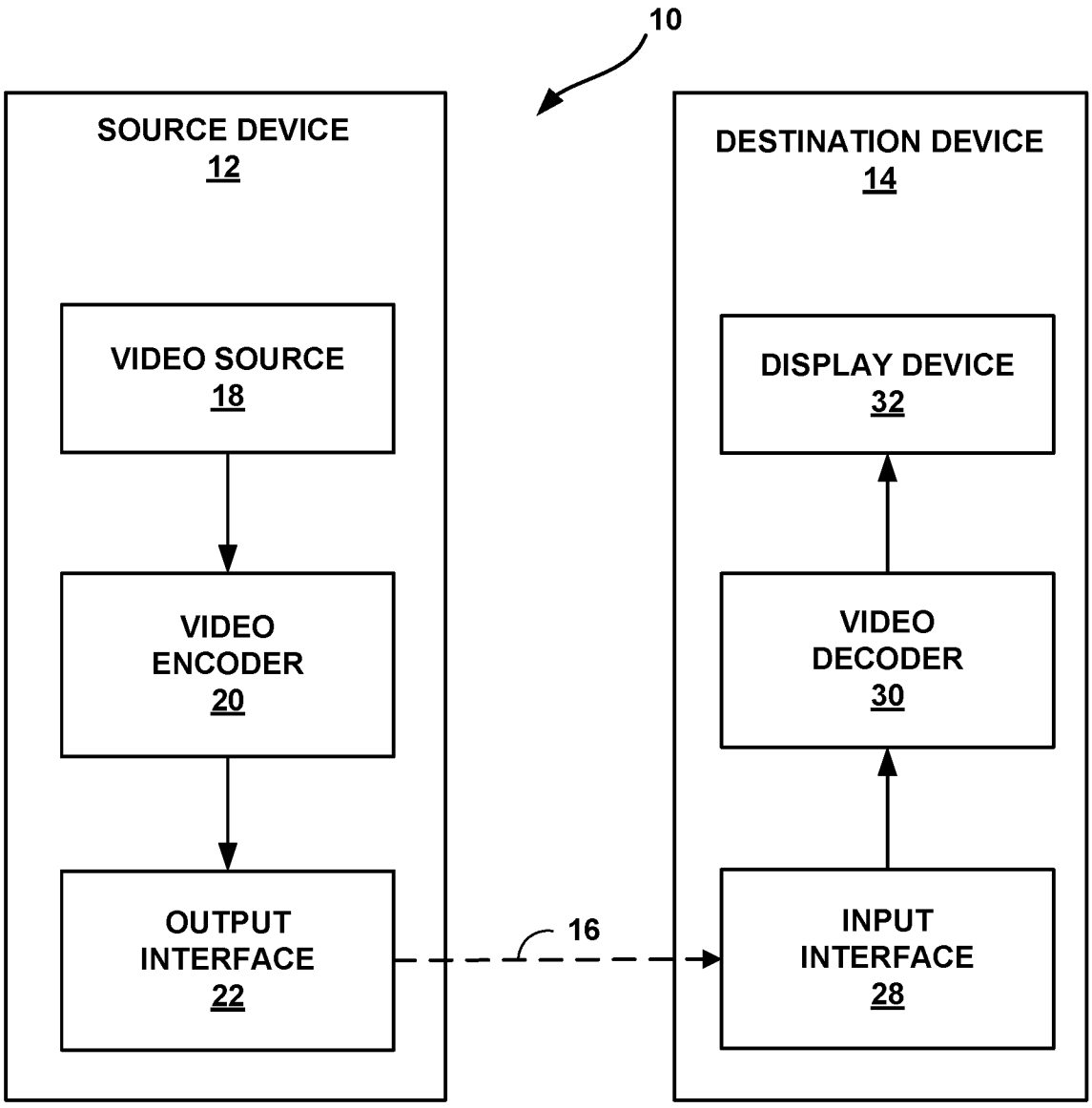
10
SOURCE DEVICE
12
VIDEO SOURCE
18
VIDEO
ENCODER
20
OUTPUT
INTERFACE
22
16
DESTINATION DEVICE
14
DISPLAY DEVICE
32
VIDEO
DECODER
30
INPUT
INTERFACE
28

FIG. 1

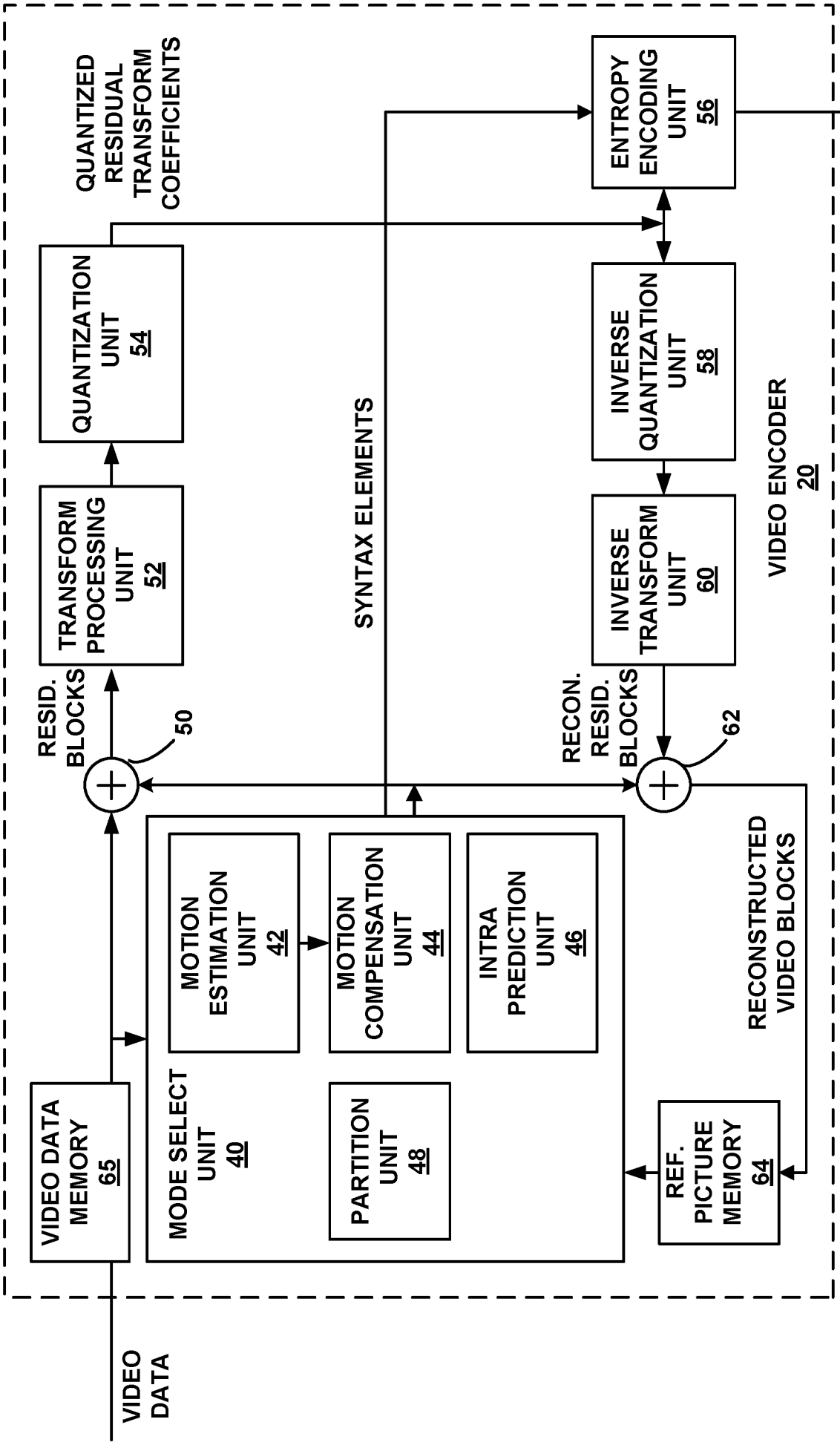
VIDEO DATA
VIDEO DATA MEMORY 65
MODE SELECT UNIT 40
MOTION ESTIMATION UNIT 42
MOTION COMPENSATION UNIT 44
INTRA PREDICTION UNIT 46
PARTITION UNIT 48
REF. PICTURE MEMORY 64
RESID. BLOCKS
50
TRANSFORM PROCESSING UNIT 52
QUANTIZATION UNIT 54
QUANTIZED RESIDUAL TRANSFORM COEFFICIENTS
SYNTAX ELEMENTS
ENTROPY ENCODING UNIT 56
INVERSE QUANTIZATION UNIT 58
INVERSE TRANSFORM UNIT 60
RECON. RESID. BLOCKS
62
RECONSTRUCTED VIDEO BLOCKS
VIDEO ENCODER 20

