
Input data
AI encoding unit
Storage/ Transmission unit
AI decoding unit
Reconstructed data

FIG. 1a

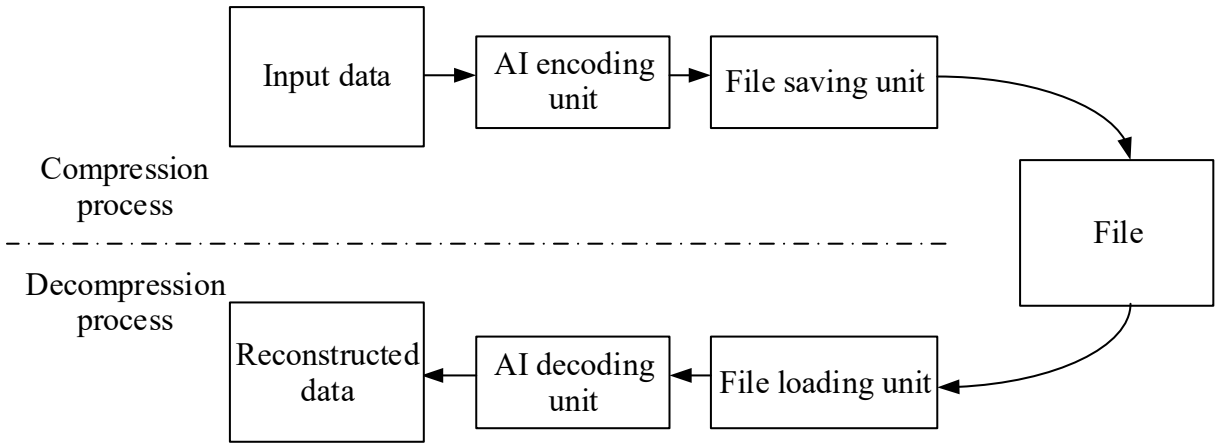

Input data
AI encoding unit
File saving unit
Compression process
File
Decompression process
Reconstructed data
AI decoding unit
File loading unit

FIG. 1b

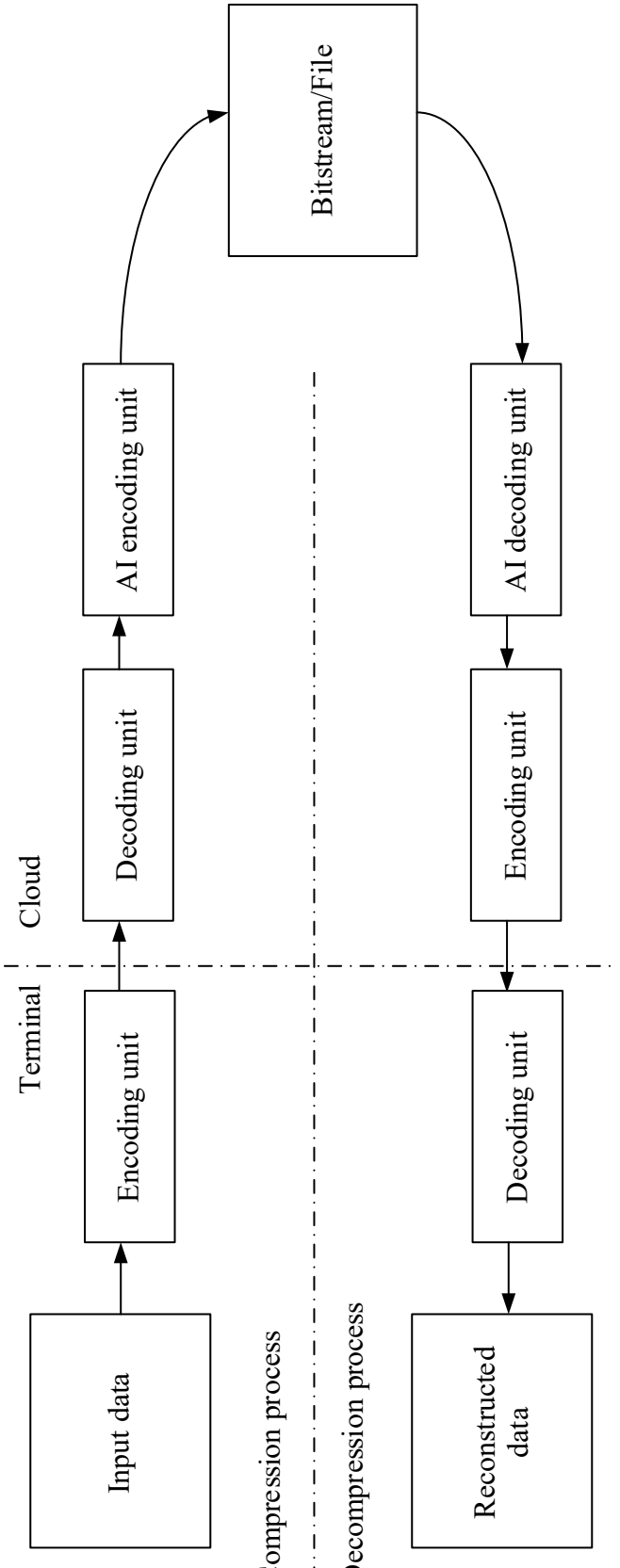

Bitstream/File
AI encoding unit
AI decoding unit
Decoding unit
Encoding unit
Cloud
Terminal
Encoding unit
Decoding unit
Input data
Reconstructed data
Compression process
Decompression process

