FIG. 1

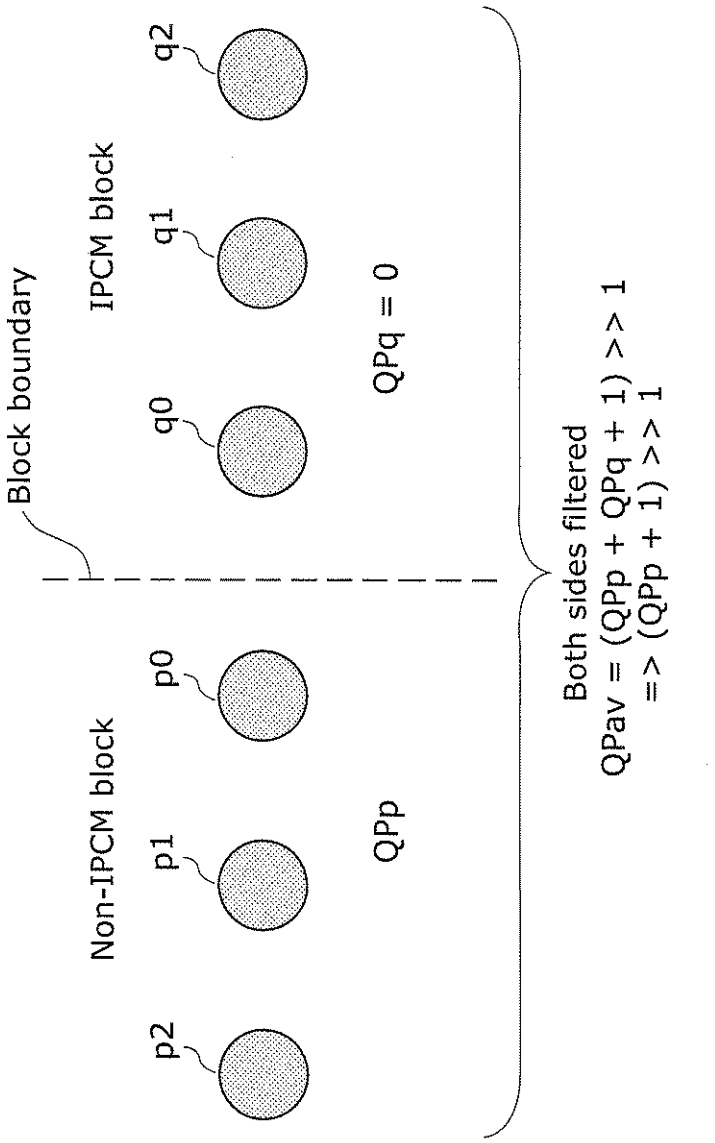

Block boundary
IPCM block
q0
q1
q2
QPq = 0
Non-IPCM block
p0
p1
p2
QPp
Both sides filtered
QPav = (QPp + QPq + 1) >> 1
=> (QPp + 1) >> 1

FIG. 2

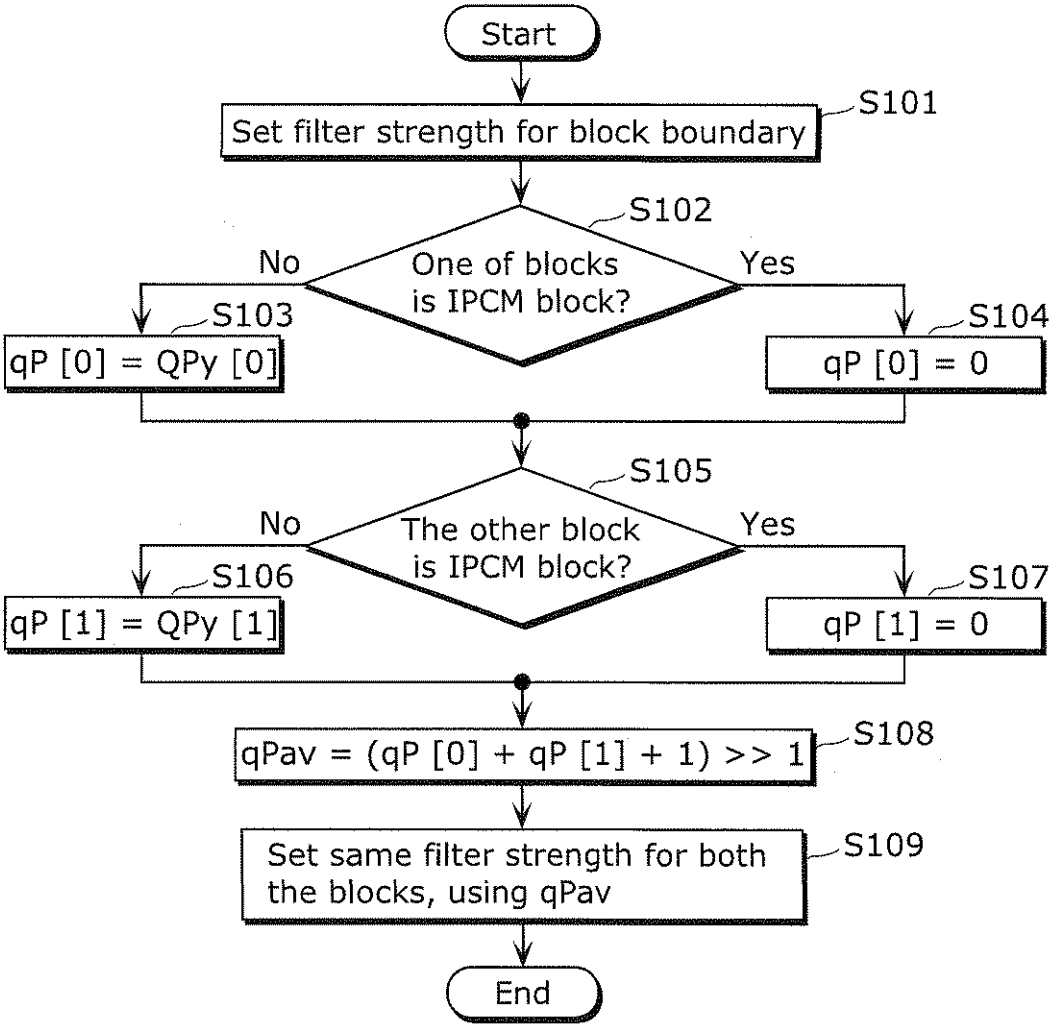

Start
Set filter strength for block boundary
S101
S102
One of blocks is IPCM block?
No
Yes
S103
qP [0] = QPy [0]
S104
qP [0] = 0
S105
The other block is IPCM block?
No
Yes
S106
qP [1] = QPy [1]
S107
qP [1] = 0
qPav = (qP [0] + qP [1] + 1) >> 1
S108
Set same filter strength for both the blocks, using qPav
S109
End

FIG. 3

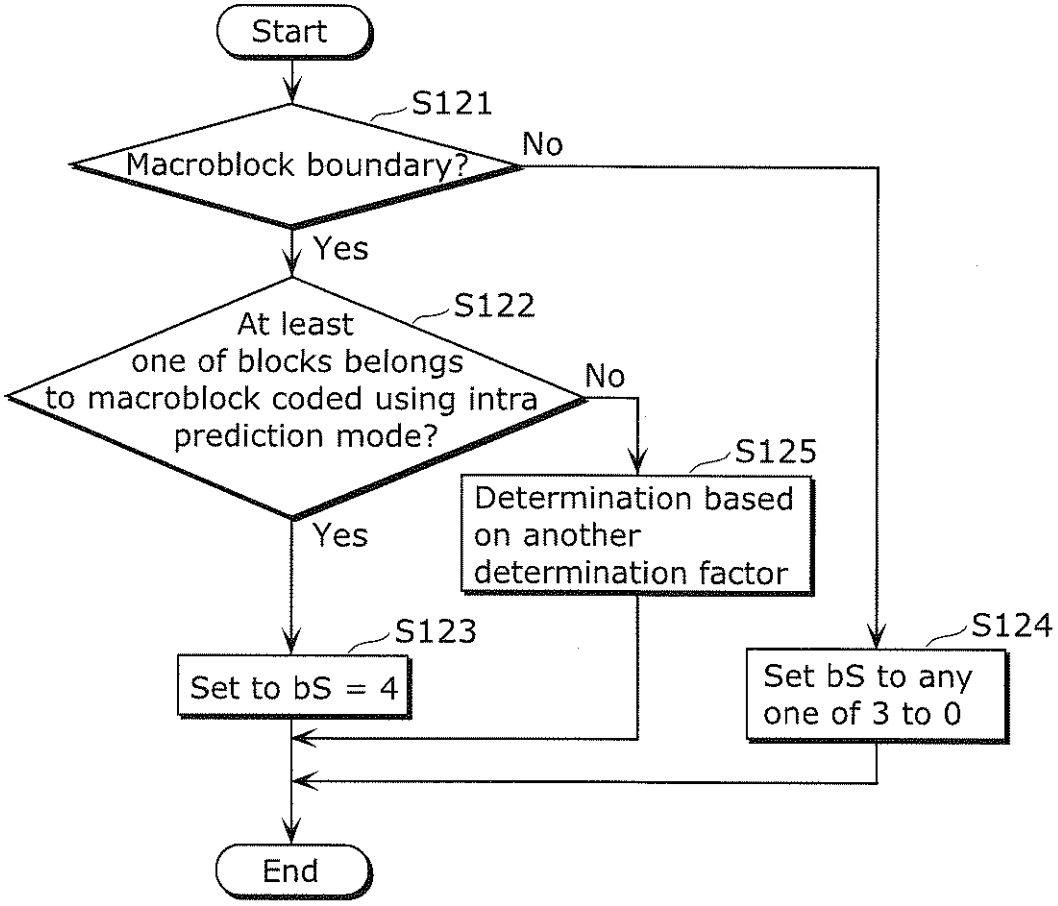

Start
S121
Macroblock boundary?
No
Yes
S122
At least one of blocks belongs to macroblock coded using intra prediction mode?
No
Yes
S125
Determination based on another determination factor
S123
Set to bS = 4
S124
Set bS to any one of 3 to 0
End

FIG. 4

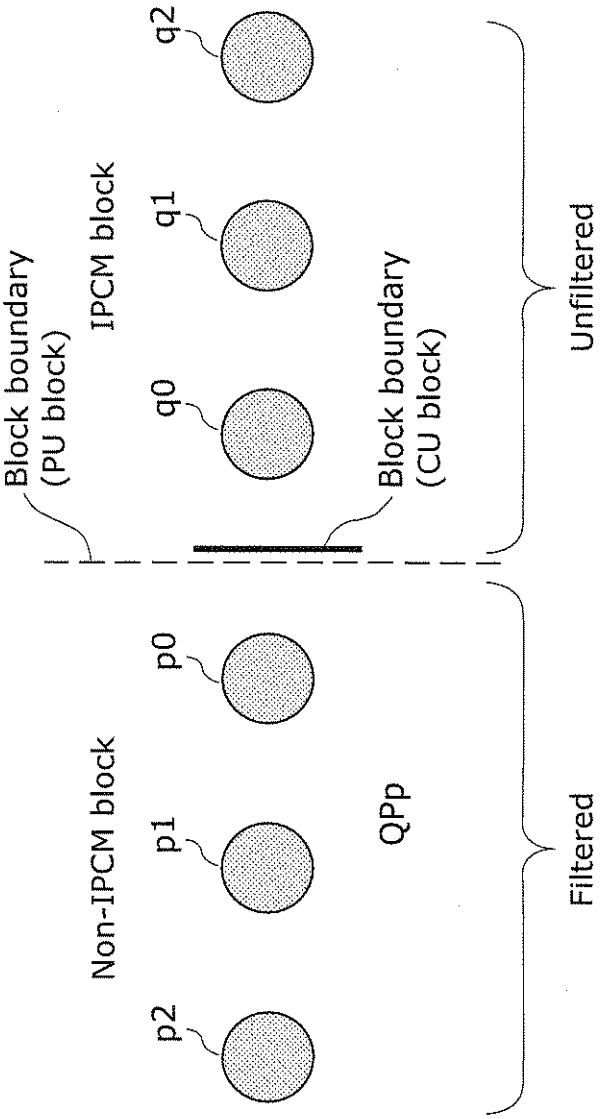

Block boundary
(PU block)
IPCM block
q2
q1
q0
Block boundary
(CU block)
Unfiltered
Non-IPCM block
p0
p1
p2
QPp
Filtered

