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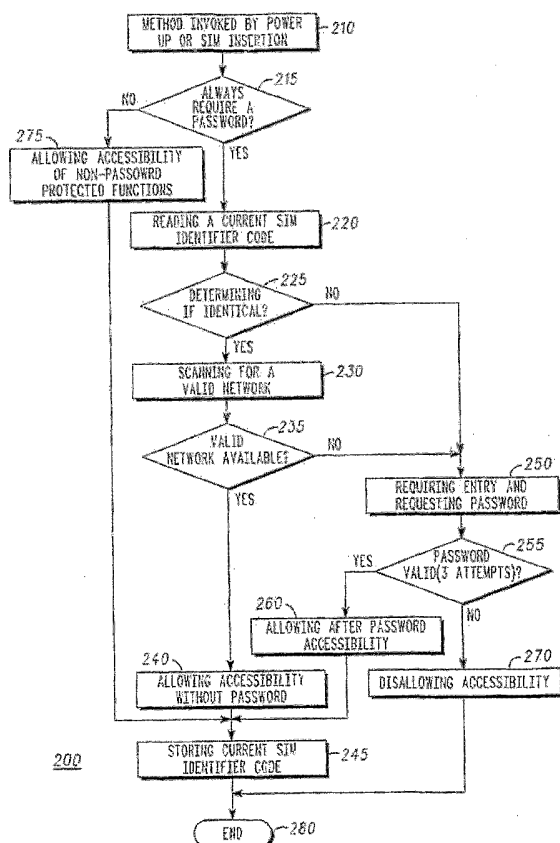
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(54) Title: METHOD AND RADIO TELEPHONE ALLOWING ACCESSIBILITY OF PASSWORD PROTECTED FUNCTIONS



(57) Abstract: A radio telephone (100) and method (200) for allowing accessibility of password protected functions on the radio telephone (100). The method (100) provides for reading a current SIM identifier code (220) that uniquely identifies a currently inserted SIM. Next, a determining test (225) is performed for determining, from the current SIM identifier code, if the currently inserted SIM is identical to a previously inserted SIM that allowed accessibility of the password protected functions. The method then performs a scanning step (230) for identifying a valid network associated with the currently inserted SIM. Finally, the method performs a step (260) of allowing, without a radio telephone password, accessibility of the password protected functions, wherein the allowing automatically provides accessibility to the password protected functions when the currently inserted SIM is identical to the previously inserted SIM and there is a valid network associated with the currently inserted SIM.

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**METHOD AND RADIO TELEPHONE ALLOWING ACCESSIBILITY OF
PASSWORD PROTECTED FUNCTIONS**

FIELD OF THE INVENTION

5 This invention relates to the field of radio
telephones having a Subscriber Identification Module
Interface that is often called a SIM card reader. The
invention is particularly useful for radio telephones with
10 password protection capabilities.

BACKGROUND OF THE INVENTION

15 In radio telephone systems such as the Global System
for Mobile Communications (GSM) radiotelephone system, a
Subscriber Identification Module (SIM) card is inserted
into a radio telephone for providing subscriber
identification, billing information and other information
concerning the operation of the radio telephone. A
20 microchip card conventionally referred to as a Subscriber
Identification Module (SIM) is a key component of the GSM
that is removably insertable into a GSM radio telephone in
order to allow the telephone to register and communicate
over the GSM network.

25 In a typical radio telephone communication system,
each subscriber unit or SIM is assigned an International
Mobile Subscriber Identification number (UMSI) which
uniquely identifies the subscriber unit from other
30 subscriber units.

35 In the present telecommunications environment, SIM
cards are used to allow the SIM card holder to have access
to any telecommunications device such as a cellular
telephone which will receive the SIM card. The SIM card is

used primarily to provide a customer profile from which the customer may be billed for usage of the telecommunications network. Thus, the SIM card is used to authenticate or authorize a user.

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Portable electronic communications devices such as radio telephones (cellphones) that are easy to transport are becoming commonplace. Such radio telephones come in a variety of different form factors and support many features and functions.

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For purposes of convenience there is a general trend toward miniaturization of many types of portable radio telephones. Miniaturization generally makes it easier to carry the electronic device, including fitting the radio telephones into a user's pocket/purse or attaching the device to a user's belt. However, such miniaturization can make it easier to misplace or lose, by theft or otherwise, the radio telephone. Accordingly, password protection for SIM card network registration and radio telephone accessibility is used to deter theft and encourage return of a misplaced radio telephone. However, such password protection may be inconvenient.

