FIG. 1

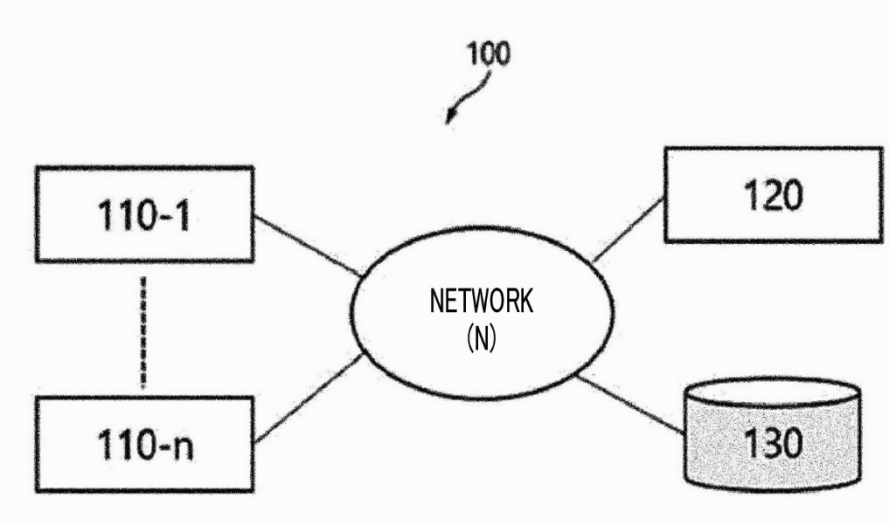

100
110-1
110-n
NETWORK
(N)
120
130

FIG. 2

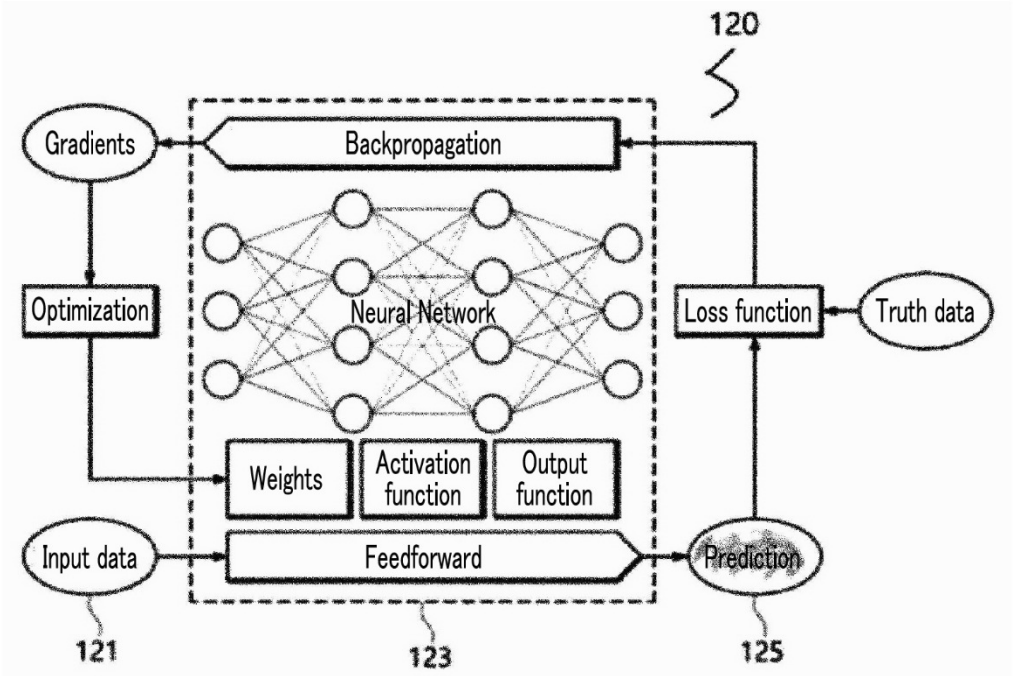

120
Gradients
Backpropagation
Optimization
Neural Network
Loss function
Truth data
Weights
Activation function
Output function
Input data
Feedforward
Prediction
121
123
125

