

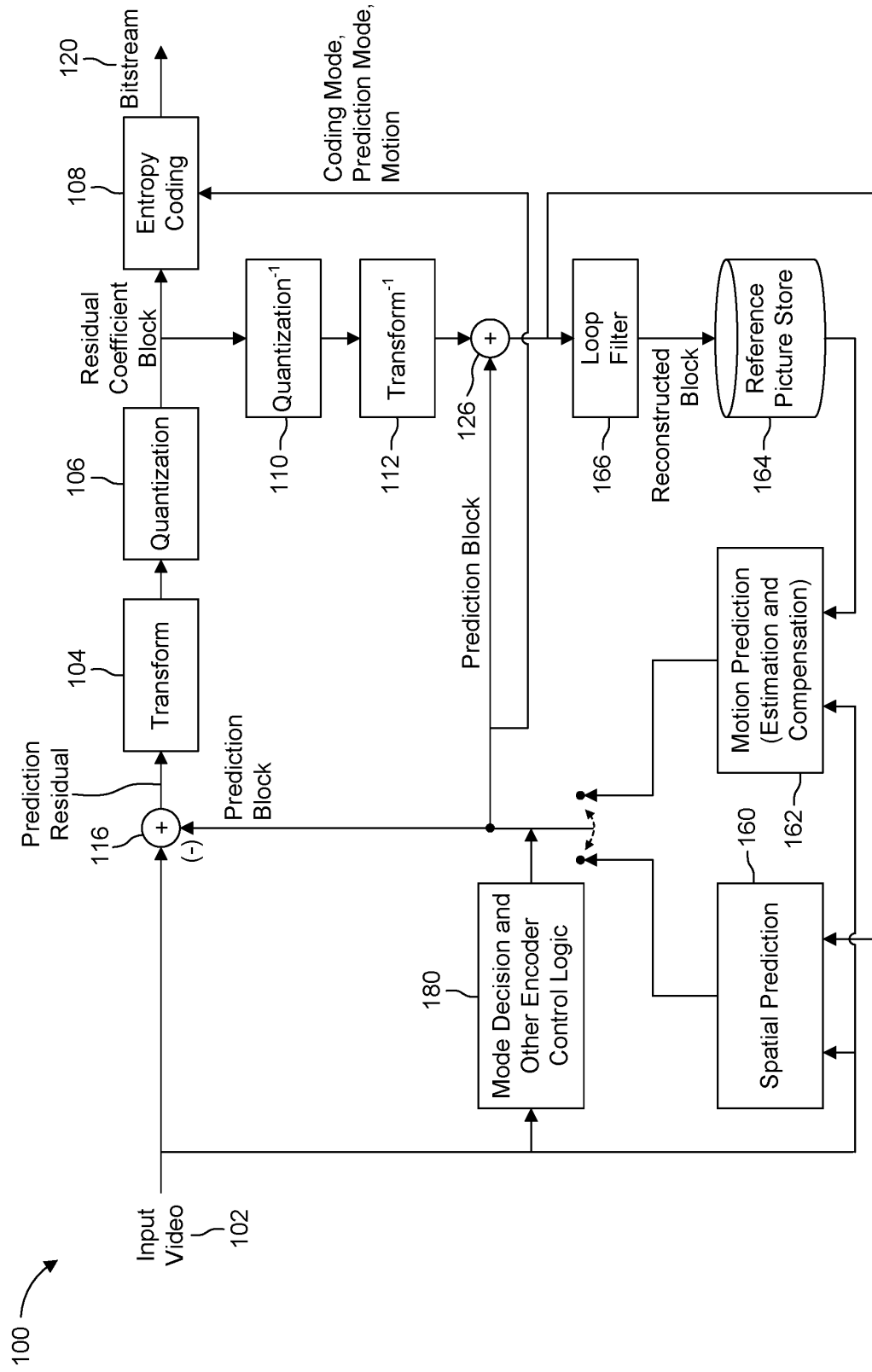


FIG. 1: General Diagram of Block-based Video Encoder for the VVC

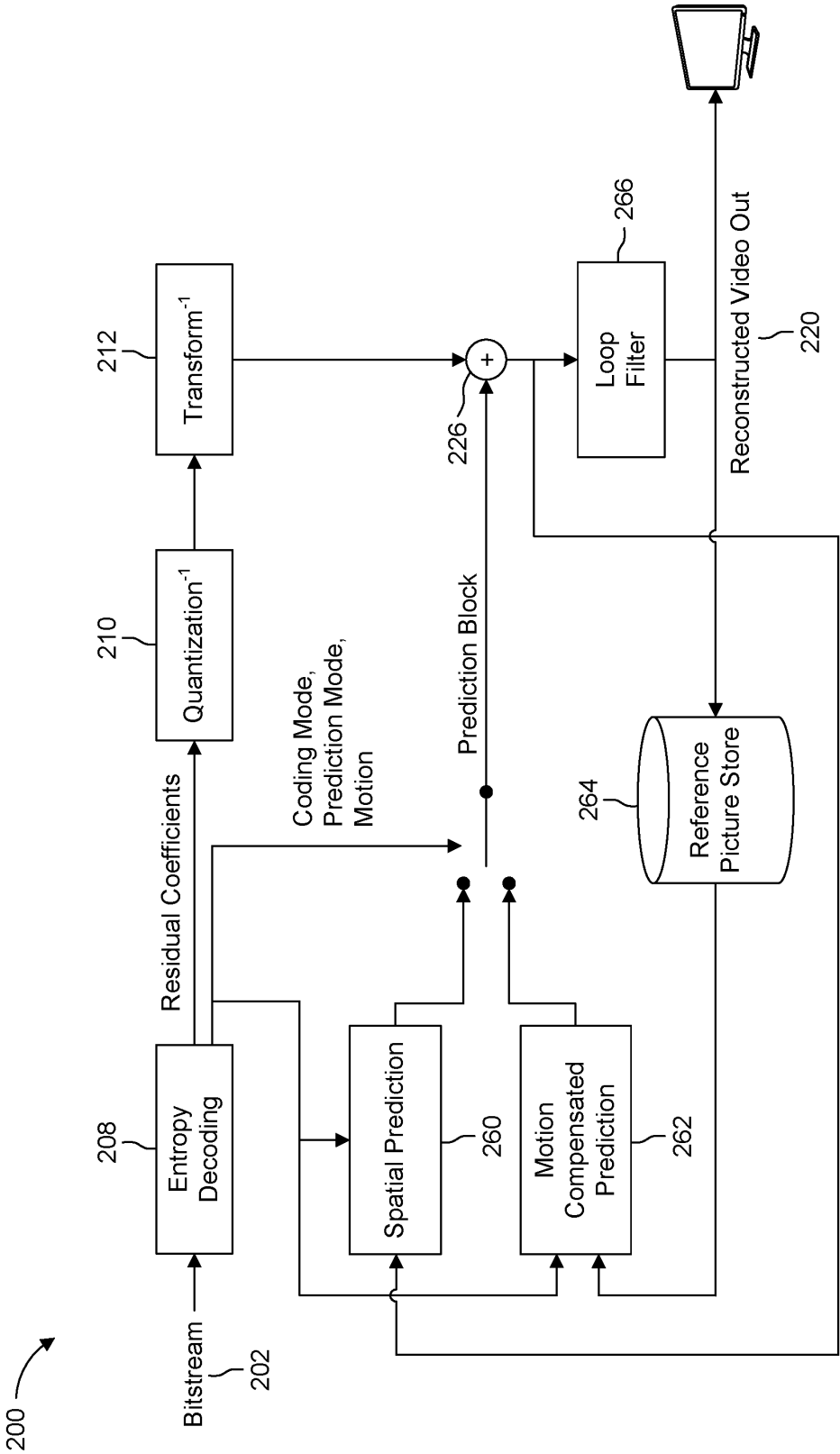


FIG. 2: General Diagram of Block-based Video Decoder



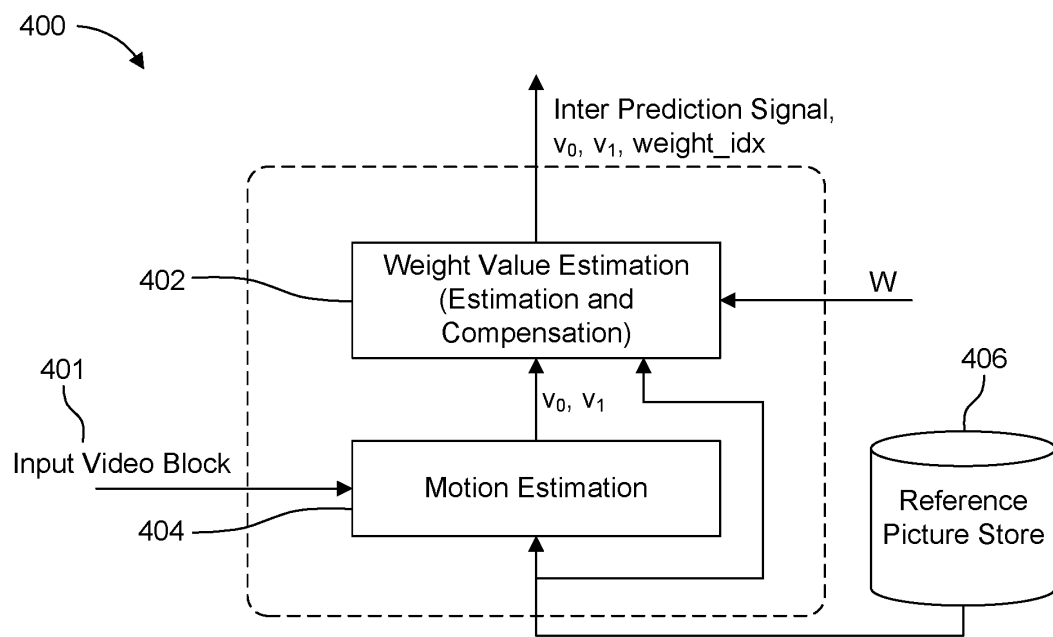


FIG. 4: General Block Diagram of the Generalized Bi-prediction Module

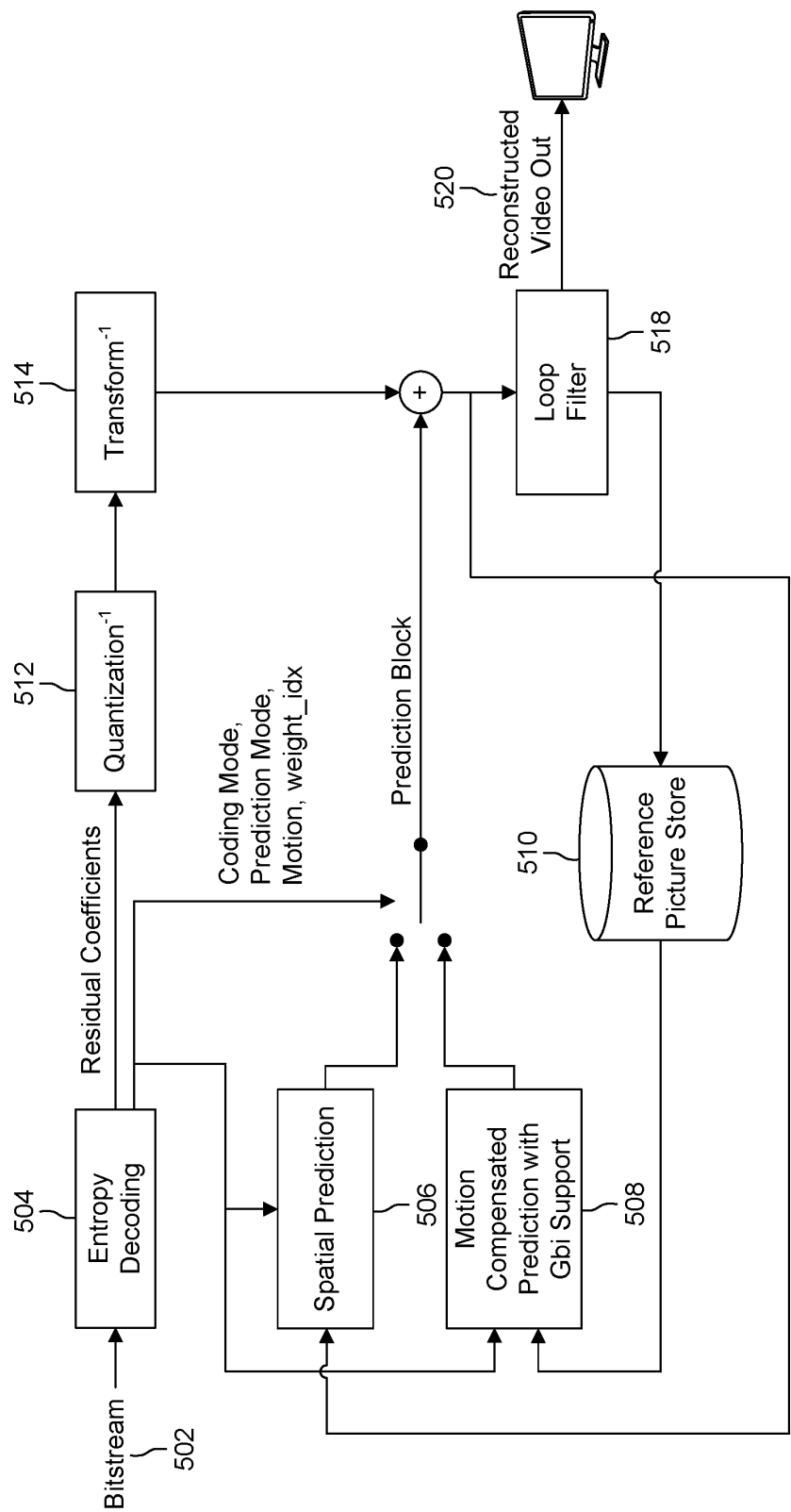


FIG. 5: General Block Diagram of a Video Decoder with GBI Support

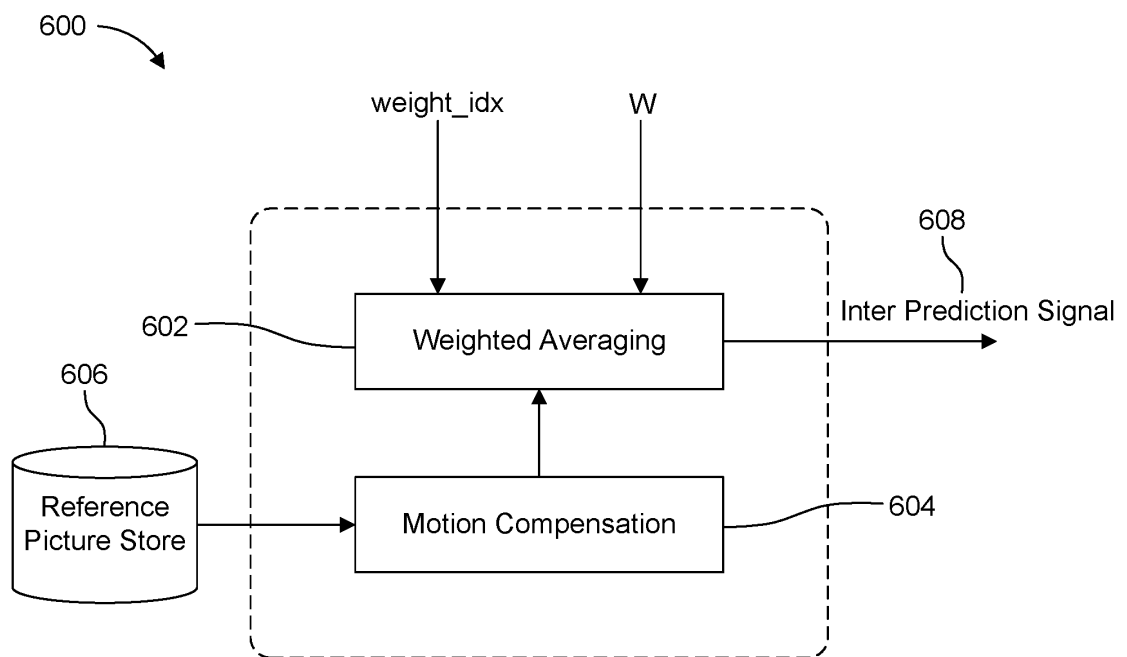


FIG. 6: General Block Diagram of the Generalized Bi-prediction Module

