

1/72

FIG. 1

1	short_term_ref_pic_set(idx) {	Descriptor
2	inter_ref_pic_set_prediction_flag	u(1)
3	if (inter_ref_pic_set_prediction_flag) {	
4	delta_idx_minus1	ue(v)
5	delta_rps_sign	u(1)
6	abs_delta_rps_minus1	ue(v)
7	for (j = 0; j <= NumDeltaPocs[RIdx]; j++) {	
8	used_by_curr_pic_flag[j]	u(1)
9	if (!used_by_curr_pic_flag[j])	
10	use_delta_flag[j]	u(1)
11	}	
12	}	
13	else {	
14	num_negative_pics	ue(v)
15	num_positive_pics	ue(v)
16	for (i = 0; i < num_negative_pics; i++) {	
17	delta_poc_s0_minus1[i]	ue(v)
18	used_by_curr_pic_s0_flag[i]	u(1)
19	}	
20	for (i = 0; i < num_positive_pics; i++) {	
21	delta_poc_s1_minus1[i]	ue(v)
22	used_by_curr_pic_s1_flag[i]	u(1)
23	}	
24	}	
25	}	

FIG. 2

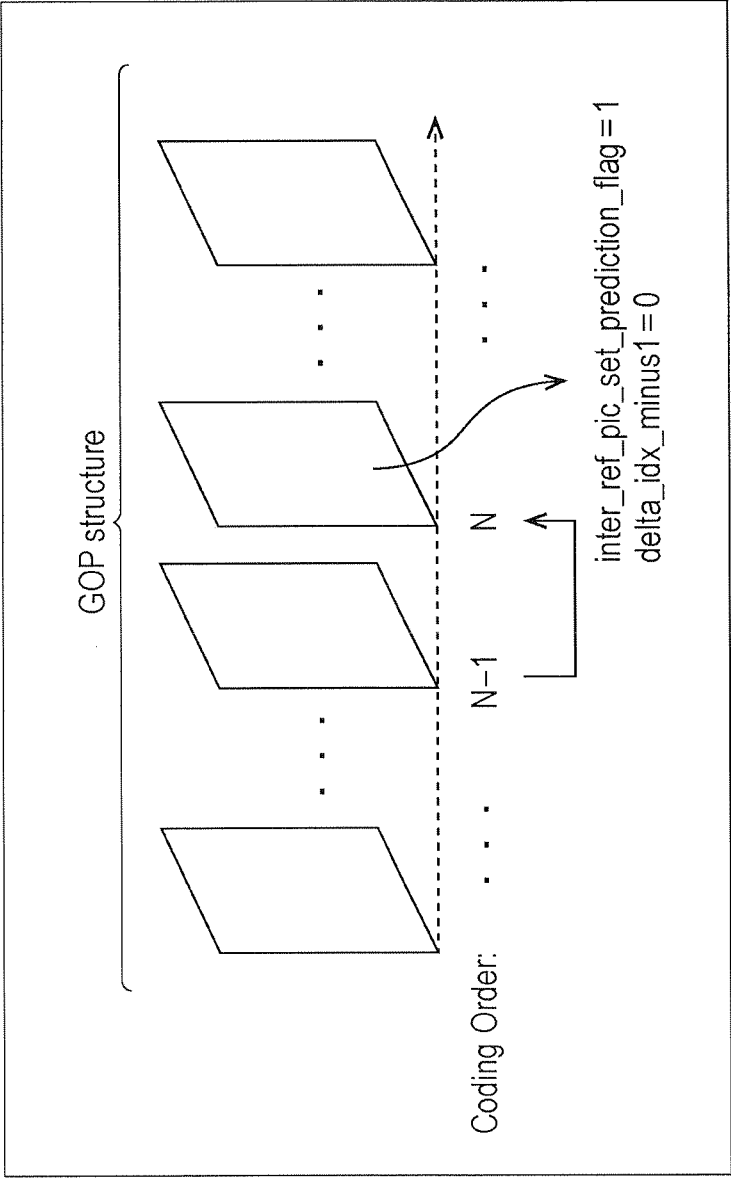
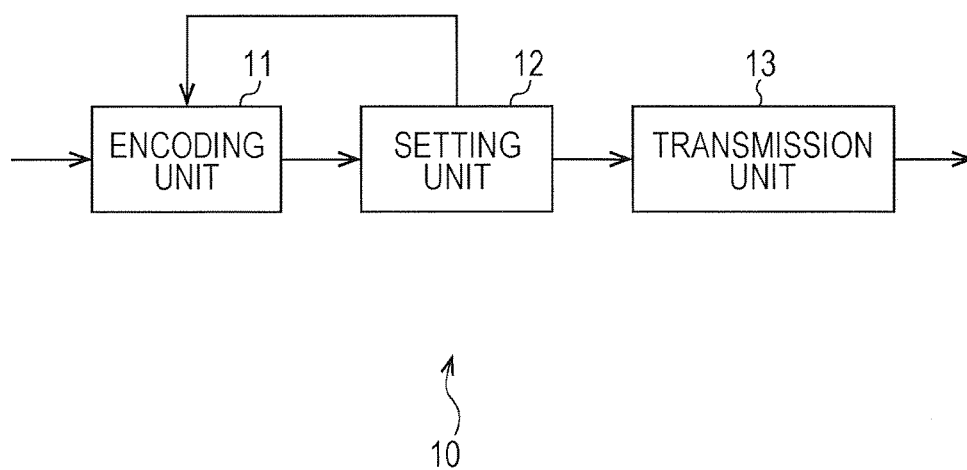


FIG. 3

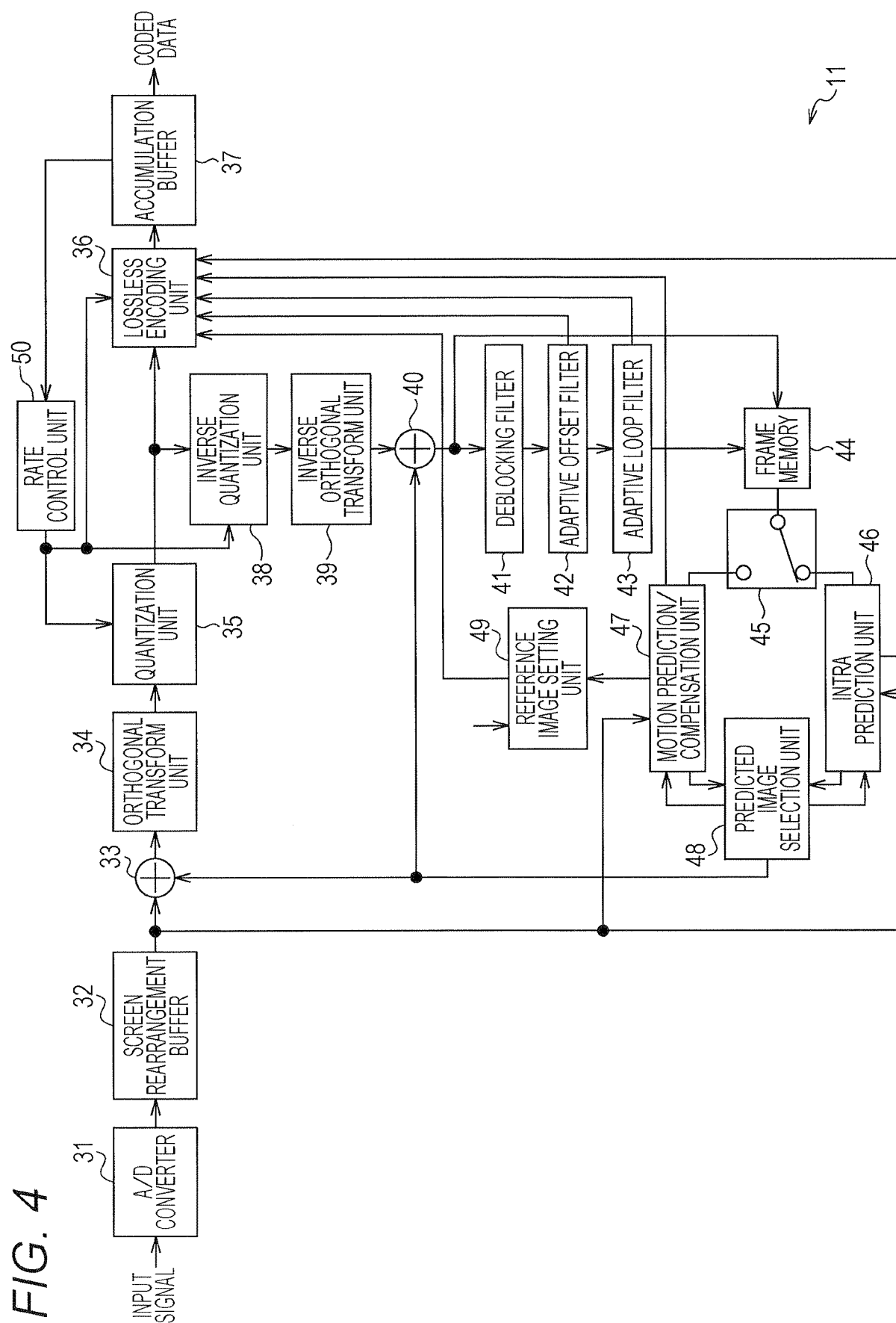


FIG. 5

1	seq_parameter_set_rbsp() {	Descriptor
2	...	
3	seq_loop_filter_across_slices_enabled_flag	u(1)
4	asymmetric_motion_partitions_enabled_flag	u(1)
5	nsrqt_enabled_flag	u(1)
6	sample_adaptive_offset_enabled_flag	u(1)
7	adaptive_loop_filter_enabled_flag	u(1)
8	if(adaptive_loop_filter_enabled_flag)	
9	alf_coef_in_slice_flag	u(1)
10	if(pcm_enabled_flag)	
11	pcm_loop_filter_disable_flag	u(1)
12	sps_temporal_id_nesting_flag	u(1)
13	[Ed. (BB): xy padding syntax missing here, present in HM software]	
14	if(log2_min_coding_block_size_minus3 == 0)	
15	inter_4x4_enabled_flag	u(1)
16	num_short_term_ref_pic_sets	ue(v)
17	for(i = 0; i < num_short_term_ref_pic_sets; i++)	
18	short_term_ref_pic_set(i)	
19	long_term_ref_pics_present_flag	u(1)
20	sps_temporal_mvp_enable_flag	u(1)
21	...	
22	}	

FIG. 6

1	short_term_ref_pic_set(idx) {	Descriptor
2	if(idx == 0)	
3	inter_ref_pic_set_prediction_flag = 0	
4	else	
5	inter_ref_pic_set_prediction_flag	u(1)
6	if(inter_ref_pic_set_prediction_flag) {	
7	...	
8	}	
9	...	
10	}	

FIG. 7

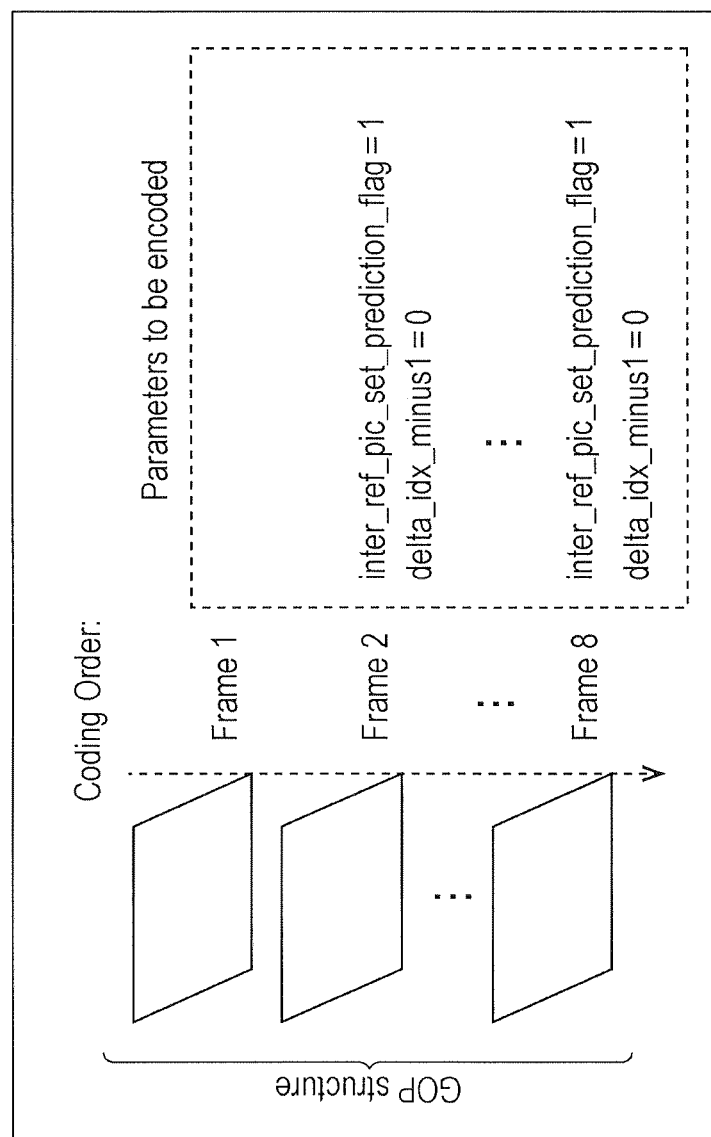


FIG. 8

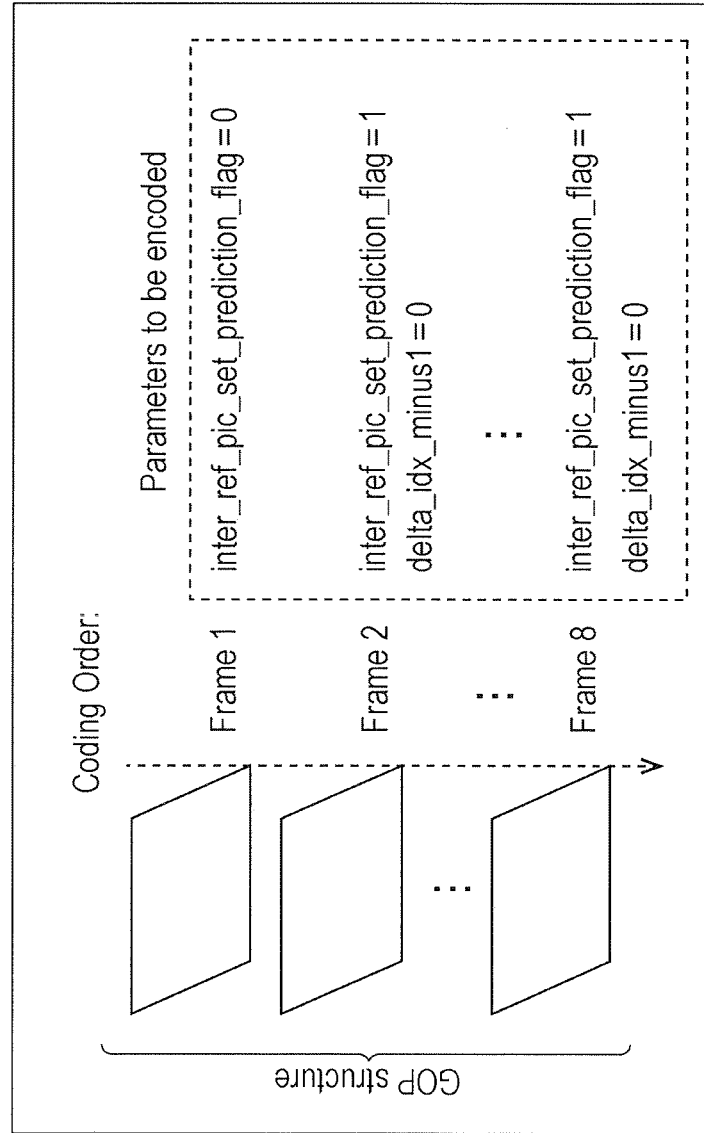
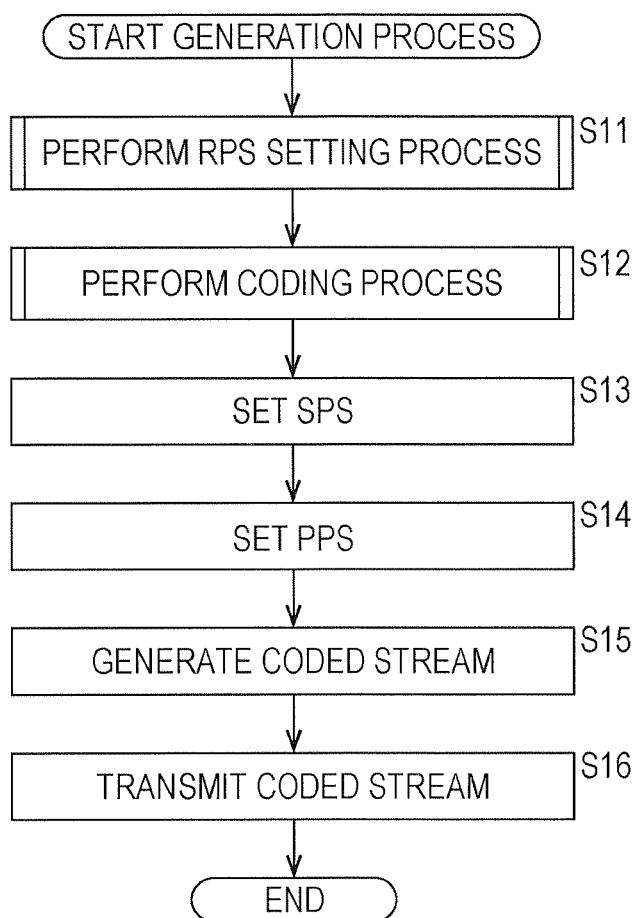


FIG. 9

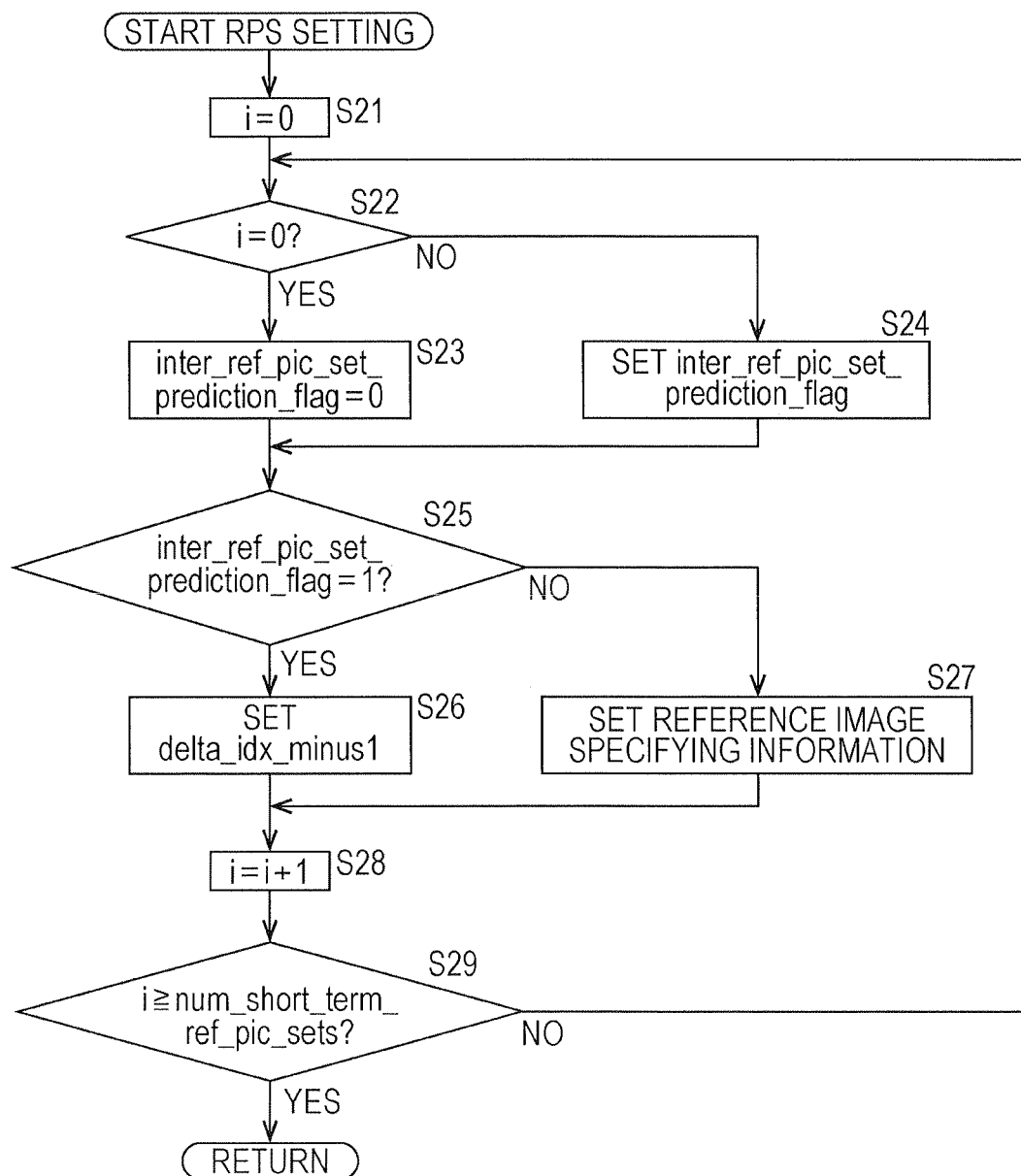
1	slice_header () {	Descriptor
2	...	
3	if (!IdrPicFlag) {	
4	pic_order_cnt_lsb	u(v)
5	short_term_ref_pic_set_sps_flag	u(l)
6	if (!short_term_ref_pic_set_sps_flag)	
7	short_term_ref_pic_set(num_short_term_ref_pic_sets)	
8	else	
9	short_term_ref_pic_set_idx	u(v)
10	if (long_term_ref_pics_present_flag) {	
11	num_long_term_pics	ue(v)
12	for (i = 0; i < num_long_term_pics; i++) {	
13	poc_lsb_lt[i]	u(v)
14	delta_poc_msb_present_flag[i]	u(l)
15	if (delta_poc_msb_present_flag[i])	
16	delta_poc_msb_cycle_lt[i]	ue(v)
17	used_by_curr_pic_lt_flag[i]	u(l)
18	}	
19	}	
20	}	
21	...	
22	}	

