

FIG. 1A

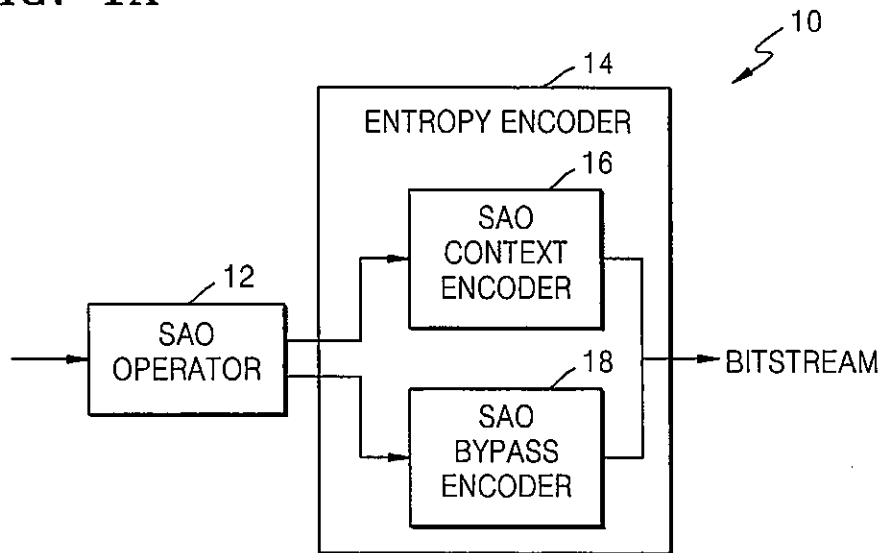


FIG. 1B

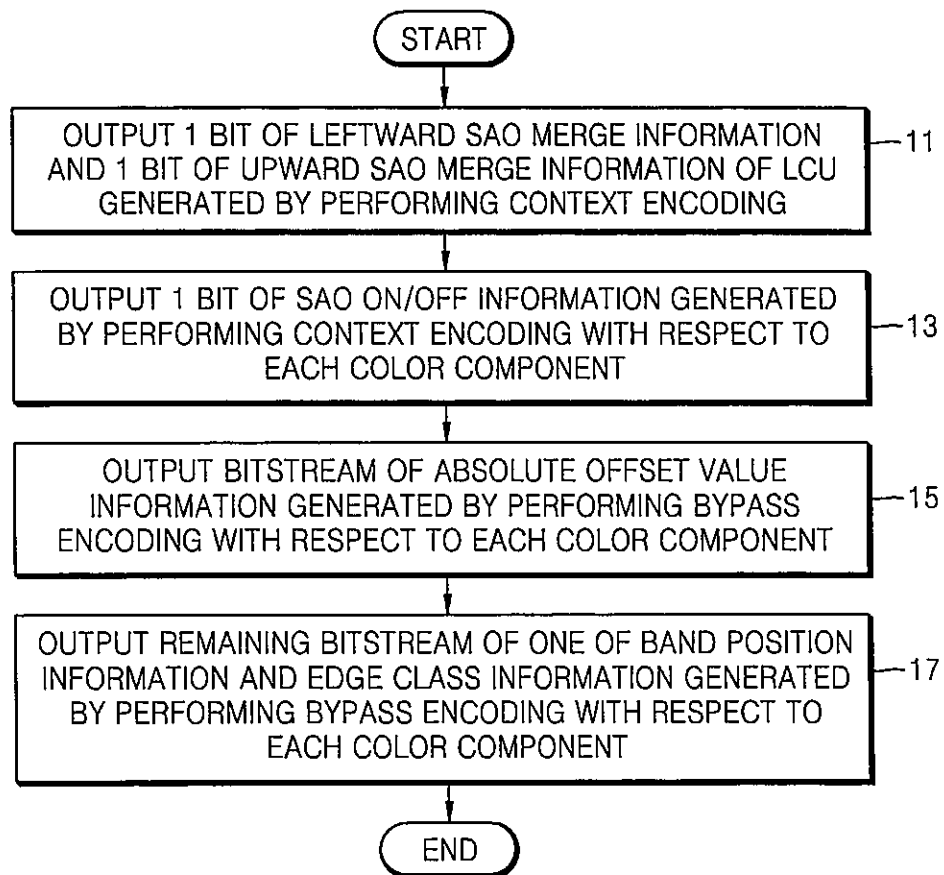


FIG. 2A

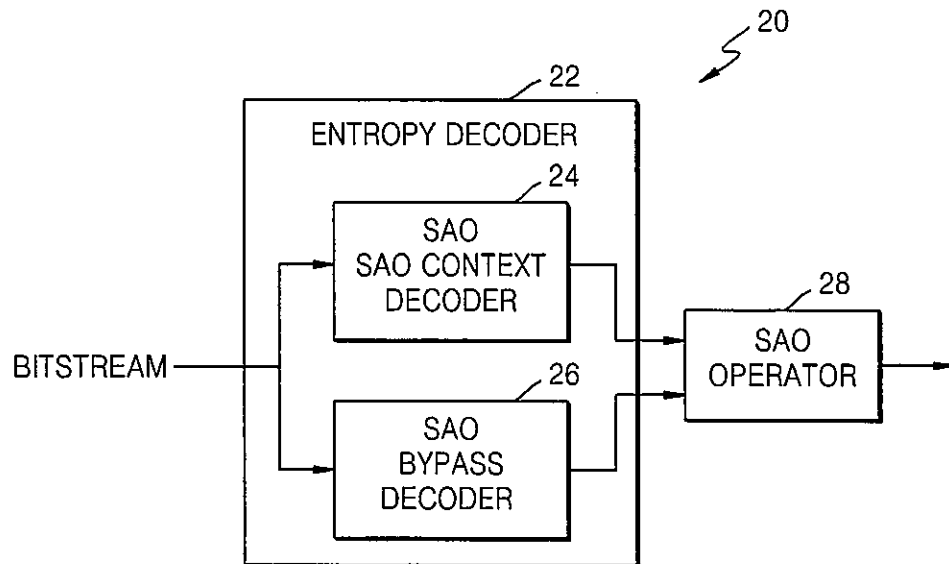


FIG. 2B

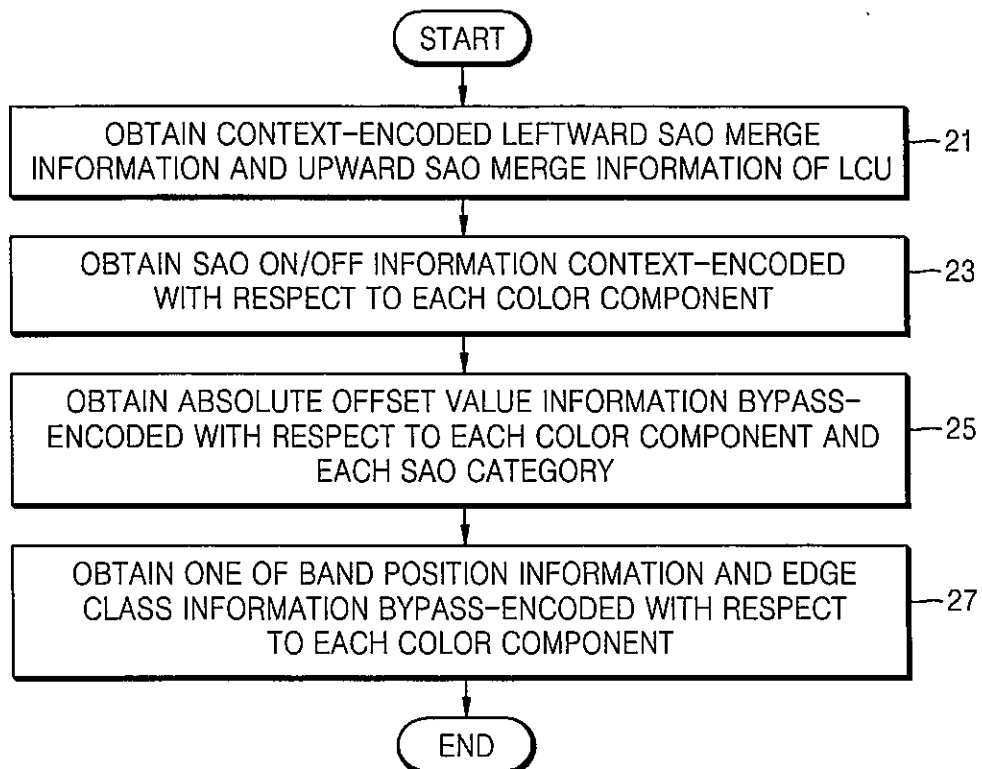


FIG. 3

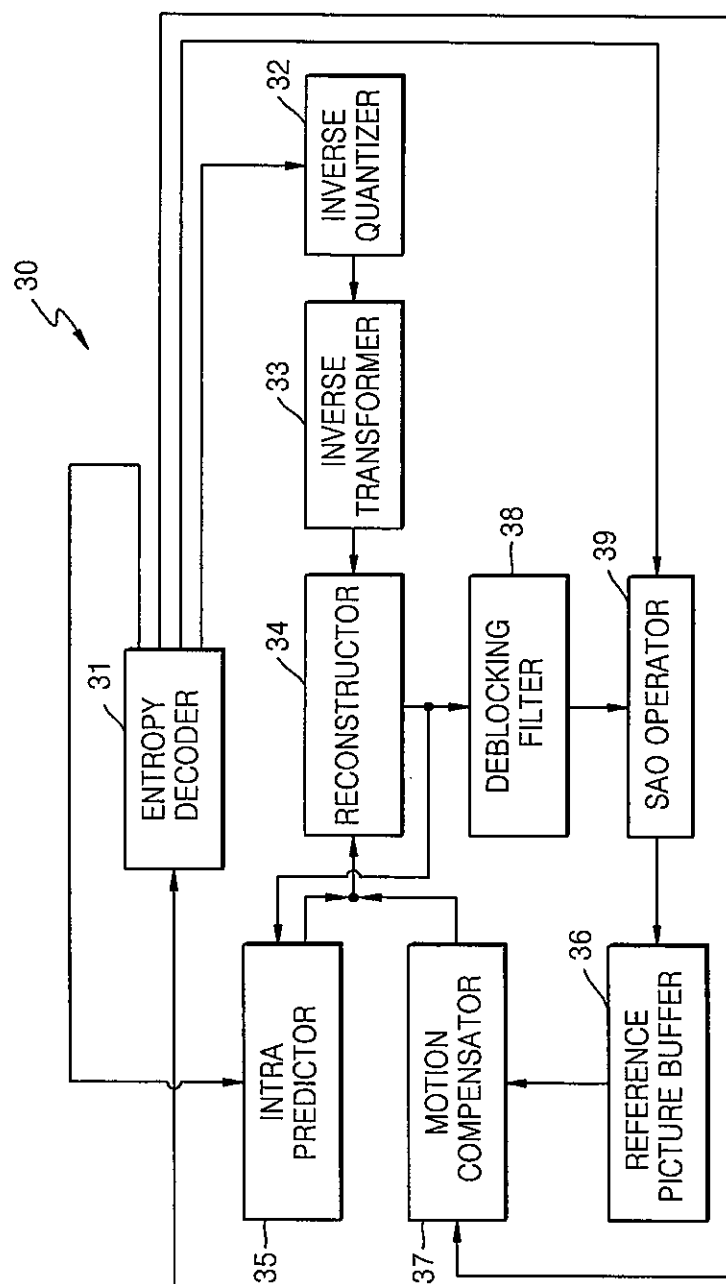


FIG. 4

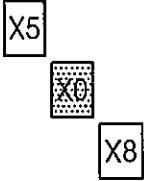
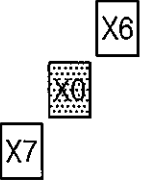
41	42	43	44
EO CLASS = 0	EO CLASS = 1	EO CLASS = 2	EO CLASS = 3
HORIZONTAL	VERTICAL	135° DIAGONAL	45° DIAGONAL
			

FIG. 5A

CATEGORY	CONDITION
1	$X_c < X_a \ \&\& \ X_c < X_b$
2	$(X_c < X_a \ \&\& \ X_c == X_b) \parallel (X_c == X_a \ \&\& \ X_c < X_b)$
3	$(X_c > X_a \ \&\& \ X_c == X_b) \parallel (X_c == X_a \ \&\& \ X_c > X_b)$
4	$X_c > X_a \ \&\& \ X_c > X_b$
0	IF CONDITIONS FOR CATEGORIES 1, 2, 3, AND 4 ARE NOT SATISFIED

