred to the processor 18, which i.e. supports the GSM terminal software. The processor 18 also forms the interface to the peripheral units of the apparatus, including a RAM memory 17a and a Flash ROM memory 17b, a SIM card 16, the display 3 and the keypad 2 (as well as data, power supply, etc.). The digital signal-processing unit 14 speech-decodes the signal, which is transferred from the processor 18 to the earpiece 5 via a D/A converter (not shown).

The mobile station main control circuit, including the processor 18 (can be implemented as several micro-controllers) and blocks 30-33 for controlling transmission of profiles as short messages according to the present invention. The blocks 30-33 can be interpreted as a data processing unit of the terminal, which can be formed in full by programming the processor 18.

The status of the mobile phones will in the present preferred embodiment be described using “set profiles” e.g. a profile desirable for use in a given area.
In the following, the operation of the terminal will be discussed with focus on the reception of set profiles including ringing tones, volume setting, graphics and name of the profile.

When a mobile phone 1 receives a set profile included in a short message, the message is received through the transmitter/receiver unit 19 and is passed into a destination box or an inbox 9 of the data processing unit including a memory for storing the message. The received message can be stored in a memory located in the SIM card. First the type of message is detected, and if the received message is an ordinary short message, the processor 18 notifies in the display 3 that short message received.

If the message has an identifier indicating that the message includes a set profile, the processor 18 will further search for an element identifying the individual elements of the profile. When the elements have been identified, the processor 18 starts to process the received data. For the name of the profile, the processor 18 performs a transformation of the binary characters into ASCII characters and identifies the text label as the name of the profile. For the ringing tone element, the processor 18 performs a transformation of the binary characters into ASCII characters and further the transformation of the ASCII characters into a ringing tone. For an eventual graphic element, the processor 18 performs a transformation of the binary characters into a bit map file with the dimensions given in the element identifier, and if it is an animation the transformation is repeated for each image. All the individual elements are stored in a temporary memory.
By means of the short message service (SMS) of the GSM system, it is presently possible to send a single message having a maximum length of which is 160 7-bit ASCII characters corresponding to 140 bytes. However, by concatenating several individual messages into a concatenated message, a higher data content will be obtained.

Syntax of the set profile transmission

The syntax of the profile transmission message is based on <line-feed> delimited presentation. The content is formatted as follows:

\[\text{<profile-set-message>}::=\text{<profile-set-keyword>\text{<profile-set-body>\text{<profile-message>}}\]
\[\text{<profile-set-keyword>}:="\text{Profile set}\"\text{<line-feed>}; 'case-sensitive}'\]
\[\text{<profile-set-body>}::=\text{<unique-id>\text{<line-feed>}; free-text (e.g. explanation)\text{<line-feed>};}\]
\[\text{<request-type>\text{<line-feed>};}\]
\[\text{<to-set-profile>\text{<line-feed>};}\]
\[\text{[<end-time>]\text{<line-feed>};}\]

\[\text{<unique-id>}::=\text{unique id generated by the server.}\]
\[\text{<request-type>}::=\text{request to set | ask to set | set and display | set and don't display}\]
\[\text{<to-set-profile>}::=\text{General | Silent | Meeting | Outdoor | Pager | Supplied profile}\]
\[\text{<end-time>}::=\text{local time at which the old profile should be restored}\]

The profile message body is preferably in accordance with the "Multipart Message Syntax" defined in the Nokia Smart Messaging platform, described in the Smart Messaging
Specification, revision 3.0.0, December 18, 2000, hereby enclosed by reference.

<profile-body>::=
   [<name-field>]<line-feed>; 'profile name'
   [<ringing-tone-field>]<line-feed>; ''
   <Ringing-Tone-programming-language> (see below)
   [<ringing-volume>]<line-feed>; 'ringing tone level'
   [<incoming-call-alert>]<line-feed>; 'incoming-call-alert'
   [<message-alert-tone>]<line-feed>; 'message-alert-tone'
   [<keypad-tones>]<line-feed>; 'keypad-tones'
   [<warning-tones>]<line-feed>; 'warning-tones'
   [<vibrating-alert>]<line-feed>; 'vibrating-alert'
   [<graphic-filed>]<line-feed>
   <OTA-bitmap>..="\Header>Image-data> (see below)

The supplementary information fields (<ringing-tone-field> to <graphic-filed>) may be absent, but as the syntax requires, that the field separators (<line-feed>) must be present.

