

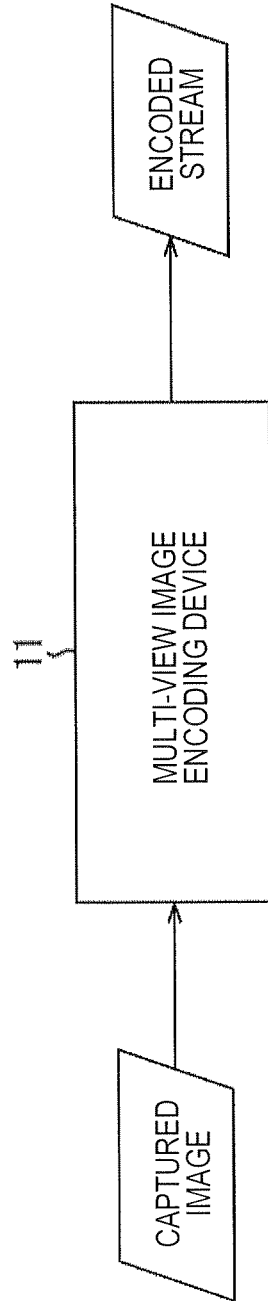
FIG. 1

FIG. 2

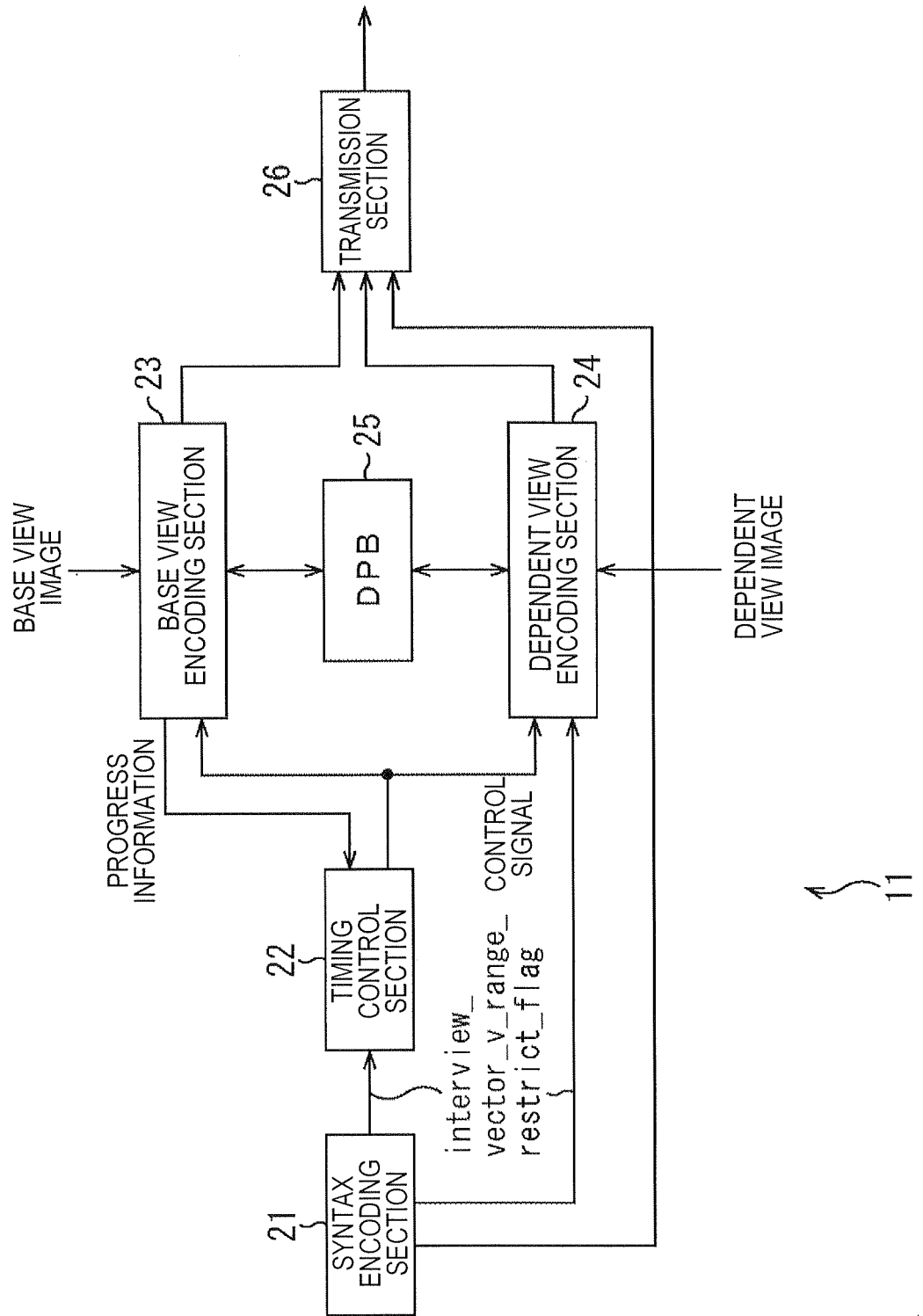


FIG. 3

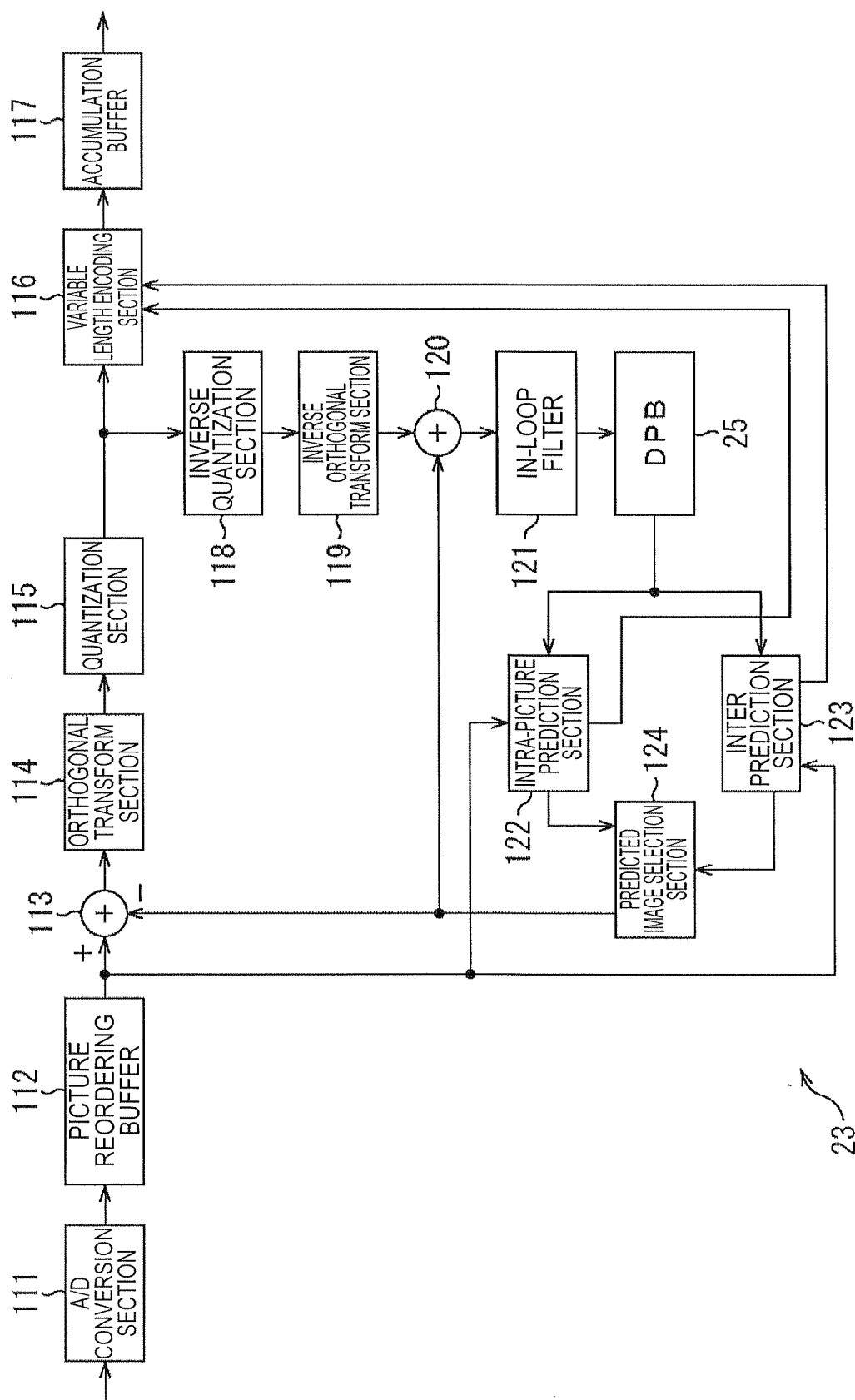


FIG. 4

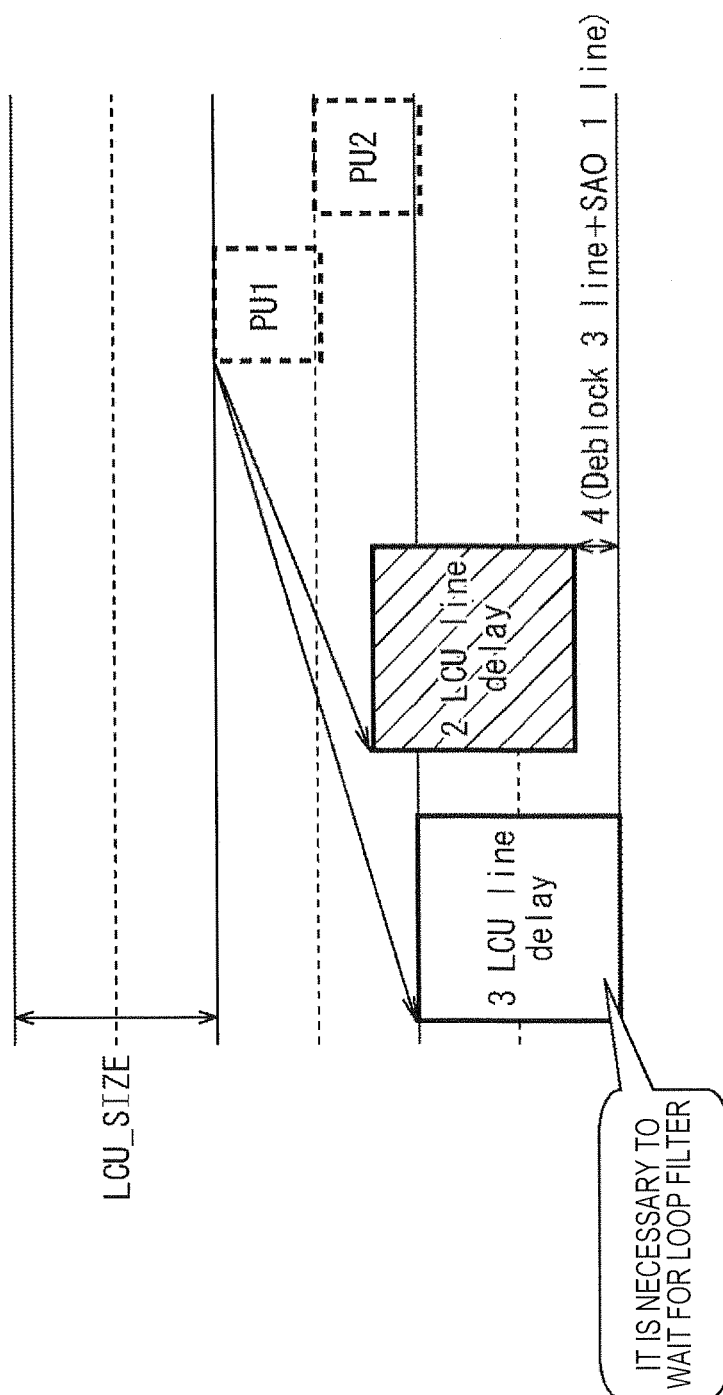
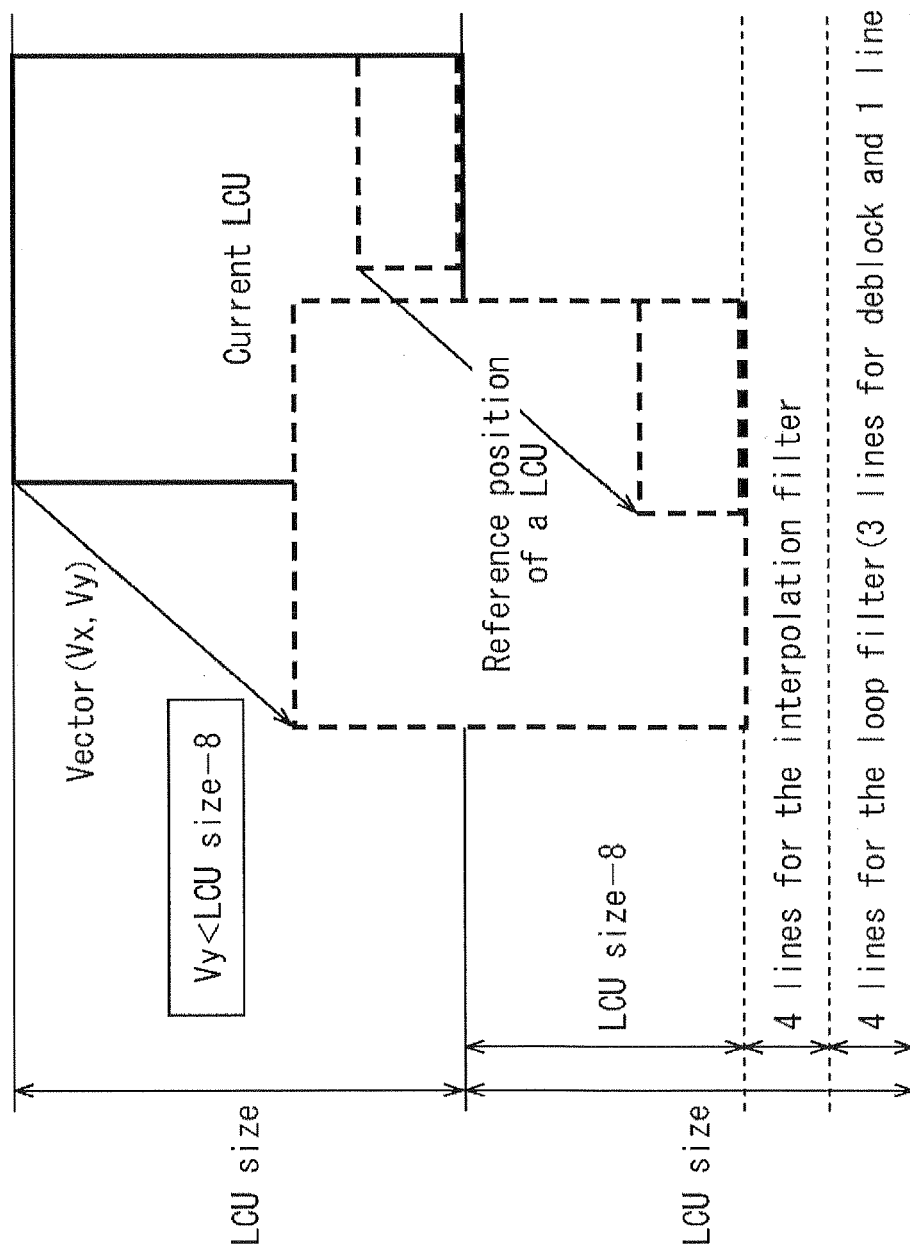


