FIG. 1

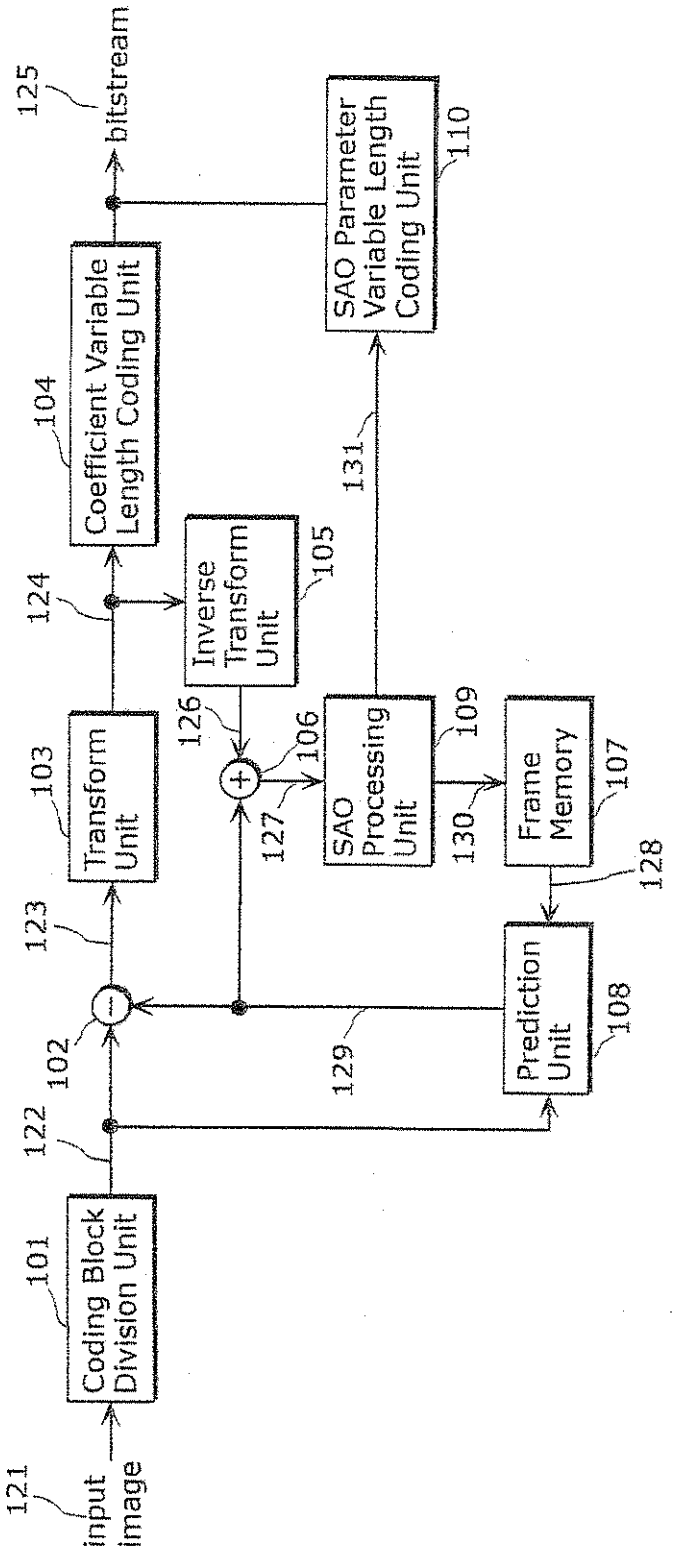

100
121
input image
101
Coding Block Division Unit
122
102
123
103
Transform Unit
104
Coefficient Variable Length Coding Unit
125
bitstream
124
105
Inverse Transform Unit
126
106
127
109
SAO Processing Unit
130
107
Frame Memory
128
108
Prediction Unit
129
131
110
SAO Parameter Variable Length Coding Unit

FIG. 2

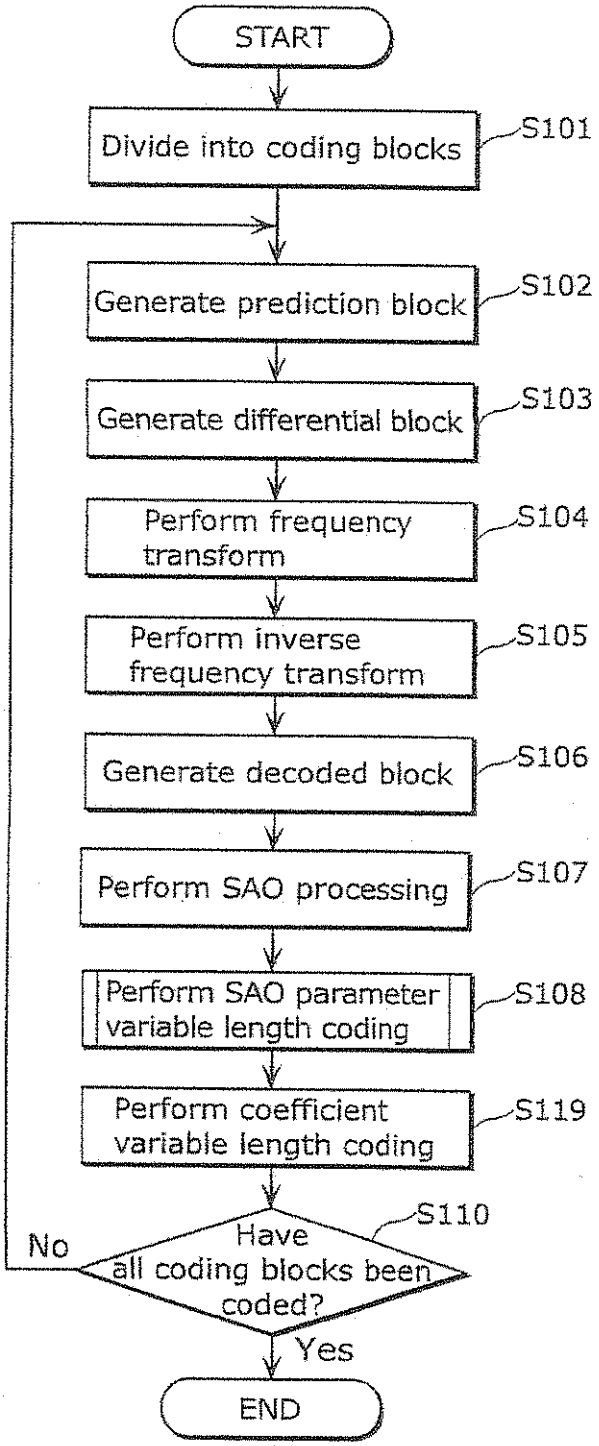

START
Divide into coding blocks
S101
Generate prediction block
S102
Generate differential block
S103
Perform frequency transform
S104
Perform inverse frequency transform
S105
Generate decoded block
S106
Perform SAO processing
S107
Perform SAO parameter variable length coding
S108
Perform coefficient variable length coding
S119
Have all coding blocks been coded?
S110
No
Yes
END

FIG. 3

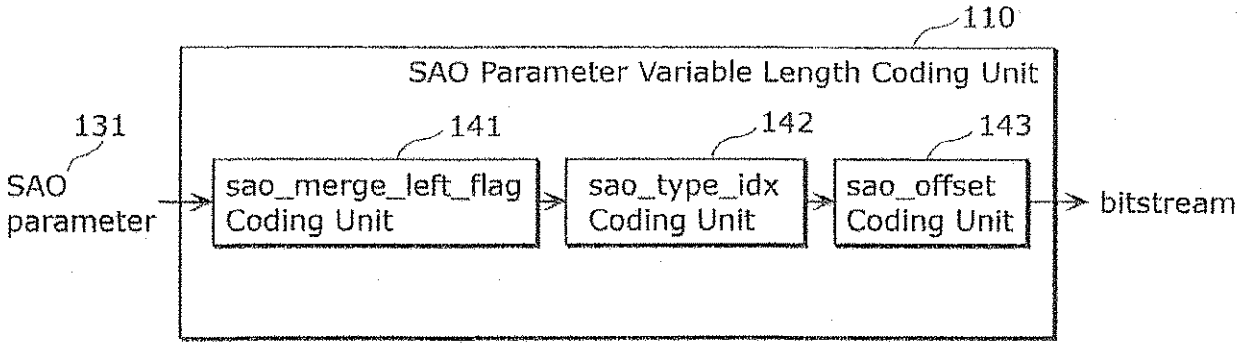

110
SAO Parameter Variable Length Coding Unit
131
SAO
parameter
141
sao_merge_left_flag
Coding Unit
142
sao_type_idx
Coding Unit
143
sao_offset
Coding Unit
bitstream

FIG. 4

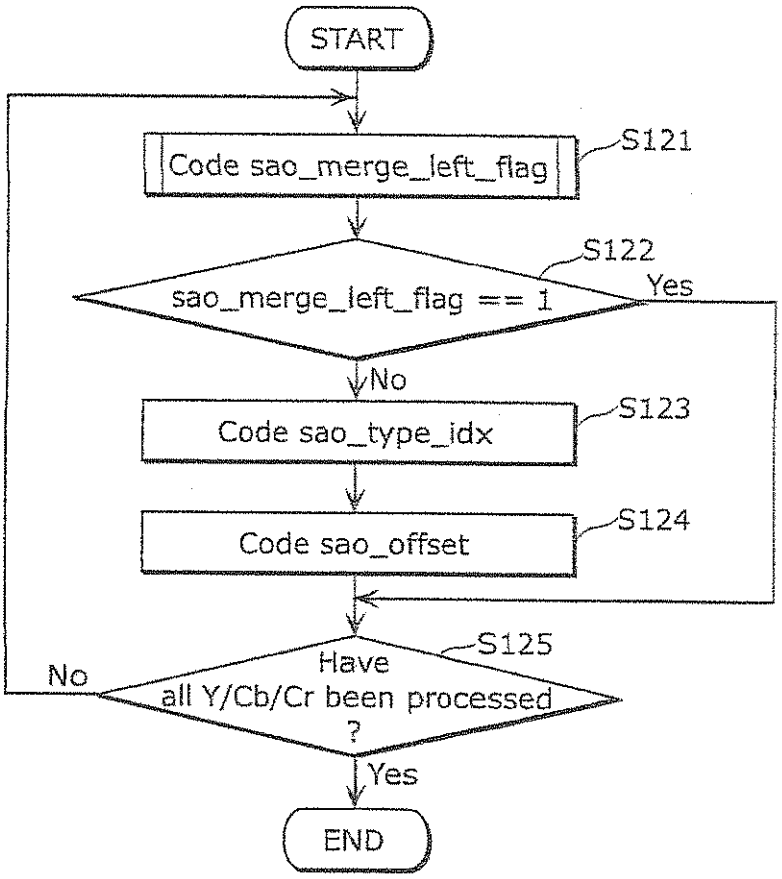

START
Code sao_merge_left_flag
S121
sao_merge_left_flag == 1
S122
Yes
No
Code sao_type_idx
S123
Code sao_offset
S124
Have all Y/Cb/Cr been processed ?
S125
No
Yes
END

