

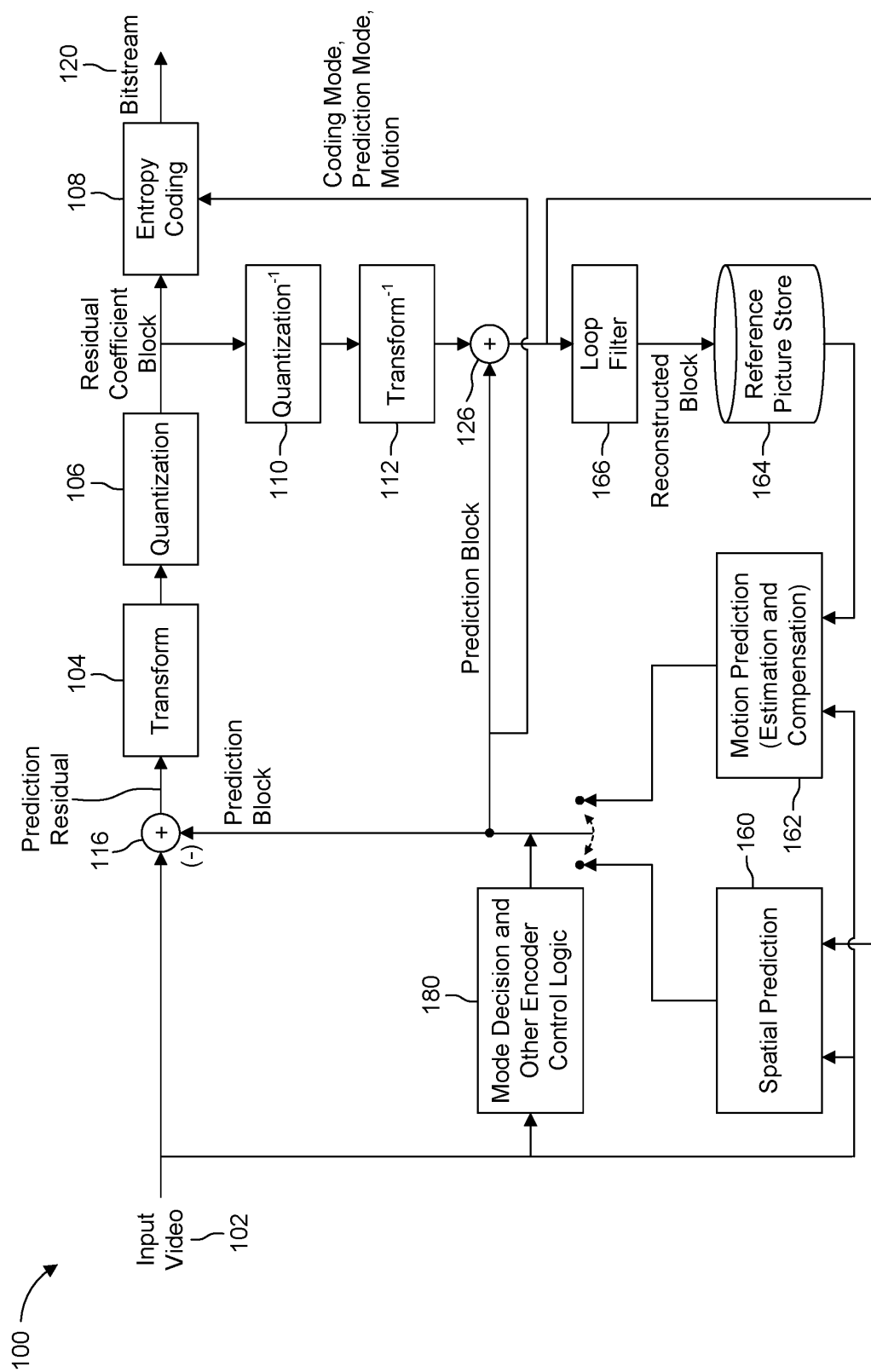


FIG. 1: General Diagram of Block-based Video Encoder for the VVC

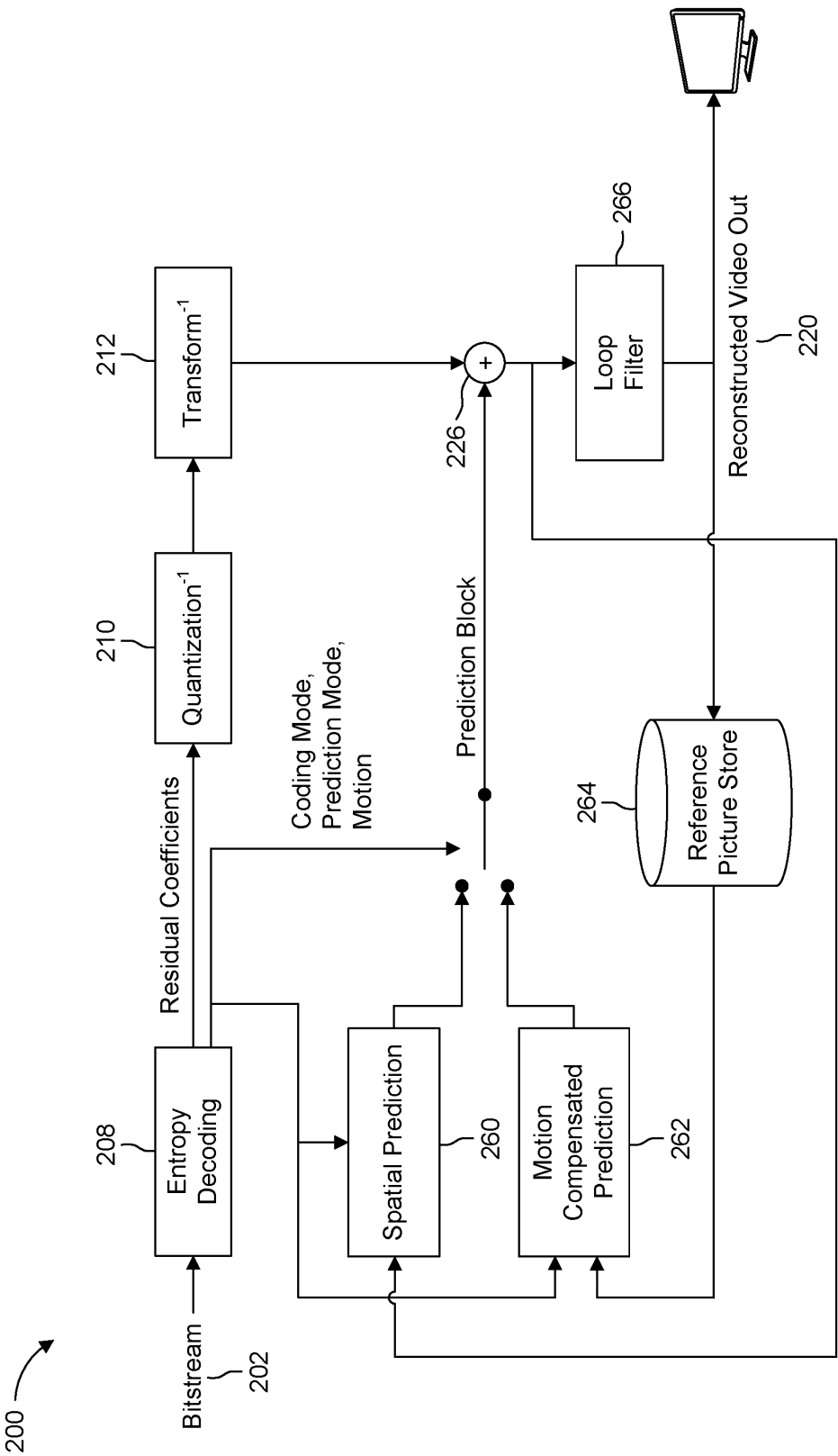


FIG. 2: General Diagram of Block-based Video Decoder

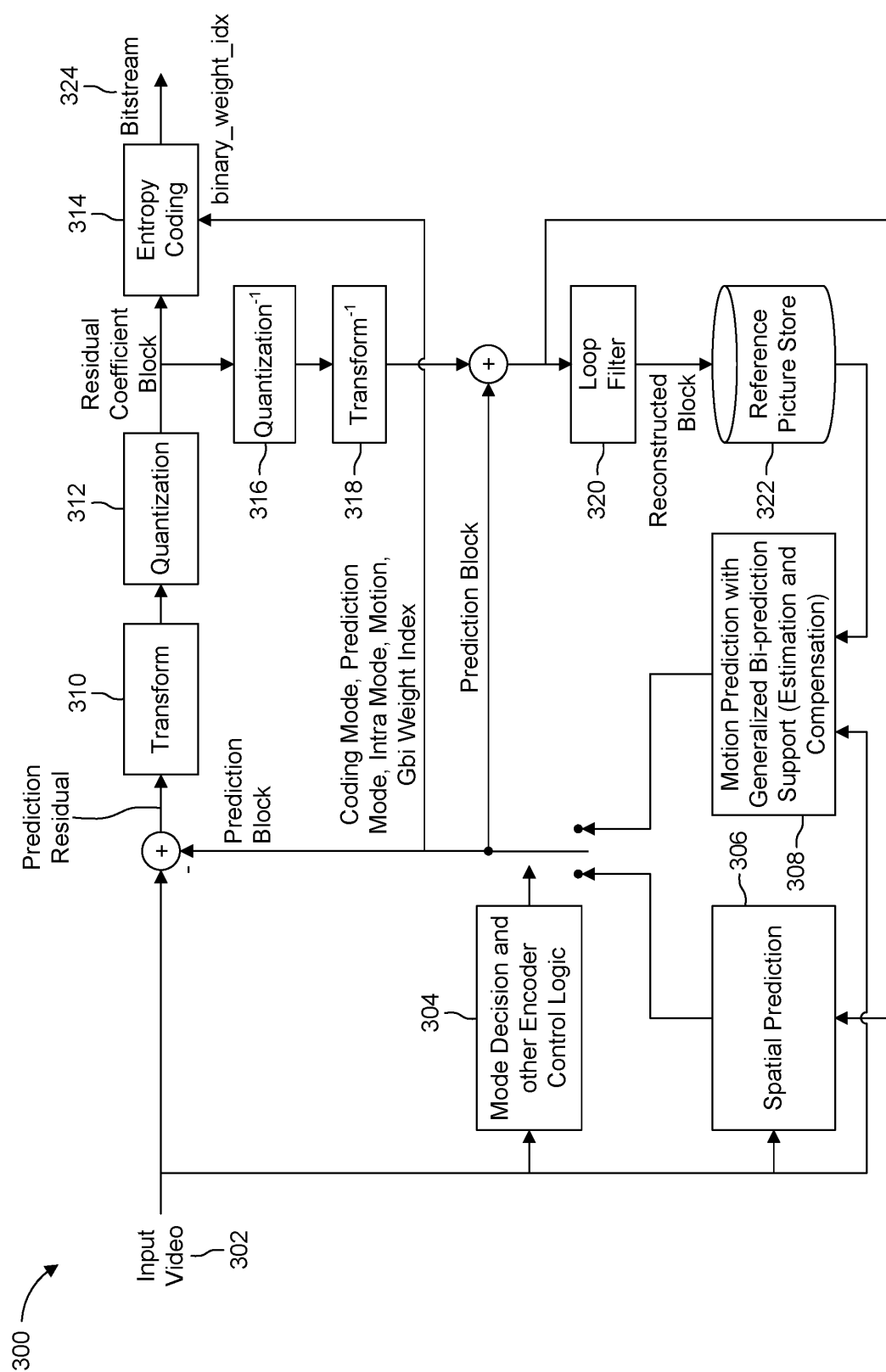


FIG. 3: General Block Diagram of a Video Encoder that Supports GBI

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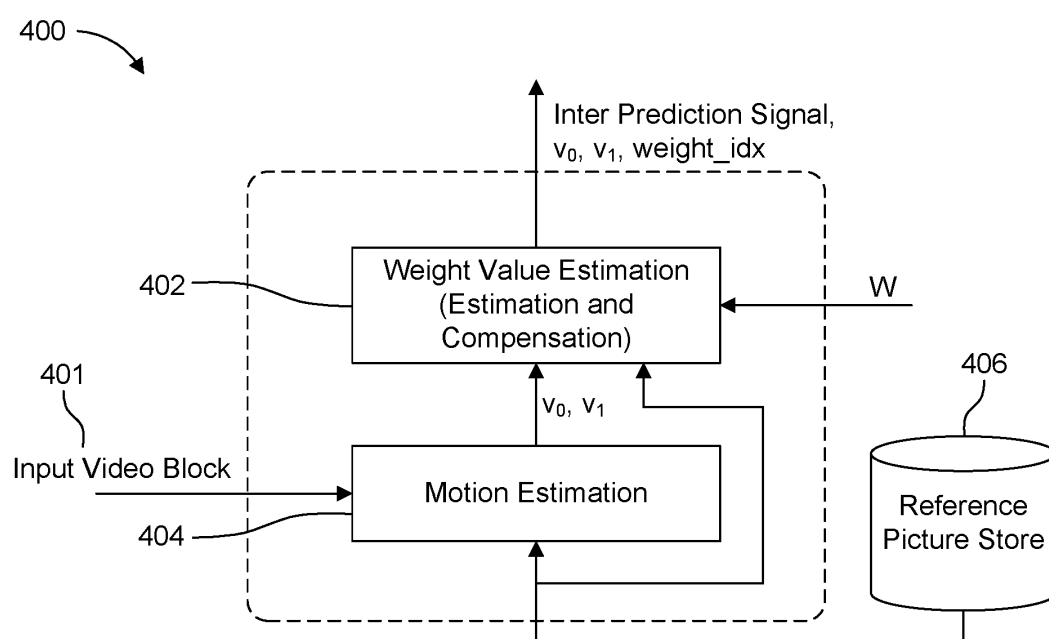