FIG. 2

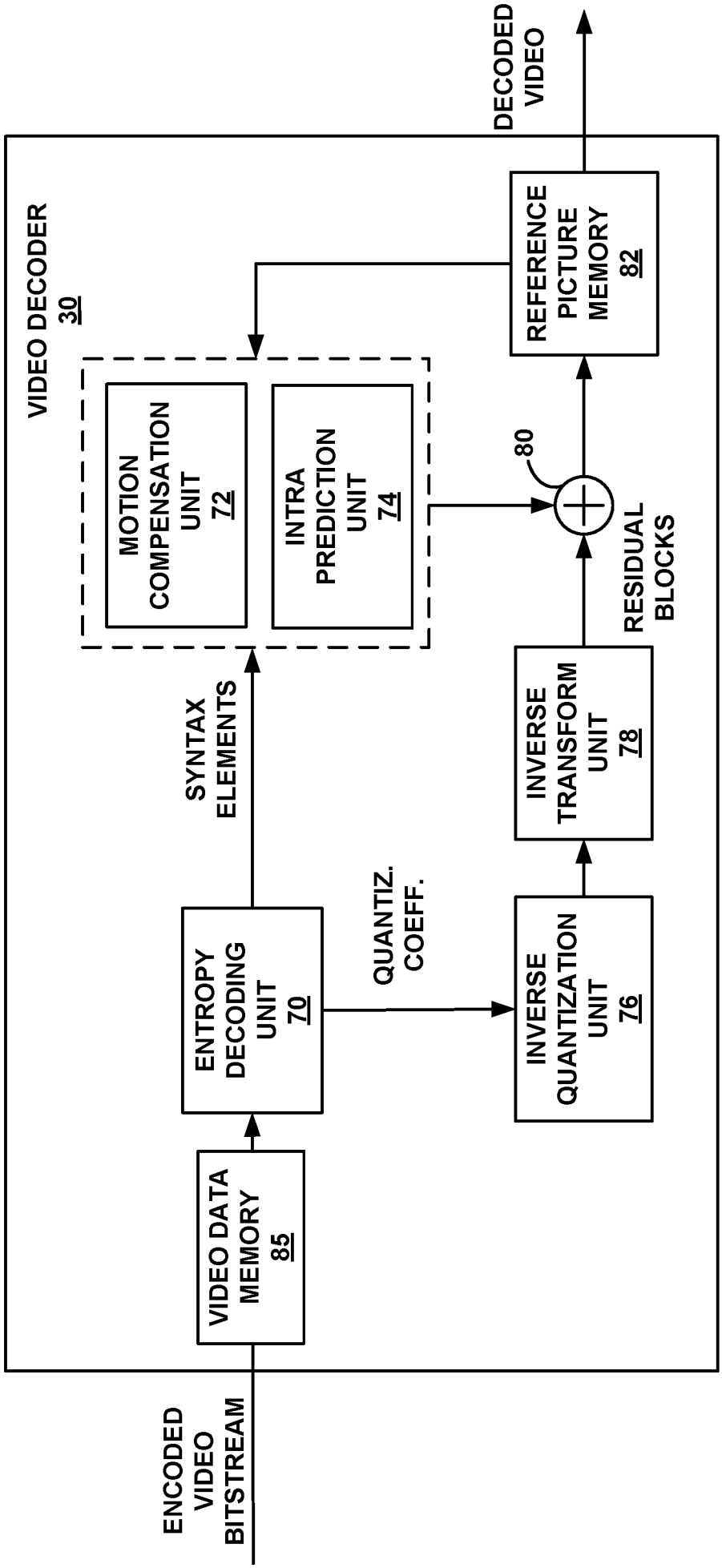
DECODED VIDEO
VIDEO DECODER 30
REFERENCE PICTURE MEMORY 82
MOTION COMPENSATION UNIT 72
INTRA PREDICTION UNIT 74
80
RESIDUAL BLOCKS
INVERSE TRANSFORM UNIT 78
SYNTAX ELEMENTS
QUANTIZ. COEFF.
ENTROPY DECODING UNIT 70
INVERSE QUANTIZATION UNIT 76
VIDEO DATA MEMORY 85
ENCODED VIDEO BITSTREAM

FIG. 3

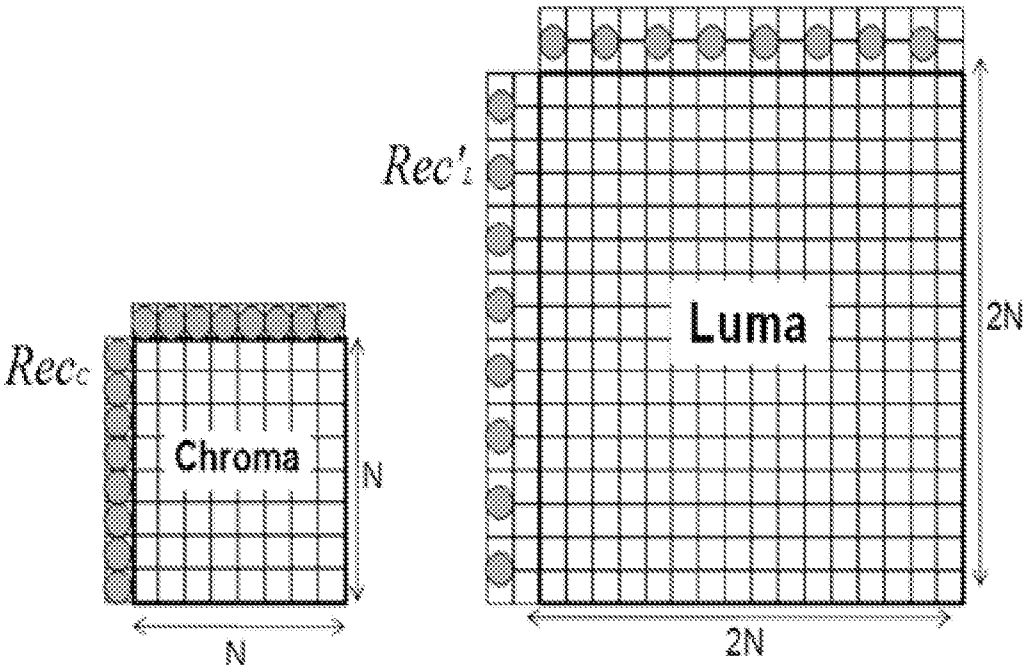

FIG. 4

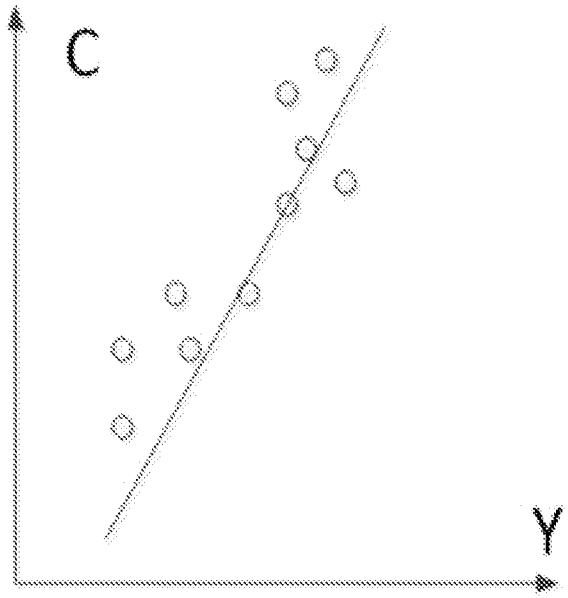

FIG. 5

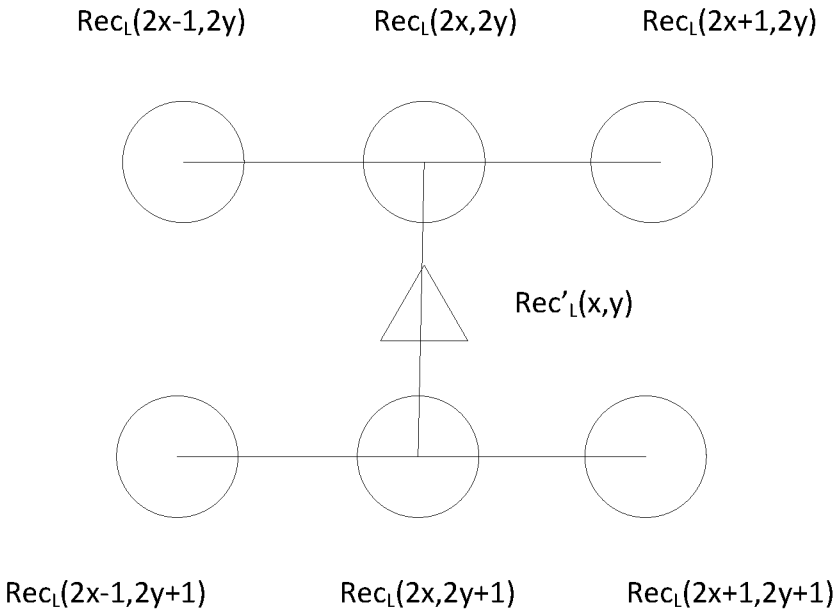
Rec$_L$(2x-1,2y)
Rec$_L$(2x,2y)
Rec$_L$(2x+1,2y)
Rec'$_L$(x,y)
Rec$_L$(2x-1,2y+1)
Rec$_L$(2x,2y+1)
Rec$_L$(2x+1,2y+1)