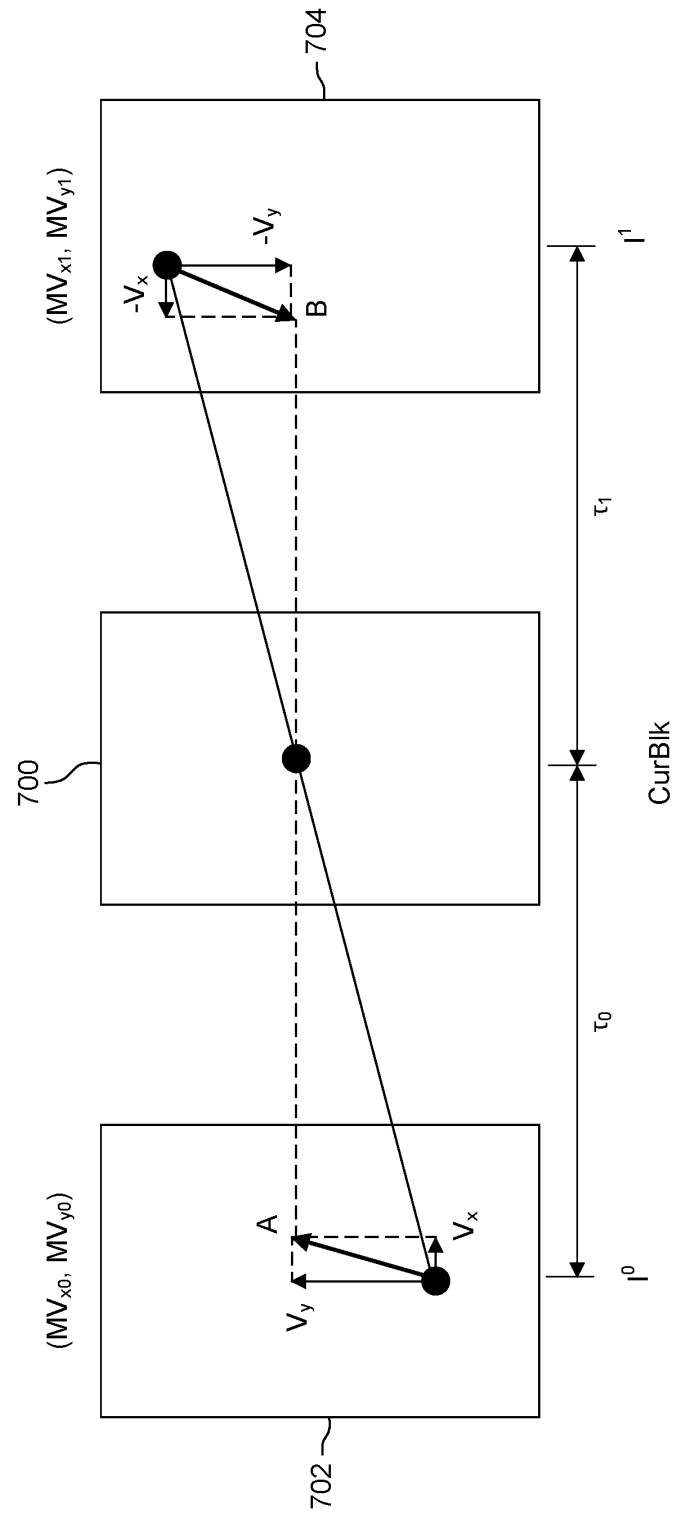


FIG. 7: Illustration of Bidirectional Optical Flow

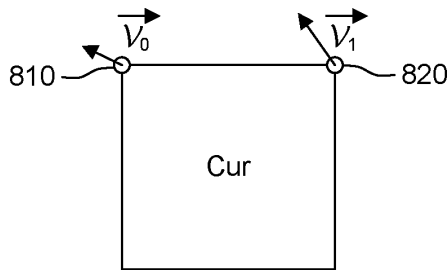


FIG. 8A: Four-parameter Affine Mode: the Affine Model

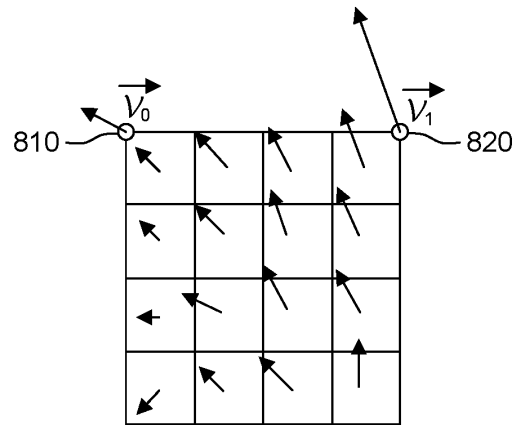


FIG. 8B: Four-parameter Affine Mode: the Sub-block-level Motion Derivation for Affine Blocks

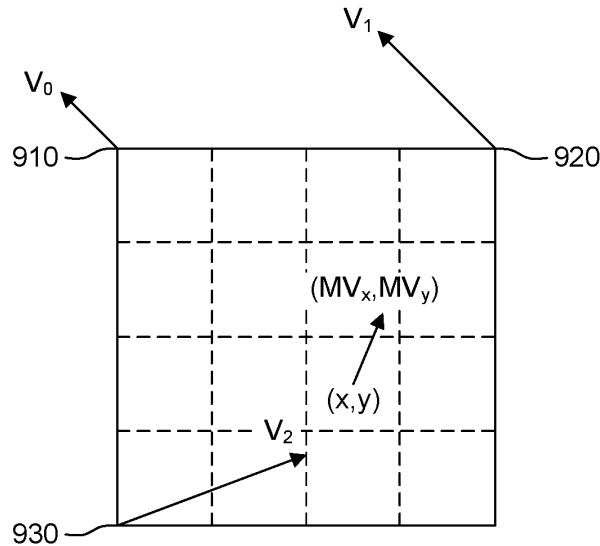


FIG. 9: Six-parameter Affine Mode: V_0 , V_1 , and V_2 are Control Points; (MV_x, MV_y) is Motion Vector of the Sub-block Centered at Position (x, y)

