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[54] **TECHNIQUE FOR ADAPTATION OF HIDDEN MARKOV MODELS FOR SPEECH RECOGNITION**

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Related U.S. Application Data

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[51] **Int. Cl.**[7] **G10L 15/14**

[52] **U.S. Cl.** **704/256**; 704/243

[58] **Field of Search** 704/243, 244, 704/245, 256; 382/178–185

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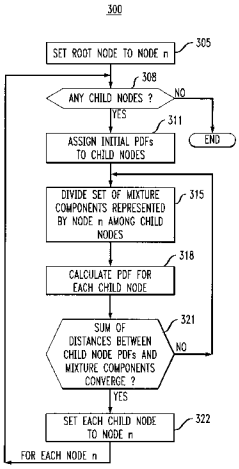
[57] **ABSTRACT**

A speech recognition system learns characteristics of speech by a user during a learning phase to improve its performance. Adaptation data derived from the user's speech and its recognized result is collected during the learning phase. Parameters characterizing hidden Markov Models (HMMs) used in the system for speech recognition are modified based on the adaptation data. To that end, a hierarchical structure is defined in an HMM parameter space. This structure may assume the form of a tree structure having multiple layers, each of which includes one or more nodes. Each node on each layer is connected to at least one node on another layer. The nodes on the lowest layer of the tree structure are referred to as "leaf nodes." Each node in the tree structure represents a subset of the HMM parameters, and is associated with a probability measure which is derived from the adaptation data. In particular, each leaf node represents a different one of the HMM parameters, which is derivable from the probability measure associated with the leaf node. This probability measure is a function of the probability measures which are associated with the nodes connected to the leaf node, and which represent "hierarchical priors" to such a probability measure.

38 Claims, 3 Drawing Sheets



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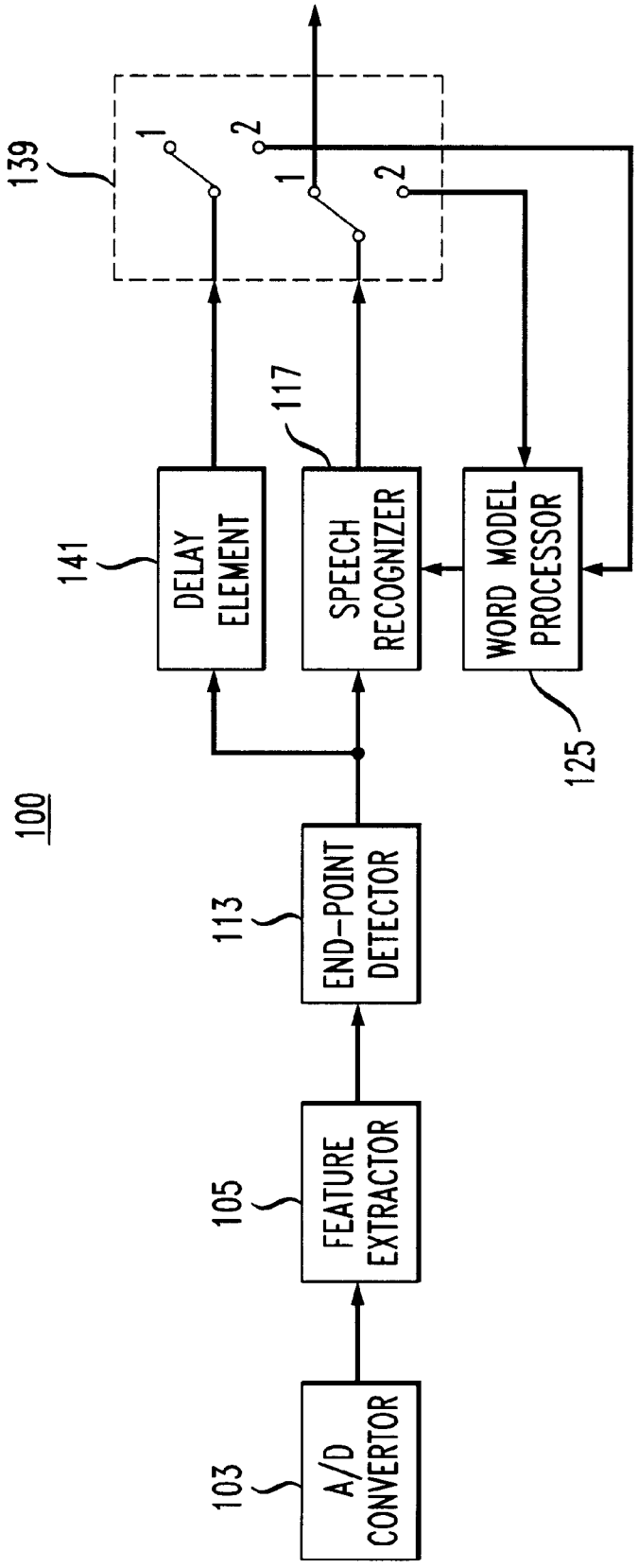


