FIG. 1A

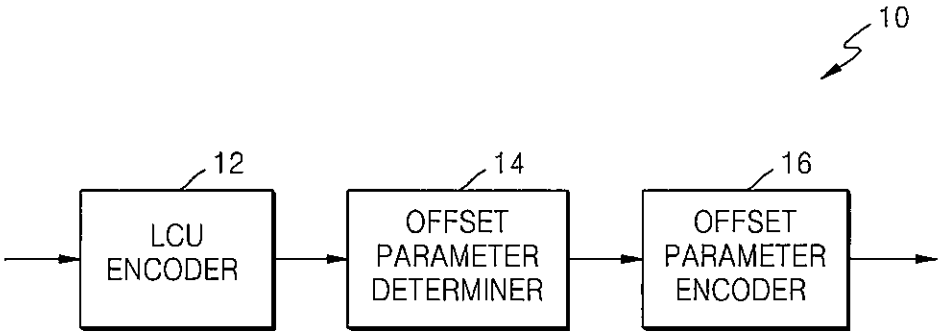

10
12
LCU ENCODER
14
OFFSET PARAMETER DETERMINER
16
OFFSET PARAMETER ENCODER

FIG. 1B

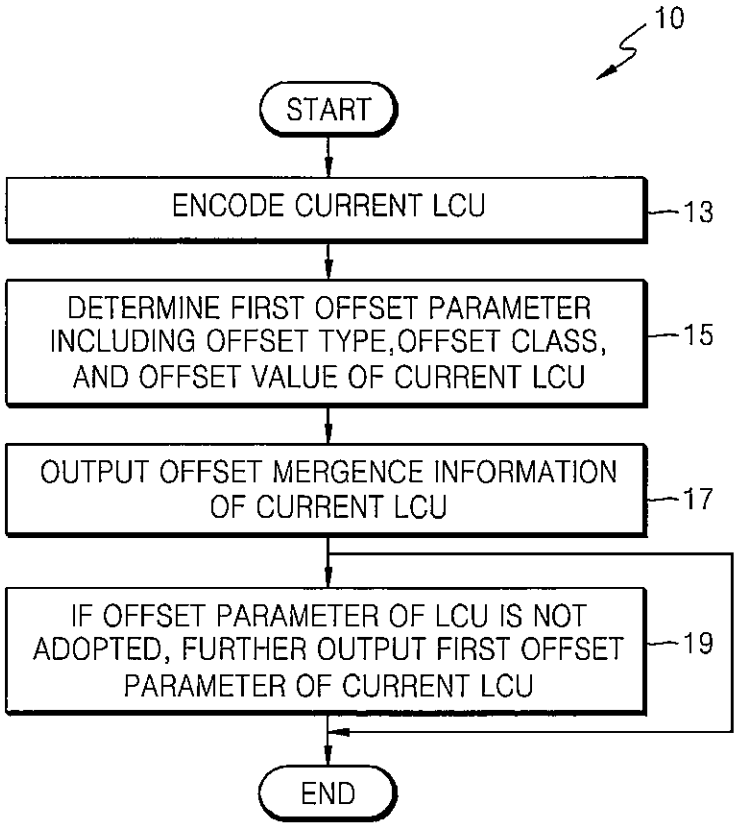

10
START
ENCODE CURRENT LCU
13
DETERMINE FIRST OFFSET PARAMETER INCLUDING OFFSET TYPE,OFFSET CLASS, AND OFFSET VALUE OF CURRENT LCU
15
OUTPUT OFFSET MERGENCE INFORMATION OF CURRENT LCU
17
IF OFFSET PARAMETER OF LCU IS NOT ADOPTED, FURTHER OUTPUT FIRST OFFSET PARAMETER OF CURRENT LCU
19
END

FIG. 2A

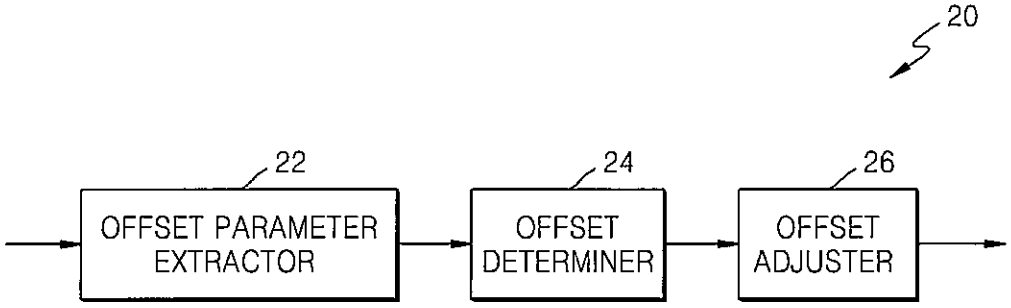

20
22
OFFSET PARAMETER EXTRACTOR
24
OFFSET DETERMINER
26
OFFSET ADJUSTER

FIG. 2B

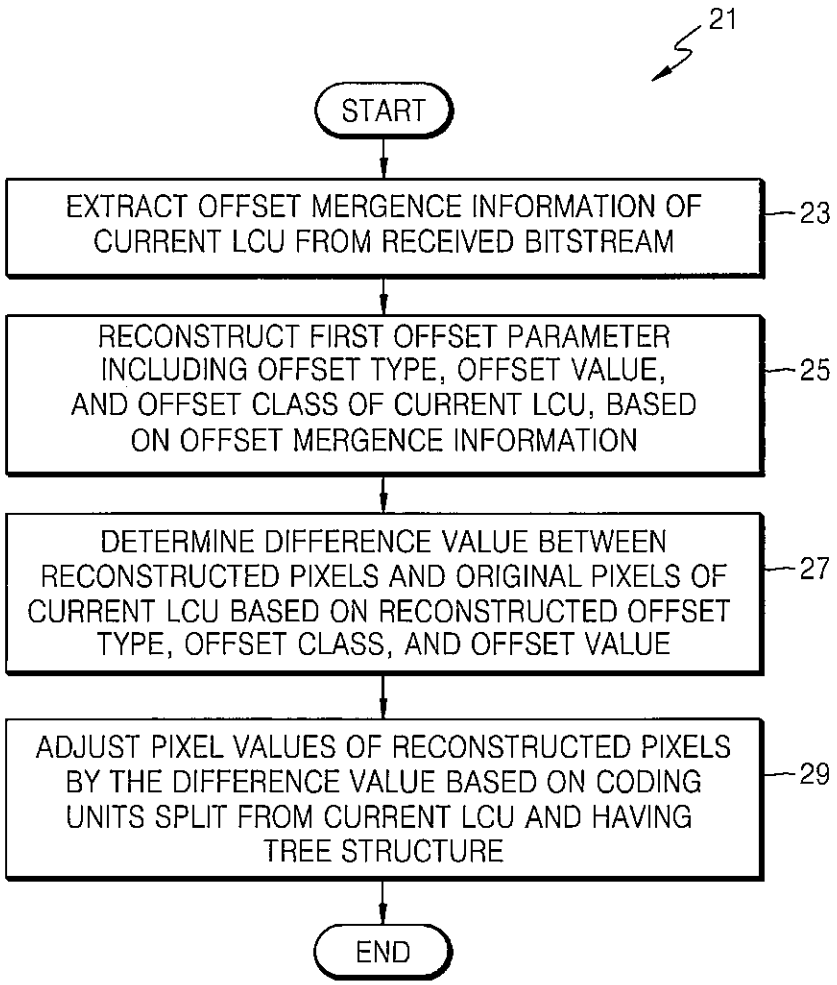

21
START
EXTRACT OFFSET MERGENCE INFORMATION OF CURRENT LCU FROM RECEIVED BITSTREAM
23
RECONSTRUCT FIRST OFFSET PARAMETER INCLUDING OFFSET TYPE, OFFSET VALUE, AND OFFSET CLASS OF CURRENT LCU, BASED ON OFFSET MERGENCE INFORMATION
25
DETERMINE DIFFERENCE VALUE BETWEEN RECONSTRUCTED PIXELS AND ORIGINAL PIXELS OF CURRENT LCU BASED ON RECONSTRUCTED OFFSET TYPE, OFFSET CLASS, AND OFFSET VALUE
27
ADJUST PIXEL VALUES OF RECONSTRUCTED PIXELS BY THE DIFFERENCE VALUE BASED ON CODING UNITS SPLIT FROM CURRENT LCU AND HAVING TREE STRUCTURE
29
END

FIG. 3

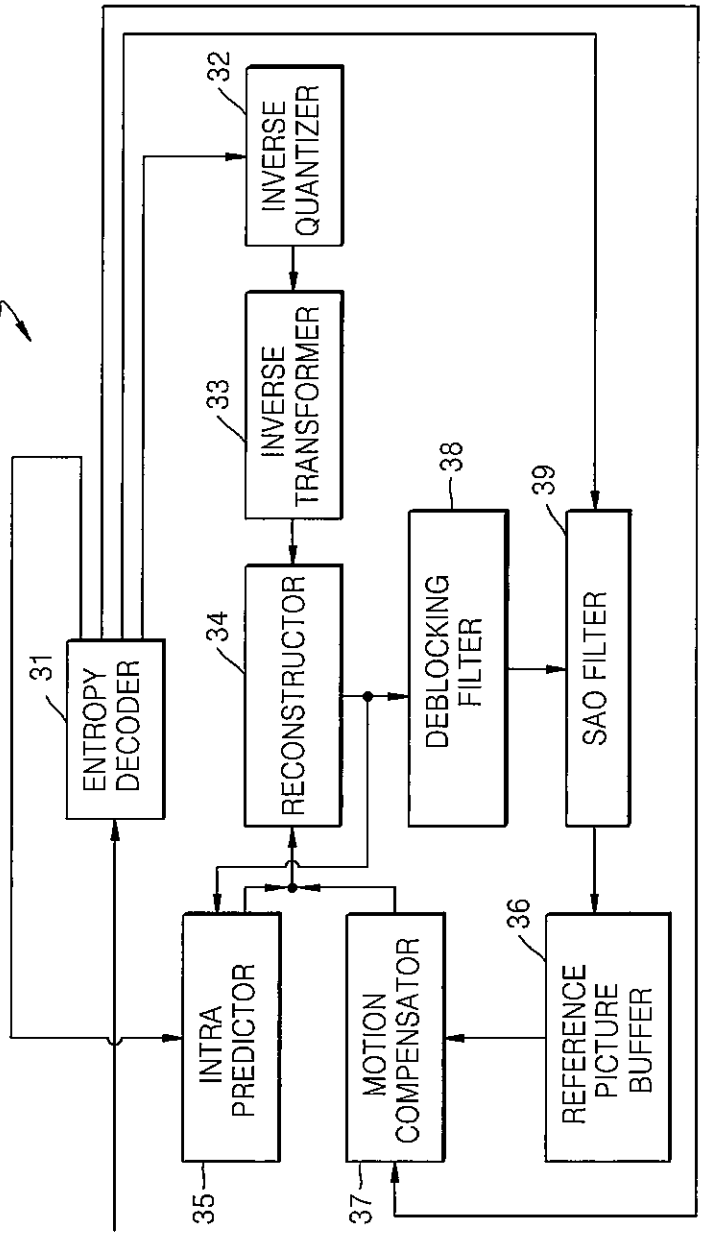

30
31
ENTROPY DECODER
32
INVERSE QUANTIZER
33
INVERSE TRANSFORMER
34
RECONSTRUCTOR
35
INTRA PREDICTOR
36
REFERENCE PICTURE BUFFER
37
MOTION COMPENSATOR
38
DEBLOCKING FILTER
39
SAO FILTER

