AUSTRALIA

Patents Act 1990

672259

Section 29

PATENT REQUEST: STANDARD PATENT/PATENT OF ADDITION

We, being the person identified below as the Applicant, request the grant of a patent to the person identified below as the Nominated Person, for an invention described in the accompanying standard complete specification.

Full application details follow.

[71] Applicant: ERICSSON GE MOBILE COMMUNICATIONS INC.

Address: P.O. BOX 13969, 1 TRIANGLE DRIVE, RESEARCH TRIANGLE PARK, N.C. 27709, UNITED STATES OF AMERICA

[70] Nominated Person: ERICSSON GE MOBILE COMMUNICATIONS INC.

Address: P.O. BOX 13969, 1 TRIANGLE DRIVE, RESEARCH TRIANGLE PARK, N.C. 27709, UNITED STATES OF AMERICA

[54] Invention Title: ACCESS CONTROLLED DEVICE FOR RENDERING SERVICES

[72] Name(s) of actual inventor(s): MATS OLOF BARVESTEN

[74] Address for service in Australia: c/o WATERMARK PATENT & TRADEMARK ATTORNEYS, of The Atrium, 290 Burwood Road, Hawthorn, Victoria 3122, Australia Attorney Code: WM

BASIC CONVENTION APPLICATION(S) DETAILS

[31] Application Number	[33] Country	Country Code	[32] Date of Application
9203351-3	SWEDEN	SE	9TH NOVEMBER 1992

Basic Applicant(s): TELEFONAKTIEBOLAGET LM ERICSSON

Drawing number recommended to accompany the abstract .....1.....

By our Patent Attorneys,
WATERMARK PATENT & TRADEMARK ATTORNEYS

..... DATED this 5th day of November 1993.

L. J. Dyson
Registered Patent Attorney

P/00/008b 12/11/91
Section 29 (1)
Regulation 3.1 (2)

AUSTRALIA

Patents Act 1990

NOTICE OF ENTITLEMENT

We, **ERICSSON GE MOBILE COMMUNICATIONS, INC. (now ERICSSON INC.)** of, 1 Triangle Drive, Research Triangle Park, North Carolina 27709, USA respectively, being the applicant in respect of Application No. 50498/93 state the following:-

The Persons nominated for the grant of the patent has entitlement from the actual inventors: Barvesten, Mats Olaf by assignment.

The person nominated for the grant of the patent is the applicant of the application listed in the declaration under Article 8 of the PCT by assignment.

The basic application listed on the request form is the first application made in a Convention country in respect of the invention.

ERICSSON INC.
By our Patent Attorneys,
WATERMARK PATENT & TRADEMARK ATTORNEYS

..... 10 July 1996

L. J. Dyson
Registered Patent Attorney (Date)

AU9350498

(12) PATENT ABRIDGMENT (11) Document No. AU-B-50498/93
(19) AUSTRALIAN PATENT OFFICE (10) Acceptance No. 672239

(54) Title
ACCESS CONTROLLED DEVICE FOR RENDERING SERVICES

International Patent Classification(s)
(51)[5] H04M 001/66 H04Q 007/04

(21) Application No. : 50498/93 (22) Application Date : 05.11.93

(30) Priority Data

(31) Number	(32) Date	(33) Country
9203351	09.11.92	SE SWEDEN

(43) Publication Date : 19.05.94

(44) Publication Date of Accepted Application : 26.09.96

(71) Applicant(s)
ERICSSON GE MOBILE COMMUNICATIONS INC.