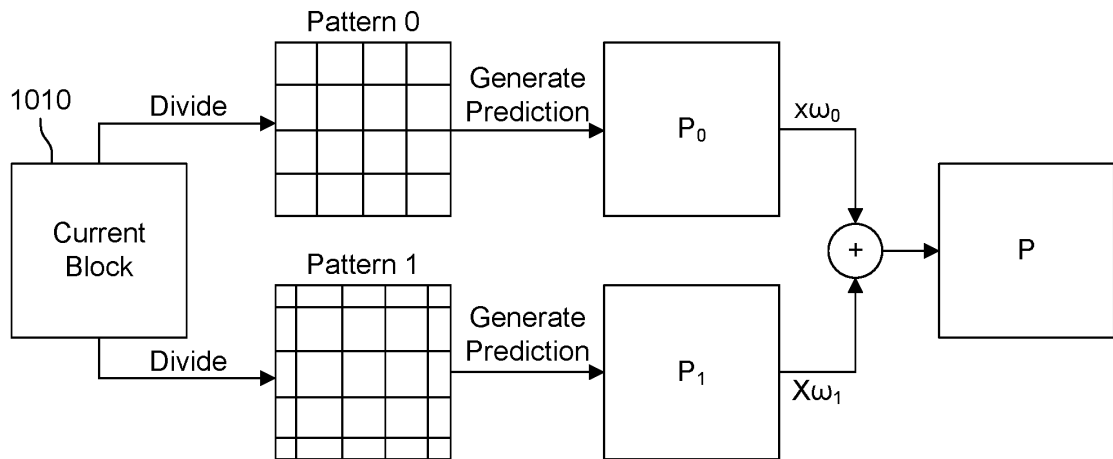


FIG. 10: Interweaved Prediction Procedure

1100

1	1	1	1
1	3	3	1
1	3	3	1
1	1	1	1

FIG. 11: Weighting Values in a Sub-block

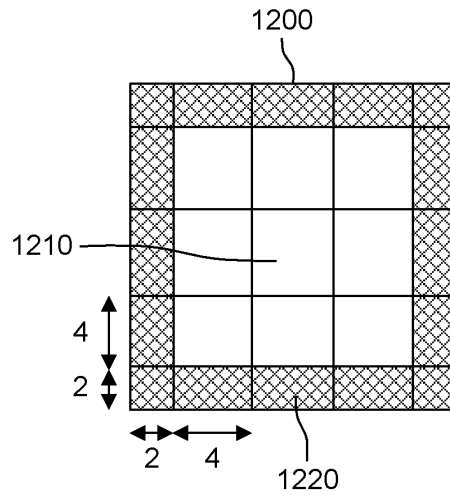


FIG. 12: Interweaved Prediction is not Applied on the Cross Hatched Regions

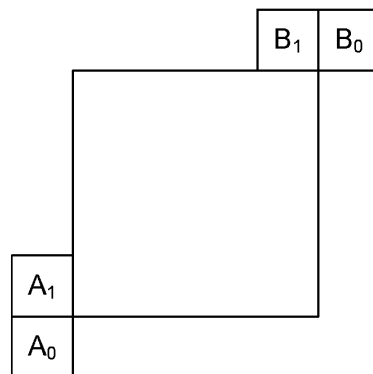


FIG. 13A: The SbTMVP Process in VVC - Spatial Neighboring Blocks Used by ATVMP

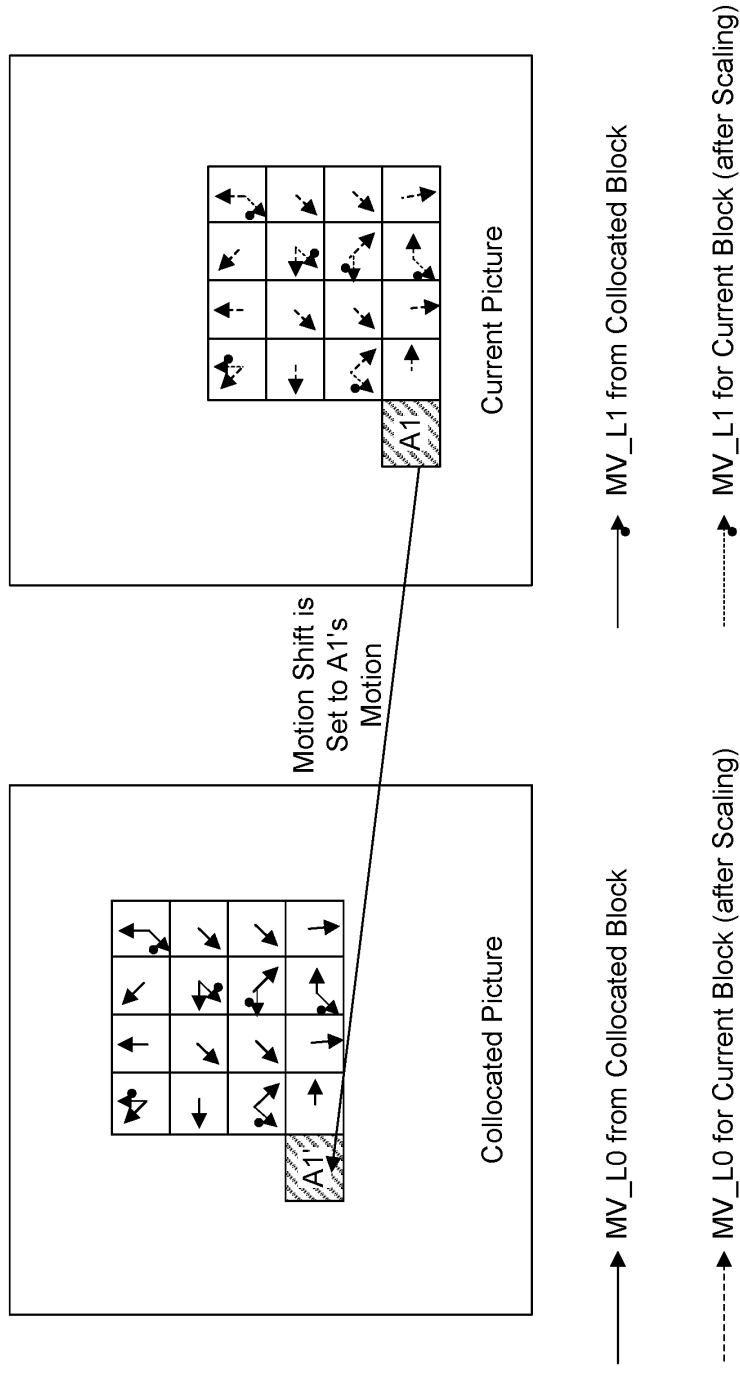


FIG. 13B: The SbTMVP Process in VVC - Deriving Sub-CU Motion Field by Applying a Motion Shift from Spatial Neighbor and Scaling the Motion Information from the Corresponding Collocated Sub-CUs

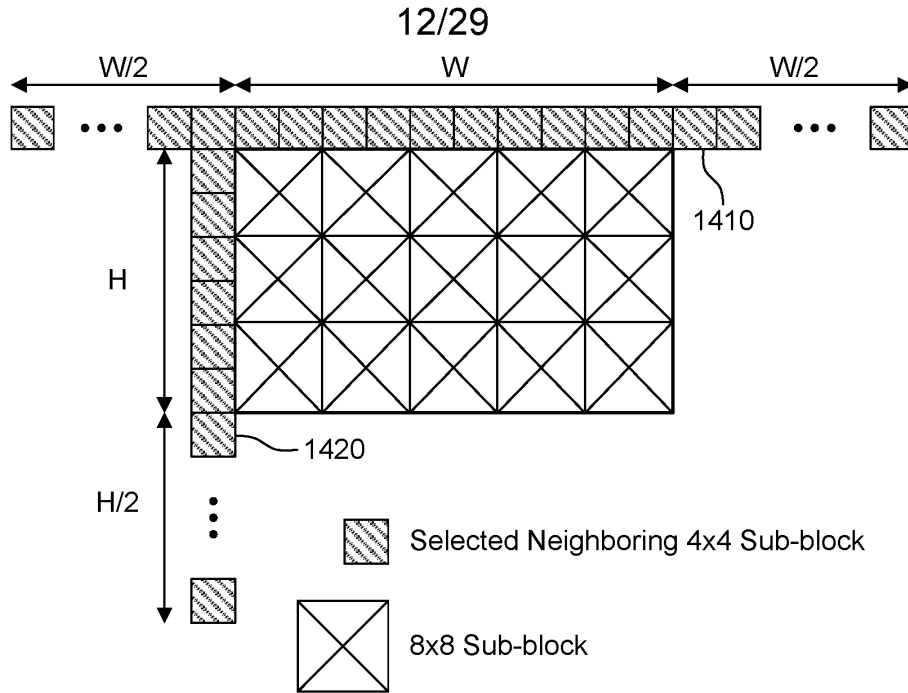


FIG. 14: Neighboring Motion Vectors that are Used in RMVF Motion Parameter Derivation

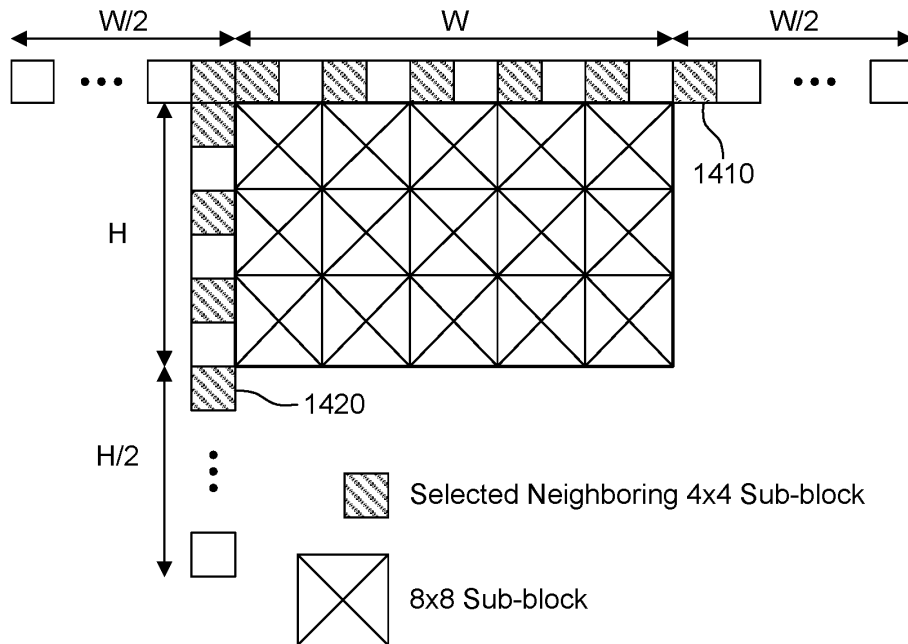


FIG. 15: Reduced Neighboring Motion Vector Candidates for RMVF Motion Parameter Derivation

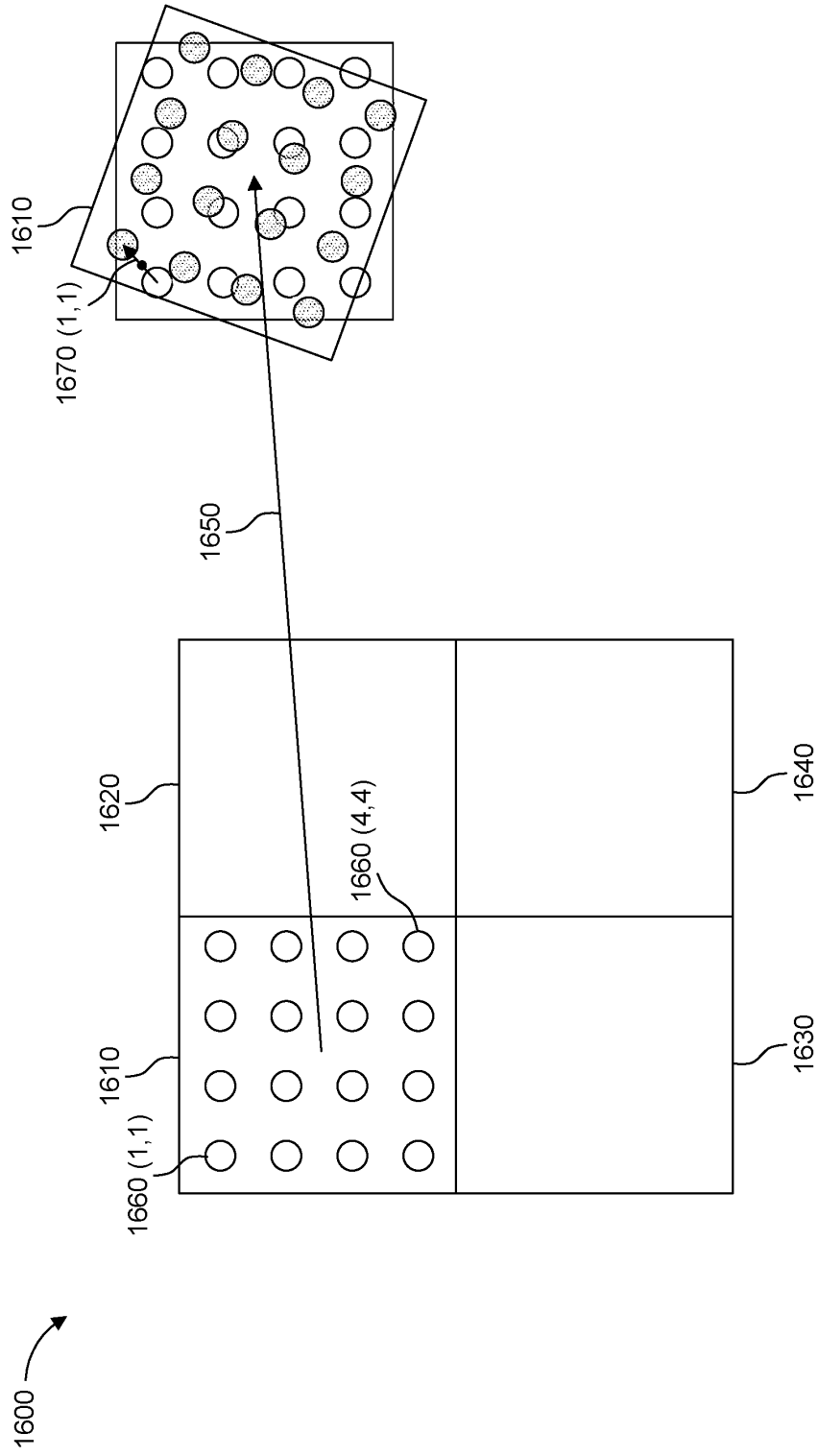


FIG. 16: Sub-block MV (Arrow) and Pixel-level MV Difference (Arrow with Circle)

