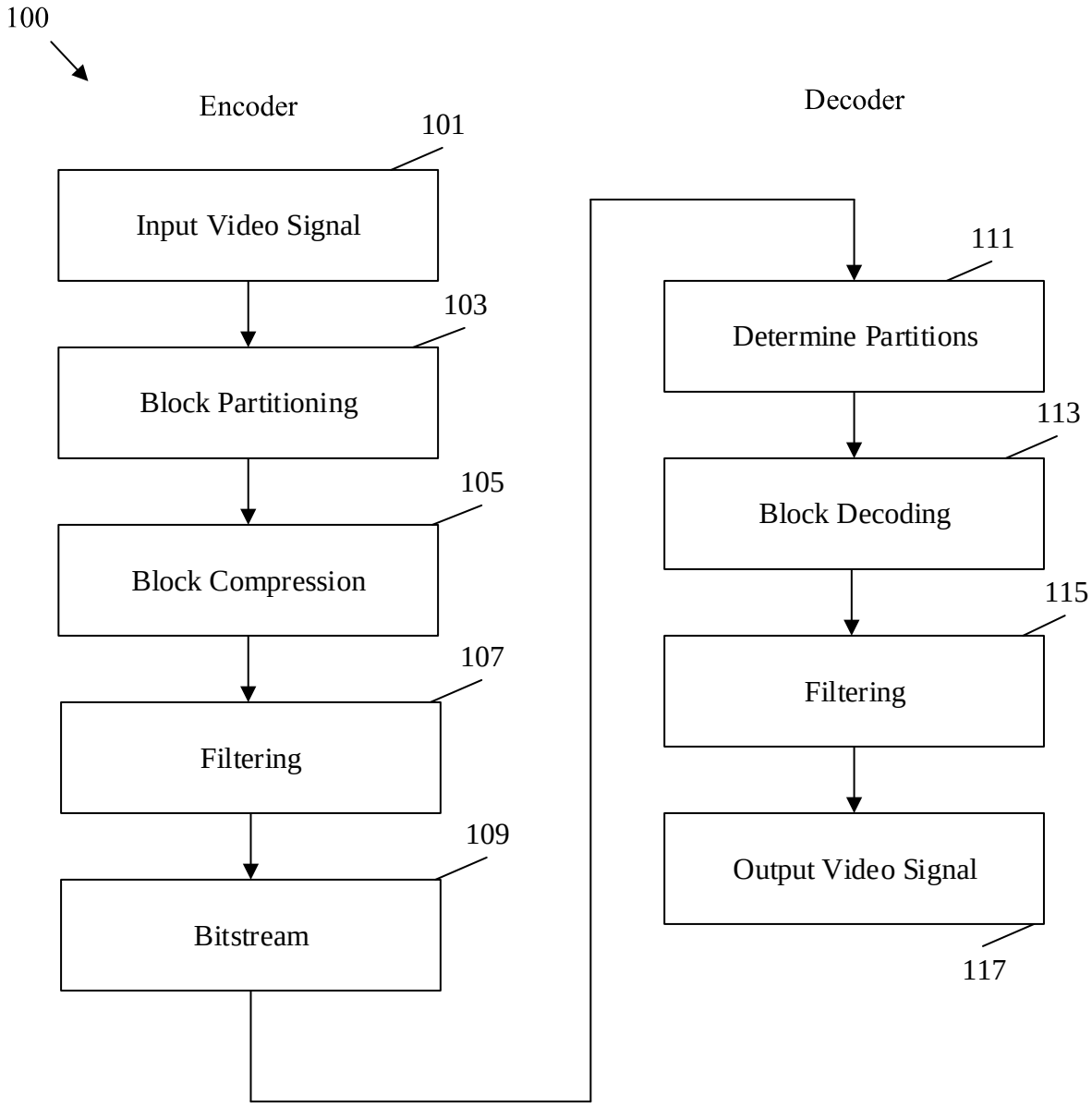

100
Encoder
Decoder
101
Input Video Signal
103
Block Partitioning
105
Block Compression
107
Filtering
109
Bitstream
111
Determine Partitions
113
Block Decoding
115
Filtering
Output Video Signal
117

