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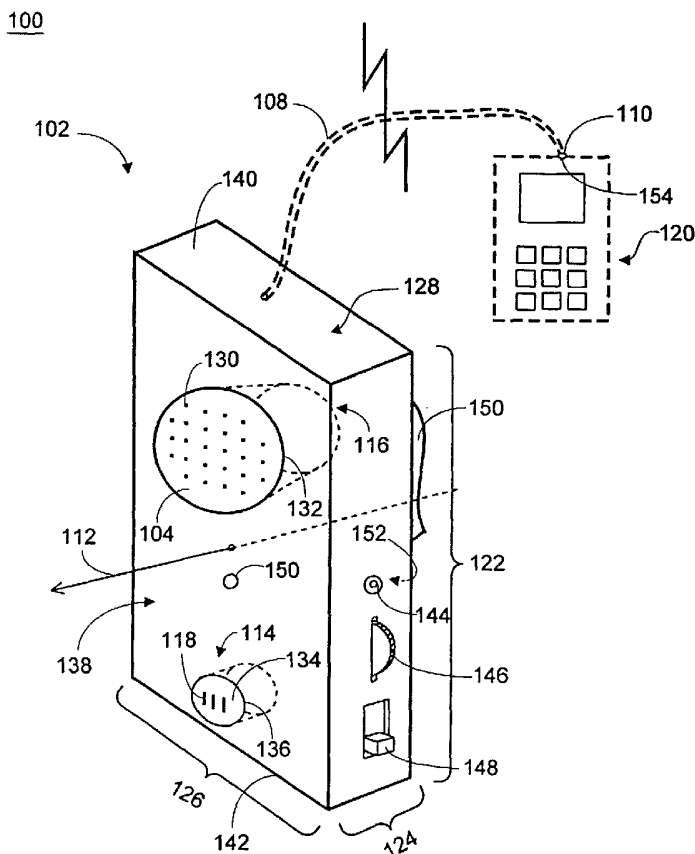
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(54) Title: COMPACT HANDS-FREE ADAPTER FOR USE WITH A CELLULAR TELEPHONE



(57) Abstract: The present invention provides a portable, pocket sized speakerphone device (102) adaptable for use with a cellular telephone (120), and a method (Fig. 1) for making such a device. The device reduces howling, including echoing and feedback, sufficiently to enable use of the device as a telephone speakerphone (102). To reduce howling, one or more of the following may be utilized: attenuation circuitry; sound insulation means; positioning the loudspeaker (116) and the microphone (114) of the device such that the outlet of the loudspeaker (116) for emitting sound from the loudspeaker (116) faces in the same direction as the outlet of the microphone (114) for receiving sound into the microphone (114) and such that a line extending between the outlet of the loudspeaker (116) and the outlet of the microphone (114) would form a right angle with a line extending in the direction of the outlet of the loudspeaker and the outlet of the microphone face.



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**INTERNATIONAL SEARCH REPORT**

International application No.

PCT/US02/16986

| <b>A. CLASSIFICATION OF SUBJECT MATTER</b>  |   |  |
|---|---|--|
| IPC(7) : H04B 1/38, H04M 1/00   |   |  |
| US CL : 455/569, 570, 90, 575, 550; 379/406, 410, 411, 407, 428, 432, 433   |   |  |
| According to International Patent Classification (IPC) or to both national classification and IPC   |   |  |
| <b>B. FIELDS SEARCHED</b>   |   |  |
| Minimum documentation searched (classification system followed by classification symbols)<br>U.S. : 455/569, 570, 90, 575, 550; 379/406, 410, 411, 407, 428, 432, 433 |   |  |
| 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 practicable, search terms used)  |   |  |
| <b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>   |   |  |
| Category *  | Citation of document, with indication, where appropriate, of the relevant passages  | Relevant to claim No.  |
| Y   | US 5,588,041 A (MEYER, JR et al) 24 December 1996; col. 2, line 10- col. 4, line 64; col. 8, lines 9- 67.   | 1-35   |
| Y   | US 4,741,018 (PORTRATZ et al) 26 APRIL 1988; col. 2, lines 1-28; col. 3, line 3- col. 5, line 60.   | 1-35   |
| Y   | US 6,097,971 A (HOSOI) 01 August 2000; col. 2, line 57- col. 3, line 67; col. 5, line 1- col. 6, line 32.   | 1-35   |
| Y   | US 6,081,594 A (TSENG) 27 June 2000; col. 1, line 42- col. 2, line 10; col. 2, lines 30- 61   | 1-35   |
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