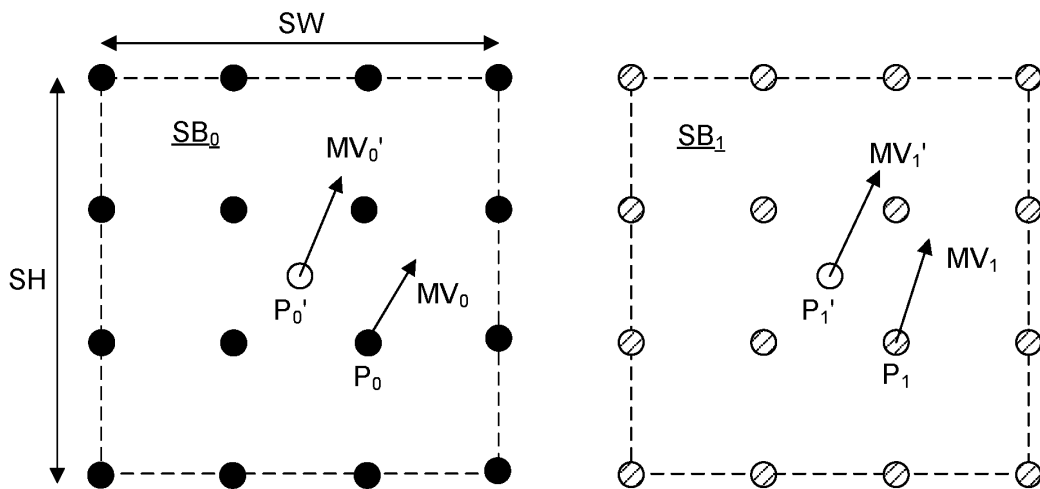


FIG. 17A: MV Derivation for Sub-block for One 8x4 CU

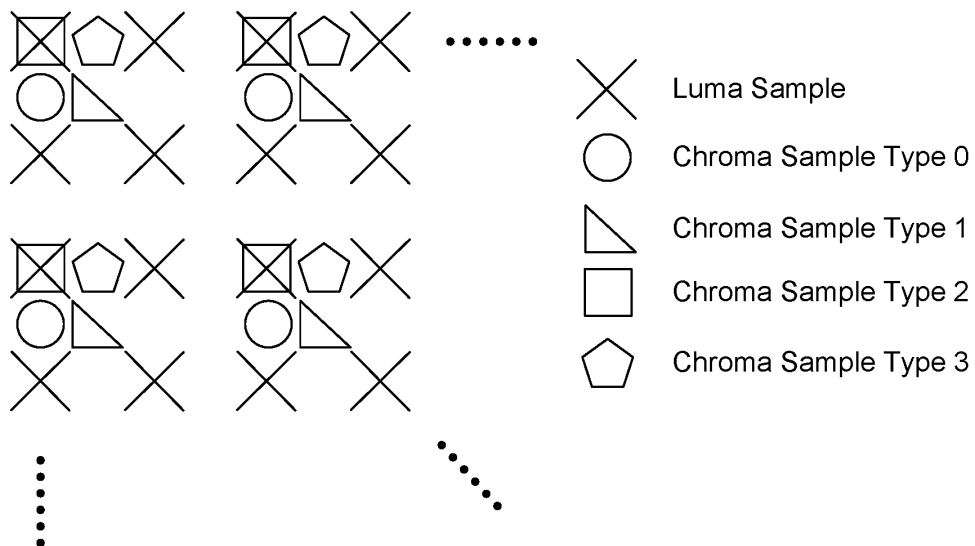


FIG. 17B: Locations of Chroma Samples in 4:2:0 Chroma Format

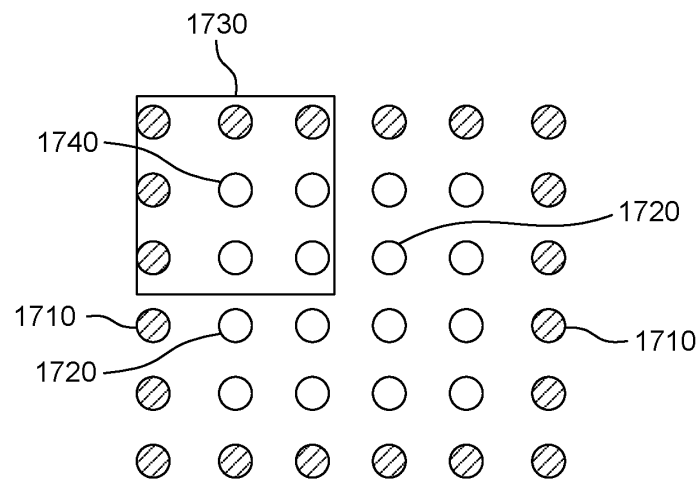
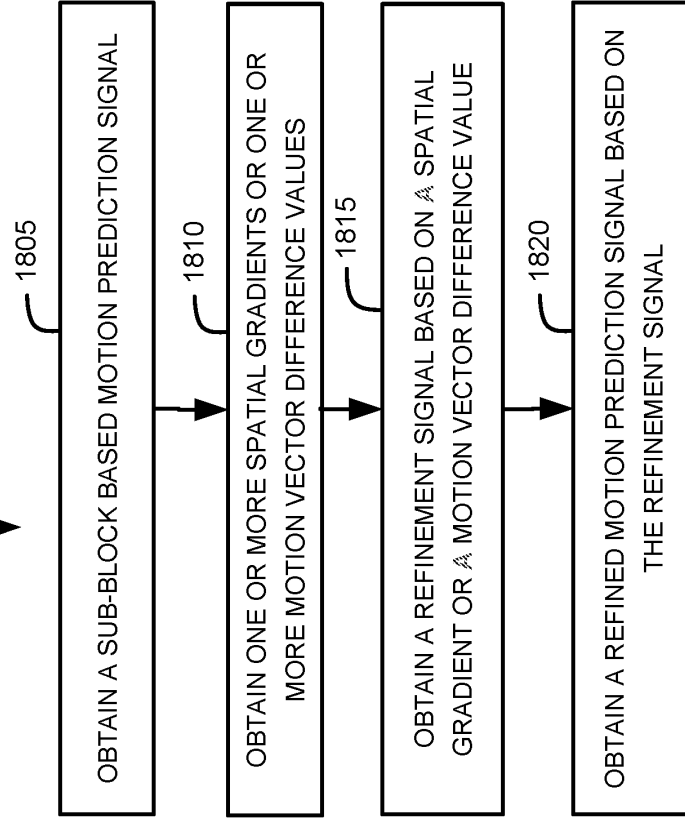
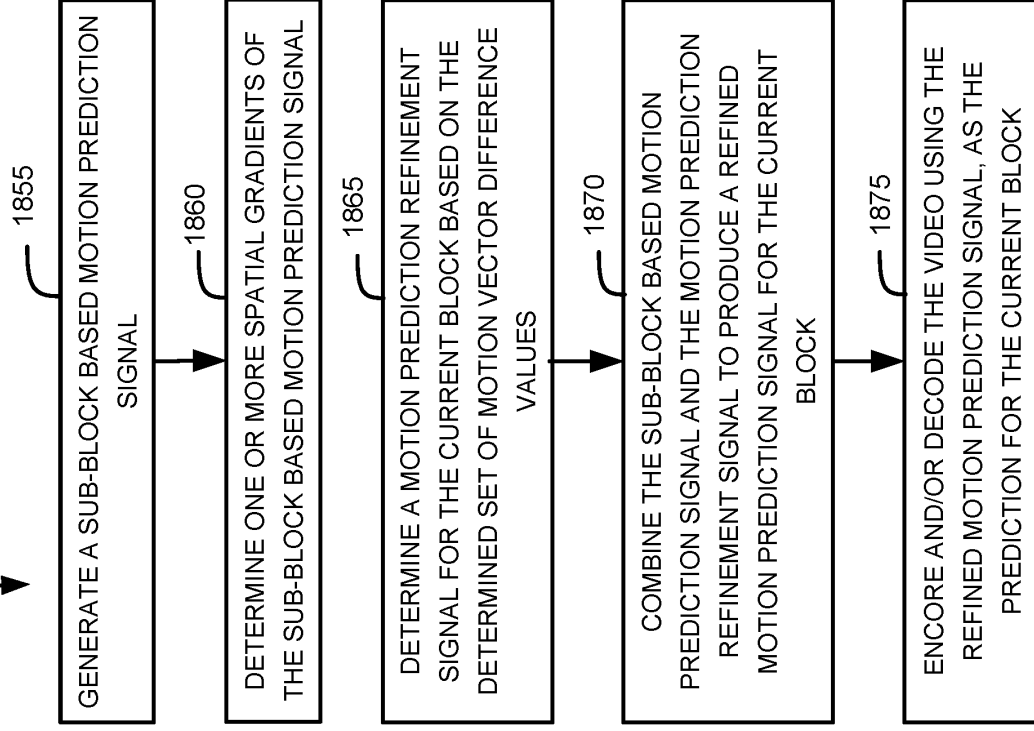


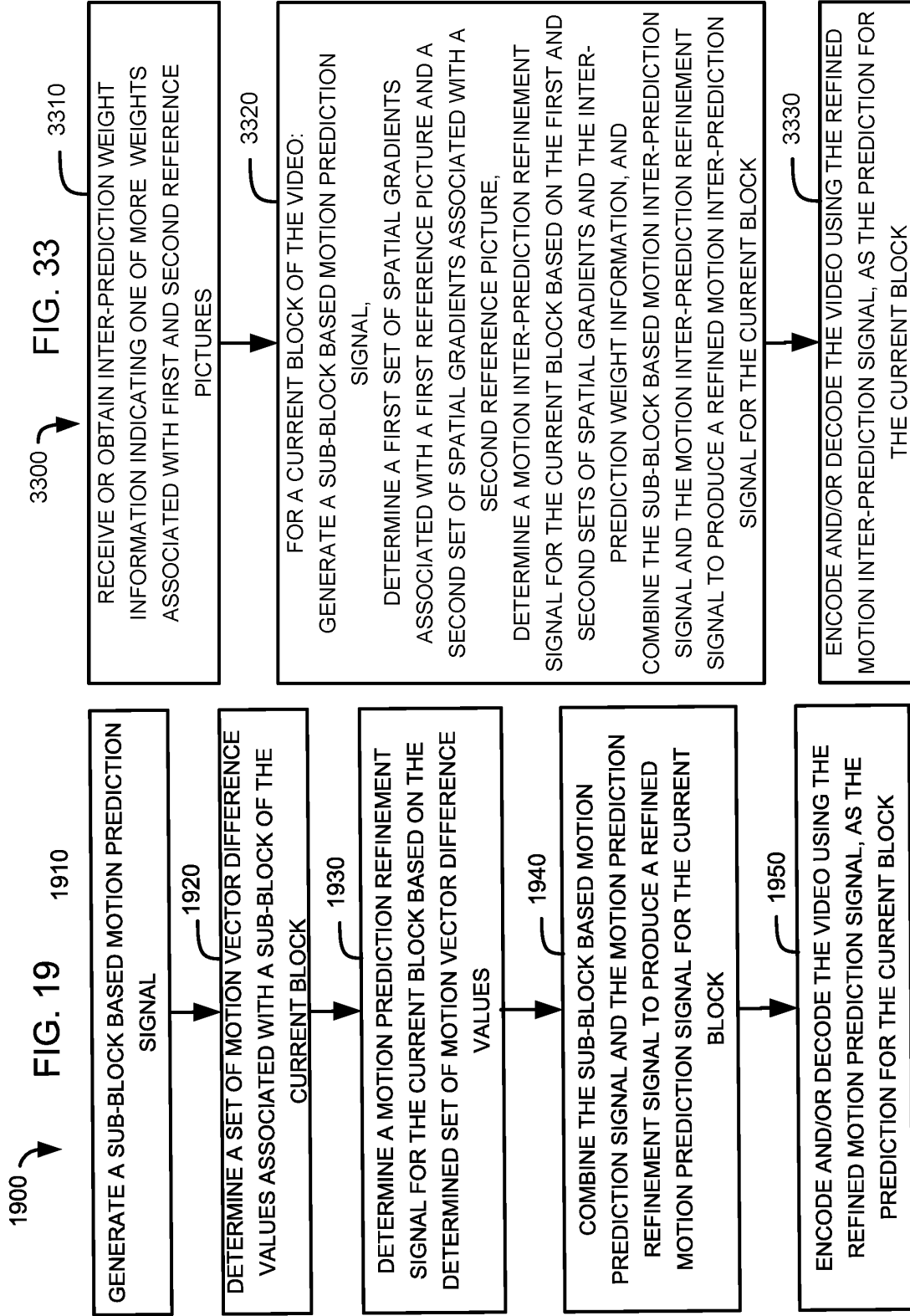
FIG. 17C: Extended Prediction Sub-block. Shaded Circles are Padding Samples around 4x4 Sub-block. Using Sobel Filter as an Example, Samples in the box are Used to Calculate the Gradients of the Sample in the Center of the Box

