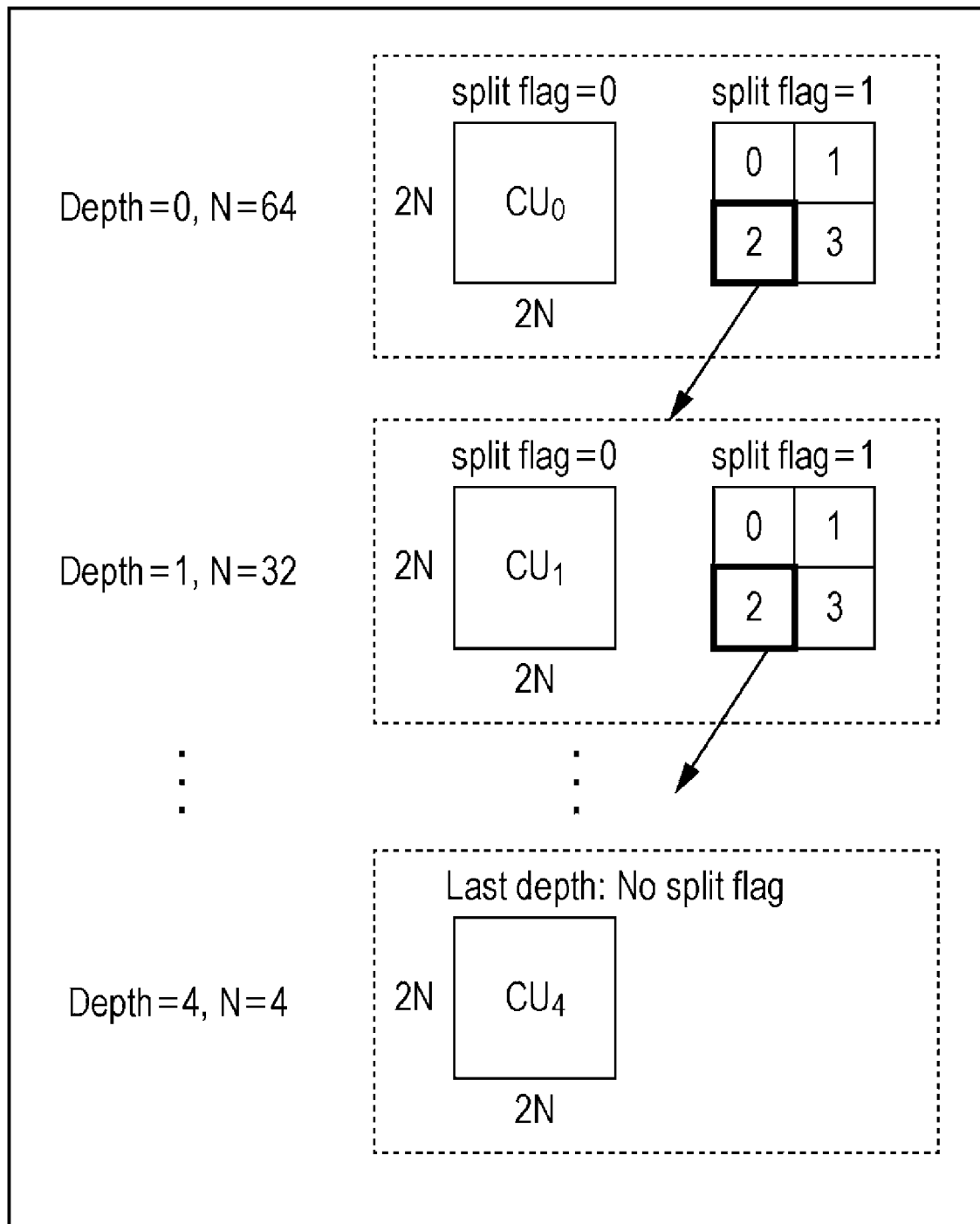


[Fig. 1]

FIG. 1



[Fig. 2]

FIG. 2

rep_format_idx_present_flag	u(1)
if(rep_format_idx_present_flag)	
vps_num_rep_formats_minus1	ue(v)
for (i = 0; i <= vps_num_rep_formats_minus1; i++)	
rep_format()	
if(rep_format_idx_present_flag)	
for (i = 1; i <= MaxLayersMinus1; i++)	
if(vps_num_rep_formats_minus1 > 0)	
vps_rep_format_idx[i]	u(v)

[Fig. 3]

FIG. 3

if(nuh_layer_id>0) {	
 update_rep_format_flag	u(1)
 if(update_rep_format_flag)	
 sps_rep_format_idx	u(8)
 } else {	
 chroma_format_idc	ue(v)
 if(chroma_format_idc == 3)	
 separate_colour_plane_flag	u(1)
 pic_width_in_luma_samples	ue(v)
 pic_height_in_luma_samples	ue(v)
 }	

[Fig. 4]

FIG. 4

VPS

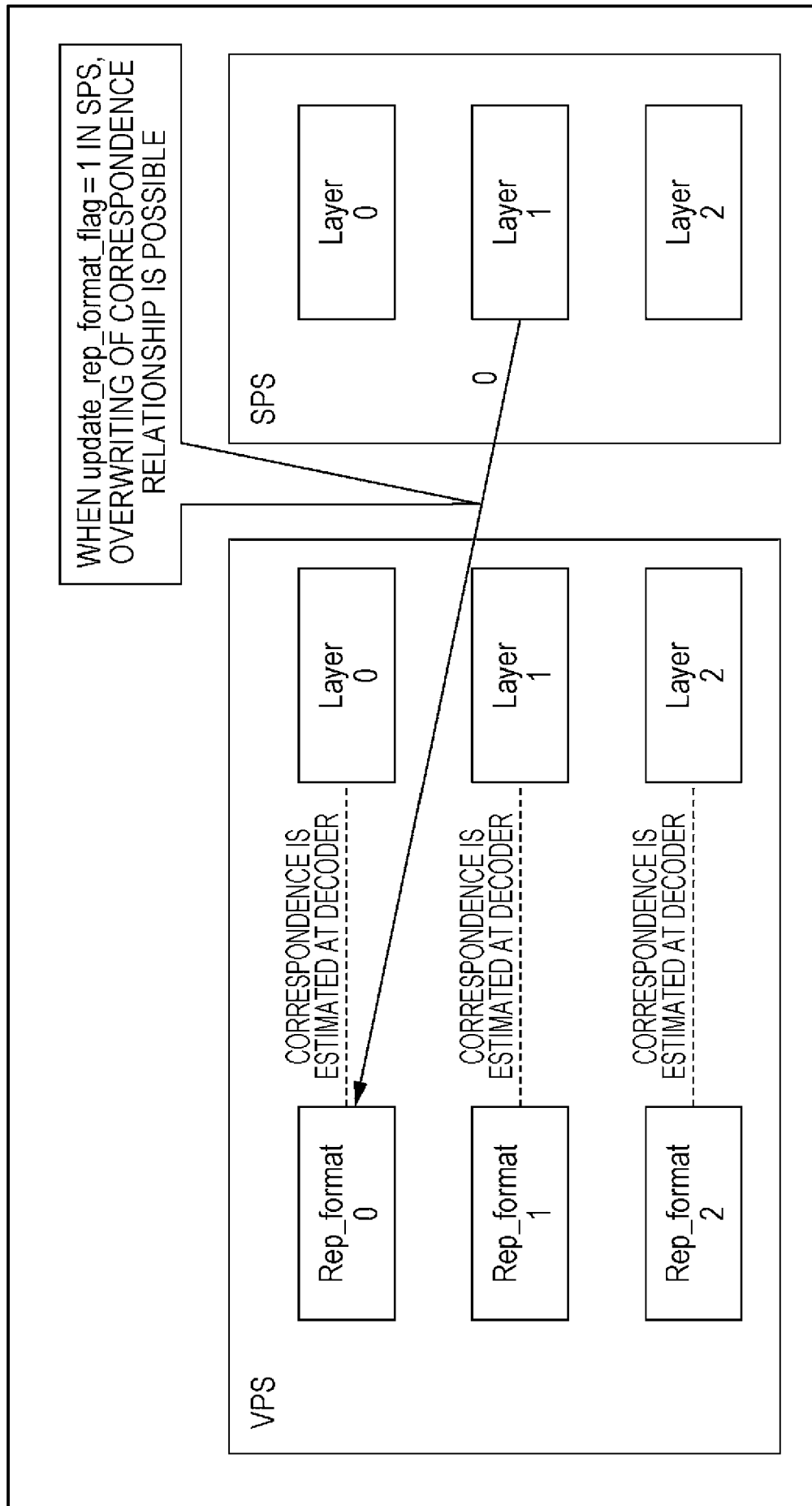
- **rep_format_idx_present_flag** equal to 1 specifies that the syntax elements **vps_num_rep_formats_minus1** and **vps_rep_format_idx[i]** are present. **rep_format_idx_present_flag** equal to 0 specifies that the syntax elements **vps_num_rep_formats_minus1** and **vps_rep_format_idx[i]** are not present.
- **vps_num_rep_formats_minus1** plus 1 specifies the number of the following **rep_format()** syntax structures in the VPS. When not present, the value of **vps_num_rep_formats_minus1** is inferred to be equal to **MaxLayersMinus1**. The value of **vps_num_rep_formats_minus1** shall be in the range of 0 to 255, inclusive.
- **vps_rep_format_idx[i]** specifies the index, into the list of **rep_format()** syntax structures in the VPS, of the **rep_format()** syntax structure that applies to the layer with **nuh_layer_id** equal to **layer_id_in_nuh[i]**. When not present, the value of **vps_rep_format_idx[i]** is inferred to be equal to **(rep_format_idx_present_flag ? 0 : i)**. The value of **vps_rep_format_idx[i]** shall be in the range of 0 to **vps_num_rep_formats_minus1**, inclusive. The number of bits used for the representation of **vps_rep_format_idx[i]** is **Ceil(Log2(vps_num_rep_formats_minus1 + 1))**.

SPS

- **update_rep_format_flag** equal to 1 specifies that **sps_rep_format_idx** is present and that the **sps_rep_format_idx**-th **rep_format()** syntax structures in the active VPS applies to the layers that refer to this SPS. **update_rep_format_flag** equal to 0 specifies that **sps_rep_format_idx** is not present. When not present, the value of **update_rep_format_flag** is inferred to be equal to 0.

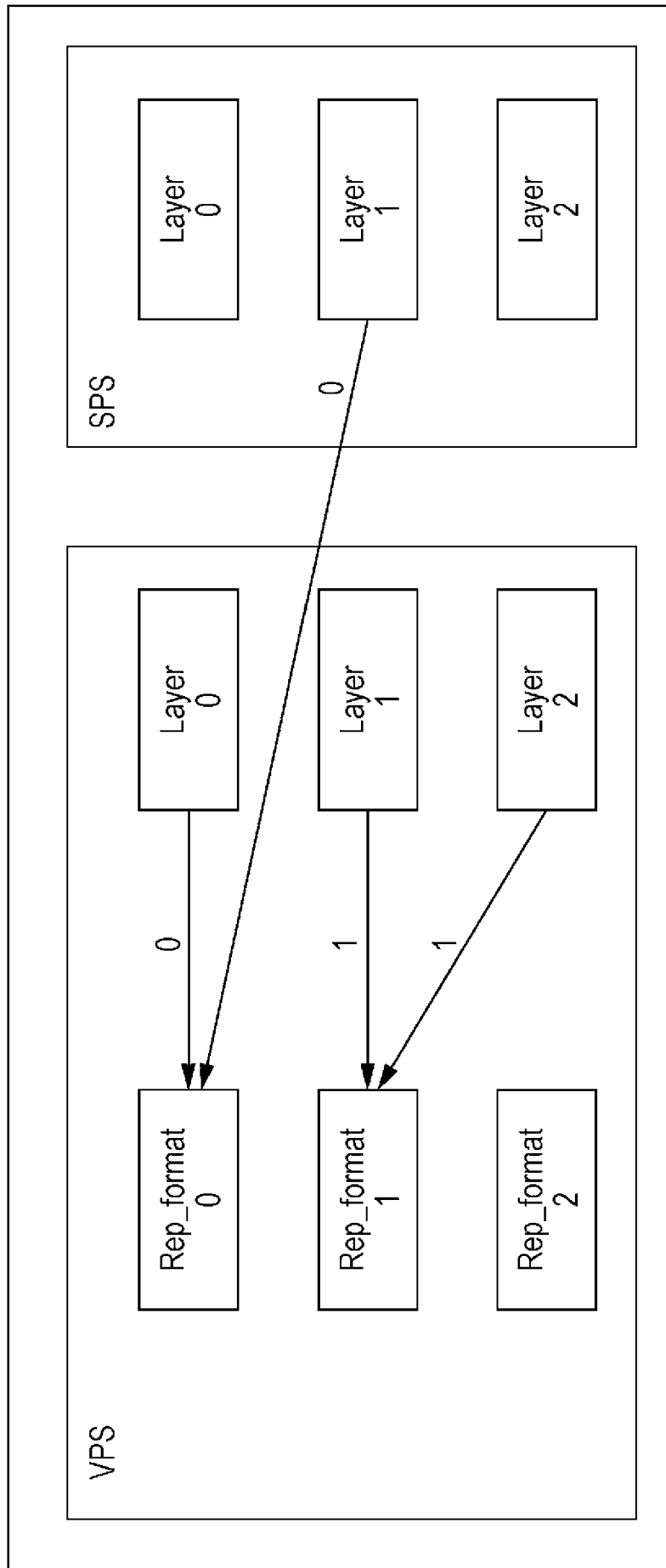
[Fig. 5]

FIG. 5



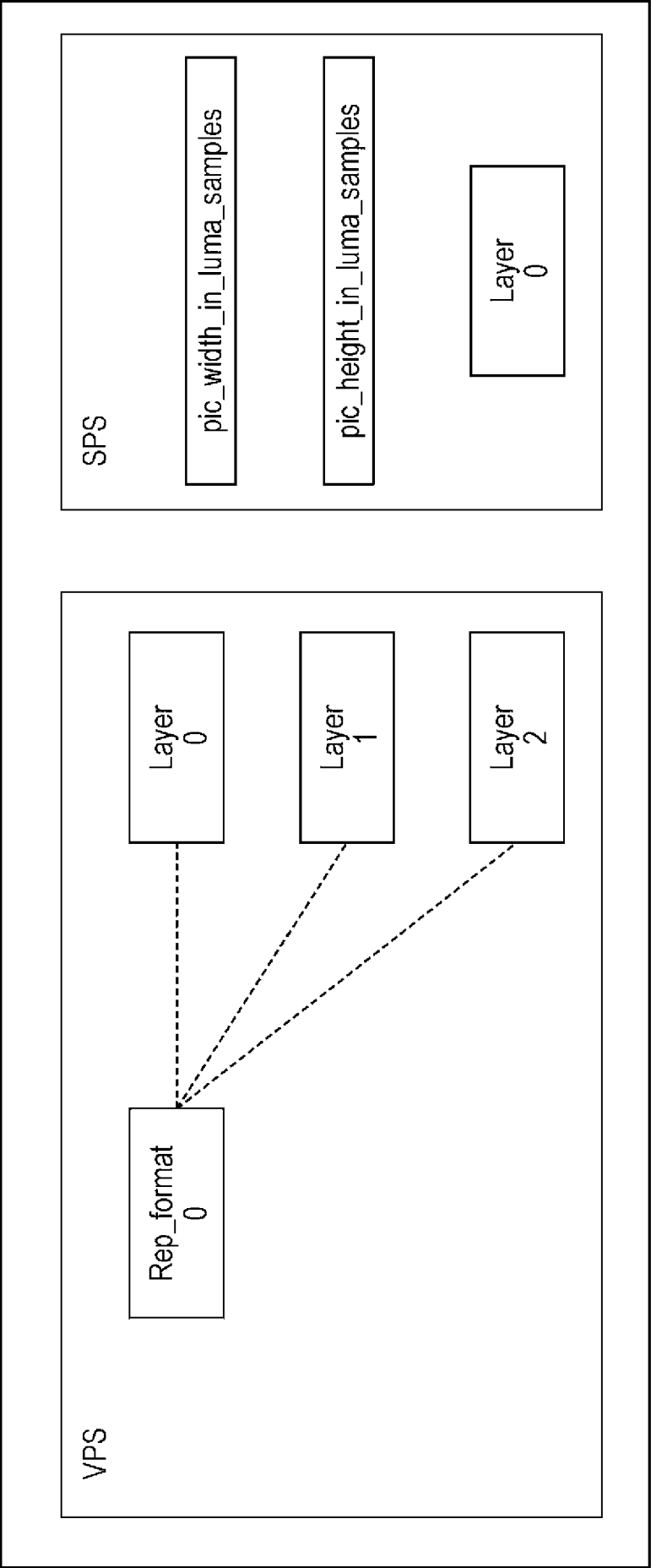
[Fig. 6]