FIG. 5

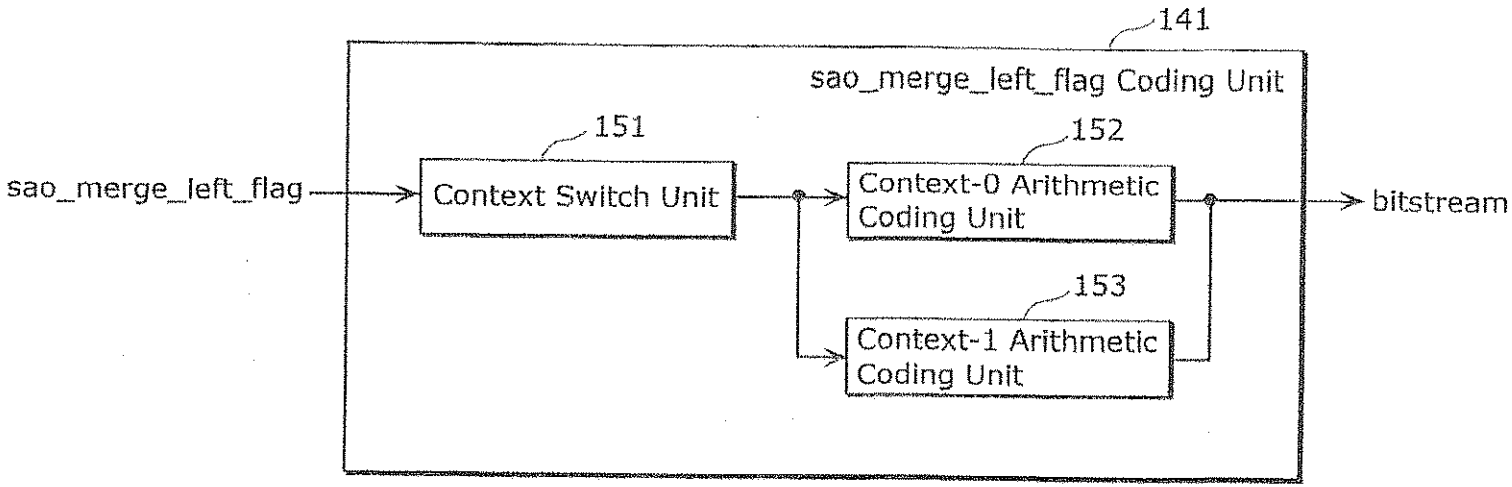

141
sao_merge_left_flag Coding Unit
151
152
sao_merge_left_flag
Context Switch Unit
Context-0 Arithmetic Coding Unit
bitstream
153
Context-1 Arithmetic Coding Unit

FIG. 6

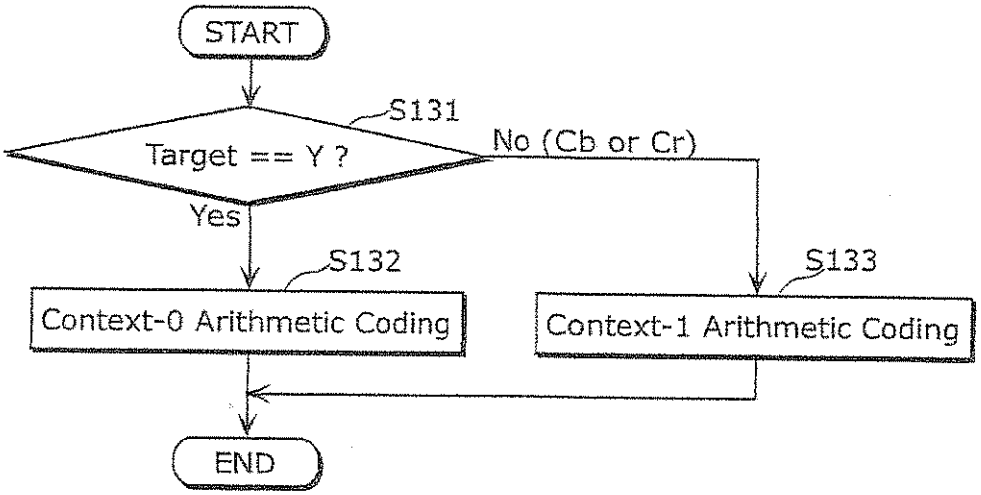

START
S131
Target == Y ?
No (Cb or Cr)
Yes
S132
S133
Context-0 Arithmetic Coding
Context-1 Arithmetic Coding
END

FIG. 7

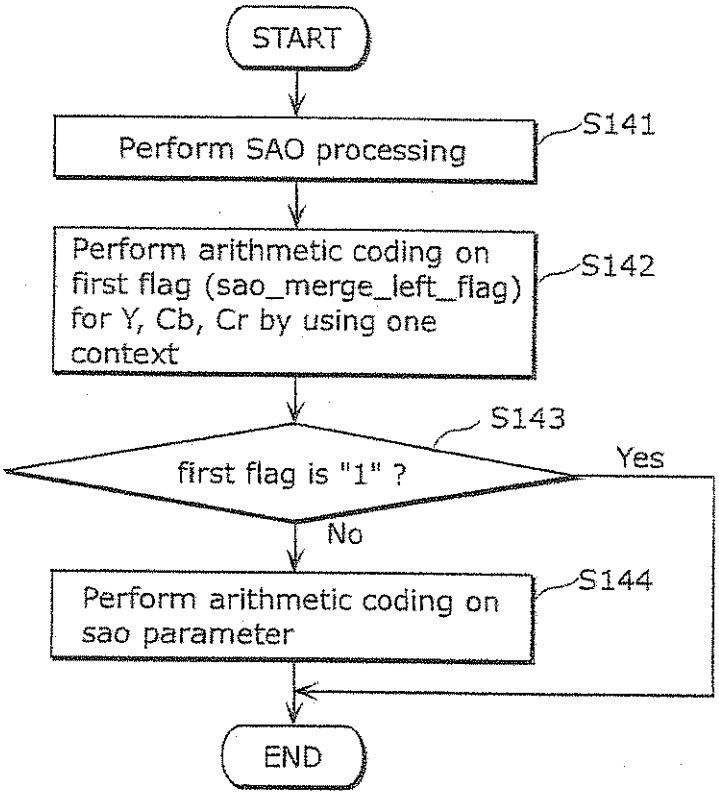

START
Perform SAO processing
S141
Perform arithmetic coding on first flag (sao_merge_left_flag) for Y, Cb, Cr by using one context
S142
S143
first flag is "1" ?
Yes
No
Perform arithmetic coding on sao parameter
S144
END

FIG. 8

	Main									HE10								
	AI			RA			LB			AI			RA			LB		
	Y	Cb	Cr	Y	Cb	Cr	Y	Cb	Cr	Y	Cb	Cr	Y	Cb	Cr	Y	Cb	Cr
Embodiment 1	0.0	0.0	0.0	0.0	0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	0.0	-0.1	0.1
Variation 1	0.0	0.0	0.0	-0.1	-0.2	-0.3	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	0.0	-0.1	0.1

FIG. 9

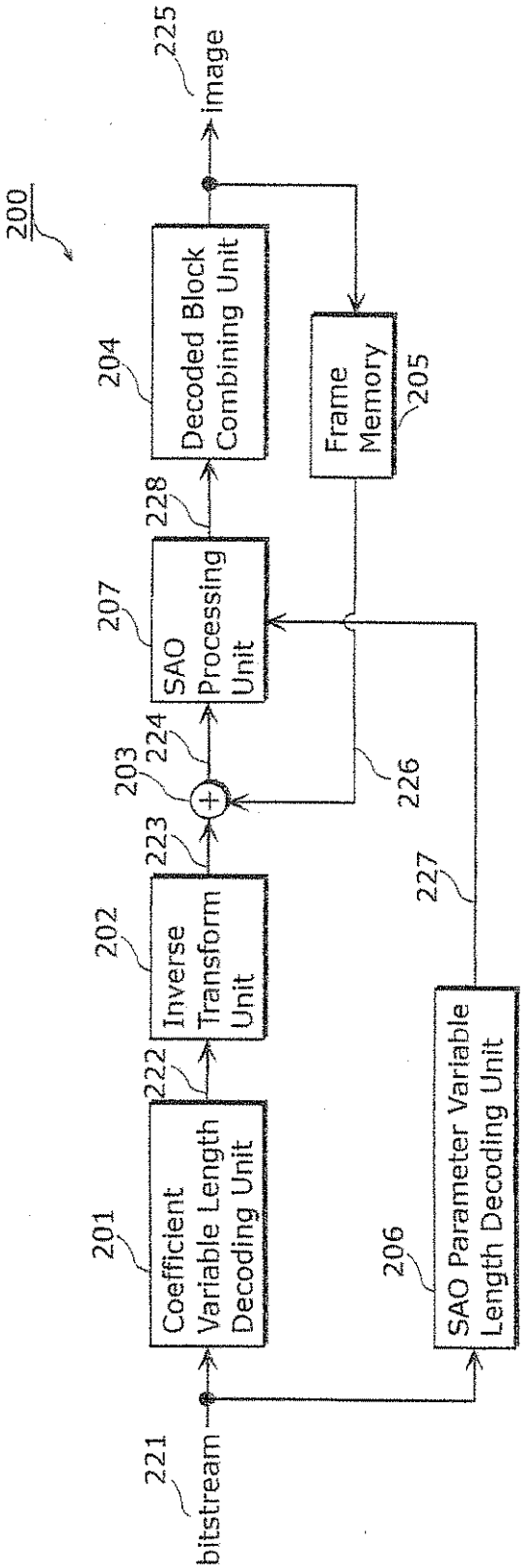

200
221
bitstream
201
Coefficient Variable Length Decoding Unit
222
202
Inverse Transform Unit
223
203
224
207
SAO Processing Unit
228
204
Decoded Block Combining Unit
225
image
205
Frame Memory
226
206
SAO Parameter Variable Length Decoding Unit
227

FIG. 10

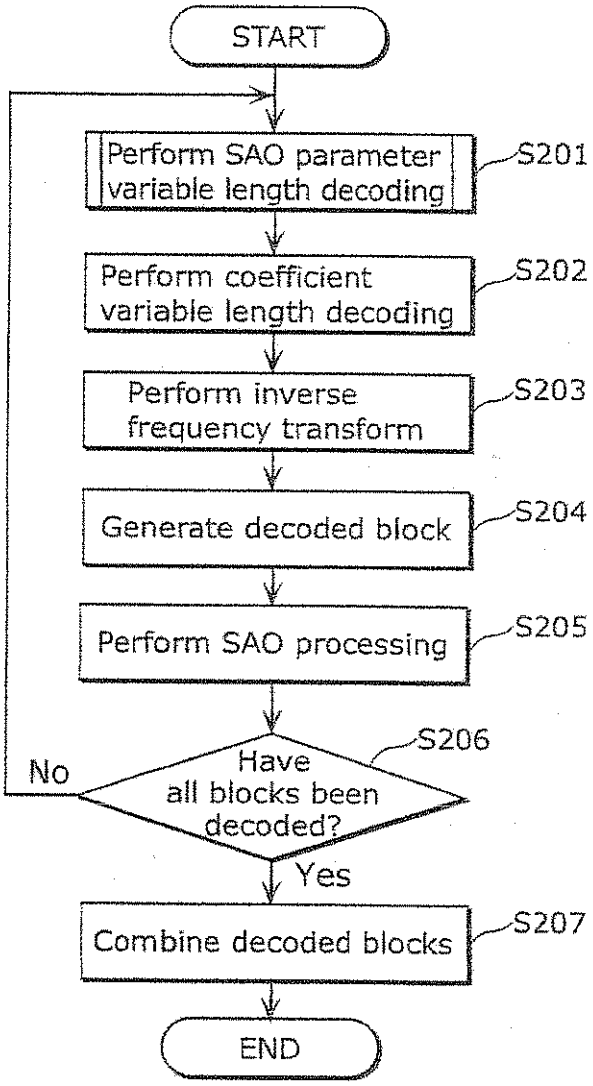

START
Perform SAO parameter variable length decoding
S201
Perform coefficient variable length decoding
S202
Perform inverse frequency transform
S203
Generate decoded block
S204
Perform SAO processing
S205
Have all blocks been decoded?
S206
No
Yes
Combine decoded blocks
S207
END