FIG. 5

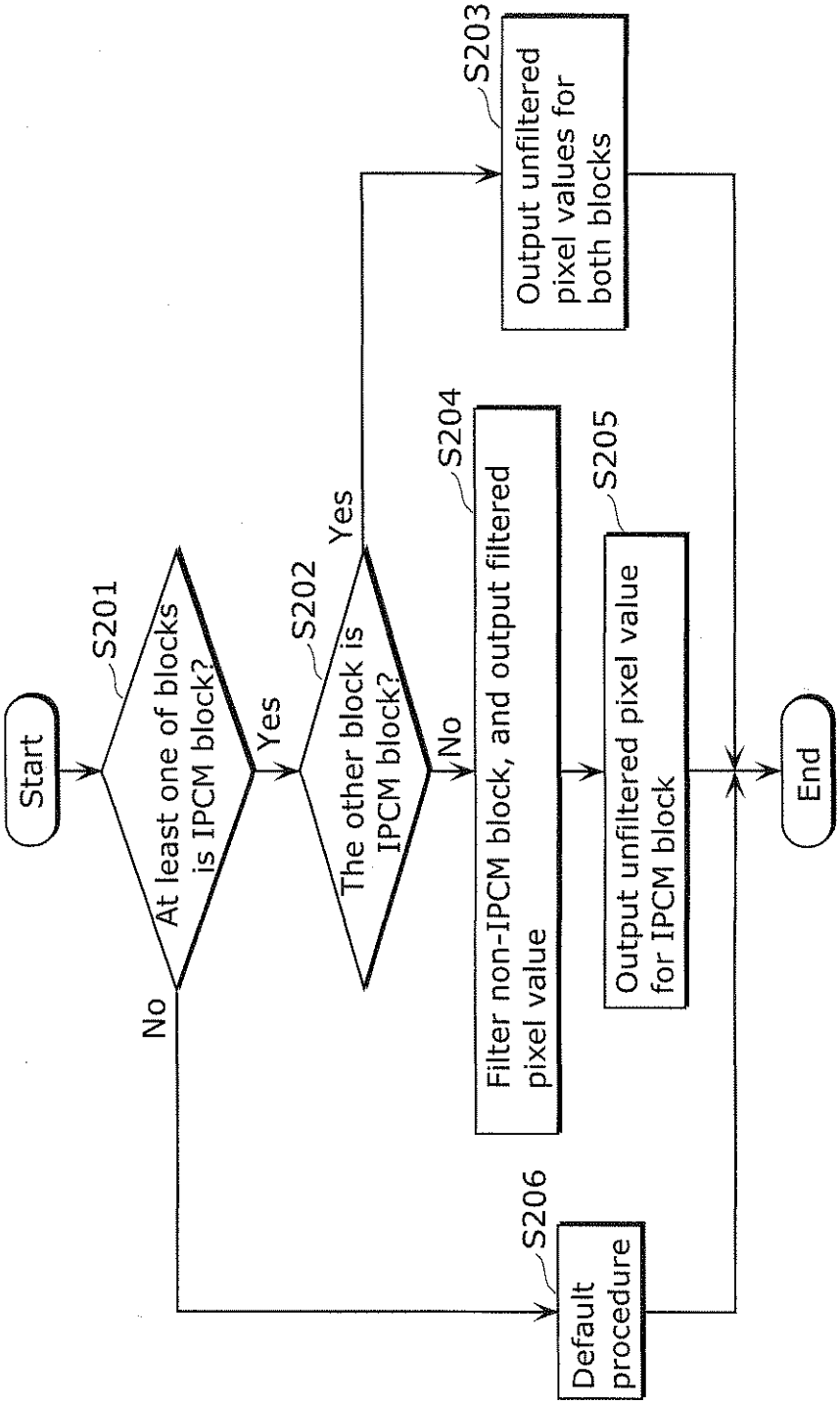

Start
S201
At least one of blocks is IPCM block?
Yes
No
S202
The other block is IPCM block?
Yes
No
S203
Output unfiltered pixel values for both blocks
S204
Filter non-IPCM block, and output filtered pixel value
S205
Output unfiltered pixel value for IPCM block
S206
Default procedure
End

FIG. 6

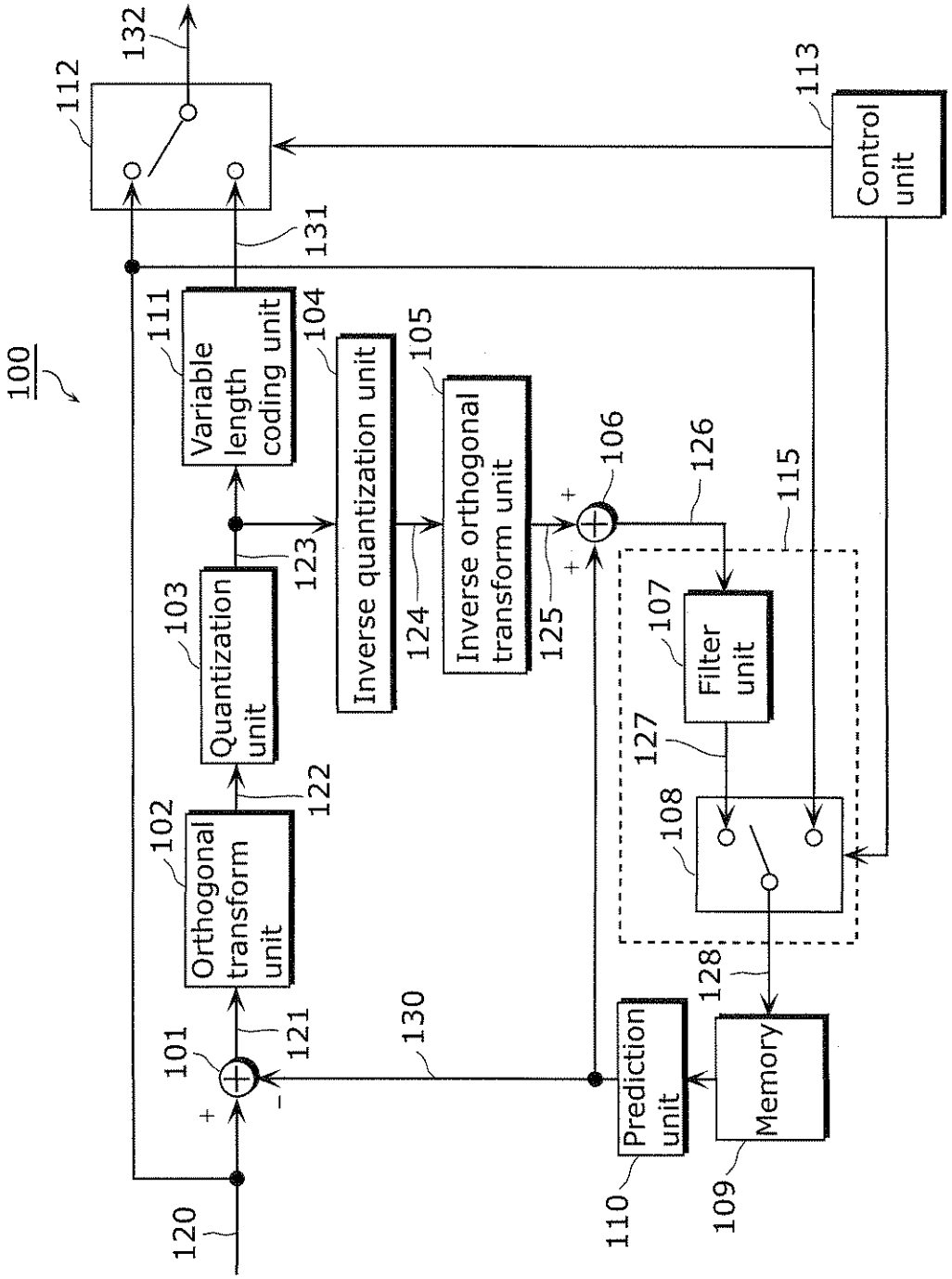

100
101
102
103
104
105
106
107
108
109
110
111
112
113
115
120
121
122
123
124
125
126
127
128
130
131
132
Orthogonal transform unit
Quantization unit
Variable length coding unit
Inverse quantization unit
Inverse orthogonal transform unit
Filter unit
Prediction unit
Memory
Control unit

FIG. 7A

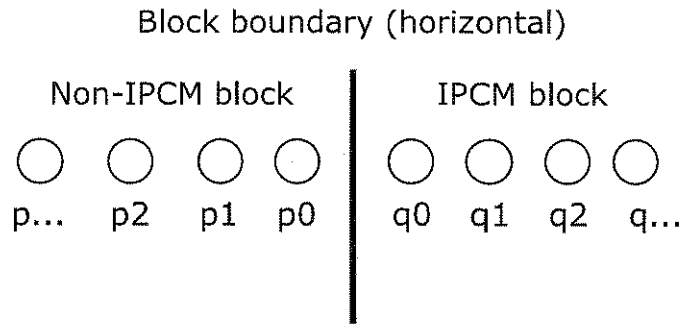

Block boundary (horizontal)
Non-IPCM block
IPCM block
p...
p2
p1
p0
q0
q1
q2
q...

FIG. 7B

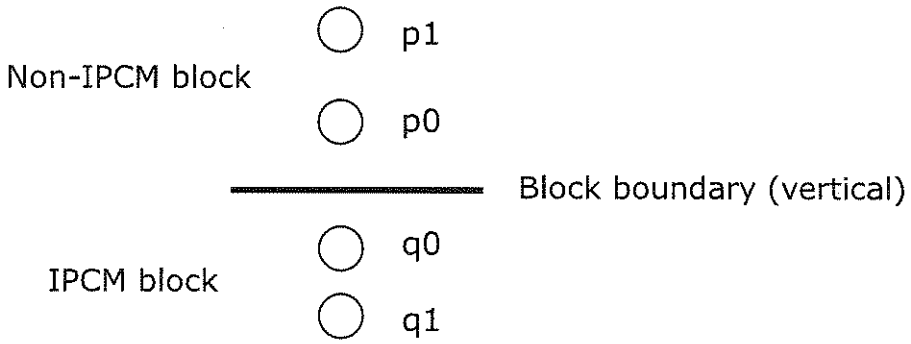

Non-IPCM block
p1
p0
Block boundary (vertical)
IPCM block
q0
q1

FIG. 8A

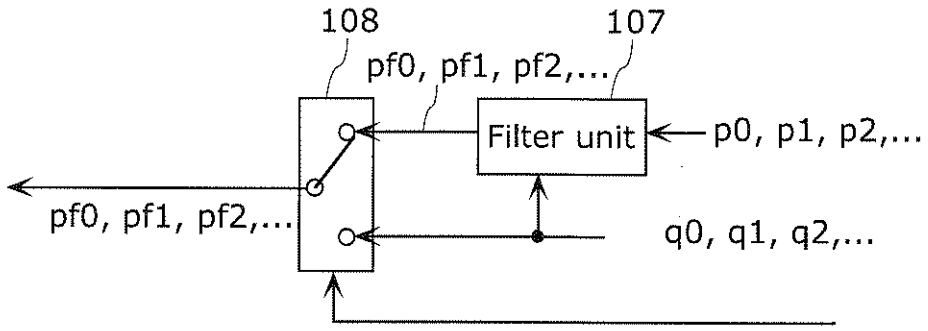

108
107
pf0, pf1, pf2,...
Filter unit
p0, p1, p2,...
pf0, pf1, pf2,...
q0, q1, q2,...

FIG. 8B

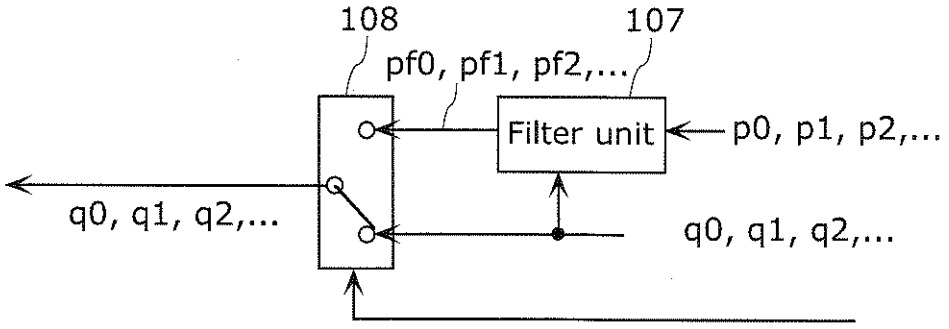

108
107
pf0, pf1, pf2,...
Filter unit
p0, p1, p2,...
q0, q1, q2,...
q0, q1, q2,...

FIG. 9

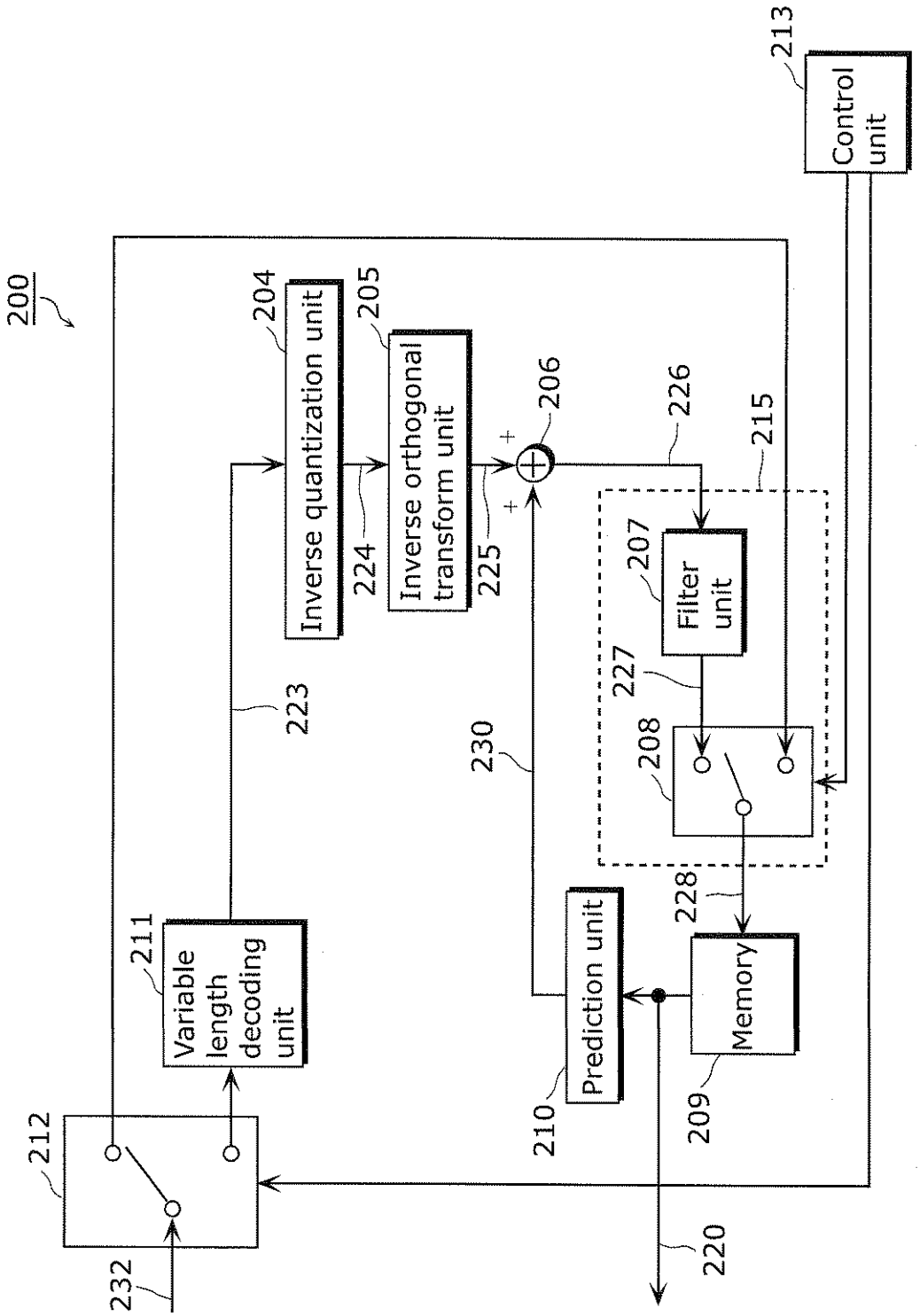

200
213
Control unit
204
Inverse quantization unit
205
Inverse orthogonal transform unit
206
226
215
224
225
207
Filter unit
223
227
230
208
211
Variable length decoding unit
228
Prediction unit
Memory
212
210
209
232
220

