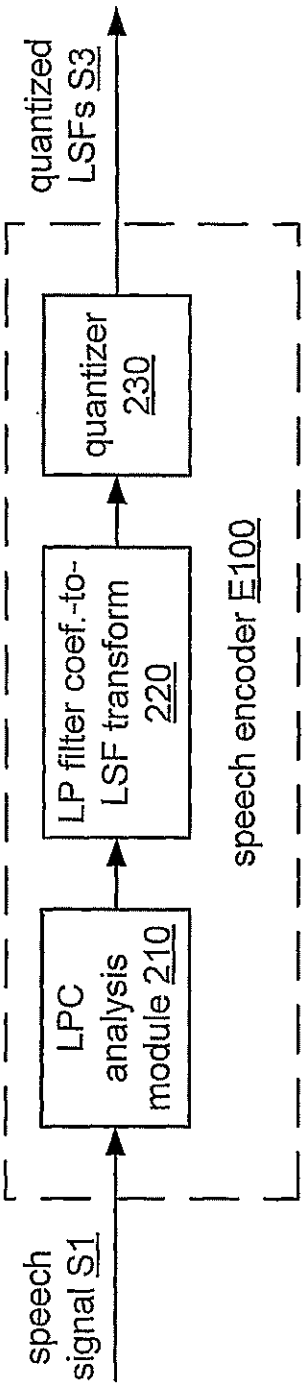

speech signal S1
LPC analysis module 210
LP filter coef.-to-LSF transform 220
quantizer 230
quantized LSFs S3
speech encoder E100

FIG. 1a

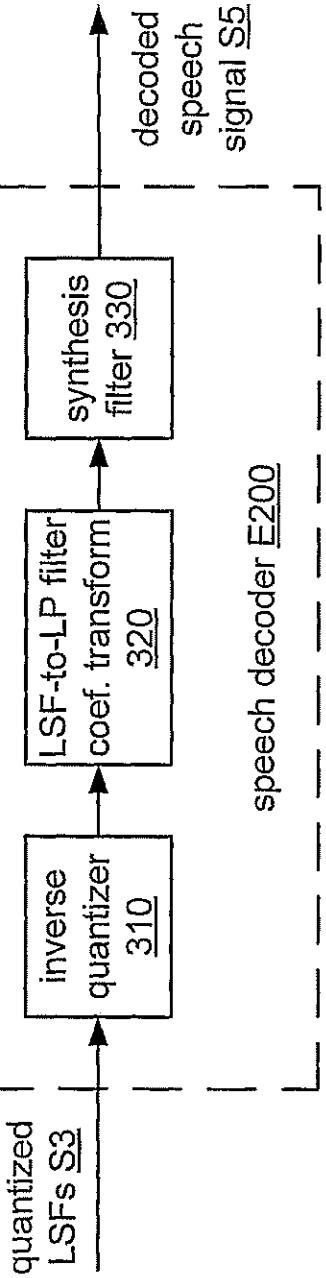

quantized LSFs S3
inverse quantizer 310
LSF-to-LP filter coef. transform 320
synthesis filter 330
decoded speech signal S5
speech decoder E200