10/72

FIG. 10

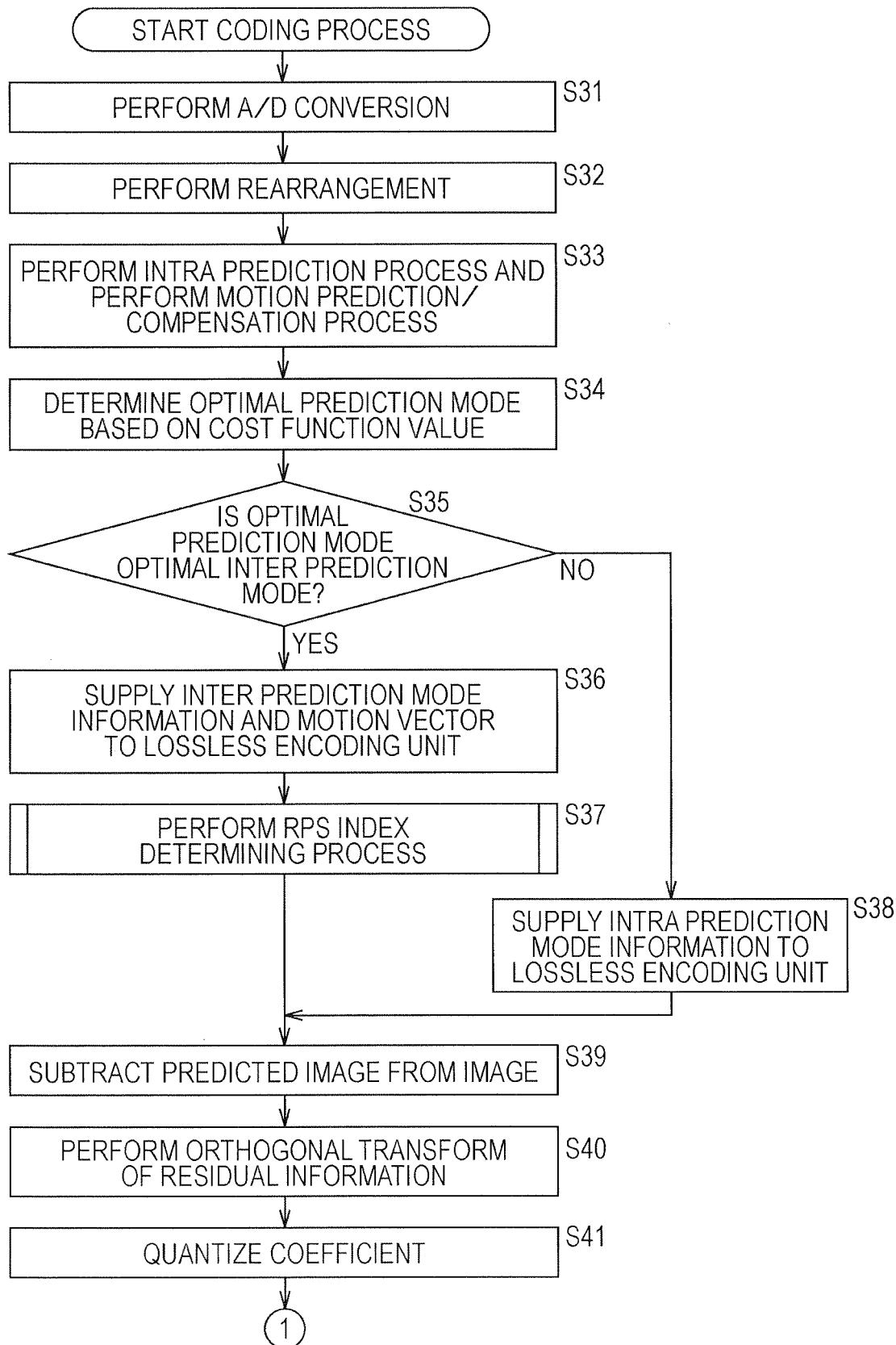
11/72

FIG. 11

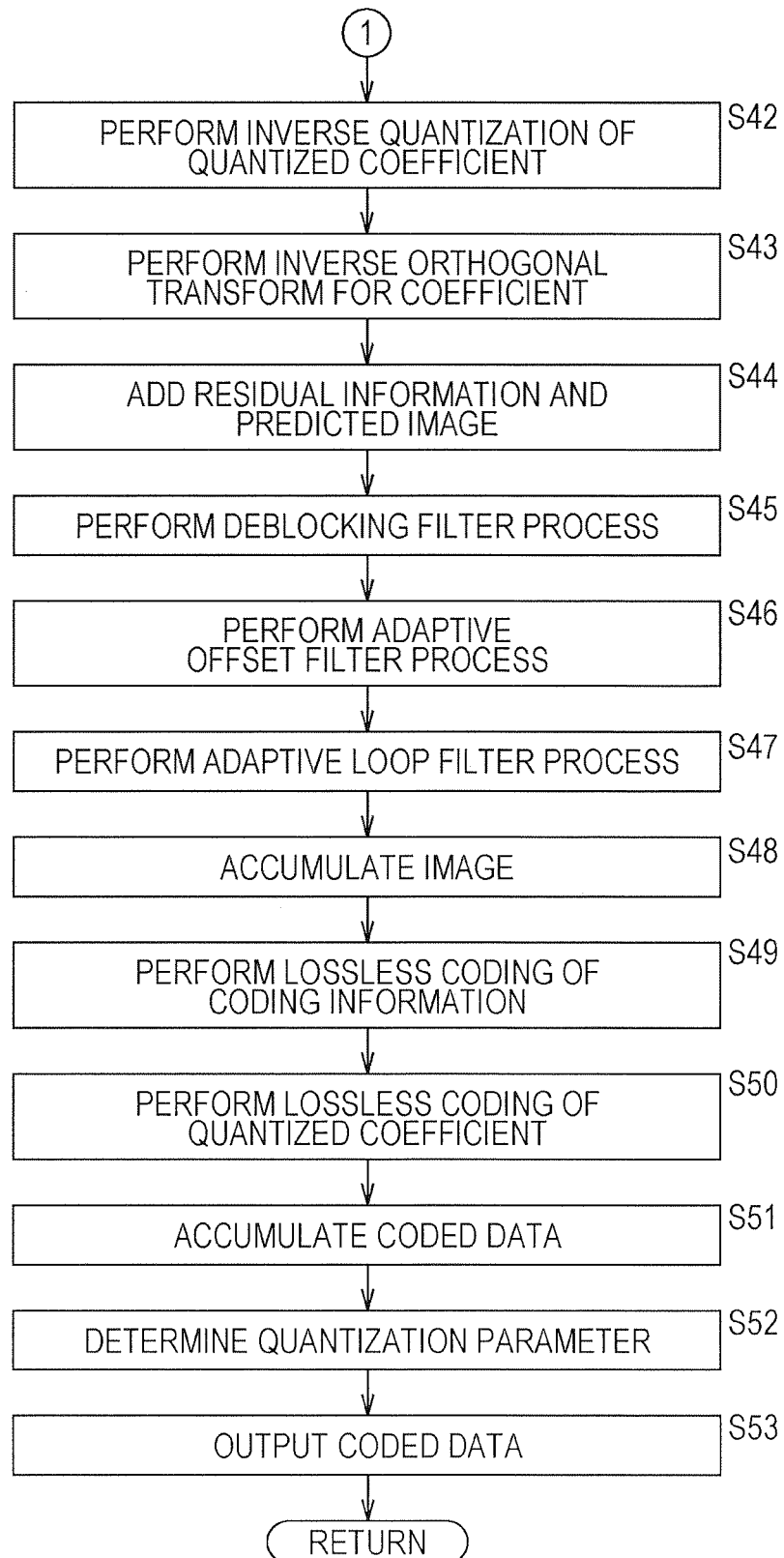


12/72

FIG. 12



13/72

FIG. 13

14/72

FIG. 14

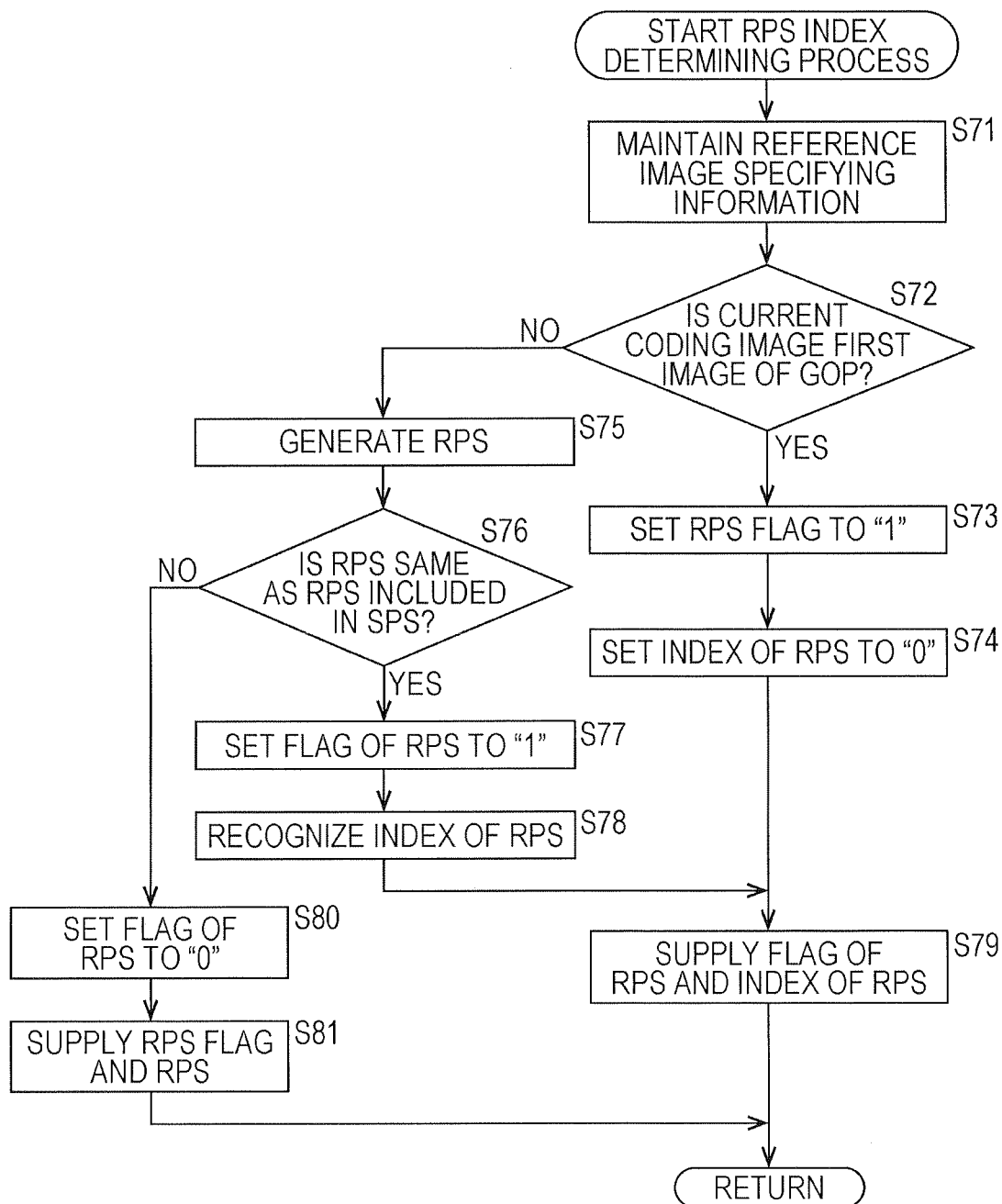


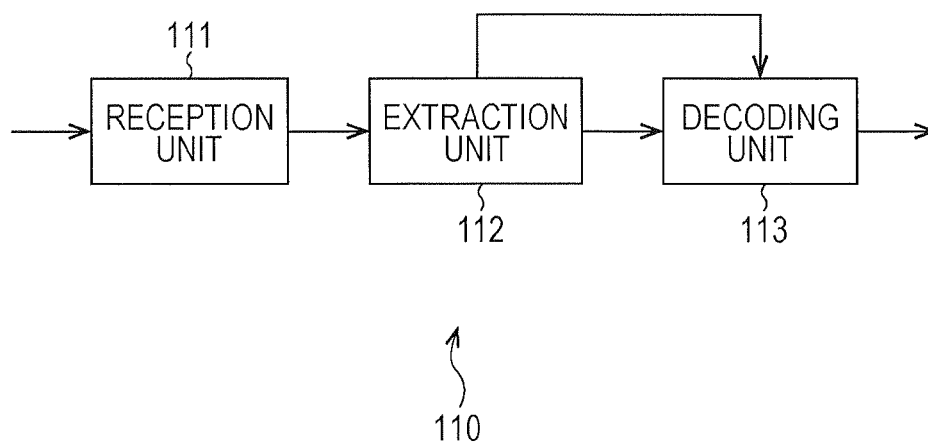
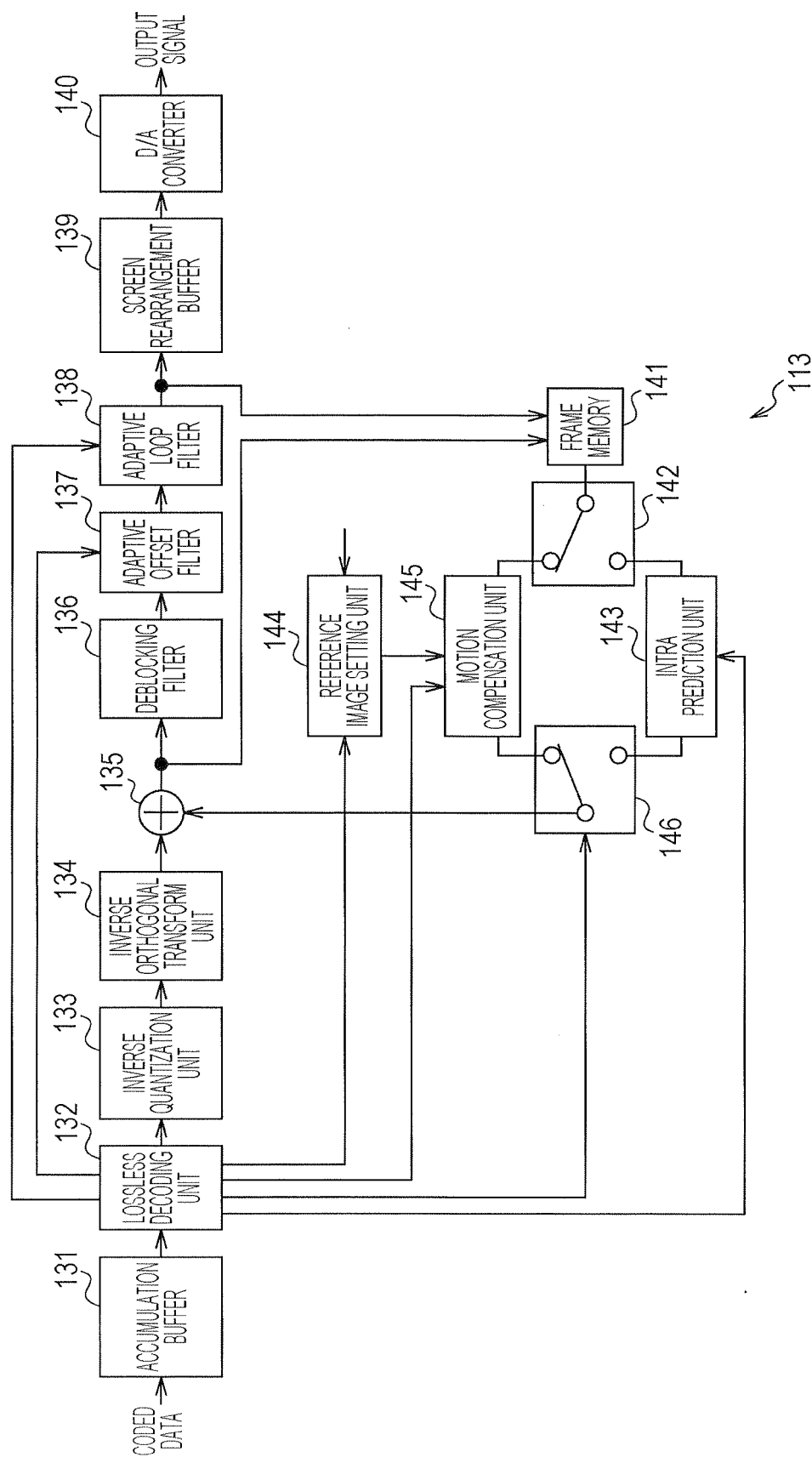
FIG. 15

FIG. 16



17/72

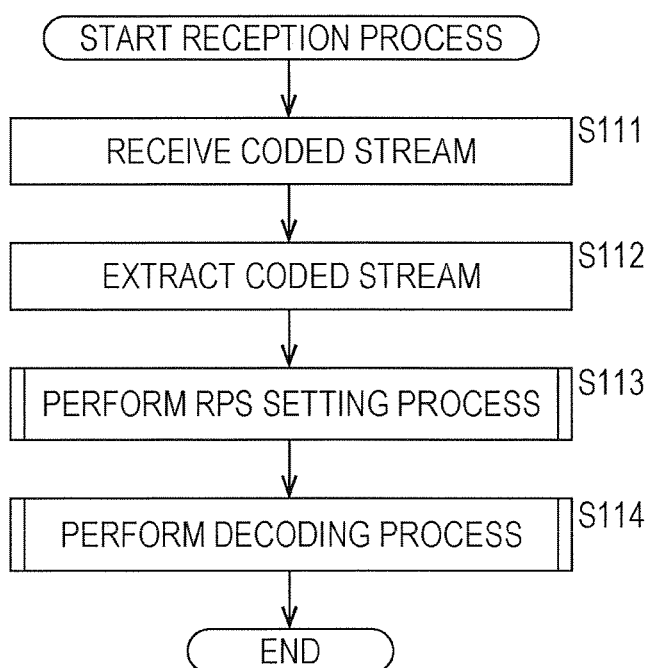
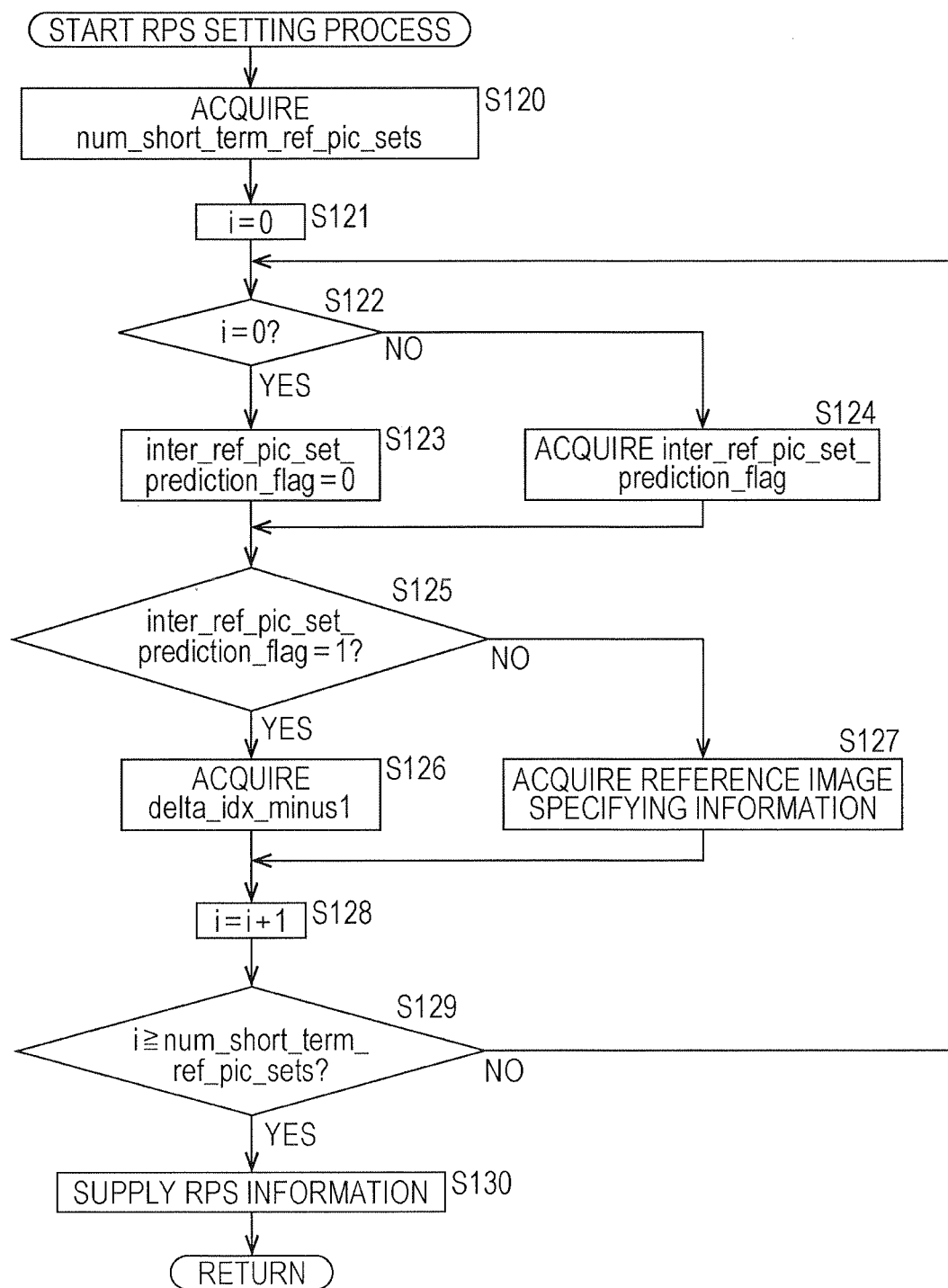
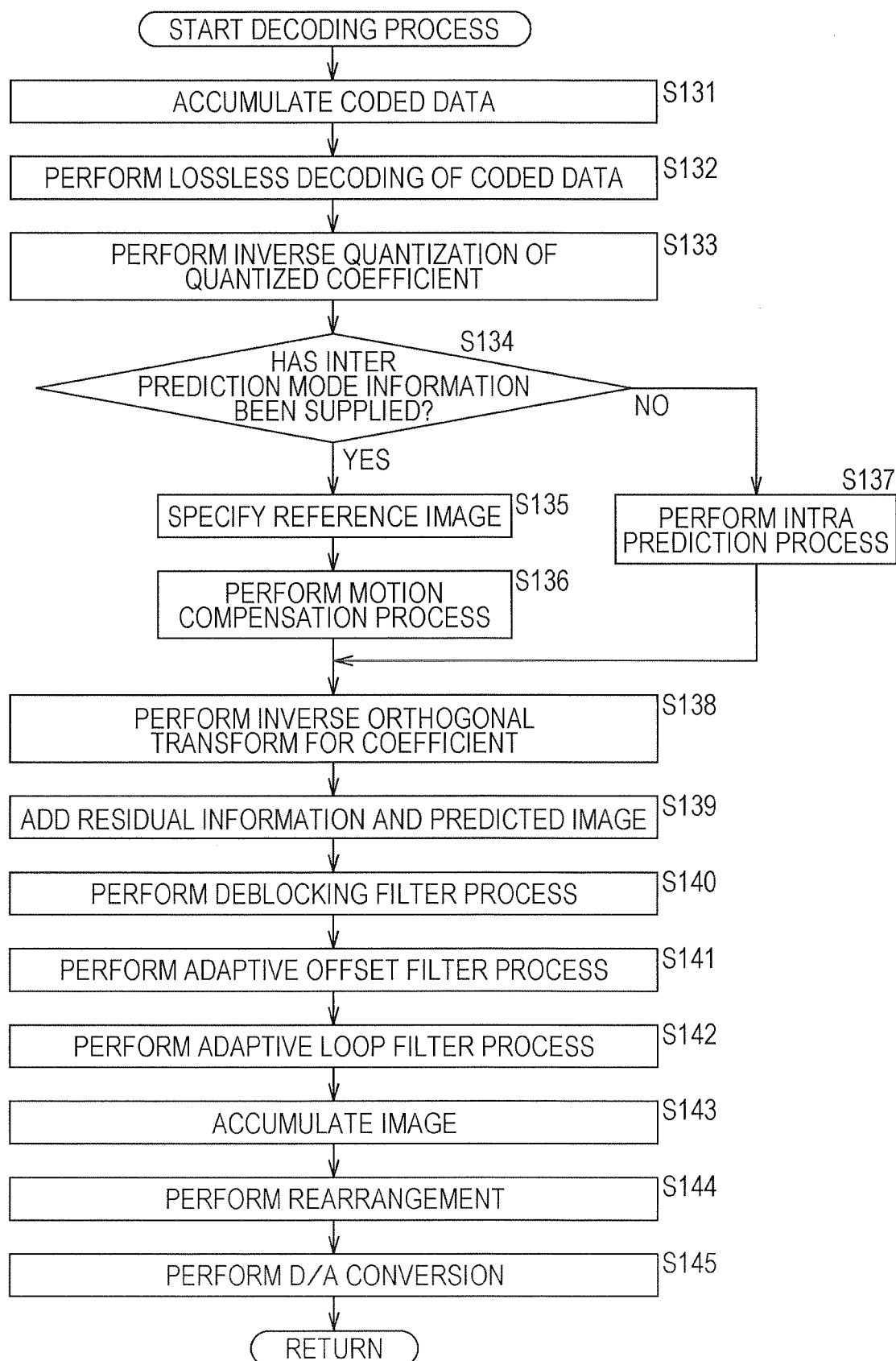
FIG. 17

