(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
15 July 2004 (15.07.2004)

PCT

(10) International Publication Number
WO 2004/059956 A1

(51) International Patent Classification[7]: H04M 1/2745, 1/725, H04Q 7/32

(21) International Application Number:
PCT/TR2003/000105

(22) International Filing Date:
30 December 2003 (30.12.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
2002/02802 31 December 2002 (31.12.2002) TR
2003/00158 5 February 2003 (05.02.2003) TR

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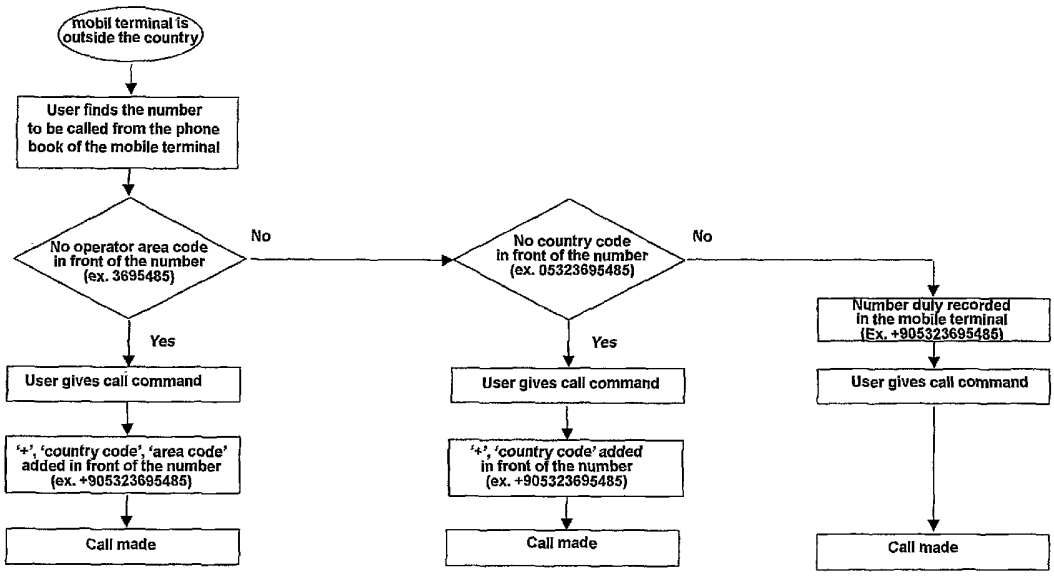
(81) Designated States *(national)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States *(regional)*: ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:
— *with international search report*
— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: A METHOD AND A MOBILE TERMINAL TO SIMPLIFY INTERNATIONAL CALLS



(57) Abstract: The invention is related to a new method and a mobile terminal which ensures that when a user of a mobile terminal calls a number in the country where his SIM card is registered, while he is out of the country, the characters required for an international calling procedure are added in front of the number to be called, in the event the number does not conform international calling procedure, without requiring the user to enter the characters and as regards to international calls made from any country to any other country, international calling characters such as the international calling prefix or country code of the country to be called are automatically added to each number called when necessary.

WO 2004/059956 A1

A METHOD AND A MOBILE TERMINAL TO SIMPLIFY INTERNATIONAL CALLS

TECHNICAL FIELD

The invention relates to calls made from a mobile phone capable of making wireless communication over a cellular network and particularly to a method and a mobile terminal which simplifies international calls made by a user with said mobile device.

When a user of a mobile terminal such as a mobile phone, PDA, capable to communicate over a cellular network such as GSM, leaves the country his SIM card is registered, attempts to make a call from his mobile terminal to any number in the country where his SIM card is registered, he has to add "+" sign, which is the international prefix or in addition country code of his country in front of each number to be called in the country where his SIM card is registered, in the event the number has not been recorded in the required form. With current technology, the only possible way to avoid adding the sign and codes is to add prefix and national code in front of each number, which the user may possibly call. Otherwise, in case of emergency or when driving, adding manually the prefix and national code to call someone becomes quite an unpractical procedure. Especially, it requires concentration on the device for a while when it is necessary to make such additions in front of the numbers recalled from the memory of the communication device.

