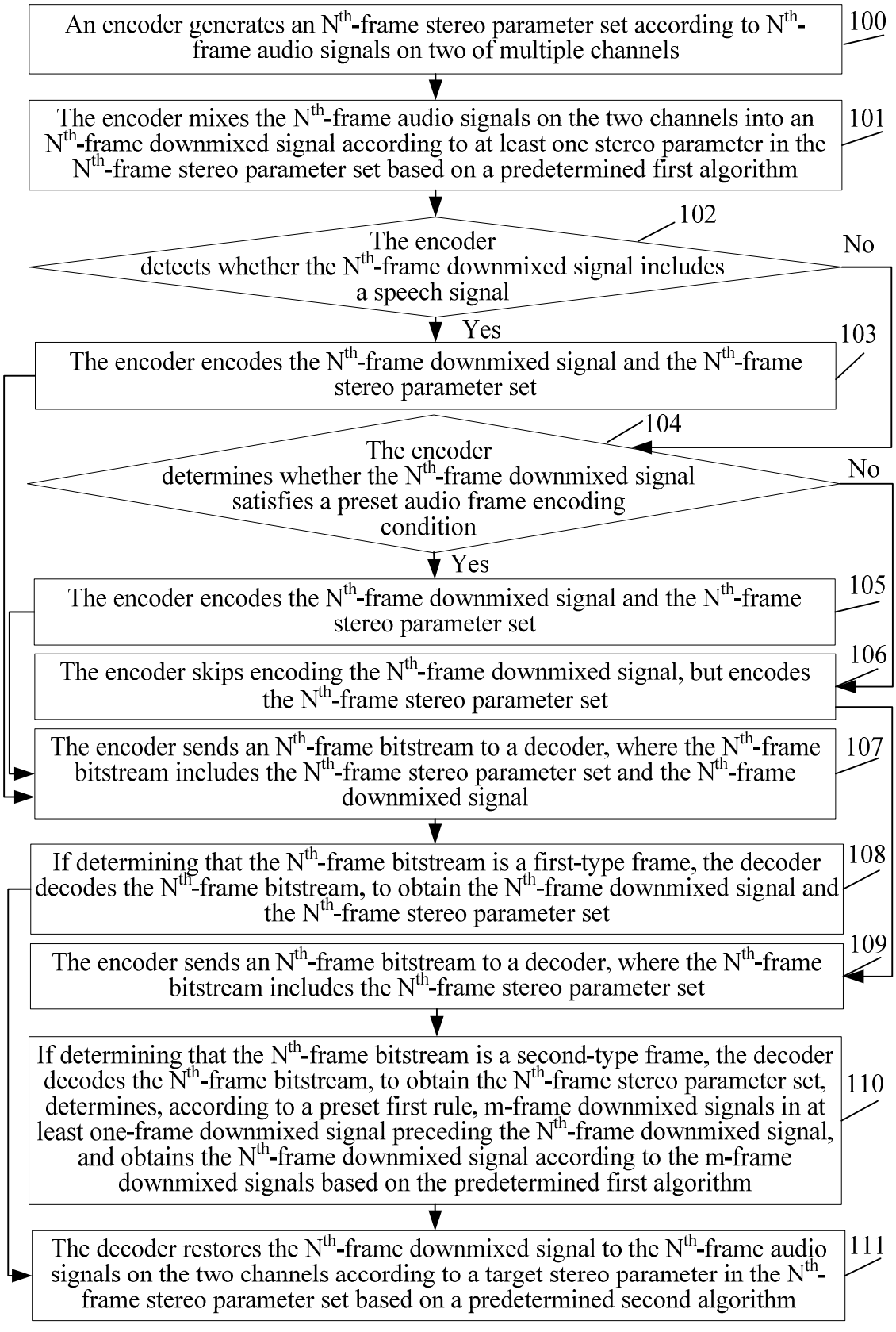

An encoder generates an N^th-frame stereo parameter set according to N^th-frame audio signals on two of multiple channels
100
The encoder mixes the N^th-frame audio signals on the two channels into an N^th-frame downmixed signal according to at least one stereo parameter in the N^th-frame stereo parameter set based on a predetermined first algorithm
101
The encoder detects whether the N^th-frame downmixed signal includes a speech signal
102
No
Yes
The encoder encodes the N^th-frame downmixed signal and the N^th-frame stereo parameter set
103
The encoder determines whether the N^th-frame downmixed signal satisfies a preset audio frame encoding condition
104
No
Yes
The encoder encodes the N^th-frame downmixed signal and the N^th-frame stereo parameter set
105
The encoder skips encoding the N^th-frame downmixed signal, but encodes the N^th-frame stereo parameter set
106
The encoder sends an N^th-frame bitstream to a decoder, where the N^th-frame bitstream includes the N^th-frame stereo parameter set and the N^th-frame downmixed signal
107
If determining that the N^th-frame bitstream is a first-type frame, the decoder decodes the N^th-frame bitstream, to obtain the N^th-frame downmixed signal and the N^th-frame stereo parameter set
108
The encoder sends an N^th-frame bitstream to a decoder, where the N^th-frame bitstream includes the N^th-frame stereo parameter set
109
If determining that the N^th-frame bitstream is a second-type frame, the decoder decodes the N^th-frame bitstream, to obtain the N^th-frame stereo parameter set, determines, according to a preset first rule, m-frame downmixed signals in at least one-frame downmixed signal preceding the N^th-frame downmixed signal, and obtains the N^th-frame downmixed signal according to the m-frame downmixed signals based on the predetermined first algorithm
110
The decoder restores the N^th-frame downmixed signal to the N^th-frame audio signals on the two channels according to a target stereo parameter in the N^th-frame stereo parameter set based on a predetermined second algorithm
111

