FIG. 1

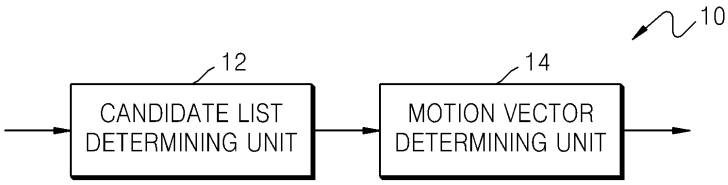

10
12
CANDIDATE LIST DETERMINING UNIT
14
MOTION VECTOR DETERMINING UNIT

FIG. 2

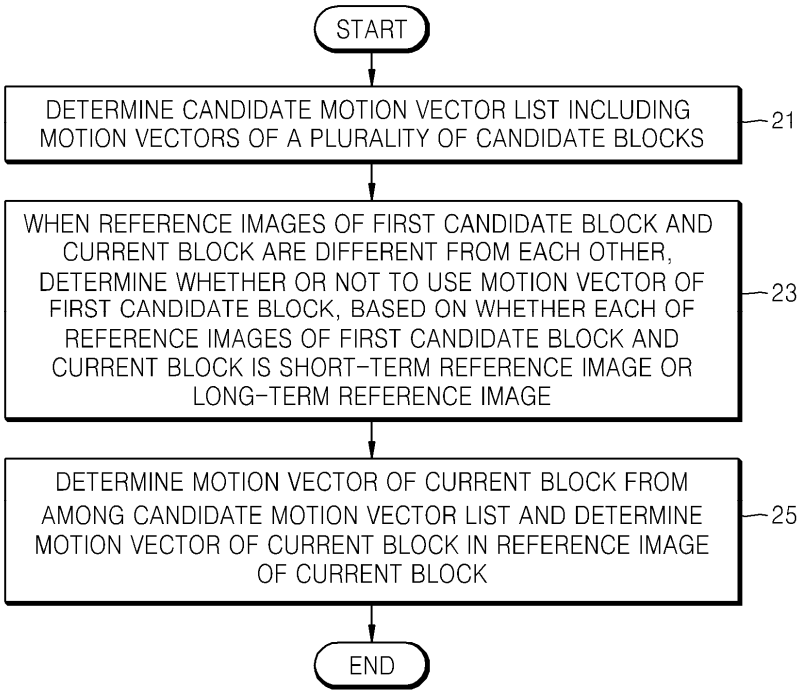

START
DETERMINE CANDIDATE MOTION VECTOR LIST INCLUDING MOTION VECTORS OF A PLURALITY OF CANDIDATE BLOCKS
21
WHEN REFERENCE IMAGES OF FIRST CANDIDATE BLOCK AND CURRENT BLOCK ARE DIFFERENT FROM EACH OTHER, DETERMINE WHETHER OR NOT TO USE MOTION VECTOR OF FIRST CANDIDATE BLOCK, BASED ON WHETHER EACH OF REFERENCE IMAGES OF FIRST CANDIDATE BLOCK AND CURRENT BLOCK IS SHORT-TERM REFERENCE IMAGE OR LONG-TERM REFERENCE IMAGE
23
DETERMINE MOTION VECTOR OF CURRENT BLOCK FROM AMONG CANDIDATE MOTION VECTOR LIST AND DETERMINE MOTION VECTOR OF CURRENT BLOCK IN REFERENCE IMAGE OF CURRENT BLOCK
25
END