Therefore, enabling a mobile terminal (such as mobile phone, PDA) user to easily call any number in the country where his SIM card is registered, when he is in abroad, without making any extra procedure, even if the number is not recorded suitable for calls from abroad, would eliminate all above-mentioned disadvantages.

BRIEF DESCRIPTION OF THE INVENTION

The current invention is related to a calling method eliminating all above disadvantages and a mobile terminal which performs the method.

In the current invention, SIM card features of said mobile terminals are used to realize the method. SIM cards are units which are installed into mobile terminals such as a mobile phone and identify the terminal in the cellular network and without such cards, it is not possible to identify such mobile terminals in the cellular network. Therefore, a SIM card includes information unique to the subscriber such as unique subscriber number and international mobile subscriber identity (IMSI), the list of networks and countries which may provide service to the subscriber (MCC and MNC) and phone numbers, single key calling numbers.

The purpose of the invention is to ensure that when such a mobile terminal is used to call in abroad, any number in the country where the SIM card of the terminal is registered, the characters required to make such call are added in front of the number, which is not suitable for international calls, without requiring the user to enter the characters.

In order to achieve this purpose, the invention is a method for simplifying international calls, made by a mobile terminal communicating with a SIM card over a cellular network, from outside the country where SIM card is registered in to the country comprising the steps of : on said mobile terminal;

checking whether the number to be called includes characters required for an international call and conforms number format of the country where SIM card is registered

directly making the call if the number to be called includes said characters

directly making the call if the number to be called does not conform with said number format

adding required characters based on identification information included in the SIM card if the number to be called does not include said characters required for an international call.

In a preferred embodiment of the method, while the existence of characters required for international calls is checked, existence of international calling prefix, the country code of the country where GSM operator providing SIM card operates,

area code of the GSM operator providing SIM card in such country is also checked, and in case any of these information is missing, the number is considered as non-conforming.

In another preferred embodiment of the method, the feature of the mobile phone to add characters required for an international call is automatically activated when mobile terminal goes out of the country where SIM card is registered.

In another preferred embodiment of the method, the feature of the mobile phone to add characters required for an international call is manually activated or deactivated any time by the user.

In another preferred embodiment of the method, the identification information, included in the SIM card and added when necessary, are network code of GSM operator providing the SIM card and country code of the country where the GSM operator provides service.

In another preferred embodiment of the method, in the event the number to be called includes only the subscriber number, international calling prefix, country code of GSM operator providing the SIM card and area code of the GSM operator in its country are added respectively in front of the number to be called.

In another preferred embodiment of the method, in the event the number to be called includes area code of GSM operator, providing said SIM card in the related country, or area code of another city in the country and the subscriber number, international calling prefix and area code of GSM operator of SIM card are added respectively in front of the number to be called. In the event '0' character is included in front of the area code of GSM operator providing SIM card or another city in the related country, this characters is automatically deleted before required characters are added.

Another scope of the invention is to ensure that as regards to international calls, the characters required for international calls such as international calling prefix or the country code of the country to be called are added automatically to the number

to be called, thus enable mobile terminal users to make this procedures easily and practically.

In order to achieve this purpose, the invention is a method for simplifying international calls made by a mobile terminal communicating with a SIM card over a cellular network, comprising the steps of, on the mobile terminal;

selecting at least one of the characters, used in international calls, for adding the characters to a number to be called by using relevant menu of the mobile terminal,

adding the selected characters in front of each called number in an appropriate order by the mobile terminal.

In a preferred embodiment of the method, the characters required to make an international call, as mentioned above, are international calling prefix and country code of any country in the world.

In another preferred embodiment of the method, international calling prefix is added automatically in front of each number to be called.

In another preferred embodiment of the method, international calling prefix and country code of a country defined by the user are automatically added in front of each number to be called. Here, the user lists country codes in the world using related menu of the mobile terminal and defines country code by selecting any of them.

In another preferred embodiment of the method, the final form of the number to be called is shown on the display over user interface and user confirmation is sought before call is made.

In the invention, there is provided a new mobile terminal to realize above mentioned methods. This mobile terminal includes a processor, data input means, a display and at least one memory unit and wherein:

there is provided a menu structure which allows the user to enter commands for automatic addition of characters required for an international call to the number he desires to call and

said processor provides that the commands of the user entered in menu structure are fulfilled

whereby international call made over cellular network using a SIM card are simplified.

