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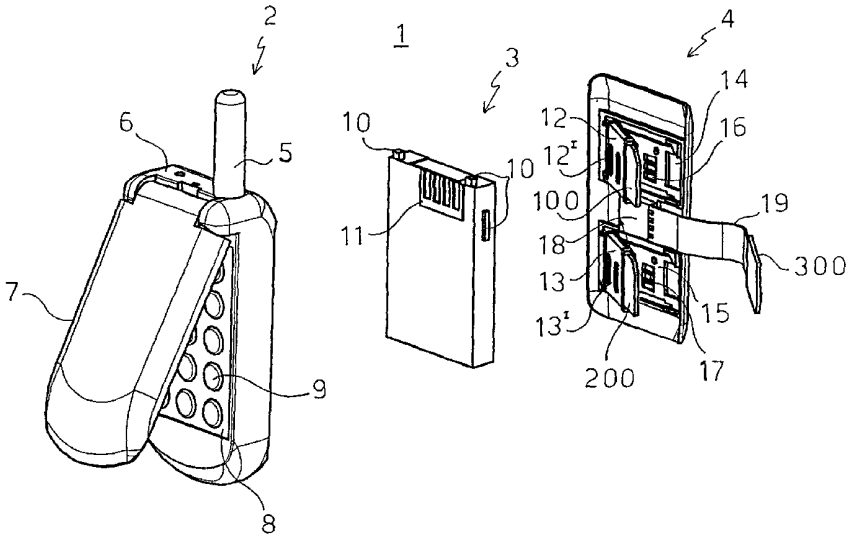
(54) Title: MOBILE TELEPHONE ACCESSORY



(57) Abstract: An accessory (4) can be fitted on a mobile telephone (1) comprising a main body (2) with a data-card reader and a supply battery (3) of the telephone. The accessory is separable from the main body and from the battery and comprises: a first seat (14) which can receive a first data card (100) and which has at least one elctrical terminal (16) for connection to the first data card, at least one second seat (15) which can receive a second data card (200) and which has at least one second electrical terminal (17) for connection to the second data card, a switch (18) which has an output port and which can connect the output port selectively to the at least one first electrical terminal, a flexible electrical cable (19), and an interface card (300) for connecting the output port to the data-card reader. This accessory enables two micro-SIM cards to be housed simultaneously in its interior and one of the two to be activated whilst the other is excluded, without the need to open the mobile telephone and remove a card in order to replace it.

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DESCRIPTION

"Mobile telephone accessory"

The present invention relates to an accessory for mobile telephones. In particular, the present invention relates to an accessory for mobile telephones which use data cards and data-card readers.

For the purposes of the present invention, the term "data card" is intended to define an element of variable external shape which includes or carries a memory device and which can be inserted removably in a mobile telephone. For example, a data card may use an integrated-circuit memory device (such a card is known by the English term "smart card" or "chip card"), or may be a magnetic card. Generally, smart cards have dimensions comparable to those of conventional plastics credit cards.

The memory devices contained in a data card may be passive, such as read-only memories, or may contain integrated processors which can process the data stored in the card.

In the field of cellular telephones, it is known to use data cards which, typically, store data which relates to the user's identity, and which can identify the type of subscription to the telephone service associated with the user. Cellular telephones have suitable seats for these data cards and card readers which transfer the data

stored in the card to the internal memories of the cellular telephone. The cellular telephone makes this data available to the communications system.

In general, in addition to the subscriber's identity, his telephone number and his personal identification number (PIN), the data stored in a smart card used in the field of cellular telephony also relate to the amount of calls made and to the number of incorrect entries of the PIN. With the expansion of the memory capacities of integrated circuits, the functions which can be implemented in a smart card can be further increased, covering applications other than those of storing personal data and service data, thus rendering the use of data cards in the field of mobile telephony ever more advantageous.

The GSM communication system (the Global System for Mobile Communication) uses a particular smart card called a SIM card (a Subscriber Identity Module) which contains data relating to the type of subscription of each user. The specific and functional characteristics of these SIM cards are known and are indicated by the standards of the respective communication system.

In general, SIM cards used in modern cellular telephones have two different formats whilst having the same functionality. The first type of SIM card, which is

known as a "credit card" or "full format" SIM card has the same dimensions as a conventional credit card, whereas the second type of card, which is known as a micro-SIM card, a small SIM card, or a "stamp format" SIM card has smaller dimensions, typically of about 20 mm x 25 mm.

Micro-SIM cards can be used in small mobile telephones such as pocket telephones, whereas credit card SIMs are used in larger telephones and can be handled more easily by the user.

The storage of the data relating to a user's subscription on removable data cards enables the same mobile telephone to be used within the scope of subscriptions paid to different mobile telephone service operators or to the same operator but with different telephone numbers and subscription characteristics.

This capability offered by data cards is utilized by users to an ever greater extent, since the increase in the number of mobile telephone service operators increases the types of subscription available to the user. In fact, subscriptions of various types, either to different operators or to a single operator, are differentiated by the tariffs and by the time bands in which the tariffs are applied. Users who possess several data cards each corresponding to a different subscription

so as to be able to use several telephone lines and to be able to select which telephone line and which operator to use on the basis of the time band and the tariff are therefore becoming ever more widespread.

In the mobile telephones commonly in use, the ability to use more than one subscription is dependent on the replacement of the data card (for example, of a micro-SIM card) inside the mobile telephone.

In fact, each time the user wishes to use a different subscription, the single data card housed inside the mobile telephone has to be removed and replaced by another data card kept by the user. The replacement of the data card may be particularly onerous because it generally requires the temporary detachment of some components of the mobile telephone (for example, the supply battery and/or a cover) to gain access to the seat in which the data card is disposed.

Moreover, the user must personally take care of the data card removed from the mobile telephone. This gives rise to a risk of its loss which is particularly likely for micro-SIM cards, because of their small size.

The object of the present invention is to provide a mobile telephone accessory which facilitates the use of several data cards, overcoming the difficulties and limitations of known mobile telephones, and which is such

that it can be fitted on mobile telephones without requiring substantial modifications of their structure.

This object is achieved by an accessory which can be fitted on a mobile telephone comprising a main body having a data-card reader and a supply battery of the telephone, characterized in that the accessory is separable from the main body and from the battery, and in that it comprises:

- a first seat which can receive a first data card and which has at least one first electrical terminal for connection to the first data card,
- at least one second seat which can receive a second data card and which has at least one second electrical terminal for connection to the second data card,
- switching means which have an output port and which can connect the output port selectively to the at least one first electrical terminal and to the at least one second electrical terminal, and
- electrical connection means for connecting the output port to the data-card reader.

The invention will be understood better from the description of non-limiting embodiments thereof, given with reference to the appended drawings, in which:

Figure 1 is an exploded, front perspective view of a

mobile telephone 1 of a first type, comprising an accessory formed in accordance with the present invention,

Figure 2 is an exploded, rear perspective view of the mobile telephone of Figure 1,

Figure 3 is a rear perspective view of the mobile telephone of Figure 1, in the assembled configuration,

Figure 4 is an exploded, front perspective view of a mobile telephone of a second type comprising a second version of the accessory formed in accordance with the present invention,

Figure 5 is an exploded, rear perspective view of the mobile telephone of Figure 4,

Figures 6 and 7 are exploded front and rear perspective views, respectively, of the mobile telephone of Figure 4, in the assembled configuration,

Figures 8 and 9 are exploded front and rear perspective views, respectively, of a mobile telephone of a third type comprising a third version of the accessory formed in accordance with the invention,

Figures 10 and 11 are exploded front and rear perspective views, respectively, of a mobile telephone of a fourth type comprising a fourth version of the accessory formed in accordance with the invention,

Figure 12 is a rear perspective view of the mobile

telephone of Figure 10, in the assembled configuration,

Figures 13 and 14 are exploded rear and front perspective views, respectively, of a mobile telephone of a fifth type comprising a fifth version of the accessory formed in accordance with the invention,

Figure 15 is a perspective view of the mobile telephone of Figure 13, in the assembled configuration,

Figure 16 shows schematically a switch suitable for use for the present invention.

The following description of some preferred embodiments of the invention will be given with reference to micro-SIM data cards, but the teachings of the present invention may be applied to data cards of any type used in mobile telephones.

Moreover, it is pointed out that, for the purposes of the present invention, the term "mobile telephone" is intended to define any telephone which can be transported by the user such as, for example, a mobile telephone which operates in a cellular communications system (characterized by the division of the territory served into cells, "clusters") or a portable telephone used within a domestic area.

Figure 1 is an exploded, front perspective view of a mobile telephone 1 of a first type formed in accordance with the present invention, comprising an accessory 4

suitable for holding two micro-SIM cards.

The mobile telephone 1 comprises a main body 2, a battery 3, and a first version of an accessory 4 for two micro-SIM cards. The substantially parallelepipedal main body 2 has an antenna 5, preferably of the extendible type, associated with one of the smaller walls 6 of the main body 2.

A movable element 7, also associated with the wall 6 of the main body 2, can pivot about a suitable articulation so as to adopt a closed position, in which it fits closely against the main body 2 or an open position, in which it extends outwardly therefrom. This movable element 7 may comprise a transducer (not shown), such as a conventional microphone, for transforming an electrical signal received by the mobile telephone 1 into sound waves.

The main body 2 comprises a key pad 8 with keys 9 for entering telephone numbers.

Typically, the main body 2 comprises receiving and transmitting units for receiving and transmitting radio-frequency signals, units for modulating and demodulating the signals to be transmitted or received, transducers for converting the user's voice into electrical signals and *vice versa*, and a circuit, including a microcomputer, for controlling the said units. The main body 2 also

comprises a data-card reader.

The main body 2 of the mobile telephone 1 and the battery 3 are in any case of conventional type and will therefore not be described further.

The battery 3 has, on its surface, fixing elements 10 such as small fixed or resiliently yielding pins enabling it to be fixed inside a suitable housing (not shown in Figure 1) formed in the rear portion of the main body 2. The battery 3 also comprises electrical terminals 11 at which the electrical energy supply of the mobile telephone 1 is available.

