FIG. 1

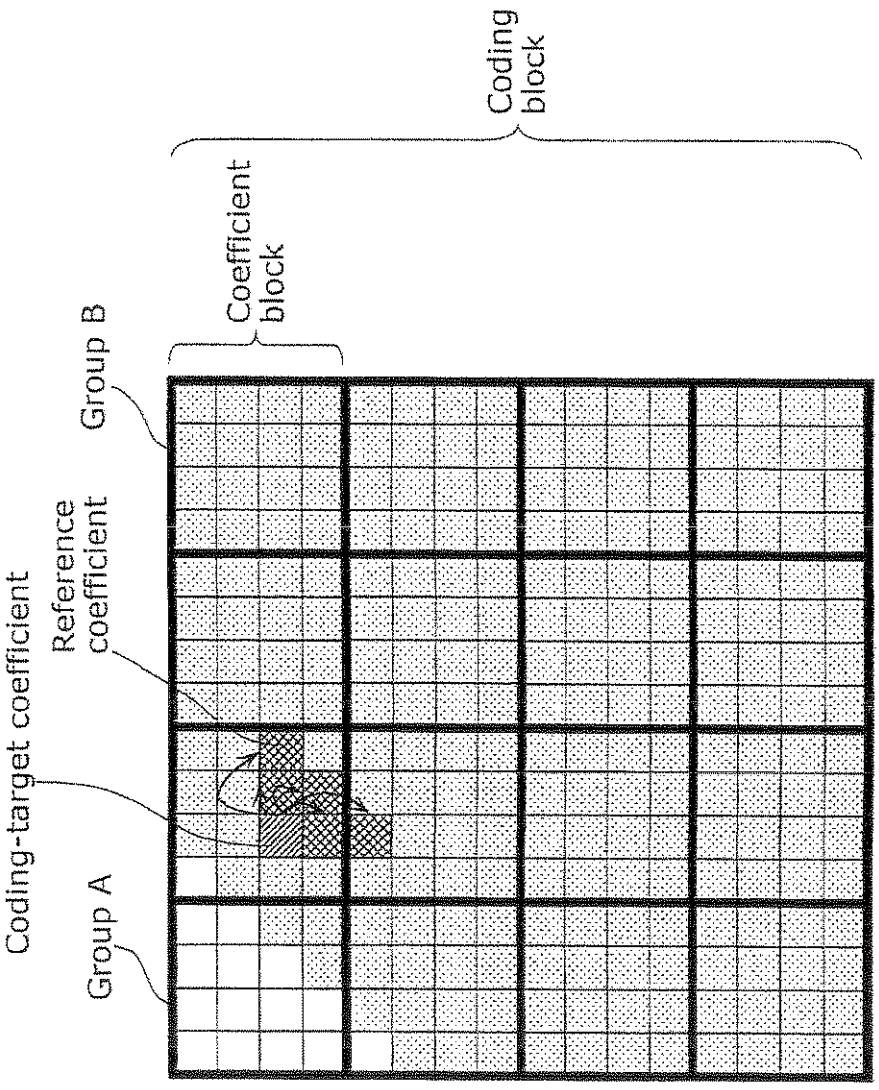

Coding block
Coefficient block
Group B
Reference coefficient
Coding-target coefficient
Group A

FIG. 2

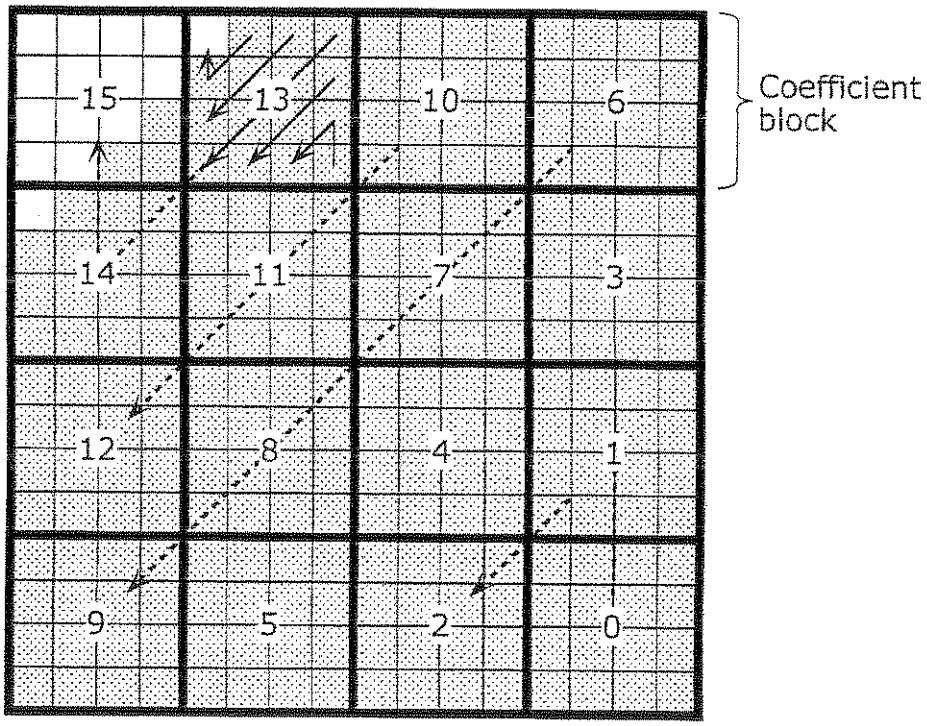


FIG. 3A

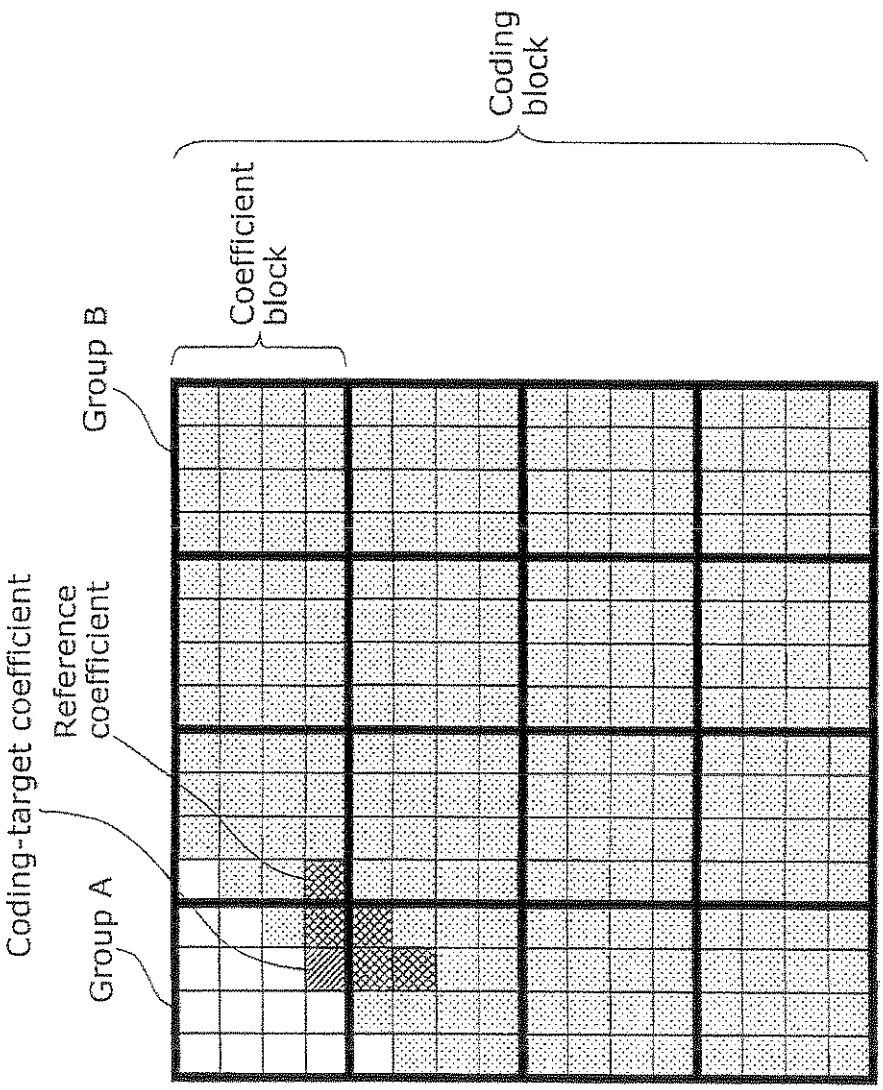

Coding block
Coefficient block
Group B
Reference coefficient
Coding-target coefficient
Group A

FIG. 3B

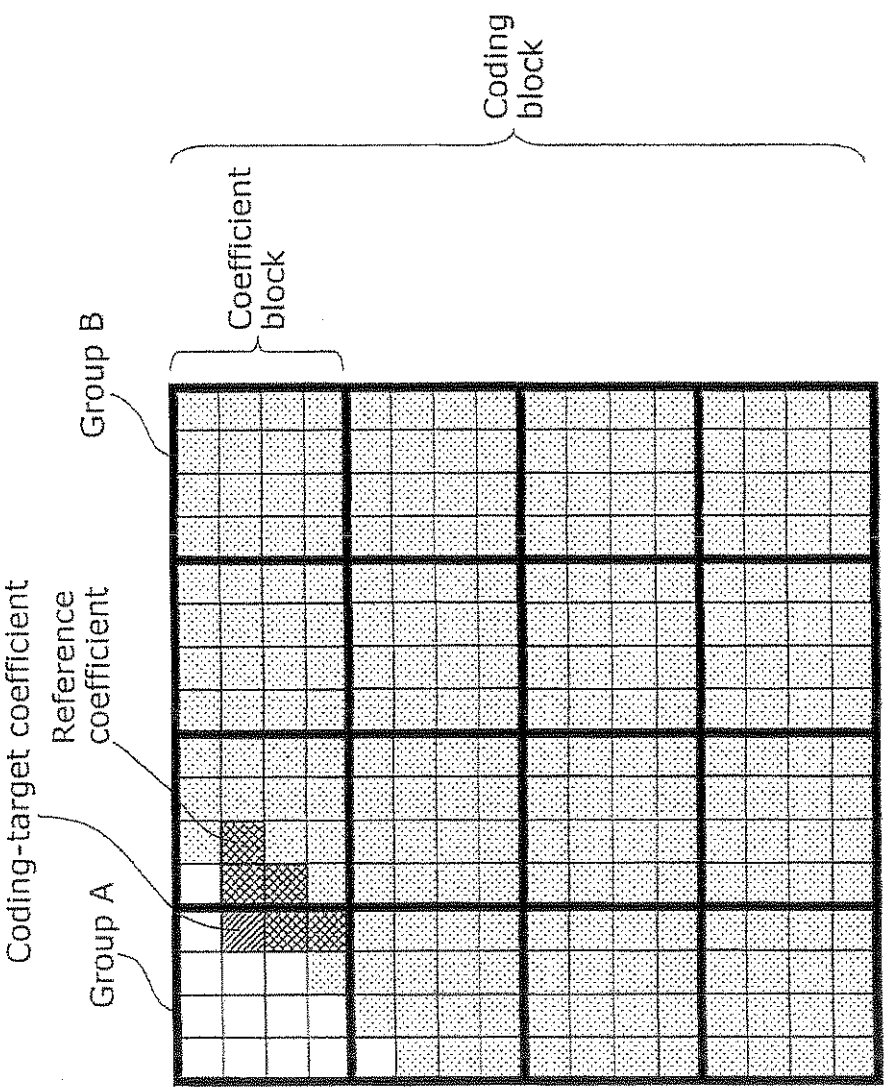

Coding block
Coefficient block
Group B
Reference coefficient
Coding-target coefficient
Group A

FIG. 4

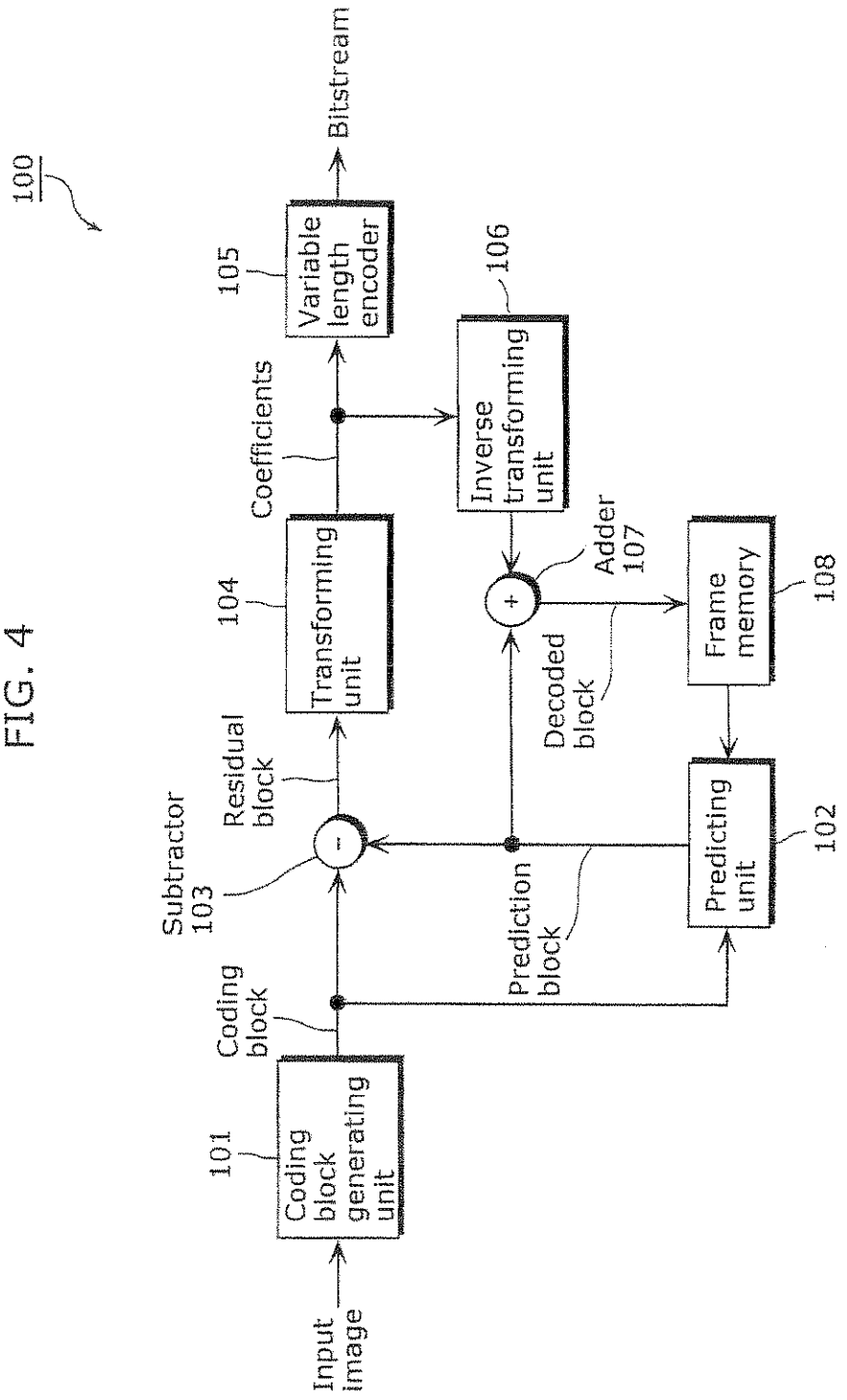

100
Input image
101
Coding block generating unit
Coding block
Subtractor 103
Residual block
104
Transforming unit
Coefficients
105
Variable length encoder
Bitstream
106
Inverse transforming unit
Adder 107
Decoded block
Frame memory
108
Predicting unit
102
Prediction block