In a preferred embodiment of the mobile terminal, when a call is made to the country where the SIM card is registered from another country, the processor checks whether the number to be called includes the characters required for such an international call and conforms numbering format of the country where SIM card is registered, and in the event the number to be called includes the characters, ensures that the call is directly made, and again, if the number to be called does not conform the numbering format ensures that call is directly made and in the event the number to be called does not include characters required for the international call, adds the characters to the number to be called based on identification information in SIM card and includes a sub menu element related to the menu structure to allow the user to command the processor start or stop working in this way.

In another preferred embodiment of the mobile terminal, said processor ensures that a number to be called which is displayed on the mobile is added characters for international call, which have been previously defined by the user and the call is made subsequently and includes sub menu elements related to the menu structure to allow the user to command the processor start or stop working in this way.

In another preferred embodiment of the mobile terminal, after the user defines a number to be called and gives calling command, the processor first checks whether the selected number includes country code of the country where SIM card is registered and if the number includes country code, it adds international calling prefix and if the country code is not included, it does not make the call, and

includes sub menu elements related to the menu structure to allow the user to command the processor start or stop working in this way.

In another preferred embodiment of the mobile terminal, said processor adds the selected country code together with the international calling prefix to the number to be called and includes sub menu elements related to the menu structure to allow the user to command the processor start or stop working in this way.

In another preferred embodiment of the mobile terminal, the country codes of all countries in the world are kept in the memory of the mobile terminal and said processor ensures that the information in the memory are listed on the display and includes sub menu elements related to the menu structure to allow the user to command the processor start or stop working in this way.

In another preferred embodiment of the mobile terminal, said processor, before making the call, displays the final form of the number to the user, after required characters for the international calls are added, and seeks confirmation of the user to start calling and, it comprises sub menu elements related to the menu structure to allow the user to command the processor start or stop working in this way.

The configuration and advantages of this invention will be understood better with following drawings, and evaluation should be made under the light of following explanations.

BRIEF DESCRIPTION ON DRAWINGS

Figure 1 flowchart of the method of adding information in the SIM card automatically to a number to be called

Figures 2a and 2b application of the present method to numbers including only subscriber number

Figures 3a and 3b application of the present method to numbers including subscriber number and GSM operator code

Figures 4a and 4b application of the present method to numbers including all necessary characters and numbers

Figure 5 flowchart of the method adding international calling characters defined by the user to a number to be dialed.

Reference Numbers

1. Mobile phone display
2. Subscriber number
3. International calling prefix
4. Country code
5. GSM operator code
6. Phone number

DETAILED DESCRIPTION OF THE INVENTION

In the invention, the procedure of adding characters required for an international call is either automatically performed by the mobile terminal, or the user defines the characters to be added and thereafter, mobile terminal adds these characters in front of the numbers to be called.

While application of the invention on a mobile phone is explained in details, this is absolutely not a restricting example. Actually, any terminal which can communicate over cellular network such as PDA, laptop can easily be used instead of a mobile phone.

Accordingly, a flowchart is given in Figure 1 with respect to automatic addition of required characters.

First of all user activates this feature by selecting a menu option "automatically add international prefixes" by using the keypad of the phone. After such option is selected, when the user in abroad, recalls or dials a phone number in the country where his SIM card is registered and presses "call" key, the processor of the mobile phone checks the content of the number displayed on the displayed and defines required procedures. As an alternative, this feature may be activated automatically without intervention of the user when the mobile phone leaves the country where SIM card is registered.

These procedures are explained in figures for a better understanding.

In the first example as seen in Figures 2a and 2b, the phone number to be called (6) includes only a subscriber number (2) which is 369 54 85. On the other hand, in this example it is assumed that area code of GSM operator (5) which has provided SIM card is 533 and as it is known, 533 is an area code of a Turkish GSM operator. In this case, when the user presses "call" key in the keypad of the mobile phone, the processor automatically analyzes the number on the display and confirms that such number includes only subscriber number, therefore not appropriate for international calling procedure. Then the processor recalls the GSM operator area code and country code of the GSM operator from the SIM card and automatically adds "+" sign, which is the international calling prefix (3) and consequently 90, which is country code of Turkey and area code of GSM operator (6) in front of the number to be dialed (6). Thus, the final form of the phone number to be dialed (6) is +90 533 369 54 85 and when the call is made, this final form is displayed to the user on the display (1) of the mobile phone.