FIG. 3

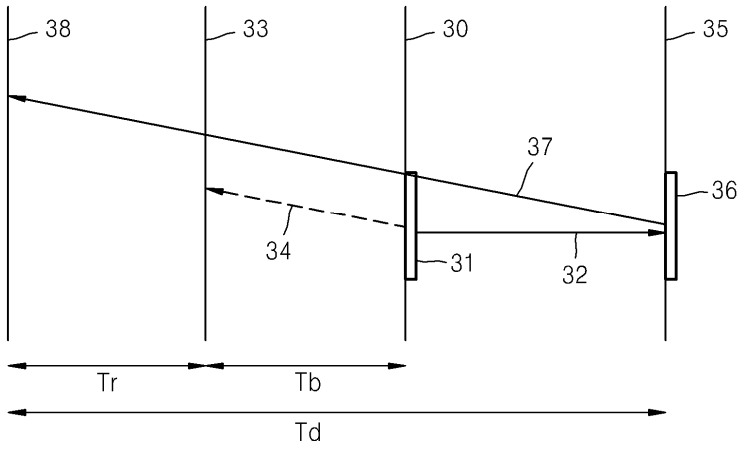


FIG. 4

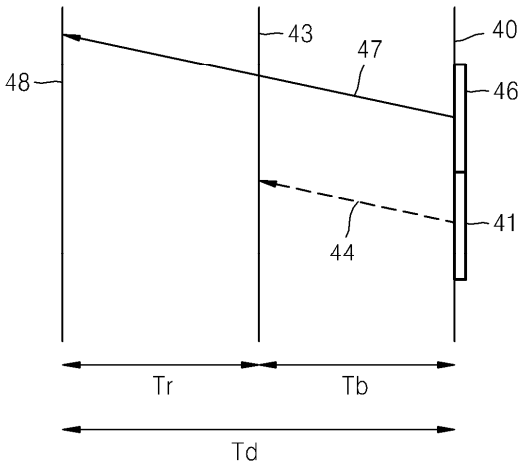


FIG. 5

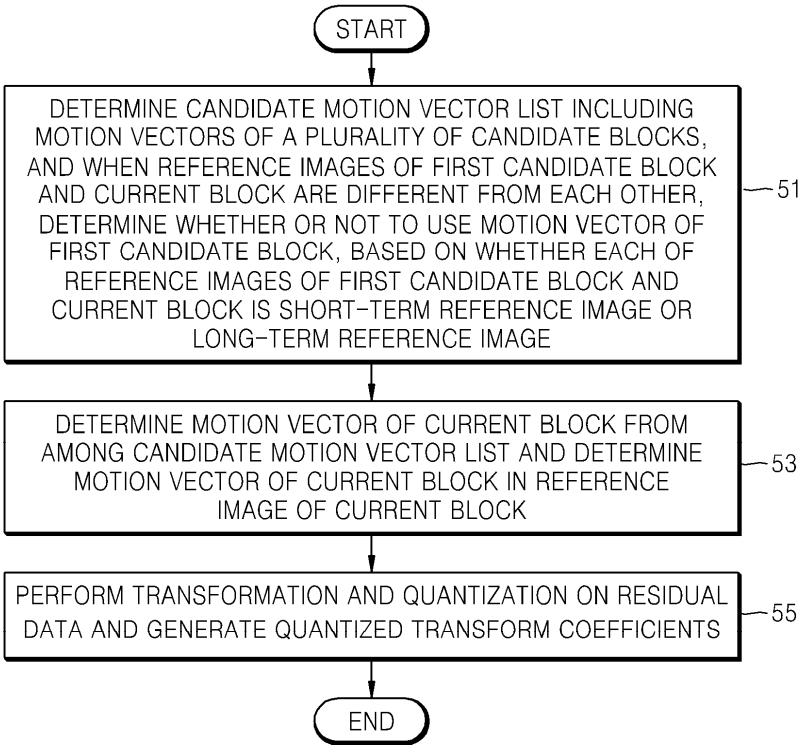

START
DETERMINE CANDIDATE MOTION VECTOR LIST INCLUDING MOTION VECTORS OF A PLURALITY OF CANDIDATE BLOCKS, AND WHEN REFERENCE IMAGES OF FIRST CANDIDATE BLOCK AND CURRENT BLOCK ARE DIFFERENT FROM EACH OTHER, DETERMINE WHETHER OR NOT TO USE MOTION VECTOR OF FIRST CANDIDATE BLOCK, BASED ON WHETHER EACH OF REFERENCE IMAGES OF FIRST CANDIDATE BLOCK AND CURRENT BLOCK IS SHORT-TERM REFERENCE IMAGE OR LONG-TERM REFERENCE IMAGE
51
DETERMINE MOTION VECTOR OF CURRENT BLOCK FROM AMONG CANDIDATE MOTION VECTOR LIST AND DETERMINE MOTION VECTOR OF CURRENT BLOCK IN REFERENCE IMAGE OF CURRENT BLOCK
53
PERFORM TRANSFORMATION AND QUANTIZATION ON RESIDUAL DATA AND GENERATE QUANTIZED TRANSFORM COEFFICIENTS
55
END

FIG. 6

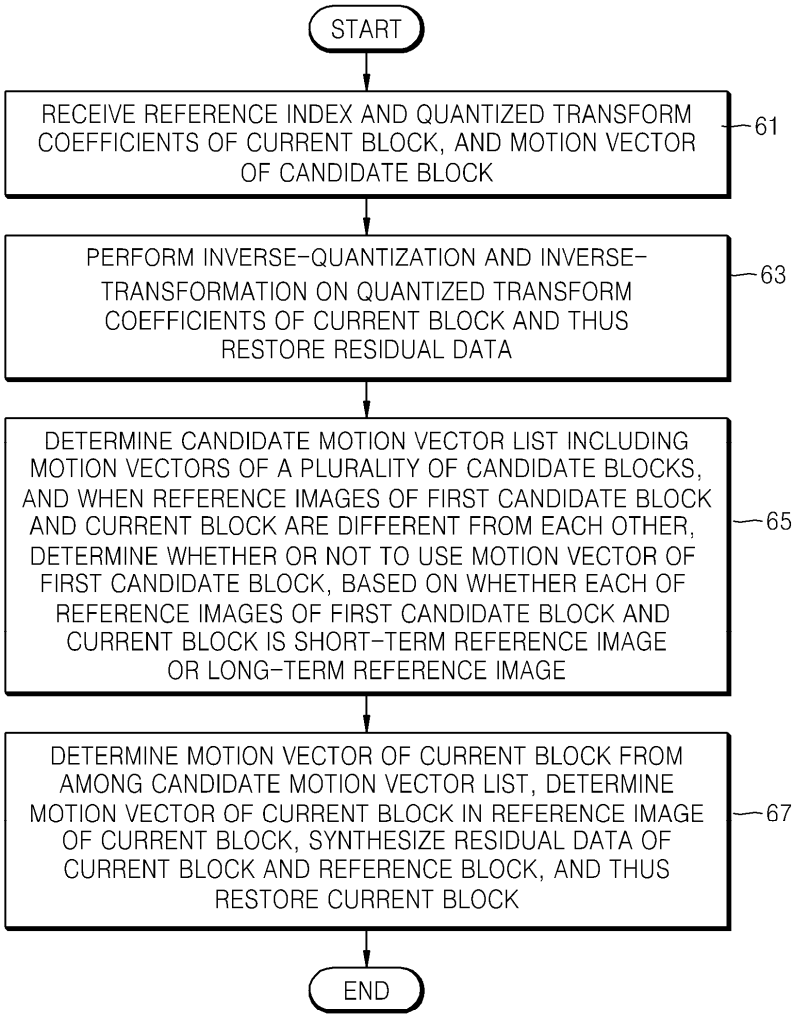

START
RECEIVE REFERENCE INDEX AND QUANTIZED TRANSFORM COEFFICIENTS OF CURRENT BLOCK, AND MOTION VECTOR OF CANDIDATE BLOCK
61
PERFORM INVERSE-QUANTIZATION AND INVERSE-TRANSFORMATION ON QUANTIZED TRANSFORM COEFFICIENTS OF CURRENT BLOCK AND THUS RESTORE RESIDUAL DATA
63
DETERMINE CANDIDATE MOTION VECTOR LIST INCLUDING MOTION VECTORS OF A PLURALITY OF CANDIDATE BLOCKS, AND WHEN REFERENCE IMAGES OF FIRST CANDIDATE BLOCK AND CURRENT BLOCK ARE DIFFERENT FROM EACH OTHER, DETERMINE WHETHER OR NOT TO USE MOTION VECTOR OF FIRST CANDIDATE BLOCK, BASED ON WHETHER EACH OF REFERENCE IMAGES OF FIRST CANDIDATE BLOCK AND CURRENT BLOCK IS SHORT-TERM REFERENCE IMAGE OR LONG-TERM REFERENCE IMAGE
65
DETERMINE MOTION VECTOR OF CURRENT BLOCK FROM AMONG CANDIDATE MOTION VECTOR LIST, DETERMINE MOTION VECTOR OF CURRENT BLOCK IN REFERENCE IMAGE OF CURRENT BLOCK, SYNTHESIZE RESIDUAL DATA OF CURRENT BLOCK AND REFERENCE BLOCK, AND THUS RESTORE CURRENT BLOCK
67
END

FIG. 7

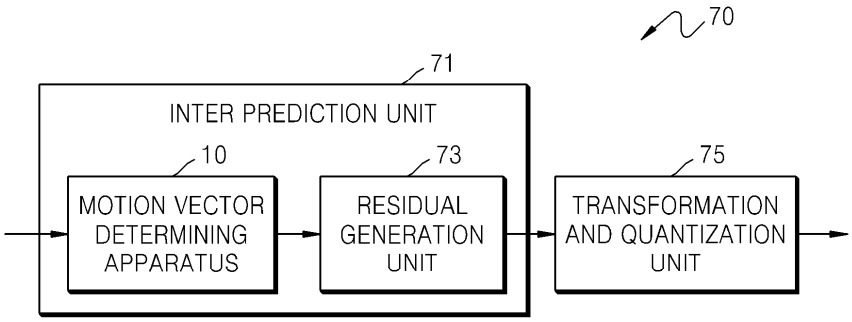

70
71
INTER PREDICTION UNIT
10
MOTION VECTOR DETERMINING APPARATUS
73
RESIDUAL GENERATION UNIT
75
TRANSFORMATION AND QUANTIZATION UNIT