FIG. 1

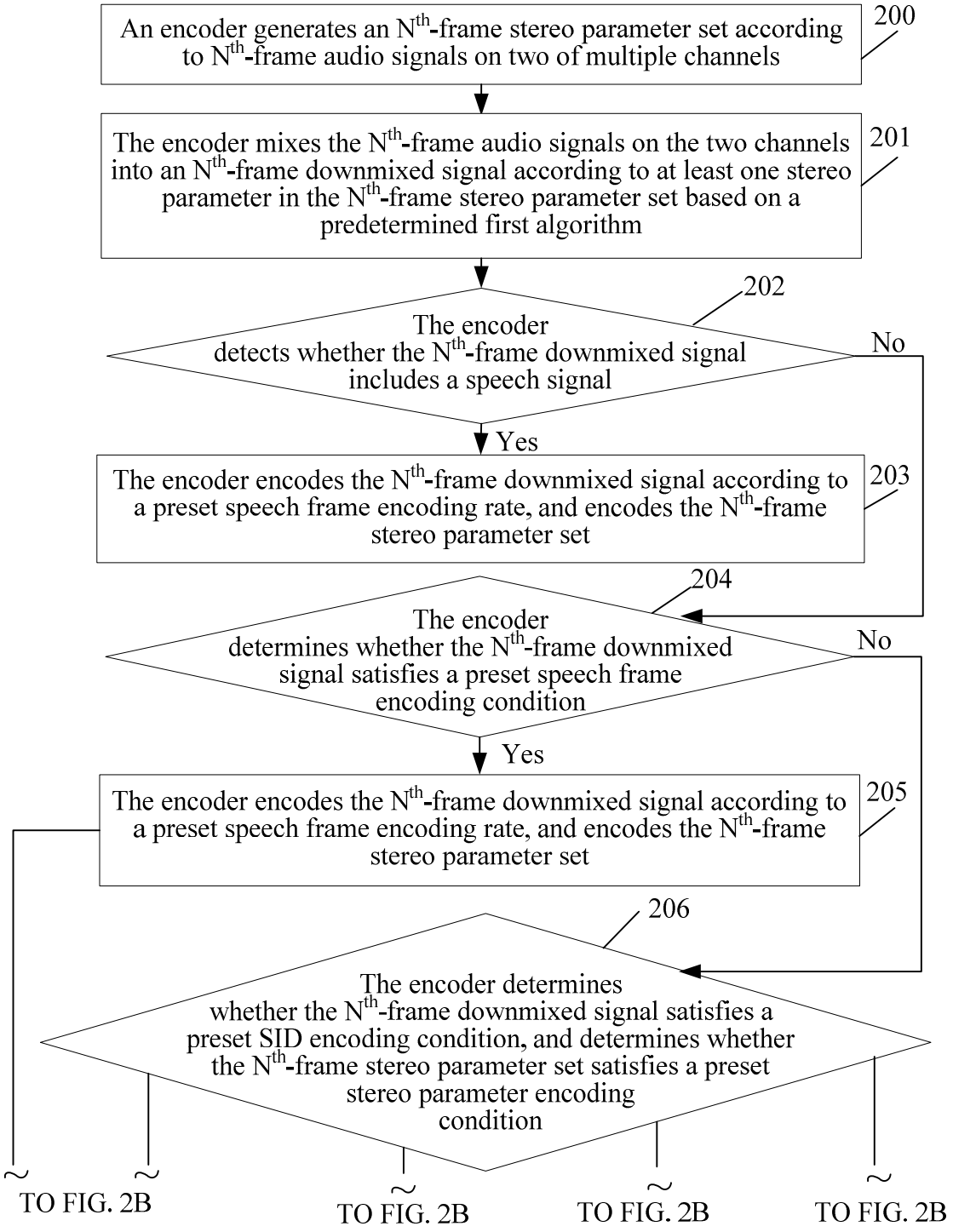

An encoder generates an Nth-frame stereo parameter set according to Nth-frame audio signals on two of multiple channels
200
The encoder mixes the Nth-frame audio signals on the two channels into an Nth-frame downmixed signal according to at least one stereo parameter in the Nth-frame stereo parameter set based on a predetermined first algorithm
201
202
The encoder detects whether the Nth-frame downmixed signal includes a speech signal
No
Yes
The encoder encodes the Nth-frame downmixed signal according to a preset speech frame encoding rate, and encodes the Nth-frame stereo parameter set
203
204
The encoder determines whether the Nth-frame downmixed signal satisfies a preset speech frame encoding condition
No
Yes
The encoder encodes the Nth-frame downmixed signal according to a preset speech frame encoding rate, and encodes the Nth-frame stereo parameter set
205
206
The encoder determines whether the Nth-frame downmixed signal satisfies a preset SID encoding condition, and determines whether the Nth-frame stereo parameter set satisfies a preset stereo parameter encoding condition
TO FIG. 2B
TO FIG. 2B
TO FIG. 2B
TO FIG. 2B