FIG. 6

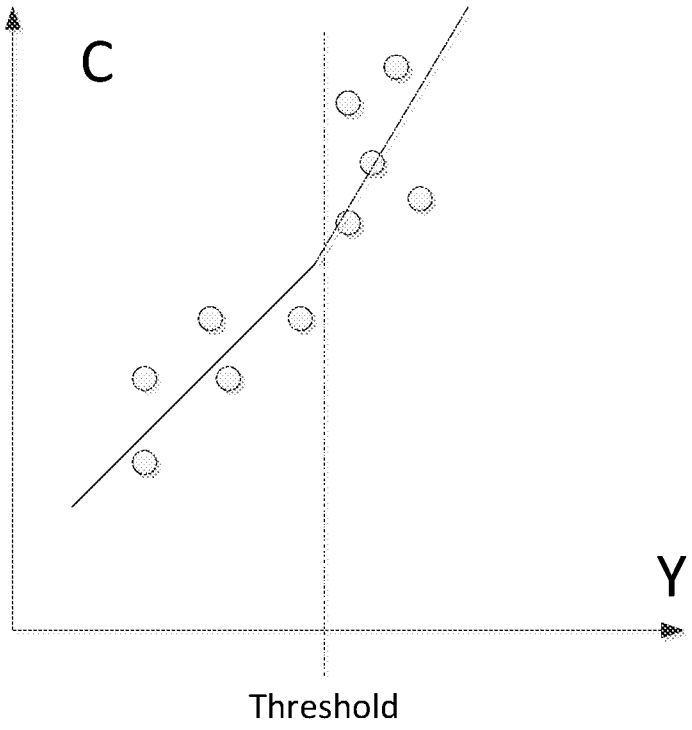
C
Y
Threshold

FIG. 7A

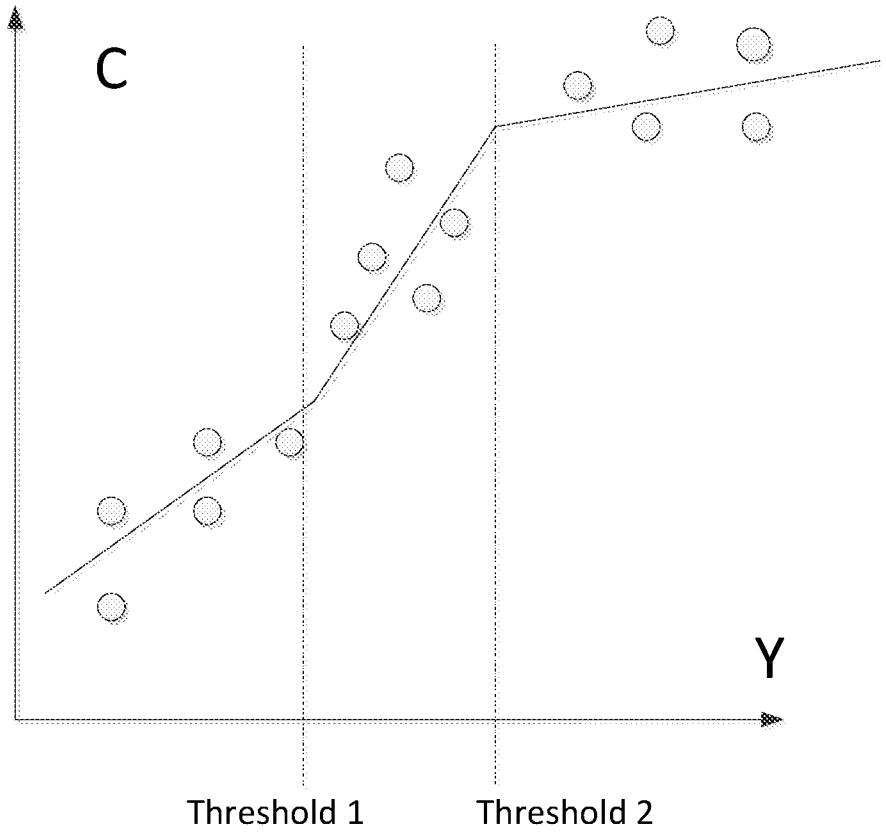

FIG. 7B

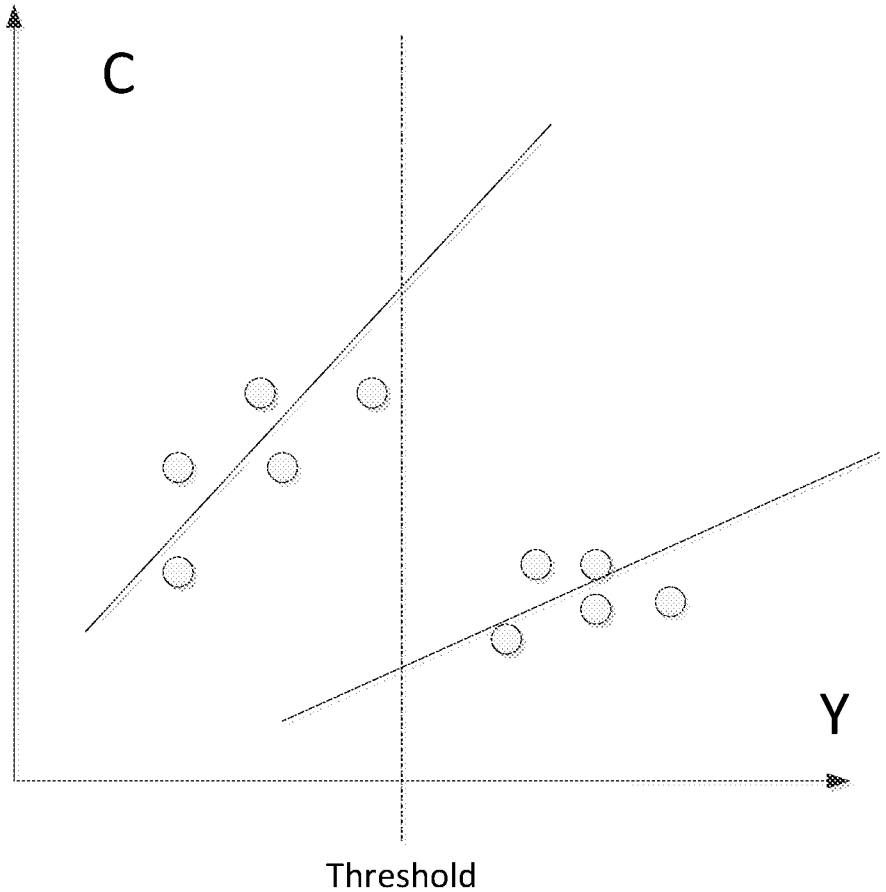

FIG. 7C

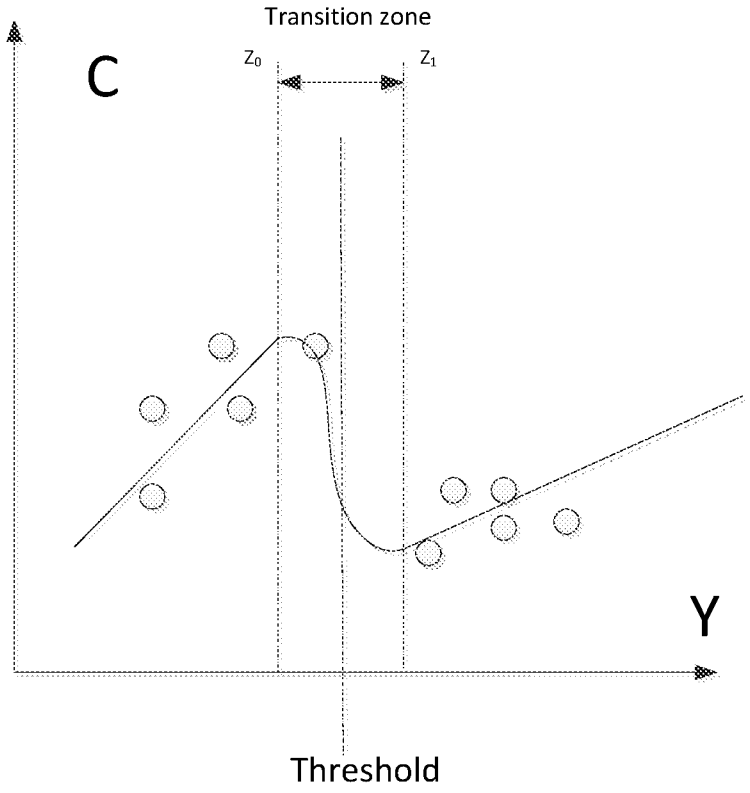
Transition zone
C
Z_0
Z_1
Y
Threshold

FIG. 7D

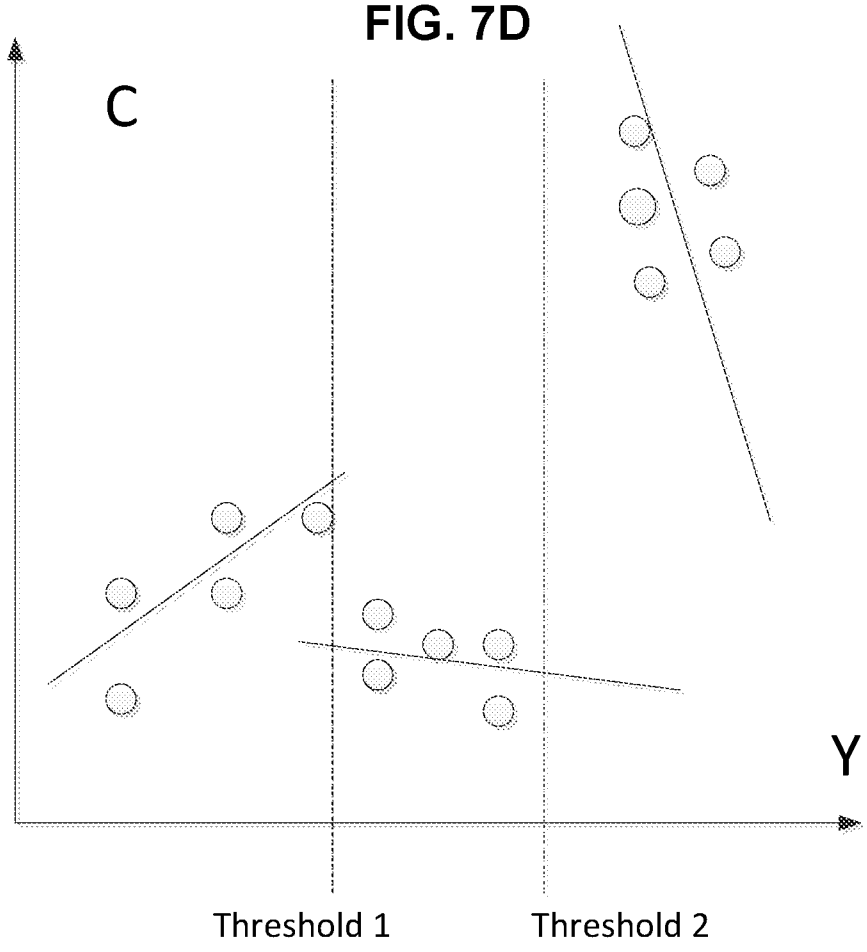
C
Y
Threshold 1
Threshold 2

FIG. 7E

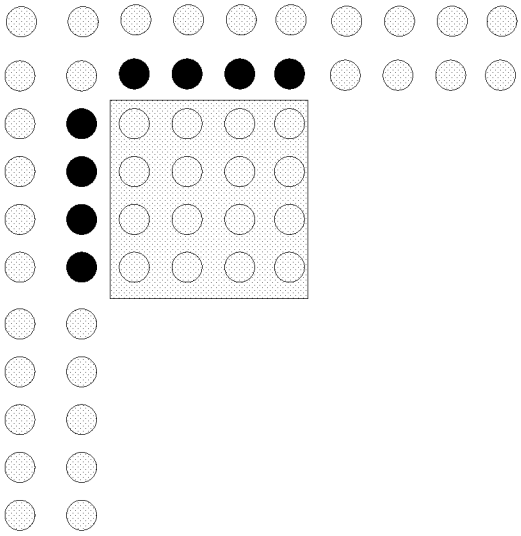

FIG. 8A