FIG. 8

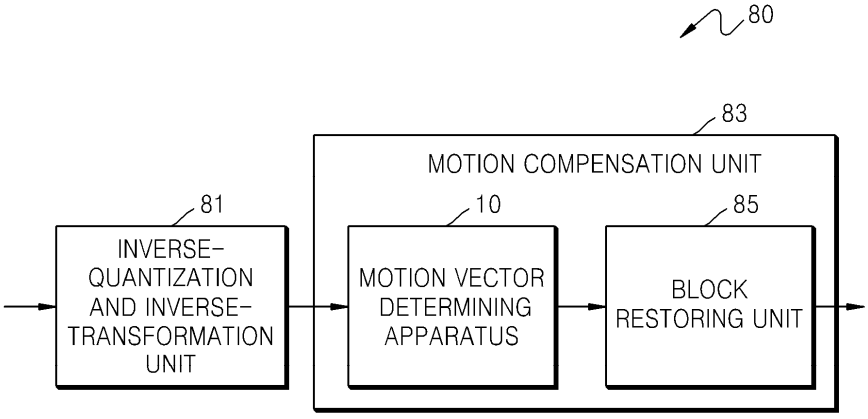

80
83
MOTION COMPENSATION UNIT
81
INVERSE-QUANTIZATION AND INVERSE-TRANSFORMATION UNIT
10
MOTION VECTOR DETERMINING APPARATUS
85
BLOCK RESTORING UNIT

FIG. 9

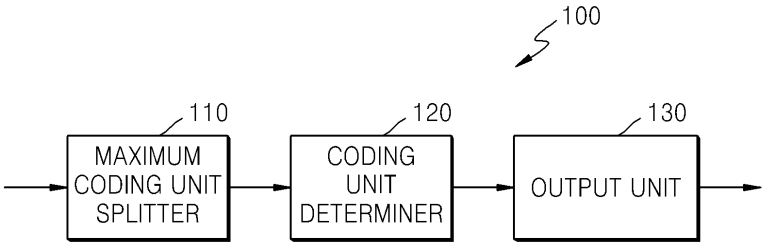

100
110
MAXIMUM CODING UNIT SPLITTER
120
CODING UNIT DETERMINER
130
OUTPUT UNIT

FIG. 10

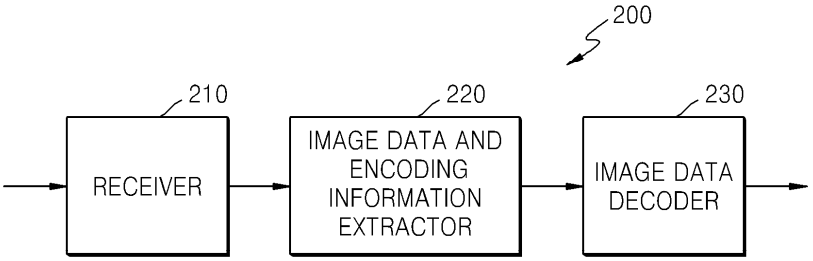

200
210
RECEIVER
220
IMAGE DATA AND ENCODING INFORMATION EXTRACTOR
230
IMAGE DATA DECODER

FIG. 11

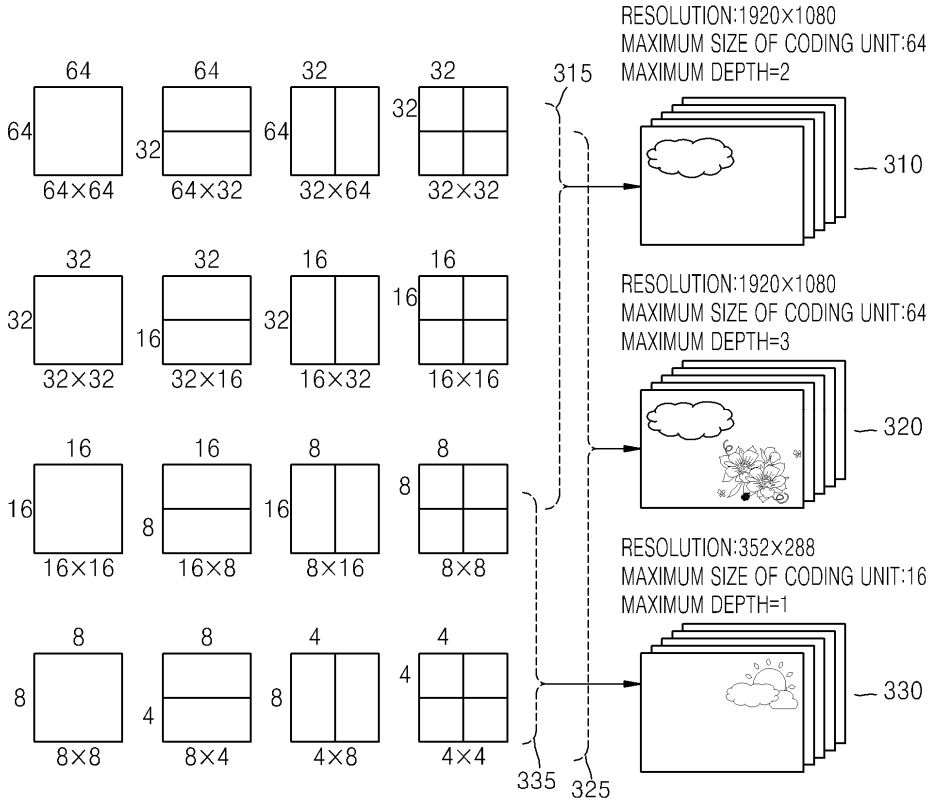

RESOLUTION:1920×1080
MAXIMUM SIZE OF CODING UNIT:64
MAXIMUM DEPTH=2
315
310
RESOLUTION:1920×1080
MAXIMUM SIZE OF CODING UNIT:64
MAXIMUM DEPTH=3
320
RESOLUTION:352×288
MAXIMUM SIZE OF CODING UNIT:16
MAXIMUM DEPTH=1
330
335
325
64×64
64×32
32×64
32×32
32×32
32×16
16×32
16×16
16×16
16×8
8×16
8×8
8×8
8×4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