The accessory 4 may be formed with a frame of plastics material produced, for example, by injection moulding.

The accessory 4 comprises, in its interior, two containers 12 and 13 for holding a first micro-SIM card 100 and a second micro-SIM card 200, respectively. The containers are plate-shaped having side walls shaped for holding the respective micro-SIM cards and each has an upper opening in which the card can easily be inserted. Moreover, the containers 12 and 13 are movable, that is, they can pivot about an articulation axis between two positions. In a first position, the containers 12 and 13 are disposed transversely relative to the accessory 4 to enable the card to be inserted therein or removed

therefrom. In a second position, the containers lie, respectively, within a first seat 14 and within a second seat 15 which are formed in the base of the accessory and are of a substantially rectangular shape.

Substantially ellipsoidal openings 12' and 13' are formed in the movable containers 12 and 13. These movable containers 12 and 13 and/or the seats 14 and 15 may have engagement means enabling the containers to be fixed inside the respective seats.

The micro-SIM cards 100 and 200 may be two cards relating to two different mobile telephone operators, or may relate to the same operator but may contain different data such as, for example, a different subscriber identity and different telephone numbers and different personal identification numbers (PINs). Each micro-SIM card comprises an integrated memory device and one or more contact pads for electrical connection to the reader. For example, each micro-SIM card may have six contact pads.

One or more terminals 16 and one or more terminals 17 are disposed in the bases of respective seats 14 and 15 and are arranged for electrical connection to the complementary contact pads of the respective micro-SIM card when it is housed in the corresponding seat, that is, when the container 12 or 13 is in the second

position. These electrical terminals are preferably resiliently yielding so as not to damage the contact pads of the micro-SIM cards with which they come into contact. For micro-SIM cards having six contact pads, each of the electrical terminals 16 and 17 comprises six independent terminals.

The accessory 4 also comprises a switch 18, shown schematically in Figure 16, comprising a first input port 28', a second input port 28'', an output port 29, an opening 26, and a movable slider 27. The electrical connections 28 which extend from the input ports 28', 28'' and the port 29 are also shown by continuous lines in Figure 16. The switch 18 is, for example, a conventional electromechanical microswitch and can adopt a first operating state which corresponds to an electrical connection between the output port 29 and the first input port 28' and a second operating state which corresponds to a connection between the output port 29 and the second input port 28''. The switch 18 is operable by the movement of the slider 27 between two positions. As a result of this movement, the switch 18 breaks the connection between one input port and the output port and establishes a connection between the other input port and the output port.

The input ports 28' and 28'' are connected,

respectively, to the electrical terminals 16 and to the electrical terminals 17, situated in the seats 14 and 15. In particular, each connection 28 is connected to a single terminal of the six electrical terminals 16 or of the six electrical terminals 17.

The switch 18 therefore enables its own output 29 to be connected to the electrical terminals 16 or 17 selectively, that is, it breaks a connection between the output port 29 and the electrical terminals of one micro-SIM-card seat (for example, of the card 100) and establishes an electrical connection between the output 29 and the electrical terminals of the other micro-SIM-card seat (for example, of the card 200).

As well as the electromechanical switches mentioned, any other switching means which have an output port and can connect the output port selectively to the terminals of the seats of the various data cards used are suitable for the purposes of the present invention.

Other suitable switches for use in the present invention are switches which use integrated circuits, also known as "analog switches".

The switch 18 can be operated manually by a user by means of the slider 27 but switches which use other methods of operation may also be used. For example, an analog switch may be operated by means of a push-button.

The output 29 of the switch 18 is connected to a flexible cable 19. In particular, the flexible cable 19 comprises at least one conductor element. More particularly, the flexible cable 19 comprises a number of conductor elements equal to the number of electrical terminals 16 or 17. This flexible cable 19 is advantageously of the type commonly known as a "flat cable", that is, the conductor elements are arranged in a manner such that the cable is ribbon-like.

The flexible cable 19 is connected to an interface card 300 which, as will be explained below, is suitable for being housed in the main body 2 of the mobile telephone 1. In particular, the interface card 300 has the same shape as the micro-SIM card for which the main body 2 is arranged and also has the same number and the same arrangement of contact pads as the card, without having memory devices.

The interface card 300 enables the flexible cable 19 to be connected electrically to the reader included in the main body 2 in a manner which is particularly easy for a user since the interface card 300 has a shape compatible with that of the data-card seat disposed in the main body 2. The output 29 of the switch 18 may also be connected to the electrical terminals 24 by other suitable connection means.

Figure 2 is an exploded perspective view of the mobile telephone 1, from the rear.

In the rear portion of the main body 2 there is a housing 20 which can hold the battery 3 and which has a rim 106.

The housing 20 contains electrical terminals 21 for connection to the electrical terminals 11 of the battery 3. In the base of the housing 20 there is a seat 22 for receiving a movable container 23 similar to the containers 12 and 13 described above, for housing a micro-SIM card. In particular, it is pointed out that the interface card 300 has a size and shape such as to be housed perfectly in the movable container 23.

The base of the seat 22 comprises electrical terminals 24 for contacting the complementary contact pads of the micro-SIM card housed in the movable container 23.

The electrical terminals 24 are connected to the above-mentioned suitable SIM-card reader included in the main body 2 of the mobile telephone 1.

The rear of the main body 2 also has a parallelepipedal element 25 in its lower portion and a convex element 25' in its upper portion. The element 25 and the element 25' are such as to cooperate with the accessory 4 to fix it to the main body 2.

The accessory 4 advantageously has smaller side walls 101 and larger side walls 102, indicated in Figure 2, having slightly curved external shapes such as to match the external shape of the main body 2 without producing roughness. These side walls 101 and 102 preferably have a rim 103 shaped so as to be complementary with the shape of the rim 105 of the housing 20.

In addition to the examples described, other suitable means may be used for fixing the accessory 4 to the main body 2.

Moreover, in the vicinity of the opening 26 in which the slider 27 can move, there may be two letters or two numbers or other symbols which enable the user to associate the position of the slider with the state of the switch 18 and thus to know which data card is connected to the main body 2 of the mobile telephone 1.

The mobile telephone 1 is assembled by inserting the interface card 300 into the movable container 23 and pivoting the container so as to connect the contact pads of the interface card 300 to the terminals 24 which are electrically connected to the SIM-card reader included in the main body 2. The battery 3 is then inserted in the housing 20 so that the terminals 11 are in contact with the terminals 21 of the body 2. The flexible cable 19

connected to the micro-SIM card 300 can advantageously bend so as to fit closely against the side wall of the housing 20 under the pressure of the battery 3. The accessory 4 is fitted on the main body 2 in a manner such as to represent a cover for the housing 20. Figure 3 is a rear perspective view of the mobile telephone 1, in the assembled configuration.

When the slider 27 is placed in a first position it causes the switch 18 to put the flexible cable 19 into contact with only one of the two micro-SIM cards (for example, the micro-SIM card 100). The data relating to the subscriber and stored in the micro-SIM card selected by the switch is made available at the interface card 300 by means of the flexible cable 19. This data can be read by the card-reader included in the body 2, via the interface card, each time the transmission system requires it.

When a user wishes to use the other micro-SIM card (for example, the card 200), it will suffice to move the slider 27 to the opposite position, causing the switch 18 to break the connection between the flexible cable 19 and the previously-selected card used and to put the flexible cable 19 into contact with the other micro-SIM card (the card 200).

Typically, this switching operation takes place

after the mobile telephone has been turned off and the telephone can be turned on again after switching. It should be noted that the switch 18 is independent of the battery 3.

After the switching, the SIM-card reader is connected to the micro-SIM card thus selected and the transmission system will thus have available the data stored in this second micro-SIM card.

It is pointed out that the accessory formed in accordance with the present invention is particularly advantageous since it enables two micro-SIM cards to be housed simultaneously in a single telephone and enables one of the two to be activated and the other to be excluded, without the need to open the mobile telephone and remove one card in order to replace it.

Moreover, insofar as overall size permits, the accessory formed in accordance with the present invention, may contain more than two data cards. In this case, a switching means which can switch between the ports connected to each of the data cards usable will be used.

The present invention is particularly advantageous for data cards which store data relating to the type of subscription paid by the user but it may also be applied to mobile telephones which use data cards containing data

of other types.

It is pointed out that the accessory formed in accordance with the invention may be fitted on a mobile telephone of any type, irrespective of the characteristics of the telecommunications system used, GSM, TACS, etc.

Moreover, the accessory formed in accordance with the present invention can be adapted to commercially available mobile telephones of various types, without requiring substantial modifications of the main body or of the battery.

Further specific embodiments of the invention will be described by way of example.

In the following drawings, components similar to those described above will be indicated by the same reference numerals and will not be described further.

Figure 4 is an exploded, front perspective view of a mobile telephone 30 of a second type, comprising a main body 31, a second version 32 of the accessory, and a battery 33 having a rim 33'.

The main body 31 comprises a movable element 34 which can pivot about an articulation disposed on the lower portion of the main body 31. This movable element 34 performs the function of protecting the keypad 8.

Figure 5 is an exploded, rear perspective view of

the mobile telephone 30.

This drawing shows a housing 35 for receiving a portion of the accessory 32. The housing 35 comprises electrical supply terminals 36 disposed in the upper portion of the housing and a seat 37 suitable for housing a micro-SIM card. This seat may contain a movable container similar to those described above.

The accessory 32 comprises, in the same manner as the accessory 4, movable containers 12 and 13 for micro-SIM cards and seats 14 and 15 for the containers, with respective electrical terminals 16 and 17. In Figure 5, the seats 14 and 15 are adjacent one another and the flexible cable 19 is disposed in a lower portion of the accessory 32, in a folded position and connected to the interface card 300. In its upper portion, the accessory 32 comprises electrical terminals 38 disposed at the front and electrical terminals 39 disposed at the rear, enabling the electrical terminals 36 of the main body 31 to be connected to the electrical terminals present on the upper portion of the battery 33.

