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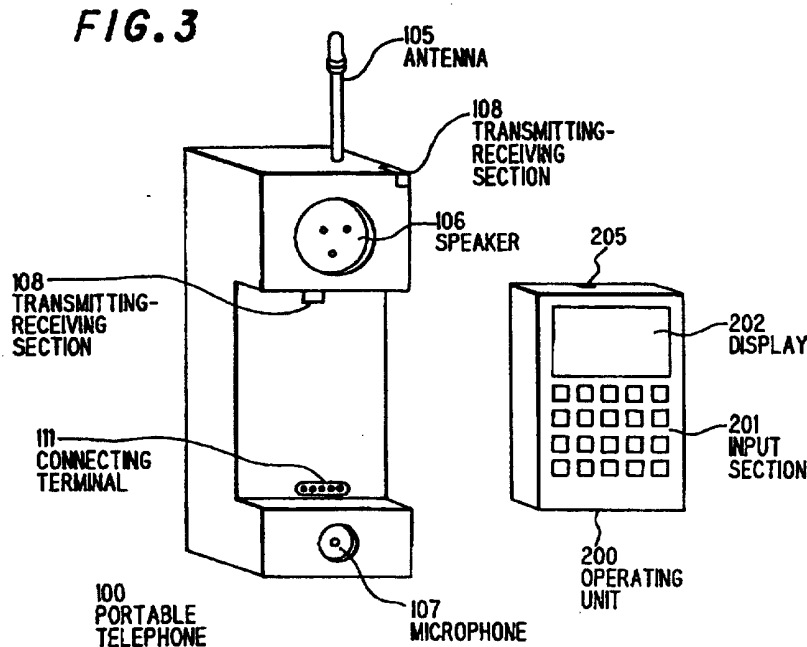
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(54) Portable telephone with detachable operating unit

(57) An operating unit 200 that contains an input section or keypad 201 for inputting information such as the telephone number of a called party, is releasably mounted on the main body 100 of a radiotelephone. The main body 100 includes a telephone transceiver consisting of a speaker 106, microphone 107, and radio transmitting section (101, 102, Figure 2). Data communication between the operating unit 200 and main body 100 is conducted via terminals 111 and/or infrared devices 108, 205.