FIG. 12

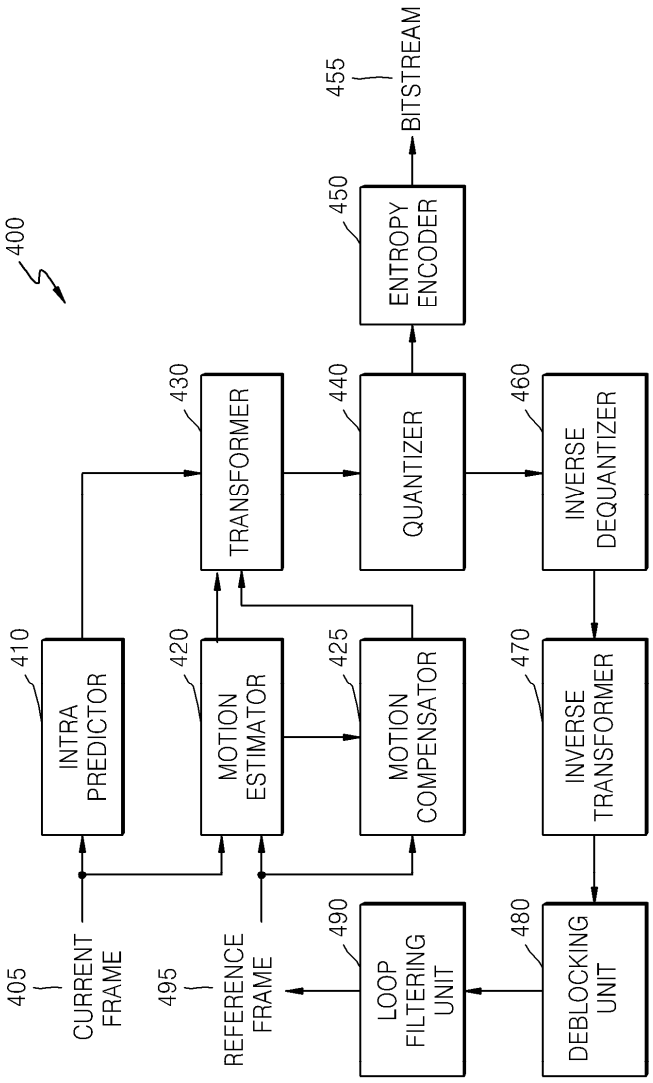

400
405
CURRENT FRAME
410
INTRA PREDICTOR
420
MOTION ESTIMATOR
425
MOTION COMPENSATOR
430
TRANSFORMER
440
QUANTIZER
450
ENTROPY ENCODER
455
BITSTREAM
460
INVERSE DEQUANTIZER
470
INVERSE TRANSFORMER
480
DEBLOCKING UNIT
490
LOOP FILTERING UNIT
495
REFERENCE FRAME

FIG. 13

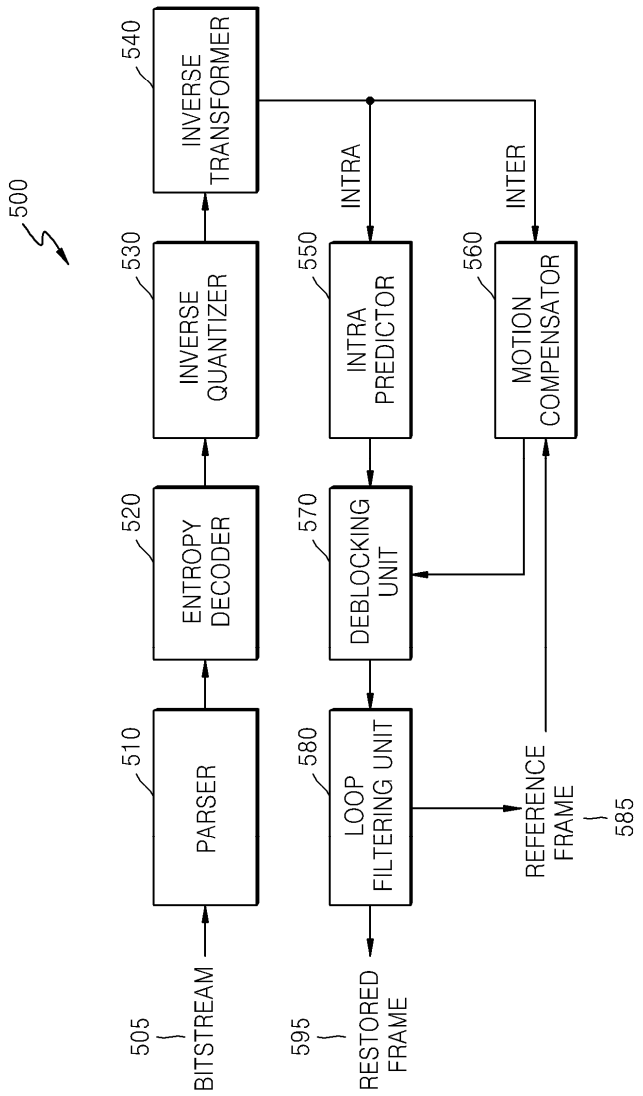

500
505
BITSTREAM
510
PARSER
520
ENTROPY DECODER
530
INVERSE QUANTIZER
540
INVERSE TRANSFORMER
INTRA
550
INTRA PREDICTOR
INTER
560
MOTION COMPENSATOR
570
DEBLOCKING UNIT
580
LOOP FILTERING UNIT
595
RESTORED FRAME
REFERENCE FRAME
585

FIG. 14

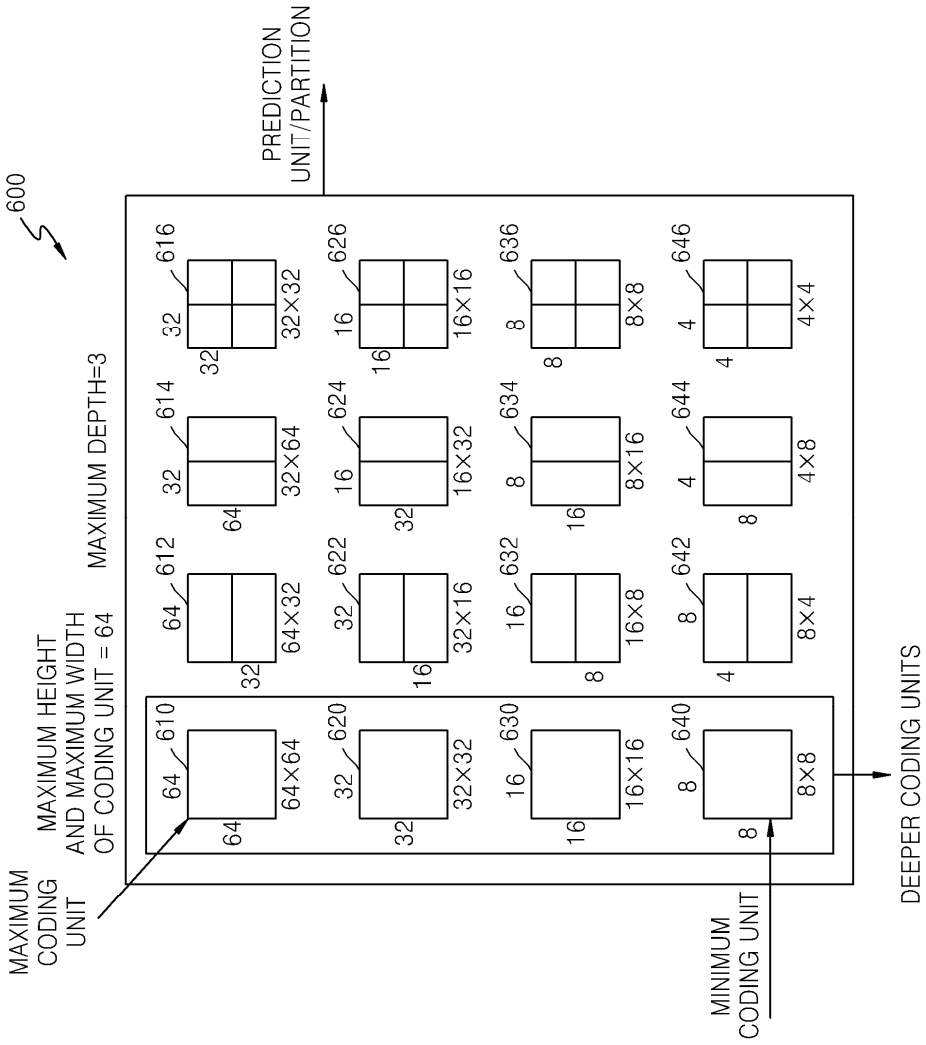

600
MAXIMUM CODING UNIT
MAXIMUM HEIGHT AND MAXIMUM WIDTH OF CODING UNIT = 64
MAXIMUM DEPTH=3
PREDICTION UNIT/PARTITION
MINIMUM CODING UNIT
DEEPER CODING UNITS
64
610
64×64
32
620
32×32
16
630
16×16
8
640
8×8
64
612
64×32
32
622
32×16
16
632
16×8
8
642
8×4
32
614
32×64
16
624
16×32
8
634
8×16
4
644
4×8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