1800 → FIG. 18A



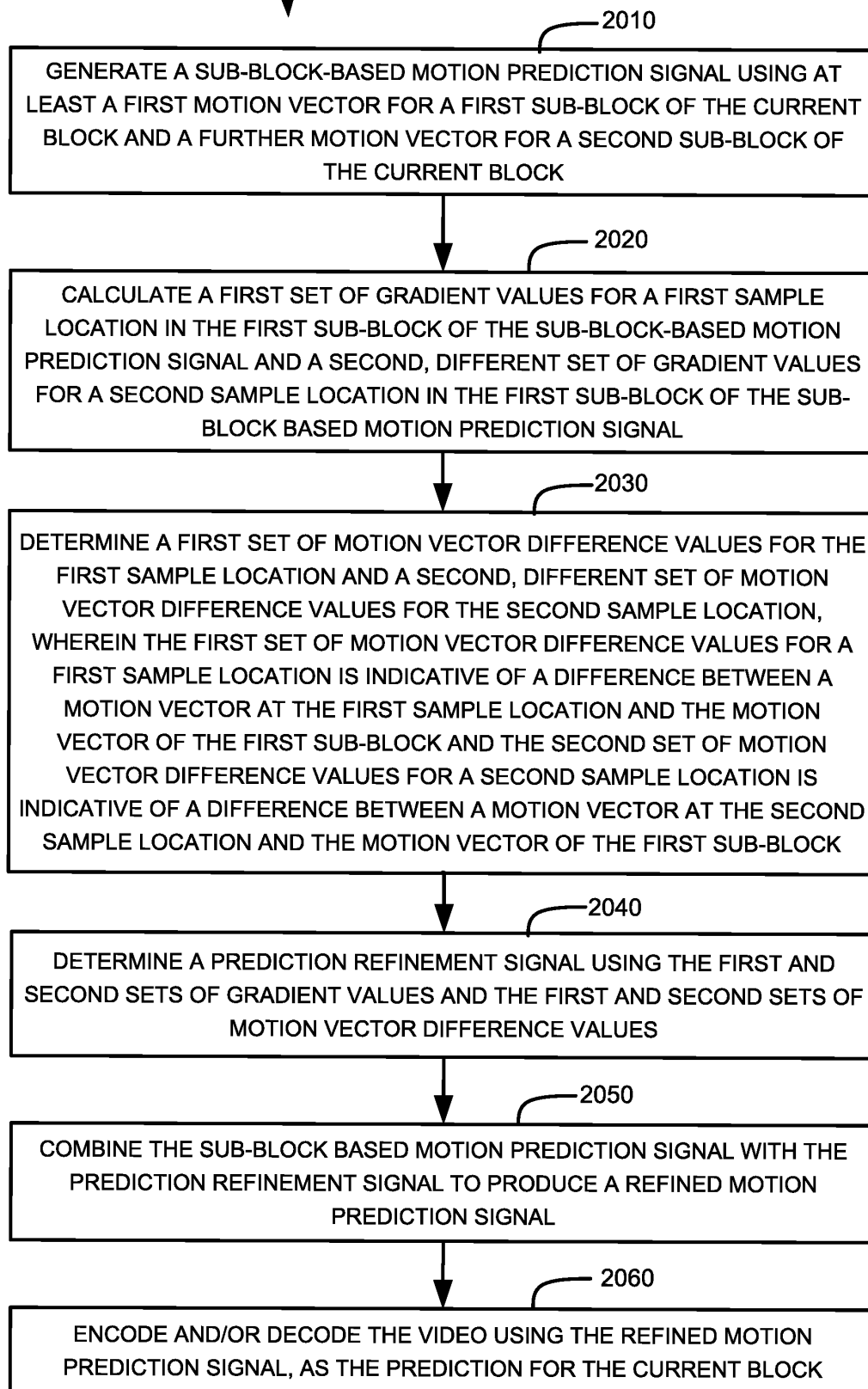
1850 → FIG. 18B





2000

FIG. 20



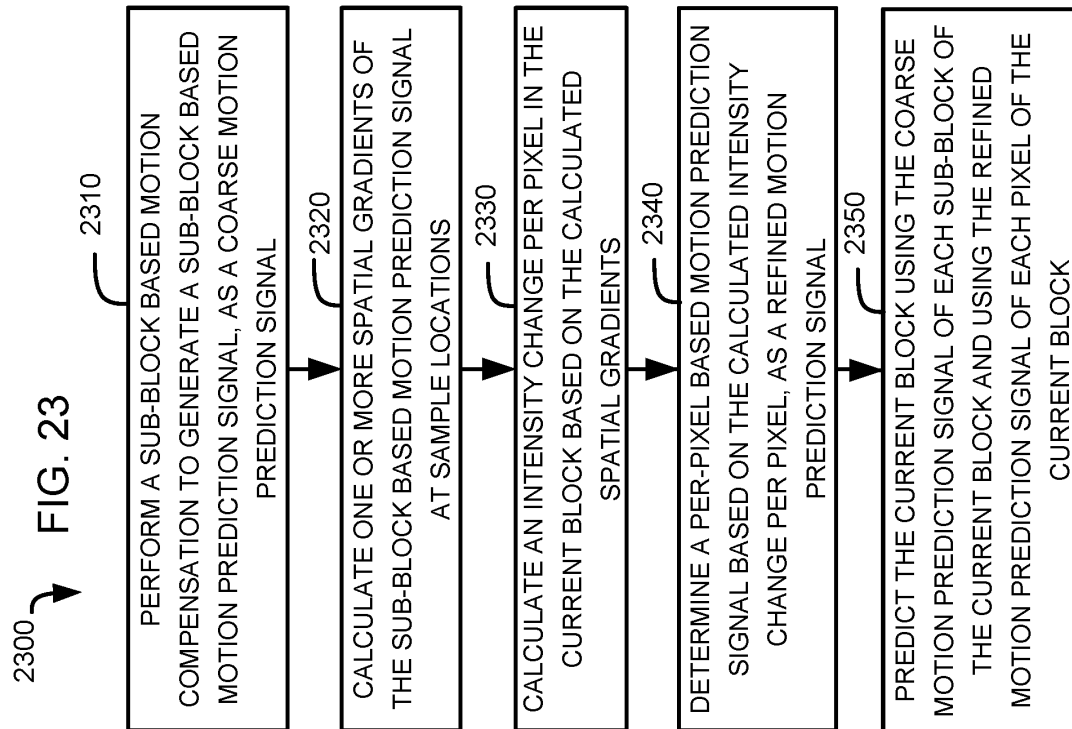
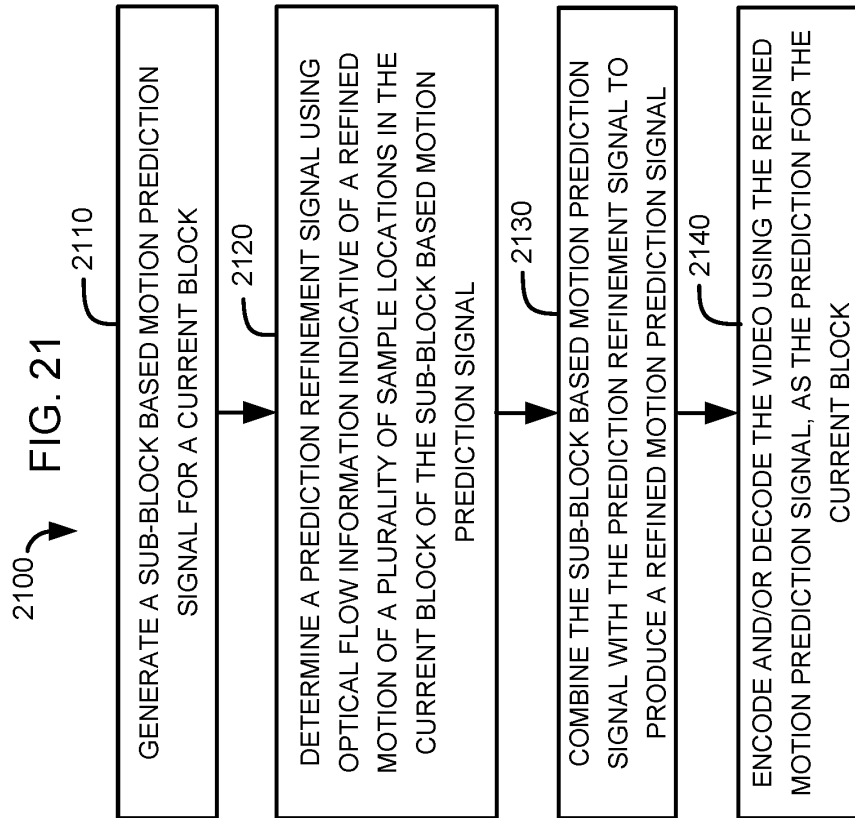