The switch 18 is disposed in the rear portion of the accessory 32 and is similar to that described above. The switch 18 is connected electrically to the electrical terminals 16 and 17 which in turn can be connected to the electrical contacts of the micro-SIM cards.

The accessory 32 has a first rim 40 facing towards the main body 31 and suitable for fitting inside the housing 35. Moreover, the accessory 32 has a second rim 41 disposed outside the first and constituting, at the front, a rim for abutment with the main body 31. In the rear portion of the accessory 32, this second rim 41 defines a housing 42 for holding a portion of the battery 33 as well as the switch 18.

The rim 41 has an opening 43 which allows the user to remove the battery 33 partially fitted in the housing 42.

The rim 40 and the rim 41 represent specific examples of suitable fixing means usable for fixing the accessory 32 to the main body 31 and for fixing the battery 33 to the accessory 32, respectively.

The mobile telephone 30 is assembled by inserting the interface card 300 in the suitable seat 37 in a manner such that the contact pads of the card are in contact with the electrical terminals of the main body 31 which in turn are connected to the SIM-card reader. The rim 40 of the accessory 32 is inserted in the housing 35 so that the electrical terminals 38 come into contact with the electrical terminals 36. The battery 33 is then fitted in the housing 42 so that the electrical terminals 11 are connected to the terminals 39.

Figures 6 and 7 are front and rear perspective views of the mobile telephone 30, respectively. Figure 6 shows the slider 27 which enables the user to operate the switch 18 in order to select one of the two micro-SIM cards, as stated above.

It is pointed out that, in contrast with the mobile telephone 1 described above, in which the accessory 4 also performs the functions of covering the housing containing the battery 3, for the mobile telephone 3, the covering function is performed by the battery 33 itself. With reference to the particular mobile telephone 30, the accessory 32 is formed in a manner such that it can be inserted between the main body 31 and the battery 33 without requiring any modification of the shapes and sizes of these two elements.

With reference to a mobile telephone formed in accordance with the prior art and comprising a main body 31 having a housing 35 for housing the battery 33, the accessory 32 can be formed with dimensions such as to fit the structure of this mobile telephone.

In greater detail, the inner rim 40 of the accessory 32 may advantageously be formed with the same dimensions as the front of the battery 33. The outer rim 42 may be formed so as to define a housing 42 which has the same dimensions as the housing 35 originally provided for

holding the front portion of the battery 33.

Figures 8 and 9 are exploded rear and front perspective views, respectively, of a mobile telephone 50 of a third type formed in accordance with the invention, comprising a third version 51 of the accessory.

The mobile telephone 50 comprises a main body 52 including the battery necessary for its supply. The main body 52 has an upper wall 54 and a lower wall 55. An opening 53 disposed in the side of the main body 42 enables a micro-SIM card to be inserted in a suitable seat provided with electrical terminals.

The accessory 51 has a substantially flat central region 56 as well as an upper region 57 and a lower region 58, both suitably curved.

These regions 57 and 58 are shaped in a manner such as to interfere with the upper wall 54 and with the lower wall 55 of the main body 52, respectively, enabling the accessory 51 to be fitted on the body 52. The interference play between the accessory 51 and the main body 52 enables the accessory to be fixed sufficiently firmly, at the same time allowing it to be removed easily.

The accessory 51 comprises side edges 59 which protect its inner portion which comprises, as described with reference to the accessory 4, the movable containers

12 and 13, the seats 14 and 15, and the electrical terminals 16 and 17.

The seats 14 and 15 are preferably arranged in a manner such that their major axes are parallel to the major axis of the telephone, enabling the width of the accessory to be reduced, optimizing its overall size. The movable containers 12 and 13 can pivot upwards to enable the respective micro-SIM cards 100 and 200 to be inserted.

The side edge 59 has an opening 59' through which the flexible cable 19 connected to the interface card 300 and to the switch 18 disposed between the two seats 14 and 15 can extend.

In the assembled configuration, the mobile telephone 50 may have a short portion of flexible cable 19 outside the accessory 51 and the main body 52. In this case, Velcro® is advantageously used for fixing this portion of cable to the mobile telephone 50.

Figures 10 and 11 are exploded rear and front perspective views, respectively, of a mobile telephone 60 of a fourth type formed in accordance with the invention and comprising a fourth version 61 of the accessory.

The mobile telephone 60 comprises a main body 62, and a parallelepipedal battery 63, separable from the body 62 and having electrical terminals inserted in

openings 64. The main body 62 comprises a housing 65 for holding the battery 63. The housing 65 has electrical terminals 66 for connection to the terminals inserted in the openings 64 of the battery 63.

In a lower portion of the rear of the main body 62, there is a seat 22 with an associated movable micro-SIM card container 23 similar to that described above for the mobile telephone 1. The rear of the main body 62 has a rim 67 which can mate with a complementary rim 68 of the accessory 61.

In the lower portion of the rear of the main body 62, there is a push-button 70 for releasing the accessory 61 from the main body.

The rim 68 of the accessory 61 has fixing elements 69 for exerting a pressure on the inside of the rim 67 of the main body 62 in order to favour the fixing of the accessory 61 which also performs the functions of a cover. In the lower portion of the accessory 61, there is an opening 71 through which the push-button 70 can extend.

The accessory 61 has, in its interior, movable containers 12 and 13, seats 14 and 15, and electrical terminals 16 and 17, as described above. The two seats 14 and 15 have their major axes arranged horizontally and are disposed side by side and the switch 18 (which is not

visible in Figures 10 and 11) is preferably disposed in the lower portion of the accessory 61 so as to face the seat 22 of the main body 62.

The mobile telephone 60 is assembled in the same way as the mobile telephone 1, by the insertion of the interface card 300 in the container 23, the insertion of the battery in the housing 65 and, finally, the fitting of the accessory 61. The flexible cable 19 adapts to the shape of the battery 63.

The slider 27 which operates the switch 18 can be seen from Figure 12 which shows the mobile telephone 60 in the assembled configuration.

Figures 13 and 14 are exploded rear and front perspective views, respectively, of a mobile telephone 80 of a fifth type formed in accordance with the invention, comprising a fifth version 81 of the accessory.

The mobile telephone 80 comprises a main body 82 having an element 83 pivotable about an articulation disposed in the vicinity of the lower portion of the keypad 8.

This element 83 may perform, for example, the function of protecting the keys 9.

The main body 82 has a hollow region 104 with a substantially rectangular base defined at the top by a wall 85 and at the bottom by a wall 86. The upper wall 85

has an opening 87 for the insertion of a micro-SIM card in a seat (not shown) having electrical terminals (not shown) for connection to a suitable SIM-card reader. The electrical terminals 91 for the supply of energy to the telephone, are also disposed in the wall 85.

The rim 88 of the wall 86, which defines the hollow region 104 at the bottom, has a recess 89.

The battery 84 has electrical terminals 92 disposed on an upper wall 93. The battery 84 also has a projection 94 of a shape such that it fits perfectly in the recess 89 of the main body 82.

As shown in Figure 14, the accessory 81 comprises, in its interior, movable containers 12 and 13 for the micro-SIM cards 100 and 200, seats 14 and 15, and electrical terminals 16 and 17, as described above. The two seats 14 and 15 have their major axes disposed horizontally and are arranged side by side and the switch 18 is disposed in the upper portion of the accessory 81. In Figure 14, the flexible cable 19 projecting from the switch 18 is bent upwards to allow the interface card 300 to be inserted in the appropriate opening 87.

The accessory 81 also comprises a projection 90 having a shape such that it can be inserted in the recess 89 in the main body 82.

The slider 27 for operating the switch 18 is

disposed on a side of the accessory 81 not visible in Figures 13-15.

The front portion of the accessory 81 has, at the top, a first element 95 carrying electrical terminals 96 which can be connected to the electrical terminals 85 included in the main body 82. The upper portion of the accessory 82 has a second, parallelepipedal element 97 which projects towards the rear portion of the accessory 81.

The rear portion of the accessory 81 has a wall 86'.

The second element 97 and the wall 86' define a hollow region 104' for housing the battery 84.

The rear wall 86' has a rim 88' which has a recess 89'.

The second element 97 comprises electrical terminals 98 connected electrically to the electrical terminals 96 of the element 95. The electrical terminals 98 are disposed on a wall of the second element 97 which faces downwards so that they can come into contact with the terminals 92 of the battery 84. In the assembled configuration, shown in Figure 15, the terminals 96 and 98 enable the battery 84 to be put into electrical contact with the terminals 85 of the main body.

The mobile telephone 80 is assembled by inserting the interface card 300 in the opening 87 and putting the

accessory 81 in the region 104 so that the projection 90 is inserted in the recess 89.

The battery 84, which also performs the functions of a cover, is disposed on the rear of the accessory 81. The battery 84 is disposed in the hollow region 104' so that the projection 94 is inserted in the recess 89'. The hollow region 104' defined by the element 97 and by the wall 86' has the same dimensions and the same shape as the region 104 defined by the walls 85 and 86.

It is pointed out that the main bodies 31, 52, 62, 82 of the mobile telephones 30, 50, 60, 80 include components and electronic devices which are similar to those indicated above with reference to the main body 2 and in any case are known to an expert in the art. Moreover, the connections between the switch 18 and the electrical terminals for connection to the two micro-SIM cards for each of the types of mobile telephone described or for further types, can easily be identified by an expert in the art on the basis of the description provided and of the corresponding drawings.

In the mobile telephones 30, 50, 60, 80, the switch 18 for selecting one micro-SIM card and excluding the other is operated in the same way as described for the mobile telephone 1.

Moreover, the accessories 32, 51, 61, 81, have

advantages similar to those described with reference to the accessory 4 of Figure 1.

It is pointed out that the shape, the arrangement of the internal components, and the dimensions of the accessory formed in accordance with the invention may vary with respect to those described in order to be adapted to mobile telephones of different types. An expert in the art can easily determine such variations of the accessory formed in accordance with the invention, on the basis of this description and of the appended drawings.