FIG. 3

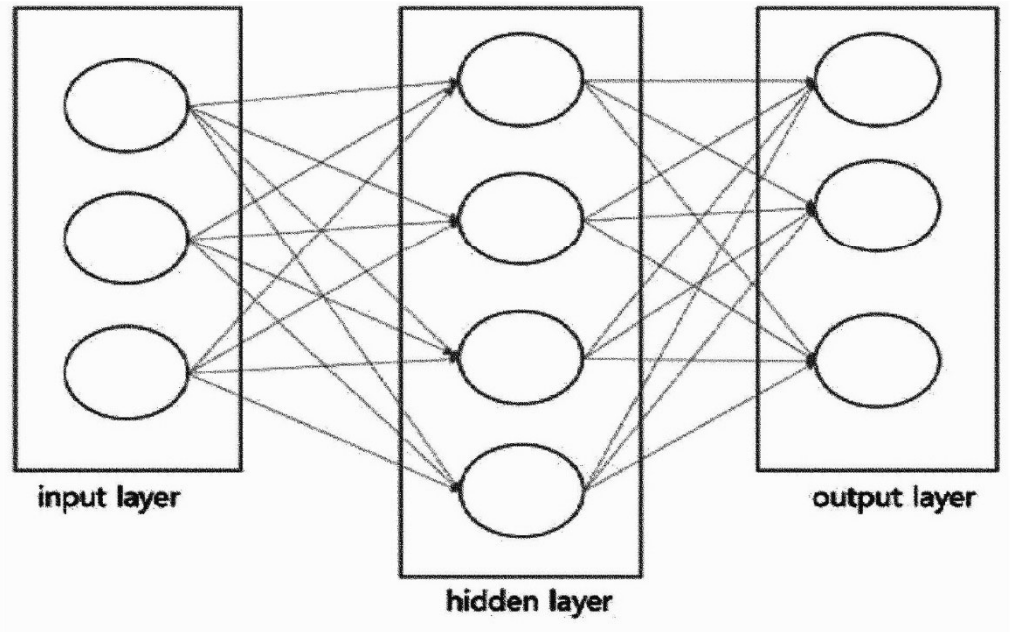

input layer
hidden layer
output layer

FIG. 4

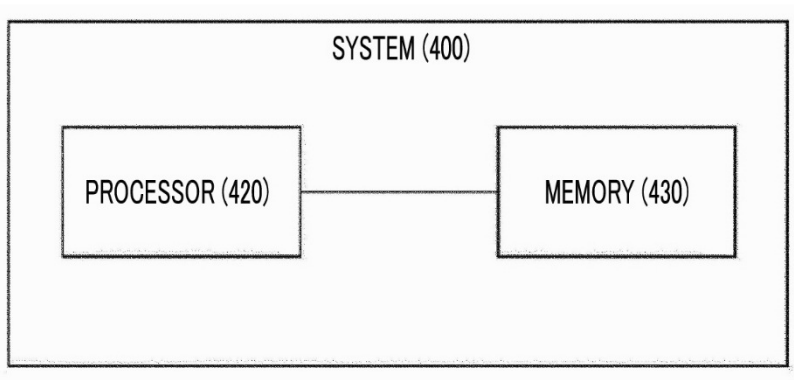

SYSTEM (400)
PROCESSOR (420)
MEMORY (430)