FIG. 22

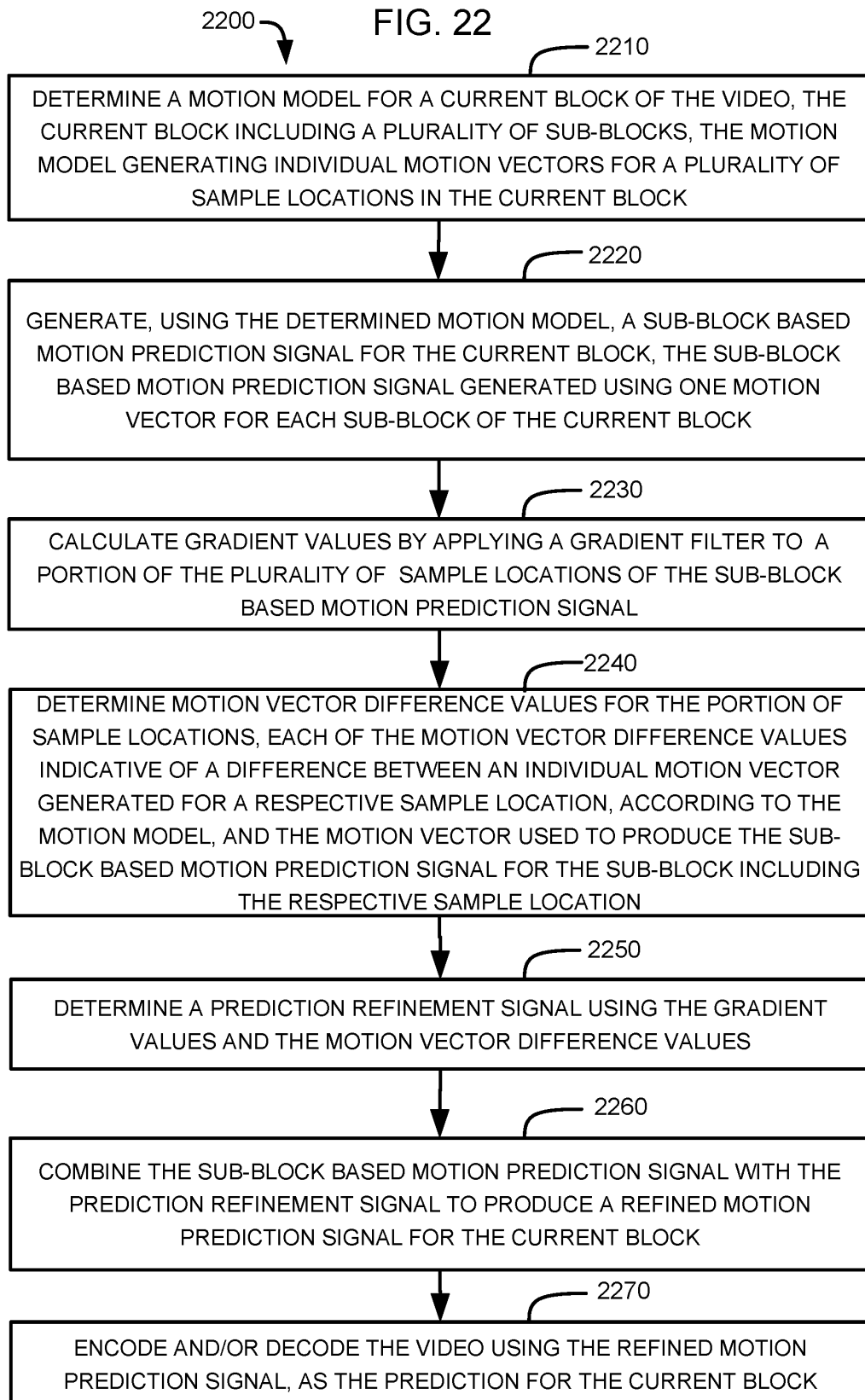
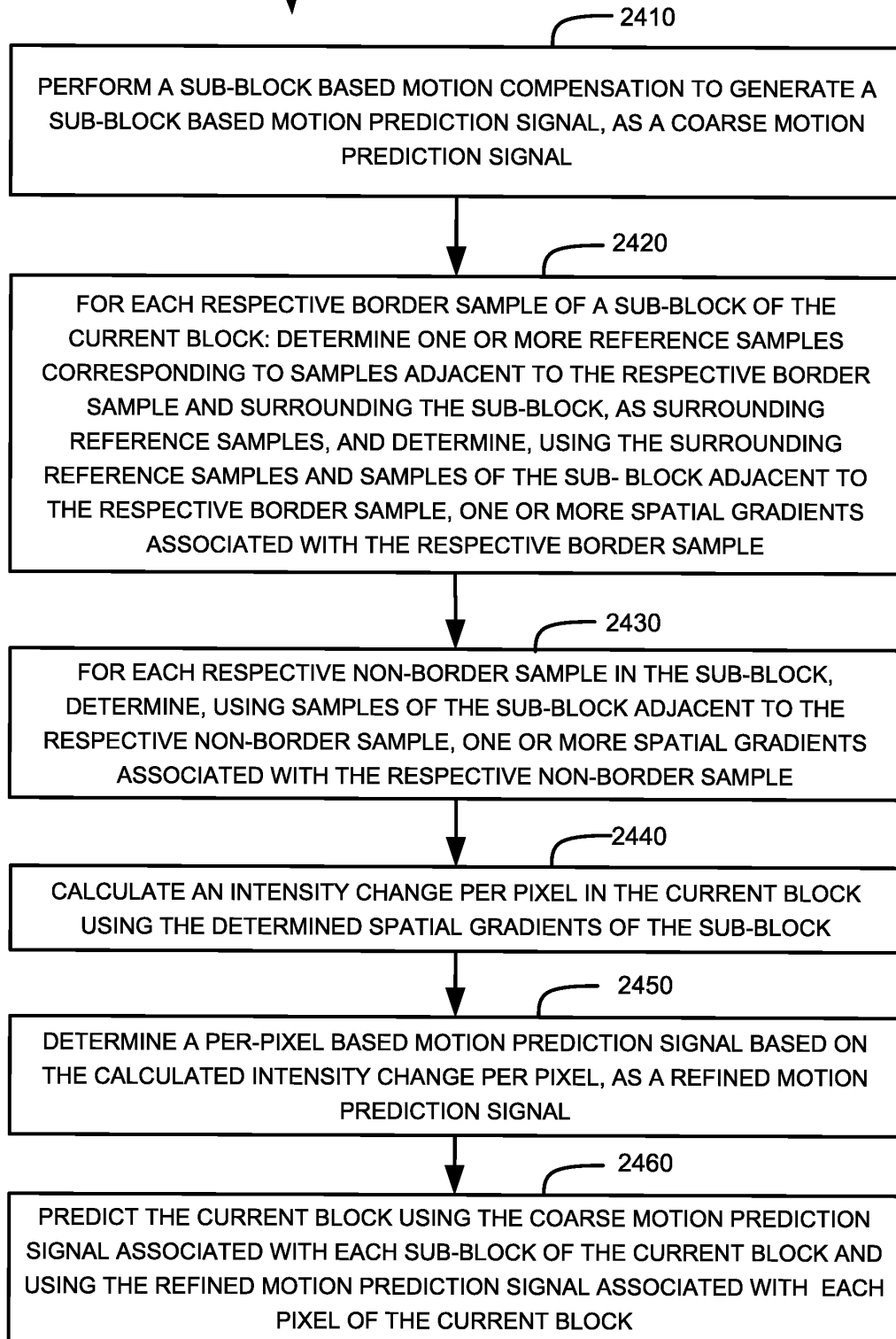
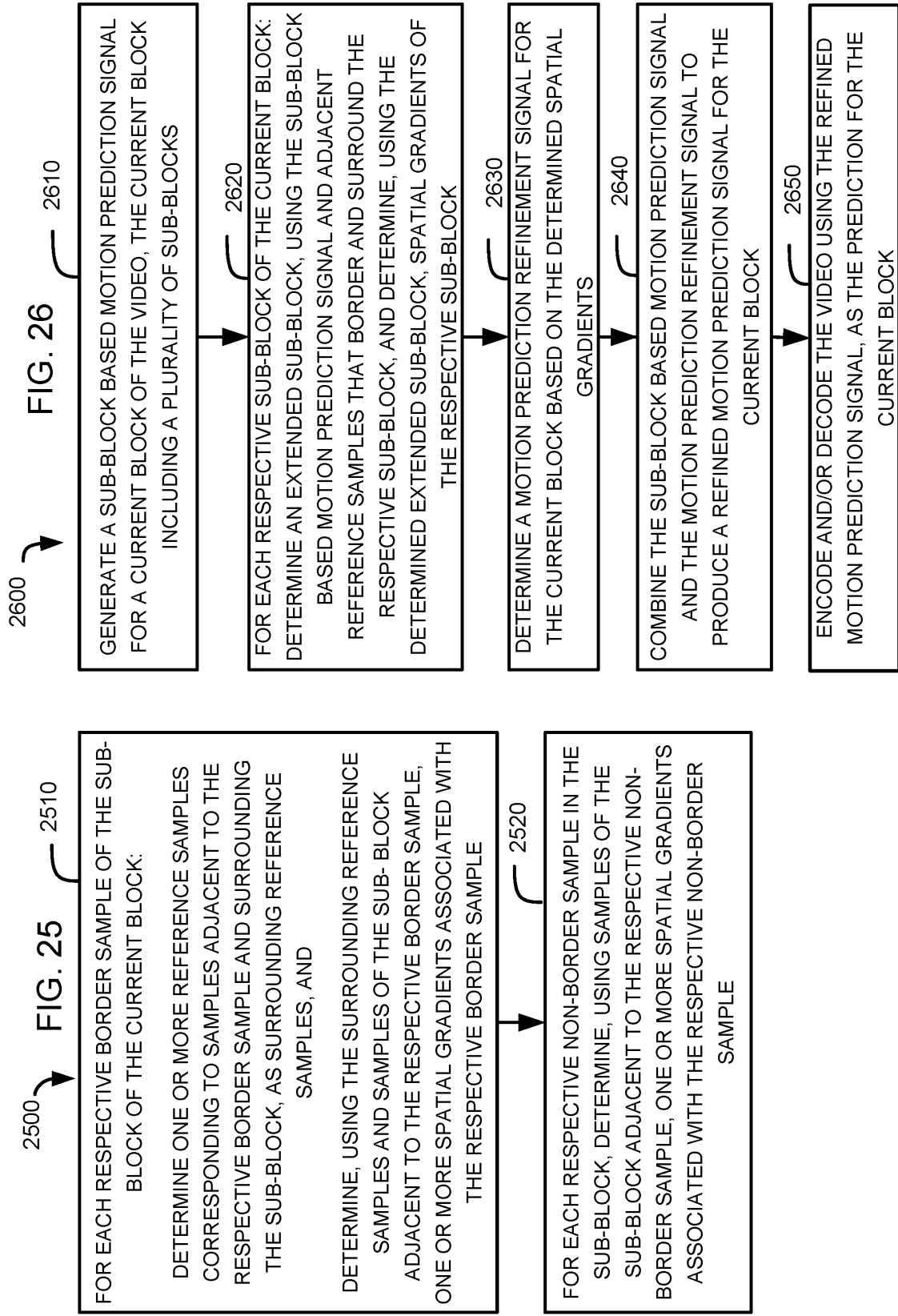
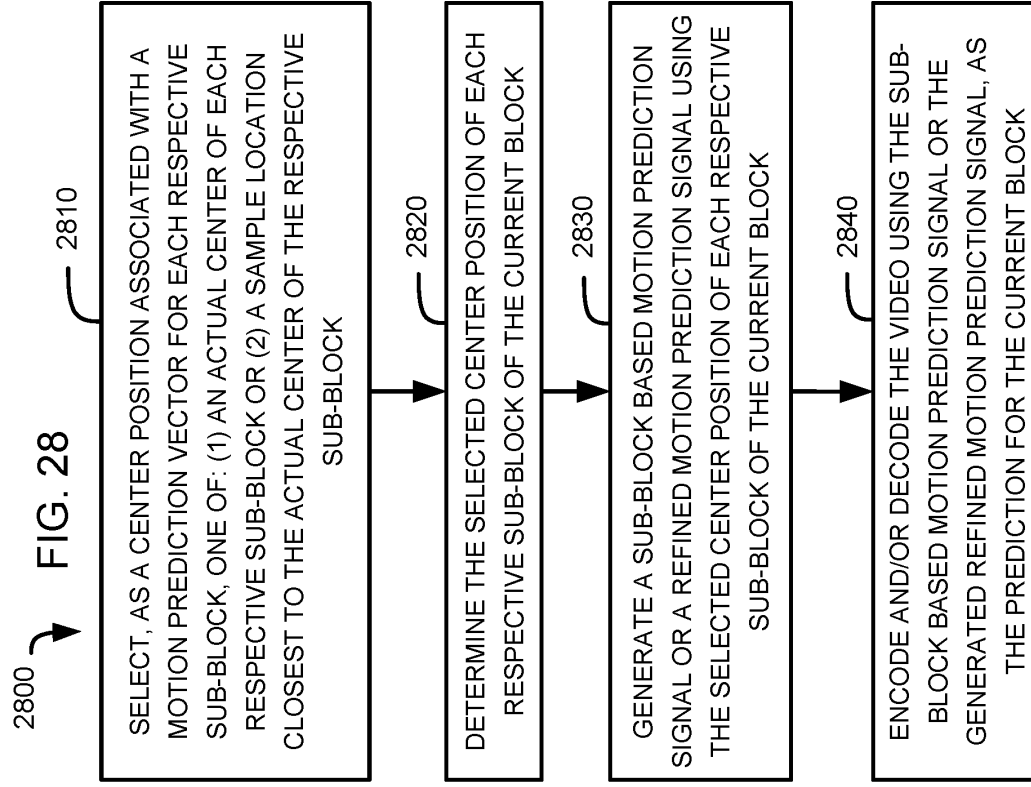
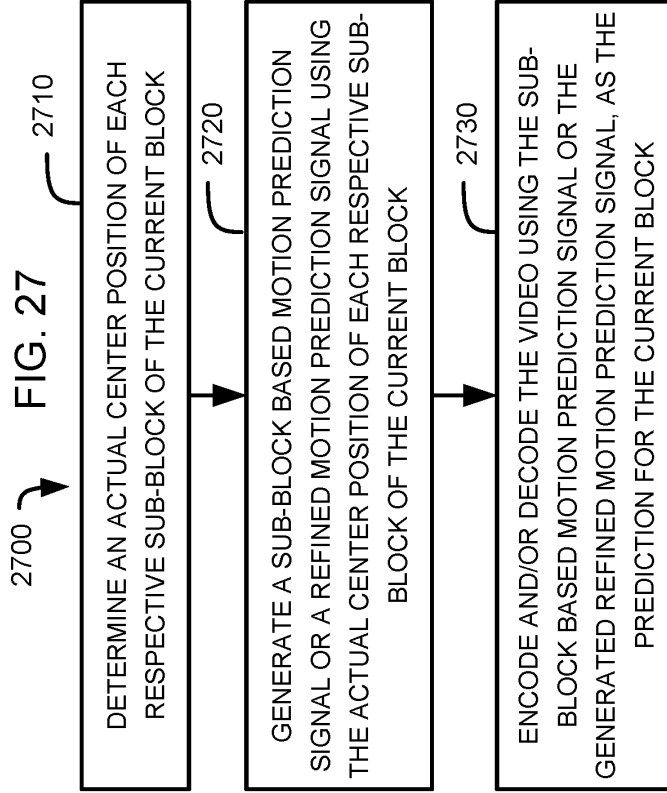


