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United States Patent [19]

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Davis et al.

[45] Date of Patent: **Dec. 10, 1996**

[54] TELECOMMUNICATION SYSTEM FOR AUTOMATIC SWITCHING BETWEEN VOICE AND VISUAL DATA COMMUNICATIONS USING FORMS

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[21] Appl. No.: **417,201**

[57] ABSTRACT

[22] Filed: **Apr. 5, 1995**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 380,064, Jan. 30, 1995, which is a continuation-in-part of Ser. No. 271,850, Jul. 7, 1994, which is a continuation-in-part of Ser. No. 877,328, May 1, 1992, Pat. No. 5,365,577, which is a continuation-in-part of Ser. No. 589,203, Sep. 27, 1990, Pat. No. 5,164,982.

A telecommunication system provides voice and data communications over a conventional telephone line between a server station and a client station using visual forms. The client station includes a processor, display, telephone, and data circuit-terminating equipment (DCE) for data communications. The server station includes a processor, DCE, and either a telephone or a voice card for audio communications. Each DCE includes a modem, a start signal generator for transmitting a start signal over the telephone line prior to transmission of data by the modem, a start signal detector, and a switch that automatically switches the DCE from voice mode to data mode while data is being communicated. The client processor also includes a definition of a visual form having a number of controls with predetermined properties, including properties defining permissible actions that can be taken with respect to each control and instructions to be executed in response to specified actions. The client employs a mouse, keyboard, or the like to select a control in the visual form and to perform an action on the selected control. At least some of the controls include a property directing the client processor to switch the DCE to data mode, transmit data identifying the action, and then return to voice mode. The server processor is programmed to execute steps in response to the actions received from said client station. The visual forms at both stations can be linked so that they are automatically updated to reflect actions at the other station.

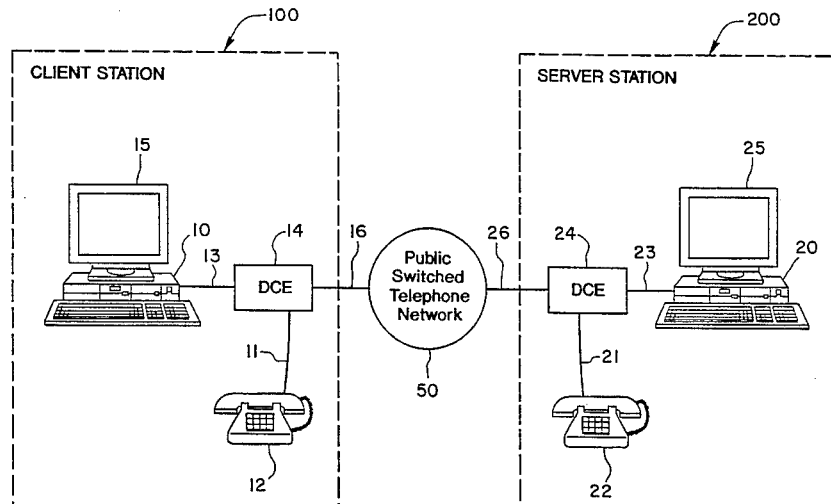
[51] Int. Cl.⁶ **H04M 11/00**
[52] U.S. Cl. **379/96; 379/97; 379/207**
[58] Field of Search **379/90, 91, 93, 379/96-98, 100, 201, 207; 375/222; 348/14, 15, 17, 18**

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35 Claims, 16 Drawing Sheets