FIG. 2a

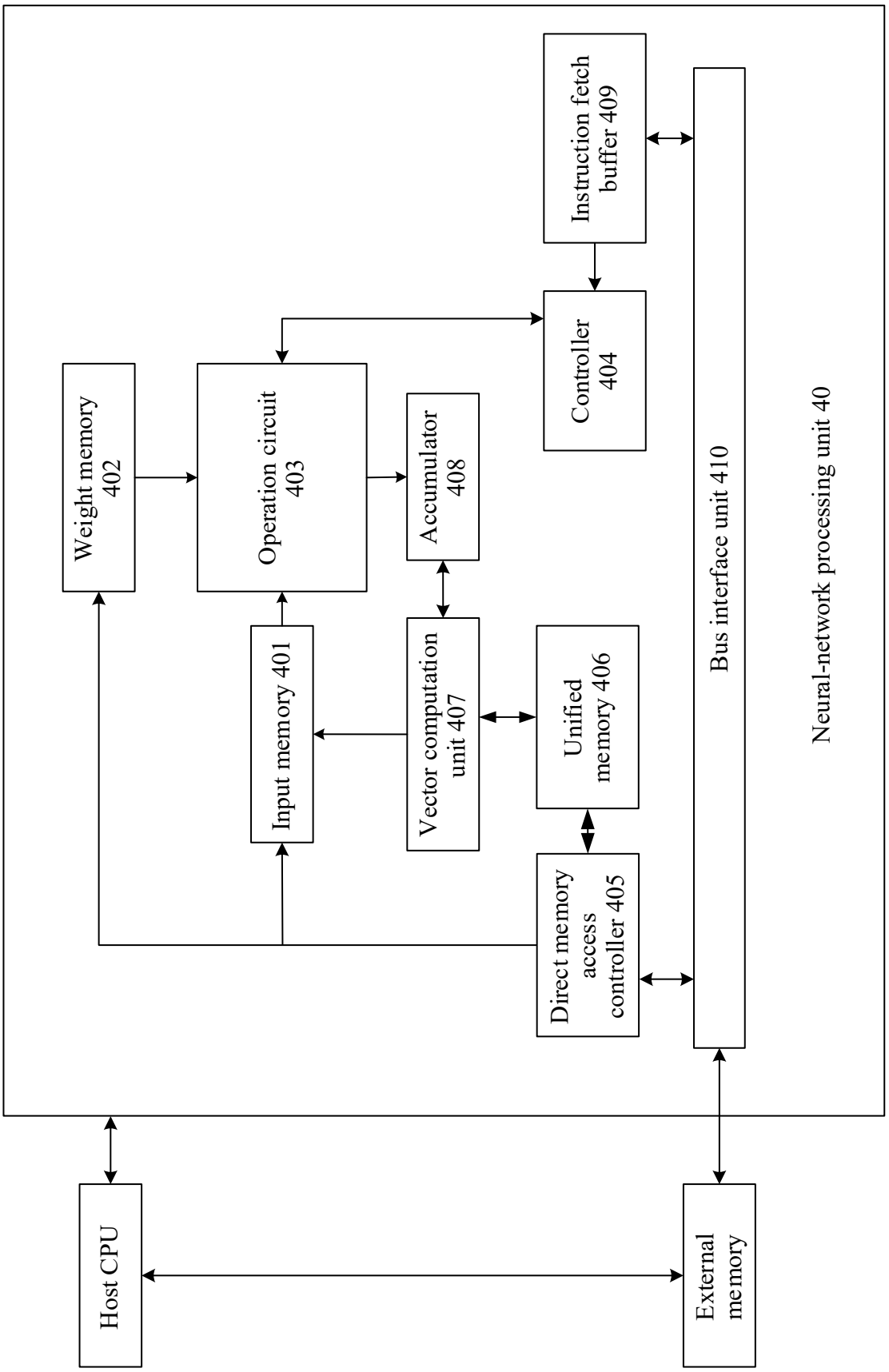

Host CPU
External memory
Neural-network processing unit 40
Bus interface unit 410
Instruction fetch buffer 409
Controller 404
Weight memory 402
Operation circuit 403
Accumulator 408
Input memory 401
Vector computation unit 407
Unified memory 406
Direct memory access controller 405

FIG. 2b

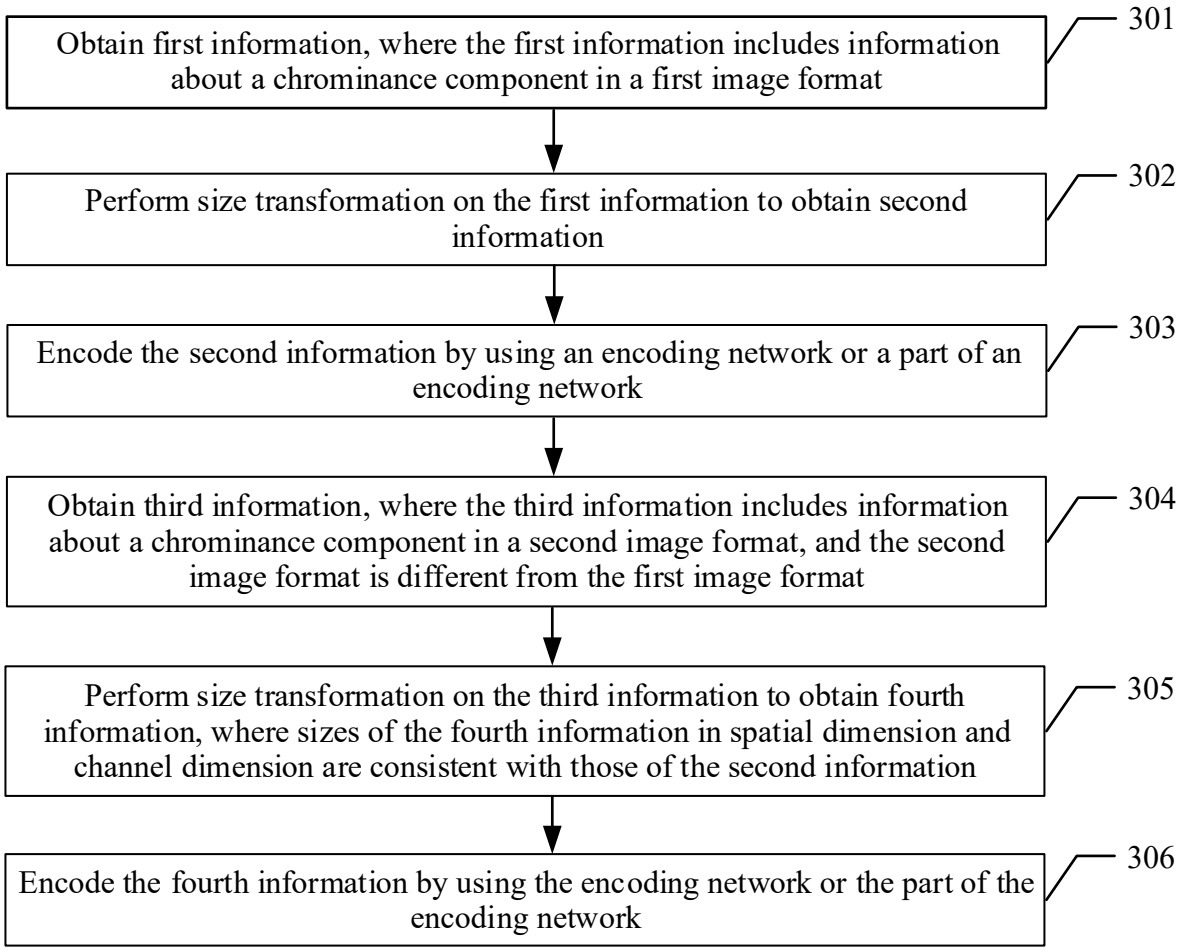

Obtain first information, where the first information includes information about a chrominance component in a first image format
301
Perform size transformation on the first information to obtain second information
302
Encode the second information by using an encoding network or a part of an encoding network
303
Obtain third information, where the third information includes information about a chrominance component in a second image format, and the second image format is different from the first image format
304
Perform size transformation on the third information to obtain fourth information, where sizes of the fourth information in spatial dimension and channel dimension are consistent with those of the second information
305
Encode the fourth information by using the encoding network or the part of the encoding network
306