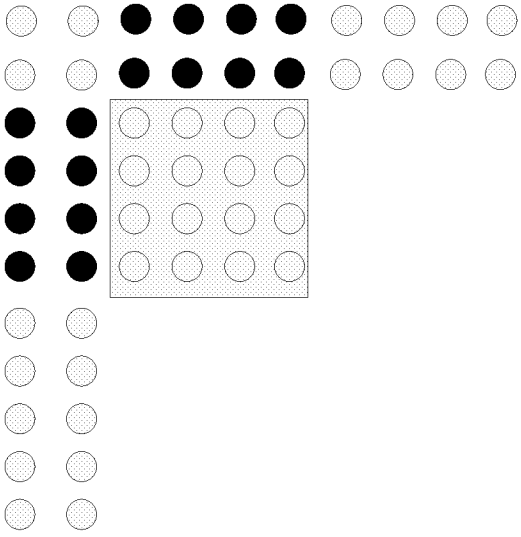

FIG. 8B

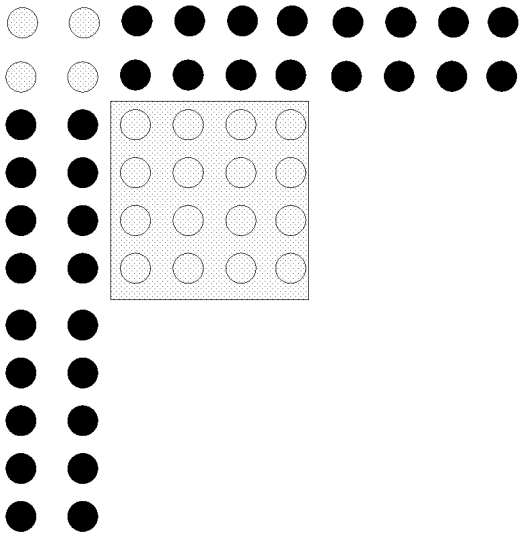

FIG. 8C

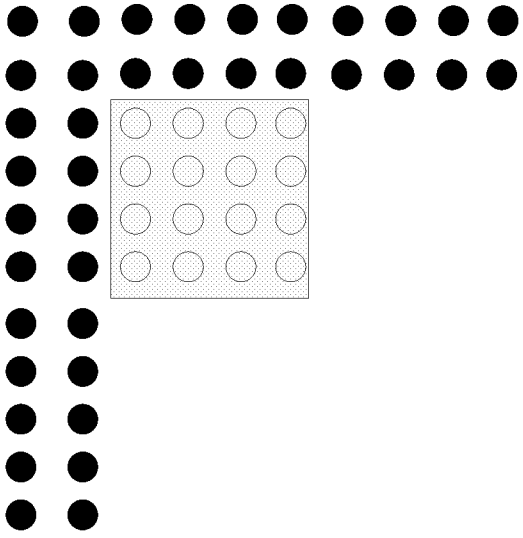

FIG. 8D

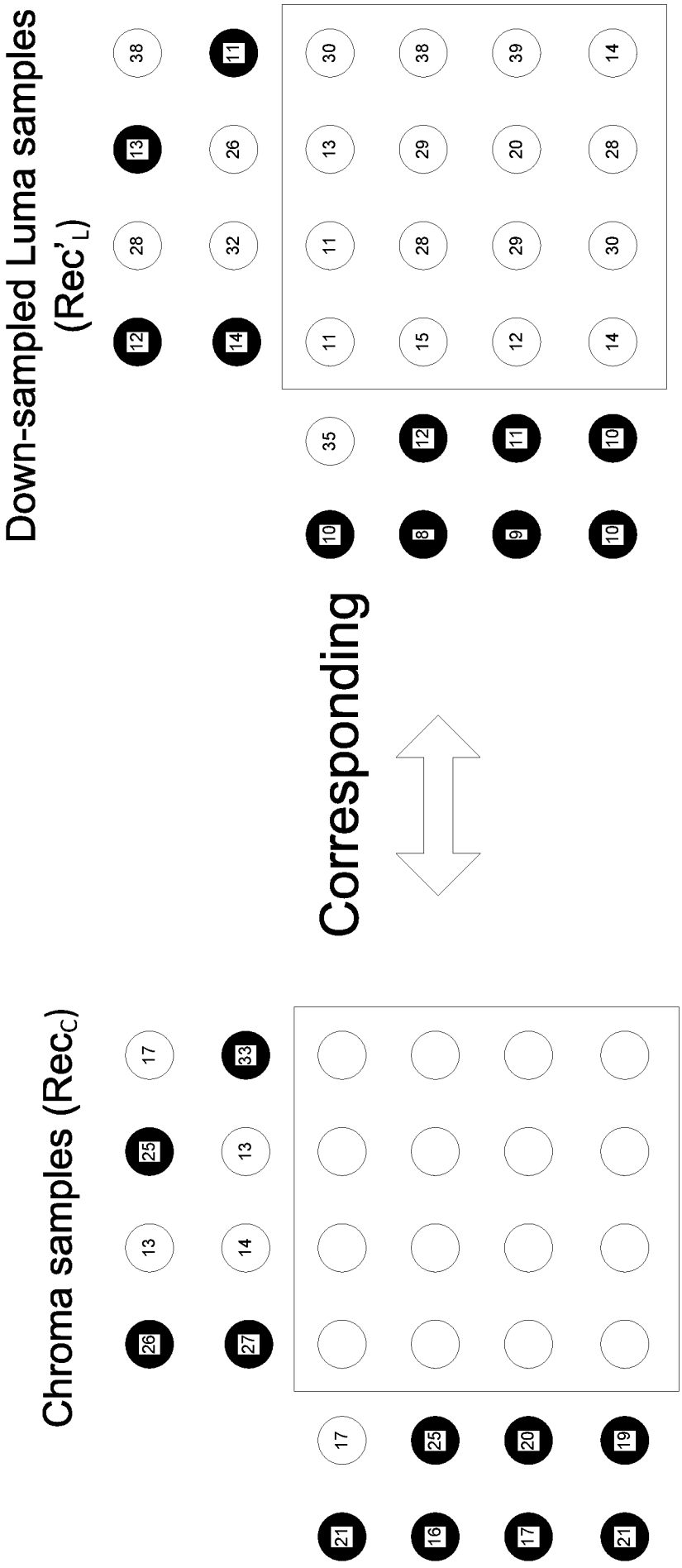
Down-sampled Luma samples (Rec'L)
Corresponding
Chroma samples (RecC)
Current block

FIG. 9

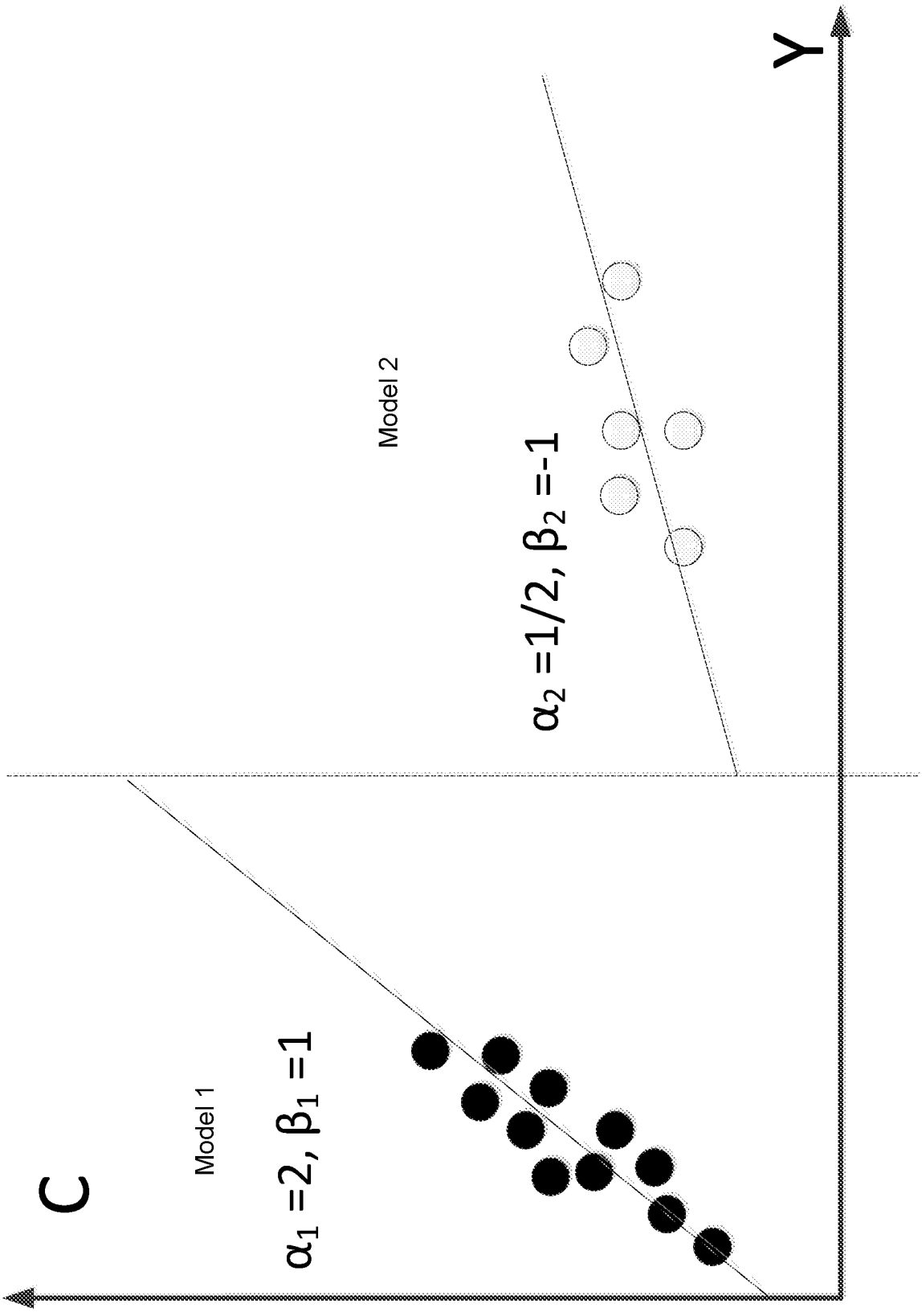
C
Model 1
$\alpha_1 = 2, \beta_1 = 1$
Model 2
$\alpha_2 = 1/2, \beta_2 = -1$
Y
Threshold = 17