FIG. 2A

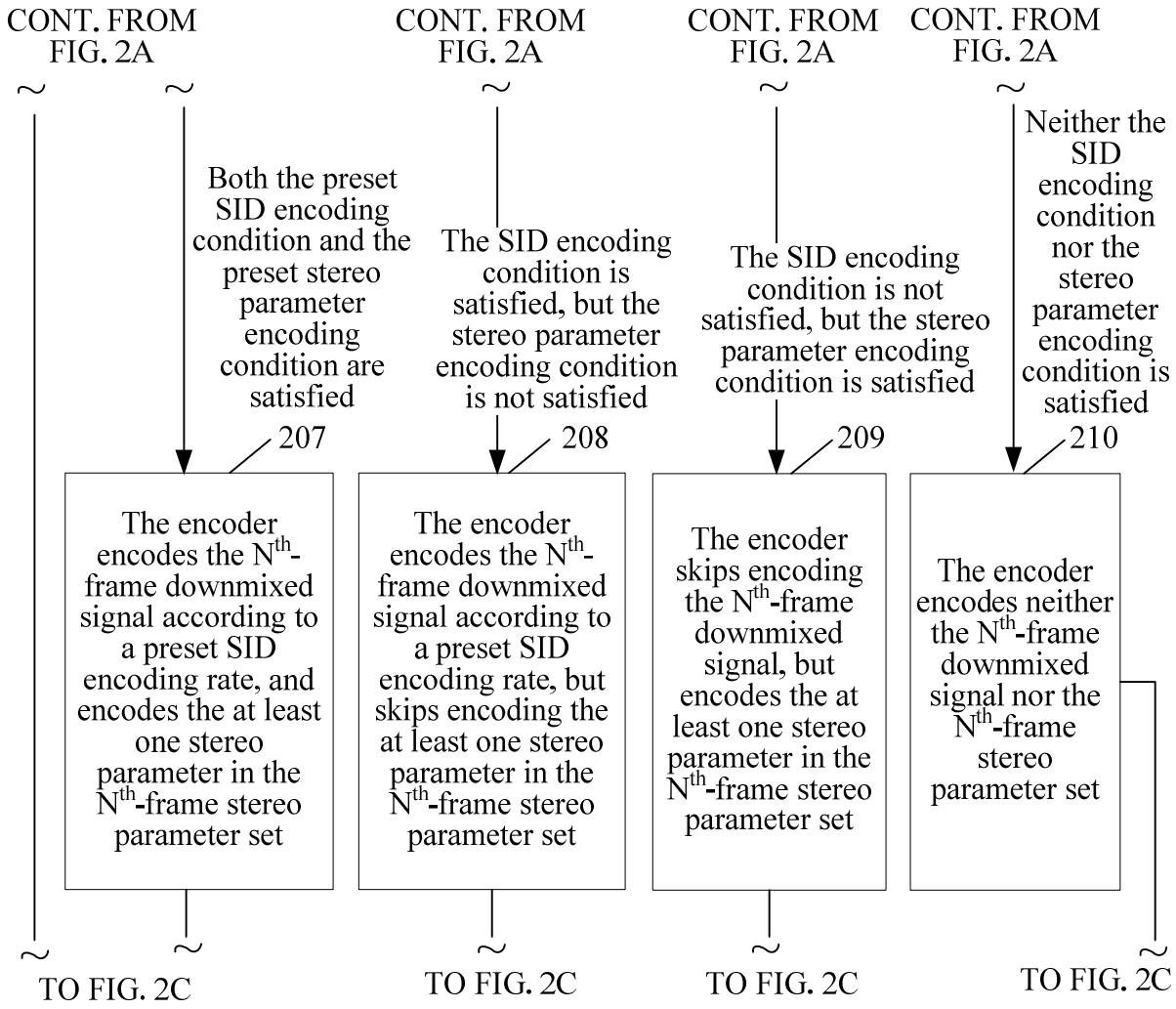

CONT. FROM FIG. 2A
CONT. FROM FIG. 2A
CONT. FROM FIG. 2A
CONT. FROM FIG. 2A
Both the preset SID encoding condition and the preset stereo parameter encoding condition are satisfied
The SID encoding condition is satisfied, but the stereo parameter encoding condition is not satisfied
The SID encoding condition is not satisfied, but the stereo parameter encoding condition is satisfied
Neither the SID encoding condition nor the stereo parameter encoding condition is satisfied
207
208
209
210
The encoder encodes the Nth-frame downmixed signal according to a preset SID encoding rate, and encodes the at least one stereo parameter in the Nth-frame stereo parameter set
The encoder encodes the Nth-frame downmixed signal according to a preset SID encoding rate, but skips encoding the at least one stereo parameter in the Nth-frame stereo parameter set
The encoder skips encoding the Nth-frame downmixed signal, but encodes the at least one stereo parameter in the Nth-frame stereo parameter set
The encoder encodes neither the Nth-frame downmixed signal nor the Nth-frame stereo parameter set
TO FIG. 2C
TO FIG. 2C
TO FIG. 2C
TO FIG. 2C