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FIG. 1 PRIOR ART

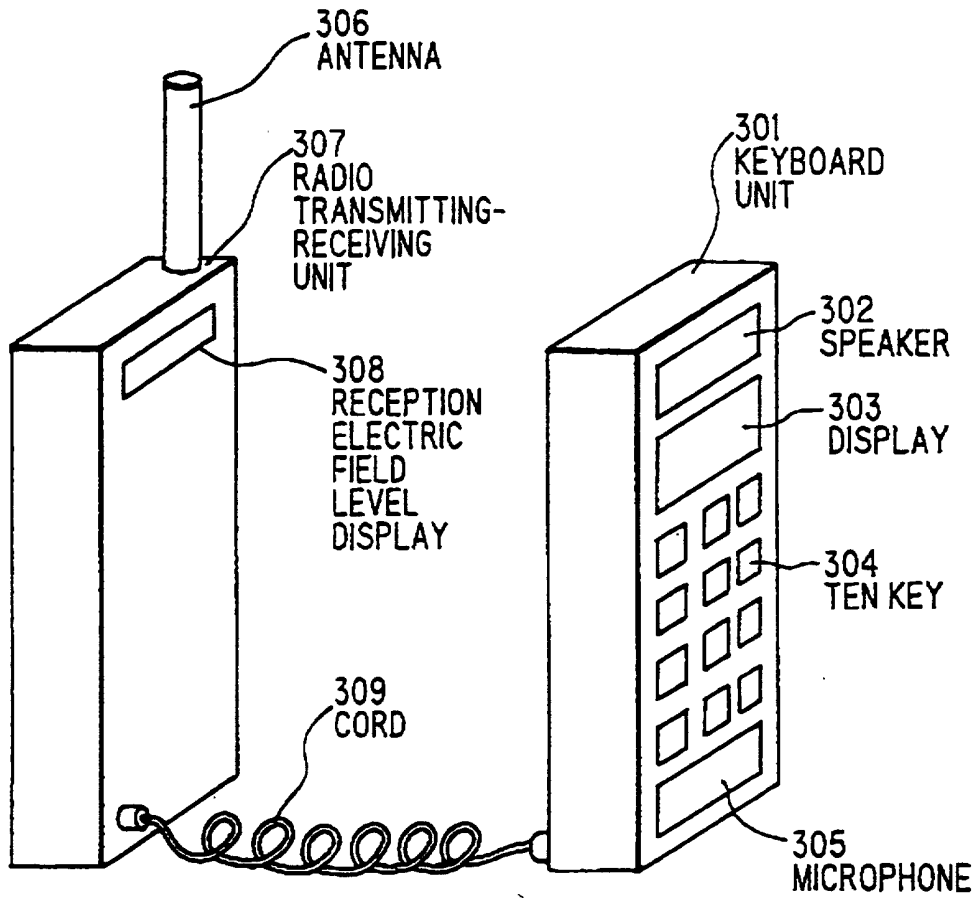


FIG. 2

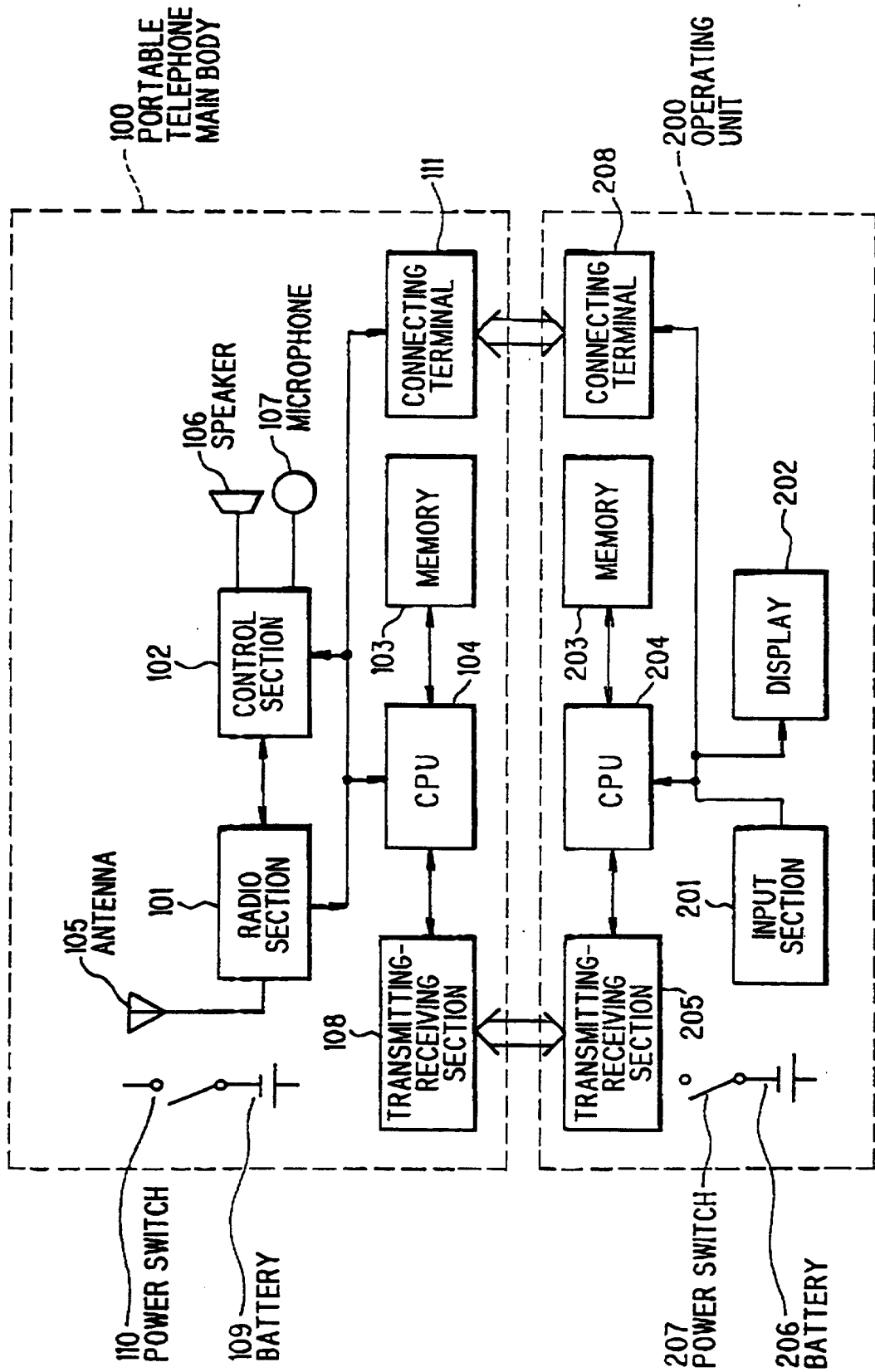
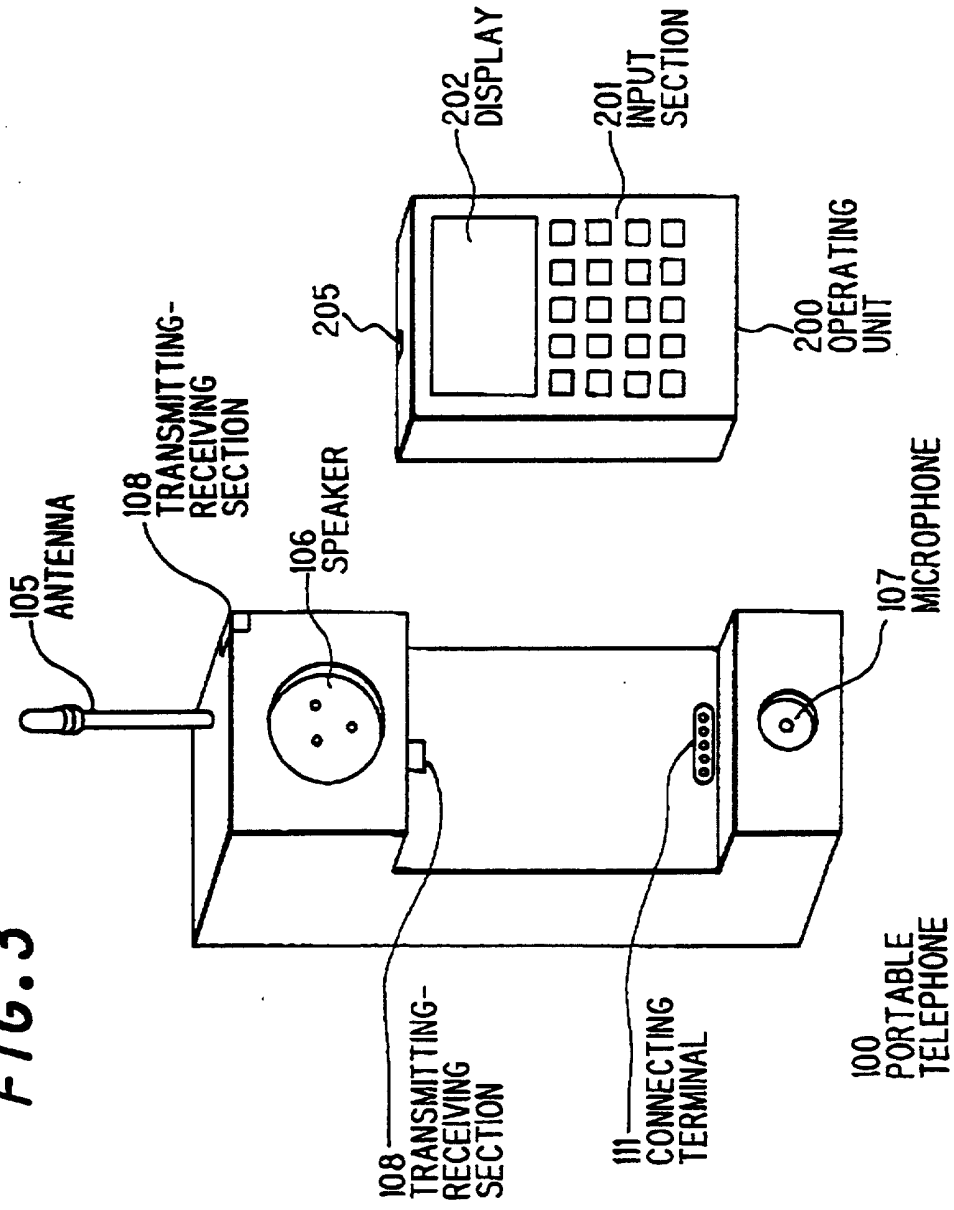


FIG. 3



PORTABLE COMMUNICATION DEVICE

FIELD OF THE INVENTION

This invention relates to a portable communication device,
5 and more particularly to, a portable communication device whose
operating unit can be separated from the main body of the
portable communication device.