FIG. 1

FIG. 2

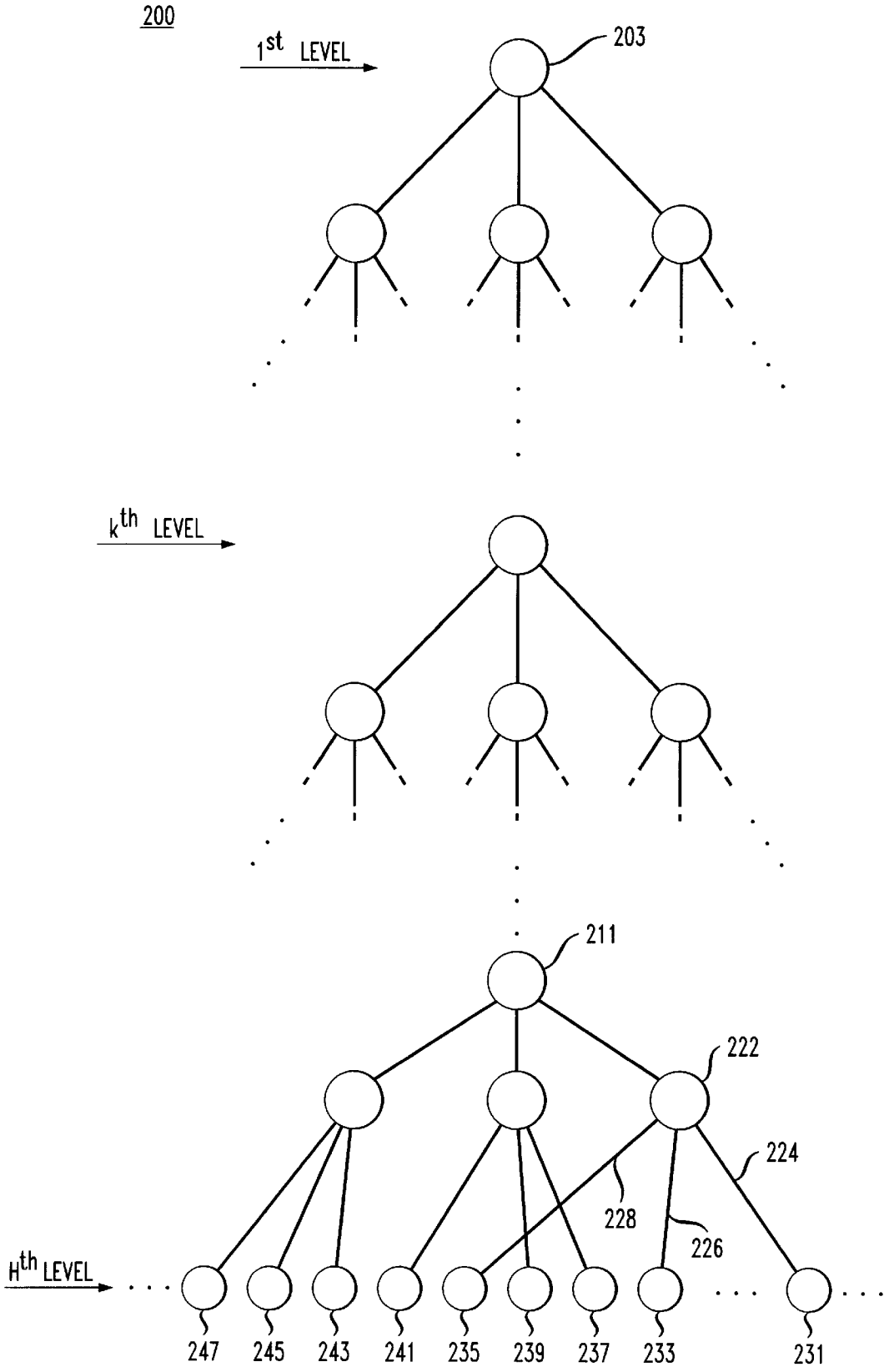
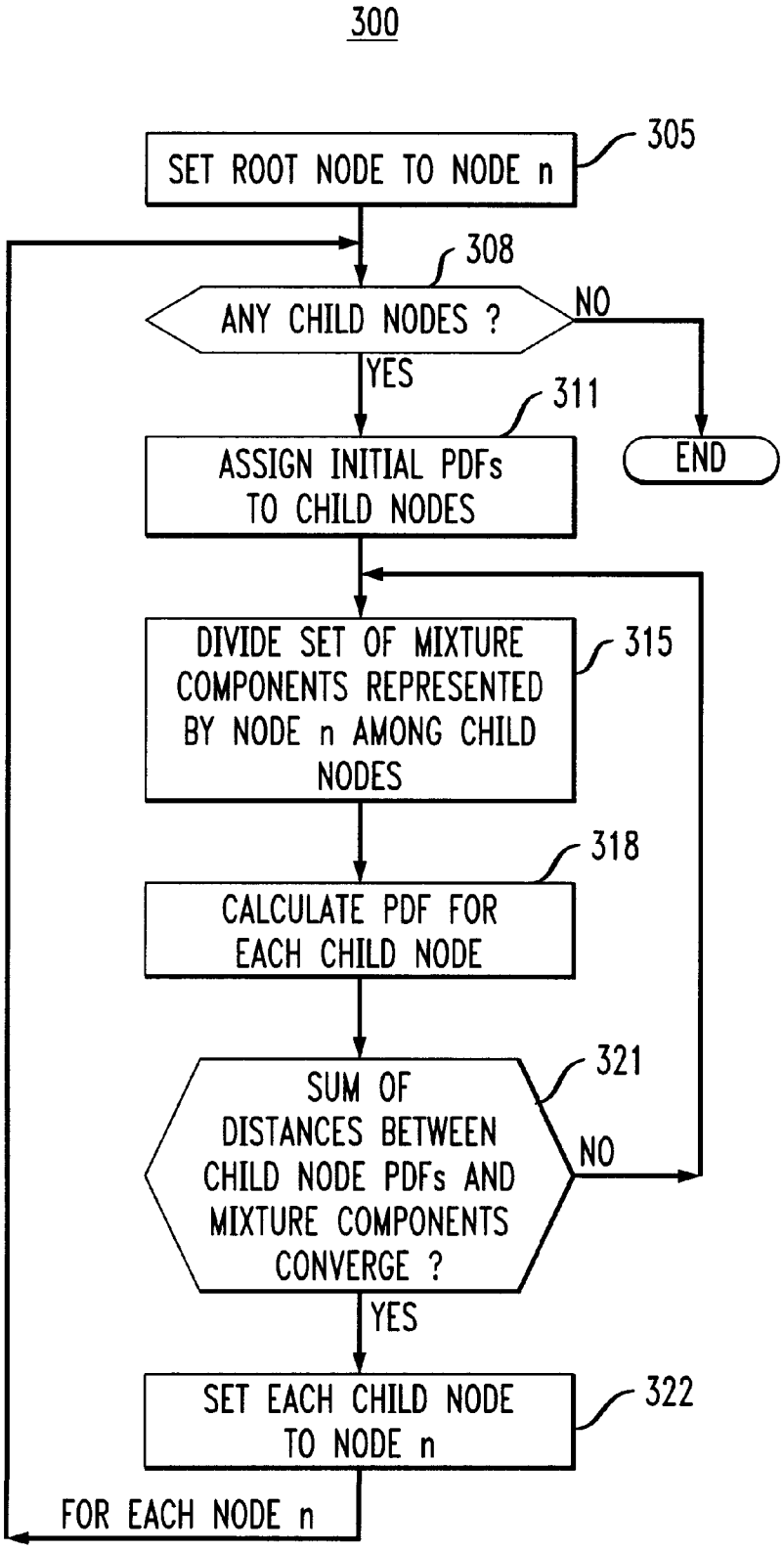


FIG. 3



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