FIG. 18



19/72

FIG. 19

20/72

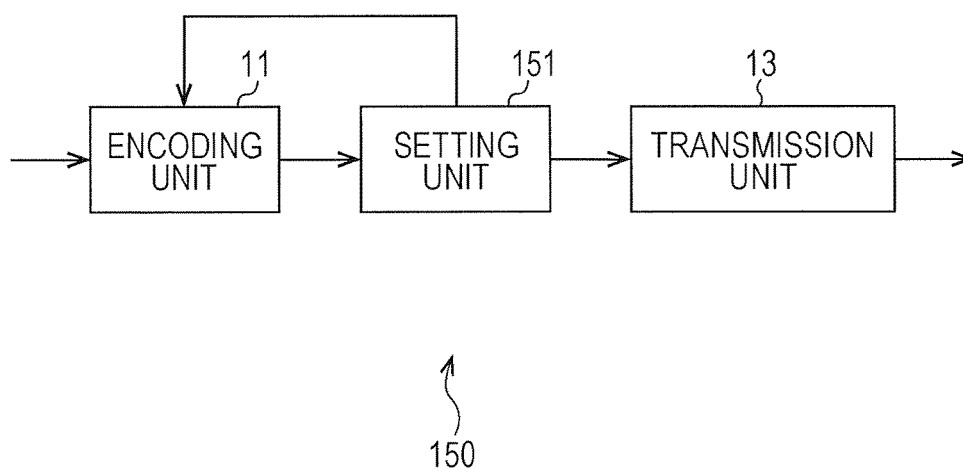
FIG. 20

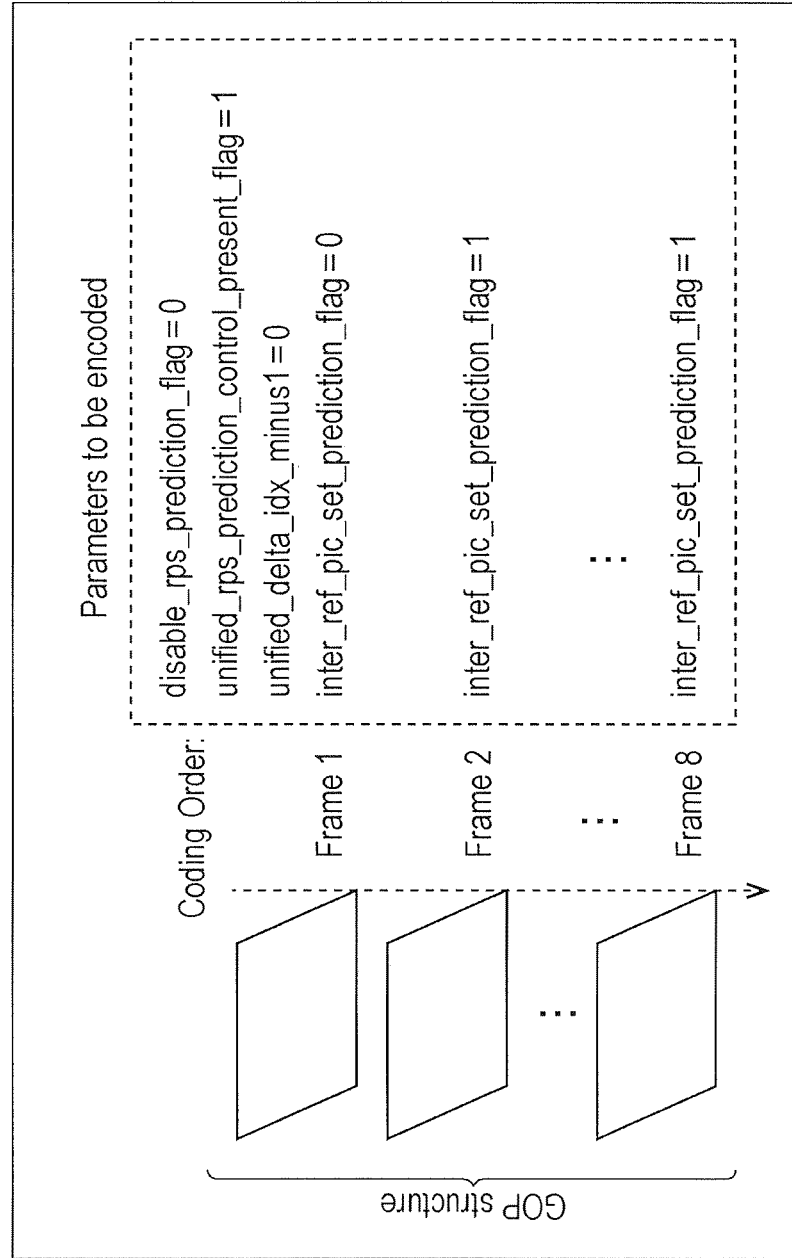
FIG. 21

1	seq_parameter_set_rbsp() {	Descriptor
2	...	
3	num_short_term_ref_pic_sets	ue(v)
4	disable_rps_prediction_flag	u(1)
5	if(! disable_rps_present_flag) {	
6	unified_rps_prediction_control_present_flag	u(1)
7	if(unified_rps_prediction_control_present_flag)	
8	unified_delta_idx_minus1	ue(v)
9	}	
10	for(i = 0; i < num_short_term_ref_pic_sets; i++)	
11	short_term_ref_pic_set(i)	
12	...	
13	}	

FIG. 22

1	short_term_ref_pic_set(idx) {	Descriptor
2	if(disable_rps_prediction_flag)	
3	inter_ref_pic_set_prediction_flag = 0	
4	else	
5	inter_ref_pic_set_prediction_flag	u(1)
6	if(inter_ref_pic_set_prediction_flag) {	
7	if(unified_rps_prediction_control_present_flag)	
8	delta_idx_minus1 = unified_delta_idx_minus1	
9	else	
10	delta_idx_minus1	ue(v)
11	...	
12	}	
13	else {	
14	...	
15	}	

FIG. 23



24/72

FIG. 24

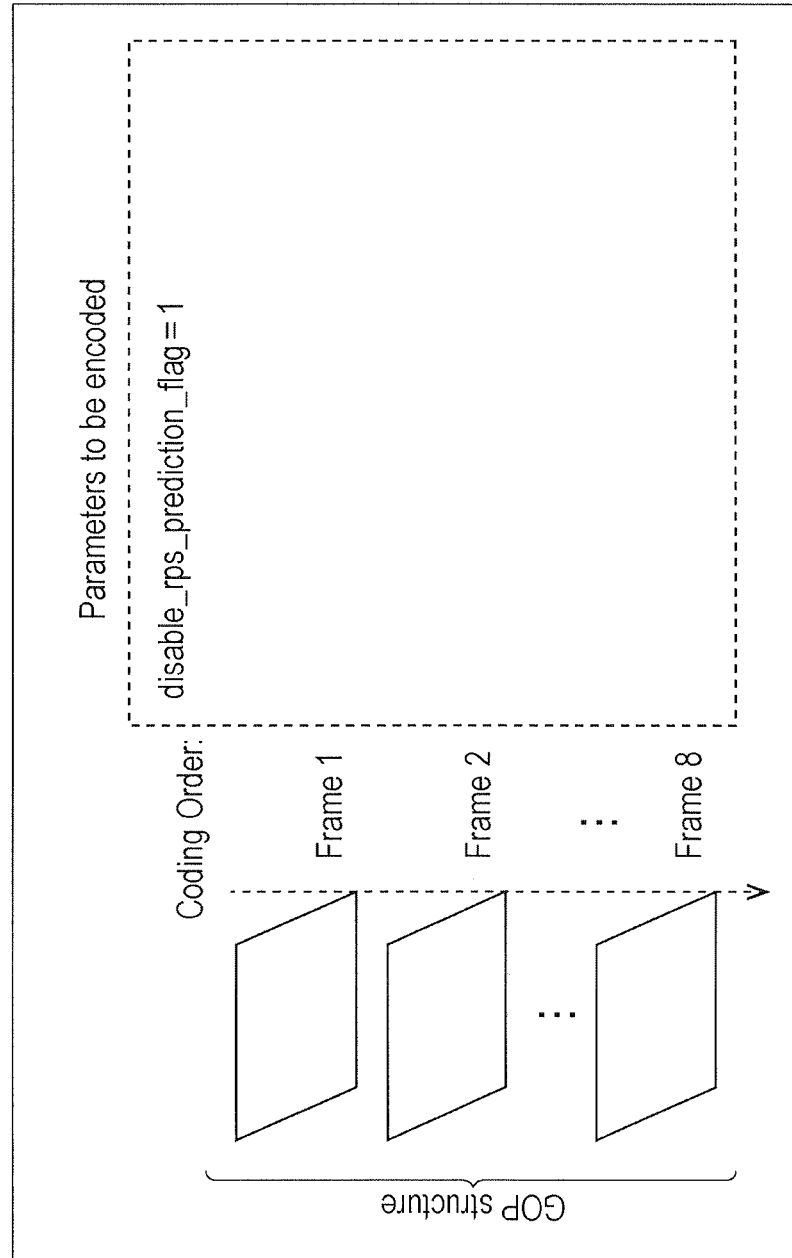
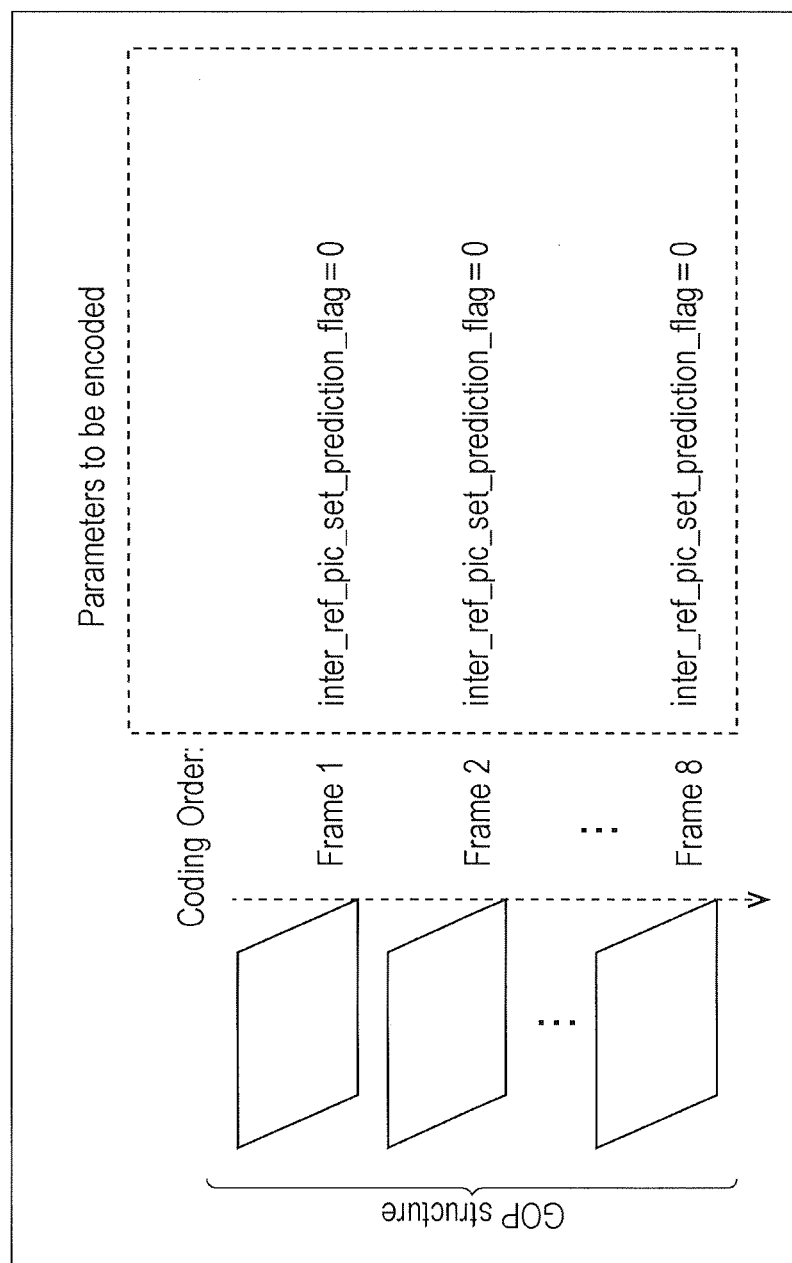
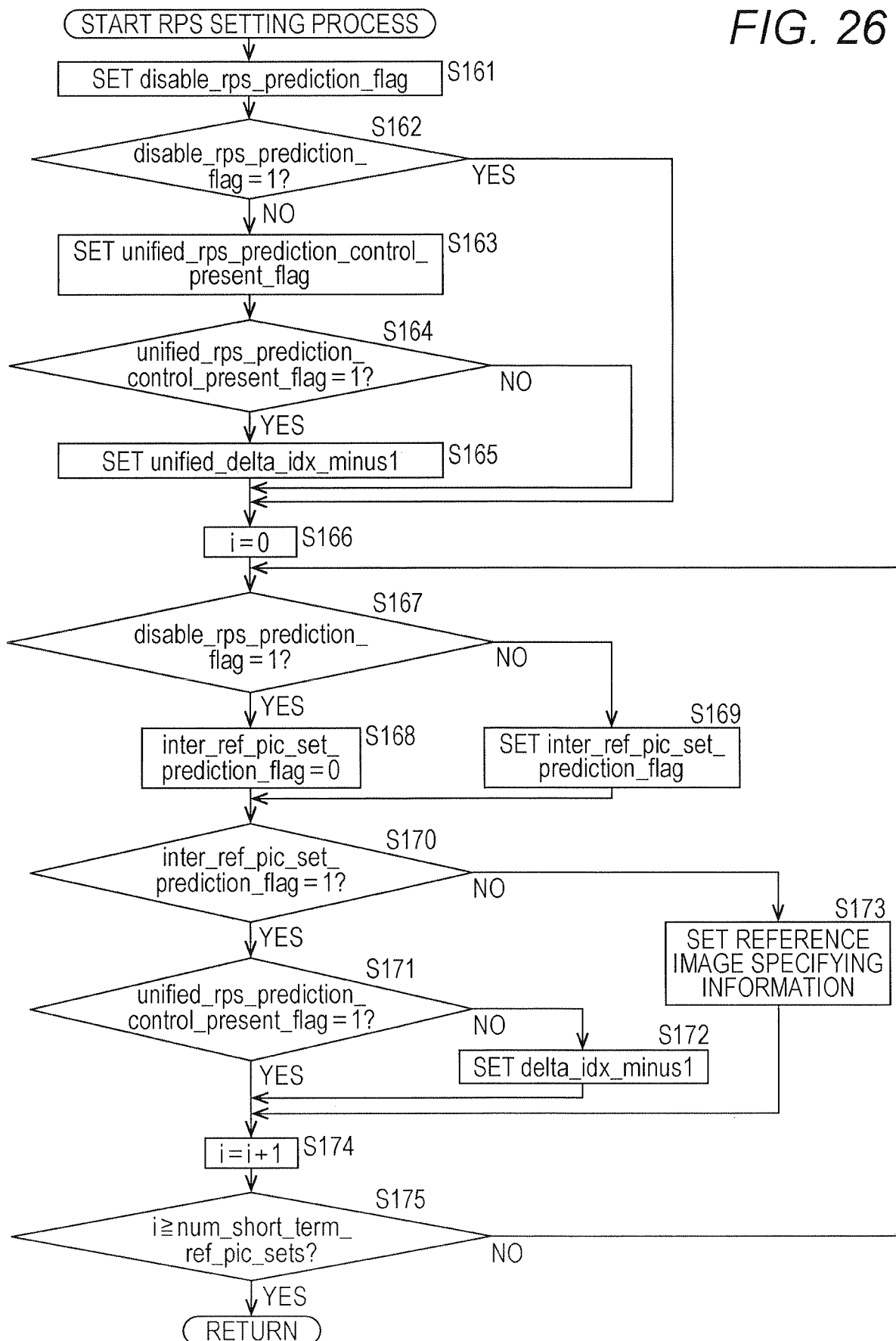


FIG. 25



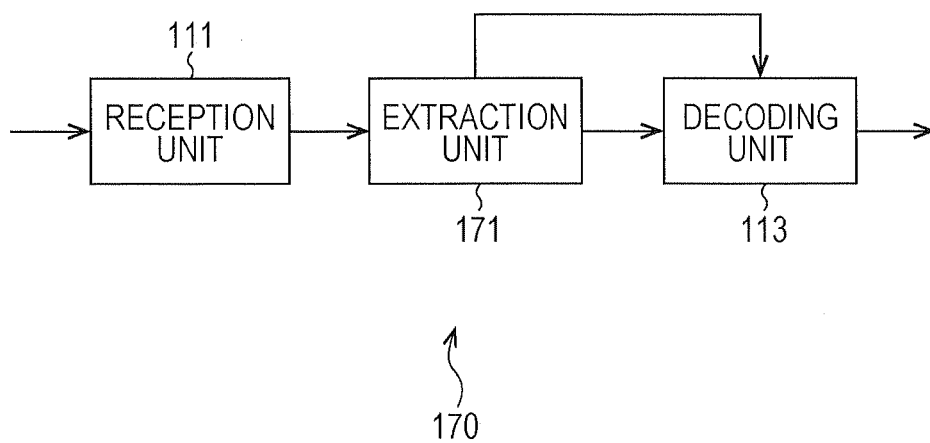
26/72

FIG. 26



27/72

FIG. 27



28/72

FIG. 28

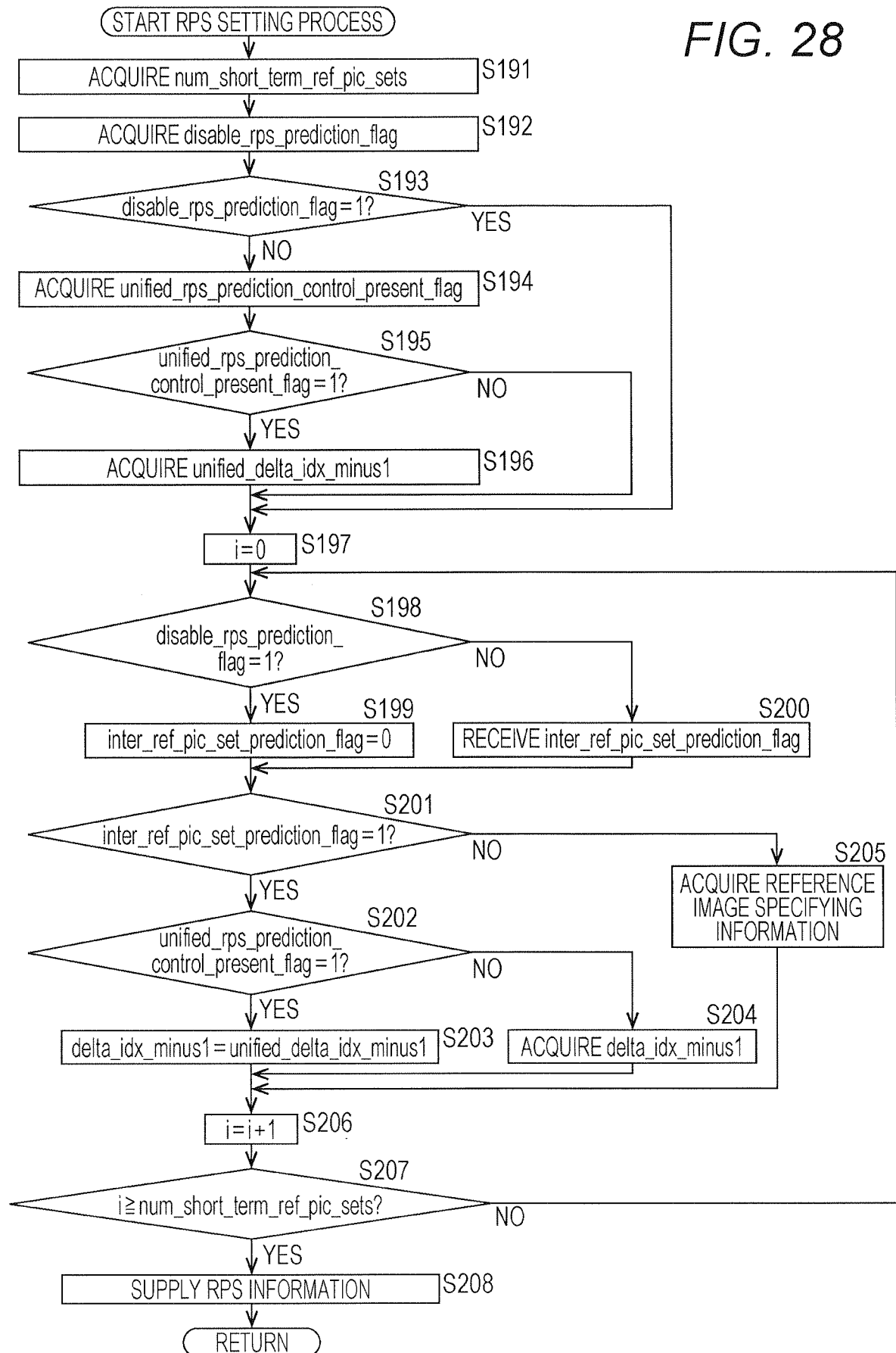
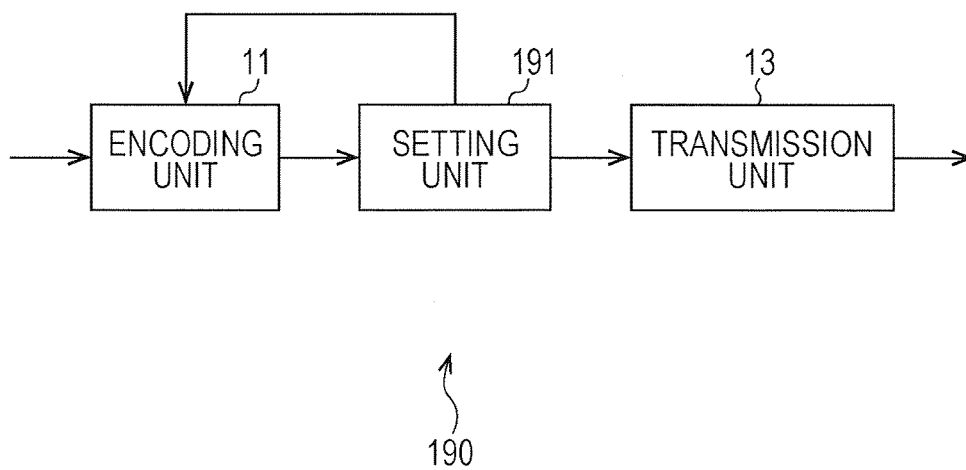