In the second example, as seen in Figures 3a and 3b, the number to be dialed (6) is assumed as 0542 369 54 85. This phone number includes 0542, which is area code of a GSM operator (5) operating in Turkey and consequently the subscriber number (2). In this case, when the user gives 'call' command to the phone, the processor analyzes the number on the display and confirms that the number is appropriate for international calling procedure. Then using its software, the processor adds international calling prefix (3) and consequently 90(4), which is country code of Turkey, where 054 operator is operating in front of the number to be dialed (6) and in the meantime deletes '0' in 0542 GSM operator code and makes the number suitable for international call.

In the third example, as seen in Figures 4a and 4b, the phone number to be dialed is (6) +90 535 369 54 85. In this case, when the user when the user gives 'call' command, the processor confirms that the number includes all characters required for an international call and allows direct calling without making an extra procedure.

On the other hand, the user can manually define the characters to be added for an international call. An exemplary flowchart is given in Figure 5. In this flowchart, the user is assumed to recall the number to be dialed from the phone book of the phone.

According to this flowchart, the user first defines the characters he wants to add by selecting among sub menu option included preferably under the phone book menu. This sub menu includes "add international calling prefix" and "add country code" options. On the other hand, "list country codes" option is included under "add country code" option.

Accordingly, after the user select the "add international calling prefix" option, when the user recalls or dials a phone number and presses "call" key, the processor of the mobile phone checks whether the selected number includes country code of the country where SIM card is registered and in case the number includes the country code, it adds "+" sign, however if it does not include country code, it passes the entered numbers without making any procedure until finding an entry with country code. For example, if we assume that SIM card is registered in Turkey, the mobile phone seeks "90" in front of each number commanded to call and adds + sign in front of each number meeting such requirement.

Furthermore, after adding each + sign, the processor displays a confirmation display and asks confirmation by the user and does not make the call unless the confirmation is made.

In another example, when the user selects "add country code" option in the menu of said phone and gives "call" command to call the defined number, the processor of the mobile phone adds + sign and selected country code to the number to be called and makes the call. Here, the user selects "list country codes" option in the menu to see country codes in the world and easily selects the country and its code by using up and down keys on the keypad. For example, when the user selects England, +44 is added in front of each number to be dialed by the processor. In addition, the processor may ask user to confirm before each call.

In an alternative configuration of the invention, in order to allow the user to enable his mobile phone with required technical specifications (such as supporting wireless Java technology) operate any or all of the above explained features for adding international prefixes, a software together with data on related menu structure are uploaded to a server and the user who is entitled to access the server downloads the software and menu data to his mobile phone over a communication link such as Internet and after downloading is completed, the user runs the downloaded software and makes necessary adjustments on his mobile phone.

In an alternative configuration of the invention, in order to enable any mobile phone operate any or all of above mentioned features for adding international prefixes, a software and menu data related to mentioned menu structure are uploaded to SIM cars. Thus, when the user installs Sim card on any mobile phone, the processor of the phone runs the software on SIM card and ensures that related menu are added to the phone.

Although the present invention has been shown and described in terms of a preferred embodiment, it will be appreciated that changes and modifications will be evident to those skilled in the art from knowledge of the teachings of the present invention. Such changes and modifications, which do not depart from the spirit, scope and teachings herein, are deemed to fall within the purview of the invention as set forth in the appended claims.

CLAIMS

1. A method for simplifying international calls, made by a mobile terminal communicating with a SIM card over a cellular network, from outside the country where SIM card is registered in to the country comprising the steps of : on said mobile terminal;

   checking whether the number to be called includes characters required for an international call and conforms number format of the country where SIM card is registered

   directly making the call if the number to be called includes said characters

   directly making the call if the number to be called does not conform with said number format

   adding required characters based on identification information included in the SIM card if the number to be called does not include said characters required for an international call.