(72) Inventor(s)
MATS OLOF BARVESTEN

(74) Attorney or Agent
WATERMARK PATENT & TRADEMARK ATTORNEYS , Locked Bag 5, HAWTHORN VIC 3122

(56) Prior Art Documents
US 5266782
US 4868846
EP 281728

(57) Claim

1. Arrangement (10) for rendering services such as telephone communication, data communication, etc, comprising a terminal unit (1) and an access unit (2), the terminal unit (1) comprising terminal unit identification means (PIN_t) being stored in the terminal unit (1) and the access unit (2) comprising first access-unit-identification means (IMSI) in the form of a code or similar, terminal unit (1) as well as access unit (2) being lockable, characterised in that, in the terminal unit are furthermore stored first access-unit-identificati , means ($IMSI_{s,i}$) for a given number (n) of access units (2) (SIM), whereupon starting up of the arrangement involving contact between the terminal unit (1) and an access unit (SIM) (2) with a certain access-unit-identification means ($IMSI_c$), the code of the identification means ($IMSI_c$) of the access unit (2) is compared with at least one code for access-unit-identification means ($IMSI_{s,i}$) which code is stored in the terminal unit, wherein correspondence between stored access-unit-identification means ($IMSI_{s,i}$) and actual access-unit-identification means ($IMSI_c$) leads to unlocking of the terminal unit (1) whereas at least the terminal-unit-identification code (PIN_t) has to be entered upon non-correspondence means stored and actual access-unit-identification means.

P/00/011 28/5/91
Regulation 3.2(2)

AUSTRALIA

Patents Act 1990

ORIGINAL
COMPLETE SPECIFICATION
STANDARD PATENT

Application Number:

Lodged:

Invention Title: ACCESS CONTROLLED DEVICE FOR RENDERING SERVICES

The following statement is a full description of this invention, including the best method of performing it known to us :-

P21797.41NAT AMB/AK
1993-10-11

TITLE:

Access controlled device for rendering services.

TECHNICAL FIELD:

The present invention relates to an arrangement for rendering services as stated in the first part of claim 1. Similar devices may under a lot of circumstances easily be abused and are very attractive to steal which might have serious consequences. This is the case as well if e.g. the access units are not lockable or are not locked as well as if the terminal unit is not lockable or is not locked so that they merely can be used by users who really should have access to the one or the other of the units. This is e.g. the case with mobile telephones where the subscription is not related to a particular mobile telephone or terminal unit but is related to a separate card. Therethrough a terminal unit or a telephone may be used with any card. If on the other hand the access unit, or the card, is not locked, anyone may use the card and therethrough also charge the subscription. One way to solve this problem, i.e. to protect the terminal unit as well as the access unit is to implement a "lock" in the terminal unit as well as in the access unit wherethrough a user has to enter a code to "unlock" the terminal unit and a further code to "lock up" the card and thus get access to the subscription. This however is tedious since two different codes have to be entered each time upon use which is very inconvenient, among others since it is difficult to remember the increasing number of codes which are necessary in the society and also because it is annoying each time, which may be a large number of times, having to enter two codes. It is therefore very probable that the user inactivates one

or the other of the codes or in the worst case both identification codes in order to be able to get a quick access to his phone whereby the user runs the risk that the device, or one of the units comprised by the device or arrangement, are abused or stolen.

STATE OF THE ART:

Devices as referred to above are known but as mentioned above they suffer the drawback that either two different codes have to be entered upon every activation of the terminal or it is not bothered to lock e.g. the terminal, but also in some cases, the card or the access unit. This is for example the case with the digital GSM-system. In this system the subscription is on a separate so called SIM-card (Subscriber Identity Module). In this case the terminal unit, or the telephone, is very attractive for stealing since the SIM-card which should have access to the telephone simply can be exchanged through another SIM-card and therethrough the telephone may be used freely by users who should not have access to the, in this case, telephone. This is particularly the case when the terminal units are intended to be used by a particular user or a particular group of users or when the terminal quite simply is stolen. In the he known device the access unit, or the SIM-card, comprises a so called PIN-code (Personal Identification Number) whereas the terminal unit, or the telephone, in turn comprises another PIN-code so that in order to get a full protection of terminal unit (telephone) as well as access unit (card), both codes must be entered at every activation of the terminal unit or the telephone. This leads consequently to a very awkward handling of the device.