FIG. 11

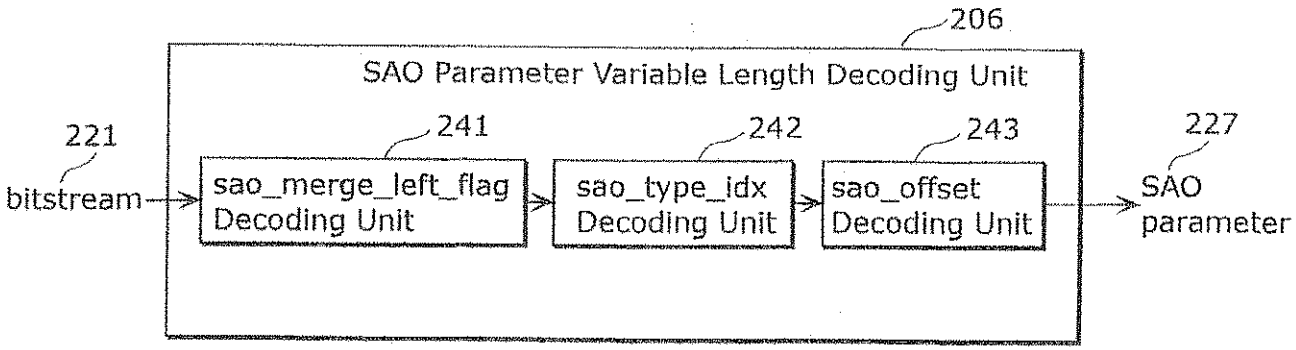

206
SAO Parameter Variable Length Decoding Unit
221
bitstream
241
sao_merge_left_flag
Decoding Unit
242
sao_type_idx
Decoding Unit
243
sao_offset
Decoding Unit
227
SAO
parameter

FIG. 12

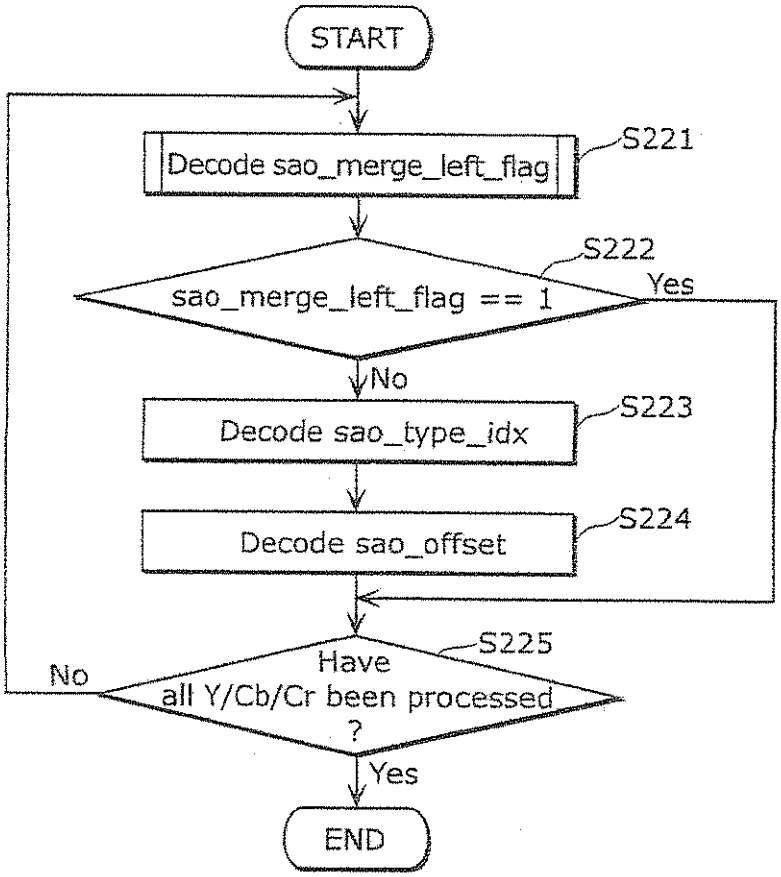

START
Decode sao_merge_left_flag
S221
S222
sao_merge_left_flag == 1
Yes
No
Decode sao_type_idx
S223
Decode sao_offset
S224
S225
Have all Y/Cb/Cr been processed ?
No
Yes
END

FIG. 13

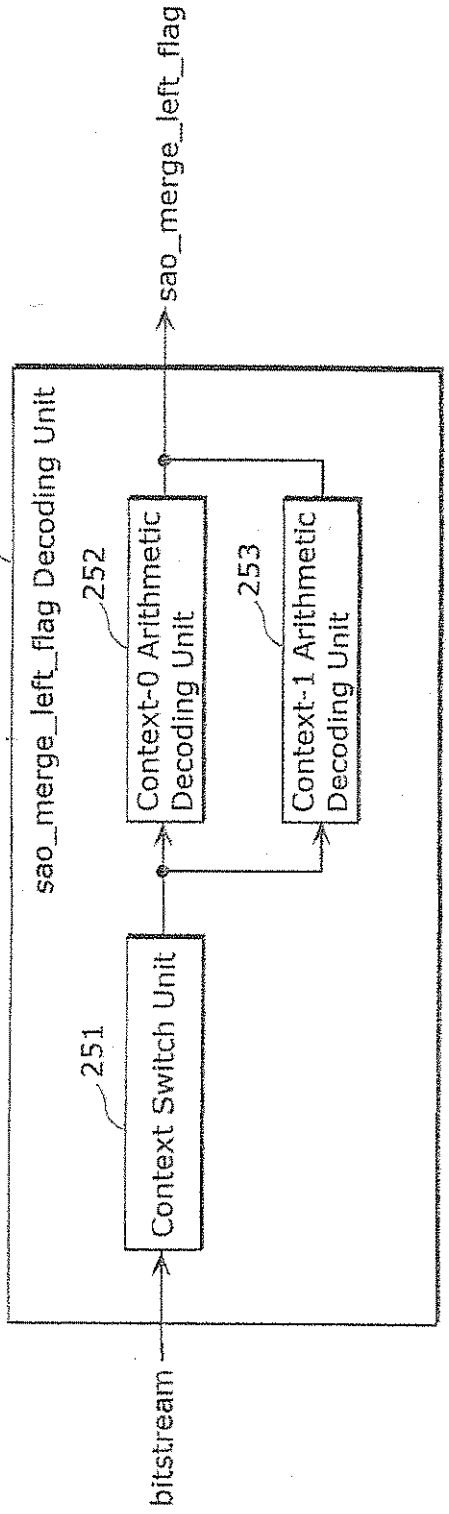

bitstream
241
sao_merge_left_flag Decoding Unit
251
Context Switch Unit
252
Context-0 Arithmetic Decoding Unit
253
Context-1 Arithmetic Decoding Unit
sao_merge_left_flag

FIG. 14

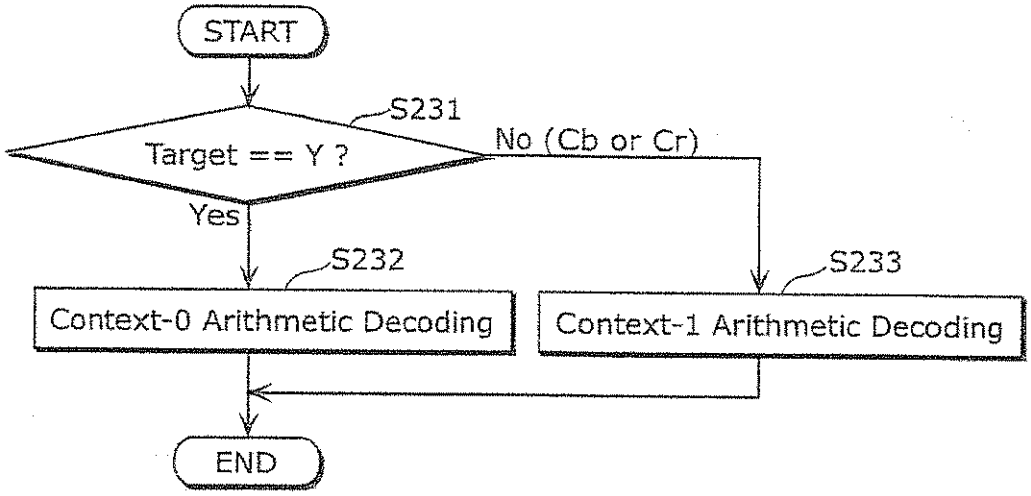

START
S231
Target == Y ?
No (Cb or Cr)
Yes
S232
S233
Context-0 Arithmetic Decoding
Context-1 Arithmetic Decoding
END

FIG. 15

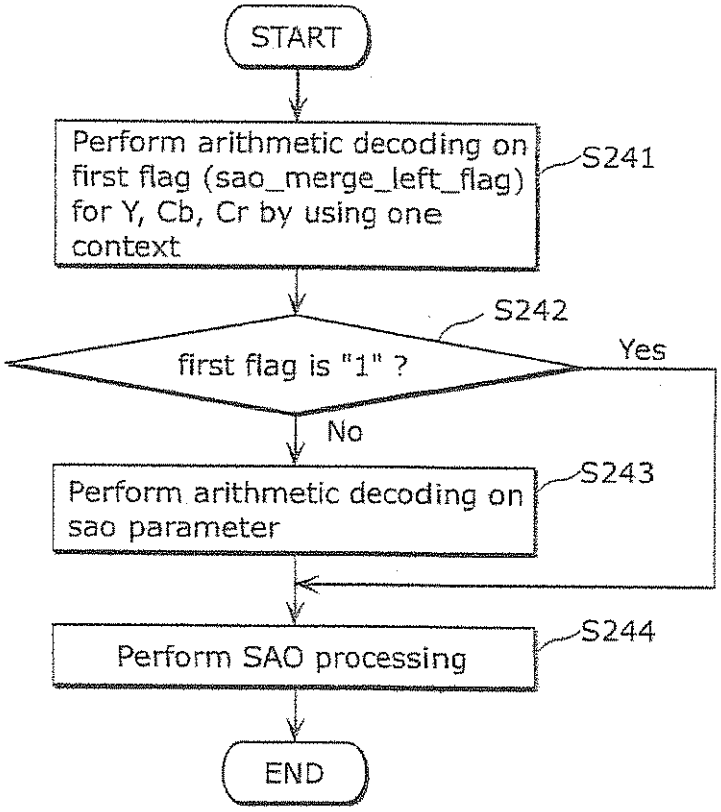

START
Perform arithmetic decoding on first flag (sao_merge_left_flag) for Y, Cb, Cr by using one context
S241
S242
first flag is "1" ?
Yes
No
Perform arithmetic decoding on sao parameter
S243
Perform SAO processing
S244
END