FIG. 5

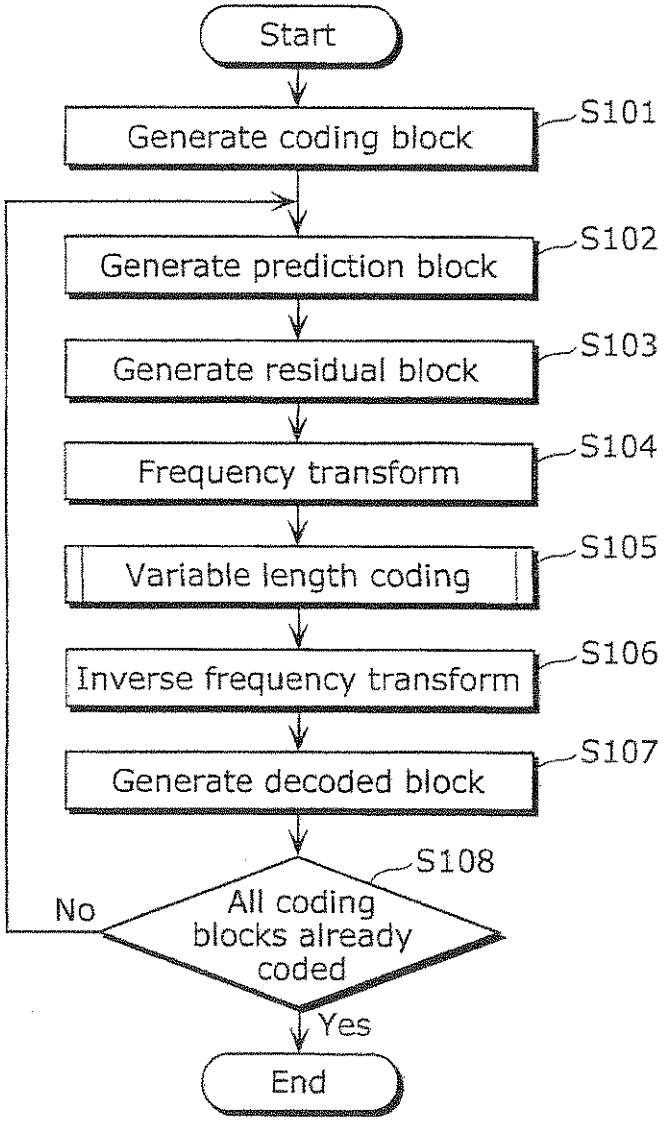

Start
Generate coding block
S101
Generate prediction block
S102
Generate residual block
S103
Frequency transform
S104
Variable length coding
S105
Inverse frequency transform
S106
Generate decoded block
S107
S108
All coding blocks already coded
No
Yes
End

FIG. 6

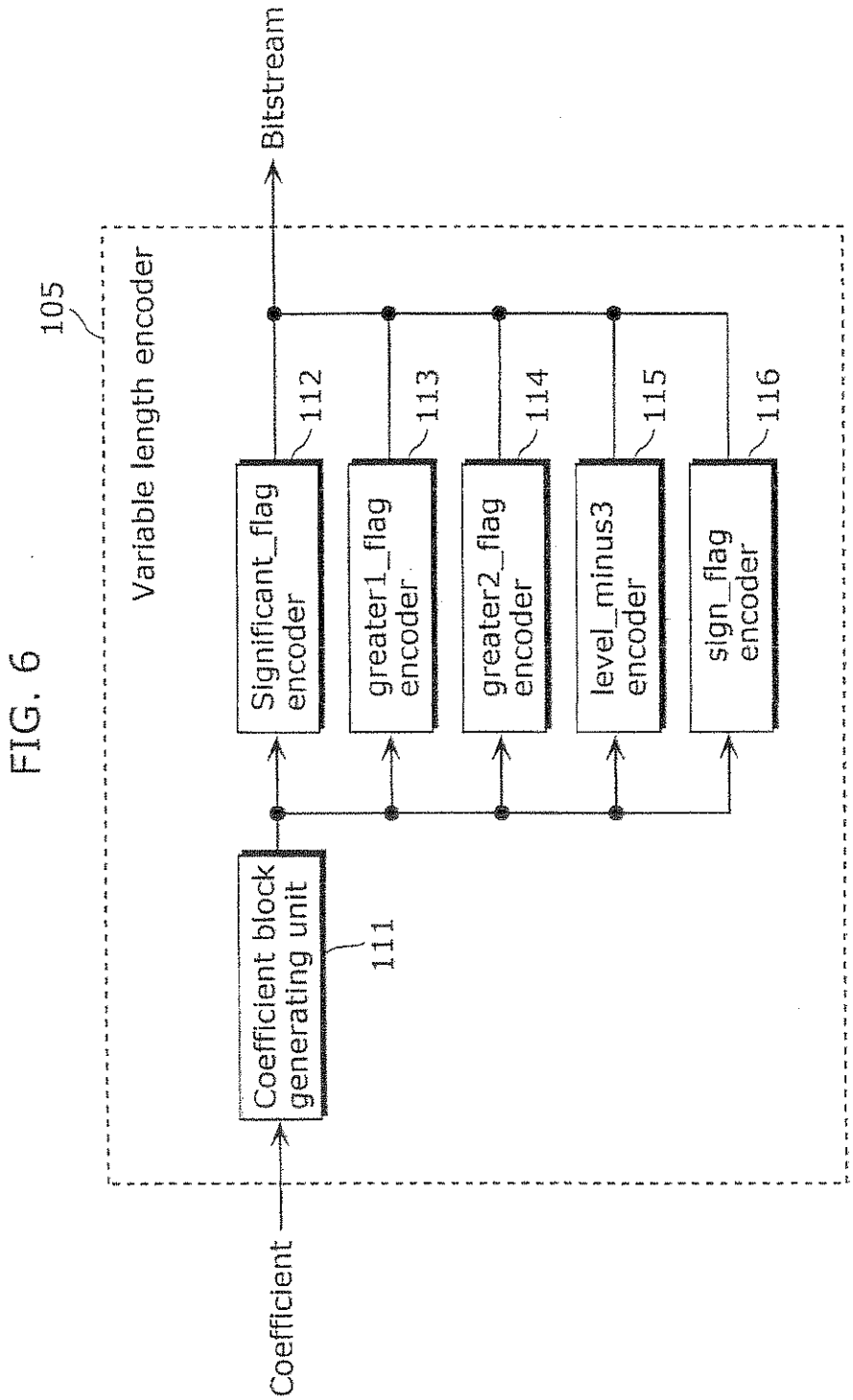

105
Variable length encoder
Bitstream
Coefficient
Coefficient block generating unit
111
Significant_flag encoder
112
greater1_flag encoder
113
greater2_flag encoder
114
level_minus3 encoder
115
sign_flag encoder
116

FIG. 7

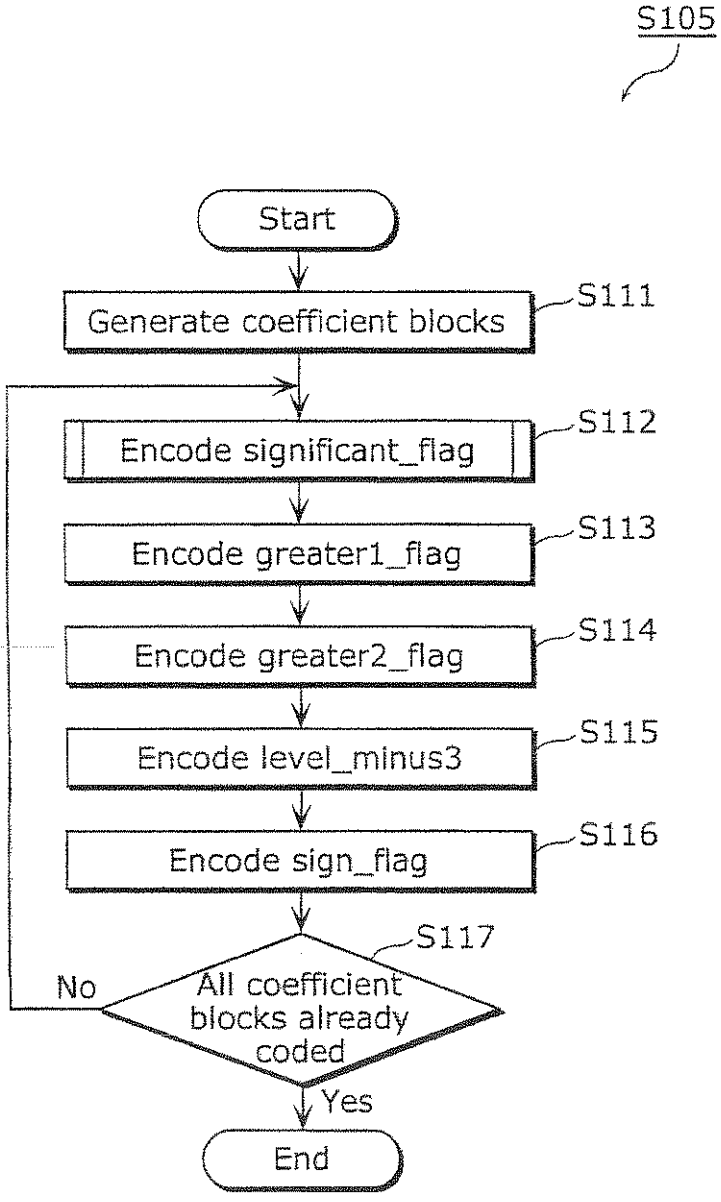

S105
Start
Generate coefficient blocks
S111
Encode significant_flag
S112
Encode greater1_flag
S113
Encode greater2_flag
S114
Encode level_minus3
S115
Encode sign_flag
S116
All coefficient blocks already coded
S117
No
Yes
End

FIG. 8

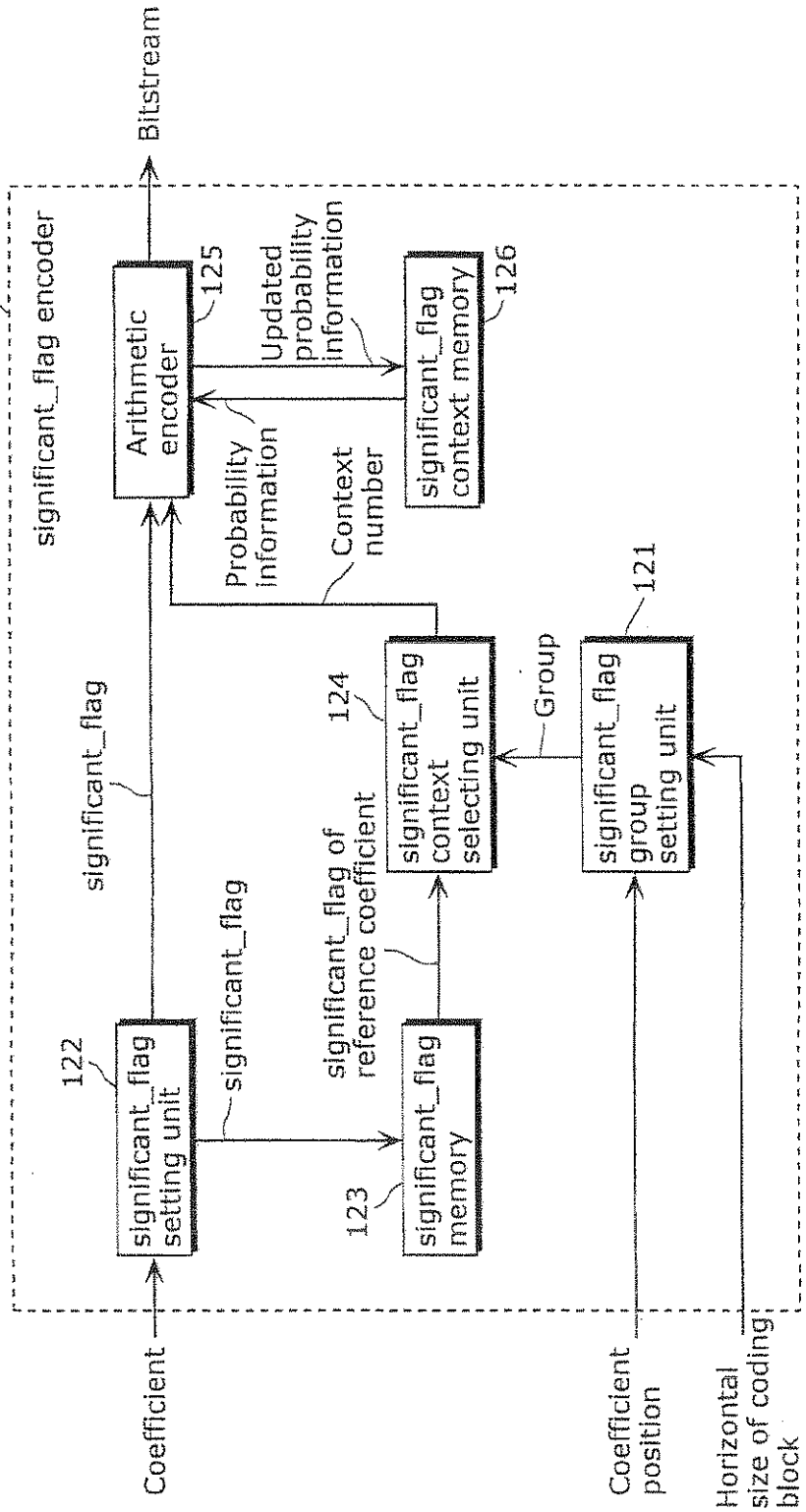

112
significant_flag encoder
Bitstream
Arithmetic encoder
125
Updated probability information
significant_flag context memory
126
Probability information
Context number
significant_flag
significant_flag setting unit
122
significant_flag
significant_flag of reference coefficient
significant_flag memory
123
significant_flag context selecting unit
124
Group
significant_flag group setting unit
121
Coefficient
Coefficient position
Horizontal size of coding block

FIG. 9

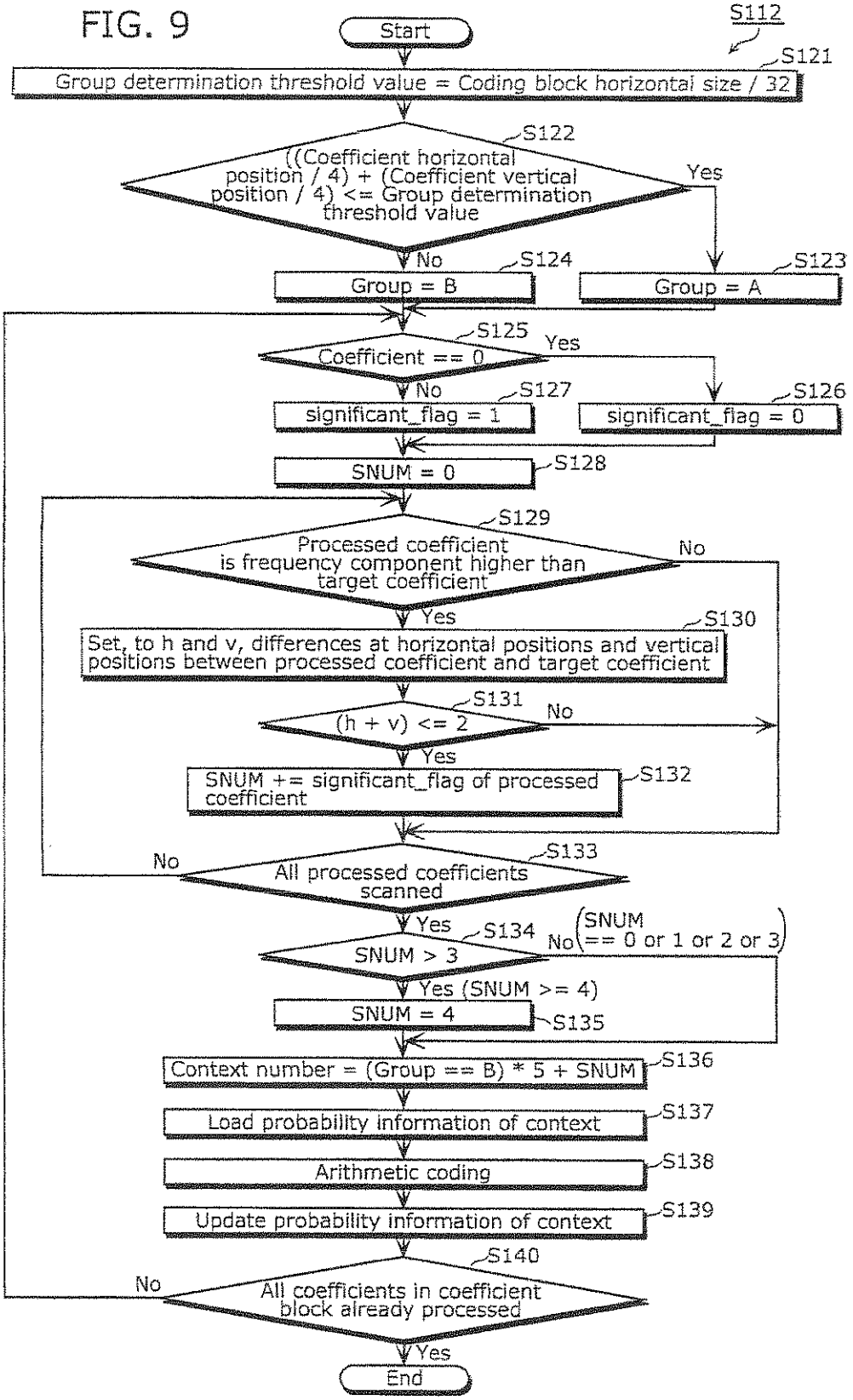

Start
S112
S121
Group determination threshold value = Coding block horizontal size / 32
S122
((Coefficient horizontal position / 4) + (Coefficient vertical position / 4) <= Group determination threshold value
Yes
No
S124
Group = B
S123
Group = A
S125
Coefficient == 0
Yes
No
S127
significant_flag = 1
S126
significant_flag = 0
SNUM = 0
S128
S129
Processed coefficient is frequency component higher than target coefficient
No
Yes
S130
Set, to h and v, differences at horizontal positions and vertical positions between processed coefficient and target coefficient
S131
(h + v) <= 2
No
Yes
SNUM += significant_flag of processed coefficient
S132
S133
No
All processed coefficients scanned
Yes
S134
SNUM > 3
No
(SNUM == 0 or 1 or 2 or 3)
Yes (SNUM >= 4)
SNUM = 4
S135
Context number = (Group == B) * 5 + SNUM
S136
Load probability information of context
S137
Arithmetic coding
S138
Update probability information of context
S139
S140
No
All coefficients in coefficient block already processed
Yes
End