FIG. 1b

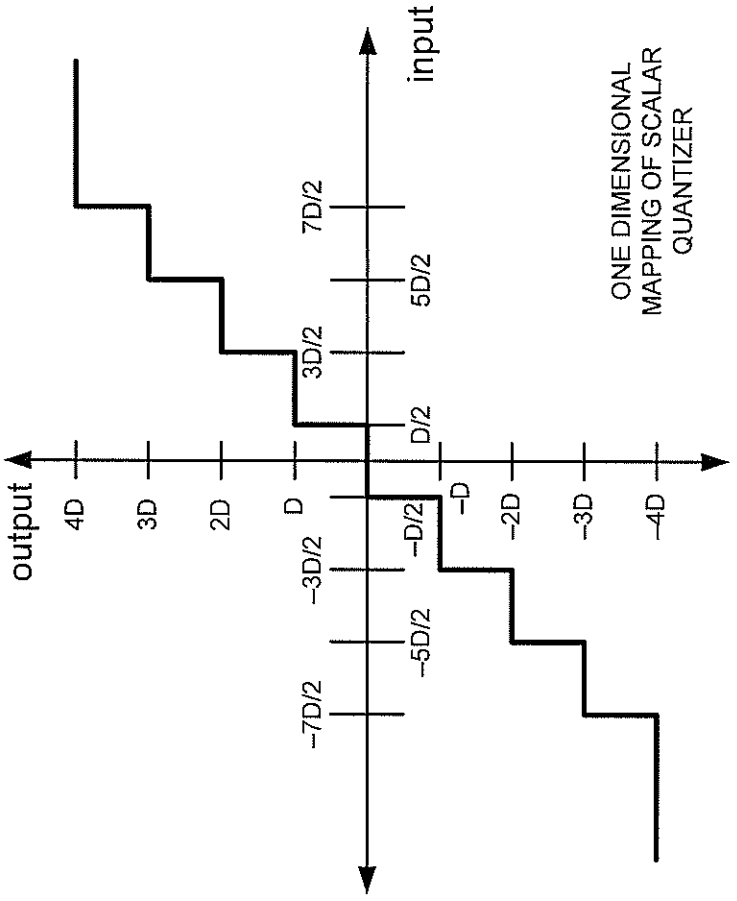

input
output
7D/2
5D/2
3D/2
D/2
-D/2
-3D/2
-5D/2
-7D/2
4D
3D
2D
D
-D
-2D
-3D
-4D
ONE DIMENSIONAL
MAPPING OF SCALAR
QUANTIZER