FIG. 4: General Block Diagram of the Generalized Bi-prediction Module

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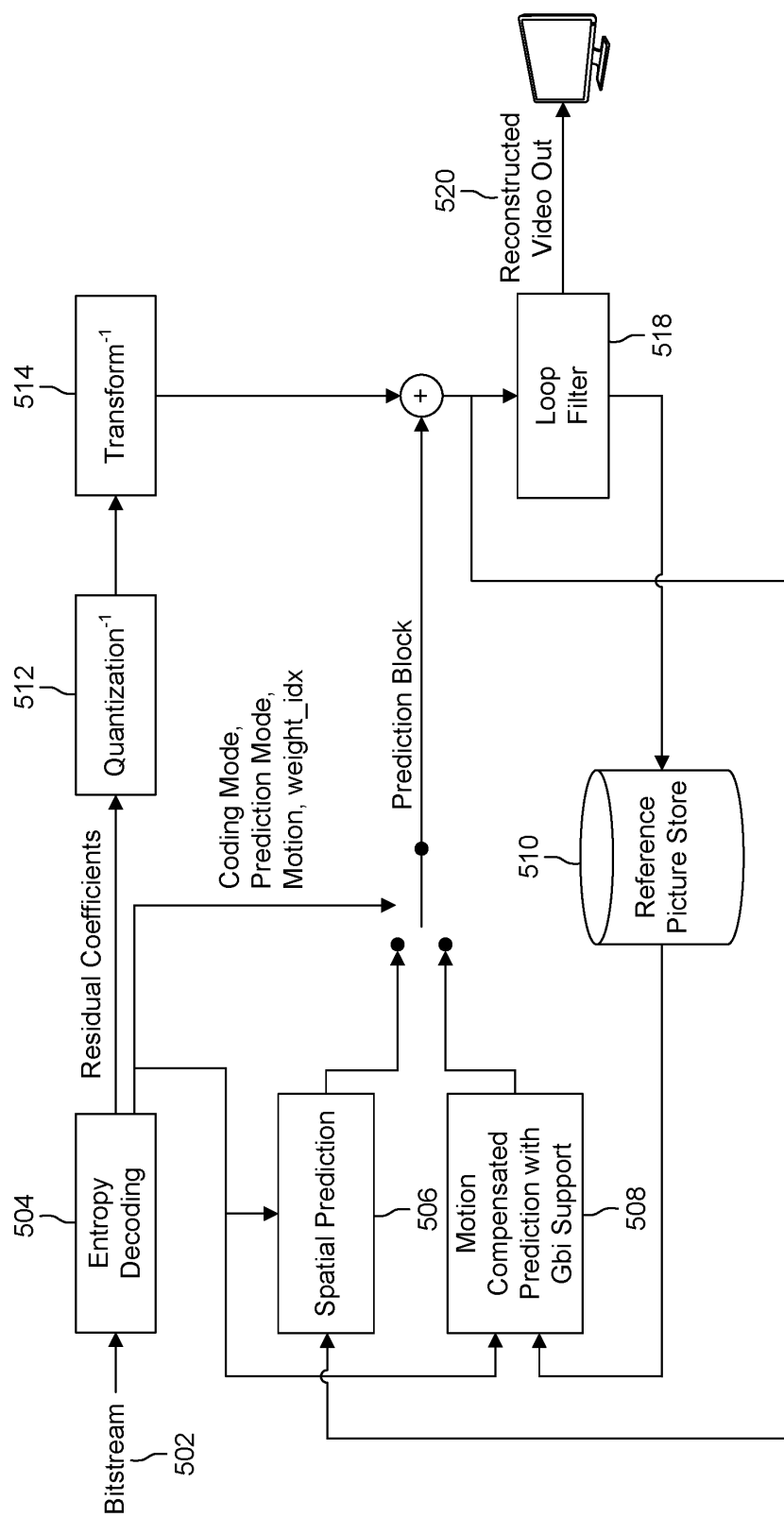


FIG. 5: General Block Diagram of a Video Decoder with GBI Support

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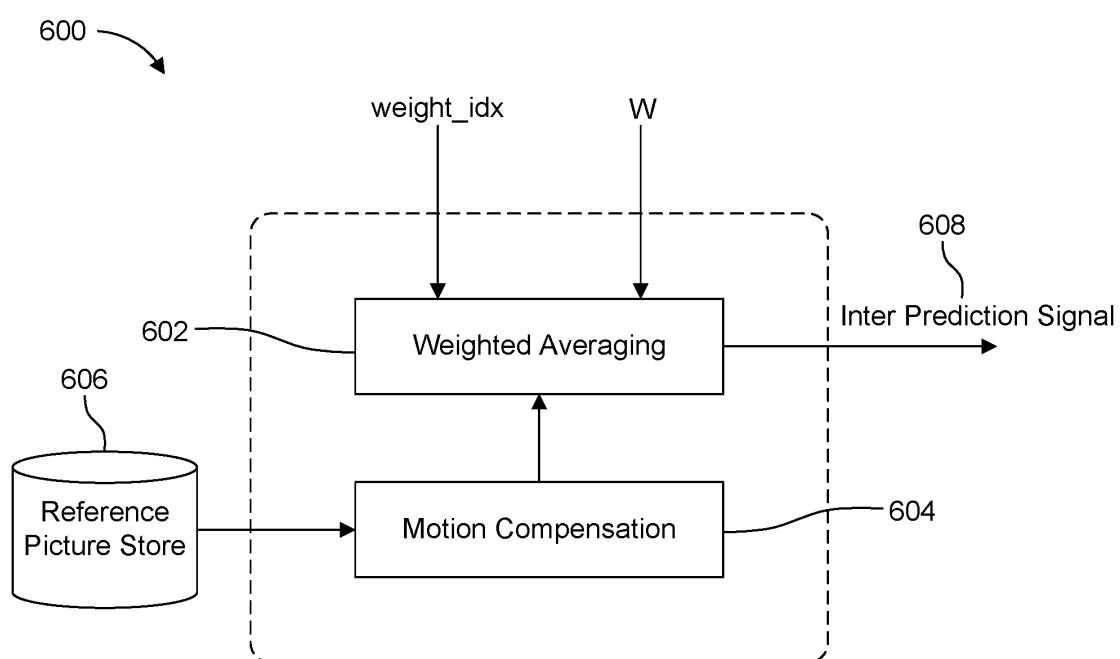


FIG. 6: General Block Diagram of the Generalized Bi-prediction Module

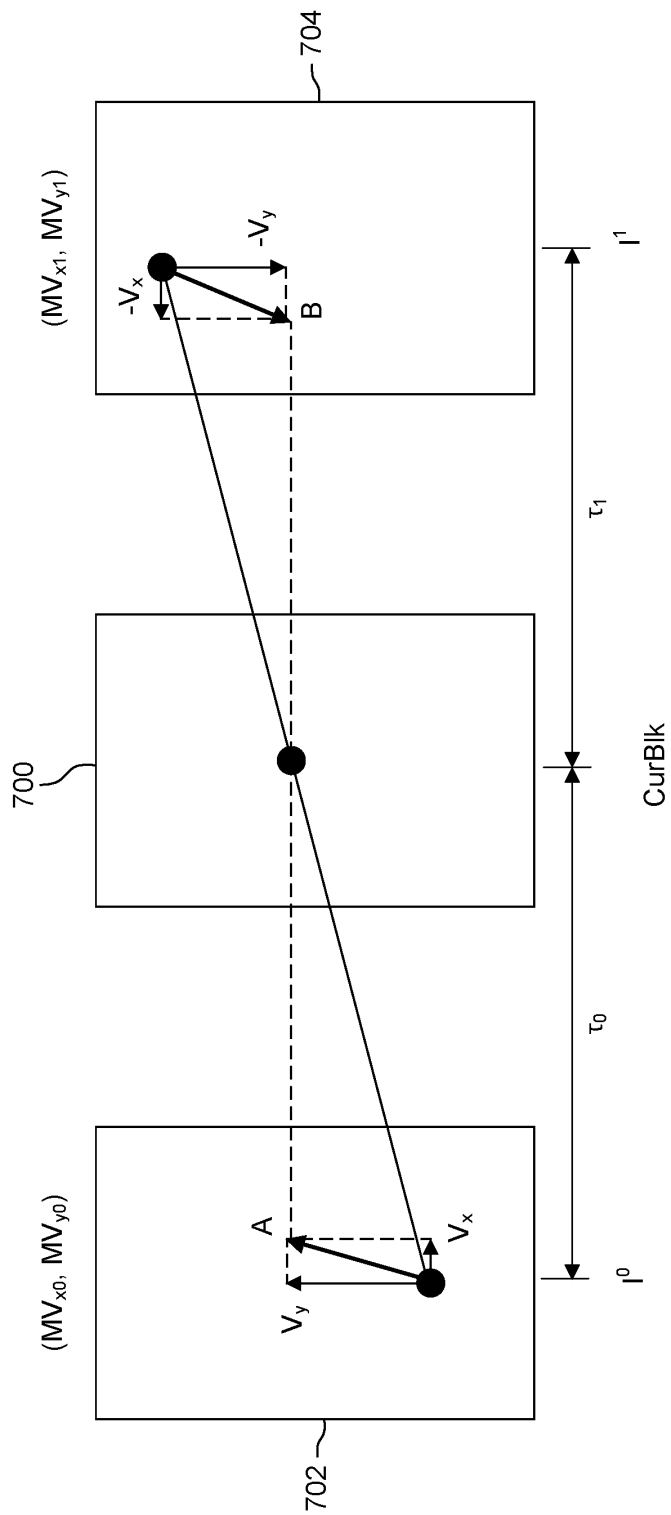


FIG. 7: Illustration of Bidirectional Optical Flow

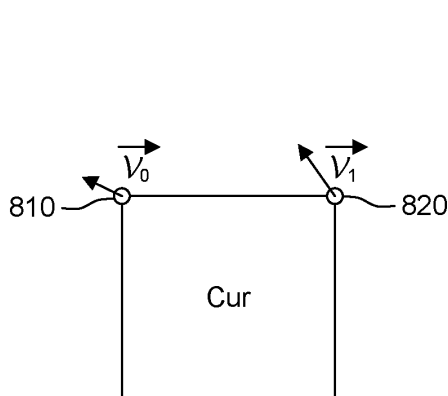


FIG. 8A: Four-parameter Affine Mode: the Affine Model

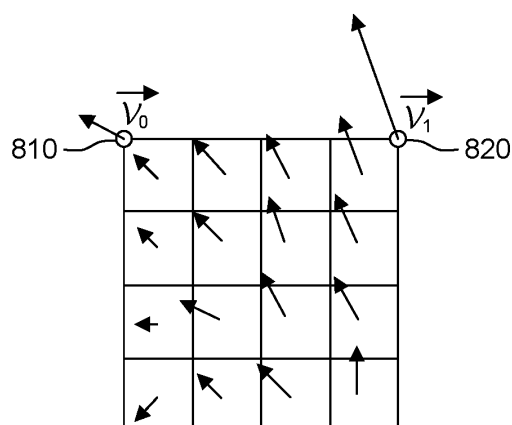


FIG. 8B: Four-parameter Affine Mode: the Sub-block-level Motion Derivation for Affine Blocks