FIG. 10A

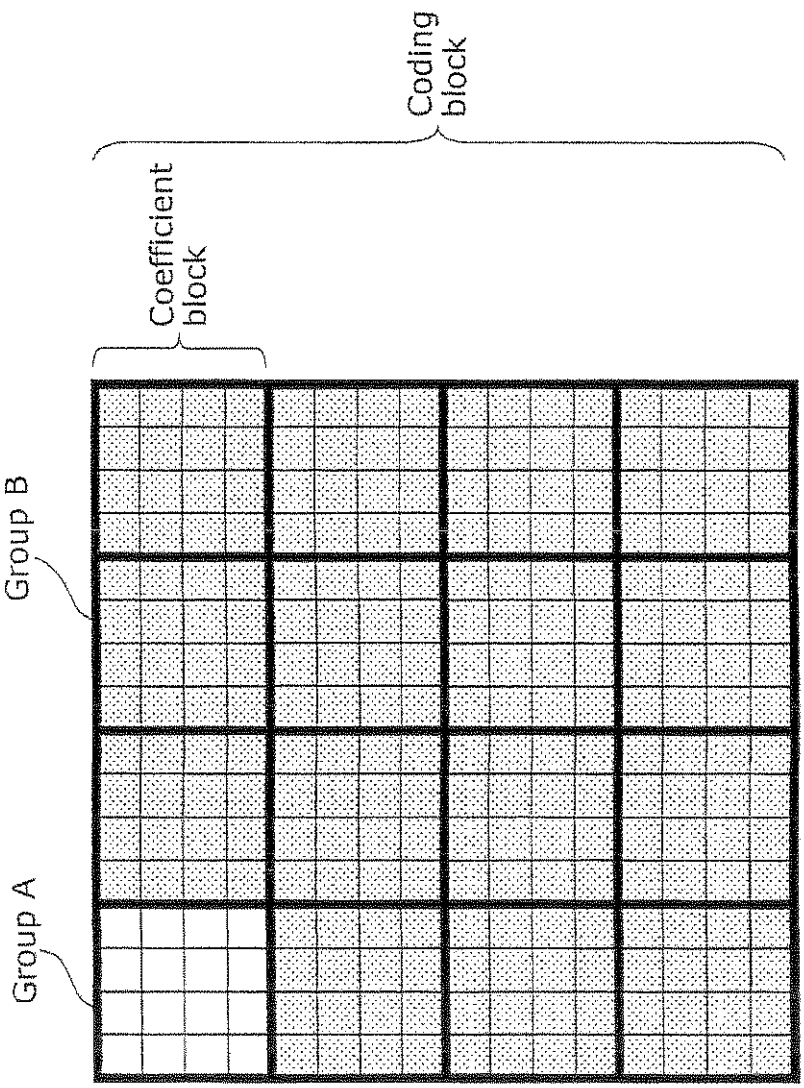


FIG. 10B

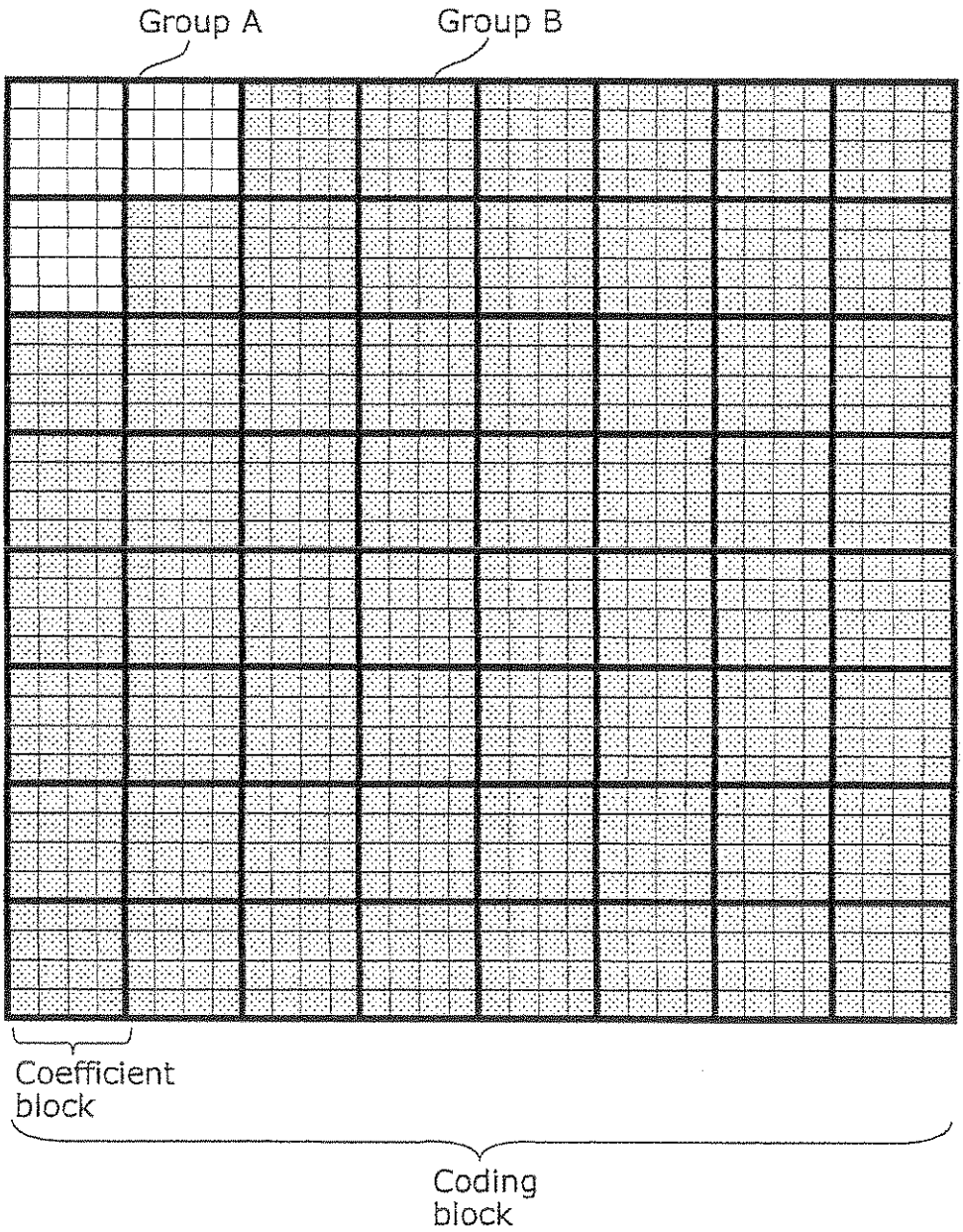


FIG. 11A

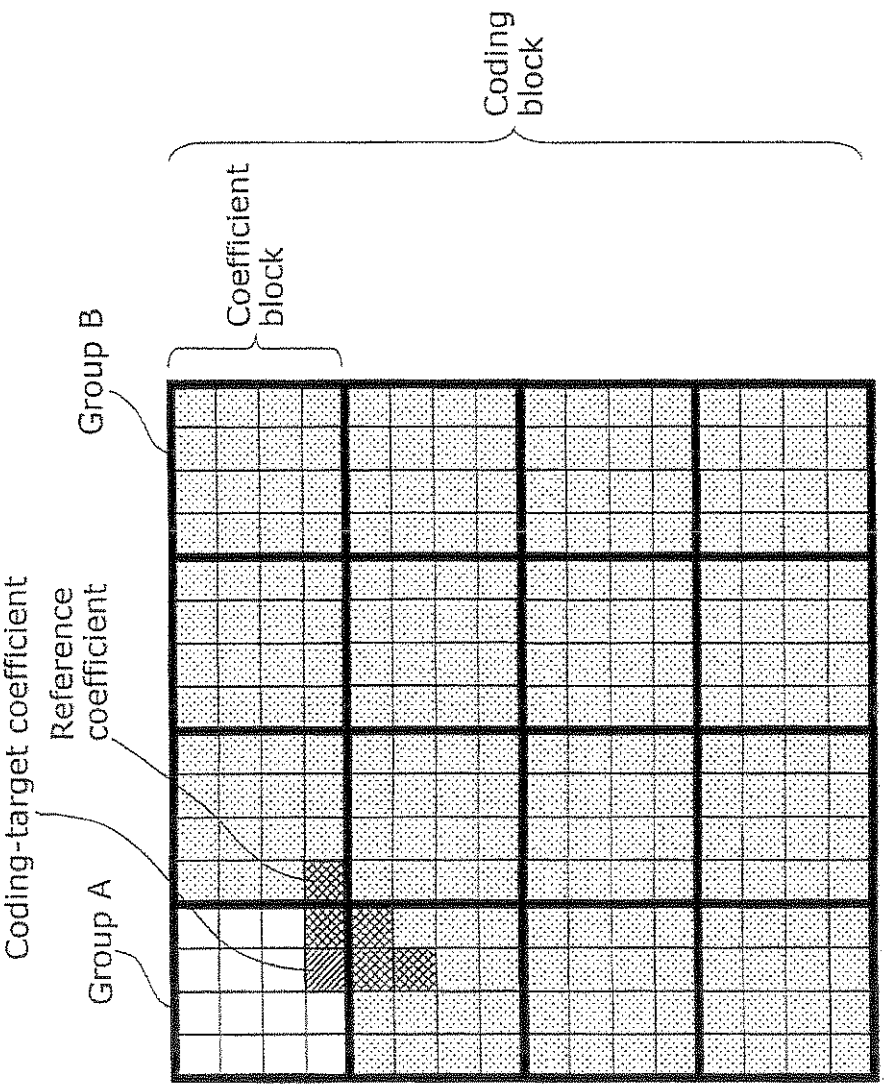

Coding block
Coefficient block
Group B
Reference coefficient
Coding-target coefficient
Group A

FIG. 11B

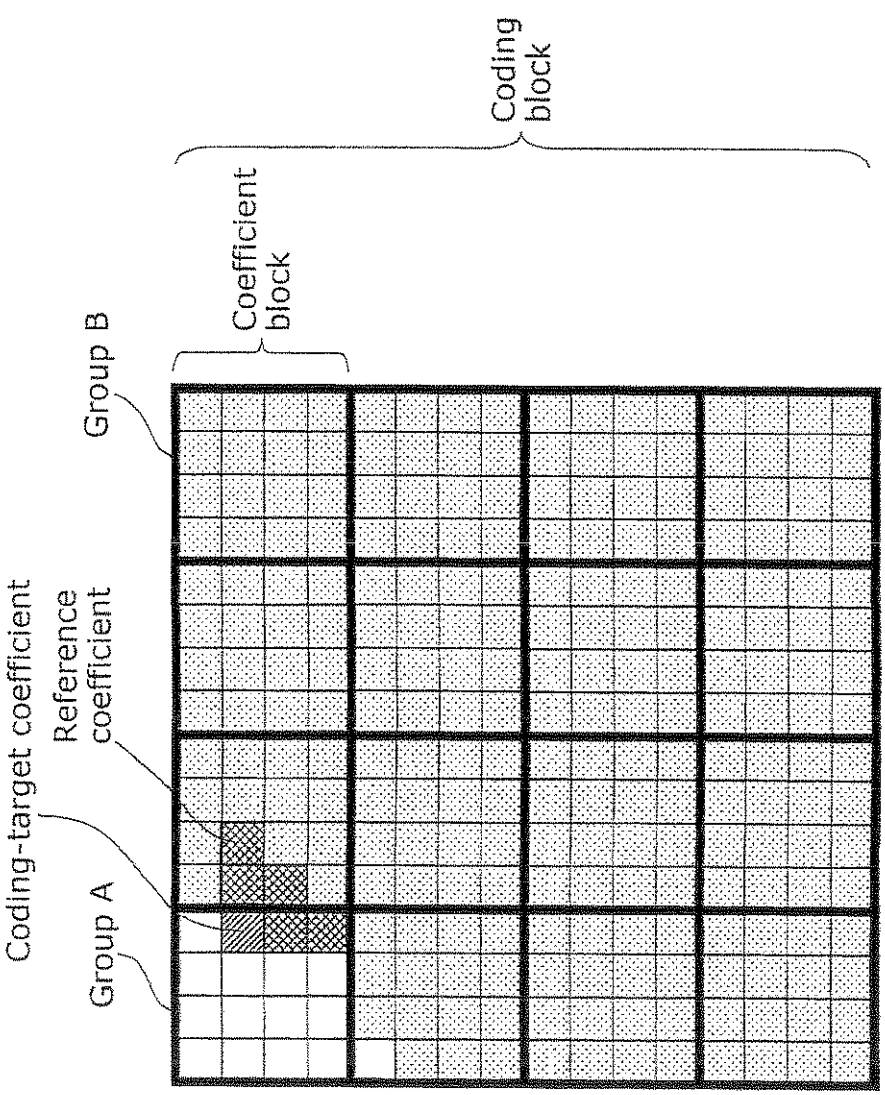

Coding block
Coefficient block
Group B
Reference coefficient
Coding-target coefficient
Group A

FIG. 12

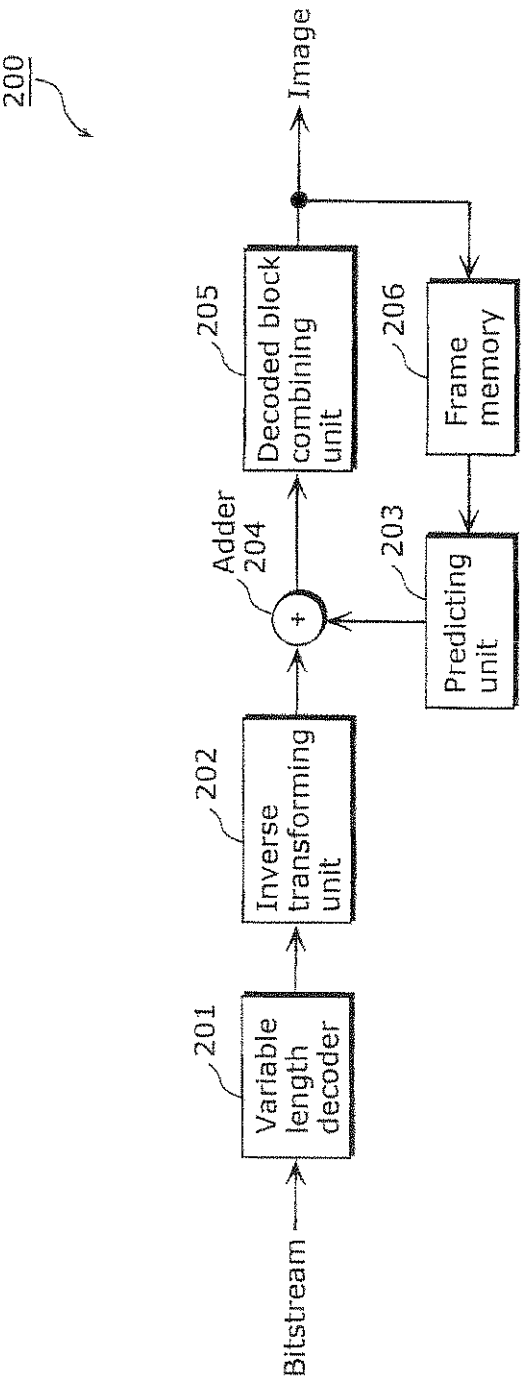

200
Image
Bitstream
201
Variable length decoder
202
Inverse transforming unit
Adder
204
+
203
Predicting unit
205
Decoded block combining unit
206
Frame memory