FIG. 5B

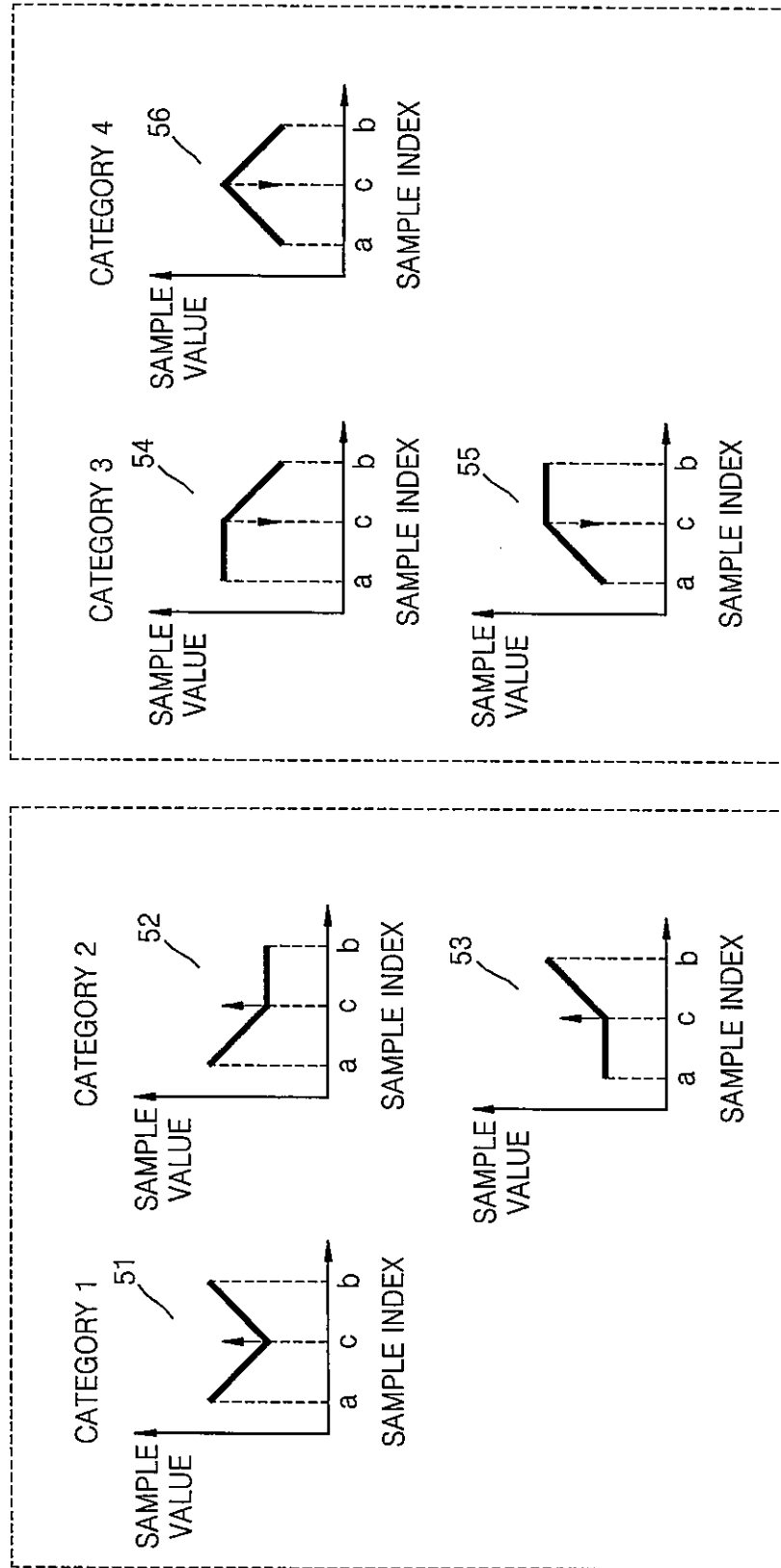
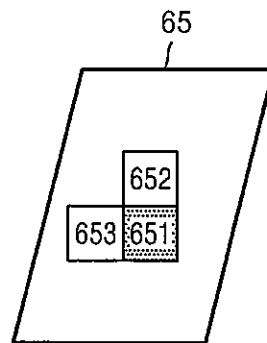


FIG. 6A**FIG. 6B**

60

```

for( cldx = 0; cldx < 3; cldx++ ){ // LOOP OPERATION WITH RESPECT TO 3
                                // COLOR COMPONENTS

    sao_merge_left_flag           // 1 BIN BY CONTEXT-ENCODING
    sao_merge_up_flag            // 1 BIN BY CONTEXT-ENCODING
    sao_type_idx                 // 6 BINS BY CONTEXT-ENCODING
    sao_band_position            // 5 BINS BY BYPASS-ENCODING
        for( i = 0; i < 4; i++ ){ // LOOP OPERATION WITH RESPECT TO 4
                                // SAO CATEGORIES

            sao_offset_abs        // 31 BINS BY CONTEXT-ENCODING
            sao_offset_sign       // 1 BIN BY BYPASS-ENCODING
        }
    }
}

