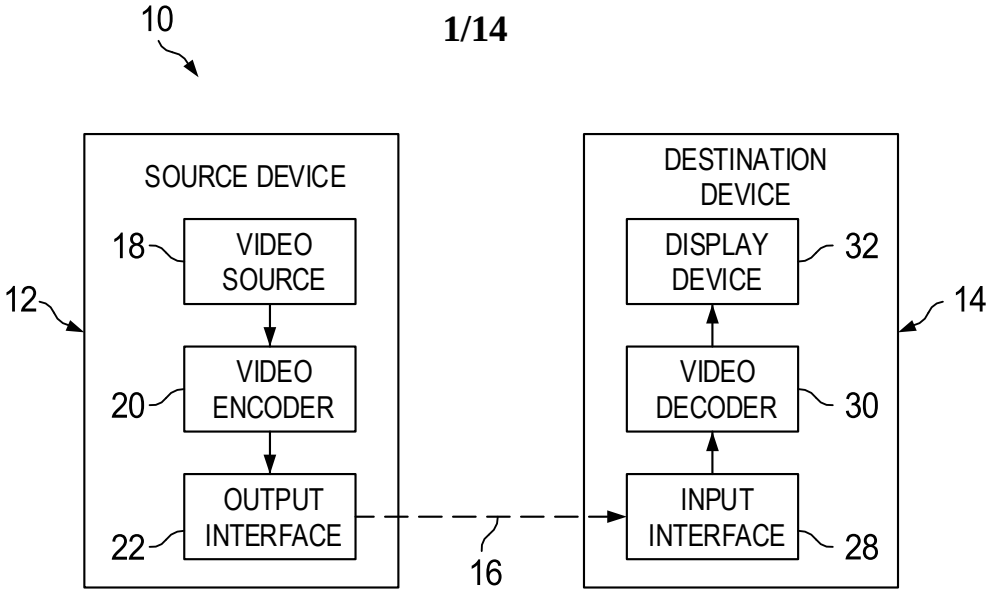
10
SOURCE DEVICE
18
VIDEO SOURCE
12
20
VIDEO ENCODER
22
OUTPUT INTERFACE
16
DESTINATION DEVICE
DISPLAY DEVICE
32
14
VIDEO DECODER
30
INPUT INTERFACE
28

FIG. 1

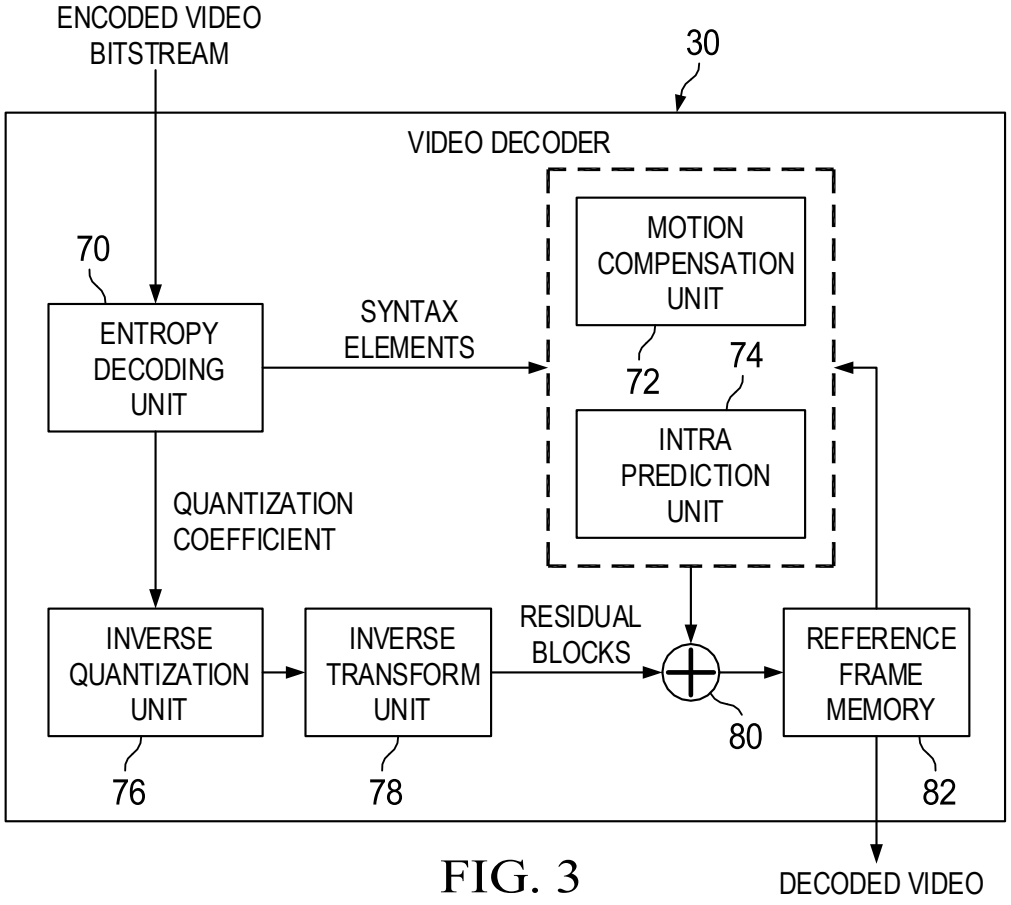
ENCODED VIDEO BITSTREAM
30
VIDEO DECODER
70
ENTROPY DECODING UNIT
SYNTAX ELEMENTS
MOTION COMPENSATION UNIT
72
74
INTRA PREDICTION UNIT
QUANTIZATION COEFFICIENT
INVERSE QUANTIZATION UNIT
INVERSE TRANSFORM UNIT
RESIDUAL BLOCKS
80
REFERENCE FRAME MEMORY
76
78
82
DECODED VIDEO