FIG. 13

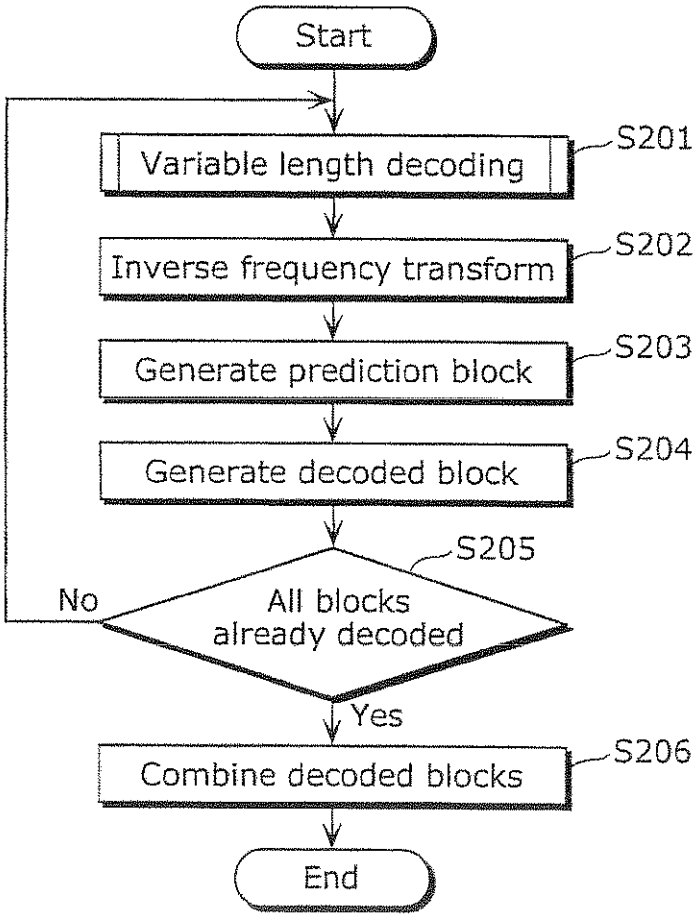

Start
Variable length decoding
S201
Inverse frequency transform
S202
Generate prediction block
S203
Generate decoded block
S204
S205
All blocks already decoded
No
Yes
Combine decoded blocks
S206
End

FIG. 14

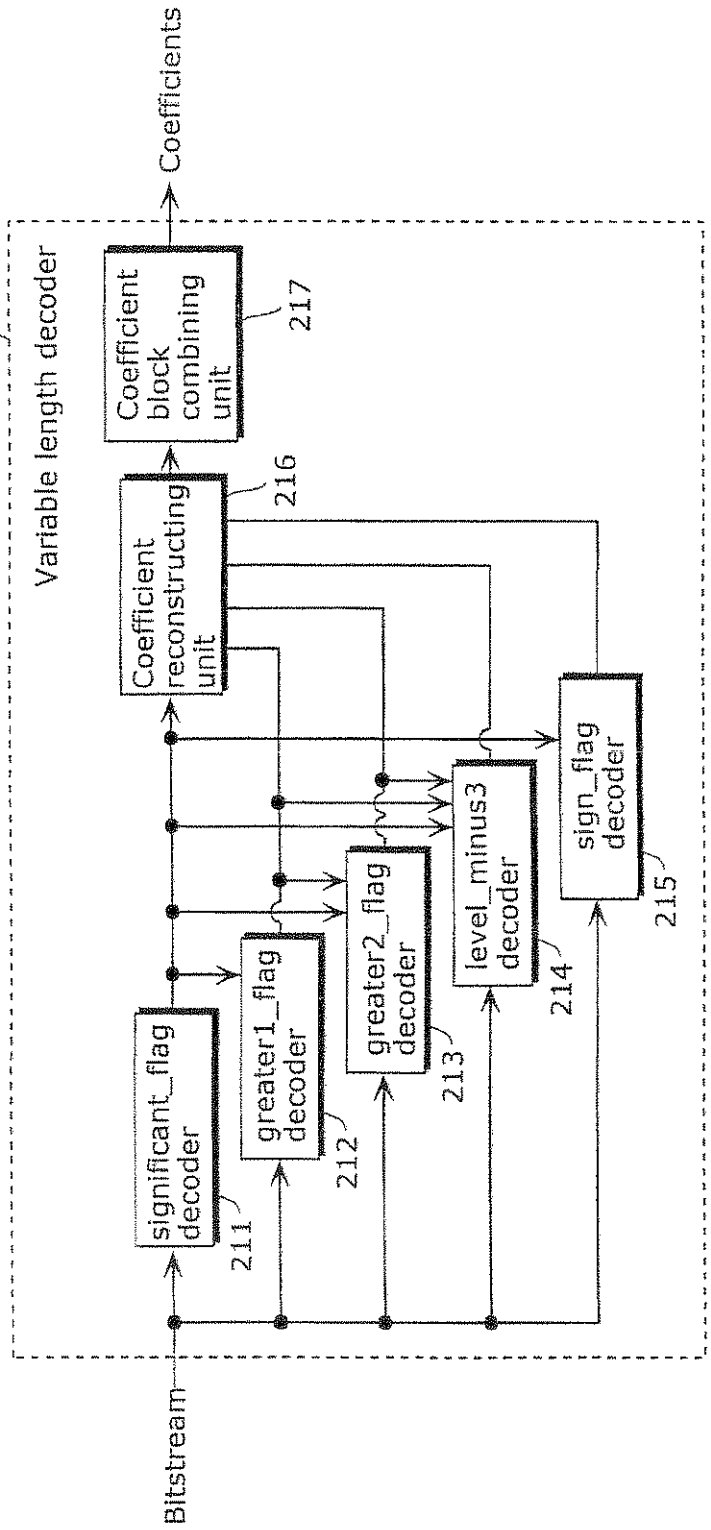

Bitstream
Variable length decoder
201
significant_flag decoder
211
greater1_flag decoder
212
greater2_flag decoder
213
level_minus3 decoder
214
sign_flag decoder
215
Coefficient reconstructing unit
216
Coefficient block combining unit
217
Coefficients

FIG. 15

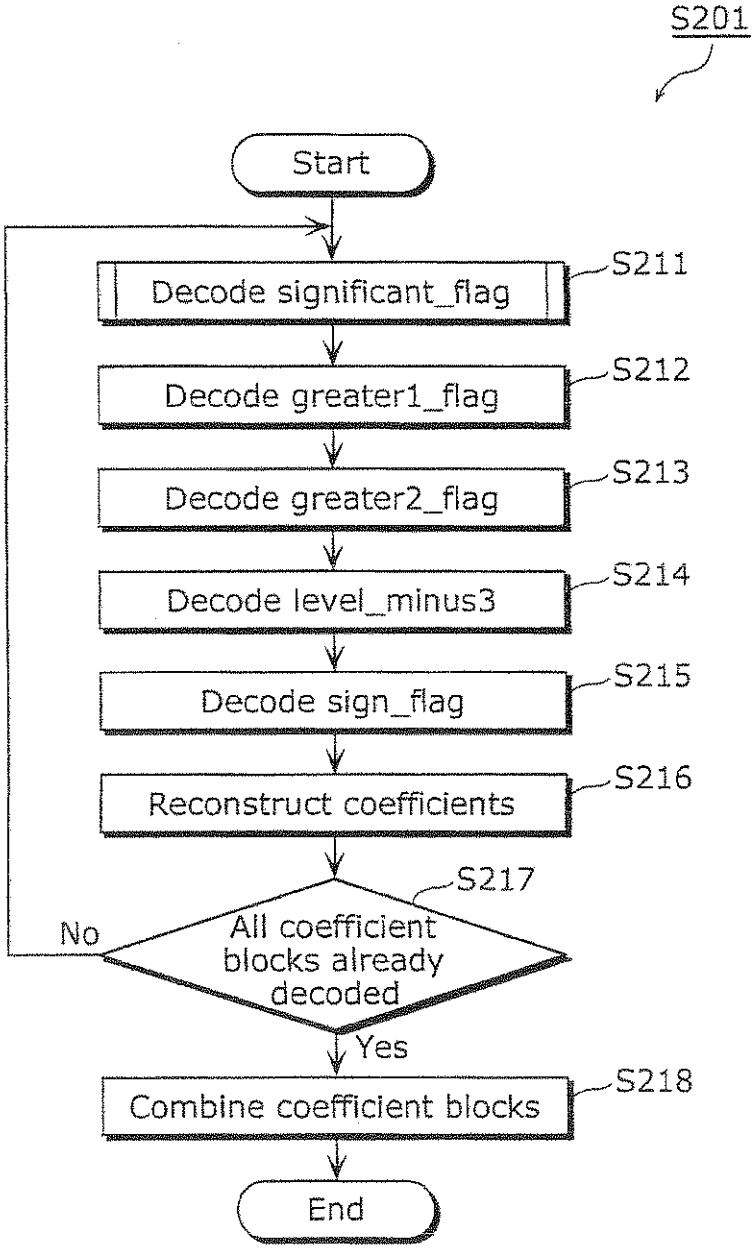

S201
Start
Decode significant_flag
S211
Decode greater1_flag
S212
Decode greater2_flag
S213
Decode level_minus3
S214
Decode sign_flag
S215
Reconstruct coefficients
S216
S217
All coefficient blocks already decoded
No
Yes
Combine coefficient blocks
S218
End

FIG. 16

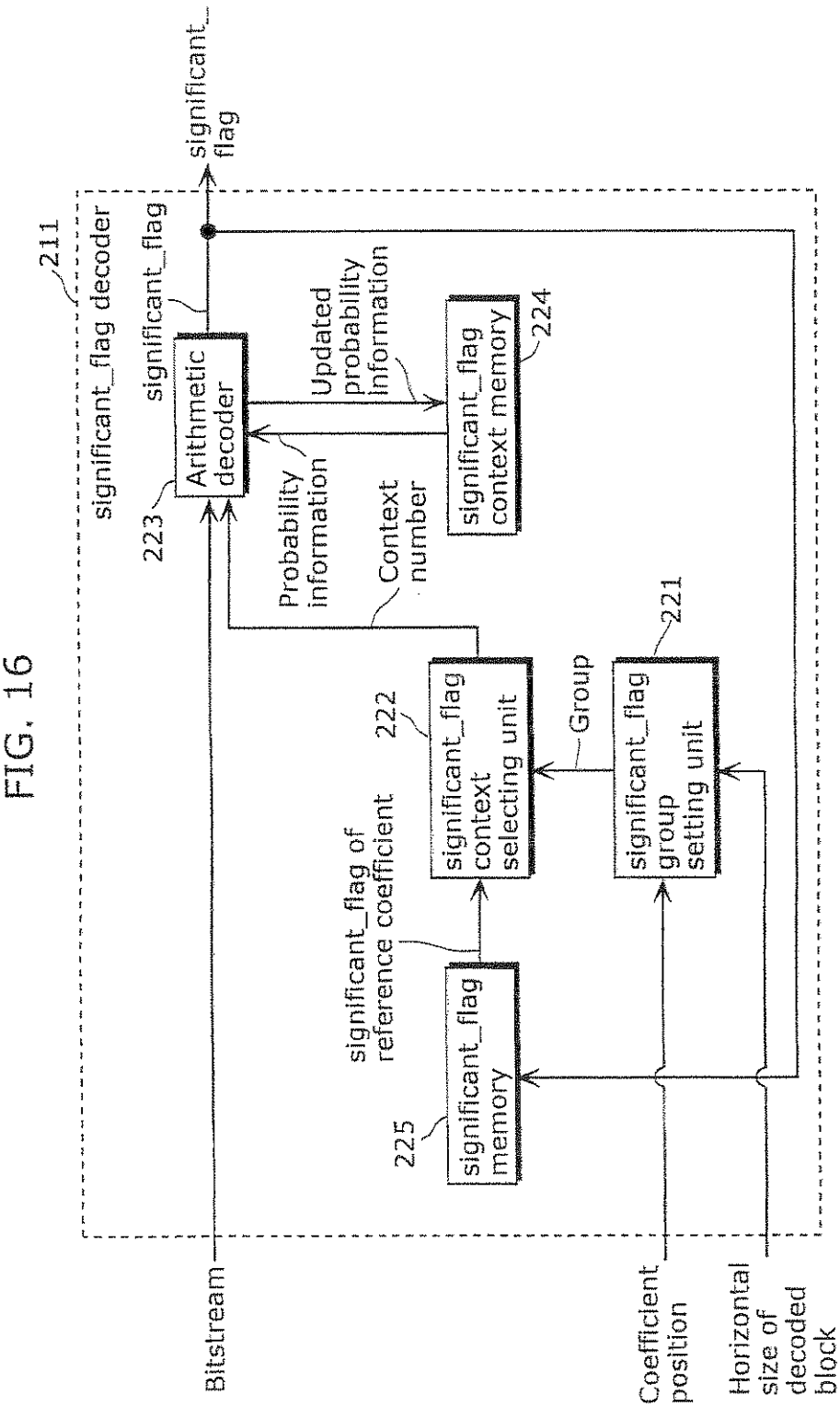

211
significant_flag decoder
significant_flag
223
Arithmetic decoder
Probability information
Context number
Updated probability information
224
significant_flag context memory
222
significant_flag context selecting unit
Group
221
significant_flag group setting unit
significant_flag of reference coefficient
225
significant_flag memory
Bitstream
Coefficient position
Horizontal size of decoded block

FIG. 17

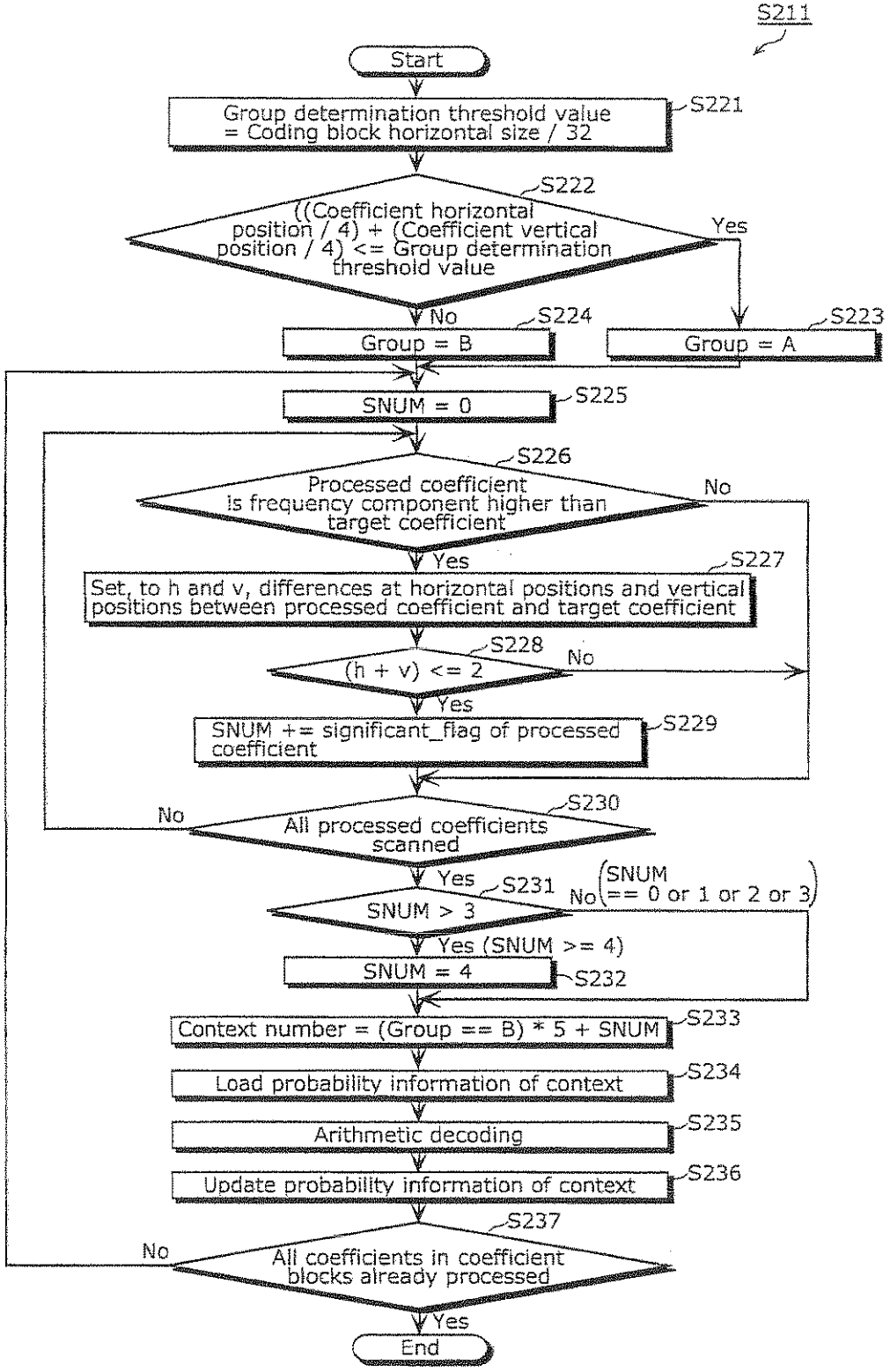

S211
Start
Group determination threshold value = Coding block horizontal size / 32
S221
((Coefficient horizontal position / 4) + (Coefficient vertical position / 4) <= Group determination threshold value
S222
Yes
No
Group = B
S224
Group = A
S223
SNUM = 0
S225
Processed coefficient is frequency component higher than target coefficient
S226
No
Yes
Set, to h and v, differences at horizontal positions and vertical positions between processed coefficient and target coefficient
S227
(h + v) <= 2
S228
No
Yes
SNUM += significant_flag of processed coefficient
S229
All processed coefficients scanned
S230
No
Yes
SNUM > 3
S231
No (SNUM == 0 or 1 or 2 or 3)
Yes (SNUM >= 4)
SNUM = 4
S232
Context number = (Group == B) * 5 + SNUM
S233
Load probability information of context
S234
Arithmetic decoding
S235
Update probability information of context
S236
All coefficients in coefficient blocks already processed
S237
No
Yes
End