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In this specification, including the claims, the terms 'comprises', 'comprising' or similar terms are intended to mean a non-exclusive inclusion, such that a method or apparatus that comprises a list of elements does not include those elements solely, but may well include other elements not listed.

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SUMMARY OF THE INVENTION

According to one aspect of the invention there is provided a method for allowing accessibility of password protected functions on a radio telephone, the method comprising:

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Reading a current SIM identifier code that uniquely identifies a currently inserted SIM that is currently inserted into a SIM interface of the radio telephone;

Determining, from the current SIM identifier code, if the currently inserted SIM is identical to a previously inserted SIM that was previously inserted into the SIM interface and allowed accessibility of the password protected functions on the radio telephone;

Scanning for a valid network associated with the currently inserted SIM module; and

Allowing, without a radio telephone password, accessibility of the password protected functions on a radio telephone, wherein the allowing automatically provides accessibility to the password protected functions on the radio telephone when the currently inserted SIM is identical to the previously inserted SIM and there is a valid network associated with the currently inserted SIM.

Preferably, the method is invoked by a power up routine of the radio telephone. Suitably, the method may be invoked by detection of an insertion of a SIM into the SIM interface.

Suitably, the method includes a further step of requiring entry of the radio telephone password before providing the accessibility to the password protected functions on the radio telephone, the requiring being invoked when the currently inserted SIM is different to the previously inserted SIM.

Preferably, the step of requiring is further characterised by being invoked when there is no valid network associated with the currently inserted SIM.

Suitably, the step of requiring is further characterised by being invoked when there is no currently inserted SIM.

Preferably, the current SIM identifier code is obtained from an International Mobile Subscriber Identification number (IMSI) stored on the currently inserted SIM.

According to another aspect of the invention there is provided a radio telephone comprising:

A processor;

A static memory operatively coupled to the processor;

A SIM interface operatively coupled to the processor, wherein in use the processor provides for allowing, without a radio telephone password, accessibility of password protected functions on the radio telephone, wherein the allowing automatically provides accessibility to the password protected functions on a radio telephone when a currently inserted SIM currently inserted into the SIM interface is identical to a previously inserted SIM previously inserted into a SIM interface and there is a valid network associated with the currently inserted SIM.

Preferably, the processor provides for the allowing as a result of a power up routine of the radio telephone. Suitably, the processor may provide for the allowing as a result of a detection of an insertion of a SIM into the SIM interface.

Suitably, the radio telephone may effect any of the above described steps.

BRIEF DESCRIPTION OF THE DRAWINGS

In order that the invention may be readily understood and put into practical effect, reference will now be made to a preferred embodiment as illustrated with reference to the accompanying drawings in which:

Fig. 1 is a block diagram illustrating circuitry of a radio telephone in accordance with the invention; and

Fig. 2 is a flow diagram illustrating a method for allowing accessibility of password protected functions on the radio telephone of Fig. 1.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT OF THE
INVENTION

In the drawings, like numerals on different Figs are used to indicate like elements throughout. With reference to Fig. 1, there is illustrated a radio communications device in the form of a radio telephone 100 comprising a radio frequency communications unit 102 coupled to be in communication with a processor 103. The radio telephone 100 also has a keypad 106 and a display screen 105 coupled to be in communication with the processor 103. As will be apparent to a person skilled in the art, screen 105 may be a touch screen thereby making the keypad 106 optional.

The processor 103 includes an encoder/decoder 111 with an associated Code Read Only Memory (ROM) 112 storing data for encoding and decoding voice or other signals that may be transmitted or received by the radio telephone 100. The processor 103 also includes a micro-processor 113 coupled, by a common data and address bus 117, to the encoder/decoder 111, a character Read Only Memory (ROM) 114, a Random Access Memory (RAM) 104, static memory 116 and a SIM interface 118. The static programmable memory 116 and a SIM (often called a SIM card) operatively coupled to the SIM interface 118 each can store, amongst other things, selected incoming text messages and a Telephone Number Database TND (phonebook) comprising a number field for telephone numbers and name field for identifiers associated with one the numbers in the name field. For

instance, one entry in the Telephone Number Database TND may be 91999111111 (entered in the number field) with an associated identifier ``Steven C at work'' in the name field. The SIM card and static memory 116 may also store
5 passwords for allowing accessibility to password protected functions on the radio telephone 100.