FIG. 3

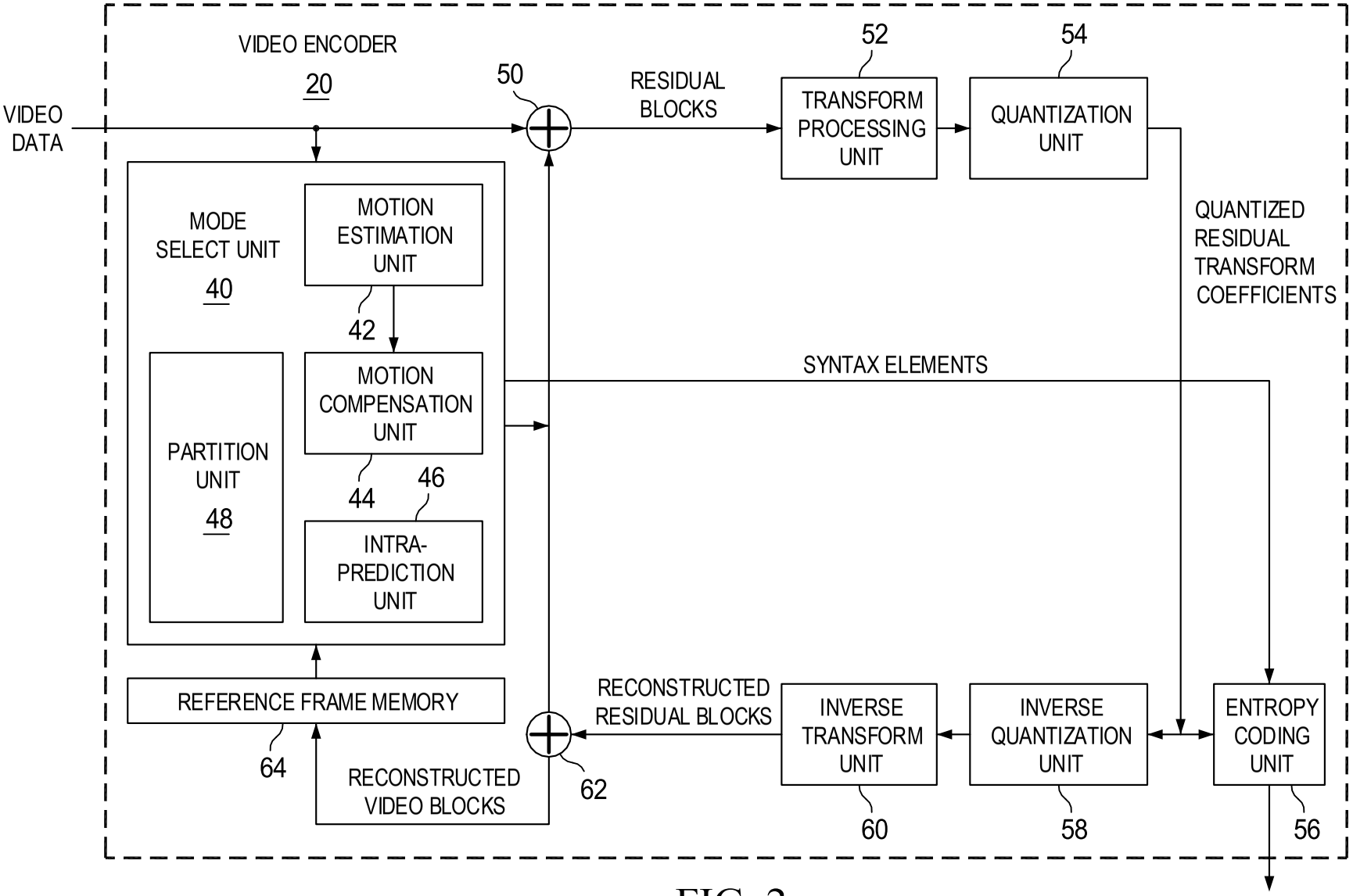
VIDEO ENCODER
20
VIDEO DATA
50
RESIDUAL BLOCKS
52
TRANSFORM PROCESSING UNIT
54
QUANTIZATION UNIT
QUANTIZED RESIDUAL TRANSFORM COEFFICIENTS
MODE SELECT UNIT
40
MOTION ESTIMATION UNIT
42
MOTION COMPENSATION UNIT
44
46
INTRA-PREDICTION UNIT
PARTITION UNIT
48
SYNTAX ELEMENTS
REFERENCE FRAME MEMORY
64
RECONSTRUCTED VIDEO BLOCKS
62
RECONSTRUCTED RESIDUAL BLOCKS
INVERSE TRANSFORM UNIT
60
INVERSE QUANTIZATION UNIT
58
ENTROPY CODING UNIT
56

FIG. 2

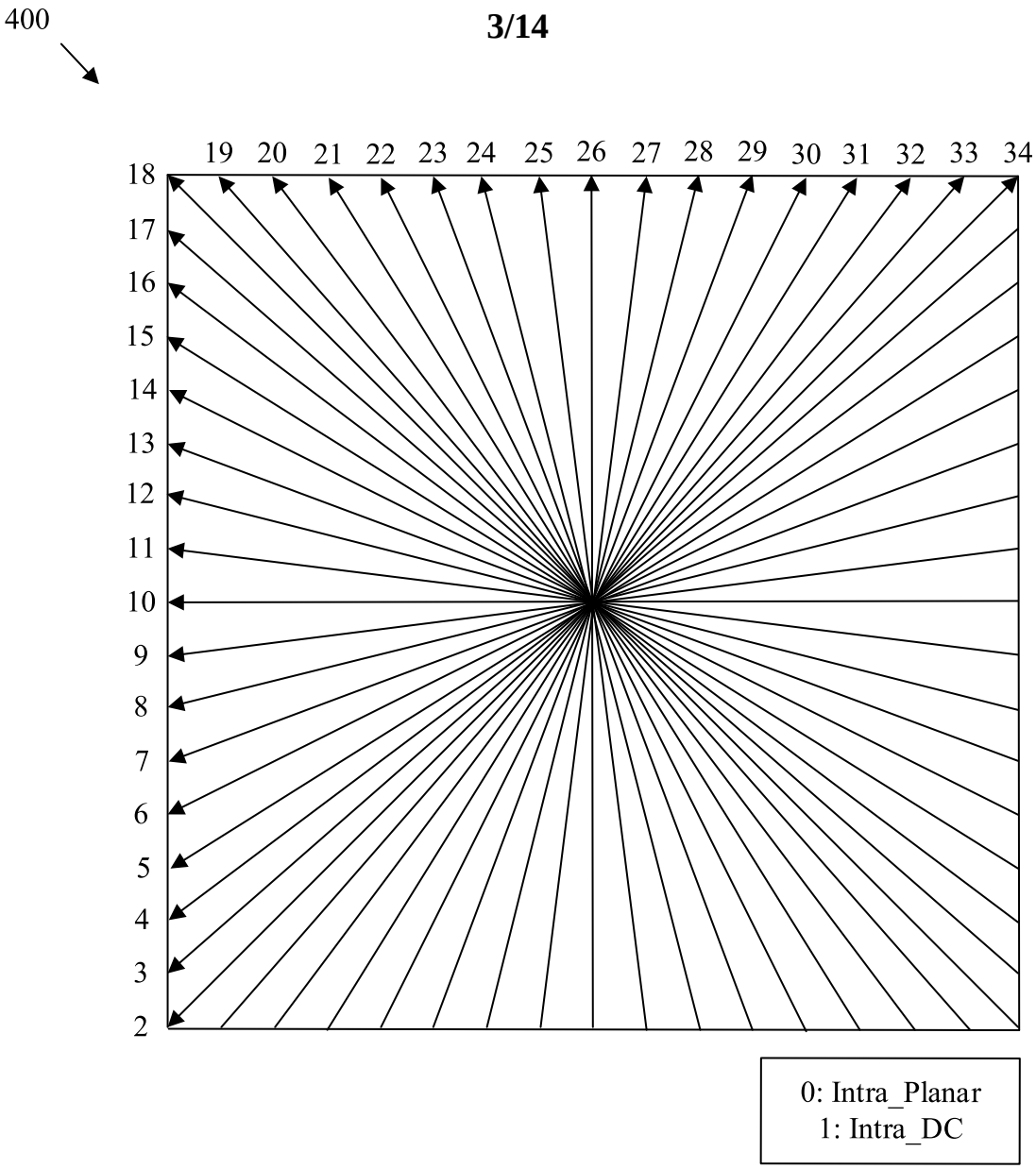
400
19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
0: Intra_Planar
1: Intra_DC