FIG. 10A

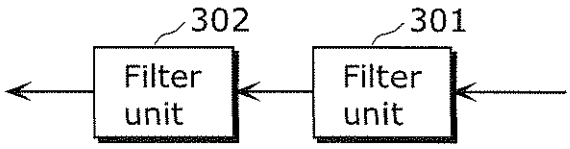


FIG. 10B

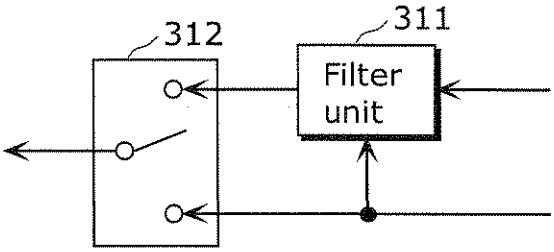


FIG. 10C

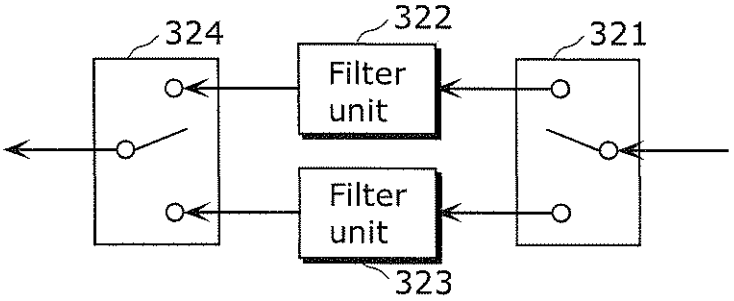


FIG. 10D

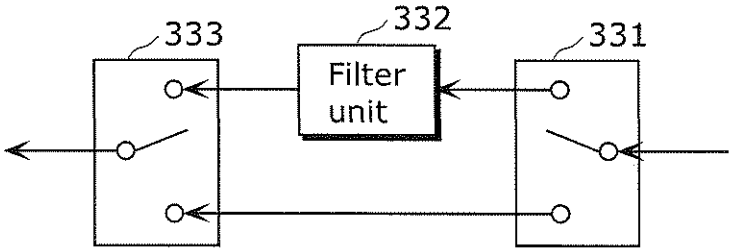


FIG. 10E

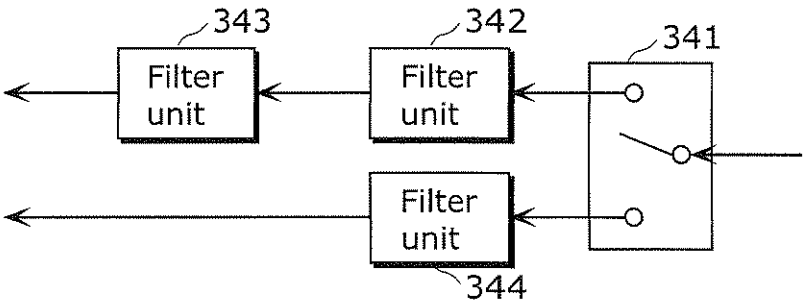


FIG. 10F

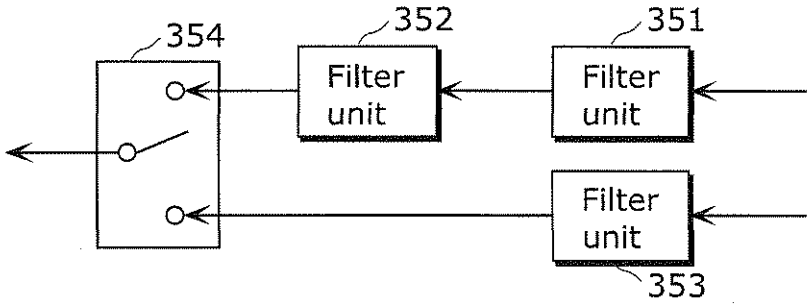


FIG. 10G

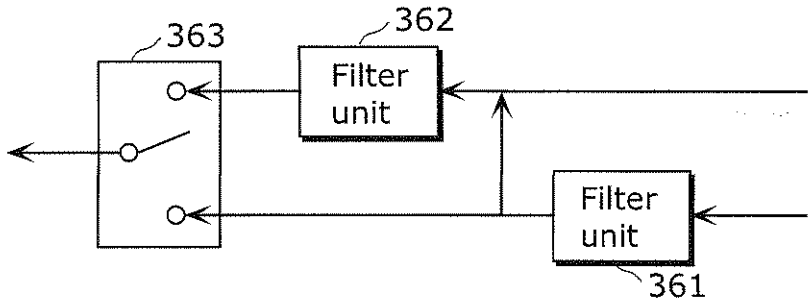


FIG. 10H

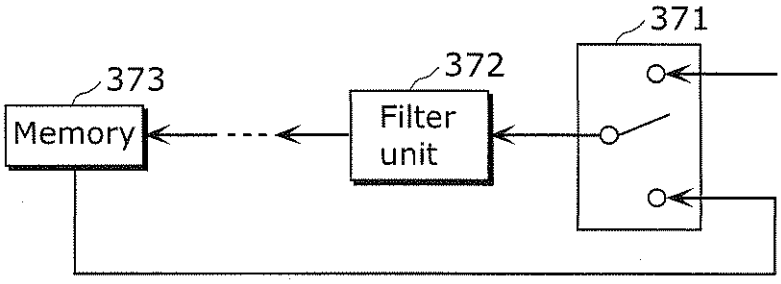


FIG. 11

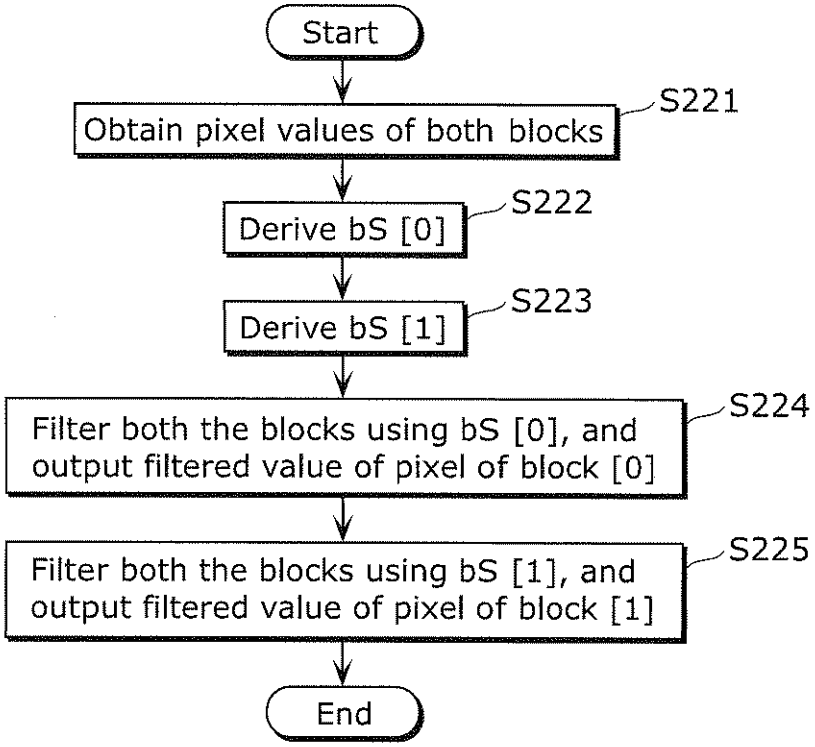

Start
Obtain pixel values of both blocks
S221
Derive bS [0]
S222
Derive bS [1]
S223
Filter both the blocks using bS [0], and output filtered value of pixel of block [0]
S224
Filter both the blocks using bS [1], and output filtered value of pixel of block [1]
S225
End

FIG. 12

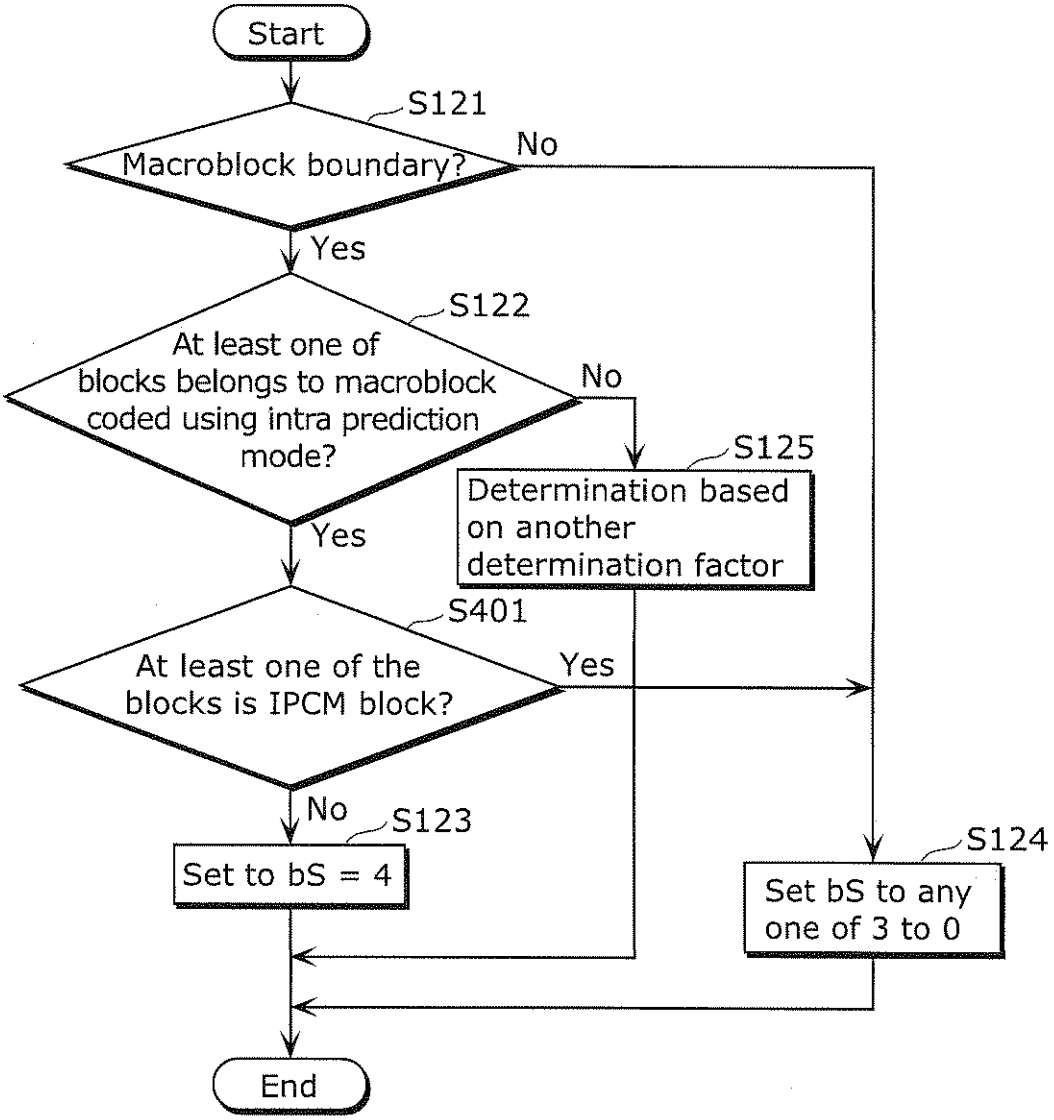

Start
S121
Macroblock boundary?
No
Yes
S122
At least one of blocks belongs to macroblock coded using intra prediction mode?
No
S125
Determination based on another determination factor
Yes
S401
At least one of the blocks is IPCM block?
Yes
No
S123
Set to bS = 4
S124
Set bS to any one of 3 to 0
End

