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(54) Title of the Invention: **Fine-tuning multi-head network from a single transformer layer of pre-trained language model**  
Abstract Title: **Fine-tuning multi-head network from a single transformer layer of pre-trained language model**

(57) Techniques are provided for customizing or fine-tuning a pre-trained version of a machine-learning model that includes multiple layers and is configured to process audio or textual language input. Each of the multiple layers is configured with a plurality of layer-specific pre-trained parameter values corresponding to a plurality of parameters, and each of the multiple layers is configured to implement multi-head attention. An incomplete subset of the multiple layers is identified for which corresponding layer-specific pre-trained parameter values are to be fine-tuned using a client data set. The machine-learning model is fine-tuned using the client data set to generate an updated version of the machine-learning model, where the layer-specific pre-trained parameter values configured for each layer of one of more of the multiple layers not included in the incomplete subset are frozen during the fine-tuning. Use of the updated version of the machine-learning model is facilitated.

FIG. 1