FIG. 3

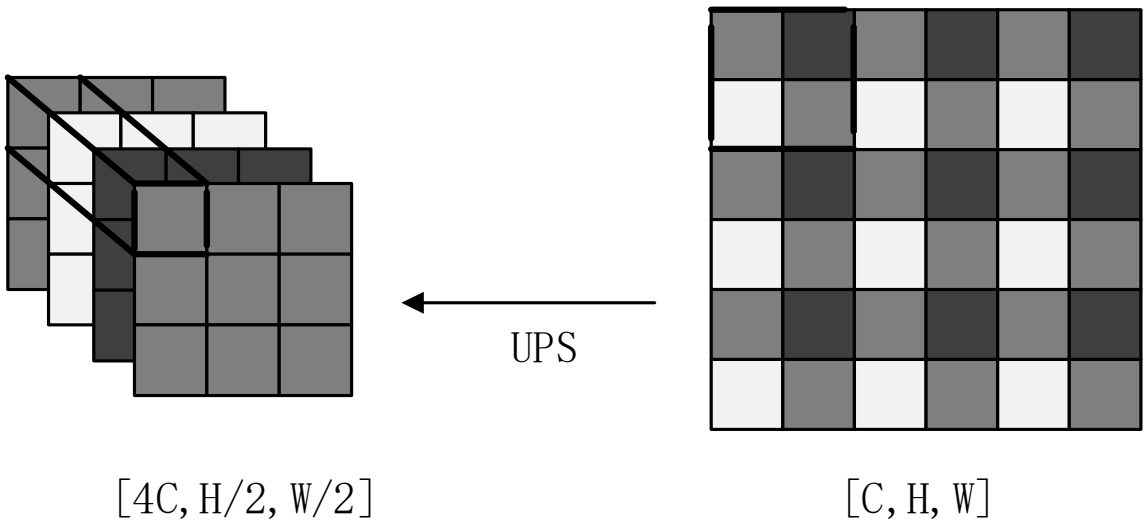

UPS
[4C, H/2, W/2]
[C, H, W]

FIG. 4

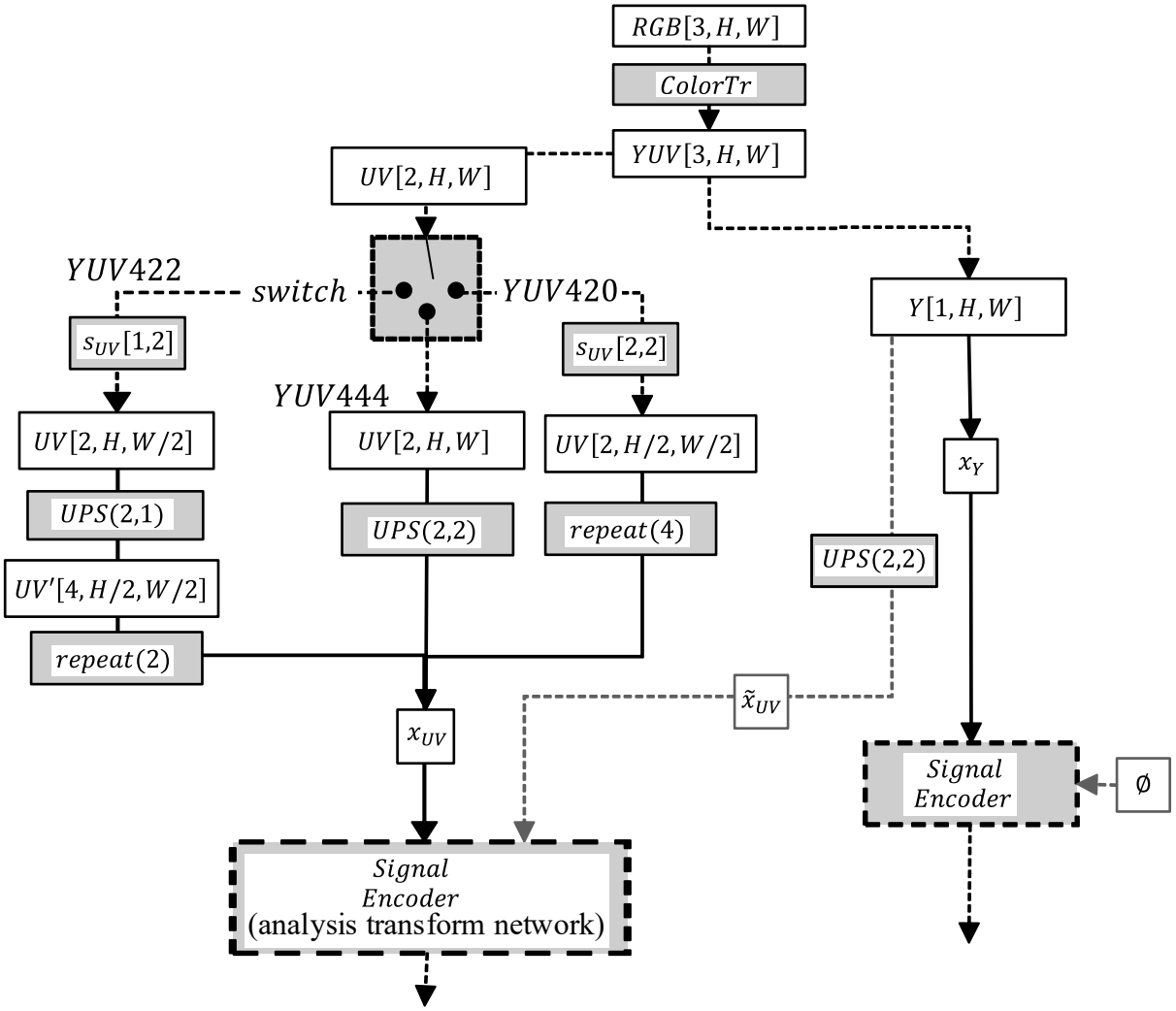

RGB[3,H,W]
ColorTr
YUV[3,H,W]
UV[2,H,W]
YUV422
switch
YUV420
Y[1,H,W]
s_UV[1,2]
s_UV[2,2]
YUV444
UV[2,H,W/2]
UV[2,H,W]
UV[2,H/2,W/2]
x_Y
UPS(2,1)
UPS(2,2)
repeat(4)
UPS(2,2)
UV'[4,H/2,W/2]
repeat(2)
x̃_UV
x_UV
Signal Encoder
∅
Signal Encoder (analysis transform network)