FIG. 2

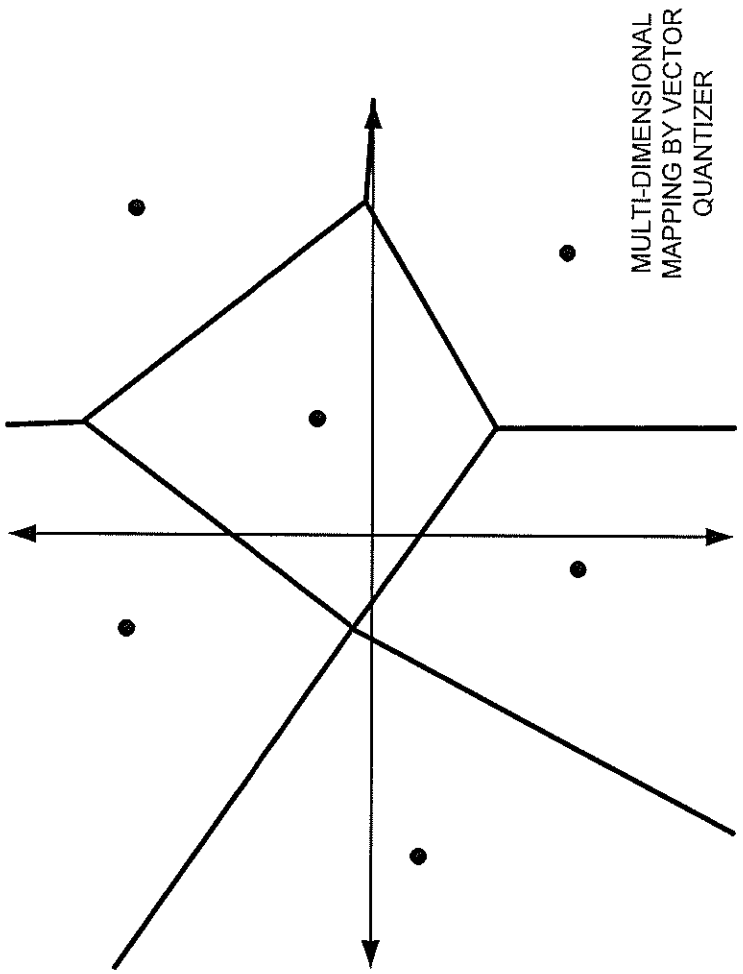


FIG. 3

FIG. 4a

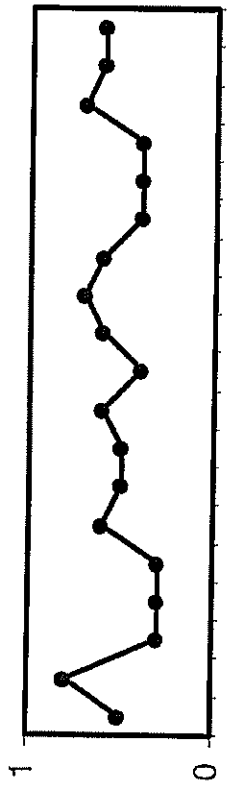


FIG. 4b

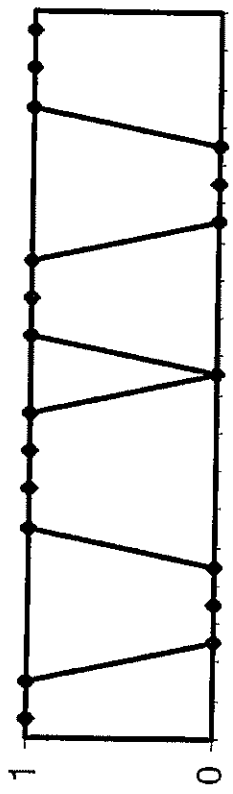


FIG. 4c

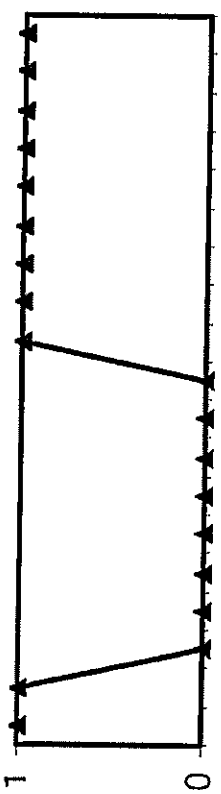
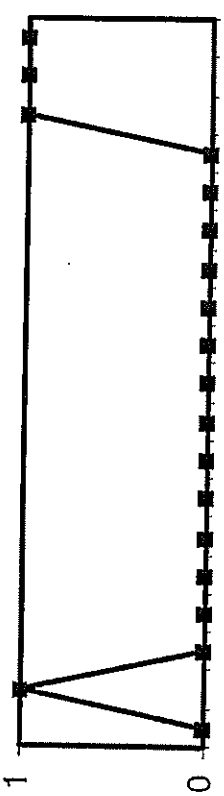


FIG. 4d



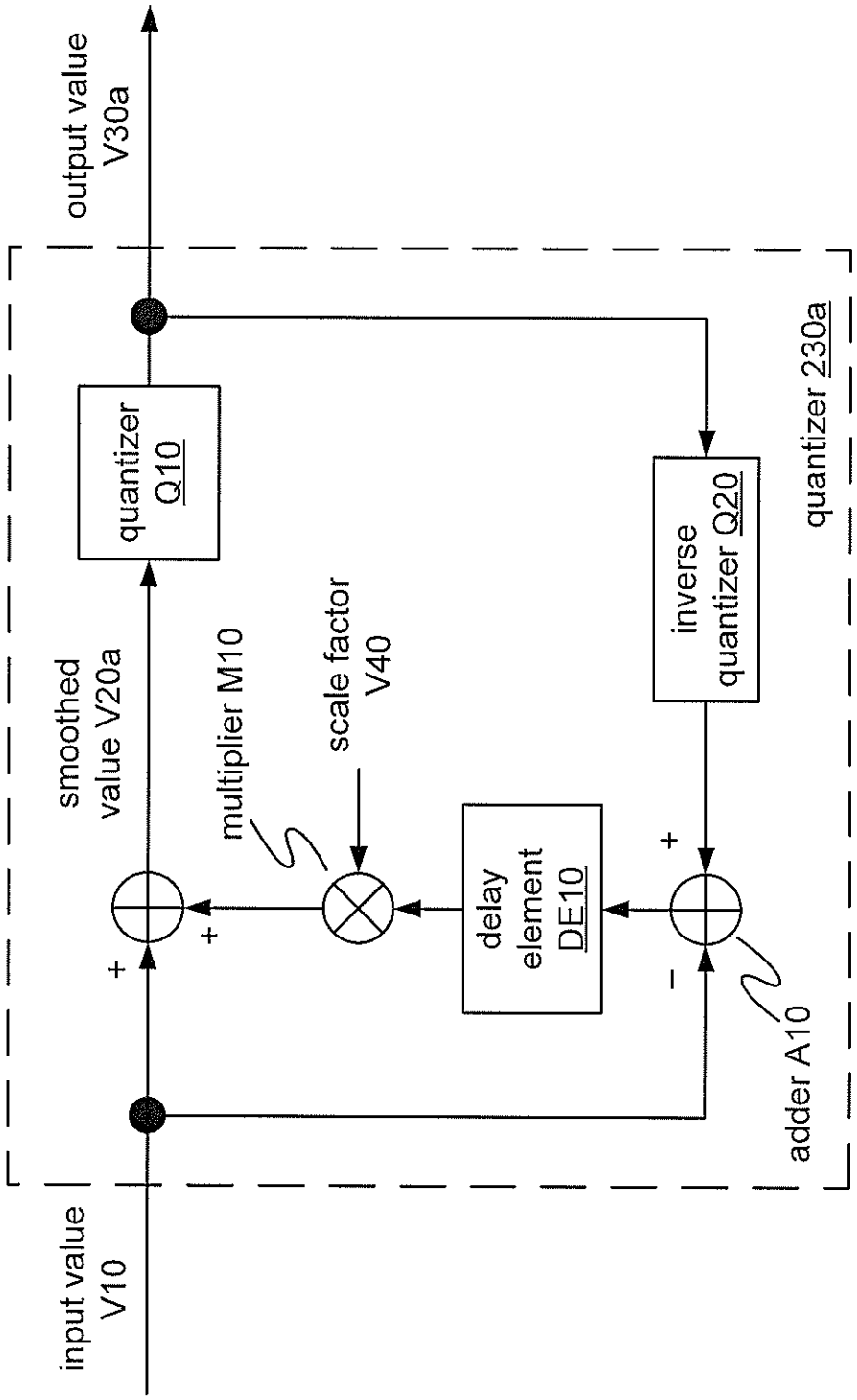

output value
V30a
quantizer
Q10
smoothed
value V20a
multiplier M10
scale factor
V40
delay
element
DE10
inverse
quantizer Q20
quantizer 230a
input value
V10
adder A10
+
+
+
–