CLAIMS

1. An accessory (4) which can be fitted on a mobile telephone (1) comprising a main body (2) having a data-card reader and a supply battery (3) of the telephone, characterized in that the accessory is separable from the main body and from the battery, and in that it comprises:

- a first seat (14) which can receive a first data card (100) and which has at least one first electrical terminal (16) for connection to the first data card,
- at least one second seat (15) which can receive a second data card (200) and which has at least one second electrical terminal (17) for connection to the second data card,
- switching means (18) which have an output port (29) and which can connect the output port selectively to the at least one first electrical terminal and to the at least one second electrical terminal, and
- electrical connection means (19, 300) for connecting the output port to the data-card reader.

2. An accessory according to Claim 1, characterized in that the switching means are operable by a user.

3. An accessory according to Claim 1,

characterized in that the first seat and the at least one second seat can house a micro-SIM card (a Subscriber Identification Module).

4. An accessory according to Claim 1, characterized in that the switching means comprise an electromechanical switch which can adopt a first state corresponding to an electrical connection between the output and the at least one first electrical terminal and a second state corresponding to a connection between the output and the at least one second electrical terminal.

5. An accessory according to Claims 2 and 4, characterized in that the electromechanical switch comprises a slider (27) movable between a first position and a second position corresponding to the first state and to the first state of the switch, respectively.

6. An accessory according to Claim 1, characterized in that the electrical connection means comprise a cable (19) including at least one conductor element.

7. An accessory according to Claim 6, characterized in that the cable is flexible.

8. An accessory according to Claim 6, characterized in that the cable is of the flat type.

9. An accessory according to Claim 1, characterized in that the electrical connection means

comprise an interface card (300) which can be inserted in a data-card seat (22) disposed in the main body of the mobile telephone.

10. An accessory according to Claim 9, characterized in that the data-card seat disposed in the main body of the mobile telephone can house a micro-SIM data card (a Subscriber Identification Module).

11. An accessory according to Claim 1, characterized in that the first seat and the at least one second seat comprise a first container (12) and at least one second container (13) for housing the first and second data cards, respectively, the containers being pivotable between a position for the insertion of the data cards and a position of electrical contact between the cards and the at least one first electrical terminal and the at least one second electrical terminal.

12. An accessory according to Claim 1, characterized in that it comprises a frame made of plastics material.

13. An accessory according to Claim 1, characterized in that it comprises fixing means (103; 57, 58) for cooperating with the main body for the fixing of the accessory to the mobile telephone.

14. An accessory according to Claim 1, characterized in that the mobile telephone has a first

housing (42, 43) and in that the accessory can be inserted in the housing.

15. An accessory according to Claim 14, characterized in that it comprises a second housing (42) for the battery.

16. An accessory according to Claim 15, characterized in that it comprises means for fixing the battery to the second housing.

17. An accessory according to Claim 15, characterized in that the main body comprises supply terminals (36; 85), and in that it comprises further electrical terminals (38-39; 96, 98) for connecting the battery to the supply terminals.

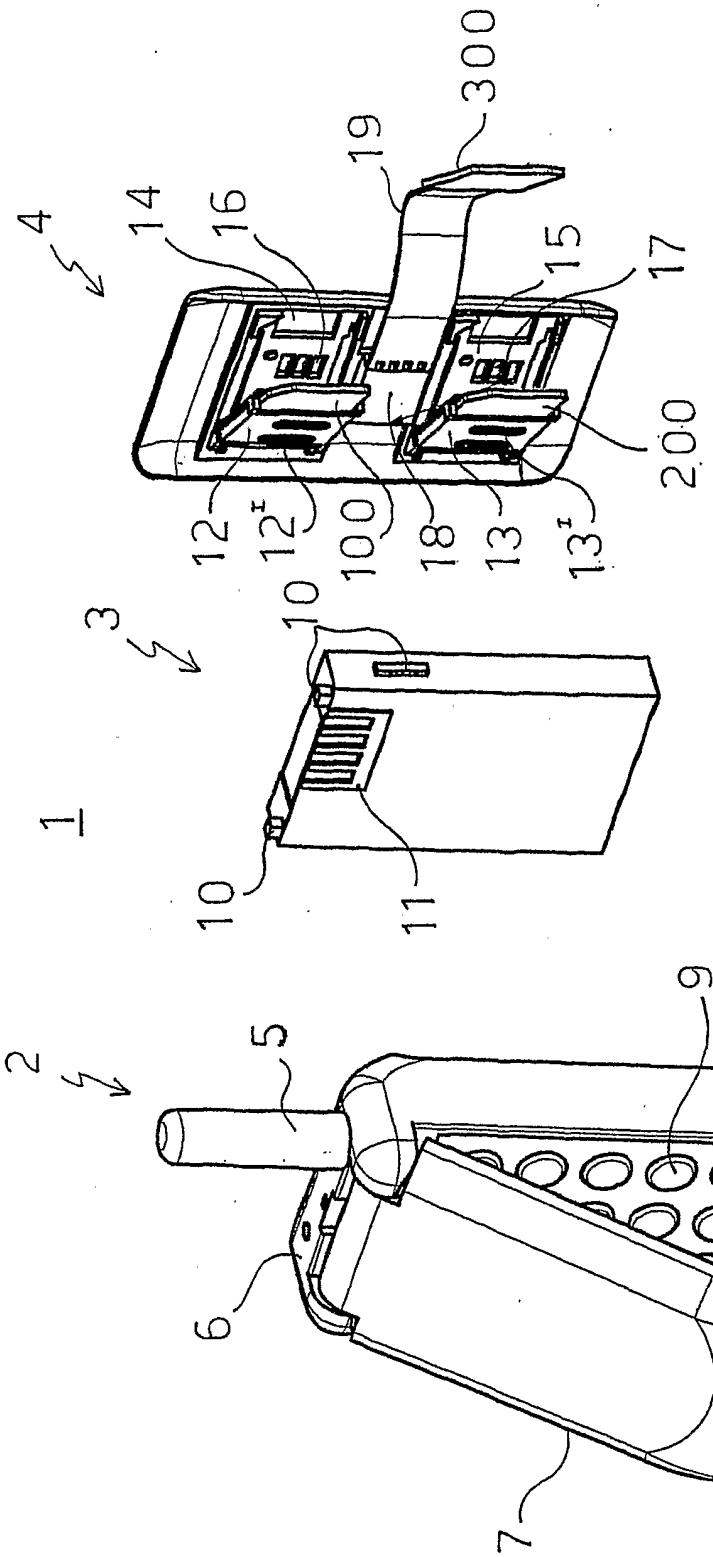
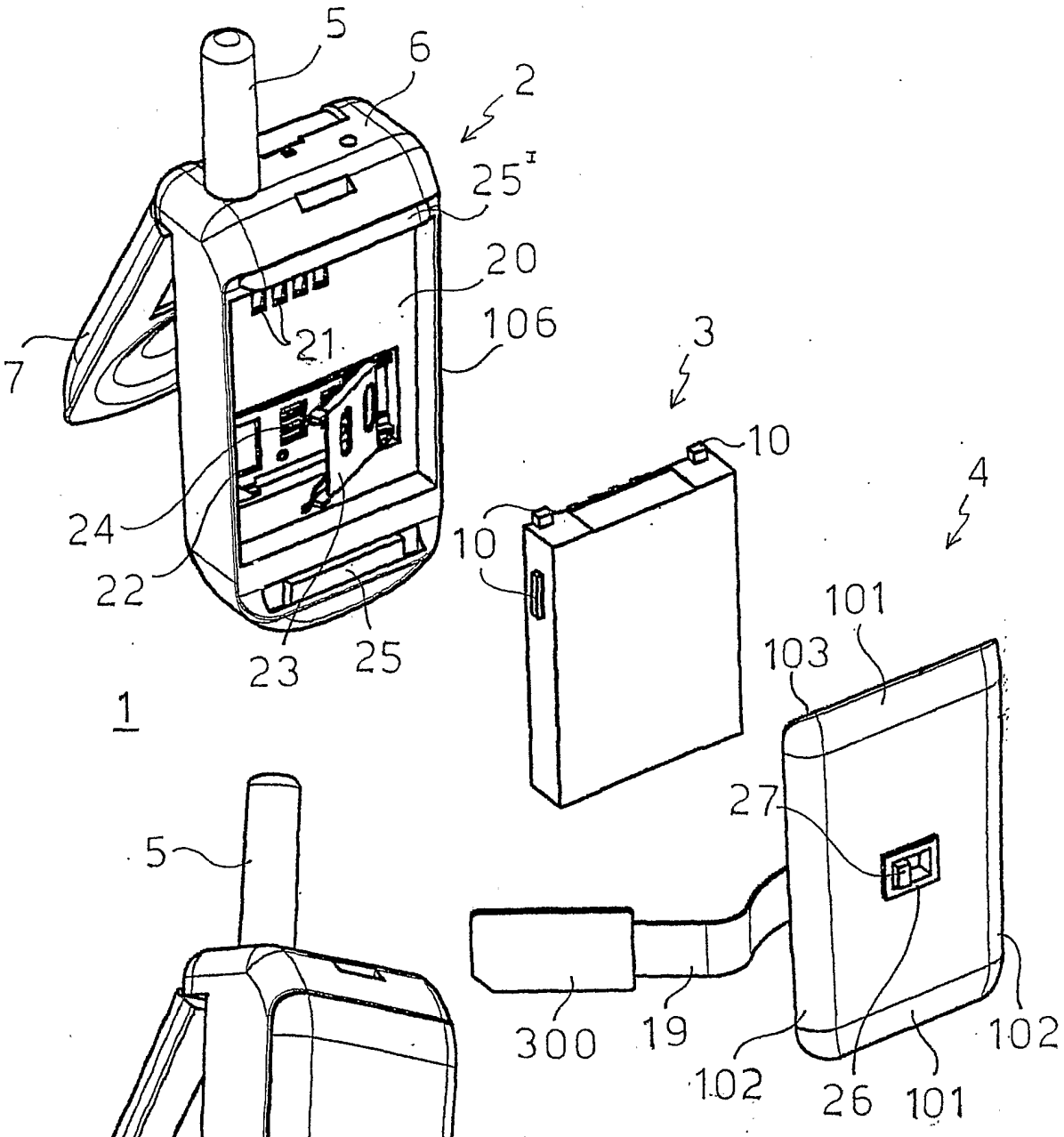