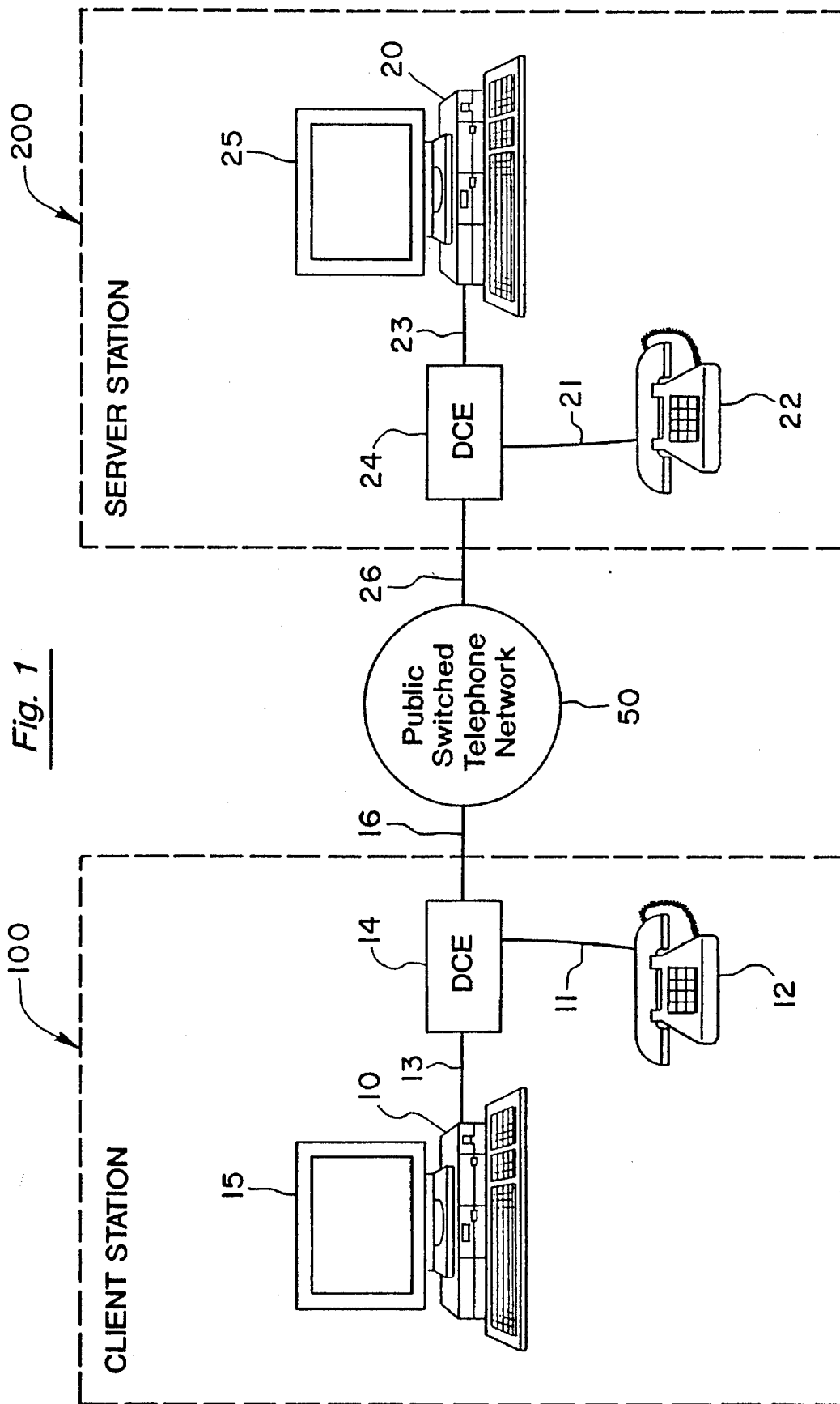


Fig. 1

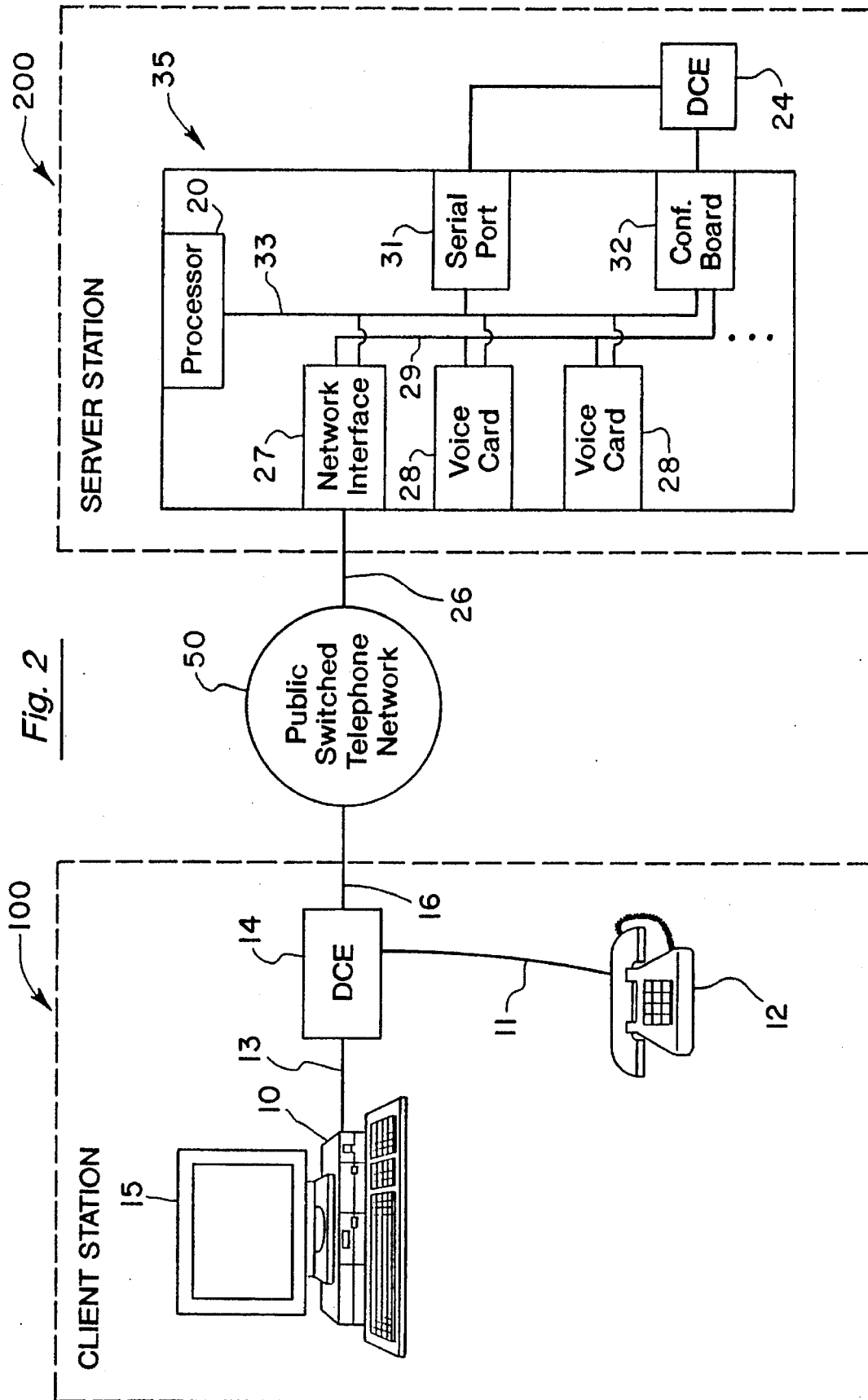


