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# United States Patent [19]

Allard et al.

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[54] **PERSONAL COMMUNICATOR HAVING IMPROVED CONTRAST CONTROL FOR A LIQUID CRYSTAL, TOUCH SENSITIVE DISPLAY**

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[73] Assignee: **International Business Machines Corp.**, Armonk, N.Y.

[21] Appl. No.: **146,342**

[22] Filed: **Nov. 1, 1993**

[51] Int. Cl.<sup>6</sup> ..... **G09G 3/22**

[52] U.S. Cl. .... **345/173; 345/63; 345/147**

[58] Field of Search ..... **345/77, 63, 89, 147, 345/173, 179; 178/18-20; 348/734, 738, 761, 790, 791, 794**

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[57] **ABSTRACT**

A personal communicator has a touch sensitive overlay coupled with a liquid crystal display (LCD). The communicator has two external (non-screen) up/down buttons for adjusting the volume of a cellular phone speaker. These volume buttons are also used to allow the user to adjust contrast. In accordance with one operation, contrast is adjusted in response to the user touching a predetermined area of the screen at the same time as one of the up or down buttons is actuated. In accordance with another operation, contrast is adjusted in response to the user first pressing both speaker volume buttons to enter a contrast adjustment mode, and thereafter pressing one or the other of such buttons, to increase or decrease contrast as desired.