On the other hand, in known analogue mobile telephone systems the subscription is programmed into the telephone

terminal. This is done with special equipment and is handled by authorized personnel which is picked out and controlled by the operator, therefore the same problems do not arise in this case.

BRIEF DESCRIPTION OF THE INVENTION:

The object of the present invention is to provide an arrangement for rendering services wherein a terminal unit as well as an access unit are safe against thefts and may not easily be abused at the same time as the device is easy to use and in the normal case do not require a double entering of codes and wherein particularly advantageous no entering or giving of codes at all is necessary to give the owner or the prioritized user access to the device without the device therefore getting less safe or protected against thefts. A further object with the invention is to provide an arrangement which permits fast and easy access and wherein the simplified access may be given to one or more users depending on what is desired.

An arrangement through which these as well as other objects are achieved is given by the characteristics of the characterizing part of claim 1.

A further object with the invention is particularly to, if so desired, enable to render information about identification number (for example telephone number) or codes belonging to access units which have been acceded simplified access. This object is achieved through the characteristics as given in claim 14.

Further preferred embodiments are given by the characteristics in the further subclaims.

BRIEF DESCRIPTION OF THE DRAWINGS:

The invention will in the following be further described with reference to the drawings in an explanatory and by no means limiting way, wherein

Fig. 1 schematically illustrates a terminal unit and an access unit in the form of a telephone with a card,

Fig. 2 schematically illustrates an example of a flow diagram with steps which are gone through upon activation of the terminal for "locking up" of terminal unit as well as access unit (in the illustrated case a telephone and a card).

DETAILED DESCRIPTION OF THE INVENTION:

In the embodiment shown in Fig. 1 a device or an arrangement 10 is shown wherein the terminal unit comprises a mobile telephone 1 and the access unit comprises an electronical card 2 comprising the subscription. The device furthermore comprises a push button means 5, a memory 3 and a micro processor unit 4. In the display 6 among others telephone numbers are shown. In the shown embodiment the device refers to the cellular so called GSM-mobile telephone system, particularly the CME 20-system (Ericsson). In this context it is also referred to recommendation GSM 11.11. In the shown embodiment the card 2 with an electronical memory comprises a so called SIM-card (Subscriber Identity Module) further described in Recommendation GSM 02.17 which contains the information which unambiguously identifies the subscriber. In the SIM-card 2 the so called IMSI-code (International Mobile Subscriber Identity) is stored. A mobile station, MS, which for example may be a station mounted on a vehicle, a portable station or a hand carried station, may only be

used if a valid IMSI-code is present. In the cases when the terminal unit or the telephone 1 is not locked or secured by a so called EIR-register (Equipment Identity Register) (not yet in use) which in one way can be seen as a different alternative to the present invention as theft protection is concerned, it would be easy to abuse or steal the terminal unit or the telephone 1. Upon starting up or activation of the telephone 1, the telephone 1 and the SIM-card 2 communicate with each other. The IMSI-code for the SIM-card(-s) 2 is (are) to be stored in a memory in the phone, e.g. in an EEPROM-storage. The IMSI-code may then be stored in a number of different ways which are known per se, e.g. the whole of it, partly, non-ciphered or ciphered or random numbered generated with calculation of rest or any other method. The storing may take place either automatically or manually. According to an advantageous embodiment of the invention it is possible to, apart from storing of the identity of the own SIM-card, i.e. its IMSI-code, also store the IMSI-codes of a number of other SIM-cards which should have a simplified or prioritized access to the terminal unit or the telephone 1.

Particularly under reference to the flow diagram of Fig. 2 in the following the sequence will be described wherein, after one or more IMSI-codes have been stored in a storage of a terminal unit as well as possibly also PIN_t and PIN_c-codes, the terminal is activated or started up wherein a number of different possibilities are possible depending on the actual IMSI-code having been stored or not.