2. A method according to claim 1, wherein, while checking the existence of characters required for international calls, existence of international calling prefix, the country code of the country where GSM operator, providing SIM card, operates, area code of the GSM operator providing SIM card in the country is also checked.

3. A method according to claim 1, wherein, the feature of the mobile phone to add characters required for an international call is automatically activated when mobile terminal goes outside the country where SIM card is registered.

4. A method according to claim 1, wherein, the feature of the mobile phone to add characters required for an international call is manually activated or deactivated at any time by the user.

5. A method according to claim 1, wherein, said identification information, in the SIM card, added when necessary, are network code of GSM operator providing

the SIM card and country code of the country where the GSM operator provides service.

6. A method according to claim 1, wherein, if the number to be called includes only the subscriber number, international calling prefix, country code of GSM operator providing the SIM card and area code of the GSM operator in its country are added respectively in front of the number to be called.

7. A method according to claim 1, wherein, if the number to be called includes area code of GSM operator, providing the SIM card, in the related country or area code of another city in the country and the subscriber number, international calling prefix and country code of GSM operator providing the SIM card are added respectively in front of the number to be called.

8. A method according to claim 7, wherein, if '0' character is included in front of the area code of GSM operator providing SIM card or another city in the related country, this characters is automatically deleted before required characters are added.

9. A method for simplifying international calls made by a mobile terminal communicating with a SIM card over a cellular network, comprising the steps of, on the mobile terminal;

selecting at least one of the characters, used in international calls, for adding the characters to a number to be called by using relevant menu of the mobile terminal,

adding the selected characters in front of each called number in an appropriate order by the mobile terminal.

10. A method according to claim 9, wherein, said characters required to make an international call are international calling prefix and country code of any country in the world.

11. A method according to claim 9, wherein, when the option of adding international calling prefix is selected via the relevant menu of the mobile

terminal and "call" command is given to the mobile terminal, it is checked whether the number to be called includes the country code of the country where SIM card is registered and if the number includes the country code, international calling prefix is added in front of the number to be called and the call is made and if it does not include the number is passed without making any call.

12. A method according to claim 9, wherein, when the option of adding country code is selected via the relevant menu of the mobile terminal, the user firstly selects the country code to be added from the related menu options of the terminal, thus when the user selects the number to be called and gives calling command, the selected country code is added in front of each number called together with international prefix and call is made.

13. A method according to any of claims 9 to 12, wherein, after the selected characters are added, the final form of the number to be called is shown on the display over user interface and user confirmation is sought before call is made.

14. A mobile terminal having a processor, data input means, a display and at least one memory unit, wherein:

there is provided a menu structure which allows the user to enter commands for automatic addition of characters required for an international call to the number he desires to call and

said processor provides that the commands of the user entered in menu structure are fulfilled

whereby international call made over cellular network using a SIM card are simplified.

15. A mobile terminal according to claim 14, wherein, when a call is made to the country where the SIM card is registered from another country, the processor checks whether the number to be called includes the characters required for such an international call and conforms numbering format of the country where SIM card is registered, and in the event the number to be called includes said

characters, ensures that the call is directly made, and again, if the number to be called does not conform said numbering format ensures that call is directly made and if the number to be called does not include characters required for the international call, adds the characters to the number to be called based on identification information in SIM card and, it comprises a sub menu element related to said menu structure to allow the user to command the processor start or stop working in this way.

16. A mobile terminal according to claim 14, wherein, said processor ensures that a number to be called, displayed on the mobile, is added characters for international call, which have been previously defined by the user and the call is made subsequently and there are sub menu elements related to the menu structure to allow the user to command the processor start or stop working in this way.

17. A mobile terminal according to claim 16, wherein, after the user defines a number to be called and gives calling command, the processor first checks whether the selected number includes country code of the country where SIM card is registered and if the number includes country code, it adds international calling prefix and if the country code is not included, it does not make the call, and there are sub menu elements related to the menu structure to allow the user to command the processor start or stop working in this way.

18. A mobile terminal according to claim 16, wherein, said processor adds the selected country code together with the international calling prefix to the number to be called and there are sub menu elements related to the menu structure to allow the user to command the processor start or stop working in this way.