FIG. 13

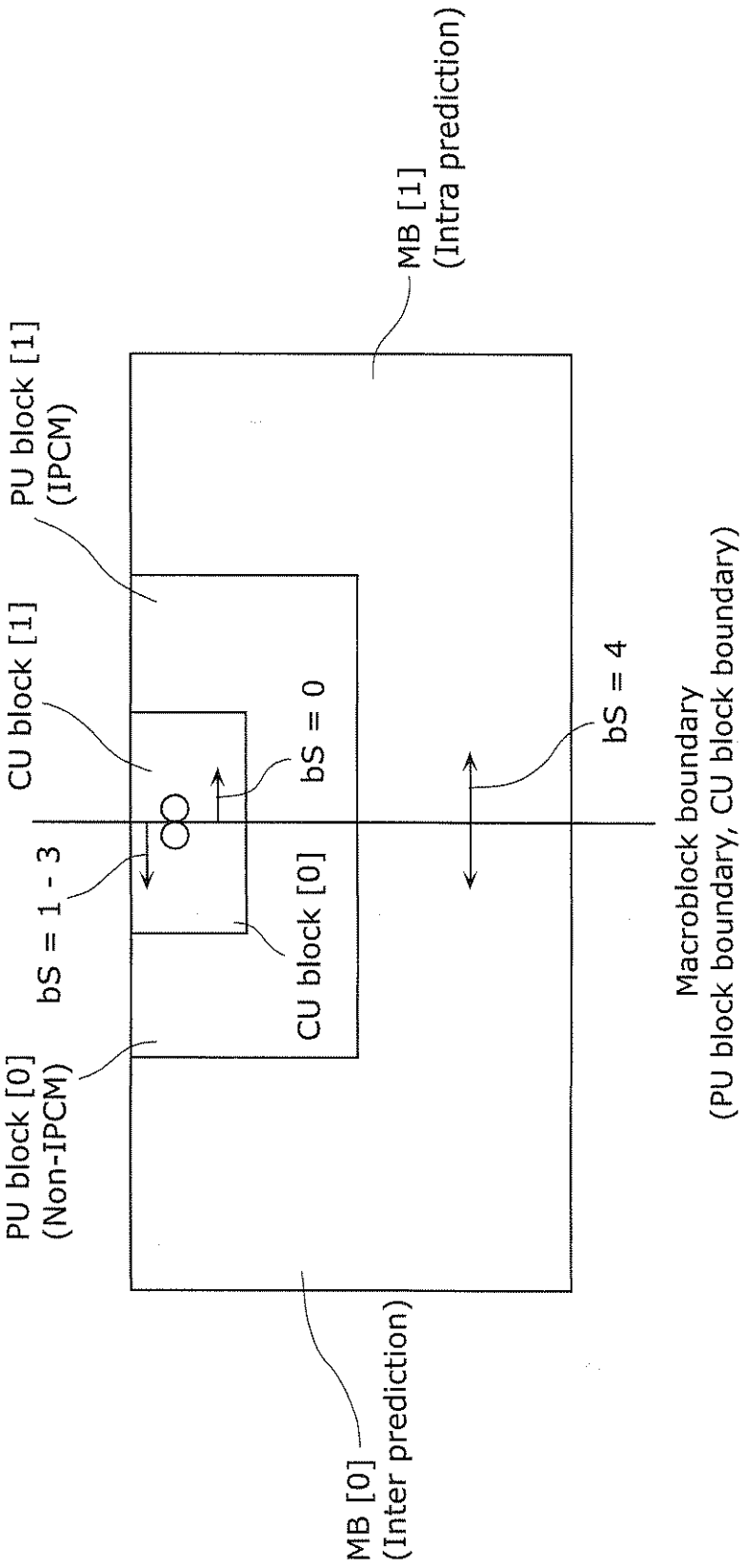

MB [1]
(Intra prediction)
PU block [1]
(IPCM)
CU block [1]
bS = 0
bS = 4
bS = 1 - 3
CU block [0]
PU block [0]
(Non-IPCM)
Macroblock boundary
(PU block boundary, CU block boundary)
MB [0]
(Inter prediction)

FIG. 14A

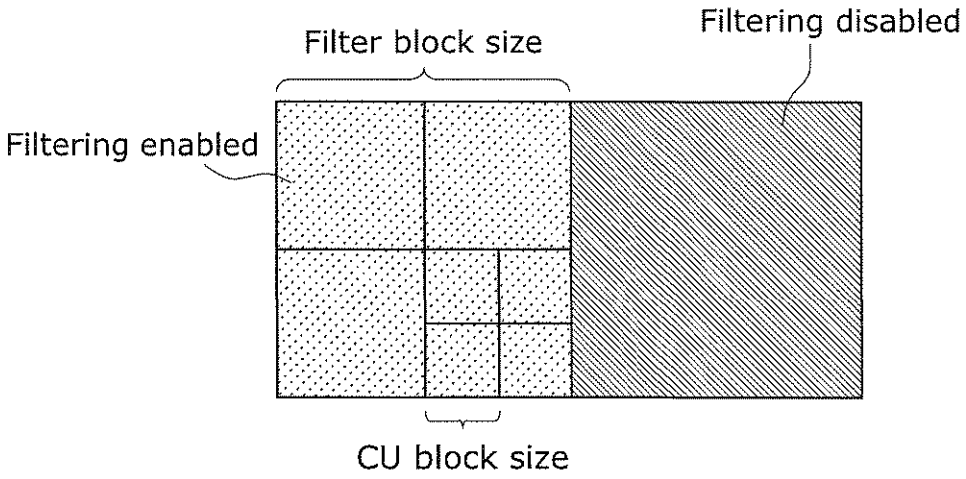


FIG. 14B

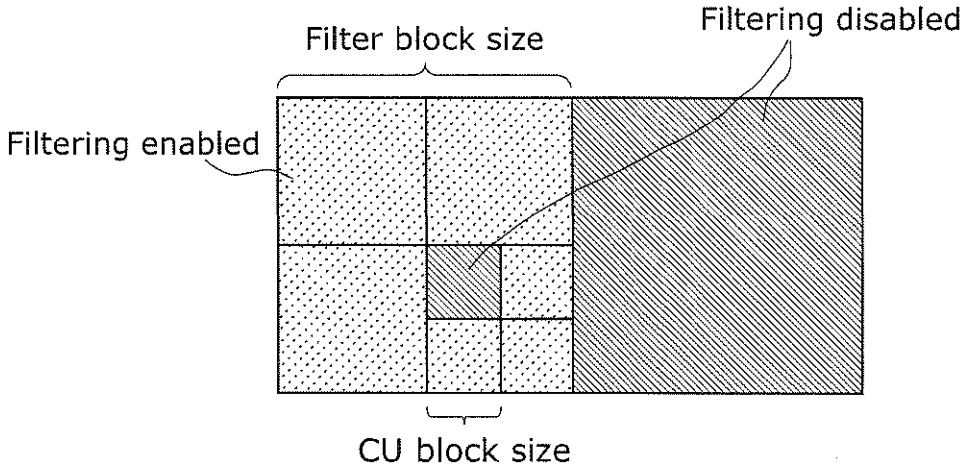


FIG. 15

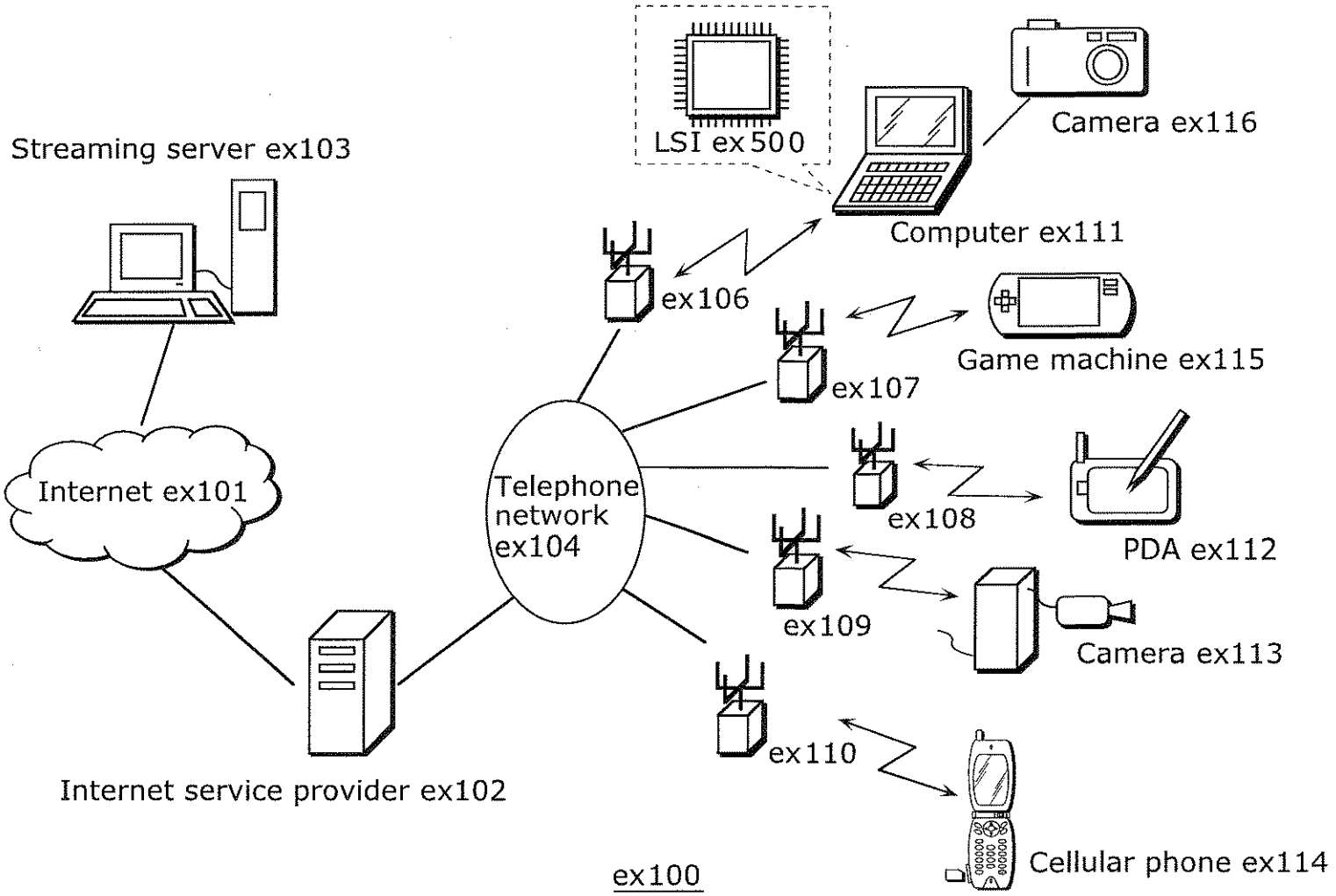

LSI ex500
Camera ex116
Streaming server ex103
Computer ex111
ex106
ex107
Game machine ex115
Internet ex101
Telephone network ex104
ex108
PDA ex112
ex109
Camera ex113
ex110
Internet service provider ex102
Cellular phone ex114
ex100

FIG. 16

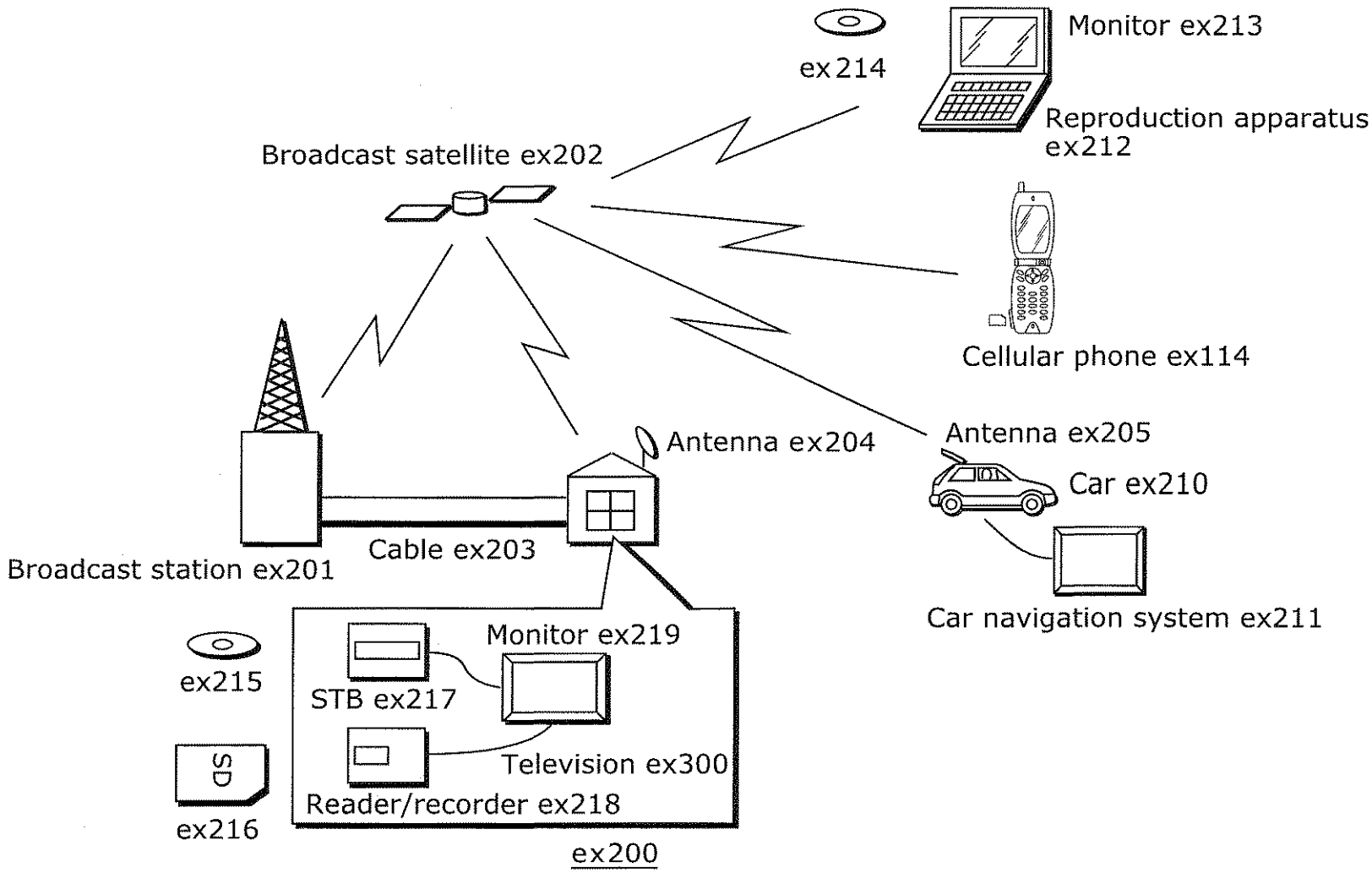

ex214
Monitor ex213
Reproduction apparatus ex212
Broadcast satellite ex202
Cellular phone ex114
Antenna ex204
Antenna ex205
Car ex210
Cable ex203
Broadcast station ex201
Car navigation system ex211
Monitor ex219
ex215
STB ex217
Television ex300
SD
Reader/recorder ex218
ex216
ex200