Upon activation of the telephone, wherein either a card already is present in the telephone 1 or a new one has been introduced, the actual $IMSI_c$-code is sent to the telephone 1 (according to the GSM-recommendation) via the microprocessor 4, as stated above, where it is compared to in the telephone 1 stored $IMSI_{s,i}$-code(-s). If $IMSI_c$ corresponds

to any $IMSI_s$-code which has been stored in the telephone 1, the telephone is started up without requiring any further measure to be taken or without asking for any further code. If on the other hand the codes do not correspond the telephone 1 demands a PIN_t-code for the terminal unit or the telephone 1.

Thus, on every occasion of activation of the telephone 1, in the memory 3 stored code(-s) ($IMSI_{s,i}$) are compared with the received code ($IMSI_c$) of the actual SIM-card. A so called PIN-code for the SIM-card may likewise be stored in the storage 3 in a way similar to that of the IMSI-code(-s). In the storage 3 of the terminal unit (telephone) are apart from one or more IMSI-codes also a PIN_t, i.e. a Personal Identification Number for the terminal, is stored. According to different embodiments may furthermore PIN_c of those cards whose $IMSI_c$-code(-s) have been stored, be stored therein as well as a telephone number for the corresponding subscription. This is however dependent on desires and requirements and provisions and merely shows advantageous embodiments. Now returning to the case wherein the actual $IMSI_c$-code does correspond to the stored $IMSI_s$-code and the terminal is locked up. Thereafter is investigated if the actual PIN_c-code of the card is stored. If this is the case, the PIN_c-code of the actual card is picked up from the memory 3 whereupon it is transmitted to the card 2 which thereafter is locked up and then the telephone 1 as well as the card (access unit) 2 are unlocked and the device 10 is as far as locking is concerned ready to be used or open for communication. In this case, consequently, is not required the entering of any code by the user. (If PIN_c is stored (and activated), this code is requested and will then have to be entered or given).

If however the actual $IMSI_c$-code does not correspond to any stored $IMSI_s$-code the terminal unit 1 or the telephone 1 requests a PIN_t-code for the terminal. When this code is given the terminal 1 is unlocked. Thereafter is asked if the PIN_c-code for the card is activated. If not, the card is unlocked and thus was not locked. If yes, the PIN_c-code is requested and when this is given, the card is locked up and the device is ready to be used as far as locking is concerned. If on the other hand the actual IMSI-code has corresponded to a stored $IMSI_s$-code it is also possible that the PIN_c-code of the actual card has not been stored. The terminal is in this case, as already mentioned above, already unlocked. Then is examined if any PIN_c-code for the card is activated. If yes, this is given whereupon the card is locked up. If not, the card consequently has not been locked and is therefore unlocked and the device is ready to be used as far as locking is concerned. Thus it is possible for an authorized user, i.e. a user who should have access to telephone as well as to card not to enter any code at all but that the card as well as the terminal are unlocked automatically. If however the actual $IMSI_c$-code has not been stored in the terminal it is possible to get access by entering PIN-codes for terminal and card. Eventually these codes could be associated with each other and for example consist of one and the same code.

According to a preferred embodiment at least one $IMSI_c$-code as well as also PIN-codes for card as well as for terminal are stored in the memory. To avoid the storage of the PIN-code of the card it might also be possible, as mentioned above, to associate this with the PIN-code of the terminal. According to a preferred embodiment is however the PIN_c-code of the card stored in a ciphered form in the memory 3.

The cards may for example comprise cards with an electronical memory but also cards with a magnetical memory or other alternatives are possible.