FIG. 1

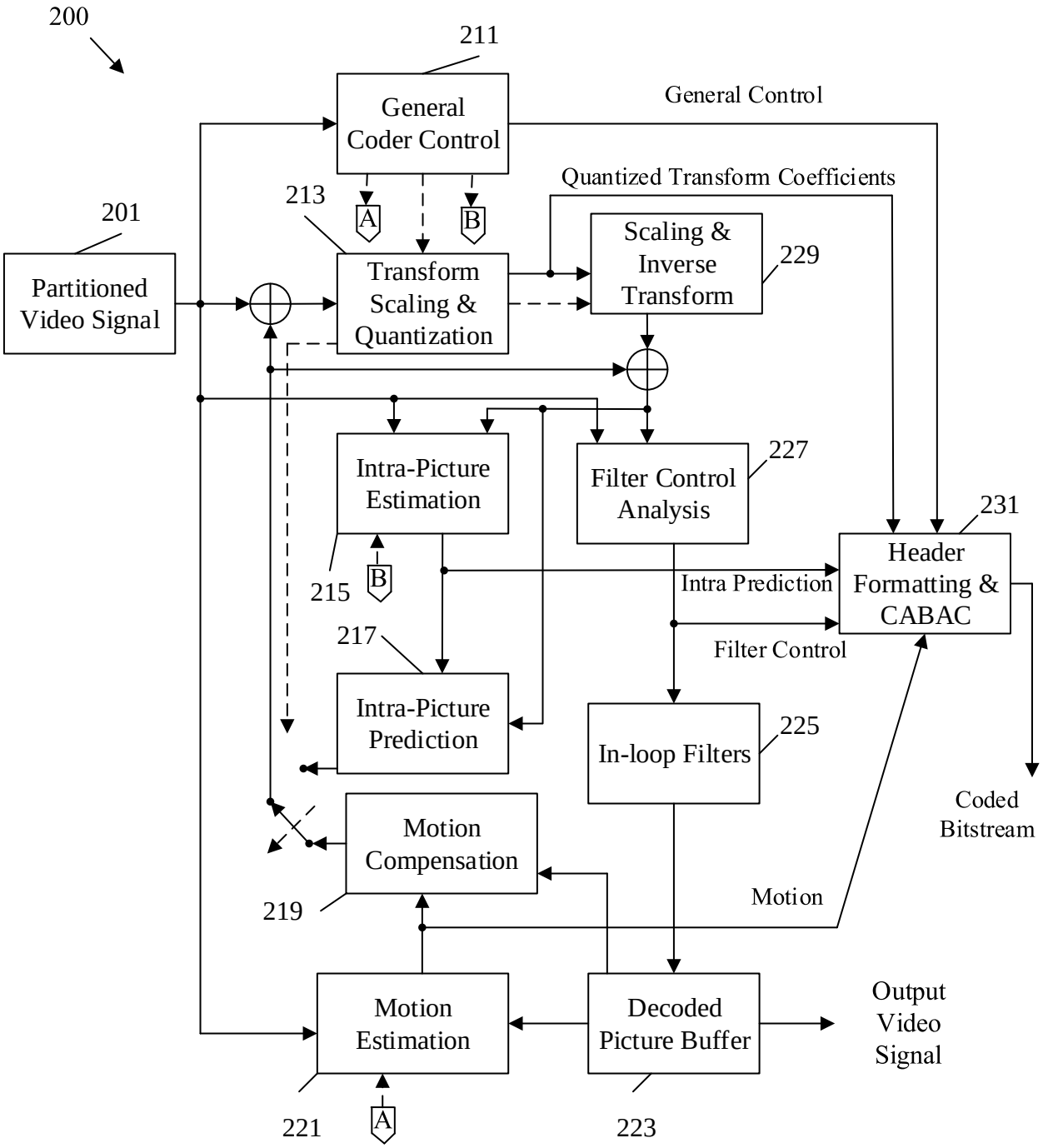

200
211
General Coder Control
General Control
Quantized Transform Coefficients
213
A
B
201
Partitioned Video Signal
Transform Scaling & Quantization
Scaling & Inverse Transform
229
Intra-Picture Estimation
Filter Control Analysis
227
231
Header Formatting & CABAC
215
B
Intra Prediction
Filter Control
217
Intra-Picture Prediction
In-loop Filters
225
Coded Bitstream
Motion Compensation
219
Motion
Motion Estimation
Decoded Picture Buffer
Output Video Signal
221
A
223