FIG. 24

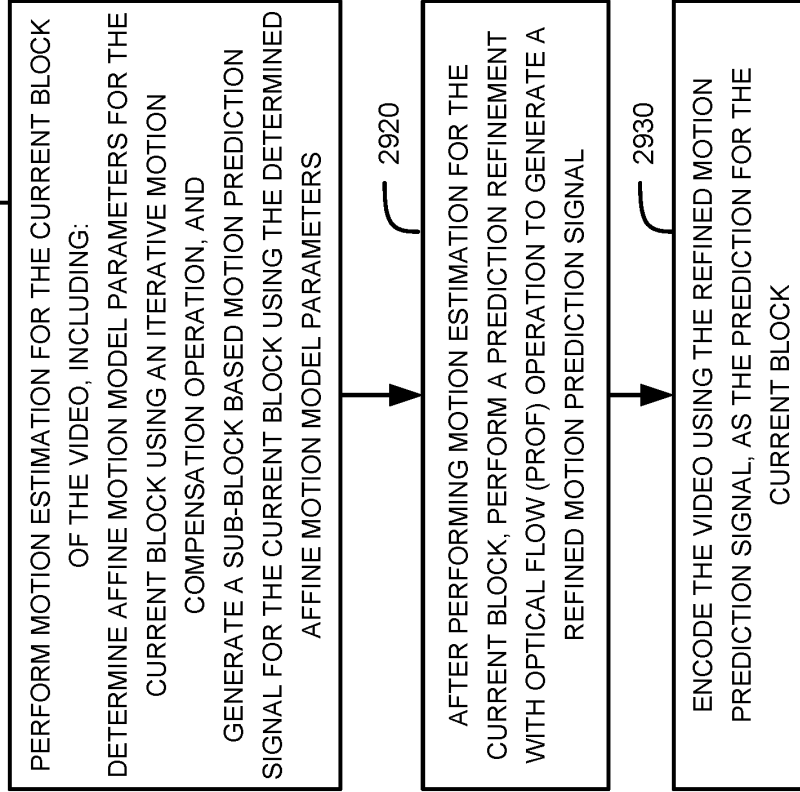
2400



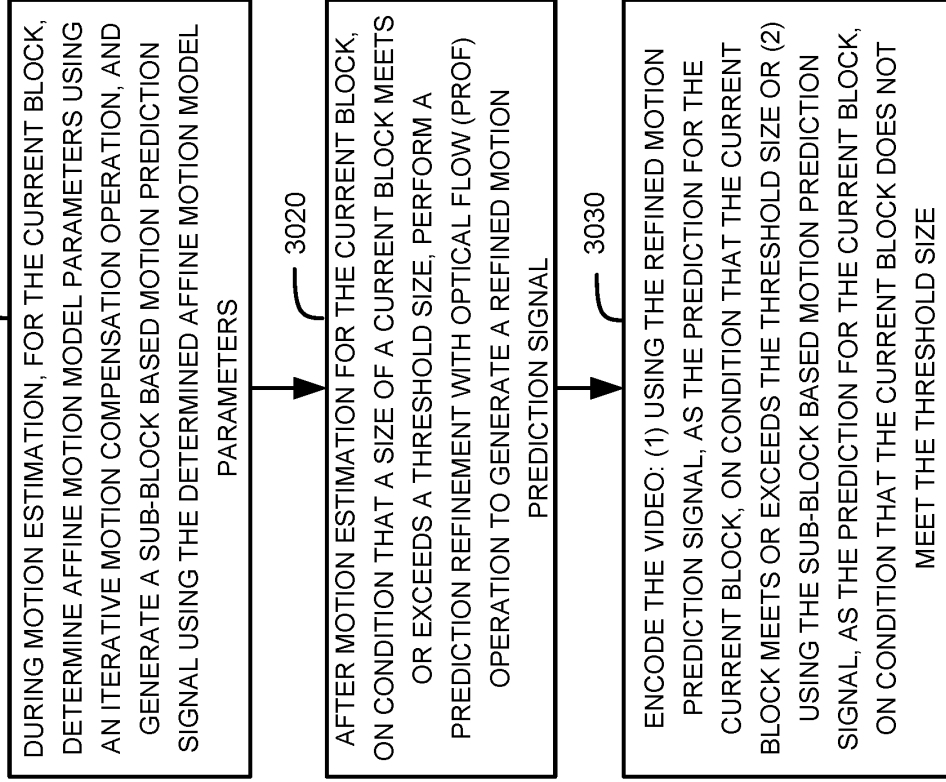


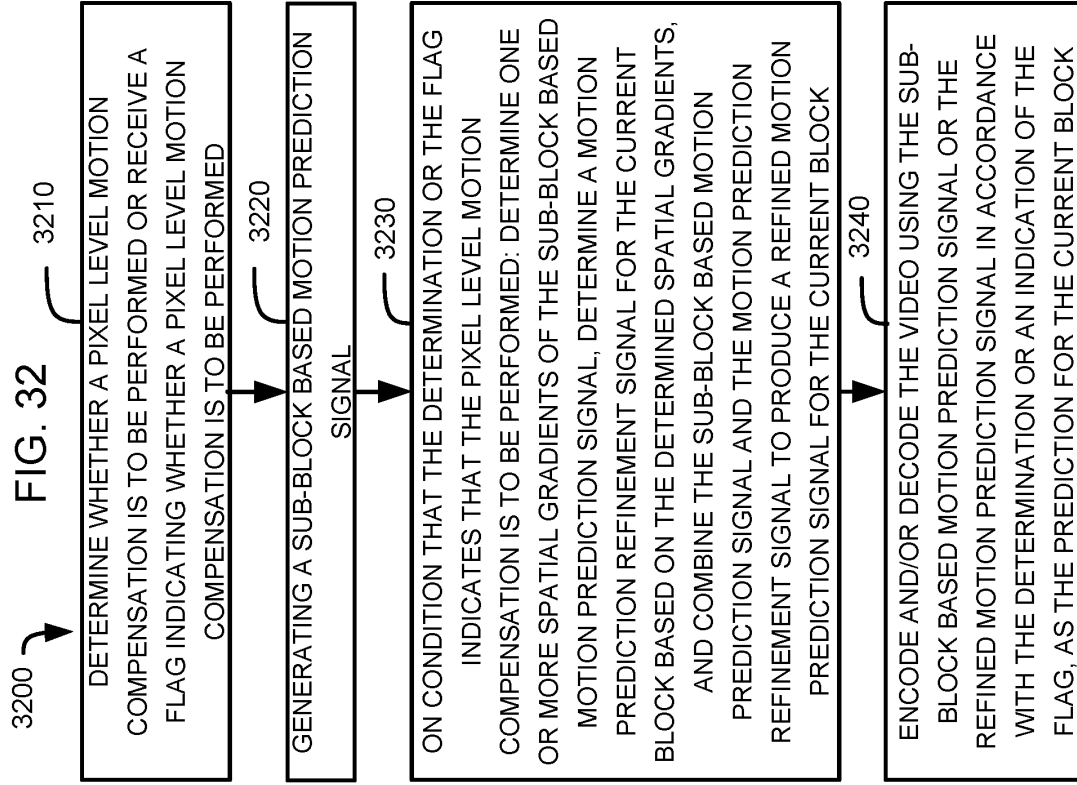
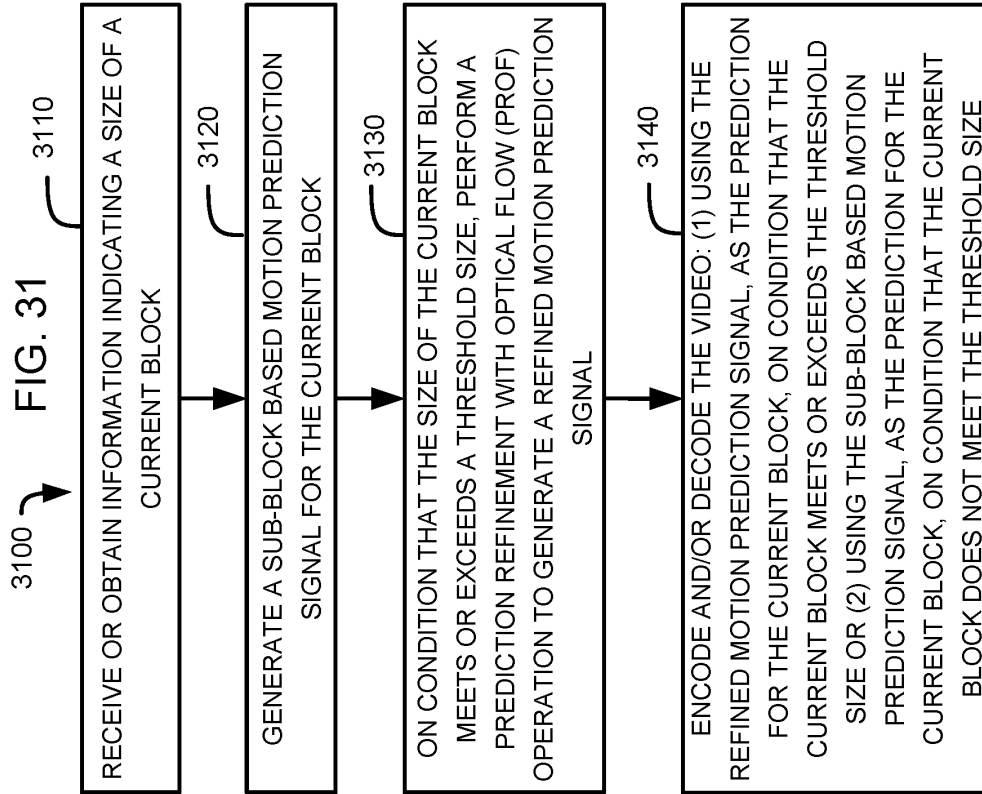