FIG. 2B

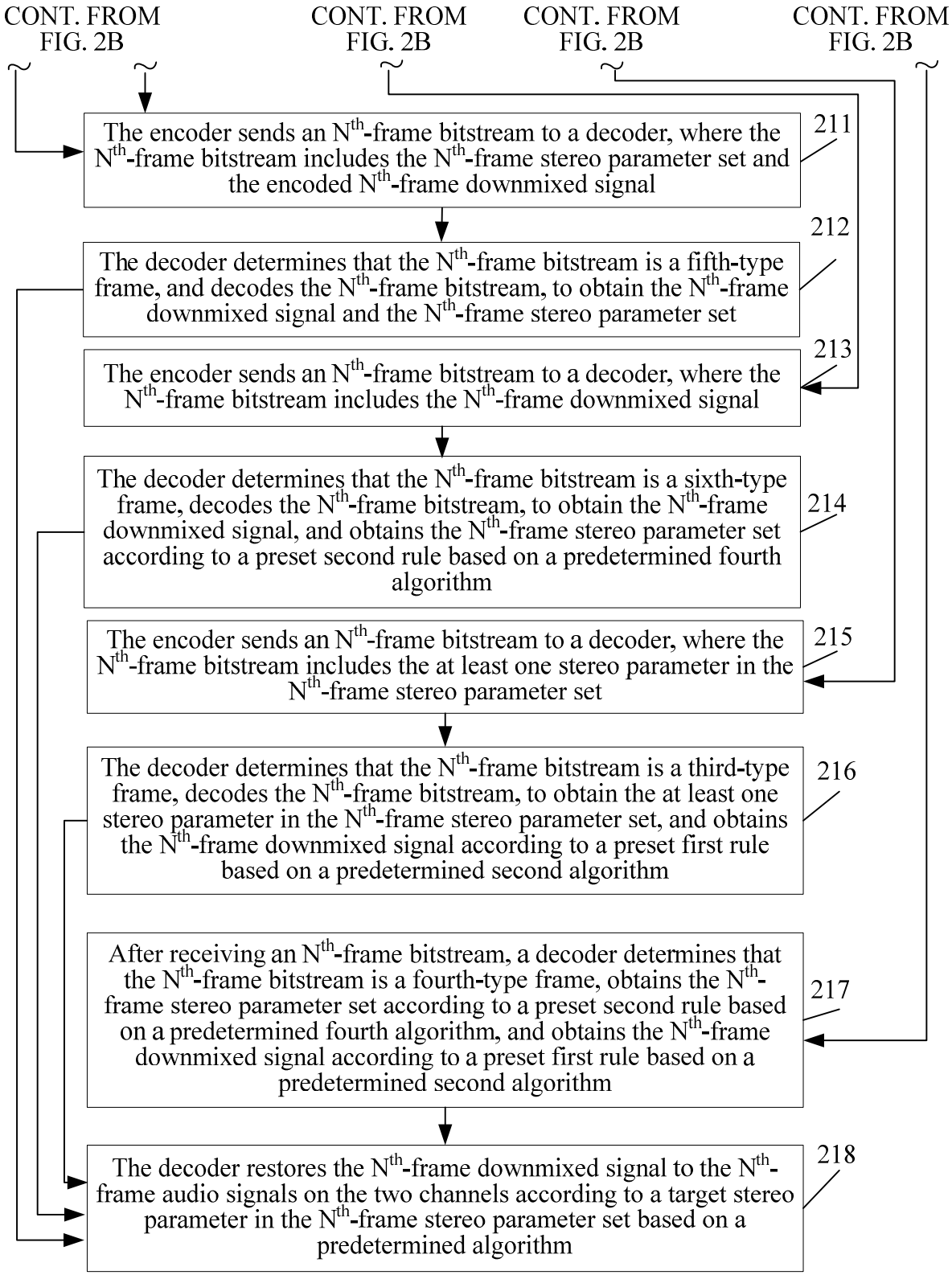

CONT. FROM FIG. 2B
CONT. FROM FIG. 2B
CONT. FROM FIG. 2B
CONT. FROM FIG. 2B
The encoder sends an Nth-frame bitstream to a decoder, where the Nth-frame bitstream includes the Nth-frame stereo parameter set and the encoded Nth-frame downmixed signal
211
The decoder determines that the Nth-frame bitstream is a fifth-type frame, and decodes the Nth-frame bitstream, to obtain the Nth-frame downmixed signal and the Nth-frame stereo parameter set
212
The encoder sends an Nth-frame bitstream to a decoder, where the Nth-frame bitstream includes the Nth-frame downmixed signal
213
The decoder determines that the Nth-frame bitstream is a sixth-type frame, decodes the Nth-frame bitstream, to obtain the Nth-frame downmixed signal, and obtains the Nth-frame stereo parameter set according to a preset second rule based on a predetermined fourth algorithm
214
The encoder sends an Nth-frame bitstream to a decoder, where the Nth-frame bitstream includes the at least one stereo parameter in the Nth-frame stereo parameter set
215