FIG. 18

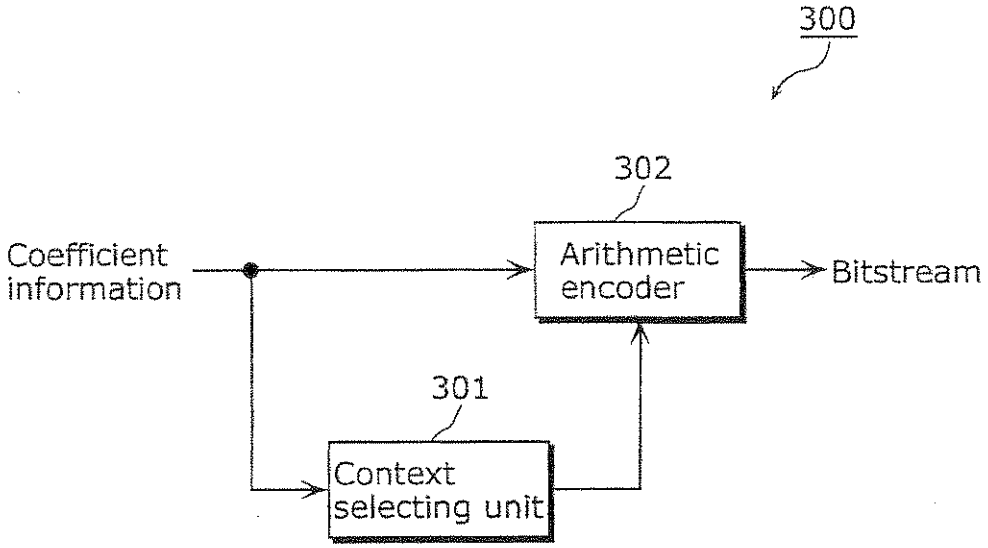

300
302
Coefficient information
Arithmetic encoder
Bitstream
301
Context selecting unit

FIG. 19

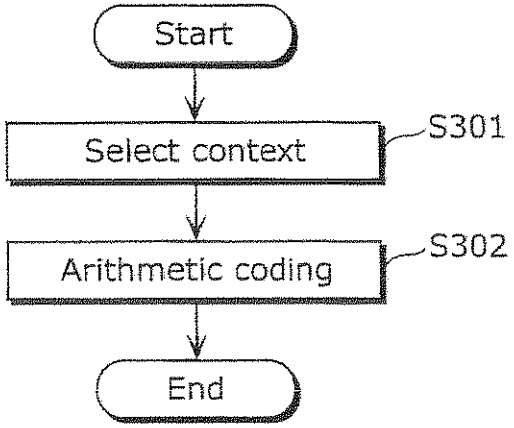

Start
Select context
S301
Arithmetic coding
S302
End

FIG. 20

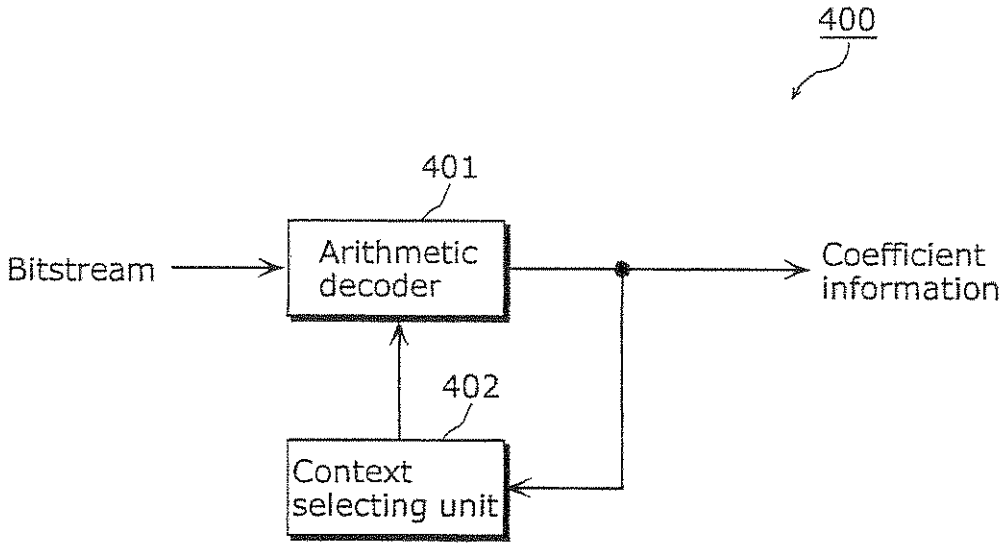

400
401
Bitstream
Arithmetic decoder
Coefficient information
402
Context selecting unit

FIG. 21

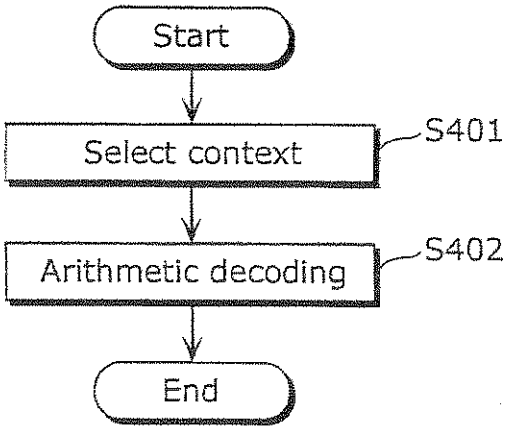

Start
Select context
S401
Arithmetic decoding
S402
End

FIG. 22

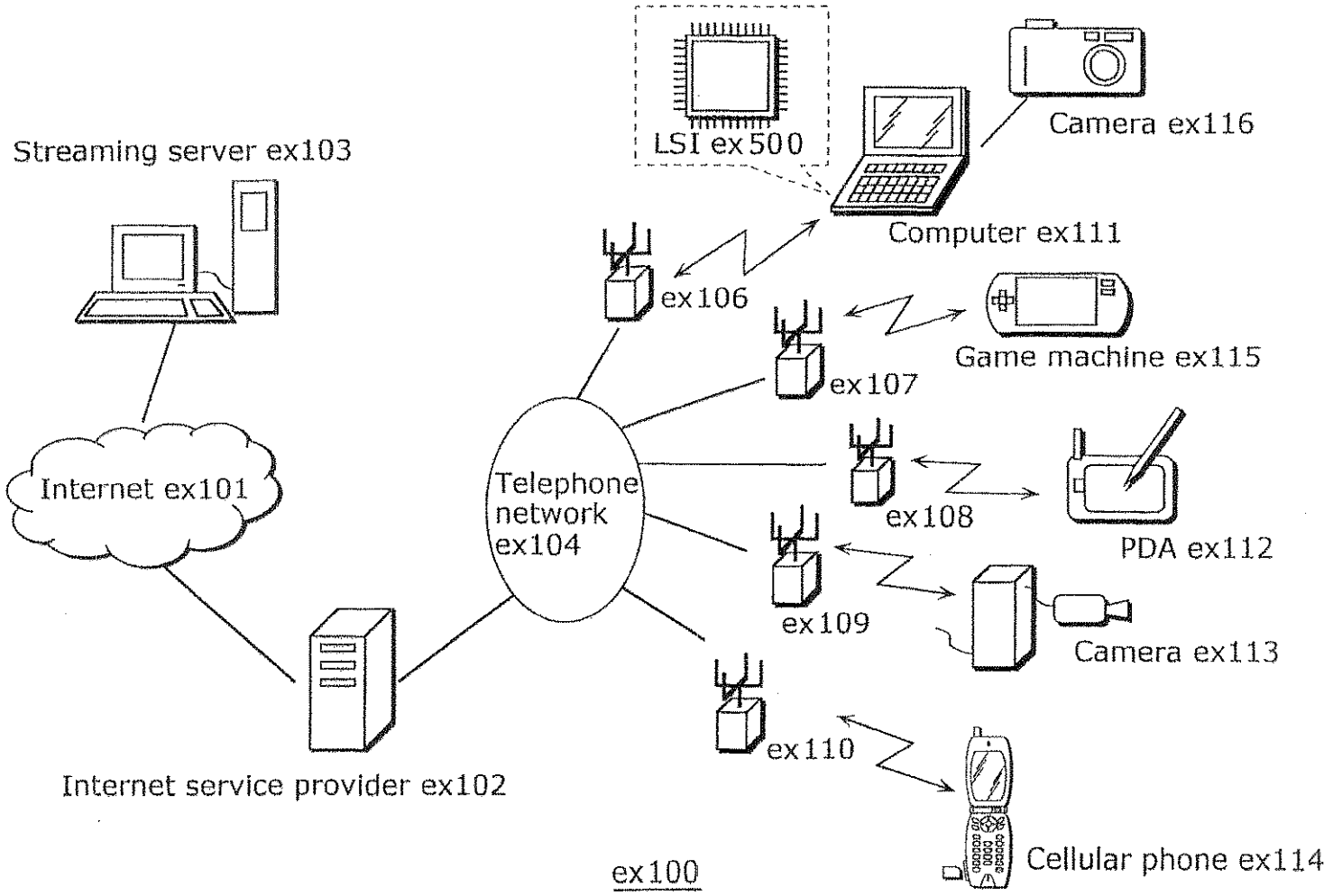

LSI ex500
Camera ex116
Streaming server ex103
Computer ex111
ex106
ex107
Game machine ex115
Internet ex101
Telephone network ex104
ex108
PDA ex112
ex109
Camera ex113
ex110
Internet service provider ex102
Cellular phone ex114
ex100

FIG. 23

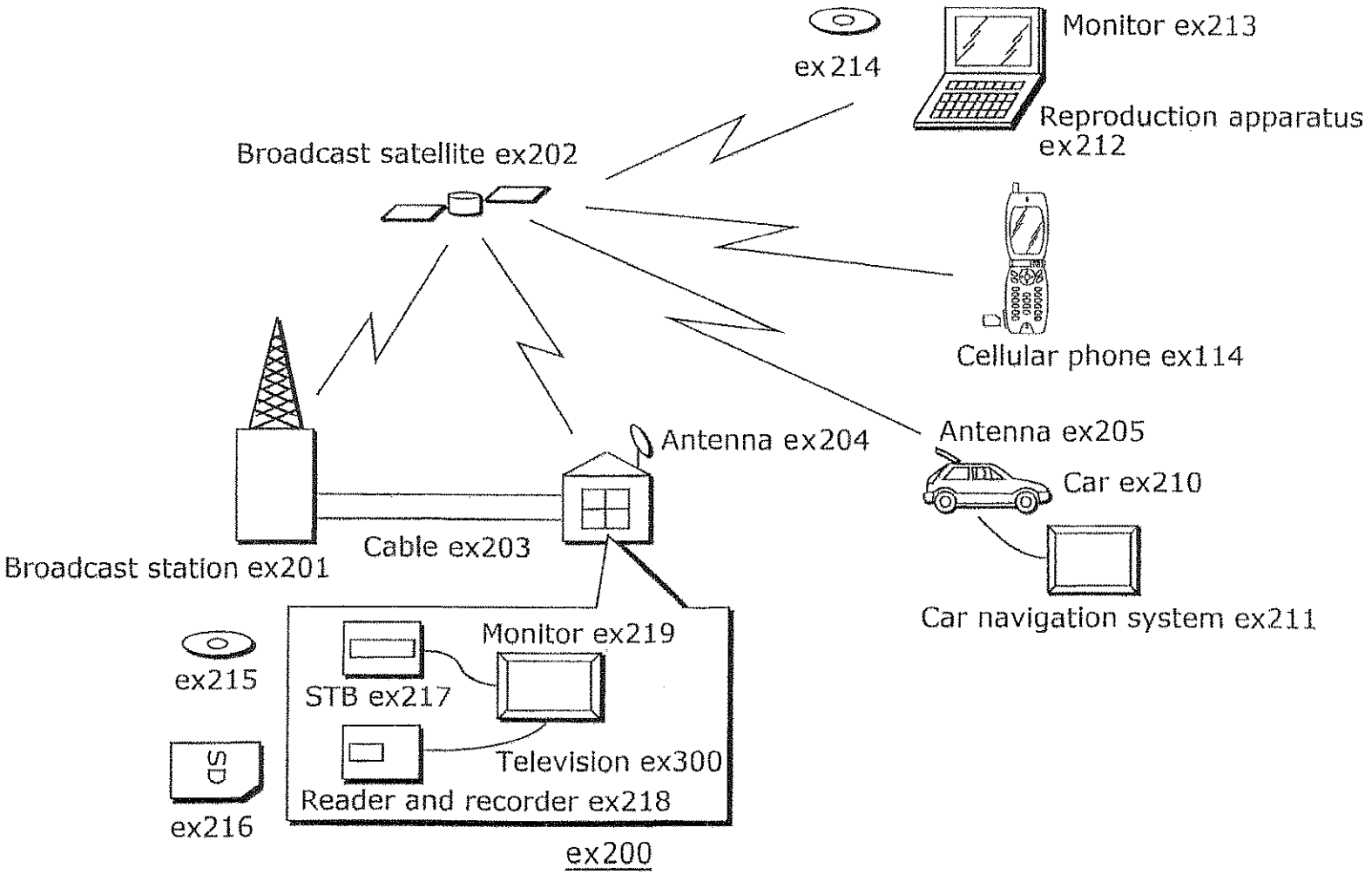

ex214
Monitor ex213
Reproduction apparatus ex212
Broadcast satellite ex202
Cellular phone ex114
Antenna ex204
Antenna ex205
Car ex210
Broadcast station ex201
Cable ex203
Car navigation system ex211
Monitor ex219
ex215
STB ex217
SD
Television ex300
Reader and recorder ex218
ex216
ex200

FIG. 24

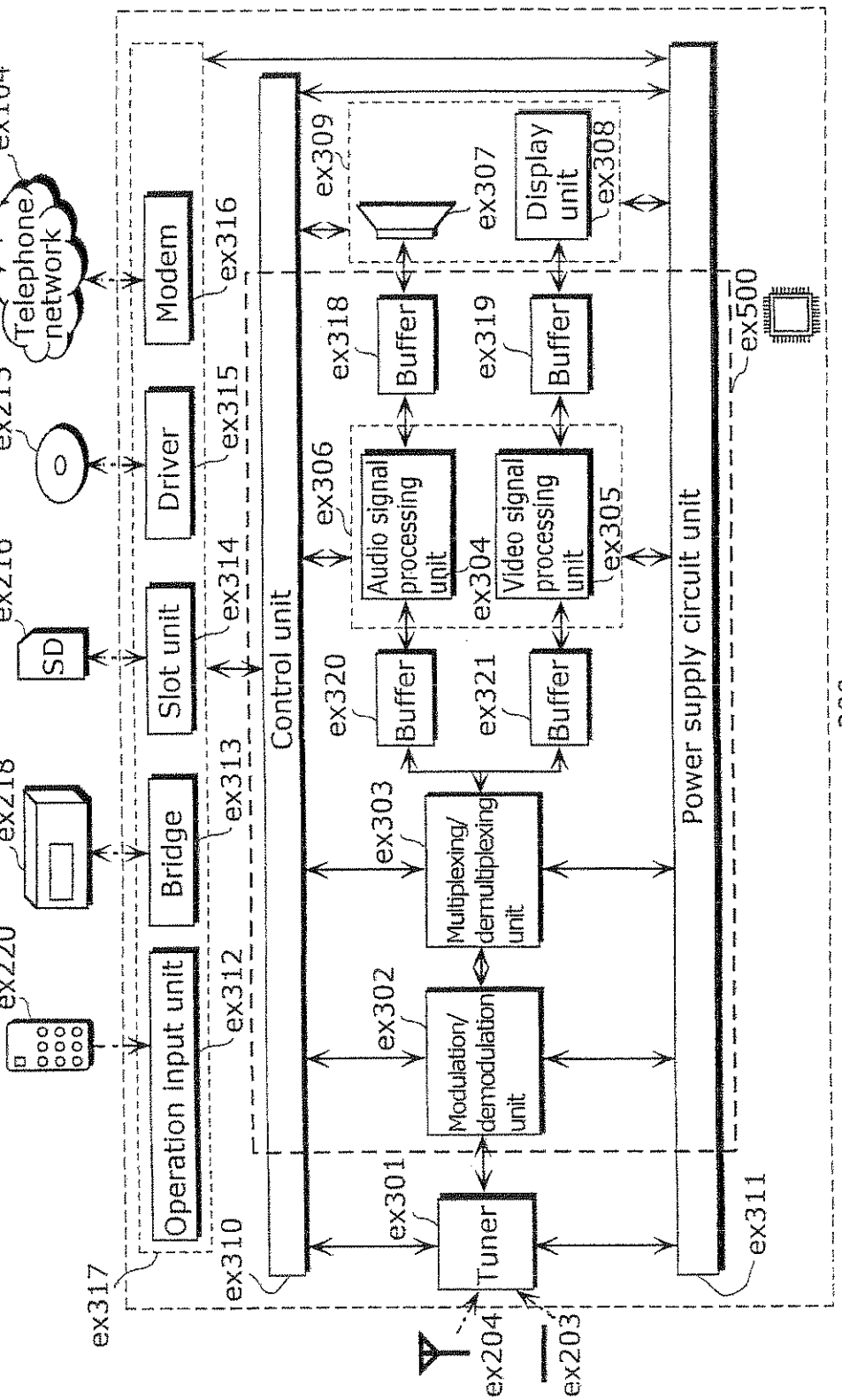

ex104
Telephone network
ex215
ex216
SD
ex218
ex220
ex317
ex204
ex203
ex310
Tuner
ex301
Modulation/ demodulation unit
ex302
Multiplexing/ demultiplexing unit
ex303
ex312
Operation input unit
ex313
Bridge
ex314
Slot unit
ex315
Driver
ex316
Modem
Control unit
ex320
Buffer
ex321
Buffer
ex306
Audio signal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