FIG. 29

30/72

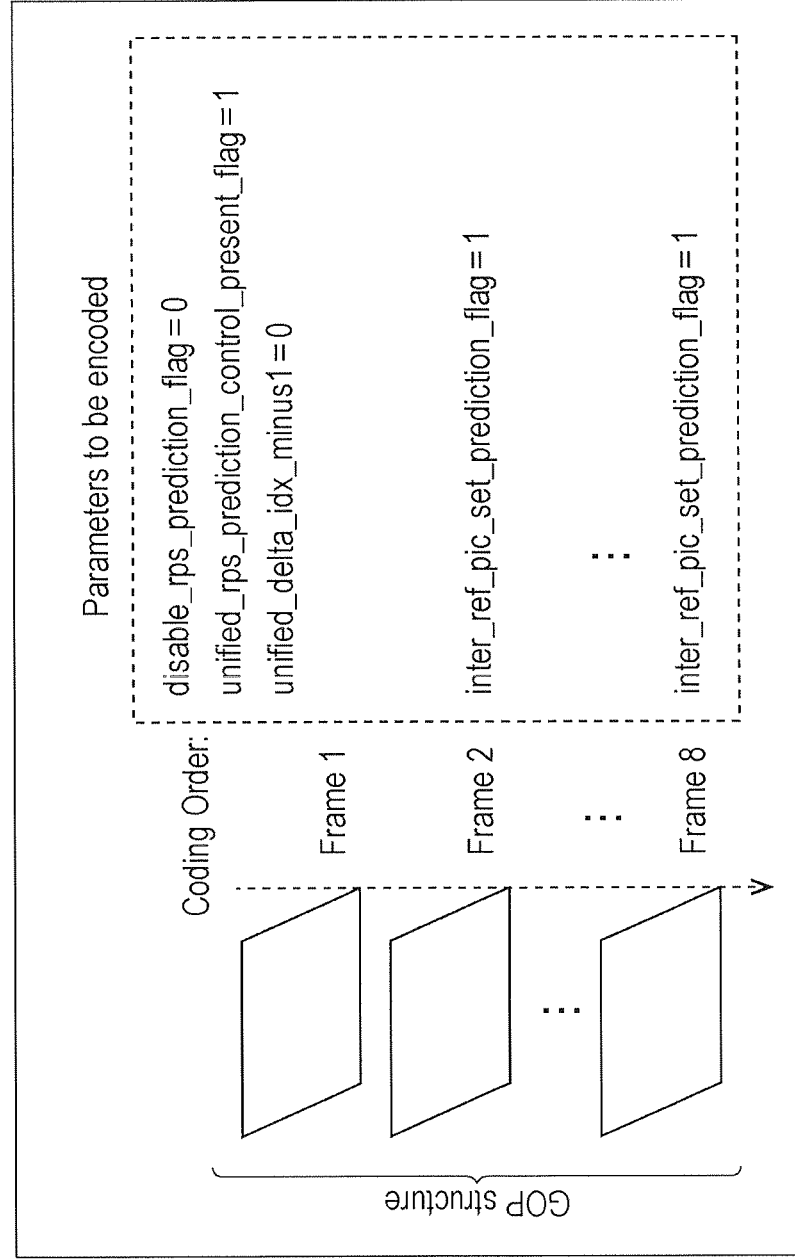
FIG. 30

1	seq_parameter_set_rbsp() {	Descriptor
2	...	
3	num_short_term_ref_pic_sets	ue(v)
4	disable_rps_prediction_flag	u(1)
5	if(! disable_rps_present_flag) {	
6	unified_rps_prediction_control_present_flag	u(1)
7	if(unified_rps_prediction_control_present_flag)	
8	unified_delta_idx_minus1	ue(v)
9	}	
10	for(i = 0; i < num_short_term_ref_pic_sets; i++)	
11	short_term_ref_pic_set(i)	
12	...	
13	}	

FIG. 31

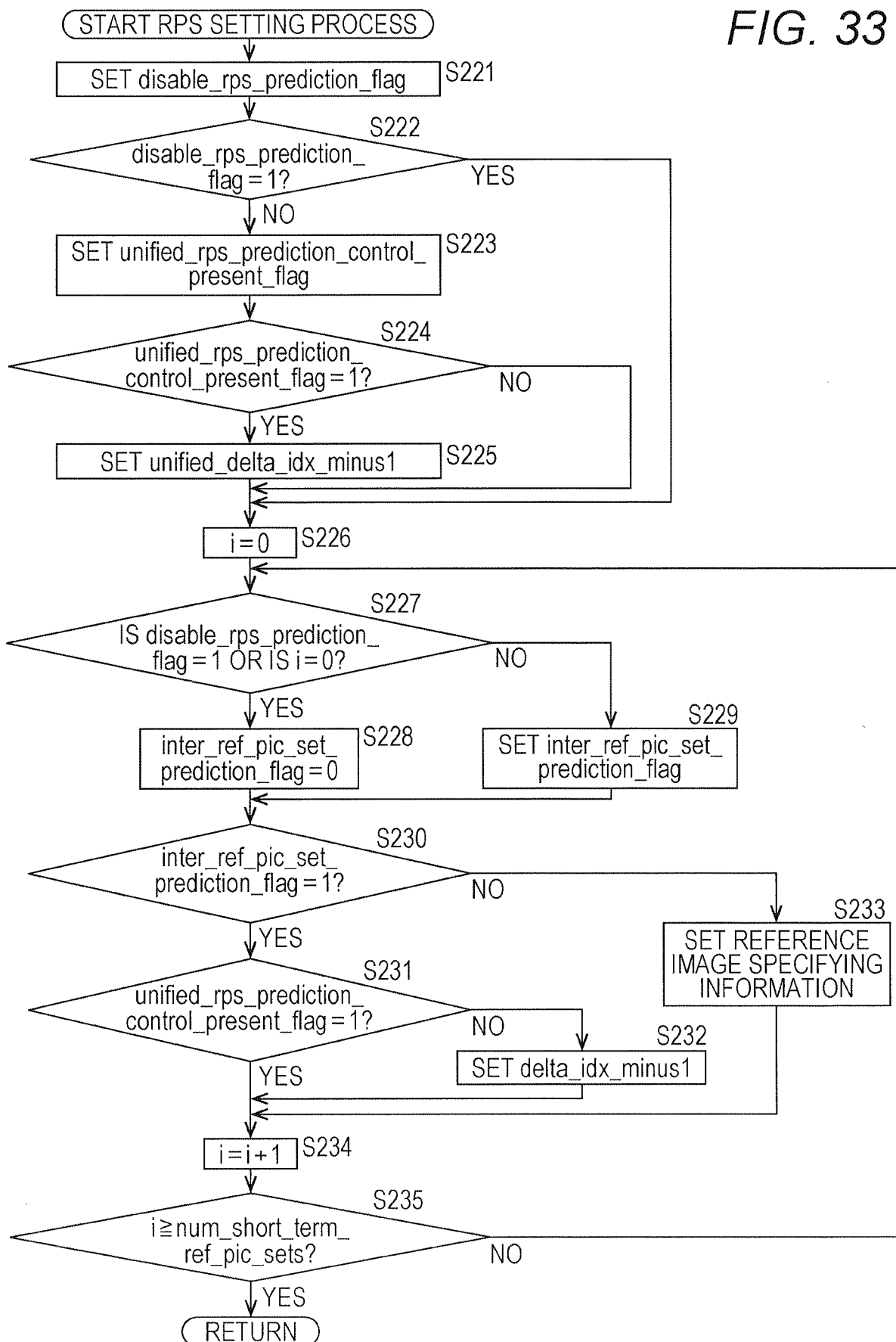
1	short_term_ref_pic_set(idx) {	Descriptor
2	if (idx == 0 disable_rps_prediction_flag)	
3	inter_ref_pic_set_prediction_flag = 0	
4	else	
5	inter_ref_pic_set_prediction_flag	u(1)
6	if(inter_ref_pic_set_prediction_flag) {	
7	if(unified_rps_prediction_control_present_flag)	
8	delta_idx_minus1 = unified_delta_idx_minus1	
9	else	
10	delta_idx_minus1	ue(v)
11	...	
12	}	
13	else{...}	
14	}	

FIG. 32

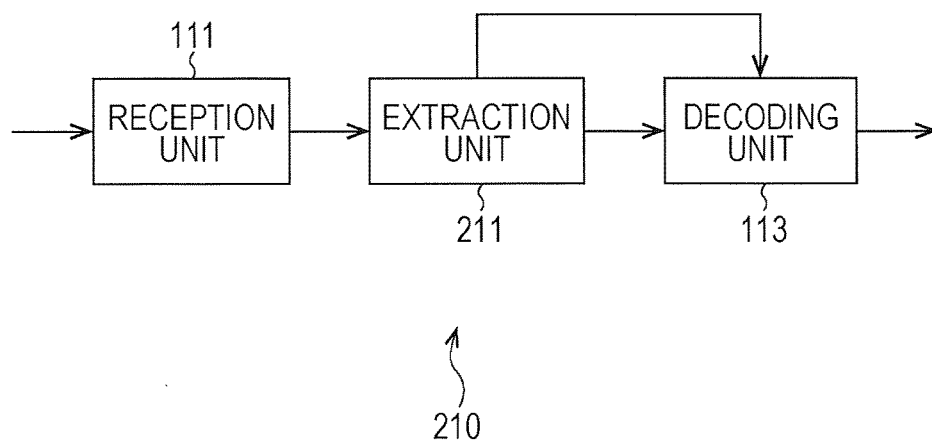


33/72

FIG. 33

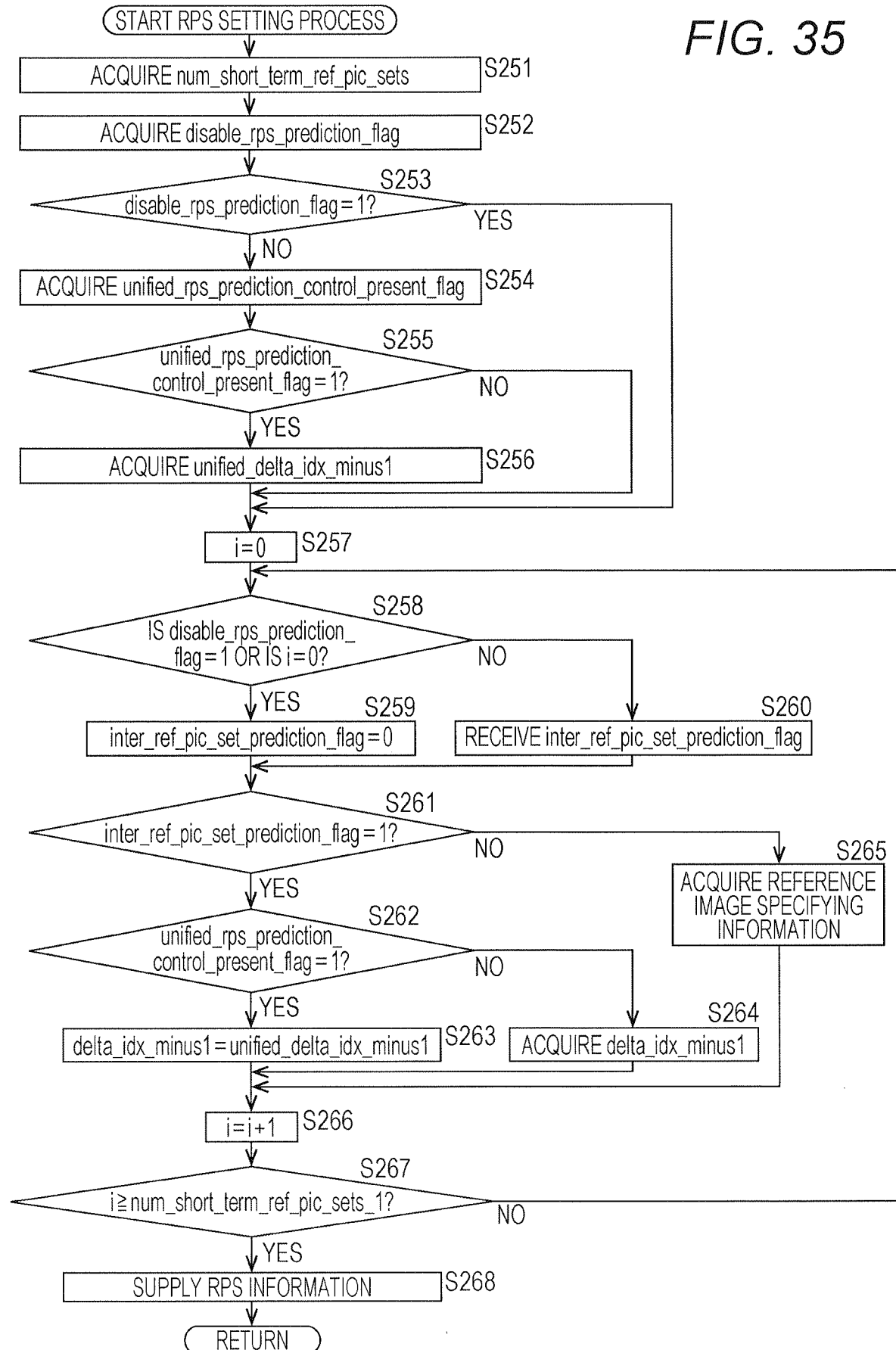


34/72

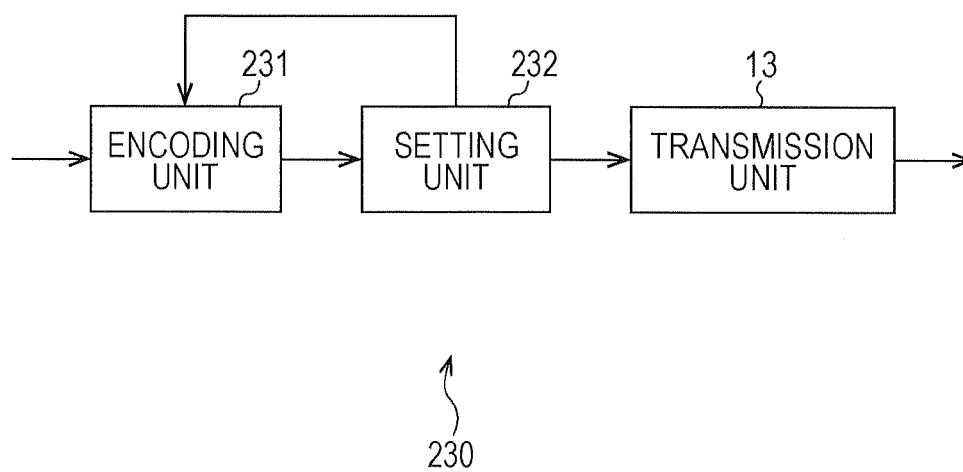
FIG. 34

35/72

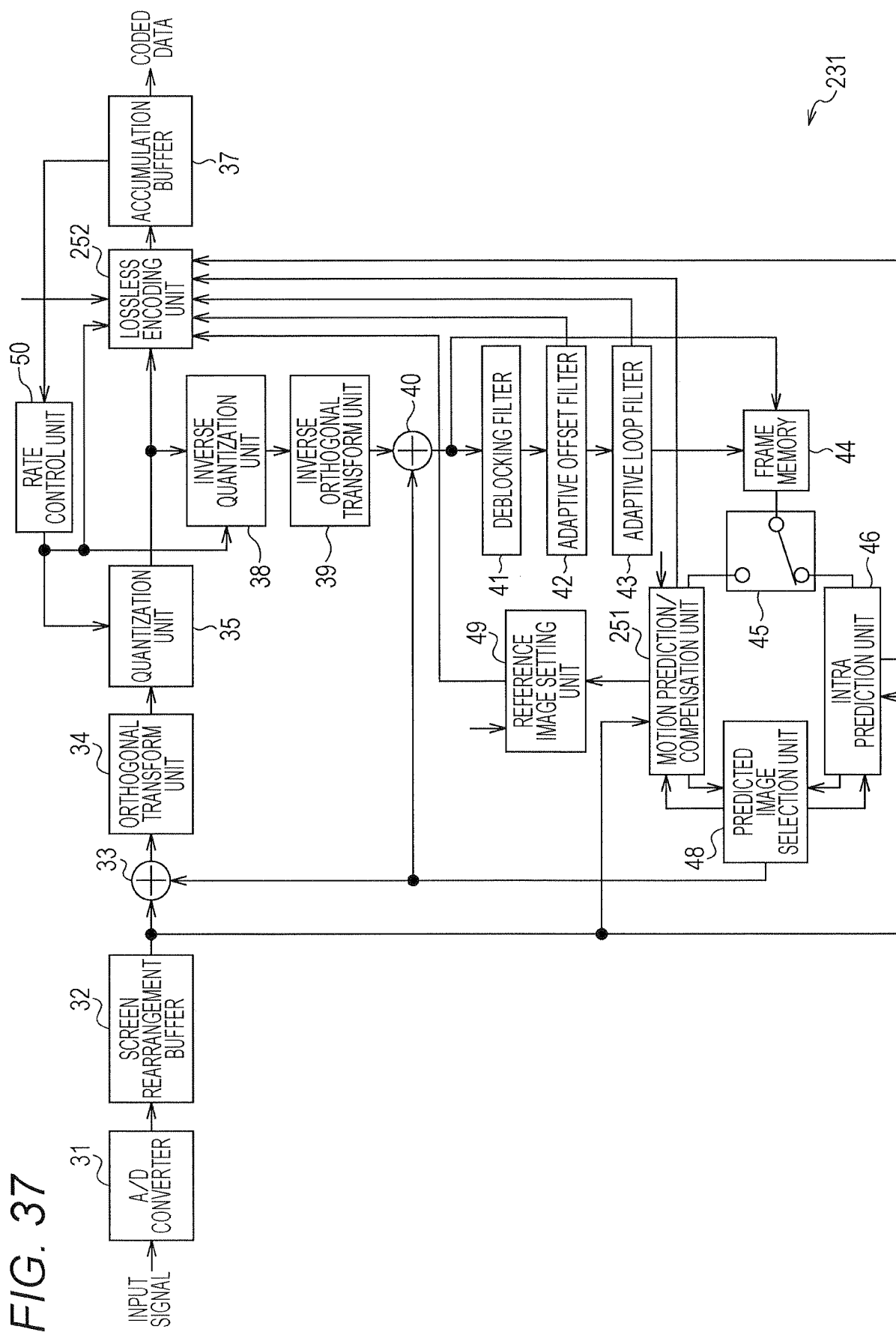
FIG. 35



36/72

FIG. 36

37/72



38/72

FIG. 38

1	pic_parameter_set_rbsp() [	Descriptor
2	pic_parameter_set_id	ue(v)
3	seq_parameter_set_id	ue(v)
4	sign_data_hiding_flag	u(1)
5	cabac_init_present_flag	u(1)
6	unified_slice_type_flag	u(1)
7	if(unified_slice_type_flag)	
8	all_intra_slice_flag	u(1)
9	if(!(unified_slice_type_flag && all_intra_slice_flag))	
10	no_b_slice_flag	u(1)
11	if(!(unified_slice_type_flag && all_intra_slice_flag)) {	
12	num_ref_idx_l0_default_active_minus1	ue(v)
13	if(!no_b_slice_flag)	
14	num_ref_idx_l1_default_active_minus1	ue(v)
15	}	
16	pic_init_qp_minus26	se(v)
17	constrained_intra_pred_flag	u(1)
18	transform_skip_enabled_flag	u(1)
19	cu_qp_delta_enabled_flag	u(1)
20	if(cu_qp_delta_enabled_flag)	
21	diff_cu_qp_delta_depth	ue(v)
22	pic_cb_qp_offset	se(v)
23	pic_cr_qp_offset	se(v)
24	pic_slice_level_chroma_qp_offsets_present_flag	u(1)
25	if(!(unified_slice_type_flag && all_intra_slice_flag)) {	
26	weighted_pred_flag	u(1)
27	if(!no_b_slice_flag)	
28	weighted_bipred_flag	u(1)
29	}	
30	output_flag_present_flag	u(1)
31	transquant_bypass_enable_flag	u(1)
32	dependent_slice_enabled_flag	u(1)
33	tiles_enabled_flag	u(1)
34	entropy_coding_sync_enabled_flag	u(1)
35	entropy_slice_enabled_flag	u(1)
36	if(tiles_enabled_flag) {	
37	num_tile_columns_minus1	ue(v)
38	num_tile_rows_minus1	ue(v)
39	uniform_spacing_flag	u(1)
40	if(!uniform_spacing_flag) {	
41	for(i=0; i<num_tile_columns_minus1; i++)	
42	column_width_minus1[i]	ue(v)

39/72

FIG. 39

1	for(i=0;i< num_tile_rows_minus1;i++)	
2	row_height_minus1[i]	ue(v)
3	]	
4	loop_filter_across_tiles_enabled_flag	u(1)
5	]	
6	loop_filter_across_slices_enabled_flag	u(1)
7	deblocking_filter_control_present_flag	u(1)
8	if(deblocking_filter_control_present_flag) {	
9	deblocking_filter_override_enabled_flag	u(1)
10	pps_disable_deblocking_filter_flag	u(1)
11	if(!pps_disable_deblocking_filter_flag) {	
12	beta_offset_div2	se(v)
13	tc_offset_div2	se(v)
14	}	
15	}	
16	pps_scaling_list_data_present_flag	u(1)
17	if(pps_scaling_list_data_present_flag)	
18	scaling_list_data()	
19	log2_parallel_merge_level_minus2	ue(v)
20	slice_header_extension_present_flag	u(1)
21	slice_extension_present_flag	u(1)
22	pps_extension_flag	u(1)
23	if(pps_extension_flag)	
24	while(more_rbsp_data())	
25	pps_extension_data_flag	u(1)
26	rbbsp_trailing_bits()	
27	}	

40/72
FIG. 40

1	pic_parameter_set_rbsp() {	Descriptor
2	pic_parameter_set_id	ue(v)
3	seq_parameter_set_id	ue(v)
4	sign_data_hiding_flag	u(1)
5	cabac_init_present_flag	u(1)
6	num_ref_idx_l0_default_active_minus1	ue(v)
7	num_ref_idx_l1_default_active_minus1	ue(v)
8	pic_init_qp_minus26	se(v)
9	constrained_intra_pred_flag	u(1)
10	transform_skip_enabled_flag	u(1)
11	cu_qp_delta_enabled_flag	u(1)
12	if(cu_qp_delta_enabled_flag)	
13	diff_cu_qp_delta_depth	ue(v)
14	pic_cb_qp_offset	se(v)
15	pic_cr_qp_offset	se(v)
16	pic_slice_level_chroma_qp_offsets_present_flag	u(1)
17	weighted_pred_flag	u(1)
18	weighted_bipred_flag	u(1)
19	output_flag_present_flag	u(1)
20	transquant_bypass_enable_flag	u(1)
21	dependent_slice_enabled_flag	u(1)
22	tiles_enabled_flag	u(1)
23	entropy_coding_sync_enabled_flag	u(1)
24	entropy_slice_enabled_flag	u(1)
25	if(tiles_enabled_flag) {	
26	num_tile_columns_minus1	ue(v)
27	num_tile_rows_minus1	ue(v)
28	uniform_spacing_flag	u(1)
29	if(!uniform_spacing_flag) {	
30	for (i=0; i<num_tile_columns_minus1; i++)	
31	column_width_minus1[i]	ue(v)
32	for (i=0; i<num_tile_rows_minus1; i++)	
33	row_height_minus1[i]	ue(v)
34	}	
35	loop_filter_across_tiles_enabled_flag	u(1)
36	}	
37	loop_filter_across_slices_enabled_flag	u(1)
38	deblocking_filter_control_present_flag	u(1)
39	if(deblocking_filter_control_present_flag) {	
40	deblocking_filter_override_enabled_flag	u(1)
41	pps_disable_deblocking_filter_flag	u(1)
42	if(!pps_disable_deblocking_filter_flag) {	
43	beta_offset_div2	se(v)

