

A memory module reader and a telephone apparatus
incorporating a memory module reader

This invention relates to a memory module reader such as for a cellular radio telephone, commonly known as a "mobile phone". It also relates to a cellular radio telephone apparatus incorporating such a reader.

The term "memory module" is intended to refer to a data card, such as a chip card. The data card may be a passive memory card, i.e. having a read only memory (ROM), or an active processor card, i.e. capable of processing information internally within the card.

It is known in the field of cellular radio telephones to use a memory module such as a data card which may be removably inserted into the telephone. Data, such as subscriber identity information, is read from the inserted card and used in the subsequent operation of the telephone.

In addition to subscriber identity information, such as the subscriber telephone number and personal identification number (PIN), the chip card may store, for example, call charge information and a telephone directory.

Such chip cards which identify the subscriber are known, at least in Europe, as "SIM" (Subscriber Identity Module).

There are currently two different standards used for the SIM card and a third has been proposed. The functionality of the SIM card is the same for all standards, essentially only the exterior dimensions are different. The two current standards are (a) a credit-card size SIM card, and (b) a smaller plug-in SIM card about 20mm x 25mm. The proposed third standard is likely to be a mid-sized SIM card about half the size of a regular credit card. Although the credit-card format is perceived as a convenient size for the user from a practical standpoint, it is relatively large, and smaller card sizes are needed as miniaturisation continues to drive down the overall size of the telephone. The smaller plug-in SIM card is intended to normally remain in the telephone.

It is desirable that a telephone should be operable with more than one card format. For example, a smaller plug-in SIM card can be used for business purposes and a SIM card having the credit-card format can be used for private purposes. When a telephone is to be used with more than one card there is the risk that a card not in use can be lost or damaged. This is particularly the case with the smaller plug-in SIM card.

A solution to the problem of using a telephone with more than one size of card format is known from Document DI. This discloses a cellular radio telephone which is provided with a slot for receiving one of two types of adaptor. The first adaptor accepts a larger SIM card and is provided with a slot at one end into which the card can be introduced. The second adaptor is capable of accepting a smaller SIM card and comprises a pivotable card holder into which the card can be introduced from one end. This cannot accept the larger type of SIM card.

Whilst the arrangement disclosed in DI does allow the telephone to be used with either type of card, when one card is in use the other adaptor and card must be removed from the telephone. Although the cards are partially protected, they could then become lost when not in use.

To overcome the problem of loss or damage to the memory cards, an alternative solution is known from Document DII, which again forms a part of the state of the art. In this document a number of memory module readers for a cellular radio telephone are disclosed in which more than one card can be stored in the telephone, with a different type of card reader provided for each type of card. To prevent the

telephone from attempting to read from more than one card at once, a microprocessor monitors the presence of cards and uses data from the cards in a predetermined sequence stored in memory of the telephone.

Whilst such an arrangement prevents loss or damage of the cards, it requires a complex and expensive microprocessor circuit to select which card will be used when more than one card is inserted at once. The need for a number of different types of data reader also increases the size of the apparatus. Individually, each memory module reader only accepts one card.

An object of the present invention is to at least partially overcome these problems presented by the prior telephone apparatuses and the memory module readers which they use.

In accordance with one aspect the present invention provides a memory module reader according to Claim 1.

By providing a first support means for a first card, and a second support means for a second card which can be moved from a reading position to a storage position, it is possible for one card to be permanently held by the memory module reader whilst another card is used. Thus, it is trivial to switch from use of one card to another.

In use, a second card can be inserted in the moveable support means and moved to its storage position. The reader can then receive a first card in its first support means to read from that card, for instance for private purposes. Once removed, the second card may then be simply moved to its reading position without risk of losing the second card if required, for example, for business use.

In one preferred arrangement, the first and second support means may support different sized memory modules. It is preferred that the second support means retains the smaller sized module as this is most easily lost.

The second support means may be pivotally attached to the memory module reader by a hinge, and in one preferred arrangement may be received in a recess in a base of the reader when in its storage position to allow a first size module to be inserted above the second storage means.

In an especially advantageous arrangement, a resilient flap may be provided on the free end of the holder. This has been found to be advantageous in preventing accidental release of the memory module but allowing release when desired without the use of tools. In an alternate, a separate closure member could be snap-fitted on the end of the holder.