FIG. 4

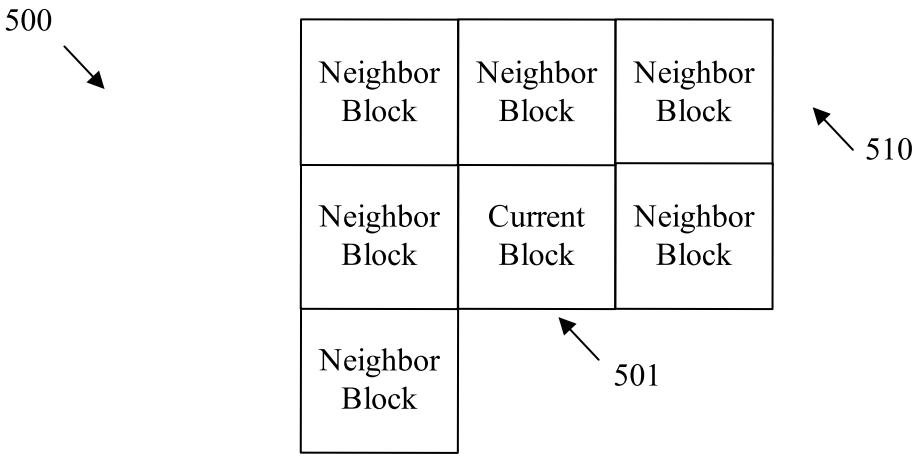
500
Neighbor Block
Neighbor Block
Neighbor Block
Neighbor Block
Current Block
Neighbor Block
Neighbor Block
510
501

FIG. 5

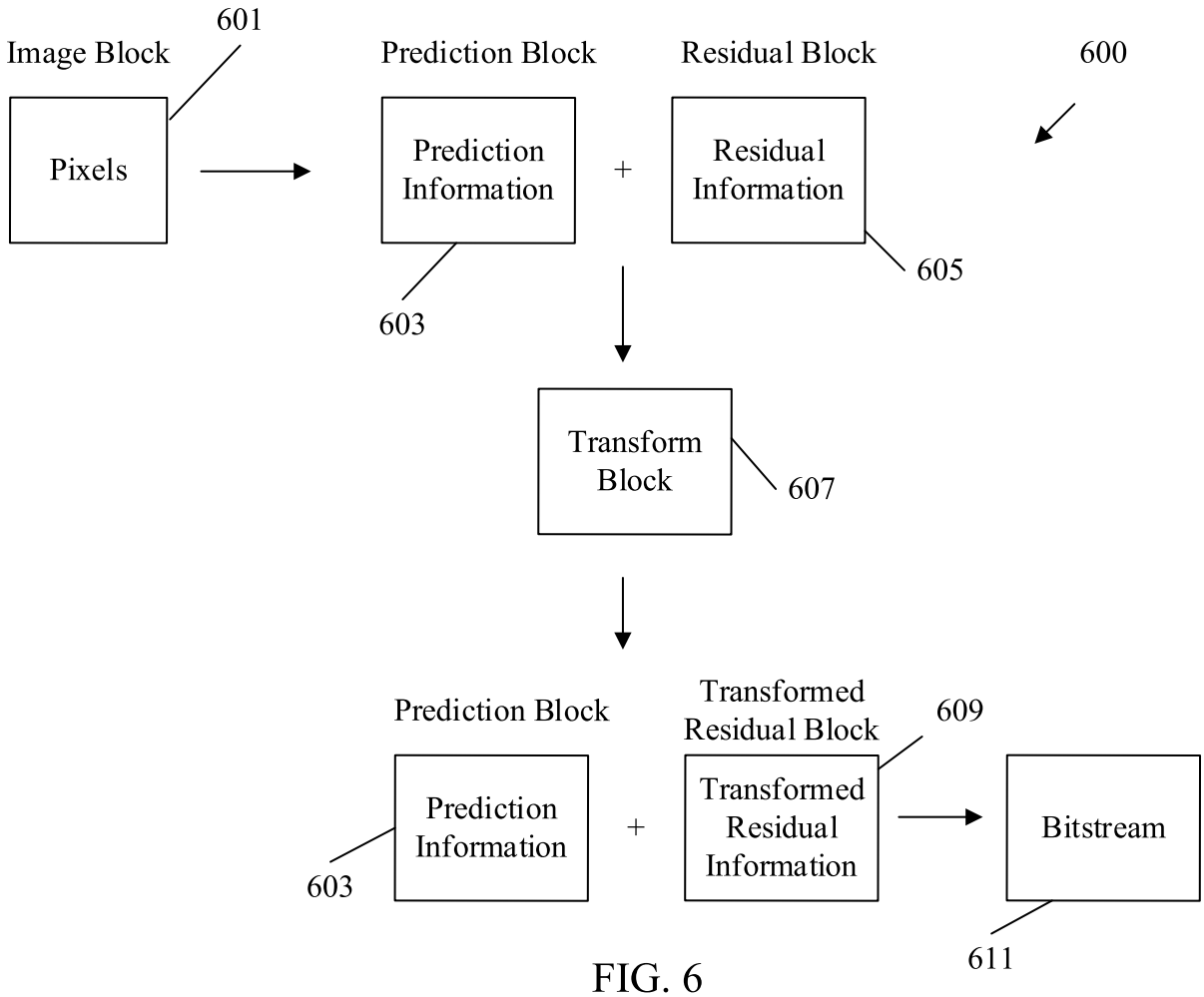
601
Image Block
Pixels
Prediction Block
Prediction Information
603
+
Residual Block
Residual Information
605
600
Transform Block
607
Prediction Block
Prediction Information
603
+
Transformed Residual Block
609
Transformed Residual Information
Bitstream
611