FIG. 6



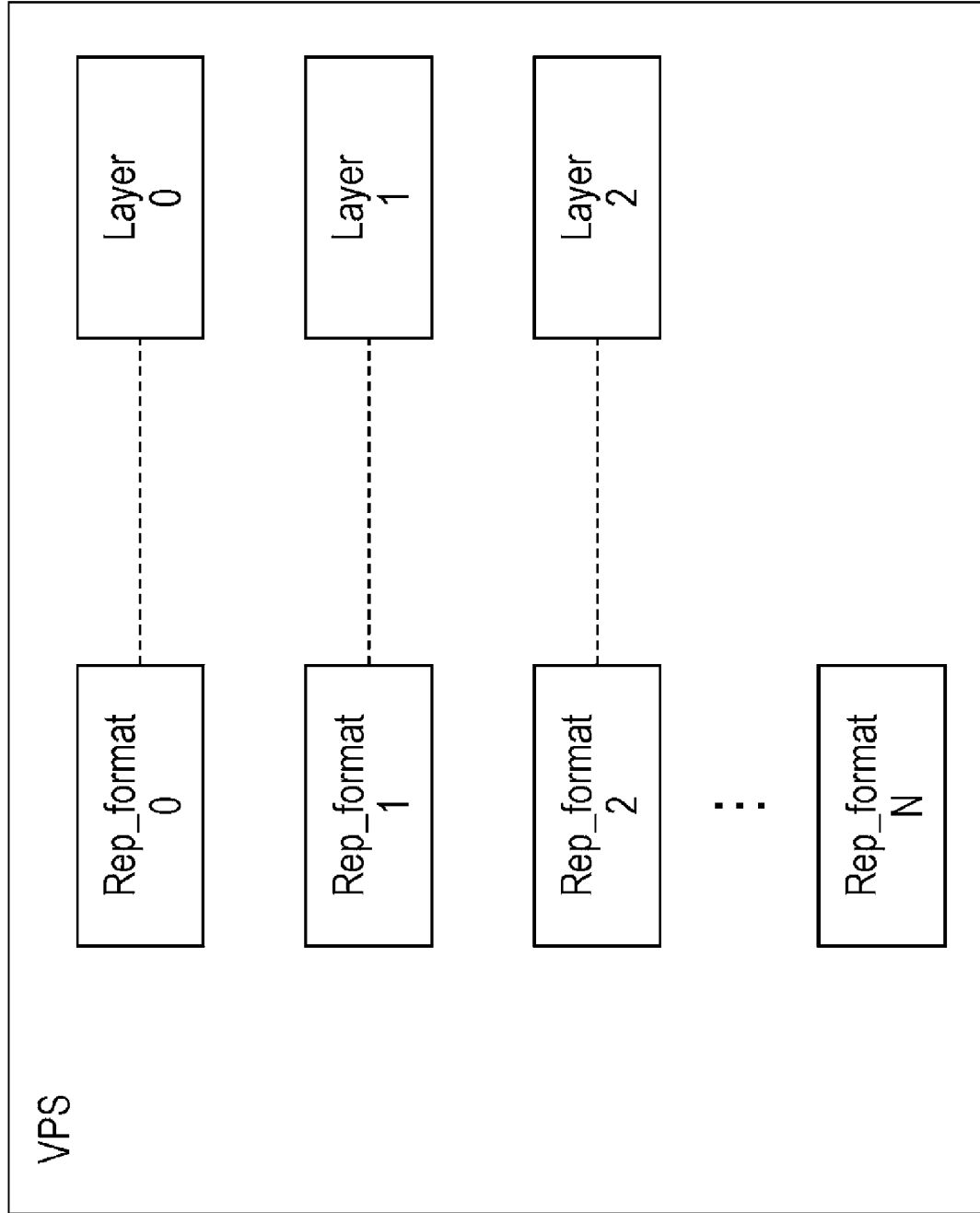
[Fig. 7]

FIG. 7



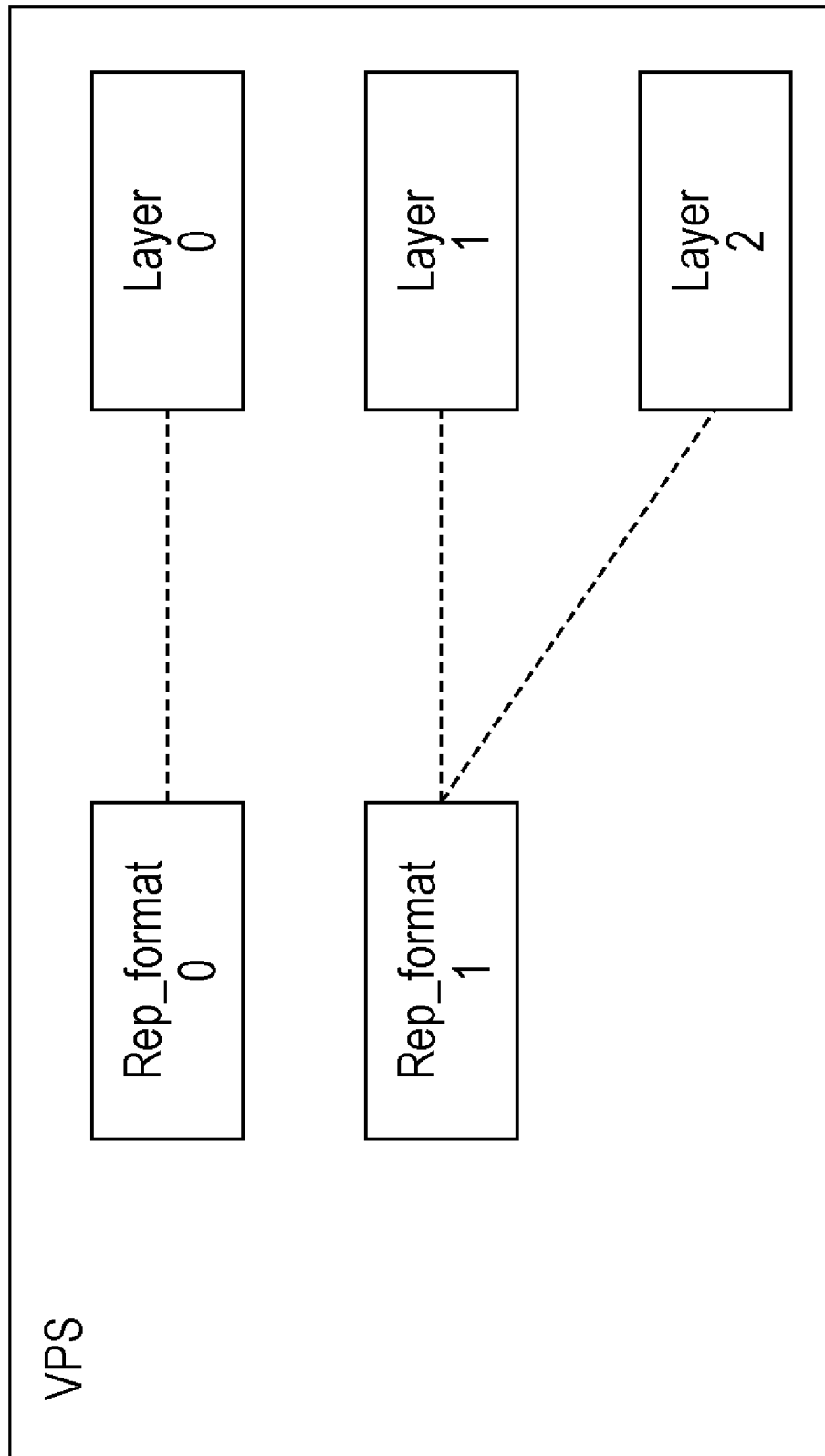
[Fig. 8]

FIG. 8



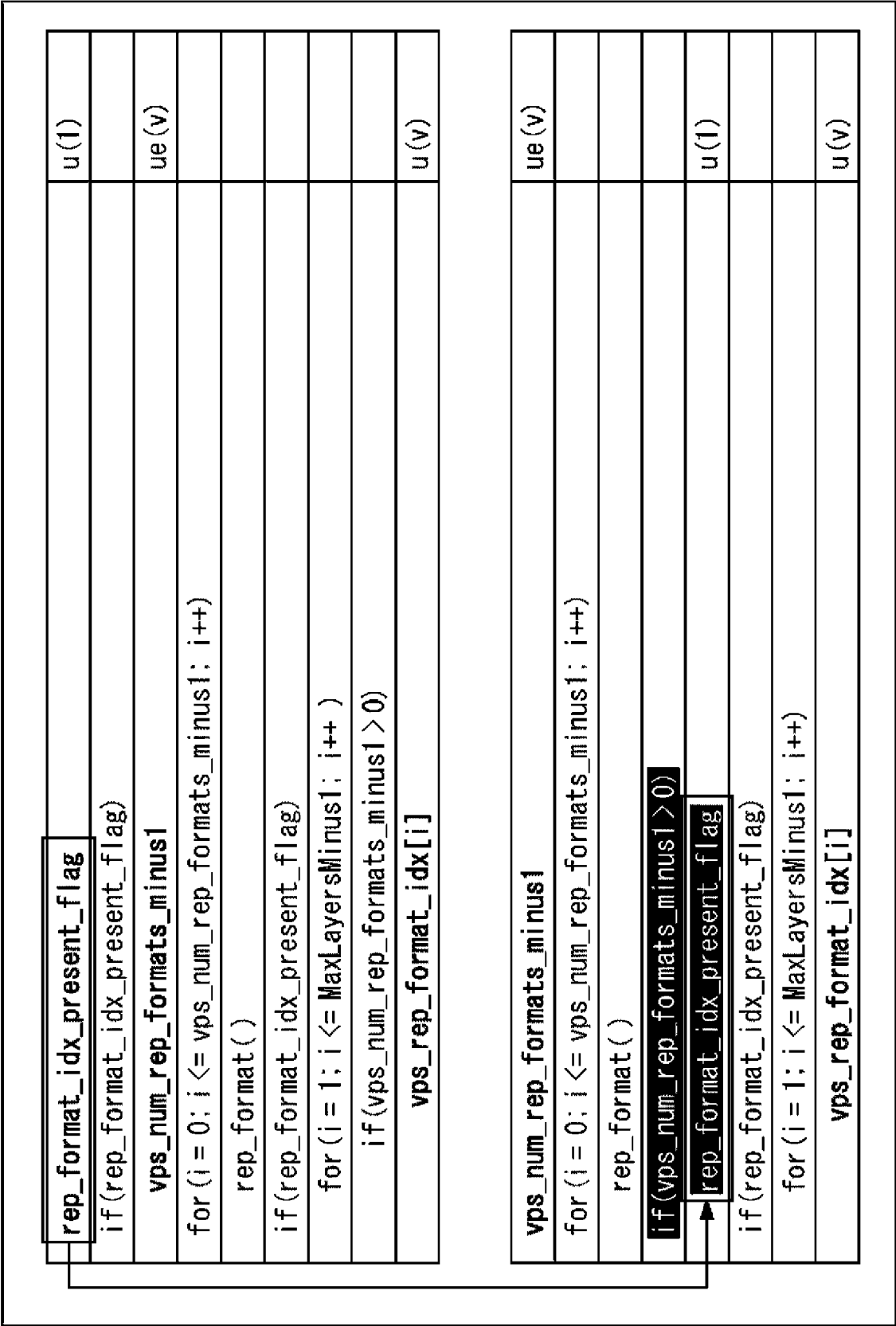
[Fig. 9]

FIG. 9



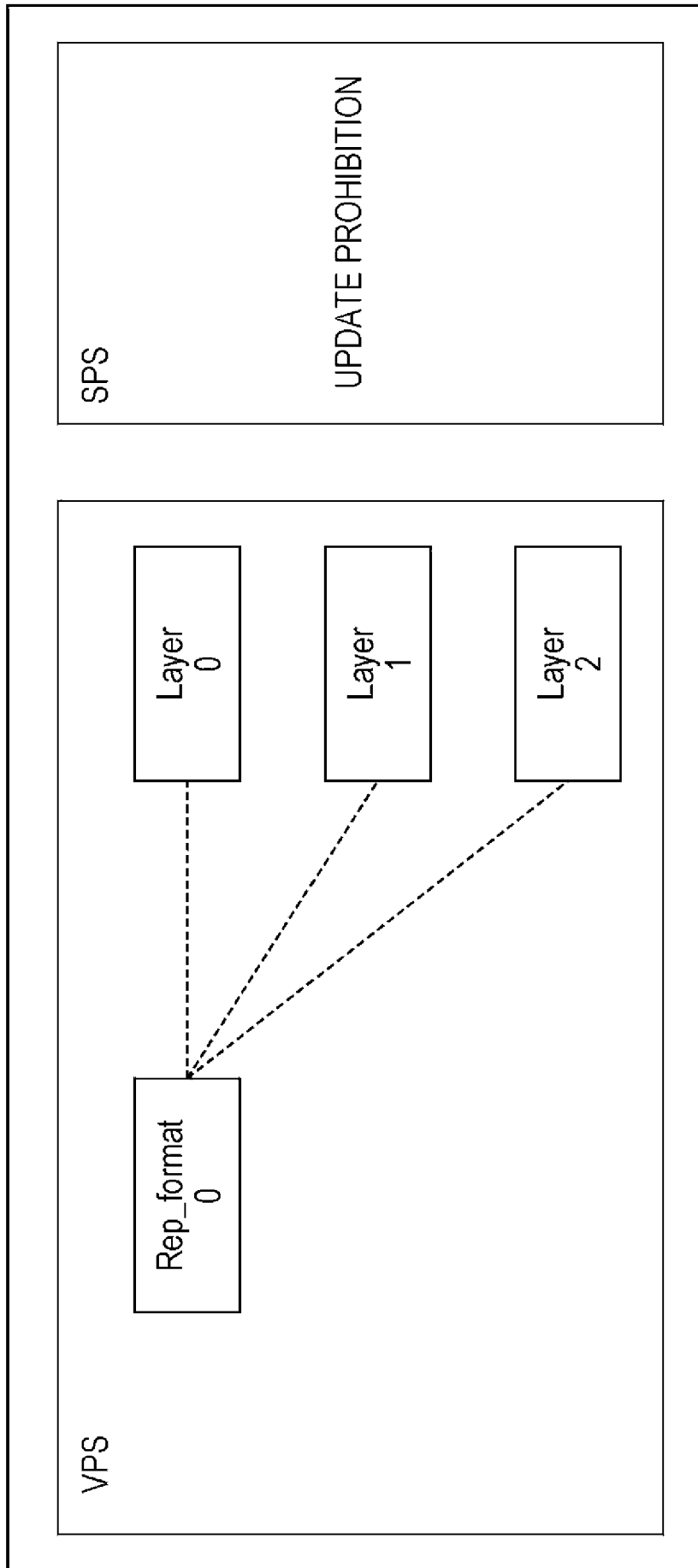
[Fig. 10]

FIG. 10



[Fig. 11]

FIG. 11



[Fig. 12]

FIG. 12

vps_num_rep_formats_minus1	ue(v)
for (i = 0; i <= vps_num_rep_formats_minus1; i++)	
rep_format ()	
if(vps_num_rep_formats_minus1 > 0)	
rep_format_idx_present_flag	u(1)
if(rep_format_idx_present_flag)	
for (i = 1; i <= MaxLayersMinus1; i++)	
vps_rep_format_idx[i]	u(v)

[Fig. 13]

FIG. 13

if(nuh_layer_id>0) {	
update_rep_format_flag	u(1)
if(update_rep_format_flag)	
sps_rep_format_idx	u(8)
} else {	
chroma_format_idc	ue(v)
if(chroma_format_idc == 3)	
separate_colour_plane_flag	u(1)
pic_width_in_luma_samples	ue(v)
pic_height_in_luma_samples	ue(v)
}	

[Fig. 14]

FIG. 14

VPS

- **vps_num_rep_formats_minus1** plus 1 specifies the number of the following rep_format() syntax structures in the VPS. The value of vps_num_rep_formats_minus1 shall be in the range of 0 to 255, inclusive.
- **rep_format_idx_present_flag** equal to 1 specifies that the syntax elements vps_rep_format_idx[i] is present. rep_format_idx_present_flag equal to 0 specifies that the syntax element vps_rep_format_idx[i] is not present. When not present, the value of rep_format_idx_present_flag is inferred to be equal to 0.
- **vps_rep_format_idx[i]** specifies the index, into the list of rep_format() syntax structures in the VPS, of the rep_format() syntax structure that applies to the layer with nuh_layer_id equal to layer_id_in_nuh[i]. The value of vps_rep_format_idx[i] shall be in the range of 0 to vps_num_rep_formats_minus1, inclusive. The number of bits used for the representation of vps_rep_format_idx[i] is $\text{Ceil}(\text{Log2}(\text{vps_num_rep_formats_minus1} + 1))$. When not present, the value of vps_rep_format_idx[i] is inferred to be equal to $(\text{rep_format_idx_present_flag} ? 0 : \text{Min}(\text{i.vps_num_rep_formats_minus1}))$.

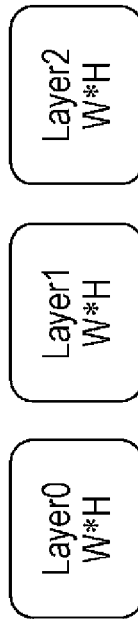
SPS

- **update_rep_format_flag** equal to 1 specifies that sps_rep_format_idx is present and that the sps_rep_format_idx-th rep_format() syntax structures in the active VPS applies to the layers that refer to this SPS. update_rep_format_flag equal to 0 specifies that sps_rep_format_idx is not present. When not present, the value of update_rep_format_flag is inferred to be equal to 0. If the value of vps_num_rep_formats_minus1 in the active VPS is equal to 0, the value of update_rep_format_flag shall be equal to 0.