19. A mobile terminal according to claim 18, wherein, the country codes of all countries in the world are kept in the memory of the mobile terminal and said processor ensures that the information in the memory are listed on the display and there are sub menu elements related to the menu structure to allow the user to command the processor start or stop working in this way.

20. A mobile terminal according to any of claims 14 to 19, wherein, said processor, before making the call, displays the final form of the number to the user, after required characters for the international calls are added, and seeks confirmation of the user to start calling and, it comprises sub menu elements related to the menu structure to allow the user to command the processor start or stop working in this way.

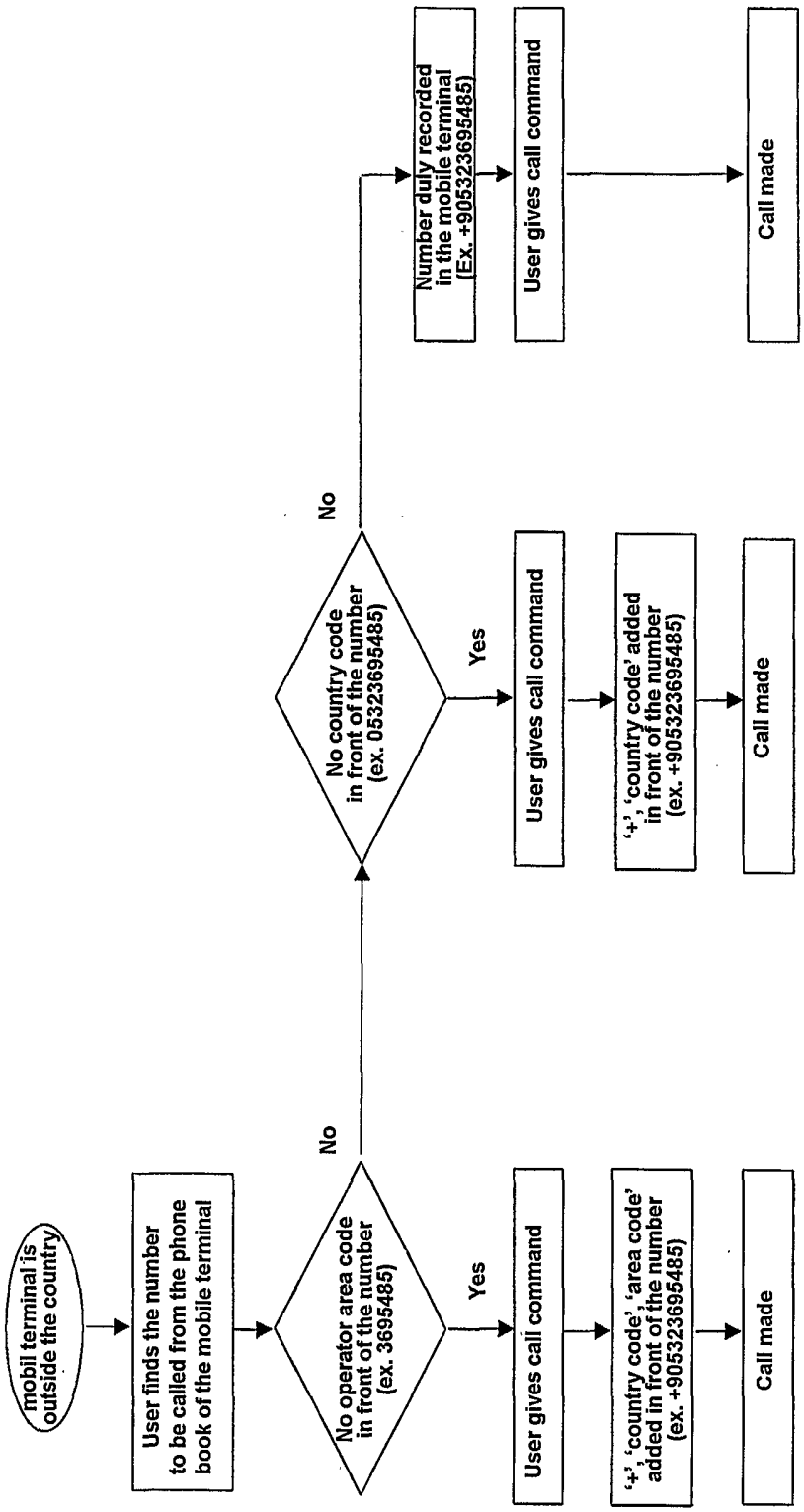

mobil terminal is outside the country
User finds the number to be called from the phone book of the mobile terminal
No operator area code in front of the number (ex. 3695485)
No
Yes
User gives call command
'+', 'country code', 'area code' added in front of the number (ex. +905323695485)
Call made
No country code in front of the number (ex. 05323695485)
No
Yes
User gives call command
'+', 'country code' added in front of the number (ex. +905323695485)
Call made
Number duly recorded in the mobile terminal (Ex. +905323695485)
User gives call command
Call made