FIG. 5



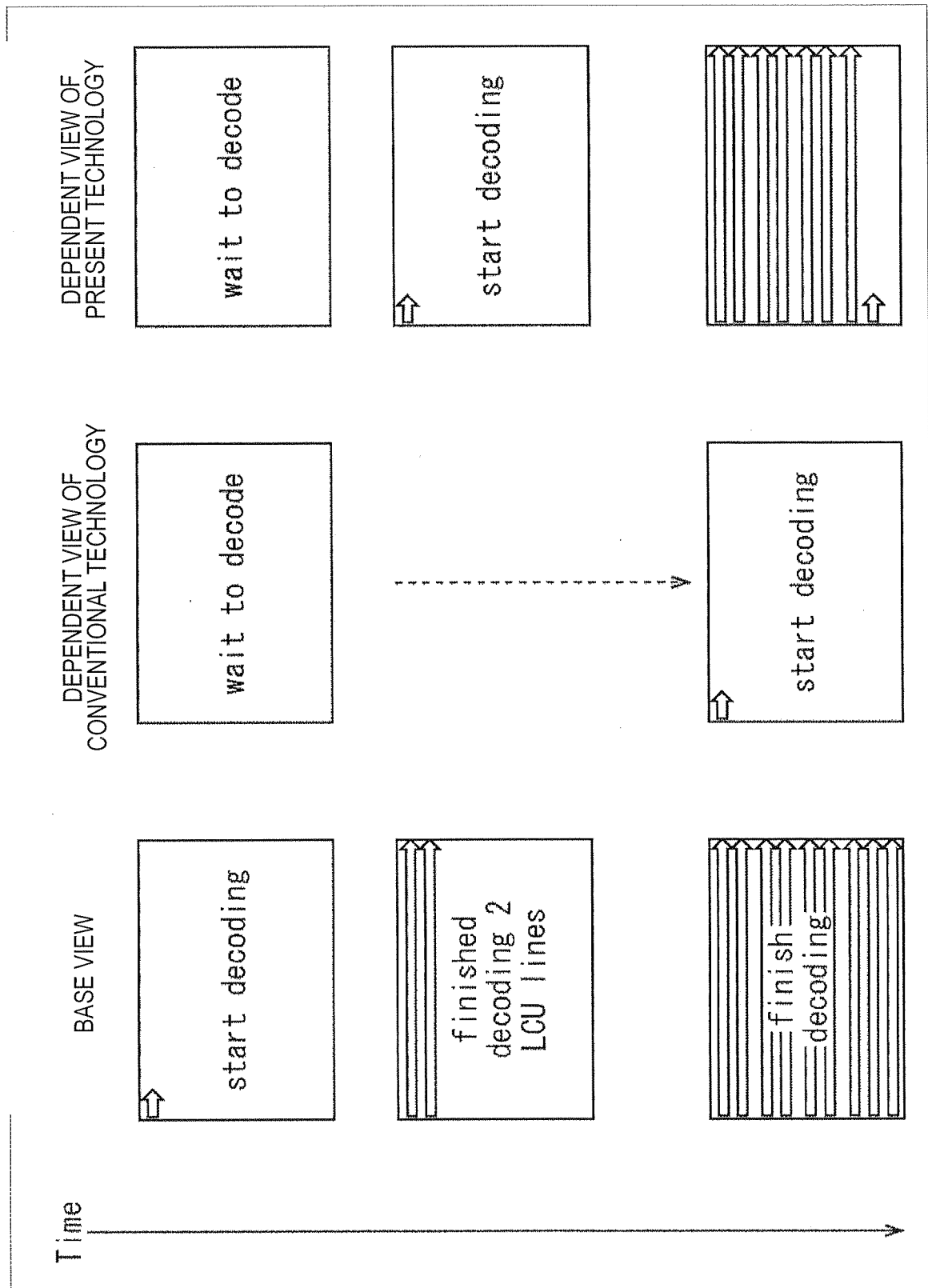


FIG. 6

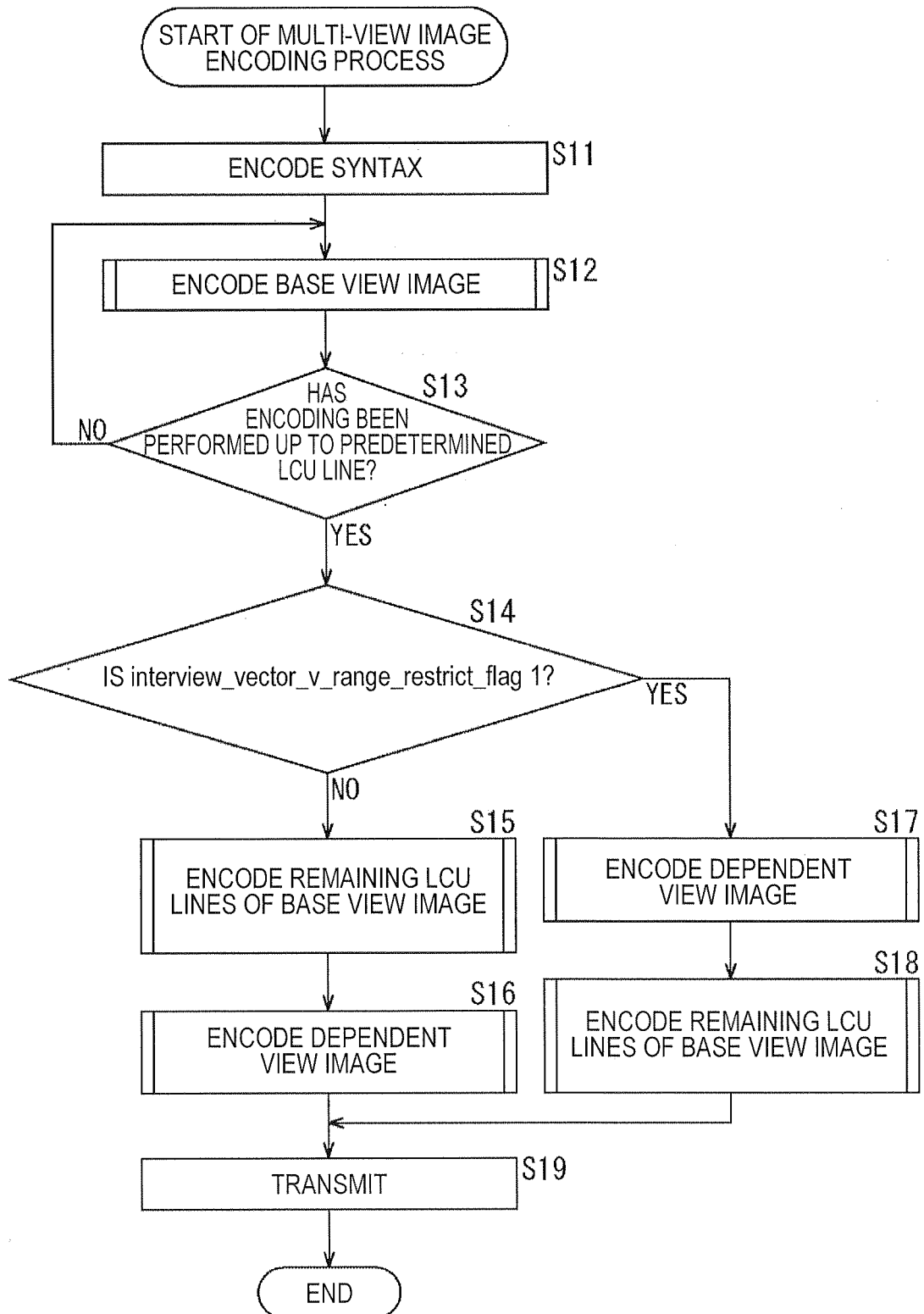
FIG. 7

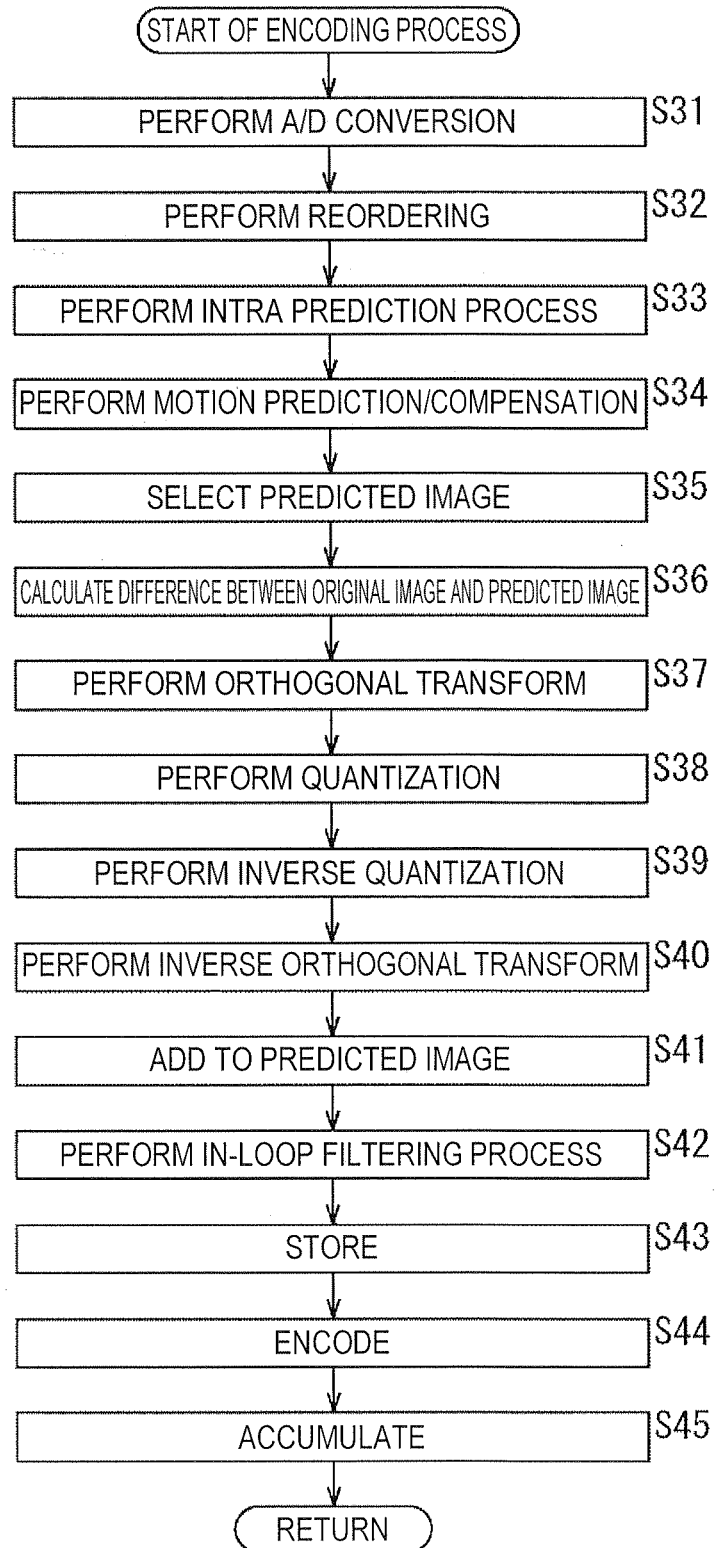
FIG. 8

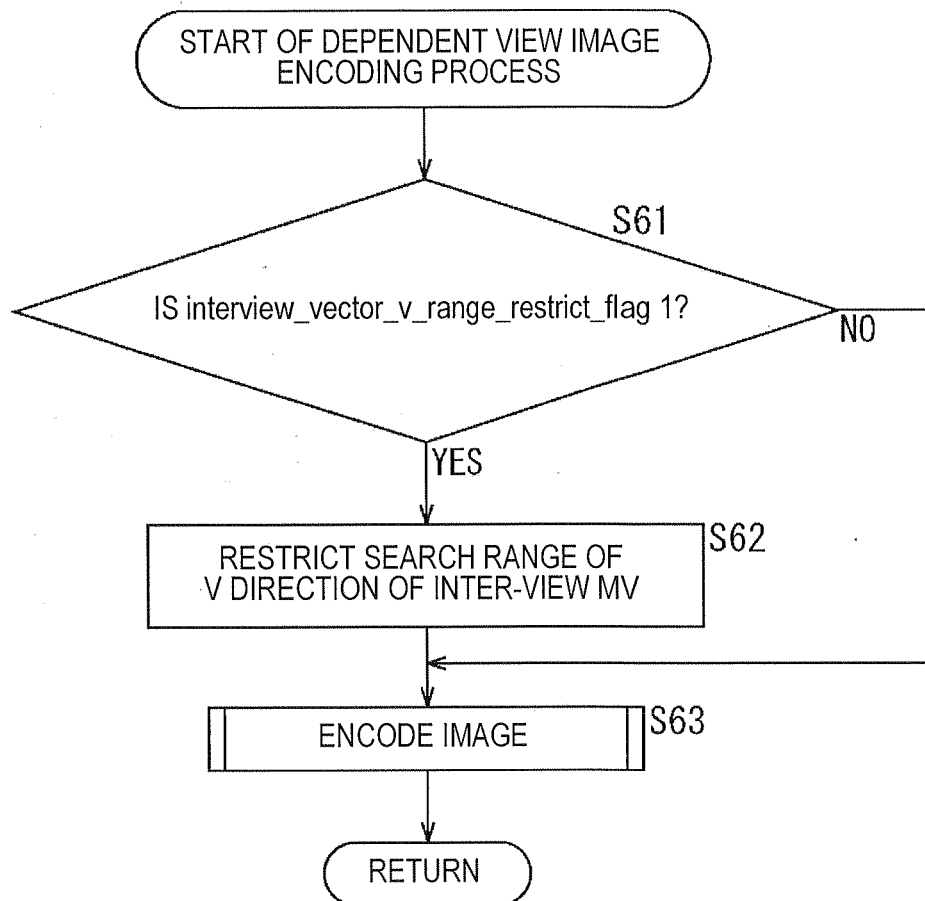
FIG. 9

FIG. 10

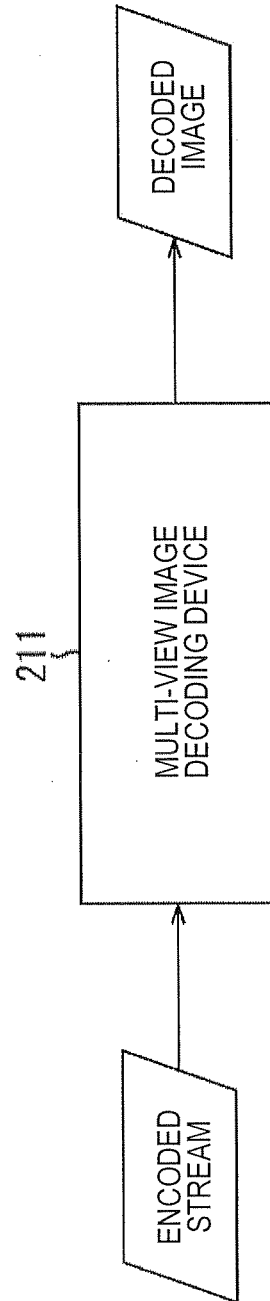
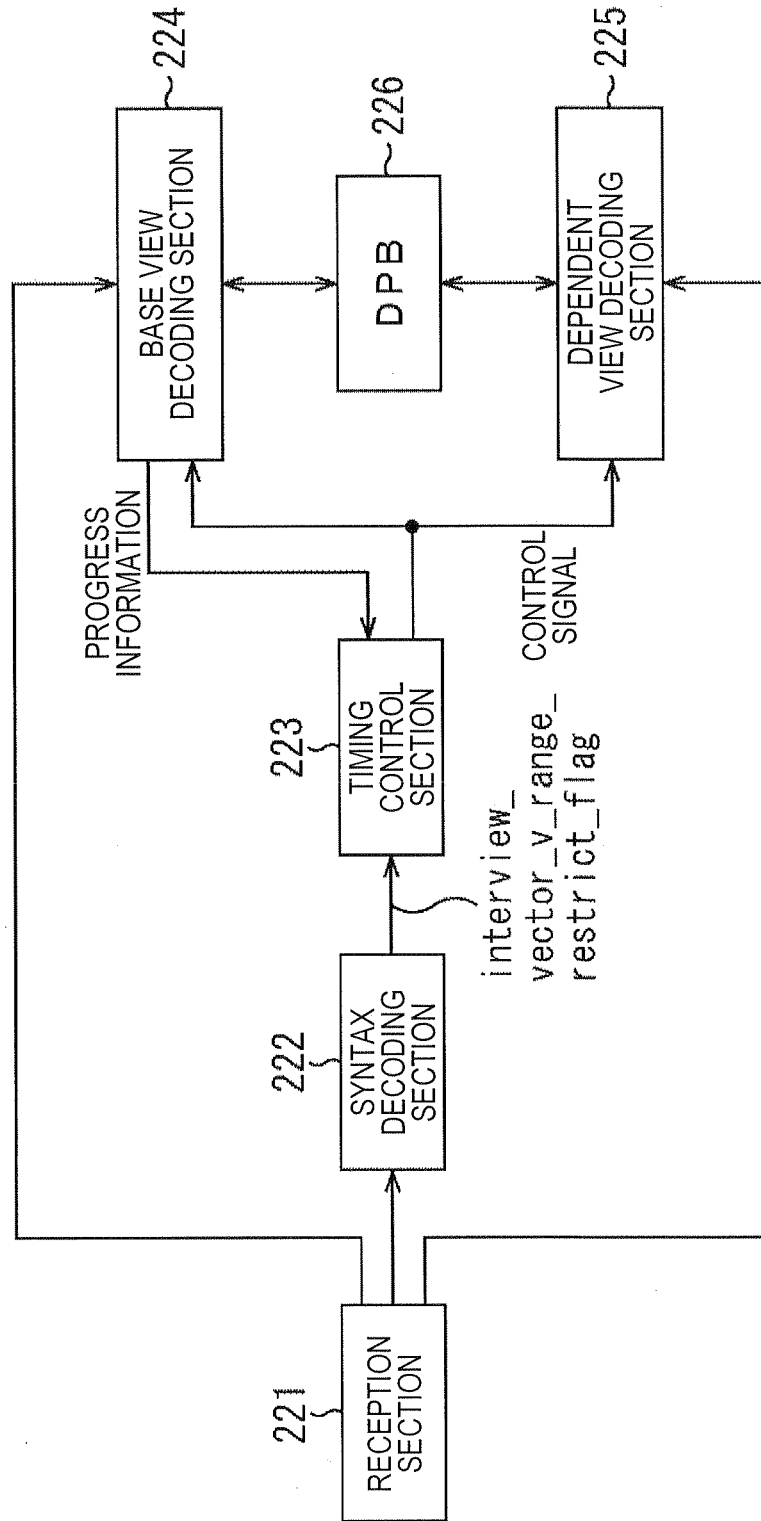
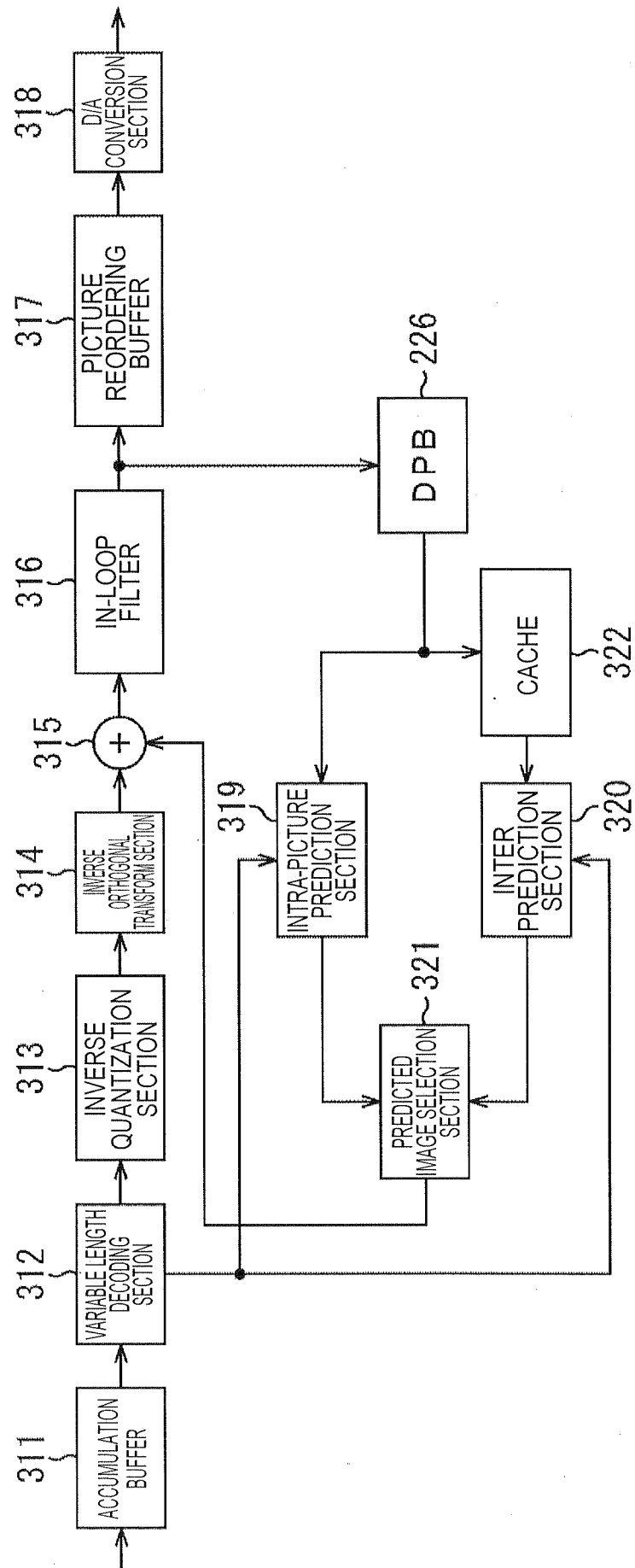


FIG. 11



211

FIG. 12



224

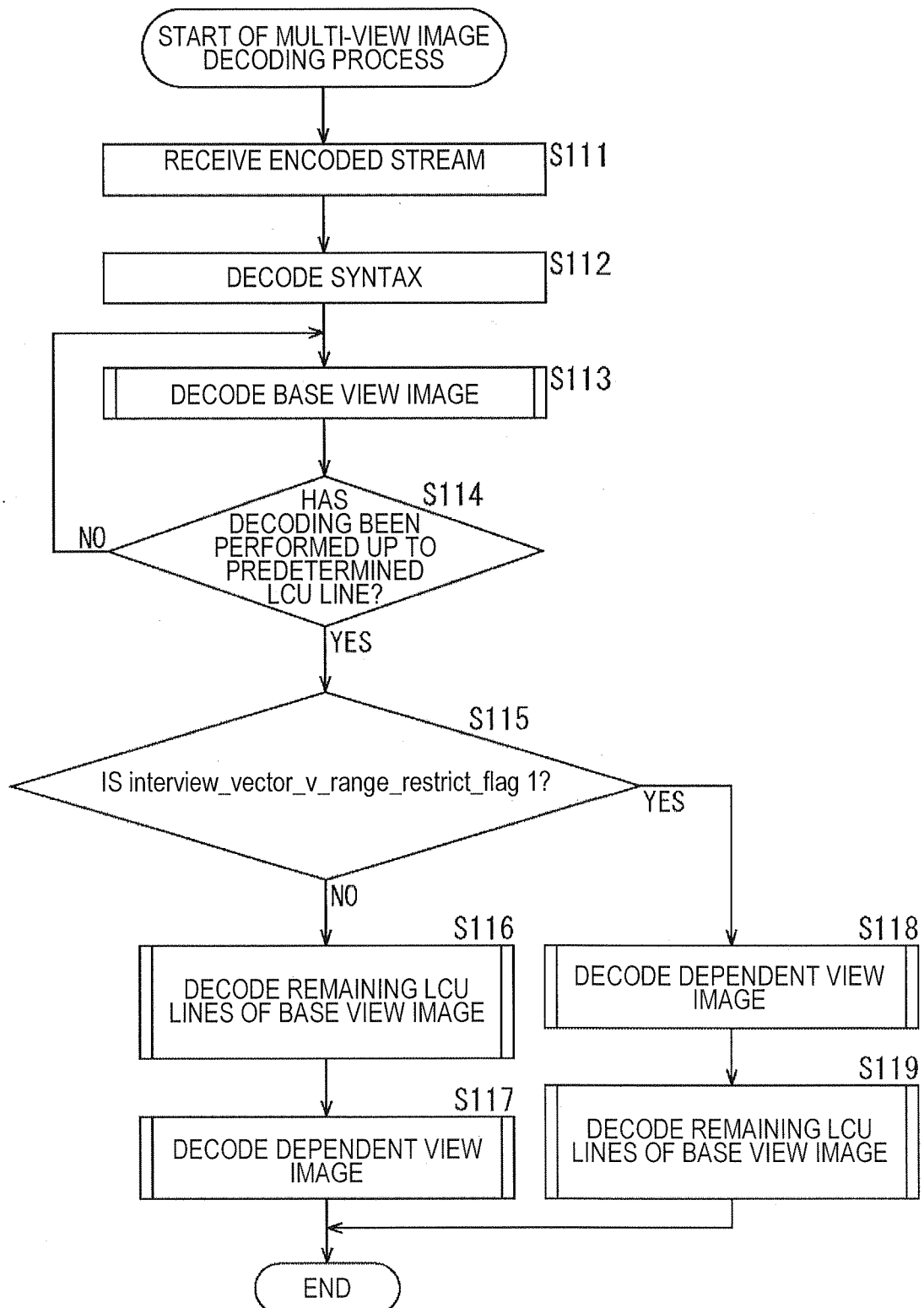
FIG. 13

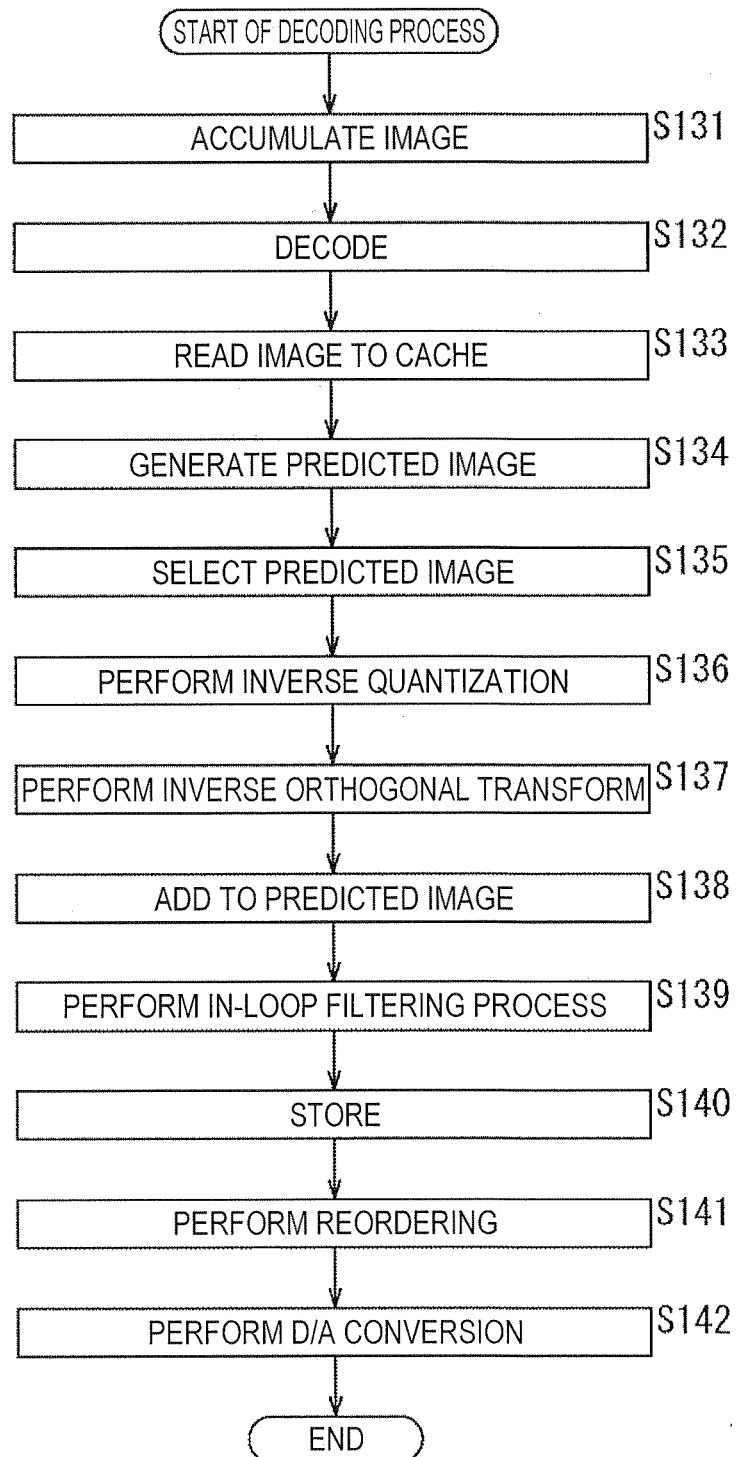
FIG. 14

FIG. 15**Syntax**

```

- seq_parameter_set_rbsp( ) {
    ...
    . if ( profile_idc == "Multi-view support Profile" ) {
        - interview_vector_v_range_restrict_flag      u(1)
    . }

```

Semantics

- interview_vector_v_range_restrict_flag equal to 1 represents vertical component of inter-view vectors, which are used in the dependent view pictures, is equal to or less than (LCUsize-8) in units of luma samples. If not present, the value shall be inferred to be 0. If profile_idc is equal to "Stereo profile", the value shall be set equal to 1.