FIG. 2

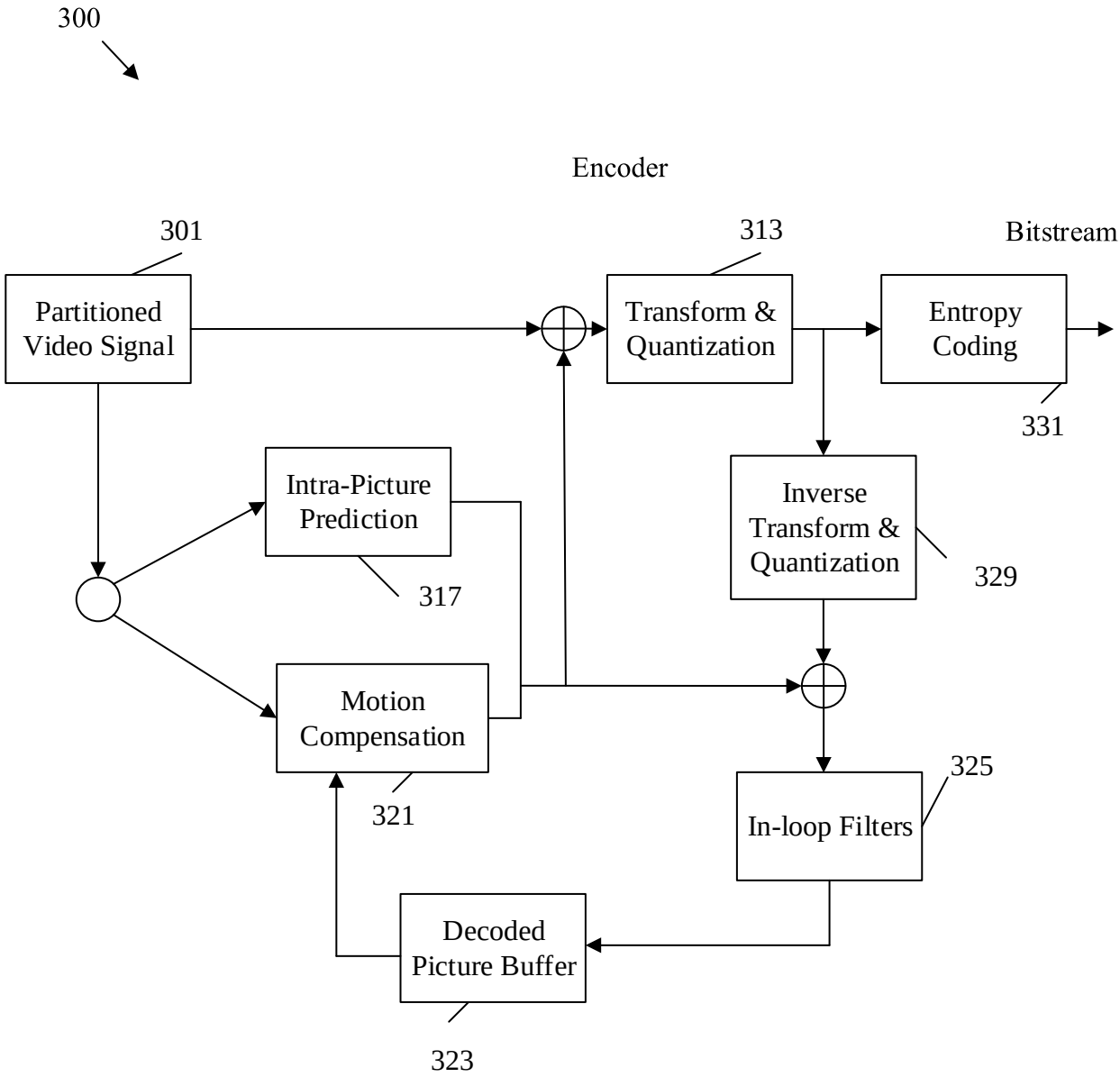

300
Encoder
301
Partitioned Video Signal
313
Transform & Quantization
Entropy Coding
Bitstream
331
Intra-Picture Prediction
317
Inverse Transform & Quantization
329
Motion Compensation
321
325
In-loop Filters
Decoded Picture Buffer
323

FIG. 3

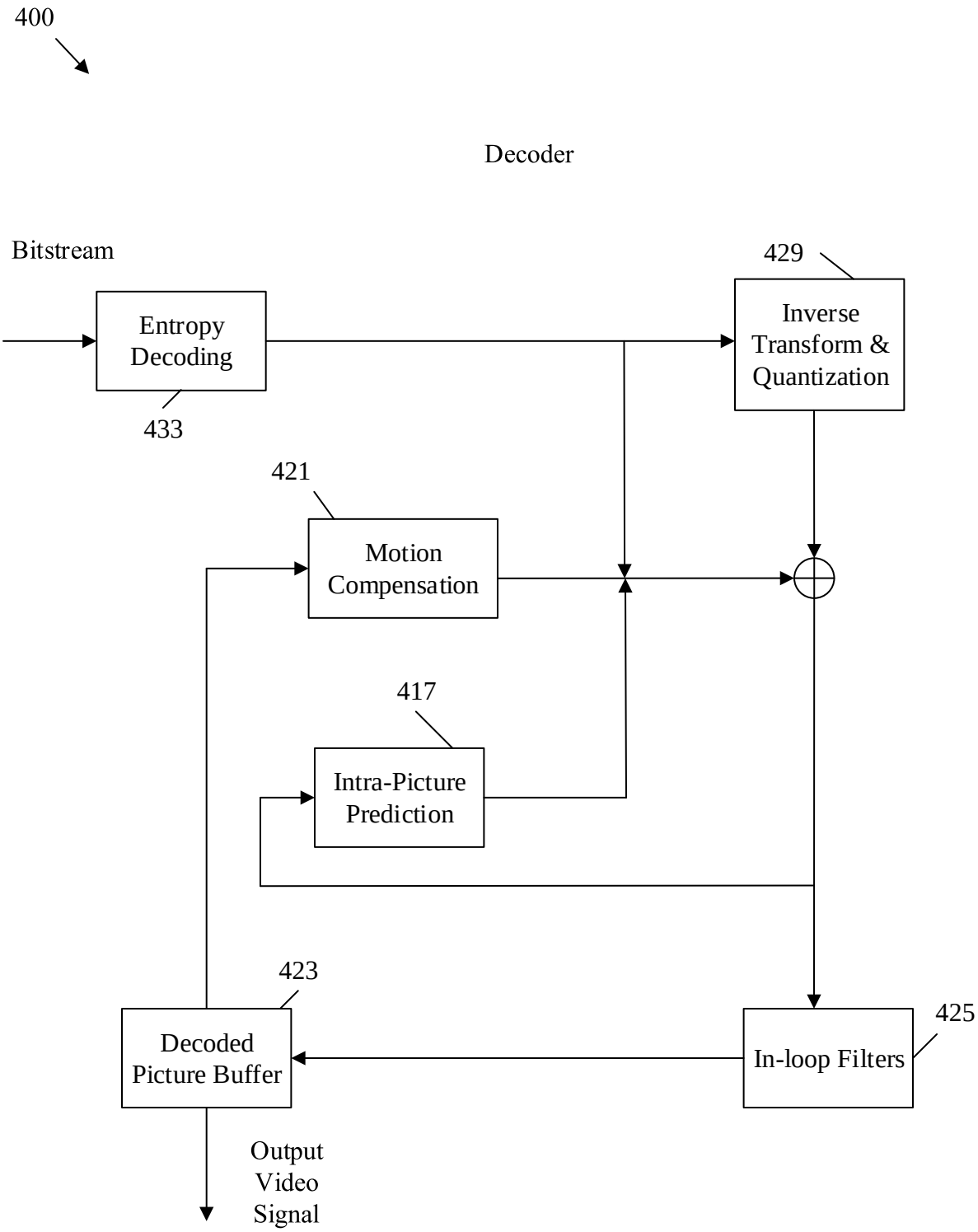

400
Decoder
Bitstream
Entropy Decoding
433
429
Inverse Transform & Quantization
421
Motion Compensation
417
Intra-Picture Prediction
423
Decoded Picture Buffer
425
In-loop Filters
Output Video Signal