FIG. 5

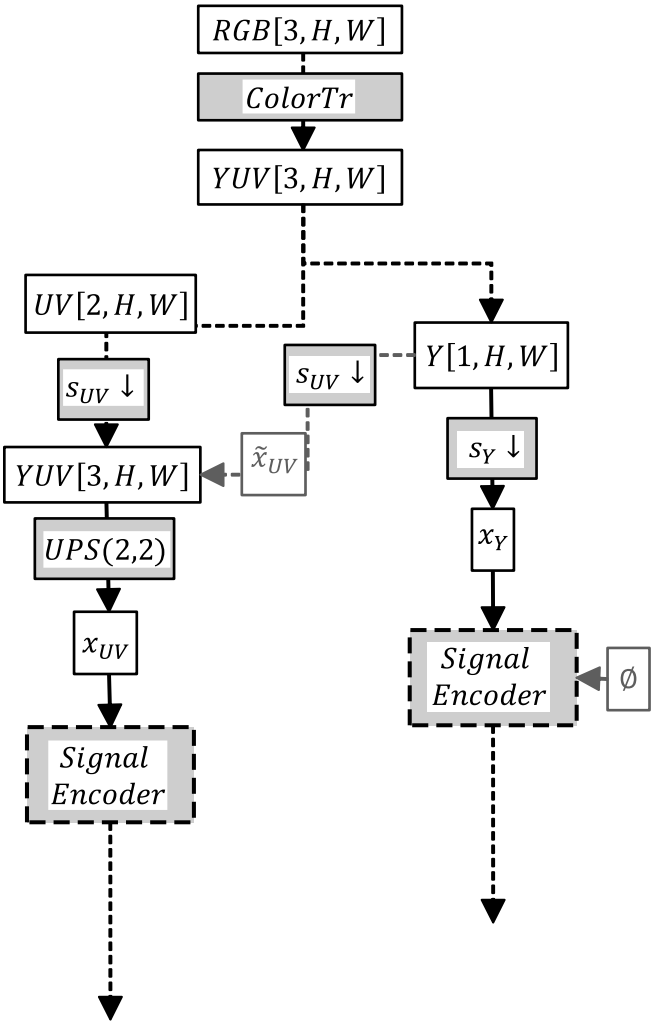

RGB[3,H,W]
ColorTr
YUV[3,H,W]
UV[2,H,W]
Y[1,H,W]
$s_{UV}\downarrow$
$s_{UV}\downarrow$
$s_Y\downarrow$
$\tilde{x}_{UV}$
YUV[3,H,W]
UPS(2,2)
x_Y
x_{UV}
Signal Encoder
Signal Encoder
∅

FIG. 6

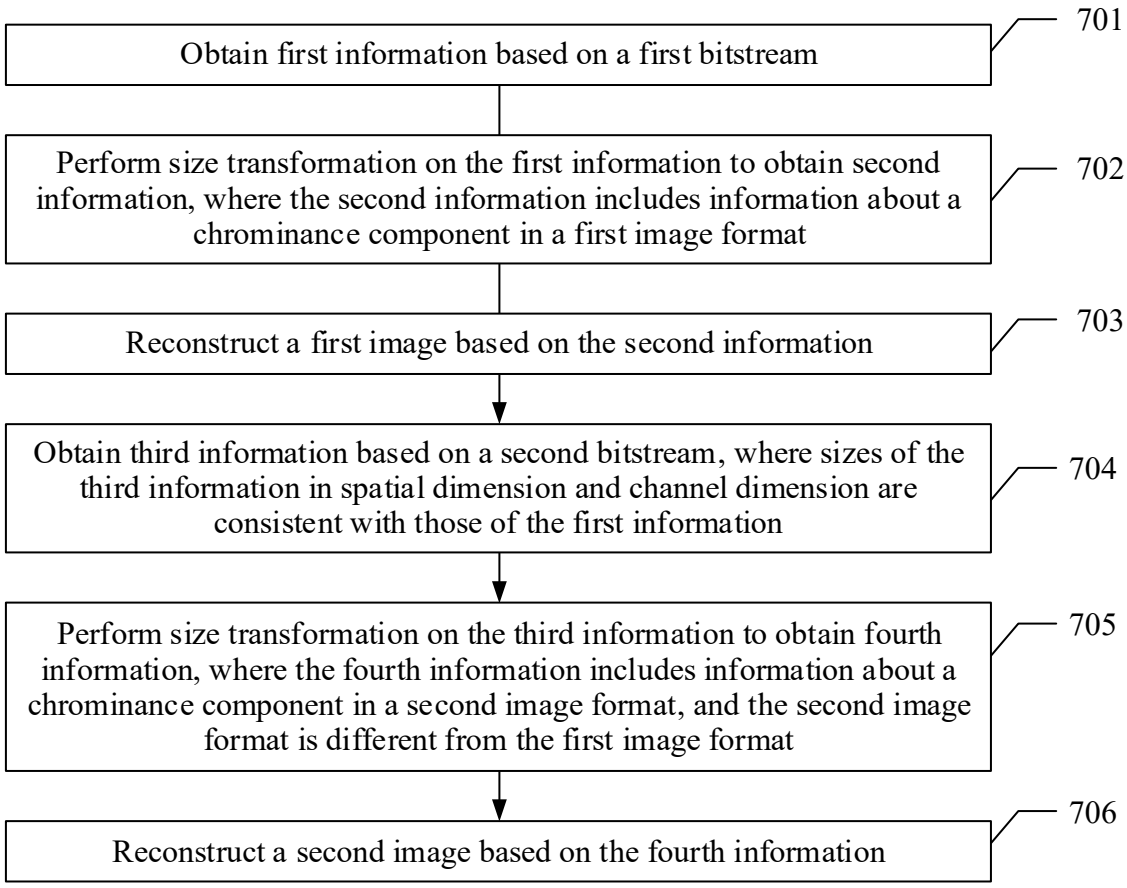

Obtain first information based on a first bitstream
701
Perform size transformation on the first information to obtain second information, where the second information includes information about a chrominance component in a first image format
702
Reconstruct a first image based on the second information
703
Obtain third information based on a second bitstream, where sizes of the third information in spatial dimension and channel dimension are consistent with those of the first information
704
Perform size transformation on the third information to obtain fourth information, where the fourth information includes information about a chrominance component in a second image format, and the second image format is different from the first image format
705
Reconstruct a second image based on the fourth information
706