**15 Claims, 5 Drawing Sheets**

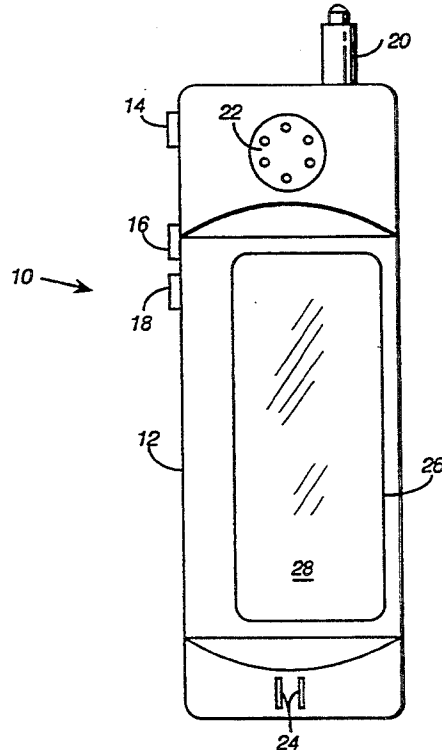


FIG. 1

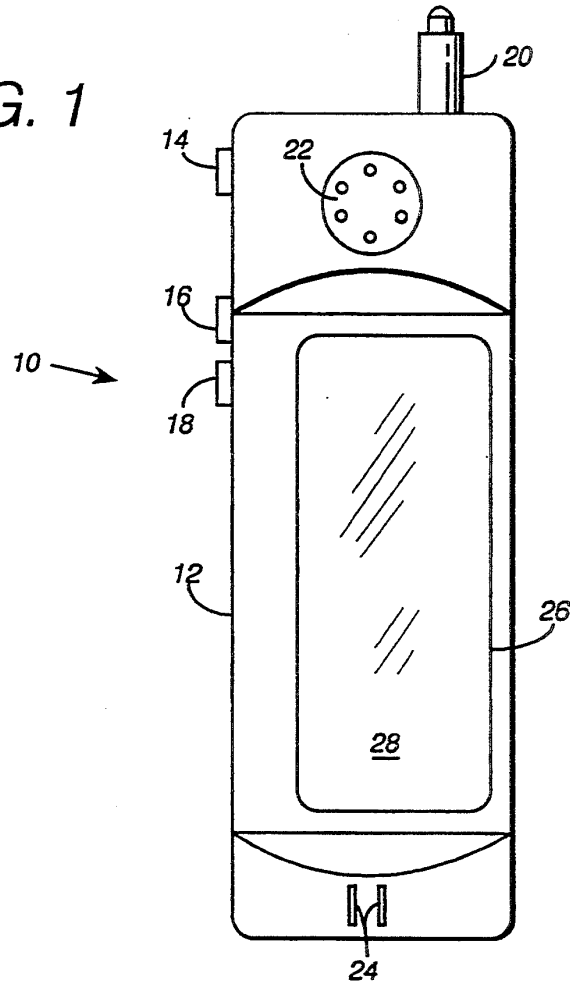


FIG. 2