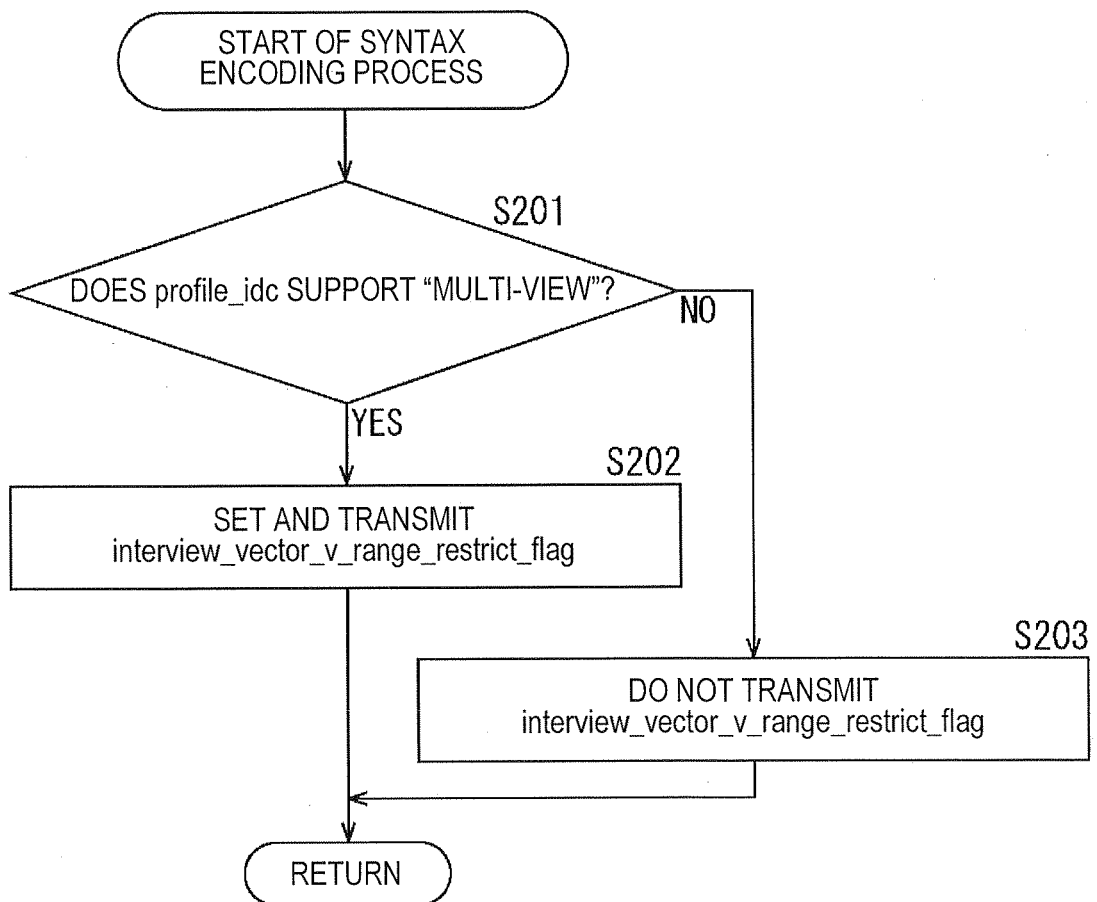
FIG. 16

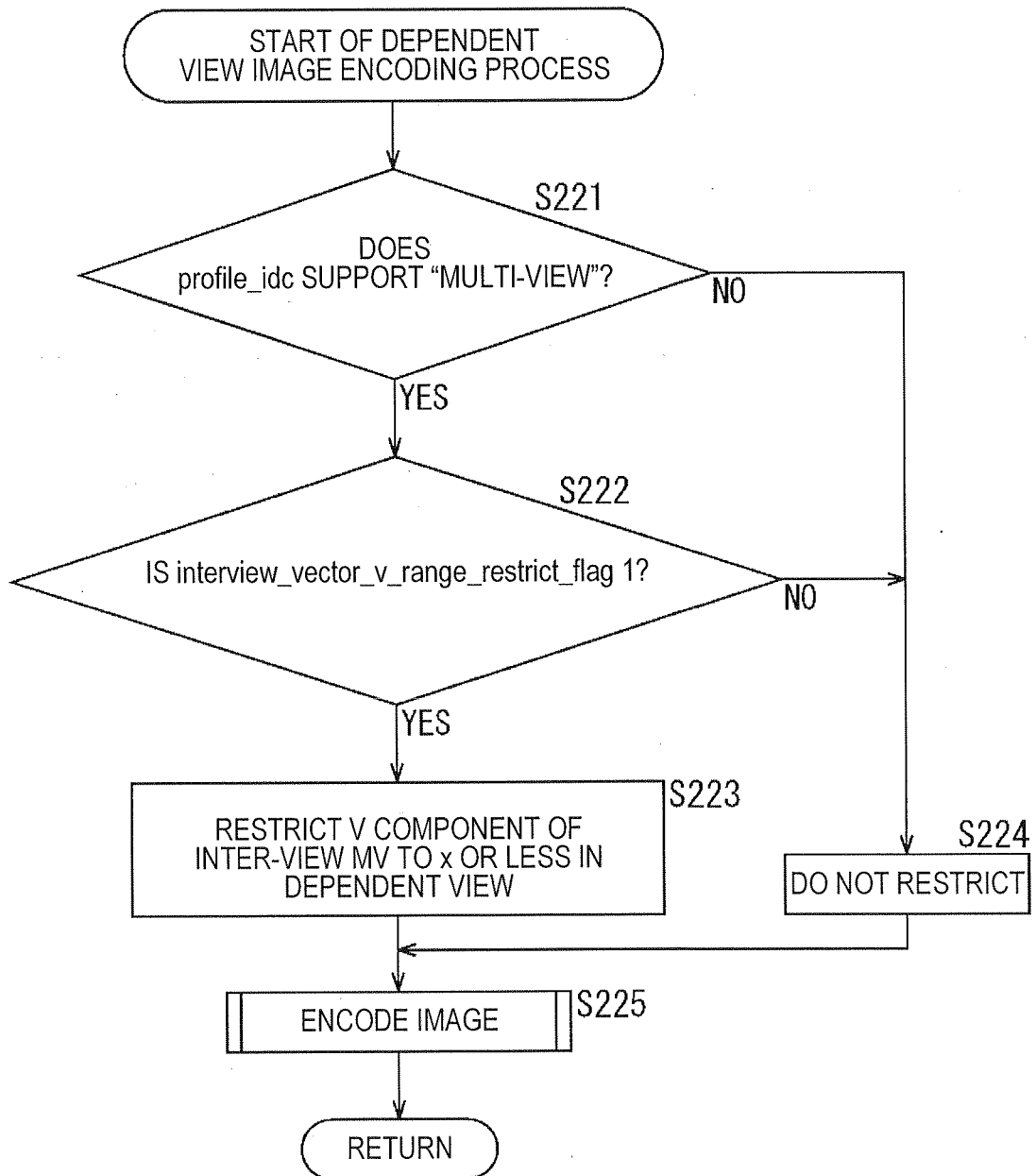
FIG. 17

FIG. 18

Syntax

```

- seq_parameter_set_rbsp( ) {
    ...
    if ( profile_idc == "Multi-view support Profile" ) {
        interview_vector_v_range_restrict_flag    u(1)
        if (interview_vector_v_range_restrict_flag == 1) {
            interview_vector_v_range              u(8)
        }
    }
}

```

Semantics

- interview_vector_v_range_restrict_flag equal to 1 represents vertical component of inter-view vectors, which are used in the dependent view pictures, are equal to or less than the value interview_vector_v_range in units of luma samples. If not present, the value shall be inferred to be 0. If profile_idc is equal to "Stereo profile", the value shall be set equal to 1.
- interview_vector_v_range represents the maximum value of vertical component of the inter-view vectors in units of luma samples. If not present, the value shall be inferred to be 0.

FIG. 19

Syntax

```

- seq_parameter_set_rbsp( ) {
    ...
    . if ( profile_idc == "Multi-view support Profile" ) {
        interview_vector_v_range_restrict_flag    u(1)
        if (interview_vector_v_range_restrict_flag == 1 ) {
            interview_vector_v_range              u(8)
            interview_vector_h_range              u(8)
        }
    }
    .
}

```

Semantics

- interview_vector_v_range_restrict_flag equal to 1 represents vertical component of inter-view vectors, which are used in the dependent view pictures, are equal to or less than the value interview_vector_v_range in units of luma samples. If not present, the value shall be inferred to be 0. If profile_idc is equal to "Stereo profile", the value shall be set equal to 1.
- interview_vector_v_range represents the maximum value of vertical component of the inter-view vectors in units of luma samples. If not present, the value shall be inferred to be 0.
- interview_vector_h_range represents the maximum value of horizontal component of the inter-view vectors in units of luma samples. If not present, the value shall be inferred to be 0. If the value is 255, it represents that there is no restriction about the horizontal component.

FIG. 20

Format nickname	Luma width	Luma height	constraint
SQCIF	128	96	56
QCIF	176	144	56
QVGA	320	240	56
525 SIF	352	240	56
CIF	352	288	56
525 HHR	352	480	56
625 HHR	352	576	56
Q720p	640	360	56
VGA	640	480	56
525 4SIF	704	480	56
525 SD	720	480	56
4CIF	704	576	56
625 SD	720	576	56
480p (16:9)	864	480	56
SVGA	800	600	56
QHD	960	540	56
XGA	1024	768	56
720p HD	1280	720	56
4VGA	1280	960	56
SXGA	1280	1024	56
525 16SIF	1408	960	56
16CIF	1408	1152	56
4SVGA	1600	1200	56
1080 HD	1920	1080	56
2Kx1K	2048	1024	56
2Kx1080	2048	1080	56
4XGA	2048	1536	120
16VGA	2560	1920	120
3616x1536 (2.35:1)	3616	1536	120
3672x1536 (2.39:1)	3680	1536	120
3840x2160 (4*HD)	3840	2160	120
4Kx2K	4096	2048	120
4096x2160	4096	2160	120
4096x2304 (16:9)	4096	2304	120
7680x4320	7680	4320	248
8192x4096	8192	4096	248
8192x4320	8192	4320	248

FIG. 21

Syntax

sps_extension() {	Descriptor
disparity_vector_constraint_flag	u(1)
}	

Semantics

disparity_vector_constraint_flag equal to 1 specifies that disparity vector is constrained in the CVS. When disparity_vector_constraint_flag is equal to 1, the vertical component of the disparity vector shall be equal to or less than dv_constraint_value in pixel. The variable dv_constraint_value is specified as follows.

$$dv_constraint_value = ((1 + (pic_height_in_luma_samples * 0.05) >> 6) << 6) - 8$$

When disparity_vector_constraint_flag is equal to 0, there is no constraint for disparity vector length. When not present, the value is inferred to be 0.

Stereo profile

Bitstreams conforming to the Stereo profile shall obey the following constraints:

- Sequence parameter set extensions in the non-base view shall have disparity vector constraint flag equal to 1 only.

FIG. 22

Table A—dv_constraint_value

Level	Max luma height	dv_constraint_value
1	144	56
2	288	56
2.1	360	56
3	540	56
3.1	720	56
4	1080	56
4.1	1080	56
5	2160	120
5.1	2160	120
5.2	2160	120
6	4320	248
6.1	4320	248
6.2	4320	248

Semantics

disparity_vector_constraint_flag equal to 1 specifies that disparity vector is constrained in the CVS. When disparity_vector_constraint_flag is equal to 1, the vertical component of the disparity vector shall be equal to or less than dv_constraint_value in pixel. The variable dv_constraint_value is specified in Table A. When disparity_vector_constraint_flag is equal to 0, there is no constraint for disparity_vector_length. When not present, the value is inferred to be 0.

FIG. 23

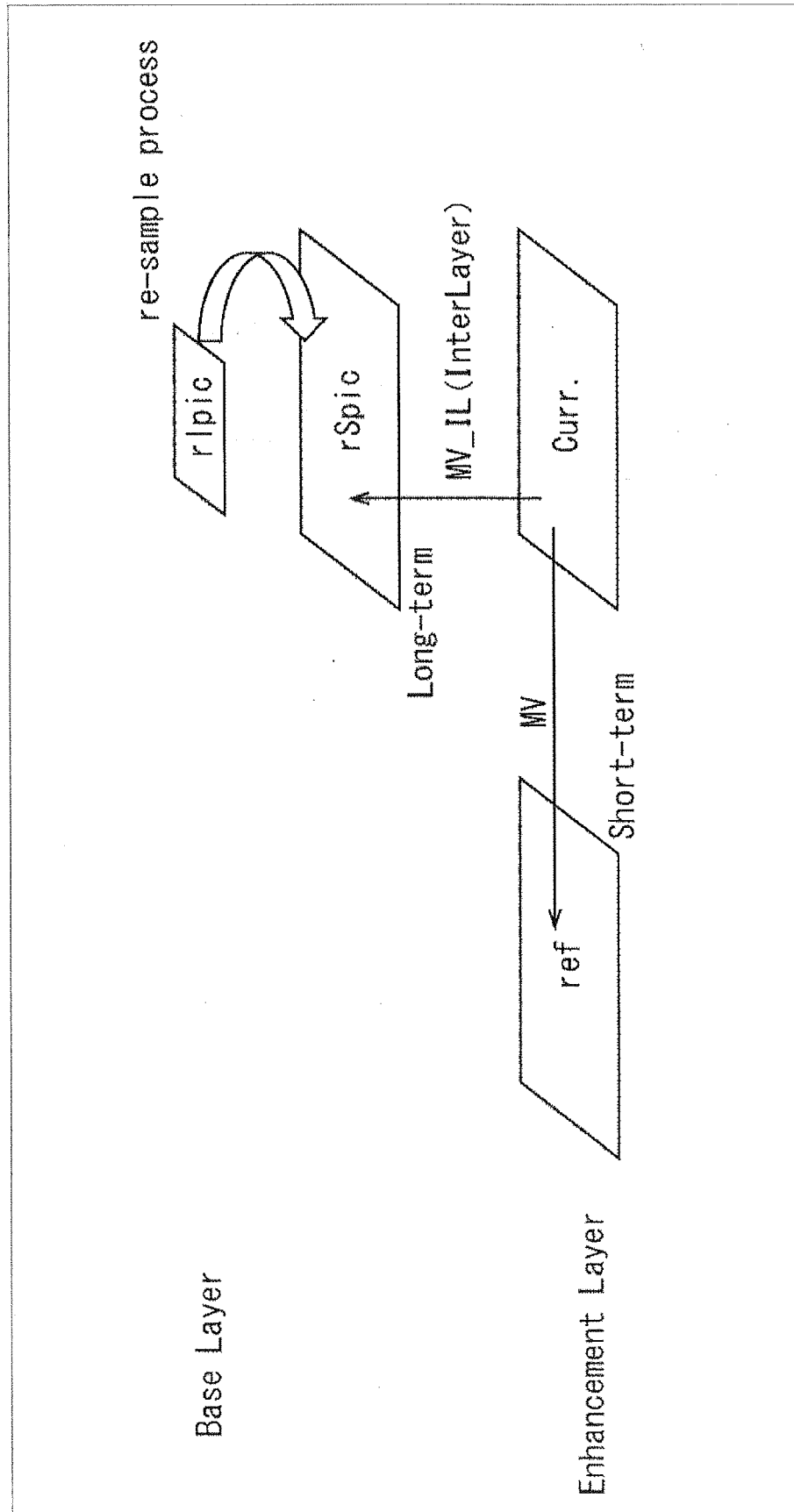
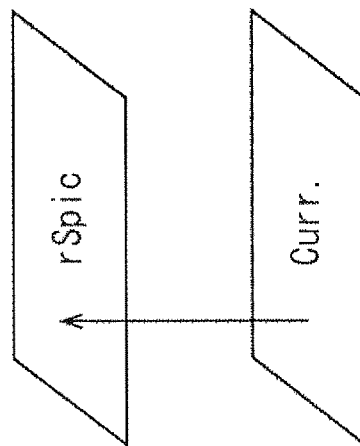


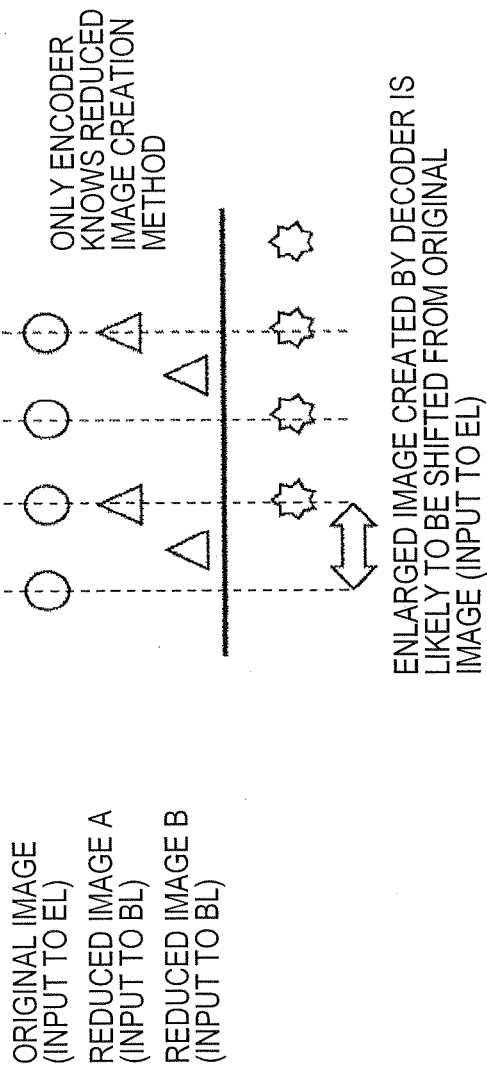
FIG. 24

Scalable video profile

Bitstreams conforming to the Stereo profile shall obey the following constraints:

- Both horizontal and vertical component of inter-layer predicted vector shall be equal to zero.

FIG. 25

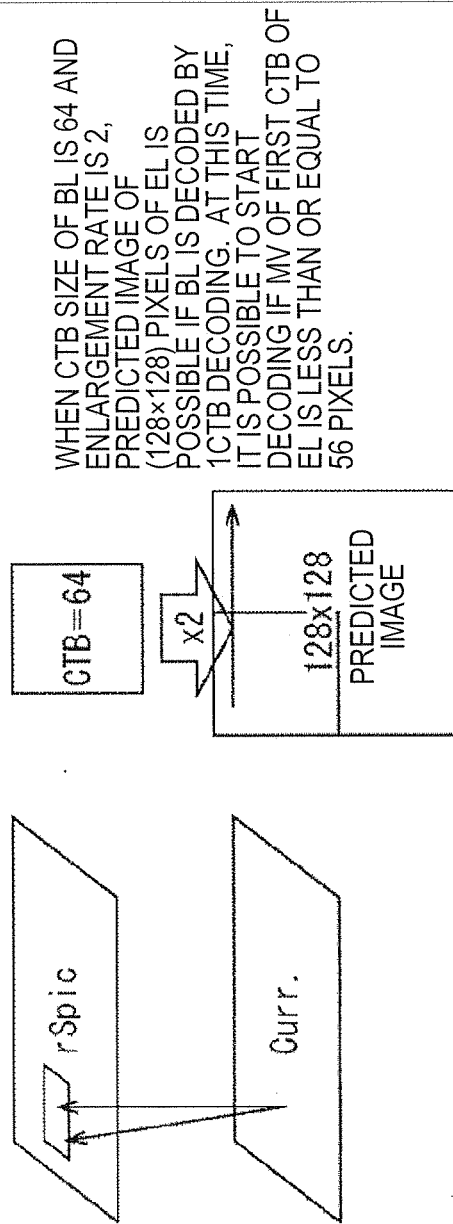


Scalable video profile

Bitstreams conforming to the Stereo profile shall obey the following constraints:

- Both horizontal and vertical component of inter-layer predicted vector shall be equal to or less than 1 in pixel.