FIG. 7

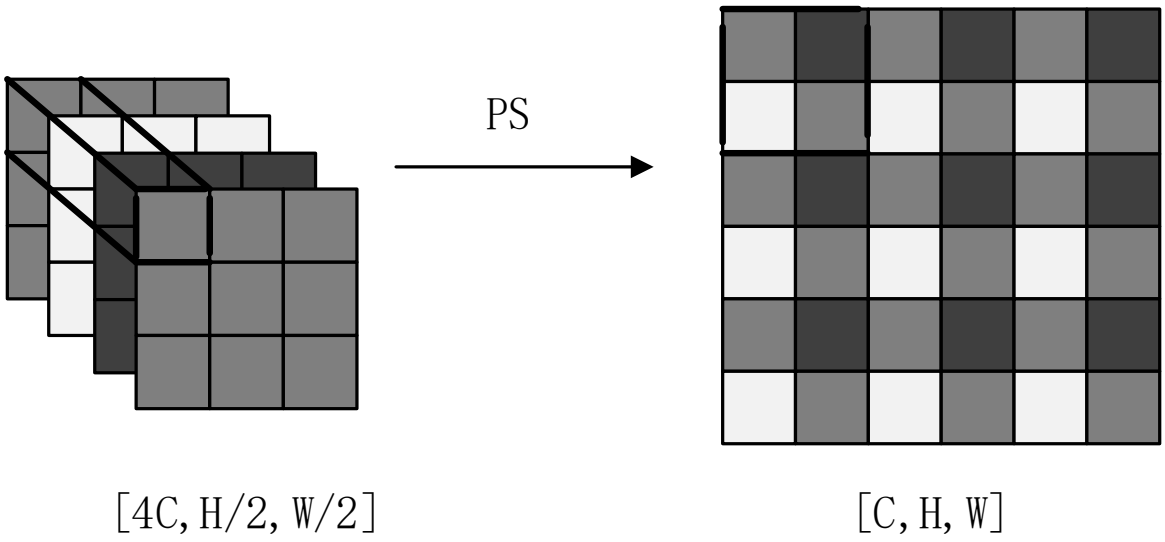

PS
[4C, H/2, W/2]
[C, H, W]

FIG. 8a

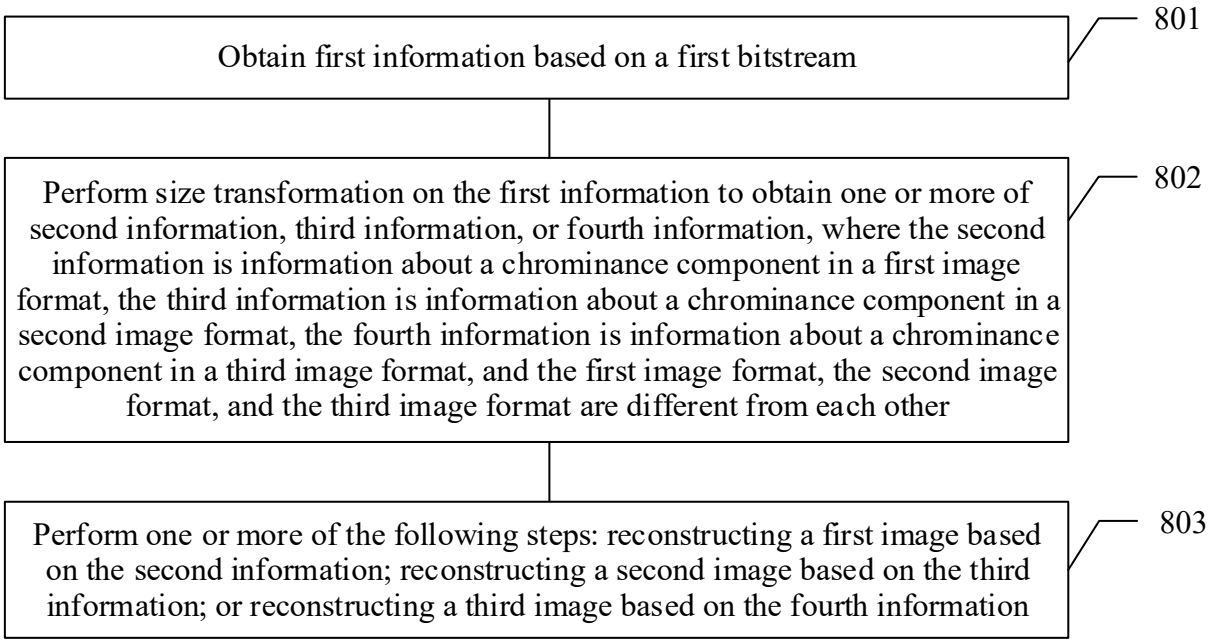

Obtain first information based on a first bitstream
801
Perform size transformation on the first information to obtain one or more of second information, third information, or fourth information, where the second information is information about a chrominance component in a first image format, the third information is information about a chrominance component in a second image format, the fourth information is information about a chrominance component in a third image format, and the first image format, the second image format, and the third image format are different from each other
802
Perform one or more of the following steps: reconstructing a first image based on the second information; reconstructing a second image based on the third information; or reconstructing a third image based on the fourth information
803