FIG. 10

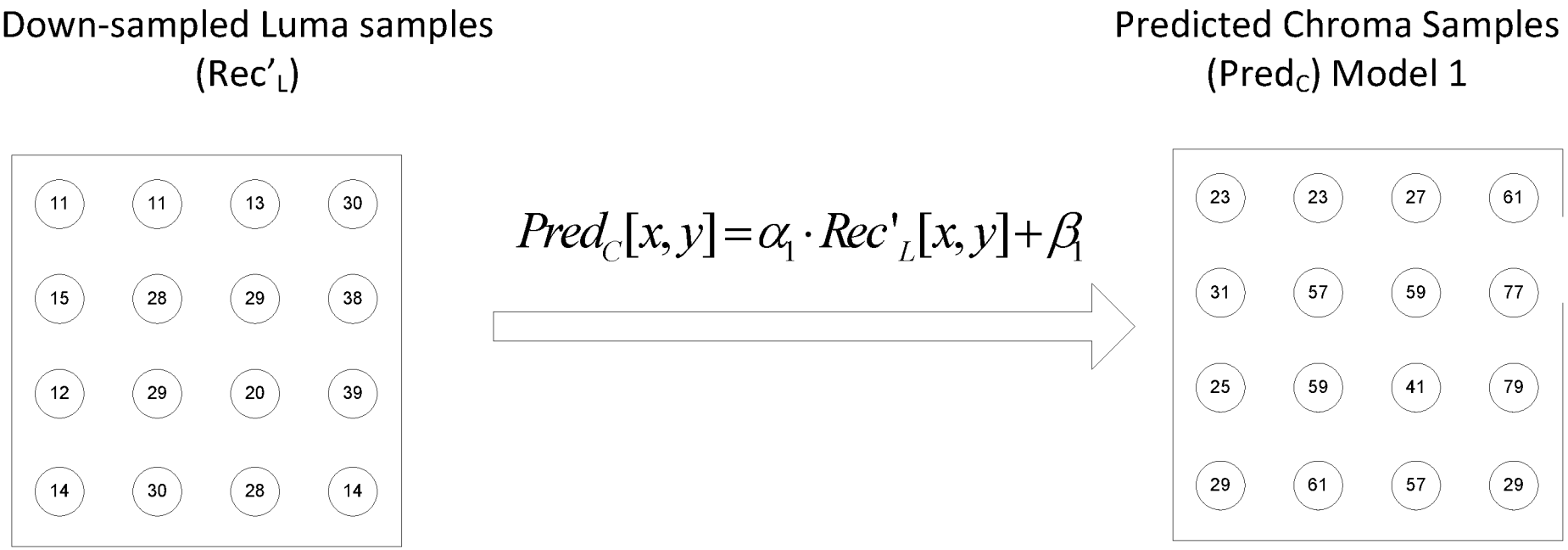
Down-sampled Luma samples
(Rec'L)
11 11 13 30
15 28 29 38
12 29 20 39
14 30 28 14
$Pred_C[x,y] = \alpha_1 \cdot Rec'_L[x,y] + \beta_1$
Predicted Chroma Samples
(PredC) Model 1
23 23 27 61
31 57 59 77
25 59 41 79
29 61 57 29

FIG. 11

Down-sampled Luma samples (Rec'L)
11 11 13 30
15 28 29 38
12 29 20 39
14 30 28 14
$Pred_C[x,y] = \alpha_2 \cdot Rec'_L[x,y] + \beta_2$
Predicted Chroma Samples (PredC) Model 2
5 5 6 14
7 13 14 18
5 14 9 19
6 14 13 6

FIG. 12

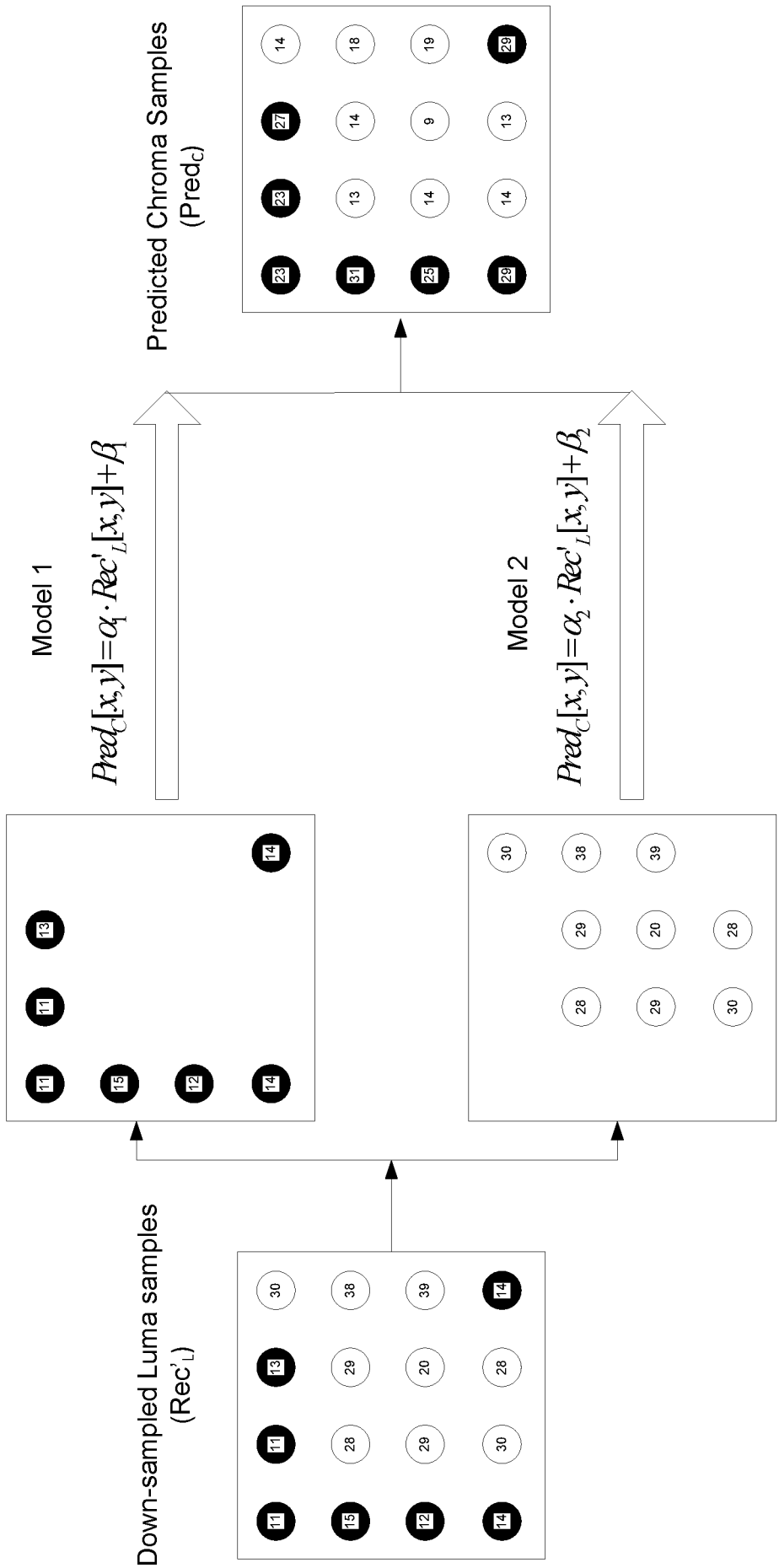
Predicted Chroma Samples
(Pred$_C$)
Model 1
$Pred_C[x,y]=\alpha_1 \cdot Rec'_L[x,y]+\beta_1$
Model 2
$Pred_C[x,y]=\alpha_2 \cdot Rec'_L[x,y]+\beta_2$
Down-sampled Luma samples
(Rec'$_L$)