[Fig. 15]

FIG. 15

SNR/VIEW SCALABILITY (ALL LAYERS HAVE THE SAME RESOLUTION), 3 LAYER



VALUE TO SEND ("—" INDICATES THAT DECODER PERFORMS ESTIMATION WITHOUT VALUE BEING TRANSFERRED)

Syntax	METHOD 1	METHOD 2	METHOD 3
rep_format_idx_present_flag	1	1	— NO TRANSFER
vps_num_rep_formats_minus1	0	(MaxLayersMinus1=3-1=2) (ESTIMATION AT DECODER SIDE)	0
0 th rep_format()	W*H	W*H	W*H
1 st rep_format()	—	W*H	—
2 nd rep_format()	—	W*H	—
vps_rep_format_idx[0]	— (DECODER ESTIMATES THAT Layer0 USES 0 th rep_format)	— (DECODER ESTIMATES THAT Layer0 USES 0 th rep_format)	— (DECODER ESTIMATES THAT Layer0 USES 0 th rep_format)
vps_rep_format_idx[1]	— (DECODER ESTIMATES THAT Layer1 USES 0 th rep_format)	— (DECODER ESTIMATES THAT Layer1 USES 1 st rep_format)	— (DECODER ESTIMATES THAT Layer1 USES 0 th rep_format)
vps_rep_format_idx[2]	— (DECODER ESTIMATES THAT Layer2 USES 0 th rep_format)	— (DECODER ESTIMATES THAT Layer2 USES 3 rd rep_format)	— (DECODER ESTIMATES THAT Layer2 USES 0 th rep_format)

[Fig. 16]

FIG. 16

SPATIAL AND SNR SCALABILITY, 3 LAYER			
	Layer0 W*H	Layer1 2W*2H	Layer2 2W*2H
VALUE TO SEND ("-" INDICATES THAT DECODER PERFORMS ESTIMATION WITHOUT VALUE BEING TRANSFERRED)			
Syntax	METHOD 1	METHOD 2	METHOD 3
rep_format_idx_present_flag	1	0	0
vps_num_rep_formats_minus1	1	(MaxLayersMinus1=3-1=2) (ESTIMATION AT DECODER SIDE)	1
0 th rep_format()	W*H	W*H	W*H
1 st rep_format()	2W*2H	2W*2H	2W*2H
2 nd rep_format()		2W*2H	-
vps_rep_format_idx[0]	(DECODER ESTIMATES THAT) (Layer0 USES 0 th rep_format)	(DECODER ESTIMATES THAT) (Layer0 USES 0 th rep_format)	(DECODER ESTIMATES THAT) (Layer0 USES 0 th rep_format)
vps_rep_format_idx[1]	1	(DECODER ESTIMATES THAT) (Layer1 USES 1 st rep_format)	(DECODER ESTIMATES THAT) (Layer1 USES 1 st rep_format)
vps_rep_format_idx[2]	1	(DECODER ESTIMATES THAT) (Layer2 USES 3 rd rep_format)	(DECODER ESTIMATES THAT) (Layer2 USES 1 st rep_format)

[Fig. 17]

FIG. 17

SPATIAL SCALABILITY, 2 LAYER (REPRESENTATIONS ARE OF THREE TYPES)

Layer0
W*H

Layer1
2W*2H

3W*3H
 RESOLUTION THAT HAS THE LIKELIHOOD OF BEING CHANGED ALONG THE WAY

VALUE TO SEND ("—" INDICATES THAT DECODER PERFORMS ESTIMATION WITHOUT VALUE BEING TRANSFERRED)

Syntax	METHOD 1	METHOD 2	METHOD 3
rep_format_idx_present_flag	1	0	0
vps_num_rep_formats_minus1	2	NO EXPRESSION	2
0 th rep_format()	W*H		W*H
1 st rep_format()	2W*2H		2W*2H
2 nd rep_format()	3W*3H		3W*3H
vps_rep_format_idx[0]	— (DECODER ESTIMATES THAT Layer0 USES 0 th rep_format)		— (DECODER ESTIMATES THAT Layer0 USES 0 th rep_format)
vps_rep_format_idx[1]	1		— (DECODER ESTIMATES THAT Layer1 USES 1 st rep_format)
vps_rep_format_idx[2]	—		—

[Fig. 18]

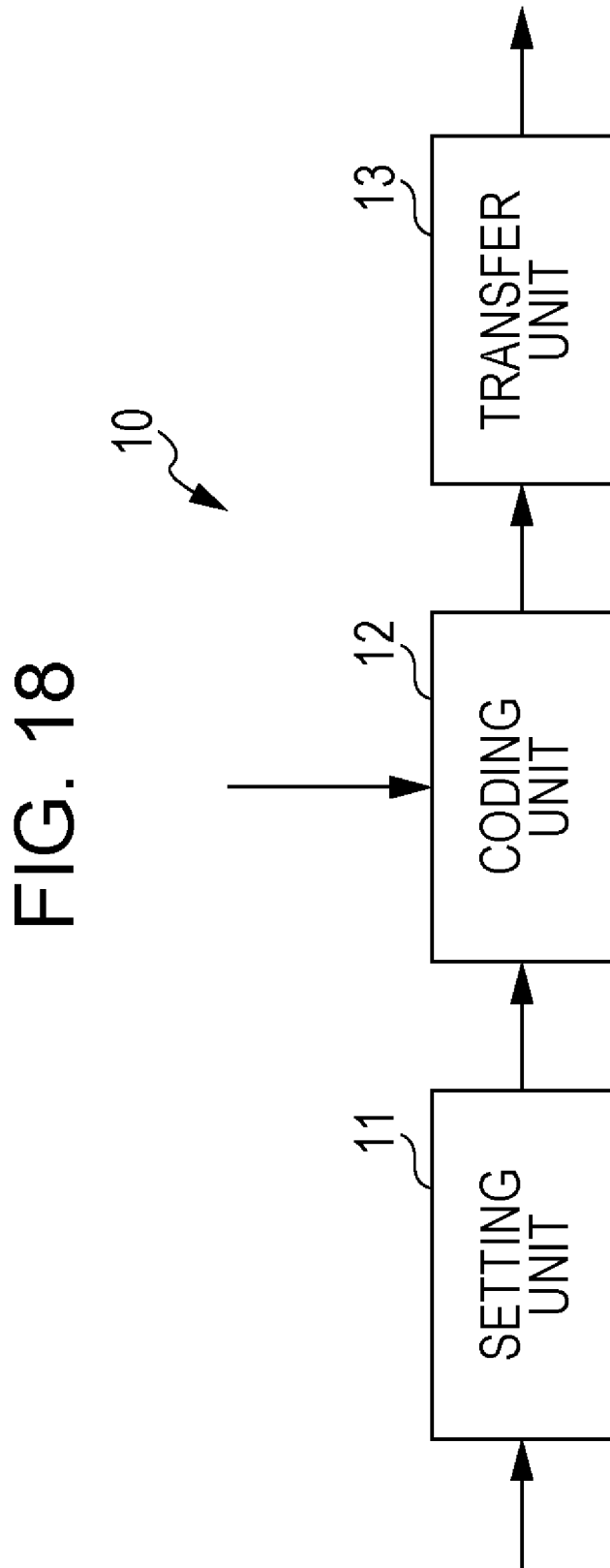
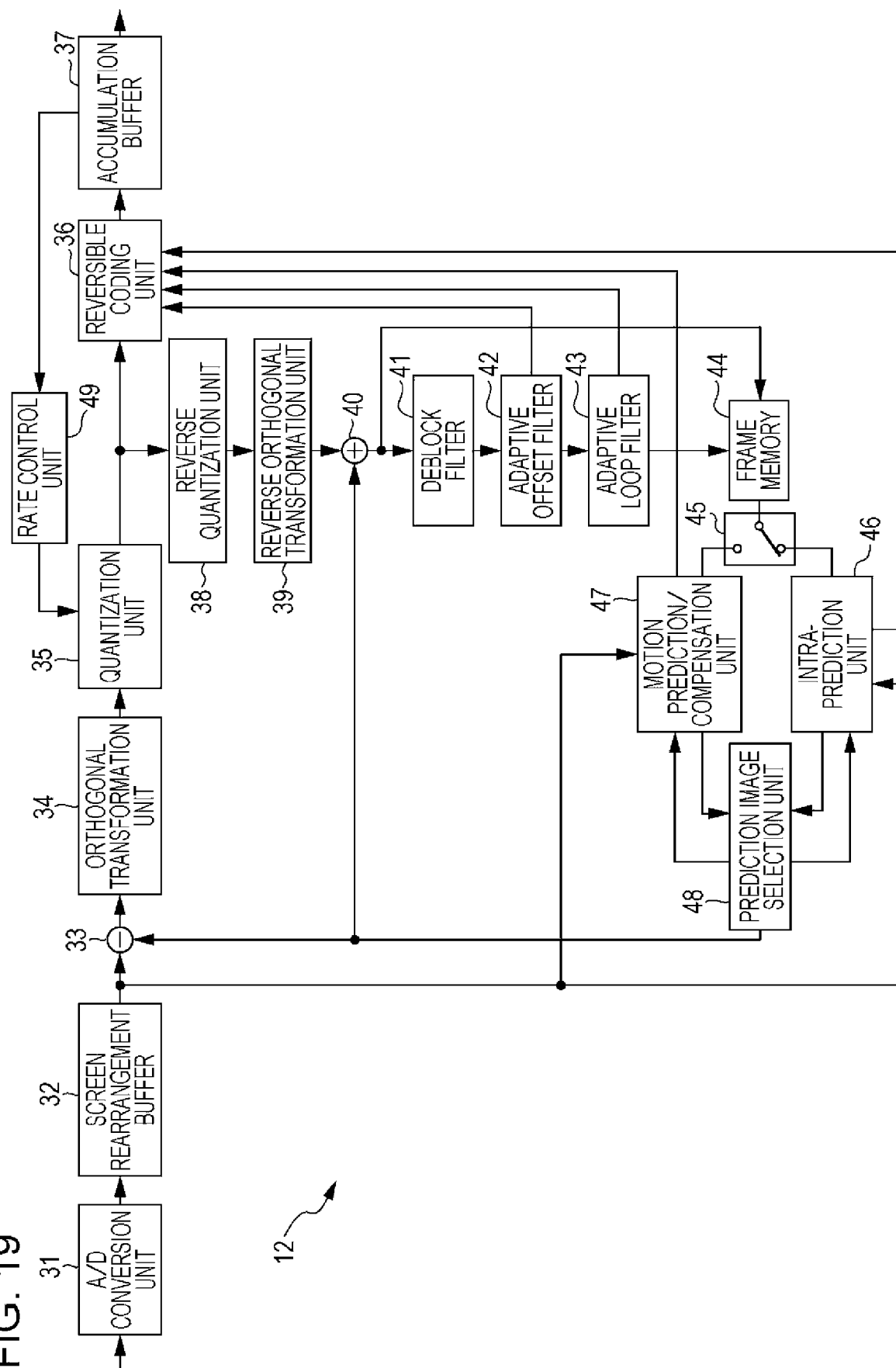
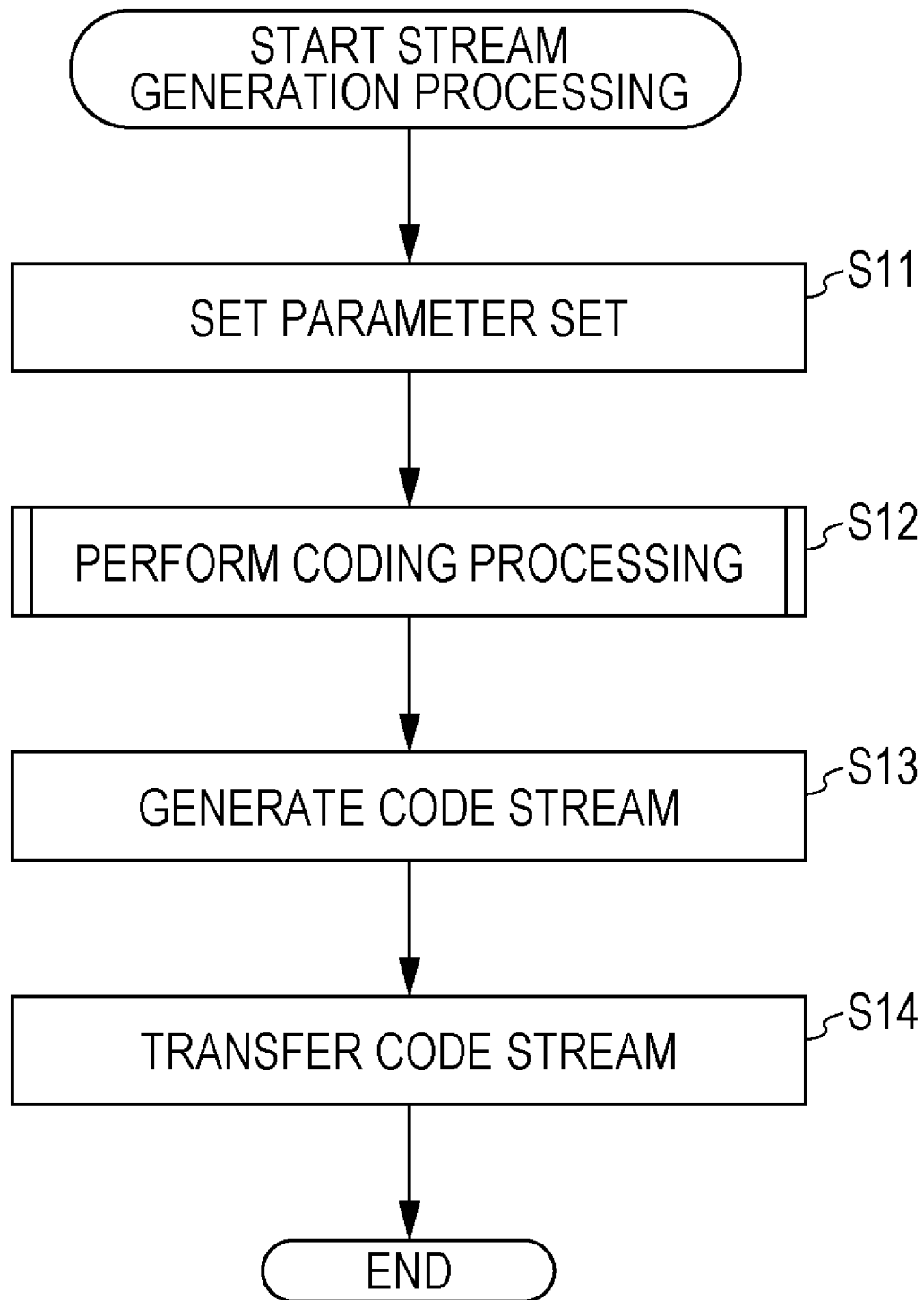


FIG. 19



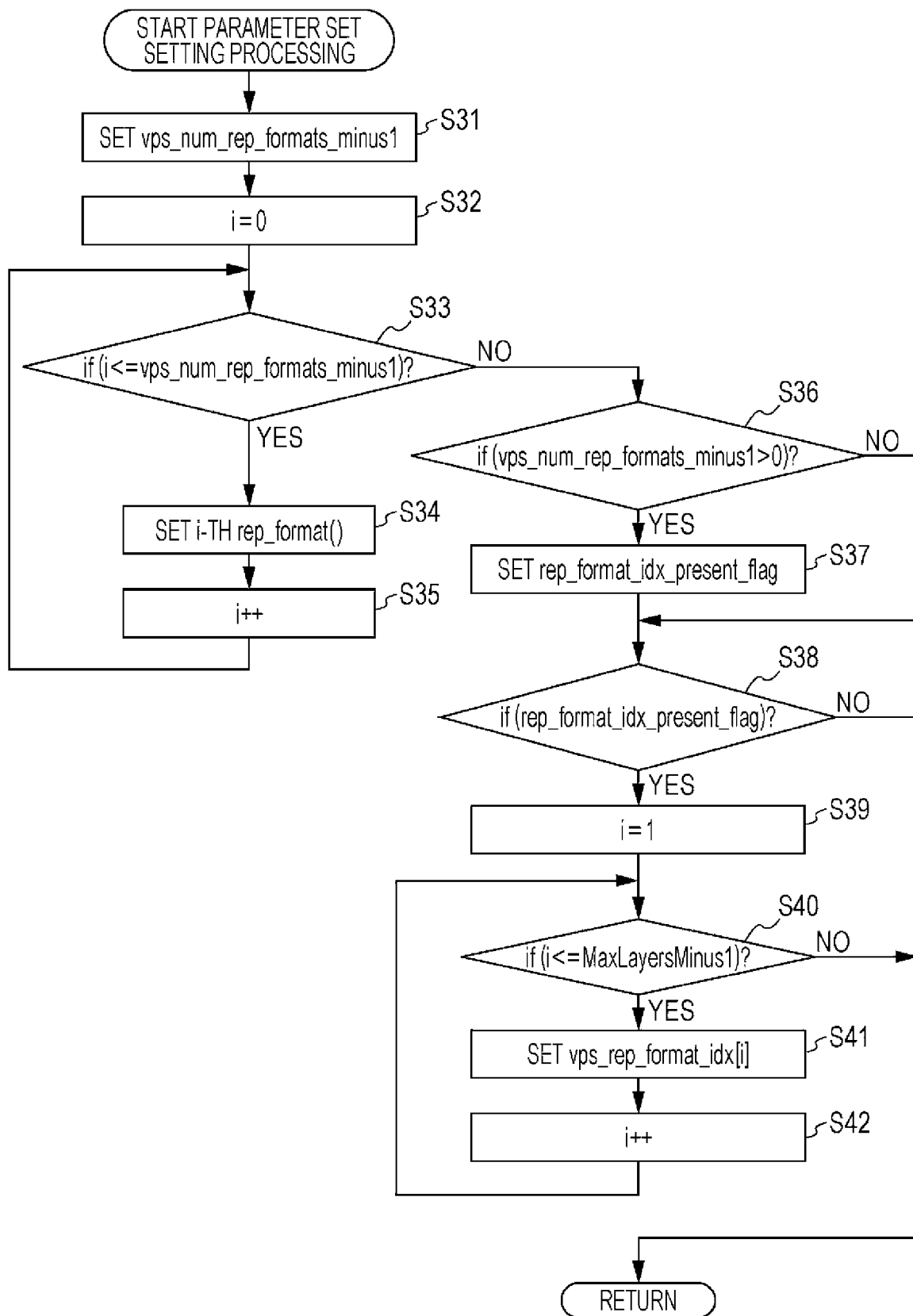
[Fig. 20]

FIG. 20



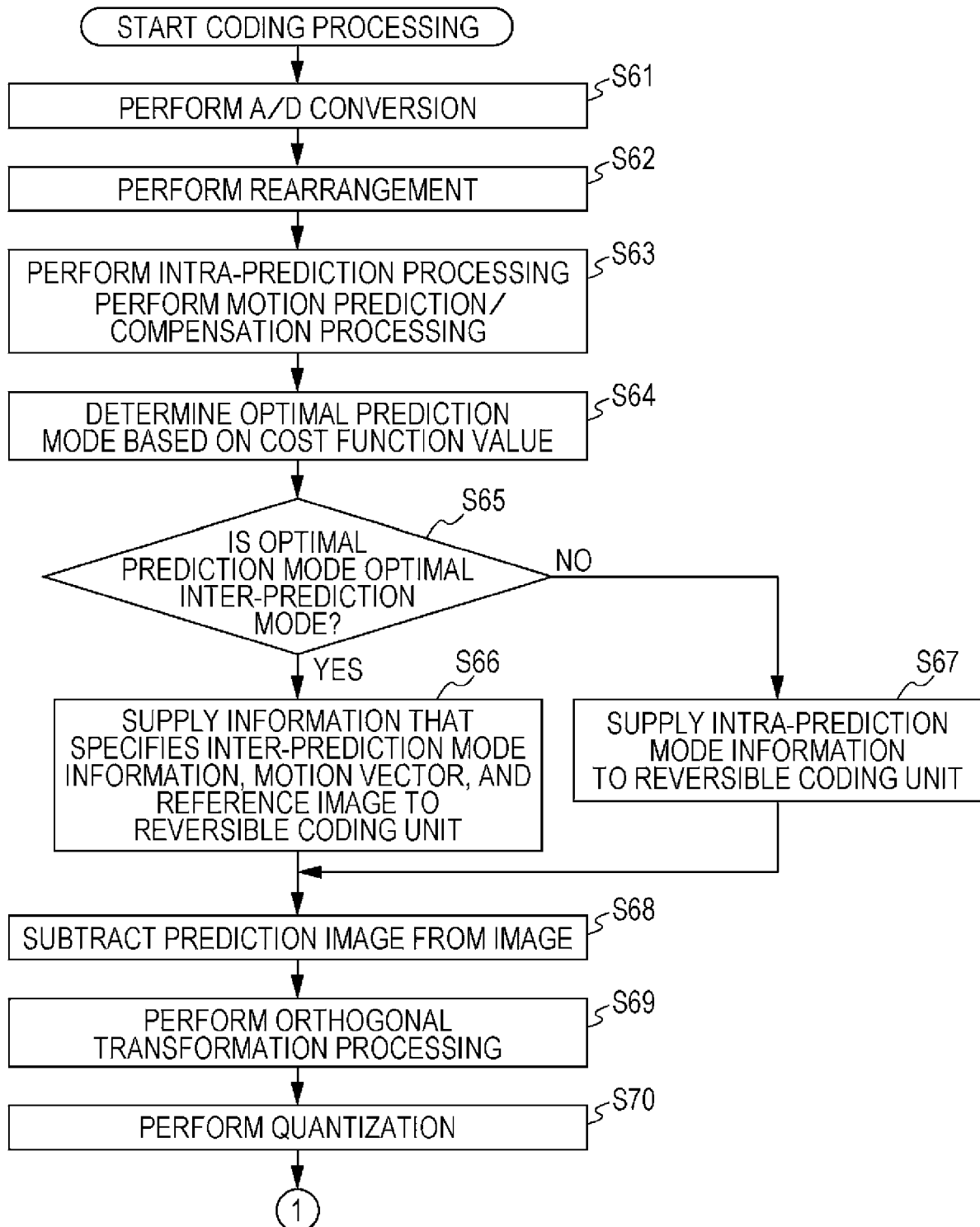
[Fig. 21]