FIG. 1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106
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1
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103
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102
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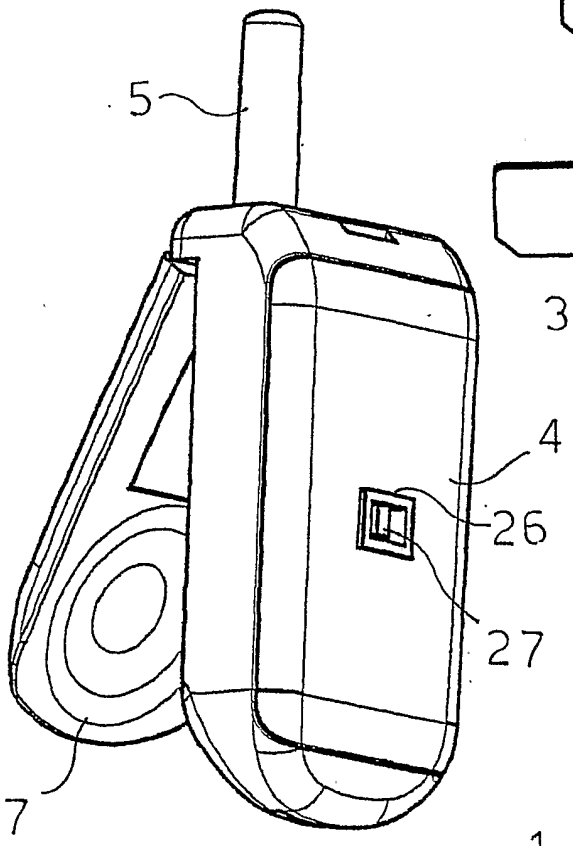
101

FIG. 2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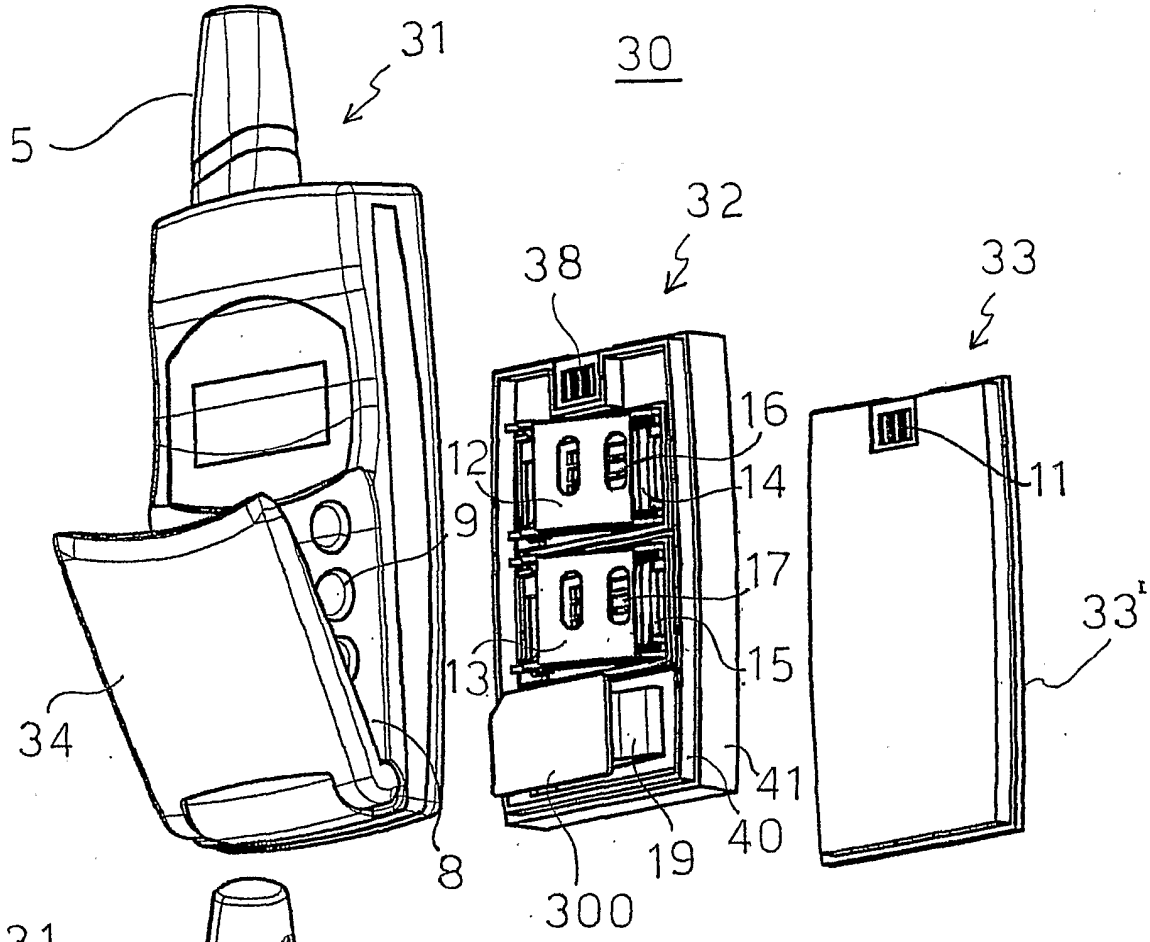
27
7
1

FIG. 3


30
31
5
32
38
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16
12
14
11
9
17
33'
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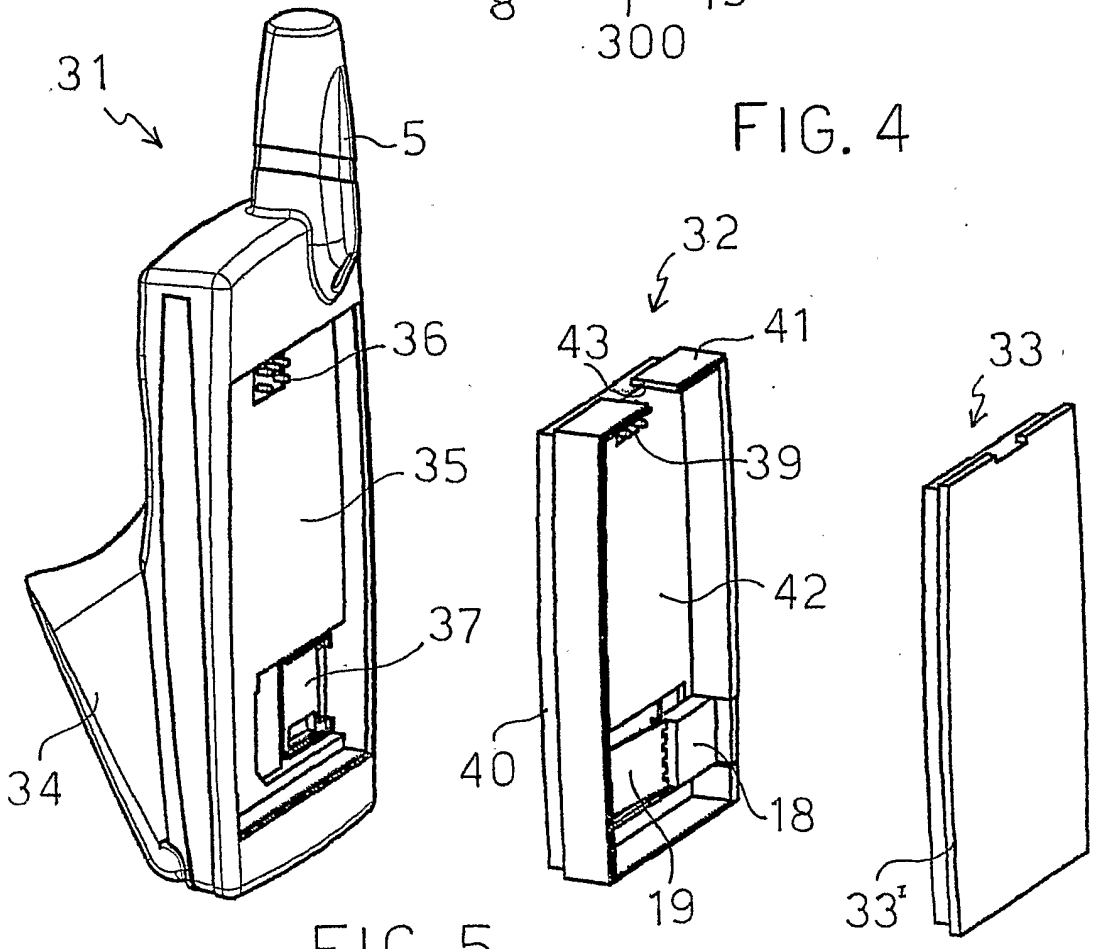
34
41
40
19
8
300

FIG. 4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42
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18
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33'