FIG. 4

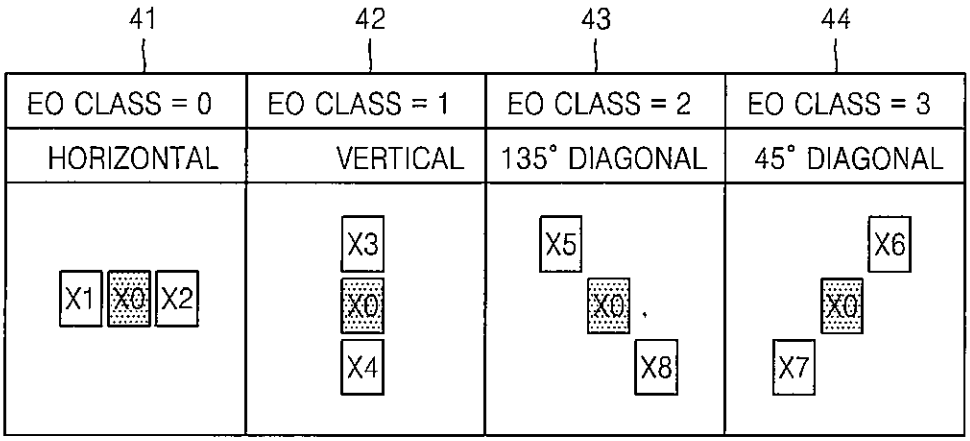
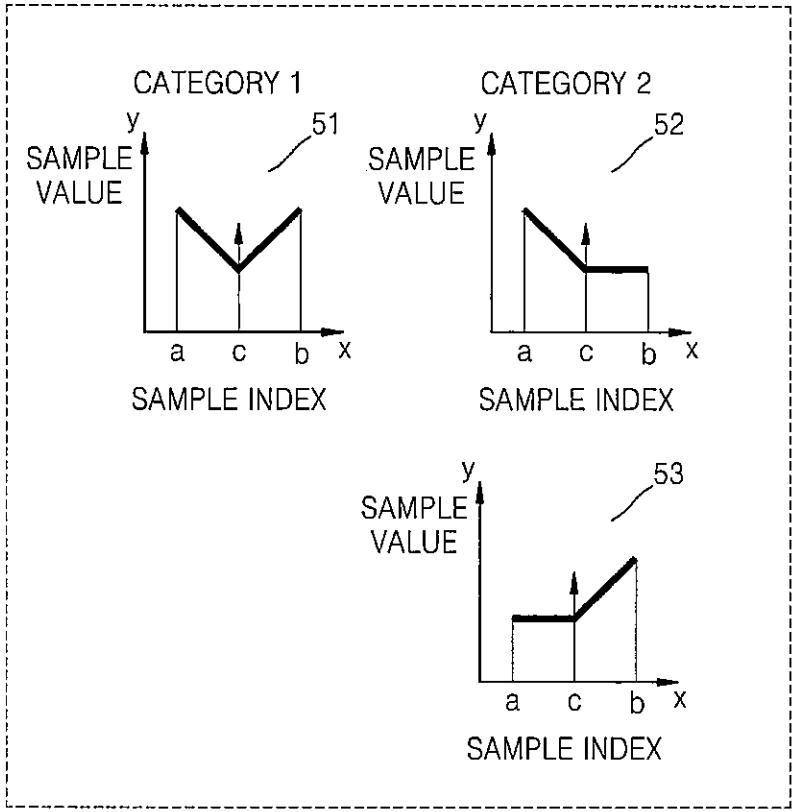


FIG. 5A

CATEGORY	CONDITION
1	Xc < Xa && Xc < Xb
2	(Xc < Xa && Xc == Xb)||(Xc == Xa && Xc < Xb)
3	(Xc > Xa && Xc == Xb)||(Xc == Xa && Xc > Xb)
4	Xc > Xa && Xc > Xb
0	IF CONDITIONS FOR CATEGORIES 1, 2, 3, AND 4 ARE NOT SATISFIED

FIG. 5B


CATEGORY 1
y
SAMPLE VALUE
51
a c b x
SAMPLE INDEX
CATEGORY 2
y
SAMPLE VALUE
52
a c b x
SAMPLE INDEX
y
SAMPLE VALUE
53
a c b x
SAMPLE INDEX

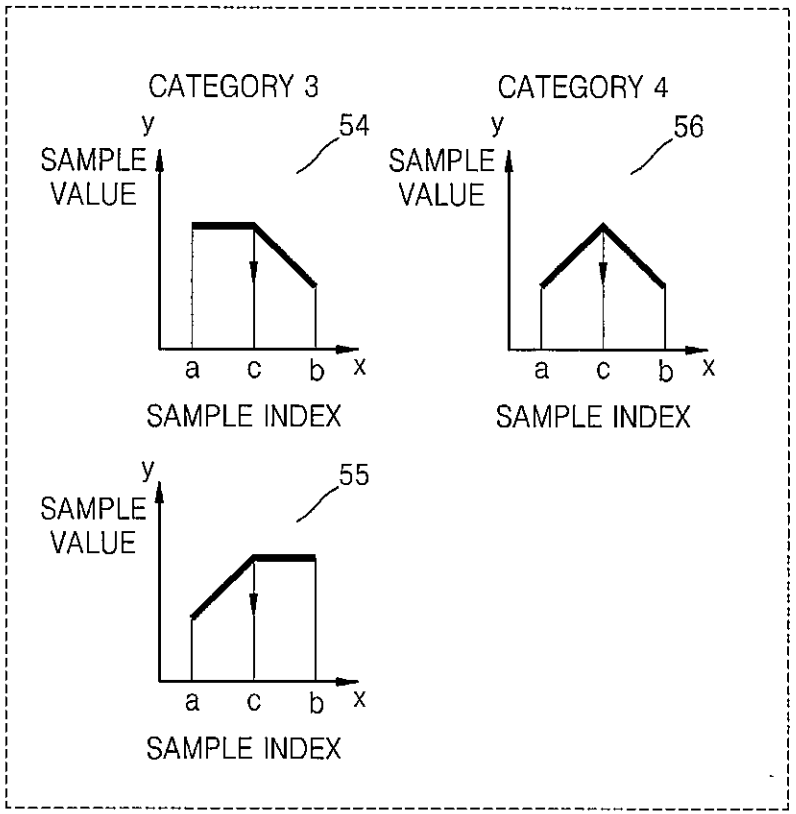

CATEGORY 3
y
SAMPLE VALUE
54
a c b x
SAMPLE INDEX
CATEGORY 4
y
SAMPLE VALUE
56
a c b x
SAMPLE INDEX
y
SAMPLE VALUE
55
a c b x
SAMPLE INDEX