FIG. 17

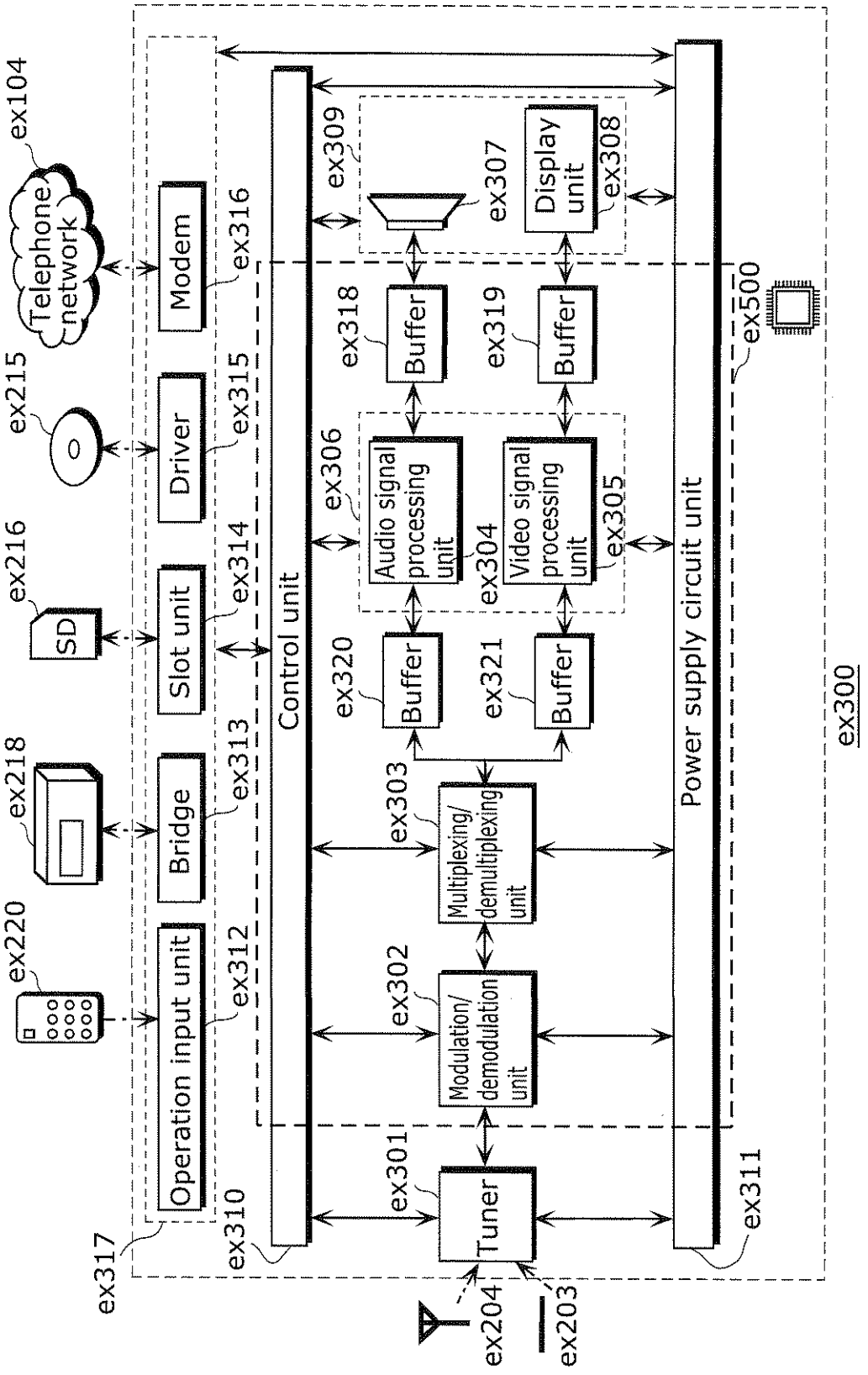

ex104
Telephone network
ex215
ex216
SD
ex218
ex220
ex317
Operation input unit
ex312
Bridge
ex313
Slot unit
ex314
Driver
ex315
Modem
ex316
Control unit
ex310
ex309
ex307
Display unit
ex308
ex318
Buffer
ex319
Buffer
ex306
Audio signal processing unit
ex304
Video signal processing unit
ex305
ex320
Buffer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

FIG. 18

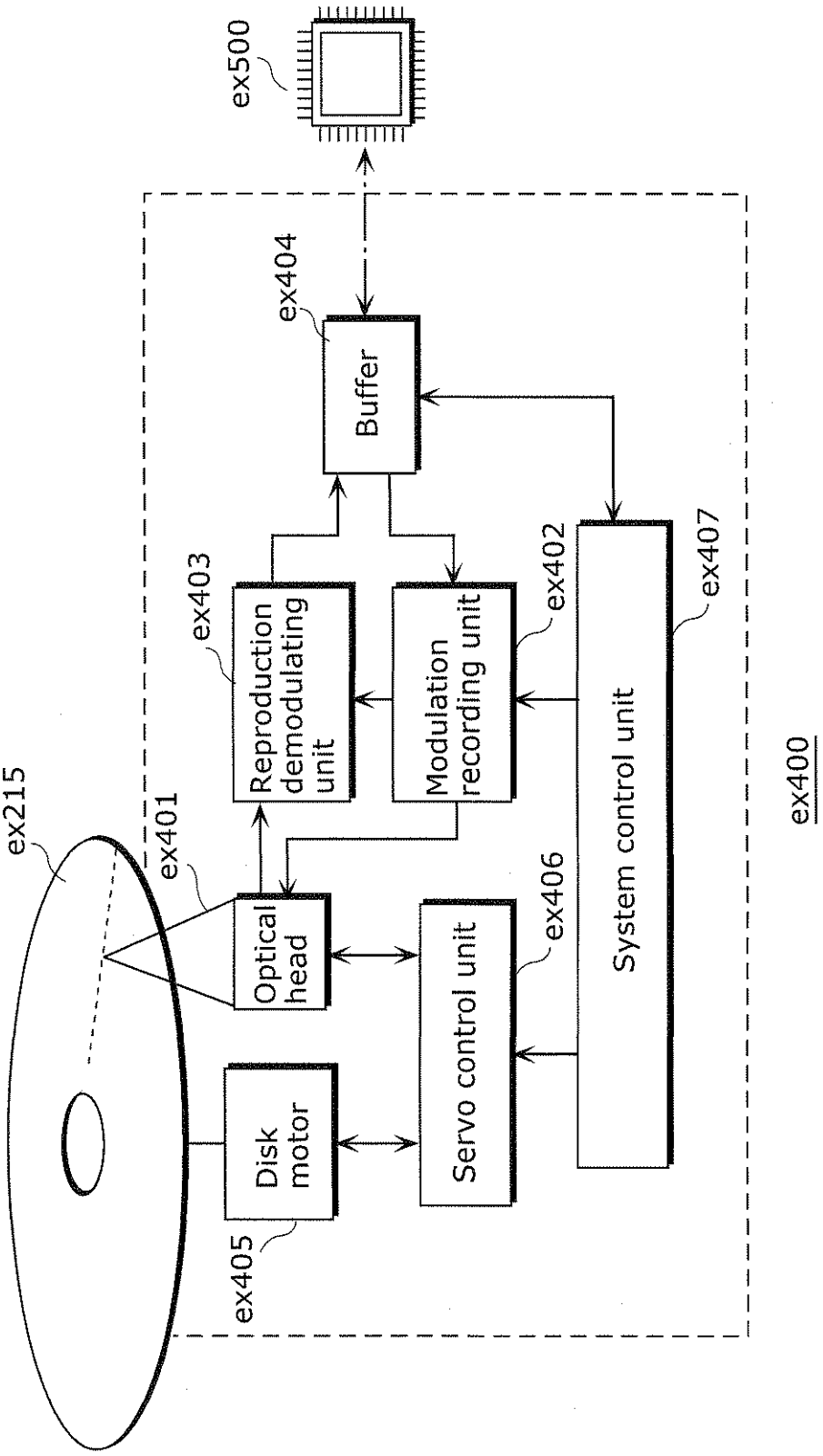

ex500
ex404
Buffer
ex403
Reproduction demodulating unit
ex402
Modulation recording unit
ex407
System control unit
ex400
ex215
ex401
Optical head
ex406
Servo control unit
Disk motor
ex405

FIG. 19

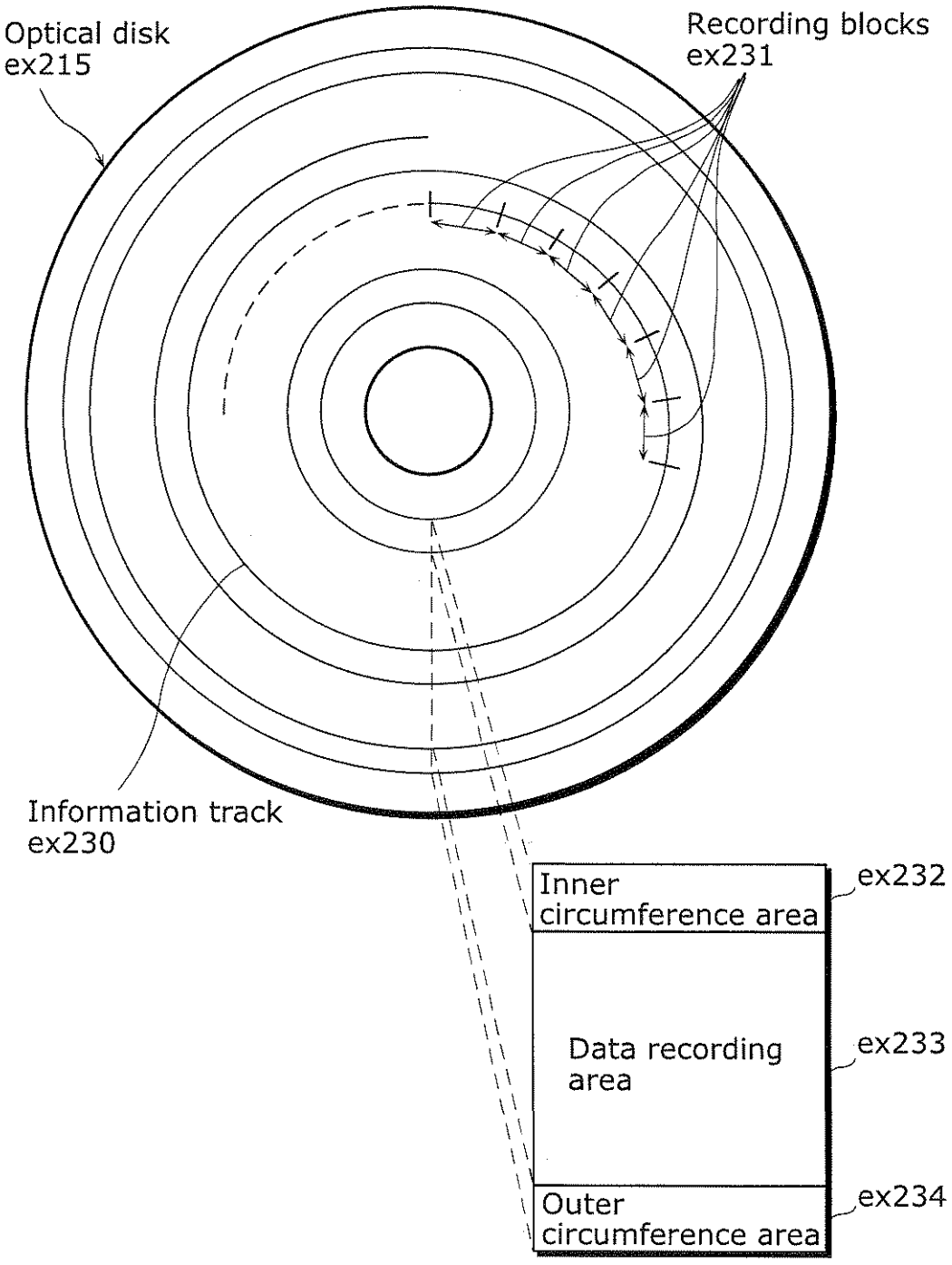

Optical disk
ex215
Recording blocks
ex231
Information track
ex230
Inner
circumference area
ex232
Data recording
area
ex233
Outer
circumference area
ex234