FIG. 16

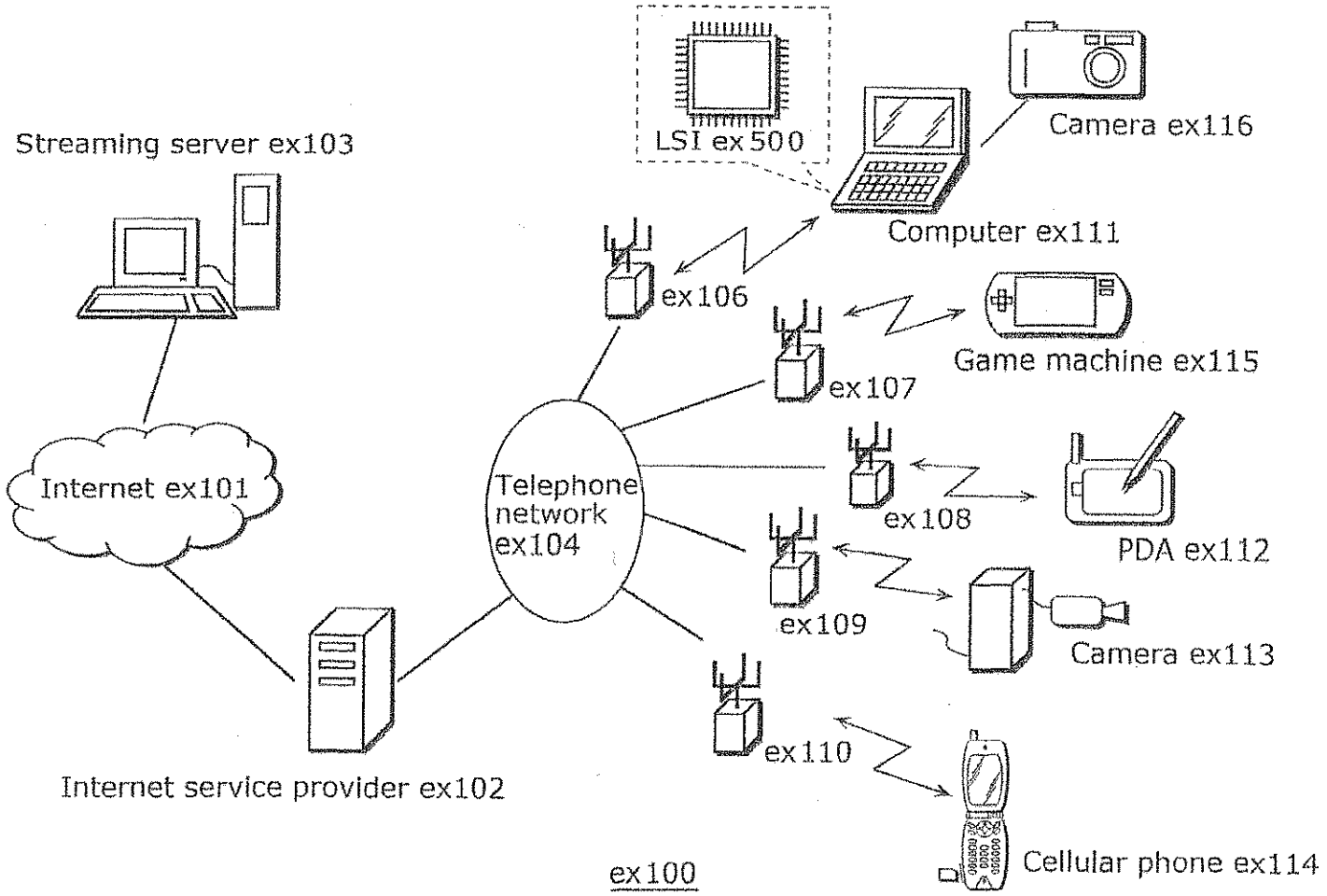

Streaming server ex103
LSI ex500
Camera ex116
Computer ex111
ex106
ex107
Game machine ex115
Internet ex101
Telephone network ex104
ex108
PDA ex112
ex109
Camera ex113
ex110
Internet service provider ex102
Cellular phone ex114
ex100

FIG. 17

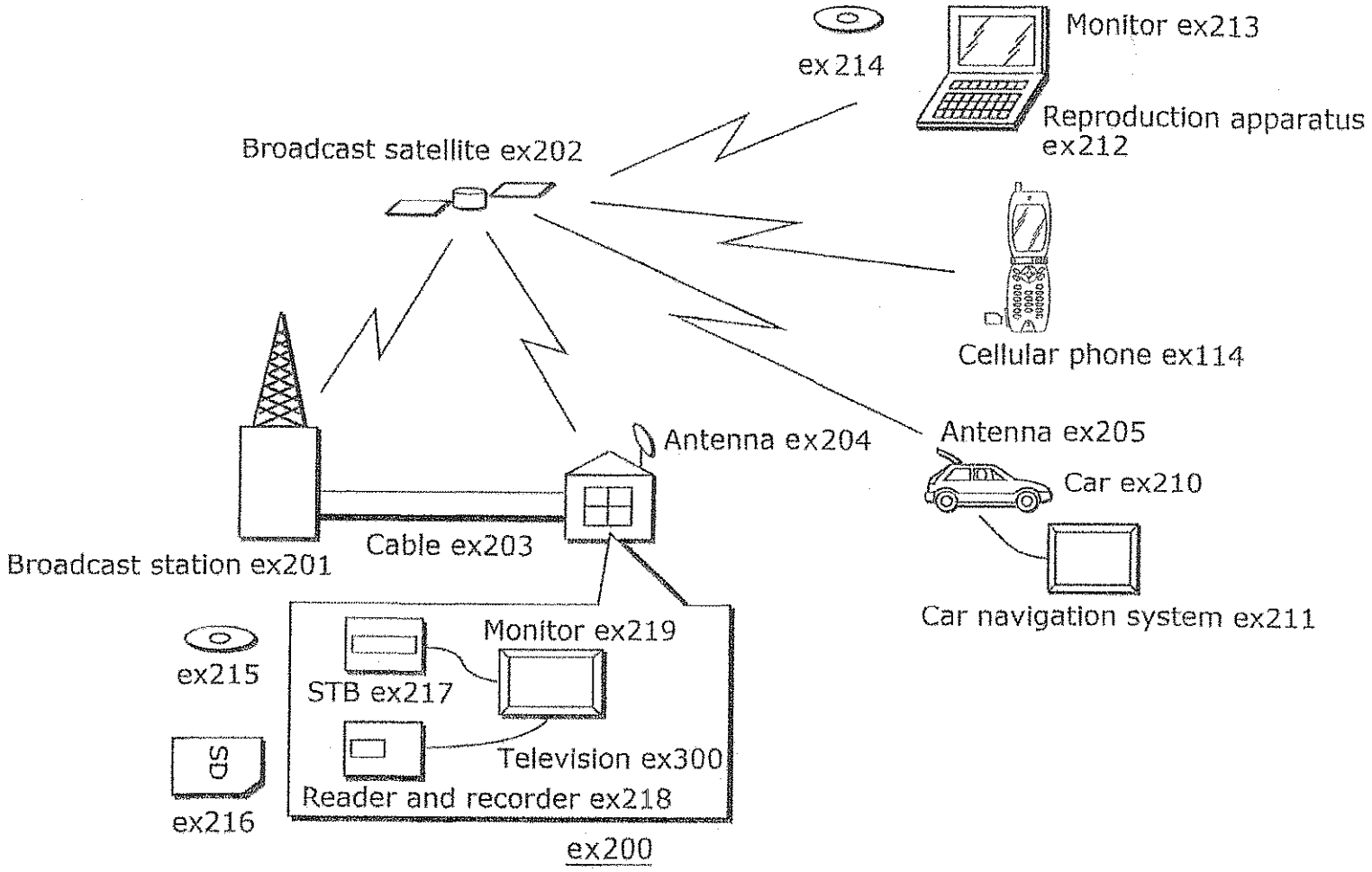

ex214
Monitor ex213
Reproduction apparatus ex212
Broadcast satellite ex202
Cellular phone ex114
Antenna ex204
Antenna ex205
Car ex210
Broadcast station ex201
Cable ex203
Car navigation system ex211
Monitor ex219
ex215
STB ex217
SD
Television ex300
Reader and recorder ex218
ex216
ex200

FIG. 18

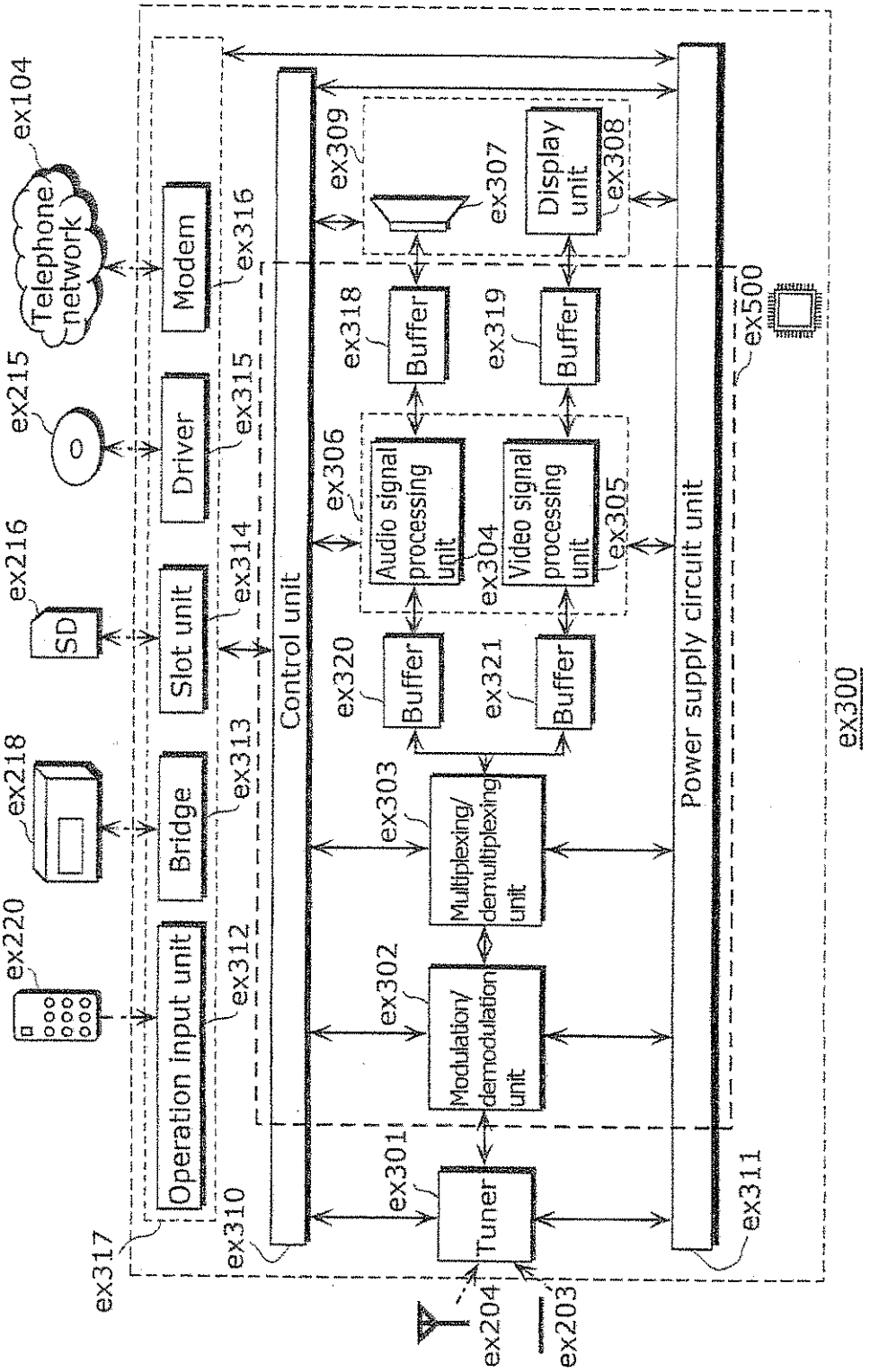

ex104
Telephone network
ex215
ex216
SD
ex218
ex220
ex317
Operation input unit
Bridge
Slot unit
Driver
Modem
ex312
ex313
ex314
ex315
ex316
ex310
Control unit
ex309
ex307
Display unit
ex308
ex318
Buffer
ex319
Buffer
ex306
Audio signal processing unit
ex304
Video signal processing unit
ex305
ex320
Buffer
ex321
Buffer
ex303
Multiplexing/ demultiplexing unit
ex302
Modulation/ demodulation unit
ex301
Tuner
Power supply circuit unit
ex500
ex311
ex204
ex203
ex300