FIG. 6

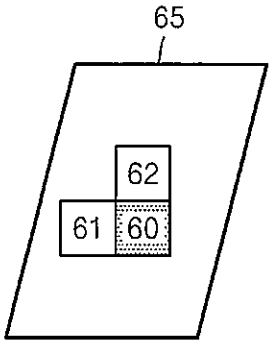


FIG. 7

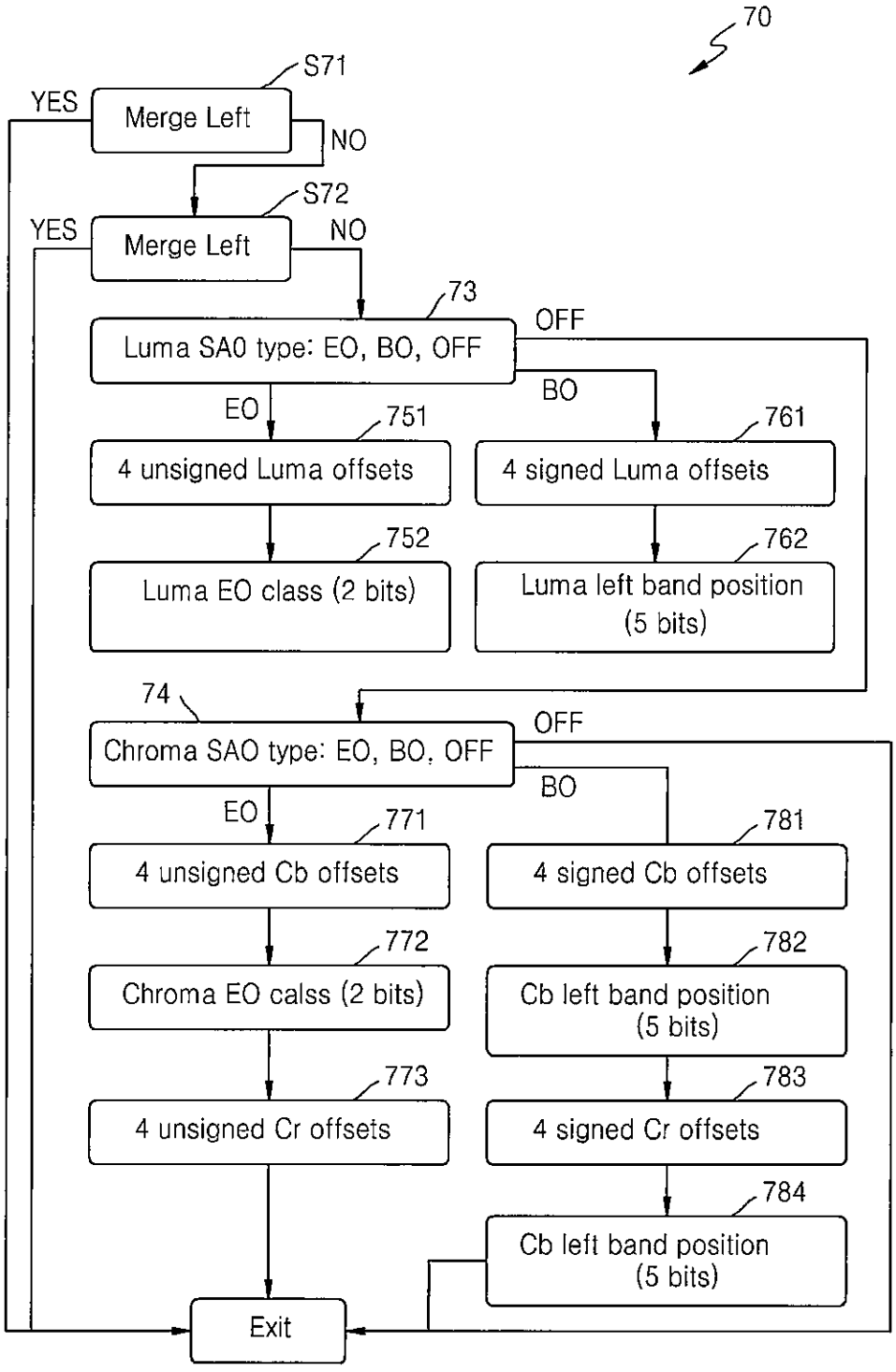

70
S71
YES
Merge Left
NO
S72
YES
Merge Left
NO
73
Luma SA0 type: EO, BO, OFF
OFF
EO
BO
751
4 unsigned Luma offsets
761
4 signed Luma offsets
752
Luma EO class (2 bits)
762
Luma left band position (5 bits)
74
Chroma SAO type: EO, BO, OFF
OFF
EO
BO
771
4 unsigned Cb offsets
781
4 signed Cb offsets
772
Chroma EO calss (2 bits)
782
Cb left band position (5 bits)
773
4 unsigned Cr offsets
783
4 signed Cr offsets
784
Cb left band position (5 bits)
Exit

FIG. 8

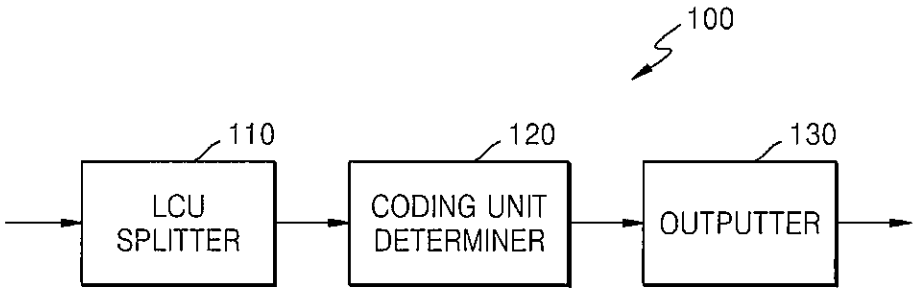

100
110
LCU SPLITTER
120
CODING UNIT DETERMINER
130
OUTPUTTER

FIG. 9

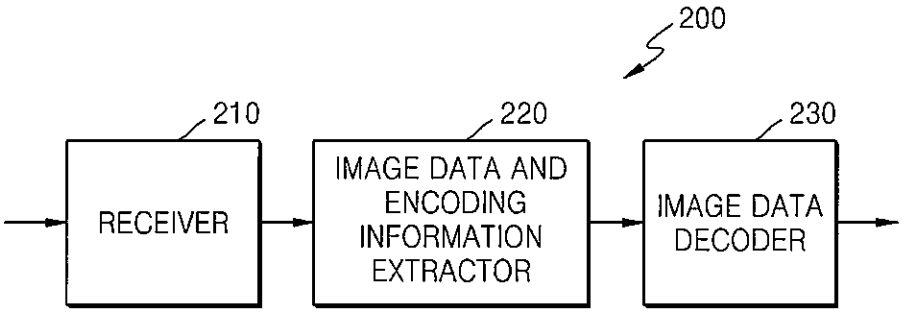

200
210
RECEIVER
220
IMAGE DATA AND ENCODING INFORMATION EXTRACTOR
230
IMAGE DATA DECODER

FIG. 10

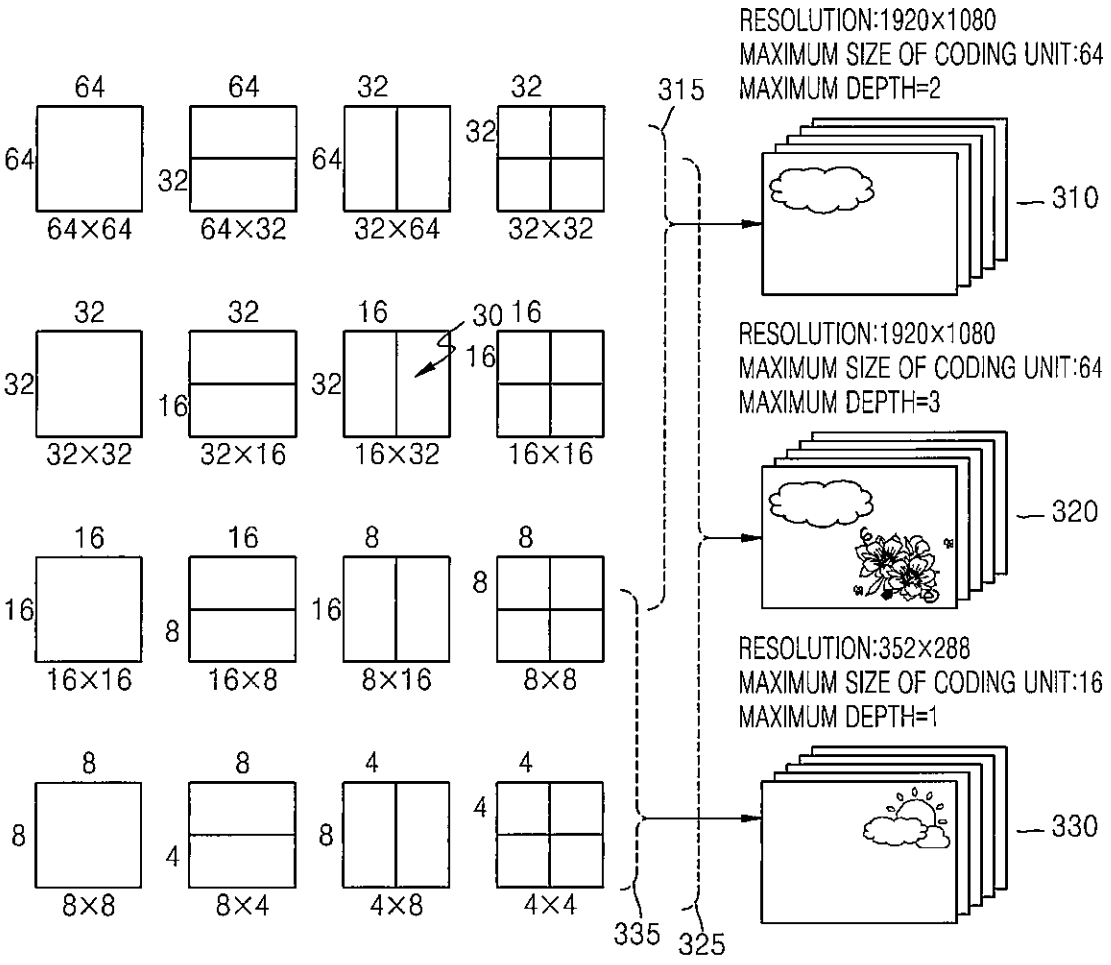

RESOLUTION:1920×1080
MAXIMUM SIZE OF CODING UNIT:64
MAXIMUM DEPTH=2
315
64
64
64×64
64
32
64×32
32
64
32×64
32
32
32×32
310
RESOLUTION:1920×1080
MAXIMUM SIZE OF CODING UNIT:64
MAXIMUM DEPTH=3
32
32
32×32
32
16
32×16
16
32
16×32
30
16
16
16×16
320
RESOLUTION:352×288
MAXIMUM SIZE OF CODING UNIT:16
MAXIMUM DEPTH=1
16
16
16×16
16
8
16×8
8
16
8×16
8
8
8×8
330
8
8
8×8
8
4
8×4
4
8
4×8
4
4
4×4
335
325