It is most convenient that a resilient member is provided which both secures a free end of the holder in its reading position and also helps to retain a first memory module in the first support means. The first support means can then conveniently comprise a slot into which one end of a memory module can be inserted whilst the other end is secured under the resilient member to hold the memory module in the correct location relative to the contact means.

In another embodiment of the invention, a memory module reader may comprise part of a telephone apparatus which includes a means for receiving a battery pack. By arranging for the battery pack to cover the memory module reader when in use, it ensures that the battery must be removed before a card can be inserted or removed. This prevents accidental damage to the card(s) occurring.

Other features of the invention are the subject of the dependent claims.

A specific embodiment of the present invention will now be described with reference to the drawings of which:

Claims

1. A memory module reader (1) comprising a body (10), contact means (5) adapted to electrically co-operate with one or more contacts on a memory module for reading data from the memory module, a first support means (2) adapted to support a first memory module in a reading position whereby the contact means (5) co-operates with one or more contacts on the first memory module, and a second support means (3) adapted to support a second memory module in a reading position whereby the contact means (5) co-operates with one or more contacts on the second memory module,

characterised in that the second support means comprises a holder (3) which is moveable between the reading position and a storage position in which the second memory module can be stored in an unused position in the memory module reader without removing the second memory module from the reader whilst the first support means is free to support the first memory module in a reading position.
2. A memory module reader according to Claim 1 in which the first support means (2) and second support means (3) are each adapted to support different size memory modules.
3. A memory module reader according to Claim 1 or Claim 2 in which the holder (3) is pivotally attached to the body (10) by a hinge (4) for movement between its reading position and its storage position.
4. A memory module reader according to Claim 1, 2 or 3 in which the holder (3) includes a resilient flap (13) which is adapted to prevent accidental release of a second size memory module from the holder (3).
5. A memory module reader according to any preceding claim in which the holder (3) is adapted to be received in a recess (6) of the body (10) when in its storage position.
6. A memory module reader according to any preceding claim in which the holder (3) is adapted to prevent access to the contact means (5) when in its reading position so as to prevent a first size memory module being supported by the first support means (2).
7. A memory module reader according to any preceding claim in which the first support means (2) comprises a slot (8) defined in the body (10) of the reader (1) which is adapted to receive one end of a first size memory module and further comprises a resilient biasing member (7) adapted to bias an opposing end of the memory module releasably towards the contact means (5).
8. A memory module reader according to Claim 7 in which the resilient biasing member (7) is further adapted to releasably secure the holder (3) of the second support means in the reading position.
9. A memory module reader according to any preceding claim in which the first support means (2) is adapted to support a credit card sized memory module whilst the second support means is adapted to support a smaller memory module.
10. A telephone apparatus which includes a memory module reader (1) according to any preceding claim whereby a second memory module can be moved from a reading to a storage position within the telephone.
11. A telephone apparatus according to Claim 10 which further includes a means for supporting a battery pack (11) so that, in use, the battery pack (11) prevents access to the memory module reader (1) when it is connected to the telephone apparatus.

12. A telephone apparatus according to Claim 10 in which a seal is provided which, in use, seals between the memory module reader (1) apparatus and the battery pack (11).

Note to the Examiner:

To obtain the broadest protection for the client I would advise that a divisional application should be filed to the feature of a phone in which the card reader is covered by the battery so that a card can only be inserted when the battery is removed. If an urgent filing date was needed I would consider including a second statement of invention in the present application, but would advise client of problem of lack of unity of invention. The independent claim of such an application need not include all of the limitations of the independent claim of the present application.

Document D1 discloses a memory module reader having a holder within which a second module can be supported. However, it is said to be only suitable for use with the smaller cards. I believe my Claim 1 to be inventive over this because even if a first card was inserted in this adaptor, it could not then function as the second card would prevent its insertion into a phone. The skilled man would therefore not be led to make such a modification to this device.

I have drafted a first claim to a memory module reader rather than a telephone apparatus since it is clear from D11 that they can be made and sold separately and the client has not said whether they only make or sell telephone apparatus. I would want to check this with the client before filing if possible.