Fig. 1

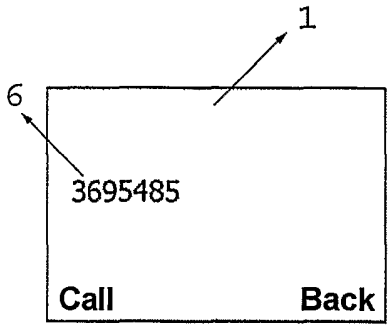


Fig. 2a

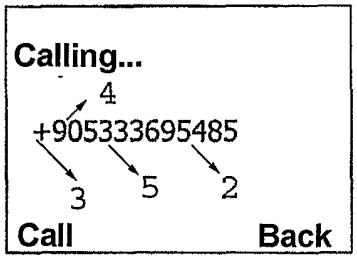


Fig. 2b

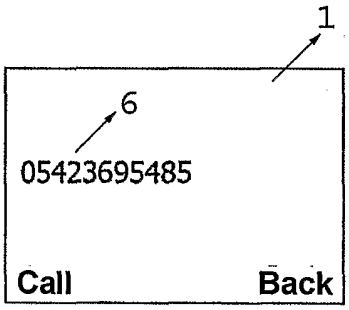


Fig. 3a

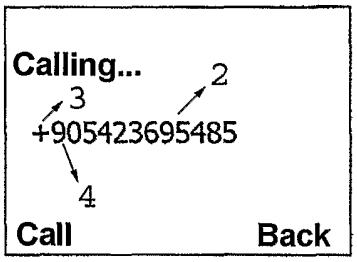


Fig. 3a

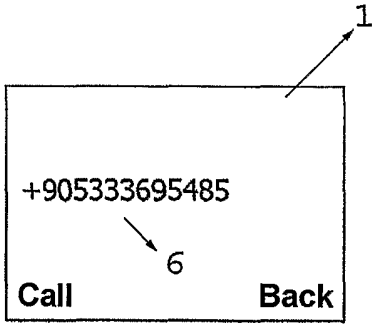


Fig. 4a

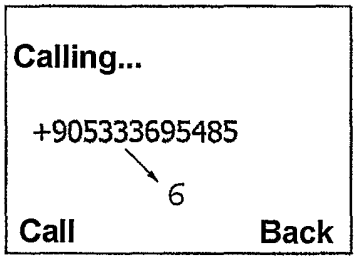


Fig. 4a

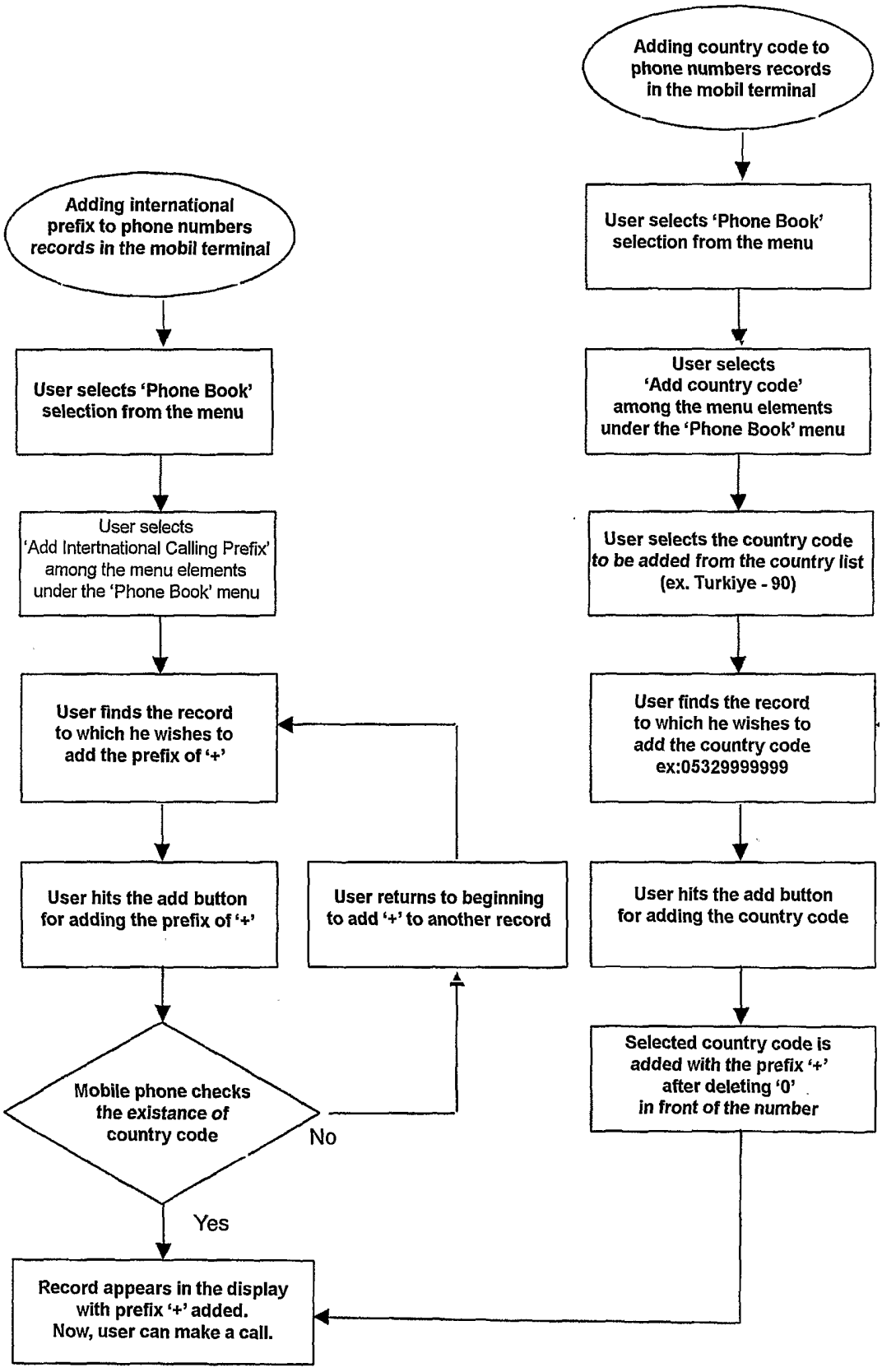

Adding country code to phone numbers records in the mobil terminal
User selects 'Phone Book' selection from the menu
User selects 'Add country code' among the menu elements under the 'Phone Book' menu
User selects the country code to be added from the country list (ex. Turkiye - 90)
User finds the record to which he wishes to add the country code ex:05329999999
User hits the add button for adding the country code
Selected country code is added with the prefix '+' after deleting '0' in front of the number
Adding international prefix to phone numbers records in the mobil terminal
User selects 'Phone Book' selection from the menu
User selects 'Add Intertnational Calling Prefix' among the menu elements under the 'Phone Book' menu
User finds the record to which he wishes to add the prefix of '+'
User hits the add button for adding the prefix of '+'
User returns to beginning to add '+' to another record
Mobile phone checks the existance of country code
No
Yes
Record appears in the display with prefix '+' added. Now, user can make a call.

Fig. 5

INTERNATIONAL SEARCH REPORT

rnational Application No
PCT/TR 03/00105

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H04M1/2745 H04M1/725 H04Q7/32

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 H04M 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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 197 11 096 A (SIEMENS AG) 24 September 1998 (1998-09-24)	1-11,14
A	column 1, line 13 - column 2, line 66 column 3, line 12 - column 5, line 22; figures 1,2	12,13, 15-20

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1

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