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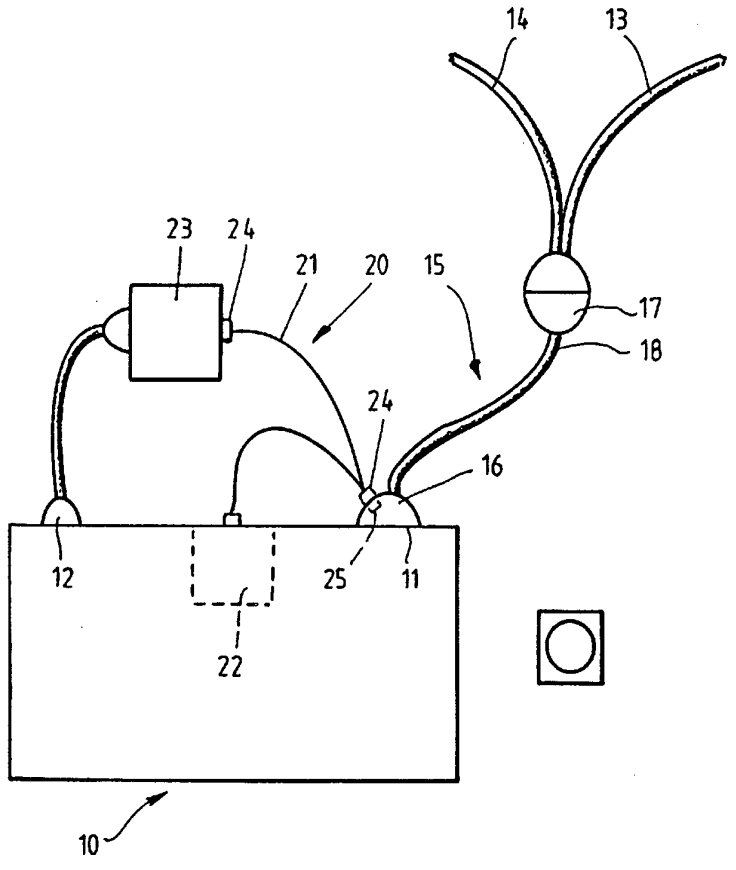
(54) Title: COMPUTER AND MODEM INTERFACE

(57) Abstract

A computer and modem interface for a mobile telephone which is adapted to be connected between a port (11) of a computer and the mobile telephone and which is adapted to be connected to a modem which may be internal (22) or external (23) of the computer. The interface including circuitry (16) such that the system can generate a pulse train equivalent to a telephone number required to be dialled by the telephone, and in the form required by the telephone, and can cause this to be transmitted by way of the circuitry to the telephone transceiver together with a send signal so that the required number can be called and means to operatively connect the modem to the circuitry so that information can be transmitted via the mobile telephone.



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COMPUTER AND MODEM INTERFACE

This invention relates to a computer and modem interface for a mobile telephone and in particular to an interface which gives a very simple arrangement whereby a computer, normally a lap top or note book computer, can be connected by way of the interface to a mobile telephone to permit communications from or to the computer via the normal and mobile telephone network.

These days many people have lap top or notebook computers and also have mobile telephones, in Australia connected to the cellular telephone net, and there is a demand to establish communication facilities between such computers and mobile telephones to enable information to be transmitted through a modem and the mobile telephone to the telephone network to another computer.

The principal object of this invention is to provide a system whereby this can be done.

The invention includes a computer and modem interface for a mobile telephone including hardware which includes cabling and circuitry adapted to be connected between a port of a computer and the connection to digital and/or analogue signals of the mobile phone and which also has means whereby connection can be made to a modem, the circuitry being such that the system can generate a pulse train equivalent to a telephone number required to be dialled by the telephone and can cause this to be transmitted by way of the circuitry to the transceiver together with a send signal whereby the required number is called and

means the modem is operatively connected to the circuitry and information can be transmitted by or to the modem using normal protocols.