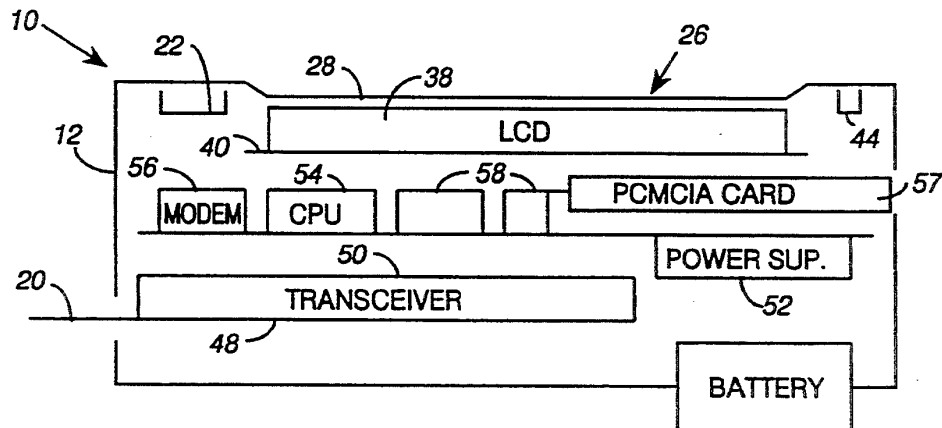


FIG. 3

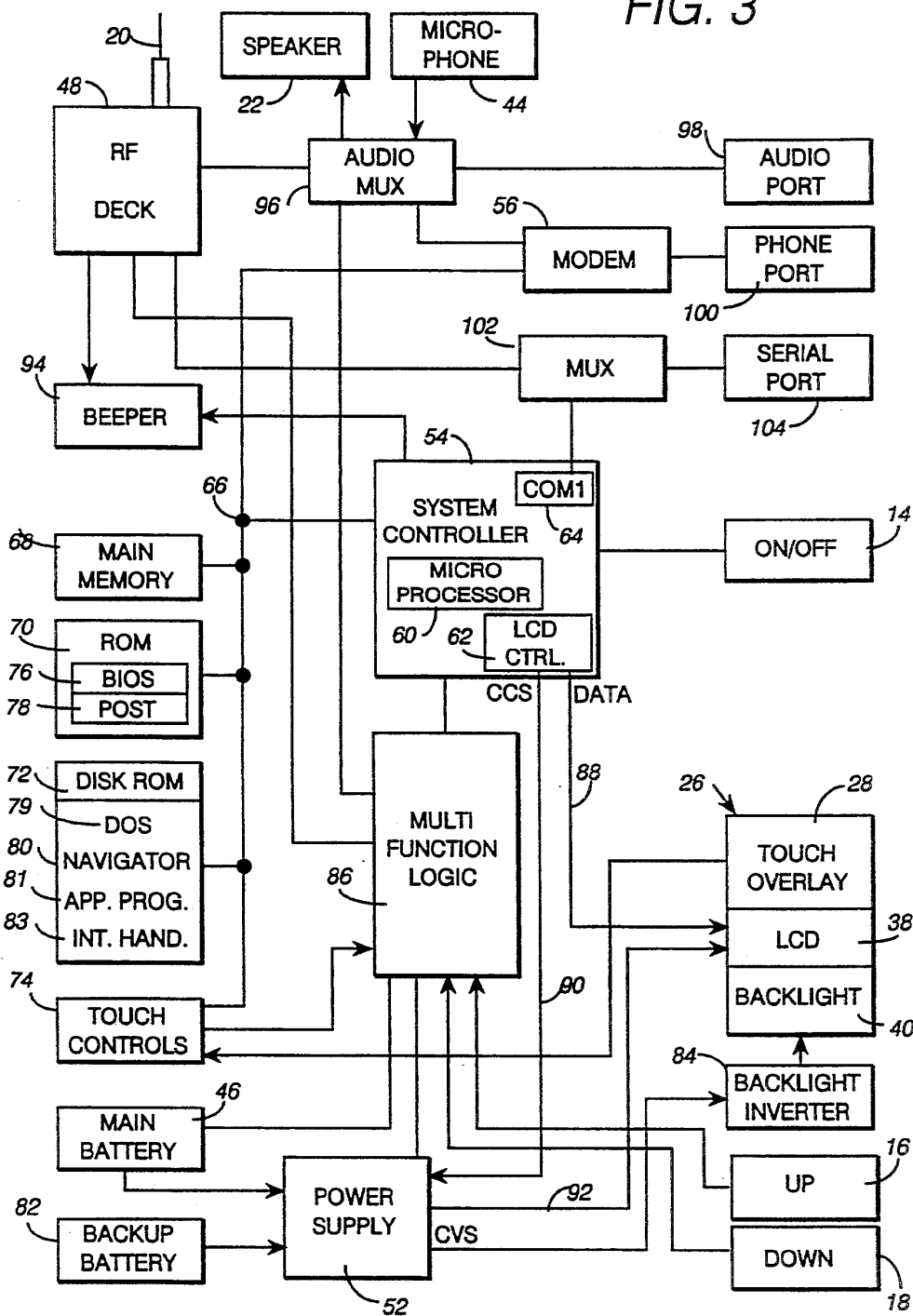


FIG. 4A

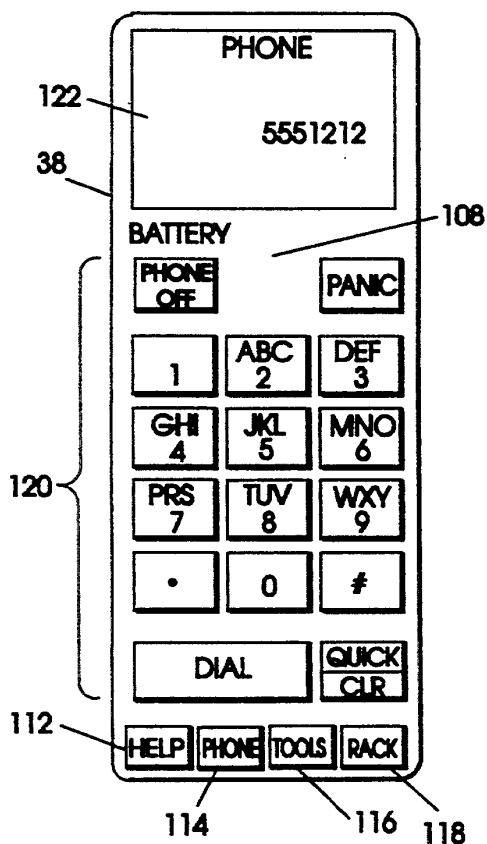


FIG. 4B

