

(12) PATENT
(19) AUSTRALIAN PATENT OFFICE

(11) Application No. AU 199666678 B2
(10) Patent No. 711065

(54) Title
Radio mobile terminal provided with an additional reader of chip cards

(51)⁶ International Patent Classification(s)
H04M 001/02 H04M 017/02
H04M 017/00 H04Q 007/32

(21) Application No: 199666678 (22) Application Date: 1996 .07 .24

(87) WIPO No: W097/05729

(30) Priority Data

(31) Number	(32) Date	(33) Country
RM95A000521	1995 .07 .27	IT

(43) Publication Date : 1997 .02 .26
(43) Publication Journal Date : 1997 .04 .24
(44) Accepted Journal Date : 1999 .10 .07

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(56) Related Art
GB 2269512

OPI DATE 26/02/97 APPLN. ID 66678/96
AOJP DATE 24/04/97 PCT NUMBER PCT/IT96/00151



AU9666678

(CT)

(51) International Patent Classification ⁶ : H04M 1/02, H04Q 7/32, H04M 17/00, 17/02	A1	(11) International Publication Number: WO 97/05729 (43) International Publication Date: 13 February 1997 (13.02.97)
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(21) International Application Number: PCT/IT96/00151

(22) International Filing Date: 24 July 1996 (24.07.96)

(30) Priority Data:
RM95A000521 27 July 1995 (27.07.95) IT

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(81) Designated States: AL, AM, AT, AU, AZ, BB, BG, BR, BY,
CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, HU,
IL, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LS, LT, LU, LV,
MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU,
SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, US, UZ,
VN, ARIPO patent (KE, LS, MW, SD, SZ, UG), Eurasian
patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European
patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT,
LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI,
CM, GA, GN, ML, MR, NE, SN, TD, TG).

Published

With international search report.

(54) Title: RADIO MOBILE TERMINAL PROVIDED WITH AN ADDITIONAL READER OF CHIP CARDS

(57) Abstract

Radio mobile terminal provided with an additional chip card reader of prepaid chip cards, which can be made available both on a terminal realized according to the TACS technology and on a terminal employing the GSM technology. The prepaid chip card embodies the payment means for the radio mobile telephony service.

Description

Radio mobile terminal provided with an additional
reader of chip cards

Technical field

The present invention relates to a radio mobile terminal
provided with an additional reader of chip cards, and
more particularly it relates to a radio mobile terminal
5 provided with an additional reader of prepaid chip
cards, which can be implemented both on terminals
realized with the TACS (Total Access Communication
System) technology, and on terminals employing the GSM
(Global System for mobile communication) technology.

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Background Art

Presently, both the TACS service of mobile telephony and
the GSM telephone service do not provide prepaid chip
cards, notwithstanding their wide diffusion. On the
15 other hand, the advantages of telephonic prepaid cards
are well known in public telephony, since they allow
their user to continuously check the amount of the credit
and expense.

GB patent 2 269 512 A (Nokia) relates to a radio
20 telephone arrangement comprising two or more card
readers for accomodating a corresponding number of
memory cards, in the form of subscribers identity
modules (Sims). The telephone is adapted to use the
information from one of the memory cards (to* the



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exclusion of the other memory cards) in accordance with a predetermined priority allocation and the prioritization may be reset automatically if a card is removed or inserted, or the user may modify the priorities, e.g. by menu selection.

5 First of all this kind of radio telephone does not take into account the use of a prepaid card in one of the provided card readers, and on principle it doesn't relate to a specific mobile cellular phone, but to a
10 radio telephone plant to which two or more card readers can be added according to the necessity.

In any case the prioritization for using one of the card readers instead of another is completely foreseeable and obvious, also because no prepaid chip card is provided.
15 GB patent 2 267 794 relates to a pre-payable mobile cellular telephone communication system. According to the invention there is provided a cellular telephone where present handsets are adapted so that a cartridge or a smart card is inserted to the handset enabling
20 connection to the network and thus make out-going telephone calls.

In this realization the handset would still be able to receive incoming calls even if the cartridge was not inserted and even if there were no credited "airtime"
25 available.

In any case the prepayable mobile cellular phone does not absolutely provide for the employment of a SIM card which would permit the use of the cellular phone



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according to a subscription contract with payment posterior to the phone call.

- 5 This use is provided neither with the card reader accommodating the prepaid chip nor by a second supplementary port. Of course in this kind of embodiment there is not any problem of prioritization for using several telephone card readers.

According to one aspect of the present invention there is provided radio mobile terminal
10 provided with an additional reading device for managing chip cards of standard format, wherein said additional reading device is a second reader having a standard format in the case of a GSM terminal, said reading device being suited to receive and to manage a prepaid chip card whereon the available credit used to benefit by the telephone service is stored, and
15 in the terminals of the GSM type the additional reader is also arranged to perform reading of SIM cards of the ID-1 format, with the following possible operative conditions of the two readers:

- if the SIM card is loaded in the ordinary reader and no card is inserted in the additional reader ID-1, the terminal of the GSM type operates on the SIM card of the
20 ordinary read;
- if a SIM card is loaded in the ordinary reader and a second SIM card is loaded in the additional reader ID-1, the GSM terminal manages the SIM card of the additional reader ID-1 only;
- if the SIM card is not loaded in the ordinary reader and only the additional reader ID-
25 1 is loaded the GSM terminal manages the SIM card of the additional ready ID-1;
- if a SIM card is loaded in the ordinary reader and in the additional reader is loaded the prepaid card, the GSM terminal operates on the SIM Card of the ordinary reader; the payment is carried out by means of the prepaid card introduced into the additional reader.