FIG. 19

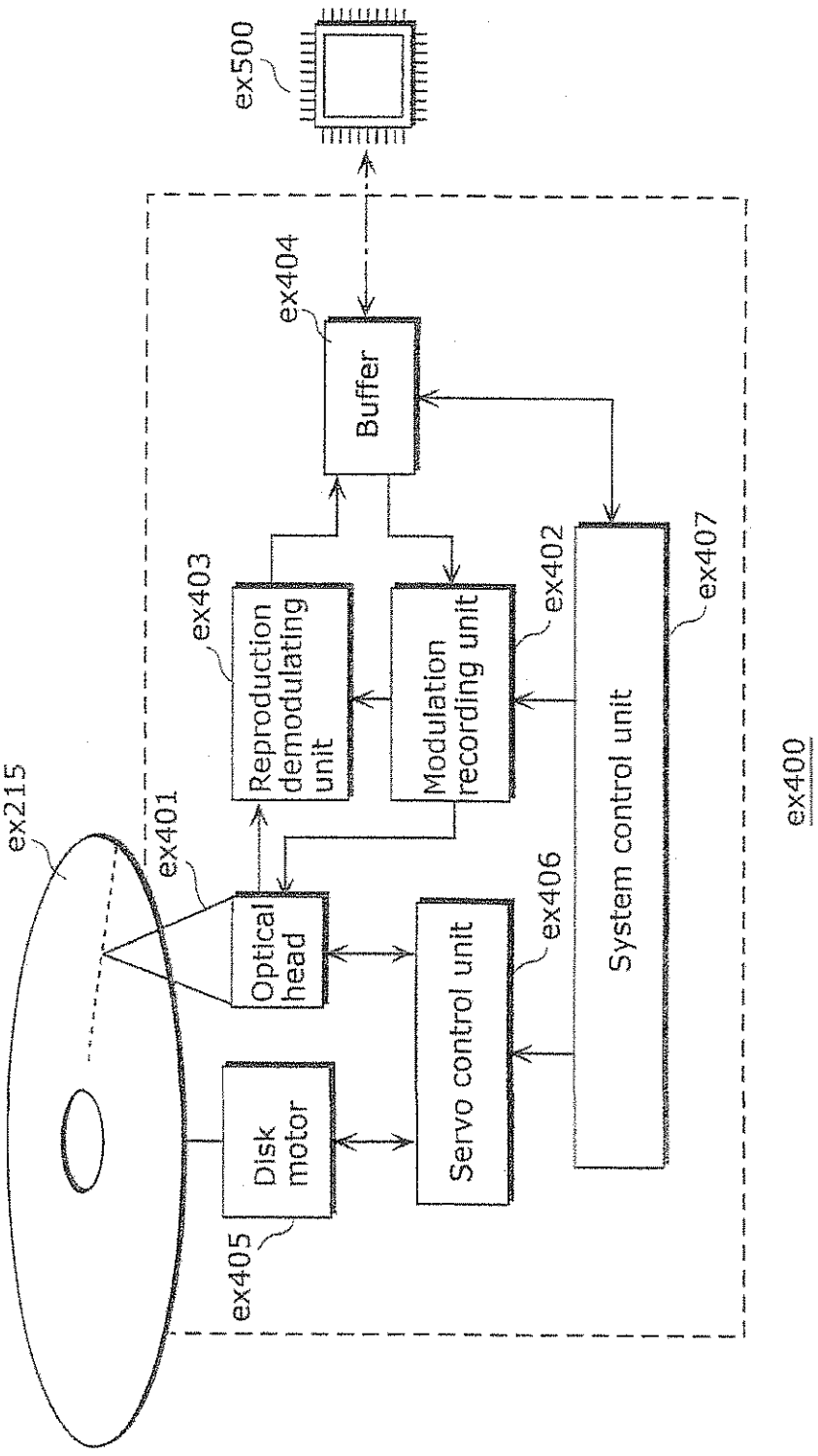

ex500
ex404
Buffer
ex403
Reproduction demodulating unit
Modulation recording unit
ex402
ex407
System control unit
ex400
ex215
ex401
Optical head
ex406
Servo control unit
Disk motor
ex405

FIG. 20

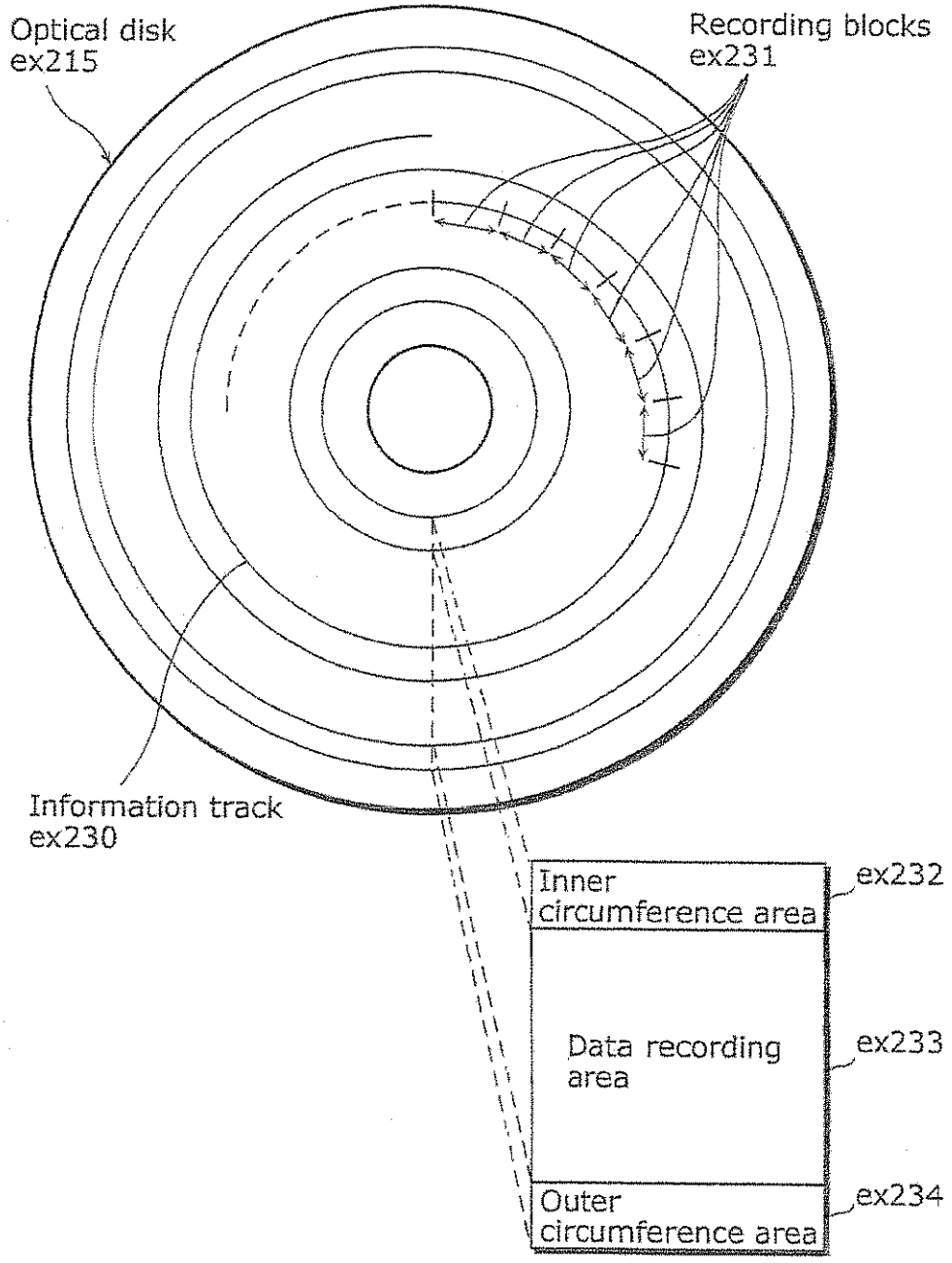

Optical disk
ex215
Recording blocks
ex231
Information track
ex230
Inner
circumference area
ex232
Data recording
area
ex233
Outer
circumference area
ex234