Fig. 2

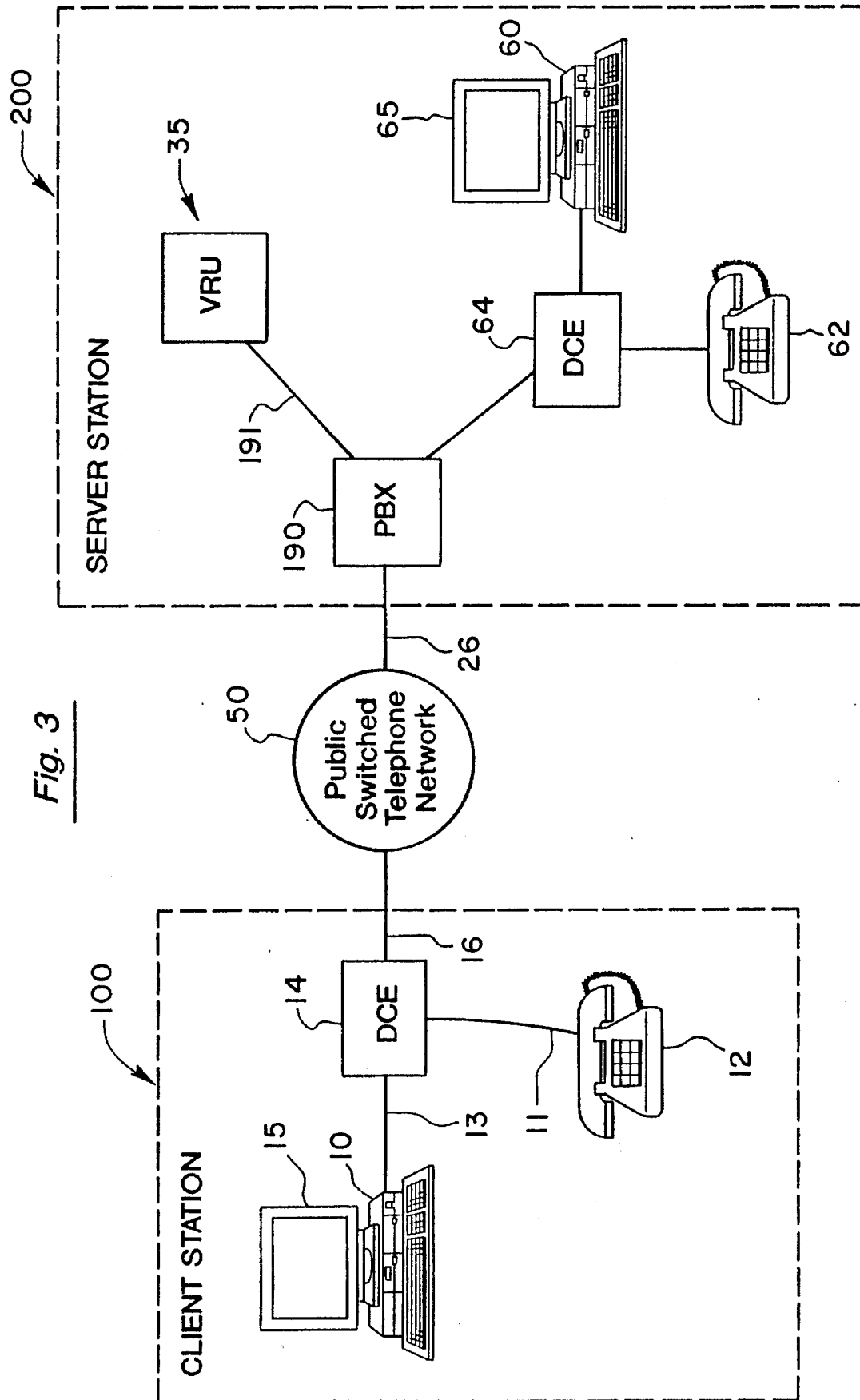
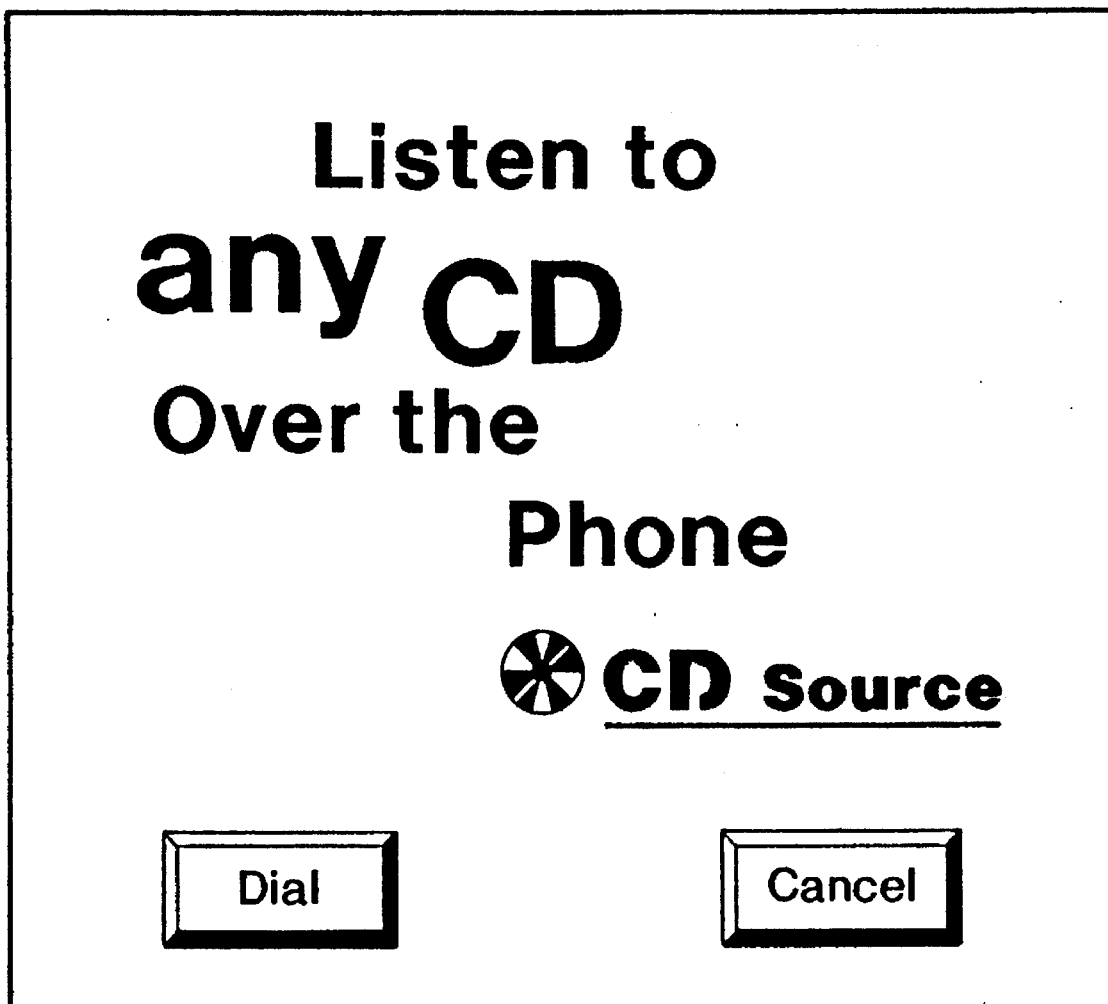


Fig. 3

Fig. 4



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