FIG. 6

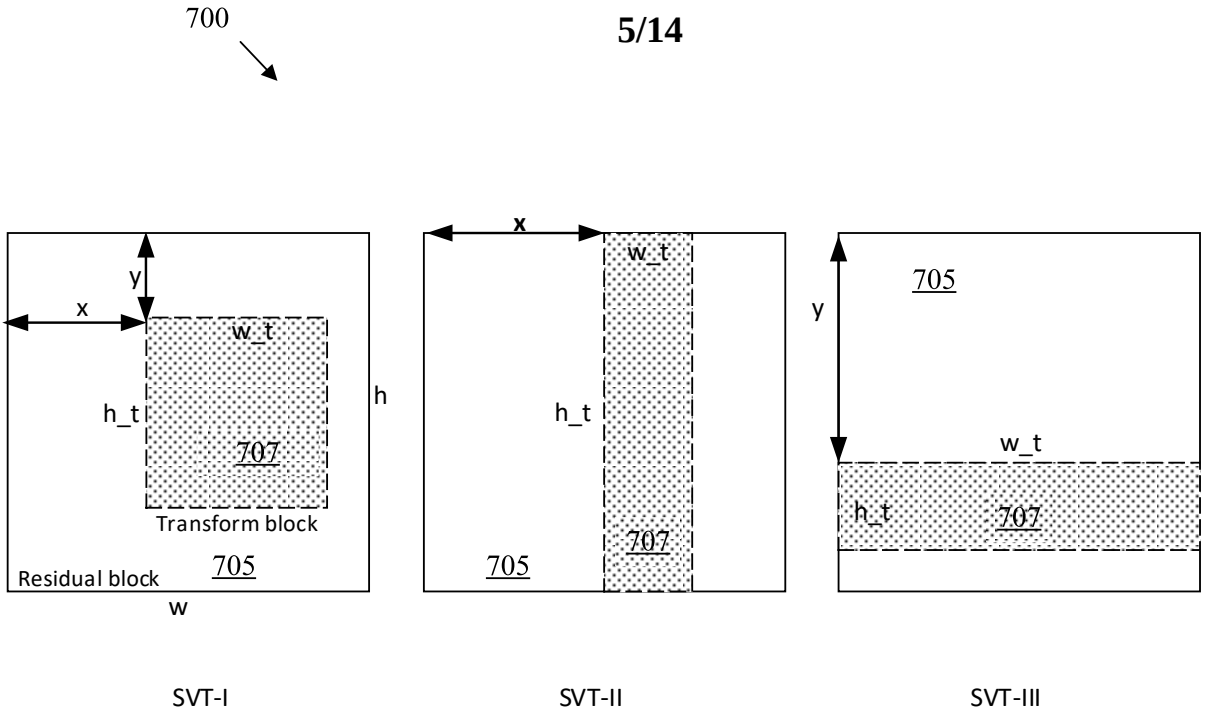
700
y
x
w_t
h_t
707
Transform block
Residual block
705
h
w
x
w_t
h_t
705
707
705
y
w_t
h_t
707
SVT-I
SVT-II
SVT-III

FIG. 7

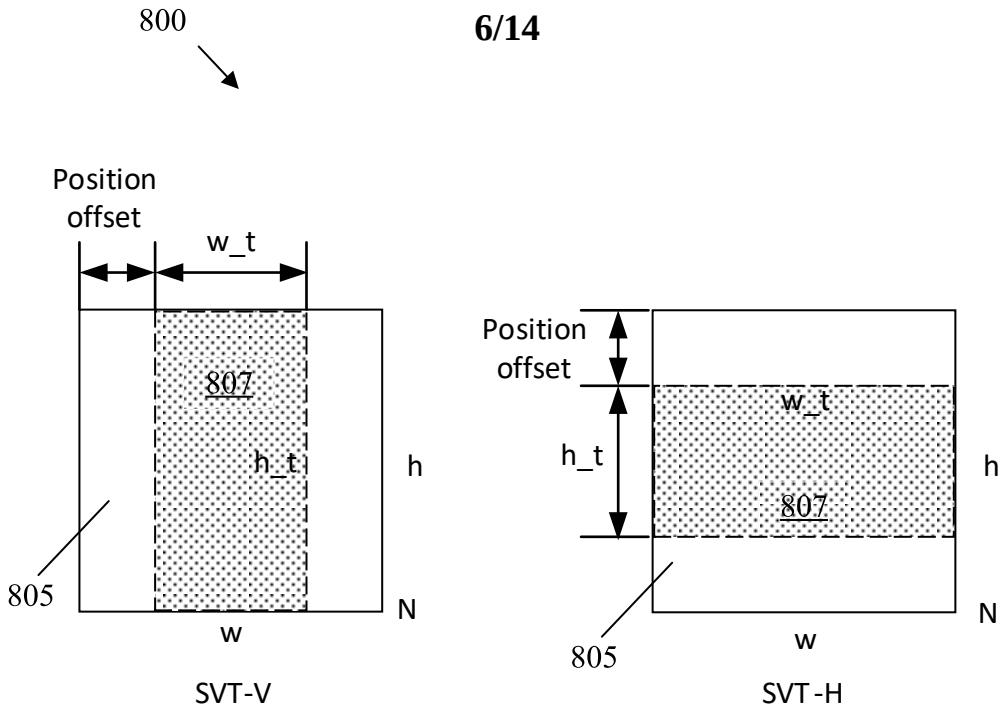
800
Position offset
w_t
807
h_t
h
805
N
w
SVT-V
Position offset
w_t
h_t
807
h
N
805
w
SVT-H

FIG. 8

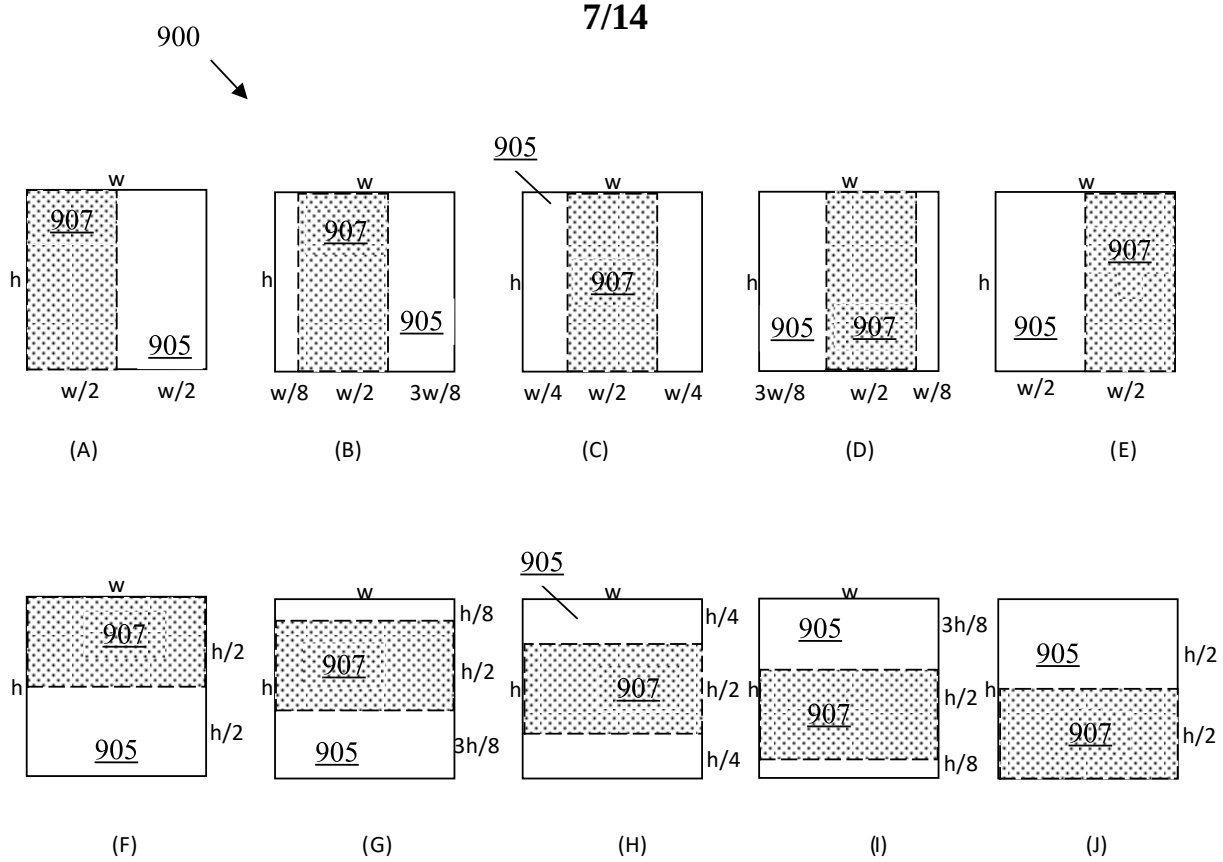
900
905
w
h
907
905
w/2
w/2
(A)
w/8
3w/8
(B)
w/4
(C)
3w/8
(D)
(E)
h/2
h/8
3h/8
h/4
3h/8
(F)
(G)
(H)
(I)
(J)