41/72

FIG. 41

1	tc_offset_div2	se(v)
2	}	
3	}	
4	pps_scaling_list_data_present_flag	u(1)
5	if(pps_scaling_list_data_present_flag)	
6	scaling_list_data()	
7	log2_parallel_merge_level_minus2	ue(v)
8	slice_header_extension_present_flag	u(1)
9	slice_extension_present_flag	u(1)
10	pps_extension_flag	u(1)
11	if(pps_extension_flag)	
12	while(more_rbsp_data())	
13	pps_extension_data_flag	u(1)
14	rbp_trailing_bits()	
15	}	

42/72

FIG. 42

1	slice_header() {	Descriptor
2	first_slice_in_pic_flag	u(1)
3	if(RapPicFlag)	
4	no_output_of_prior_pics_flag	u(1)
5	pic_parameter_set_id	ue(v)
6	if(!first_slice_in_pic_flag)	
7	slice_address	u(v)
8	if(dependent_slice_enabled_flag && !first_slice_in_pic_flag)	
9	dependent_slice_flag	u(1)
10	if(!dependent_slice_flag) {	
11	if((!unified_slice_type_flag) (unified_slice_type_flag && first_slice_in_pic_flag))	
12	slice_type	ue(v)
13	if(output_flag_present_flag)	
14	pic_output_flag	u(1)
15	if(separate_colour_plane_flag == 1)	
16	colour_plane_id	u(2)
17	if(!IdrPicFlag) {	
18	pic_order_cnt_lsb	u(v)
19	short_term_ref_pic_set_sps_flag	u(1)
20	if(!short_term_ref_pic_set_sps_flag)	
21	short_term_ref_pic_set(num_short_term_ref_pic_sets)	
22	else	
23	short_term_ref_pic_set_idx	u(v)
24	if(long_term_ref_pics_present_flag) {	
25	if(num_long_term_ref_pics_sps>0)	
26	num_long_term_sps	ue(v)
27	num_long_term_pics	ue(v)
28	for(i=0; i<num_long_term_sps+num_long_term_pics; i++) {	
29	if(i<num_long_term_sps)	
30	lt_idx_sps[i]	u(v)
31	else {	
32	poc_lsb_lt[i]	u(v)
33	used_by_curr_pic_lt_flag[i]	u(1)
34	}	
35	delta_poc_msb_present_flag[i]	u(1)
36	if(delta_poc_msb_present_flag[i])	
37	delta_poc_msb_cycle_lt[i]	ue(v)
38	}	
39	}	
40	}	
41	if(sample_adaptive_offset_enabled_flag) {	
42	slice_sao_luma_flag	u(1)
43	slice_sao_chroma_flag	u(1)

43/72

FIG. 43

1	]	
2	if(slice_type == P slice_type == B) {	
3	if(sps_temporal_mvp_enable_flag)	
4	slice_temporal_mvp_enable_flag	u(1)
5	num_ref_idx_active_override_flag	u(1)
6	if(num_ref_idx_active_override_flag) {	
7	num_ref_idx_l0_active_minus1	ue(v)
8	if(slice_type == B)	
9	num_ref_idx_l1_active_minus1	ue(v)
10	}	
11	if(lists_modification_present_flag)	
12	ref_pic_list_modification()	
13	if(slice_type == B)	
14	mvd_l1_zero_flag	u(1)
15	if(cabac_init_present_flag)	
16	cabac_init_flag	u(1)
17	if(slice_temporal_mvp_enable_flag) {	
18	if(slice_type == B)	
19	collocated_from_l0_flag	u(1)
20	if((collocated_from_l0_flag && num_ref_idx_l0_active_minus1>0) (!collocated_from_l0_flag && num_ref_idx_l1_active_minus1>0))	
21	collocated_ref_idx	ue(v)
22	}	
23	if((weighted_pred_flag && slice_type == P) (weighted_bipred_flag && slice_type == B))	
24	pred_weight_table()	
25	five_minus_max_num_merge_cand	ue(v)
26	}	
27	slice_qp_delta	se(v)
28	if(pic_slice_level_chroma_qp_offsets_present_flag) {	
29	slice_cb_qp_offset	se(v)
30	slice_cr_qp_offset	se(v)
31	}	
32	if(deblocking_filter_control_present_flag) {	
33	if(deblocking_filter_override_enabled_flag)	
34	deblocking_filter_override_flag	u(1)
35	if(deblocking_filter_override_flag) {	
36	slice_header_disable_deblocking_filter_flag	u(1)
37	if(!slice_header_disable_deblocking_filter_flag) {	
38	beta_offset_div2	se(v)
39	tc_offset_div2	se(v)
40	}	
41	}	

44/72

FIG. 44

1	}	
2	if(loop_filter_across_slices_enabled_flag && (slice_sao_luma_flag slice_sao_chroma_flag !disable_deblocking_filter_flag))	
3	slice_loop_filter_across_slices_enabled_flag	u(1)
4	}	
5	if(tiles_enabled_flag entropy_coding_sync_enabled_flag) {	
6	num_entry_point_offsets	ue(v)
7	if(num_entry_point_offsets>0) {	
8	offset_len_minus1	ue(v)
9	for(i=0;i<num_entry_point_offsets;i++)	
10	entry_point_offset[i]	u(v)
11	}	
12	}	
13	if(slice_header_extension_present_flag) {	
14	slice_header_extension_length	ue(v)
15	for(i=0;i<slice_header_extension_length;i++)	
16	slice_header_extension_data_byte[i]	u(8)
17	}	
18	byte_alignment()	
19	}	

45/72

FIG. 45

1	slice_header() {	Descriptor
2	first_slice_in_pic_flag	u(1)
3	if(RapPicFlag)	
4	no_output_of_prior_pics_flag	u(1)
5	pic_parameter_set_id	ue(v)
6	if(!first_slice_in_pic_flag)	
7	slice_address	u(v)
8	if(dependent_slice_enabled_flag && !first_slice_in_pic_flag)	
9	dependent_slice_flag	u(1)
10	if(!dependent_slice_flag) {	
11	slice_type	ue(v)
12	if(output_flag_present_flag)	
13	pic_output_flag	u(1)
14	if(separate_colour_plane_flag == 1)	
15	colour_plane_id	u(2)
16	if(!IdrPicFlag) {	
17	pic_order_cnt_lsb	u(v)
18	short_term_ref_pic_set_sps_flag	u(1)
19	if(!short_term_ref_pic_set_sps_flag)	
20	short_term_ref_pic_set(num_short_term_ref_pic_sets)	
21	else	
22	short_term_ref_pic_set_idx	u(v)
23	if(long_term_ref_pics_present_flag) {	
24	if(num_long_term_ref_pics_sps>0)	
25	num_long_term_sps	ue(v)
26	num_long_term_pics	ue(v)
27	for(i=0; i<num_long_term_sps + num_long_term_pics; i++) {	
28	if(i<num_long_term_sps)	
29	lt_idx_sps[i]	u(v)
30	else {	
31	poc_lsb_lt[i]	u(v)
32	used_by_curr_pic_lt_flag[i]	u(1)
33	}	
34	delta_poc_msb_present_flag[i]	u(1)
35	if(delta_poc_msb_present_flag[i])	
36	delta_poc_msb_cycle_lt[i]	ue(v)
37	}	
38	}	
39	}	
40	if(sample_adaptive_offset_enabled_flag) {	
41	slice_sao_luma_flag	u(1)
42	slice_sao_chroma_flag	u(1)
43	}	

46/72

FIG. 46

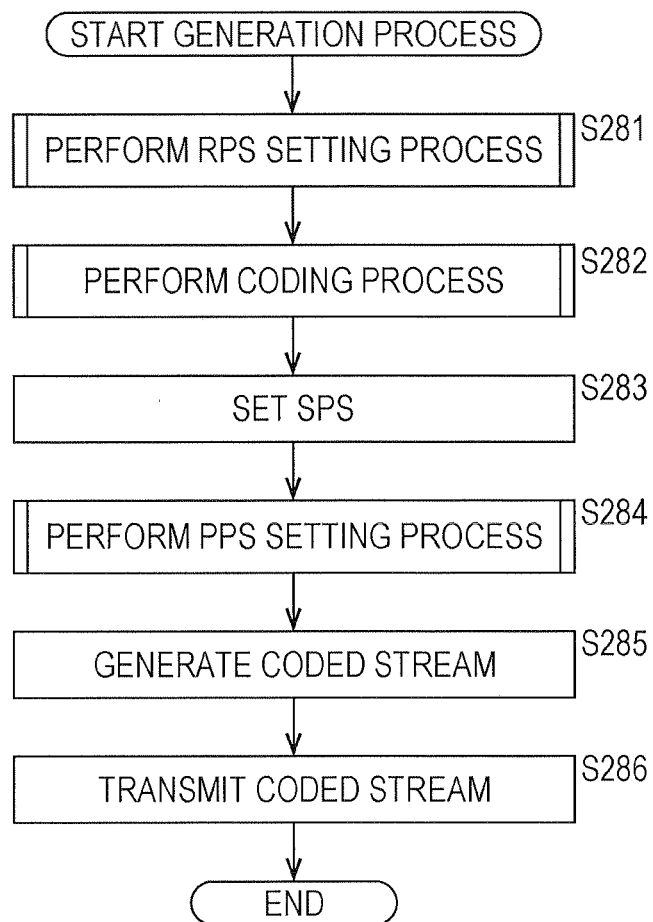
1	if(slice_type == P slice_type == B) {	
2	if(sps_temporal_mvp_enable_flag)	
3	slice_temporal_mvp_enable_flag	u(1)
4	num_ref_idx_active_override_flag	u(1)
5	if(num_ref_idx_active_override_flag) {	
6	num_ref_idx_l0_active_minus1	ue(v)
7	if(slice_type == B)	
8	num_ref_idx_l1_active_minus1	ue(v)
9	}	
10	if(lists_modification_present_flag)	
11	ref_pic_list_modification()	
12	if(slice_type == B)	
13	mvd_l1_zero_flag	u(1)
14	if(cabac_init_present_flag)	
15	cabac_init_flag	u(1)
16	if(slice_temporal_mvp_enable_flag) {	
17	if(slice_type == B)	
18	collocated_from_l0_flag	u(1)
19	if((collocated_from_l0_flag && num_ref_idx_l0_active_minus1>0) (!collocated_from_l0_flag && num_ref_idx_l1_active_minus1>0))	
20	collocated_ref_idx	ue(v)
21	}	
22	if((weighted_pred_flag && slice_type == P) (weighted_bipred_flag && slice_type == B))	
23	pred_weight_table()	
24	five_minus_max_num_merge_cand	ue(v)
25	}	
26	slice_qp_delta	se(v)
27	if(pic_slice_level_chroma_qp_offsets_present_flag) {	
28	slice_cb_qp_offset	se(v)
29	slice_cr_qp_offset	se(v)
30	}	
31	if(deblocking_filter_control_present_flag) {	
32	if(deblocking_filter_override_enabled_flag)	
33	deblocking_filter_override_flag	u(1)
34	if(deblocking_filter_override_flag) {	
35	slice_header_disable_deblocking_filter_flag	u(1)
36	if(!slice_header_disable_deblocking_filter_flag) {	
37	beta_offset_div2	se(v)
38	tc_offset_div2	se(v)
39	}	
40	}	
41	}	

47/72

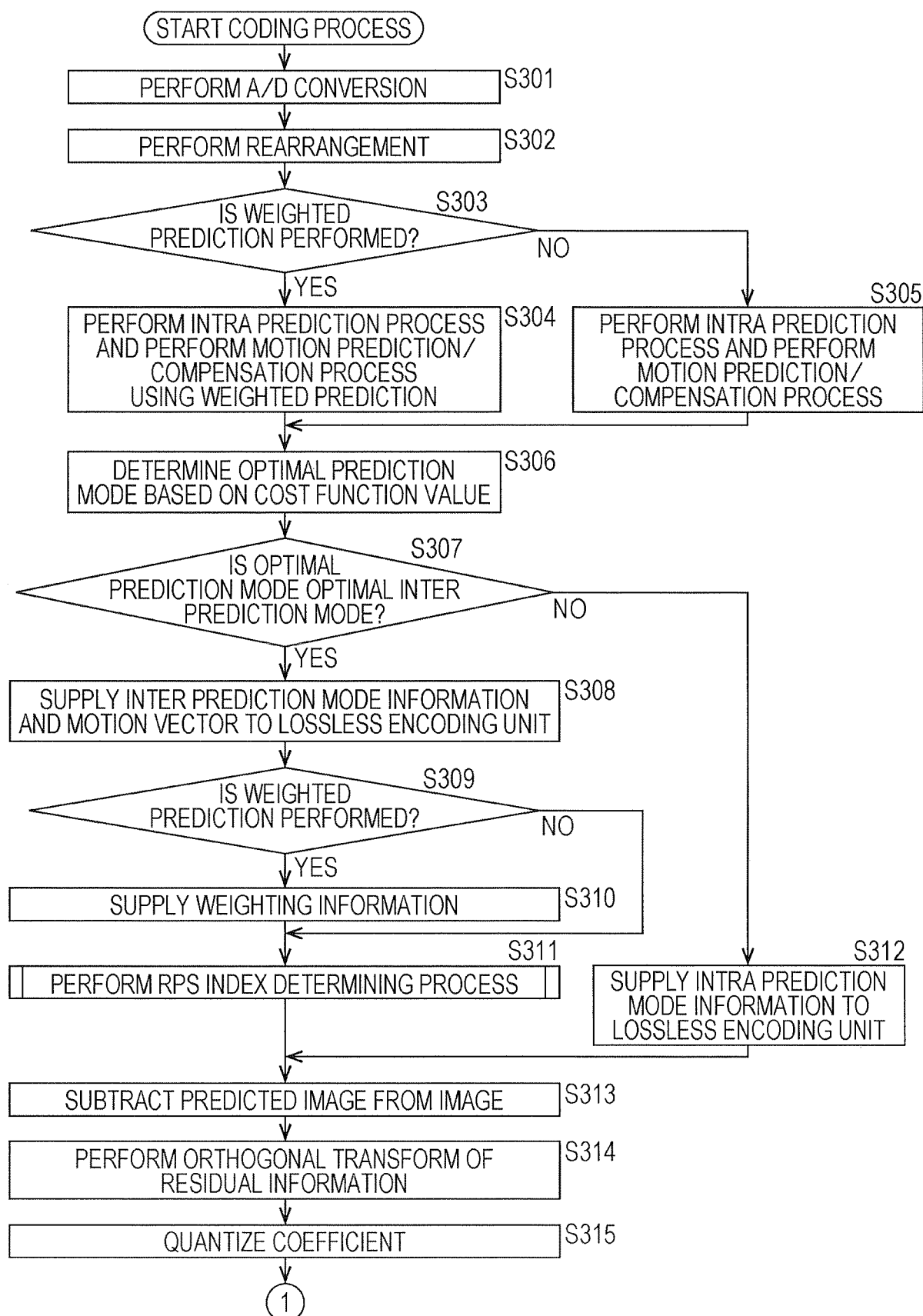
FIG. 47

1	if(loop_filter_across_slices_enabled_flag && (slice_sao_luma_flag slice_sao_chroma_flag !disable_deblocking_filter_flag))	
2	slice_loop_filter_across_slices_enabled_flag	u(1)
3	}	
4	if(tiles_enabled_flag entropy_coding_sync_enabled_flag) {	
5	num_entry_point_offsets	ue(v)
6	if(num_entry_point_offsets>0) {	
7	offset_len_minus1	ue(v)
8	for(i=0;i<num_entry_point_offsets;i++)	
9	entry_point_offset[i]	u(v)
10	}	
11	}	
12	if(slice_header_extension_present_flag) {	
13	slice_header_extension_length	ue(v)
14	for(i=0;i<slice_header_extension_length;i++)	
15	slice_header_extension_data_byte[i]	u(8)
16	}	
17	byte_alignment()	
18	}	