BACKGROUND OF THE INVENTION

10 A known separable-type portable telephone, which is
disclosed in Japanese utility model application laid-open No.62-
141245(1987), comprises a keyboard unit provided with a speaker,
a display, a keypad and a microphone, and a radio transmitting-
receiving unit provided with an antenna and a reception electric
15 field level display, where the keyboard unit and the radio
transmitting-receiving unit can be separated from each other
while being electrically connected through a cord. In this type
of portable telephone, a stable reception electric field can be
continuously obtained by placing the radio transmitting-receiving
20 unit at a position where the stable reception electric field can
be monitored by using the reception electric field level display,
while a user can talk on the telephone with the keyboard unit in
his hand.

However, in the separable-type portable telephone, the user
25 cannot use the keypad while talking on the telephone since the
keypad is disposed integrally with the speaker and the
microphone on the key board unit. To use the keypad, the user
must interrupt the talking or is forced to talk with the speaker
and the microphone considerably apart from his ear and mouth.

Namely, it is very difficult for the user to input a memo such as a telephone number with the keypad while talking on the telephone.

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SUMMARY OF THE INVENTION

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According to the invention, a portable communication device for communicating with a communication device such as a telephone through radio communication with a base station, comprises:

a main body which includes a telephone transmitter section and a telephone receiver section; and

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an operating unit which includes an input section for inputting information, such as a telephone number, of a called party;

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wherein the operating unit is releasably mounted on the main body, and data communication is conducted between the main body and the operating unit.

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According to another aspect of the invention, a portable communication device for communicating with a communication device such as a telephone through radio communication with a base station, comprises:

a main body which includes a telephone transmitter section and a telephone receiver section and a data transmitting-receiving section; and

an operating unit which includes an input section for

inputting information, such as a telephone number, of a called party and a data transmitting-receiving section;

wherein the operating unit is releasably mounted on the portable telephone main body, and data communication between the main body and the operating unit is conducted through the data transmitting-receiving section of the main body and the data transmitting-receiving section of the operating unit.

BRIEF DESCRIPTION OF THE DRAWINGS

10 The invention will be explained in more detail in conjunction with the appended drawings, wherein:

FIG.1 is a schematic perspective view showing a known separable-type portable telephone,

15 FIG.2 is a block diagram showing a portable telephone in a first preferred embodiment according to the invention, and

FIG.3 is a schematic perspective view showing a portable telephone, where an operating unit 200 is separated from a portable telephone main body 100, in a second preferred embodiment according to the invention.

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DESCRIPTION OF THE PREFERRED EMBODIMENTS

Before explaining a portable communication device in the preferred embodiment, the aforementioned known portable telephone will be explained in FIG.1.

25 As shown in FIG.1, the known separable-type portable telephone comprises a keyboard unit 301 provided with a speaker 302, a display 303, a ten key keypad 304 and a microphone 305, and a radio transmitting-receiving unit 302 provided with an antenna

306 and a reception electric field level display 308, where the keyboard unit 301 and the radio transmitting-receiving unit 302 can be separated from each other while being electrically connected through a cord 309.

5 Next, a portable telephone in the first preferred embodiment of the invention will be explained in FIG.2.

 In this embodiment, the portable telephone comprises a portable telephone main body 100 and an operating unit 200 which can be separated from the hand-held main body 100.

10 The portable telephone main body 100 comprises a radio section 101 where a radio signal is transmitted and received through an antenna 105 to and from a base station, and a control section 102 which outputs a reception signal from the radio section 101 to a speaker 106 and sends out a transmission signal
15 from a microphone to the radio section 101 by the control of CPU 104.

 Also, the portable telephone main body 100 includes a memory 103 which is controlled by CPU 104 and CPU 104 which controls the radio section 101, the control section 102, the memory 103 and
20 a transmitting-receiving section 108.

 Furthermore, the portable telephone main body 100 comprises the transmitting-receiving section 108 where data is sent and received to and from the operating unit 200, a battery 109 which supplies power to the portable telephone main body 100, a power
25 switch 110 which is used to switch on or off the power of the portable telephone main body 100, and a connecting terminal 111 which is used to electrically connect the portable telephone main body 100 with the operating unit 200.

On the other hand, the operating unit 200 comprises an input section 201 which includes a calling key, a ring-off key, a keypad etc., a display 202, a memory 203 in which a telephone number etc. is stored, and CPU 204 which controls the memory 203 and a transmitting-receiving section 205.

Furthermore, the operating unit 200 comprises the transmitting-receiving section 205 where data is sent and received to and from the portable telephone main body 100, a battery 206 which supplies power to the operating unit 200, a power switch 207 which is used to switch on or off the power of the operating unit 200, and a connecting terminal 208 which is used to electrically connect the operating unit 200 with the portable telephone main body 100.