FIG. 20A

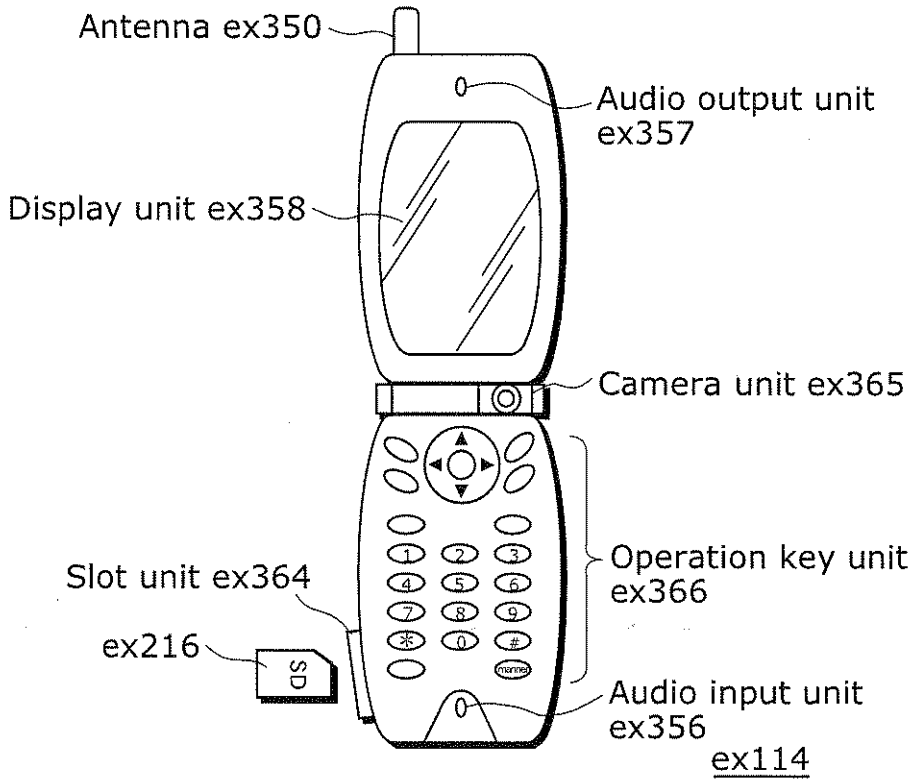


FIG. 20B

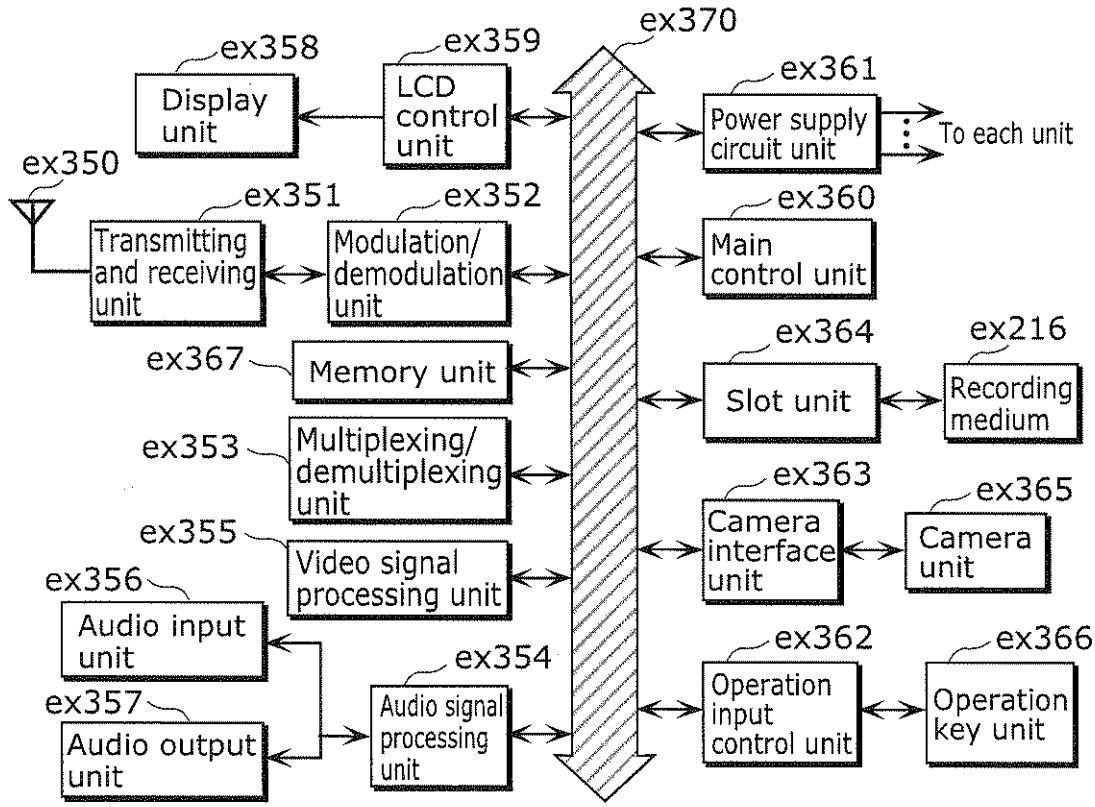


FIG. 21

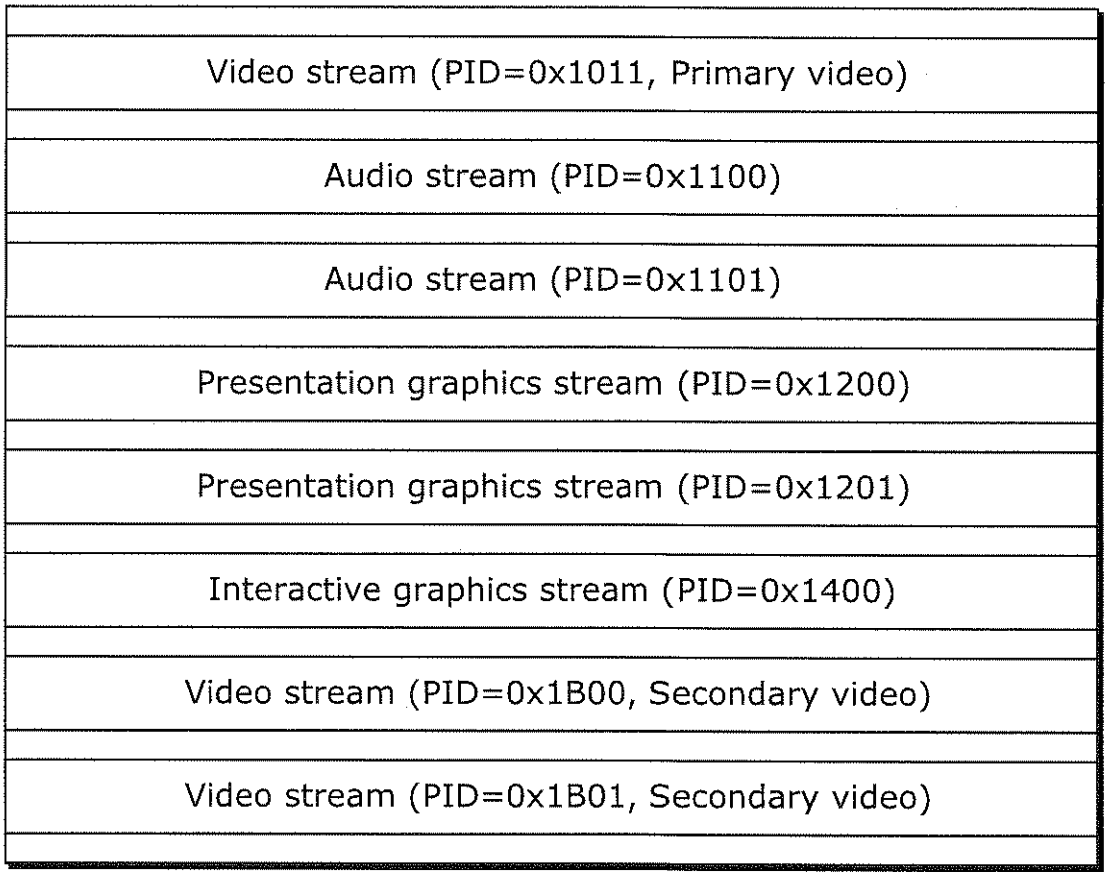

Video stream (PID=0x1011, Primary video)
Audio stream (PID=0x1100)
Audio stream (PID=0x1101)
Presentation graphics stream (PID=0x1200)
Presentation graphics stream (PID=0x1201)
Interactive graphics stream (PID=0x1400)
Video stream (PID=0x1B00, Secondary video)
Video stream (PID=0x1B01, Secondary video)

FIG. 22

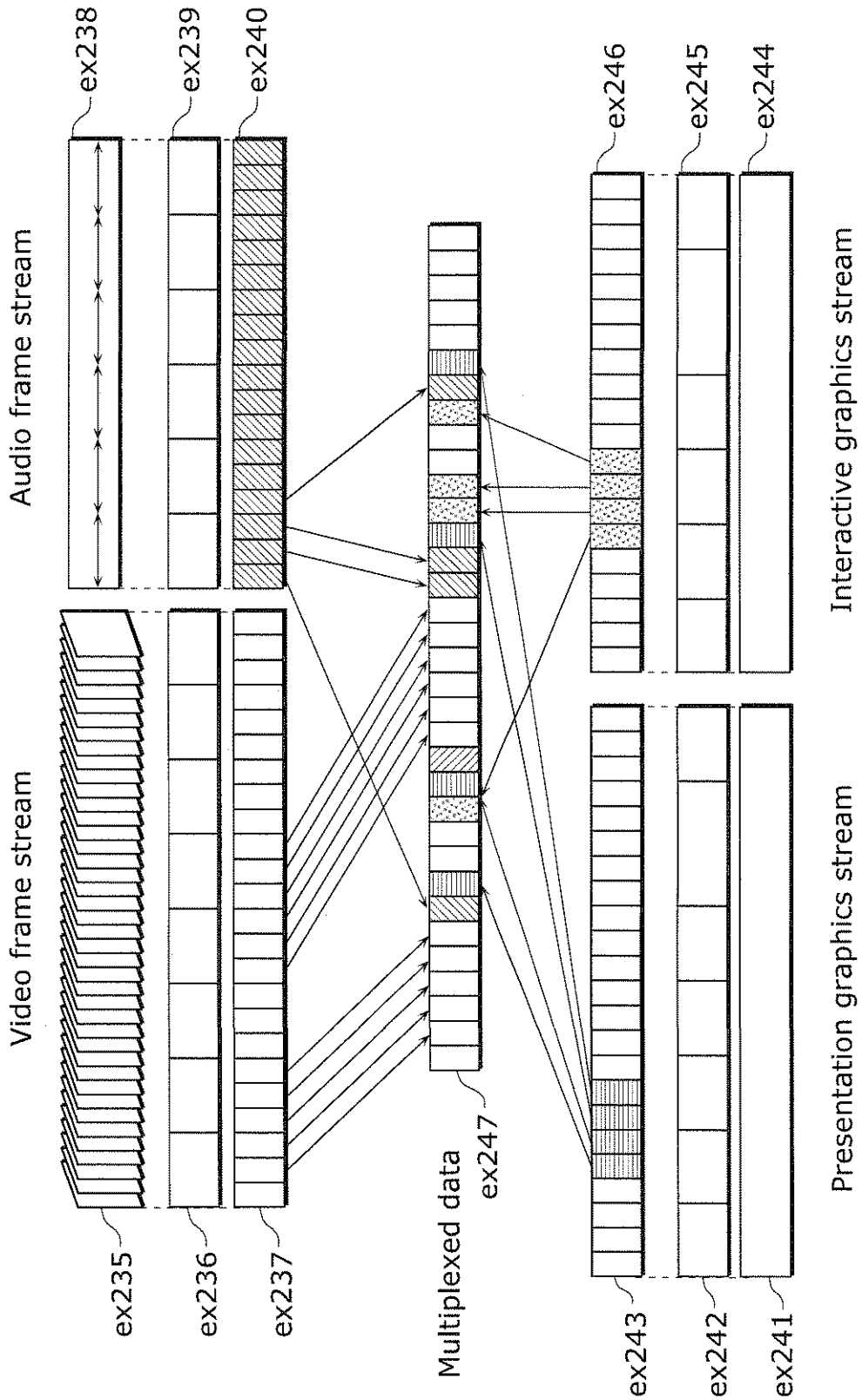

Video frame stream
Audio frame stream
Multiplexed data
Presentation graphics stream
Interactive graphics stream
ex235
ex236
ex237
ex238
ex239
ex240
ex241
ex242
ex243
ex244
ex245
ex246
ex247