The ringing tone format is handset independent, and described only the audio related information. A tune is intended to be saved in the terminal. They can be used to implement message notification with a special ringing tone.

The OTA bitmap format enables graphical information to be sent to a wide variety of handsets. Depending on the handset implementation, it may be possible for the user to create graphical objects and then send them to other handsets. The OTA bitmap format is handset independent, and describes only the graphical information.

The ringing tone format and the OTA bitmap format are well known in the art from e.g. the Nokia Smart Messaging platform, described in the Smart Messaging Specification, revision 3.0.0, December 18, 2000, and will therefore not be explained in detail here.
Upon receipt of the set profile message, several different scenarios are possible in the next step:

Scenario 1) (ask to set)

When the message is received a warning tone sounds and the text "Profile set message received. Do you want the profile to be silent?", as shown in Fig. 3.1. The incoming set profile can be discarded by pressing the "Clear key" 9. However, after the "Clear key" 9 has been pressed, a confirmation query with text "Discard set profile?" will be displayed. The softkey label of the softkey 8 is "OK". By pressing the softkey 8 at the phone exits to idle state, and discards the set OTA profile without saving the profile. Pressing the "clear key" 9 instead of confirming the discarding will cancel the operation; in other words, the set profile is not deleted and the phone returns to the softkey option list at.

When the user, upon the soft notification presses the softkey 8 having the softkey label 22 "Option" the phone 1 displays a selection list of the following selectable items (Fig. 3.2):

- Details
- Use profile
- Discard

The softkey function is "OK". By selecting "Details" from the option list using the navigation key 10 the phone will display a selection list in a well known manner.

If the user in selects "Use profile" from the selection list (Fig. 3.2), the phone displays an information note 27 as shown in Fig. 3.3 with the display text "Set profile has
been activated" and activates the set profile. After this, the phone display returns to the idle state.

By selecting "Discard" from the selection list in Fig. 3.2, the phone will display the confirmation note query "Discard set profile". If the user confirms by pressing the soft key "OK", the received set profile is discarded and the confirmation note query saying "Set profile discarded" is displayed. After this, the phone goes to the idle state.

Scenario 2) (set and display)

When the message is received a warning tone sounds and the text "Profile set message received. The profile has been set to silent", as shown in Fig 3.4 and activates the set profile.

Scenario 3) (set and don’t display)

When the message is received the mobile phone activates the set profile automatically without warning the user.

The set profile message can contains an end-time field:

\[<\text{end-time}>]<\text{line-feed}>;

This field can be used to deactivate the set profile at a given local time, e.g. a meeting ends, at which time the previous profile is activated again. The mobile phone can be programmed to prompting for user acceptance before deactivating the set profile.

The 'free-text' field can be used to add information to the notify the recipient of the set profile of e.g. the reasons for activating a set profile.
The set profile also can contain an instruction which profile is to be set, and does not have to include a profile as such. It is thus possible to set any of the profiles already available on the mobile phone: e.g. 'General', 'Silent', 'Meeting', 'Outdoor' and 'Pager'. Alternatively a profile to be set can be attached to the set profile message.

The message may also include an identifier. The identifier comprises three parts:

1. an identifier of the sender or sending device;
2. a message identifier;
3. a unique sequence number.

Thus, it is possible for a user to configure the phone to ignore messages from a specific sender. Further, the above identifier allows identification of duplicate messages. Thus, the phone can suppress further requests for changing the profile after an earlier rejection of the same request by the user. The identifier also allows specific request messages to be deleted afterwards by another message.

The mobile phone can be set to deactivate the set profile when it is no longer registered in the cell for which it received the set profile message, either automatically or after prompting for user acceptance.

Another preferred embodiment of the invention is described with reference to Fig. 4. The phone 1 is equipped with a Bluetooth sender/receiver (not shown). The Bluetooth receiver is normally in a passive mode in which it scans for RF contacts with other Bluetooth devices. A building 50 e.g. a library has a room 51, e.g. a reading room in which quietness is demanded. Sounds produced by mobile phones are undesirable. The room 51 is equipped with a Bluetooth transmitter/receiver 40 that scans for the presence of
other Bluetooth devices. The range of the transmitter/receiver 40 corresponds substantially to the area of the room. The transmitter/receiver 40 detects the presence of the mobile phone upon entry of the latter in the room and initiates communication with the Bluetooth sender/receiver of the phone 1. During the communication the sender/receiver 41 sends the phone a profile message containing a request for changing the profile to a silent profile contained in the profile message. Upon receipt of the profile message the phone responds as described for the SMS based embodiment described above.