FIG. 25

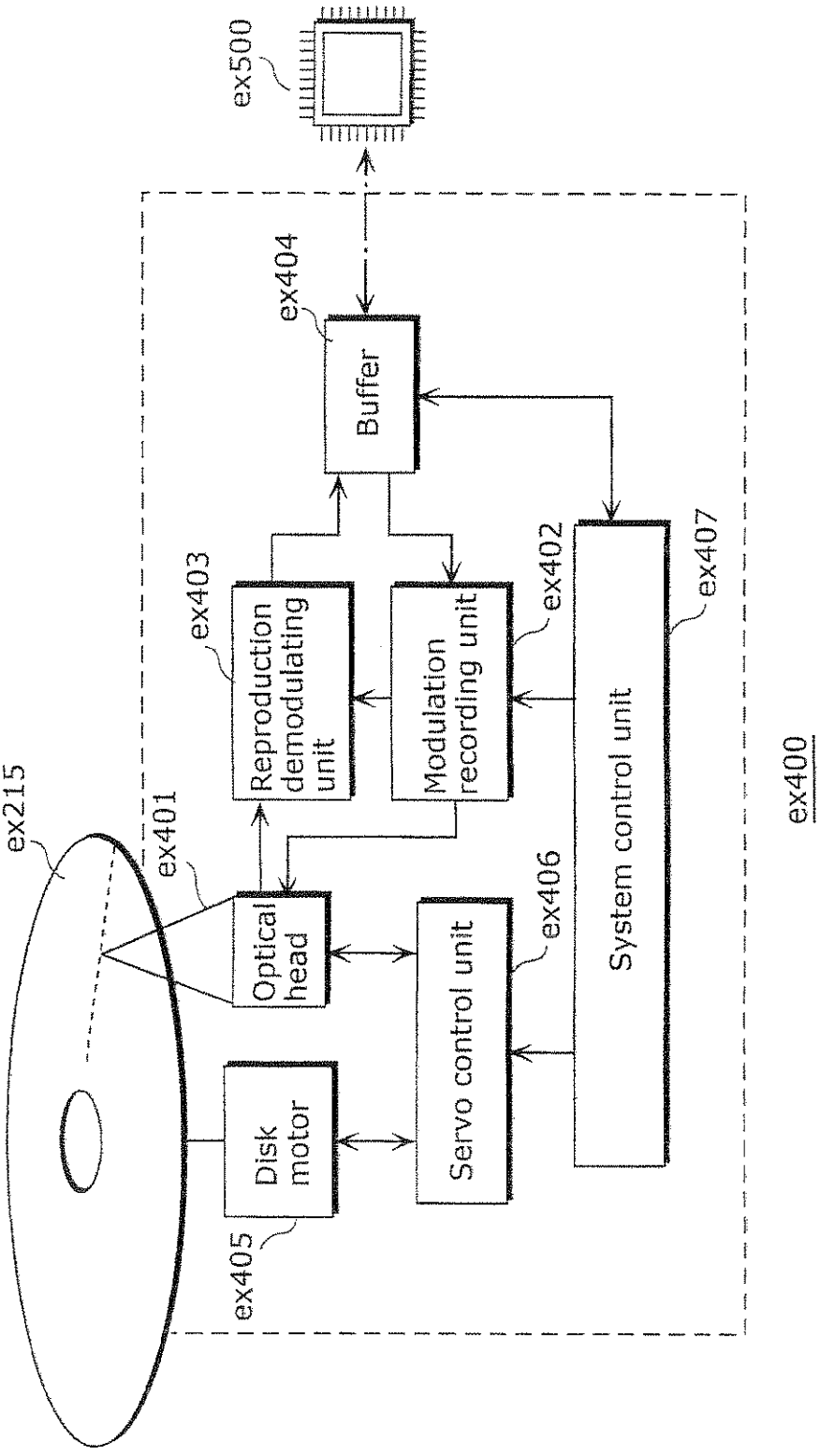

ex500
ex404
Buffer
ex403
Reproduction demodulating unit
ex402
Modulation recording unit
ex407
System control unit
ex215
ex401
Optical head
ex406
Servo control unit
Disk motor
ex405
ex400

FIG. 26

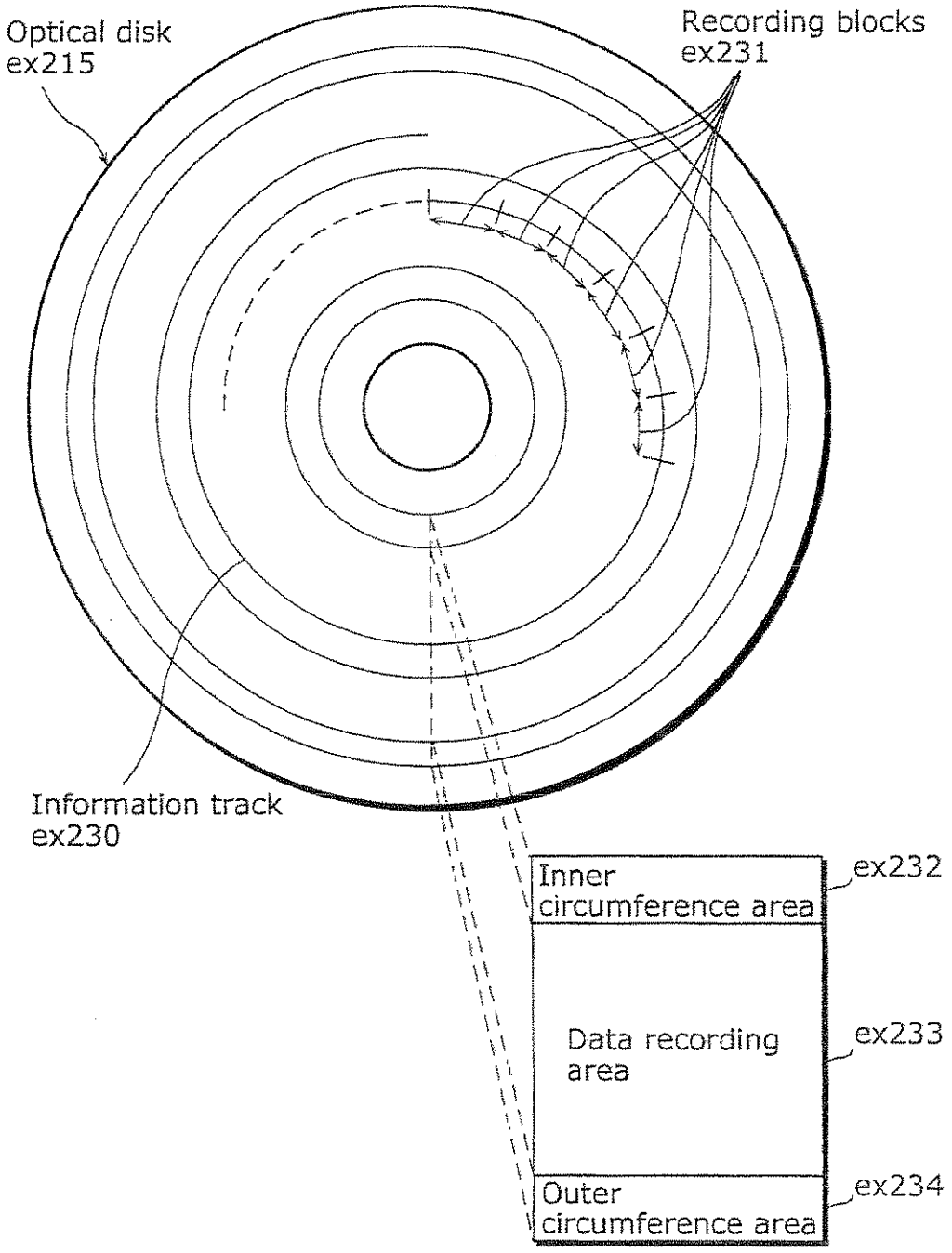

Optical disk
ex215
Recording blocks
ex231
Information track
ex230
Inner
circumference area
ex232
Data recording
area
ex233
Outer
circumference area
ex234

FIG. 27A

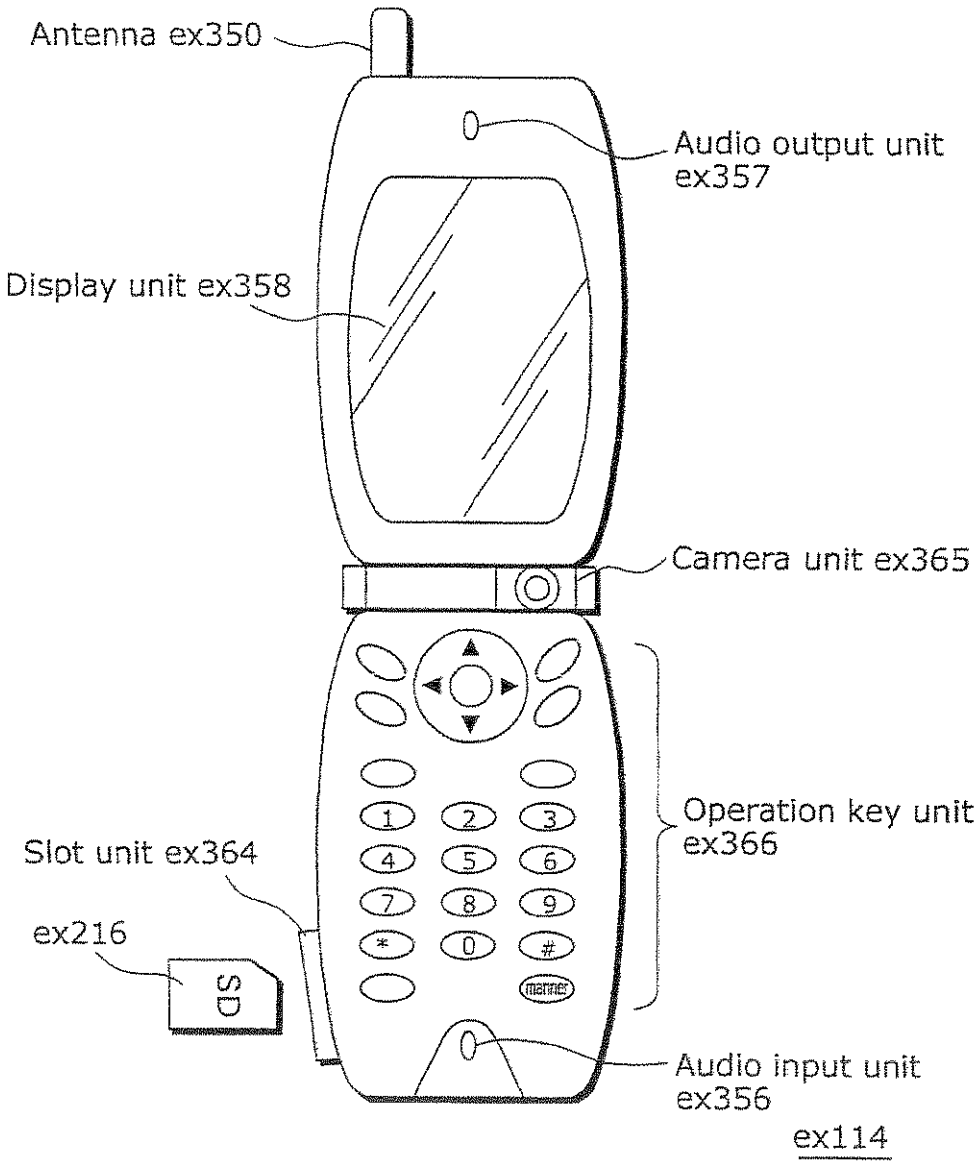

Antenna ex350
Audio output unit ex357
Display unit ex358
Camera unit ex365
Operation key unit ex366
Slot unit ex364
ex216
SD
Audio input unit ex356
ex114

FIG. 27B

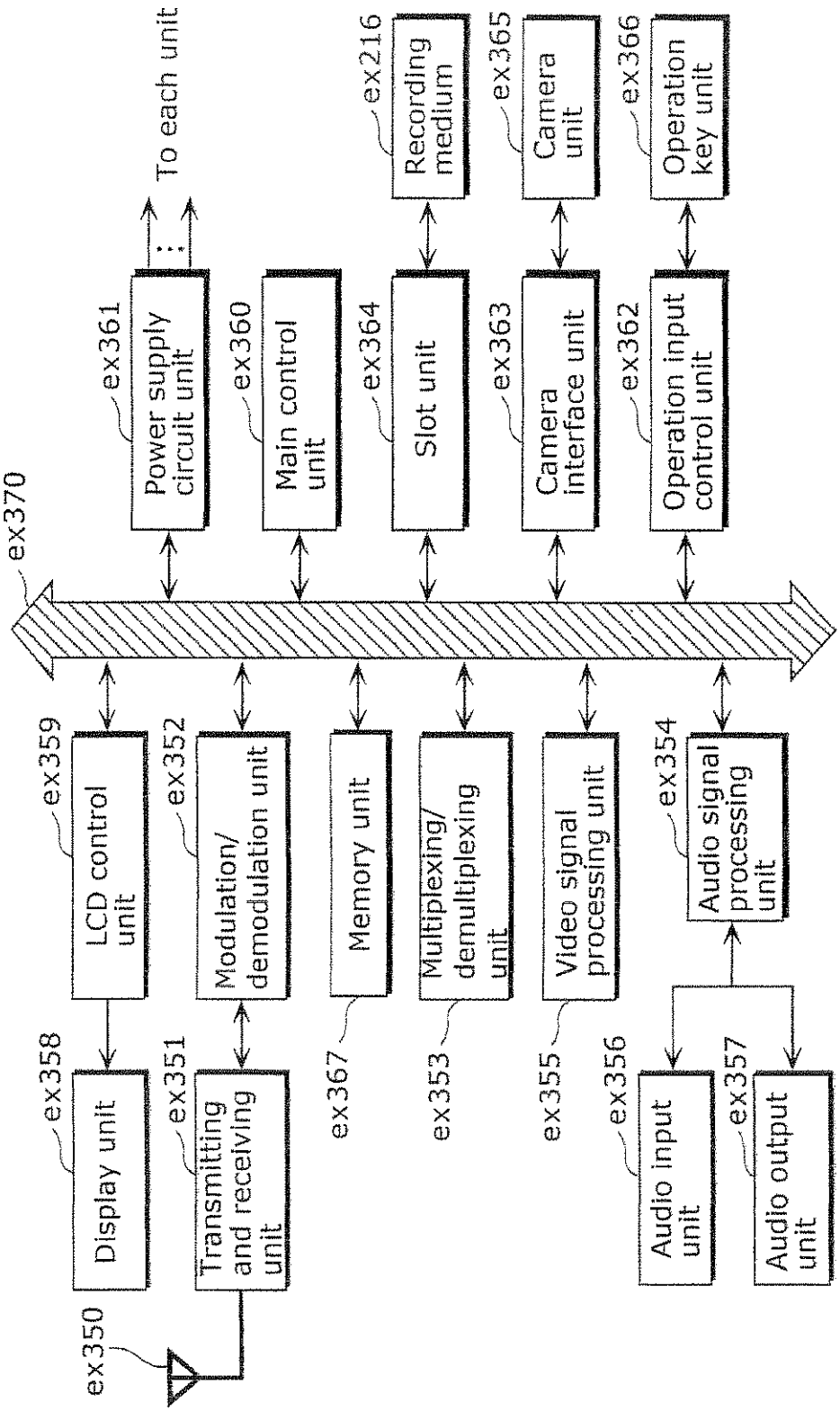

ex370
ex361
Power supply circuit unit
To each unit
ex360
Main control unit
ex364
Slot unit
ex216
Recording medium
ex363
Camera interface unit
ex365
Camera unit
ex362
Operation input control unit
ex366
Operation key unit
ex359
LCD control unit
ex352
Modulation/ demodulation unit
Memory unit
ex367
Multiplexing/ demultiplexing unit
ex353
Video signal processing unit
ex355
ex354
Audio signal processing unit
ex358
Display unit
ex351
Transmitting and receiving unit
ex350
ex356
Audio input unit
ex357
Audio output unit