FIG. 8b

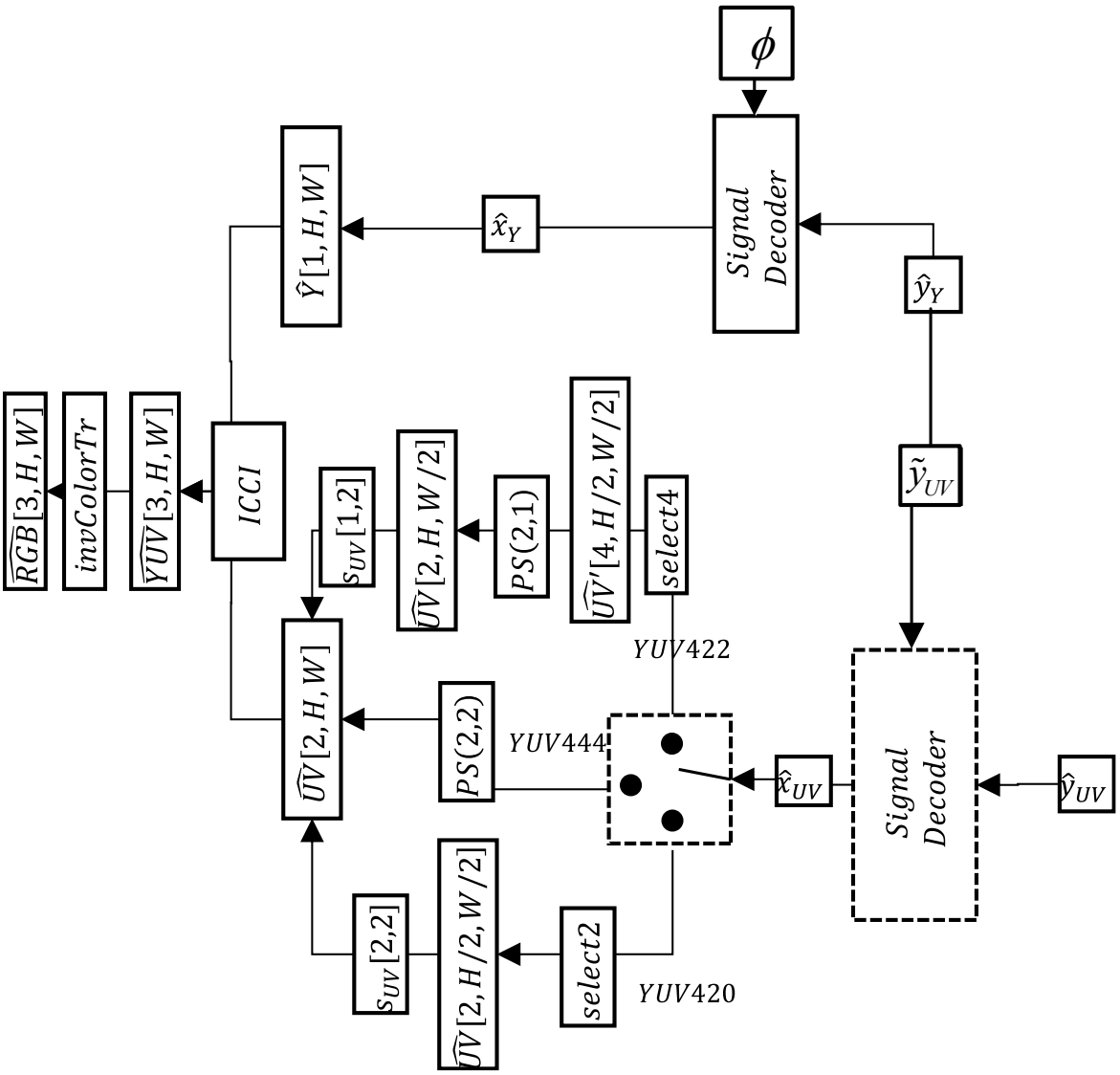

ϕ
Signal Decoder
$\hat{x}_Y$
$\hat{Y}[1,H,W]$
$\hat{y}_Y$
$\tilde{y}_{UV}$
$\widehat{RGB}[3,H,W]$
invColorTr
$\widehat{YUV}[3,H,W]$
ICCI
$s_{UV}[1,2]$
$\widehat{UV}[2,H,W/2]$
PS(2,1)
$\widehat{UV}'[4,H/2,W/2]$
select4
YUV422
$\widehat{UV}[2,H,W]$
PS(2,2)
YUV444
$\hat{x}_{UV}$
Signal Decoder
$\hat{y}_{UV}$
$s_{UV}[2,2]$
$\widehat{UV}[2,H/2,W/2]$
select2
YUV420

FIG. 9

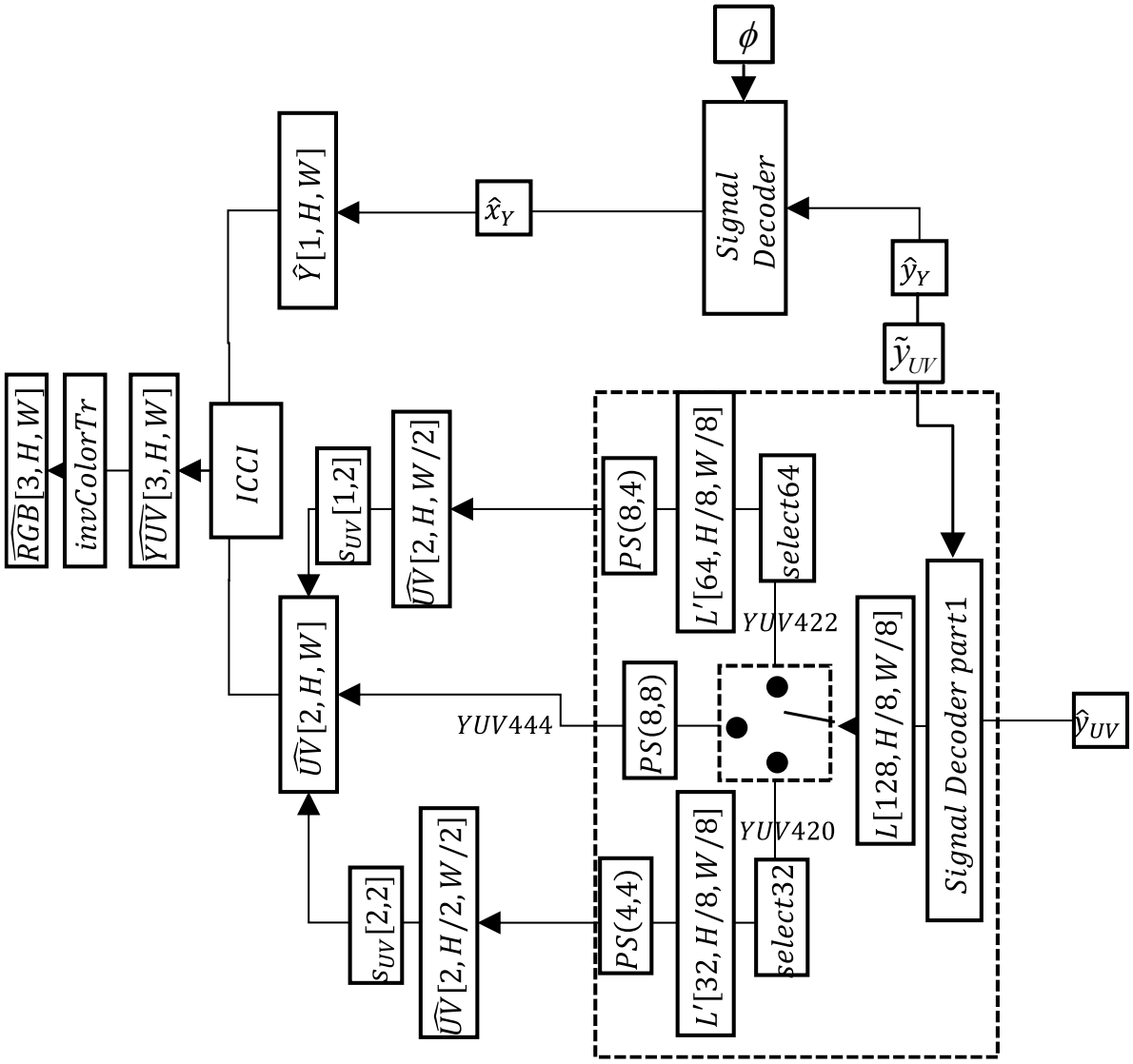

ϕ
Signal Decoder
$\hat{x}_Y$
$\hat{Y}[1,H,W]$
$\hat{y}_Y$
$\tilde{y}_{UV}$
$\widehat{RGB}[3,H,W]$
$invColorTr$
$\widehat{YUV}[3,H,W]$
ICCI
$s_{UV}[1,2]$
$\widehat{UV}[2,H,W/2]$
$PS(8,4)$
$L'[64,H/8,W/8]$
$select64$
$YUV422$
$\widehat{UV}[2,H,W]$
$YUV444$
$PS(8,8)$
$L[128,H/8,W/8]$
Signal Decoder part1
$\hat{y}_{UV}$
$YUV420$
$s_{UV}[2,2]$
$\widehat{UV}[2,H/2,W/2]$
$PS(4,4)$
$L'[32,H/8,W/8]$
$select32$