```

FIG. 7A

```

70
sao_param( rx, ry){
  if( rx > 0 ) {
    leftCtbnSlice = CtbAddrInSlice > 0
    leftCtbnTile = TileId[ CtbAddrTS ] == TileId[ CtbAddrRStoTS[ CtbAddrRS - 1 ] ]
    if( leftCtbnSlice && leftCtbnTile )
71 ——— sao_merge_left_flag
      }
      if( ry > 0 && !sao_merge_left_flag ) {
        upCtbnSlice = ( CtbAddrTS - CtbAddrRStoTS[ CtbAddrRS - PicWidthInCtbs ] ) <= CtbAddrInSlice
        upCtbnTile = TileId[ CtbAddrTS ] == TileId[ CtbAddrRStoTS[ CtbAddrRS - PicWidthInCtbs ] ]
        if( upCtbnSlice && upCtbnTile )
72 ——— sao_merge_up_flag
          }
          if( !sao_merge_up_flag && !sao_merge_left_flag ) {
73 ——— for( cldx = 0; cldx < 3; cldx++ ){
            if( ( slice_sao_flag_luma && cldx == 0 ) || ( slice_sao_flag_chroma && cldx > 0 ) ) {
74 ——— if ( cldx == 0 ){
              741 ——— sao_on_off_flag_luma[ rx ][ ry ]
                if ( sao_on_off_flag_luma[ rx ][ ry ] )
              743 ——— sao_eo_bo_flag_luma[ rx ][ ry ]
                }
              75 ——— if ( cldx == 1 ){
                751 ——— sao_on_off_flag_chroma[ rx ][ ry ]
                  if ( sao_on_off_flag_chroma[ rx ][ ry ] )
                753 ——— sao_eo_bo_flag_chroma[ rx ][ ry ]
                  }
                76 ——— if ( SaoTypeIdx[cldx][ rx ][ ry ] != 0 ) {
                  for( i = 0; i < 4; i++ )
                    77 ——— sao_offset_abs[ cldx ][ rx ][ ry ][ i ]
                    78 ——— if( SaoTypeIdx[ cldx ][ rx ][ ry ] == 1 ) {
                      for( i = 0; i < 4; i++ ) {
                        if( sao_offset_abs[ cldx ][ rx ][ ry ][ i ] != 0 )
781 ——— sao_offset_sign[ cldx ][ rx ][ ry ][ i ]
                      }
                    }
                    782 ——— sao_band_position[ cldx ][ rx ][ ry ]
                  }
                }
              79 ——— else{
                if ( cldx == 0 ) sao_eo_class_luma[ rx ][ ry ]
                if ( cldx == 1 ) sao_eo_class_chroma[ rx ][ ry ]
                }
              }
            }
          }
        }
      }
    }
  }
}

```

FIG. 7B

```

sao_param( rx, ry){
  if( rx > 0 ) {
    leftCtbnSlice = CtbAddrInSlice > 0
    leftCtbnTile = TileId[ CtbAddrTS ] == TileId[ CtbAddrRStoTS[ CtbAddrRS - 1 ]]
    if( leftCtbnSlice && leftCtbnTile )
71 — sao_merge_left_flag
      }
      if( ry > 0 && !sao_merge_left_flag ) {
        upCtbnSlice = ( CtbAddrTS - CtbAddrRStoTS[ CtbAddrRS - PicWidthInCtbs ]) <= CtbAddrInSlice
        upCtbnTile = TileId[ CtbAddrTS ] == TileId[ CtbAddrRStoTS[ CtbAddrRS - PicWidthInCtbs ]]
        if( upCtbnSlice && upCtbnTile )
72 — sao_merge_up_flag
          }
          if( !sao_merge_up_flag && !sao_merge_left_flag ) {
83 — sao_on_off_flag_luma[ rx ][ ry ]
              if( sao_on_off_flag_luma[ rx ][ ry ] )
831 — sao_eo_bo_flag_luma[ rx ][ ry ]
                  if( sao_eo_bo_flag_luma[ rx ][ ry ]==1)
833 — sao_eo_class_luma[ rx ][ ry ]
84 — sao_on_off_flag_chroma[ rx ][ ry ]
                  if( sao_on_off_flag_chroma[ rx ][ ry ] )
841 — sao_eo_bo_flag_chroma[ rx ][ ry ]
                      if( sao_eo_bo_flag_chroma[ rx ][ ry ]==1)
843 — sao_eo_class_chroma[ rx ][ ry ]
85 — for( cldx = 0; cldx < 3; cldx++){
86 — if( SaoTypeIdx[cldx][ rx ][ ry ]!=0) {
                      for( i = 0; i < 4; i++ )
87 — sao_offset_abs[ cldx ][ rx ][ ry ][ i ]
88 — if( SaoTypeIdx[cldx][ rx ][ ry ]==1) {
                          for( i = 0; i < 4; i++ ) {
                              if( sao_offset_abs[ cldx ][ rx ][ ry ][ i ] != 0 )
881 — sao_offset_sign[ cldx ][ rx ][ ry ][ i ]
                                  }
883 — sao_band_position[ cldx ][ rx ][ ry ]
                              }
                          }
                      }
                  }
              }
          }
      }
  }
}

```

FIG. 7C

```

sao_param( rx, ry){
  if( rx > 0 ) {
    leftCtbnSlice = CtbAddrInSlice > 0
    leftCtbnTile = TileId[ CtbAddrTS ] == TileId[ CtbAddrRStoTS[ CtbAddrRS - 1 ] ]
    if( leftCtbnSlice && leftCtbnTile )
71 ——— sao_merge_left_flag
    }
    if( ry > 0 && !sao_merge_left_flag ) {
      upCtbnSlice = ( CtbAddrTS - CtbAddrRStoTS[ CtbAddrRS - PicWidthInCtbs ] ) <= CtbAddrInSlice
      upCtbnTile = TileId[ CtbAddrTS ] == TileId[ CtbAddrRStoTS[ CtbAddrRS - PicWidthInCtbs ] ]
      if( upCtbnSlice && upCtbnTile )
72 ——— sao_merge_up_flag
    }
    if( !sao_merge_up_flag && !sao_merge_left_flag ) {
83 ——— sao_on_off_flag_luma[ rx ][ ry ]
84 ——— sao_on_off_flag_chroma[ rx ][ ry ]
      if( sao_on_off_flag_luma[ rx ][ ry ] )
831 ——— sao_eo_bo_flag_luma[ rx ][ ry ]
        if( sao_eo_bo_flag_luma[ rx ][ ry ] == 1 )
833 ——— sao_eo_class_luma[ rx ][ ry ]
84 ——— sao_on_off_flag_chroma[ rx ][ ry ]
        if( sao_on_off_flag_chroma[ rx ][ ry ] )
841 ——— sao_eo_bo_flag_chroma[ rx ][ ry ]
          if( sao_eo_bo_flag_chroma[ rx ][ ry ] == 1 )
843 ——— sao_eo_class_chroma[ rx ][ ry ]
85 ——— for( cldx = 0; cldx < 3; cldx++ ){
86 ——— if (SaoTypeIdx[cldx][ rx ][ ry ] != 0) {
          for( i = 0; i < 4; i++ )
87 ——— sao_offset_abs[ cldx ][ rx ][ ry ][ i ]
88 ——— if( SaoTypeIdx[cldx][ rx ][ ry ] == 1 ) {
            for( i = 0; i < 4; i++ ) {
              if( sao_offset_abs[ cldx ][ rx ][ ry ][ i ] != 0 )
881 ——— sao_offset_sign[ cldx ][ rx ][ ry ][ i ]
            }
883 ——— sao_band_position[ cldx ][ rx ][ ry ]
          }
        }
      }
    }
  }
}