Although the present invention has been described in detail for purpose of illustration, it is understood that such detail is solely for that purpose, and variations can be made therein by those skilled in the art without departing from the scope of the invention. Thus, while the preferred embodiments of the devices and methods have been described in reference to the environment in which they were developed, they are merely illustrative of the principles of the inventions. Other embodiments and configurations may be devised without departing from the scope of the appended claims.
CLAIMS:

1. A method of controlling the operating status of mobile communication terminals within a given area comprising the steps of:
   - providing a signaling device with a range that substantially covers said given area;
   - said signaling device monitoring the area to detect the presence of mobile communication terminals in said area; and
   - said signaling device sending a message containing desired operating status data for said area to said mobile communication terminals upon their detection.

2. A method according to claim 1, further comprising the step of:
   - said mobile communication terminals upon receipt of said message displaying a request for the user to change the operating status to the desired status.

3. A method according to claim 1, further comprising the steps of:
   - said mobile communication terminals upon receipt of said message displaying a request for changing the operating status of the mobile communication terminal, prompting the user to accept the requested operating status and changing the operating status to the desired status upon acceptance by the user.

4. A method according to claim 1, further comprising the steps of:
   - said mobile communication terminals upon receipt of said message changing the operating status of the mobile communication terminal automatically to the desired status.
5. A method according to any of claims 1 to 4, further comprising the step of said mobile communication terminals at given intervals sending messages indicating their presence.

6. A method according to any of claims 1 to 5, in which said message includes a time value for the desired operating status, after which the communication terminal returns to the previous or a given standard operating status, either automatically or after prompting for user acceptance.

7. A method according to any of claims 1 to 6, in which said message includes an identifier, allowing revocation of the desired operating status.

8. A method according to any of claims 1 to 7, in which said signaling device is part of a base station of a cellular network, and said mobile terminal is logged onto said base station upon detection.

9. A method according to claim 8, in which said signaling device is part of a base station with a relatively small range (micro cell).

10. A method according to claim 8 or 9, in which said message is a text message, preferably an SMS message.

11. A method according to any of claims 8 to 10, further including the step of said mobile communication terminal returning automatically to the previous or to a given standard operating state when it is logged off from the base station.

12. A method according to any of claims 1 to 7, in which said signaling device comprises an RF transceiver, and said
mobile communication terminal comprises a matching RF transceiver, both preferably operating according to a short range RF standard, such as the Bluetooth standard.

13. A method according to any of claims 1 to 12, in which said mobile communication terminal is a mobile phone and said desired operating status data comprise a ringing volume setting.

14. A method according to any of claims 1 to 13, in which said mobile communication terminal is a mobile phone and said desired operating status data comprise a profile including a ringing volume setting, a message alert tone setting, a warning tone setting, and preferably a keypad tone setting.

15. A method according to any of claims 1 to 13, in which said operating status data comprises a switch-off setting.

16. A mobile communication terminal comprising means to receive messages incorporating desired operating status data, means to identify messages incorporating desired operating status data, and means to respond to messages incorporating desired operating status data.

17. A mobile communication terminal according to claim 16, wherein said means to respond to messages incorporating desired operating status data comprises an application for displaying upon receipt of said message a request for the user to change the operating status to the desired status.

18. A mobile communication terminal according to claim 16, wherein said means to respond to messages incorporating desired operating status data comprises an application for prompting the user to accept the requested operating status and said mobile communication terminal changing
automatically the operating status to the desired status upon acceptance by the user.

19. A mobile communication terminal according to claim 16, wherein said means to respond to messages incorporating desired operating status data comprises an application for changing the operating status of the mobile communication terminal automatically to the desired status upon receipt of the message.

20. A mobile communication terminal according to claim 19, further comprising user controlled means to activate and deactivate said application for automatically changing the operating status of the mobile communication terminal.

21. A mobile communication terminal according to any of claims 16 to 20, in which said mobile communication terminal is a mobile phone.

22. A signaling device for controlling the operating status of mobile communication terminals within an area substantially corresponding to the range of said signaling device, comprising:
   - means to detect presence of mobile communication terminals in said area; and
   - means for sending a message containing desired operating status data for said area to said mobile communication terminals upon their detection.