FIG. 5

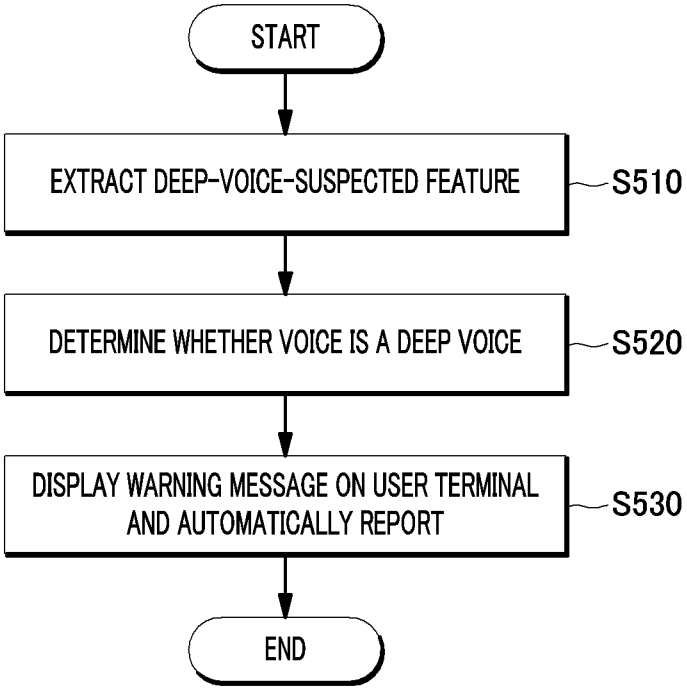

START
EXTRACT DEEP-VOICE-SUSPECTED FEATURE
S510
DETERMINE WHETHER VOICE IS A DEEP VOICE
S520
DISPLAY WARNING MESSAGE ON USER TERMINAL AND AUTOMATICALLY REPORT
S530
END

FIG. 6

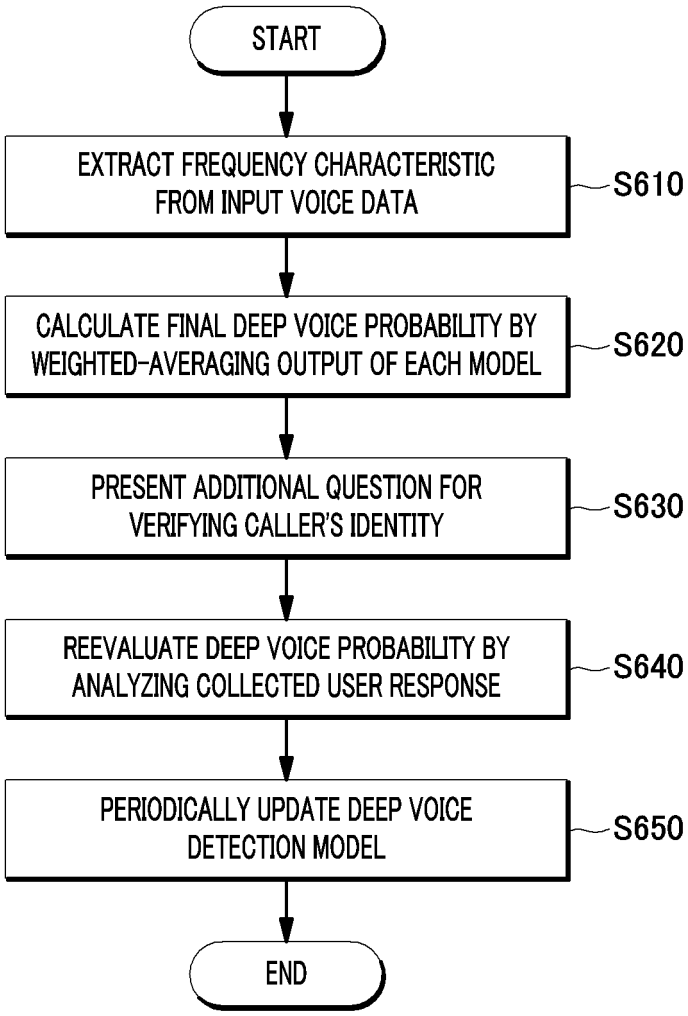

START
EXTRACT FREQUENCY CHARACTERISTIC FROM INPUT VOICE DATA
S610
CALCULATE FINAL DEEP VOICE PROBABILITY BY WEIGHTED-AVERAGING OUTPUT OF EACH MODEL
S620
PRESENT ADDITIONAL QUESTION FOR VERIFYING CALLER'S IDENTITY
S630
REEVALUATE DEEP VOICE PROBABILITY BY ANALYZING COLLECTED USER RESPONSE
S640
PERIODICALLY UPDATE DEEP VOICE DETECTION MODEL
S650
END