```

FIG. 8

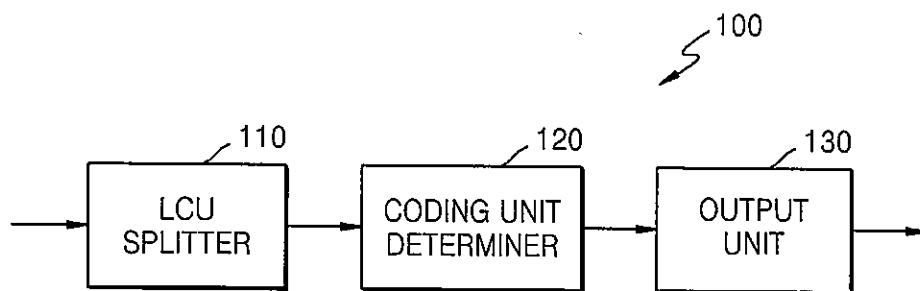


FIG. 9

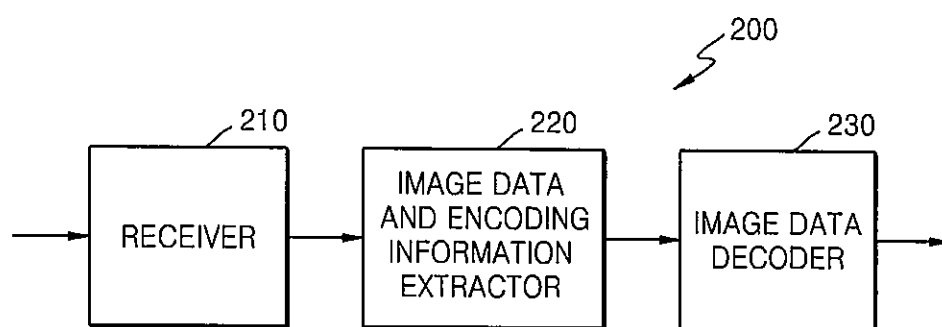


FIG. 10

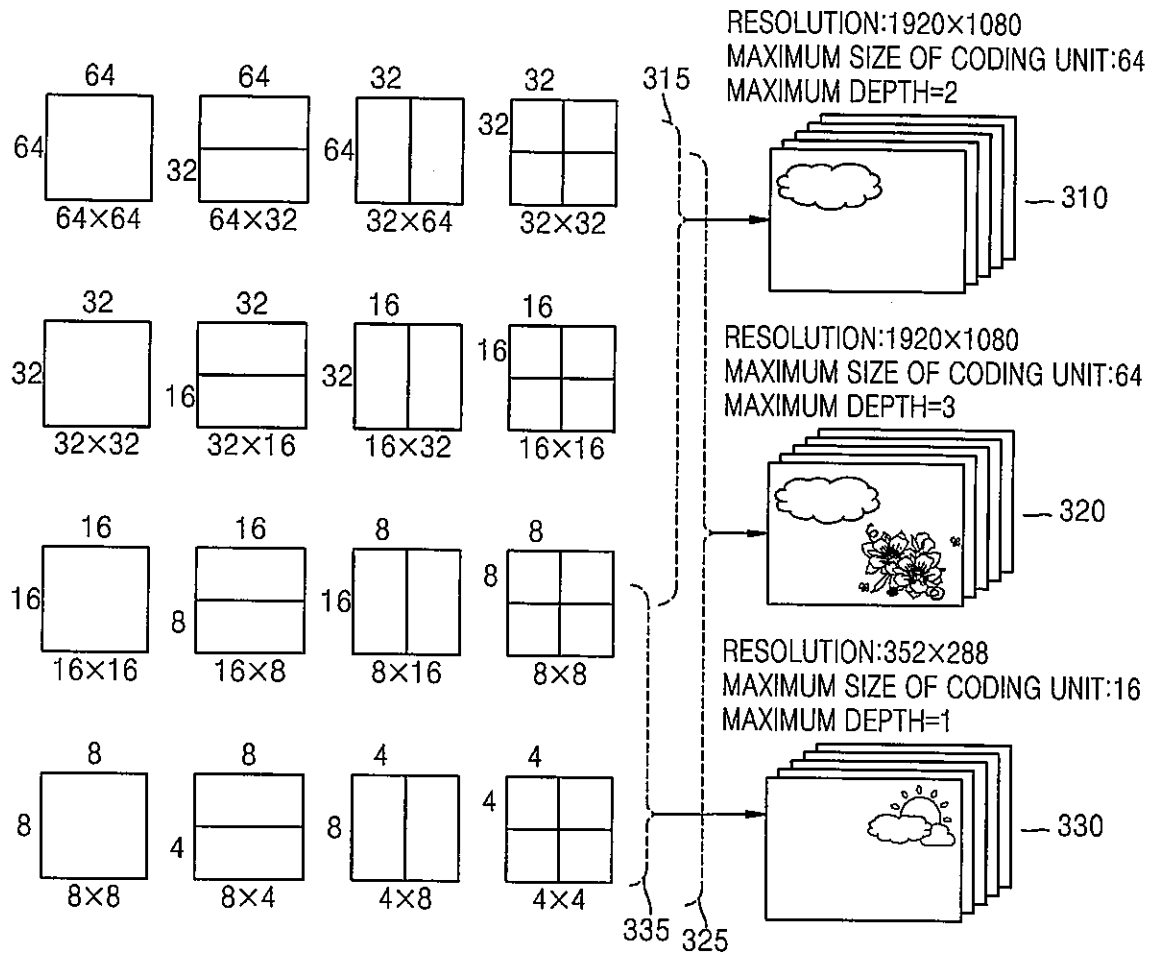


FIG. 11

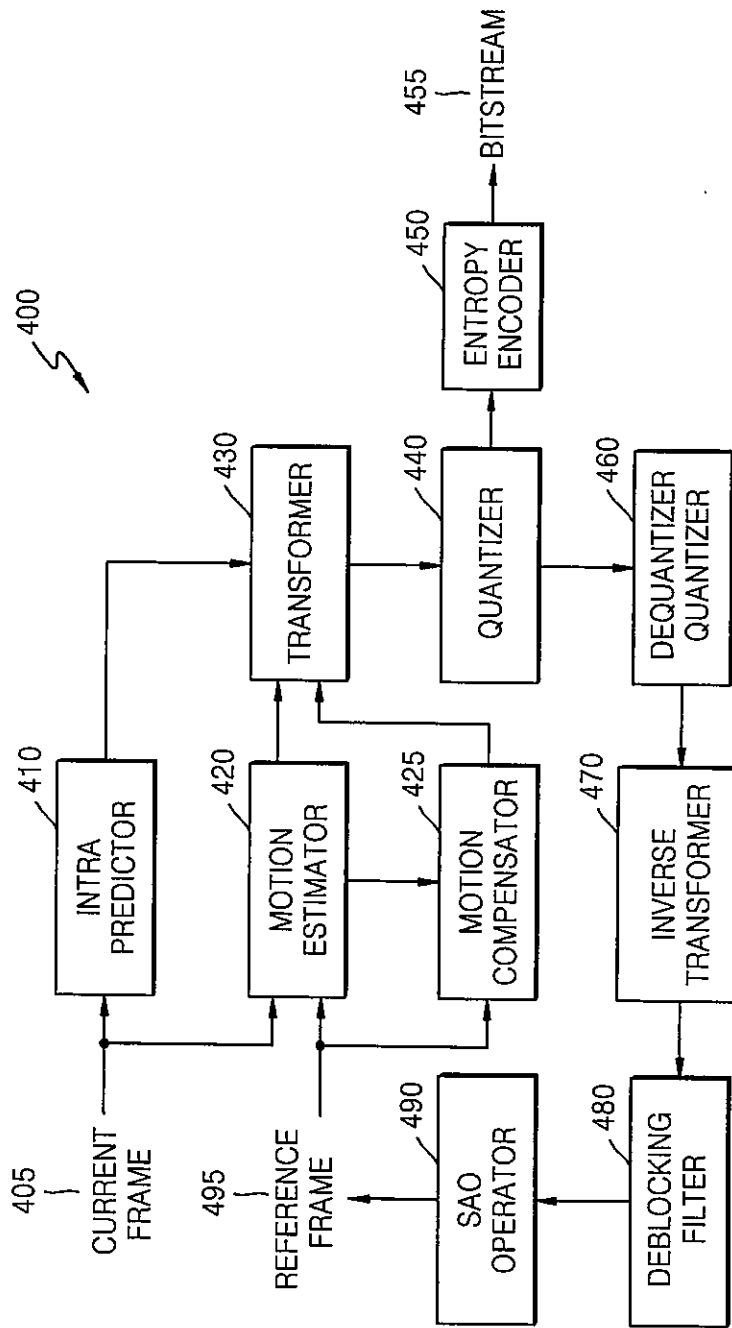