30 Best Mode of Carrying out the Invention

The above and other objects which will be clearly illustrated in the course of this description, will be attained by a radio mobile terminal provided with an additional reader of chip cards,



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wherein an additional reading device (a second reader corresponding to a standard format in the case of terminals of the GSM type) manages a prepaid chip card which stores the amount of the available credit used for benefitting by the telephone service; said chip card embodies the payment means for the radio mobile service. The additional reader of chip cards
5 complies with the ISO 7816-2 standard and the ID1 format, and it can read



cards with six contacts as well as with eight contacts.
The radio mobile terminal being compatible with the
network standard, is provided with all functions of the
network, and it is additionally equipped with the
5 functions related to the management of chip cards.
In the terminals of the GSM type the additional reader
must also be realized so as to be able to read
identification cards for mobile communication (SIM)
(SIM = Subscriber Identity Module) having a format ID-1.
10 In this case, the possible operative conditions of the
terminal comprising two chip card readers are the
following:
- if the SIM card is inserted in the usual (ordinary)
reader and no card is inserted (loaded) in the
15 additional reader ID-1, the terminal of the type GSM
manages the SIM card of the ordinary reader;
- if two SIM cards are loaded, the SIM card of the
ordinary reader and the SIM card of the additional
reader ID-1, the GSM terminal manages the SIM card of
20 the additional reader ID-1 only;
- if the ordinary or usual reader is not loaded and only
the additional reader ID-1 is loaded, the GSM terminal
manages the SIM card of the additional reader ID-1;
- if the ordinary reader is loaded and the prepaid card
25 is loaded inside the additional reader, the GSM terminal
manages the SIM card of the ordinary reader; the payment
is carried out by means of the prepaid card inserted
into the additional reader.

The additional reader of the terminal can also perform the following functions:

- it allows insertion and removal of the chip card, automatically and simply (without removing any mechanical part of the terminal);
- it prevents movement of the card during the telephonic conversation, except at the exhaustion of the credit, since the card change must be allowed;
- it automatically detects possible external connections with the card, stopping their operations.

The terminal provided with the additional reader displays the residual credit of the prepaid card, in the following operative situations:

- when the terminal is in the stand-by condition, and the user acts on the keyboard in order to interrogate it; during a charged telephone call (performed from the terminal provided with the additional reader).

The additional reader of the terminal can perform also the following management procedures (besides the usual standard network procedures):

- validation of the chip card;
- decrease of the credit units from the chip card during the conversation;
- change of the chip card which is becoming exhausted.

Industrial Applicability

The practical realization of the invention, as explained until now at an illustrative level, must of course not

be interpreted in a limitative sense. Numerous and varied may be the configurations which, starting from the basic principle set forth in claim 1, employ an additional reader of prepaid chip cards in order to
5 provide an optimum functionality of the terminal where they are located.

An additional straightforward application may concern the public telephones network implemented on the ferry-boats, wherein the terminals are included in a network
10 with a centralized management and wherein the terminal operates after the insertion of a SIM card which allows the identification of the user.

Also on this kind of terminals connected in a network, the provision of a double reader for managing prepaid
15 chip cards results in an increase of the value of the services associated to the terminal itself.

Claim

1. Radio mobile terminal provided with an additional chip card reader, including an additional reading device for managing chip cards of standard format, wherein said additional reading device is a second reader having a
- 5 standard format in the case of a GSM terminal, said reading device being suited to receive and to manage a prepaid chip card whereon the available credit used to benefit by the telephone service is stored, and embodying said chip card the payment means for the radio mobile
- 10 service, characterized in that in the terminals of the GSM type the additional reader is also arranged to perform reading of SIM cards of the ID-1 format, with the following possible operative conditions of the two readers:
- 15 - if the SIM card is loaded in the ordinary reader and no card is inserted in the additional reader I-D1, the terminal of the GSM type operates on the SIM card of the ordinary reader;
- 20 - if a SIM card is loaded in the ordinary reader and a second SIM card is loaded in the additional reader ID-1, the GSM terminal manages the SIM card of the additional reader ID-1 only;
- 25 - if the SIM card is not loaded in the ordinary reader and only the additional reader ID-1 is loaded the GSM terminal manages the SIM card of the additional reader ID-1;



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- if a SIM card is loaded in the ordinary reader and in the additional reader is loaded the prepaid card, the GSM terminal operates on the SIM Card of the ordinary reader; the payment is carried out by means of the
5 prepaid card introduced into the additional reader.



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