According to a preferred embodiment it is possible, in case the $IMSI_c$-code of an actual card is stored in the memory 3 of the terminal 1, to show for example the telephone number of the actual subscription or the SIM-card which can be useful since this in no other way is visible. Then it is examined, after unlocking of the card, if the telephone number of the card is stored in the terminal. If this is the case, it is picked up from the memory and is shown on the display 6. If the telephone number is not stored in the terminal it is examined if the telephone number is stored in the card. If this is the case, the telephone number is picked up from the memory and is also shown on the display 6. If the telephone number is not stored, no display takes place. The display of telephone numbers is advantageous since the telephone number in no other way is visible, neither on the terminal unit or on the card and if a user for example has several cards it may be difficult to remember the number as it often is difficult to remember the own number. This is the case both if one or more telephone numbers is/are connected to stored IMSI-codes.

It is furthermore possible to carry out the storage of different codes (IMSI, PIN) in the memory 3, either manually or automatically. With manual storing it could for example be effected by a so called push button device 5 or similar. Furthermore, it should be possible to change stored codes as well as to delete codes or add codes.

The invention shall of course not be limited to the shown embodiments and does not have to be a mobile telephone but it is related to every device rendering services, e.g. devices for data communication or others comprising a

terminal unit and an access unit which e.g. may comprise a subscription or similar and where it is desirable to secure the units forming part of the device against theft and abuse. A device may also comprise more than two units. The invention should not be limited to the shown embodiments but can be freely varied within the scope of the claims.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. Arrangement (10) for rendering services such as telephone communication, data communication, etc, comprising a terminal unit (1) and an access unit (2), the terminal unit (1) comprising terminal unit identification means (PIN_t) being stored in the terminal unit (1) and the access unit (2) comprising first access-unit-identification means (IMSI) in the form of a code or similar, terminal unit (1) as well as access unit (2) being lockable, characterised in that, in the terminal unit are furthermore stored first access-unit-identification means ($IMSI_{s,i}$) for a given number (n) of access units (2) (SIM), whereupon starting up of the arrangement involving contact between the terminal unit (1) and an access unit (SIM) (2) with a certain access-unit-identification means ($IMSI_c$), the code of the identification means ($IMSI_c$) of the access unit (2) is compared with at least one code for access-unit-identification means ($IMSI_{s,i}$) which code is stored in the terminal unit, wherein correspondence between stored access-unit-identification means ($IMSI_{s,i}$) and actual access-unit-identification means ($IMSI_c$) leads to unlocking of the terminal unit (1) whereas at least the terminal-unit-identification code (PIN_t) has to be entered upon non-correspondence means stored and actual access-unit-identification means.

2. Arrangement according to claim 1, characterised in that access unit (SIM) (2) comprises second access-unit-identification means (PIN_c) which may be activated or inactivated.

3. Arrangement according to claim 2, characterised in that if stored first access-unit-identification code ($IMSI_{s,i}$) does not correspond with actual access-identification code ($IMSI_c$) and the second access unit identification means are activated and comprises a code (PIN_c), this code (PIN_c) has to be given for locking up or activation of the access unit (SIM) (2).

4. Arrangement according to claim 3, characterised in that the code (PIN_c) of the second access-unit-identification means is given manually by the user.

5. Arrangement according to claim 1 or 2, characterised in that also second access unit identification means (PIN_c) are stored in tha terminal unit (1), the terminal unit upon correspondence between stored and actual access-identification-code ($IMSI_s = IMSI_c$) automatically transferring the second identification means (PIN_c) to the access unit (2) so that the arrangement (10) may be used without the second access unit identification code (PIN_c) having to be given by the user.

6. Arrangement according to claim 2, characterised in that if the second access unit identification means (PIN_c) has not been stored and upon correspondence between first access-unit-identification means ($IMSI_{s,i}$) stored in the terminal unit (1) and the actual access-unit-identification means ($IMSI_c$), the access unit (2) is locked up by entering of (PIN_c).

7. Arrangement according to anyone of claims 1 or 2, characterised in that upon non-correspondence between stored and actual access-identification code ($IMSI_c \neq IMSI_{s,i}$) terminal unit (1) as well as access unit (2) is unlocked by giving one of the terminal identification code (PIN_t) or the second access-unit-identification code (PIN_c).