The micro-processor 113 has ports for coupling to the keypad 106 screen 105 and an alert 115 that typically
10 contains an alert speaker, vibrator motor and associated drivers. Also, micro-processor 113 has ports for coupling to a microphone 135 and communications speaker 140. The character Read only memory 114 stores code for decoding or encoding text messages that may be received by the
15 communication unit 102. In this embodiment the character Read Only Memory 114 also stores operating code (OC) for micro-processor 113 and code for performing functions associated with the radio telephone 100.

The radio frequency communications unit 102 is a
20 combined receiver and transmitter having a common antenna 107. The communications unit 102 has a transceiver 108 coupled to antenna 107 via a radio frequency amplifier 109. The transceiver 108 is also coupled to a combined
25 modulator/demodulator 110 that couples the communications unit 102 to the processor 103.

Referring to Fig 2 there is illustrated a method 200
for allowing accessibility of password protected functions
30 on the radio telephone 100, the method 200 being performed by the processor 103 and associated modules comprising the radio telephone 100. The method 200 is invoked at a step 210 by either: (a) a power up routine during power up of the radio telephone 100; or (b) by detection of an
35 insertion of a SIM into the SIM interface 118 of the radio telephone 100. In this specification a SIM has the generic meaning of any subscriber or user identification module and

is interchangeable with and inclusive of, amongst others, a User Service Identity Module (USIM) or a Removable User Identity Module (RUIM).

5 After step 210, the method 200 checks, at a test step 215, if a user has set the radio telephone 100 to always require a password to be entered at, for example, the keypad 106 before allowing the accessibility of functions. If the user has not set the radio telephone 100 to always
10 require a password then the method 200 performs an allowing accessibility of non-password protected functions step 275. However, if the user has set the radio telephone 100 to always require a password, then a reading a current SIM identifier code step 220 is performed. The current SIM
15 identifier code uniquely identifies a currently inserted SIM that is inserted into the SIM interface 118 of the radio telephone 100. As will be apparent to a person skilled in the art, the current SIM identifier code is obtained from an International Mobile Subscriber
20 Identification number (IMSI) stored on the currently inserted SIM.

 After step 220, a determining if identical test 225 is conducted for determining, from the current SIM identifier
25 code, if the currently inserted SIM, that is currently inserted into the SIM interface 112, is identical to a previously inserted SIM that was previously inserted into the SIM interface 118 and allowed accessibility of the functions on the radio telephone 100. If the test 225
30 determines that the currently inserted SIM is different to the previously inserted SIM then the reading a requiring entry and requesting password step 250 is performed. Alternatively, if the test 225 determines that the currently inserted SIM is identical to the previously
35 inserted SIM then a scanning step 230 provides for scanning for a valid network associated with the currently inserted SIM. During the scanning step 230, the radio frequency

communications unit 102 scans various possible networks that may allow registration of the currently inserted SIM for effecting radio communications with the radio telephone 100.

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After the scanning step 230, a valid network available test 235 checks to ascertain if the SIM is usable. In other words, a check is made to verify if the currently inserted SIM module: (a) has been inactivated; (b) is invalid; or (c) is un-registerable in the current coverage area. If test 235 ascertains that the currently inserted SIM has been inactivated or is invalid or is un-registerable then an invalid network result occurs and the requiring entry and requesting password step 250 is performed. Alternatively, if test 235 ascertains that the currently inserted SIM is valid and registered to a valid network then an allowing accessibility step 240 is effected.

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The allowing accessibility step 240 provides for, allowing, without a radio telephone password, accessibility of the password protected functions on a radio telephone 100. This allowing accessibility thereby automatically provides accessibility to the password protected functions on the radio telephone 100 when the currently inserted SIM is identical to the previously inserted SIM and there is a valid network associated with the currently inserted SIM. Such functions can include: access to the phonebook or Telephone Number Database TND stored on the static memory 116; making and receiving telephone calls; setting password protection (for use in test step 215 and step 250); changing passwords; and accessibility to personal diaries and personal information stored on the static memory 116.

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After either steps 240 or 275 are performed, a storing step 245 is provides for storing the current SIM identifier code (the IMSI) in the static memory 116. Thus, next time

the method 100 is invoked this stored current SIM identifier code will become previously allowed SIM identifier code (IMSI) associated with one of the previously inserted SIMs that allowed accessibility of the functions that were either previously password protected or unprotected.