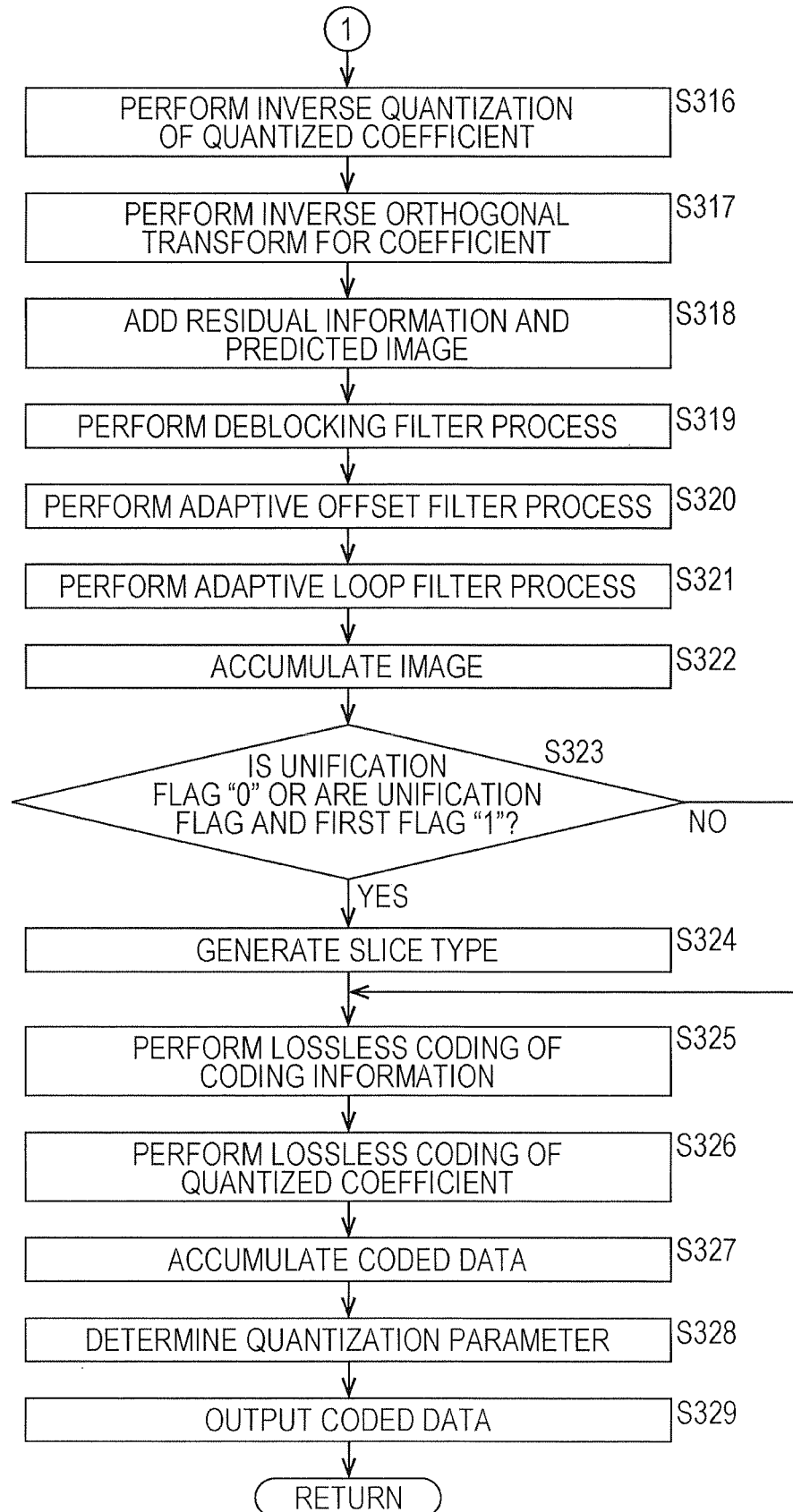
48/72

FIG. 48

49/72
FIG. 49

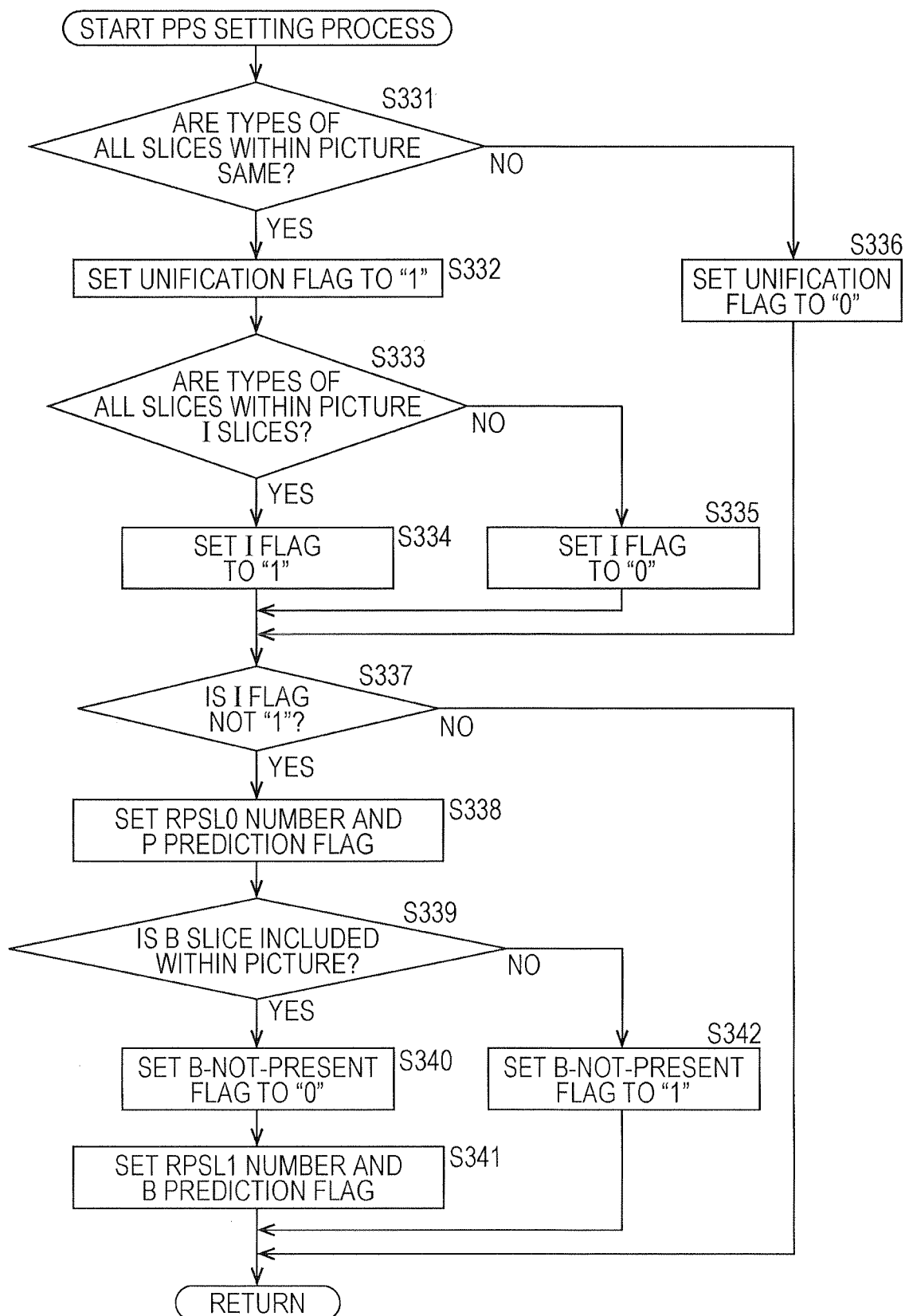


50/72

FIG. 50

51/72

FIG. 51



52/72

FIG. 52

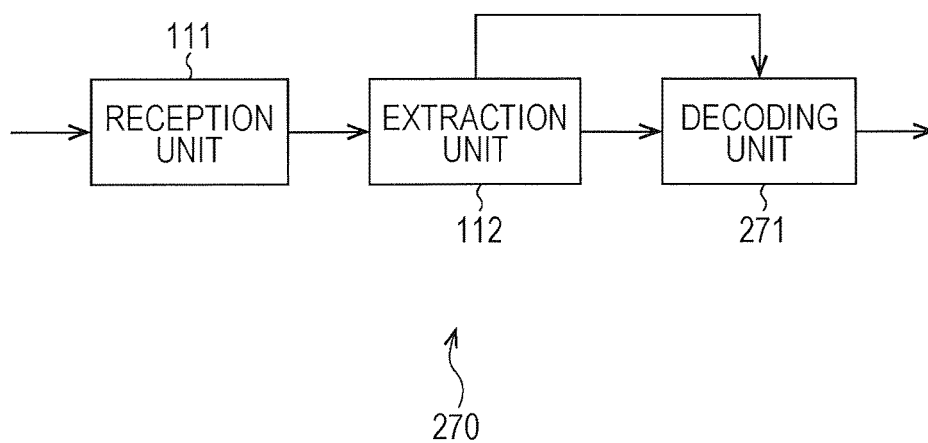
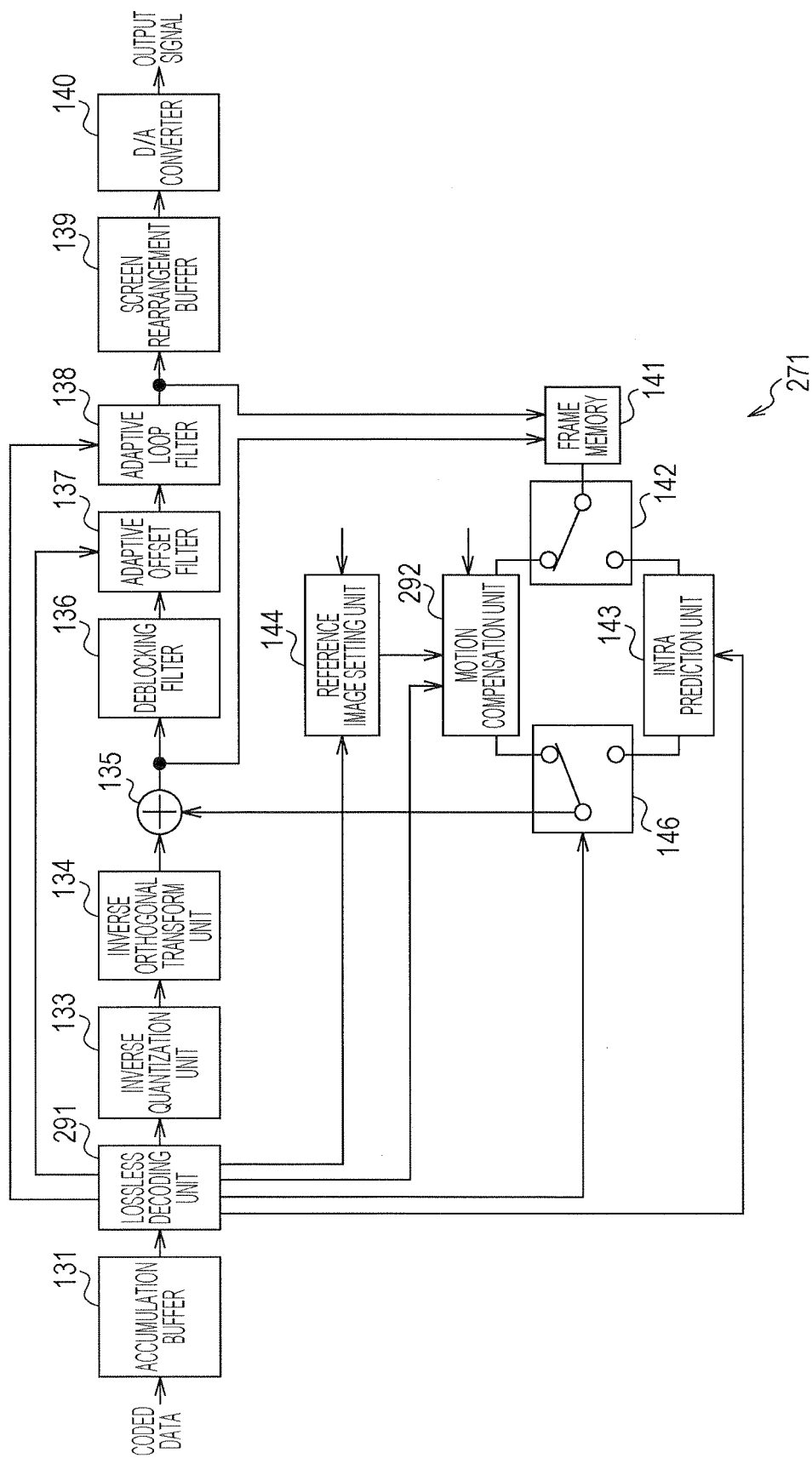
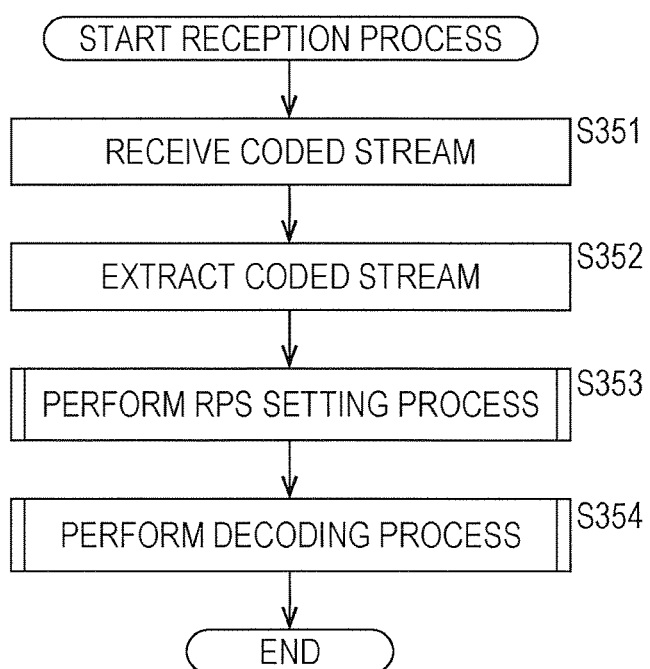


FIG. 53



54/72

FIG. 54

55/72

FIG. 55

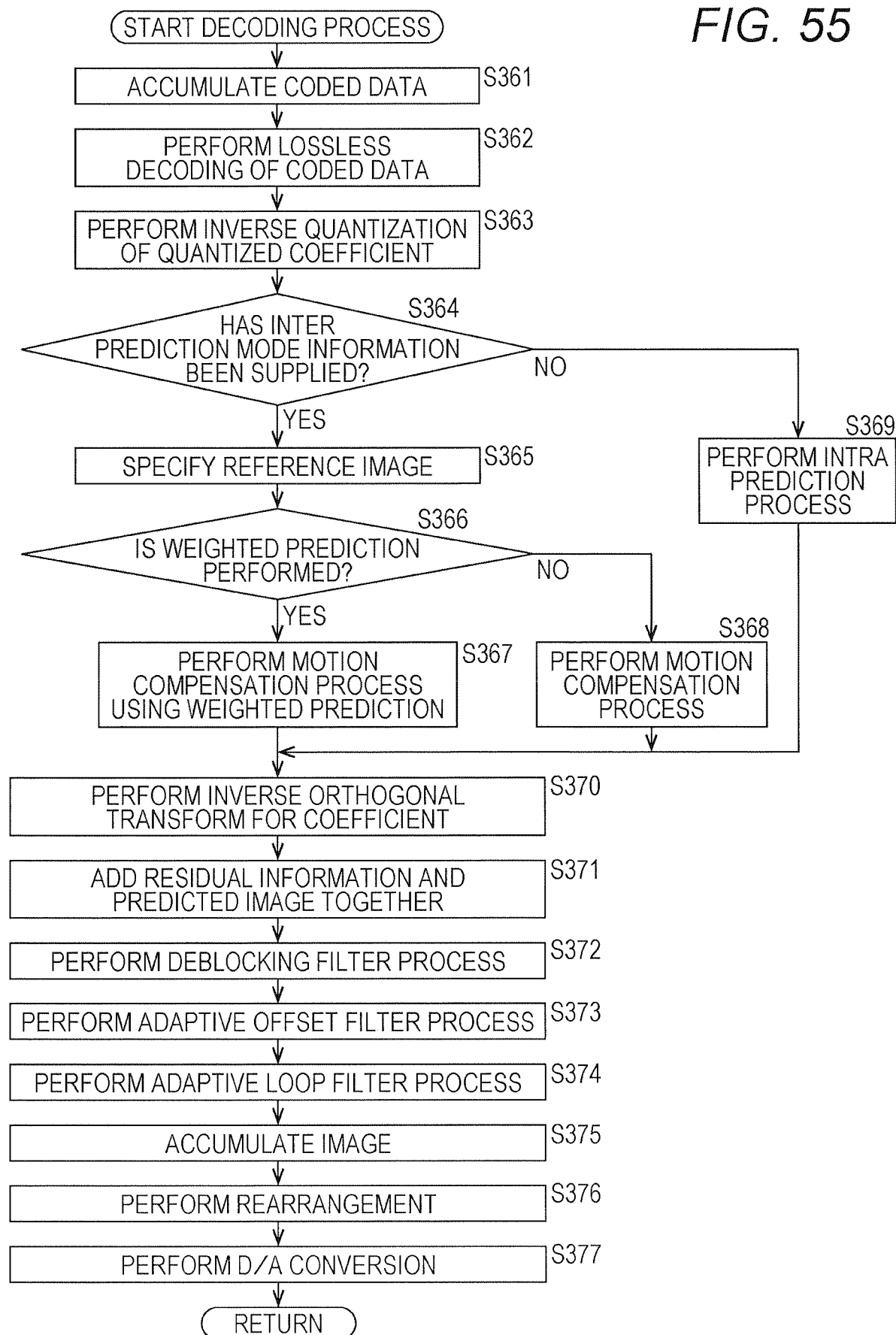
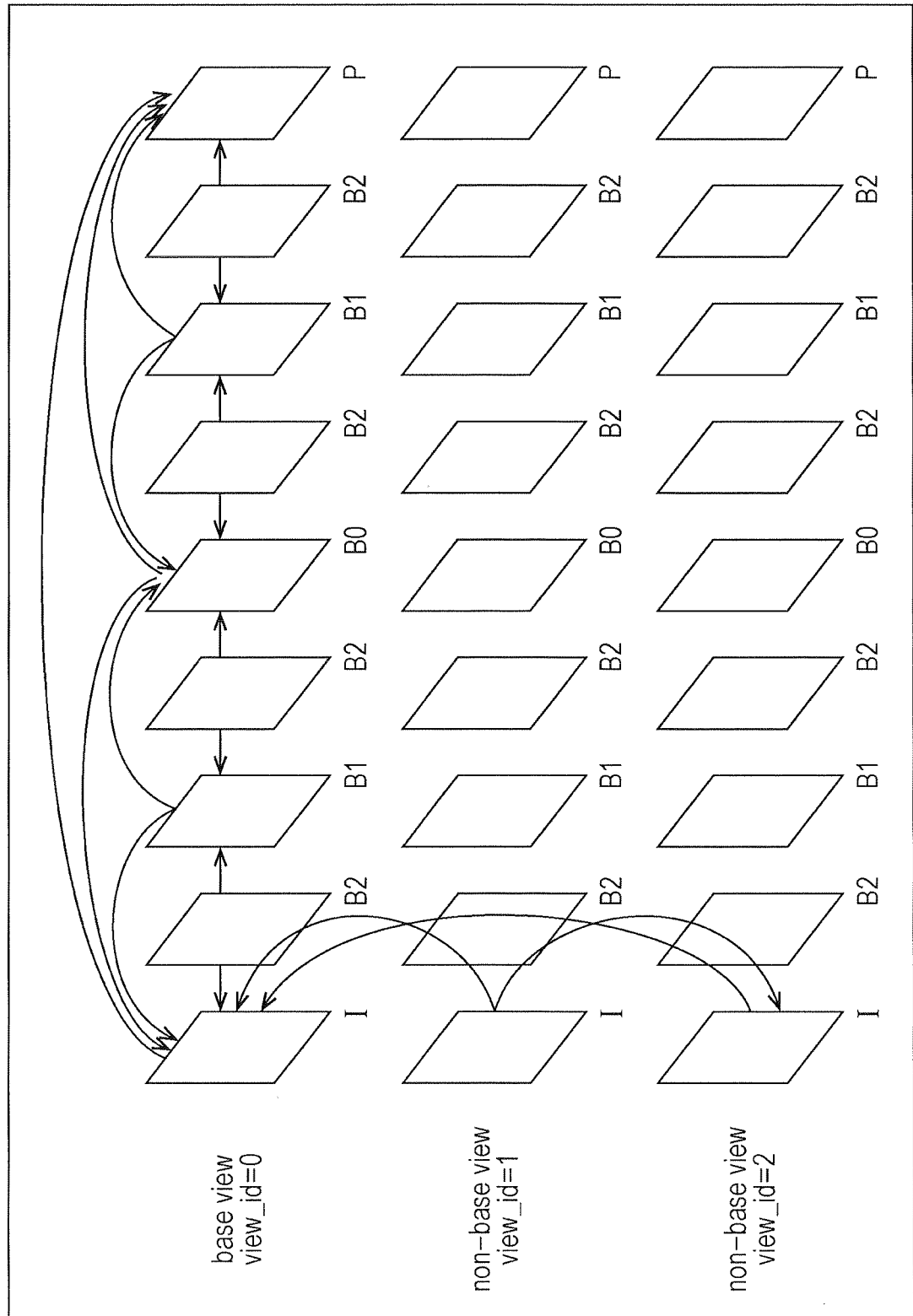
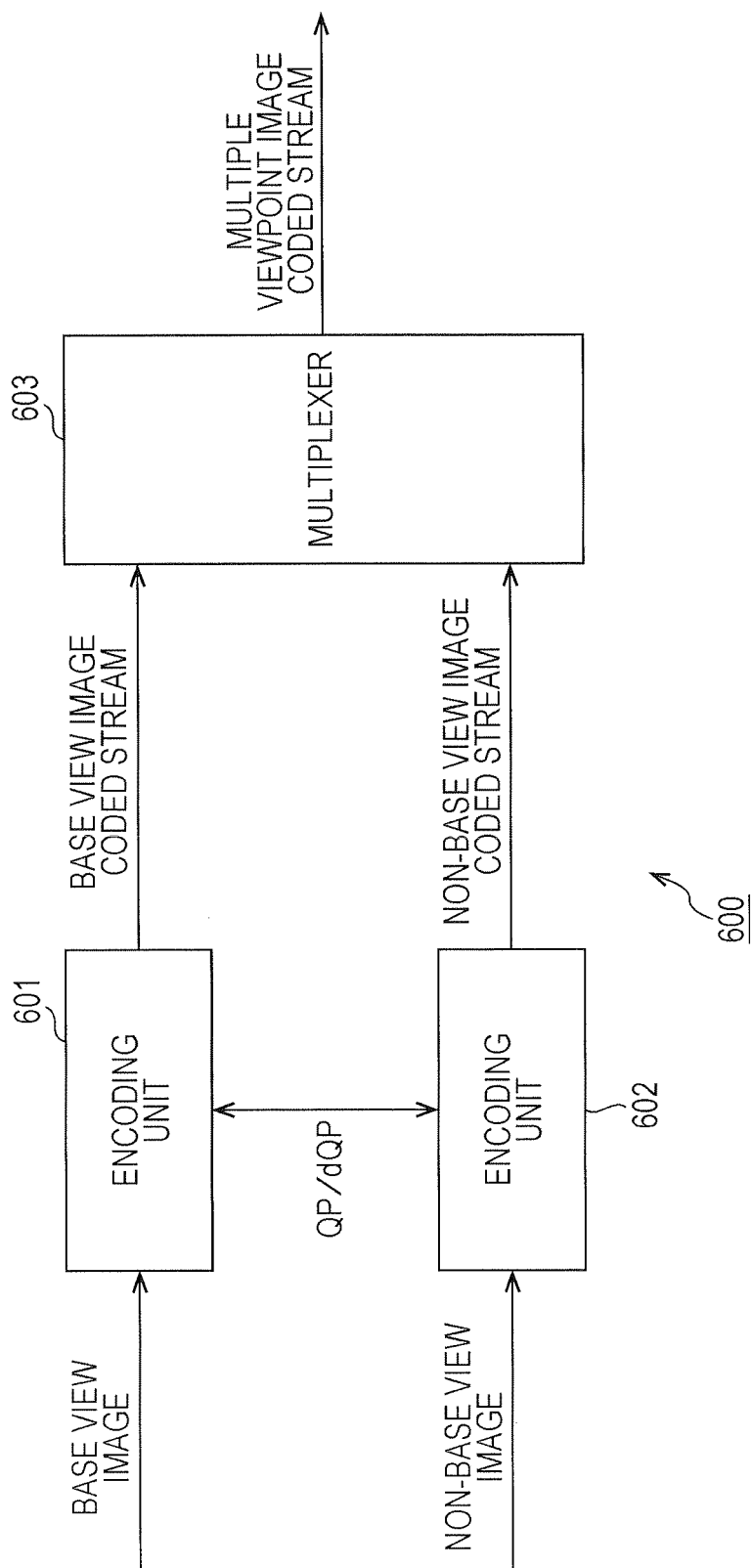