FIG. 23

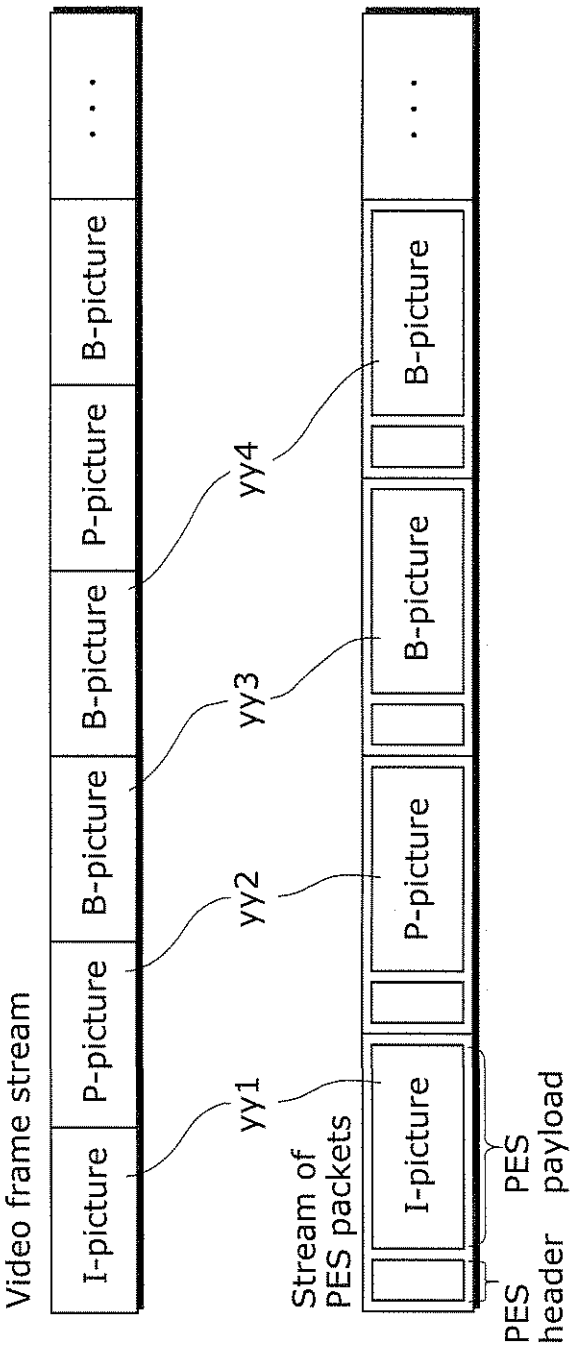

Video frame stream
I-picture
P-picture
B-picture
B-picture
P-picture
B-picture
. . .
yy1
yy2
yy3
yy4
Stream of PES packets
I-picture
P-picture
B-picture
B-picture
. . .
PES header
PES payload

FIG. 24

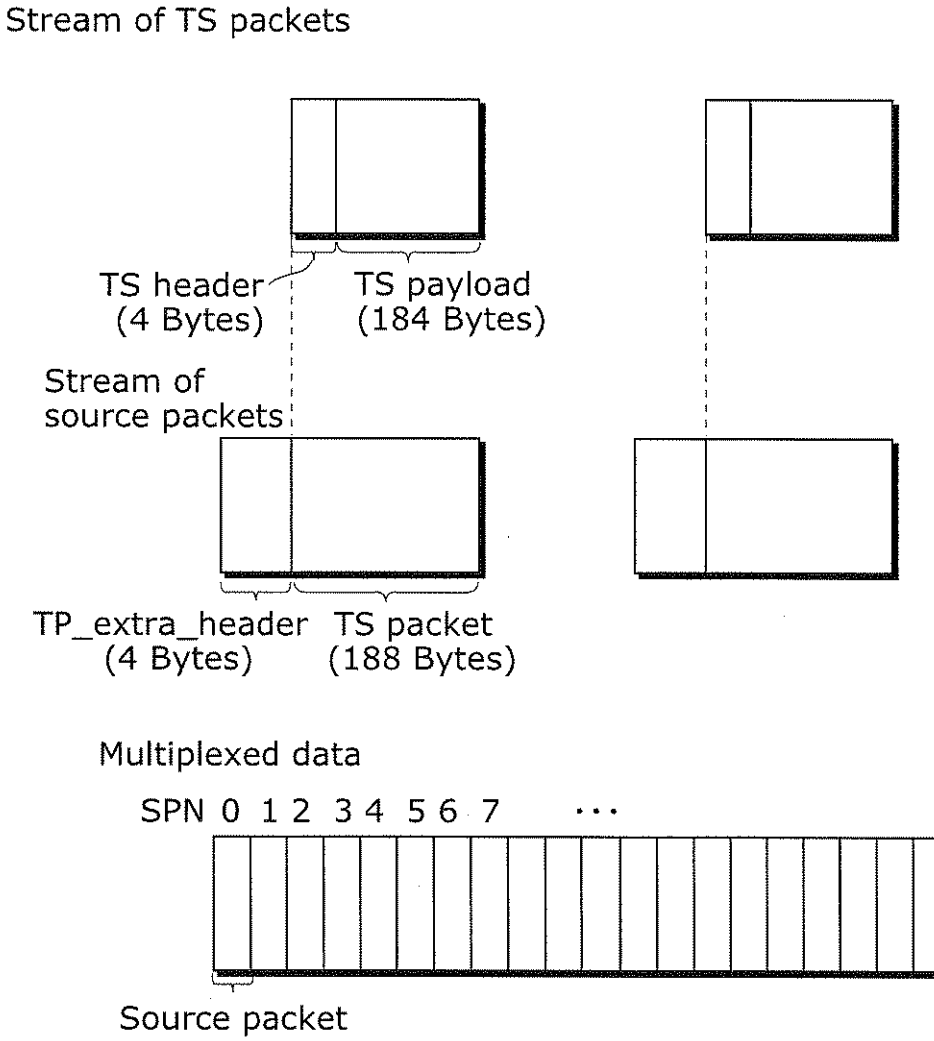

Stream of TS packets
TS header
(4 Bytes)
TS payload
(184 Bytes)
Stream of
source packets
TP_extra_header
(4 Bytes)
TS packet
(188 Bytes)
Multiplexed data
SPN 0 1 2 3 4 5 6 7 ...
Source packet

FIG. 25

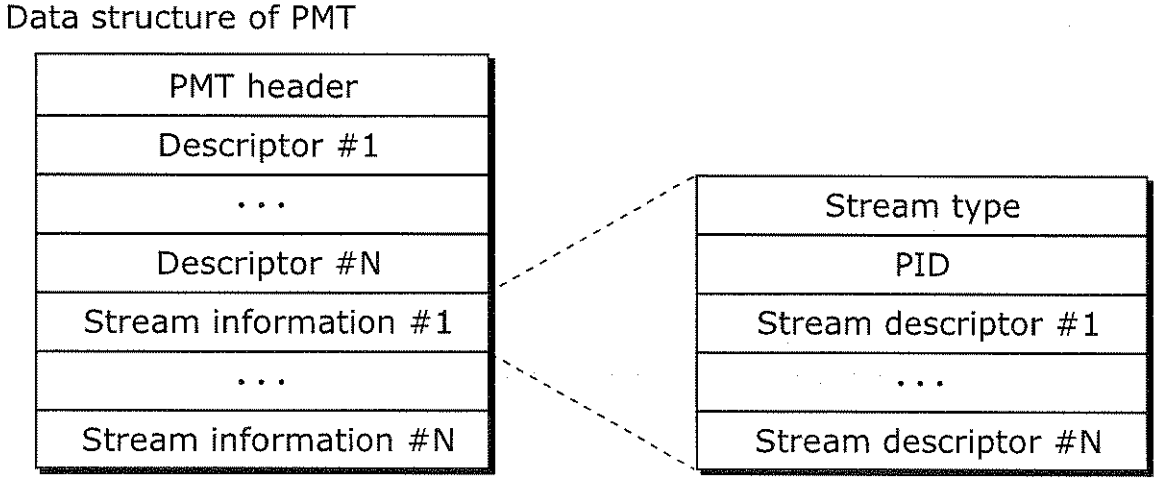

Data structure of PMT
PMT header
Descriptor #1
...
Descriptor #N
Stream information #1
...
Stream information #N
Stream type
PID
Stream descriptor #1
...
Stream descriptor #N

FIG. 26

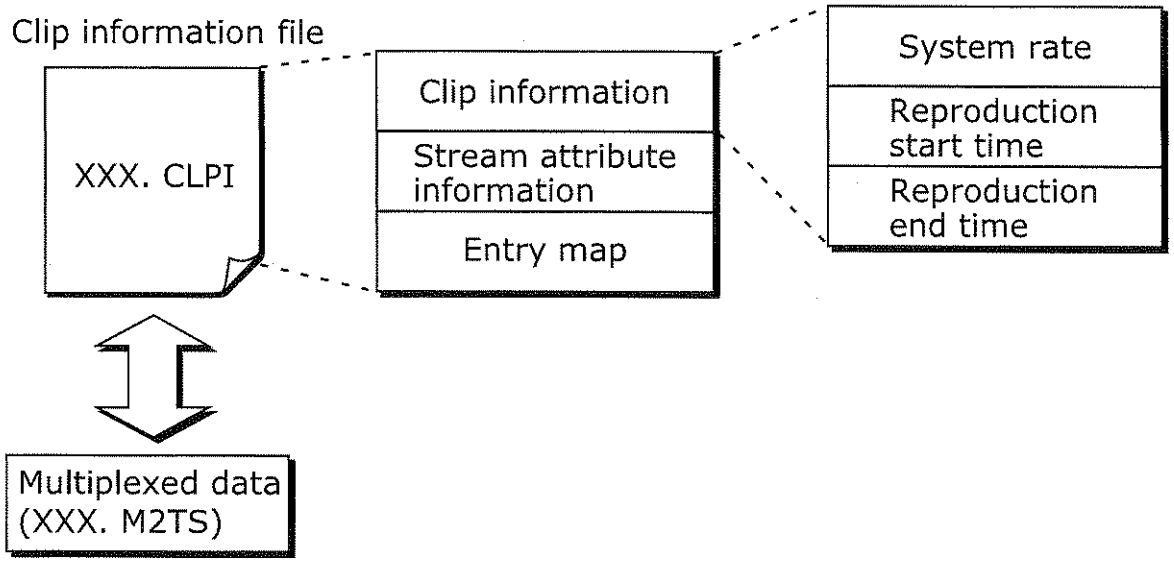

Clip information file
XXX. CLPI
Clip information
Stream attribute information
Entry map
System rate
Reproduction start time
Reproduction end time
Multiplexed data (XXX. M2TS)

FIG. 27

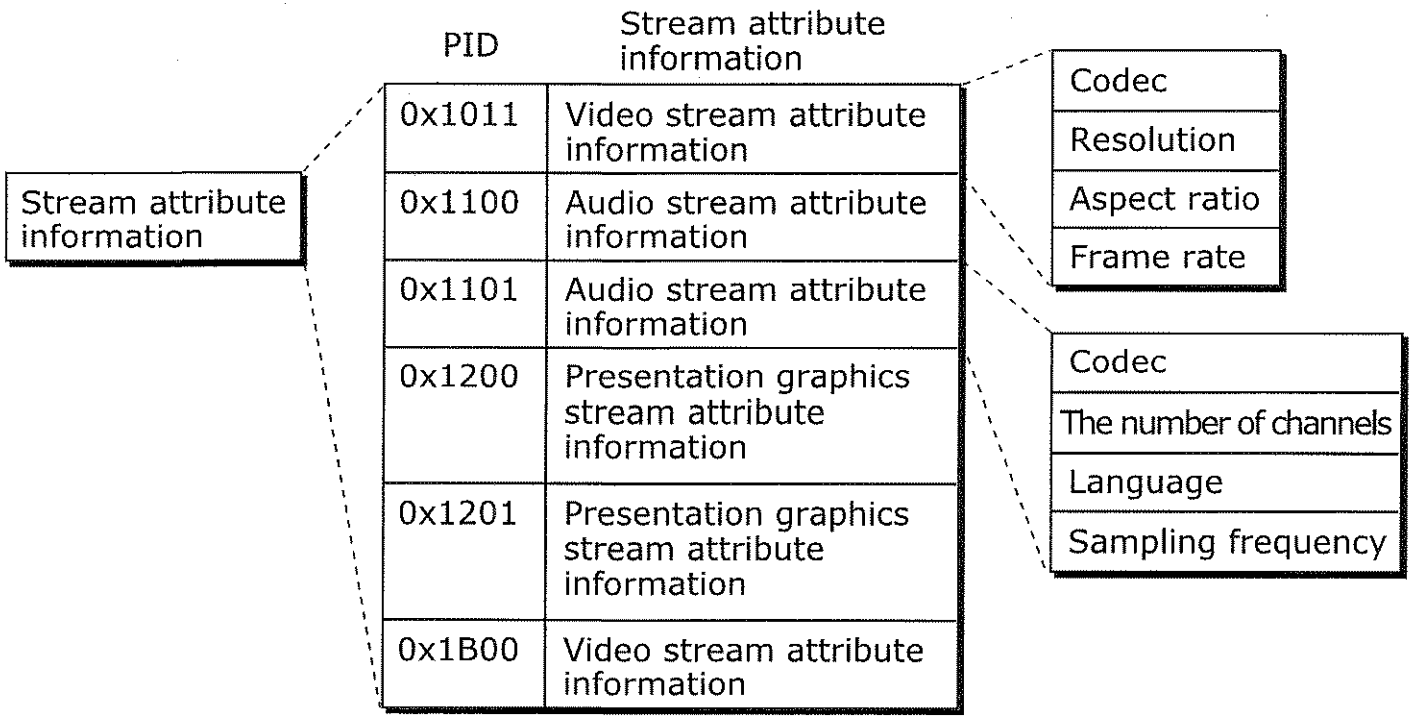

Stream attribute information
PID
Stream attribute information
0x1011
Video stream attribute information
0x1100
Audio stream attribute information
0x1101
Audio stream attribute information
0x1200
Presentation graphics stream attribute information
0x1201
Presentation graphics stream attribute information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