FIG. 21



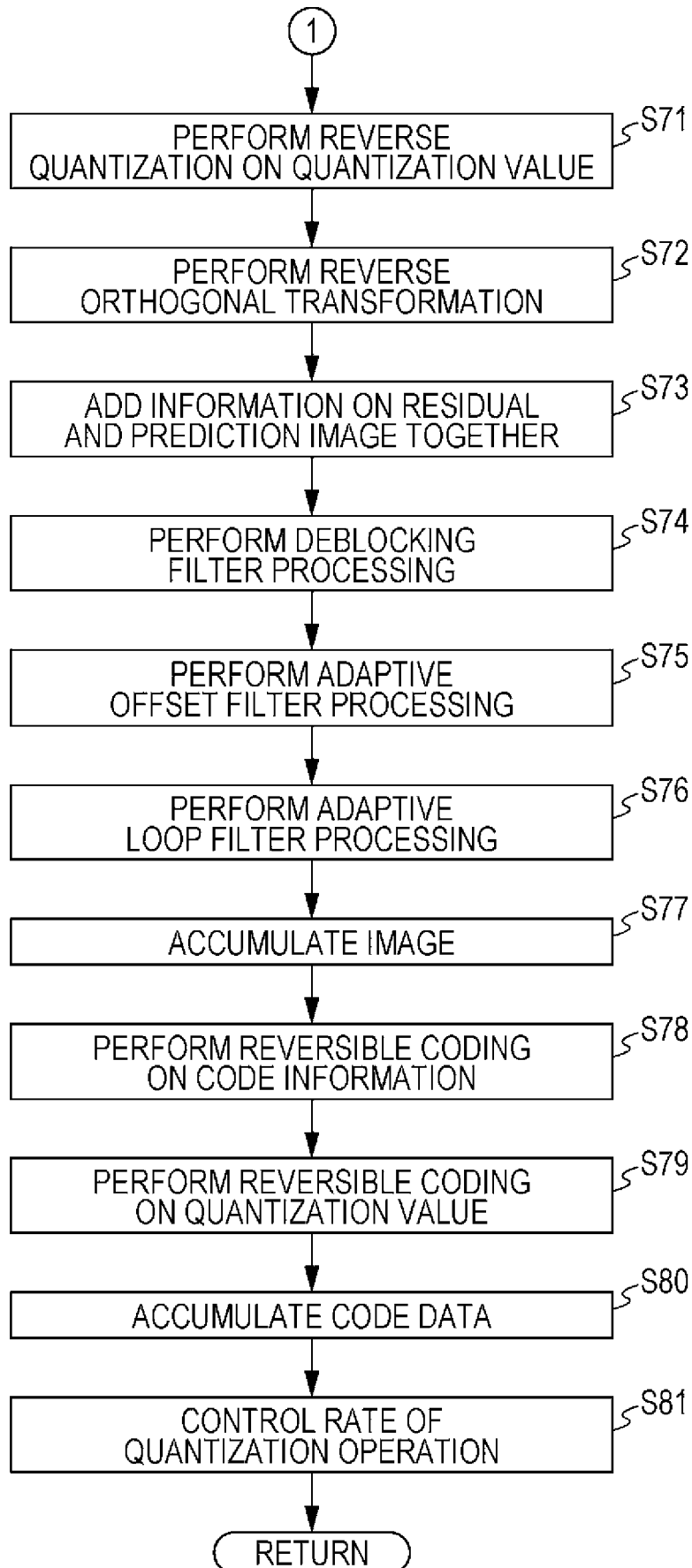
[Fig. 22]

FIG. 22

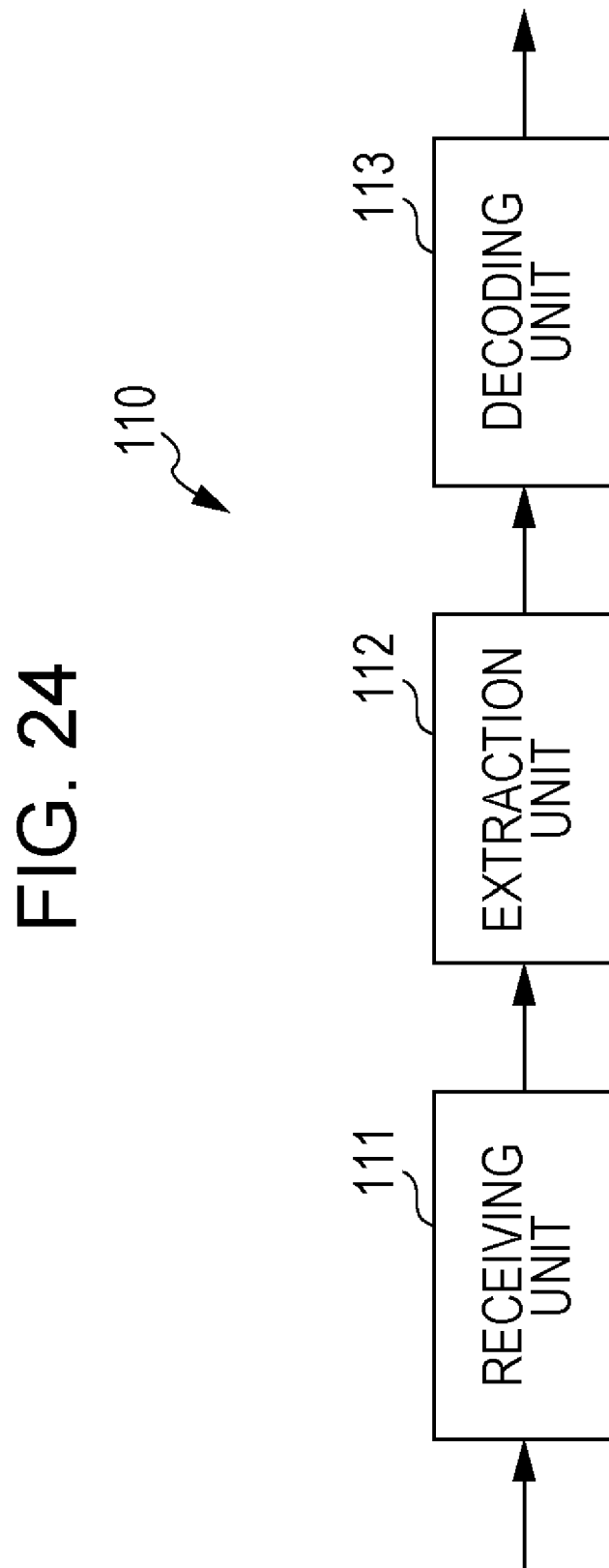


[Fig. 23]

FIG. 23

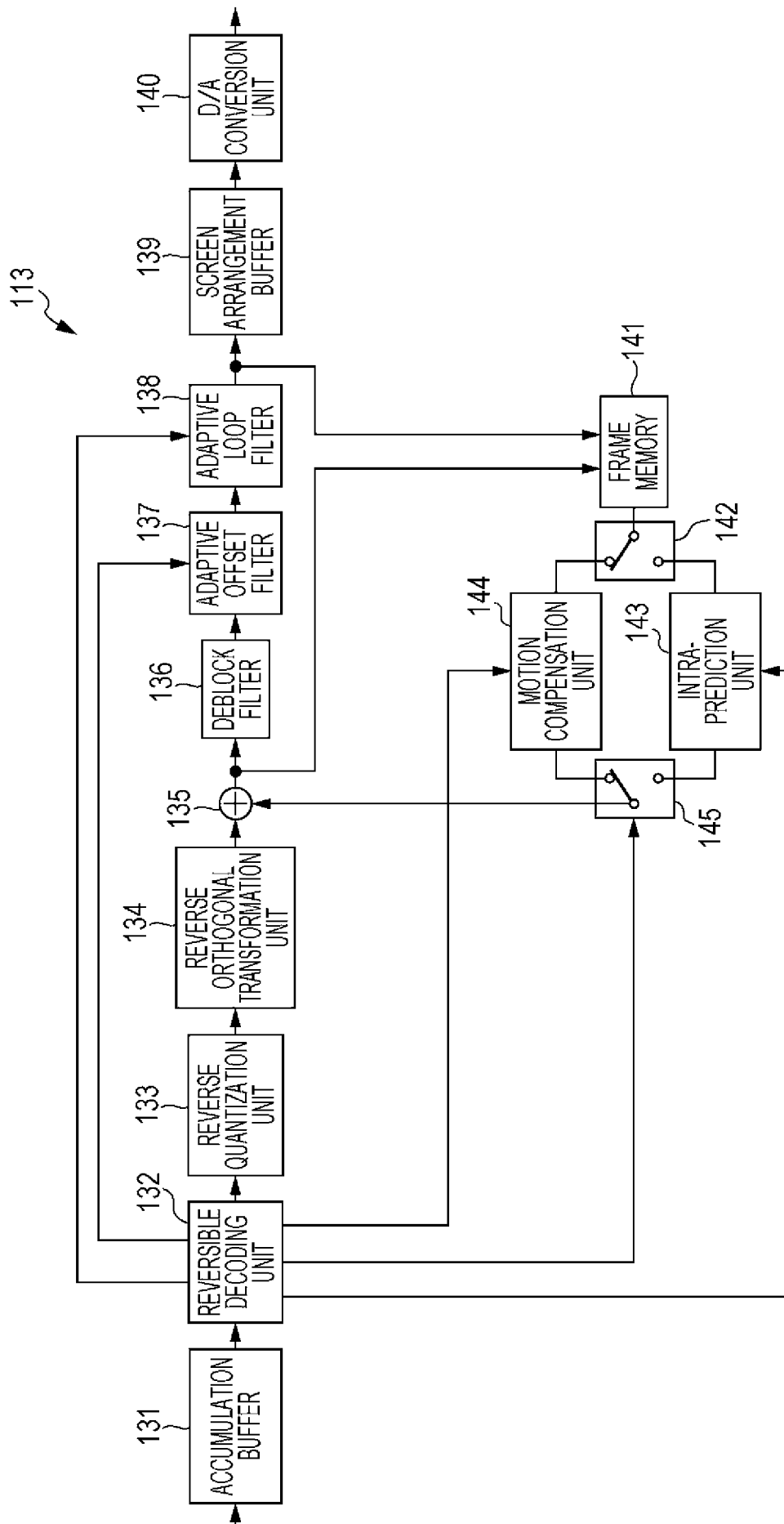


[Fig. 24]



[Fig. 25]

FIG. 25



[Fig. 26]

FIG. 26

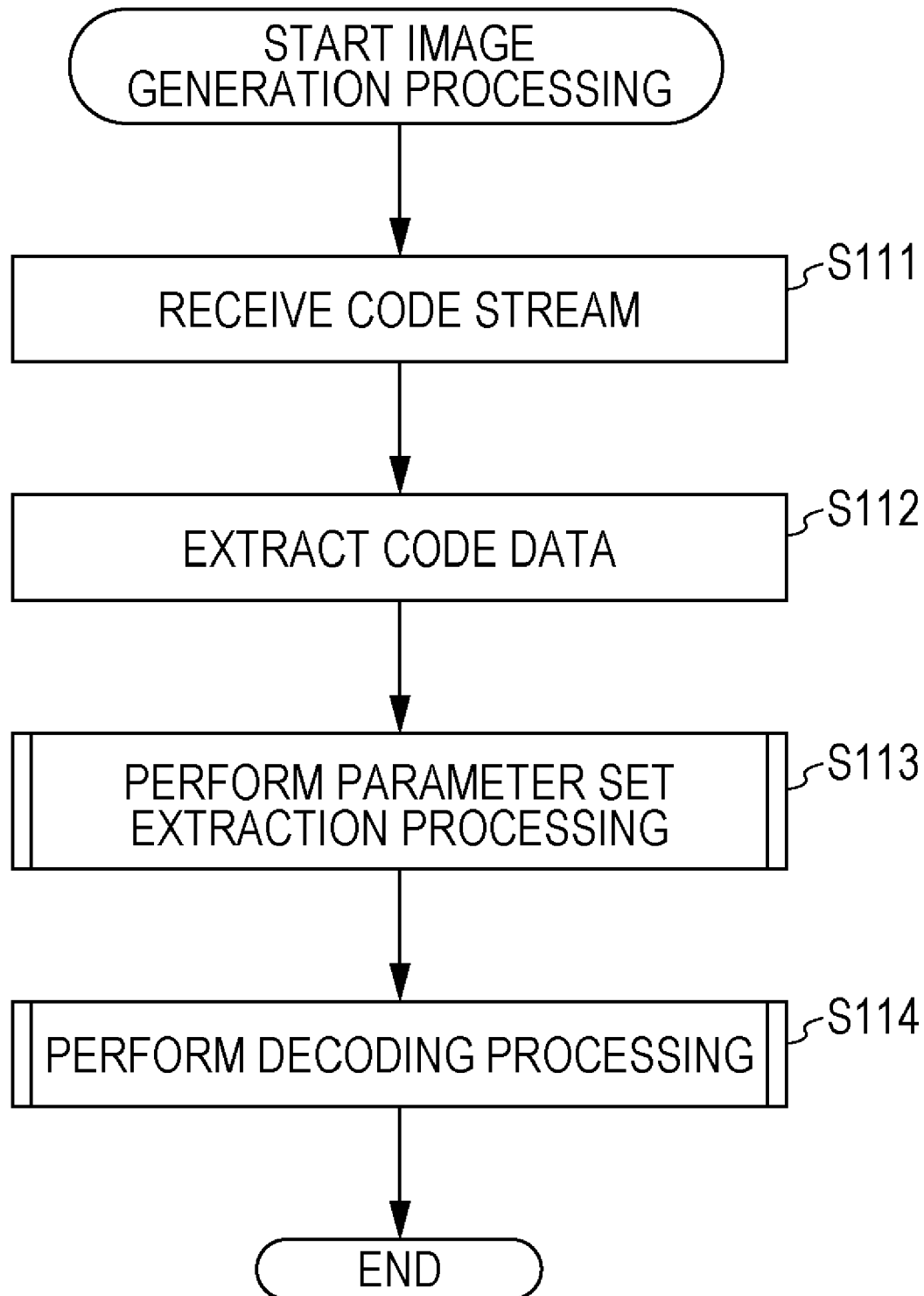
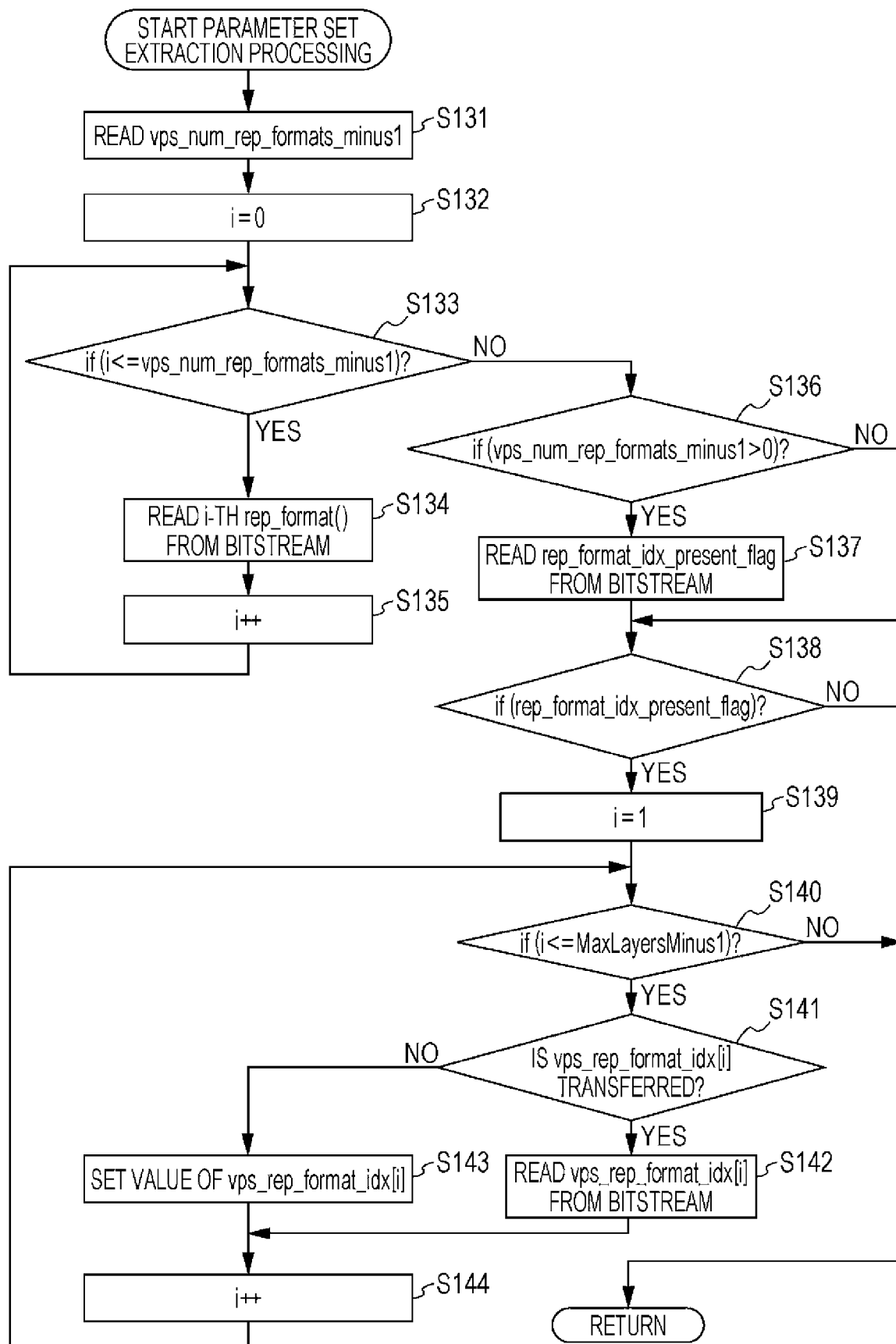
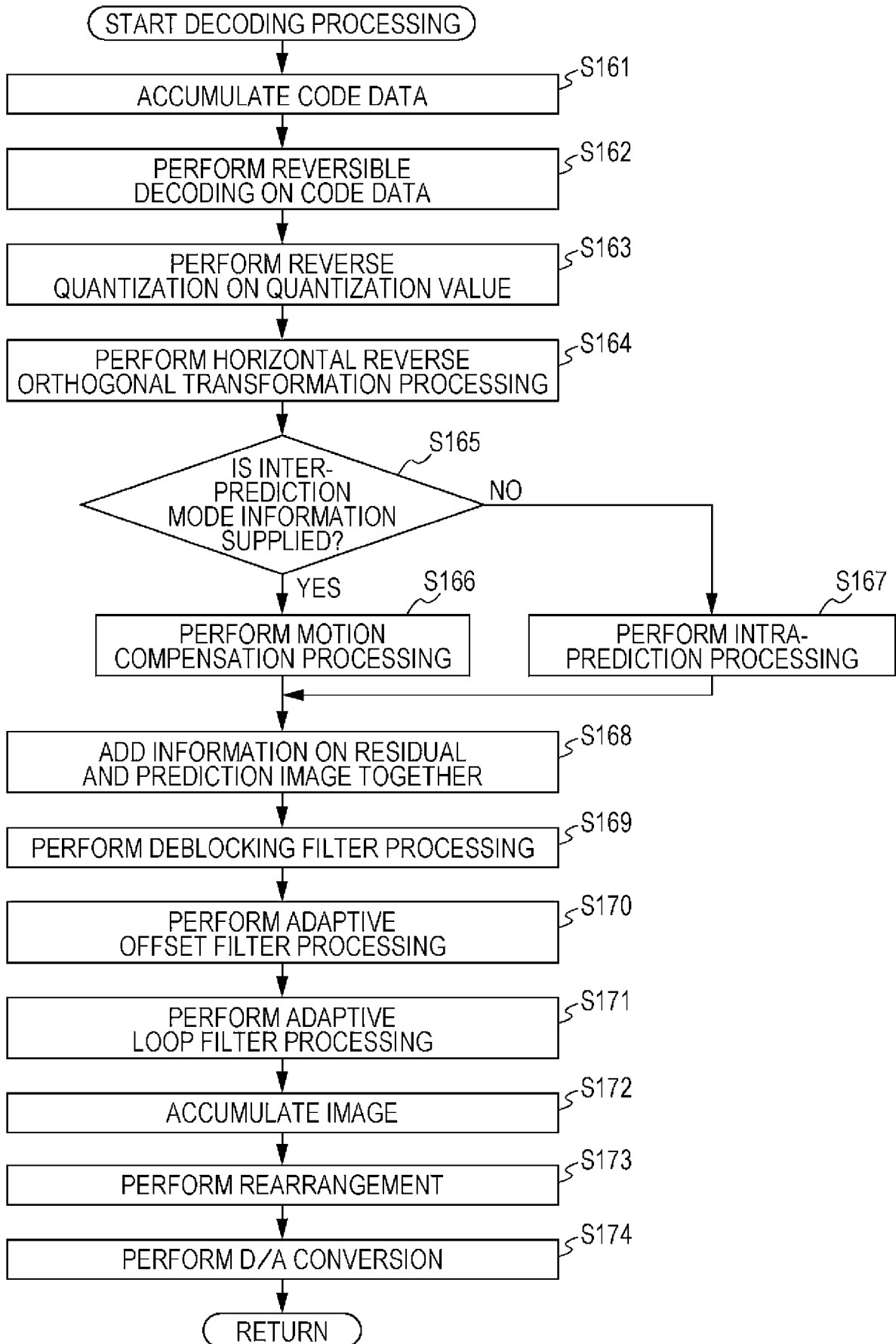