As previously mentioned, the requiring entry and requesting password step 250 is performed depending on the outcome of the determining if identical test 225 or the valid network available test 235. This step 250 displays on the screen 105 a request message requesting the user to input the required password. After the user enters a password string at the keypad 106, the method 200 performs a password valid check 255 to determine if the entered password is valid by comparing it with a password stored in the static memory 116. If there is no match after 3 attempts (3 unsuccessful entries of a password by the user) then a disallowing accessibility step 270 results thereby disallowing accessibility to the password protected functions is disallowed. Hence, the requiring step 250 provides for requiring entry of the radio telephone password before providing the accessibility to the password protected functions on the radio telephone 100. This requiring step 250 is invoked when the currently inserted SIM is different to the previously inserted SIM or when there is no valid network associated with the currently inserted SIM. The requiring of step 250 is also invoked by test 225 when there is no currently inserted SIM as there would be an null or invalid identifier code provided by step 220 and therefore the currently inserted SIM would be different the previously inserted SIM.

If there is a match at the password valid check 255 then the method 200 performs an allowing after password accessibility step 260 that allows, after verification of the radio telephone password, accessibility of the password

protected functions on a radio telephone 100. Thereafter, the storing step 245 is performed for storing the current SIM identifier code in the static memory 116.

5 After either the storing step 245 or the disallowing accessibility step 270 the method 200 terminates at an end step 280. Advantageously, the present invention provides for convenient password protection in which accessibility of password protected functions is allowed, without
10 entering a password, when the currently inserted SIM is identical to a previously inserted SIM and there is a valid network associated with the currently inserted SIM. However, if a SIM becomes invalid by a user reporting a
15 stolen SIM to the network provider, that is typically stolen along with the radio telephone then accessibility to the password protected functions is immediately disallowed.

 The detailed description provides preferred exemplary embodiments only, and is not intended to limit the scope,
20 applicability, or configuration of the invention. Rather, the detailed description of the preferred exemplary embodiments provides those skilled in the art with an enabling description for implementing preferred exemplary embodiments of the invention. It should be understood that
25 various changes may be made in the function and arrangement of elements without departing from the spirit and scope of the invention as set forth in the appended claims.

WE CLAIM:

1. A method for allowing accessibility of password protected functions on a radio telephone, the method comprising:

Reading a current SIM identifier code that uniquely identifies a currently inserted SIM that is currently inserted into a SIM interface of the radio telephone;

Determining, from the current SIM identifier code, if the currently inserted SIM is identical to a previously inserted SIM that was previously inserted into the SIM interface and allowed accessibility of the password protected functions on the radio telephone;

Scanning for a valid network associated with the currently inserted SIM module; and

Allowing, without a radio telephone password, accessibility of the password protected functions on a radio telephone, wherein the allowing automatically provides accessibility to the password protected functions on the radio telephone when the currently inserted SIM is identical to the previously inserted SIM and there is a valid network associated with the currently inserted SIM.

2. A method as claimed in claim 1, wherein the method is invoked by a power up routine of the radio telephone.

3. A method as claimed in claim 1, wherein the method is invoked by detection of an insertion of a SIM into the SIM interface.

4. A method as claimed in claim 1, wherein the method includes a further step of requiring entry of the radio telephone password before providing the accessibility to the password protected functions on the radio telephone,

the requiring being invoked when the currently inserted SIM is different to the previously inserted SIM.

5 5. A method as claimed in claim 4, wherein the step of requiring is further characterised by being invoked when there is no valid network associated with the currently inserted SIM.

10 6. A method as claimed in claim 4, wherein the step of requiring is further characterised by being invoked when there is no currently inserted SIM.

15 7. A method as claimed in claim 1, wherein the current SIM identifier code is obtained from an International Mobile Subscriber Identification number (IMSI) stored on the currently inserted SIM.

8. A radio telephone comprising:

A processor;

20 A static memory operatively coupled to the processor;

25 A SIM interface operatively coupled to the processor, wherein in use the processor provides for allowing, without a radio telephone password, accessibility of password protected functions on the radio telephone, wherein the allowing automatically provides accessibility to the password protected functions on a radio telephone when a currently inserted SIM currently inserted into the SIM interface is identical to a previously inserted SIM previously inserted into a SIM interface and there is a
30 valid network associated with the currently inserted SIM.