FIG. 56



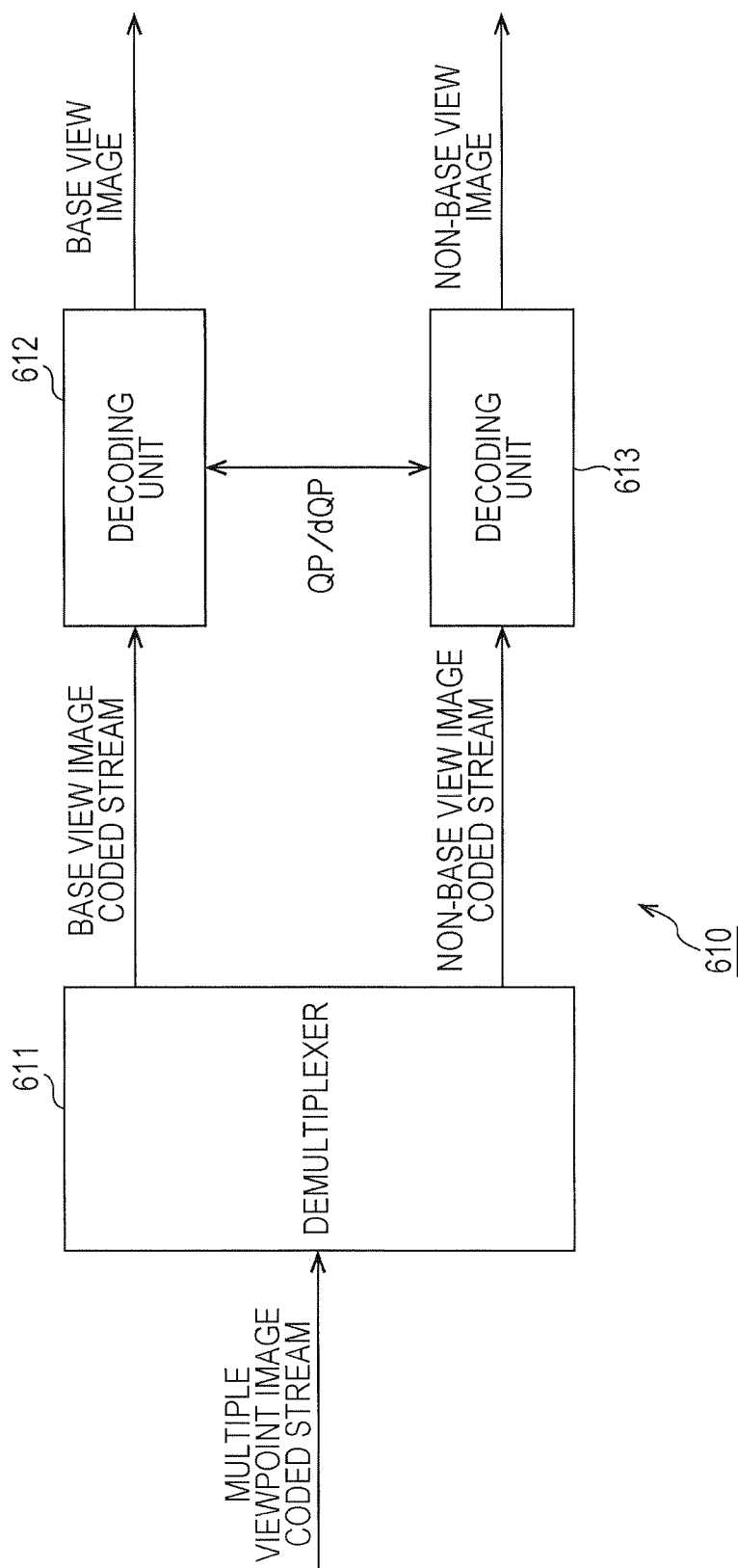
57/72

FIG. 57



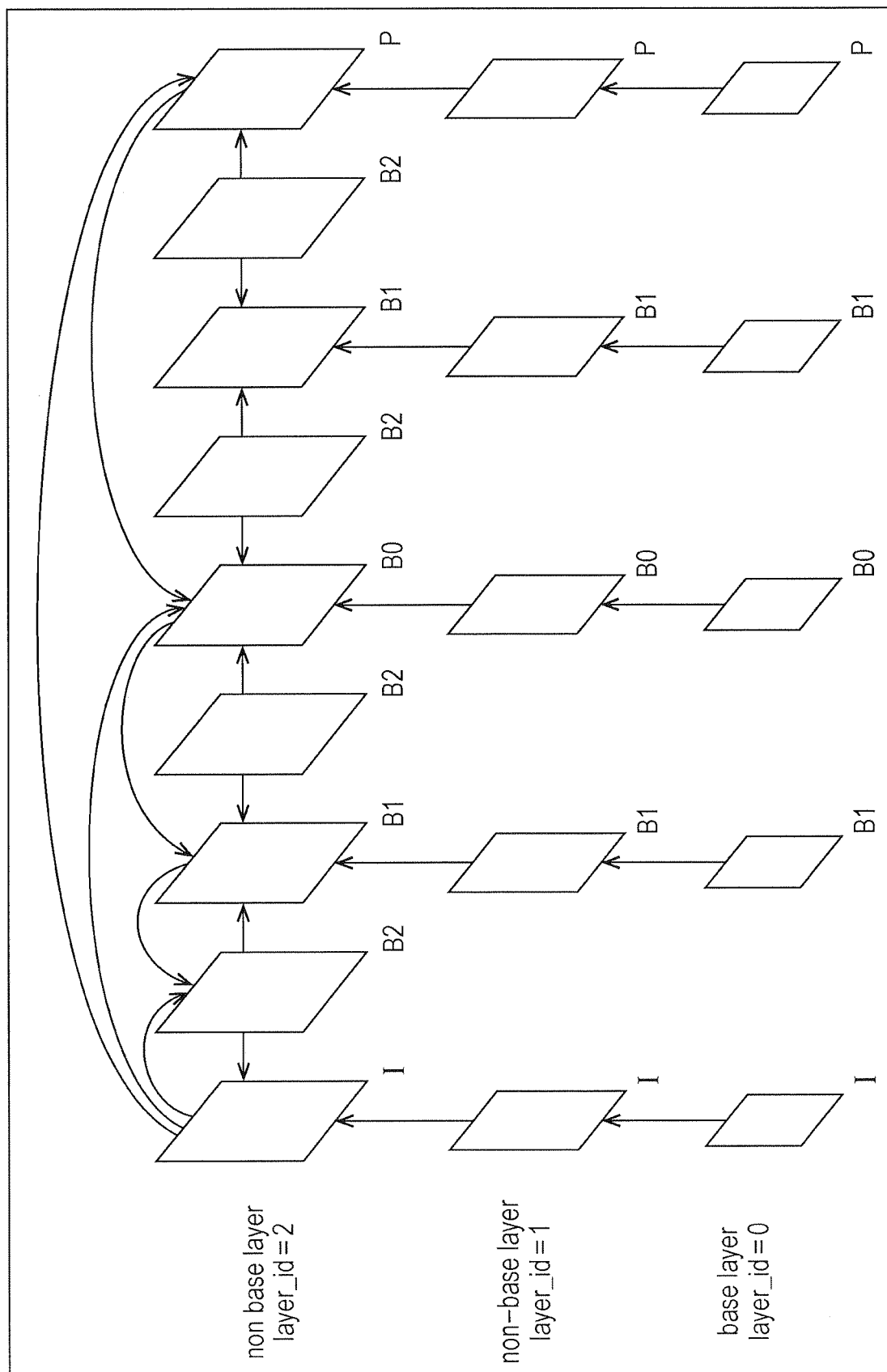
58/72

FIG. 58



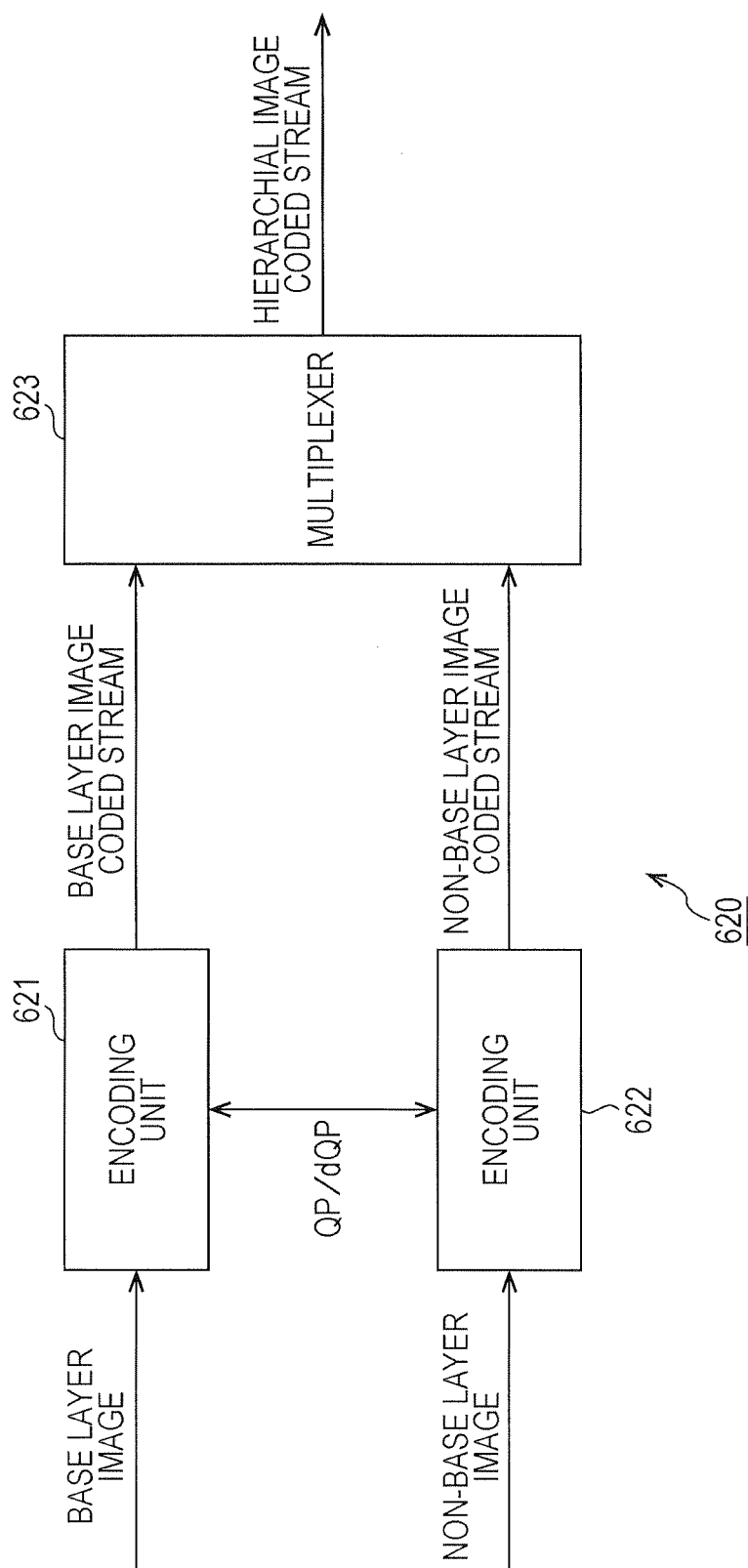
59/72

FIG. 59



60/72

FIG. 60



61/72

FIG. 61

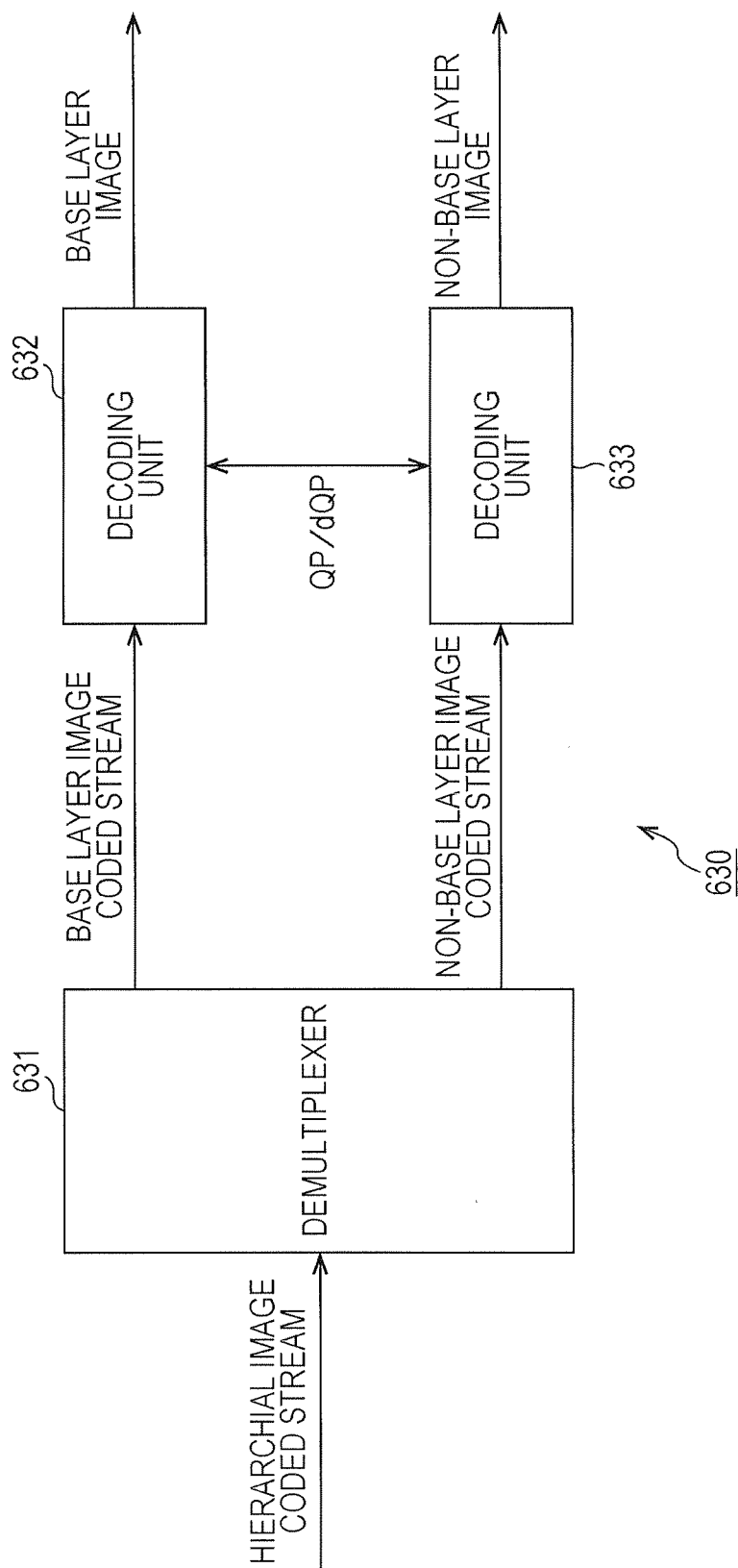


FIG. 62

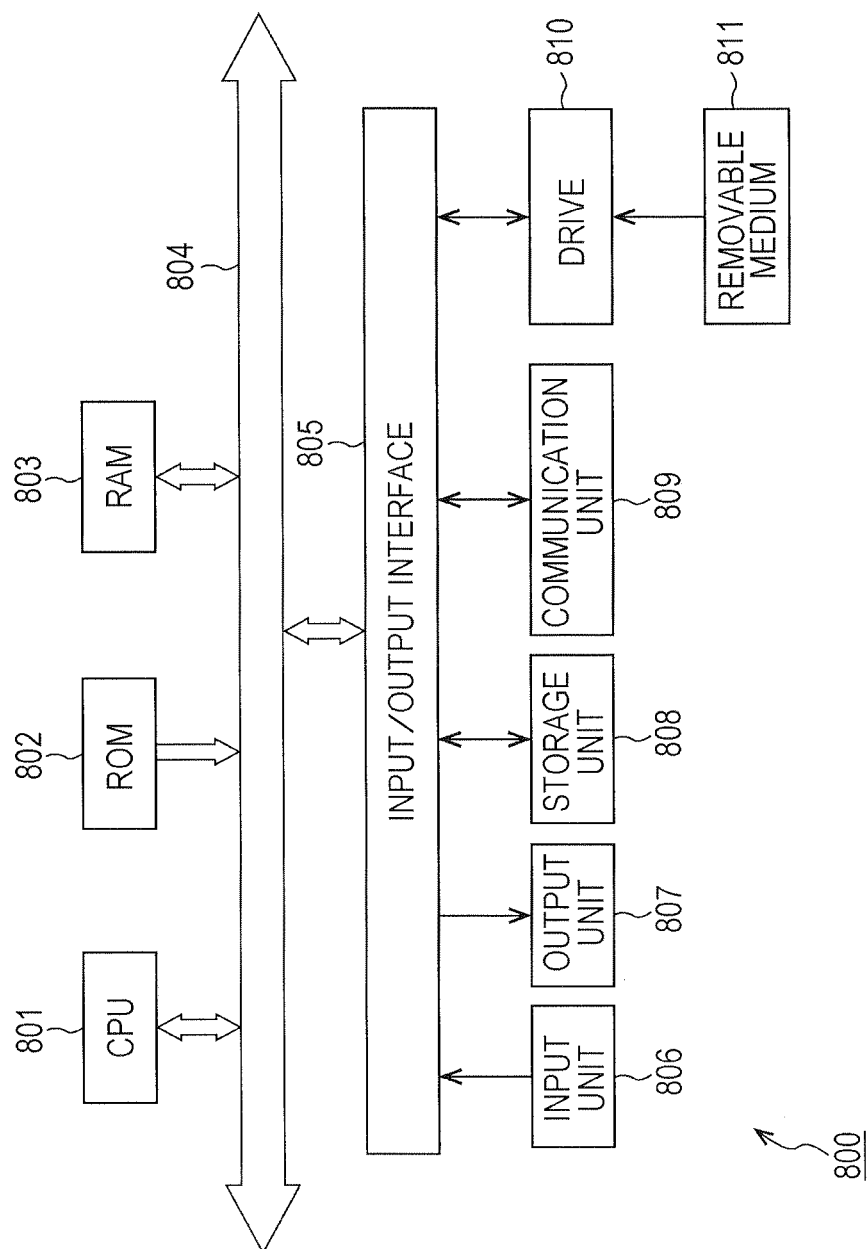
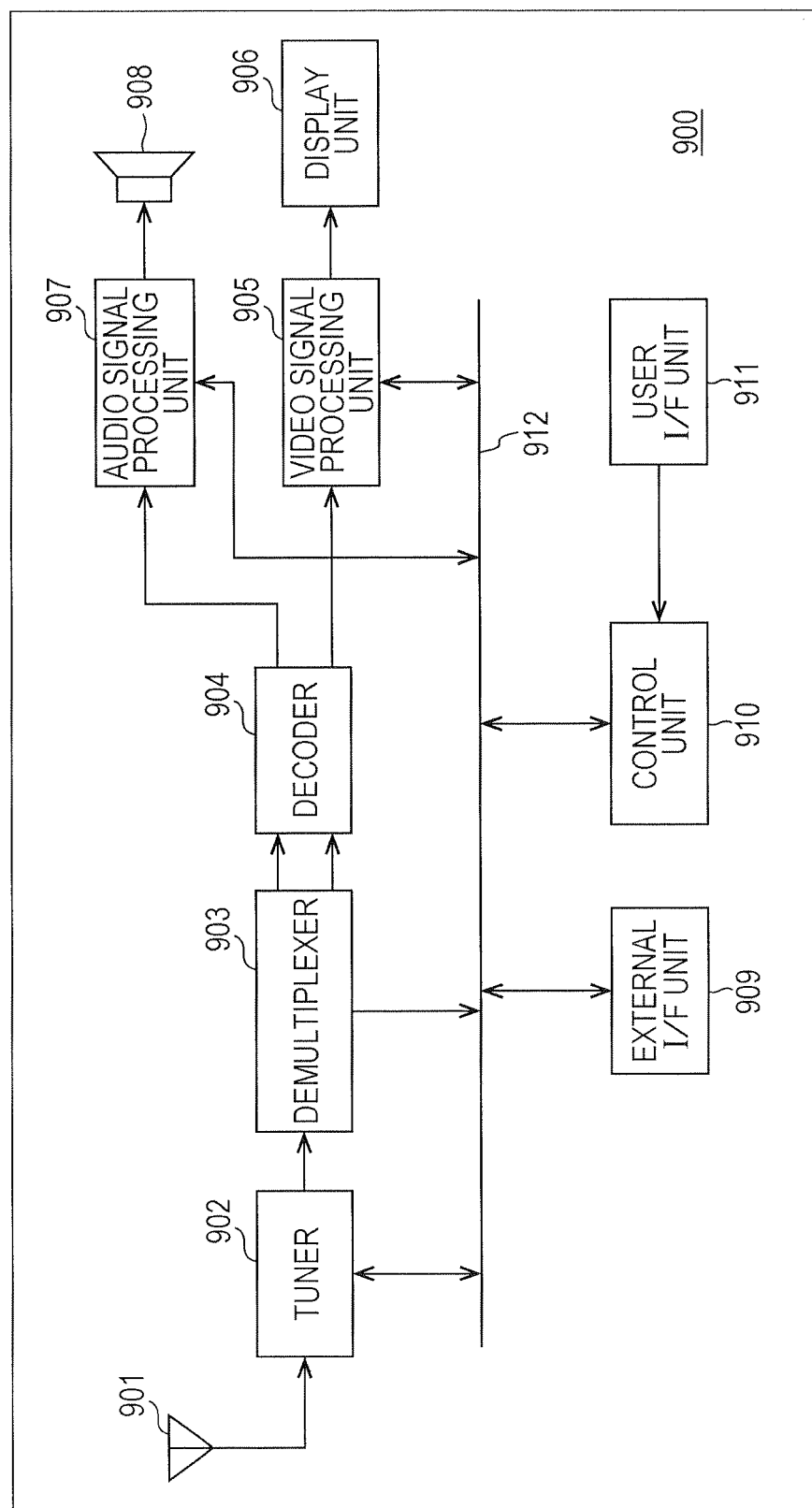
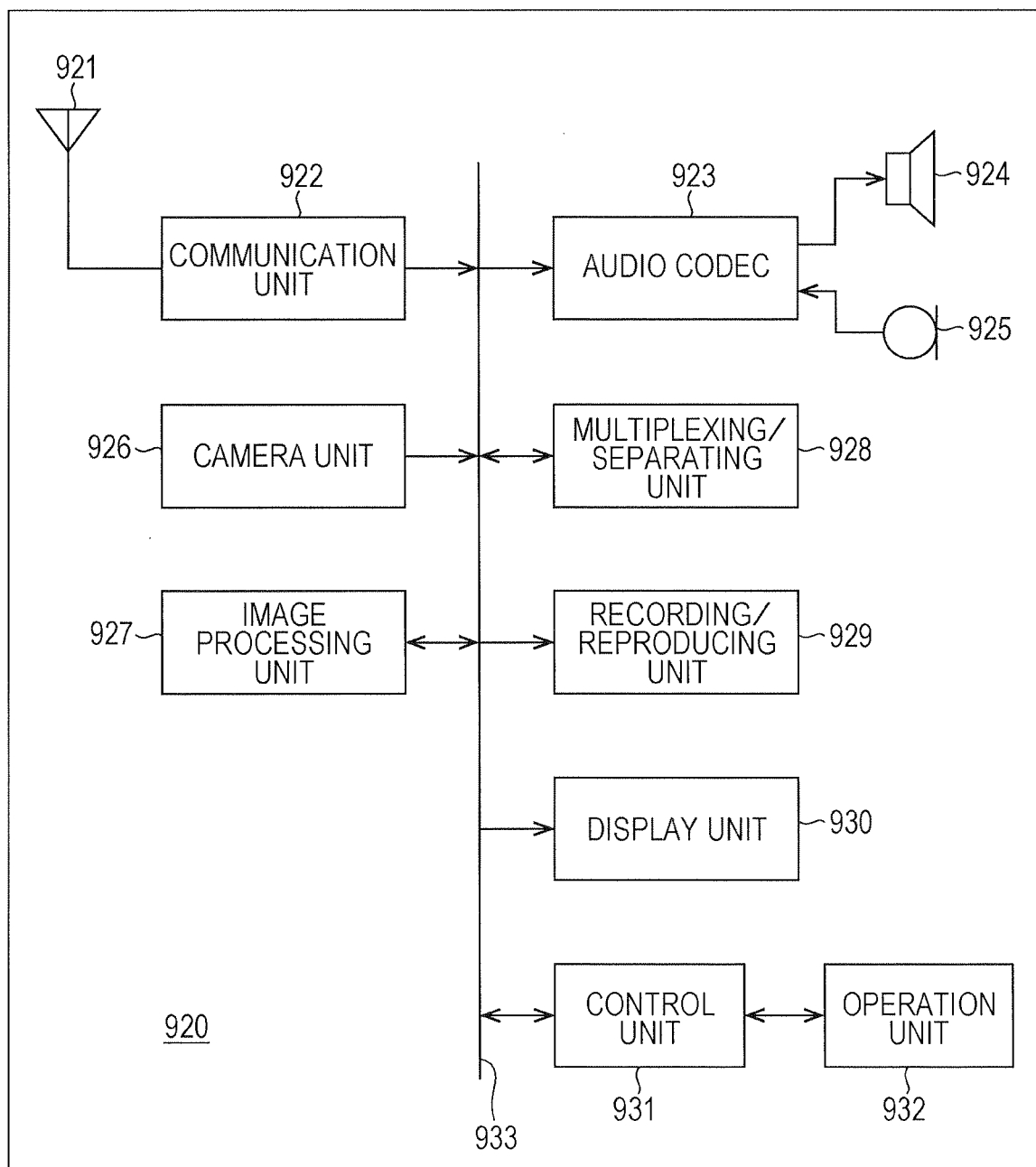