FIG. 5

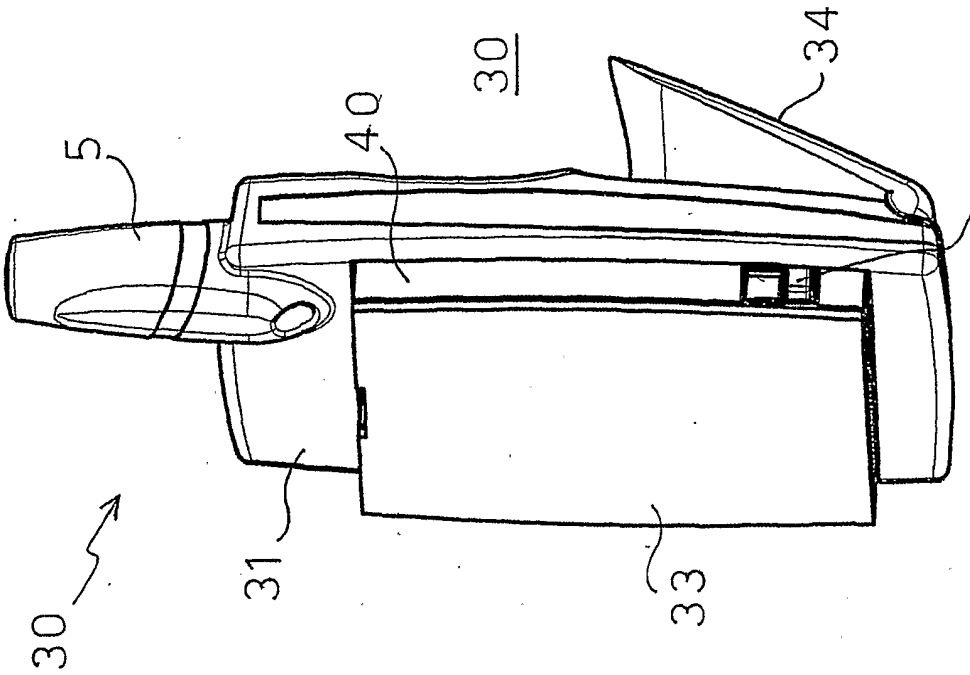


FIG.6

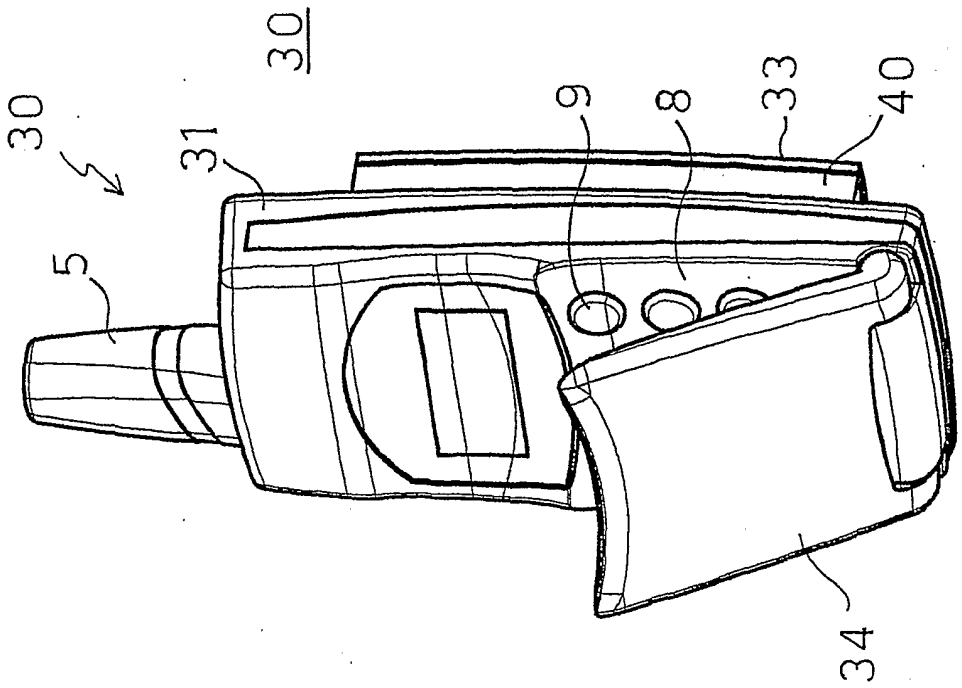
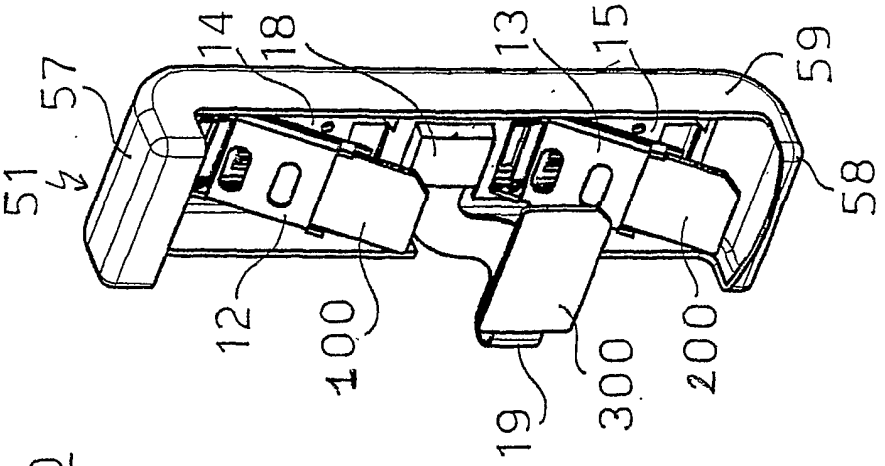


FIG.7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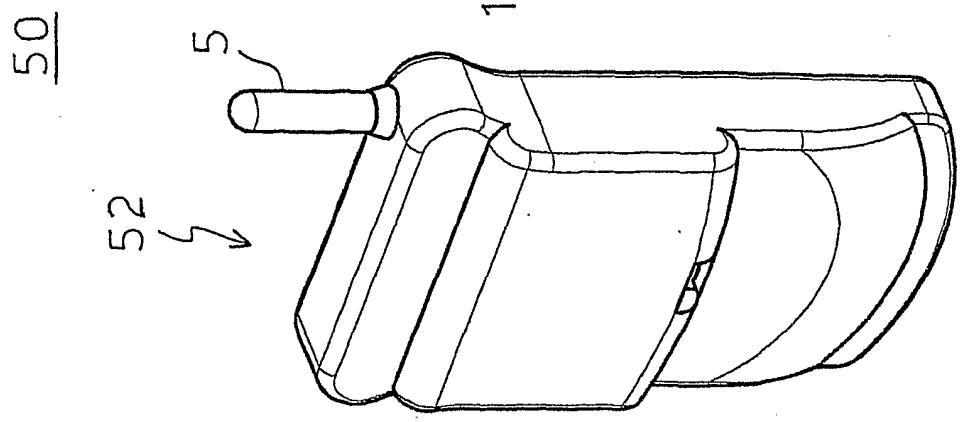
18
13
15
59
57
51
58
12
100
300
200
19

FIG.9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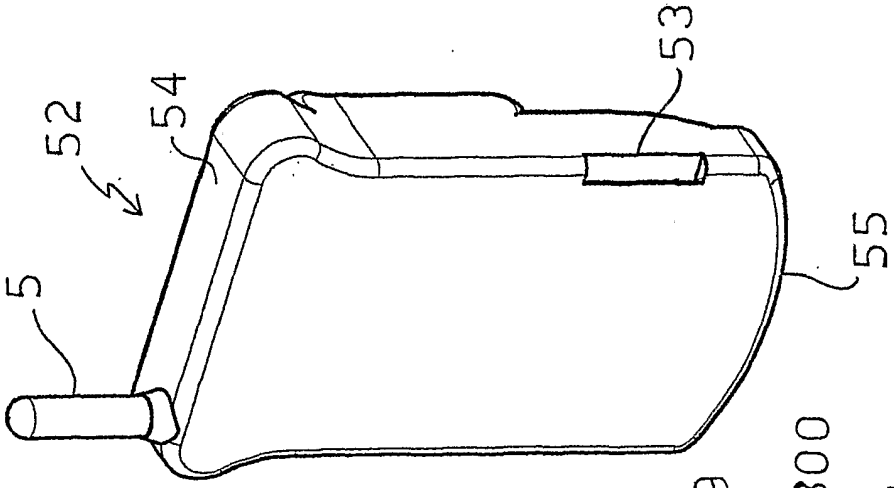
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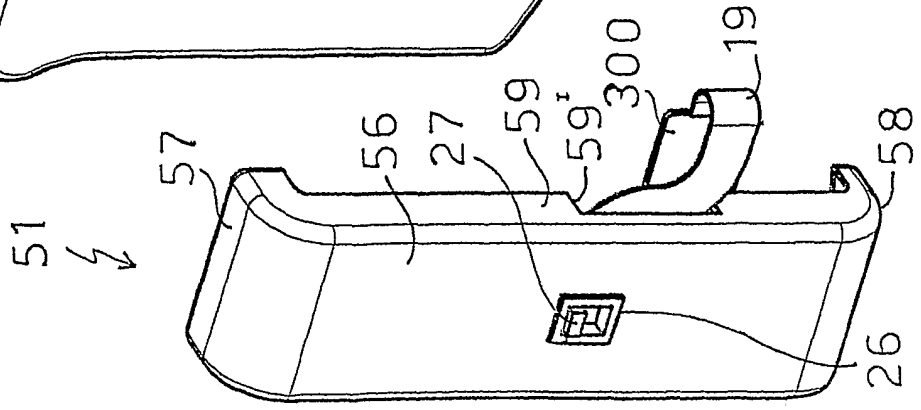
54
52
50
55
5