FIG. 5

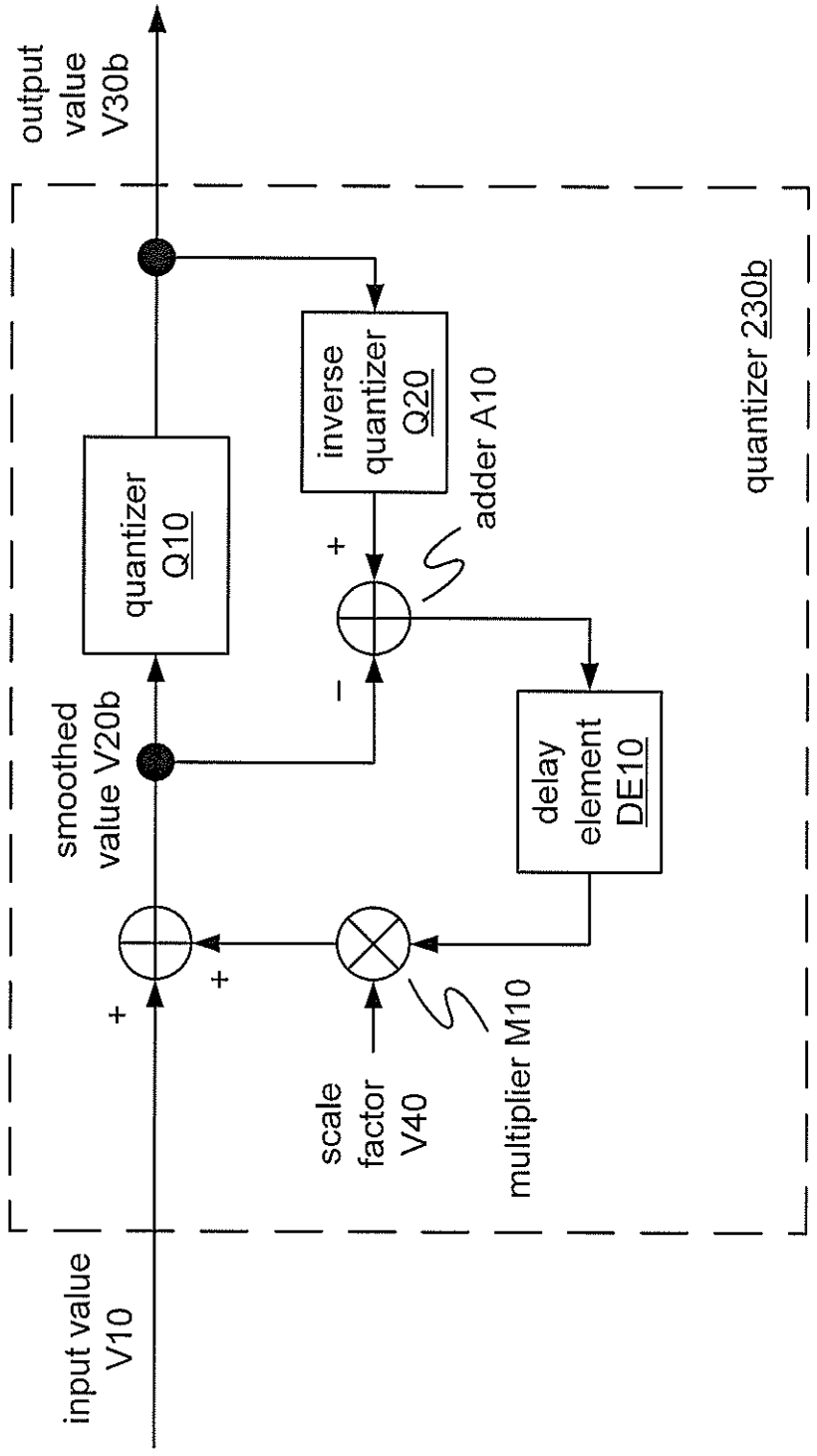

output value V30b
quantizer Q10
inverse quantizer Q20
adder A10
quantizer 230b
smoothed value V20b
delay element DE10
scale factor V40
multiplier M10
input value V10
+
+
+
−