8. Arrangement according to anyone of claims 1 to 4, 6, characterised in that upon non-correspondence between actual and any stored access-identification-code ($IMSI_c$) $\neq$ ($IMSI_s$) terminal identification code (PIN_t) as well as second access identification code (PIN_c) have to be given.

9. Arrangement according to anyone of the preceding claims, characterised in that the terminal unit (1) comprises a mobile telephone.

10. Arrangement according to anyone of the preceding claims, characterised in that the access unit (2) comprises a card eg with an electronical or a megnetical memory.

11. Arrangement according to claim 10, characterised in that the access unit (2) comprises a SIM-card (Subscriber Identity Module) defining the subscription of the mobile telephone (1).

12. Arrangement according to anyone of the preceding claims, characterised in that the first access-unit-identification code ($IMSI_{c,i}$) for at least one subscription which should have access to the telephone unit (1) or the terminal unit is stored in the terminal unit, said identification code for example being stored in a EEPROM-memory in a manner known per se, for example, being stored as a whole, partly, ciphered, or random number generated with a remainder.

13. Arrangement according to claim 12, characterised in that furthermore one or several further access-unit-identification codes ($PIN_{c,i}$) are stored in a memory in the terminal unit (1) for example as a whole, partly or ciphered in any per se known way.

14. Arrangement according to claim 13, characterised in that at least one second identification code ($PIN_{c,i}$) is stored ciphered in a memory in the terminal unit (1).

15. Arrangement according to any one of the claims 12 to 14, characterised in that the storage of the first access-identification-code ($IMSI_s$) takes place automatically.

16. Arrangement according to any one of claims 12 to 14, characterised in that the storage of the first access-identification-code ($IMSI_s$) takes place manually, for example via a push button device (5) or similar.

17. An arrangement according to any one of the claims 12 to 16, characterised in that at least one second access-identification-code (PIN_c) is stored in a memory in the terminal unit (1).

18. Arrangement according to any one of claims 9 to 17 characterised in at least one telephone number associated with at least one access unit (2) is stored.

DATED this 10th day of July, 1996.

ERICSSON INC.

WATERMARK PATENT & TRADEMARK ATTORNEYS
LEVEL 4, AMORY GARDENS
2 CAVILL AVENUE
ASHFIELD NSW 2131
AUSTRALIA

P21797.41NAT AMB/AK
1993-10-11

TITLE:

Access-controlled device for rendering services.

ABSTRACT:

The present invention relates to a device (10) for rendering services such as for example telephone communication, data communication and so on comprising a terminal unit (1) and an access unit (2), the terminal unit (1) comprising terminal unit identification means (PIN_t) which are stored in the terminal unit and the access unit comprising first access identification means (IMSI) in the form of a code or similar, terminal unit (1) as well as an access unit (2) being lockable. In the terminal unit are furthermore first access identification means for a given number of access units (SIM) stored wherein upon starting up of the device involving contact between terminal unit (1) and actual access unit (SIM) (2) with a certain access unit identification means ($IMSI_c$), the code of the identification means ($IMSI_c$) of the access unit (2) is compared to in the terminal unit (1) stored code/-s for first access identification means ($IMSI_1$) in the terminal unit, correspondence between stored access identification means ($IMSI_s$) and actual access unit identification means ($IMSI_c$) leading to locking up of the terminal unit whereas non-correspondence between stored and actual access unit identification means ($IMSI_s \neq IMSI_c$) respectively at least the terminal unit identification code (PIN_t) must be given.