FIG. 4

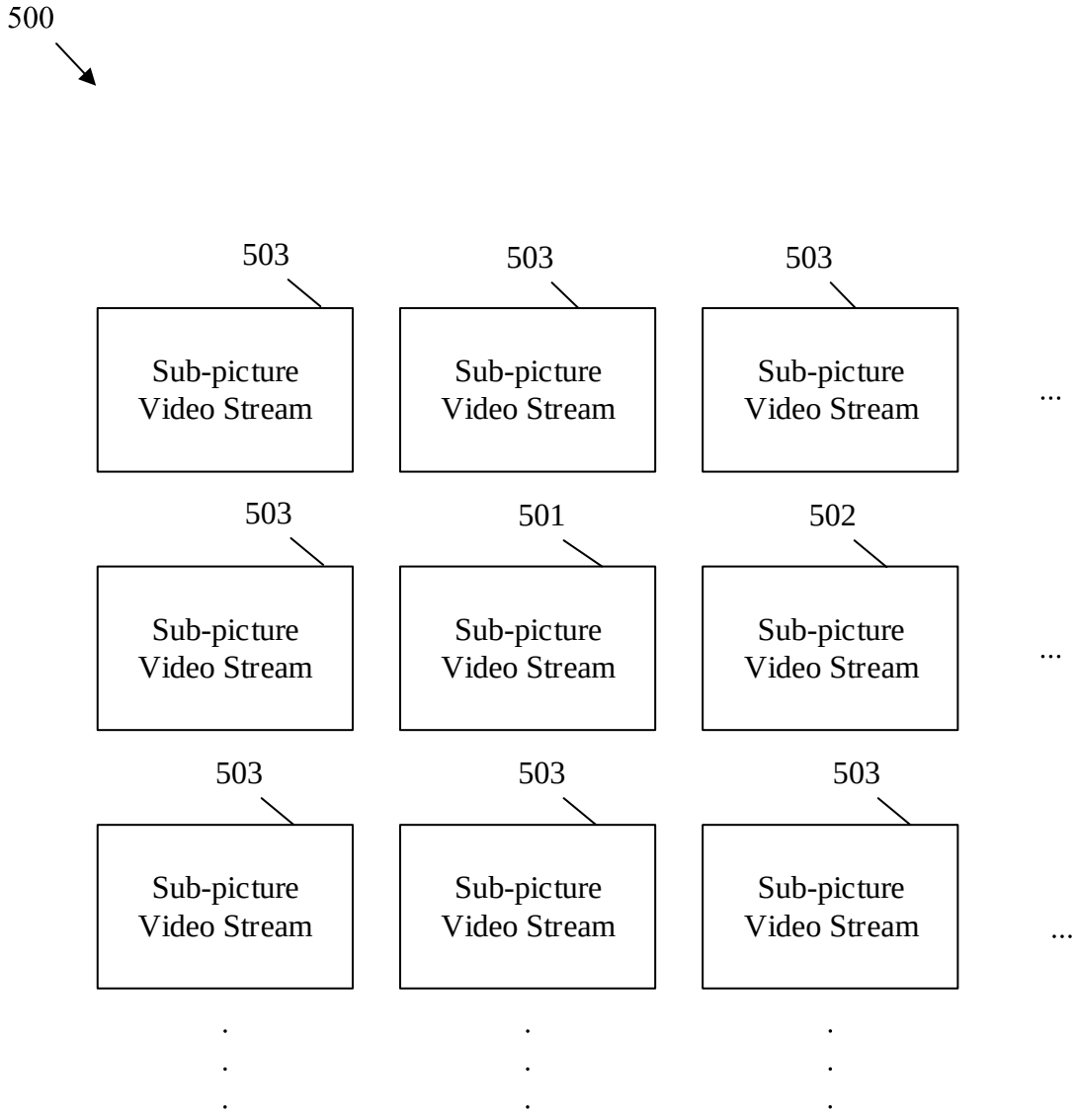

500
503
503
503
Sub-picture Video Stream
Sub-picture Video Stream
Sub-picture Video Stream
...
503
501
502
Sub-picture Video Stream
Sub-picture Video Stream
Sub-picture Video Stream
...
503
503
503
Sub-picture Video Stream
Sub-picture Video Stream
Sub-picture Video Stream
...