FIG. 28

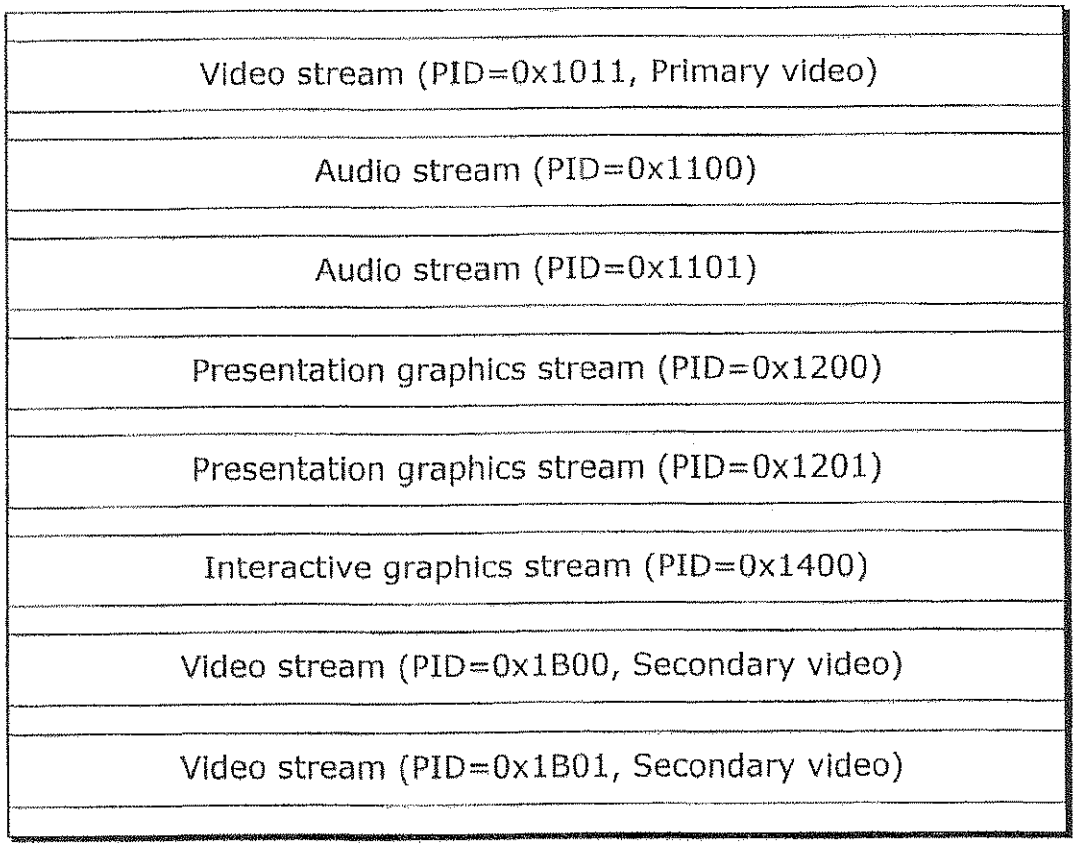

Video stream (PID=0x1011, Primary video)
Audio stream (PID=0x1100)
Audio stream (PID=0x1101)
Presentation graphics stream (PID=0x1200)
Presentation graphics stream (PID=0x1201)
Interactive graphics stream (PID=0x1400)
Video stream (PID=0x1B00, Secondary video)
Video stream (PID=0x1B01, Secondary video)

FIG. 29

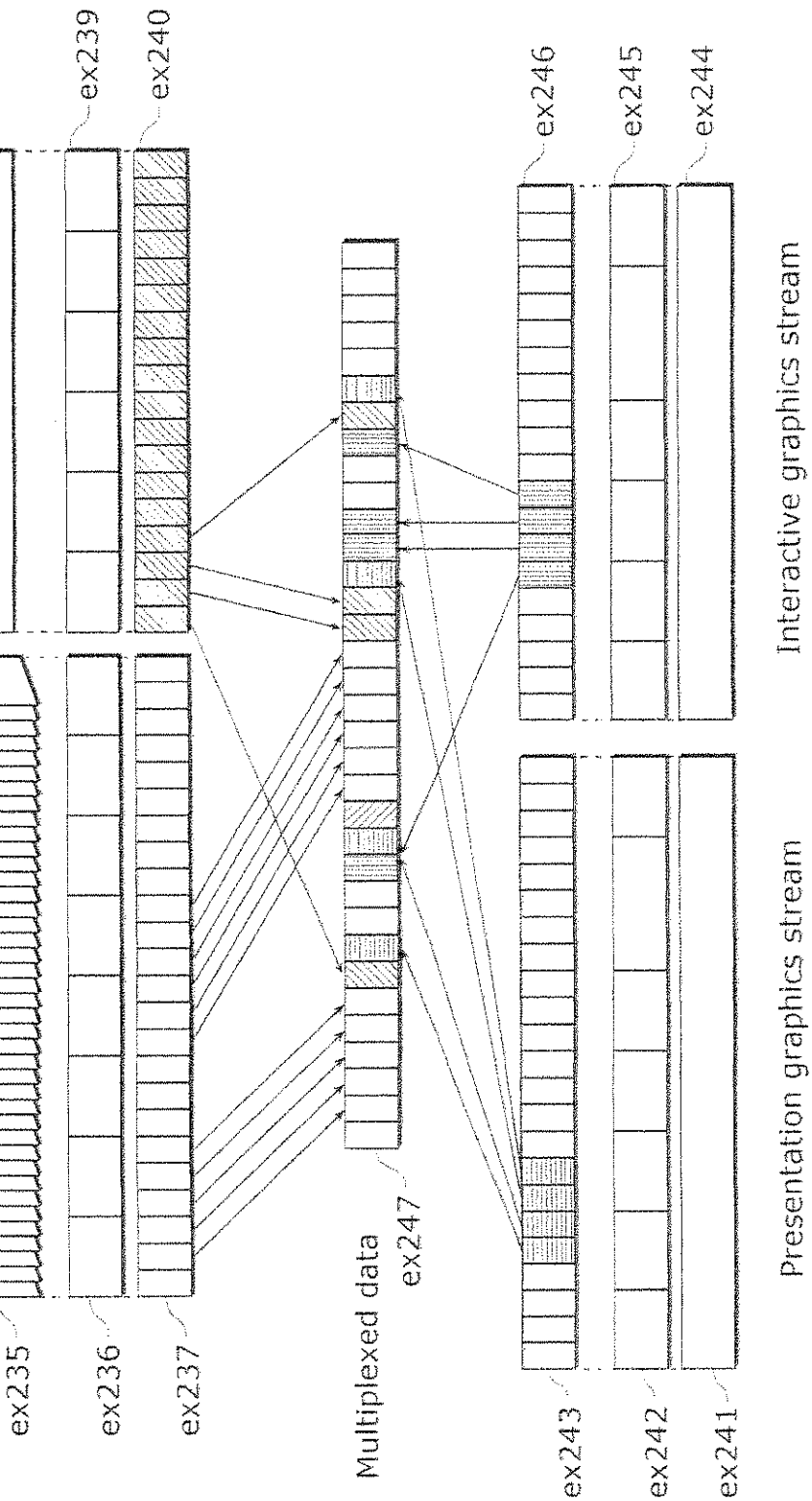

Video frame stream
Audio frame stream
ex238
ex239
ex240
ex235
ex236
ex237
Multiplexed data
ex247
ex246
ex245
ex244
ex243
ex242
ex241
Interactive graphics stream
Presentation graphics stream

FIG. 30

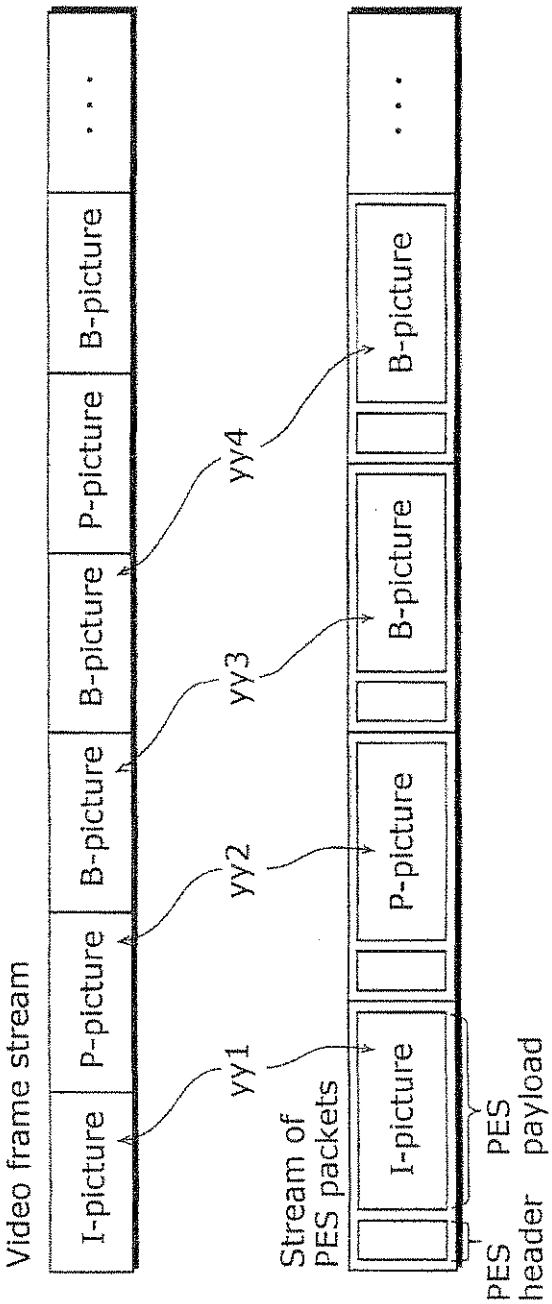
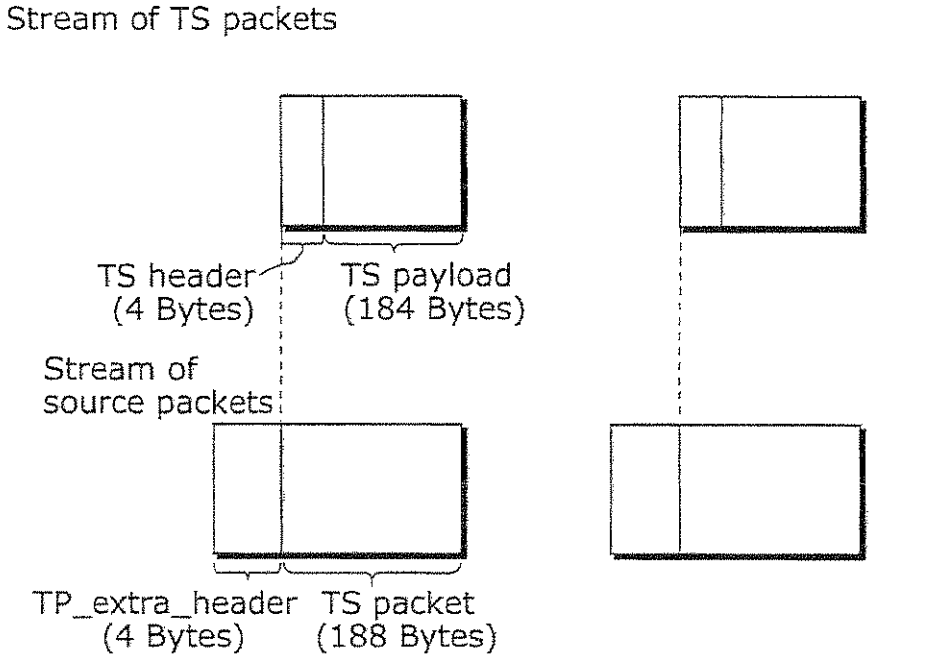

Video frame stream
I-picture
P-picture
B-picture
B-picture
P-picture
B-picture
. . .
yy1
yy2
yy3
yy4
Stream of PES packets
I-picture
P-picture
B-picture
B-picture
. . .
PES header
PES payload

FIG. 31


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)

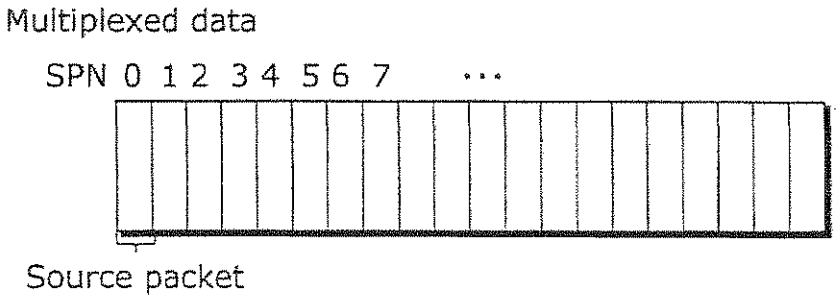

Multiplexed data
SPN 0 1 2 3 4 5 6 7 ...
Source packet

FIG. 32

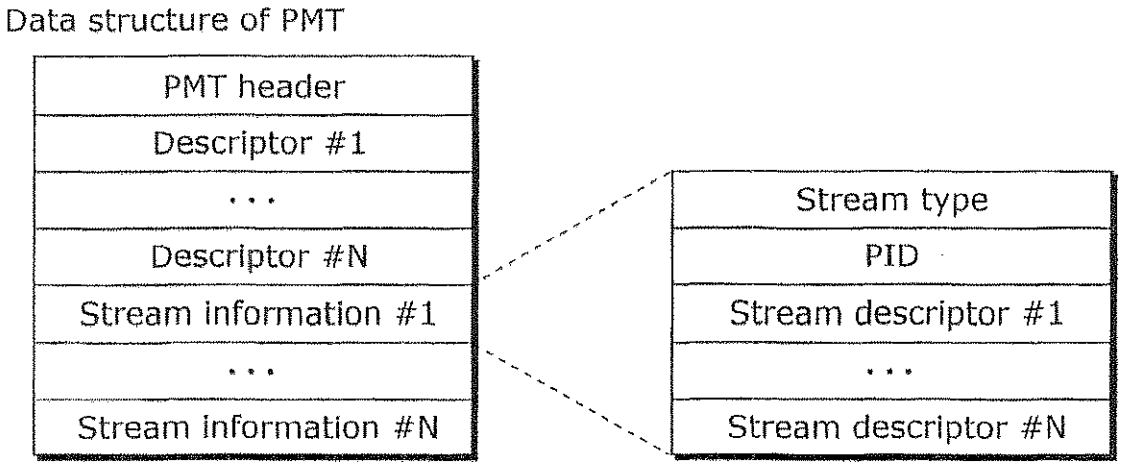

Data structure of PMT
PMT header
Descriptor #1
...
Descriptor #N
Stream information #1
...
Stream information #N
Stream type
PID
Stream descriptor #1
...
Stream descriptor #N

FIG. 33

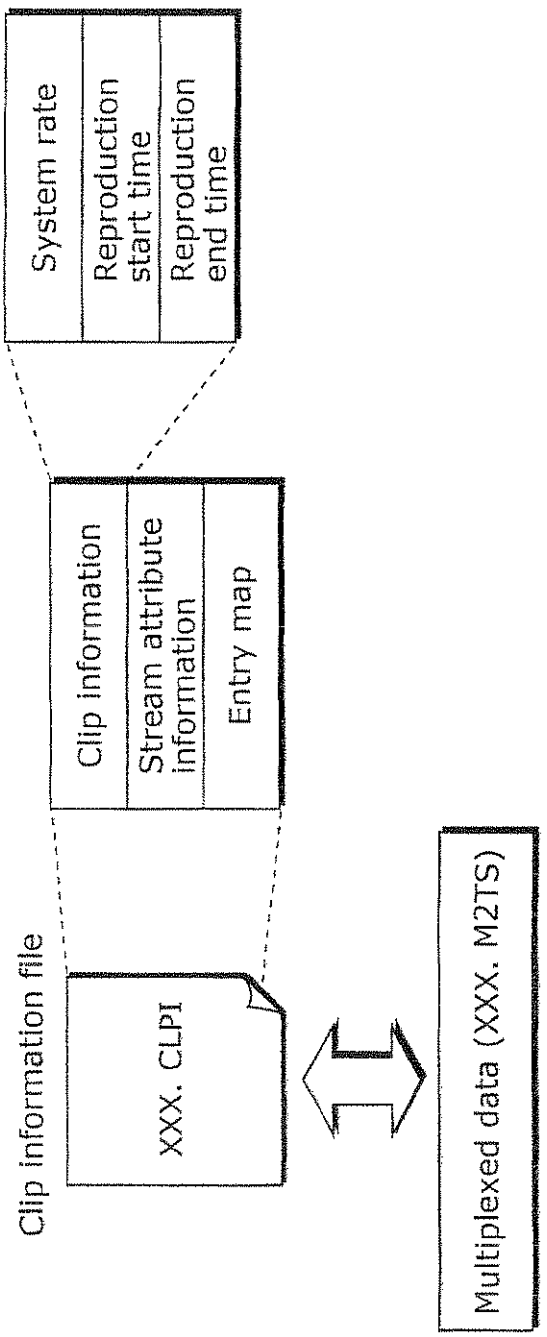

System rate
Reproduction start time
Reproduction end time
Clip information
Stream attribute information
Entry map
Clip information file
XXX. CLPI
Multiplexed data (XXX. M2TS)