FIG. 12

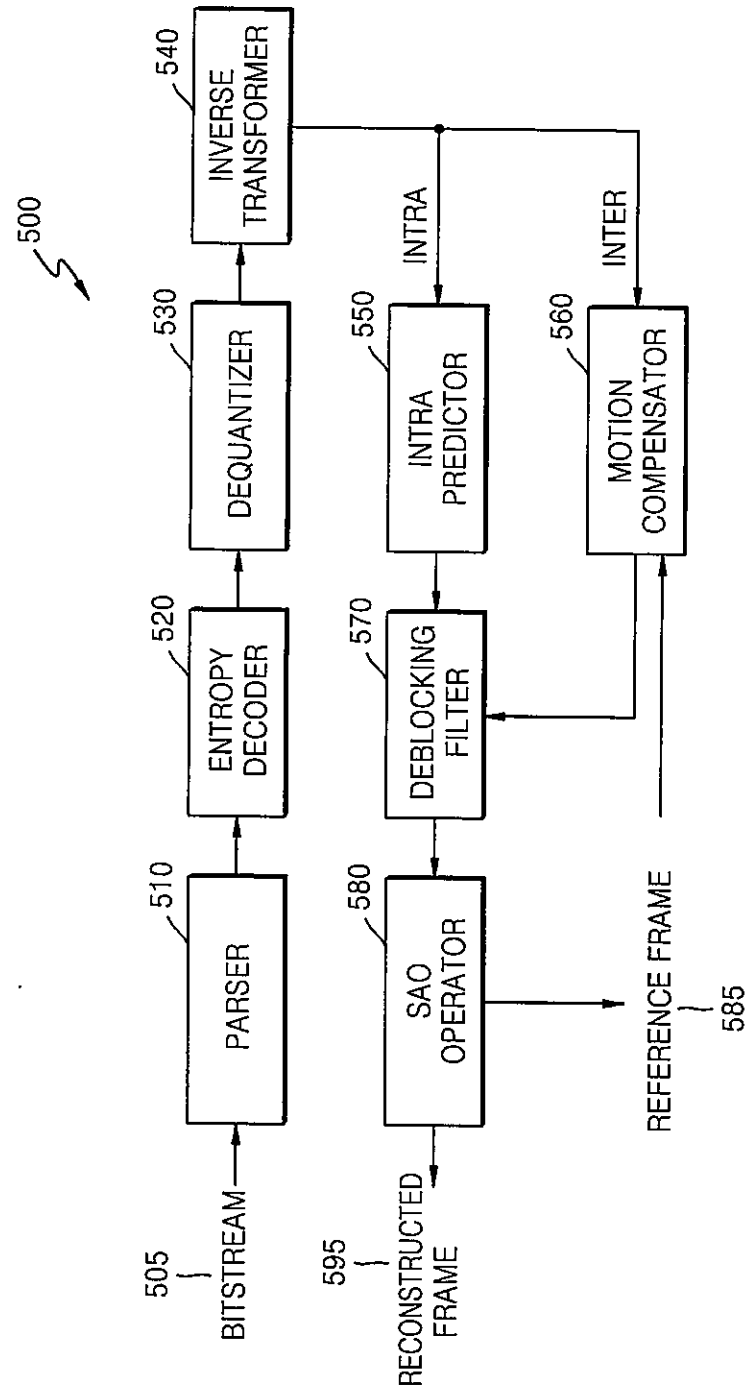


FIG. 13

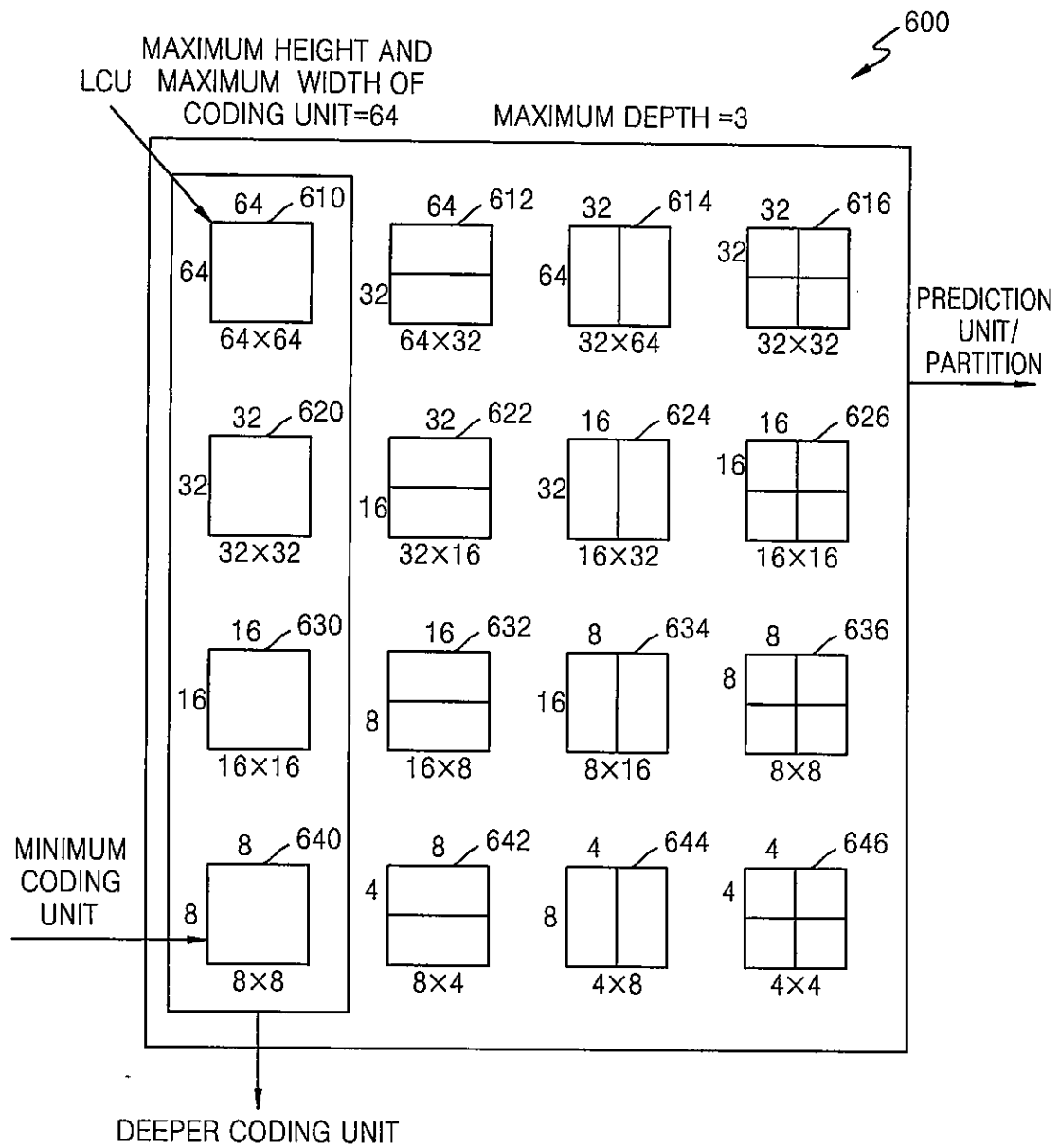


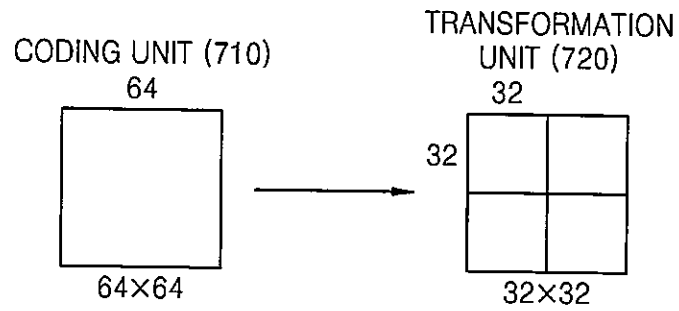
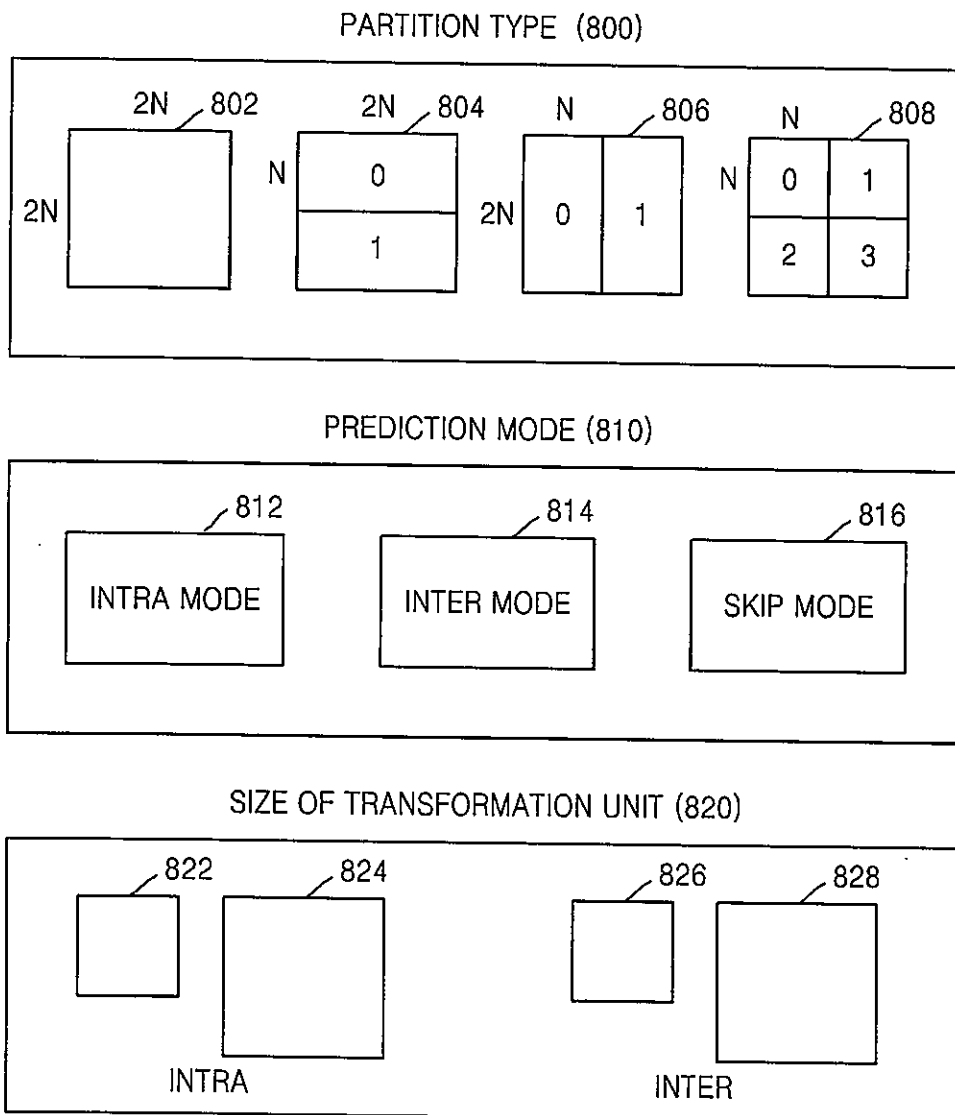
FIG. 14**FIG. 15**