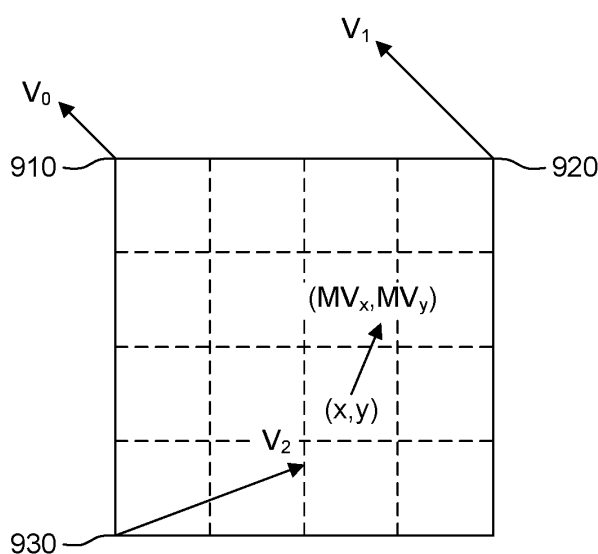


FIG. 9: Six-parameter Affine Mode: V_0 , V_1 , and V_2 are Control Points; (MV_x, MV_y) is Motion Vector of the Sub-block Centered at Position (x, y)

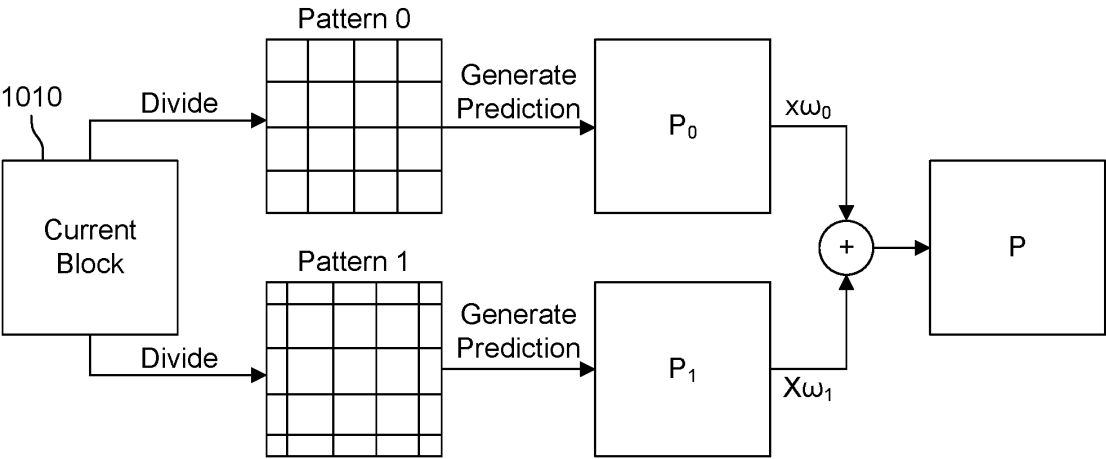


FIG. 10: Interweaved Prediction Procedure

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

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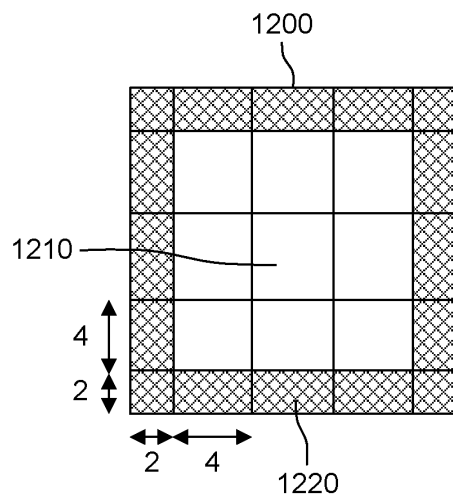


FIG. 12: Interweaved Prediction is not Applied on the Cross Hatched Regions

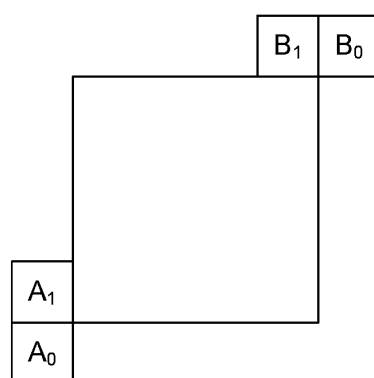


FIG. 13A: The SbTMVP Process in VVC - Spatial Neighboring Blocks Used by ATVMP

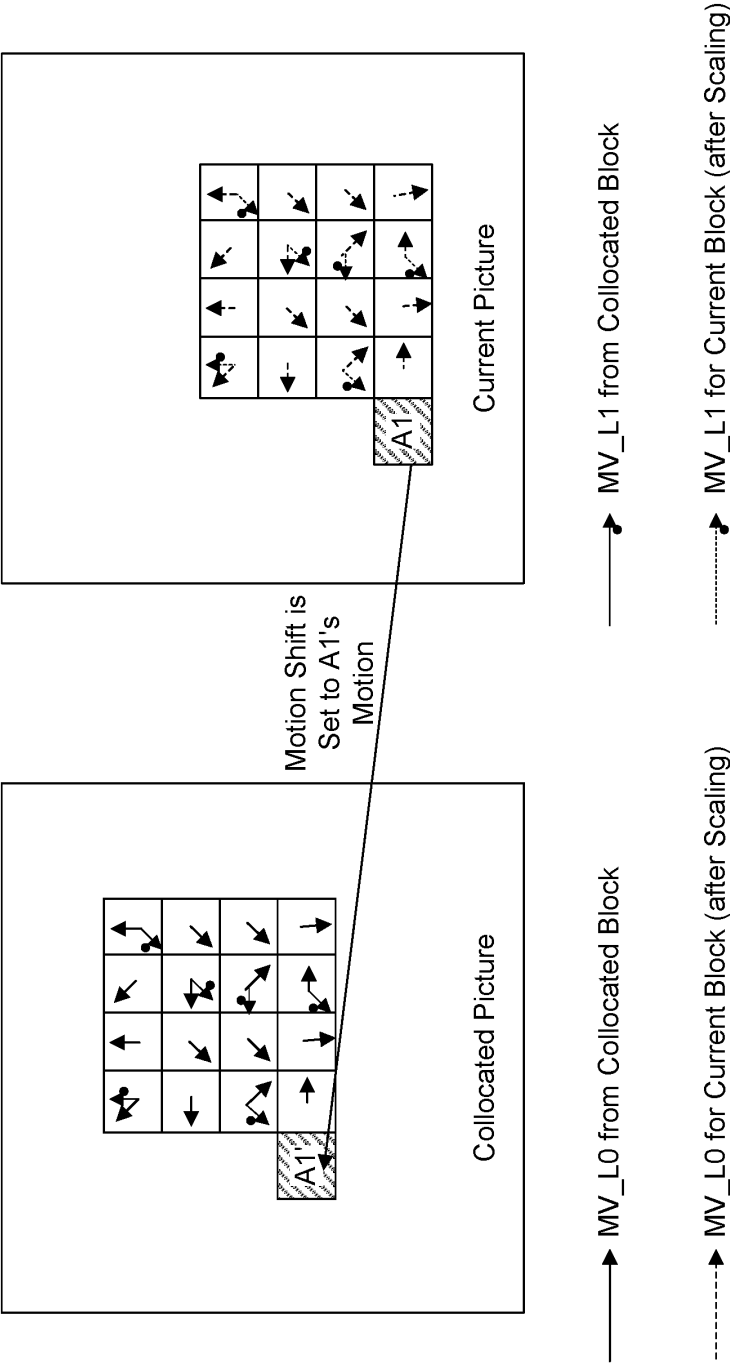


FIG. 13B: The SbTMVP Process in VVC - Deriving Sub-CU Motion Field by Applying a Motion Shift from Spatial Neighbor and Scaling the Motion Information from the Corresponding Collocated Sub-CUs

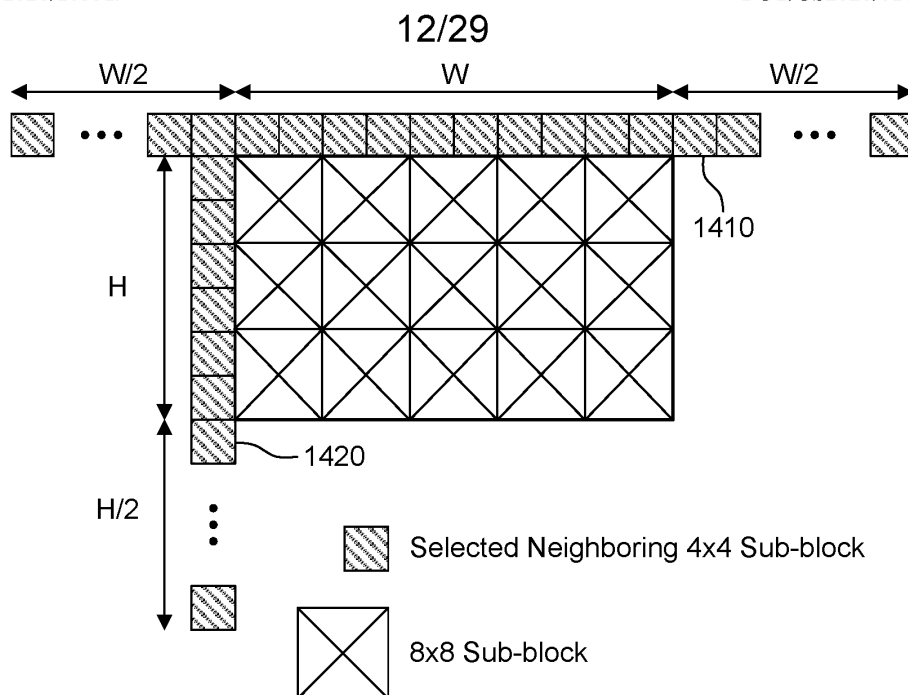


FIG. 14: Neighboring Motion Vectors that are Used in RMVF Motion Parameter Derivation

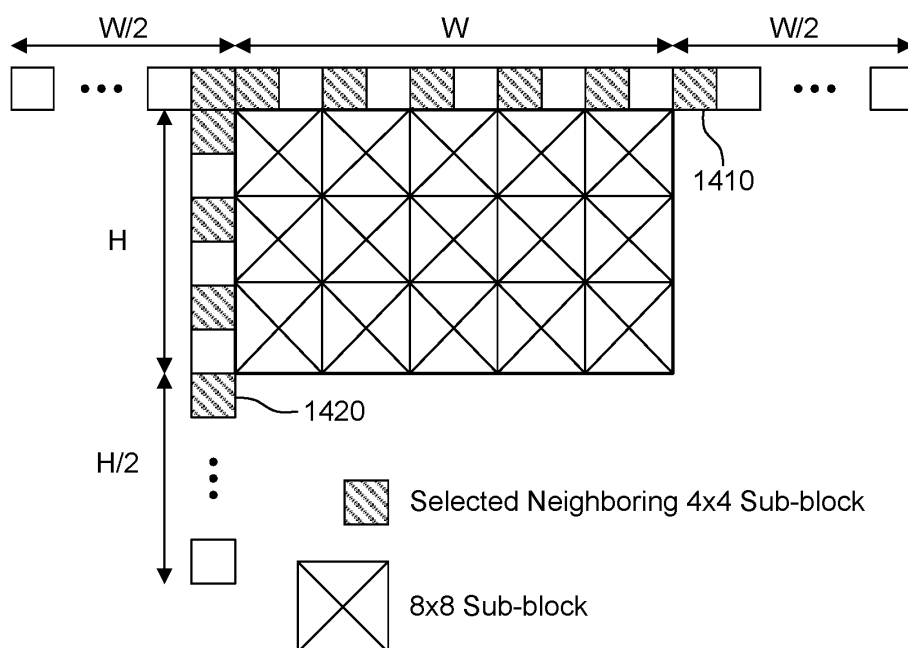


FIG. 15: Reduced Neighboring Motion Vector Candidates for RMVF Motion Parameter Derivation