FIG. 26



Scalable video profile

Bitstreams conforming to the Stereo profile shall obey the following constraints:

- Both horizontal and vertical component of inter-layer predicted vector shall be equal to or less than the `il_pred_constraint` in pixel. The variable `il_pred_constraint` is specified as follows.

$$\bullet \text{ il_pred_constraint} = (\text{scale_factor} * \text{BL_CTBsize} - \text{EL_CTBsize}) - 8$$

$$\text{Ex. il_pred_constraint} = (2 * 64 - 64) - 8 = 56 \text{ [pixel]}$$

FIG. 27

Syntax

vps_extension() {	Descriptor
for (i=1;i <= vps_max_layers_minus1;i++)	
inter_view_mv_vert_constraint_flag[i]	u(1)
}	

Semantics

inter_view_mv_vert_constraint_flag[i] specifies the value of the inter_view_mv_vert_constraint_flag syntax element in VCL NAL units of the i-th layer. For i in a range from 1 to vps_max_layers_minus1, inclusive, when not present, the value of inter_view_mv_vert_constraint_flag[i] is inferred to be equal to 0. inter_view_mv_vert_constraint_flag equal to 1 specifies that vertical component of motion vectors used for inter-layer prediction are constrained in the CVS. When inter_view_mv_vert_constraint_flag is equal to 1, the vertical component of the motion vectors used for inter-layer prediction shall be equal to or less than 56 in units of luma samples. When inter_view_mv_vert_constraint_flag is equal to 0, no constraint for of the vertical component of the motion vectors used for inter-layer prediction is signalled by this flag.

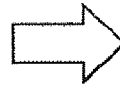
FIG. 28

CASE OF SPS_EXT SYNTAX

F.1.1.1 Stereo Main profile

Bitstreams conforming to the Stereo Main profile shall obey the following constraints:

- The sub-bitstream resulting from the sub-bitstream extraction process with any value of `tlTarget` and a value of 0 in `layerIdListTarget` as inputs shall conform to the Main profile.
- The bitstream shall contain one layer with `nuh_layer_id` equal to `i` for which `ViewId[i]` is greater than 0.
- When `ViewId[i]` is greater than 0, `inter_view_mv_vert_constraint_flag` shall be equal to 1 in the `sps_extension()` syntax structure of the active layer SPS of any coded pictures with `nuh_layer_id` equal to `i`.



CASE OF VPS_EXT SYNTAX

F.1.1.1 Stereo Main profile

Bitstreams conforming to the Stereo Main profile shall obey the following constraints:

- The sub-bitstream resulting from the sub-bitstream extraction process with any value of `tlTarget` and a value of 0 in `layerIdListTarget` as inputs shall conform to the Main profile.
- The bitstream shall contain one layer with `nuh_layer_id` equal to `i` for which `ViewId[i]` is greater than 0.
- When `ViewId[i]` is greater than 0, `inter_view_mv_vert_constraint_flag` of the `ViewId[i]` shall be equal to 1 in the `vps_extension()` syntax structure of any coded pictures with `nuh_layer_id` equal to `i`.

FIG. 29

SAME POINT AS SPS_EXT	DIFFERENT POINT FROM SPS_EXT
TRANSCODING OF BITSTREAM LEVEL IS POSSIBLE BECAUSE ENCODING FOR EVERY VIEW IS POSSIBLE	BECAUSE VPS IS HIGHER SYNTAX THAN SPS, IN CASE OF MULTI-VIEW, BITSTREAM RESTRICTION IN EACH EARLIER VIEW IS KNOWN SOONER. THUS, LOAD DISPERSION OF DECODER CORE IS EASY. AS MODIFIED EXAMPLE, WHEN SYNTAX INDICATING THAT FLAG IS SENT ONLY IN CASE OF 3D PROFILE IS SET, DETERMINATION IS EASY.

FIG. 31

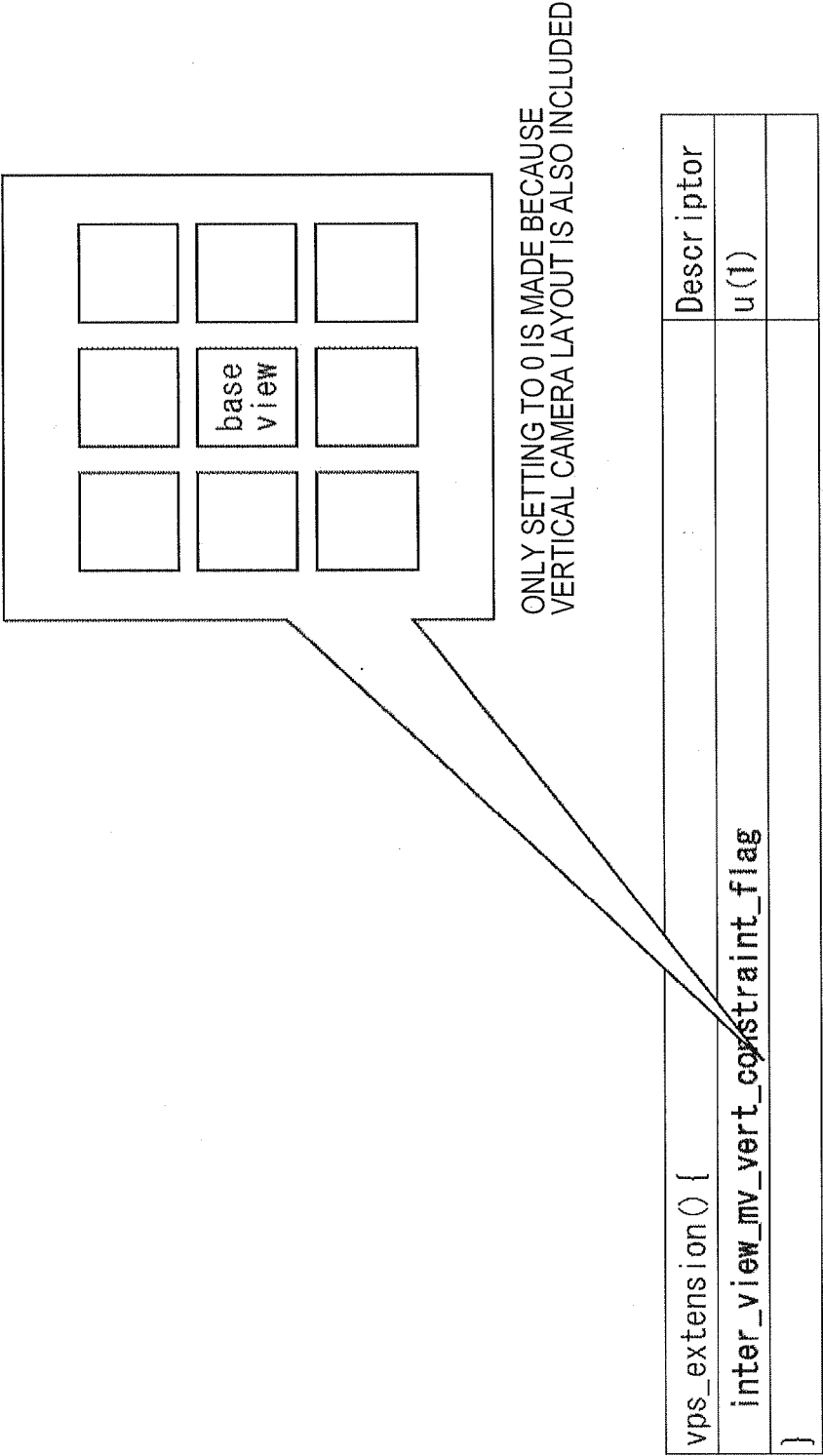


FIG. 32

sps_extension_vui_parameters() {	Descriptor
if(bitstream_restriction_flag) {	
inter_view_mv_vert_constraint_flag	
}	u(1)
}	

FIG. 33

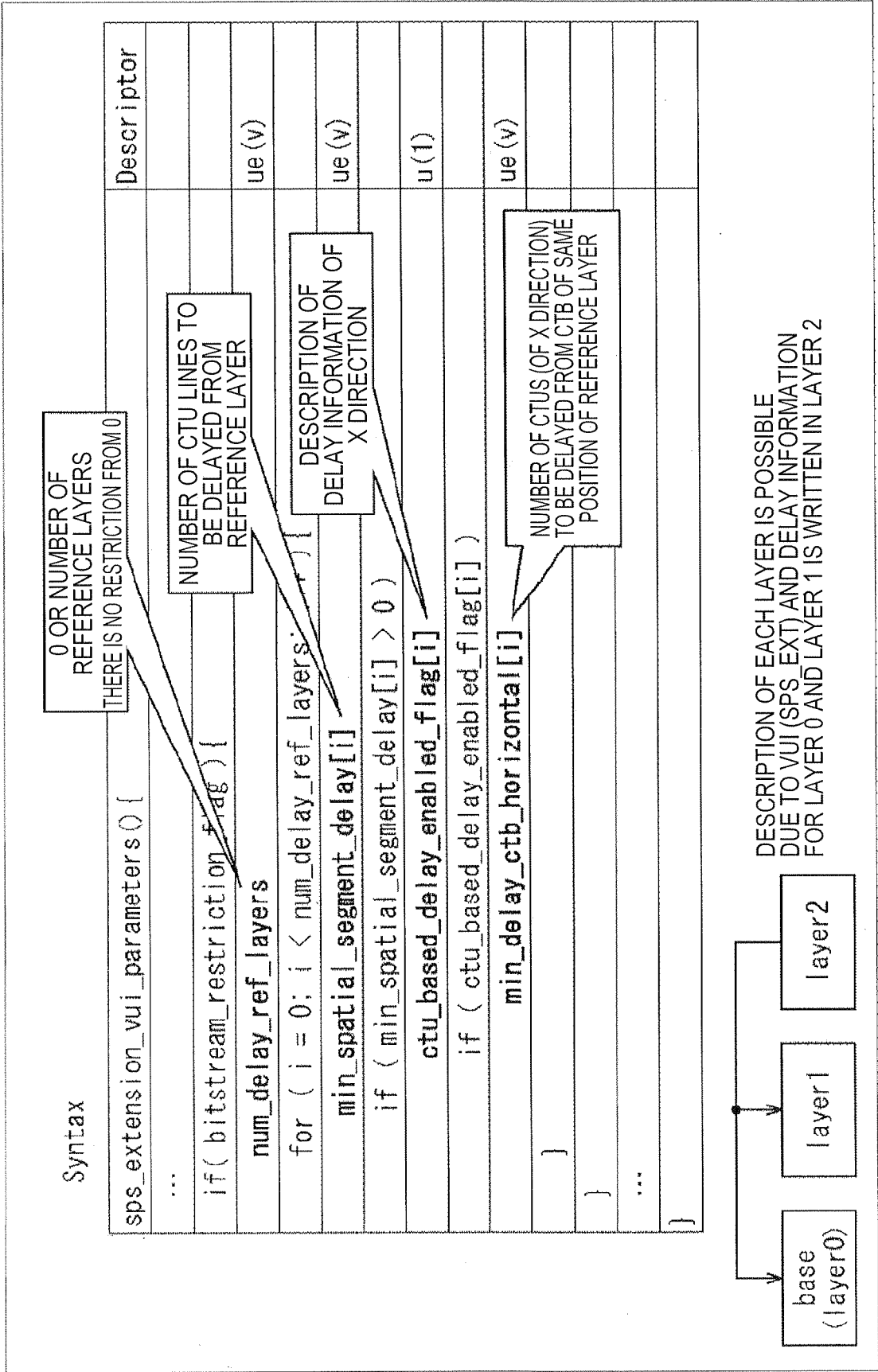


FIG. 34

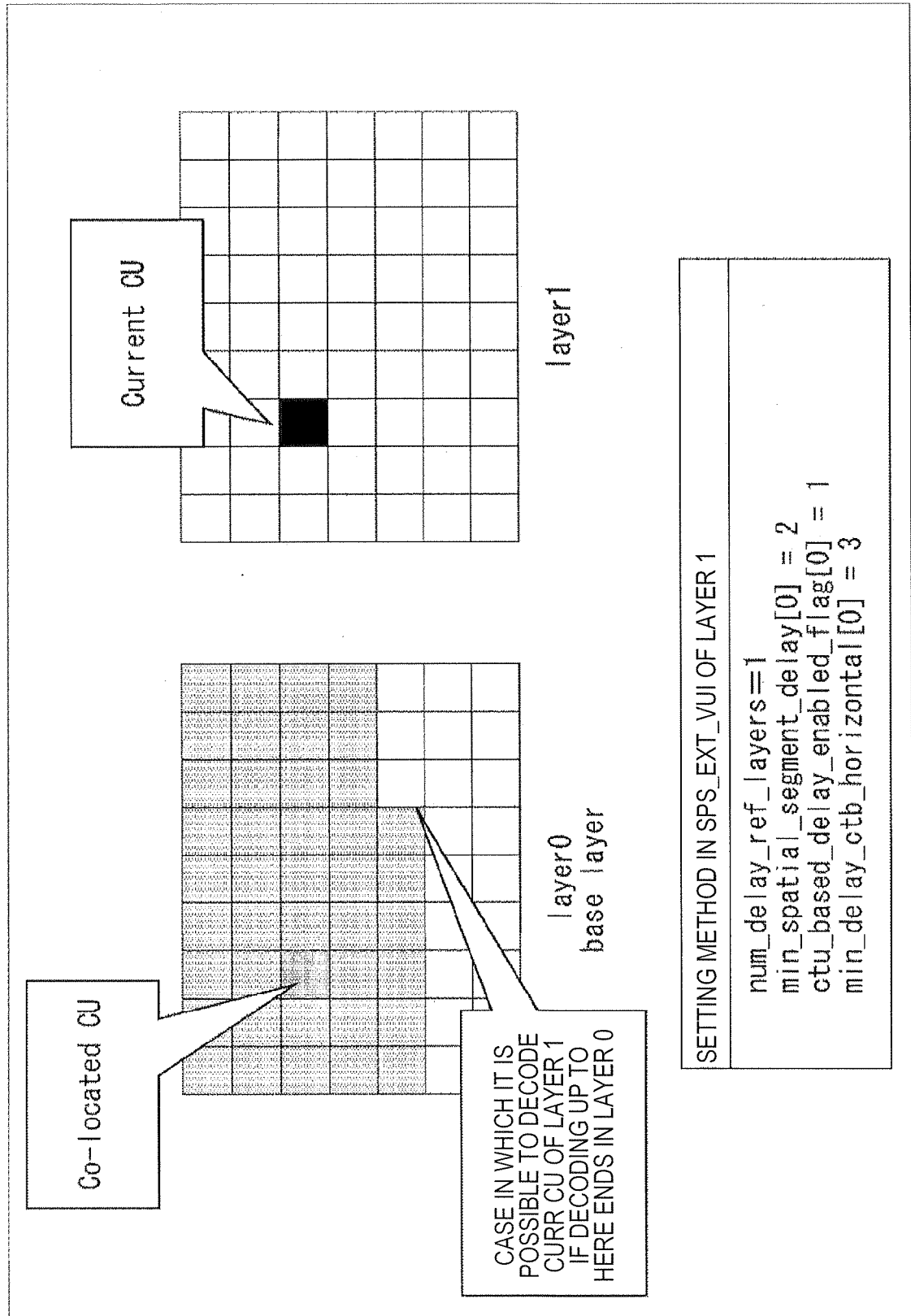


FIG.35

CASE OF SPS_EXT SYNTAX

F.1.1.1 Stereo Main profile

Bitstreams conforming to the Stereo Main profile shall obey the following constraints:

- The sub-bitstream resulting from the sub-bitstream extraction process with any value of tIdTarget and a value of 0 in layerIdListTarget as inputs shall conform to the Main profile.
- The bitstream shall contain one layer with nuh_layer_id equal to i for which ViewId[i] is greater than 0.

- When ViewId[i] is greater than 0, inter_view_mv_vert_constraint_flag shall be equal to 1 in the sps_extension() syntax structure of the active layer SPS of any coded pictures with nuh_layer_id equal to i.

CONSTRAINT BY CTU LINE

F.1.1.1 Stereo Main profile

Bitstreams conforming to the Stereo Main profile shall obey the following constraints:

- The sub-bitstream resulting from the sub-bitstream extraction process with any value of tIdTarget and a value of 0 in layerIdListTarget as inputs shall conform to the Main profile.
- The bitstream shall contain one layer with nuh_layer_id equal to i for which ViewId[i] is greater than 0.

- When ViewId[i] is greater than 0, num_delay_ref_layers shall be equal to 1 and min_spatial_segment_delay[0] shall be equal to $1 \ll (6 - \text{refLog2CtbSize})$ in the sps_extension_vui_parameters() syntax structure of the active layer SPS of any coded pictures with nuh_layer_id equal to i.

$MV_V \leq 56\text{pixel}$
 $\Leftrightarrow$ ONE-LINE DELAY WHEN CTU SIZE = 64
 TWO-LINE DELAY WHEN CTU SIZE = 32
 FOUR-LINE DELAY WHEN CTU SIZE = 16
 $\Leftrightarrow 1 \ll (6 - \text{Log2CTUsize})$ LINE DELAY

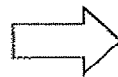


FIG. 36

SAME POINT AS interview_vector_v_range_restrict_flag	DIFFERENT POINTS FROM interview_vector_v_range_restrict_flag
SAME AS DELAY INFORMATION	RESTRICTION OF $MV_V \leq 56$ IS CHANGED ACCORDING TO ON/OFF OF LOOP FILTER IN REFERENCE PLANE OR WHETHER DISPARITY VECTOR OF Y DIRECTION HAS INTEGER PRECISION • IN CASE OF LOOP FILTER OFF, MV IS EXTENDED UP TO $MV_V \leq 60$ (= 64 - 4 OF OFFSET OF MC FILTER) PIXELS • BECAUSE MC FILTER IS UNNECESSARY WHEN MV LENGTH IS INTEGER, MV IS EXTENDED UP TO $MV_V \leq 60$ (= 64 - 4 OF OFFSET OF LOOP FILTER) • WHEN LOOP FILTER IS TURNED OFF AND MV LENGTH IS INTEGER, MV IS EXTENDED UP TO $MV_V \leq 64$