FIG. 34

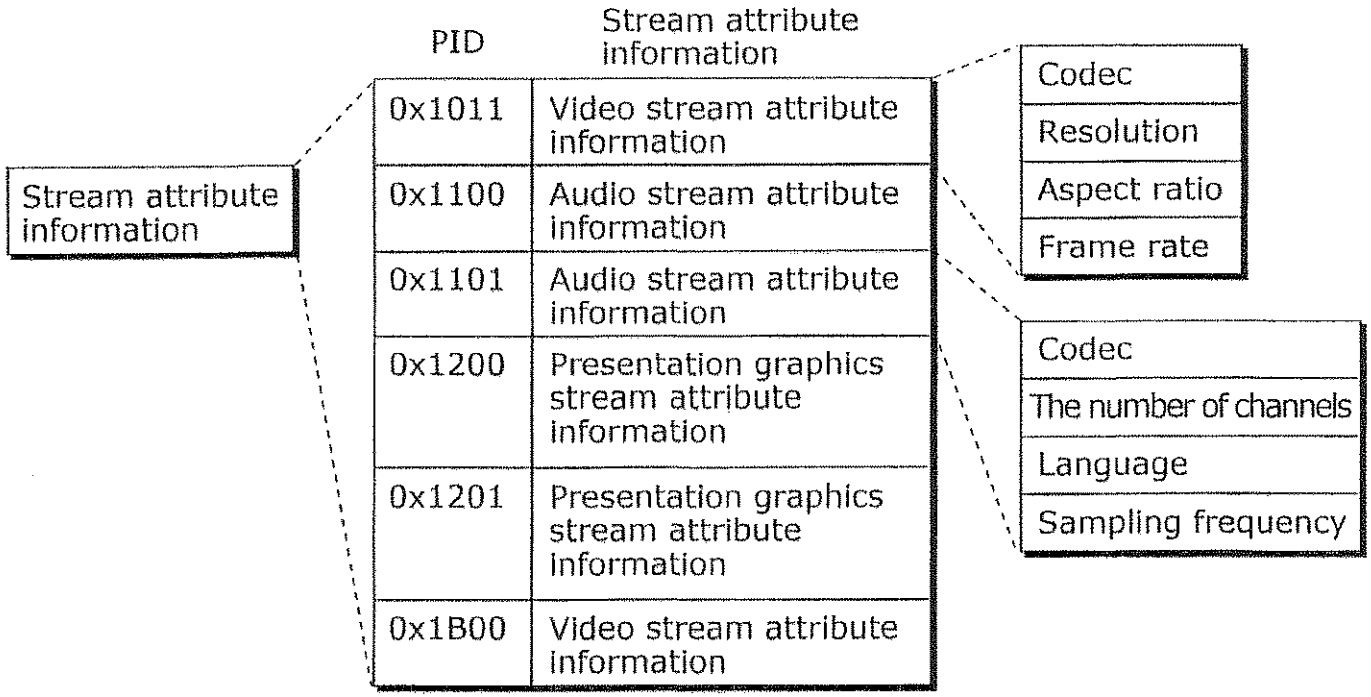

Stream attribute information
PID
Stream attribute information
0x1011
Video stream attribute information
0x1100
Audio stream attribute information
0x1101
Audio stream attribute information
0x1200
Presentation graphics stream attribute information
0x1201
Presentation graphics stream attribute information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

FIG. 35

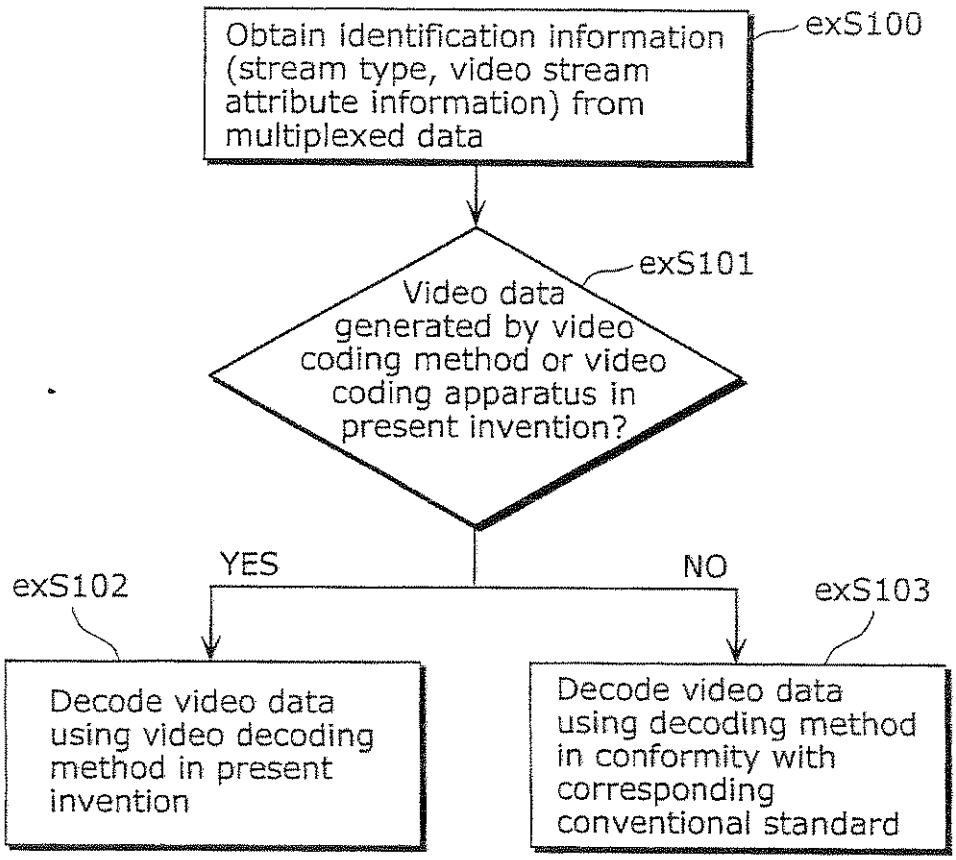

Obtain identification information (stream type, video stream attribute information) from multiplexed data
exS100
Video data generated by video coding method or video coding apparatus in present invention?
exS101
YES
NO
exS102
exS103
Decode video data using video decoding method in present invention
Decode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

FIG. 36

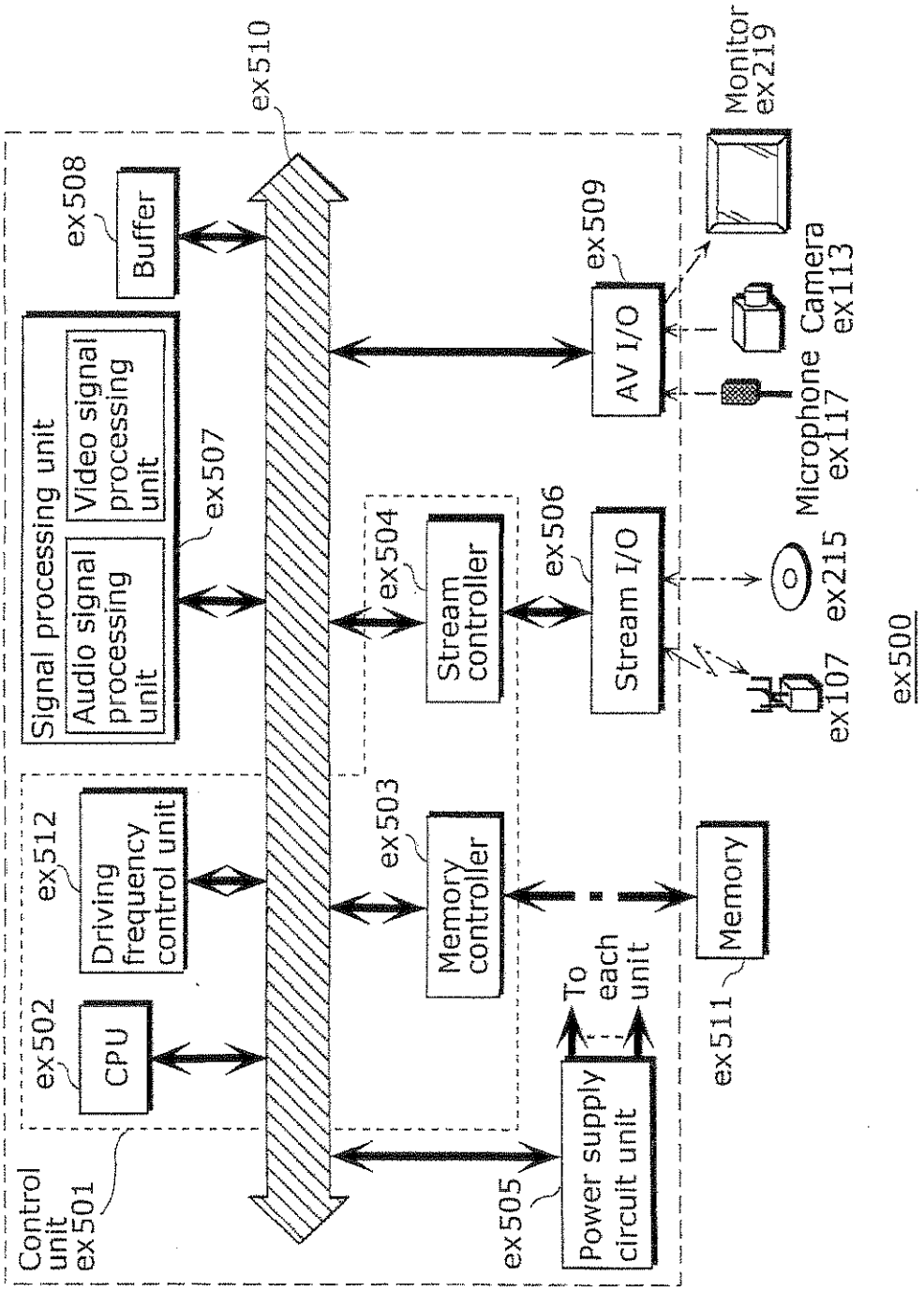
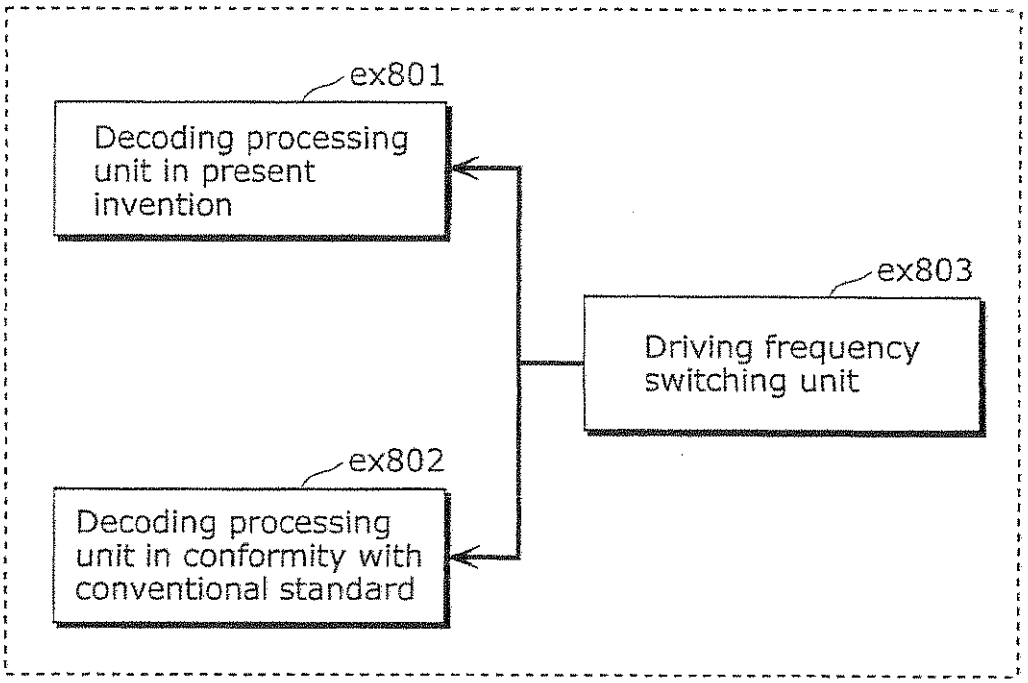

Control unit ex501
CPU ex502
Driving frequency control unit ex512
Signal processing unit
Audio signal processing unit
Video signal processing unit ex507
Buffer ex508
ex510
Monitor ex219
AV I/O ex509
Microphone ex117
Camera ex113
Stream controller ex504
Stream I/O ex506
ex215
ex107
Memory controller ex503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

FIG. 37


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

ex800

FIG. 38

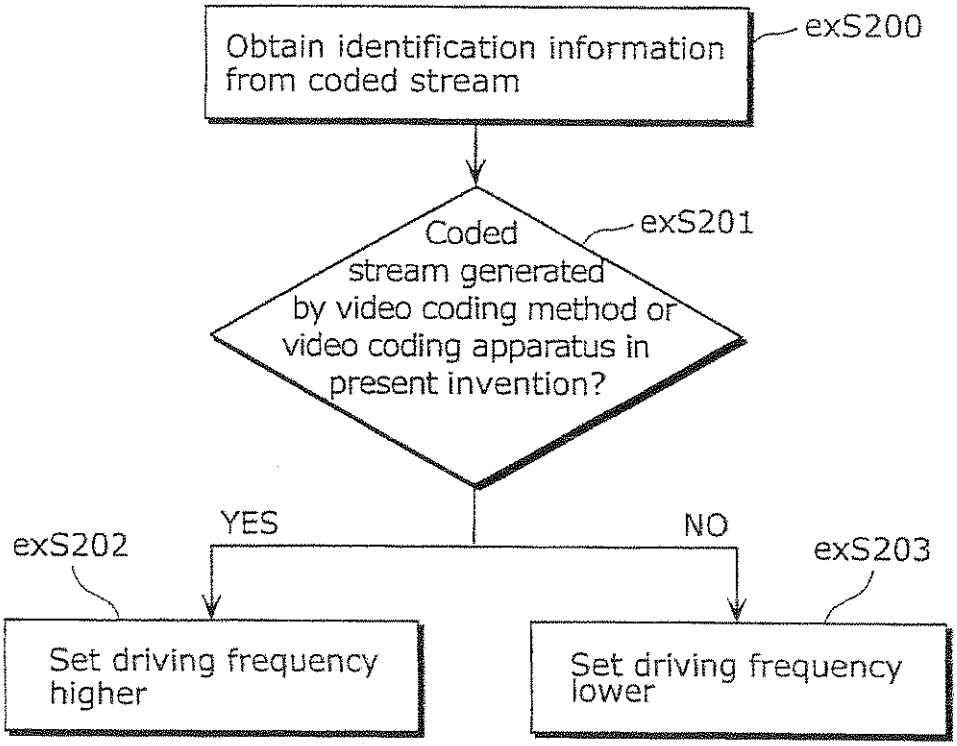

Obtain identification information from coded stream
exS200
Coded stream generated by video coding method or video coding apparatus in present invention?
exS201
YES
NO
exS202
exS203
Set driving frequency higher
Set driving frequency lower

FIG. 39

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

FIG. 40A

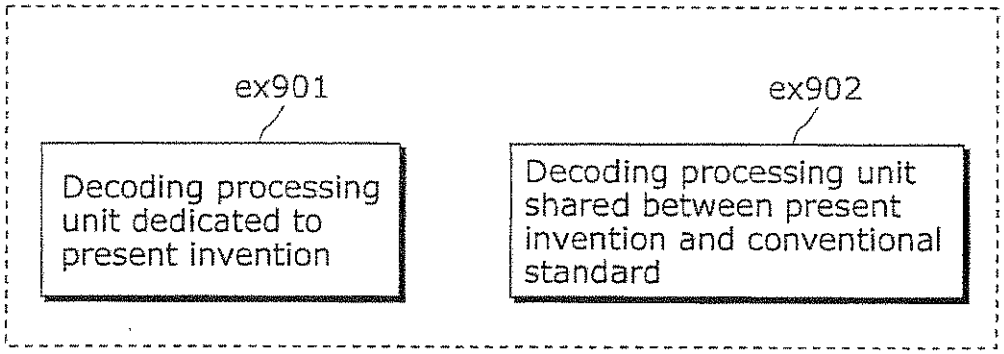


FIG. 40B

