

[54] **DOUBLE-TALK DETECTION IN AN ECHO CANCELLER**

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Attorney, Agent, or Firm—Spencer & Frank

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[30] **Foreign Application Priority Data**

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Mar. 26, 1987 [JP] Japan ..... 62-72748  
Jun. 30, 1987 [JP] Japan ..... 62-163654

[57] **ABSTRACT**

In a method and apparatus for double-talk detection in an echo canceller that uses an adaptive digital filter to estimate, from a received signal and a transmitted signal to which an echo signal of the received signal is added, the characteristics of an echo path and generate a simulated echo signal, and subtracts this echo replica from the transmitted signal in order to transmit a residual signal from which the echo signal has been removed, and which during the course of this operation detects the double-talk state according to a double-talk detection threshold and inhibits the estimation of adaptive digital filter; adaptive estimation and the double-talk detection threshold are controlled in accordance with the state of system e.g., whether it is in the single-talk state, whether the echo signal is active or idle, whether there are fluctuations in the echo path, or whether howling is taking place.

[51] Int. Cl.<sup>4</sup> ..... **H04B 3/23**  
[52] U.S. Cl. .... **370/32.1; 379/410**  
[58] Field of Search ..... 379/388, 389, 390, 406, 379/407, 410, 411; 370/32, 32.1; 341/75

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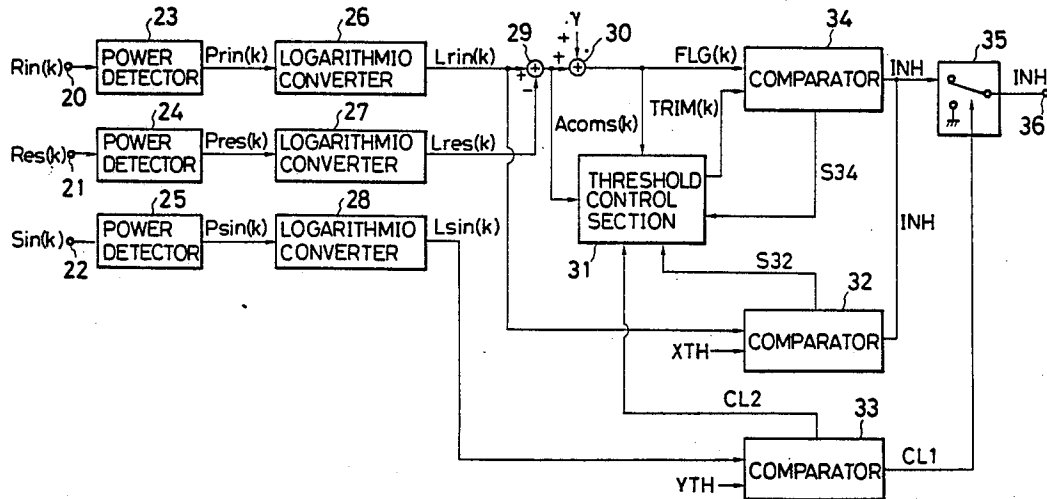
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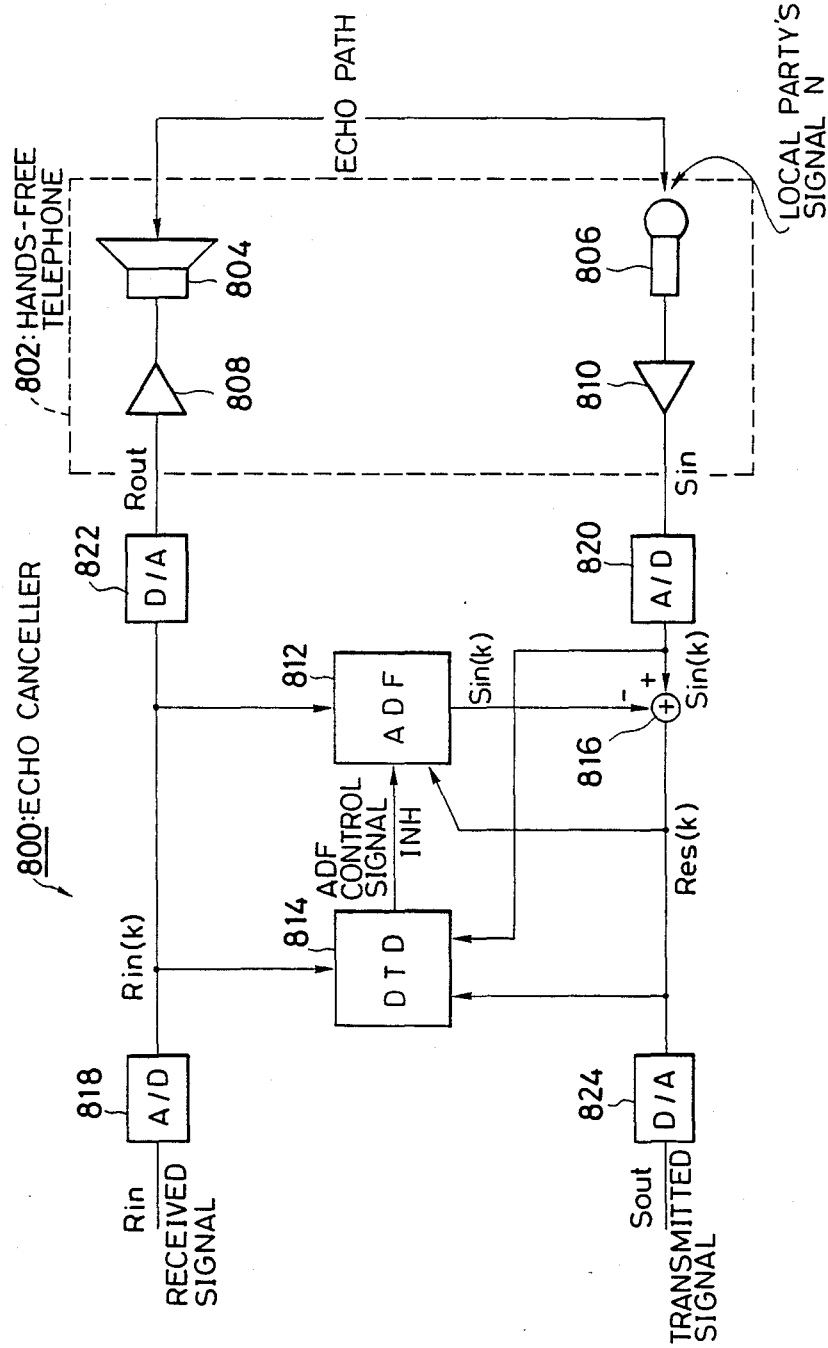
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**4 Claims, 15 Drawing Sheets**