Where the computer has a built in modem the connector is connected directly to the modem and where it is an external modem the connector is connected to the modem and the modem is connected, in the normal way, to a serial port of the computer.

In order that the invention may be more readily understood we shall describe one embodiment of the invention in relation to the attached drawing.

Shown on the drawing there is a computer 10 which would normally be a laptop or note book computer which is shown as having a parallel port 11 and a serial port 12. Connected to the parallel port 11 there is a cable assembly 15 which at one end has a parallel port connector 16 and at the other end a DB25 connector 17, the connectors 16,17 being interconnected by a 16 way multi-core cable 18.

The circuitry is located in the connector 16. Whilst having an output 13 to the mobile telephone handset and an output 14 to the mobile telephone or transceiver.

The connector 16 which is connected to the parallel port also has a modular modem connection 20 thereto having a cable 21 which can be interconnected with an internal modem 22 or external modem 23.

The connection may be by means of a modular socket 25 located in the connector 16 and the cable can have modular plugs 24 at each end.

The circuitry located in the connector 16 includes a power regulator integrated circuit which takes power from the cellular mobile telephone or from an external source and converts this to the required voltage, which may be 5 volts.

The circuitry also includes a 2 to 4 wire hybrid buffer/amplifier stage which connects the receiver and transmitter audio from the cellular mobile telephone to the modular socket 25 so that audio can be transmitted to and from the modem 22,23 by connection 20.

The gain of the audio signal can be set for the particular cellular mobile telephone by an analog switch which can be software controlled as will be described later herein.

The circuitry also includes a data switch enabling the device to communicate with cellular mobile telephones with bi-directional data lines and this is controlled by way of the parallel port 11.

The device may also include an integrated transistor array which buffers data signals from the cellular mobile telephone to the parallel port.

Whilst in this embodiment, I have referred to the parallel port 11, the arrangement could be connected to the serial port 12.

The device includes, under software control setup, auto answer and auto dial function.

The setup can be menu driven so that the type of cellular mobile telephone is selected, and this is used to control the gain previously referred, the type of modem, to ensure correct communication between the computer and the modem, hot keys, if these are required, and a ring delay time.

These functions are basically conventional and will not be described further.

The auto dial module consists of two parts. The first can be a dial window which can be controlled by a hot key selected from the setup program and which provides a prompt for the number to be dialled or, include the capability of making a selection from predetermined numbers.

There is also a program to read the digits of the required telephone number being dialled which are converted to an appropriate code for the specific cellular mobile telephone, which is selected during setup, so that a data train having the required characteristic is established, and a final send signal is forwarded to the cellular mobile telephone.

This means that the required data train is sent as a burst through the system to the transceiver of the cellular mobile telephone which initiates the transmission of the required

dialling signal from the telephone.

Once communication is established, the modem 22,23 associated with the computer communicates with the distant modem and when the carrier "off" from the modem is received then an end signal is generated by the computer and transmitted to the cellular mobile telephone thus breaking the contact and leaving the mobile telephone in its normal idle mode.

The circuitry also includes an auto answer arrangement which runs in background in the computer.

This program monitors the signal at the parallel port 11 and when this matches with an incoming call code the program causes the modem be placed "on line" and then sends a send signal to the transceiver to initiate communications. After this signal is sent, the communications will be controlled by the modem 22,23 and the distant modem in the conventional way.

When communications has ceased and a carrier "off" signal is received from the modem then the program will effect an end signal to the mobile telephone which will return it to its idle mode.

It will be seen that the device of the invention permits a relatively cheap arrangement to effect the operation of a modem from a computer making use of the facilities of the computer and the modem and also the facilities of the device itself to effect

the necessary control.

It is to be understood that various modifications can be made in this without departing from the spirit and scope of the invention.