FIG. 16

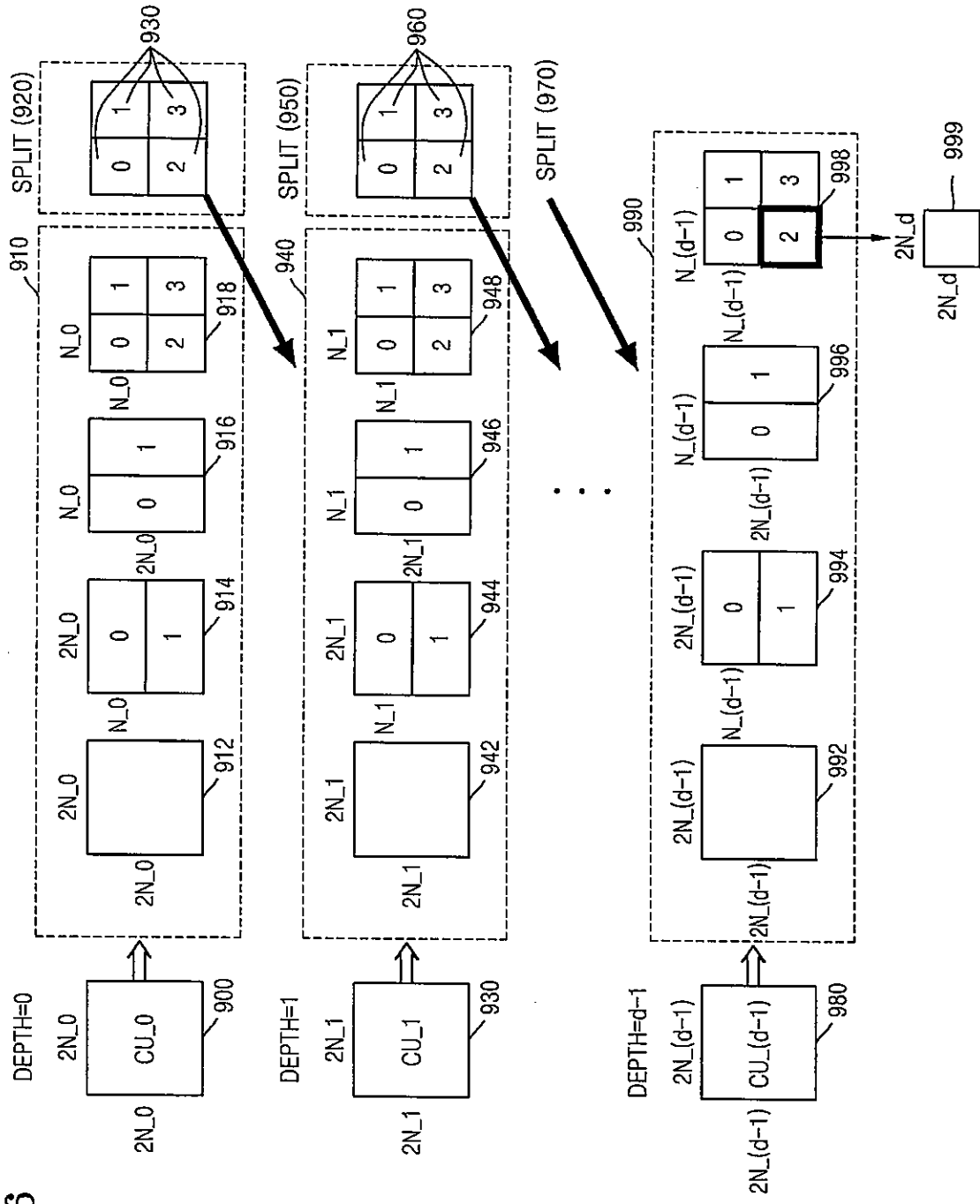
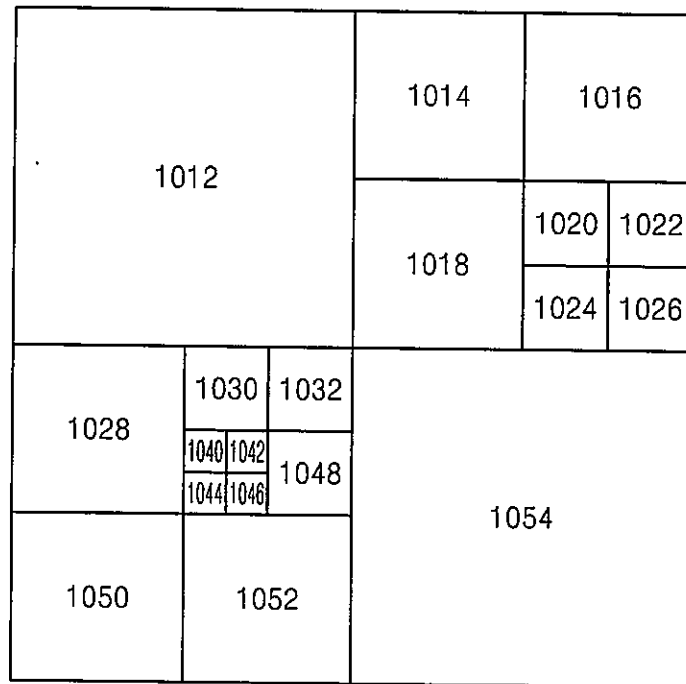
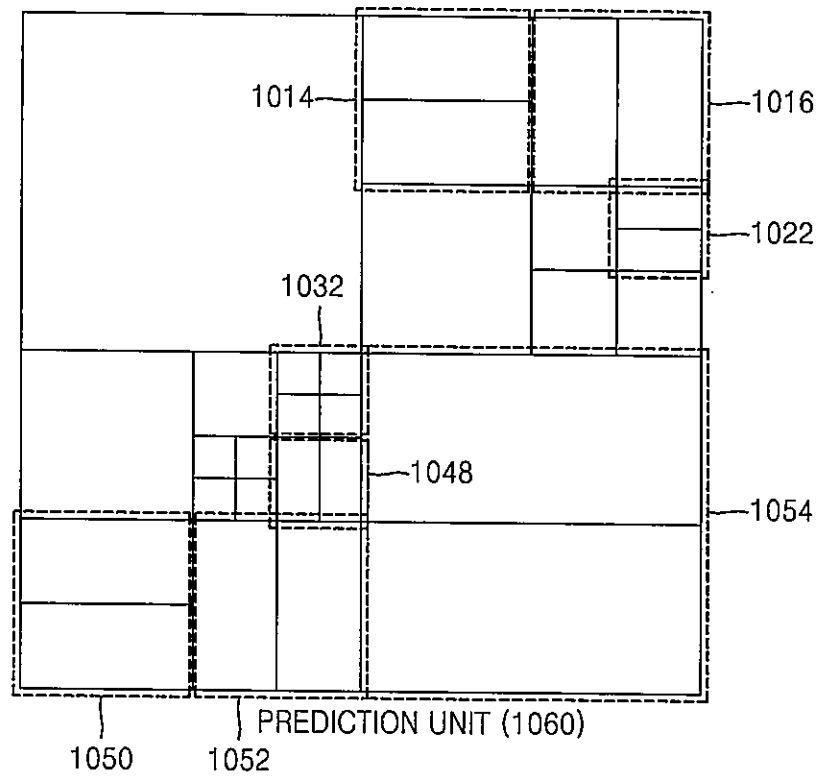


FIG. 17



CODING UNIT (1010)

FIG. 18



PREDICTION UNIT (1060)