FIG. 37

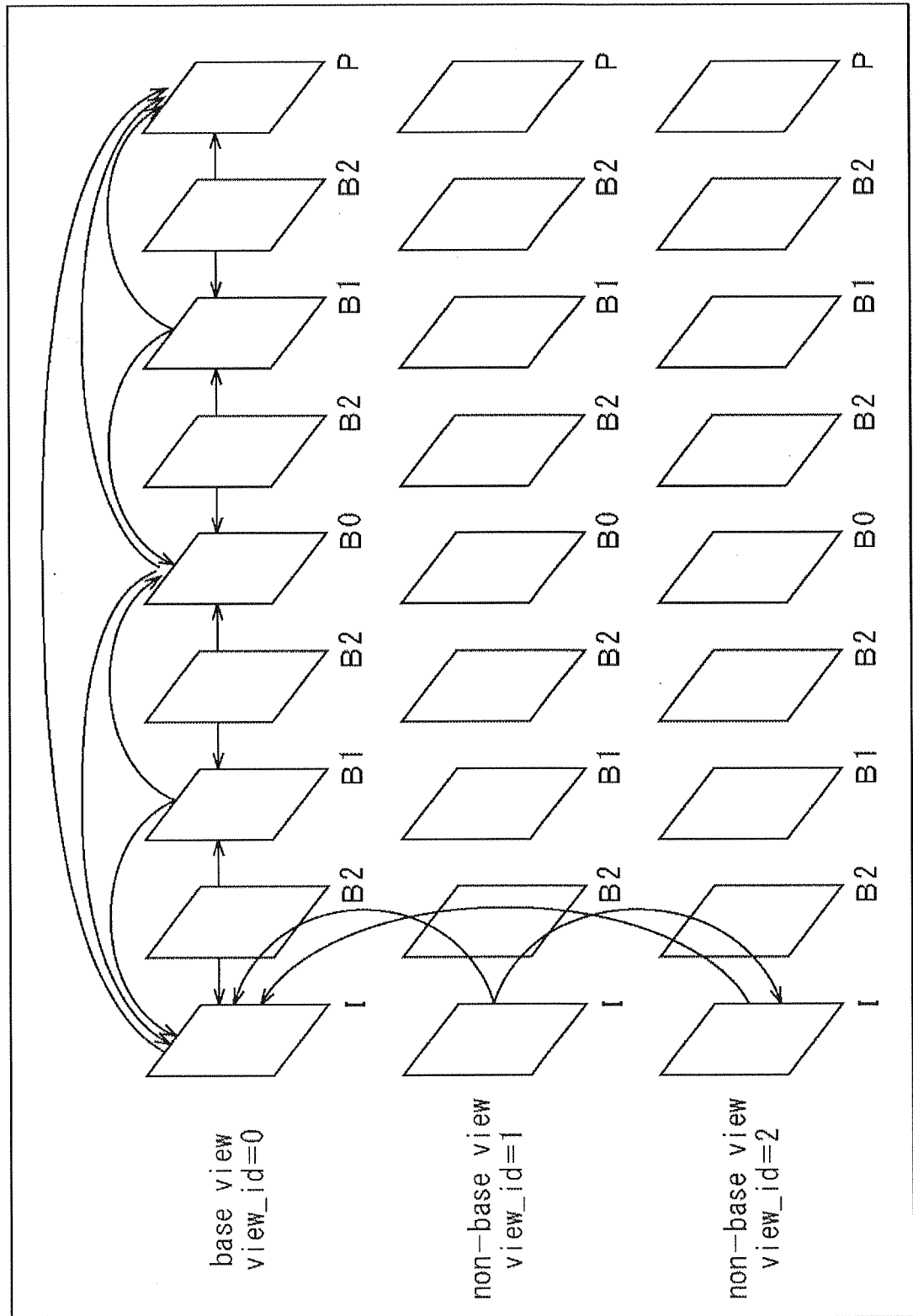


FIG. 38

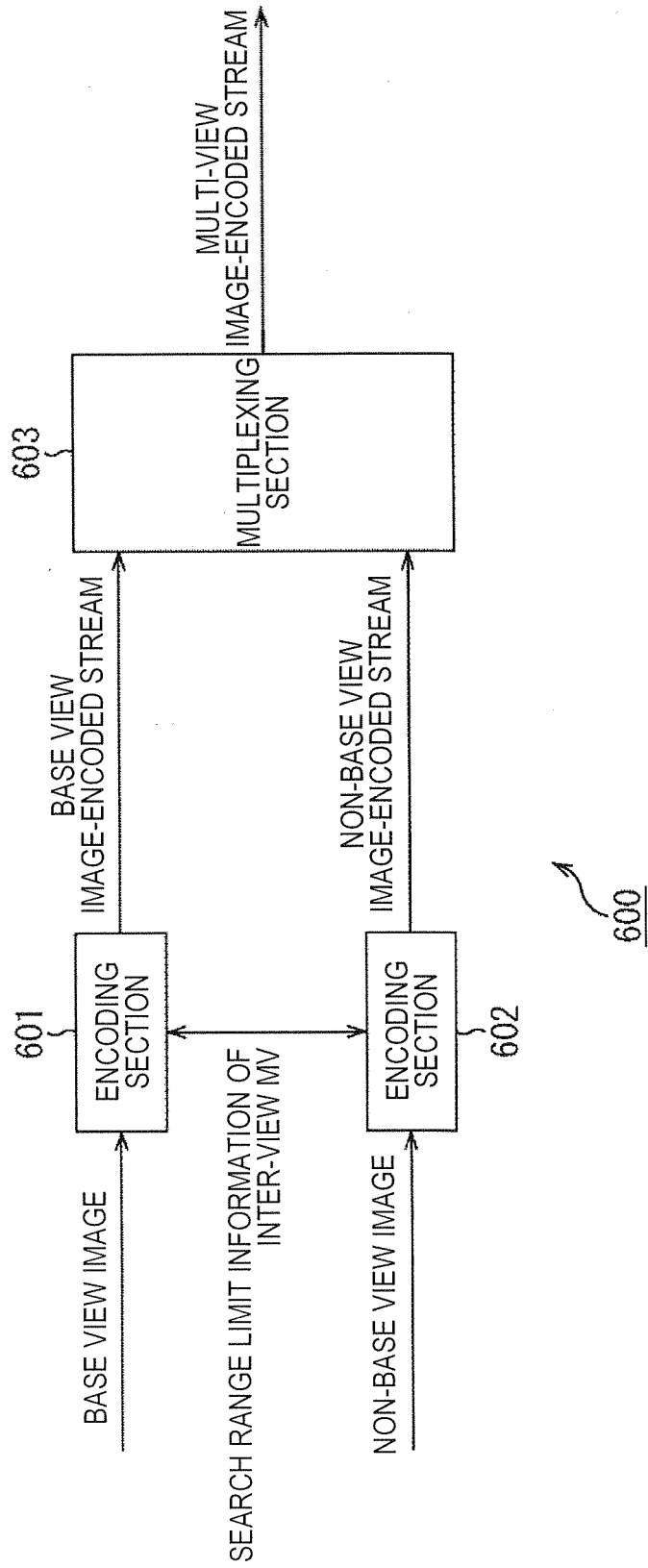


FIG. 39

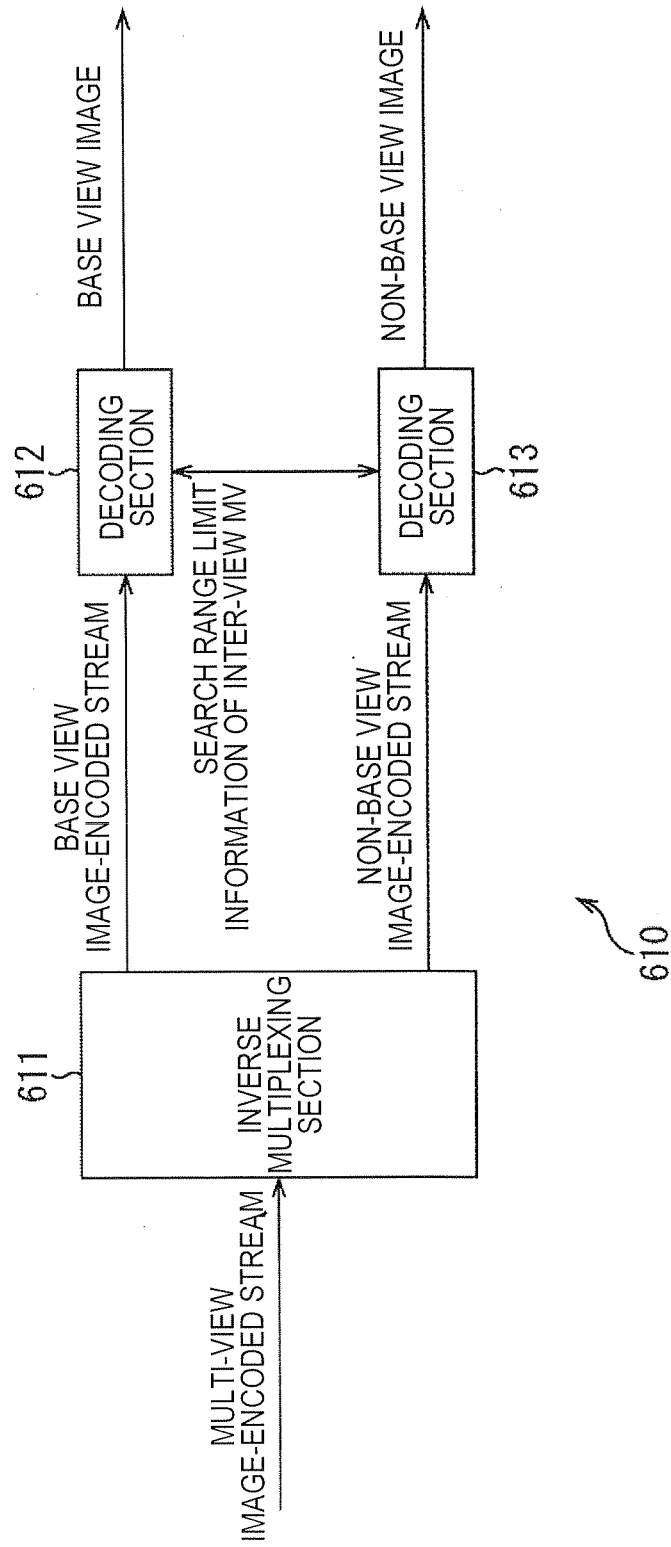


FIG. 40

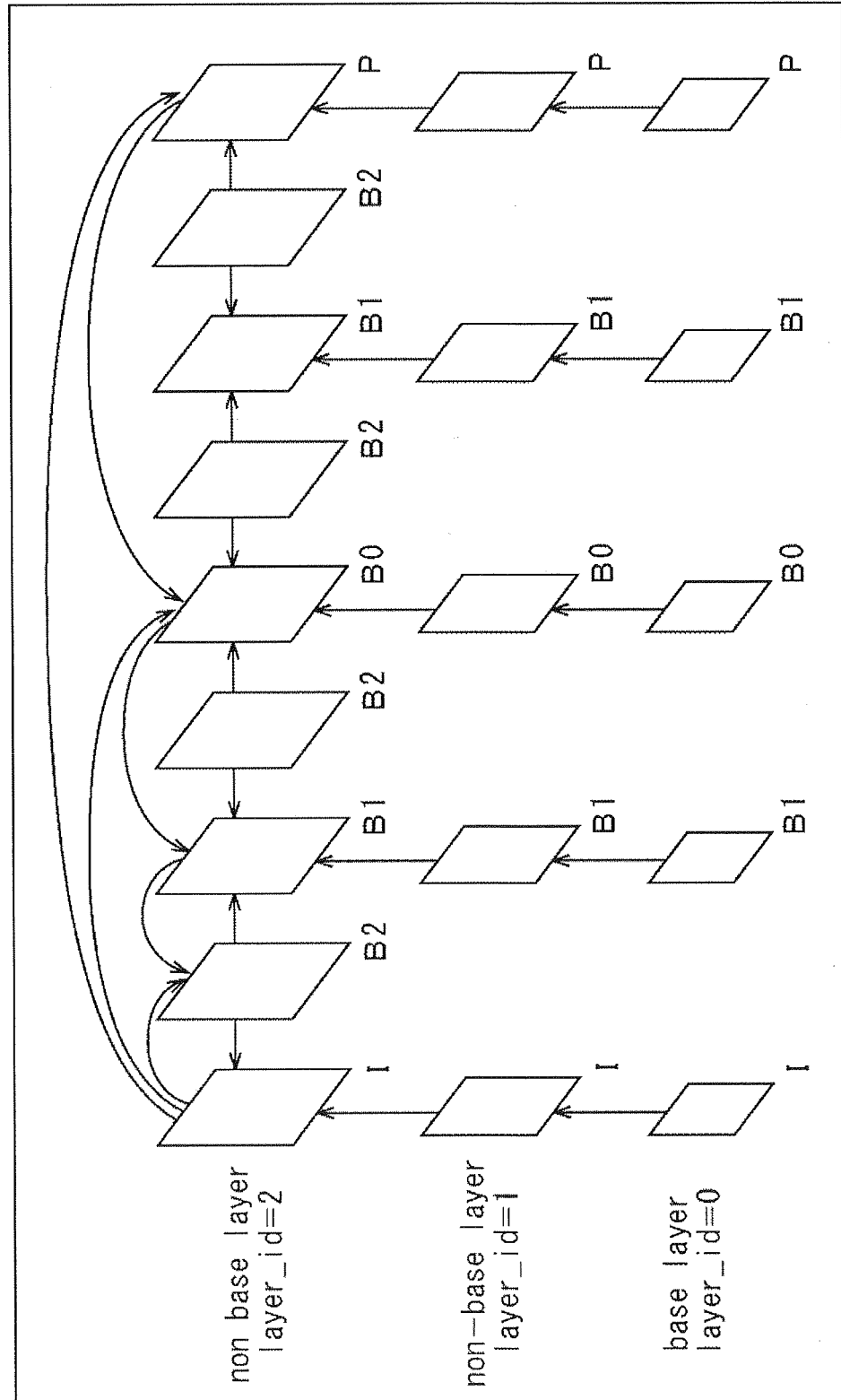


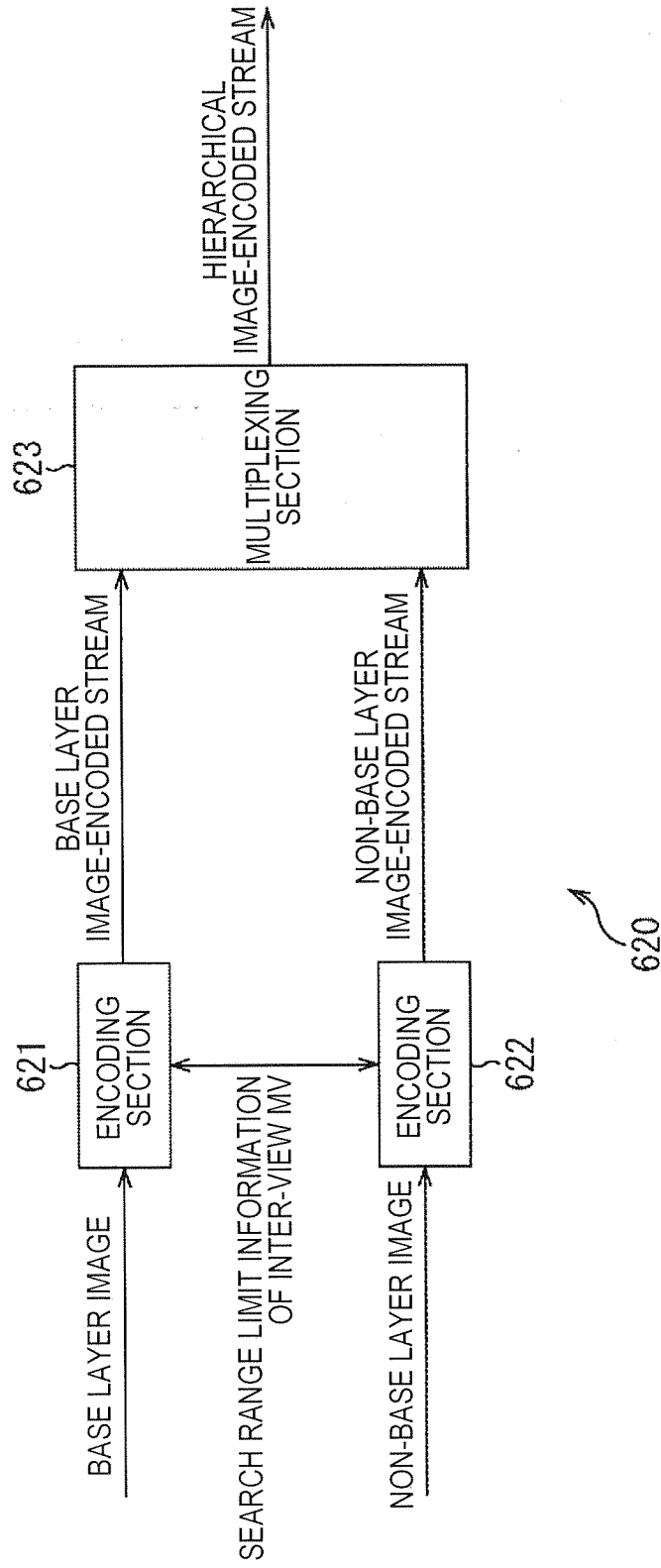
FIG. 41

FIG. 42

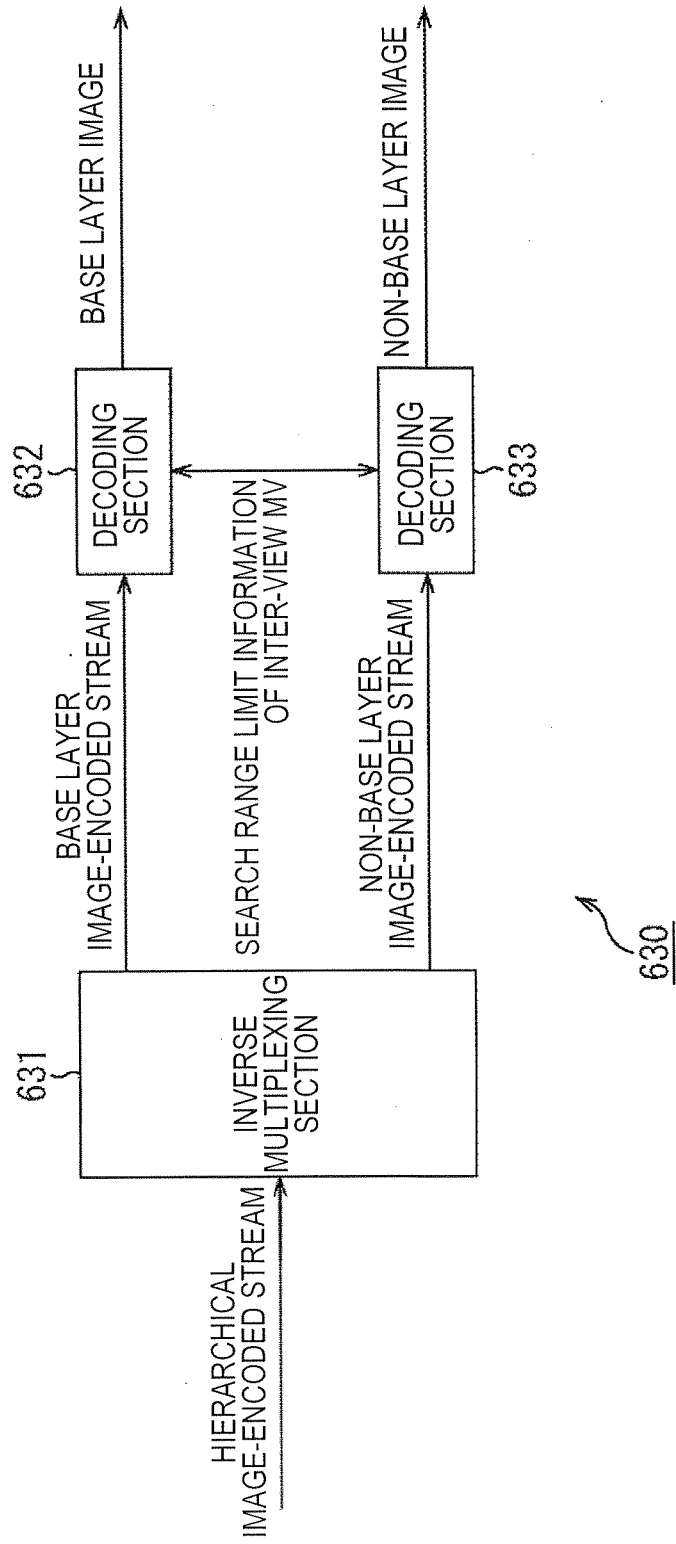


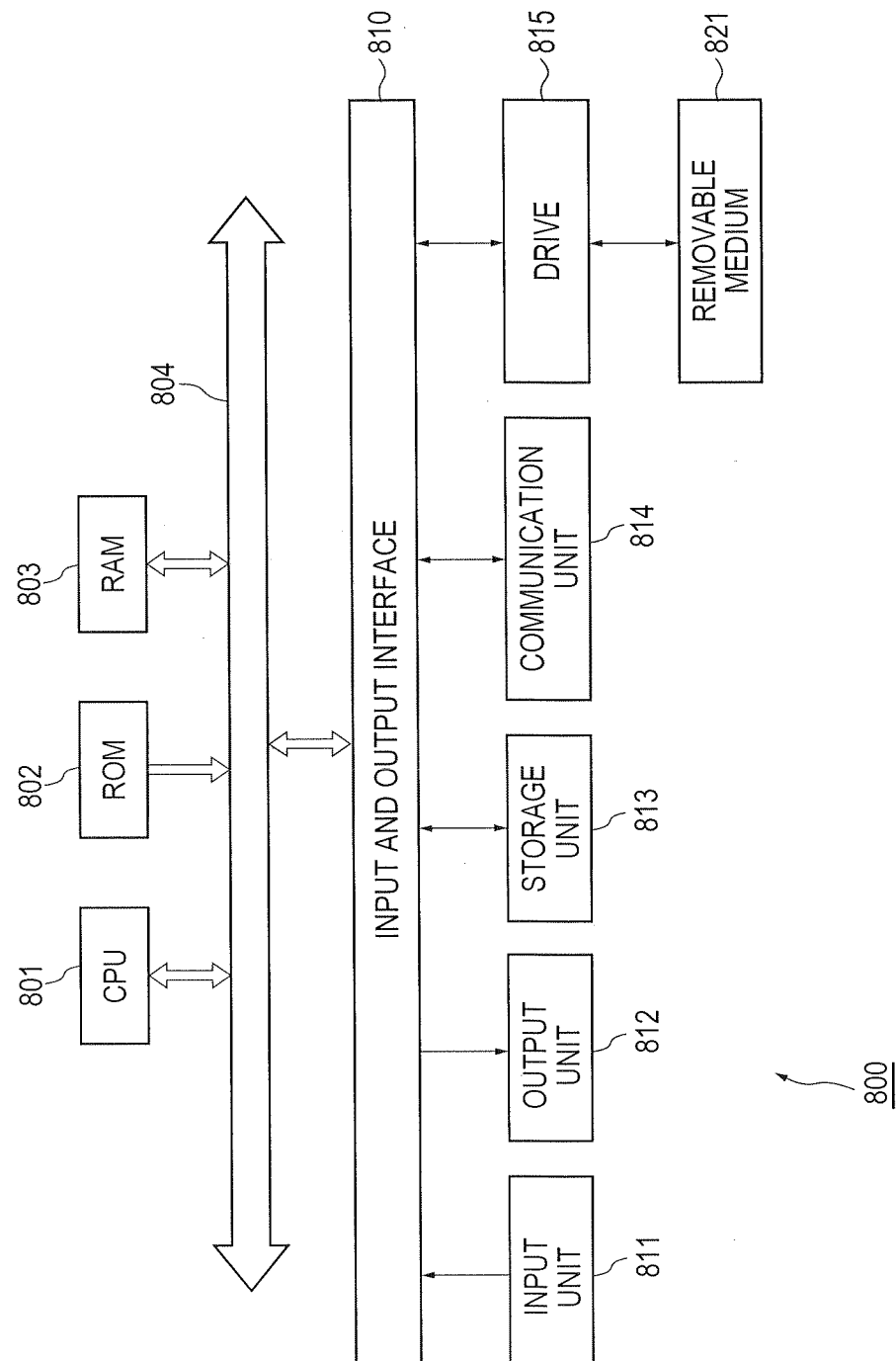
FIG. 43

FIG. 44

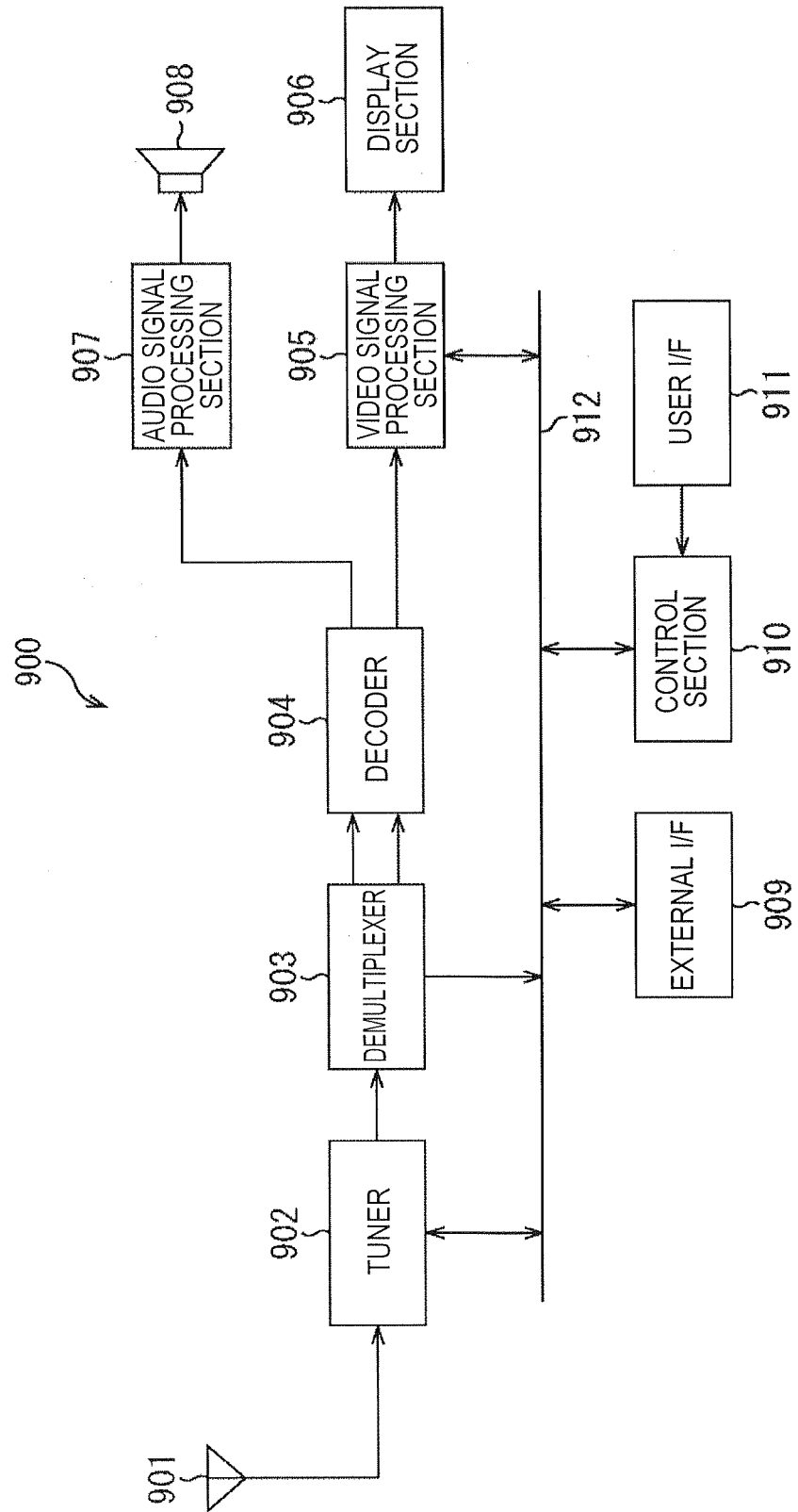


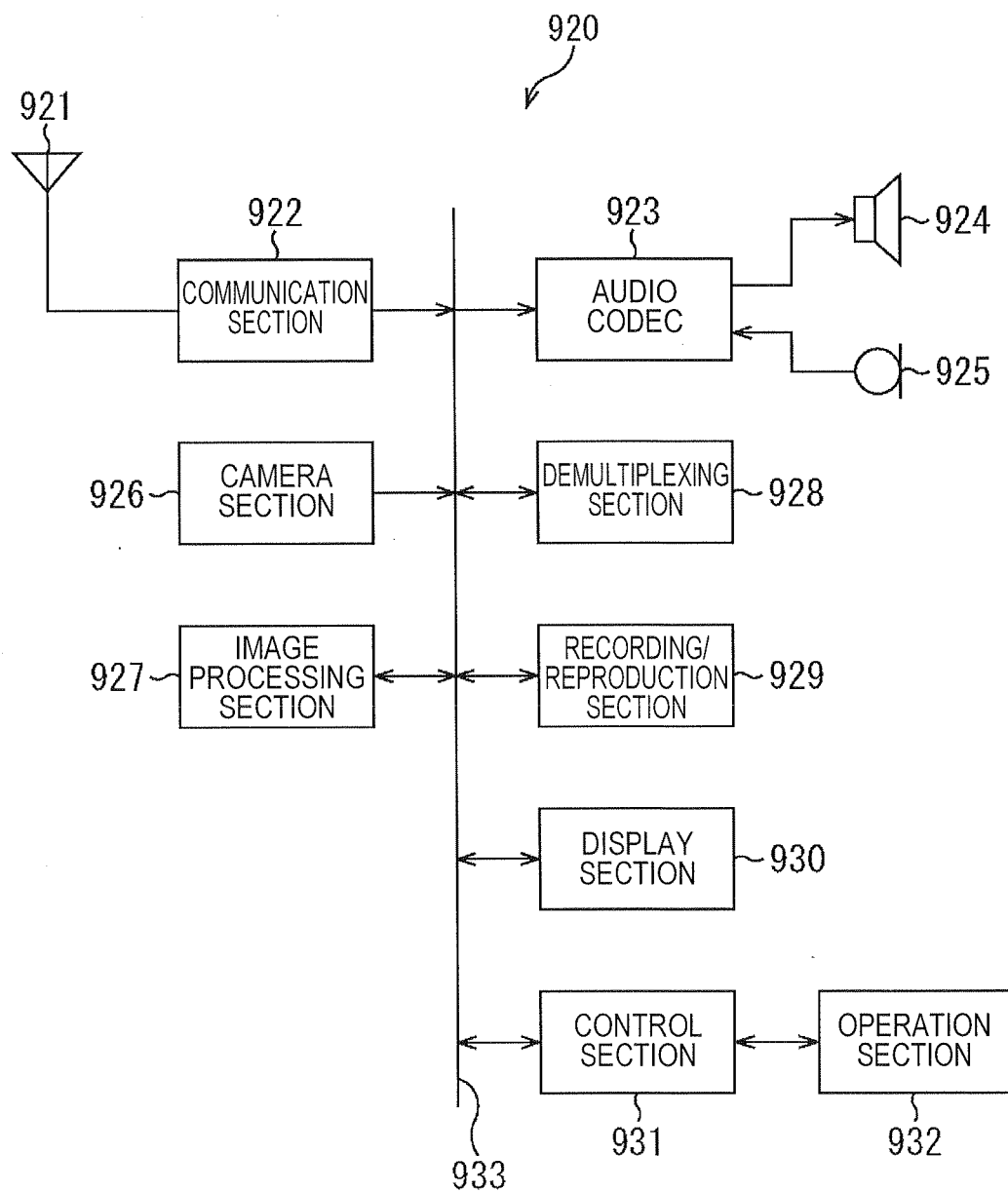
FIG. 45

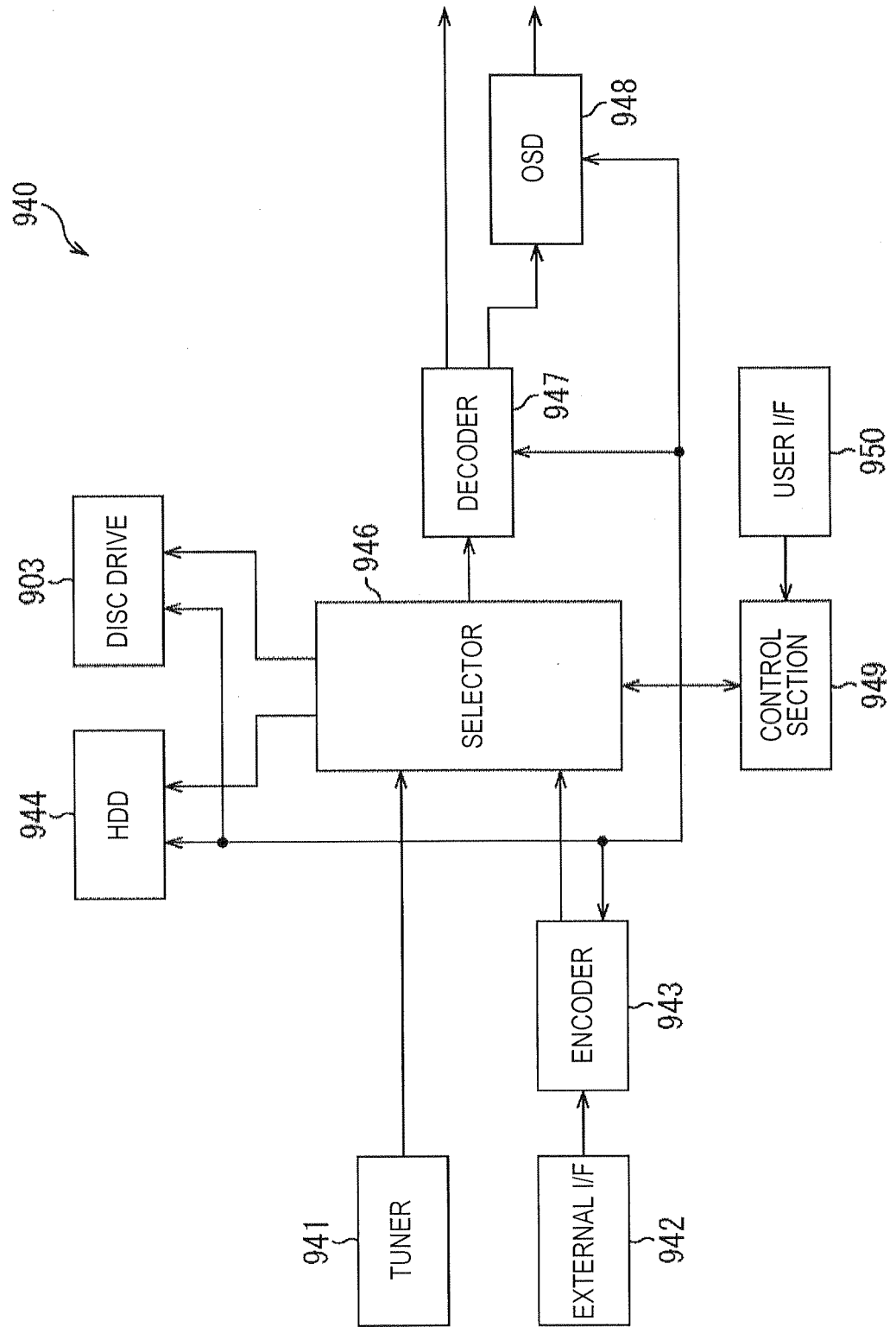
FIG. 46

FIG. 47

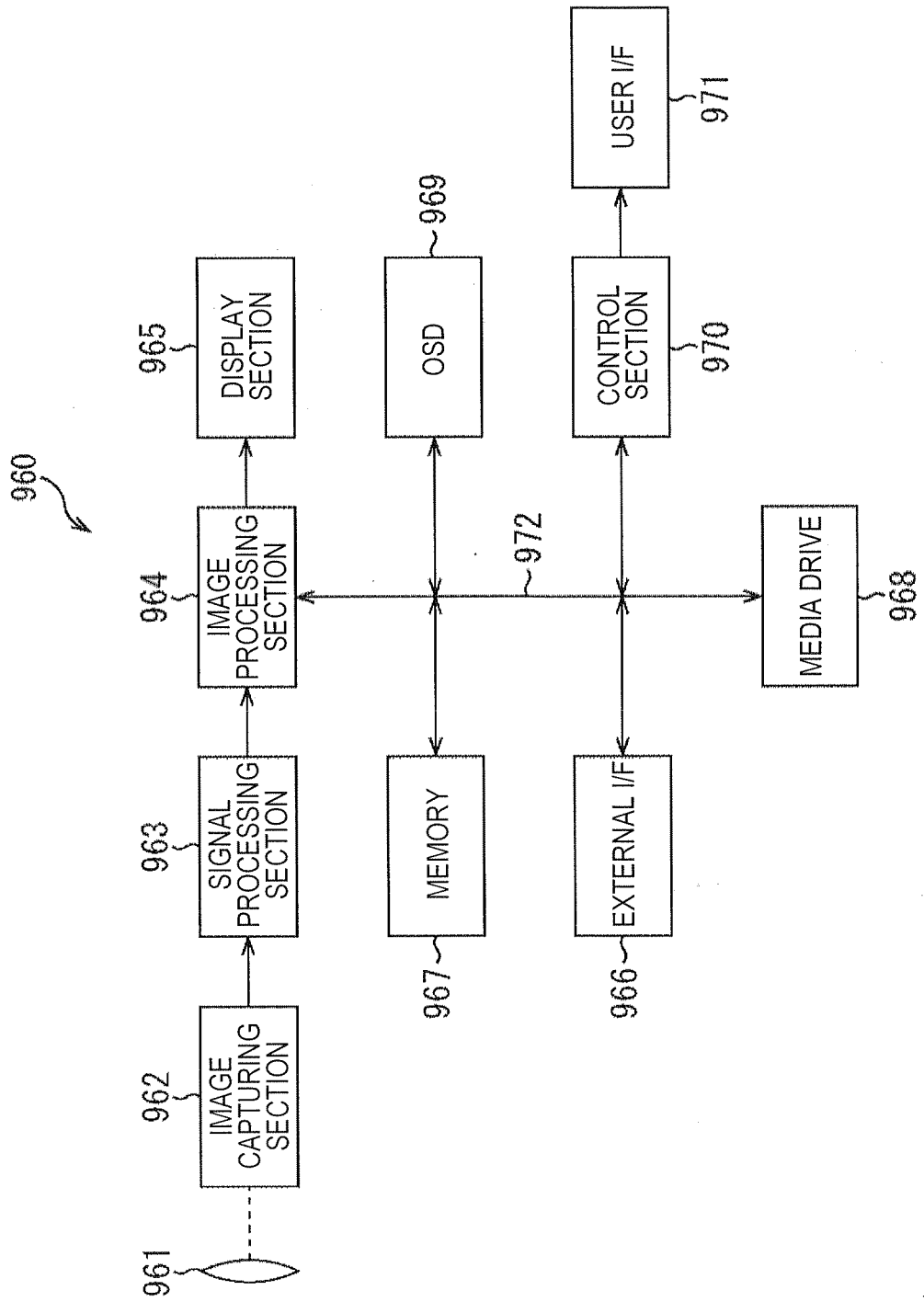


FIG. 48

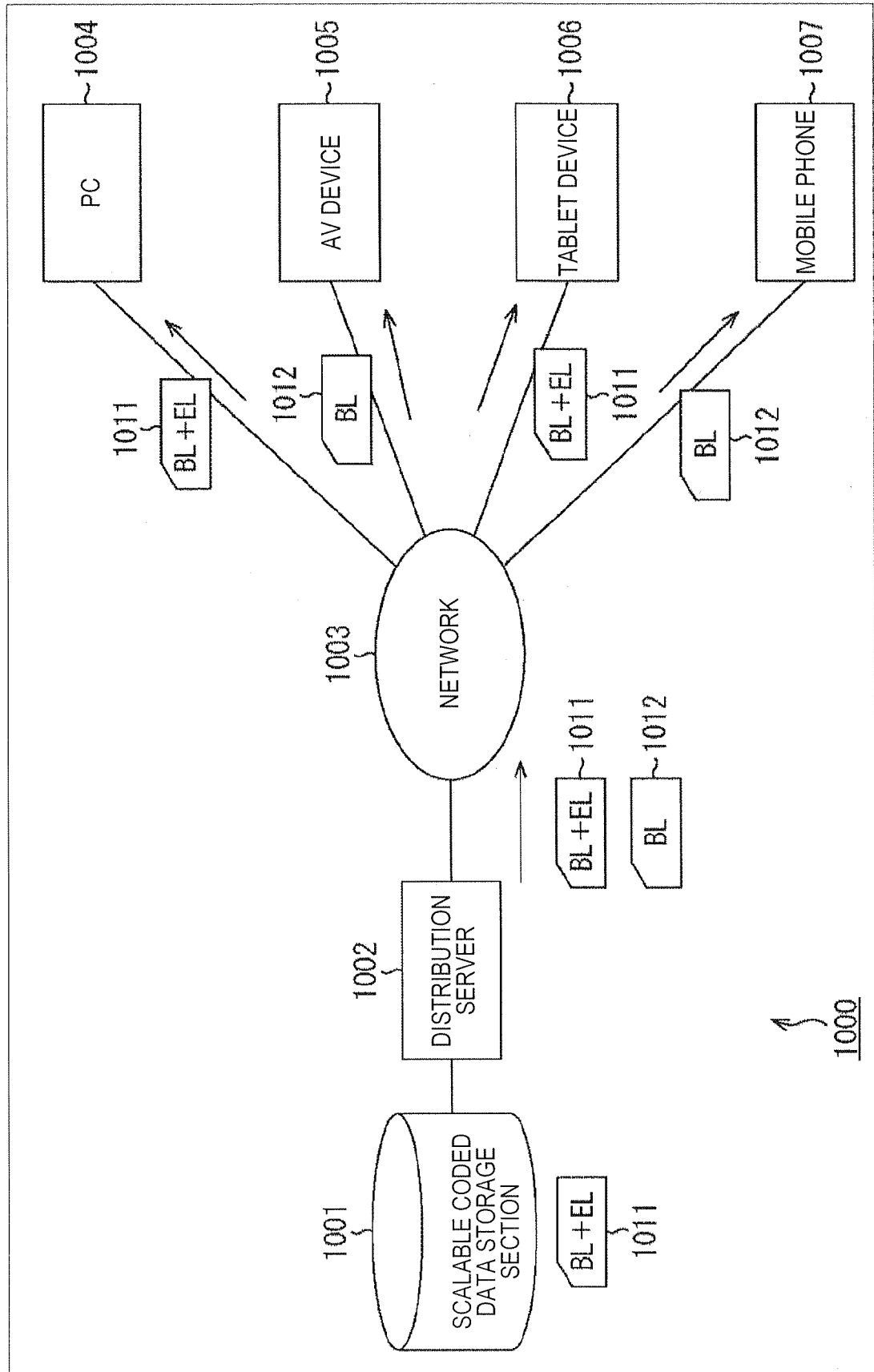


FIG. 49

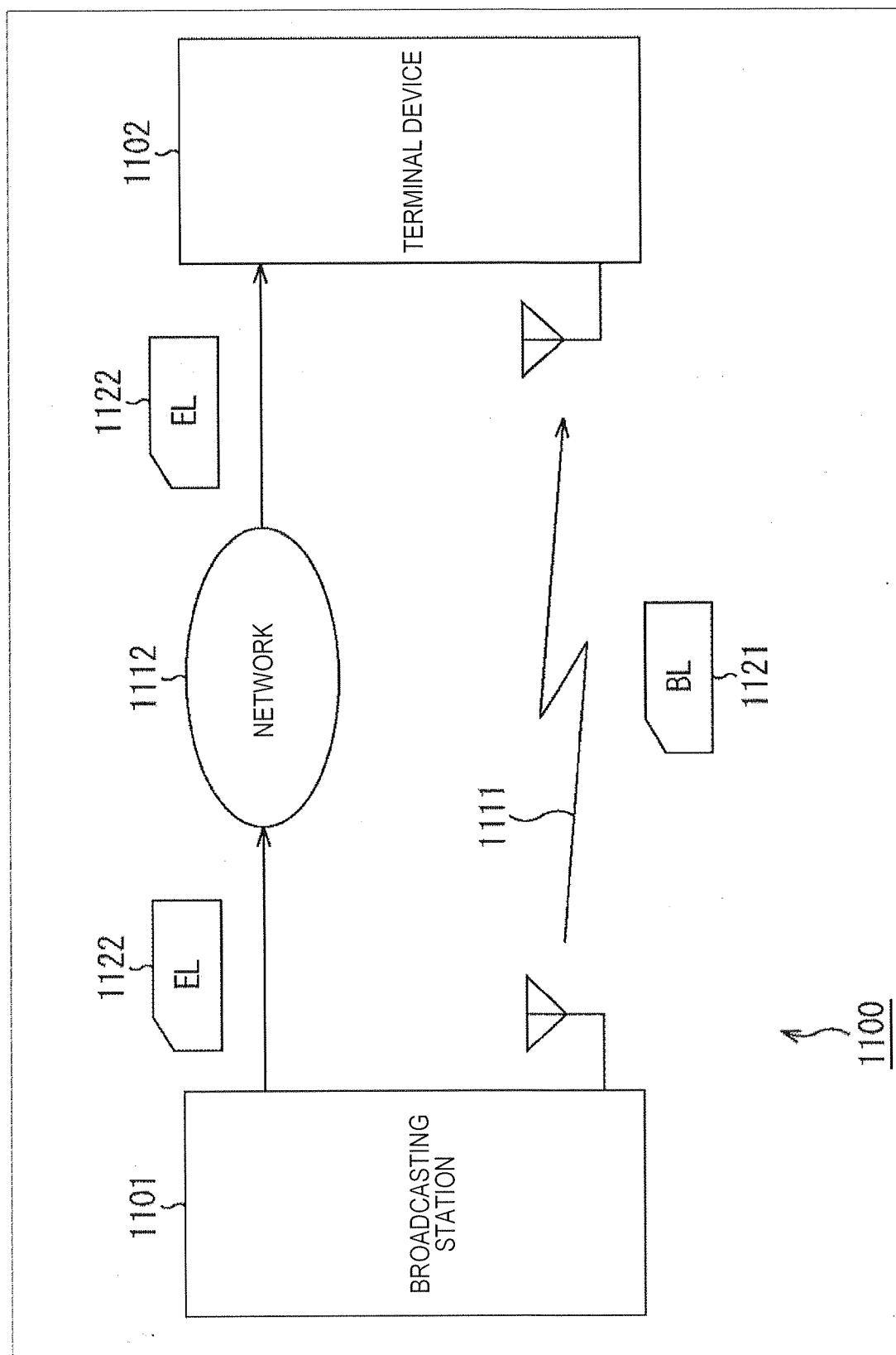


FIG. 50

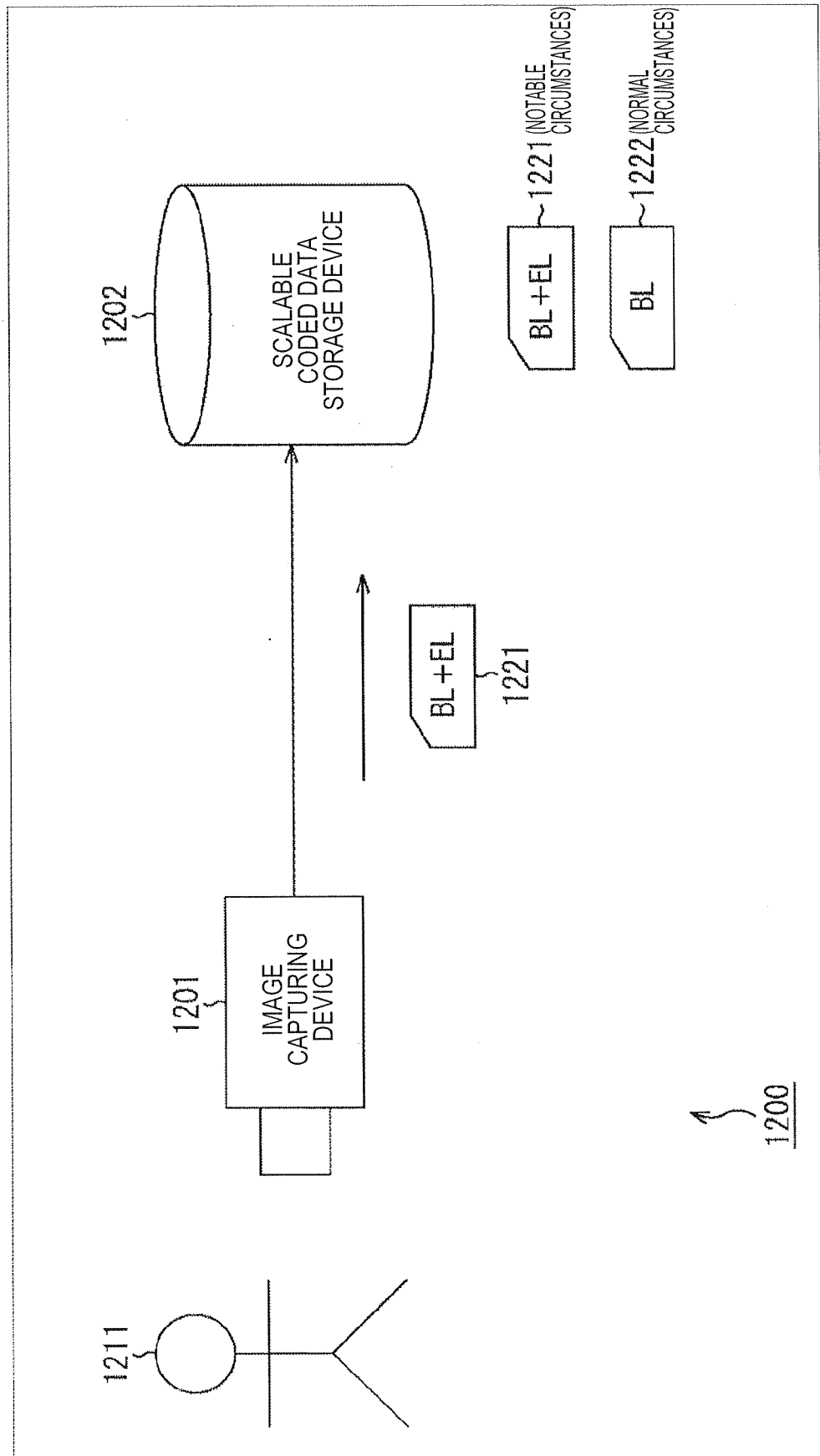


FIG. 51

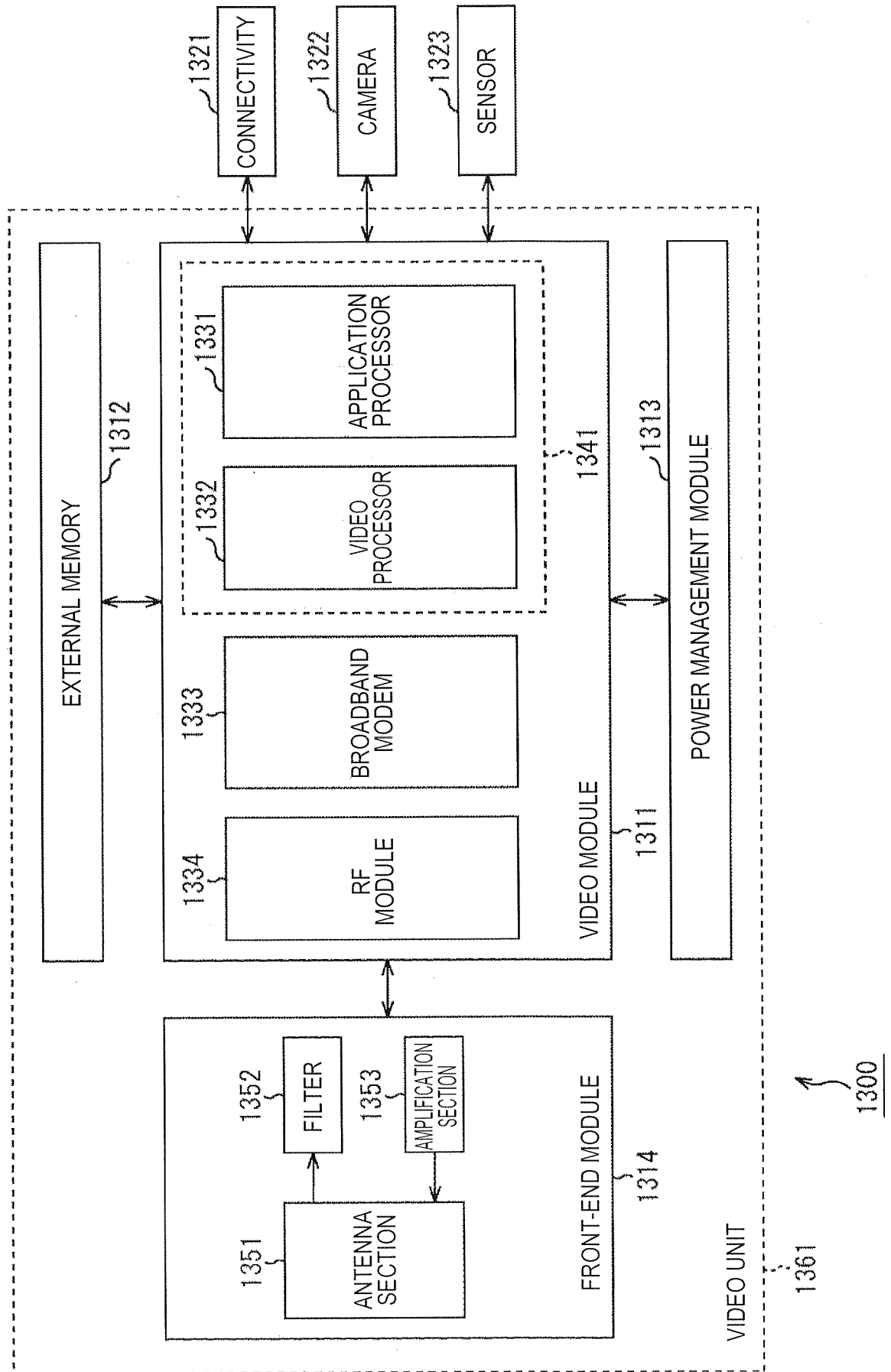


FIG. 52

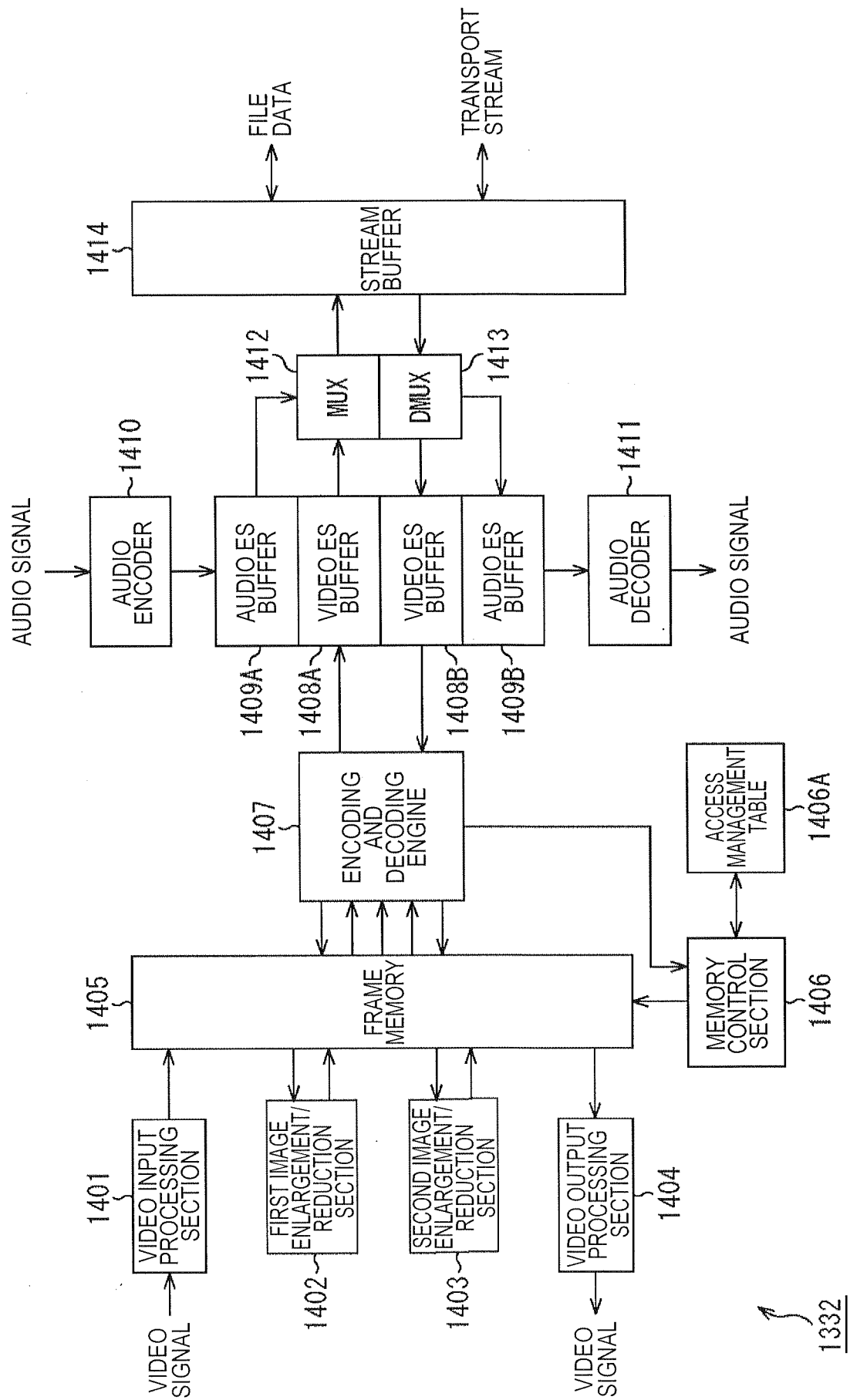