2900 → FIG. 29



3000 → FIG. 30





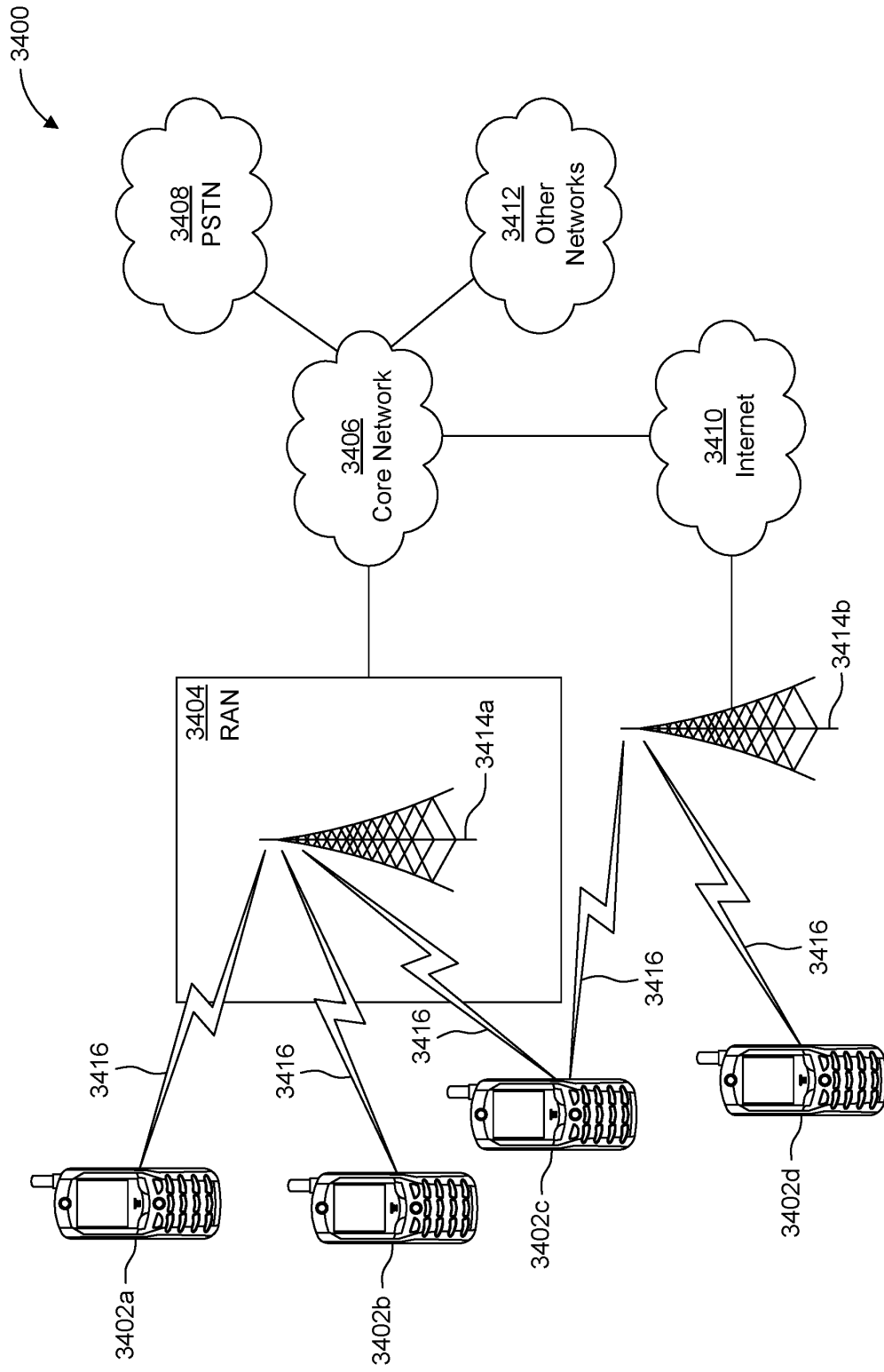


FIG. 34A

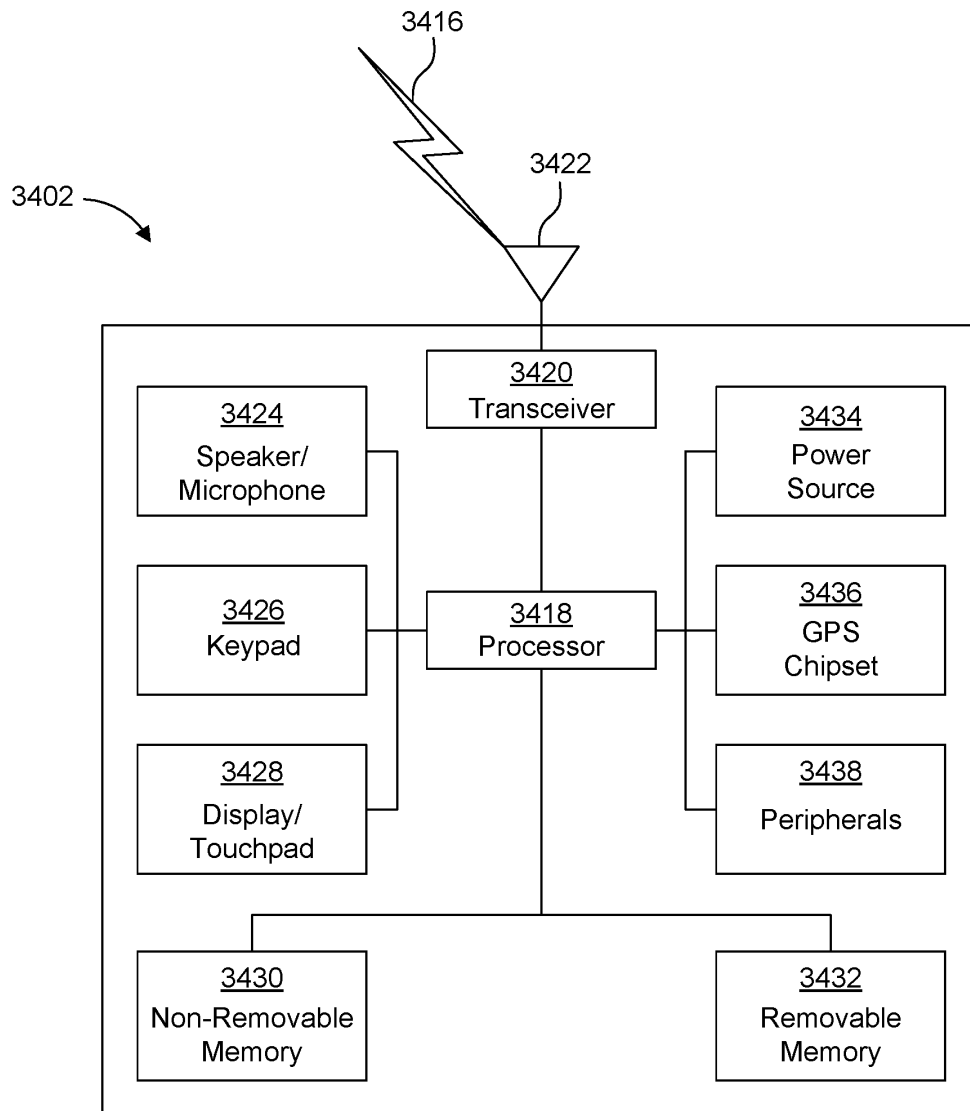


FIG. 34B

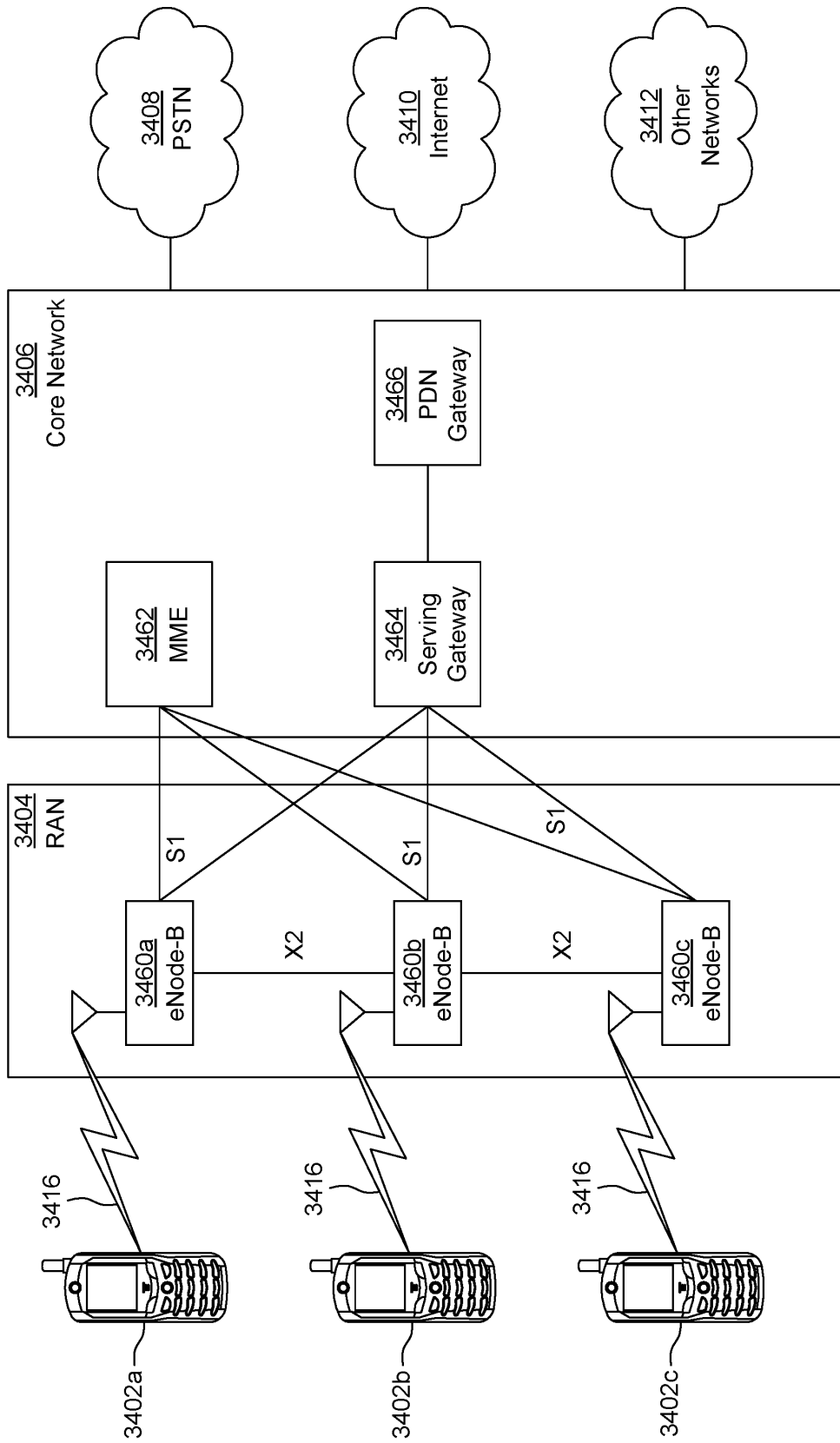


FIG. 34C

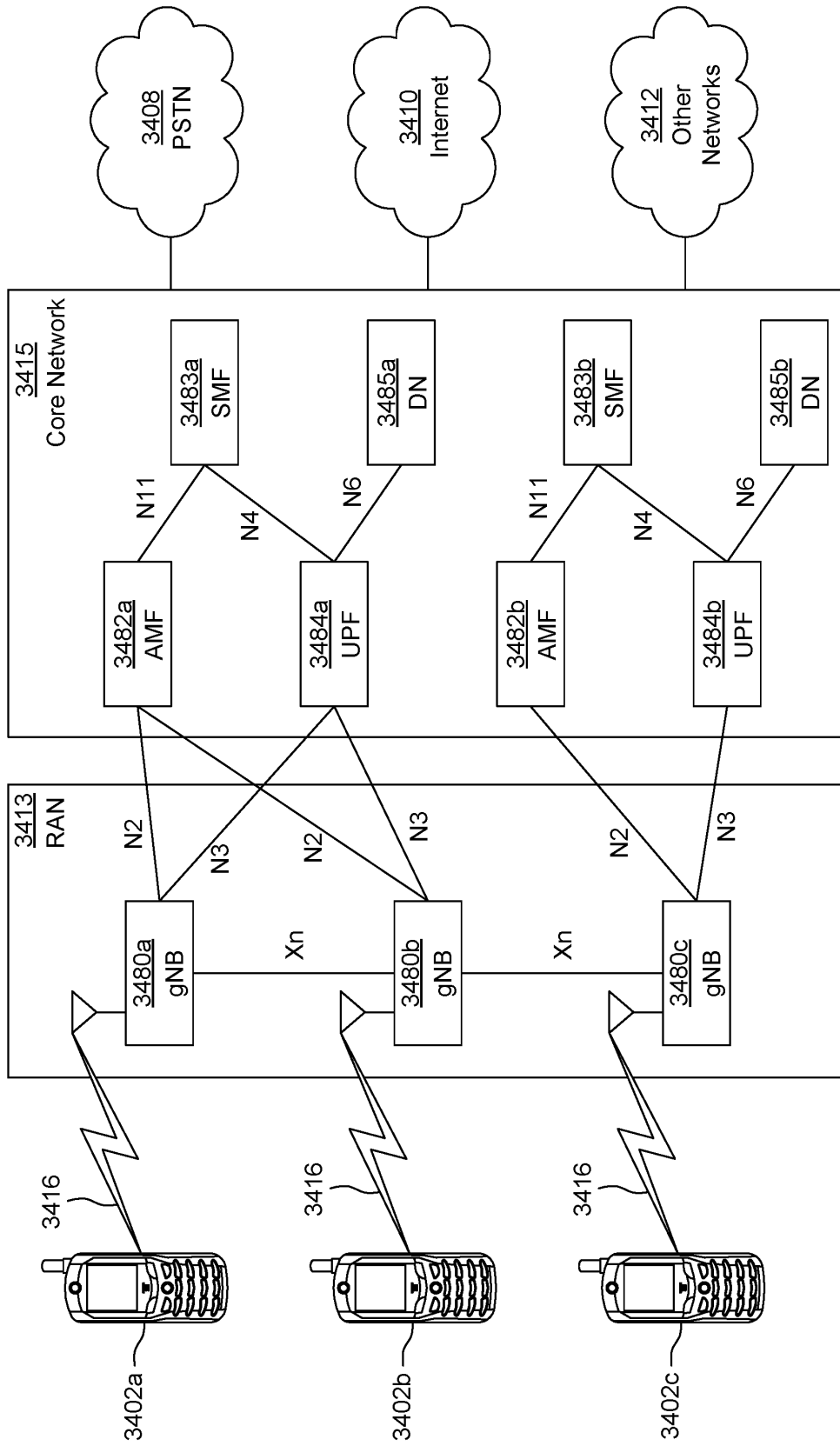


FIG. 34D