FIG. 27

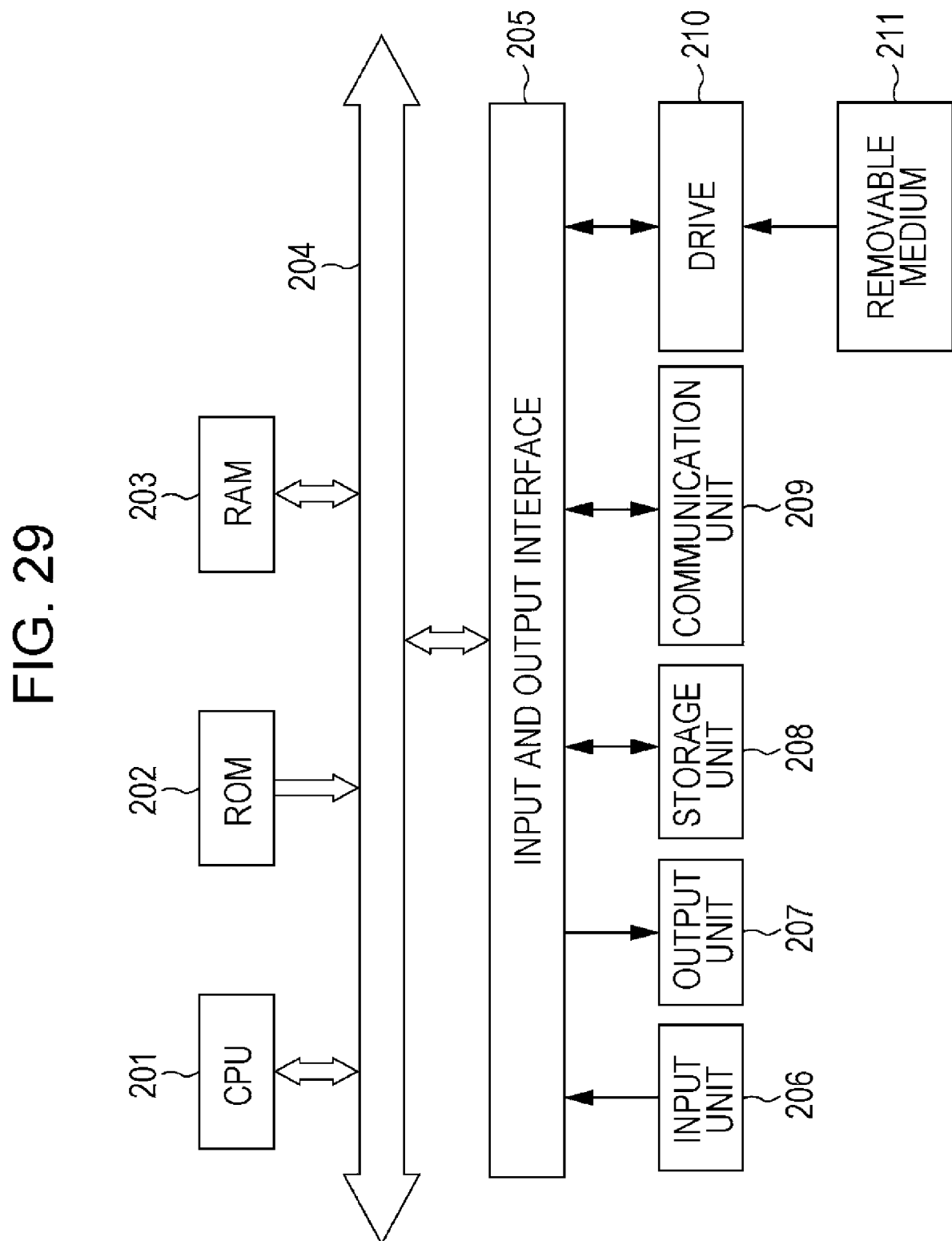


[Fig. 28]

FIG. 28

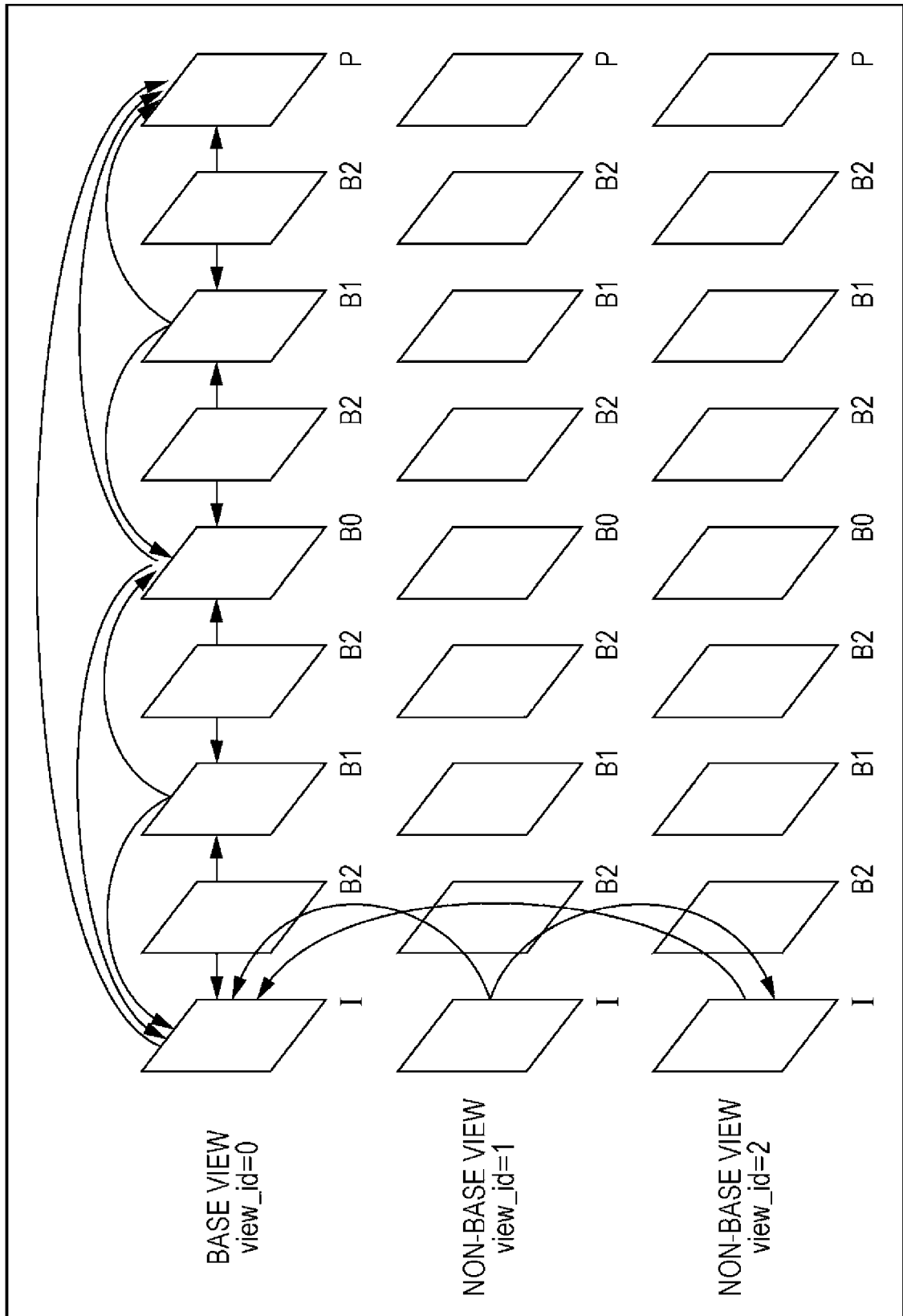


[Fig. 29]

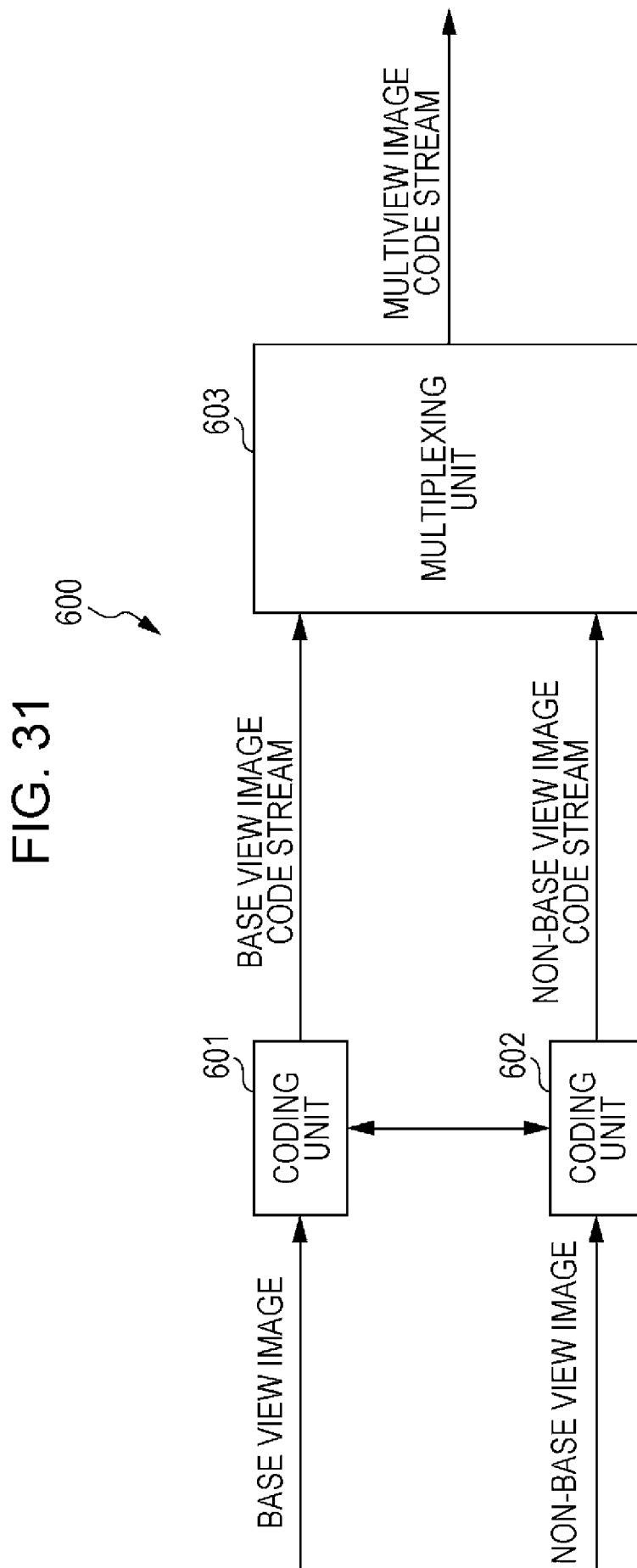


[Fig. 30]

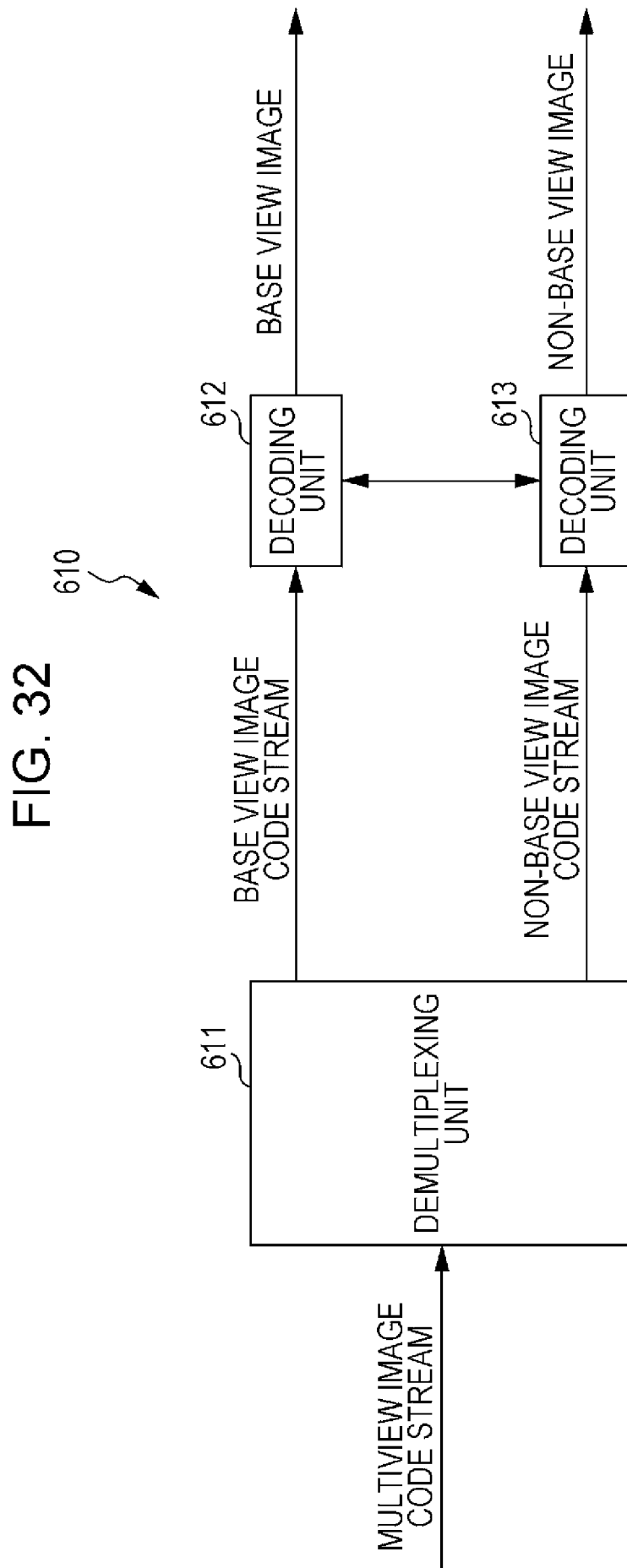
FIG. 30



[Fig. 31]