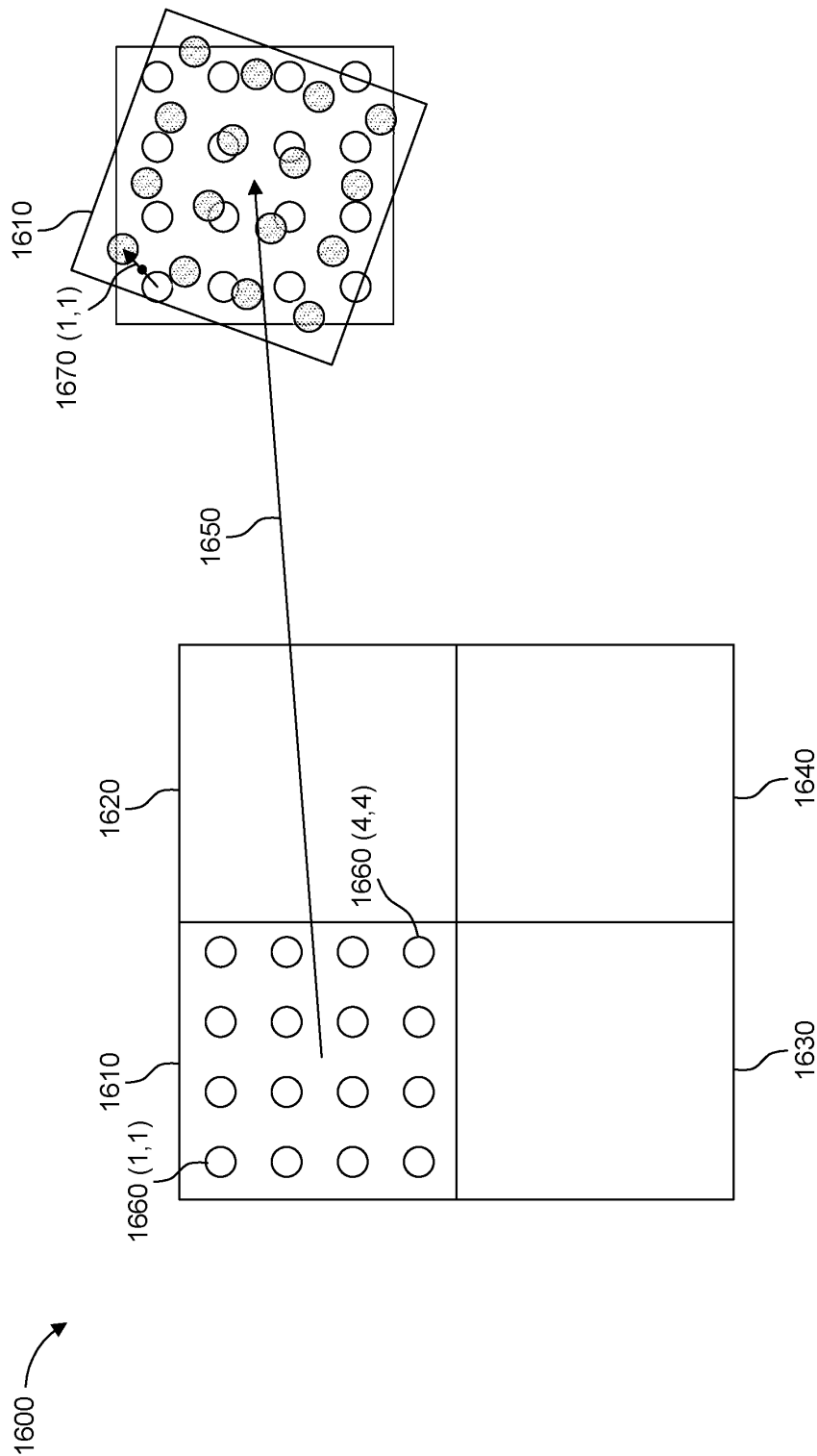


FIG. 16: Sub-block MV (Arrow) and Pixel-level MV Difference (Arrow with Circle)

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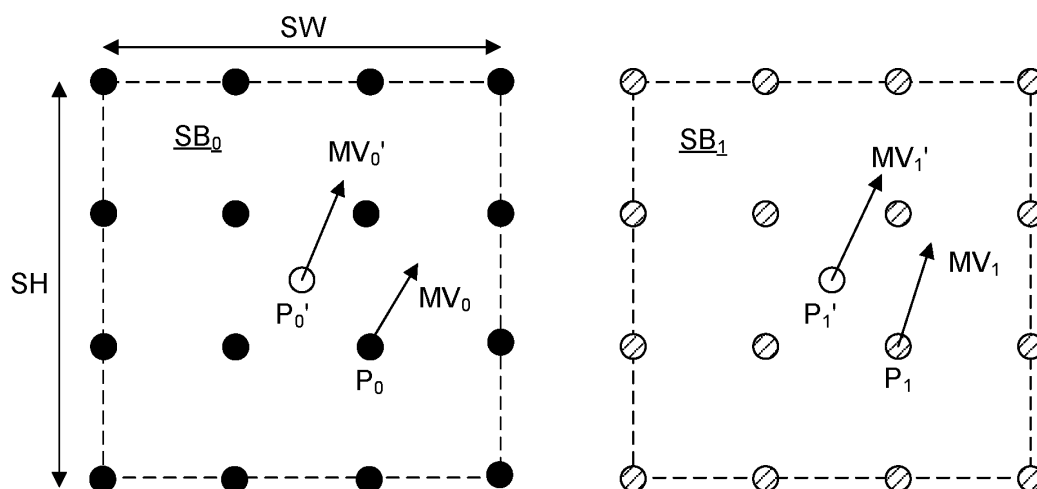


FIG. 17A: MV Derivation for Sub-block for One 8x4 CU

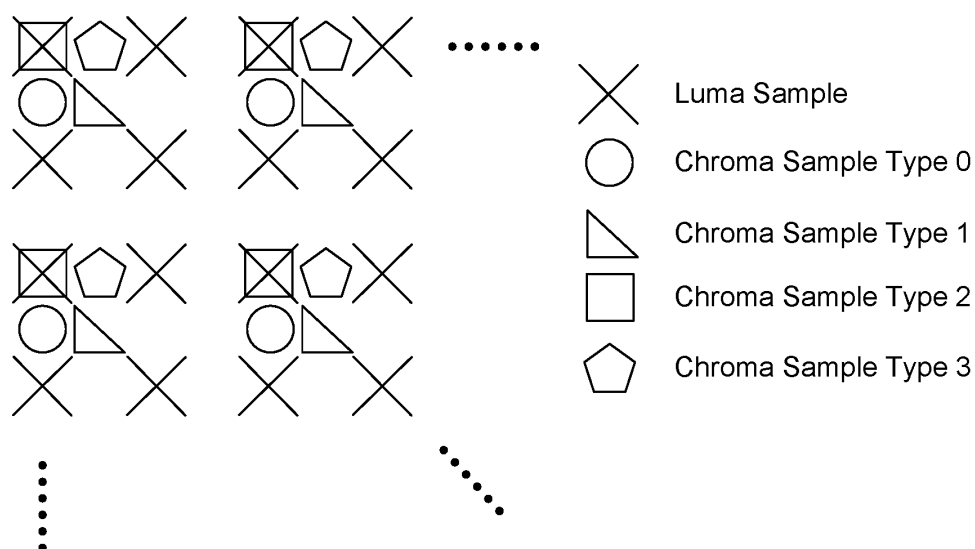


FIG. 17B: Locations of Chroma Samples in 4:2:0 Chroma Format

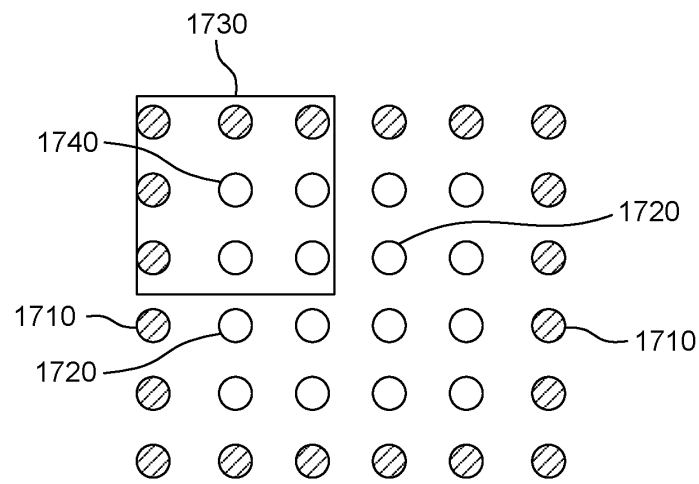
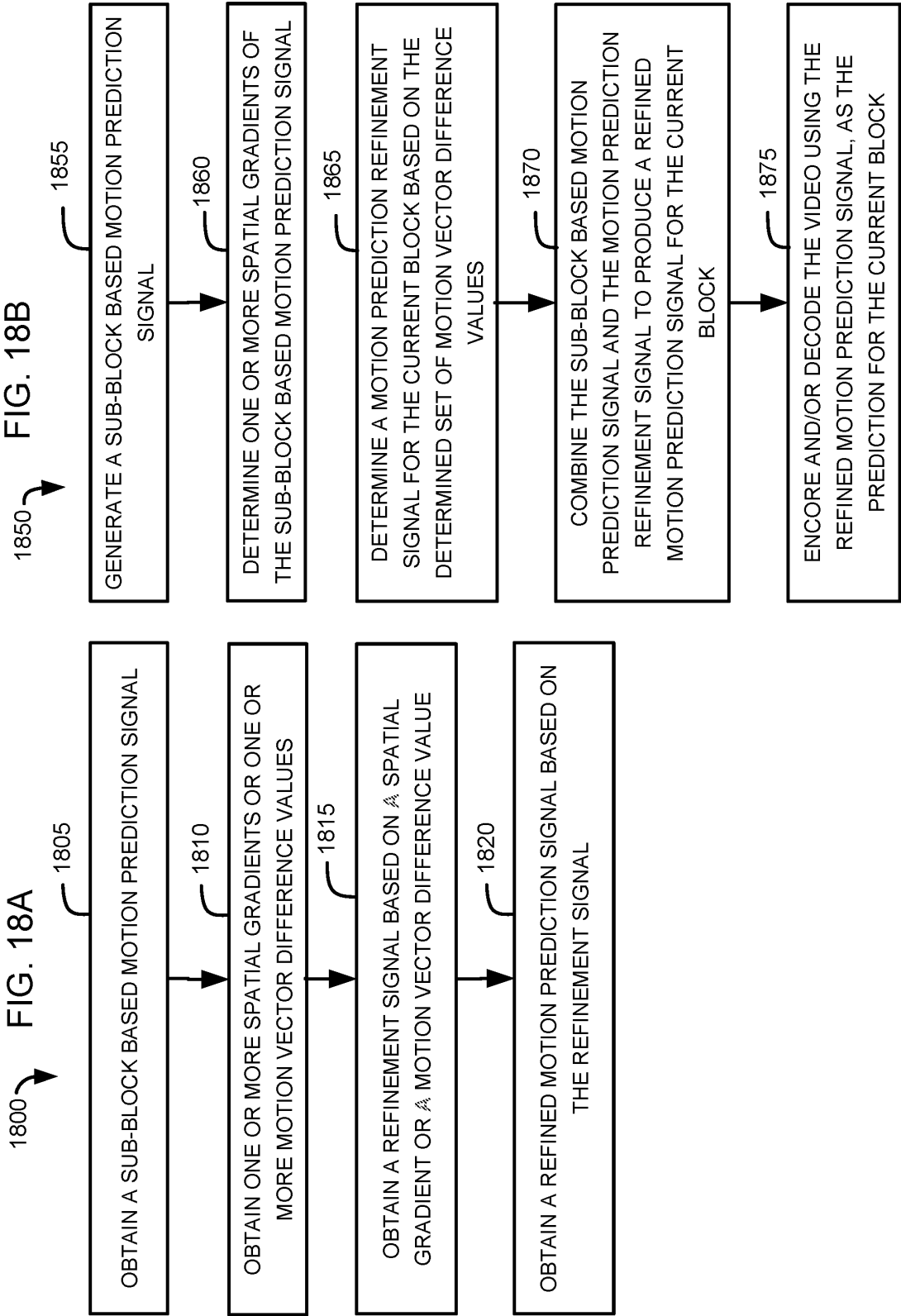
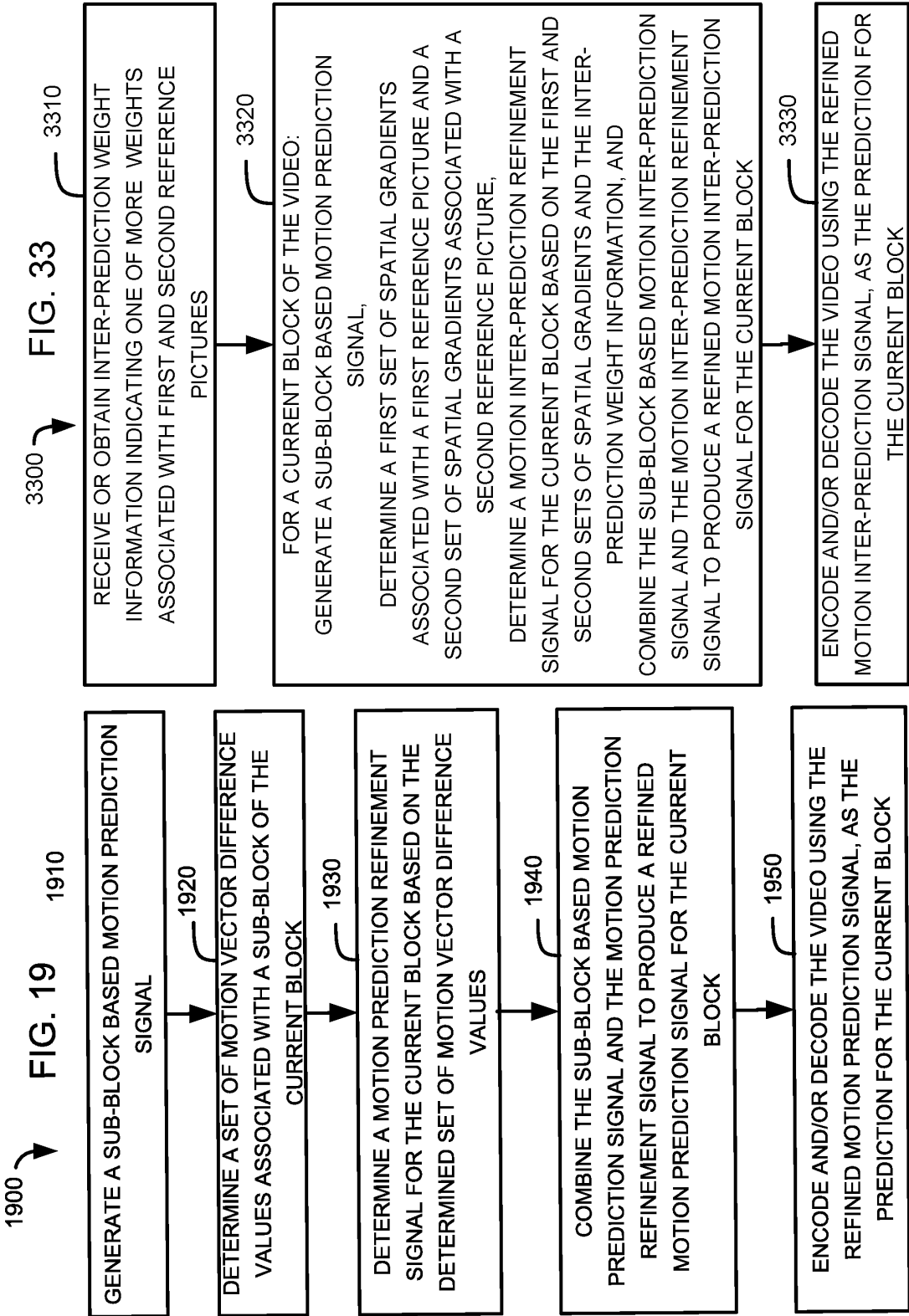