FIG. 15

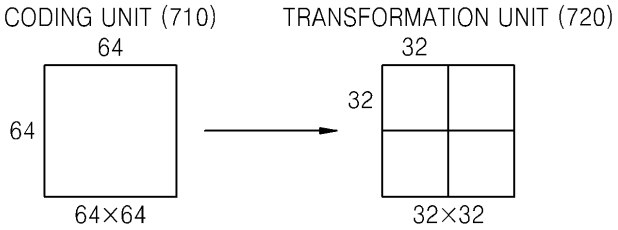
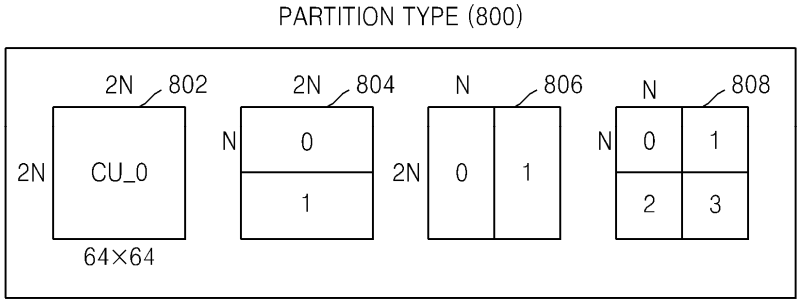
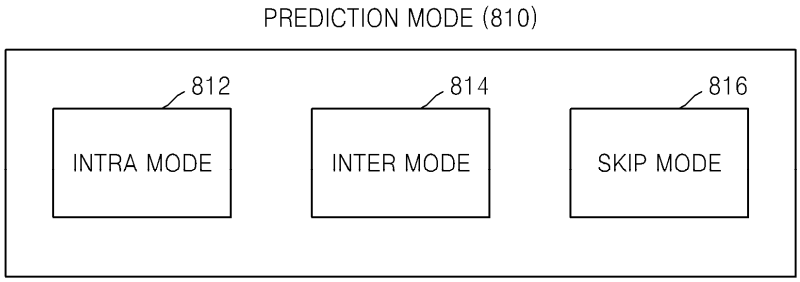

CODING UNIT (710)
TRANSFORMATION UNIT (720)
64
64
64×64
32
32
32×32

FIG. 16


PARTITION TYPE (800)
2N
802
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

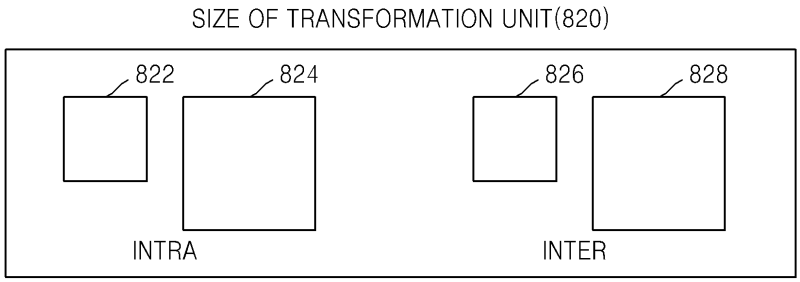

SIZE OF TRANSFORMATION UNIT(820)
822
824
826
828
INTRA
INTER

FIG. 17

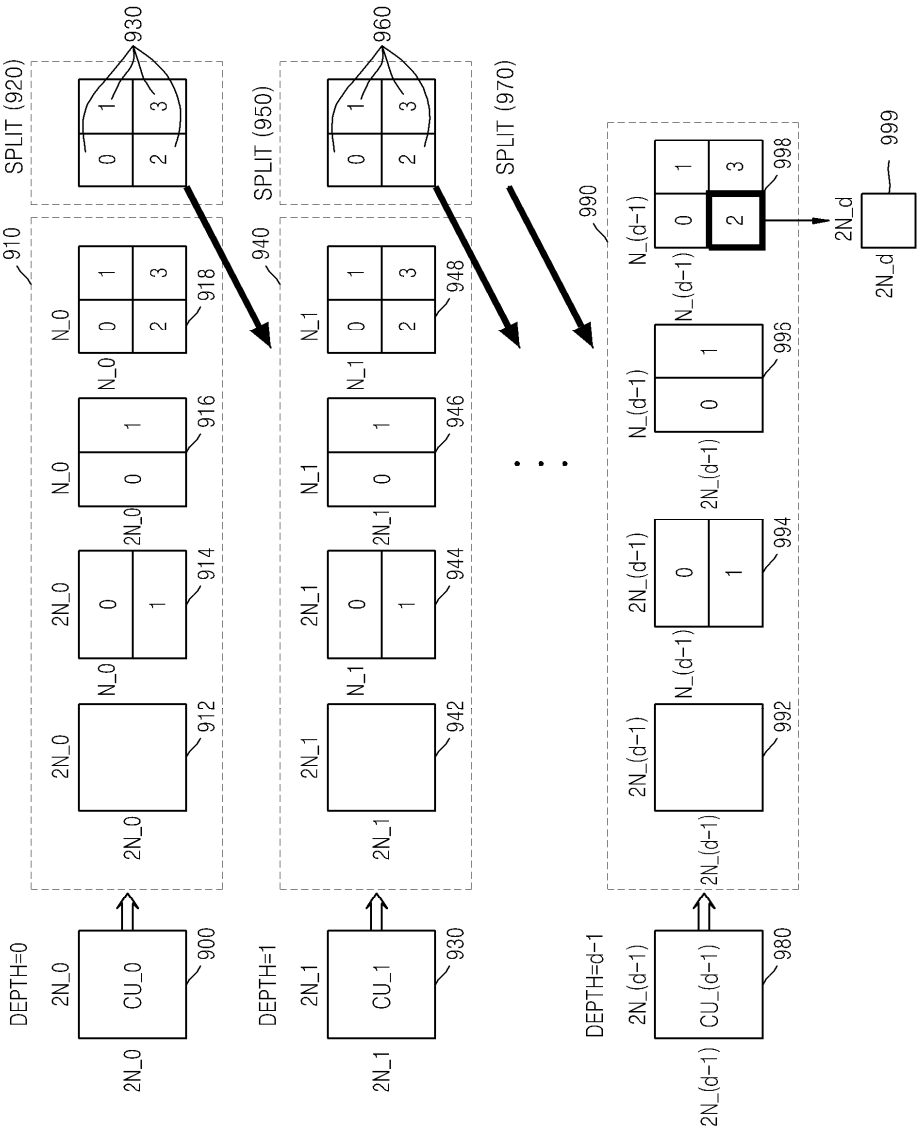
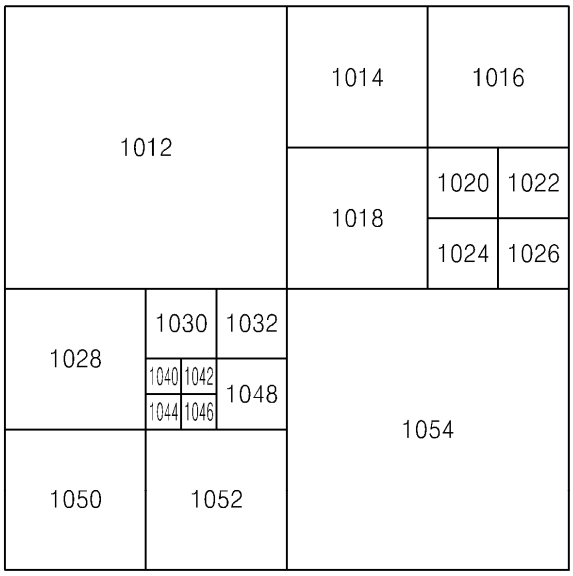