FIG. 9

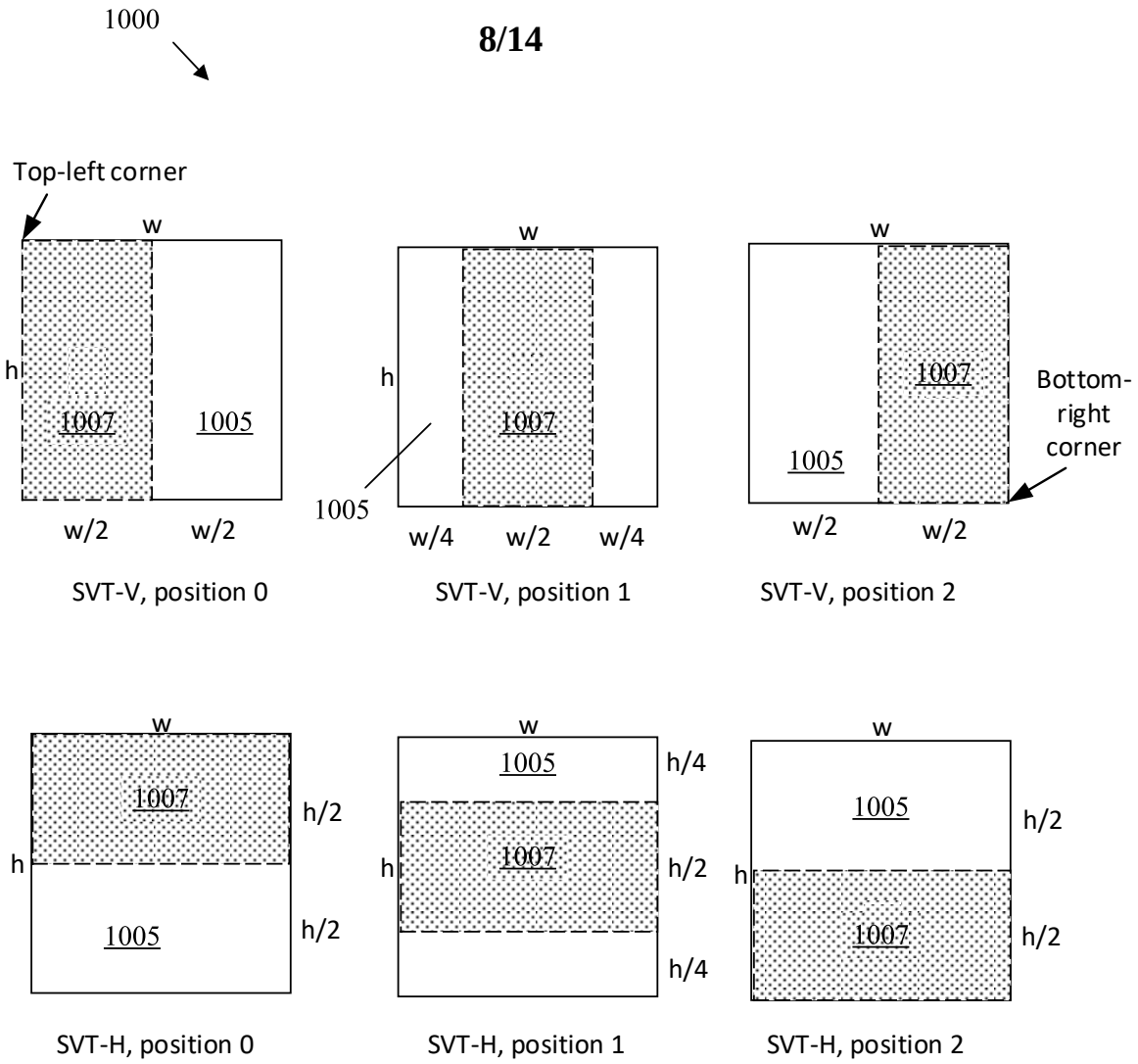
1000
Top-left corner
w
h
1007
1005
w/2
w/2
SVT-V, position 0
w
h
1007
1005
w/4
w/2
w/4
SVT-V, position 1
w
1007
1005
Bottom-right corner
w/2
w/2
SVT-V, position 2
w
1007
h/2
h
1005
h/2
SVT-H, position 0
w
1005
h/4
h
1007
h/2
h/4
SVT-H, position 1
w
1005
h/2
h
1007
h/2
SVT-H, position 2