FIG. 17C: Extended Prediction Sub-block. Shaded Circles are Padding Samples around 4x4 Sub-block. Using Sobel Filter as an Example, Samples in the box are Used to Calculate the Gradients of the Sample in the Center of the Box

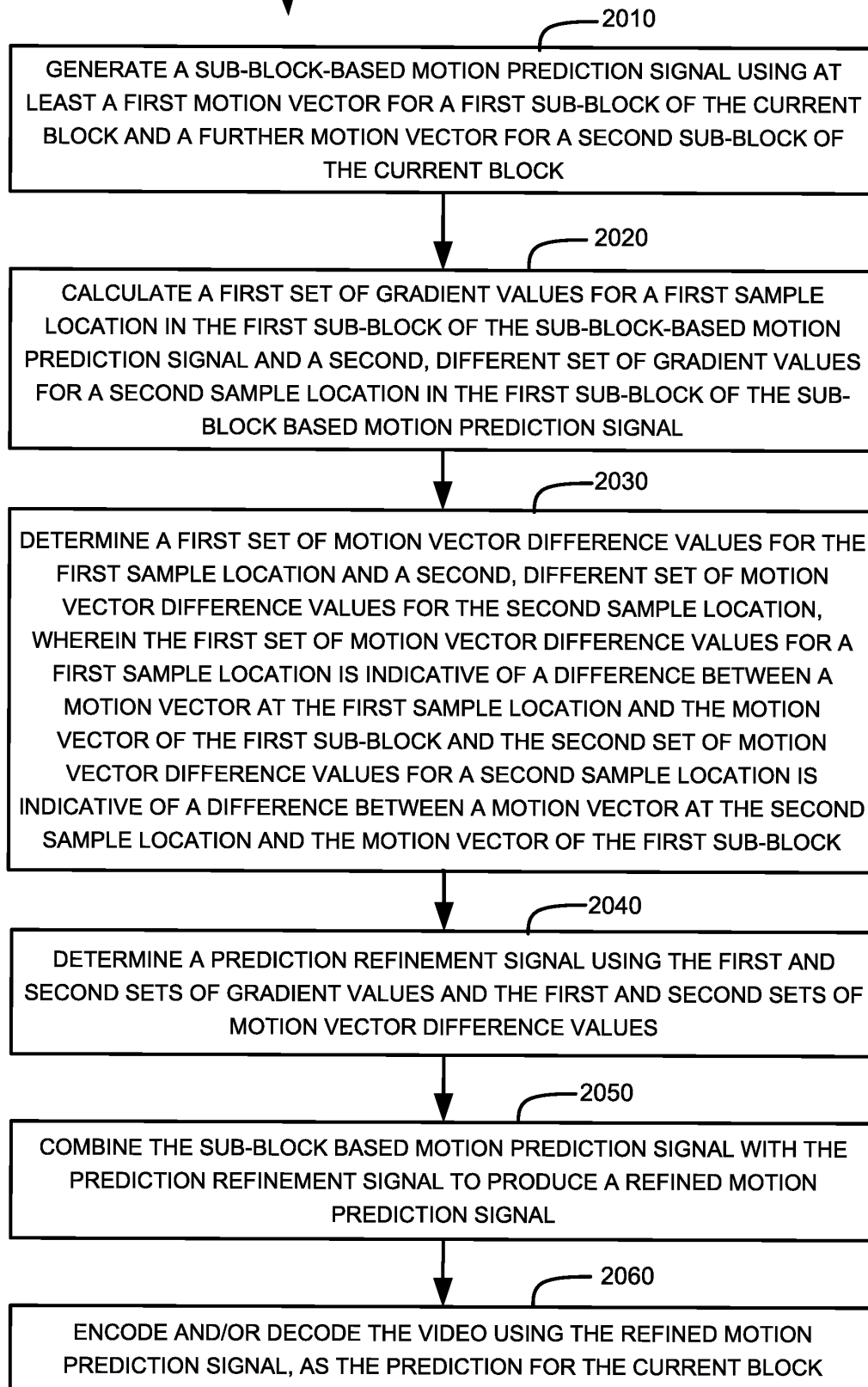