FIG. 19

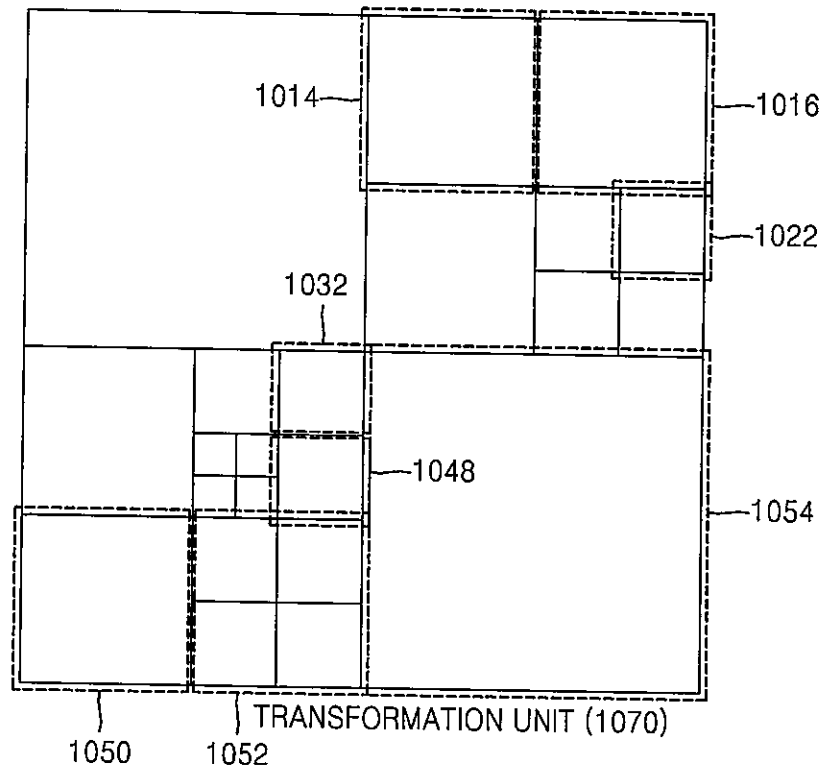


FIG. 20

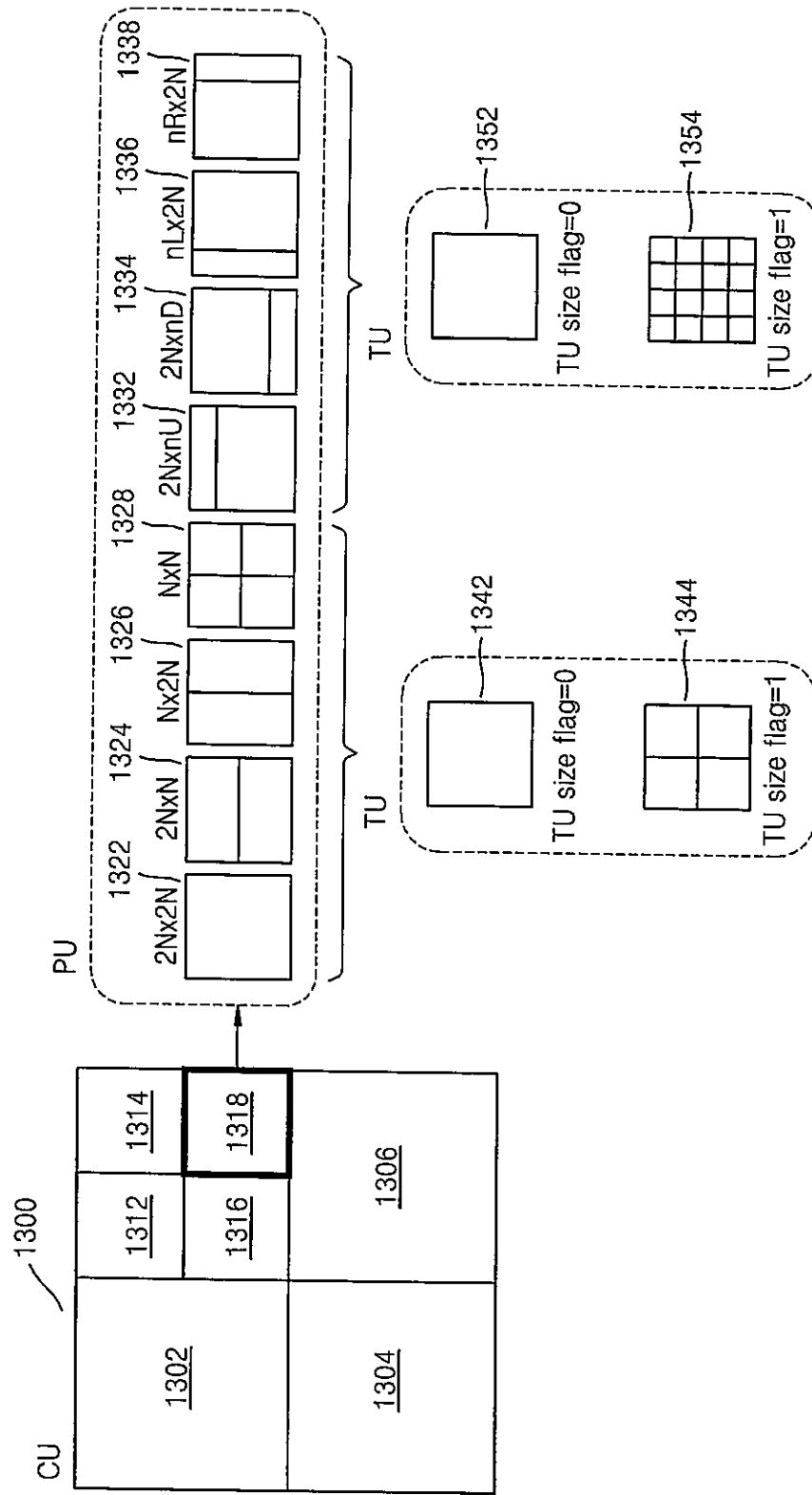


FIG. 21

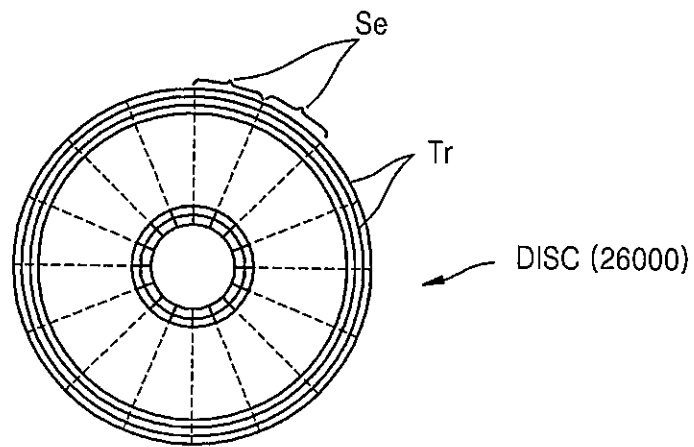


FIG. 22

