

A CAR PHONE

The present invention pertains to the field of the car phone, and more particularly relates to a car phone adding a shortened dial means.

In the conventional car phone using hands free function, a phone call is possible with both hands free. The driver using this phone is however still dangerous since he must find various function buttons on the handset and turn his eyes to push them. Particularly, the driver must push a key to perform the hands free function when taking a call, and must push the phone number buttons when making a call. At this time, the driver is still dangerous whether taking a call or making a call.

It is an object to provide a car phone adding a shortened dial means which can dial with eyes free as well as with hands free.

To achieve the object, the invention provides a car phone comprising a handset including a speaker; a cradle connected to the handset; a main unit connected to the cradle, including a code demodulator, CPU, and memory means; and transmission lines for connecting the handset, the cradle and the main unit, characterized by further comprising: a shortened dial means connected to the cradle, wherein the shortened dial means comprises: a microphone means for receiving and amplifying an input voice signal and including switching means for connecting the power source to the microphone means, key data input lines, and a code generator connected to the microphone means and the key data input lines, for generating according to the input key data a starting call code, an ending call code and codes for

enabling respective telephone numbers stored in the main unit to be output; and a transmission line for connecting the shortened dial means and the cradle.

Other features and advantages of the invention, its organisation, construction and operation will be best understood from the following detailed description of a specific embodiment thereof, taken in conjunction with the accompanying drawings in which:

Fig. 1 is a block diagram showing a construction of the present invention;

Fig. 2 is an exterior view of the shortened dial means;

Fig. 3 is a construction diagram of the microphone circuit;

Fig. 4 is a connection diagram of the transmission lines;

Fig. 5 is a construction diagram of the code generator and code demodulator;

Fig. 6a and Fig. 6b are diagrams of showing another embodiment of the present invention; and

Fig. 7 is a flow chart of showing flow of the present invention.

Fig. 1 is a block diagram showing a construction of a car phone. In Fig. 1, 10 shows a handset, 20 a main unit, 30 a cradle, and 40 shortened dial means, respectively. The constructions of the handset 10, the main unit 20, and the cradle 30 are the same as the conventional car phone.

As shown in Fig. 1, the car phone adds the shortened dial means 40 to the conventional car phone.

Fig.2 is an exterior view of the shortened dial means. In Fig.2, 21 shows a button starting and ending a call, 22 through 25 buttons calling out telephone dial numbers stored within the main unit 20, 26 fixing means, 27 a microphone, and 28 a transmission line, respectively.

The button 21 functions as starting and ending a call, and the buttons 22 through 25 function as calling out the important and useful telephone dial numbers stored within the handset 10. For example, if a user wants to dial the phone number stored in the button 23, the user pushes the button 23 and then the button 21. If he wants to end the call, he pushes the button 21 again. Such button numbers can be increased or decreased according to the user. As mentioned above the user can call by pushing the button 21 without using the handset 10. At this time the shortened dial means can be located on an upper garment, a jacket, etc. which make it easy to talk over the microphone 27.

Fig.3 is a construction diagram of the microphone circuit. In Fig.3, 31 through 33 show resistors, 34 and 35 condensers, and 36 and 37 transistors, respectively. When the handset 10 is put on the cradle 30, the power is applied to the microphone 27 of the shortened dial means instead of the microphone of the handset 10, and the user can be talking over the microphone 27.

This microphone is made up of an amplifier which consists of the resistors 31, 32, and 34, the condensers 34 and 35, and the transistor 36, and a switch circuit which consists of the transistor 37 and the resistor 33 for switching in order to apply the power source to the microphone 27 in the predetermined time.

As shown in Fig.3, this microphone circuit amplifies a voice signals input over the microphone 27, and then outputs them to the

main unit 20 over the cradle 30.

Fig.4 is a connection diagram of the transmission lines. In Fig.4, 41 shows a code generator, 42 the microphone circuit, and 43 a code demodulator, respectively.

In Fig.4, solid lines show voice path, and a dotted line shows data path. The voice signals generated in the microphone circuit 42 are sent to a voice processor of the main unit 20, and the voice signals from the voice processor are sent to the speaker 44 of the handset 10.

The data for calling out the phone number, that is, generated over the code generator 41 of the shortened dial means 40 are sent to CPU (Central Processing Unit) of the main unit 20 over the code demodulator 43.

Fig.5 is a construction diagram of the code generator 41 and code demodulator 43, In Fig.5, 51 and 52 show diodes, 53 a switch, 54 and DR gate, 55 a secret code storing port, 56 a resistor, and 57 and 58 condensers, respectively.

The data generated over the code generator 41 are sent to the code demodulator 43 through the transmission line. After the data are read in the code demodulator 43, the data are sent to CPU for processing the data.

The secret code is stored in the code generator 41 and the code demodulator 43 in order to prevent overlap and cross of voice signals and data signals on the transmission line, and also the same resistor 56 and condenser 57 are added respectively in order to have the same time constant.

Fig.6a and Fig.6b is a diagram of showing another car phone.

In Fig.6a and Fig.6b, 60 shows a level slicer, 61 an OP amp, and 62 a variable resistor, respectively.

In this embodiment, the maximum value of peak-to-peak voltage of the voice signal is controlled below one voltage, and voltage difference between high and low voltages is controlled greater than one voltage.

From this construction, only the data signals can be applied to the code demodulator 43 over the level slicer 60, and thus overlap and cross of the voice and data signals can be prevented. And also to prevent interference between each signals, the condensers 58 are used as the AC coupler. In other words, the saturation voltage is not applied to the speaker 44 of the handset 10 and the voice processor of the main unit 20.

In above Fig.1 through Fig.6b, the same reference numbers show the same device or element.

Fig.7 is a flow chart of showing flow of the car phone. The software to process the flow is stored in CPU of the conventional main unit 20. And also the phone numbers used in the shortened dial means 40 are stored in the main unit 20.

In step 100, CPU determines that data transmission from the shortened dial means 40 is completed. In step 110 the necessary bits are selected among the input data if the data transmission is completed. In step 120, CPU decides the selected bits are valid.

In steps 130, 150, and 160, CPU performs key data change and jump to re-call routine. if the selected bits are valid.

In step 140, CPU decides the key data for starting or ending a call are among the valid bits. If the key data is among the valid bits, in steps 180 and 190, jump to call starting routine or to call ending routine according to buffer value is performed.



CLAIMS:

1. A car phone comprising a handset including a speaker; a cradle connected to the handset; a main unit connected to the cradle, including a code demodulator, CPU, and memory means; and transmission lines for connecting the handset, the cradle and the main unit, characterized by further comprising: a shortened dial means connected to the cradle, wherein the shortened dial means comprises: a microphone means for receiving and amplifying an input voice signal and including switching means for connecting the power source to the microphone means, key data input lines, and a code generator connected to the microphone means and the key data input lines, for generating according to the input key data a starting call code, an ending call code and codes for enabling respective telephone numbers stored in the main unit to be output; and a transmission line for connecting the shortened dial means and the cradle.
2. A car phone according to claim 1, wherein the code demodulator and the code generator have identical resistor and condenser time constant circuits to provide the same time constant.
3. A car phone according to claim 2, wherein the code demodulator and the code generator store the same secret codes.
4. A car phone according to claim 3, further comprising a level slicer between the code generator and the code demodulator, for ensuring only data signals having voltages greater than a predetermined voltage are supplied to the code demodulator.
5. A car phone substantially as hereinbefore described with reference to and as shown in Figures 1 to 5 and 7 or 6.