The claims defining the invention are as follows:

1. A computer and modem interface for a mobile telephone including hardware which includes cabling (15) and circuitry (16) adapted to be connected between a port(11) of a computer and the connection to digital and/or analogue signals of the mobile phone and which also has means whereby connection can be made to a modem (22,23), the circuitry being such that the system can generate a pulse train equivalent to a telephone number required to be dialled by the telephone and can cause this to be transmitted by way of the circuitry to the transceiver together with a send signal whereby the required number is called and means whereby the modem is operatively connected to the circuitry and information can be transmitted by or to the modem using normal protocols.

2. An interface as claimed in claim 1 wherein the circuitry can be connected to a parallel (11) or a serial (12) port of the computer.

3. An interface as claimed in claim 1 or claim 2 wherein the required number is held in the computer and is transmitted to the circuitry on request by a user.

4. An interface as claimed in claim 1 or claim 2 wherein the individual digits required are entered by the user into the computer and these are transmitted on receipt of an

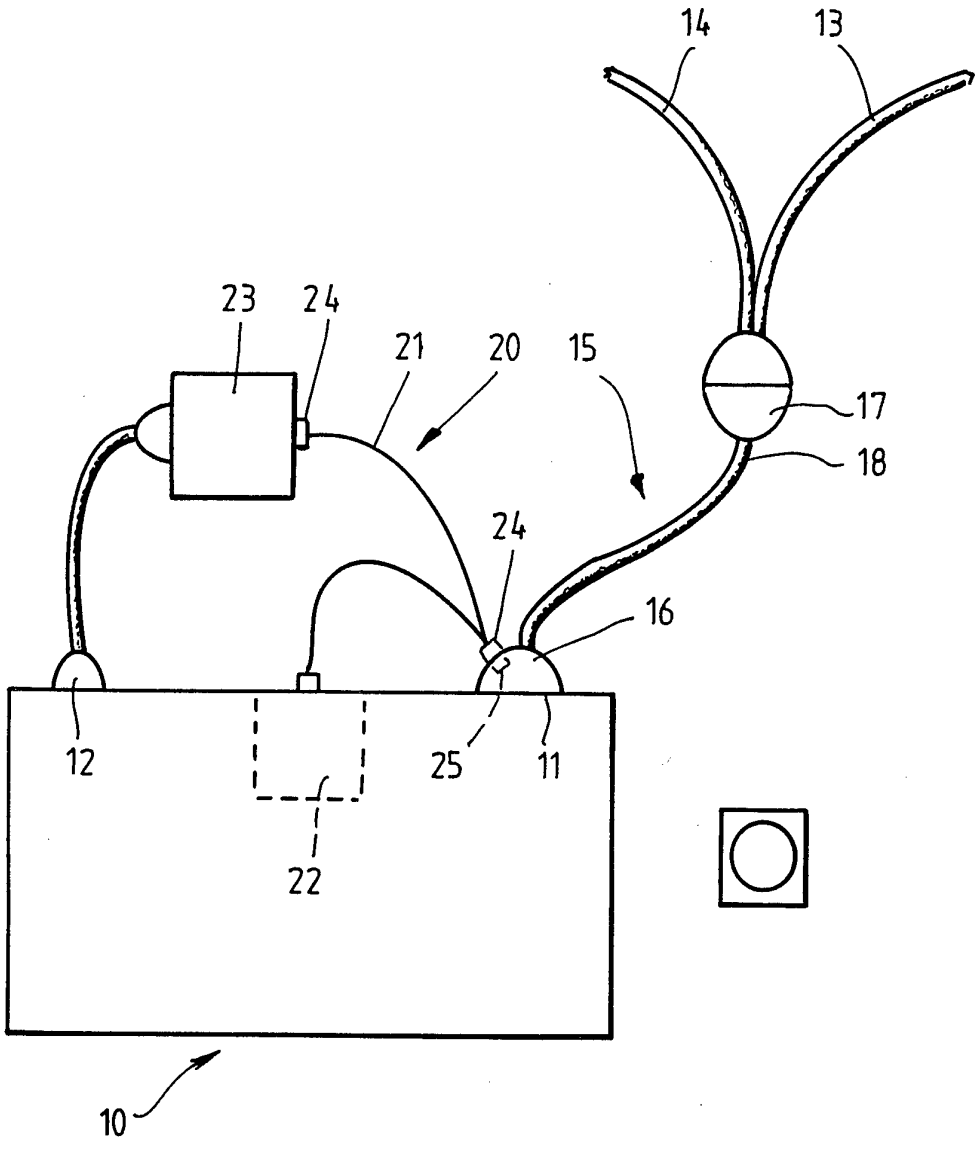
indication that the total number of digits have been completed.