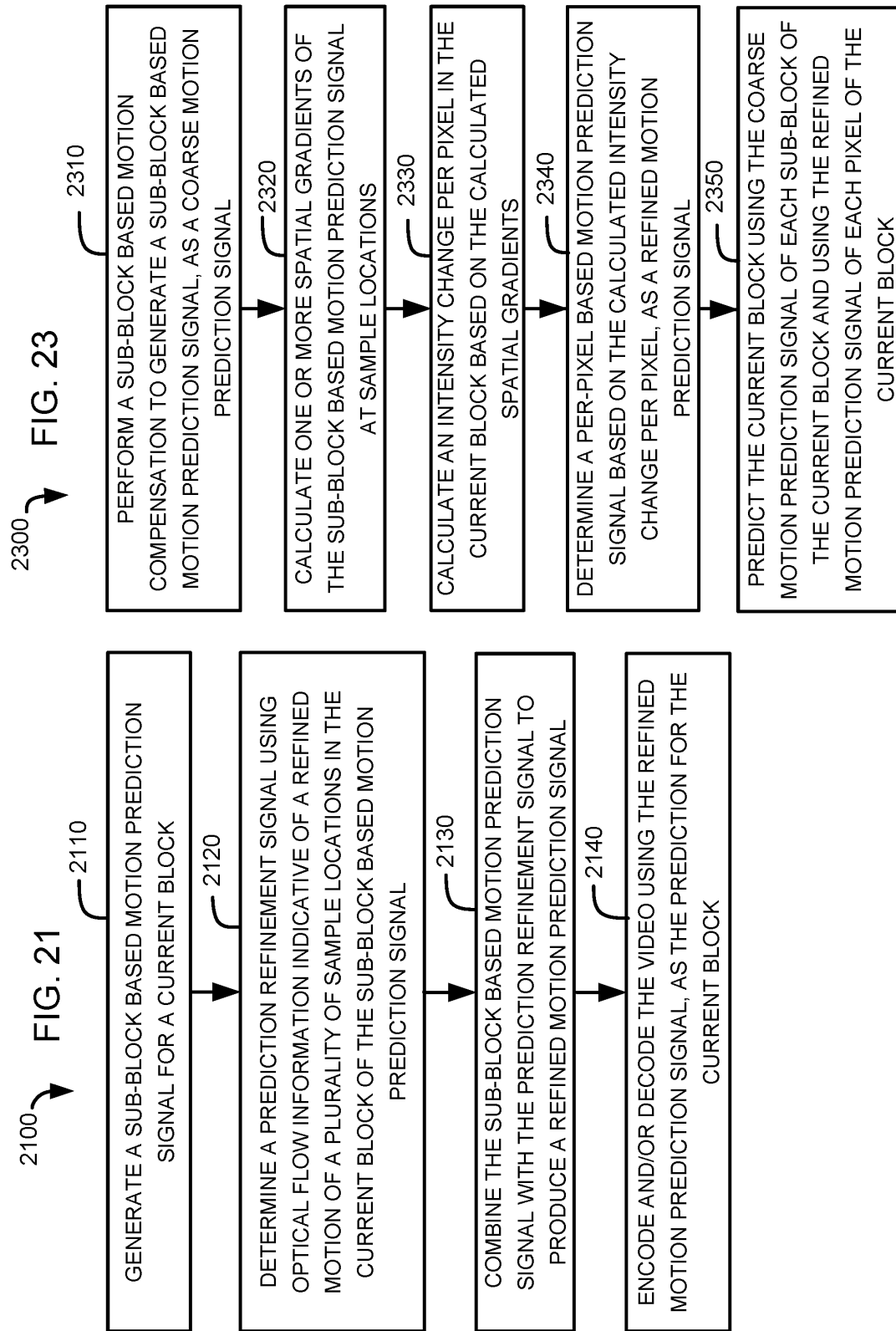


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2000

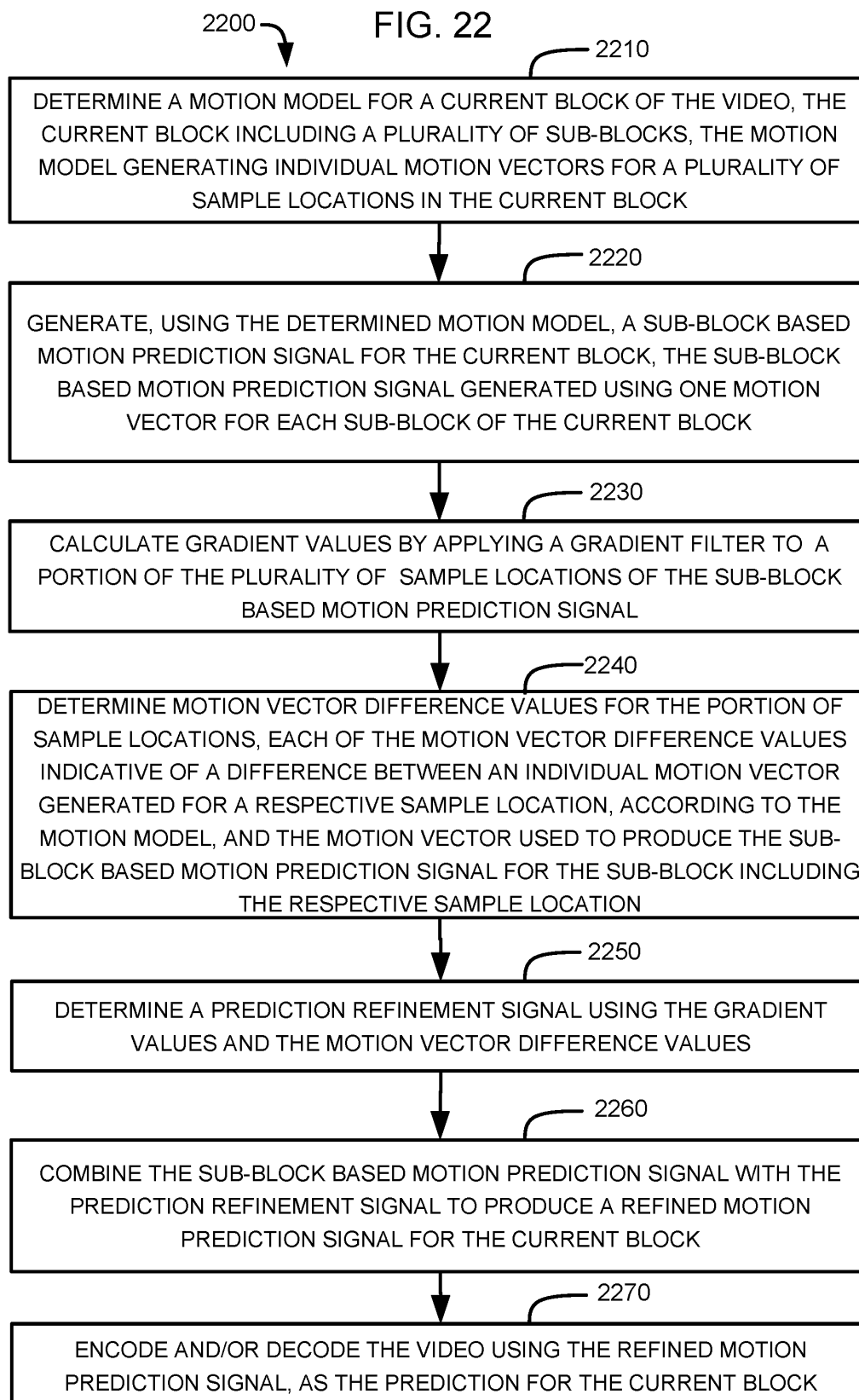
FIG. 20





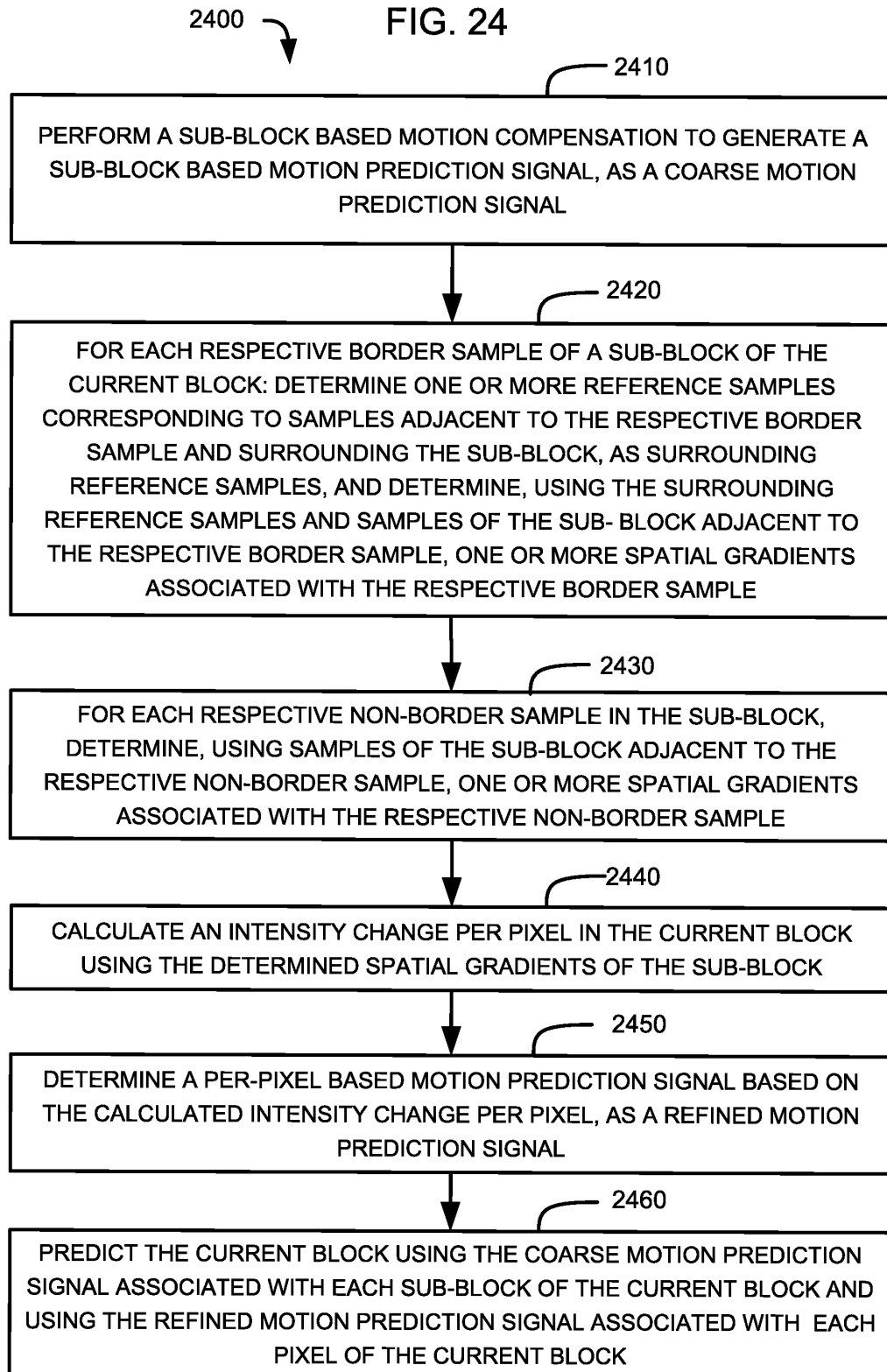
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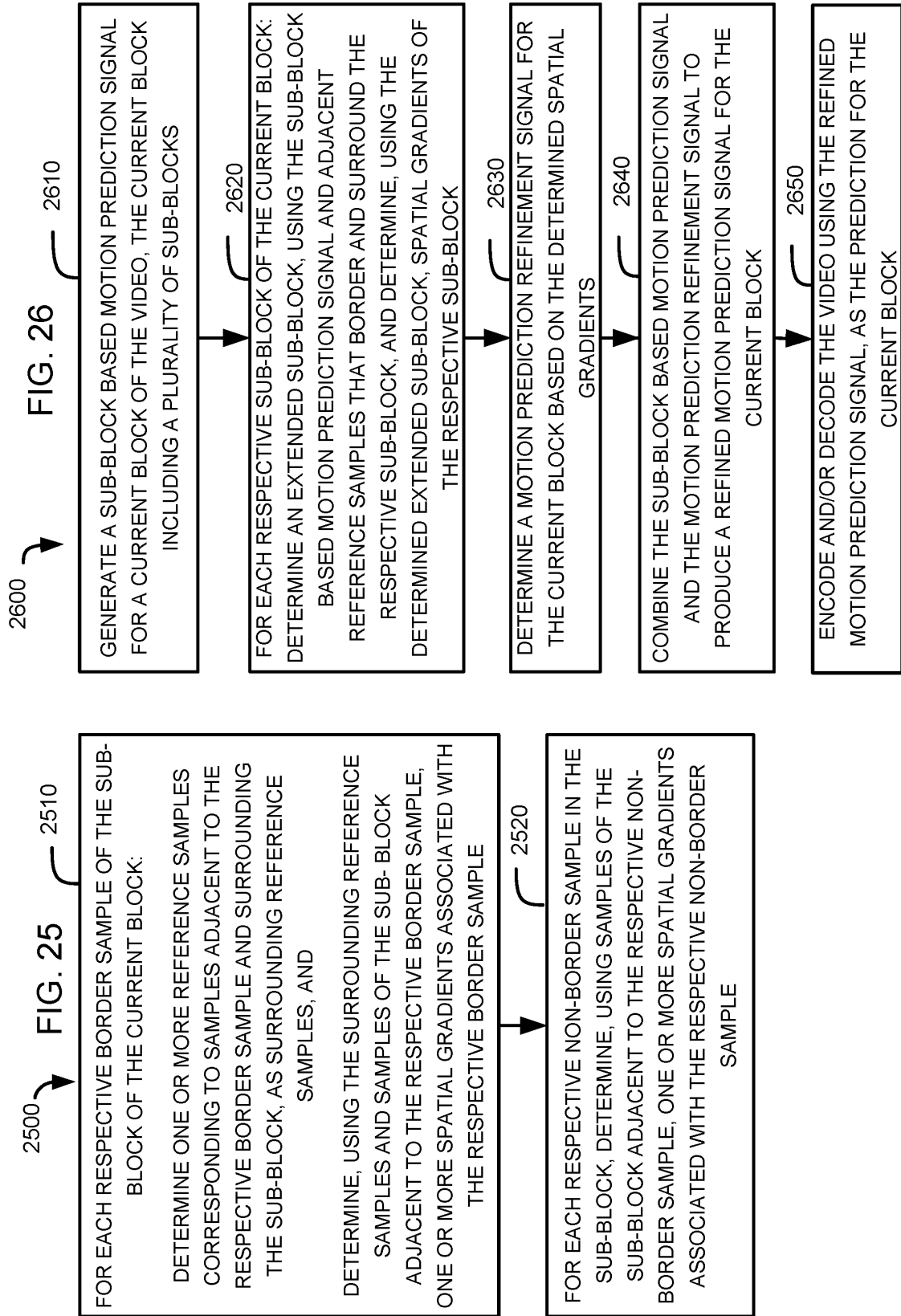
FIG. 22