FIG. 11

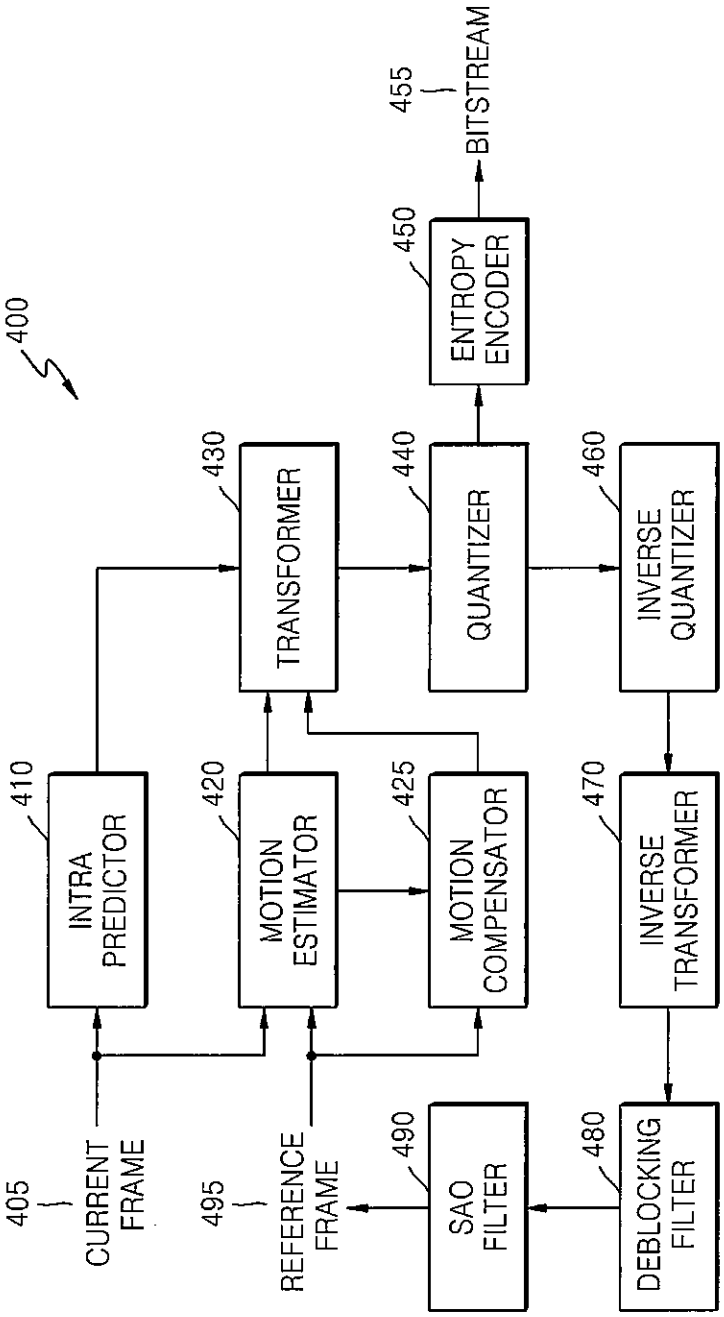

400
405
CURRENT FRAME
410
INTRA PREDICTOR
420
MOTION ESTIMATOR
425
MOTION COMPENSATOR
430
TRANSFORMER
440
QUANTIZER
450
ENTROPY ENCODER
455
BITSTREAM
460
INVERSE QUANTIZER
470
INVERSE TRANSFORMER
480
DEBLOCKING FILTER
490
SAO FILTER
495
REFERENCE FRAME

FIG. 12

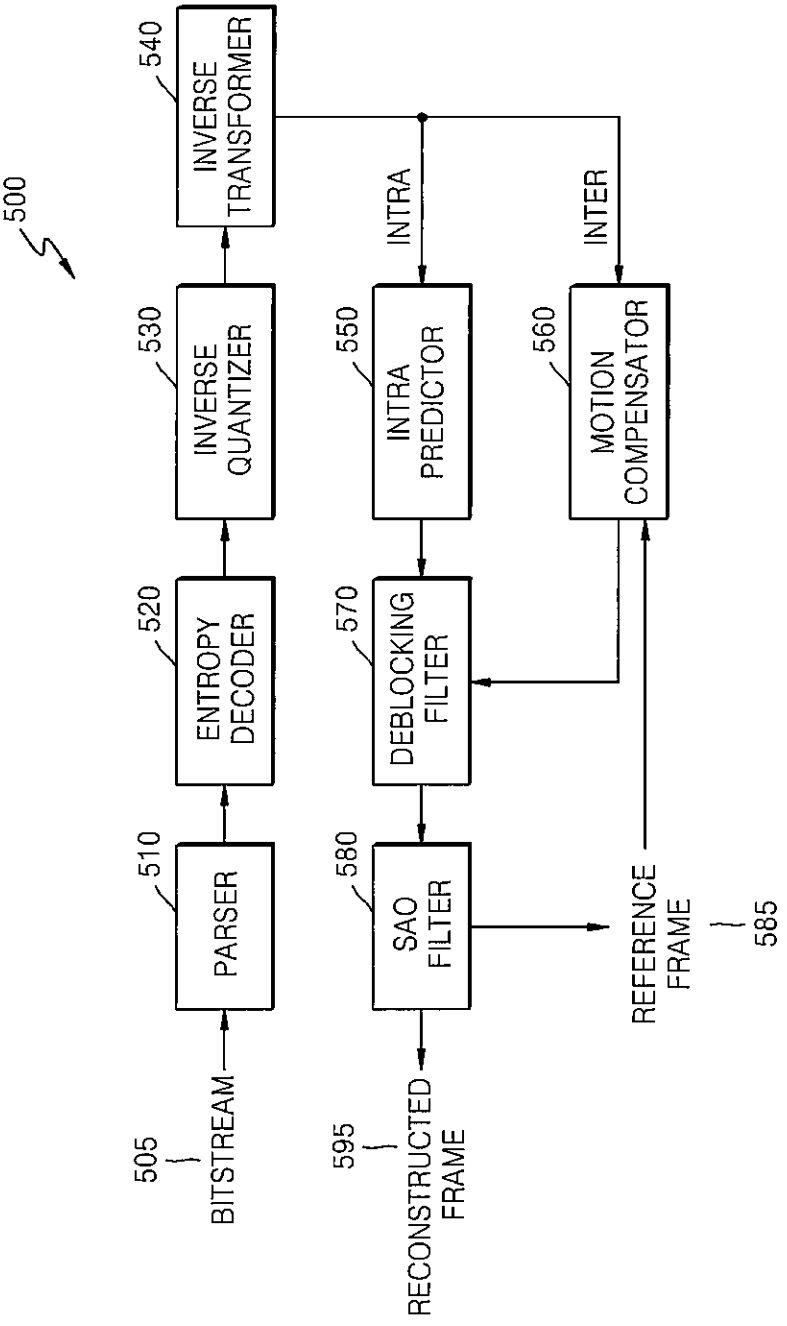

500
505
BITSTREAM
510
PARSER
520
ENTROPY DECODER
530
INVERSE QUANTIZER
540
INVERSE TRANSFORMER
INTRA
550
INTRA PREDICTOR
570
DEBLOCKING FILTER
580
SAO FILTER
595
RECONSTRUCTED FRAME
INTER
560
MOTION COMPENSATOR
REFERENCE FRAME
585

FIG. 13

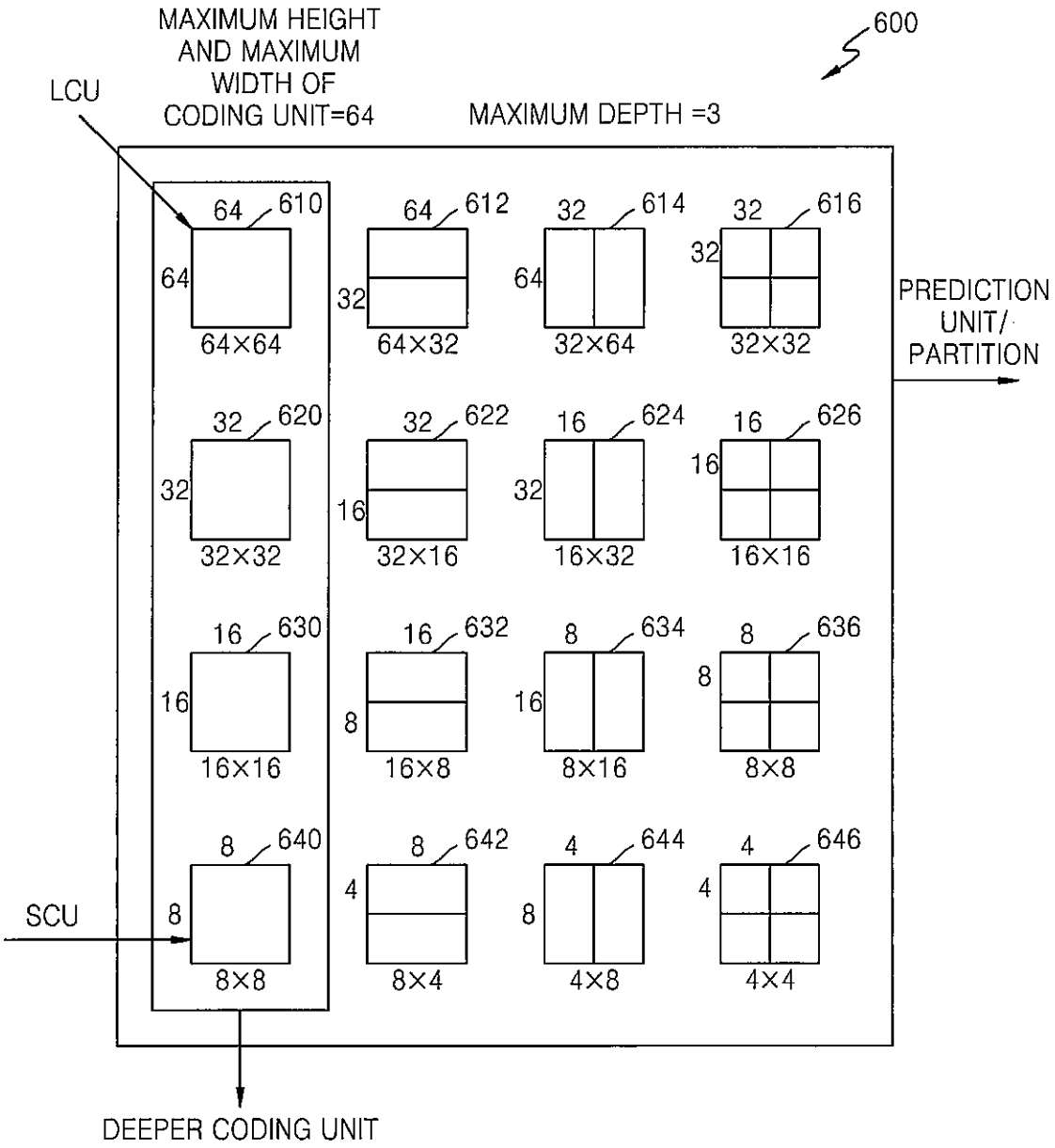

600
MAXIMUM HEIGHT AND MAXIMUM WIDTH OF CODING UNIT=64
MAXIMUM DEPTH =3
LCU
SCU
PREDICTION UNIT/ PARTITION
DEEPER CODING UNIT
64 610
64×64
64 612
64×32
32 614
32×64
32 616
32×32
32 620
32×32
32 622
32×16
16 624
16×32
16 626
16×16
16 630
16×16
16 632
16×8
8 634
8×16
8 636
8×8
8 640
8×8
8 642
8×4
4 644
4×8
4 646
4×4

