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(54) **APPARATUS AND METHOD FOR SPEECH PROCESSING USING A DENSELY CONNECTED HYBRID NEURAL NETWORK**

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(57) **ABSTRACT**

Disclosed is a speech processing apparatus and method using a densely connected hybrid neural network. The speech processing method includes inputting a time domain sample of N*1 dimension for an input speech into a densely connected hybrid network; passing the time domain sample through a plurality of dense blocks in a densely connected hybrid network; reshaping the time domain samples into M subframes by passing the time domain samples through the plurality of dense blocks, inputting the M subframes into gated recurrent unit (GRU) components of N/M-dimension; outputting clean speech from which noise is removed from the input speech by passing the M subframes through GRU components.

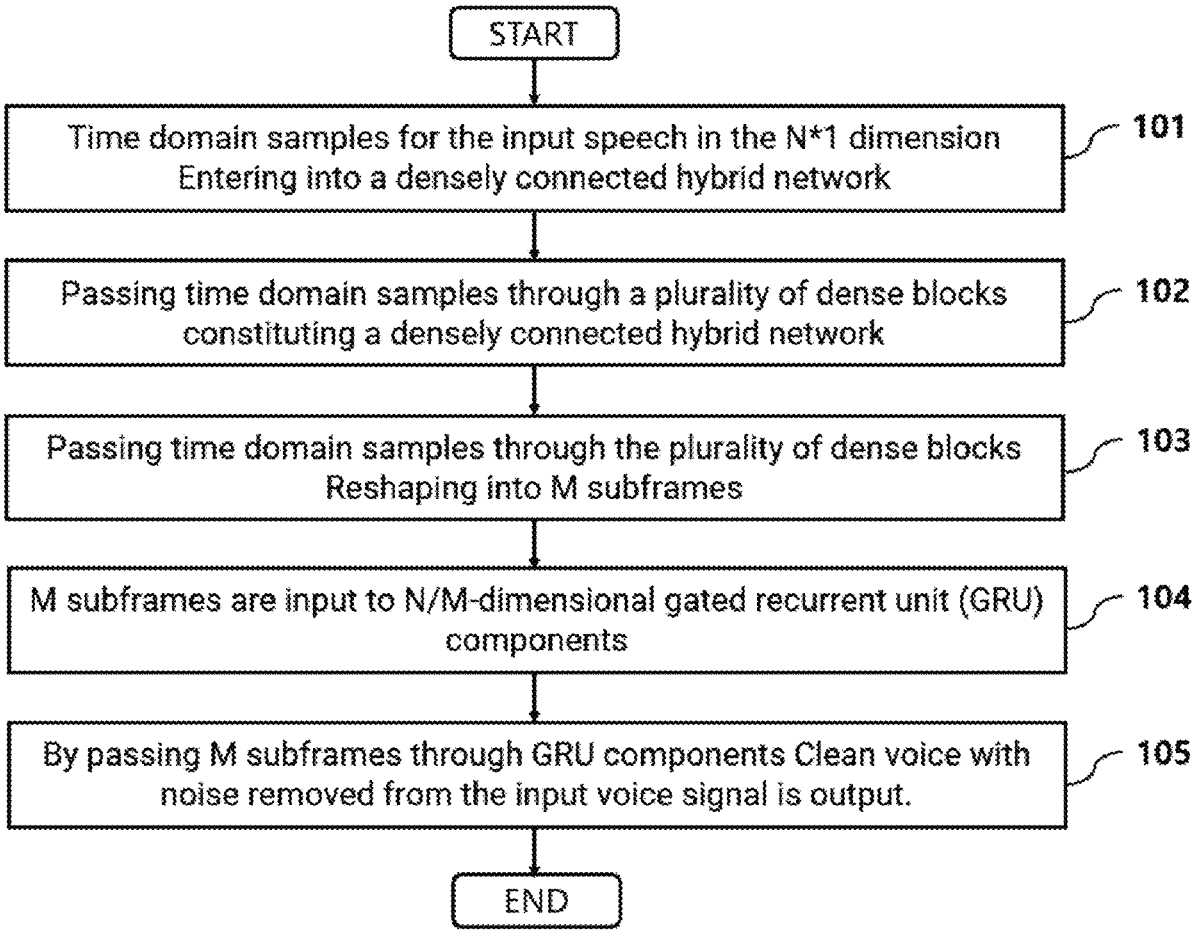


FIG. 1

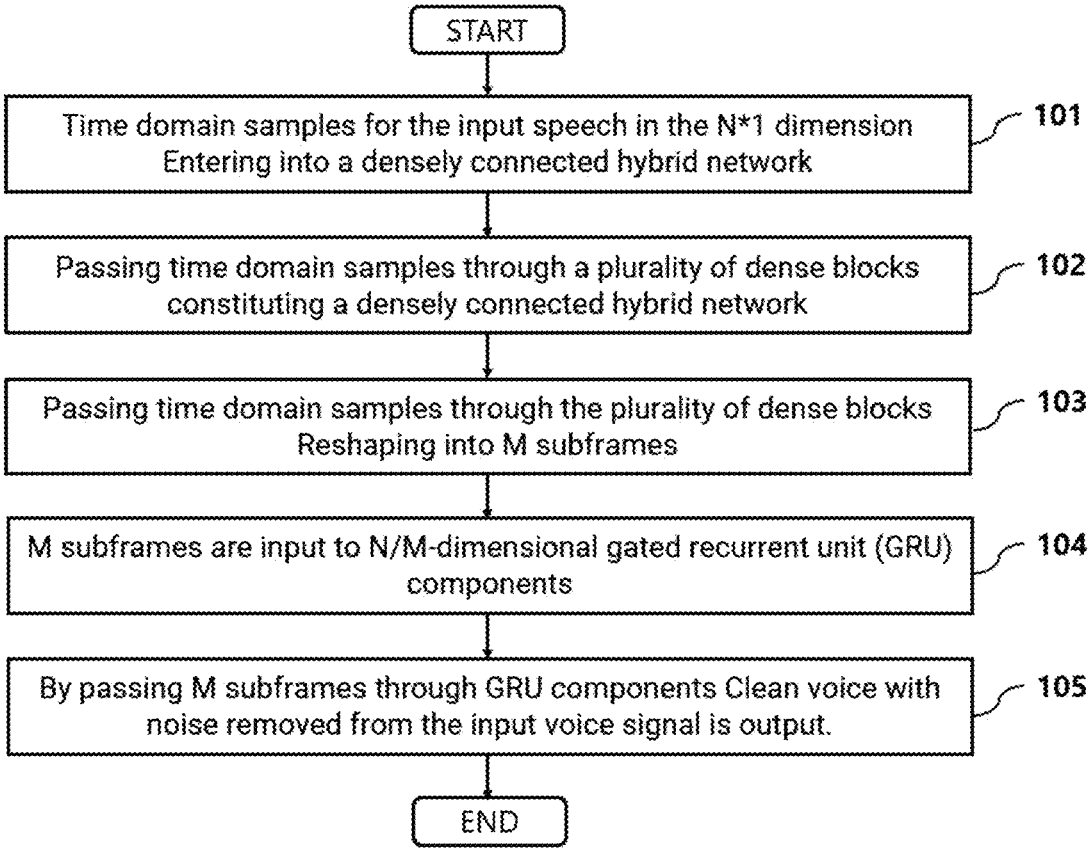
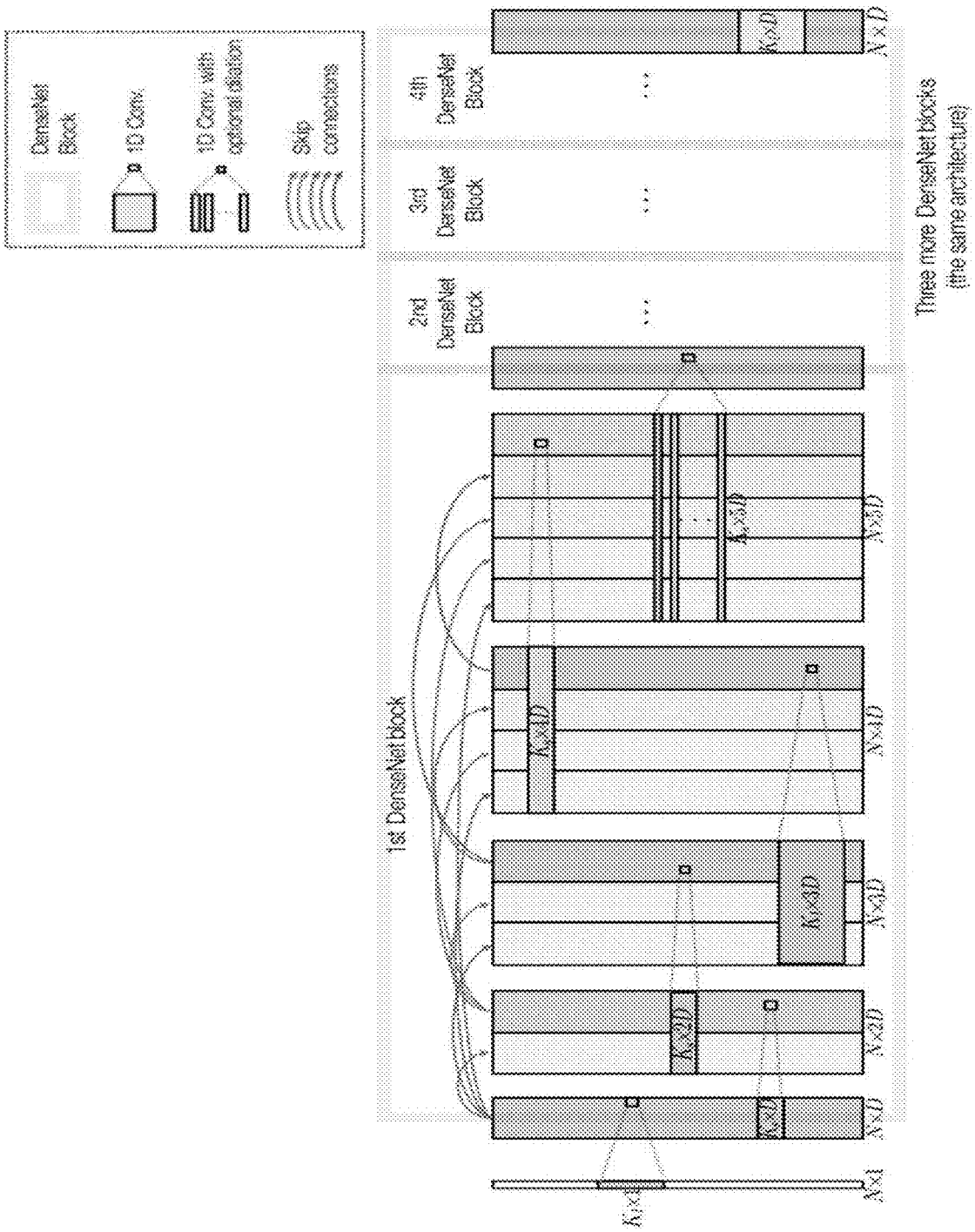

START
Time domain samples for the input speech in the N*1 dimension Entering into a densely connected hybrid network
101
Passing time domain samples through a plurality of dense blocks constituting a densely connected hybrid network
102
Passing time domain samples through the plurality of dense blocks Reshaping into M subframes
103
M subframes are input to N/M-dimensional gated recurrent unit (GRU) components
104
By passing M subframes through GRU components Clean voice with noise removed from the input voice signal is output.
105
END

FIG. 2


DenseNet Block
1D Conv
1D Conv with optional dilation
Skip connections
1st DenseNet Block
2nd DenseNet Block
3rd DenseNet Block
4th DenseNet Block
Three more DenseNet blocks (the same architecture)