FIG. 6

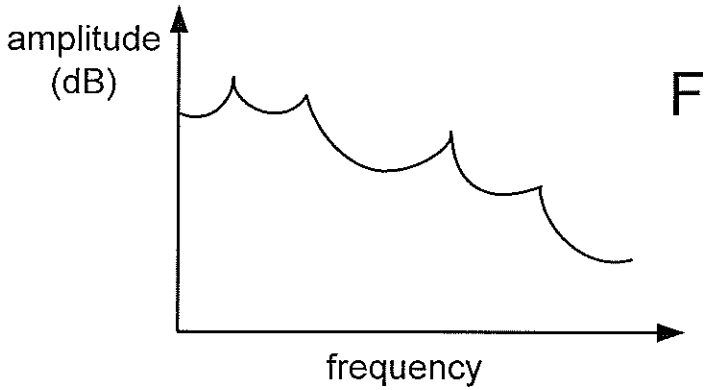

amplitude
(dB)
frequency

FIG. 7a

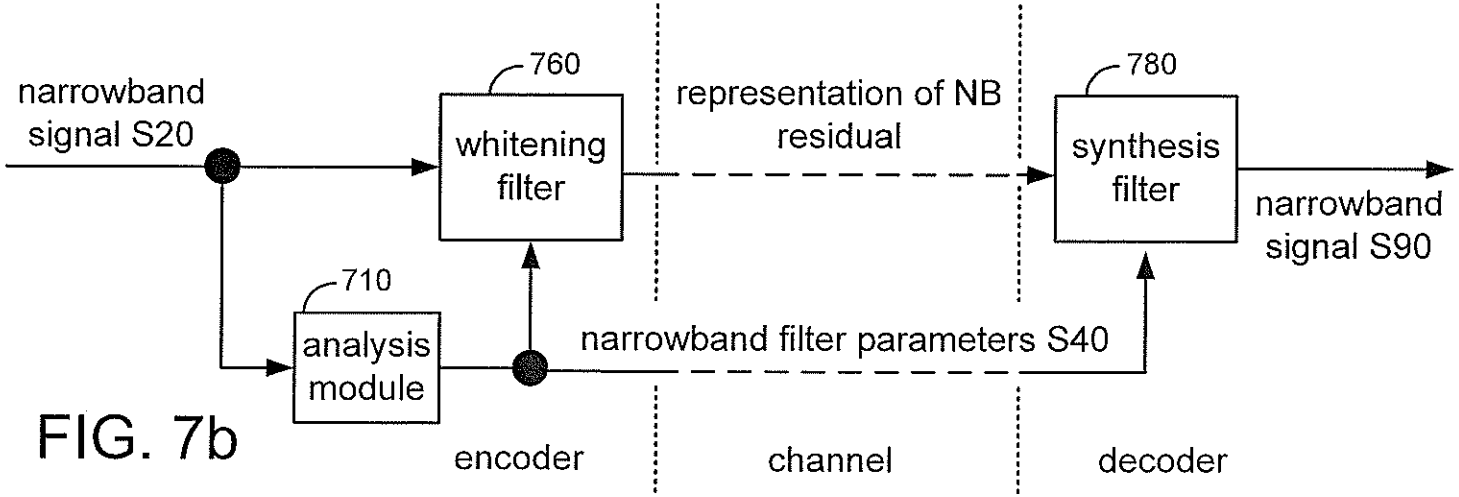

narrowband
signal S20
760
whitening
filter
representation of NB
residual
780
synthesis
filter
narrowband
signal S90
710
analysis
module
narrowband filter parameters S40
encoder
channel
decoder