FIG. 14

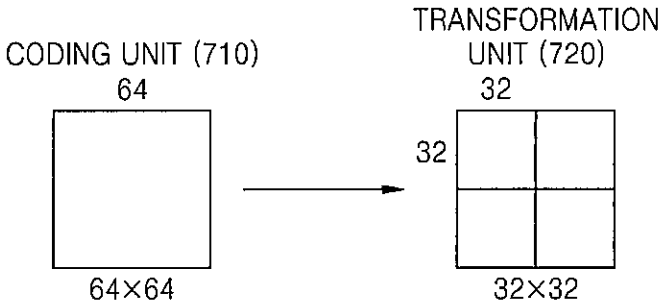

CODING UNIT (710)
64
64×64
TRANSFORMATION UNIT (720)
32
32
32×32

FIG. 15

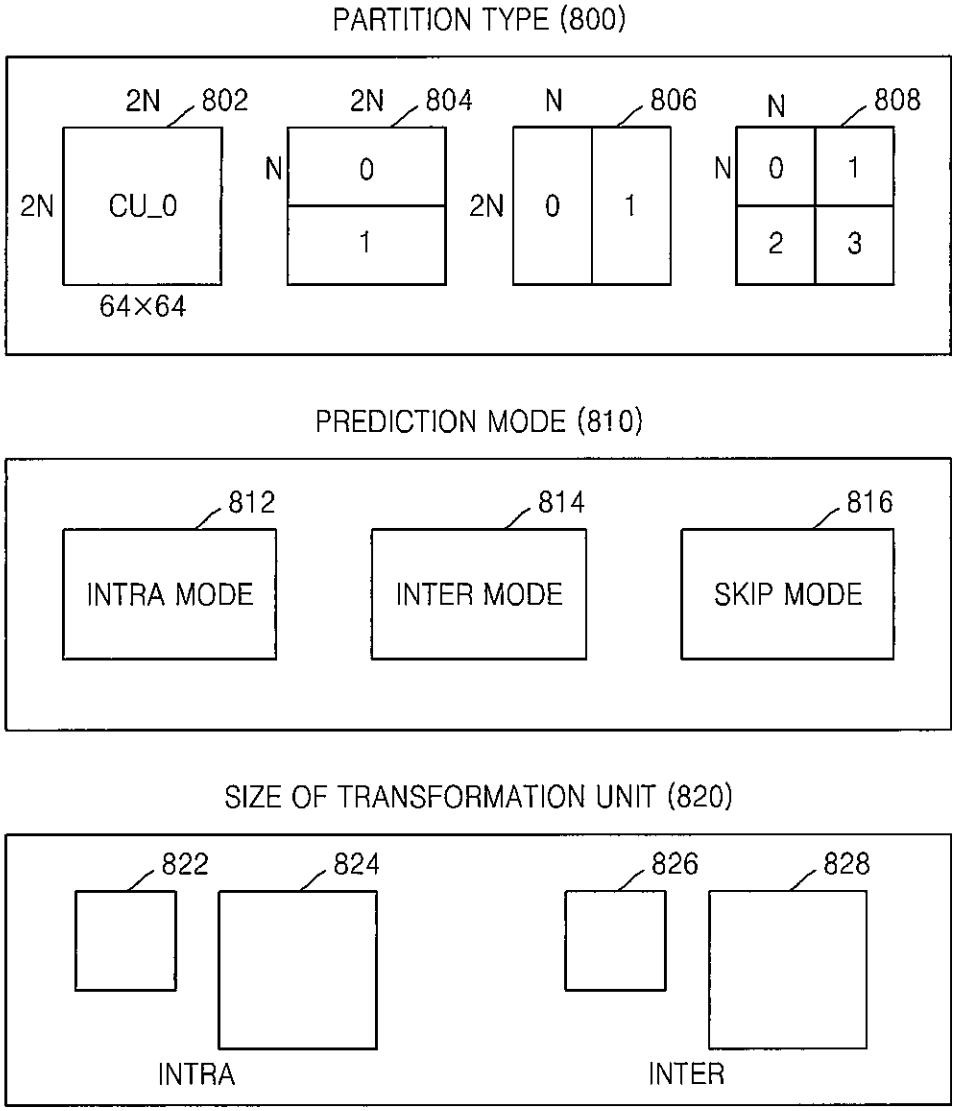

PARTITION TYPE (800)
2N
802
2N
CU_0
64×64
2N
804
N
0
1
N
806
2N
0
1
N
808
N
0
1
2
3
PREDICTION MODE (810)
812
INTRA MODE
814
INTER MODE
816
SKIP MODE
SIZE OF TRANSFORMATION UNIT (820)
822
824
INTRA
826
828
INTER

FIG. 16

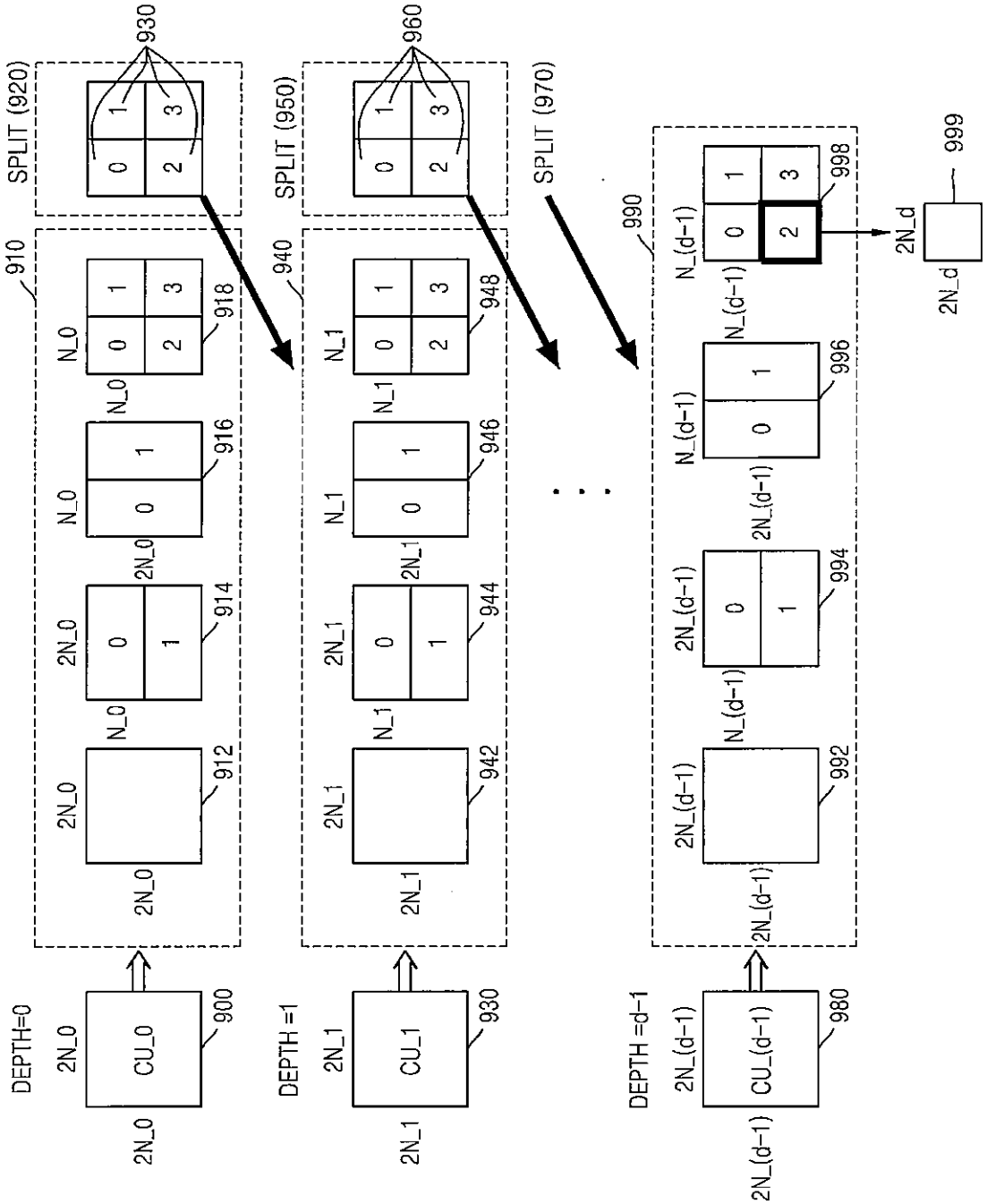
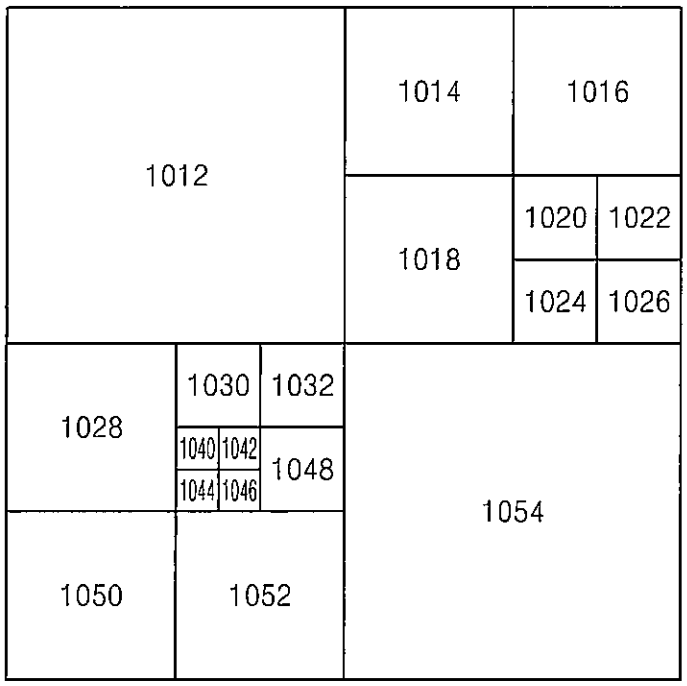

DEPTH=0
DEPTH =1
DEPTH =d-1
CU_0
CU_1
CU_(d-1)
900
930
980
SPLIT (920)
SPLIT (950)
SPLIT (970)
910
940
990
912
914
916
918
942
944
946
948
992
994
996
998
999
930
960
2N_0
N_0
2N_1
N_1
2N_(d-1)
N_(d-1)
2N_d
0
1
2
3