The decoder determines that the Nth-frame bitstream is a third-type frame, decodes the Nth-frame bitstream, to obtain the at least one stereo parameter in the Nth-frame stereo parameter set, and obtains the Nth-frame downmixed signal according to a preset first rule based on a predetermined second algorithm
216
After receiving an Nth-frame bitstream, a decoder determines that the Nth-frame bitstream is a fourth-type frame, obtains the Nth-frame stereo parameter set according to a preset second rule based on a predetermined fourth algorithm, and obtains the Nth-frame downmixed signal according to a preset first rule based on a predetermined second algorithm
217
The decoder restores the Nth-frame downmixed signal to the Nth-frame audio signals on the two channels according to a target stereo parameter in the Nth-frame stereo parameter set based on a predetermined algorithm
218

FIG. 2C

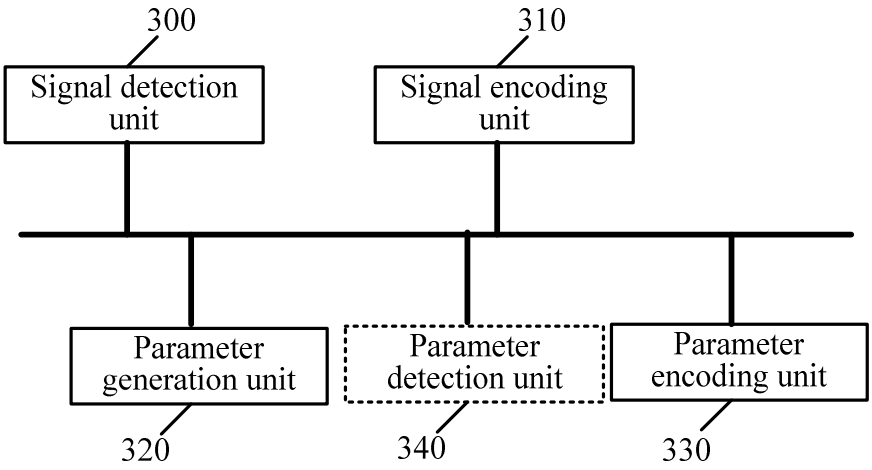

300
Signal detection unit
310
Signal encoding unit
Parameter generation unit
320
Parameter detection unit
340
Parameter encoding unit
330