FIG. 7b

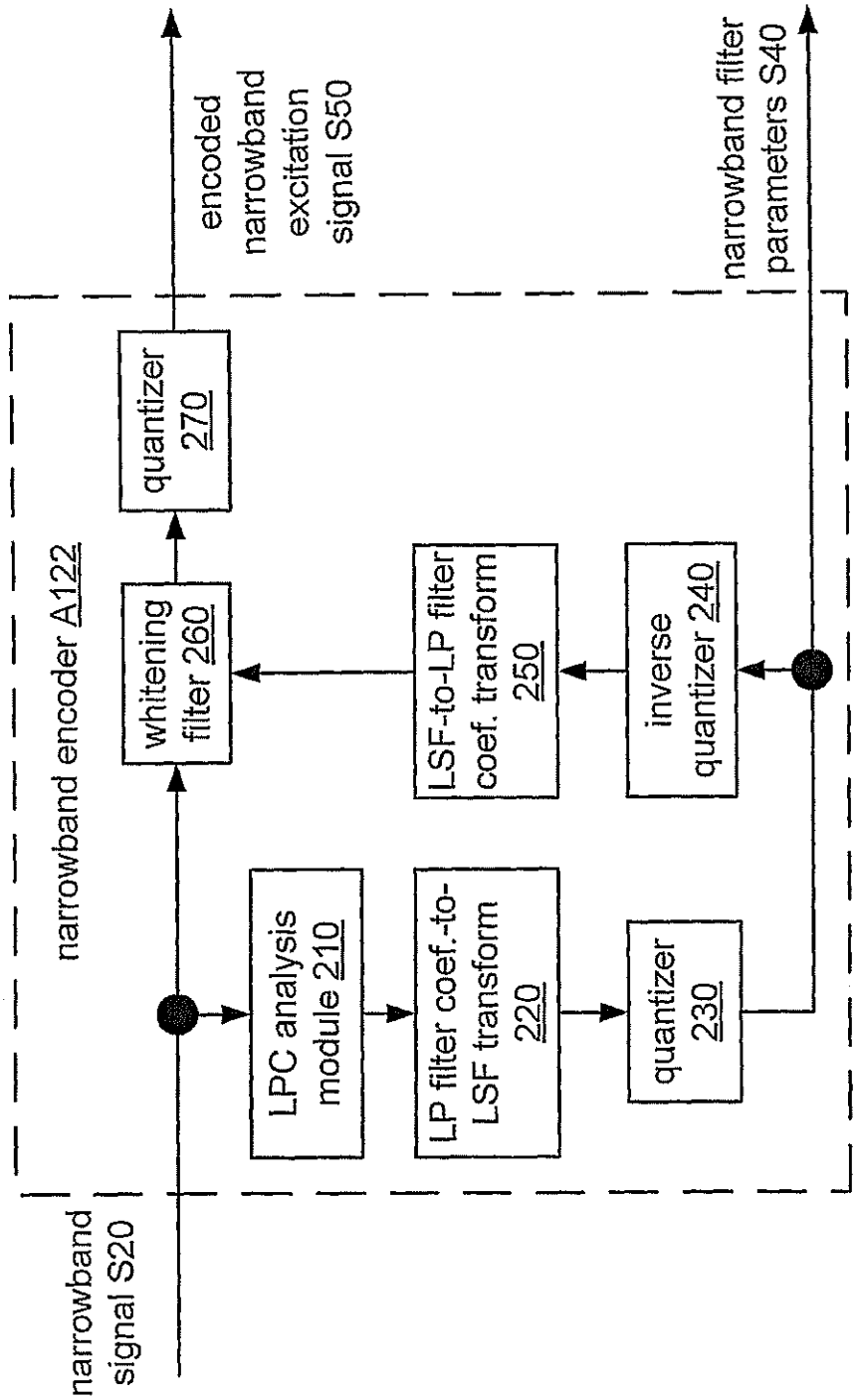

narrowband signal S20
narrowband encoder A122
LPC analysis module 210
LP filter coef.-to-LSF transform 220
quantizer 230
LSF-to-LP filter coef. transform 250
inverse quantizer 240
whitening filter 260
quantizer 270
encoded narrowband excitation signal S50
narrowband filter parameters S40