FIG. 63



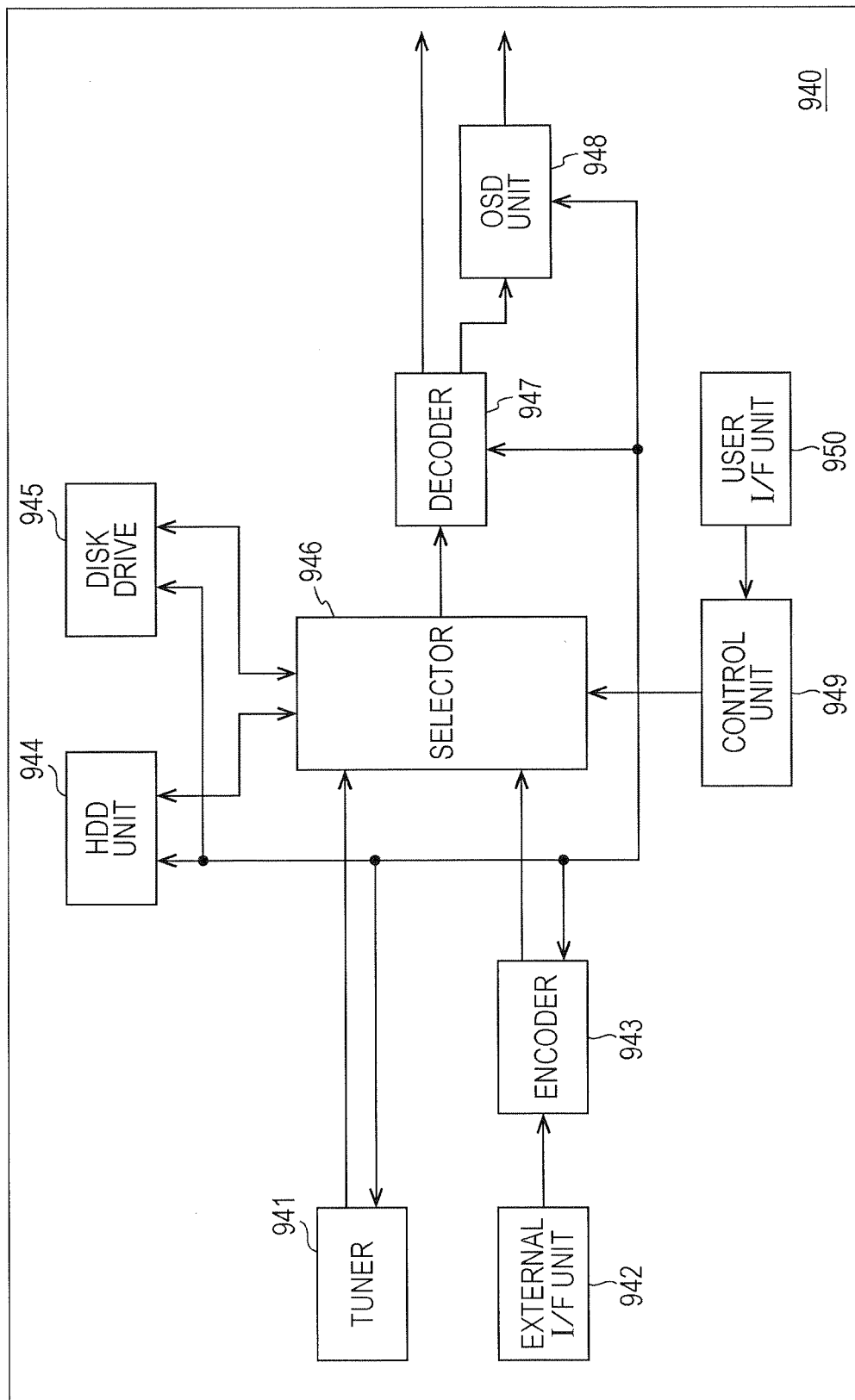
64/72

FIG. 64



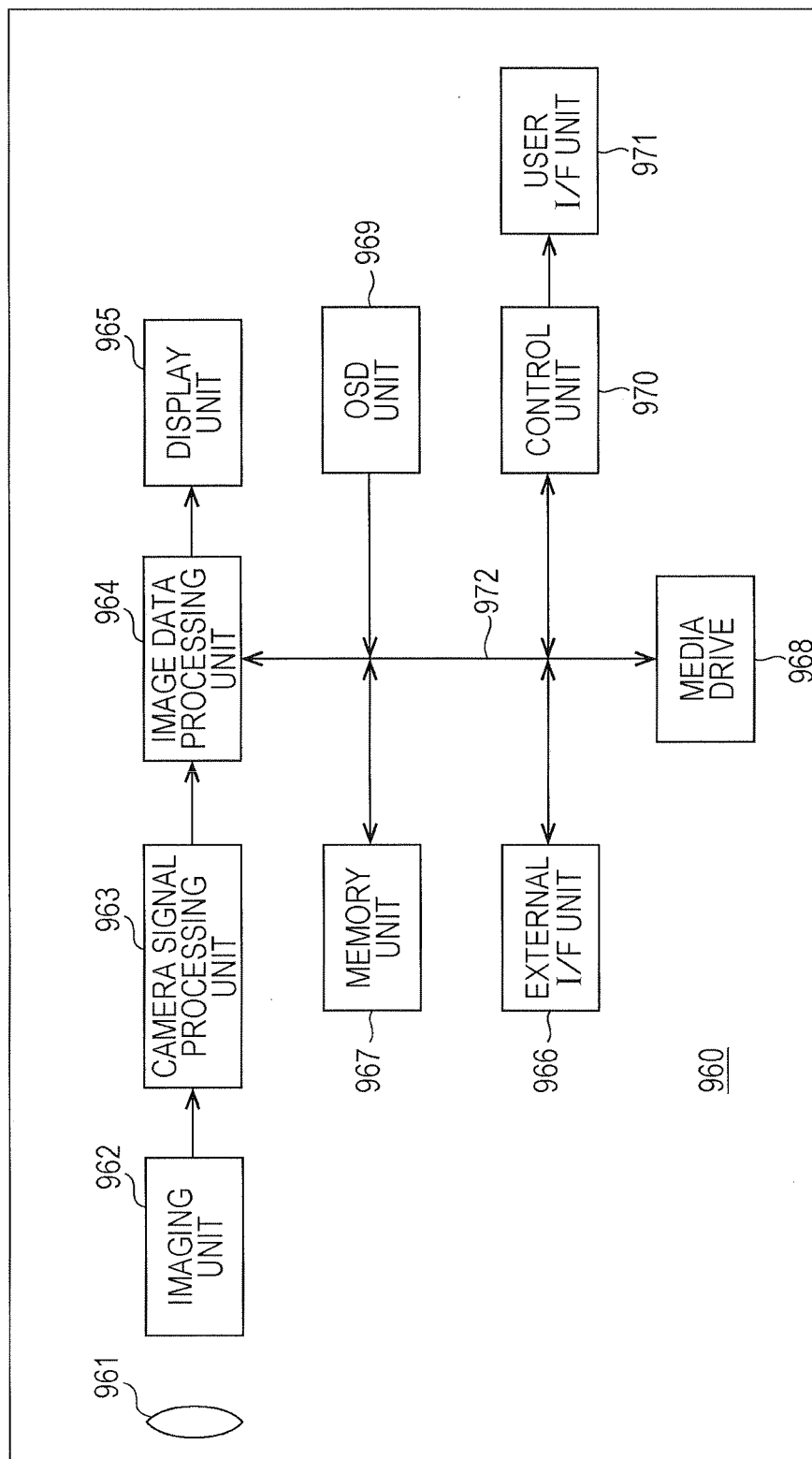
65/72

FIG. 65



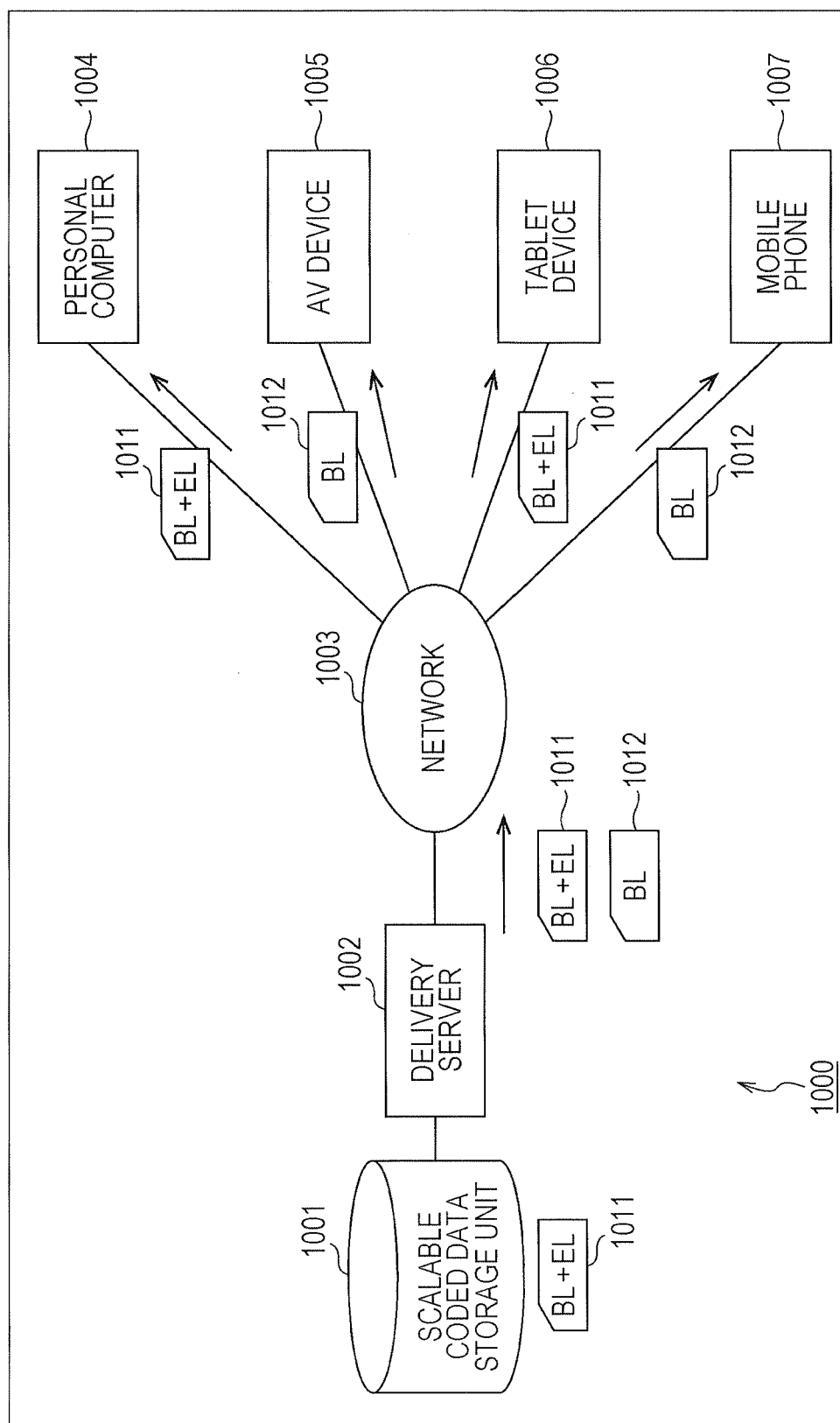
66/72

FIG. 66



67/72

FIG. 67



68/72

FIG. 68

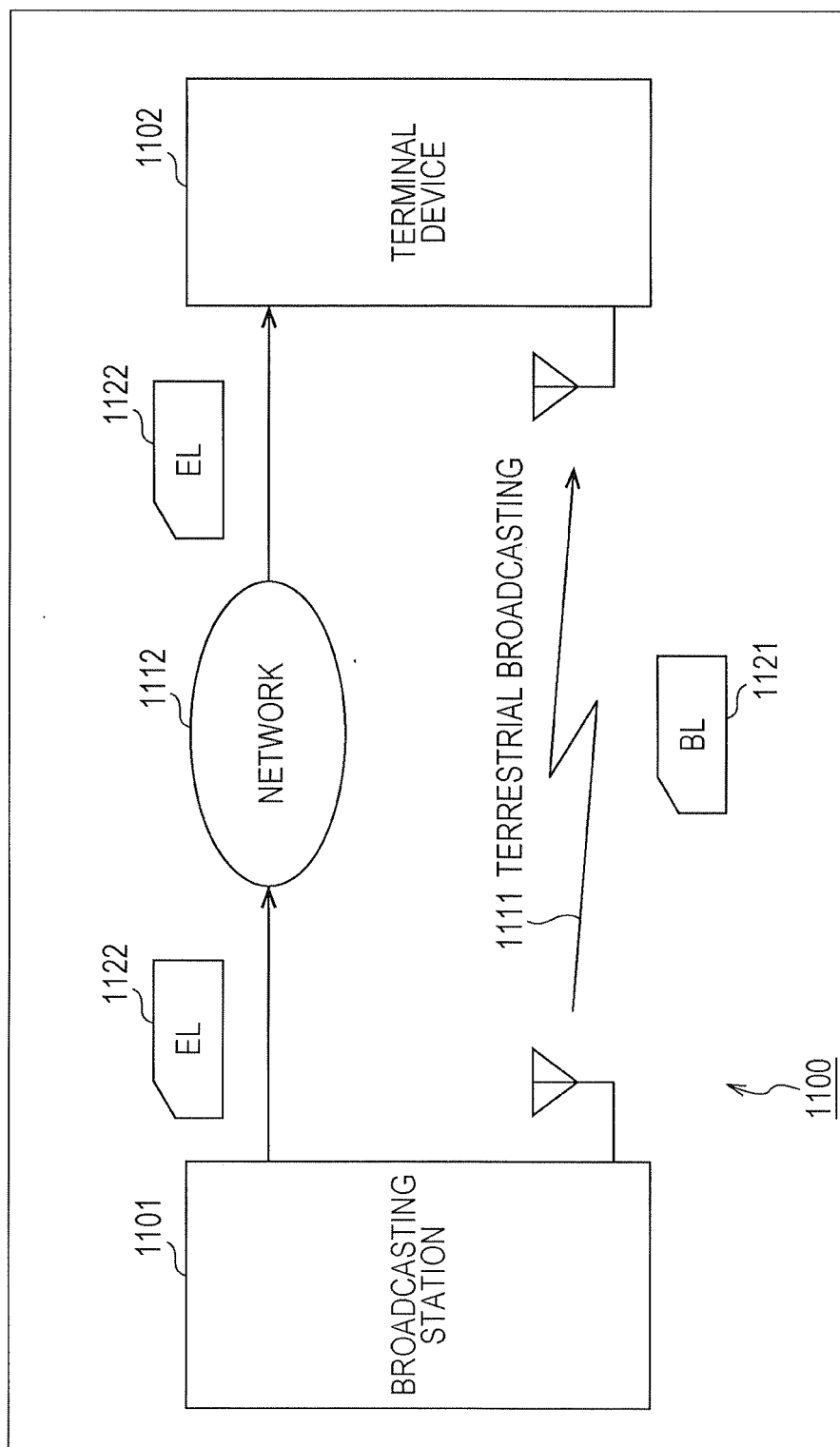
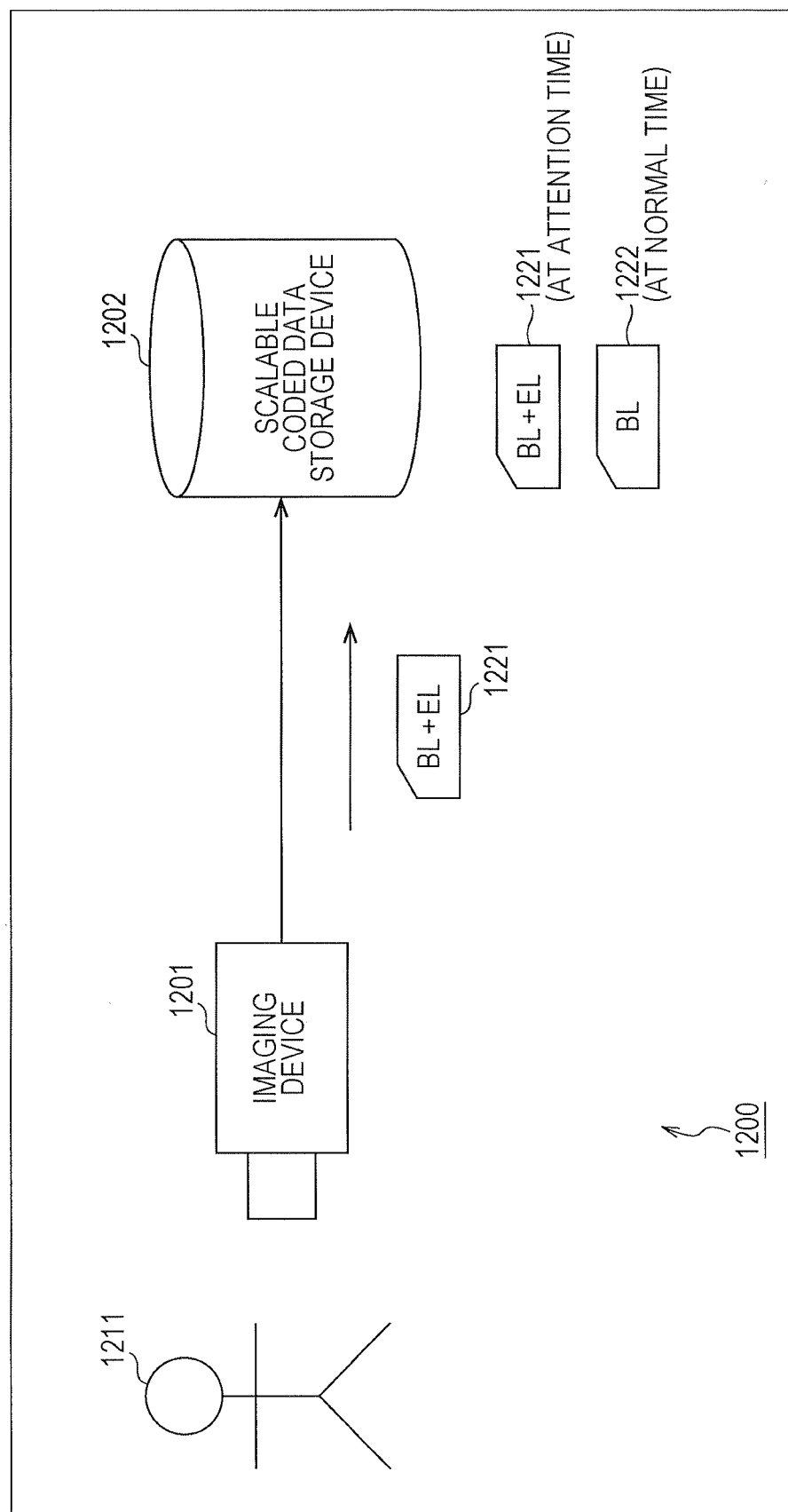
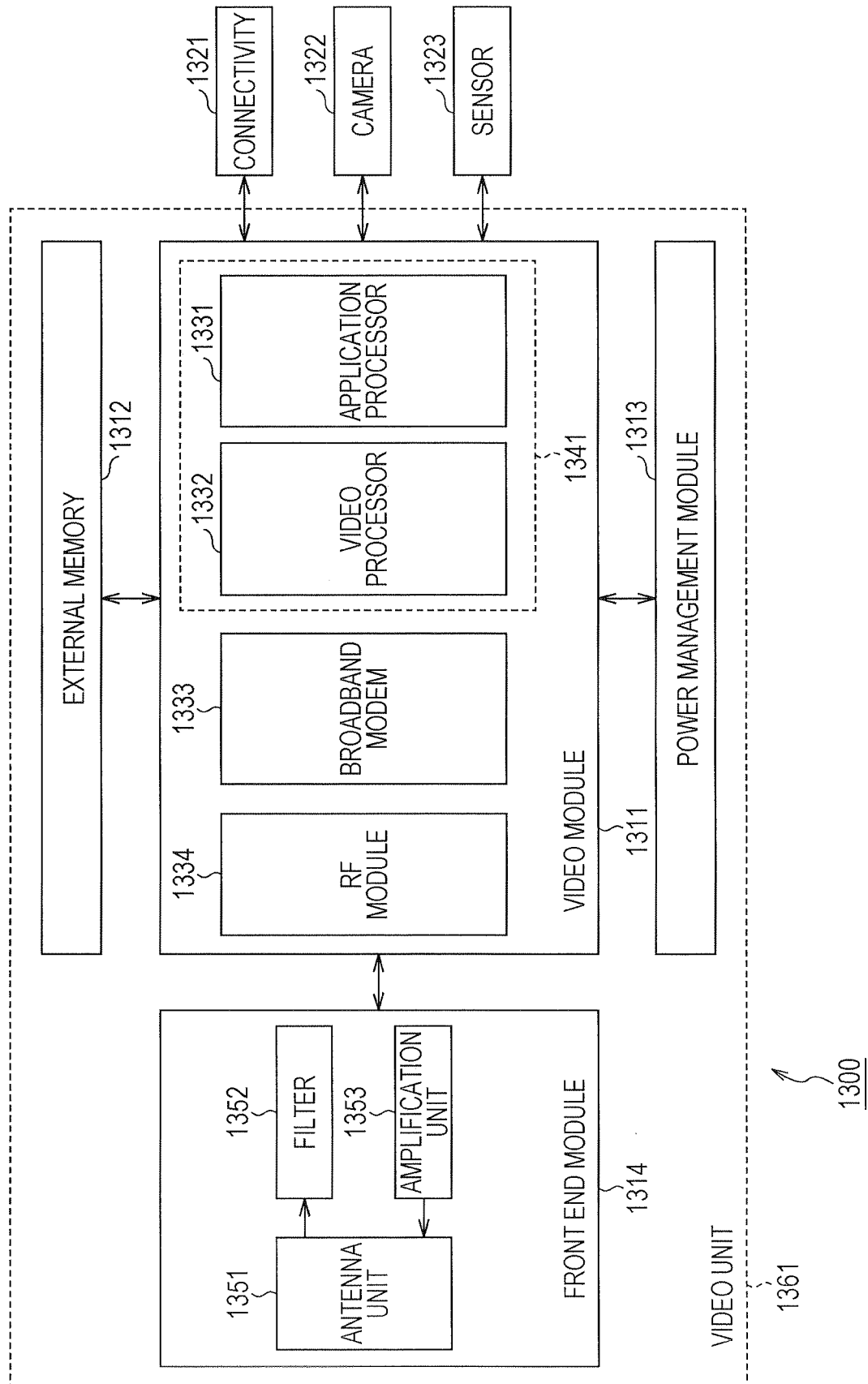


FIG. 69



70/72

FIG. 70



71/72

FIG. 71

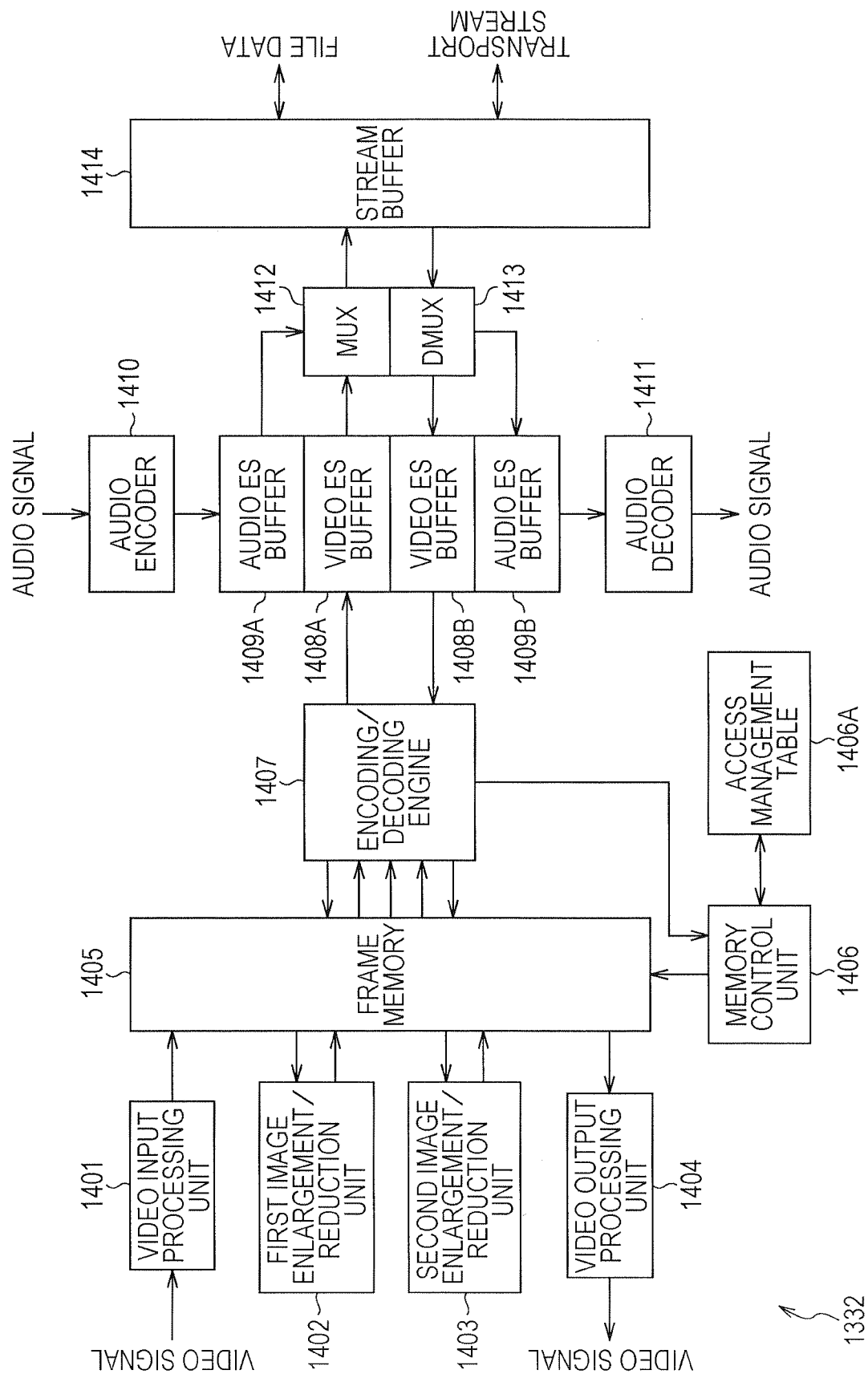


FIG. 72