5. An interface as claimed in either claim 3 or claim 4 having a set-up program for individual mobile telephones and whereby the set-up program defines the format into which individual digits are translated for transmission to the transceiver in the required form for the transceiver.

6. An interface as claimed in any preceding claim wherein when the modem provides a carrier "off" signal, there is an end signal generated which is transmitted to the telephone transceiver thus returning the telephone to its quiescent state.

7. An interface as claimed in any preceding claim wherein there is monitoring of any signal to the port to which the circuitry is attached and, on receipt of a signal which matches the incoming call code of the particular telephone, as selected by a set-up program, a signal is sent to the receiver to initiate communication.

8. An interface as claimed in any preceding claim wherein the circuitry includes a 2 to 4 wire hybrid buffer/amplifier which connects the receiver and transmitter audio signals from the telephone to an output whereby these signals can be passed to the modem.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INTERNATIONAL SEARCH REPORT

International application No.
PCT/AU92/00651

A. CLASSIFICATION OF SUBJECT MATTER
Int. Cl.[5] HO4L 29/10, 27/00, HO4M 11/06, HO4Q/ 7/04

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 HO4L 29/10, 27/00, H04M 11/06, HO4Q 7/04, HO4B 7/26

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
AU: IPC as above

Electronic data base consulted during the international search (name of data base, and where practicable, search terms used)
DERWENT, INPADOC: Modem: and Mobile: or cellular: and Telephone: or Interface

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to Claim No.
X	WO,A, 92/10047 (NOKIA MATKAPUHELIMET OY.) 11 June 1992 (11.06.92) Abstract, page 1 line 21- page 2 line 6, Figs 1-5	1-8
X	WO,A, 90/03076 (INTELLIGENCE TECHNOLOGY CORPORATION) 22 March 1990 (22.03.90) Abstract, page 12 line 24 - page 13 line 5, Figs 1,2,3	1-8
X	AU,A, 78441/91 (AUSTRALIAN TELECOMMUNICATIONS CORPORATON) 19 DECEMBER 1991 (19.12.91) page 5 line 24 - page 11 line 19	1-8

[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
24 February 1993 (24.02.93)	12 MAR 1993 (12.03.93)

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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate of the relevant passages	Relevant to Claim No.
X	GB,A, 2170977 (OKI ELECTRIC INDUSTRY CO. LTD) 13 August 1986 (13.08.86) Abstracts, page 1 lines 52-74	1-8
X	GB,A, 2177572 (OKI ELECTRIC INDUSTRY CO. LTD) 21 January 1987 (21.01.87) Abstract, page 2 line 66-page 3 line 11, fig.1	1-8
A	EP,A, 499012 (OIS OPTICAL IMAGING SYSTEMS, INC.) 19 August 1992 (19.08.92)	

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report	Patent Family Member					
WO,A 92/10047	FI	905822	FI	923359		
WO,A 90/03076	AU US	43102/89 4991197	BR	8907532	EP	387338
AU,A 78441/91	CN	1063387				
GB,A 2170977	CA	1237781	JP	62003532	SE	8600530
GB,A 2177572	CA	1237781	JP	62003532	SE	8602863
						END OF ANNEX