FIG. 10

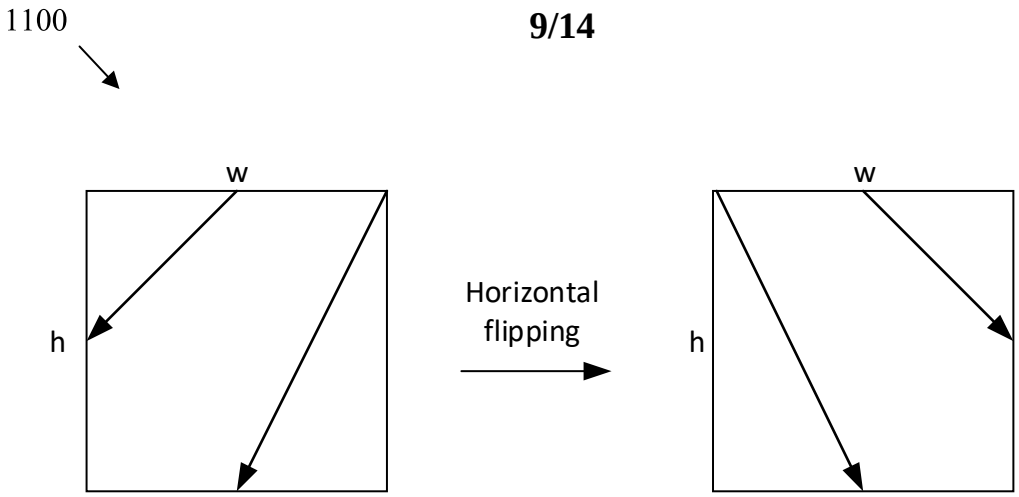

FIG. 11

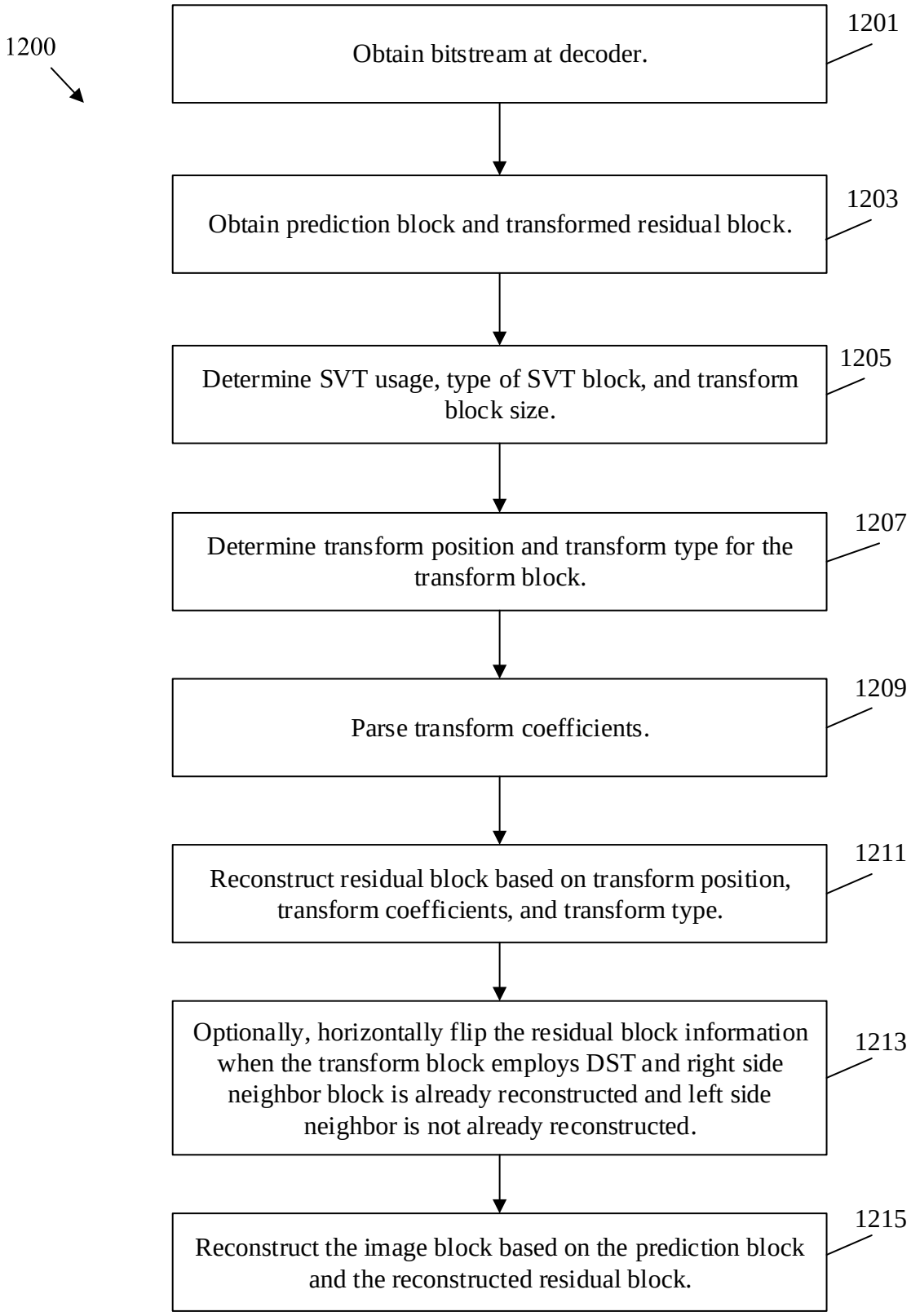
1200
Obtain bitstream at decoder.
1201
Obtain prediction block and transformed residual block.
1203
Determine SVT usage, type of SVT block, and transform block size.
1205
Determine transform position and transform type for the transform block.
1207
Parse transform coefficients.
1209
Reconstruct residual block based on transform position, transform coefficients, and transform type.
1211
Optionally, horizontally flip the residual block information when the transform block employs DST and right side neighbor block is already reconstructed and left side neighbor is not already reconstructed.
1213
Reconstruct the image block based on the prediction block and the reconstructed residual block.
1215