FIG. 21A

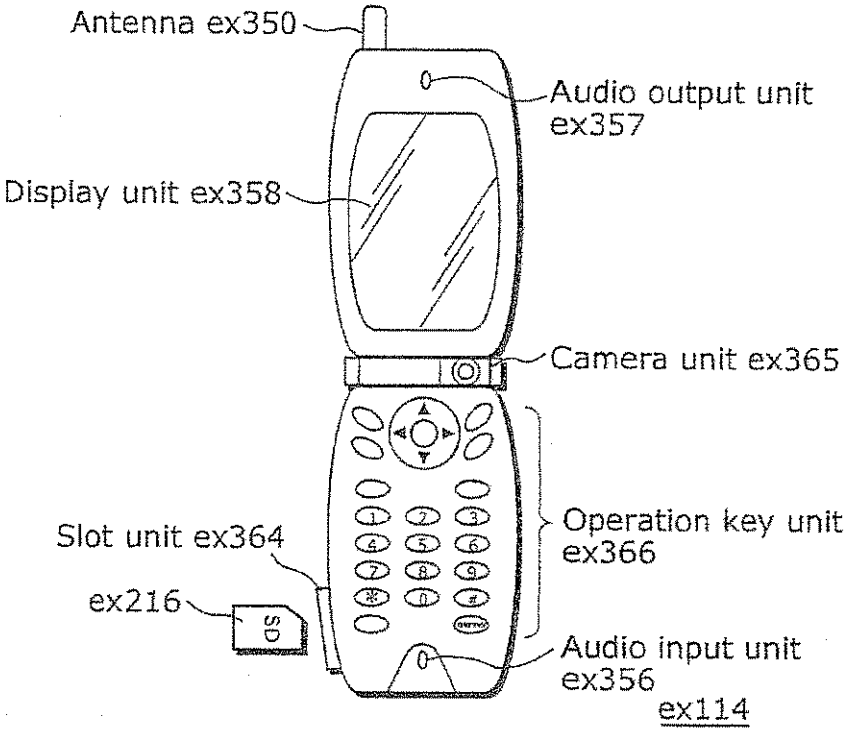


FIG. 21B

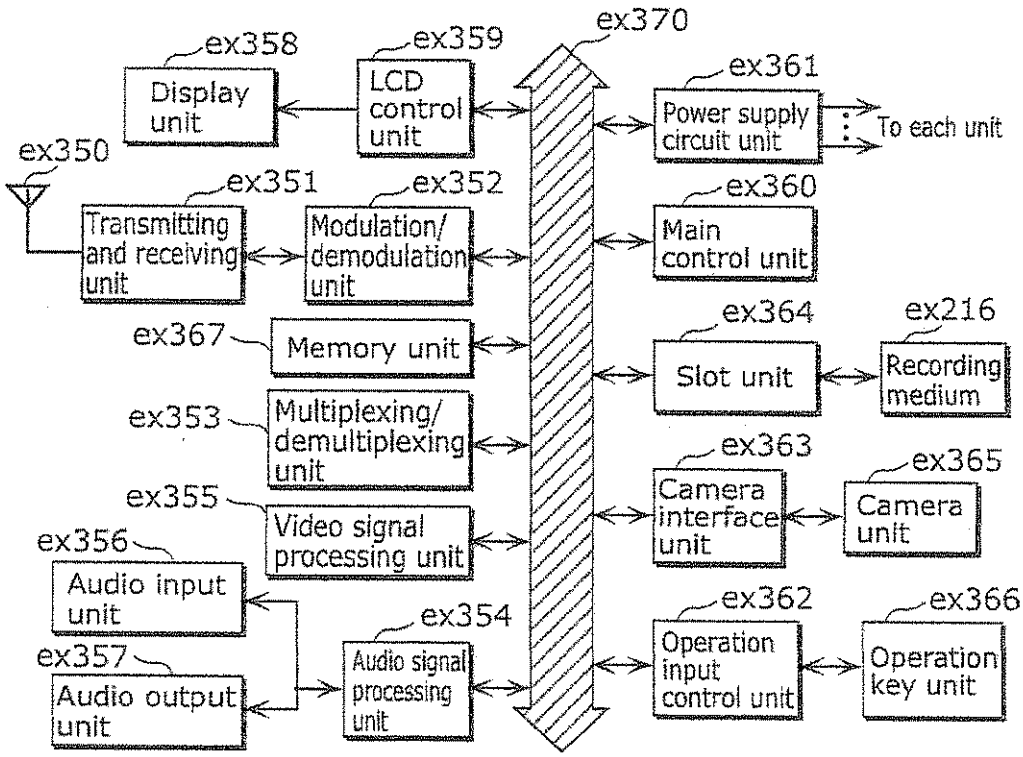


FIG. 22

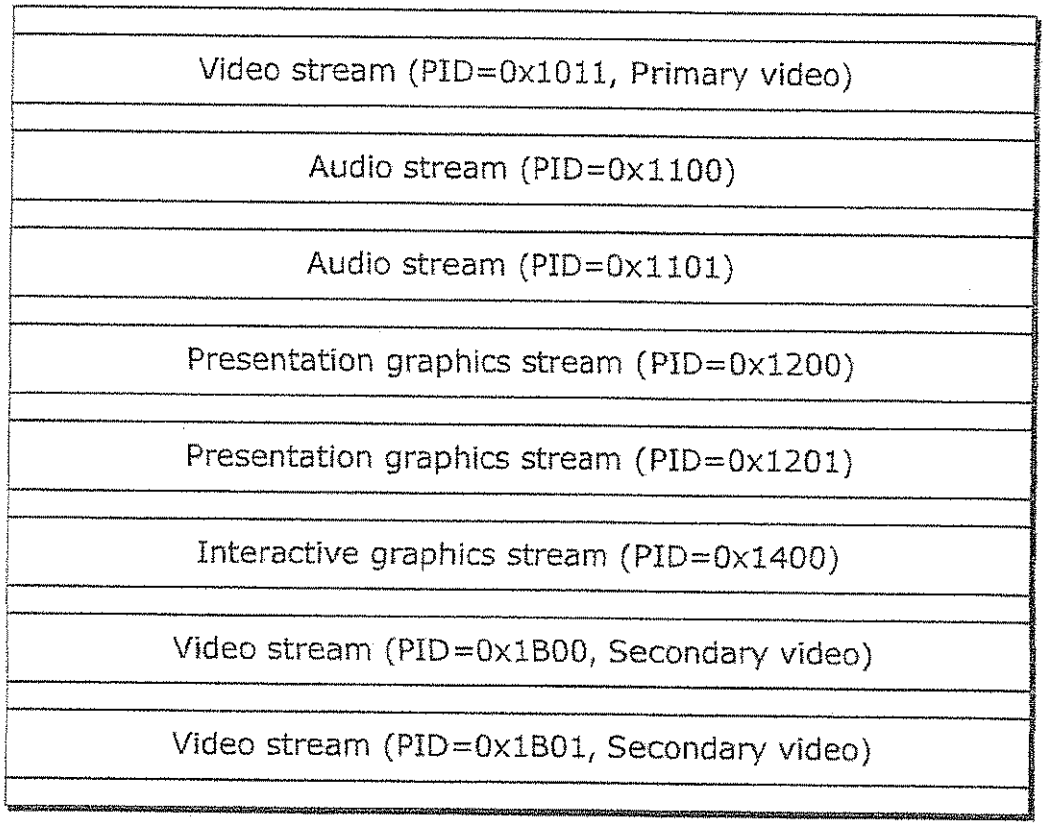

Video stream (PID=0x1011, Primary video)
Audio stream (PID=0x1100)
Audio stream (PID=0x1101)
Presentation graphics stream (PID=0x1200)
Presentation graphics stream (PID=0x1201)
Interactive graphics stream (PID=0x1400)
Video stream (PID=0x1B00, Secondary video)
Video stream (PID=0x1B01, Secondary video)

FIG. 23

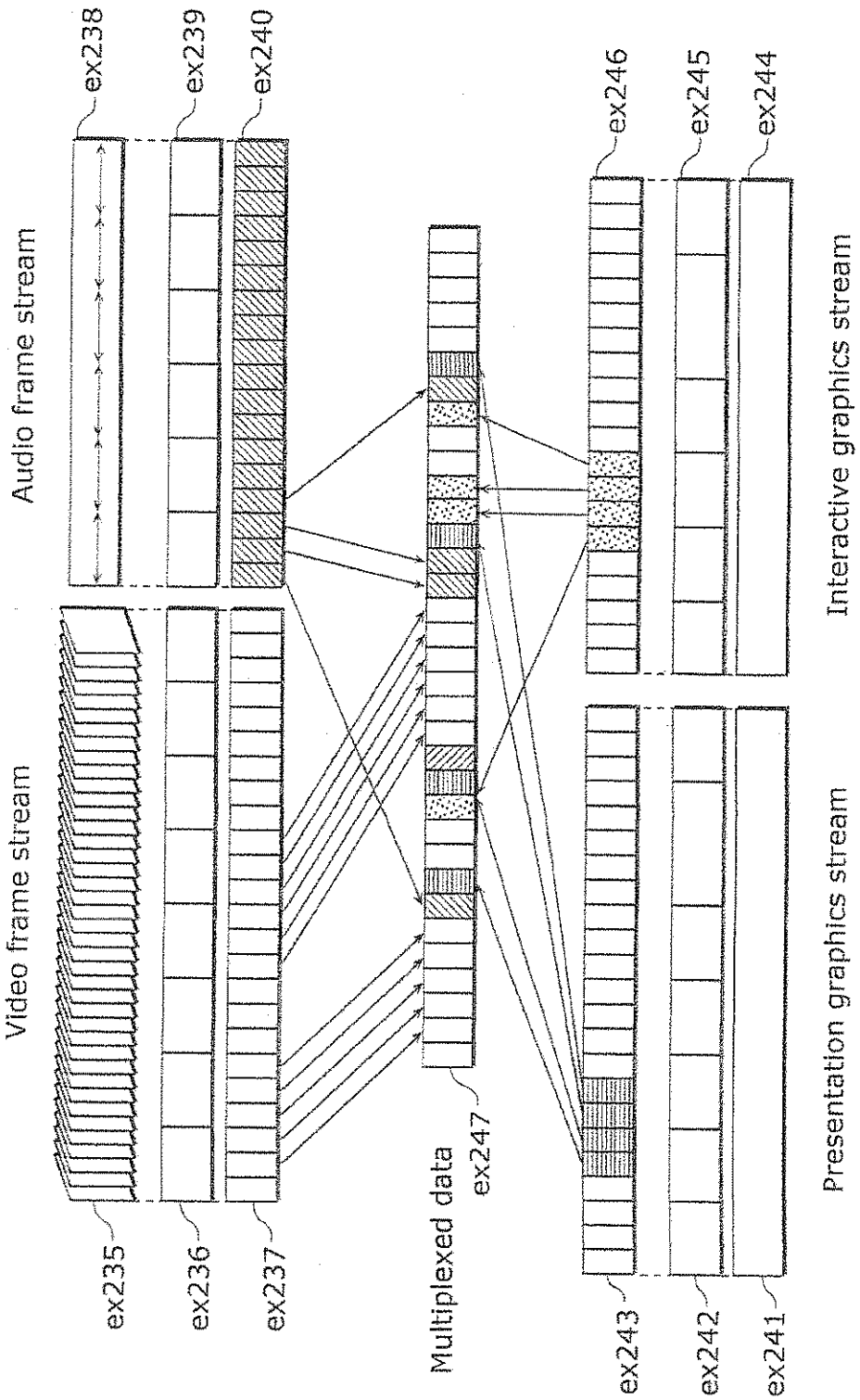

Video frame stream
Audio frame stream
Multiplexed data
Presentation graphics stream
Interactive graphics stream
ex235
ex236
ex237
ex238
ex239
ex240
ex241
ex242
ex243
ex244
ex245
ex246
ex247

FIG. 24

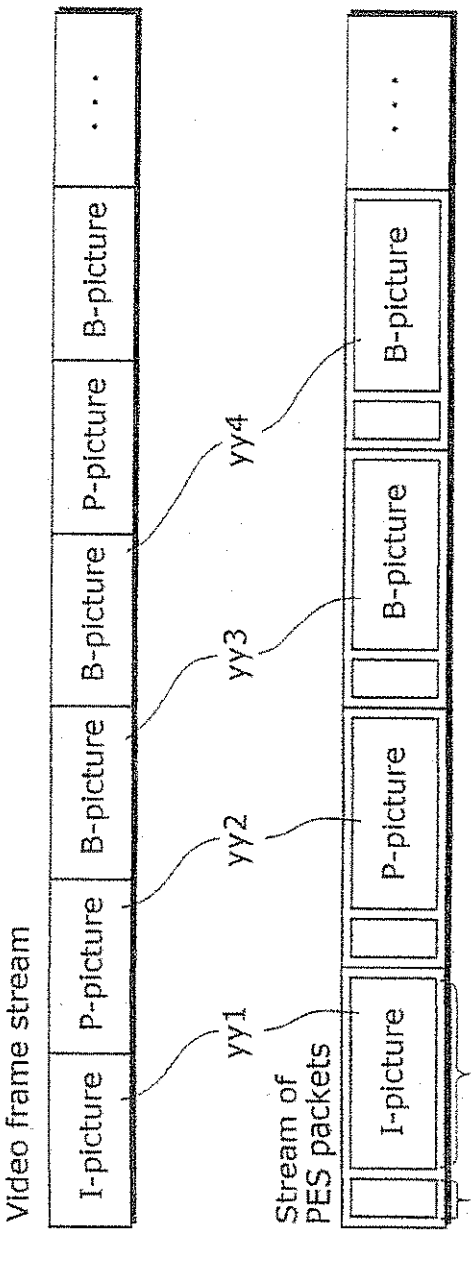

Video frame stream
I-picture
P-picture
B-picture
B-picture
P-picture
B-picture
. . .
yy1
yy2
yy3
yy4
Stream of PES packets
I-picture
P-picture
B-picture
B-picture
. . .
PES header
PES payload

FIG. 25

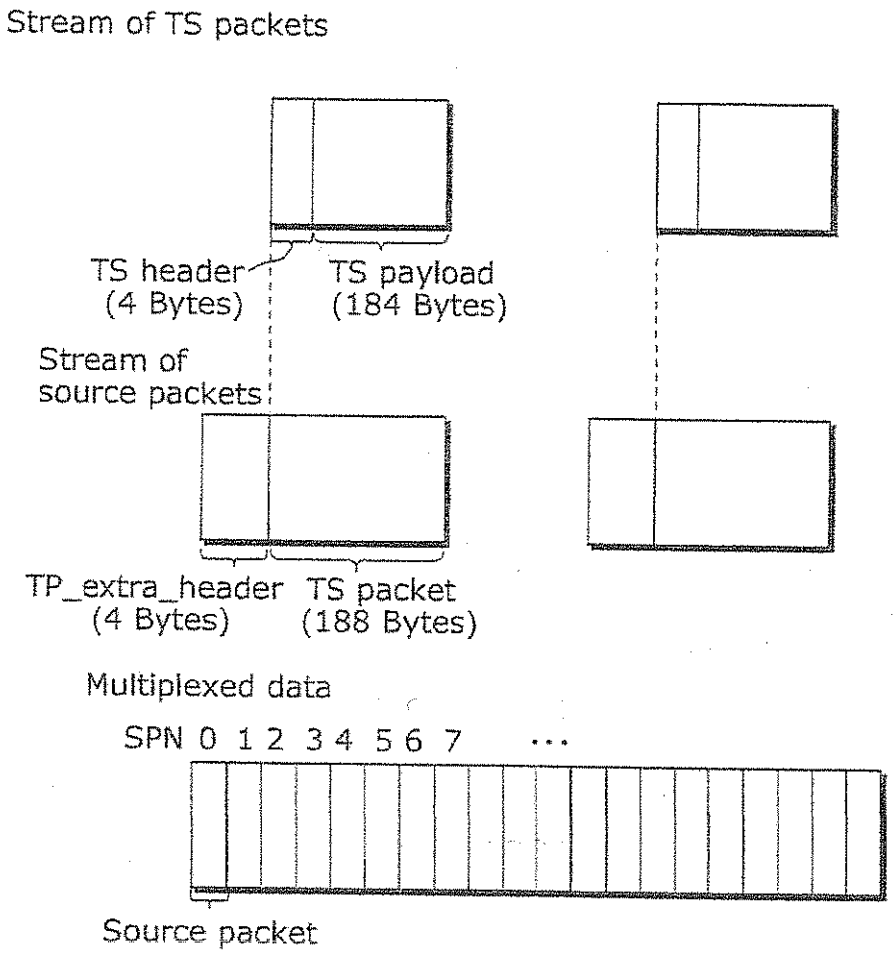

Stream of TS packets
TS header
(4 Bytes)
TS payload
(184 Bytes)
Stream of
source packets
TP_extra_header
(4 Bytes)
TS packet
(188 Bytes)
Multiplexed data
SPN 0 1 2 3 4 5 6 7 ...
Source packet