FIG.8


19
300
59'
59
27
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57
58
51
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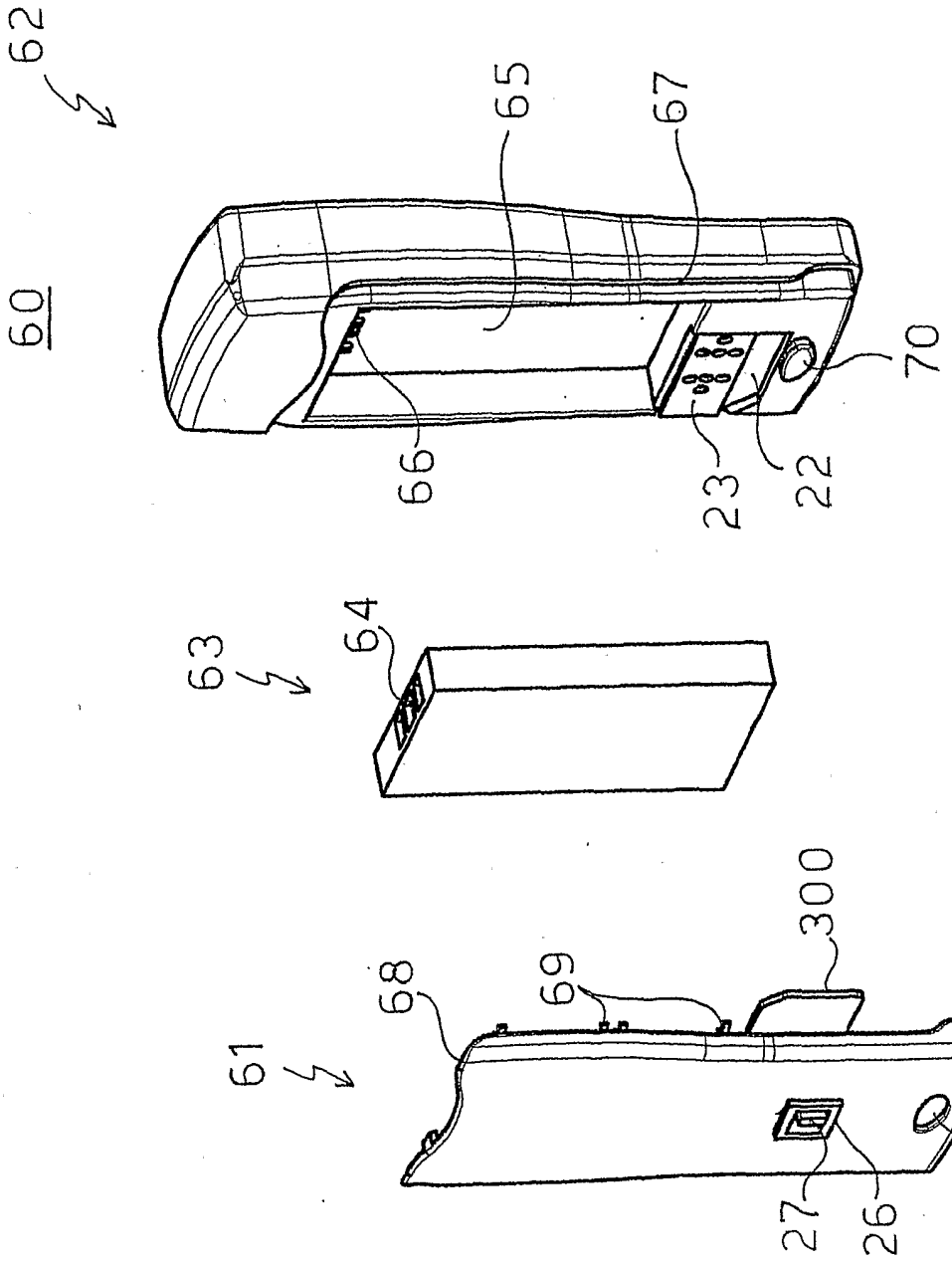


FIG.10

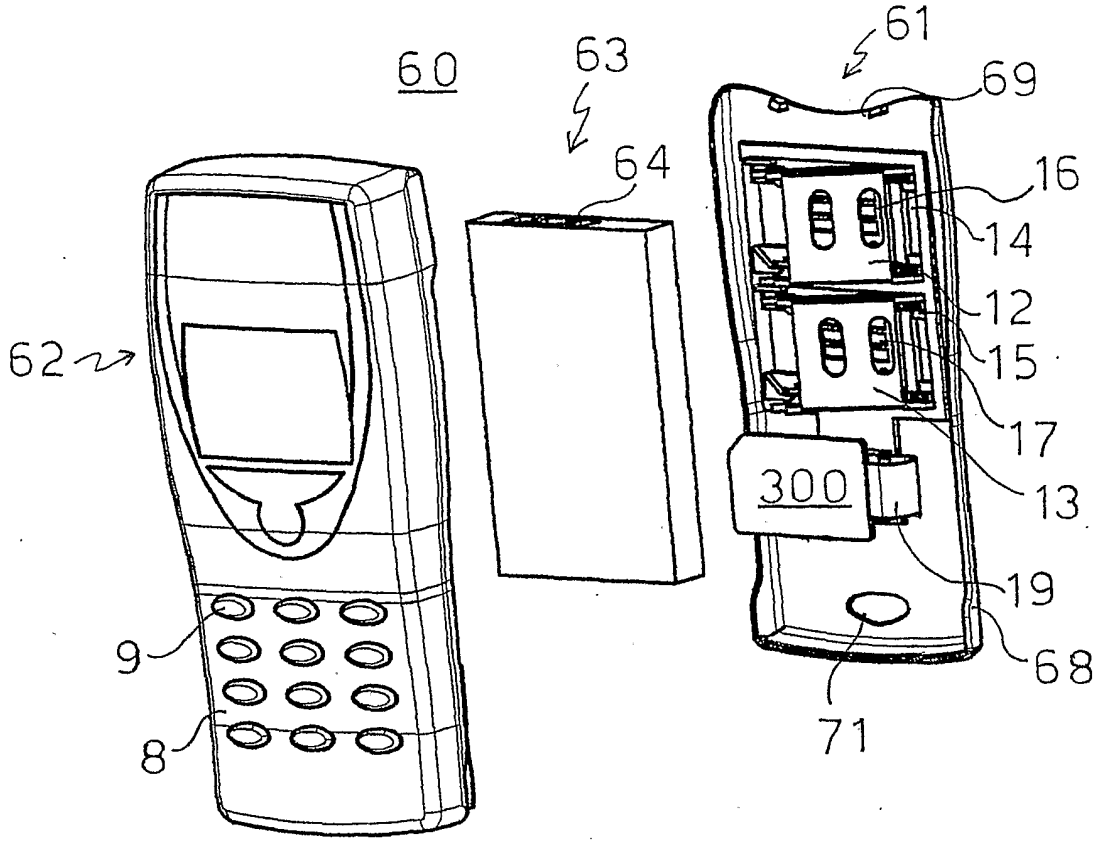


FIG. 11

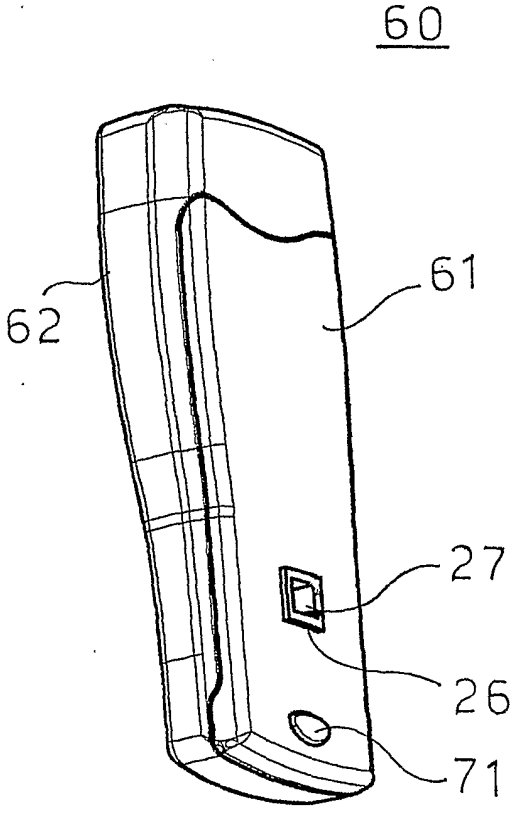
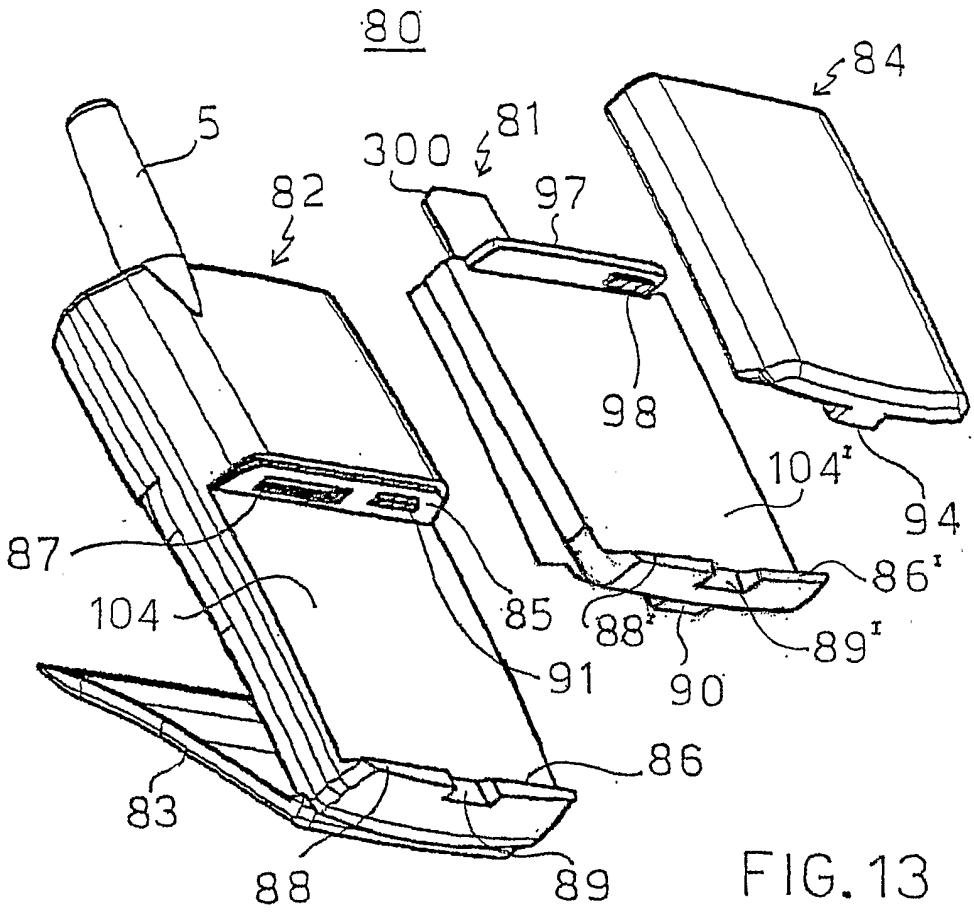