FIG. 12

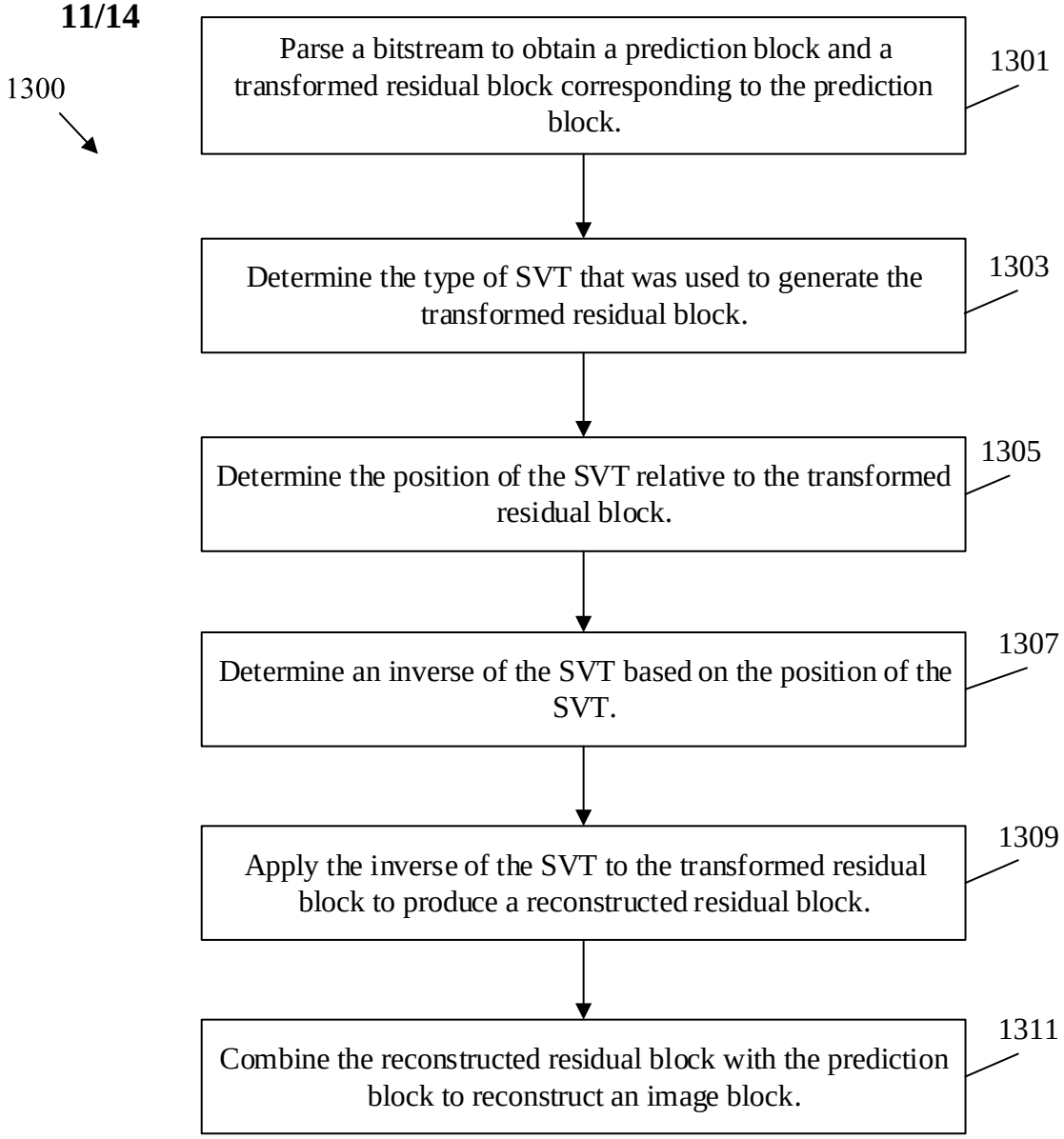
1300
Parse a bitstream to obtain a prediction block and a transformed residual block corresponding to the prediction block.
1301
Determine the type of SVT that was used to generate the transformed residual block.
1303
Determine the position of the SVT relative to the transformed residual block.
1305
Determine an inverse of the SVT based on the position of the SVT.
1307
Apply the inverse of the SVT to the transformed residual block to produce a reconstructed residual block.
1309
Combine the reconstructed residual block with the prediction block to reconstruct an image block.
1311

FIG. 13

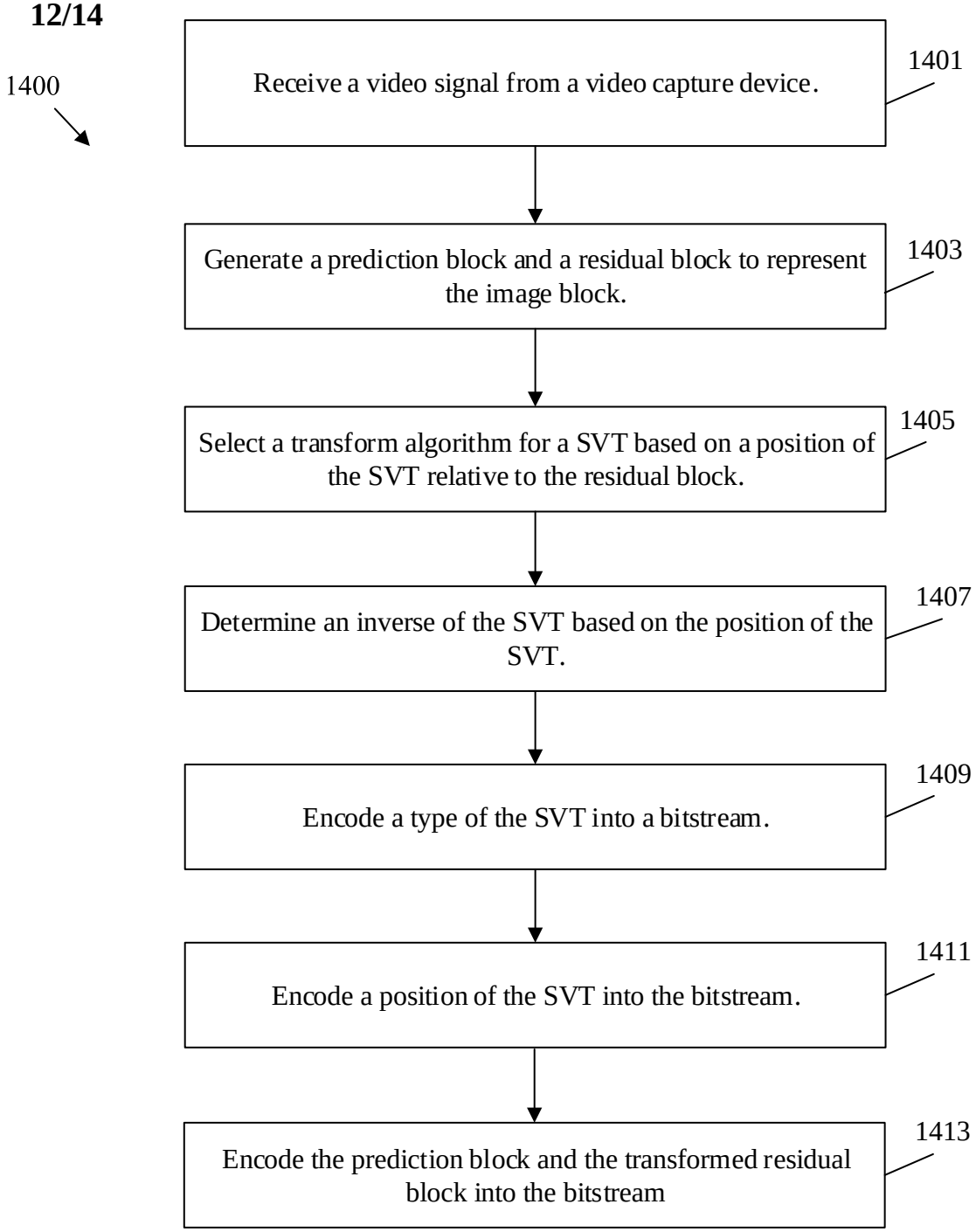
1400
Receive a video signal from a video capture device.
1401
Generate a prediction block and a residual block to represent the image block.
1403
Select a transform algorithm for a SVT based on a position of the SVT relative to the residual block.
1405
Determine an inverse of the SVT based on the position of the SVT.
1407
Encode a type of the SVT into a bitstream.
1409
Encode a position of the SVT into the bitstream.
1411
Encode the prediction block and the transformed residual block into the bitstream
1413