(Fig. 1)

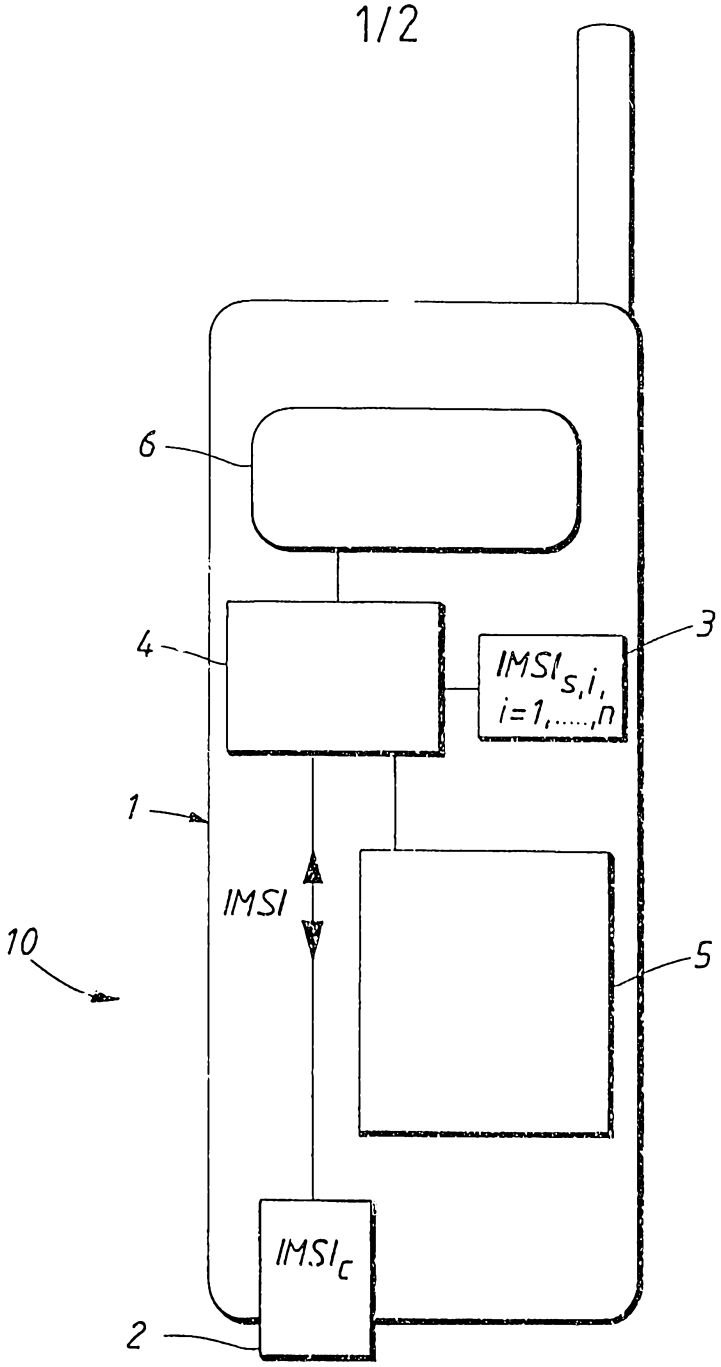

FIG. 1

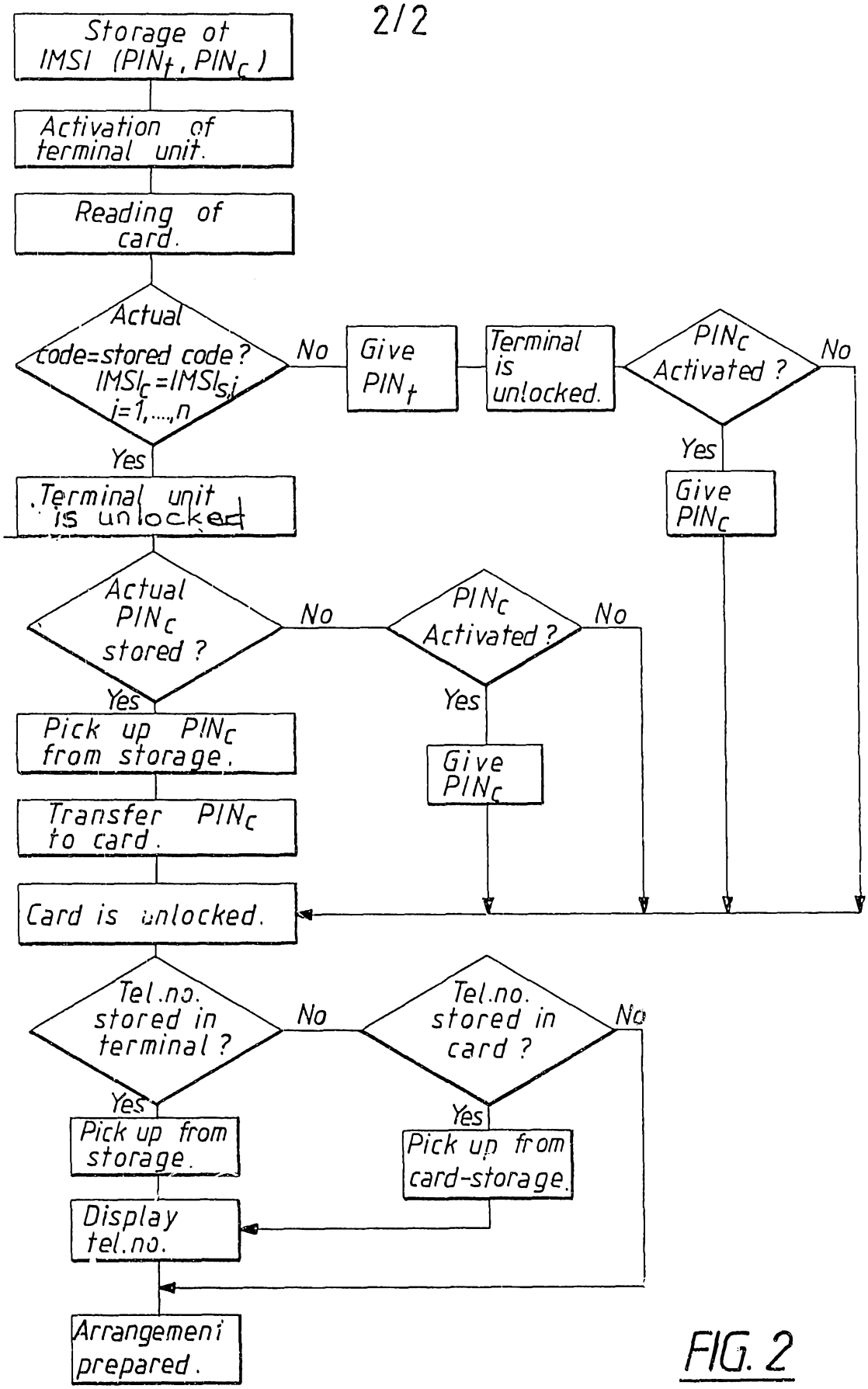
Storage of IMSI (PIN$_t$, PIN$_C$)
Activation of terminal unit.
Reading of card.
Actual code=stored code? IMSI$_C$=IMSI$_j$ j=1,...,n
No
Give PIN$_t$
Terminal is unlocked.
PIN$_C$ Activated ?
No
Yes
Give PIN$_C$
Yes
Terminal unit is unlocked
Actual PIN$_C$ stored ?
No
PIN$_C$ Activated ?
No
Yes
Yes
Pick up PIN$_C$ from storage.
Give PIN$_C$
Transfer PIN$_C$ to card.
Card is unlocked.
Tel.no. stored in terminal ?
No
Tel.no. stored in card ?
No
Yes
Yes
Pick up from storage.
Pick up from card-storage.
Display tel.no.
Arrangement prepared.

FIG. 2