FIG. 13

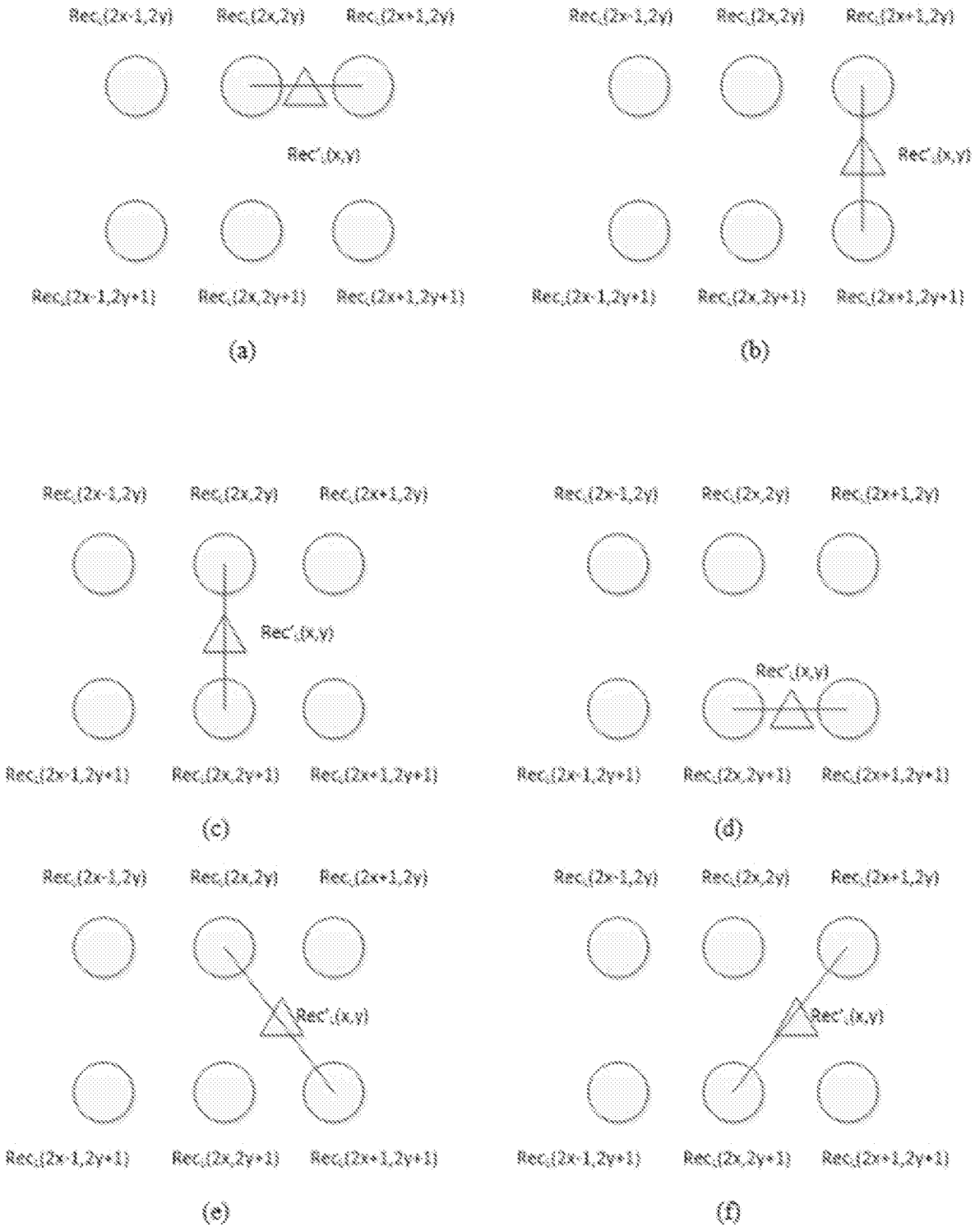

FIG. 14A

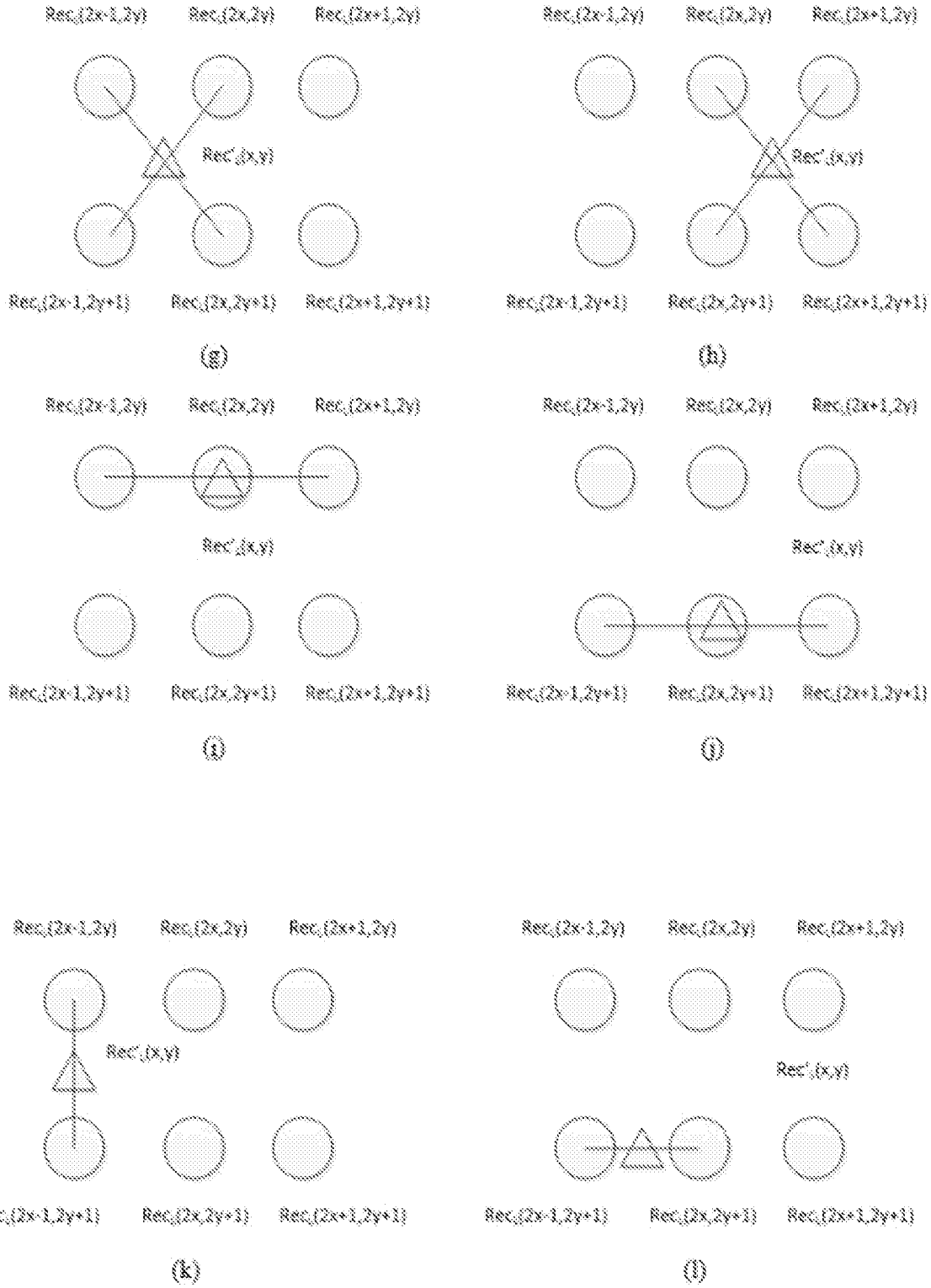

FIG. 14B

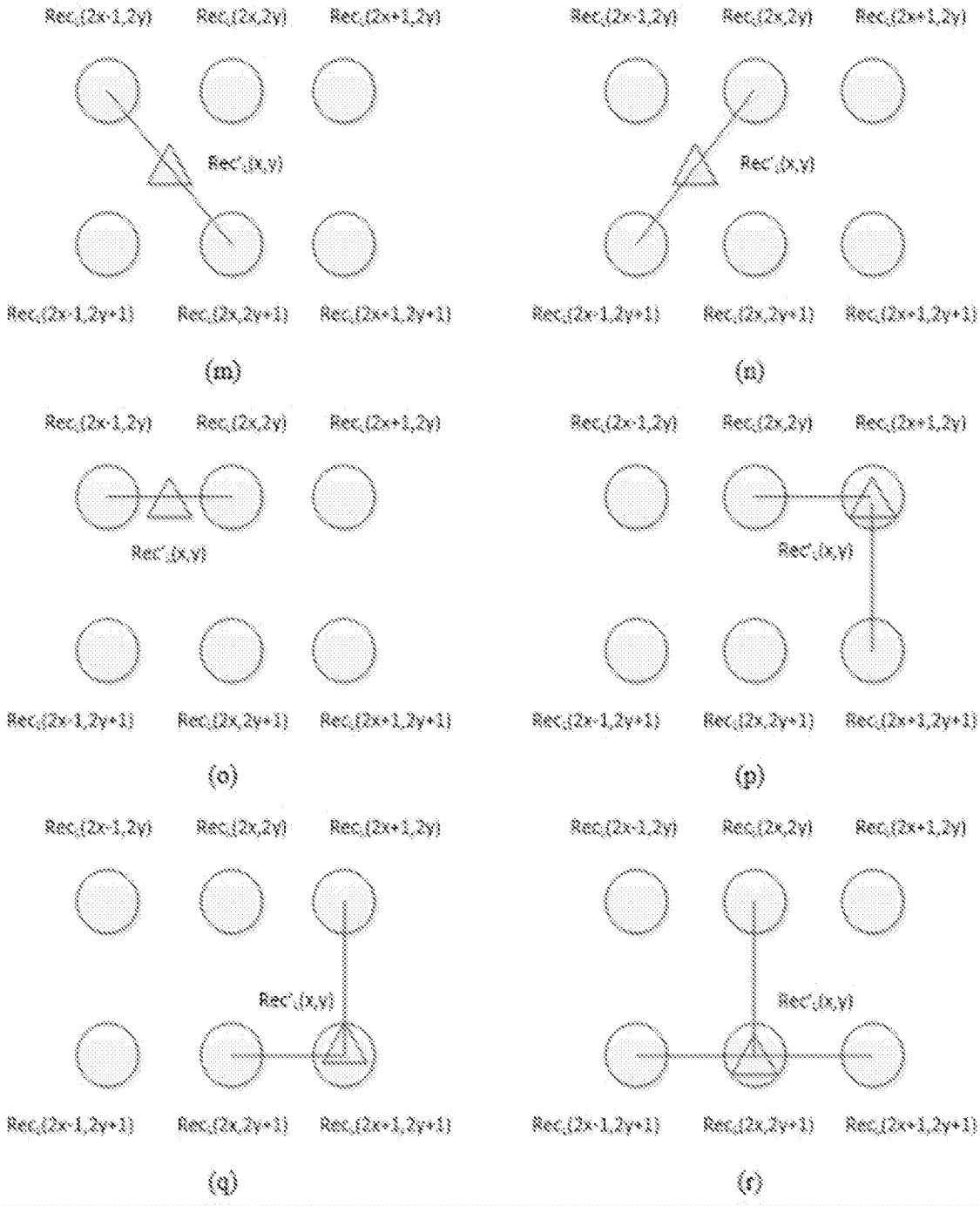