FIG. 14

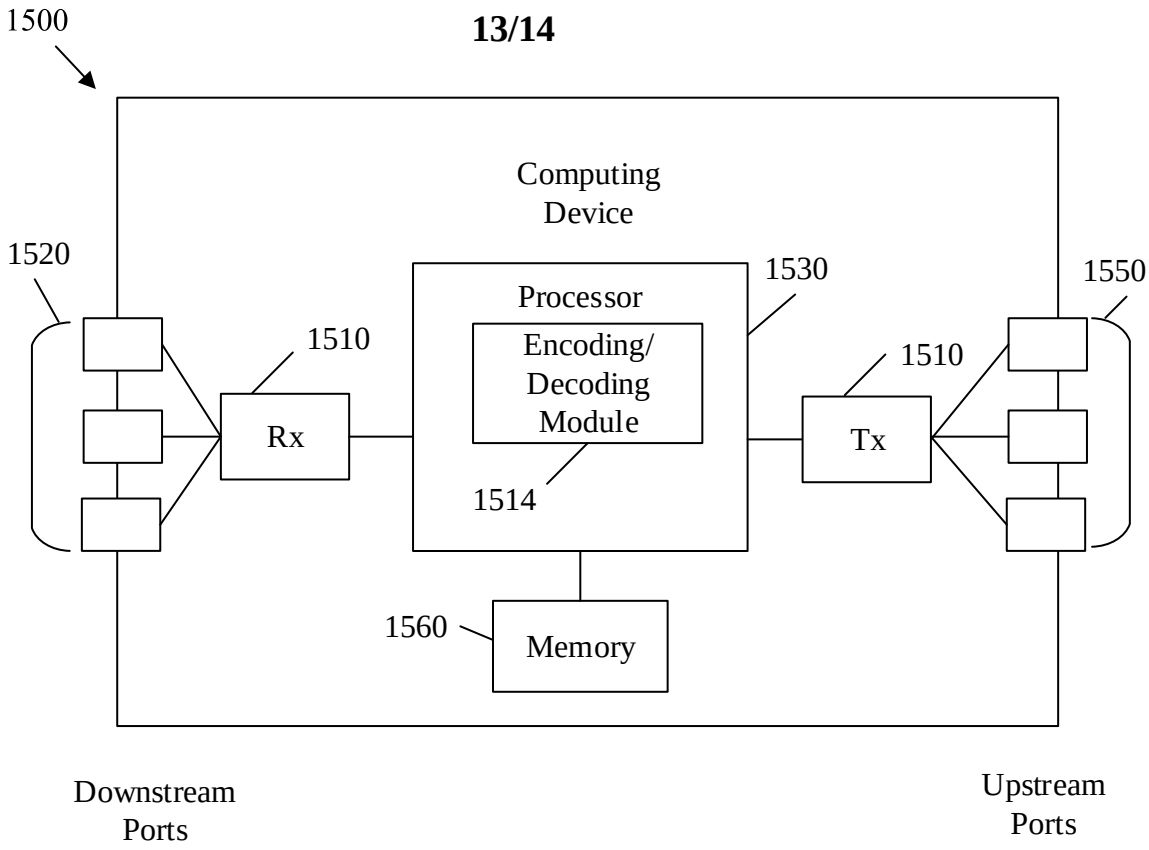
1500
Computing Device
1520
1530
1550
Processor
1510
Encoding/ Decoding Module
1510
Rx
Tx
1514
1560
Memory
Downstream Ports
Upstream Ports

FIG. 15

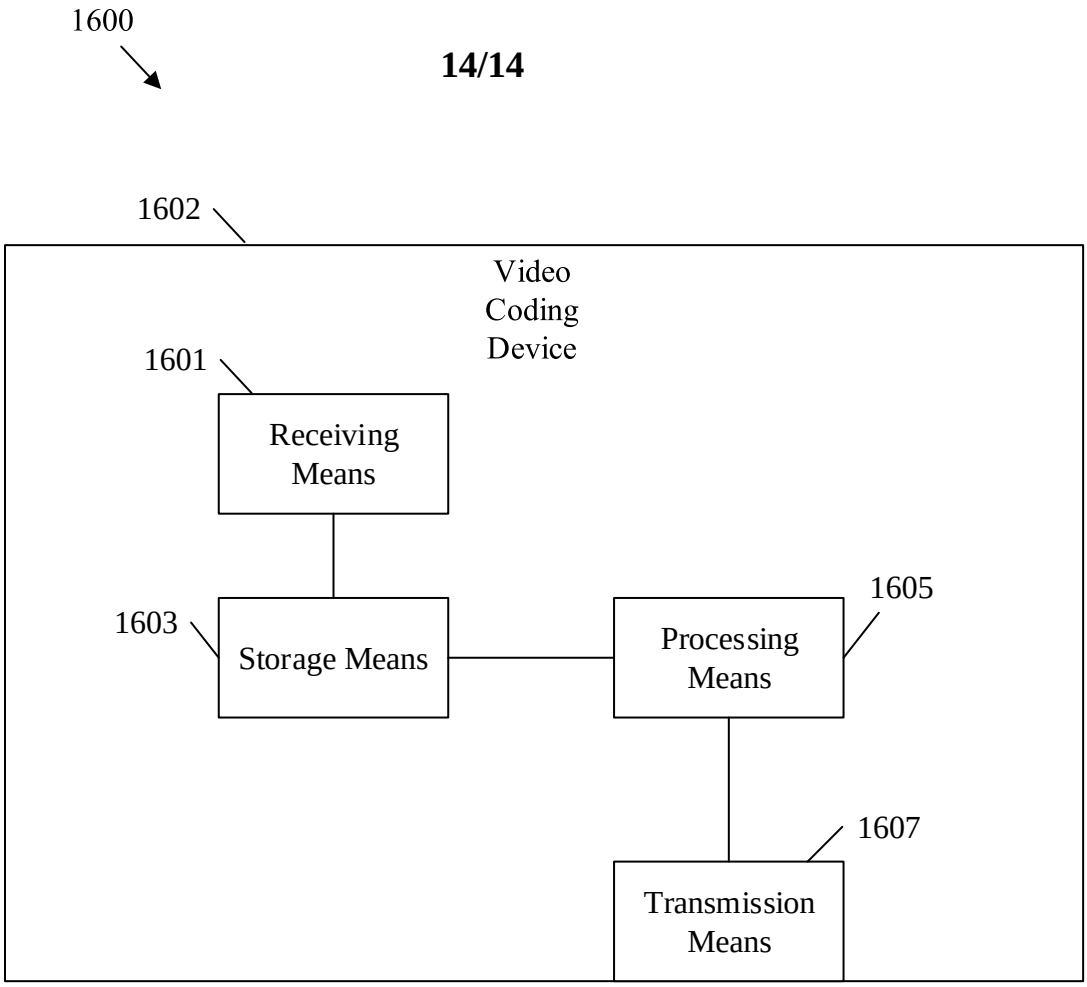
1600
1602
Video
Coding
Device
1601
Receiving
Means
1603
Storage Means
Processing
Means
1605
1607
Transmission
Means

FIG. 16