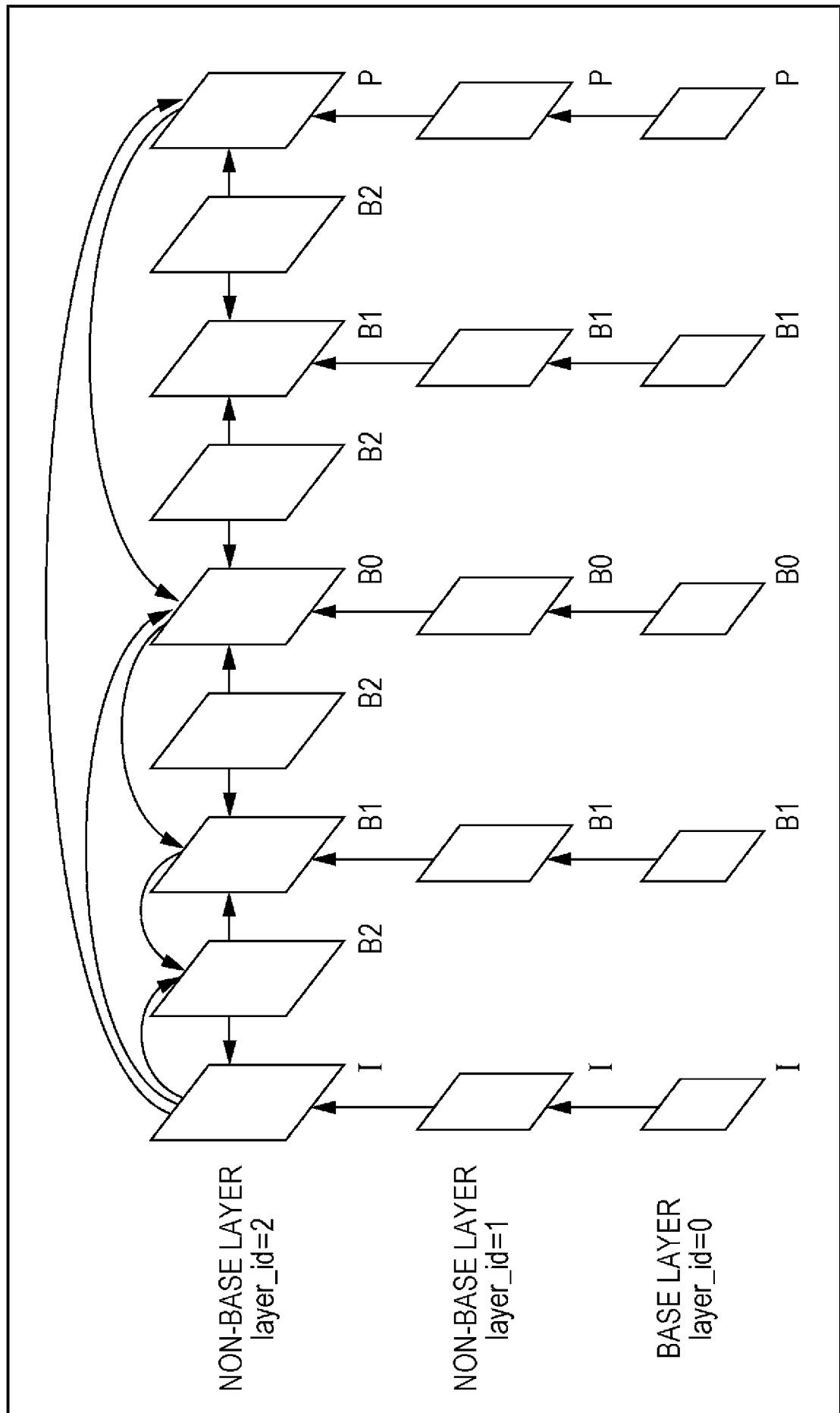


[Fig. 32]



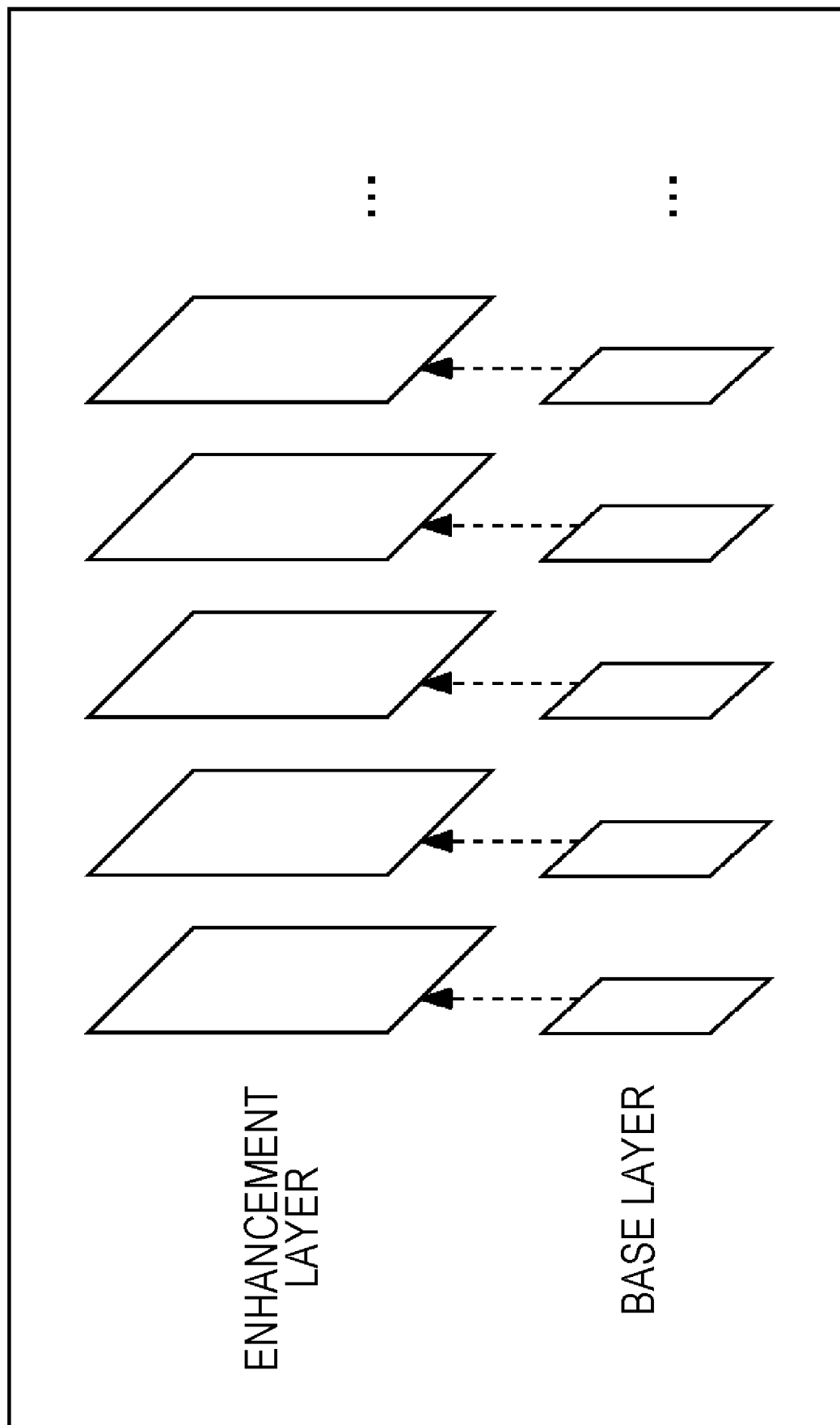
[Fig. 33]

FIG. 33



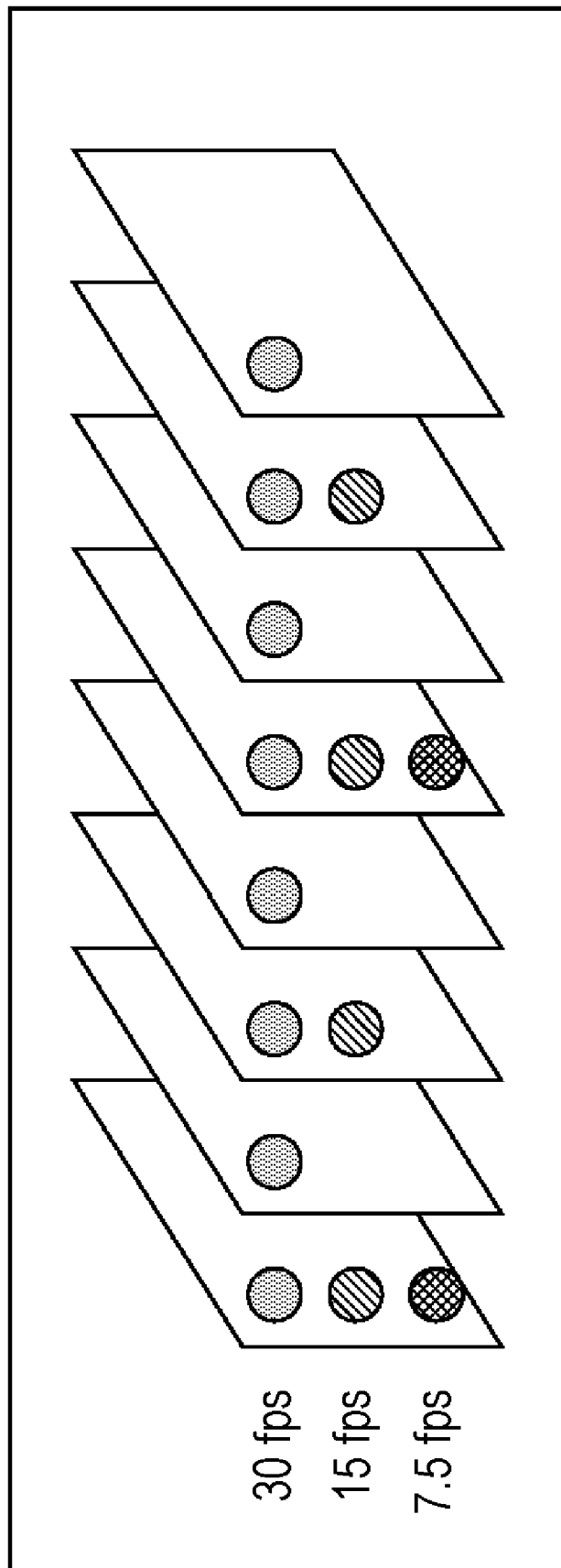
[Fig. 34]

FIG. 34



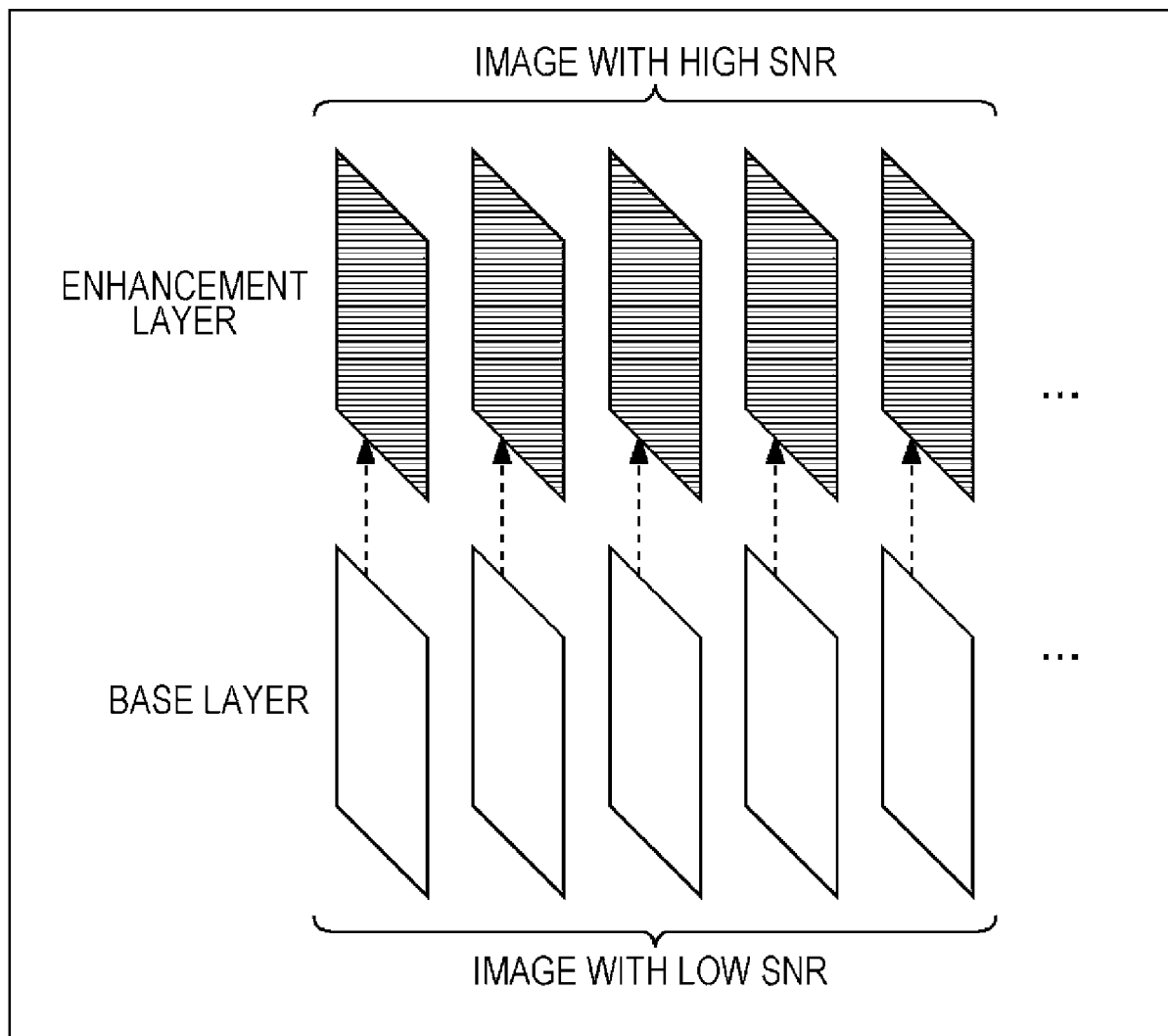
[Fig. 35]

FIG. 35

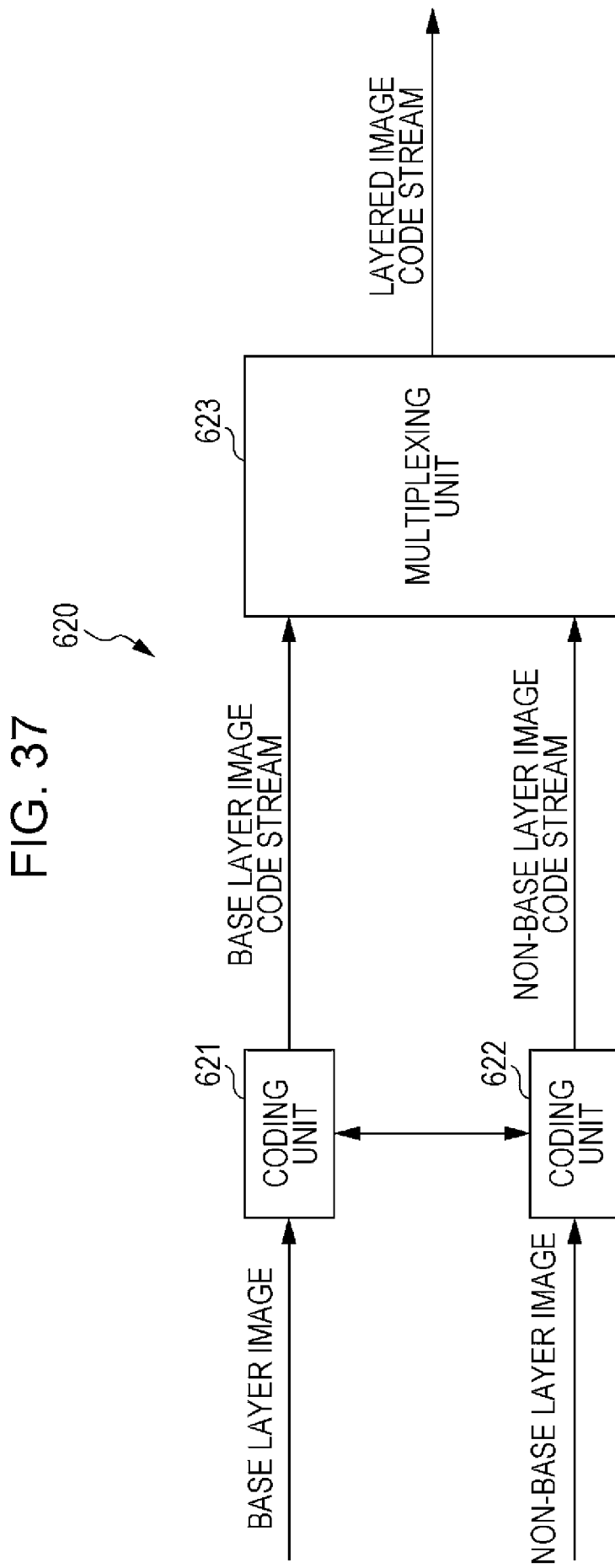


[Fig. 36]