FIG. 7

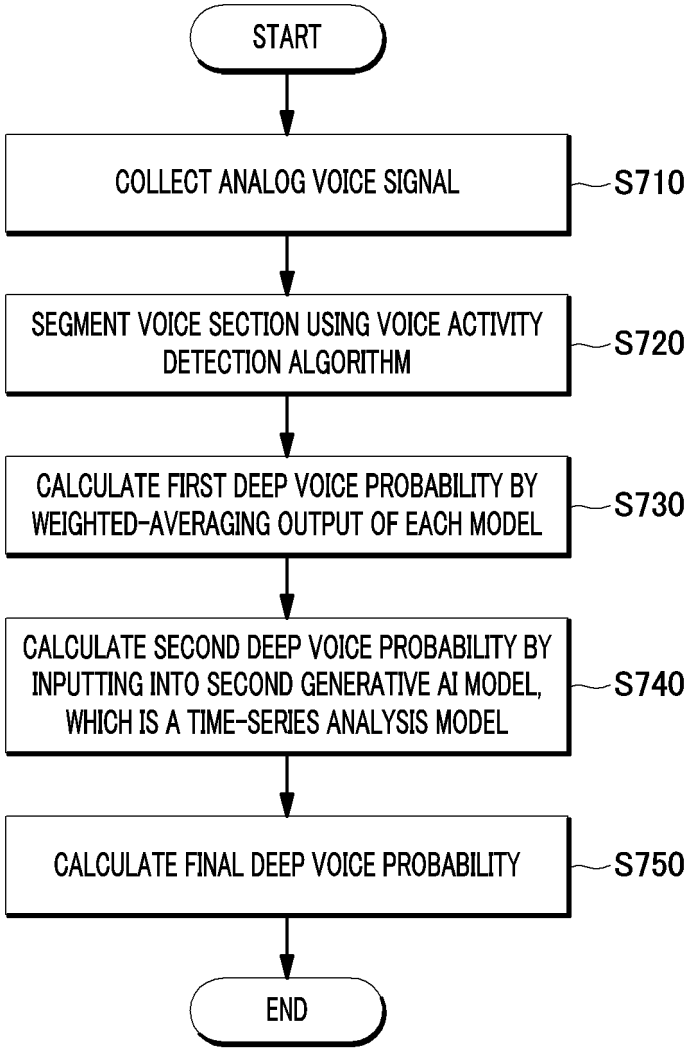
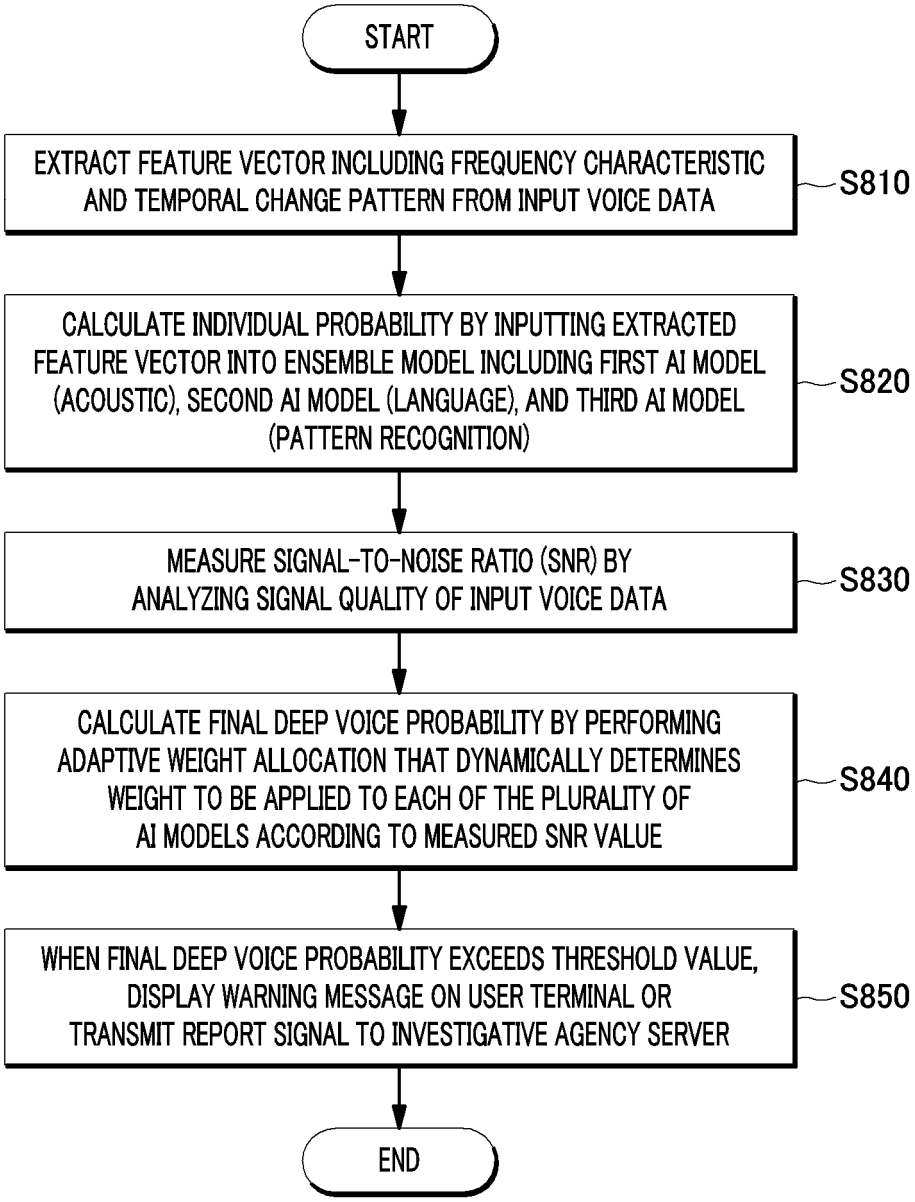