FIG. 53

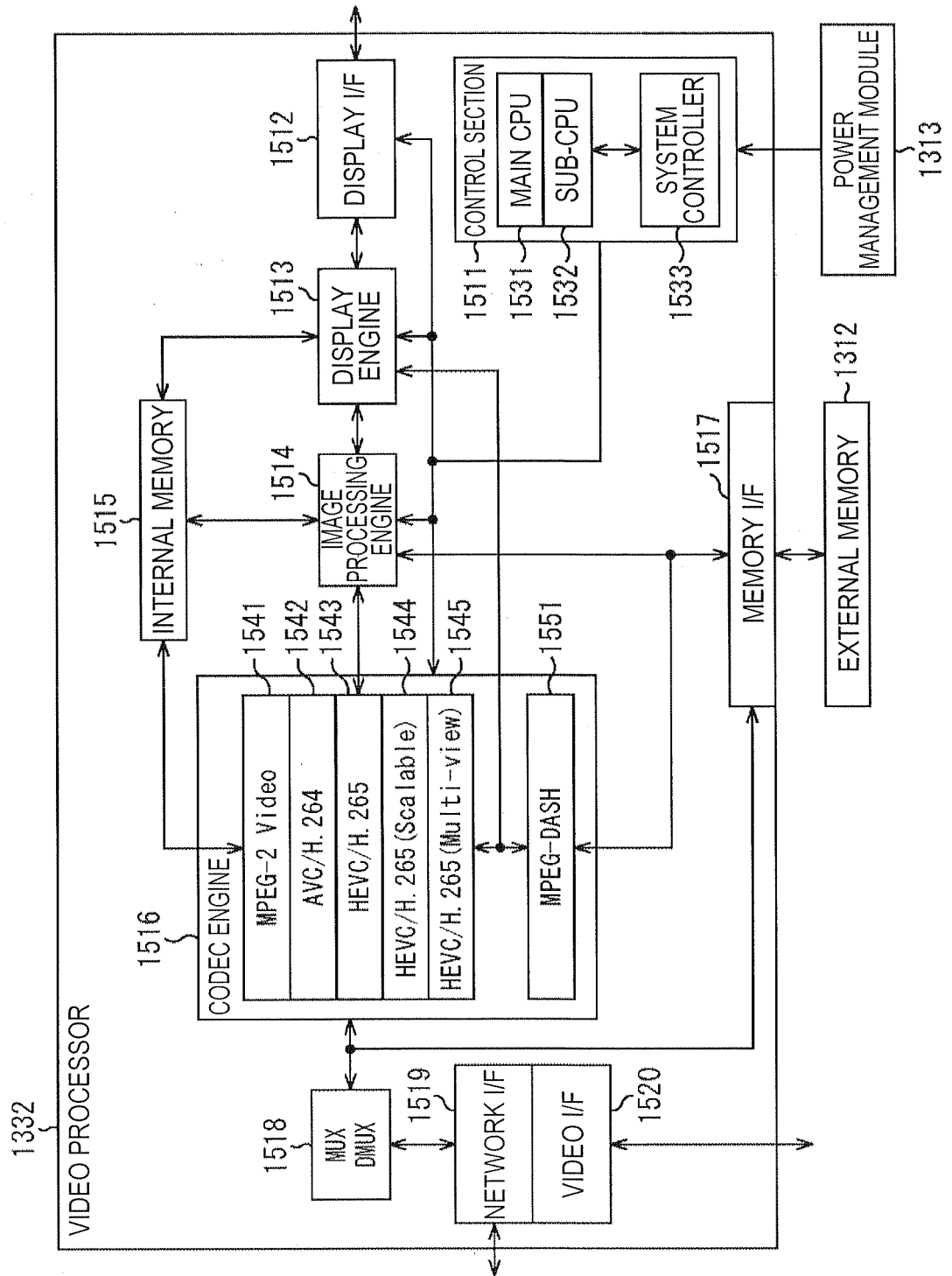


FIG. 54

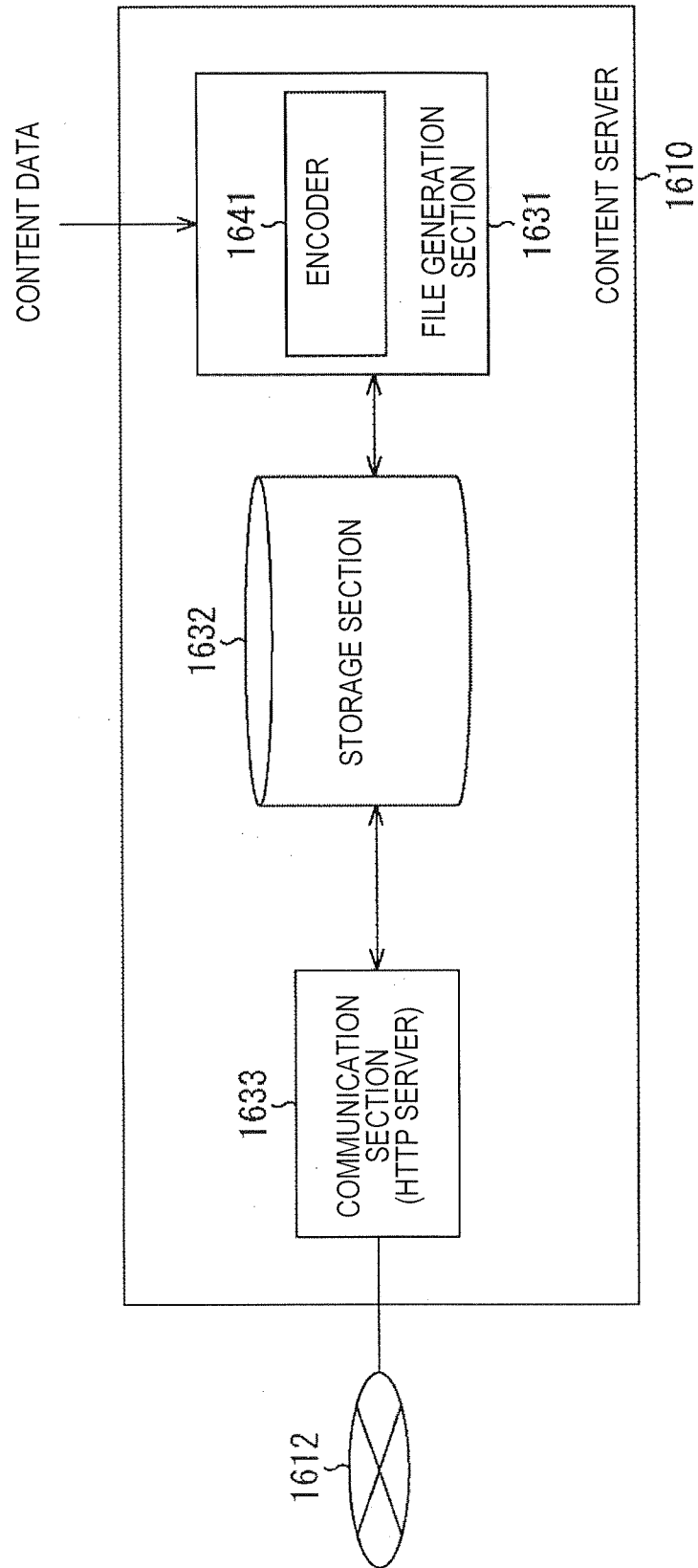


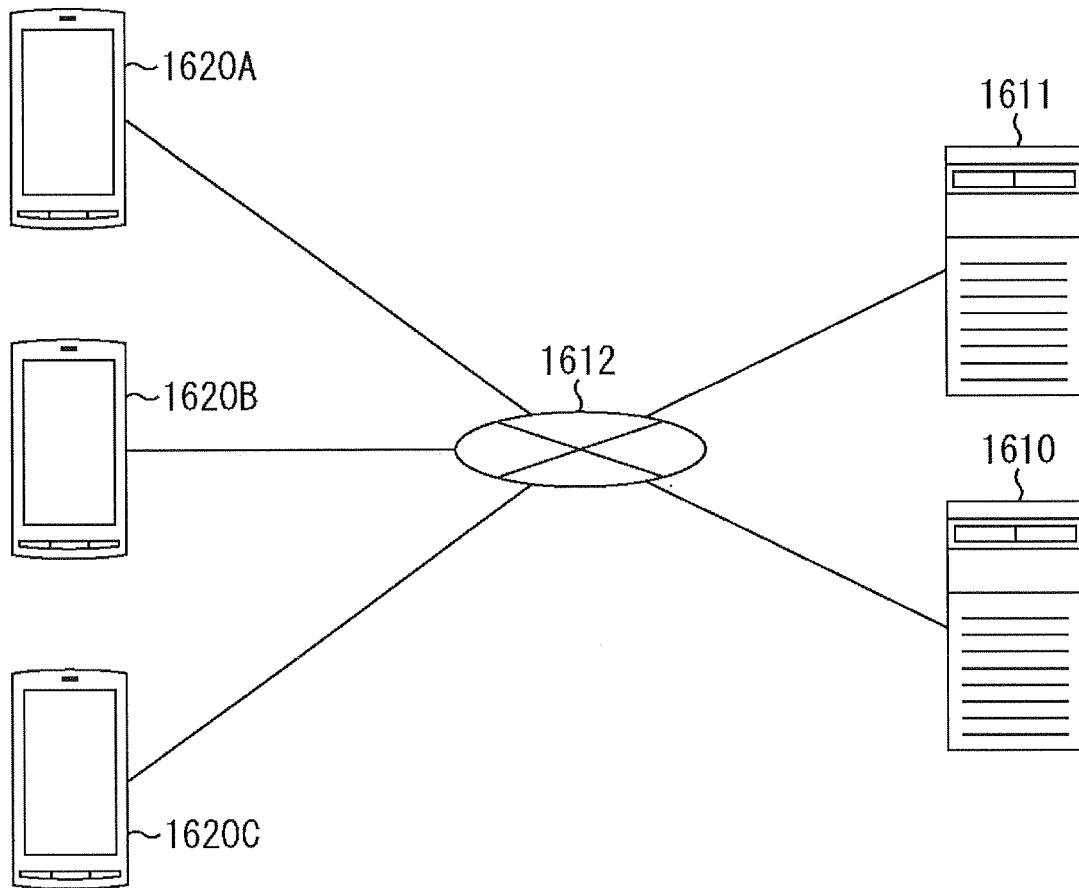
FIG. 55

FIG. 56

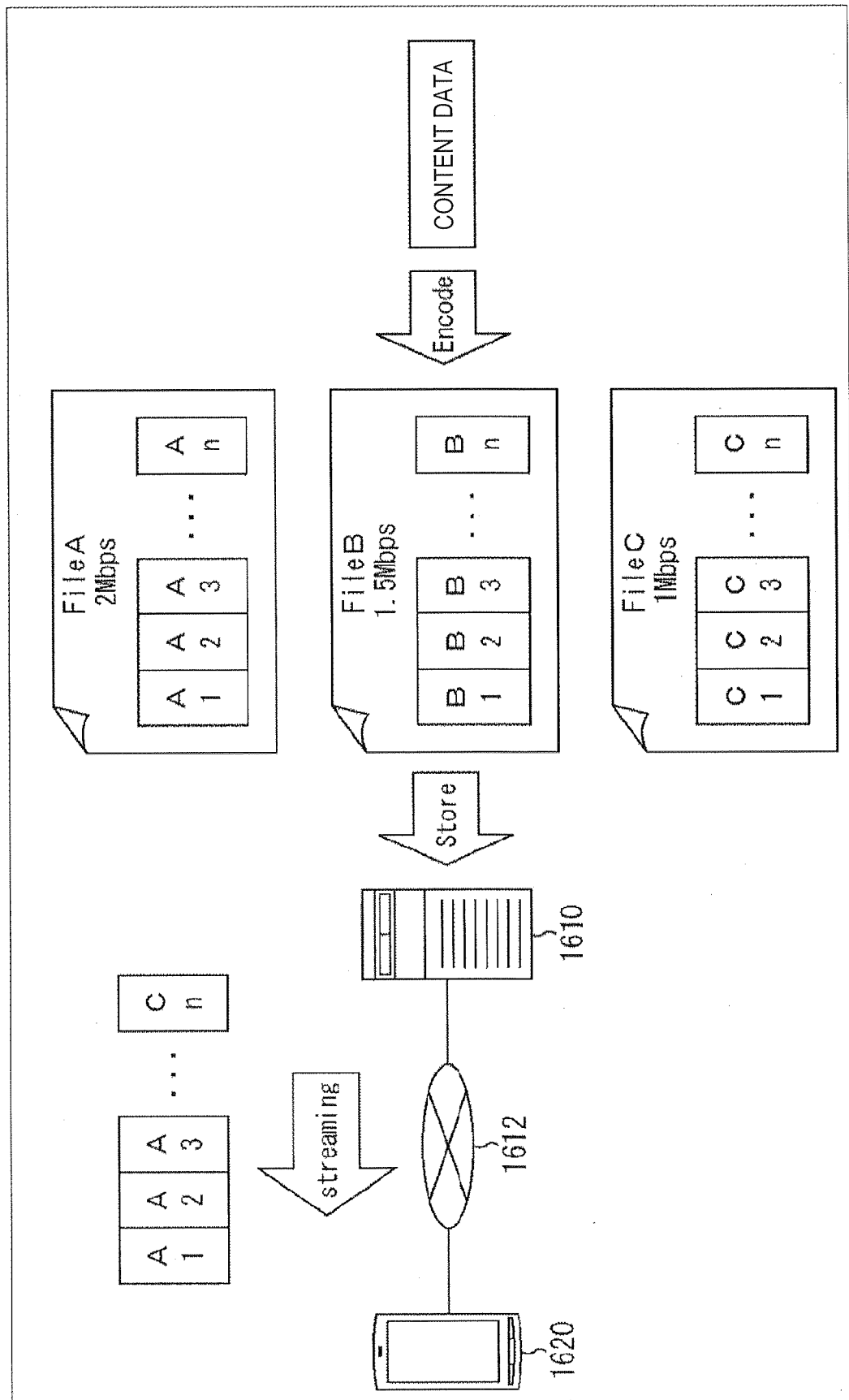


FIG. 57

```

<?xml version="1.0"?>
<MPD
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xmlns="urn:mpeg:DASH:schema:MPD:2011"
  xsi:schemaLocation="urn:mpeg:DASH:schema:MPD:2011 DASH-MPD.xsd"
  type="static"
  mediaPresentationDuration="PT3256S"
  minBufferTime="PT1.2S"
  profiles="urn:mpeg:dash:profile:isoff-on-demand:2011">
  <BaseURL>http://cdn1.example.com/</BaseURL>
  <BaseURL>http://cdn2.example.com/</BaseURL>
  <Period>
    <!--English Audio-->
    <AdaptationSet mimeType="audio/mp4" codecs="mp4a.0x40" lang="en" subsegmentAlignment="true" subsegmentStartsWithSAP="1">