9. A radio telephone as claimed in claim 8, wherein the processor provides for the allowing as a result of a power up routine of the radio telephone.

10. A radio telephone as claimed in claim 8, the processor provides for the allowing as a result of a detection of an insertion of a SIM into the SIM interface.

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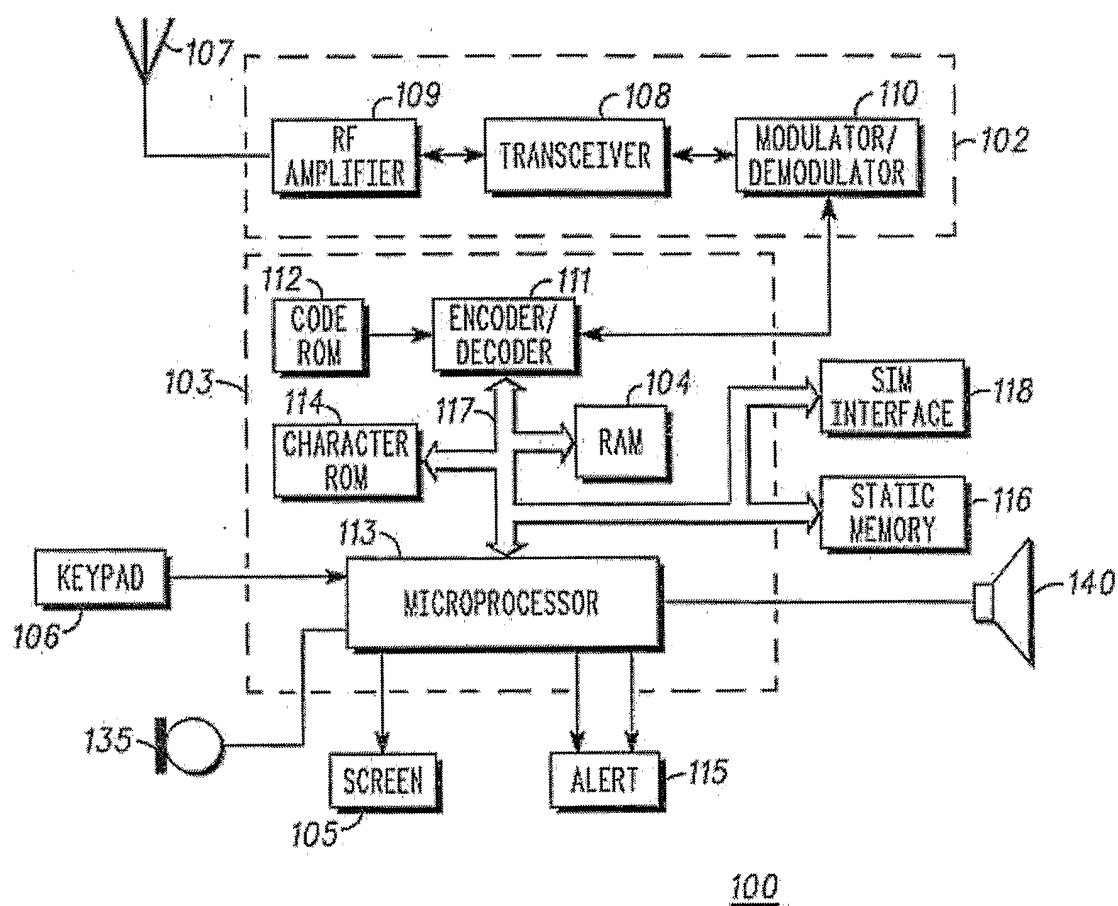
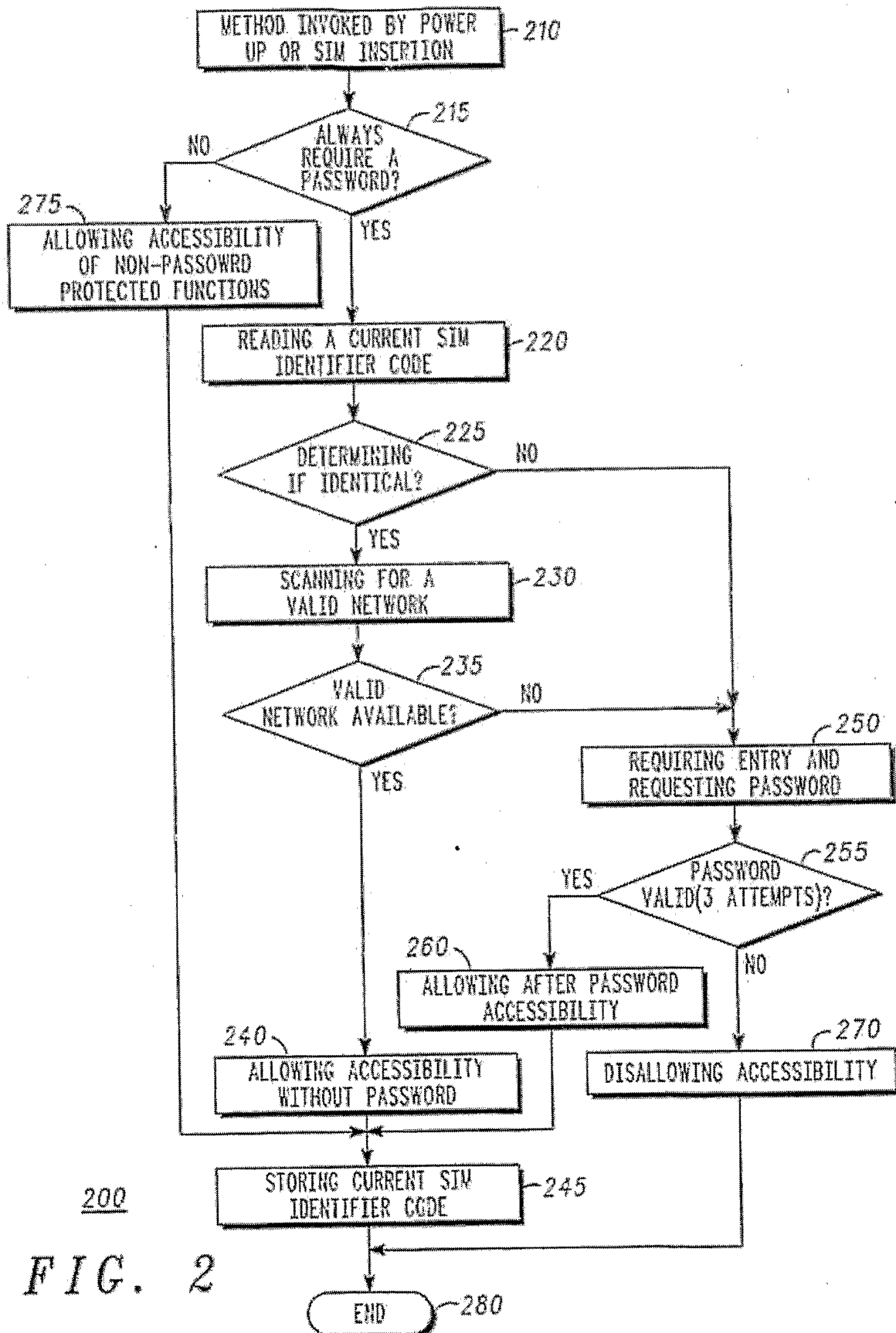