START
COLLECT ANALOG VOICE SIGNAL
S710
SEGMENT VOICE SECTION USING VOICE ACTIVITY DETECTION ALGORITHM
S720
CALCULATE FIRST DEEP VOICE PROBABILITY BY WEIGHTED-AVERAGING OUTPUT OF EACH MODEL
S730
CALCULATE SECOND DEEP VOICE PROBABILITY BY INPUTTING INTO SECOND GENERATIVE AI MODEL, WHICH IS A TIME-SERIES ANALYSIS MODEL
S740
CALCULATE FINAL DEEP VOICE PROBABILITY
S750
END

FIG. 8


START
EXTRACT FEATURE VECTOR INCLUDING FREQUENCY CHARACTERISTIC AND TEMPORAL CHANGE PATTERN FROM INPUT VOICE DATA
S810
CALCULATE INDIVIDUAL PROBABILITY BY INPUTTING EXTRACTED FEATURE VECTOR INTO ENSEMBLE MODEL INCLUDING FIRST AI MODEL (ACOUSTIC), SECOND AI MODEL (LANGUAGE), AND THIRD AI MODEL (PATTERN RECOGNITION)
S820
MEASURE SIGNAL-TO-NOISE RATIO (SNR) BY ANALYZING SIGNAL QUALITY OF INPUT VOICE DATA
S830
CALCULATE FINAL DEEP VOICE PROBABILITY BY PERFORMING ADAPTIVE WEIGHT ALLOCATION THAT DYNAMICALLY DETERMINES WEIGHT TO BE APPLIED TO EACH OF THE PLURALITY OF AI MODELS ACCORDING TO MEASURED SNR VALUE
S840
WHEN FINAL DEEP VOICE PROBABILITY EXCEEDS THRESHOLD VALUE, DISPLAY WARNING MESSAGE ON USER TERMINAL OR TRANSMIT REPORT SIGNAL TO INVESTIGATIVE AGENCY SERVER
S850
END