FIG. 5

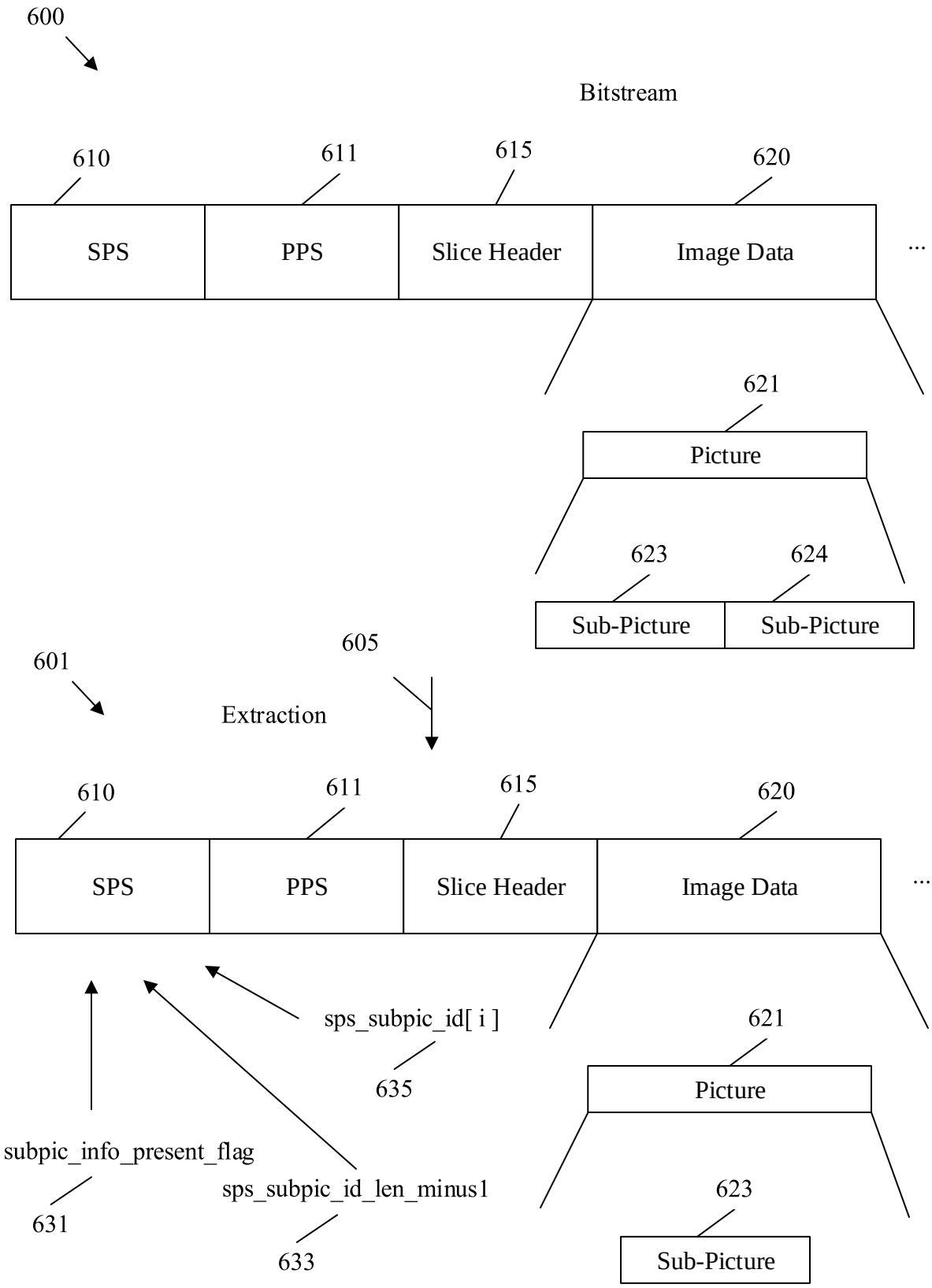

600
Bitstream
610
611
615
620
SPS
PPS
Slice Header
Image Data
...
621
Picture
623
624
Sub-Picture
Sub-Picture
605
601
Extraction
610
611
615
620
SPS
PPS
Slice Header
Image Data
...
sps_subpic_id[i]
635
621
Picture
subpic_info_present_flag
631
sps_subpic_id_len_minus1
633
623
Sub-Picture