FIG. 12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84
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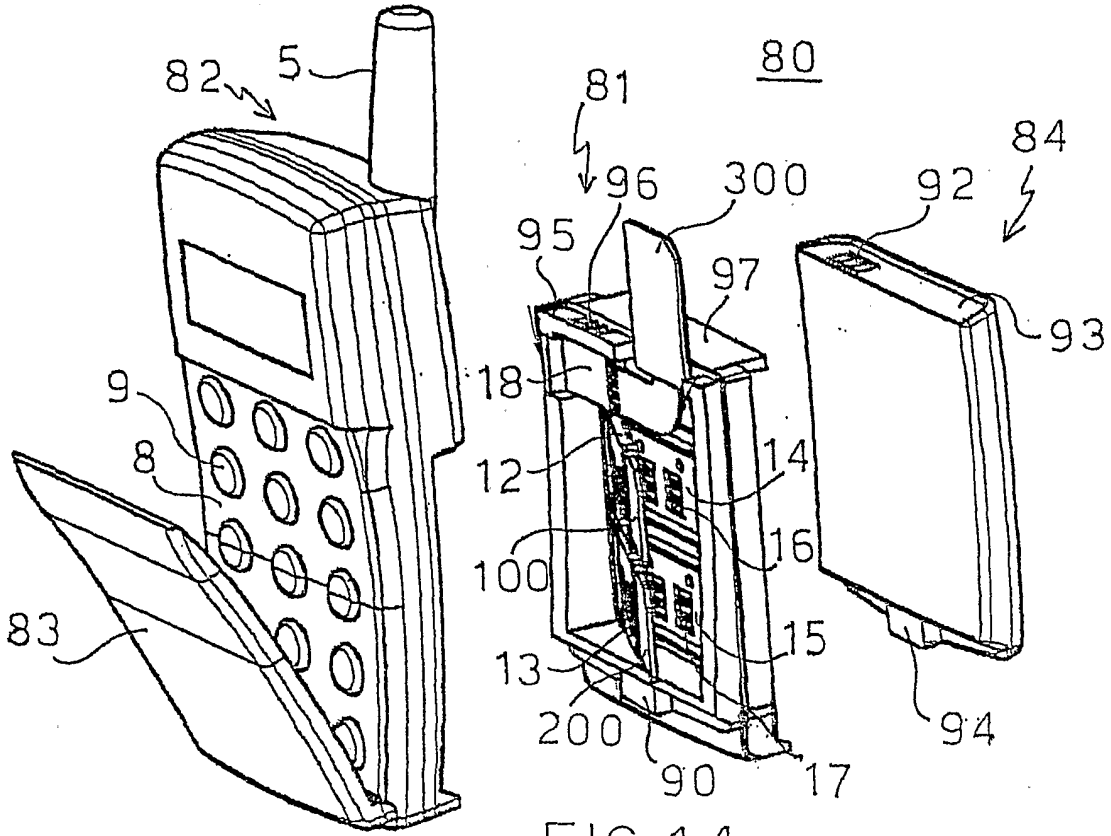
FIG. 13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94

FIG. 14

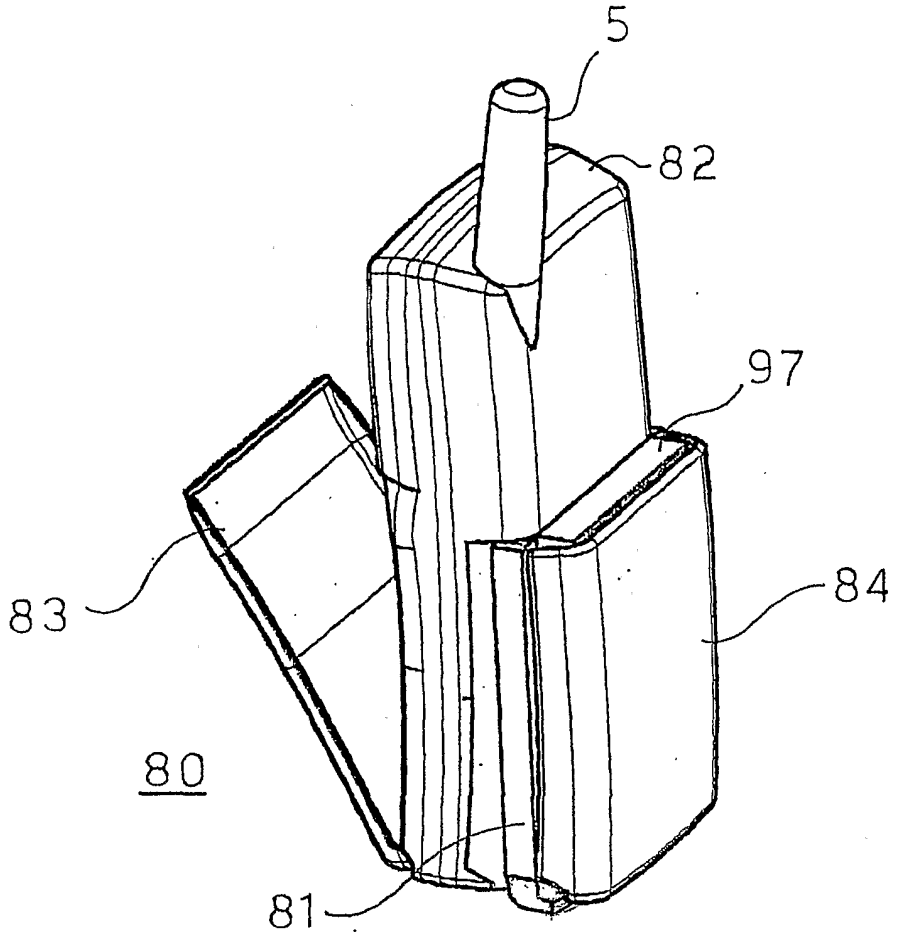

FIG.15

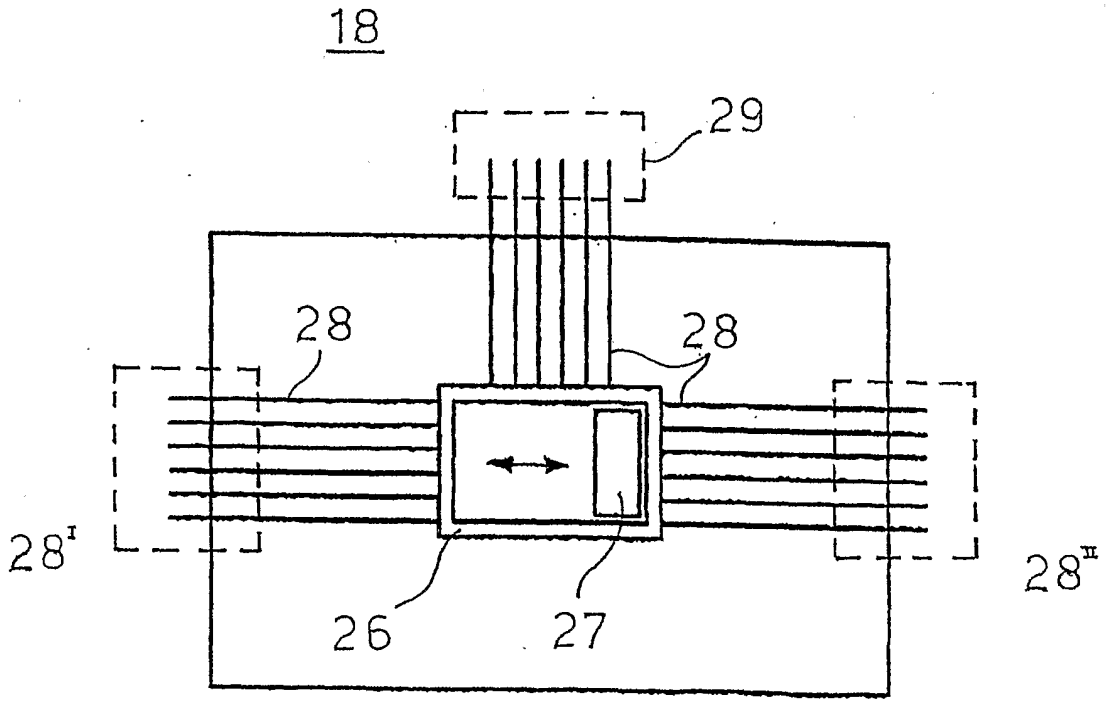

FIG.16

INTERNATIONAL SEARCH REPORT

Inte[illegible]nal Application No
PCT/IT 00/00157

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H04B1/38 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 H04B H04Q H04M

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, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X A	DE 43 02 820 A (MANNESMANN AG) 20 October 1994 (1994-10-20) the whole document	1-5,9, 10,12-14 6-8,11, 15-17
A	US 5 490 202 A (MAEKAWA HITOSHI) 6 February 1996 (1996-02-06) column 7, line 36 -column 8, line 17; figure 21	1-17
A	EP 0 785 634 A (NEWCOM TECHNOLOGIES PTY LTD) 23 July 1997 (1997-07-23) abstract; figures 1,3,5-8	1-17

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

☒ Patent family members are listed in annex.

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
13 December 2000	21/12/2000
Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31–70) 340–2040, Tx. 31 651 epo nl, Fax: (+31–70) 340–3016	Authorized officer Andersen, J.G.

INTERNATIONAL SEARCH REPORT

formation on patent family members

Int[illegible]onal Application No
PCT/IT 00/00157

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 4302820 A	20-10-1994	NONE	
US 5490202 A	06-02-1996	JP 2833397 B	09-12-1998
		JP 6232779 A	19-08-1994
		EP 0608899 A	03-08-1994
		US 5487099 A	23-01-1996
EP 0785634 A	23-07-1997	AU 1064697 A	11-08-1997
		AU 697560 B	08-10-1998
		AU 7533496 A	24-07-1997
		WO 9726719 A	24-07-1997
		CN 1214162 A	14-04-1999
		DE 29623956 U	16-11-2000
		ES 2147718 T	01-10-2000