FIG. 17



CODING UNIT (1010)

FIG. 18

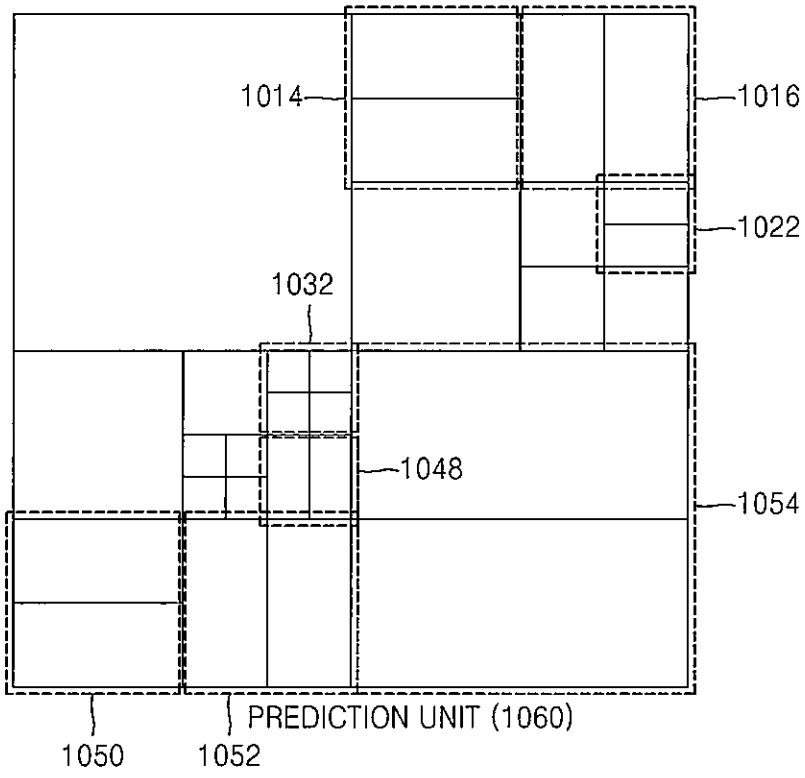


FIG. 19

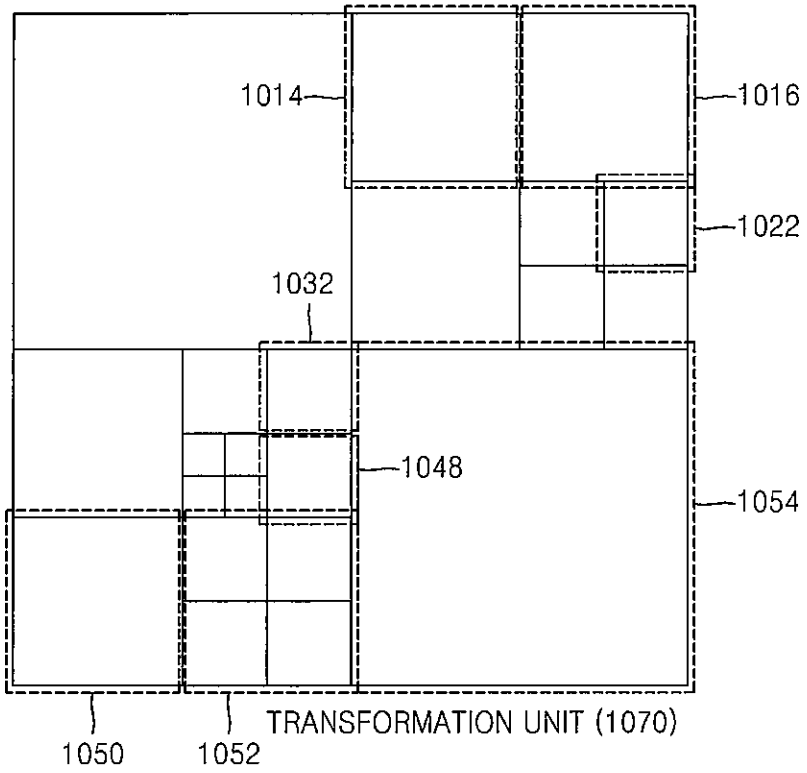

1014
1016
1022
1032
1048
1054
1050
1052
TRANSFORMATION UNIT (1070)

FIG. 20

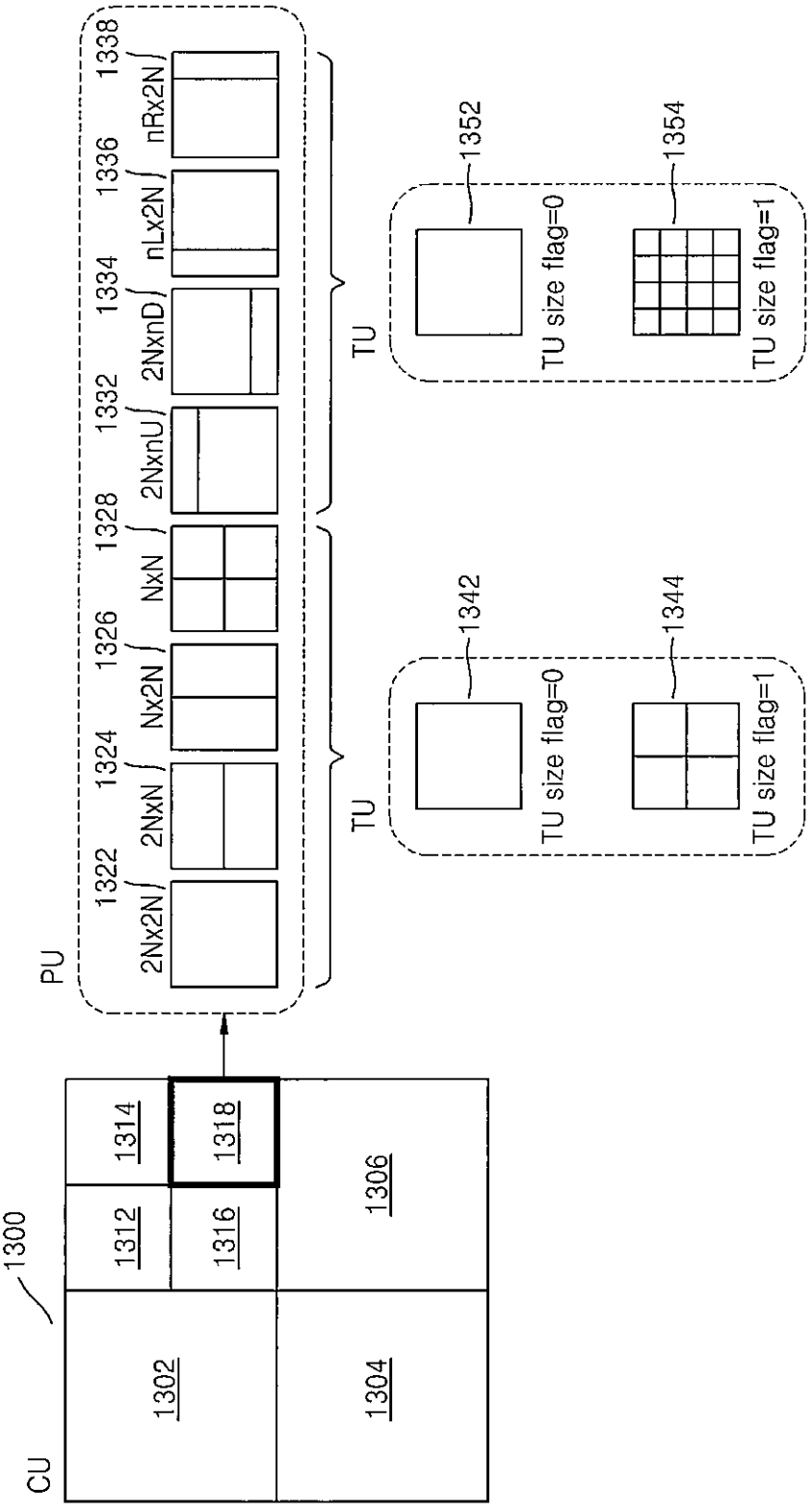

CU
1300
1302
1304
1306
1312
1314
1316
1318
PU
2Nx2N
1322
2NxN
1324
Nx2N
1326
NxN
1328
2NxnU
1332
2NxnD
1334
nLx2N
1336
nRx2N
1338
TU
TU
1342
TU size flag=0
1344
TU size flag=1
1352
TU size flag=0
1354
TU size flag=1