      <ContentProtection schemeIdUri="urn:uuid:70606953-6560-5244-4D48-656164657221"/>
      <Representation id="1" bandwidth="84000">
        <BaseURL>7657412348.mp4</BaseURL>
      </Representation>
      <Representation id="2" bandwidth="32000">
        <BaseURL>3463646346.mp4</BaseURL>
      </Representation>
    </AdaptationSet>
  </AdaptationSet>
  <!--Video-->
  <AdaptationSet mimeType="video/mp4" codecs="avc1.4d0228" subsegmentAlignment="true" subsegmentStartsWithSAP="2">
    <ContentProtection schemeIdUri="urn:uuid:70606953-6560-5244-4D48-656164657221"/>
    <Representation id="6" bandwidth="266000" width="320" height="240">
      <BaseURL>8663456473.mp4</BaseURL>
    </Representation>
    <Representation id="7" bandwidth="512000" width="320" height="240">
      <BaseURL>68363634.mp4</BaseURL>
    </Representation>
    <Representation id="8" bandwidth="1024000" width="840" height="480">
      <BaseURL>662465736.mp4</BaseURL>
    </Representation>
    <Representation id="9" bandwidth="1384000" width="840" height="480">
      <BaseURL>41325645.mp4</BaseURL>
    </Representation>
    <Representation id="A" bandwidth="1536000" width="1280" height="720">
      <BaseURL>89045625.mp4</BaseURL>
    </Representation>
    <Representation id="B" bandwidth="2048000" width="1280" height="720">
      <BaseURL>23536745734.mp4</BaseURL>
    </Representation>
  </AdaptationSet>
</Period>
</MPD>

```

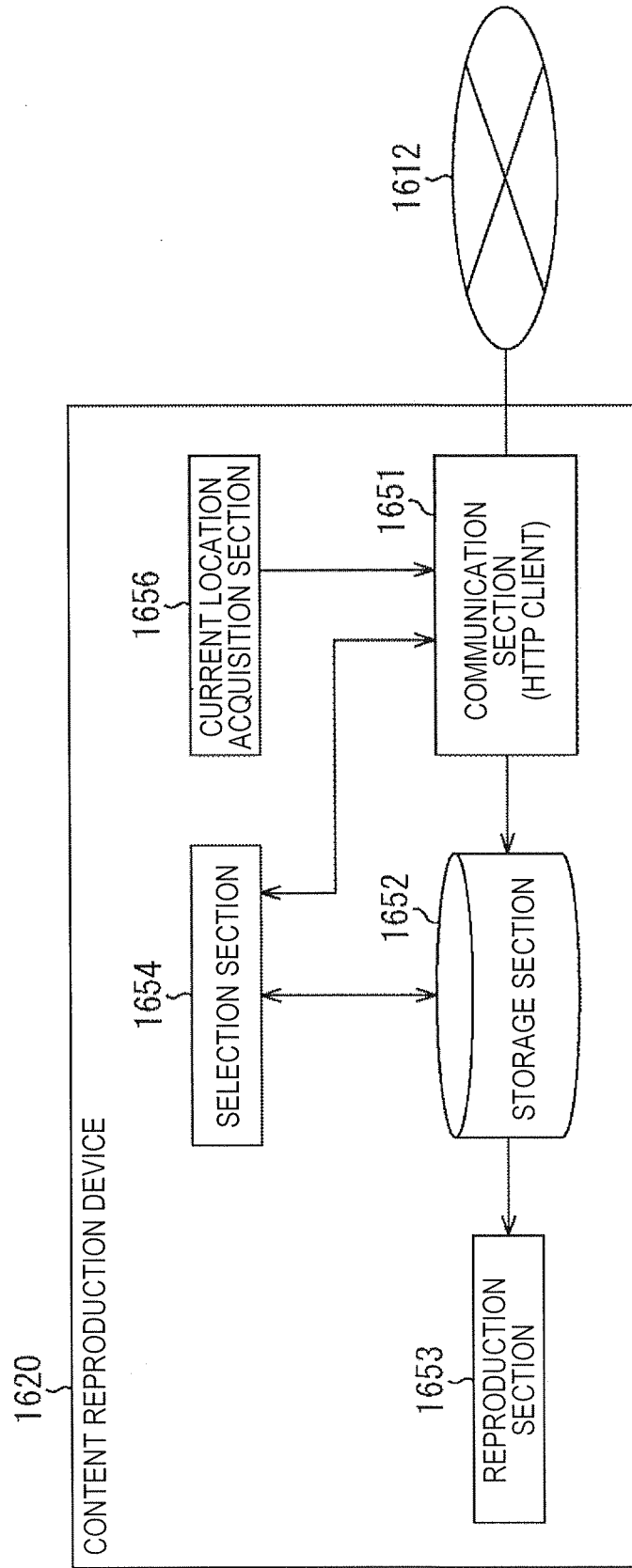
FIG. 58

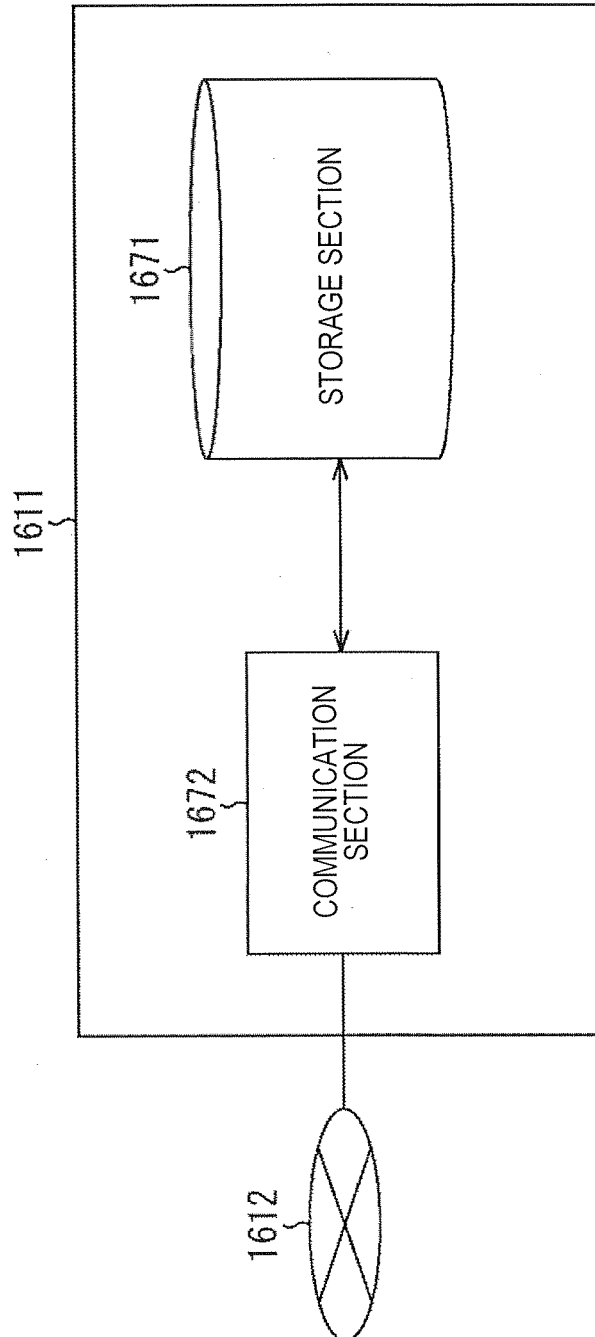
FIG. 59

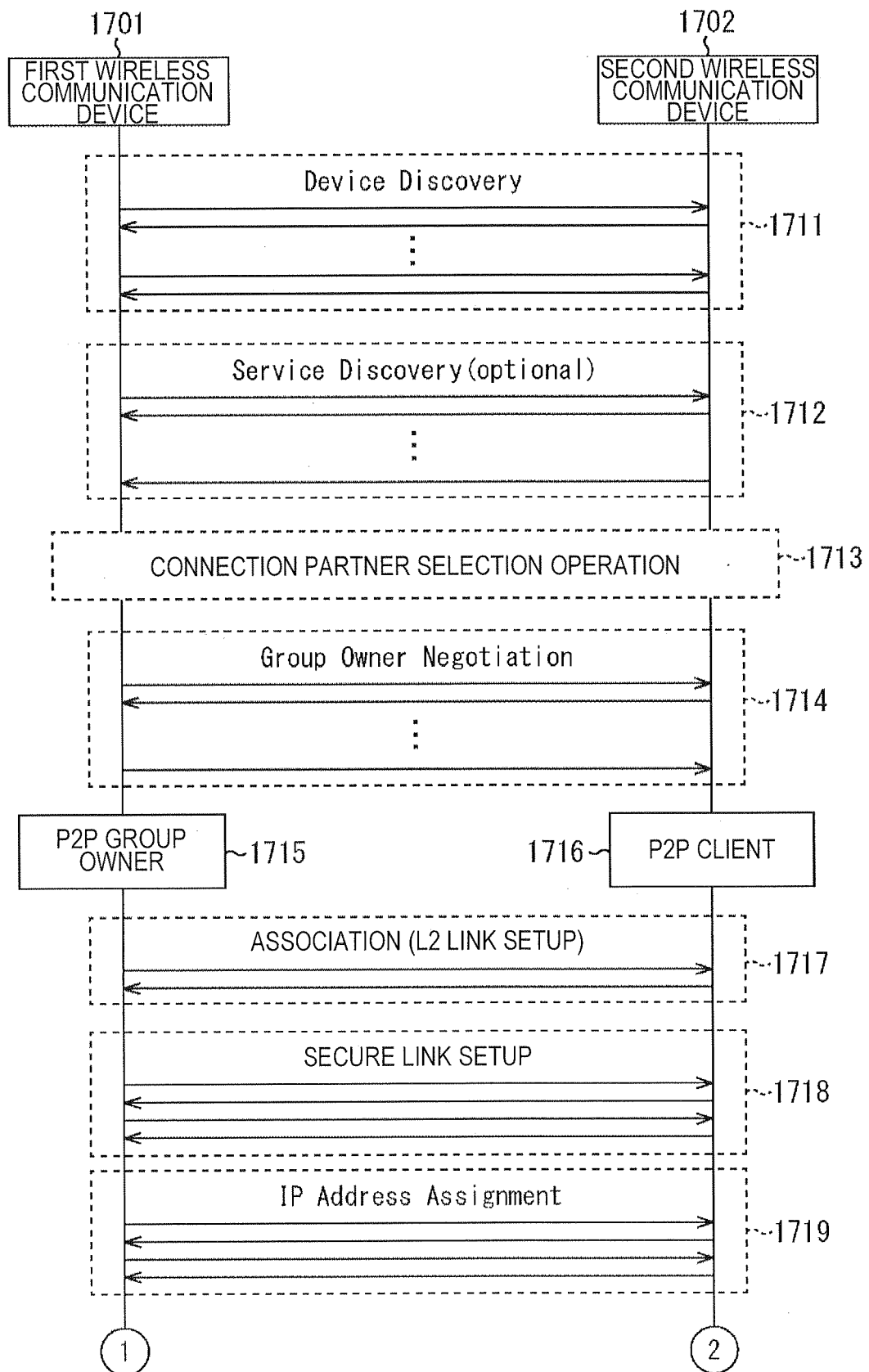
FIG. 60

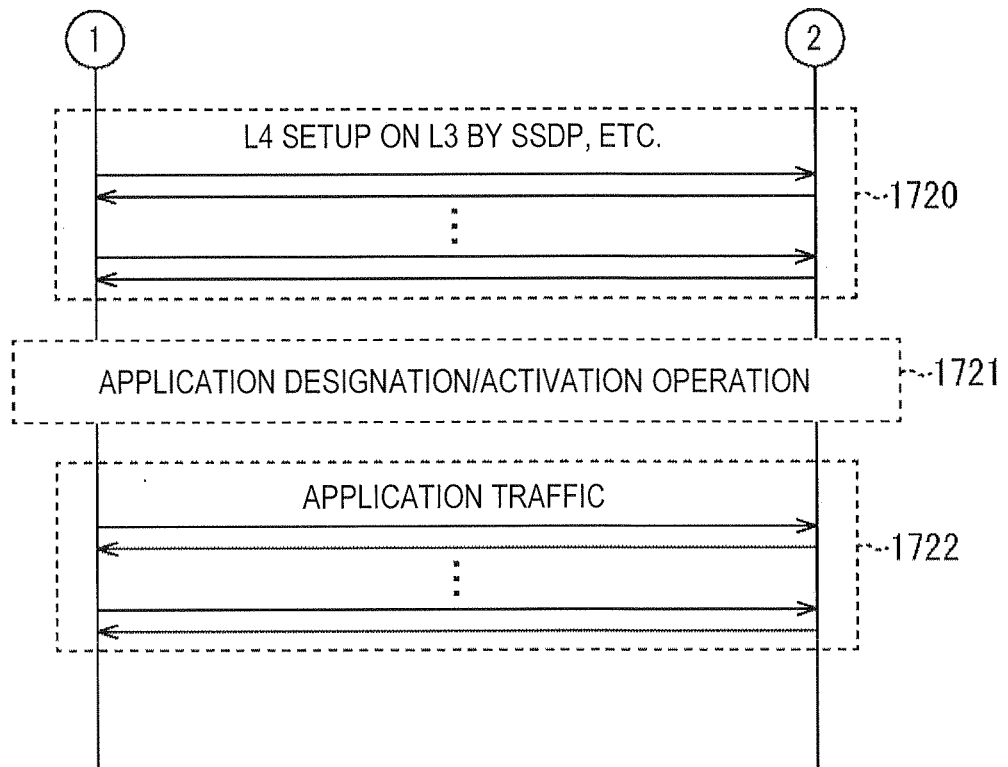
FIG. 61

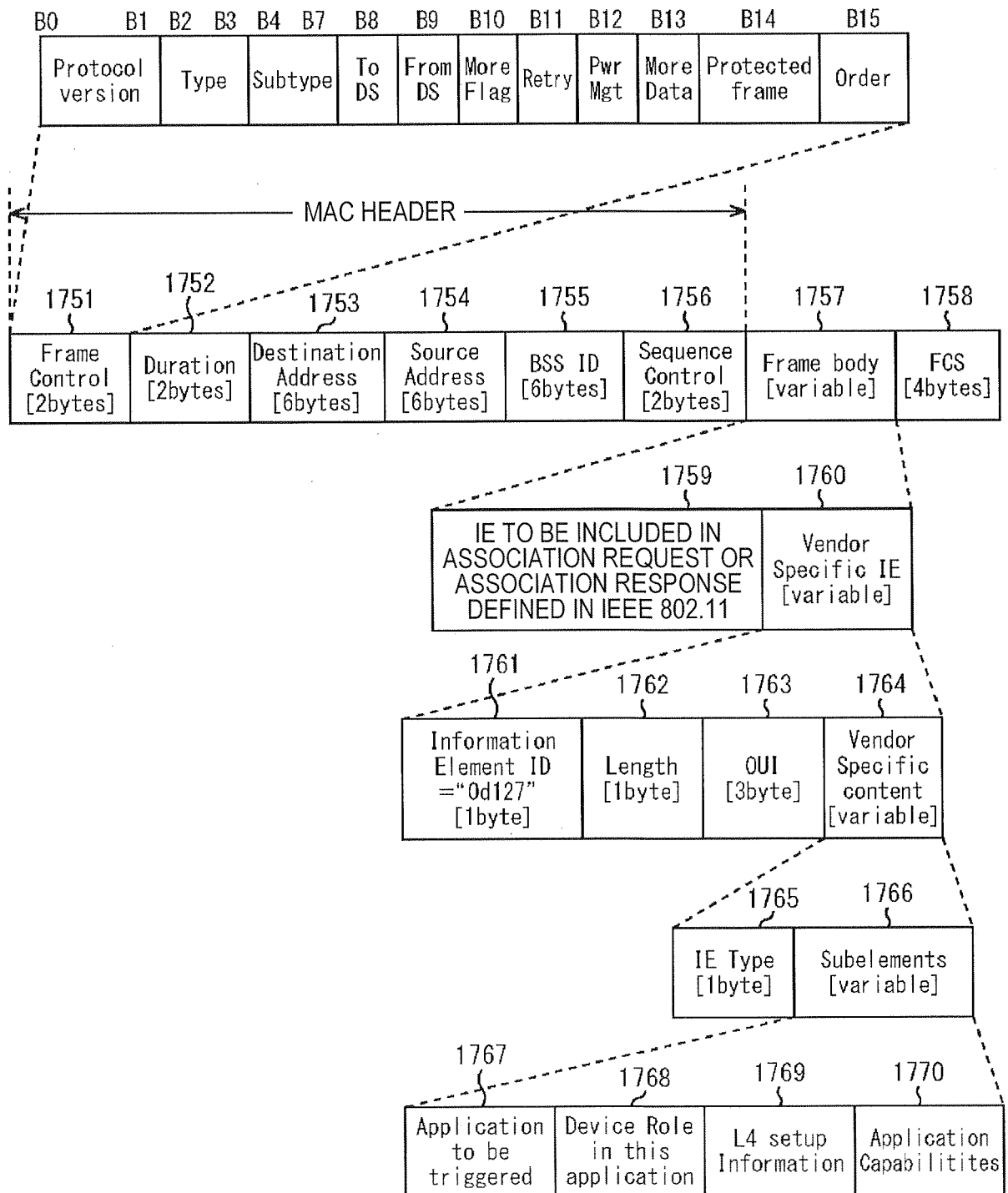
FIG. 62

FIG. 63