FIG. 26

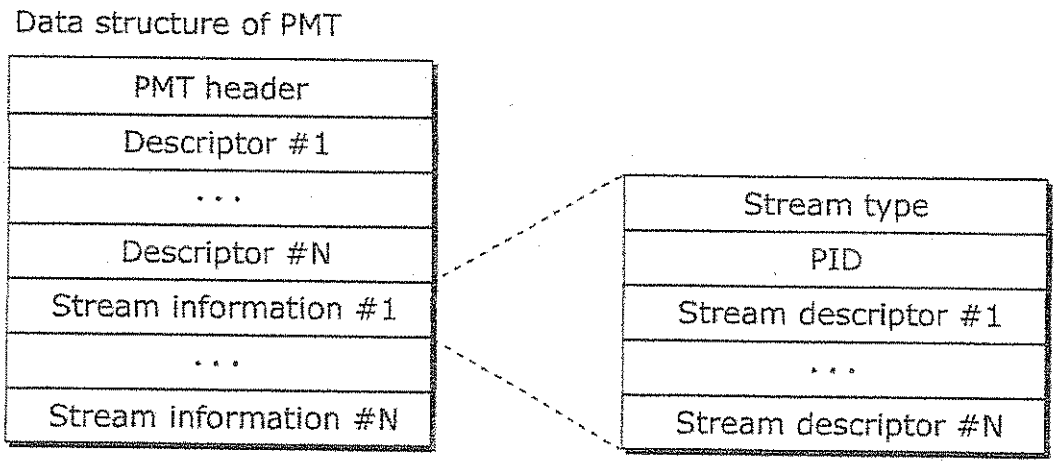

Data structure of PMT
PMT header
Descriptor #1
. . .
Descriptor #N
Stream information #1
. . .
Stream information #N
Stream type
PID
Stream descriptor #1
. . .
Stream descriptor #N

FIG. 27

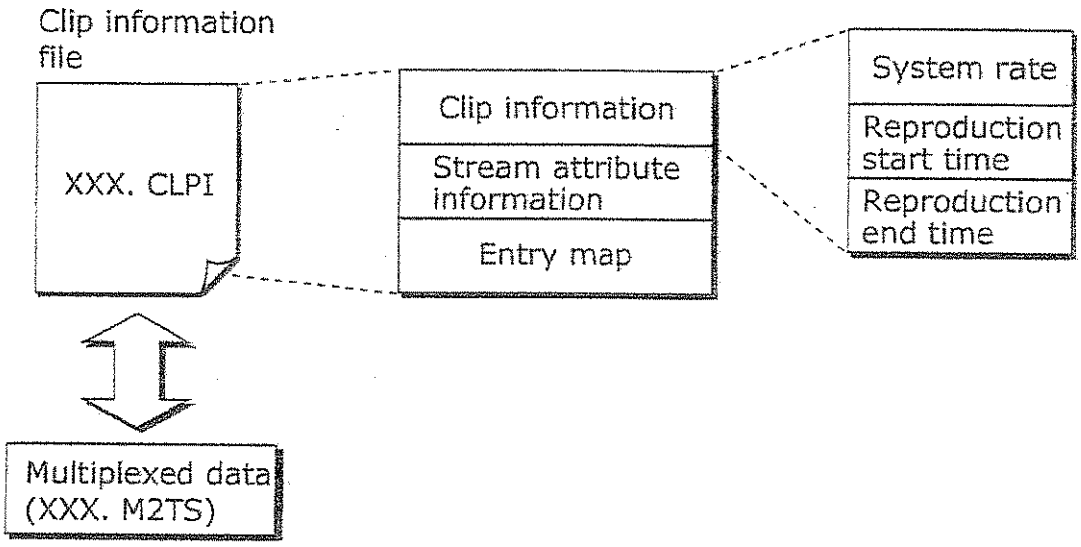

Clip information file
XXX. CLPI
Clip information
Stream attribute information
Entry map
System rate
Reproduction start time
Reproduction end time
Multiplexed data (XXX. M2TS)

FIG. 28

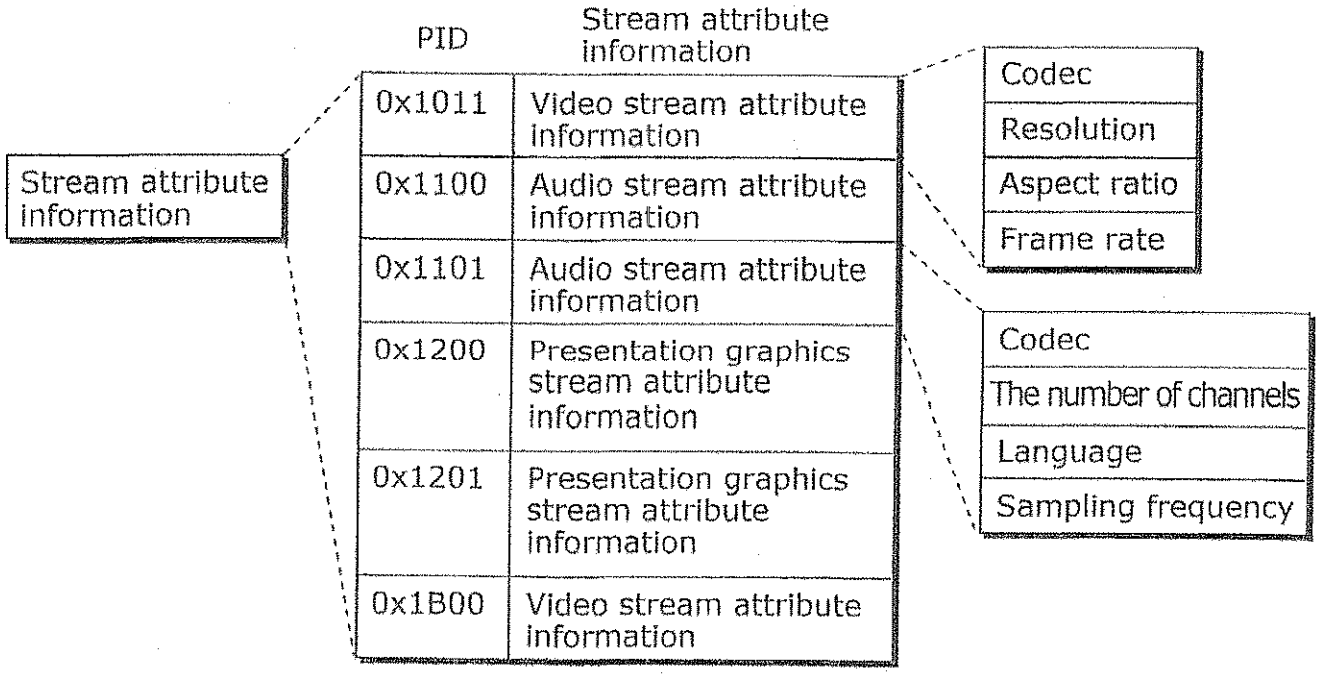

Stream attribute information
PID
Stream attribute information
0x1011
Video stream attribute information
0x1100
Audio stream attribute information
0x1101
Audio stream attribute information
0x1200
Presentation graphics stream attribute information
0x1201
Presentation graphics stream attribute information
0x1B00
Video stream attribute information
Codec
Resolution
Aspect ratio
Frame rate
Codec
The number of channels
Language
Sampling frequency

FIG. 29

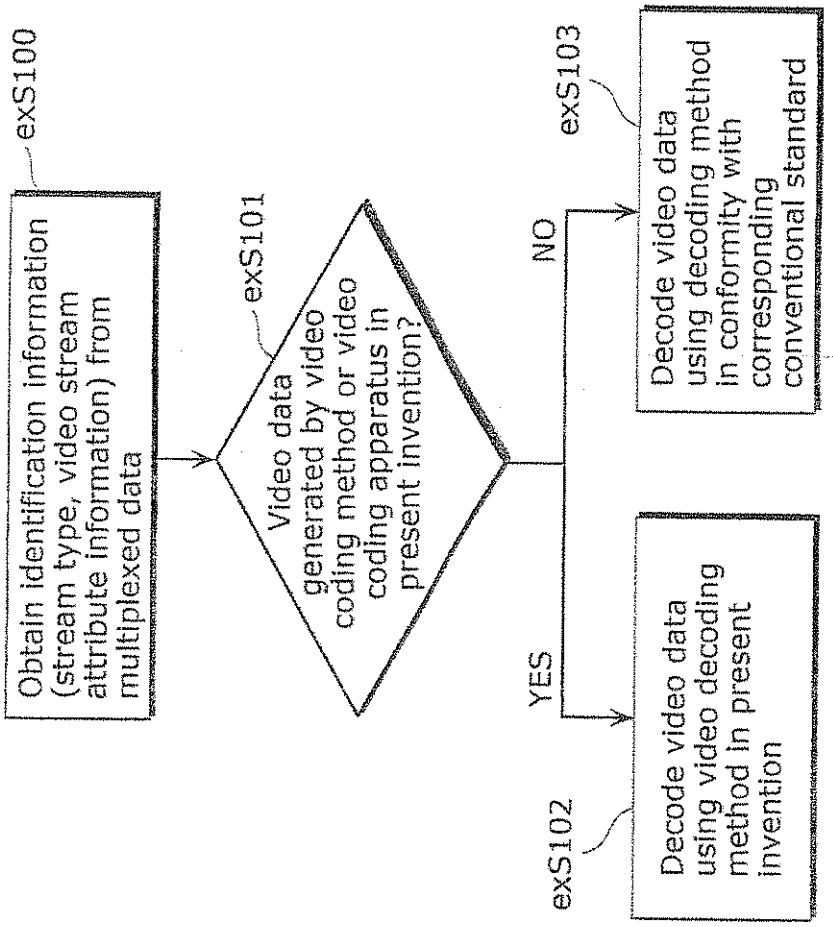

exS100
Obtain identification information (stream type, video stream attribute information) from multiplexed data
exS101
Video data generated by video coding method or video coding apparatus in present invention?
YES
NO
exS102
Decode video data using video decoding method in present invention
exS103
Decode video data using decoding method in conformity with corresponding conventional standard