FIG. 8

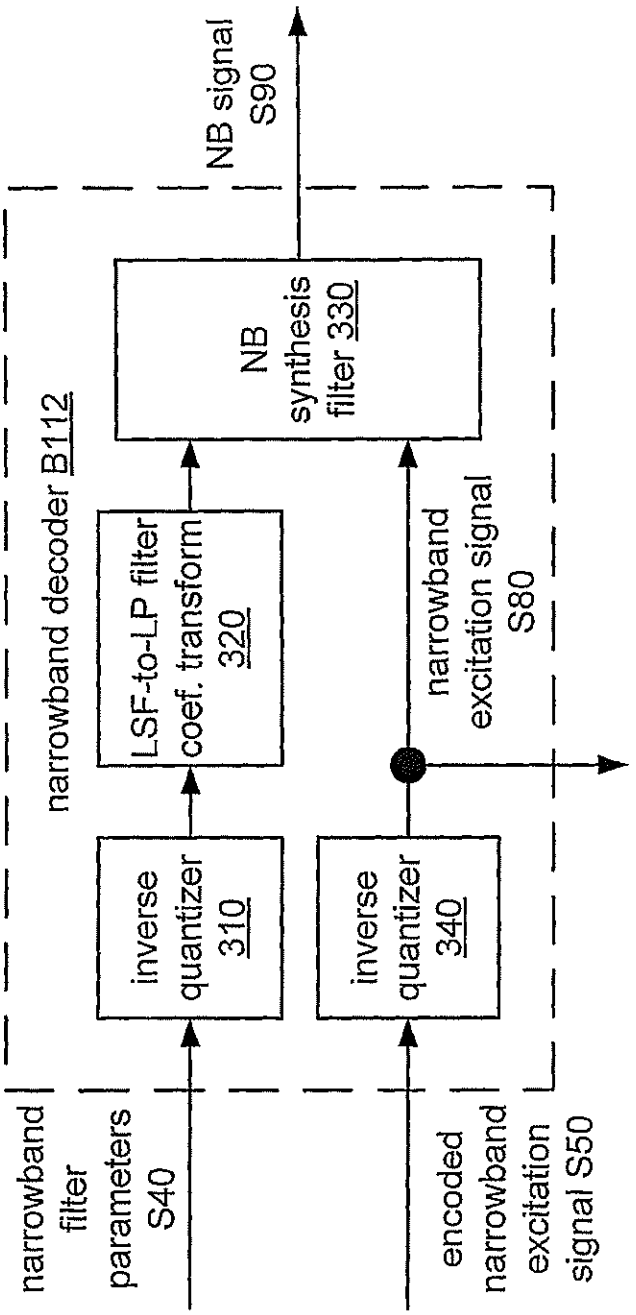

narrowband filter parameters S40
encoded narrowband excitation signal S50
narrowband decoder B112
inverse quantizer 310
LSF-to-LP filter coef. transform 320
inverse quantizer 340
NB synthesis filter 330
narrowband excitation signal S80
NB signal S90