FIG. 14C

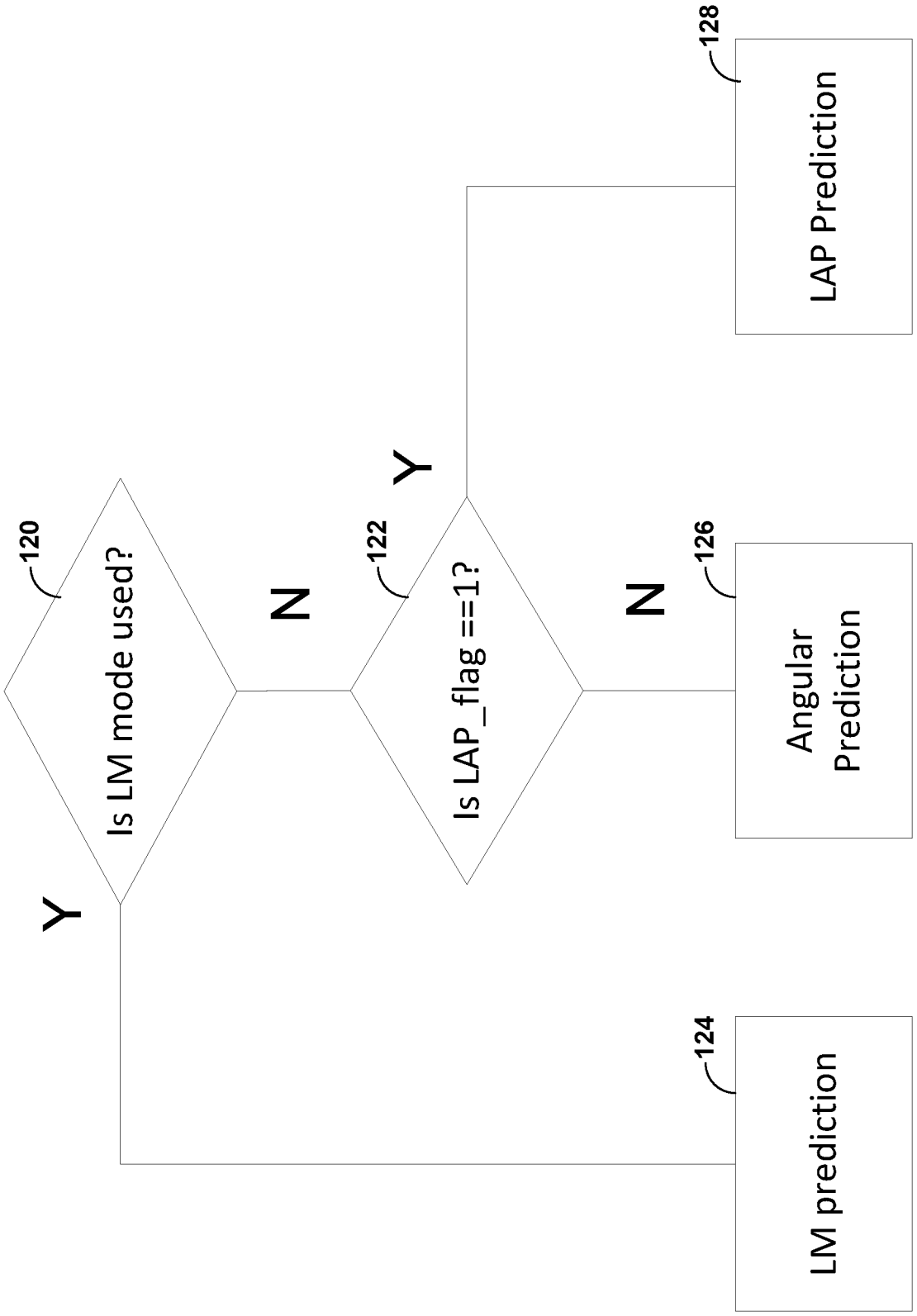
120
Is LM mode used?
Y
N
122
Is LAP_flag ==1?
Y
N
124
LM prediction
126
Angular Prediction
128
LAP Prediction