FIG. 3a

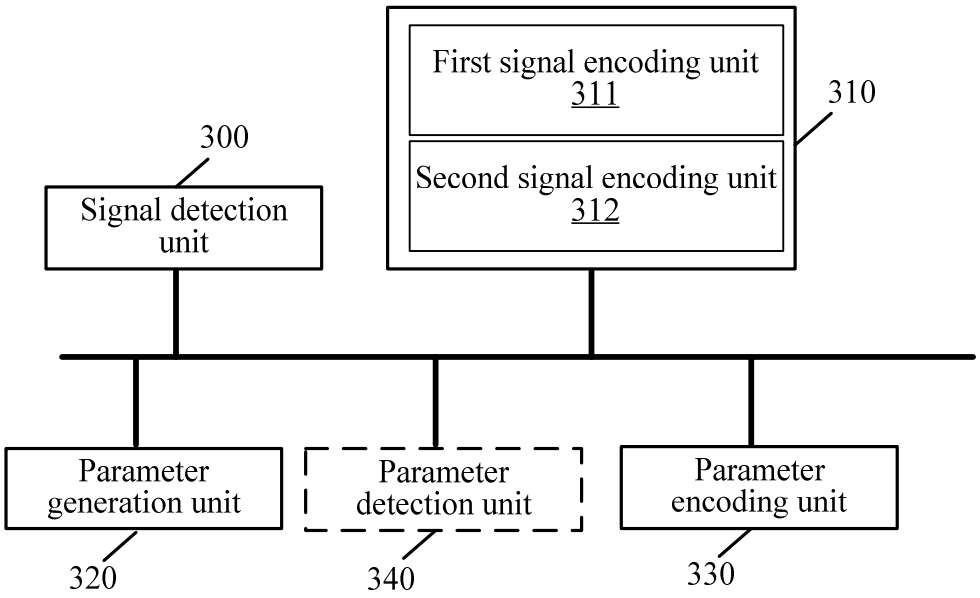

First signal encoding unit 311
Second signal encoding unit 312
310
300
Signal detection unit
Parameter generation unit
320
Parameter detection unit
340
Parameter encoding unit
330

FIG. 3b

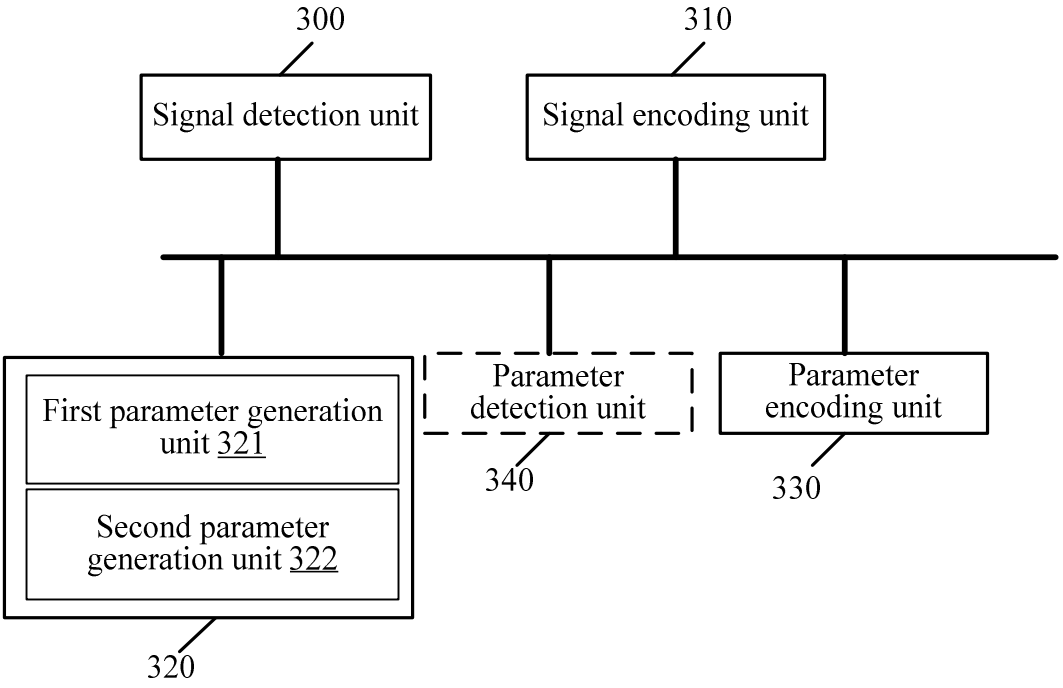

300
310
Signal detection unit
Signal encoding unit
First parameter generation unit 321
Second parameter generation unit 322
320
Parameter detection unit
340
Parameter encoding unit
330