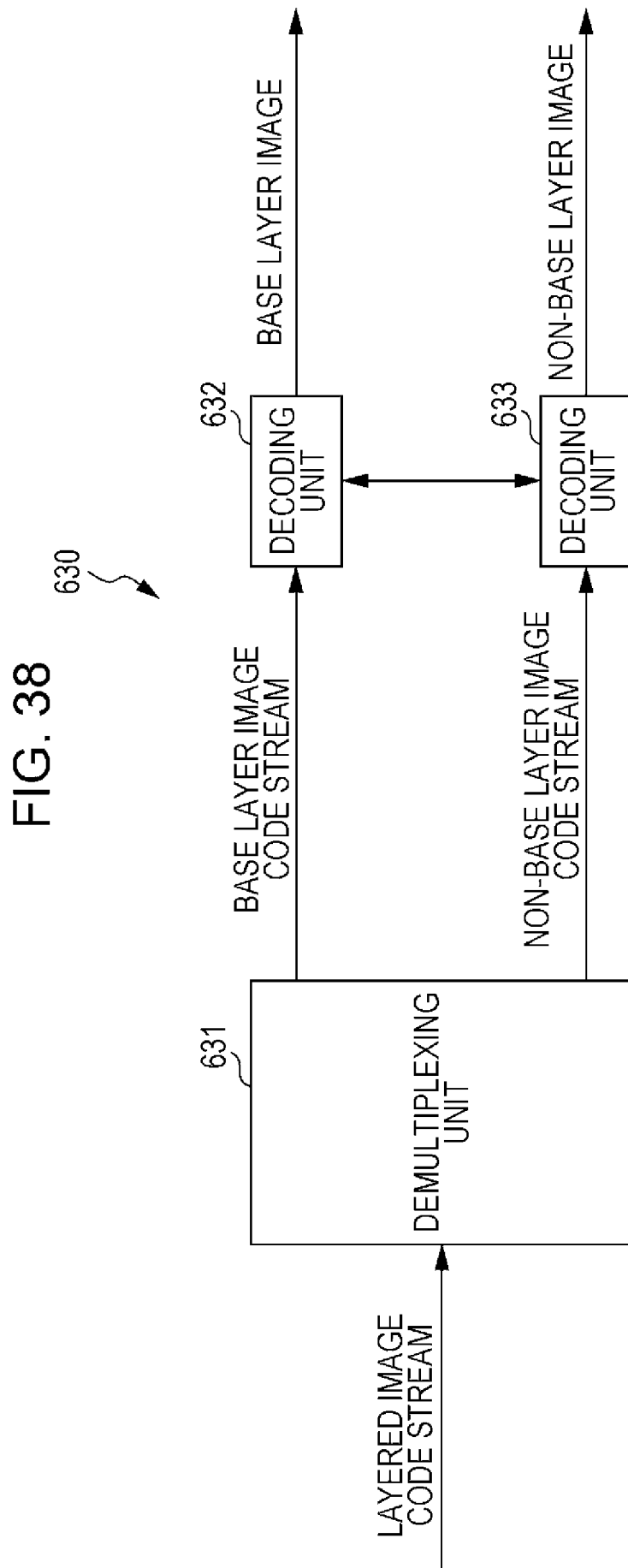
FIG. 36



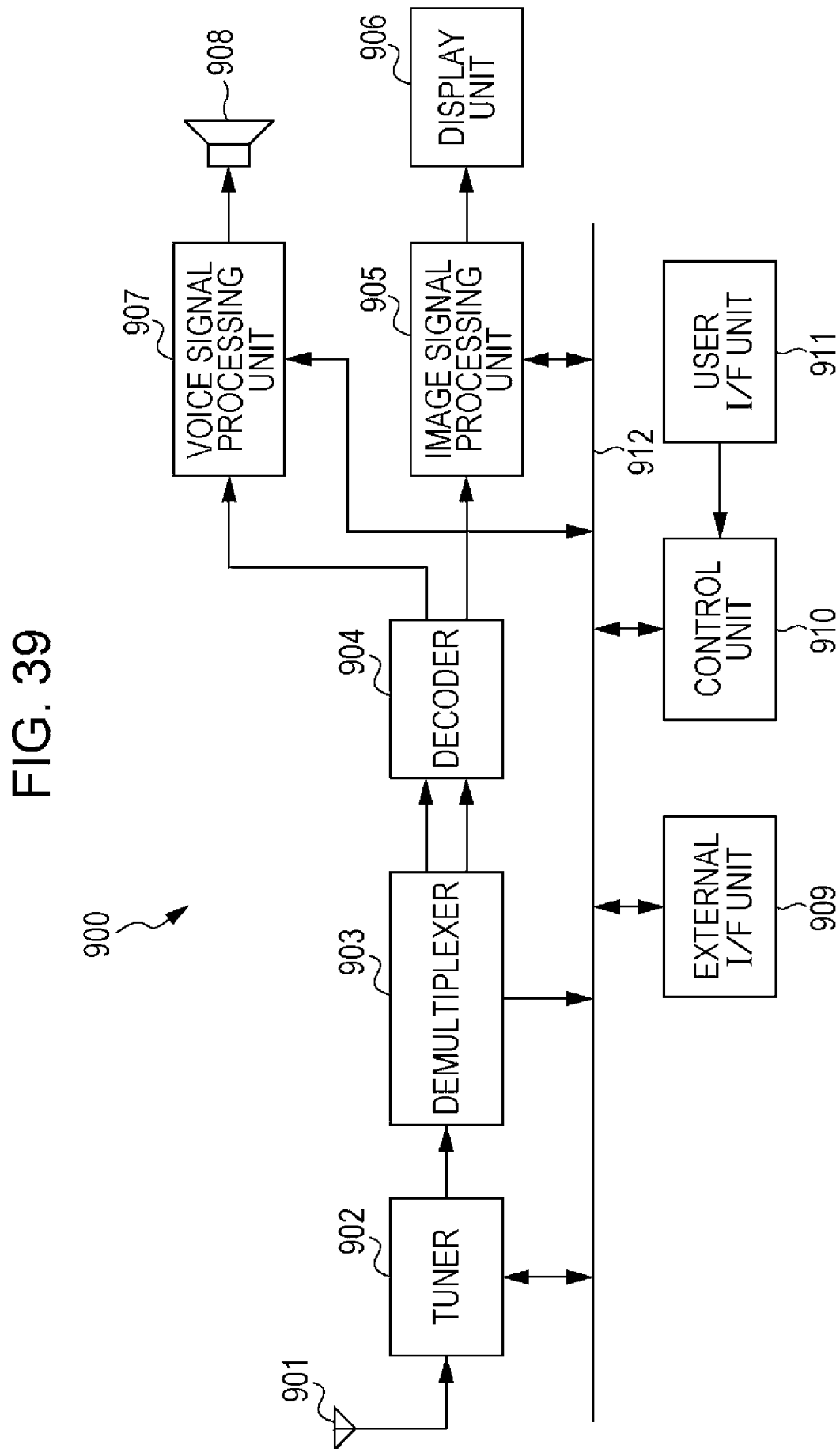
[Fig. 37]



[Fig. 38]

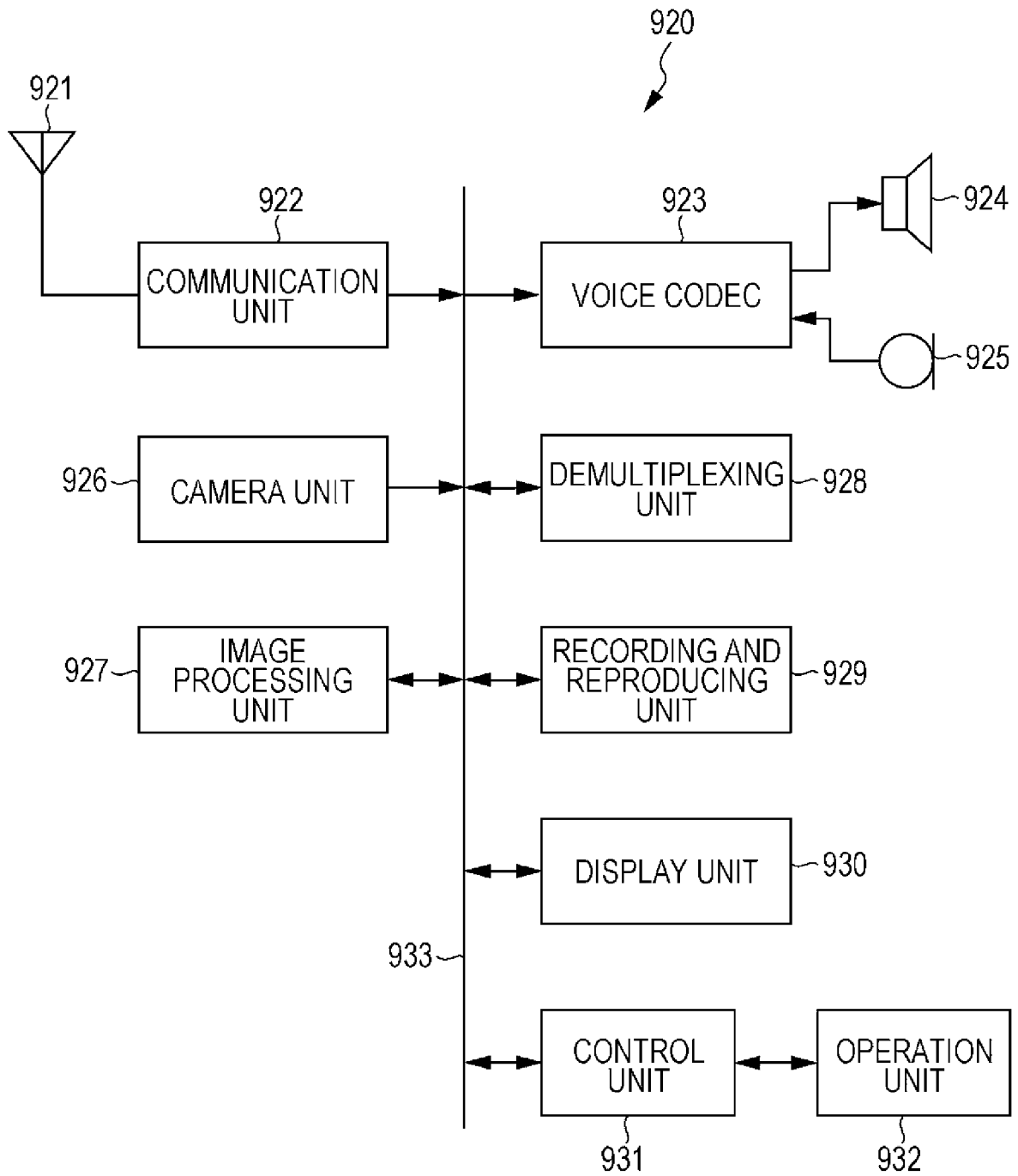


[Fig. 39]

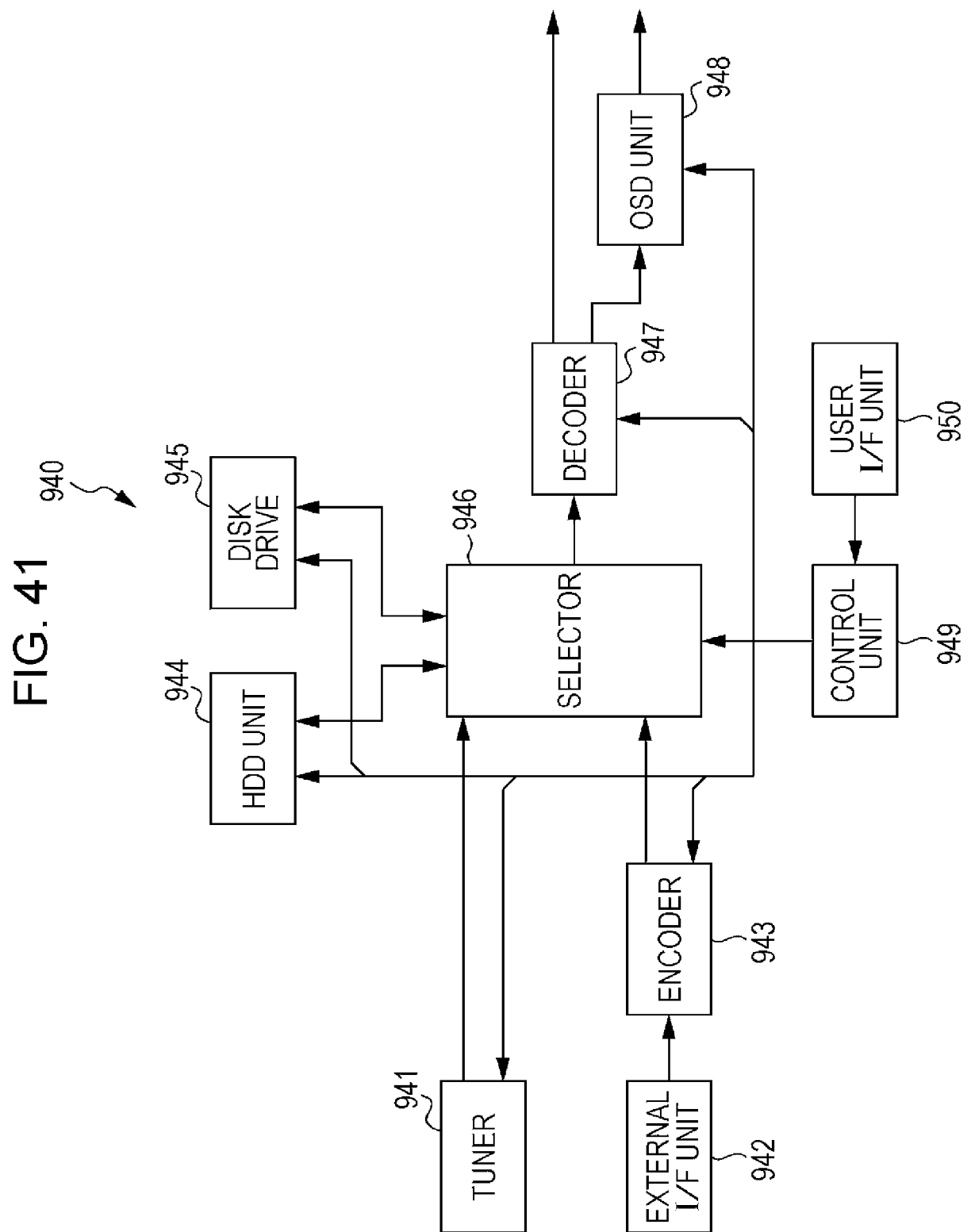


[Fig. 40]