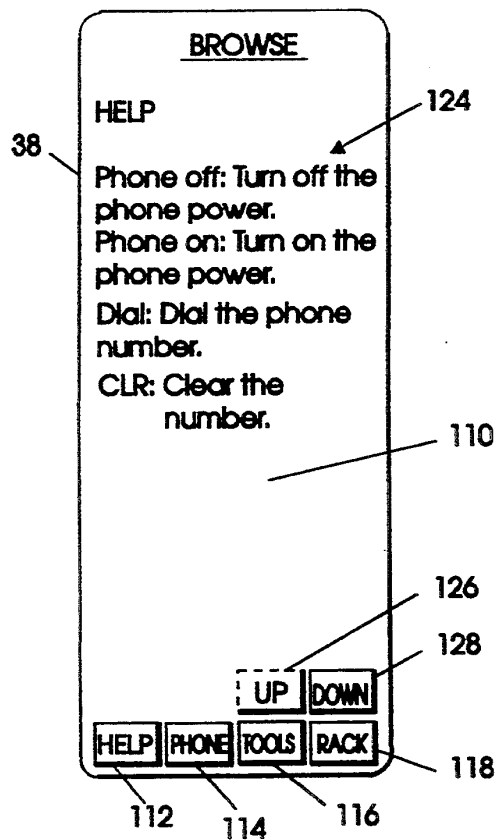
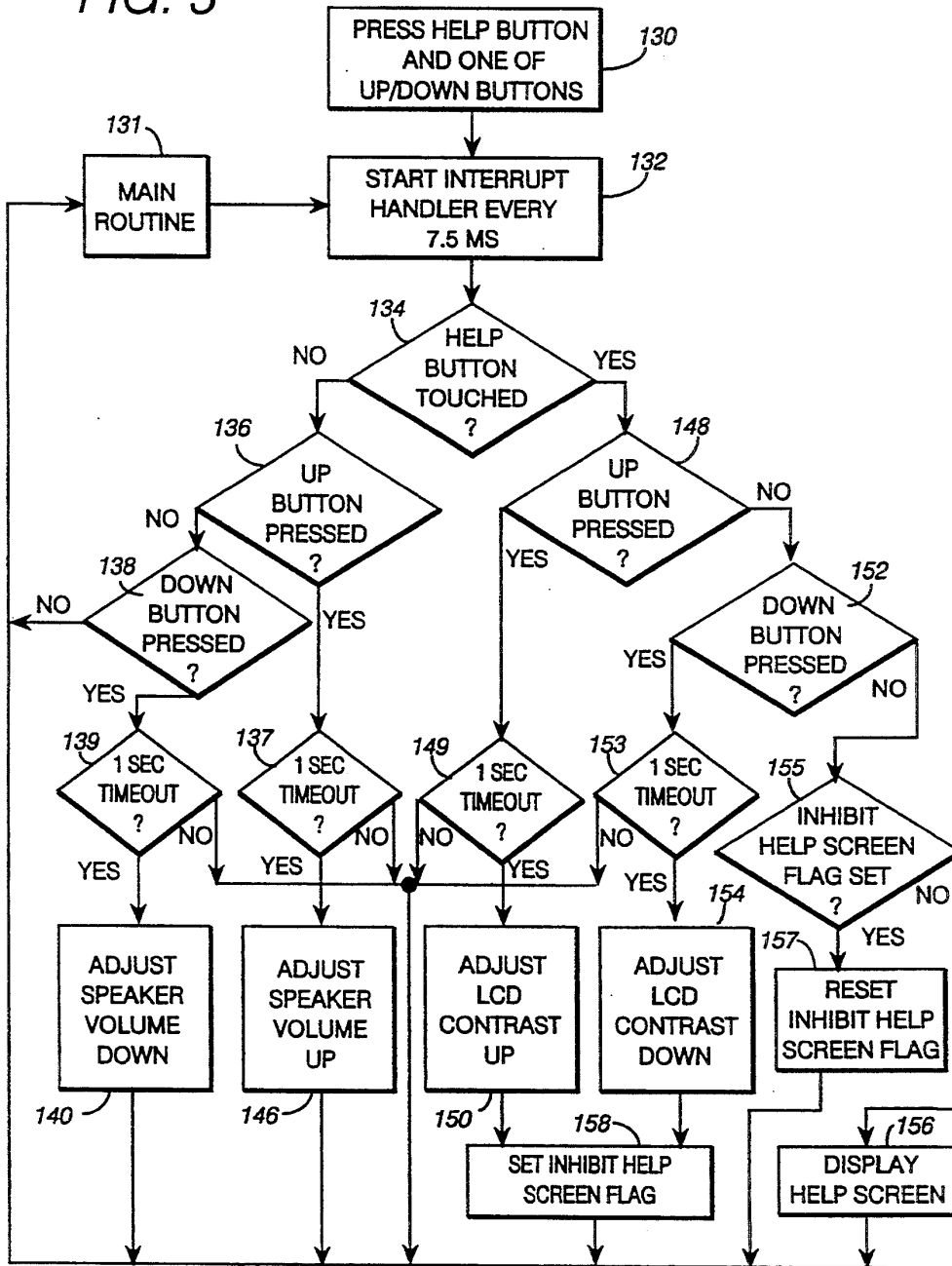


FIG. 5



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