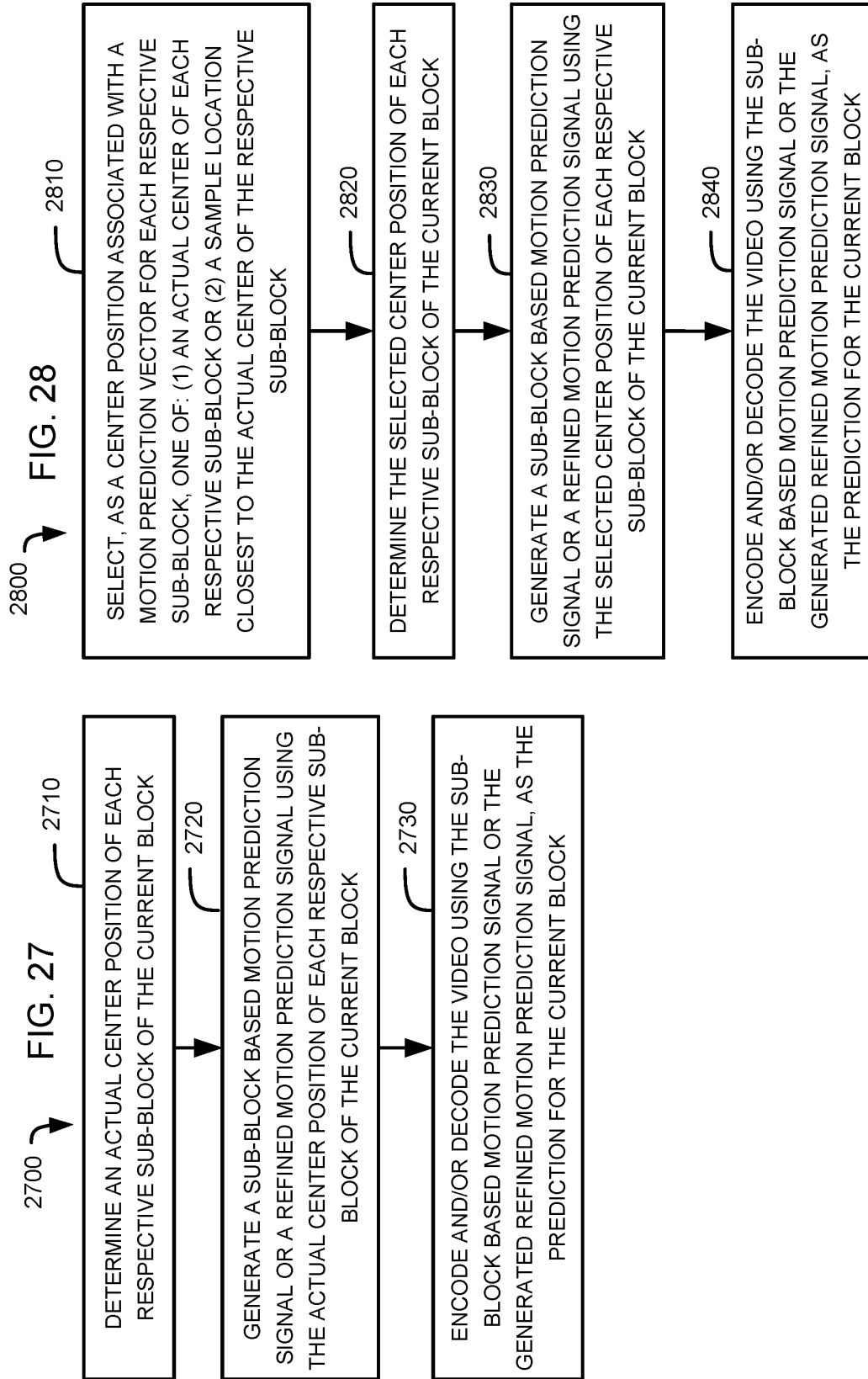


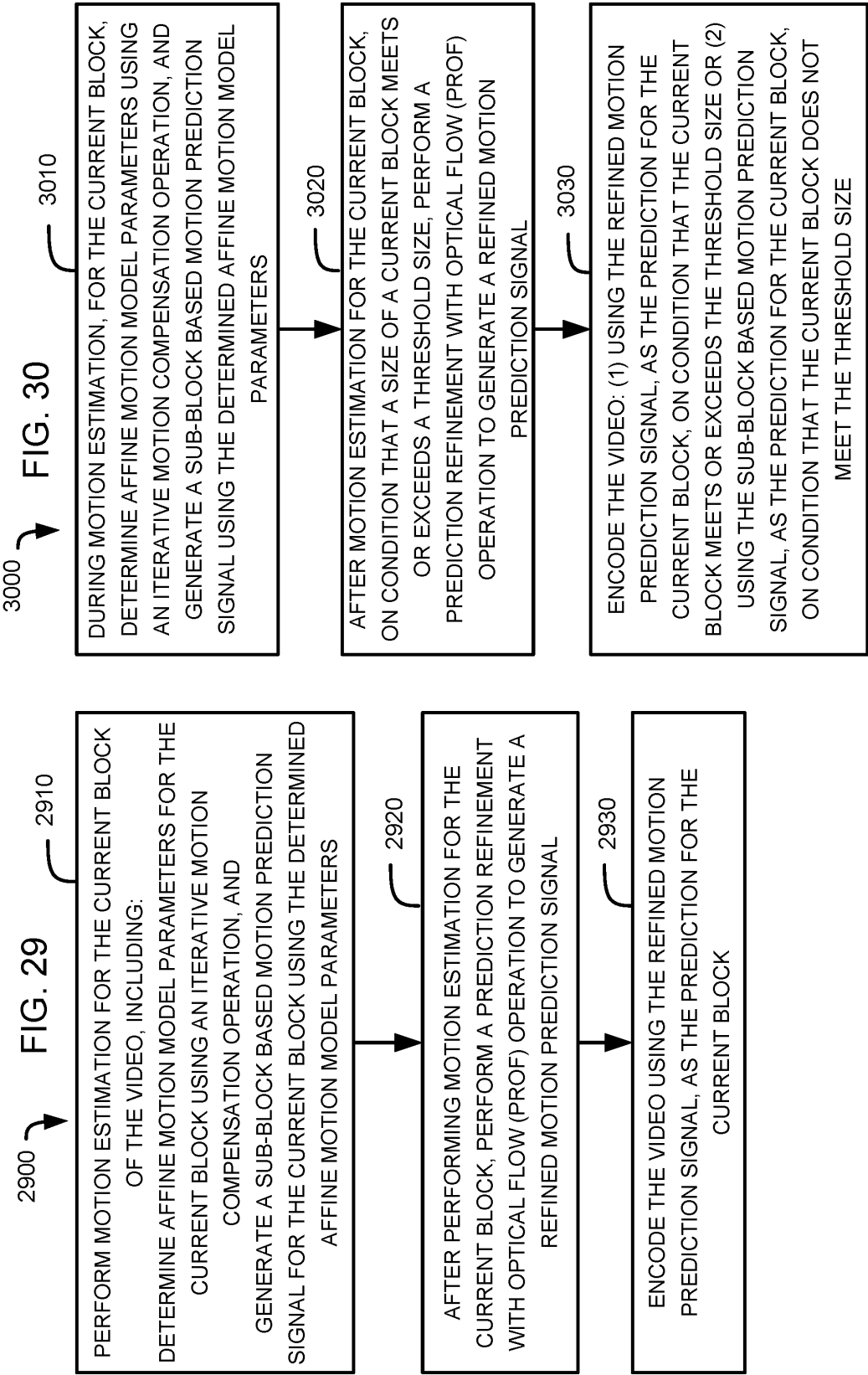
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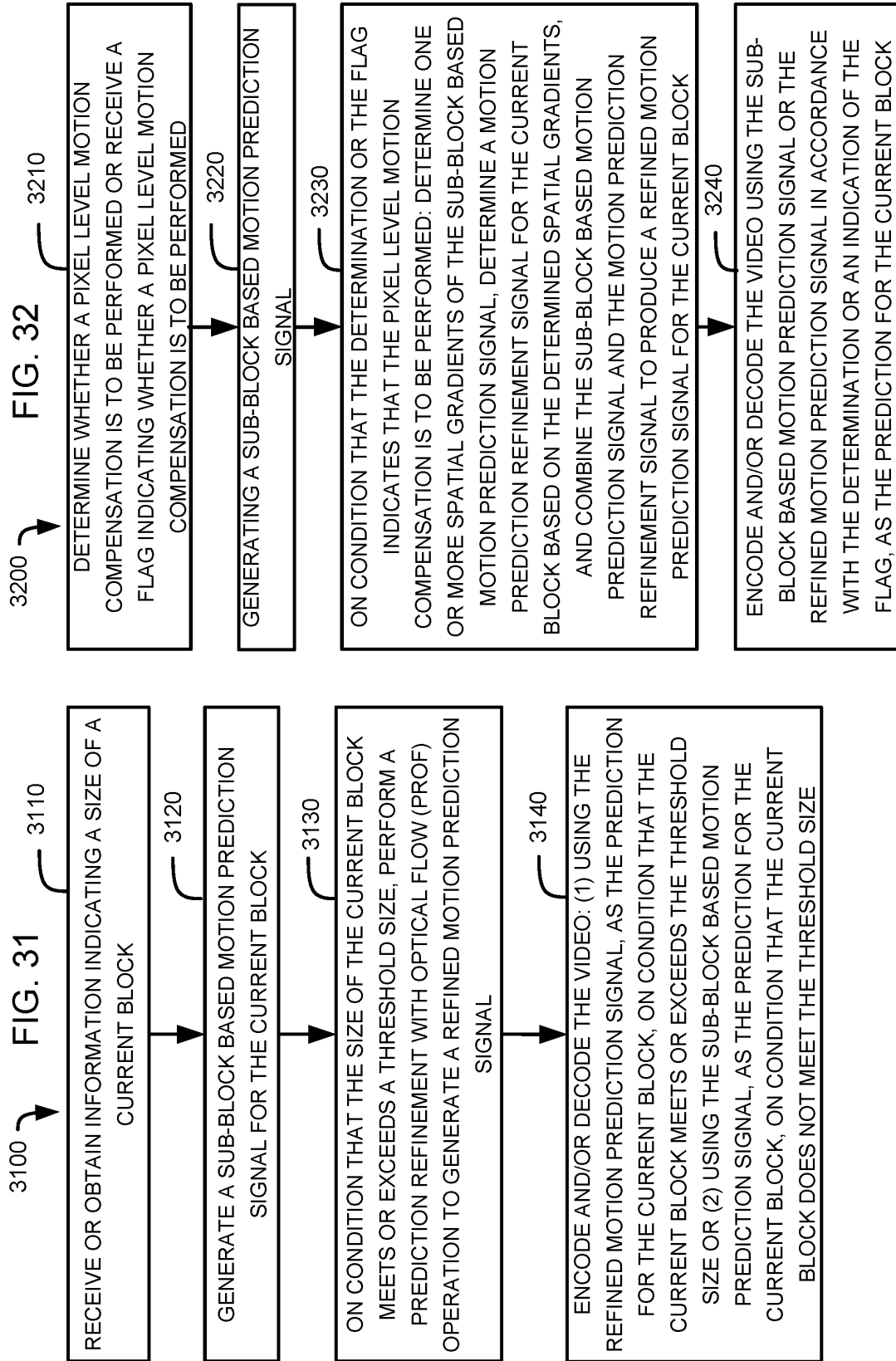
FIG. 24











