(54) **SECOND-ORDER ADAPTIVE DIFFERENTIAL MICROPHONE ARRAY**

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(57) **ABSTRACT**

A second-order adaptive differential microphone array (ADMA) has two first-order elements (e.g., **802** and **804** of **FIG. 8**), each configured to convert a received audio signal into an electrical signal. The ADMA also has (i) two delay nodes (e.g., **806** and **808**) configured to delay the electrical signals from the first-order elements and (ii) two subtraction nodes (e.g., **810** and **812**) configured to generate forward-facing and backward-facing cardioid signals based on differences between the electrical signals and the delayed electrical signals. The ADMA also has (i) an amplifier (e.g., **814**) configured to amplify the backward-facing cardioid signal by a gain parameter; (ii) a third subtraction node (e.g., **816**) configured to generate a difference signal based on a difference between the forward-facing cardioid signal and the amplified backward-facing cardioid signal; and (iii) a lowpass filter (e.g., **818**) configured to filter the difference signal from the third subtraction node to generate the output signal for the second-order ADMA. The gain parameter for the amplifier can be adaptively adjusted to move a null in the back half plane of the ADMA to track a moving noise source. In a subband implementation, a different gain parameter can be adaptively adjusted to move a different null in the back half plane to track a different moving noise source for each different frequency subband.
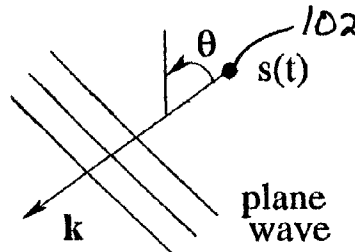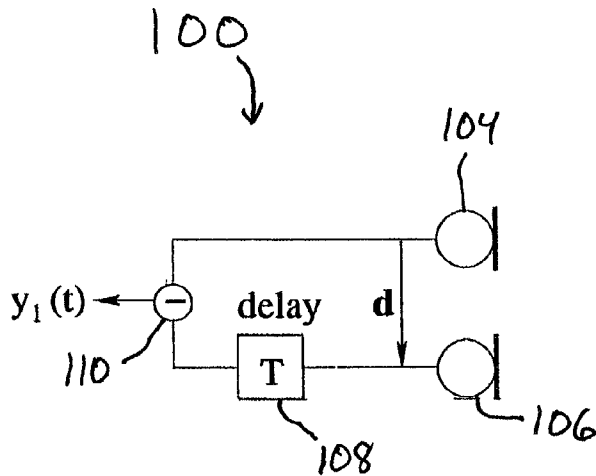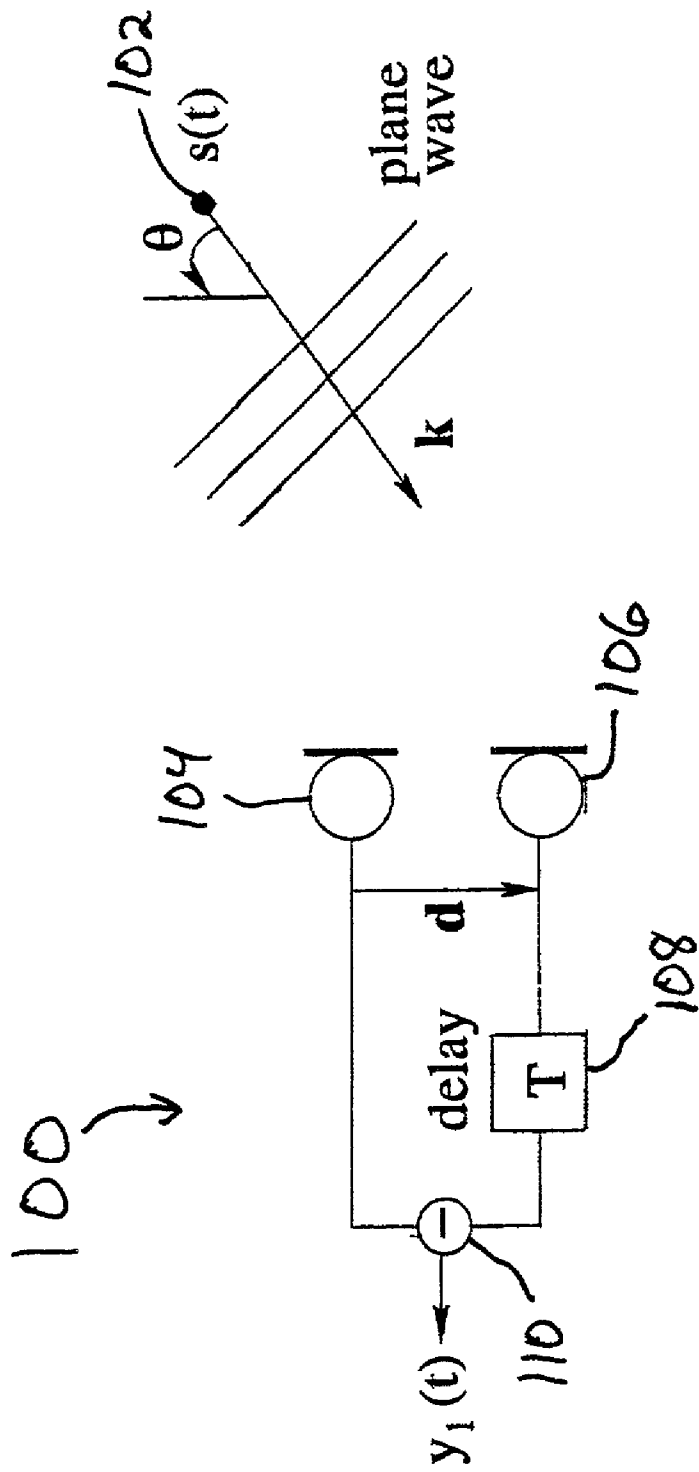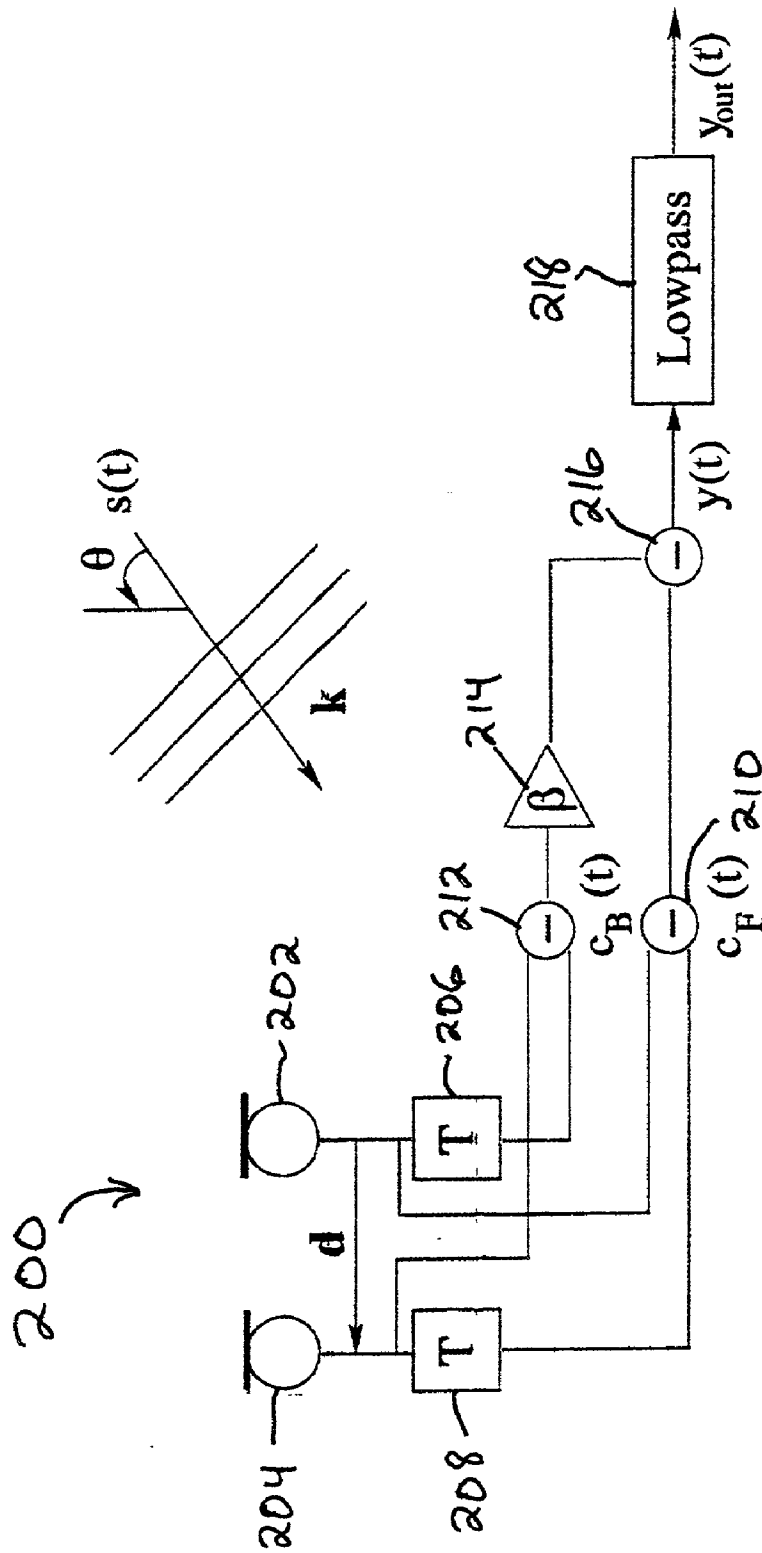
FIG. 1

FIG. 2

FIG. 3

FIG. 4

DOCKET ALARM
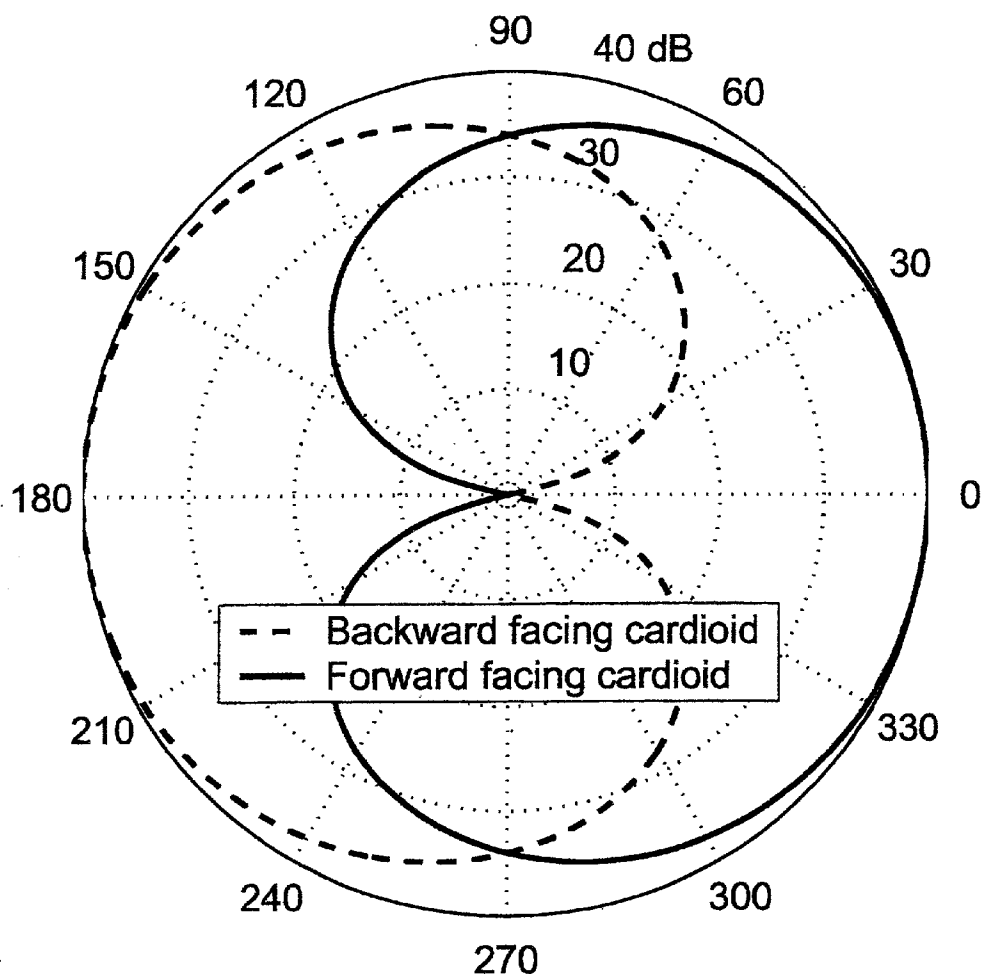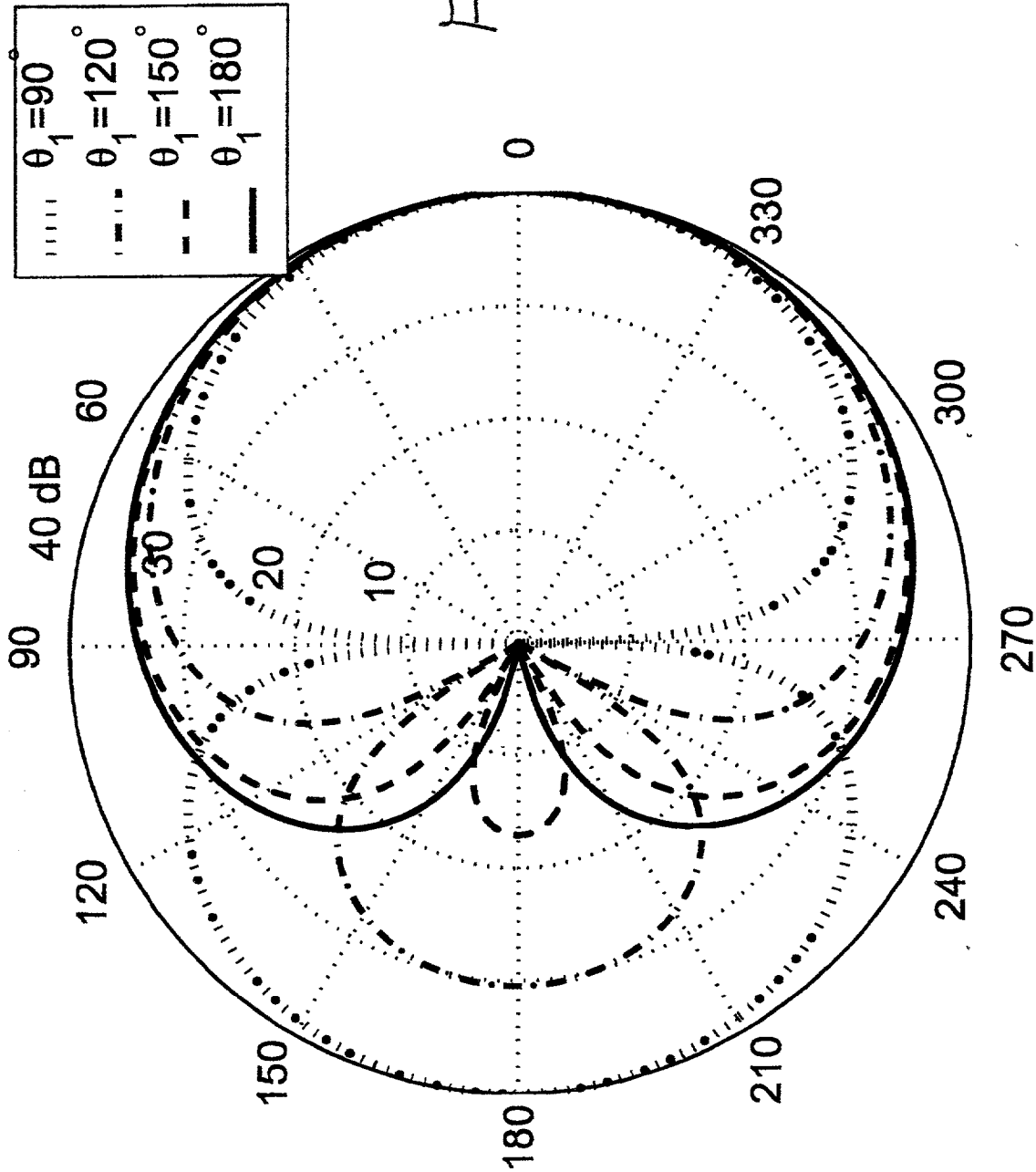
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