FIG. 15

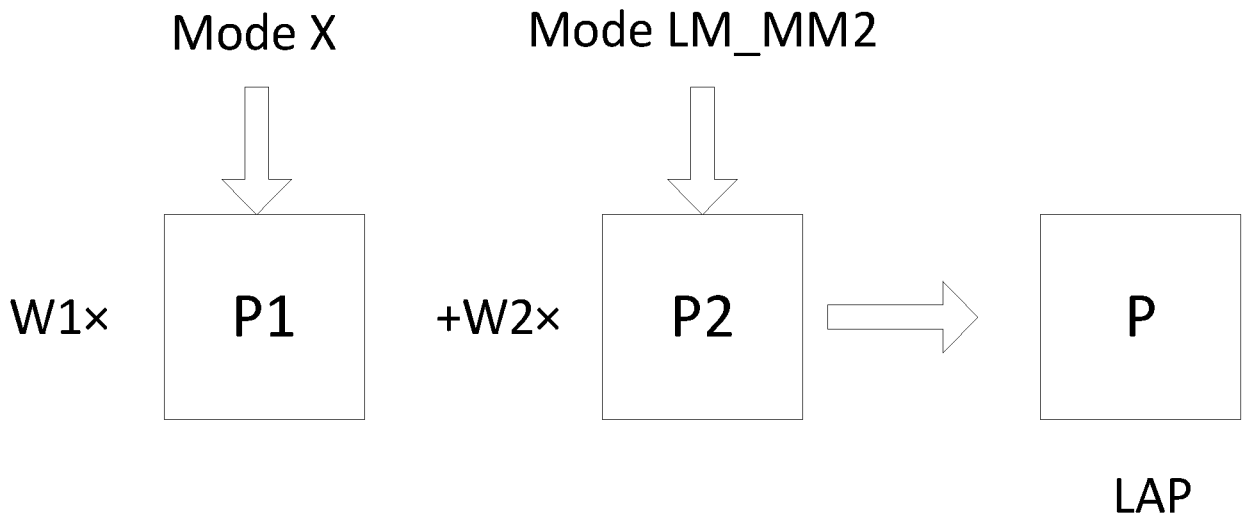
Mode X
Mode LM_MM2
W1×
P1
+W2×
P2
P
LAP

FIG. 16

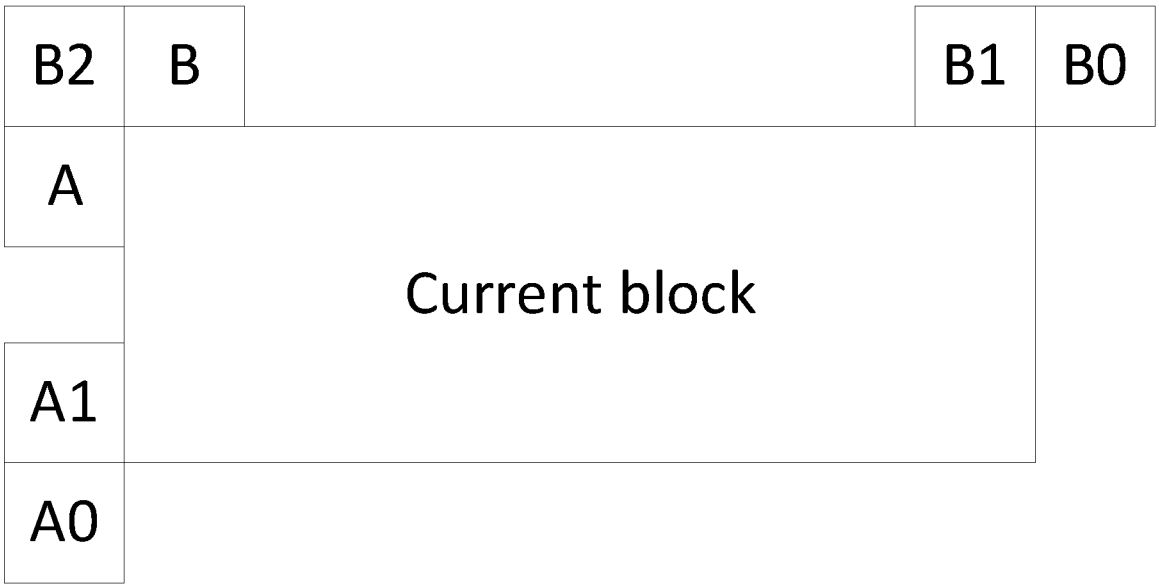
B2
B
B1
B0
A
Current block
A1
A0

FIG. 17

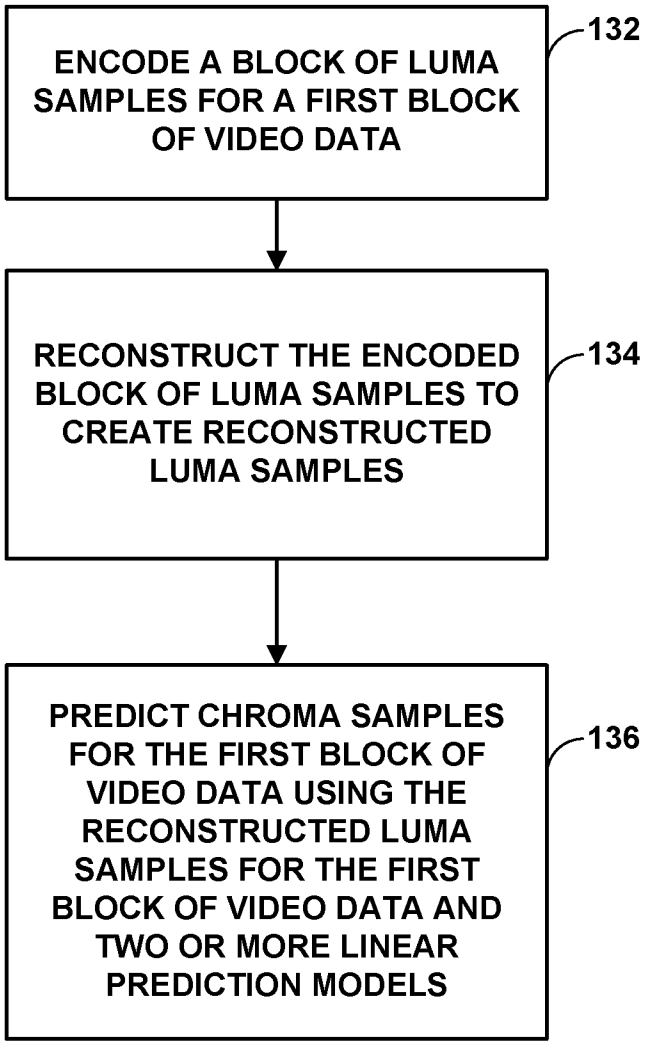
ENCODE A BLOCK OF LUMA SAMPLES FOR A FIRST BLOCK OF VIDEO DATA
132
RECONSTRUCT THE ENCODED BLOCK OF LUMA SAMPLES TO CREATE RECONSTRUCTED LUMA SAMPLES
134
PREDICT CHROMA SAMPLES FOR THE FIRST BLOCK OF VIDEO DATA USING THE RECONSTRUCTED LUMA SAMPLES FOR THE FIRST BLOCK OF VIDEO DATA AND TWO OR MORE LINEAR PREDICTION MODELS
136

FIG. 18

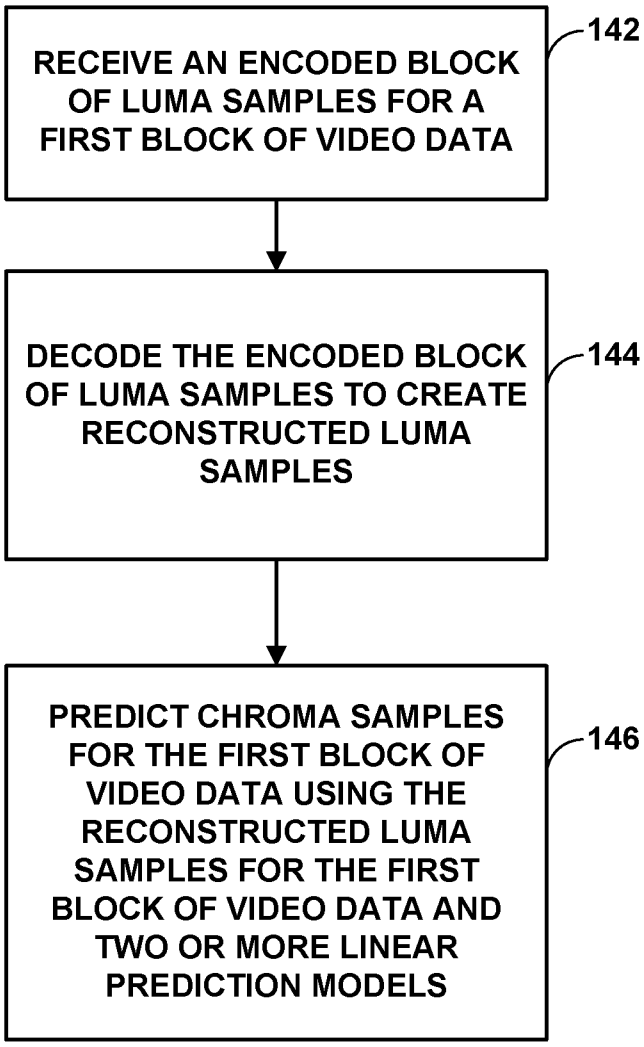
RECEIVE AN ENCODED BLOCK OF LUMA SAMPLES FOR A FIRST BLOCK OF VIDEO DATA
142
DECODE THE ENCODED BLOCK OF LUMA SAMPLES TO CREATE RECONSTRUCTED LUMA SAMPLES
144
PREDICT CHROMA SAMPLES FOR THE FIRST BLOCK OF VIDEO DATA USING THE RECONSTRUCTED LUMA SAMPLES FOR THE FIRST BLOCK OF VIDEO DATA AND TWO OR MORE LINEAR PREDICTION MODELS
146

FIG. 19

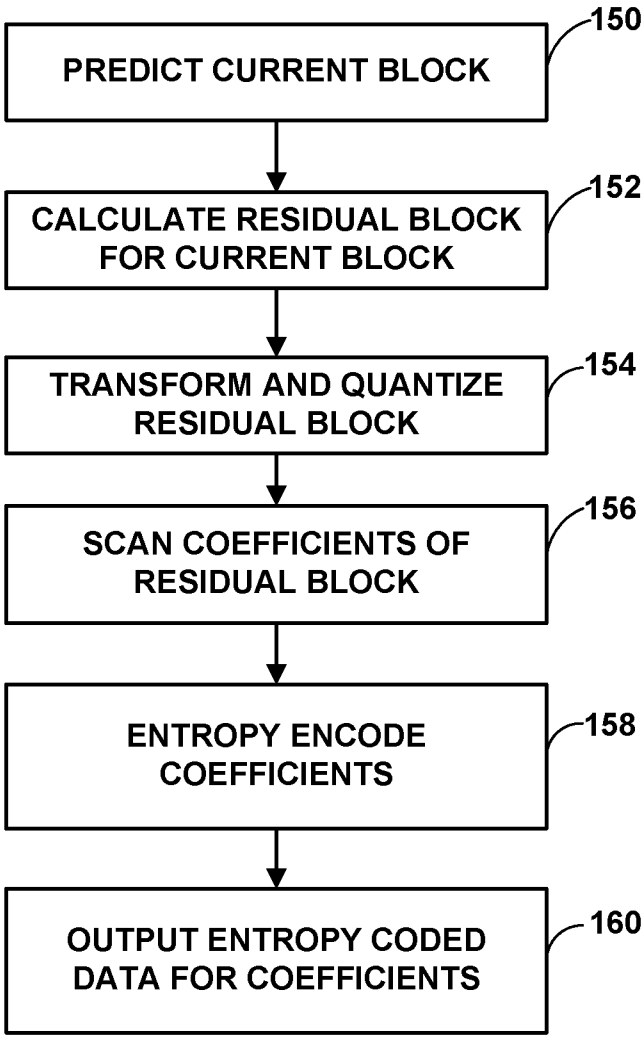
PREDICT CURRENT BLOCK
150
CALCULATE RESIDUAL BLOCK FOR CURRENT BLOCK
152
TRANSFORM AND QUANTIZE RESIDUAL BLOCK
154
SCAN COEFFICIENTS OF RESIDUAL BLOCK
156
ENTROPY ENCODE COEFFICIENTS
158
OUTPUT ENTROPY CODED DATA FOR COEFFICIENTS
160

FIG. 20

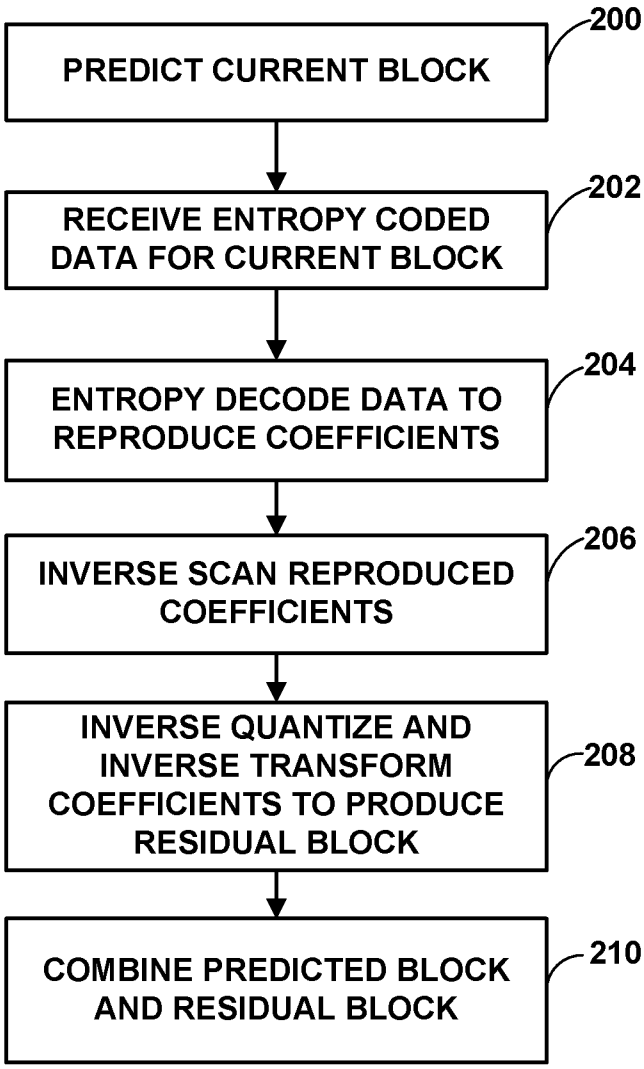
PREDICT CURRENT BLOCK
200
RECEIVE ENTROPY CODED DATA FOR CURRENT BLOCK
202
ENTROPY DECODE DATA TO REPRODUCE COEFFICIENTS
204
INVERSE SCAN REPRODUCED COEFFICIENTS
206
INVERSE QUANTIZE AND INVERSE TRANSFORM COEFFICIENTS TO PRODUCE RESIDUAL BLOCK
208
COMBINE PREDICTED BLOCK AND RESIDUAL BLOCK
210

FIG. 21