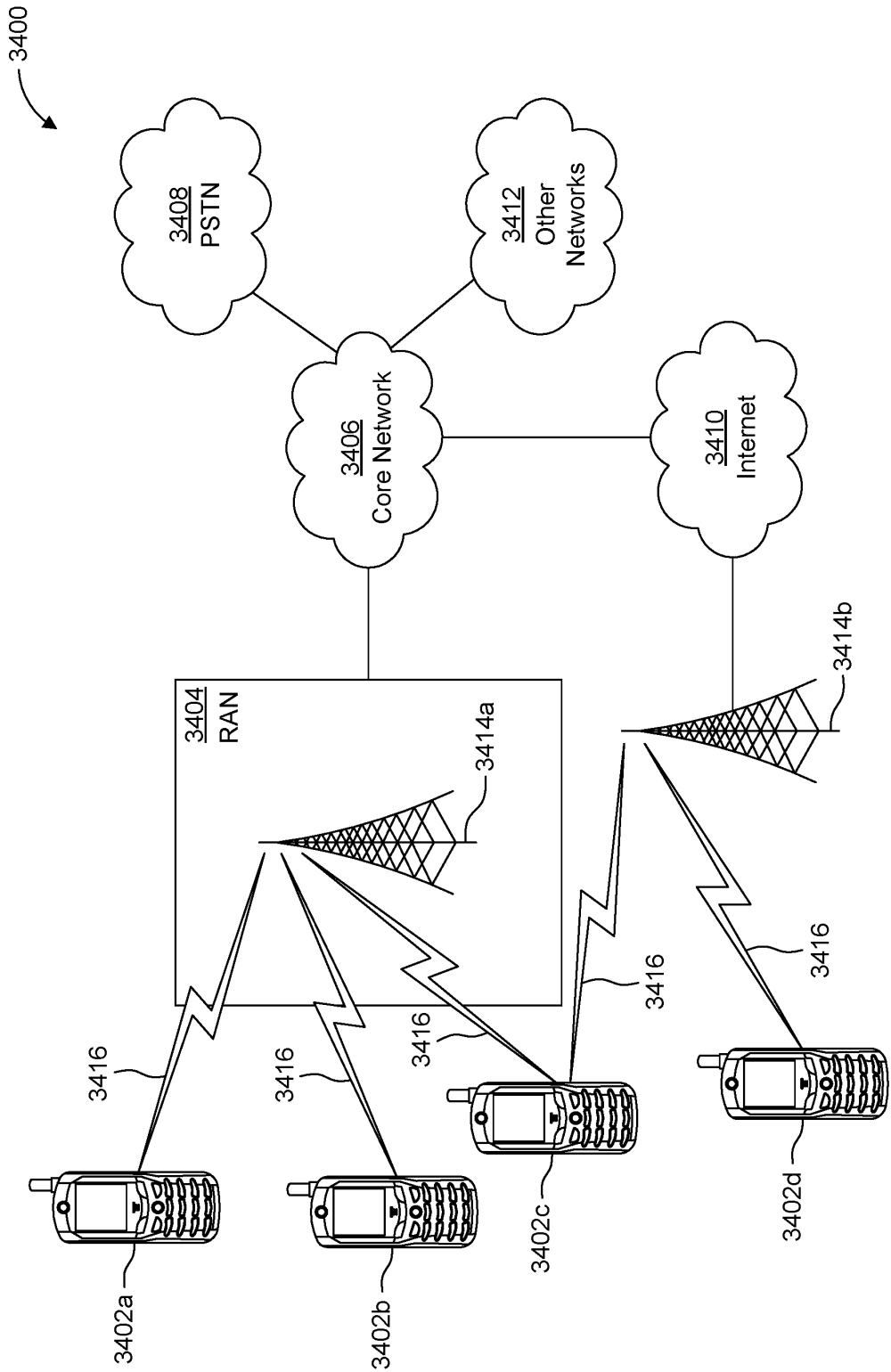


FIG. 34A

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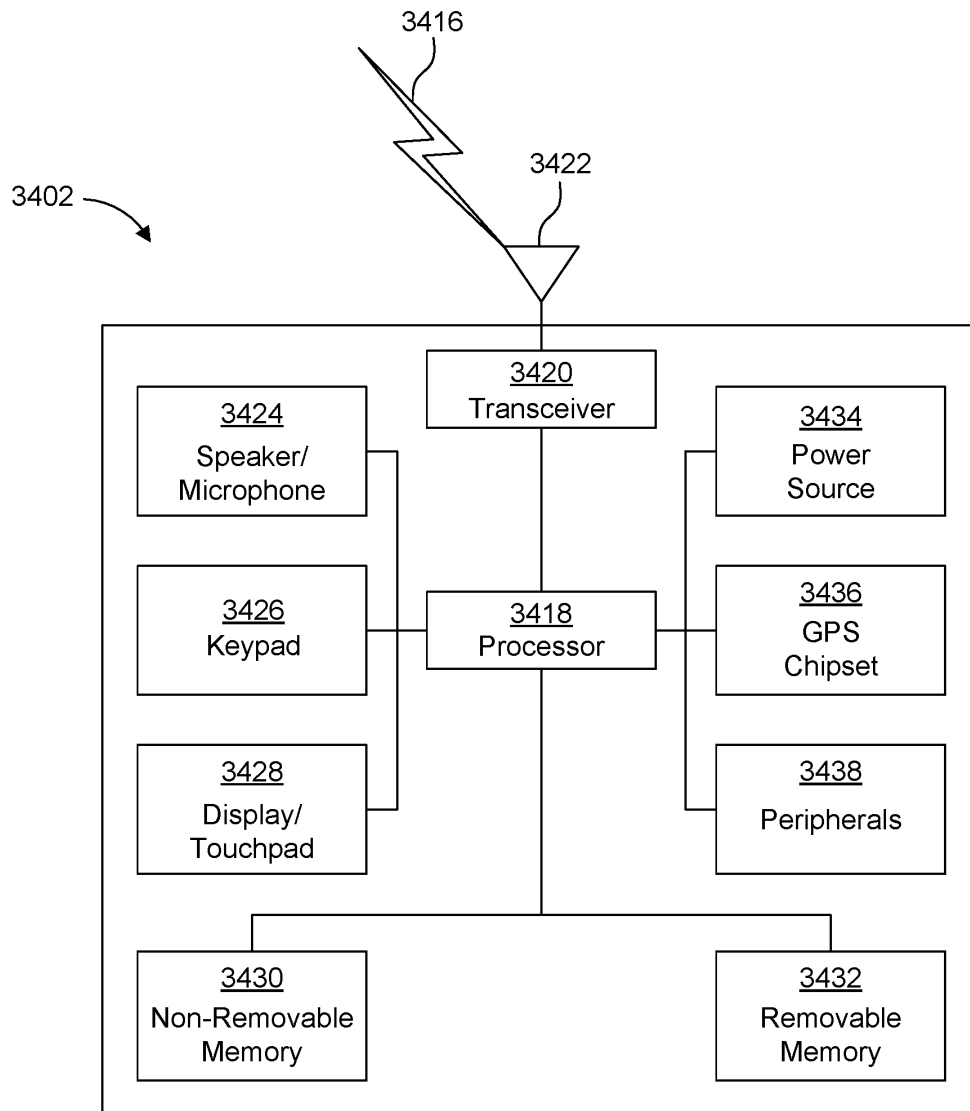


FIG. 34B

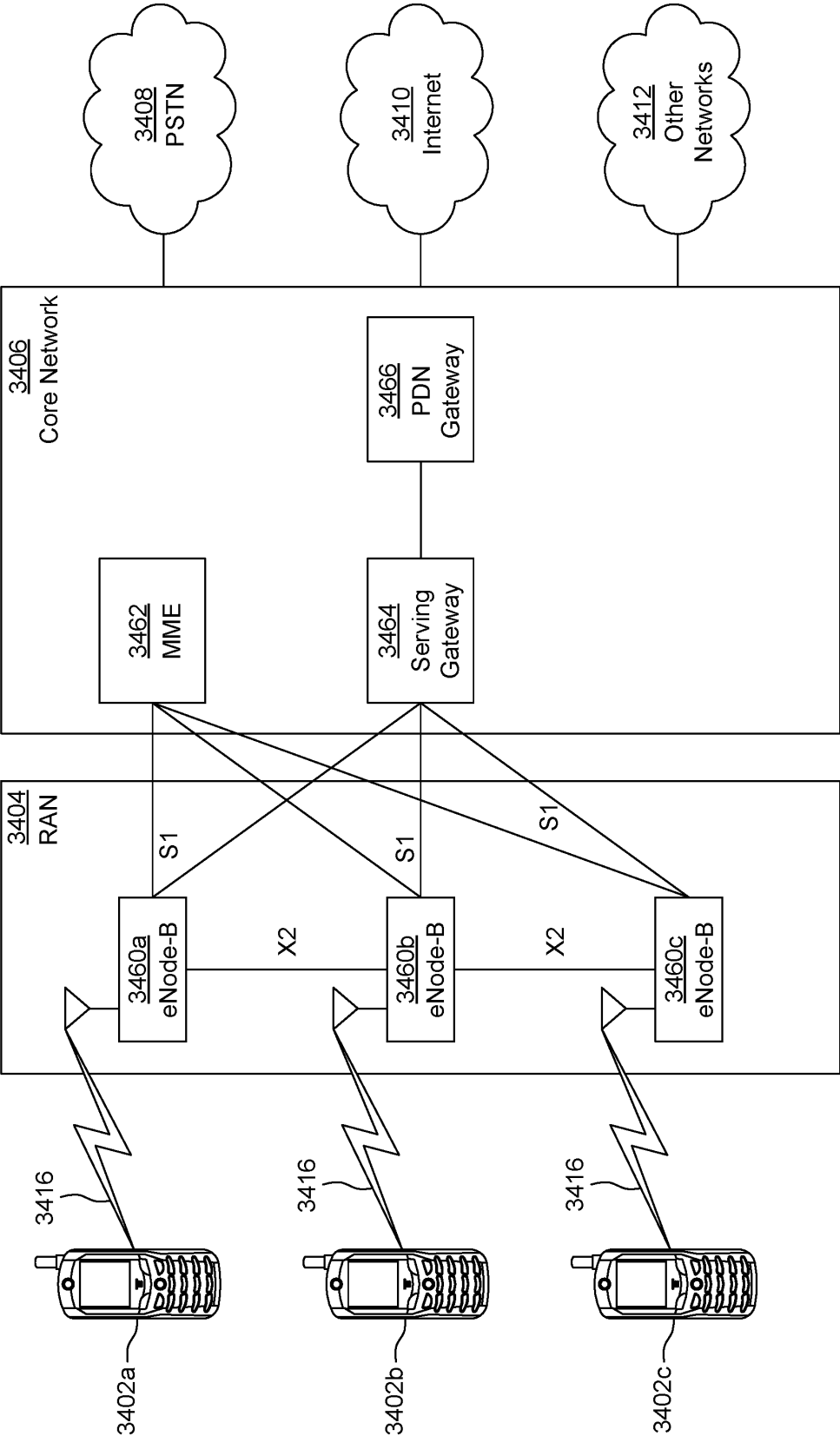


FIG. 34C

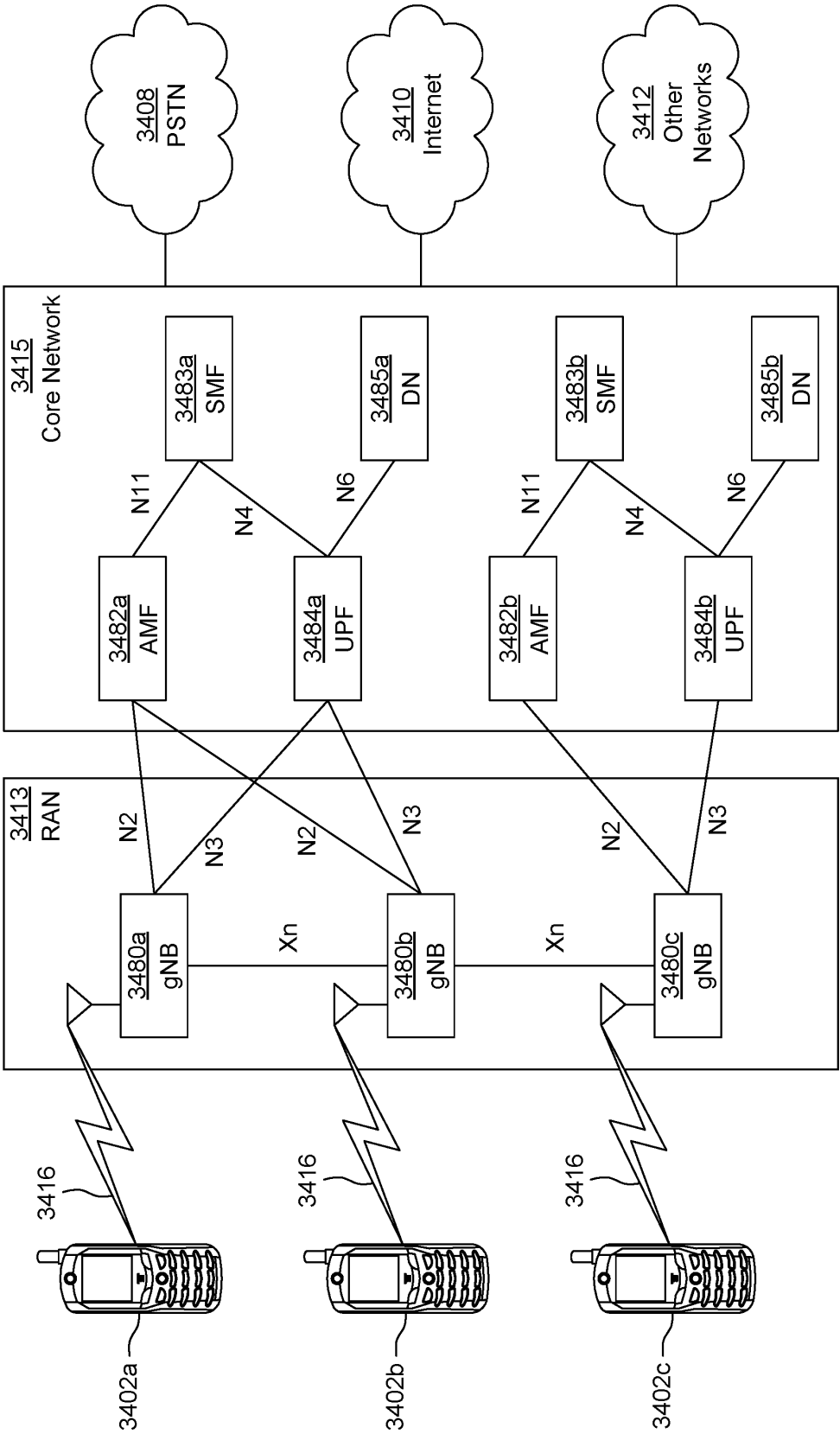


FIG. 34D