FIG. 3c

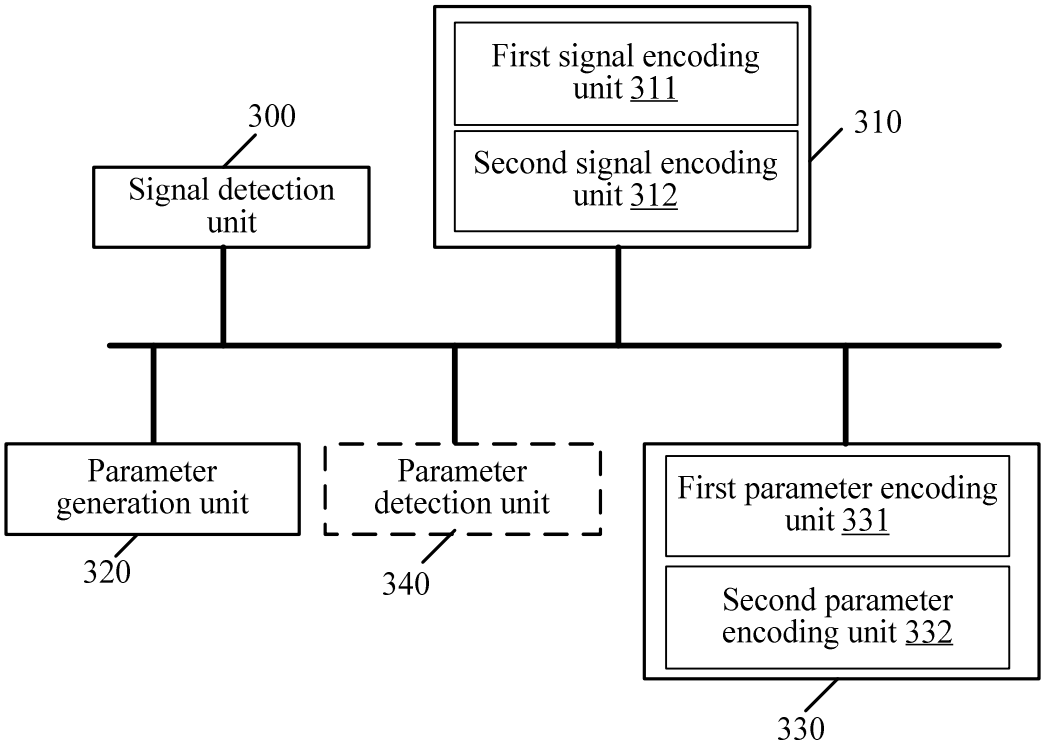

First signal encoding unit 311
Second signal encoding unit 312
310
300
Signal detection unit
Parameter generation unit
320
Parameter detection unit
340
First parameter encoding unit 331
Second parameter encoding unit 332
330

FIG. 3d

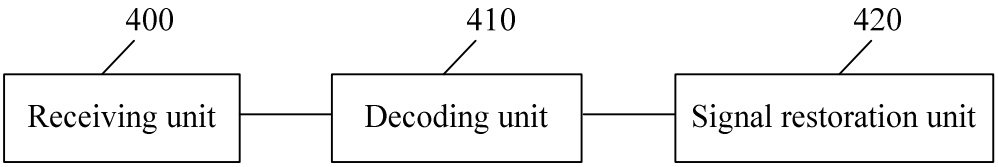

400
410
420
Receiving unit
Decoding unit
Signal restoration unit

FIG. 4

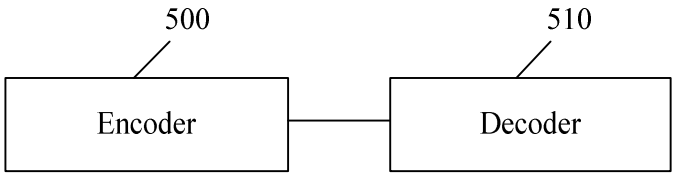

500
510
Encoder
Decoder

FIG. 5