The operation of the portable telephone in the embodiment will be explained below.

When the portable telephone main body 100 and the operating unit 200 are combined, the power switch 110 of the portable telephone main body 100 is operated to switch on or off the power of the portable telephone main body 100. In this case, data is sent and received between the portable telephone main body 100 and the operating unit 200 with the connecting terminal 111 of the portable telephone main body 100 and the connecting terminal 208 of the operating unit 200 connected with each other.

On the other hand, when the portable telephone main body 100 and the operating unit 200 are separated from each other, the power switch 110 of the portable telephone main body 100 and the power switch 207 of the operating unit 200 are operated to switch on or off the power of the portable telephone main body 100 and

the operating unit 200, respectively. In this case, data is sent and received between the portable telephone main body 100 and the operating unit 200 by transmitting and receiving an infrared signal between the transmitting-receiving section 108 of the portable telephone main body 100 and the transmitting-receiving section 205 of the operating unit 200, where both the transmitting-receiving sections 108 and 205 are preferably composed of a light-emitting element such as an infrared light-emitting diode and a light-receiving element such as a phototransistor.

To make a call from the portable telephone, the portable telephone's user inputs a telephone number of a called party by using the keypad or a contraction key of the operating unit 200 and then pushes down the calling key. By pushing down the calling key, a call signal and a telephone number of the called party are transmitted from the transmitting-receiving section 205 of the operating unit 200 to the transmitting-receiving section 108 of the portable telephone main body 100. Thereby, the portable telephone main body 100 gets into the calling state, setting a telephone circuit through radio to a base station to allow a conversation with the called party.

On the other hand, when the portable telephone receives a call, the portable telephone's user pushes down the calling key of the operating unit 200, thereby a call-reaching response signal is transmitted from the transmitting-receiving section 205 of the operating unit 200 to the transmitting-receiving section 108 of the portable telephone main body 100. Thereby, the portable telephone main body 100 responds to a call signal from

a base station, setting a telephone circuit through radio to the base station to allow a conversation with a caller.

To finish the communication, the portable telephone's user pushes down the ring-off key of the operating unit 200, thereby
5 a ring-off signal is transmitted from the transmitting-receiving section 205 of the operating unit 200 to the transmitting-receiving section 108 of the portable telephone main body 100. Thereby, the portable telephone main body 100 conducts a ring-off operation to break the radio telephone circuit to the base
10 station.

A portable telephone in the second preferred embodiment will be explained in FIG.3, wherein like parts are indicated by like reference numerals as used in FIG.2. FIG.3 shows a state that an operating unit 200 is released from a portable telephone main
15 body 100.

The portable telephone main body 100 is provided with a speaker 106 on the top and a microphone 107 on the bottom, which are disposed with an interval corresponding to an average distance between an ear and a mouth of man.

The operating unit 200 can be releasably mounted between the
20 speaker 106 and the microphone 107. The operating unit 200 is provided with an input section 201 and a display 202. The input section 201 is composed of keys, for example, a calling key, a ring-off key and a keypad, by which a user operates the portable
25 telephone. The display 202 is composed of a display unit such as a liquid crystal display, which displays data input from the input section 201 or data received from the portable telephone main body 100.

The operating unit 200 is provided with a transmitting-receiving section 205 on the upper side, where data is transmitted and received to and from the transmitting-receiving section 108 of the portable telephone main body 100. The
5 transmitting-receiving section 205 is preferably composed of a light-emitting element such as an infrared light-emitting diode for transmitting a infrared signal and a light-receiving element such as a phototransistor for receiving a infrared signal.

Also, the operating unit 200 is provided with a connecting
10 terminal 208(not shown) disposed at a position corresponding to a connecting terminal 111 on the back side.

The portable telephone main body 100 is provided with the transmitting-receiving section 108 and the connecting terminal 111 on the front side, where data is transmitted and received to
15 and from the transmitting-receiving section 205 of the operating unit 200. The transmitting-receiving section 108 is preferably composed of a light-emitting element such as an infrared light-emitting diode for transmitting a infrared signal and a light-receiving element such as a phototransistor for receiving a
20 infrared signal.

In the second embodiment, there are provided the two transmitting-receiving sections 108, 108. One is disposed at a position that corresponds to the transmitting-receiving section 205 when the operating unit 200 is mounted on the portable
25 telephone main body 100. By this transmitting-receiving section 108, the transmission and reception of data between the portable telephone main body 100 and the operating unit 200 can be performed without using the connecting terminals 111, 208. The

other is disposed on the top corner, whereby infrared rays from the operating unit 200 are easy to receive and the reach of the infrared rays can be therefore enlarged.