DEPTH=0
DEPTH=1
DEPTH=d-1
CU_0
CU_1
CU_(d-1)
SPLIT (920)
SPLIT (950)
SPLIT (970)
900
910
912
914
916
918
930
940
942
944
946
948
960
980
990
992
994
996
998
999
2N_0
N_0
2N_1
N_1
2N_(d-1)
N_(d-1)
2N_d

FIG. 18



CODING UNIT (1010)

FIG. 19

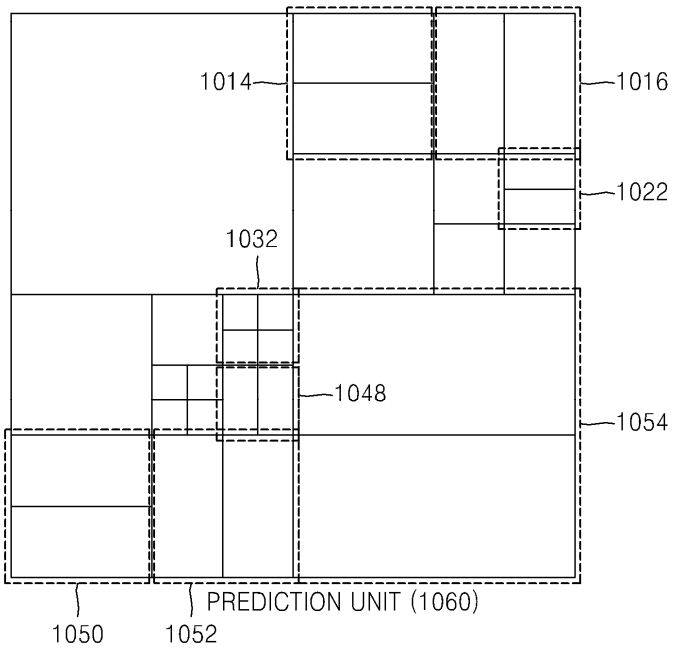


FIG. 20

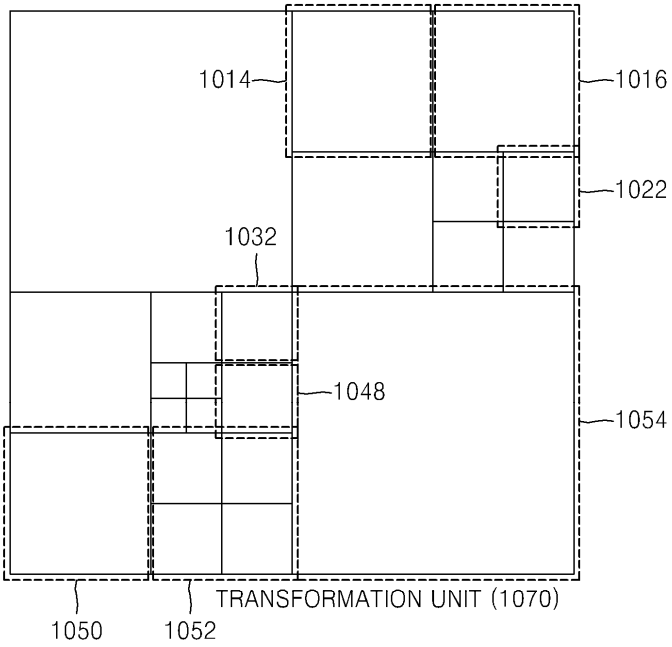

1014
1016
1022
1032
1048
1054
TRANSFORMATION UNIT (1070)
1050
1052

FIG. 21

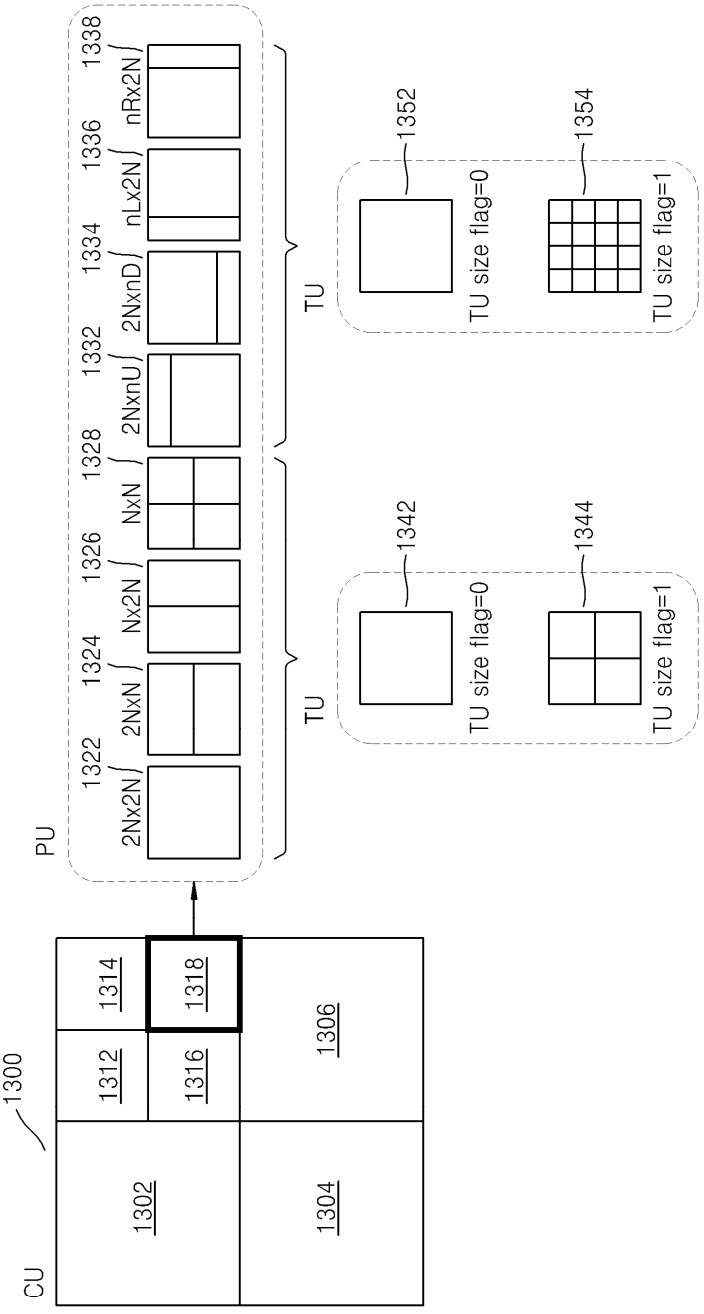

CU
1300
1302
1304
1306
1312
1314
1316
1318
PU
2Nx2N
1322
2NxN
1324
Nx2N