FIG. 30

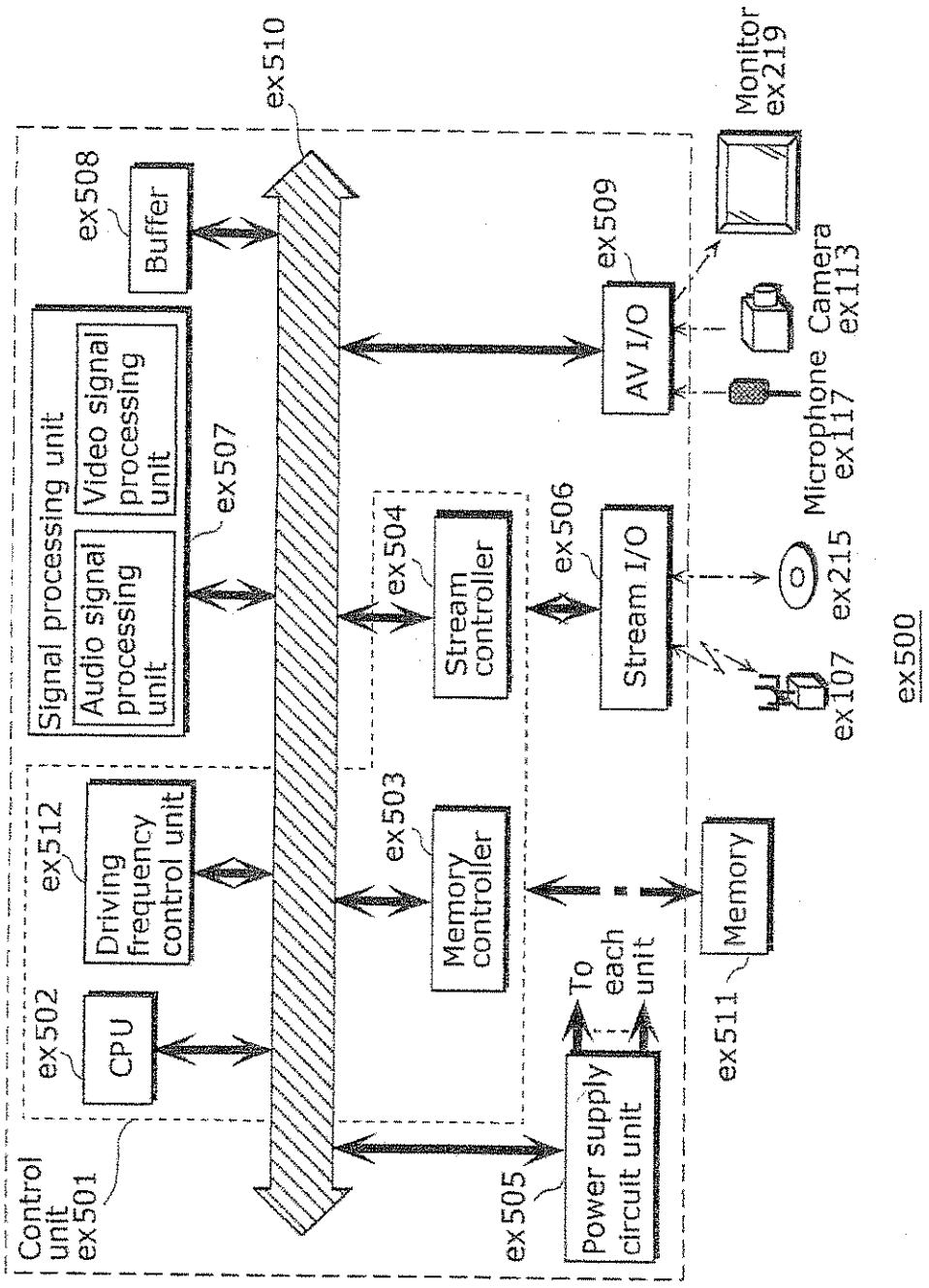
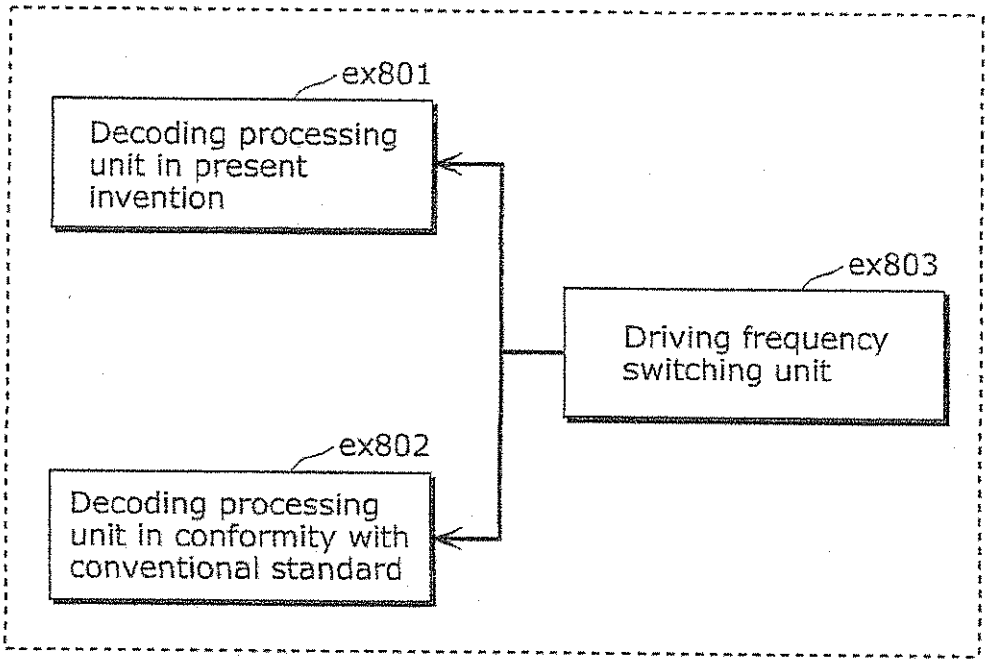

ex500
Control unit ex501
CPU ex502
Driving frequency control unit ex512
Memory controller ex503
Stream controller ex504
Power supply circuit unit ex505
To each unit
Signal processing unit
Audio signal processing unit
Video signal processing unit ex507
Buffer ex508
ex510
AV I/O ex509
Stream I/O ex506
Memory ex511
Monitor ex219
Camera ex113
Microphone ex117
ex215
ex107

FIG. 31


ex801
Decoding processing unit in present invention
ex803
Driving frequency switching unit
ex802
Decoding processing unit in conformity with conventional standard

ex800

FIG. 32

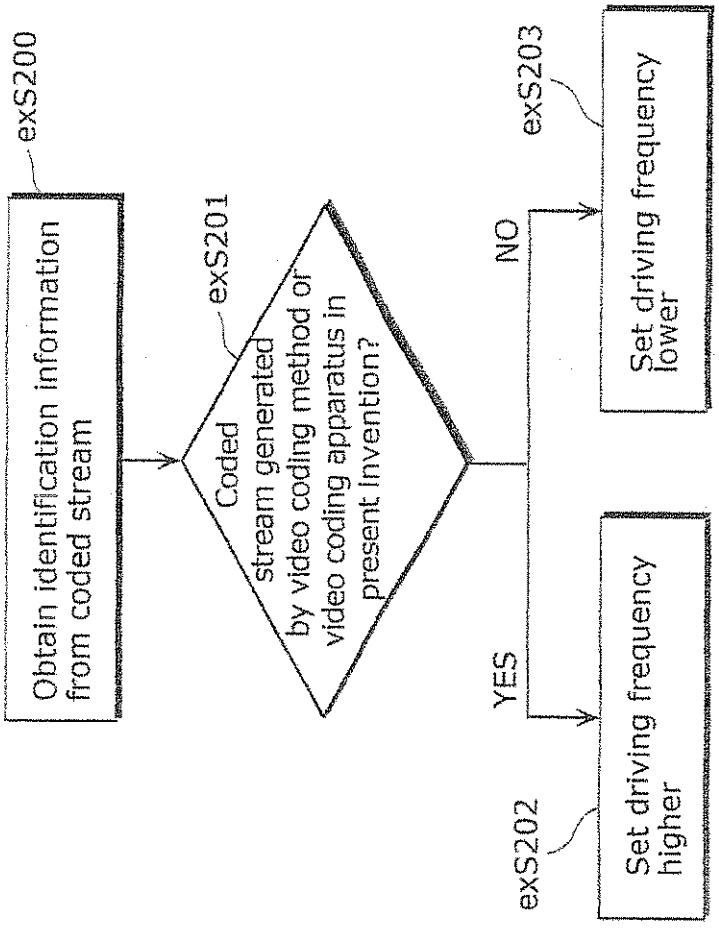

exS200
Obtain identification information from coded stream
exS201
Coded stream generated by video coding method or video coding apparatus in present invention?
YES
NO
exS202
Set driving frequency higher
exS203
Set driving frequency lower

FIG. 33

Corresponding standard	Driving frequency
MPEG-4 AVC	500 MHz
MPEG-2	350 MHz
⋮	⋮

FIG. 34A

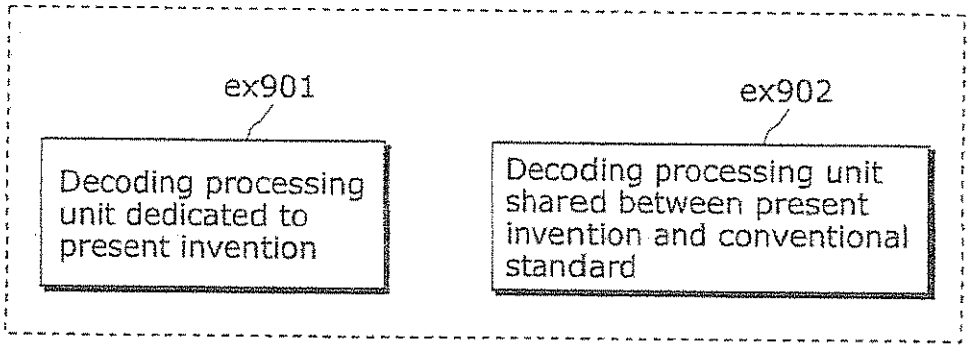
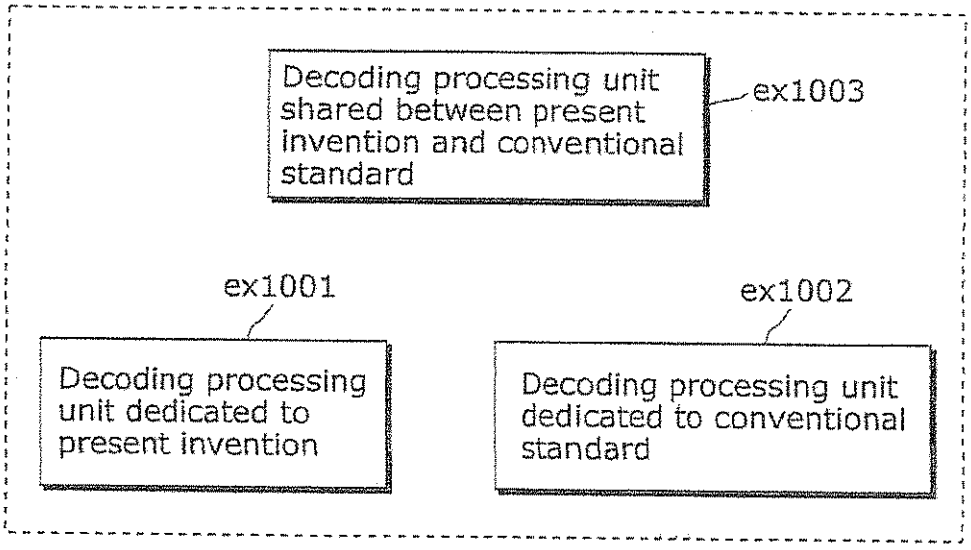



FIG. 34B