**FIG. 2**  
PRIOR ART



**FIG. 3**  
PRIOR ART

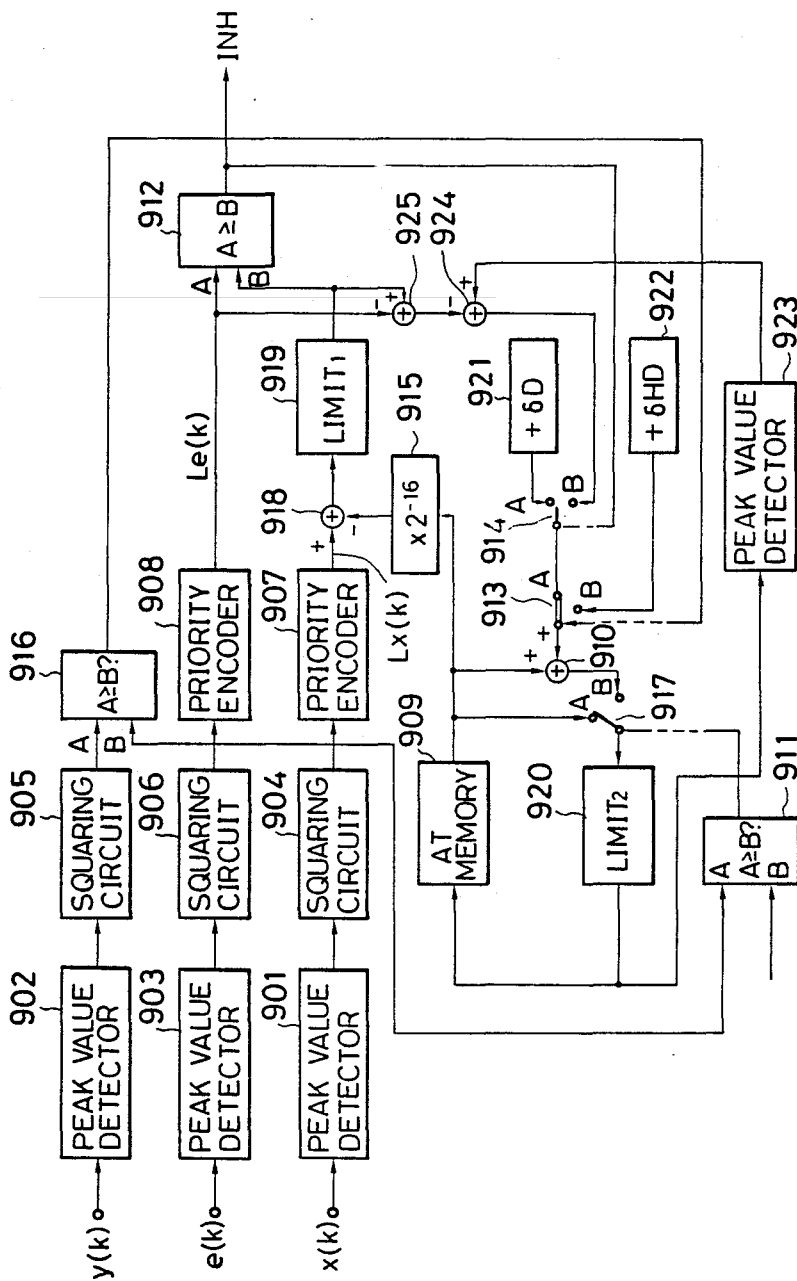
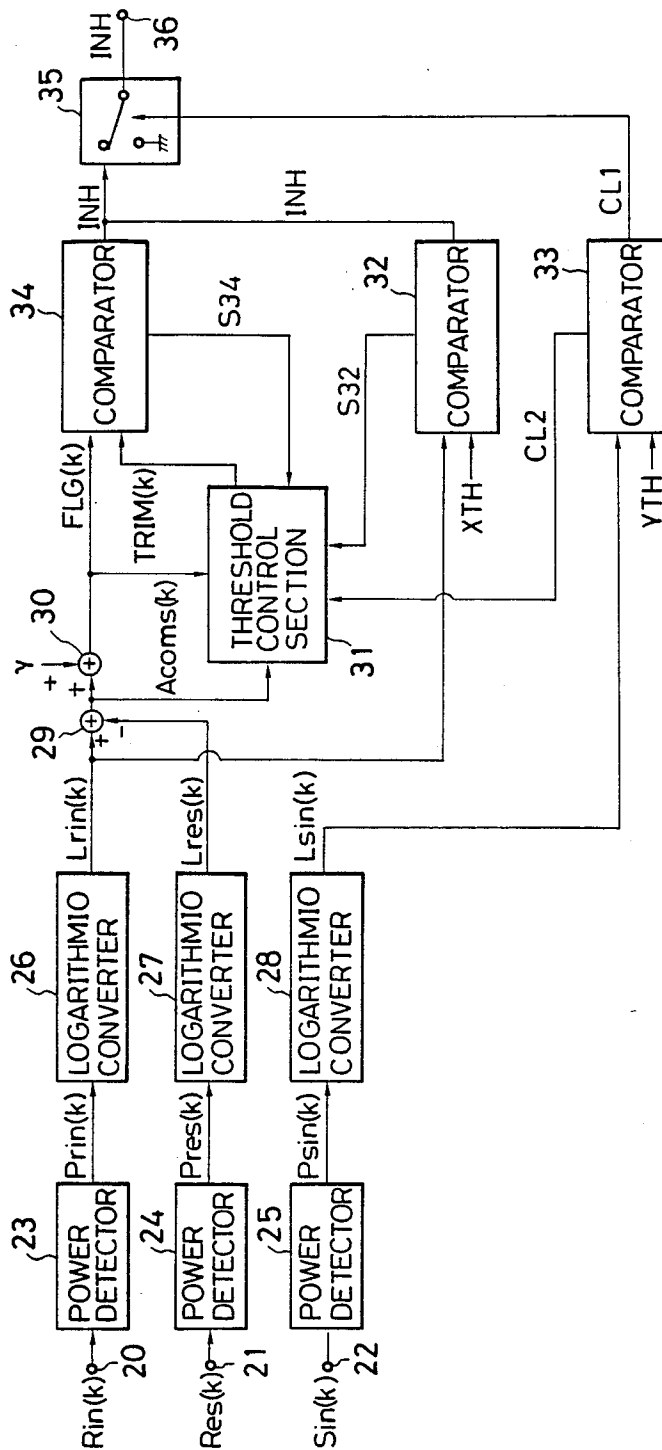


FIG. 4



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