FIG. 21

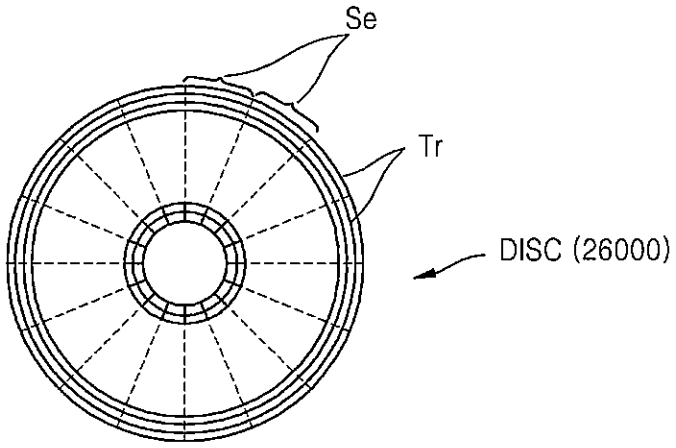


FIG. 22

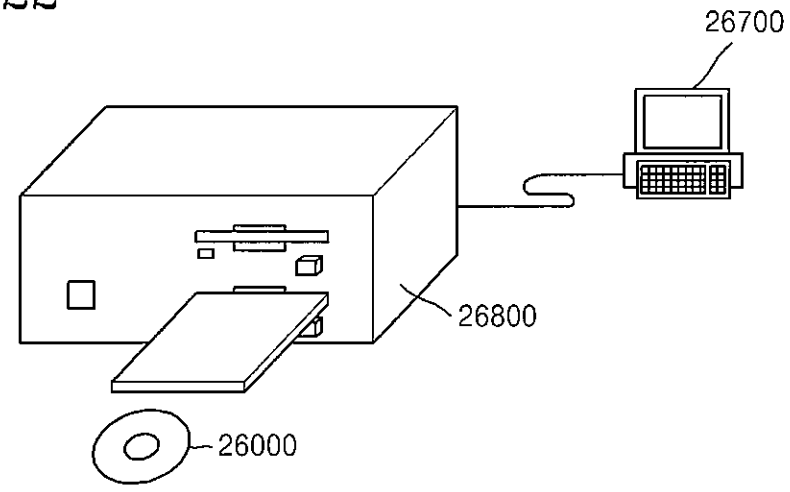


FIG. 23

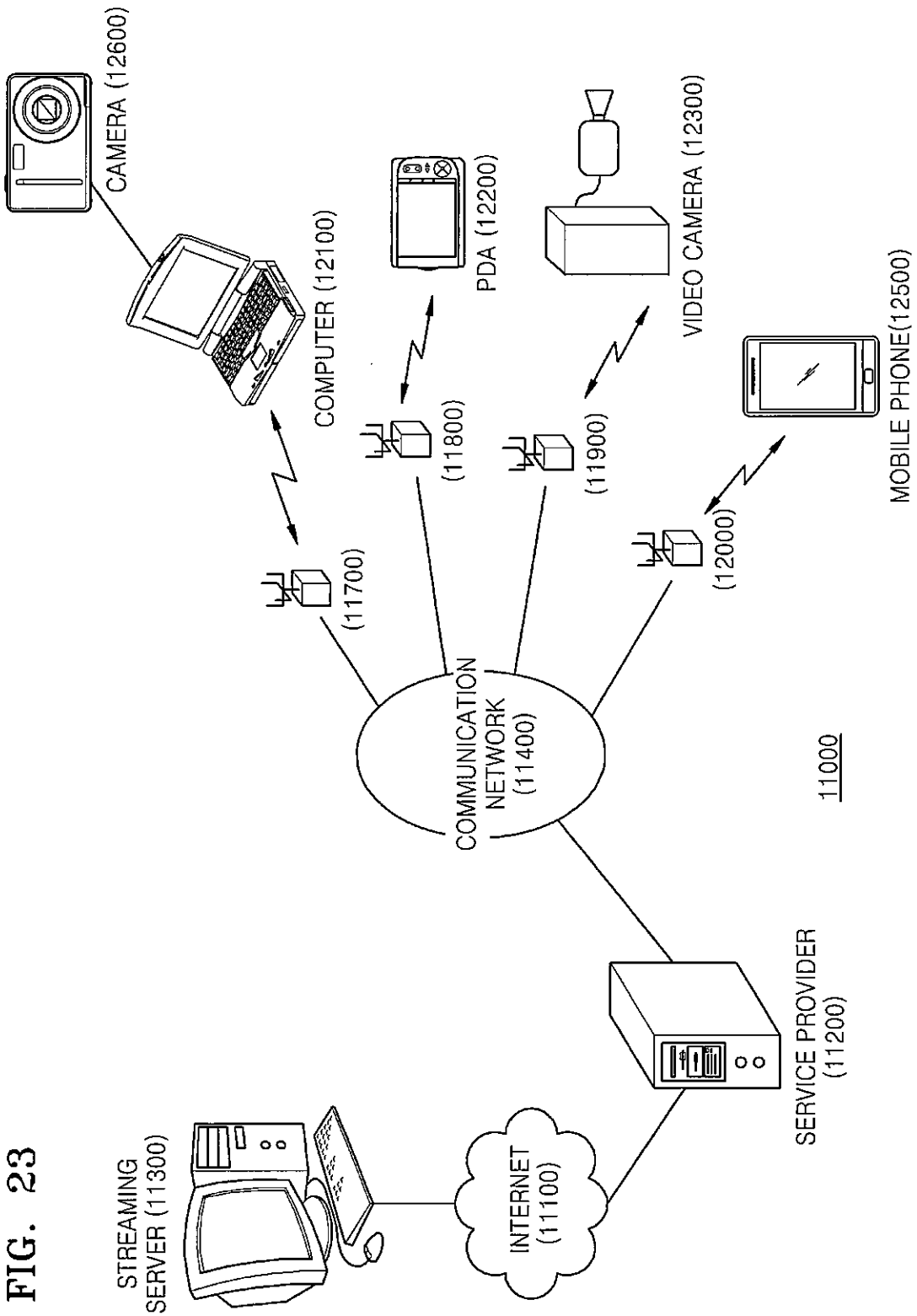

CAMERA (12600)
COMPUTER (12100)
PDA (12200)
VIDEO CAMERA (12300)
MOBILE PHONE(12500)
(11700)
(11800)
(11900)
(12000)
COMMUNICATION NETWORK (11400)
SERVICE PROVIDER (11200)
INTERNET (11100)
STREAMING SERVER (11300)
11000