1326
NxN
1328
2NxnU
1332
2NxnD
1334
nLx2N
1336
nRx2N
1338
TU
TU
1342
TU size flag=0
1344
TU size flag=1
1352
TU size flag=0
1354
TU size flag=1

FIG. 22

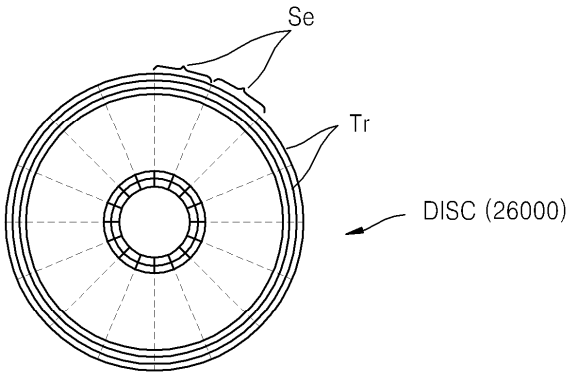


FIG. 23

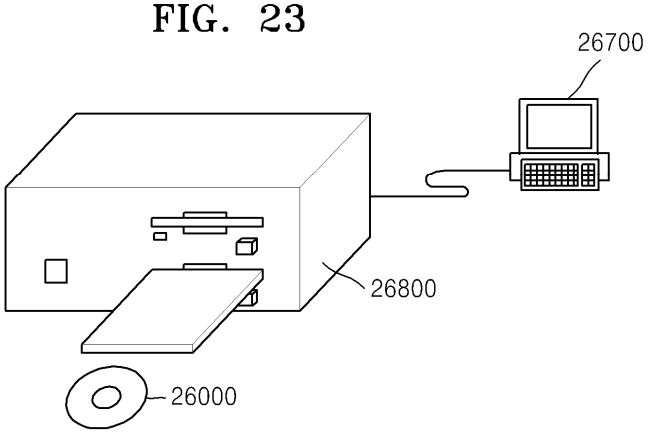


FIG. 24

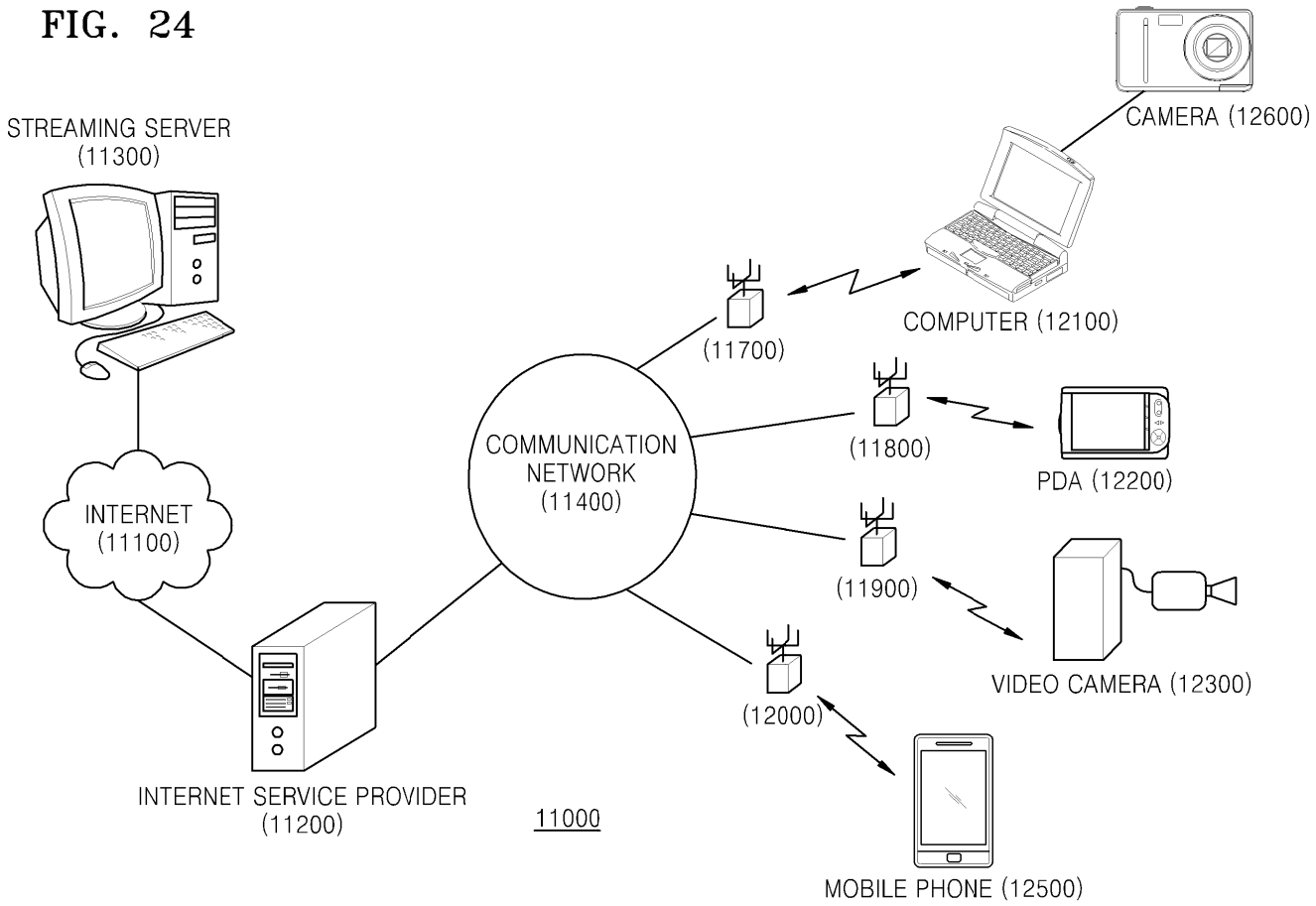

STREAMING SERVER
(11300)
INTERNET
(11100)
INTERNET SERVICE PROVIDER
(11200)
COMMUNICATION
NETWORK
(11400)
11000
(11700)
(11800)
(11900)
(12000)
CAMERA (12600)
COMPUTER (12100)
PDA (12200)
VIDEO CAMERA (12300)
MOBILE PHONE (12500)