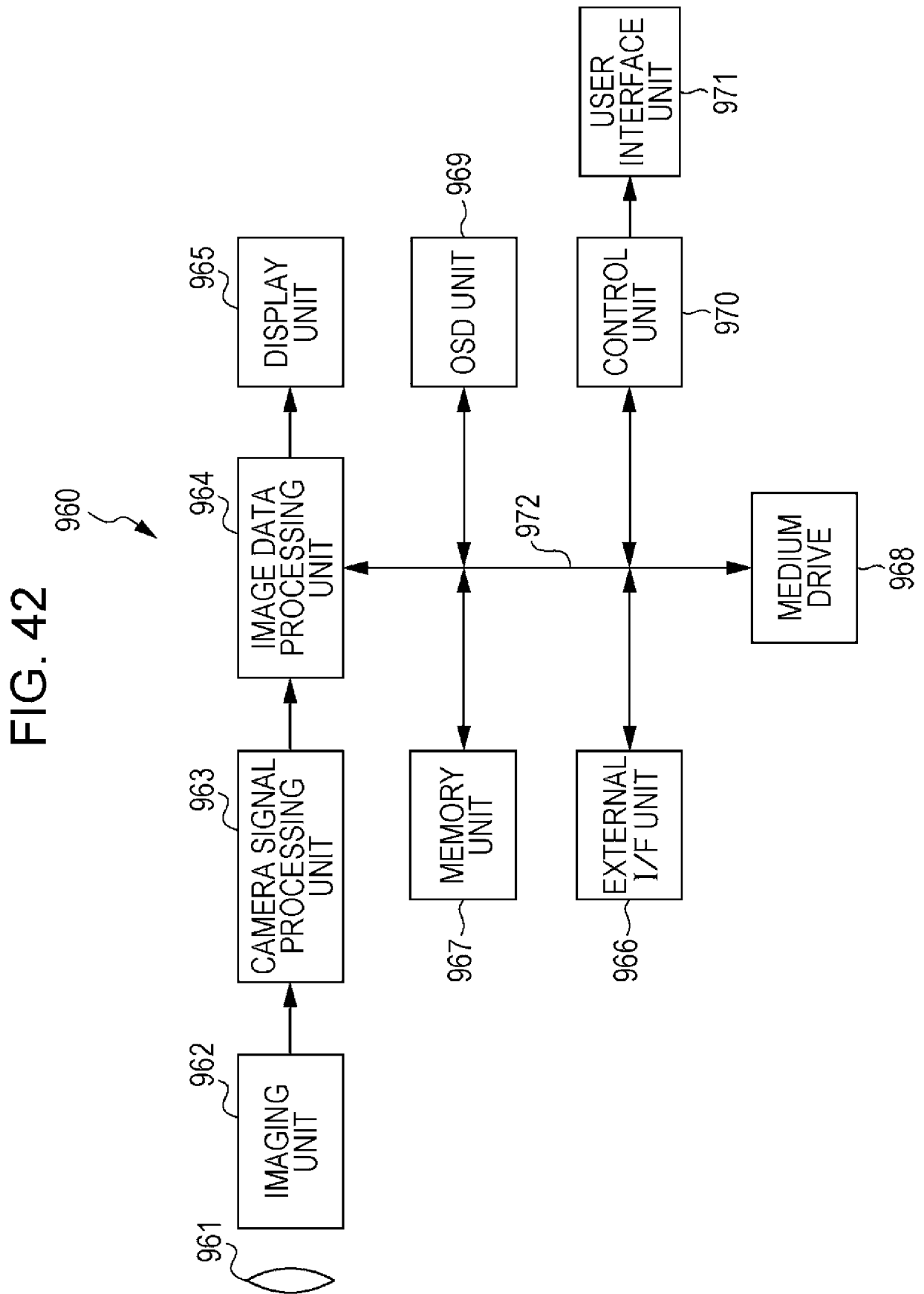
FIG. 40



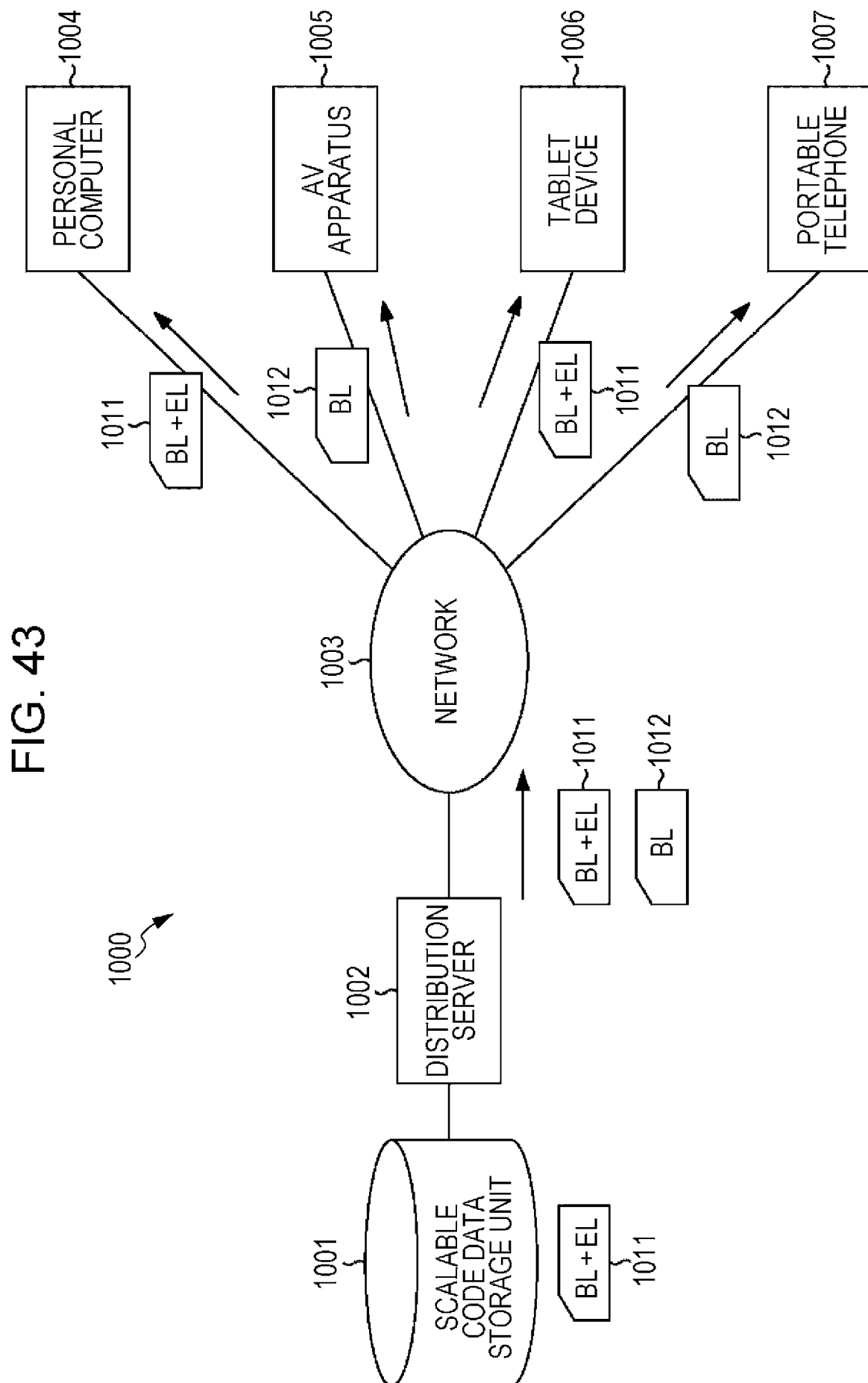
[Fig. 41]



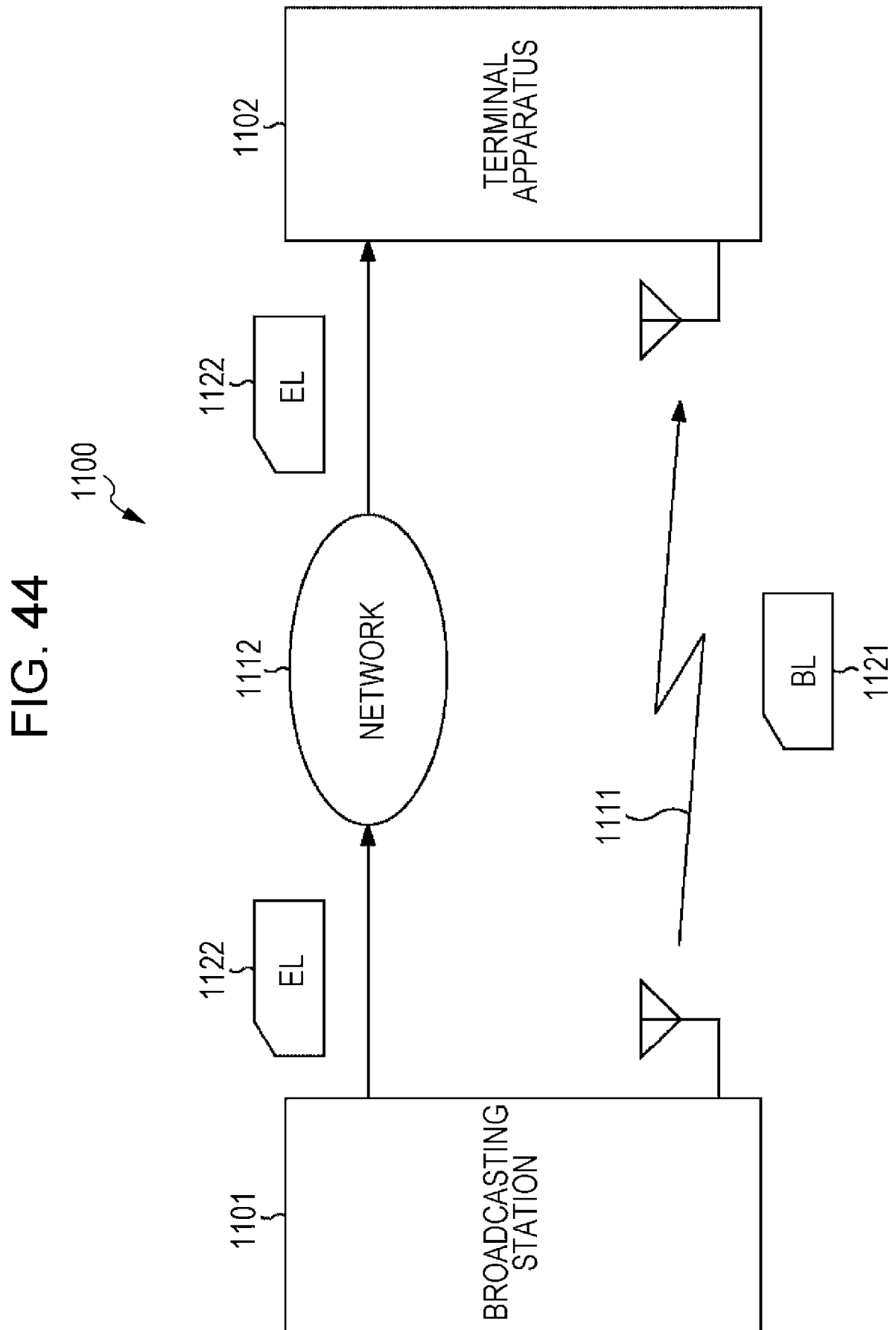
[Fig. 42]



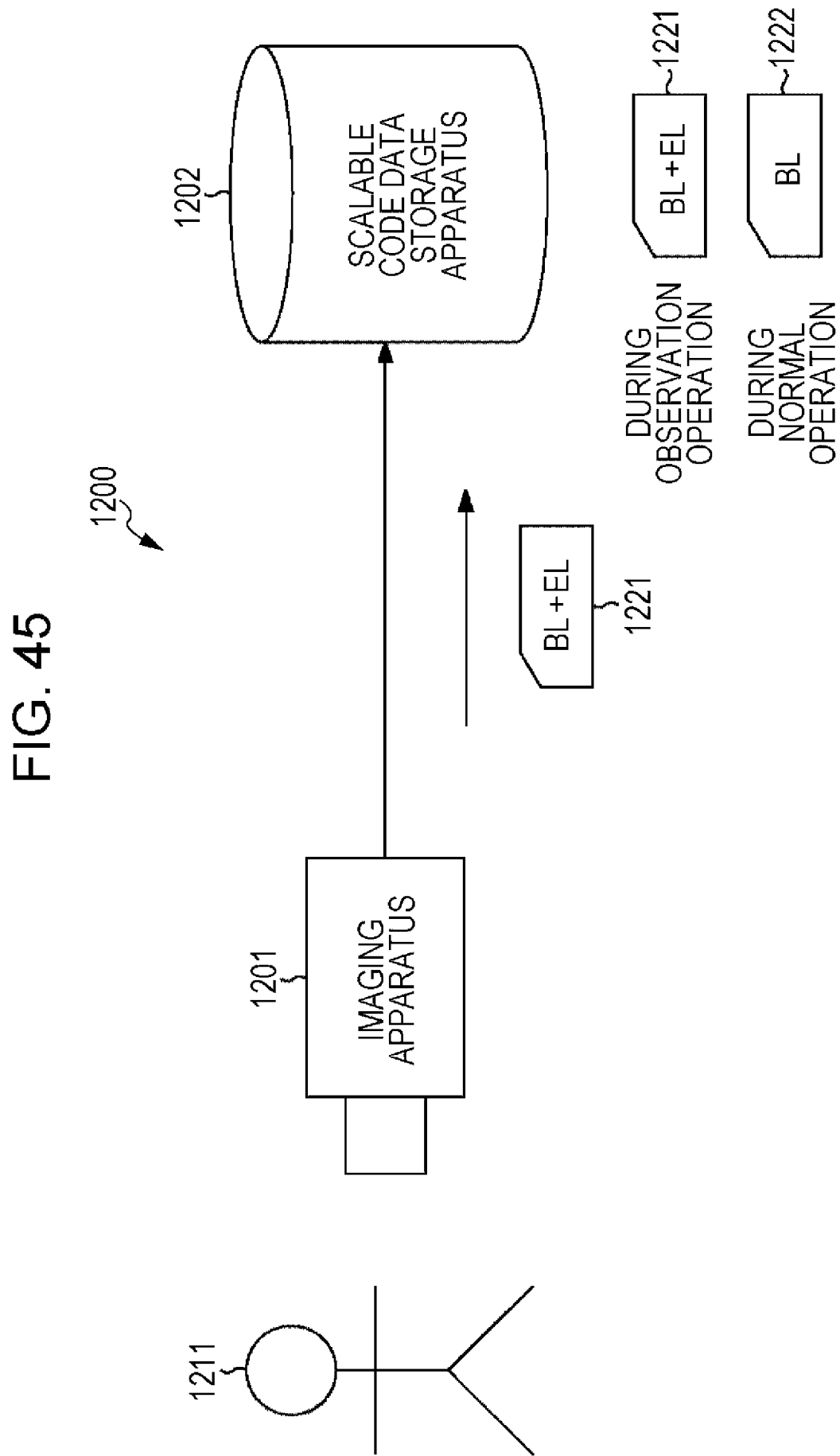
[Fig. 43]



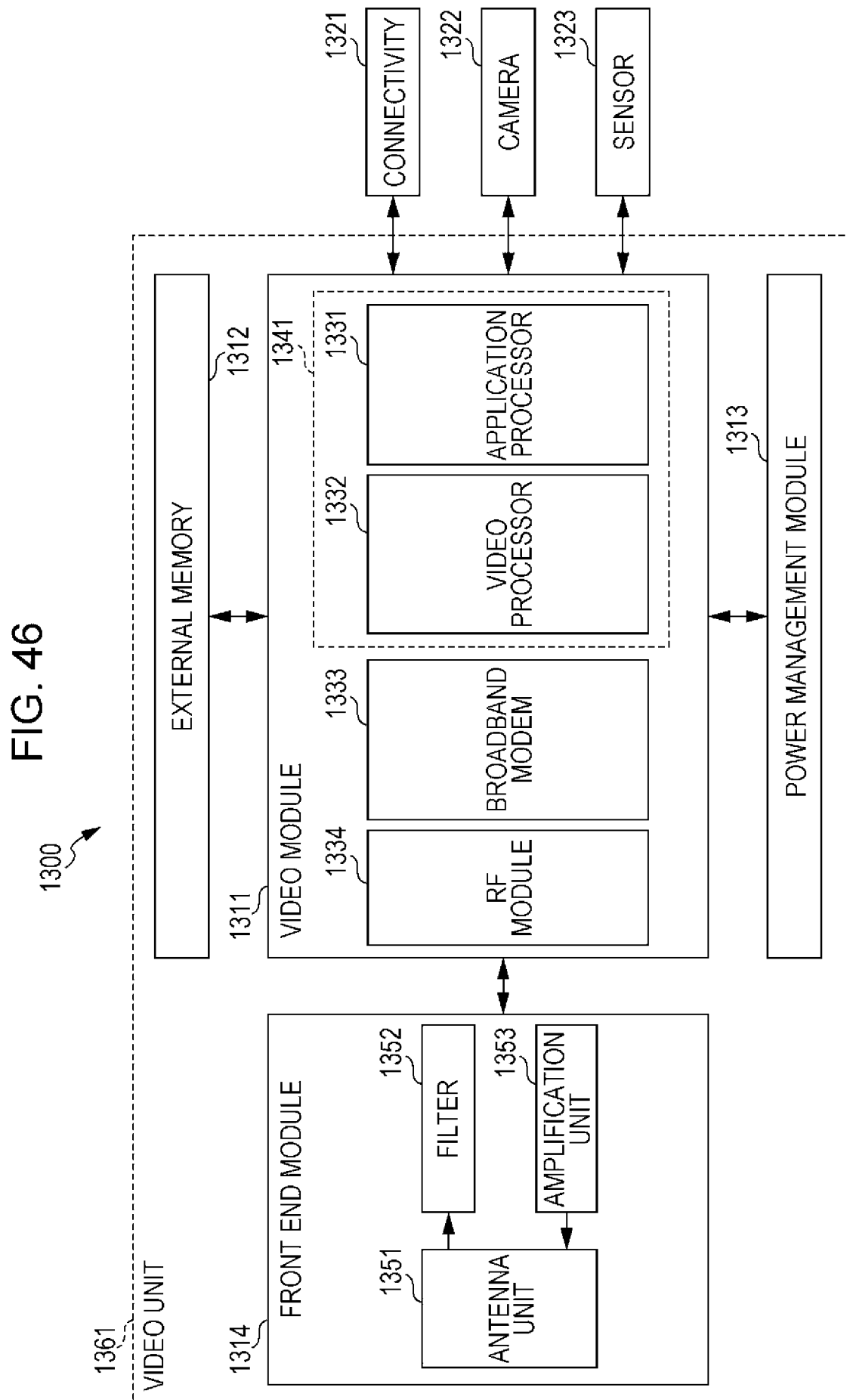
[Fig. 44]



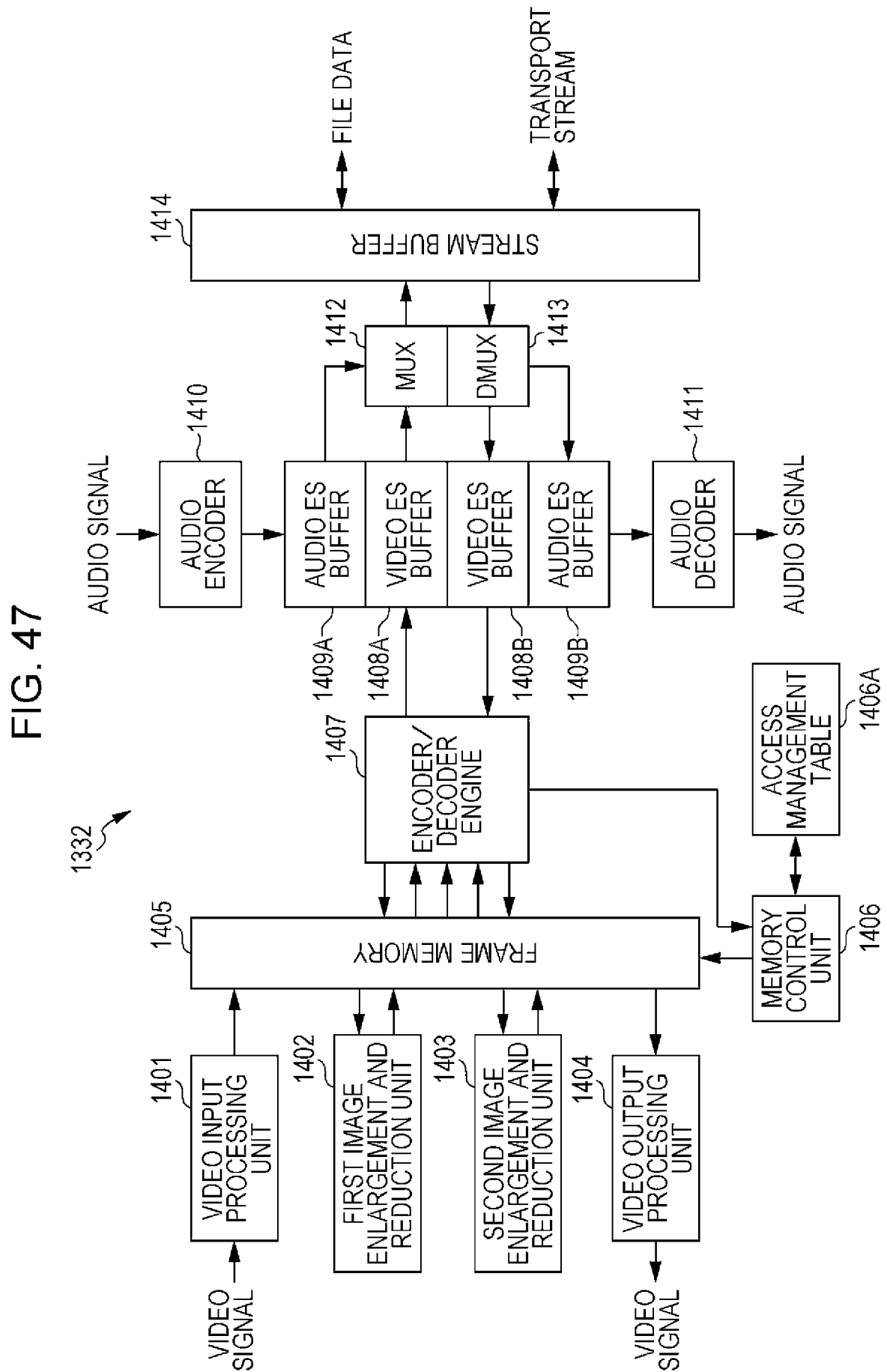
[Fig. 45]



[Fig. 46]



[Fig. 47]



[Fig. 48]

FIG. 48