FIG. 6

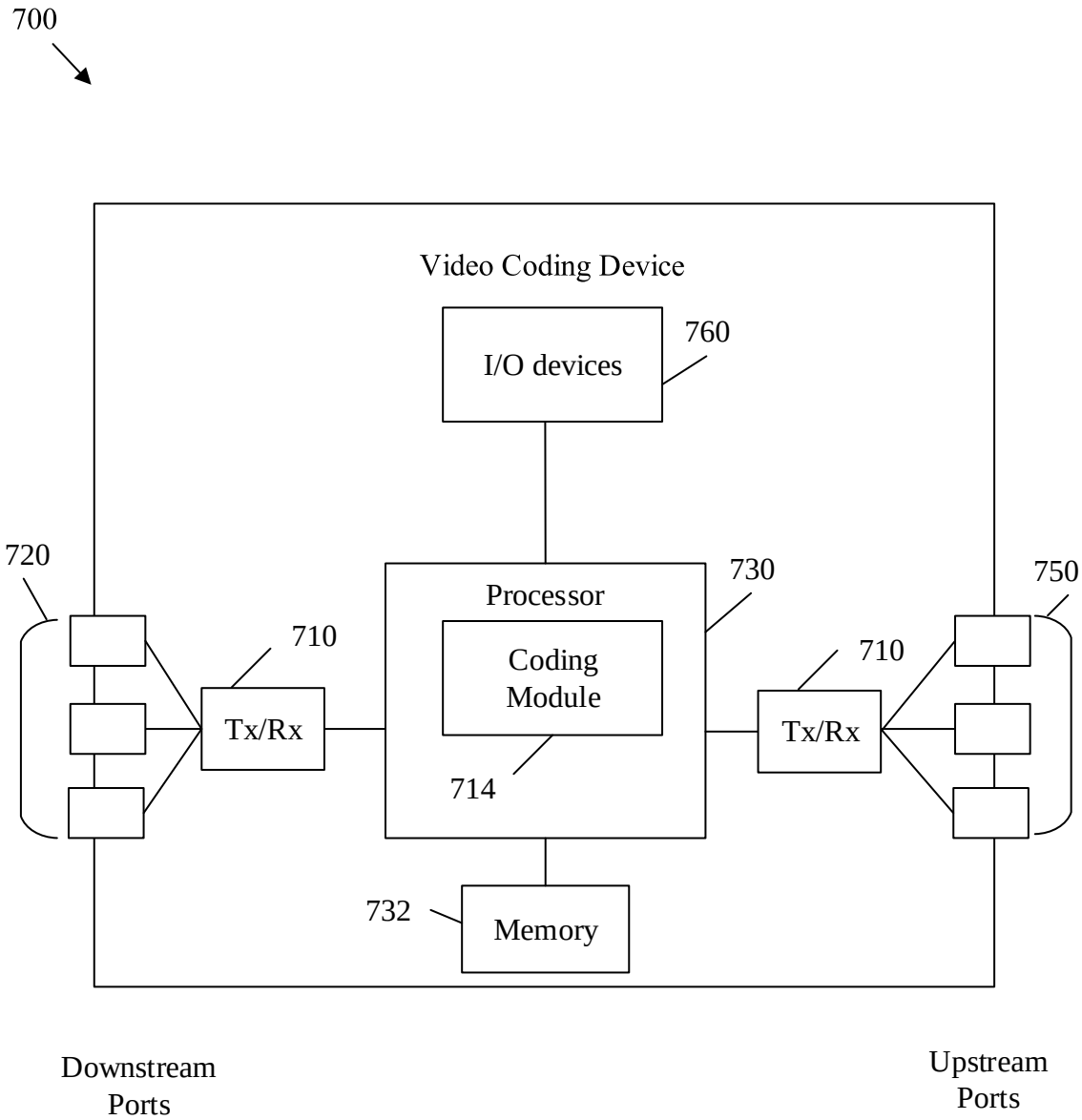

700
Video Coding Device
I/O devices
760
720
730
750
Processor
710
Coding
Module
710
Tx/Rx
Tx/Rx
714
732
Memory
Downstream
Ports
Upstream
Ports