FIG. 10

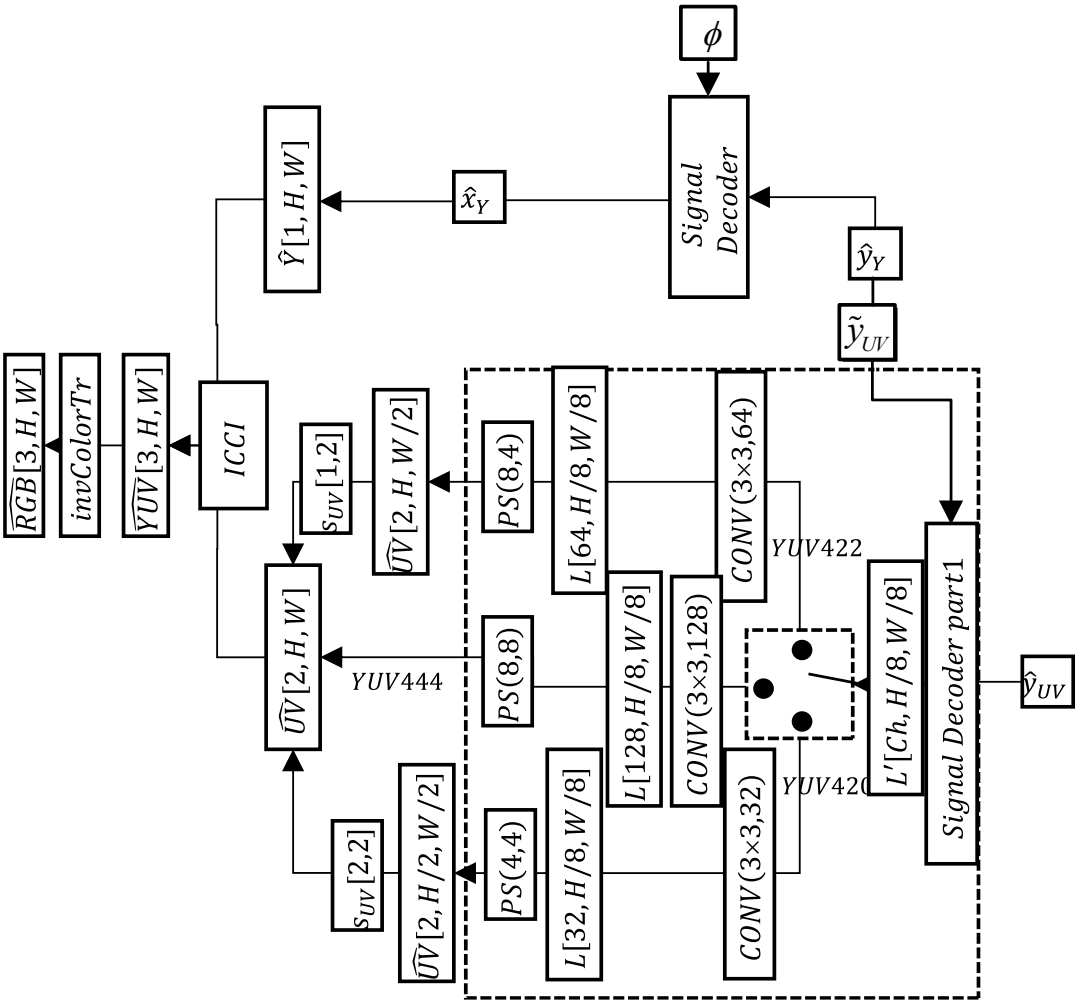

ϕ
Signal Decoder
$\hat{x}_Y$
$\hat{Y}[1,H,W]$
$\hat{y}_Y$
$\tilde{y}_{UV}$
$\widehat{RGB}[3,H,W]$
$invColorTr$
$\widehat{YUV}[3,H,W]$
$ICCI$
$s_{UV}[1,2]$
$\widehat{UV}[2,H,W/2]$
$PS(8,4)$
$L[64,H/8,W/8]$
$CONV(3\times3,64)$
$YUV422$
$\widehat{UV}[2,H,W]$
$YUV444$
$PS(8,8)$
$L[128,H/8,W/8]$
$CONV(3\times3,128)$
$L'[Ch,H/8,W/8]$
Signal Decoder part1
$\hat{y}_{UV}$
$YUV420$
$s_{UV}[2,2]$
$\widehat{UV}[2,H/2,W/2]$
$PS(4,4)$
$L[32,H/8,W/8]$
$CONV(3\times3,32)$