FIG. 28

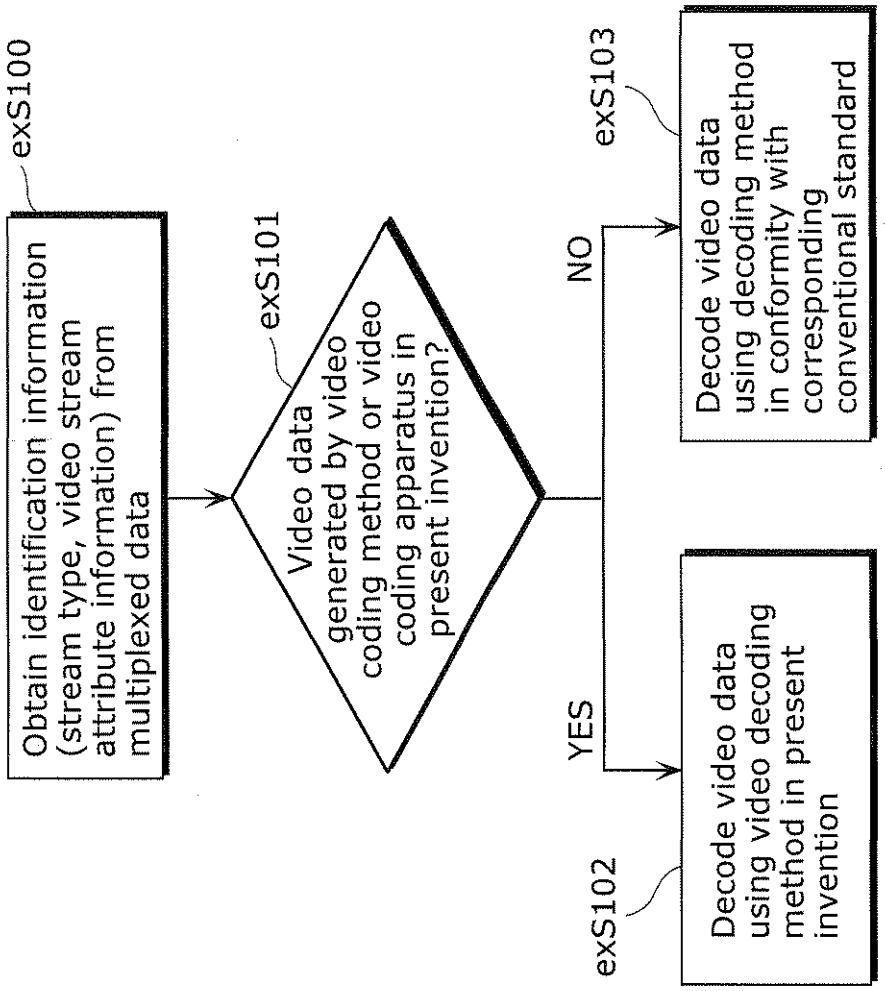

exS100
Obtain identification information (stream type, video stream attribute information) from multiplexed data
exS101
Video data generated by video coding method or video coding apparatus in present invention?
YES
NO
exS102
Decode video data using video decoding method in present invention
exS103
Decode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

FIG. 29

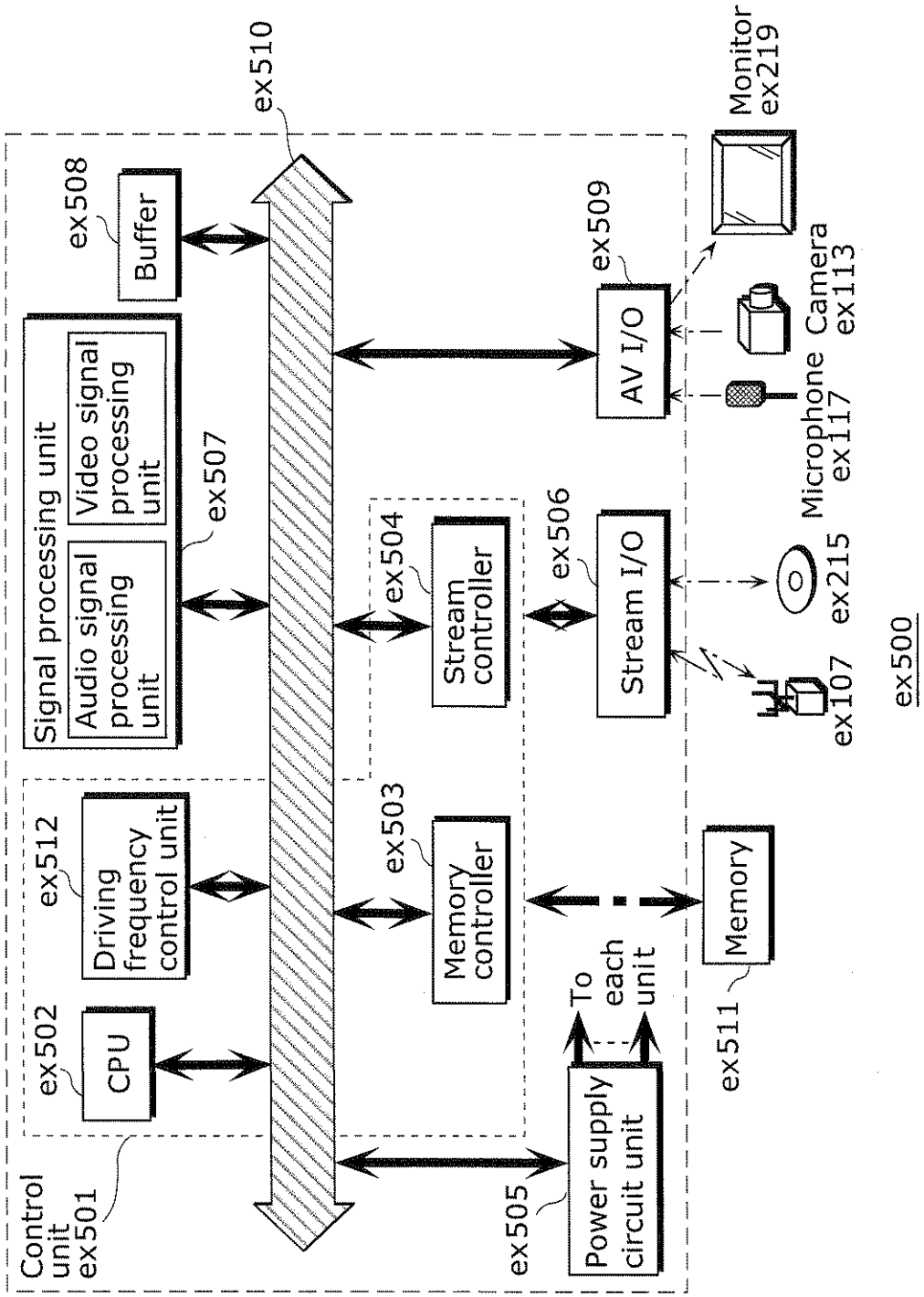

ex500
Control unit ex501
CPU ex502
Driving frequency control unit ex512
Signal processing unit
Audio signal processing unit
Video signal processing unit ex507
Buffer ex508
ex510
Memory controller ex503
Stream controller ex504
Power supply circuit unit ex505
Stream I/O ex506
AV I/O ex509
To each unit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

FIG. 30

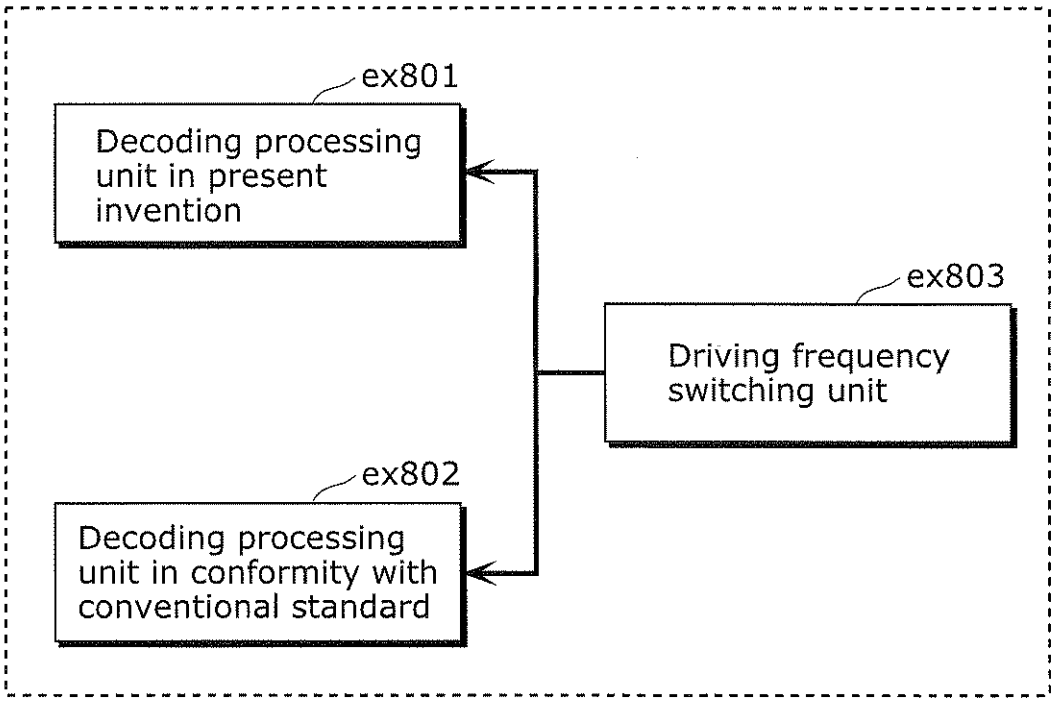

ex801
Decoding processing unit in present invention
ex803
Driving frequency switching unit
ex802
Decoding processing unit in conformity with conventional standard

FIG. 31

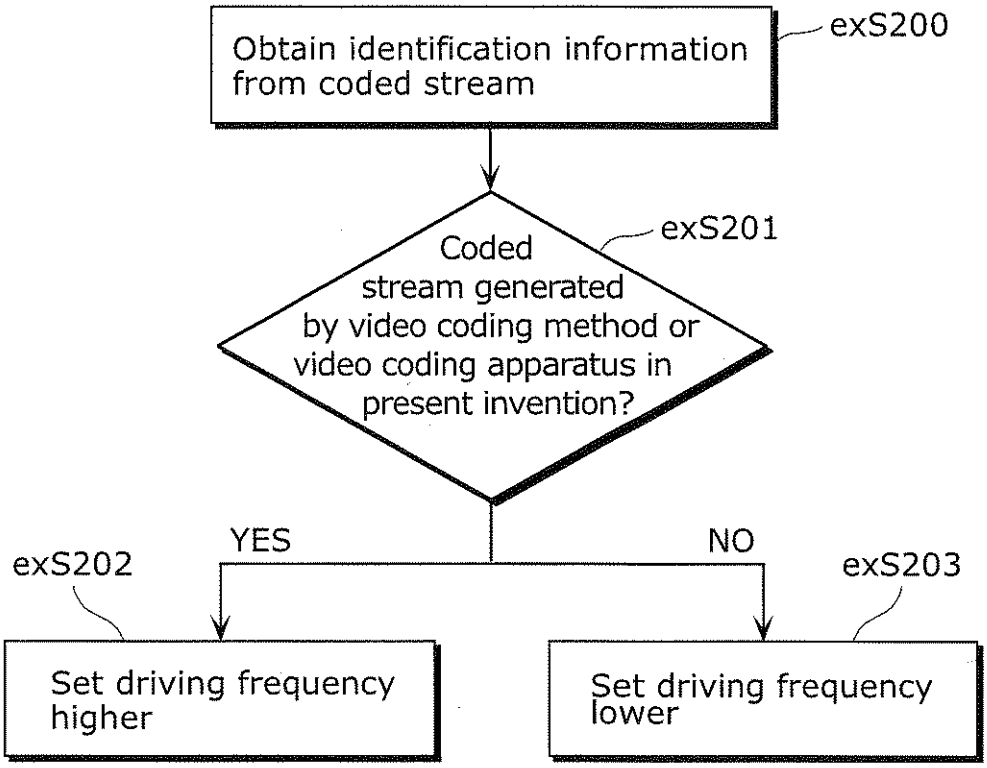


FIG. 32

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

FIG. 33A

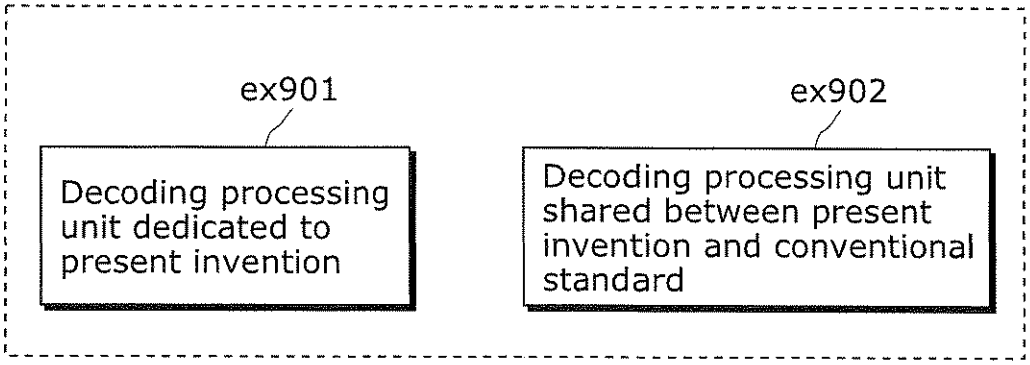


FIG. 33B