FIG. 1

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US05/23247

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : H04M 1/66, 1/00
US CL : 455/410, 411, 550.1, 558

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)
U.S. : 455/410, 411, 550.1, 558

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 practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6,032,055 (YAZAKI et al) 29 February 2000 (29.02.2000), Abstract; column 2, lines 65	1-3
---	- column 3, lines 1-27; column 4, lines 1-58; column 5, lines 22-42; column 6, lines 32-45	-----
Y		4, 7
X,P	US 2005/0075092 A1 (KIM) 7 April 2005 (7.04.2005), Abstract; Figure 2; Figure 5; p.0024; p.0028-0029	1, 4, 7
Y	US 2001/0016484 A1 (DECOTIGNIE) 23 August 2001 (23.08.2001), Abstract; p.0017-0018; p.0024	7
X	US 2001/0016484 A1 (DECOTIGNIE) 23 August 2001 (23.08.2001), p.0026-0027	1
Y	US 6,463,300 B1 (OSHIMA) 8 October 2002 (8.10.2002), Abstract; column 4, lines 25-27, 36-53; column 6, lines 35-54	4
X	US 5,266,782 (ALANARA et al) 30 November 1993 (30.11.1993), Abstract; column 2, lines 21-28, 56-64; column 3, lines 56-67	1

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

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