FIG. 11

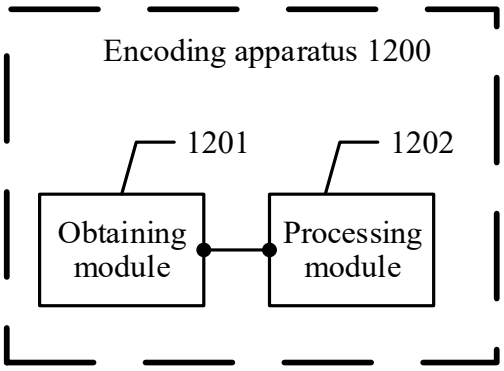

Encoding apparatus 1200
1201
1202
Obtaining module
Processing module

FIG. 12

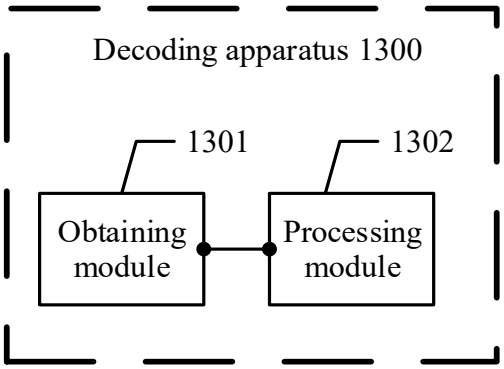

Decoding apparatus 1300
1301
1302
Obtaining module
Processing module

FIG. 13

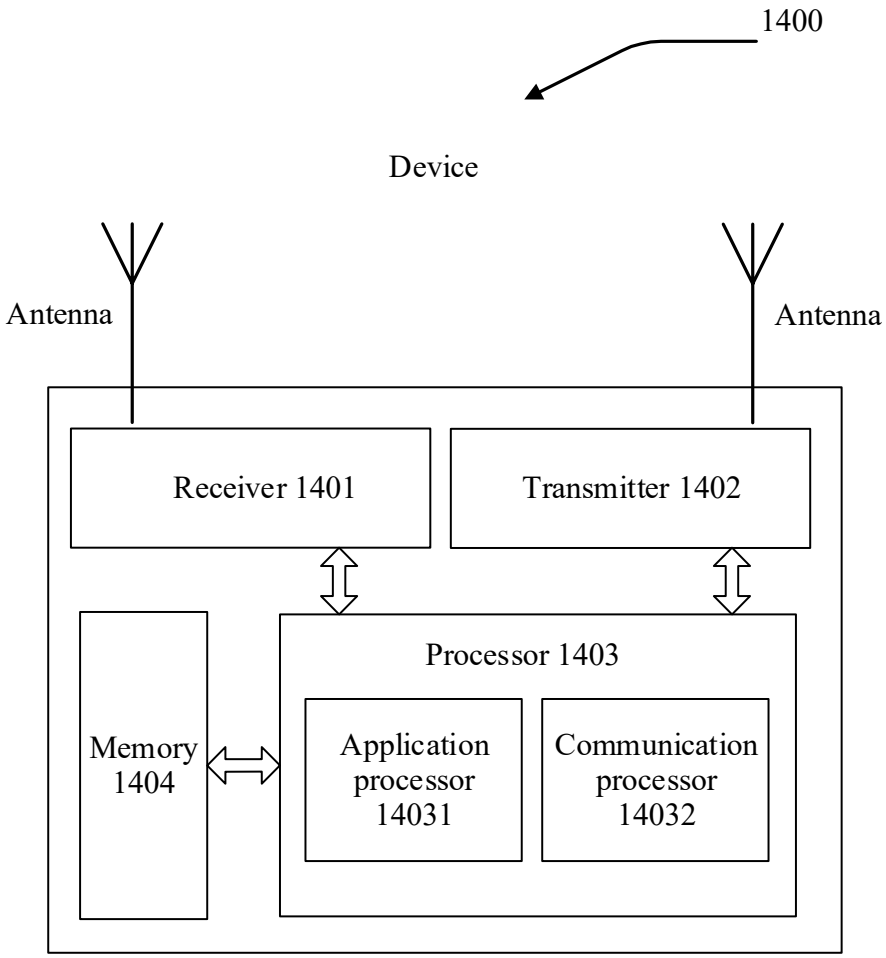

1400
Device
Antenna
Antenna
Receiver 1401
Transmitter 1402
Processor 1403
Memory 1404
Application processor 14031
Communication processor 14032

FIG. 14

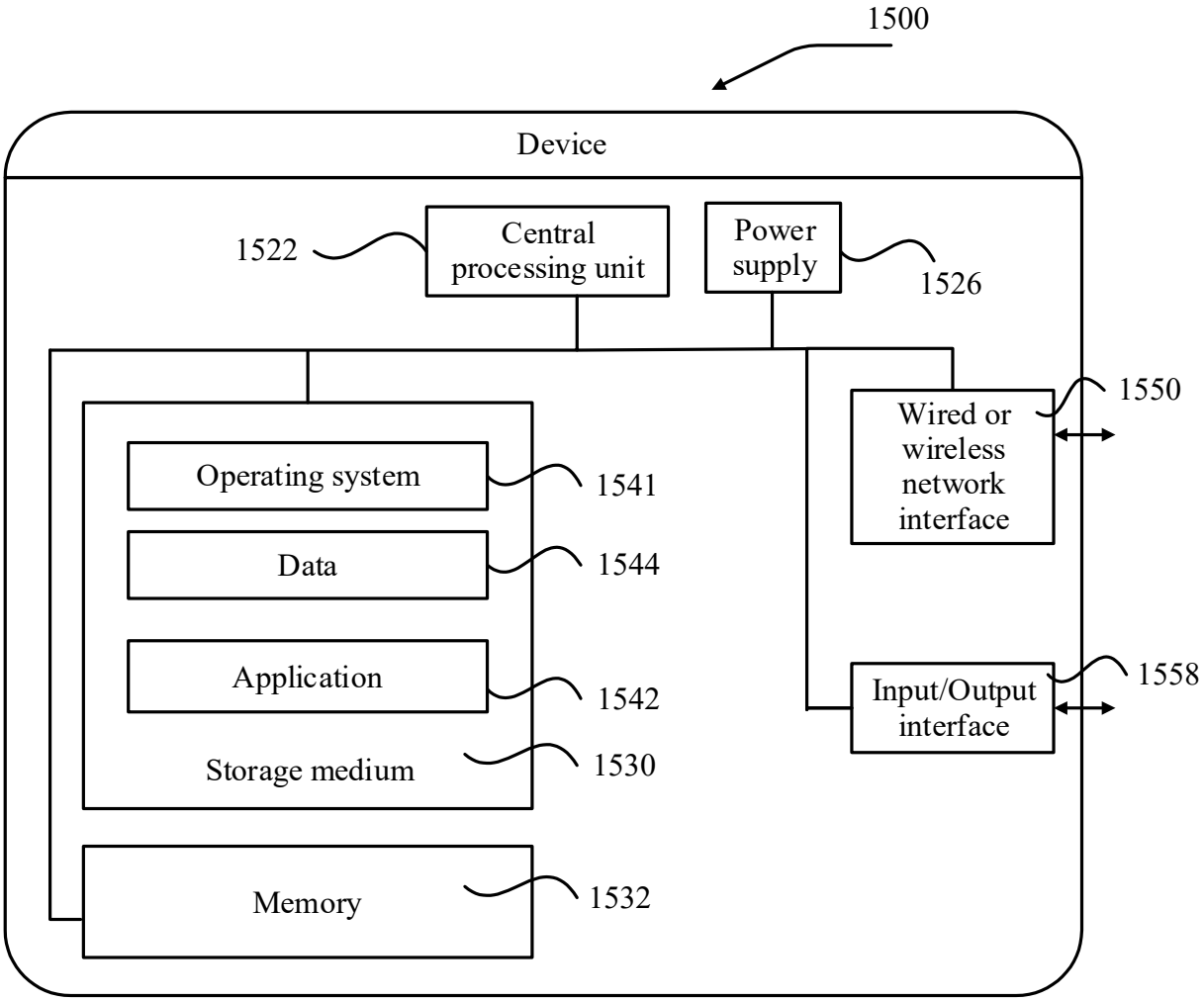

1500
Device
1522
Central processing unit
Power supply
1526
Operating system
1541
Data
1544
Application
1542
Storage medium
1530
Memory
1532
Wired or wireless network interface
1550
Input/Output interface
1558

FIG. 15