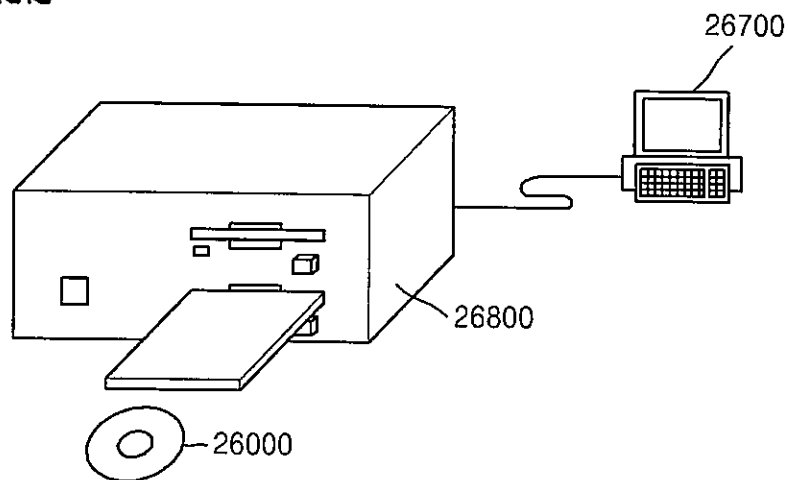


FIG. 23

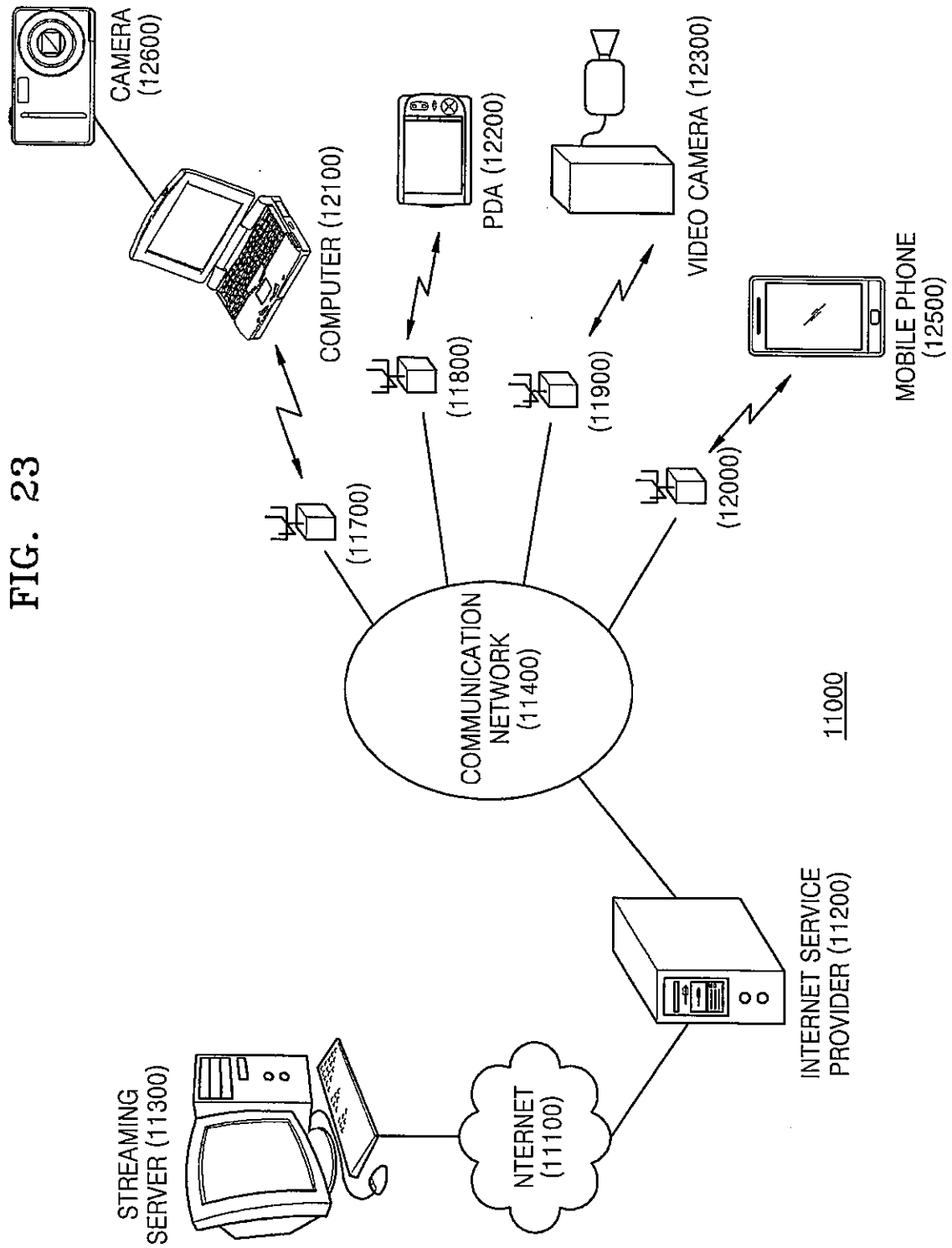


FIG. 24

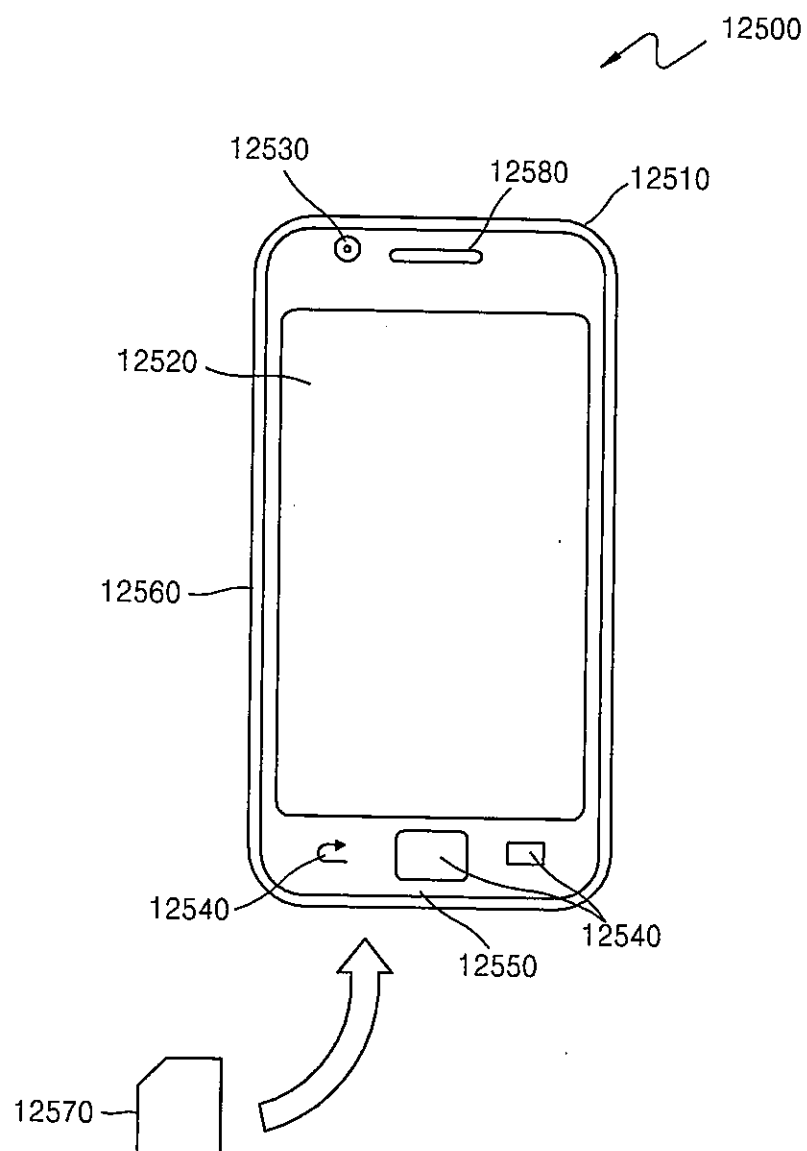


FIG. 25

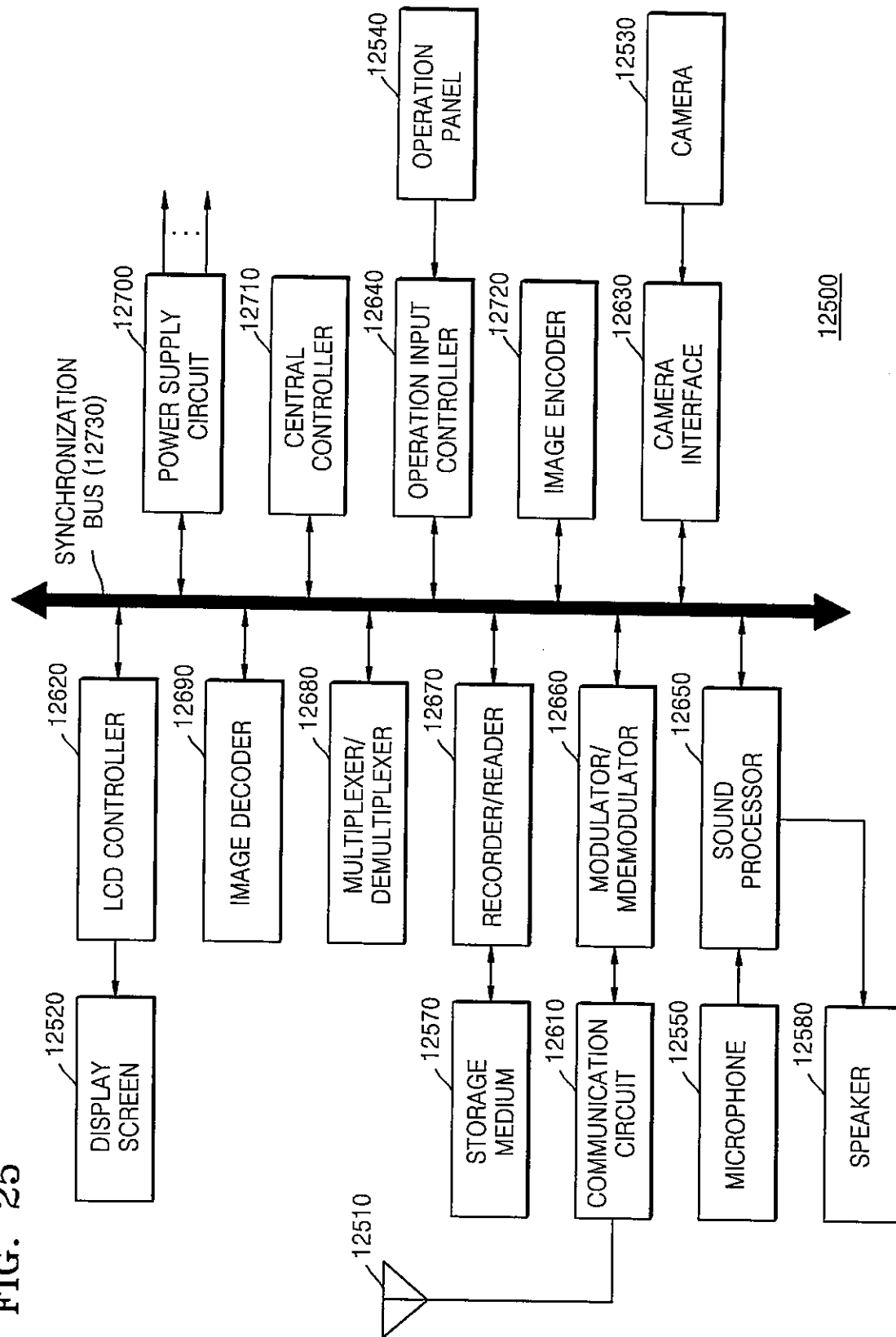


FIG. 26