FIG. 7

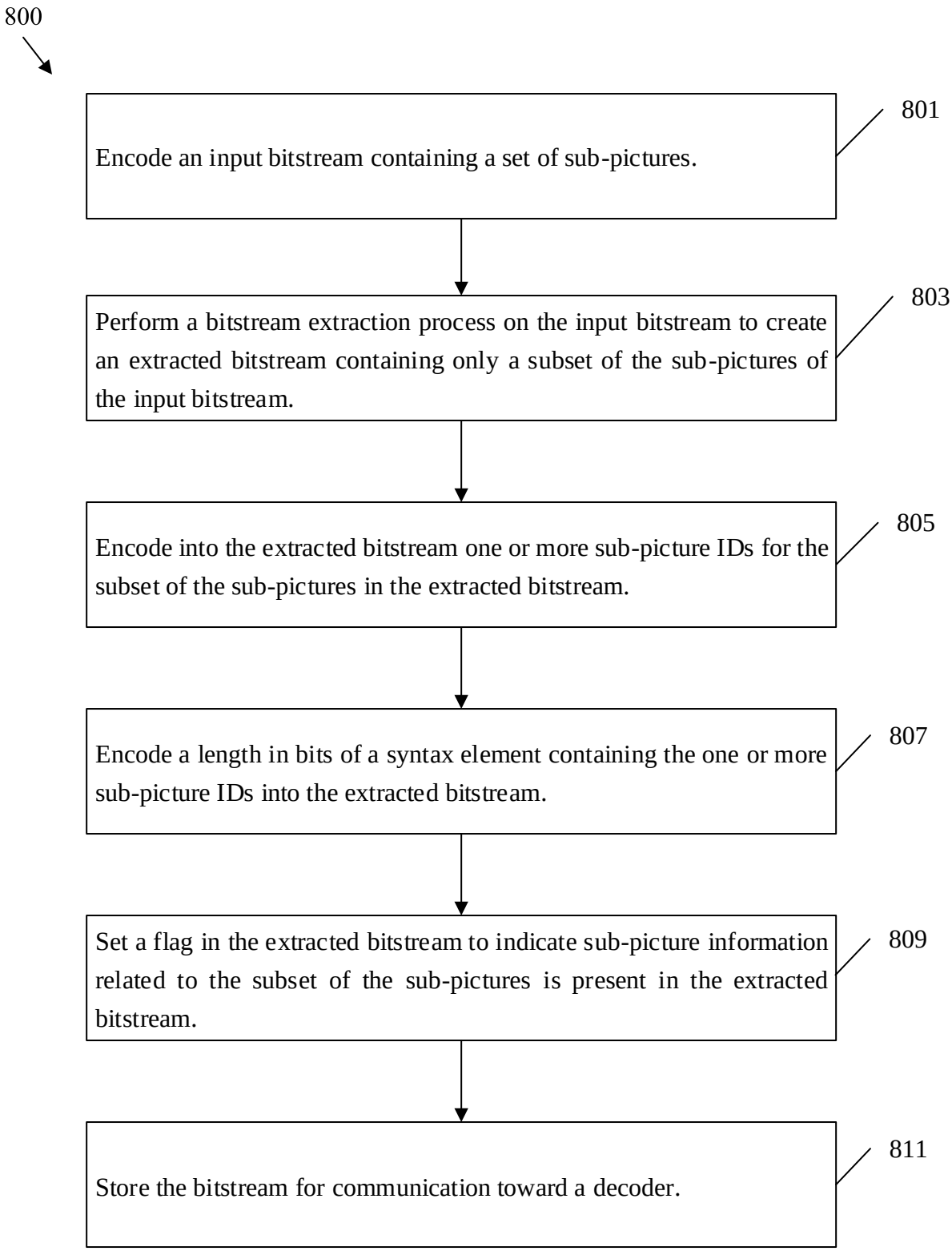

800
Encode an input bitstream containing a set of sub-pictures.
801
Perform a bitstream extraction process on the input bitstream to create an extracted bitstream containing only a subset of the sub-pictures of the input bitstream.
803
Encode into the extracted bitstream one or more sub-picture IDs for the subset of the sub-pictures in the extracted bitstream.
805
Encode a length in bits of a syntax element containing the one or more sub-picture IDs into the extracted bitstream.
807
Set a flag in the extracted bitstream to indicate sub-picture information related to the subset of the sub-pictures is present in the extracted bitstream.
809
Store the bitstream for communication toward a decoder.
811