23. A signaling device according to claim 22, in which said signaling device comprises an RF transceiver, preferably operating according to a short range RF standard, such as the Bluetooth standard.
24. A base station of a cellular network comprising a signaling device according to claim 23, preferably a base station with a relatively small range (micro cell).
Fig. 2b
FIG. 2c
"OPTIONS HAS " BEEN PRESSED

DETAILS

USE PROFILE

DISCARD

OK

"ACTIVATE" HAS BEEN SELECTED

SET PROFILE HAS BEEN ACTIVATED

OK

FIG. 3.3

FIG. 3.4

CONFIRMATION COPY
INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 H04Q7/38

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H04Q

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

<table>
<thead>
<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y</td>
<td>abstract paragraphs '0021!-‘0040!, ‘0045!, ‘0049!, ‘0056!-‘0075!; figures 1-3,6</td>
<td>14</td>
</tr>
<tr>
<td>X</td>
<td>EP 1 041 847 A (SONY INT EUROP GMBH) 4 October 2000 (2000-10-04)</td>
<td>1,4-6, 8, 9, 11, 13-16, 19, 21, 22</td>
</tr>
<tr>
<td></td>
<td>abstract paragraphs ‘0005!-‘0010!, ‘0012!-‘0026!, ‘0028!-‘0031!, ‘0038!-‘0047!</td>
<td></td>
</tr>
</tbody>
</table>

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

* Special categories of cited documents:
  *X* document defining the general state of the art which is not considered to be of particular relevance
  *E* earlier document published on or after the international filing date
  *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another document, or other special reason (as specified)
  *O* document relating to an oral disclosure, use, exhibition or other means
  *P* document published prior to the international filing date but later than the priority date claimed

* 1* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

* 2* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone or in combination with one or more of the other documents cited

* 3* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is taken alone or in combination with one or more of the other documents cited

* 4* document of the same family

Date of the actual completion of the international search

15 September 2003

Date of mailing of the international search report

22/09/2003

Name and mailing address of the ISA

European Patent Office, P.B., 5316 Patentplant 2
NL - 2280 HV Rijswijk
Tel: (+31-70) 340-2040, Tx: 31 651 epc nl.
Fax: (+31-70) 340-3016

Authorized officer

Poort, I
<table>
<thead>
<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>WO 00 76235 A (ERICSSON TELEFON AB L M) 14 December 2000 (2000-12-14)</td>
<td>1, 2, 8, 10, 15-17, 21, 22</td>
</tr>
<tr>
<td></td>
<td>abstract</td>
<td></td>
</tr>
<tr>
<td></td>
<td>page 2, line 19 – page 3, line 25</td>
<td></td>
</tr>
<tr>
<td></td>
<td>page 4, line 5 – page 5, line 17</td>
<td></td>
</tr>
<tr>
<td></td>
<td>abstract</td>
<td></td>
</tr>
<tr>
<td></td>
<td>paragraphs</td>
<td></td>
</tr>
<tr>
<td></td>
<td>‘0010!, ‘0021!, ‘0023!, ‘0026!, ‘0030!–‘0033!, ‘0052!</td>
<td></td>
</tr>
<tr>
<td>Y</td>
<td>US 5 479 476 A (FINKE-ANLAUFF ANDREA) 26 December 1995 (1995-12-26)</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>cited in the application</td>
<td></td>
</tr>
<tr>
<td></td>
<td>abstract</td>
<td></td>
</tr>
<tr>
<td></td>
<td>column 1, line 60 – column 2, line 12</td>
<td></td>
</tr>
<tr>
<td></td>
<td>column 3, line 17 – column 4, line 12</td>
<td></td>
</tr>
<tr>
<td></td>
<td>column 5, line 2 - line 52; figure 3</td>
<td></td>
</tr>
<tr>
<td>Patent document cited in search report</td>
<td>Publication date</td>
<td>Patent family member(s)</td>
</tr>
<tr>
<td>--------------------------------------</td>
<td>-----------------</td>
<td>-------------------------</td>
</tr>
<tr>
<td>US 2002028674 A1</td>
<td>07-03-2002</td>
<td>AU 7982301 A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>WO 0221866 A2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CN 1272758 A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>JP 2001008271 A</td>
</tr>
<tr>
<td>WO 0076235 A</td>
<td>14-12-2000</td>
<td>AU 5437000 A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>EP 1183885 A1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>WO 0076235 A1</td>
</tr>
<tr>
<td>US 5479476 A</td>
<td>26-12-1995</td>
<td>FI 92782 B</td>
</tr>
<tr>
<td></td>
<td></td>
<td>DE 69429123 D1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>DE 69429123 T2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>EE 9400186 A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>EP 0611070 A2</td>
</tr>
</tbody>
</table>