When the portable telephone's user wants to make a memo of some information such as a telephone number while talking on the telephone, he can operate the keys of the operating unit 200. Thereby, the contents of the key operation can be stored in the memory 203 through CPU 204. At this time, the user can make a memo by using the operating unit 200 without keeping the portable telephone main body 100 away from his ear and mouth, i.e., without interrupting the talking since the operating unit 200 can be separated from the portable telephone main body 100.

Meanwhile, when the contents of the key operation are registered as a contraction dialling, the user can easily make a call by using the contraction dialling.

Optionally, the contents of the key operation can be stored in the memory 103 of the portable telephone main body 100 by transferring them through CPU 204, the transmitting-receiving section 205, the transmitting-receiving section 108 and CPU 104 to the memory 103.

Though, in the above embodiments, the infrared communication is used between the transmitting-receiving sections 108 and 205, a low-power radio wave communication may be used therebetween.

When the operating unit 200 is mounted on the portable telephone main body 100, the power may be supplied from the portable telephone main body 100 to the operating unit 200 through the connecting terminals 111 and 208 through which data is usually transmitted and received.

Although the invention has been described with respect to specific embodiment for complete and clear disclosure, the appended claims are not to be thus limited but are to be construed as embodying all modification and alternative constructions that may be occurred to one skilled in the art which fairly fall within the basic teaching here is set forth.

5

C L A I M S :

1 1. A portable communication device for communicating with
2 a communication device such as a telephone through radio
3 communication with a base station, comprising:

4 a main body which includes a telephone transmitter section
5 and a telephone receiver section; and

6 an operating unit which includes an input section for
7 inputting information, such as a telephone number, of a called
8 party;

9 wherein said operating unit is releasably mounted on said
10 main body, and data communication is conducted between said main
11 body and said operating unit.

1 2. A portable communication device, according to claim 1,
2 wherein:

3 said operating unit comprises said input section for
4 inputting information, such as a telephone number, of a called
5 party, a data-transmitting section for transmitting data to said
6 main body, CPU for controlling said data-transmitting section and
7 a battery for supplying power to said data-transmitting section.

1 3. A portable communication device, according to claim 1,
2 wherein:

3 said operating unit comprises said input section for
4 inputting information, such as a telephone number, of a called
5 party, a data transmitting-receiving section for transmitting and
6 receiving data to and from said main body, CPU for controlling

7 said data-transmitting section, a display for displaying data
8 transmitted from said portable telephone main body and a battery
9 for supplying power to said data-transmitting section.

1 4. A portable communication device, according to claim 1,
2 wherein:

3 said data communication is conducted by using infrared rays.

1 5. A portable communication device for communicating with
2 a communication device such as a telephone through radio
3 communication with a base station, comprising:

4 a main body which includes a telephone transmitter section
5 and a telephone receiver section and a data transmitting-
6 receiving section; and

7 an operating unit which includes an input section for
8 inputting information, such as a telephone number, of a called
9 party and a data transmitting-receiving section;

10 wherein said operating unit is releasably mounted on said
11 portable telephone main body, and data communication between said
12 main body and said operating unit is conducted through said data
13 transmitting-receiving section of said main body and said data
14 transmitting-receiving section of said operating unit.

1 6. A portable communication device, according to claim 5,
2 wherein:

3 said main body includes two or more data transmitting-
4 receiving sections through which said main body transmits and
5 receives data to and from said operating unit.

1 7. A portable communication device, according to claim 5,
2 wherein:
3 said data communication is conducted by using infrared rays.

8. A portable communication device substantially as
herein described with reference to Fig.2 or Fig.3 of the
drawings.



Application No: GB 9711085.2
Claims searched: 1-7

Examiner: Anita Keogh
Date of search: 23 July 1997

**Patents Act 1977
Search Report under Section 17**

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:
UK Cl (Ed.O): H4J (JK), H4L (LECX)
Int Cl (Ed.6): H04M (1/02, 1/60, 1/62), H04B (1/034, 1/08, 1/38)
Other: Online: WPI, JAPIO

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
X	GB 2283878 A (ERICSSON) see particularly page 4 line 23 to page 5 line 9 and Figures 2a-2c	1, 4, 5, 7
X	Japio Abstract Accession No. 03436660 & JP 030099560 A (NEC) 24.04.91 (see abstract)	1, 2

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.