FIG. 8

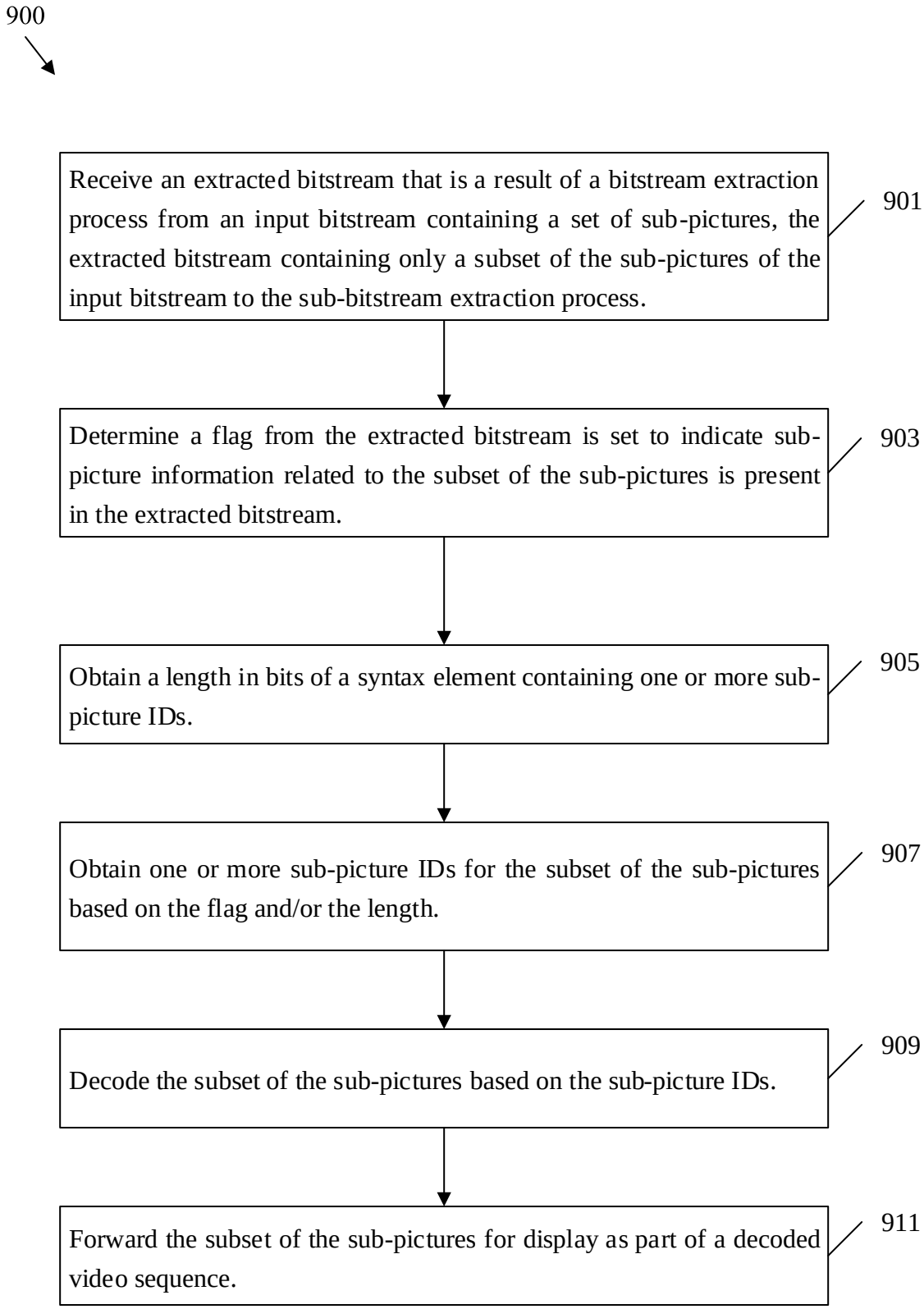

900
Receive an extracted bitstream that is a result of a bitstream extraction process from an input bitstream containing a set of sub-pictures, the extracted bitstream containing only a subset of the sub-pictures of the input bitstream to the sub-bitstream extraction process.
901
Determine a flag from the extracted bitstream is set to indicate sub-picture information related to the subset of the sub-pictures is present in the extracted bitstream.
903
Obtain a length in bits of a syntax element containing one or more sub-picture IDs.
905
Obtain one or more sub-picture IDs for the subset of the sub-pictures based on the flag and/or the length.
907
Decode the subset of the sub-pictures based on the sub-picture IDs.
909
Forward the subset of the sub-pictures for display as part of a decoded video sequence.
911

FIG. 9

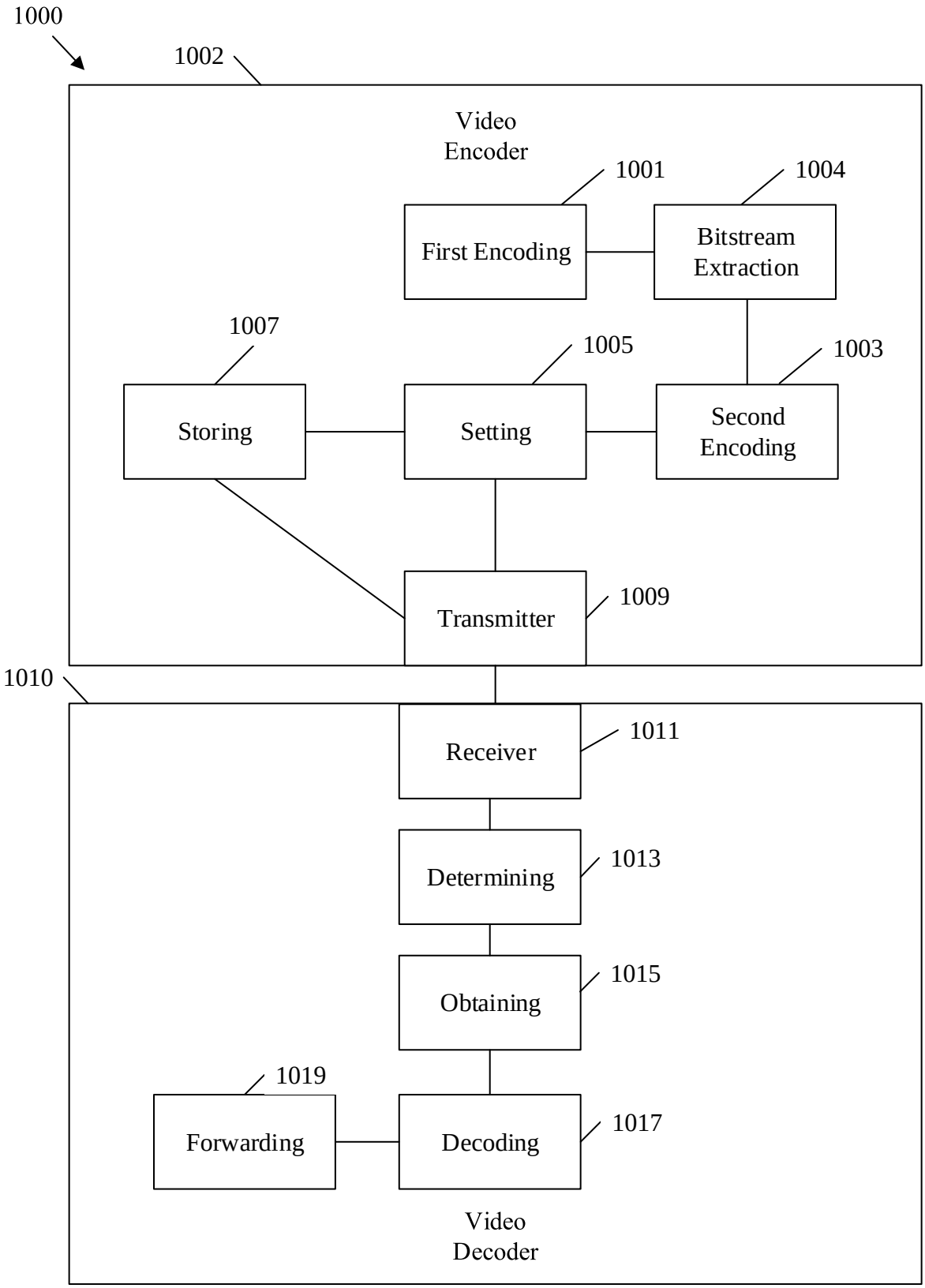

1000
1002
Video Encoder
1001
First Encoding
1004
Bitstream Extraction
1007
Storing
1005
Setting
1003
Second Encoding
Transmitter
1009
1010
Receiver
1011
Determining
1013
Obtaining
1015
1019
Forwarding
Decoding
1017
Video Decoder

FIG. 10