FIG. 24

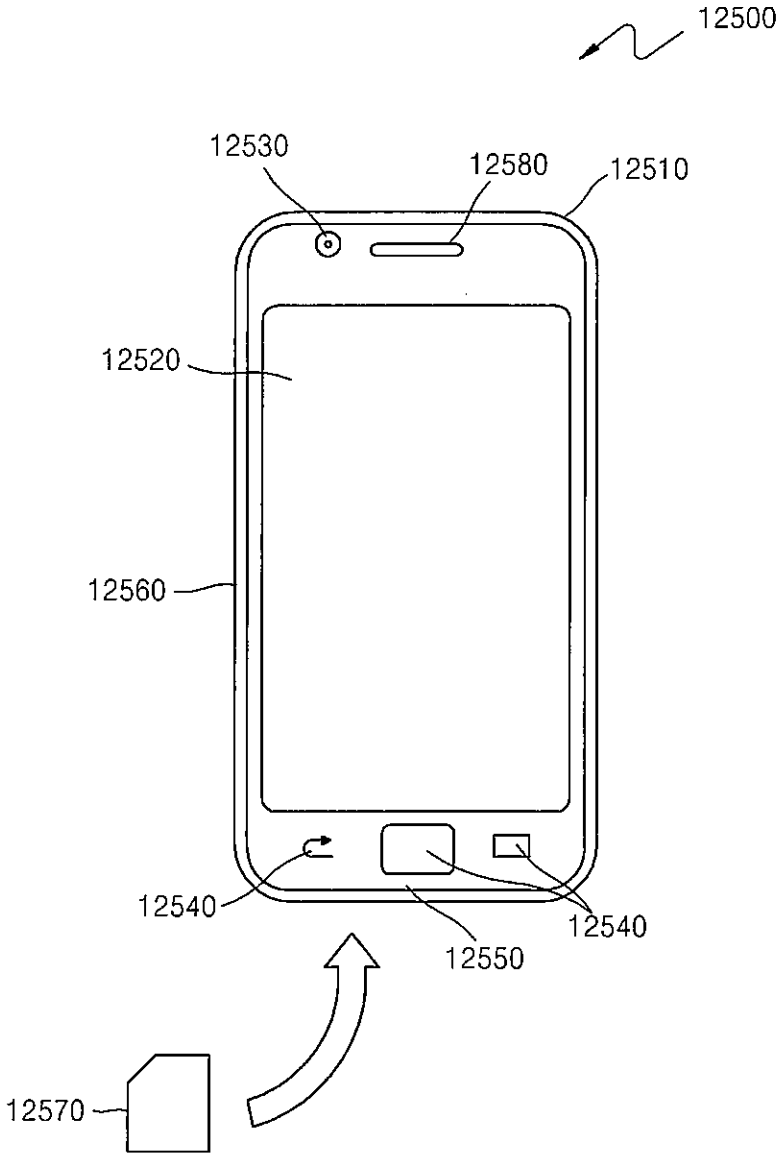

12500
12530
12580
12510
12520
12560
12540
12540
12550
12570

FIG. 25

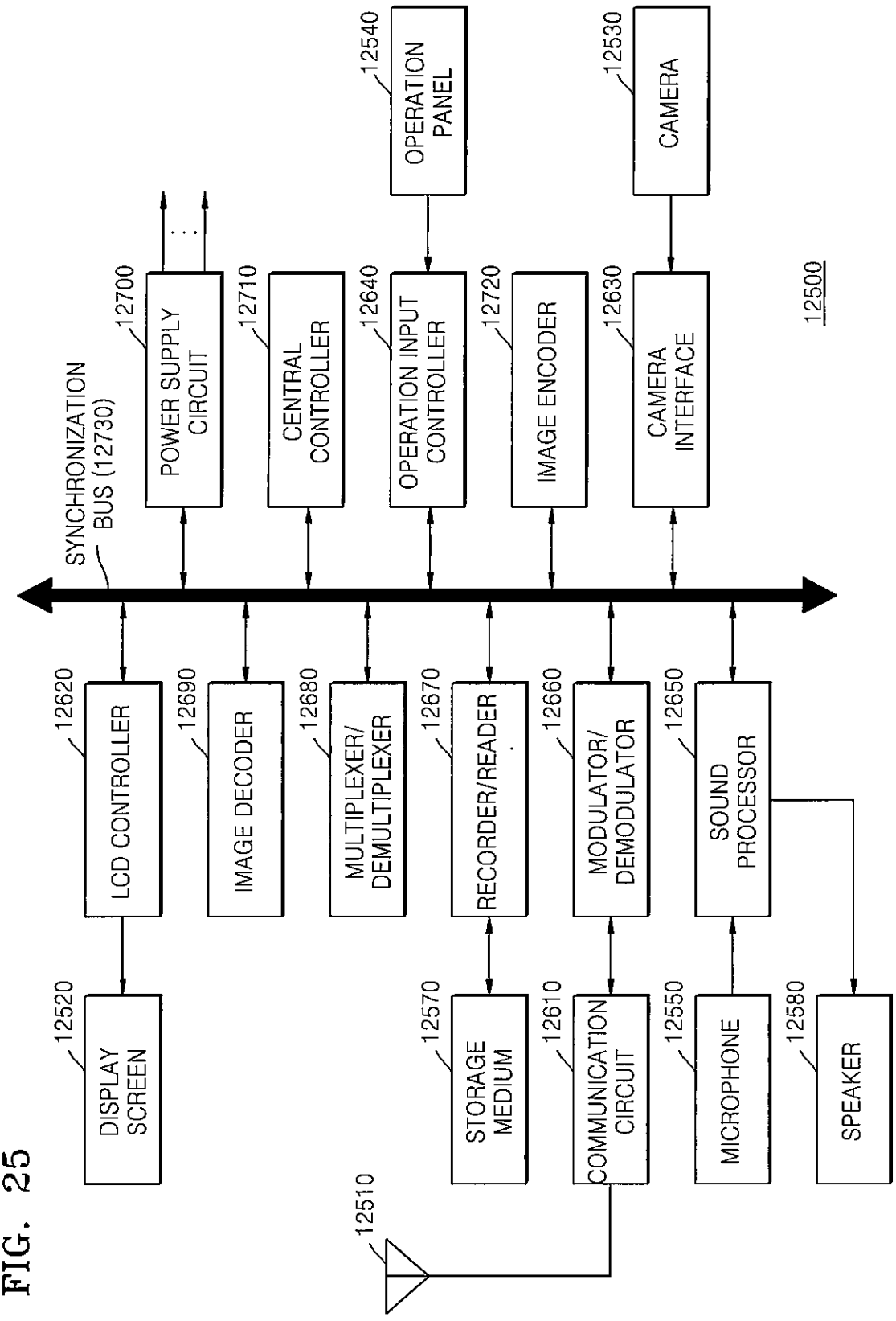

12500
SYNCHRONIZATION BUS (12730)
POWER SUPPLY CIRCUIT
12700
CENTRAL CONTROLLER
12710
OPERATION INPUT CONTROLLER
12640
OPERATION PANEL
12540
IMAGE ENCODER
12720
CAMERA INTERFACE
12630
CAMERA
12530
LCD CONTROLLER
12620
IMAGE DECODER
12690
MULTIPLEXER/ DEMULTIPLEXER
12680
RECORDER/READER
12670
MODULATOR/ DEMODULATOR
12660
SOUND PROCESSOR
12650
DISPLAY SCREEN
12520
STORAGE MEDIUM
12570
COMMUNICATION CIRCUIT
12610
MICROPHONE
12550
SPEAKER
12580
12510

FIG. 26

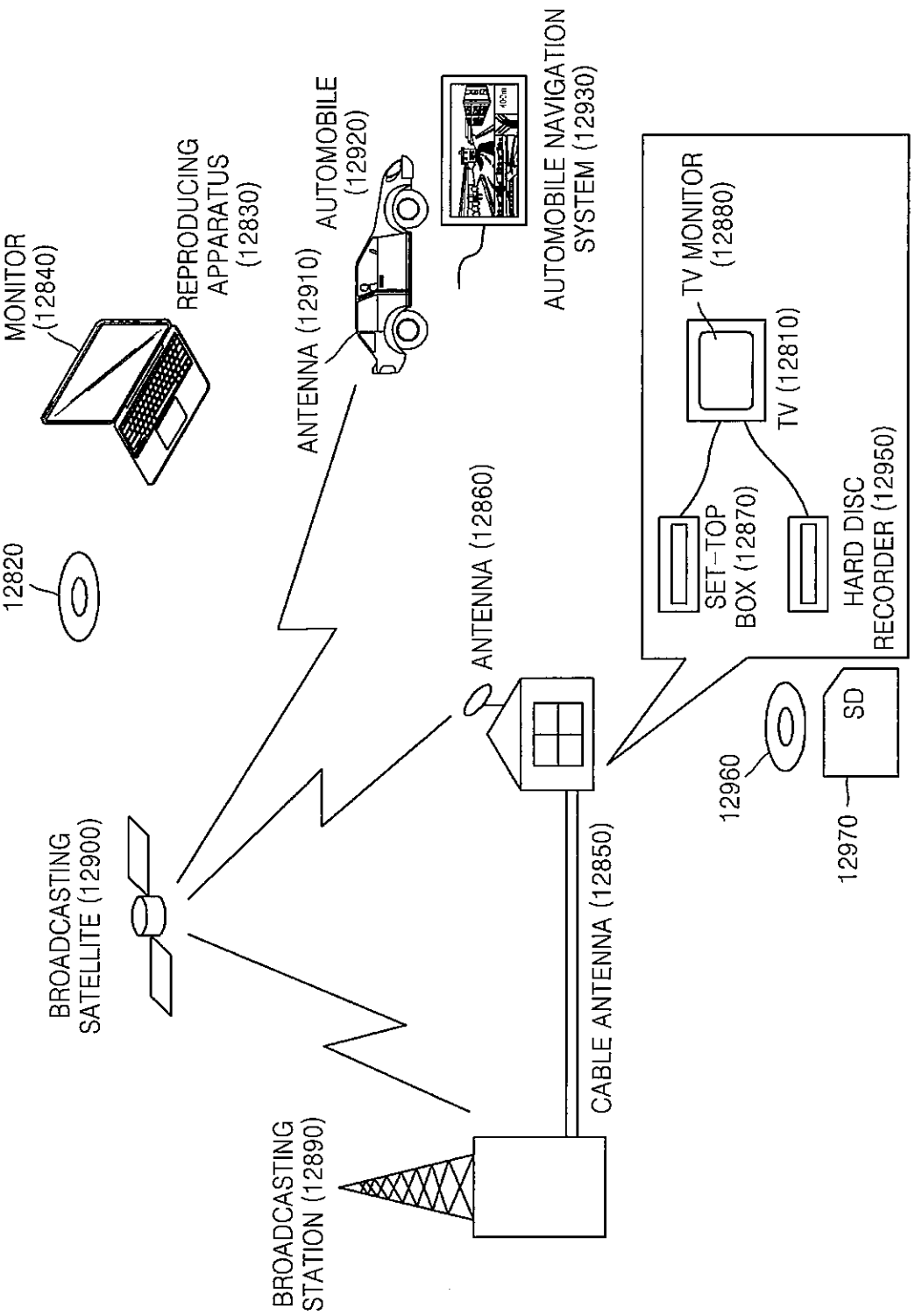
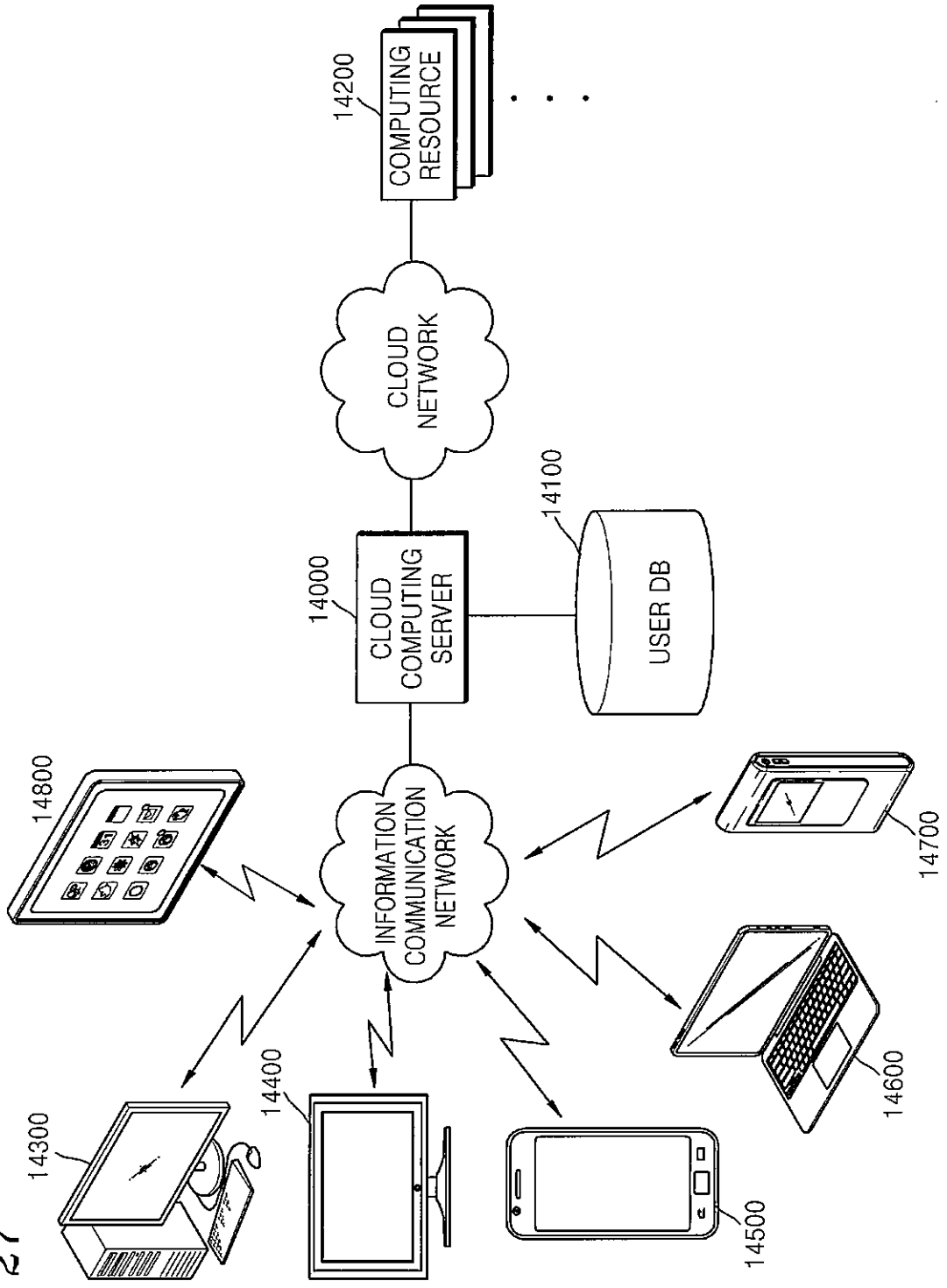

BROADCASTING STATION (12890)
BROADCASTING SATELLITE (12900)
CABLE ANTENNA (12850)
ANTENNA (12860)
ANTENNA (12910)
AUTOMOBILE (12920)
AUTOMOBILE NAVIGATION SYSTEM (12930)
REPRODUCING APPARATUS (12830)
MONITOR (12840)
12820
TV MONITOR (12880)
TV (12810)
SET-TOP BOX (12870)
HARD DISC RECORDER (12950)
12960
SD
12970

FIG. 27


14200
COMPUTING RESOURCE
CLOUD NETWORK
14100
USER DB
14000
CLOUD COMPUTING SERVER
INFORMATION COMMUNICATION NETWORK
14800
14700
14300
14400
14600
14500