FIG. 9

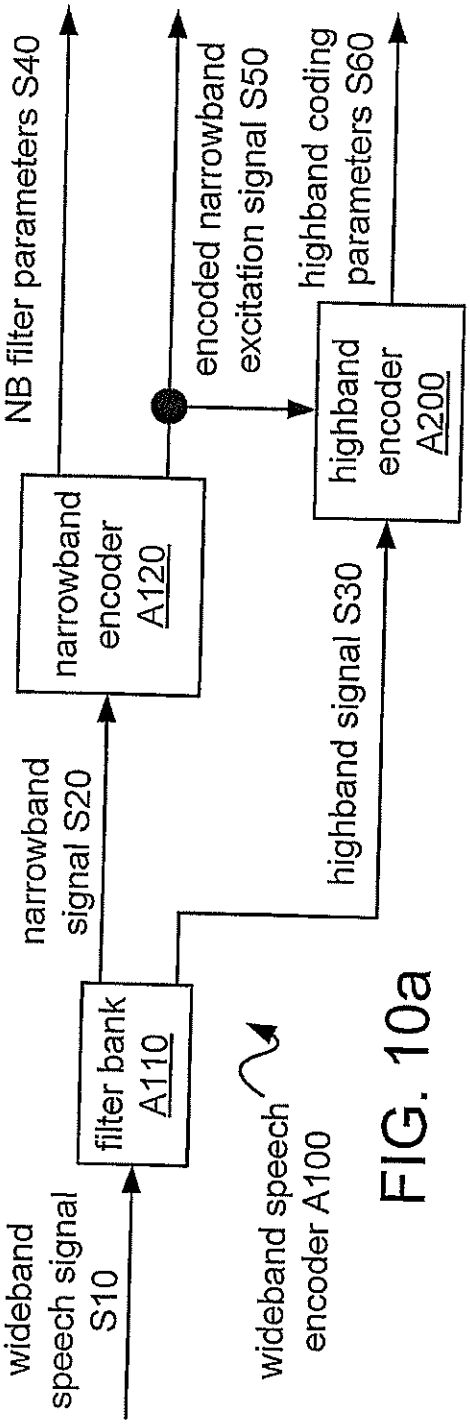


FIG. 10a

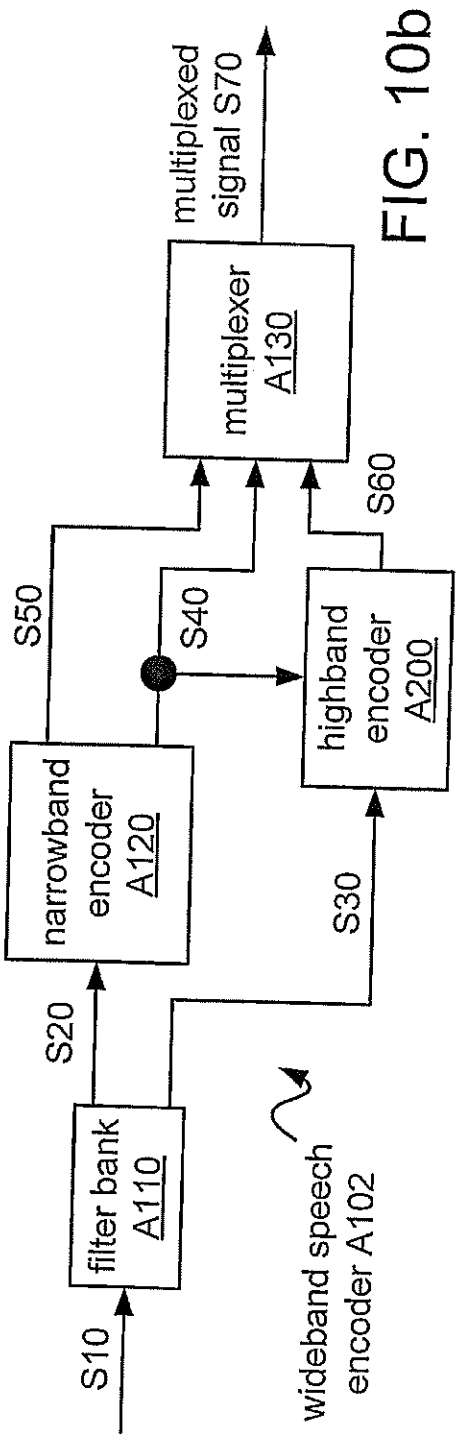


FIG. 10b

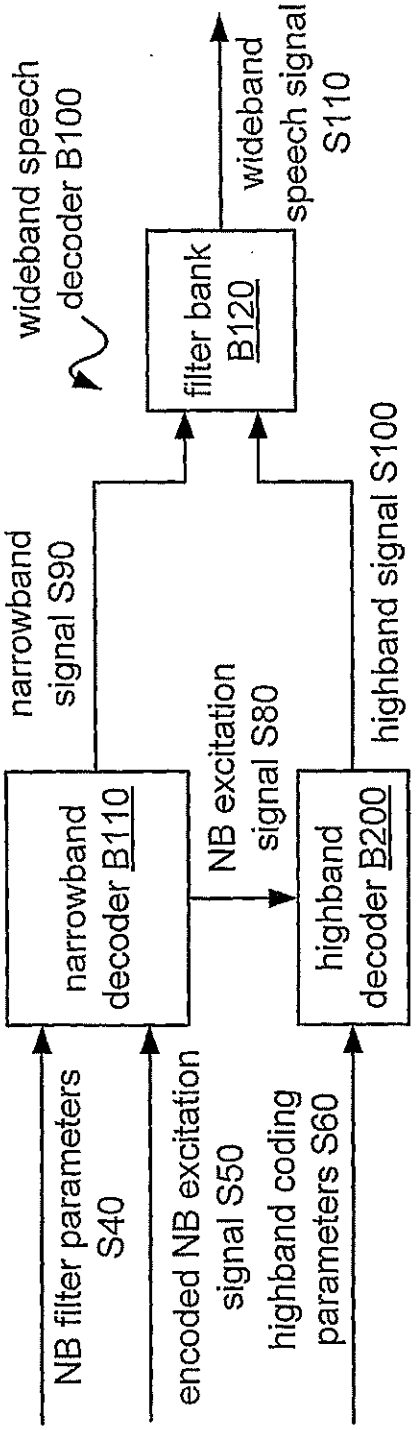


FIG. 11a

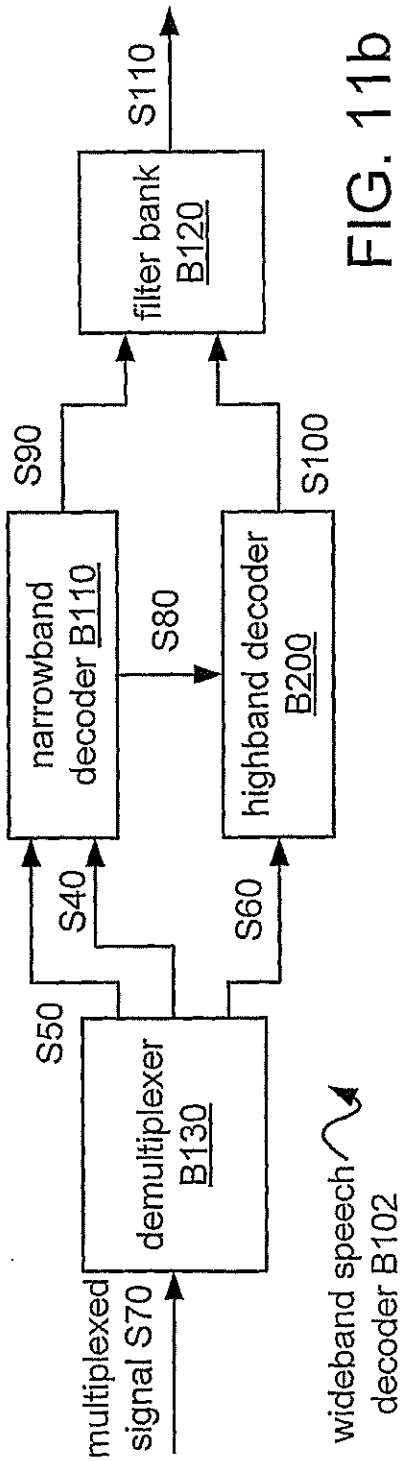


FIG. 11b