FIG. 25

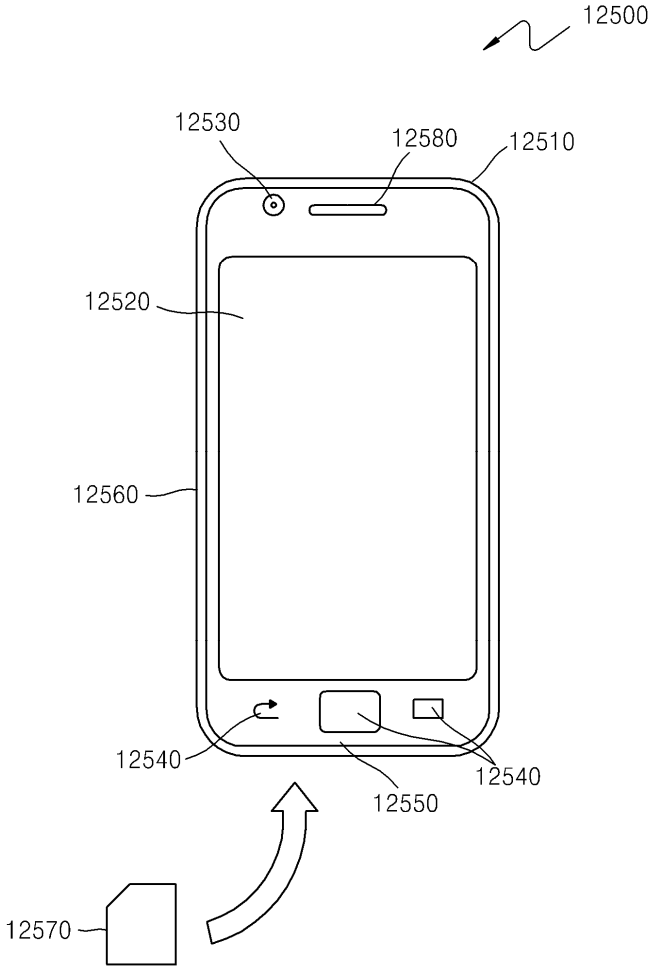

12500
12530
12580
12510
12520
12560
12540
12540
12550
12570

FIG. 26

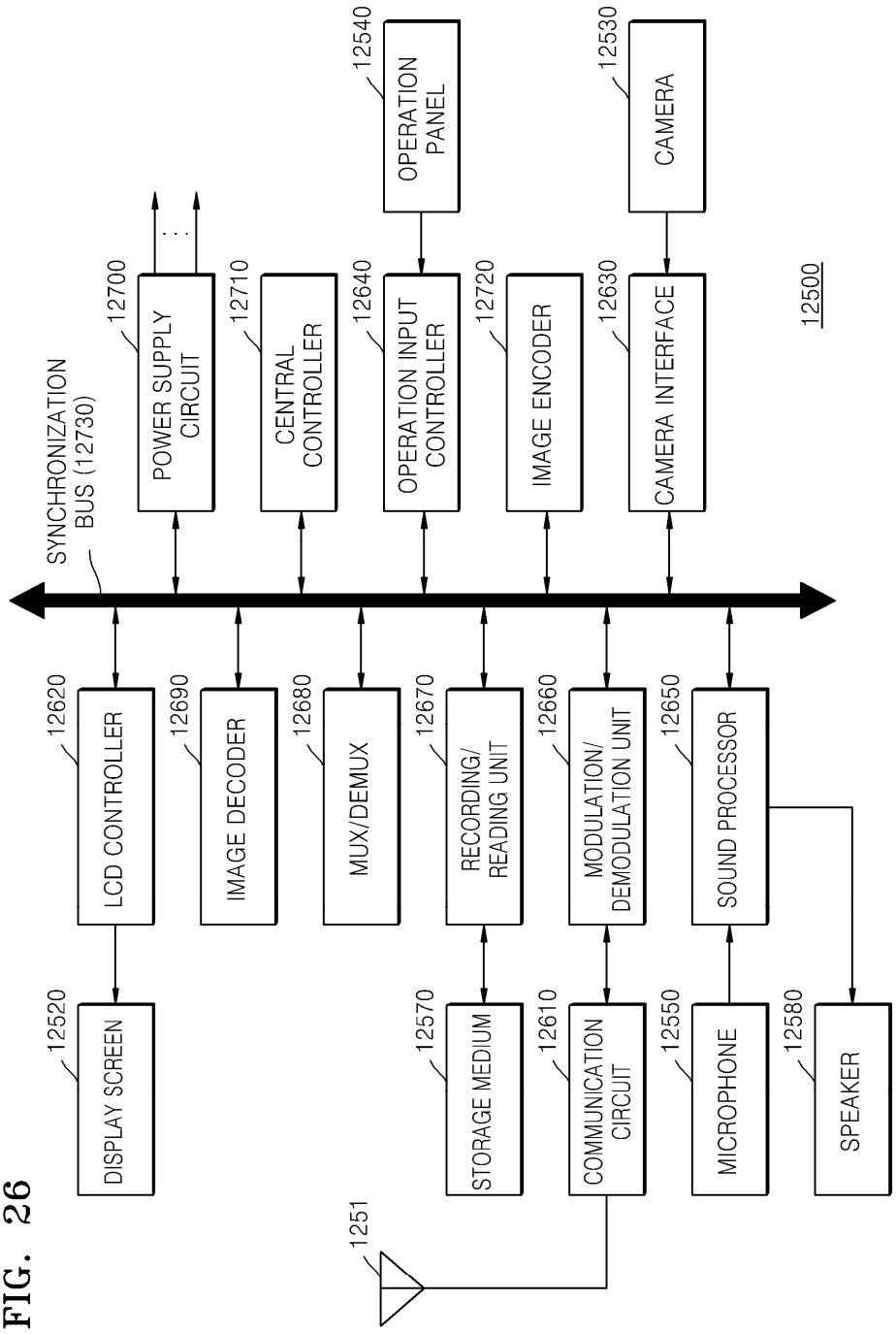

12500
SYNCHRONIZATION BUS (12730)
12700
POWER SUPPLY CIRCUIT
12710
CENTRAL CONTROLLER
12640
OPERATION INPUT CONTROLLER
12720
IMAGE ENCODER
12630
CAMERA INTERFACE
12540
OPERATION PANEL
12530
CAMERA
12620
LCD CONTROLLER
12690
IMAGE DECODER
12680
MUX/DEMUX
12670
RECORDING/ READING UNIT
12660
MODULATION/ DEMODULATION UNIT
12650
SOUND PROCESSOR
12520
DISPLAY SCREEN
12570
STORAGE MEDIUM
12610
COMMUNICATION CIRCUIT
12550
MICROPHONE
12580
SPEAKER
1251

FIG. 27

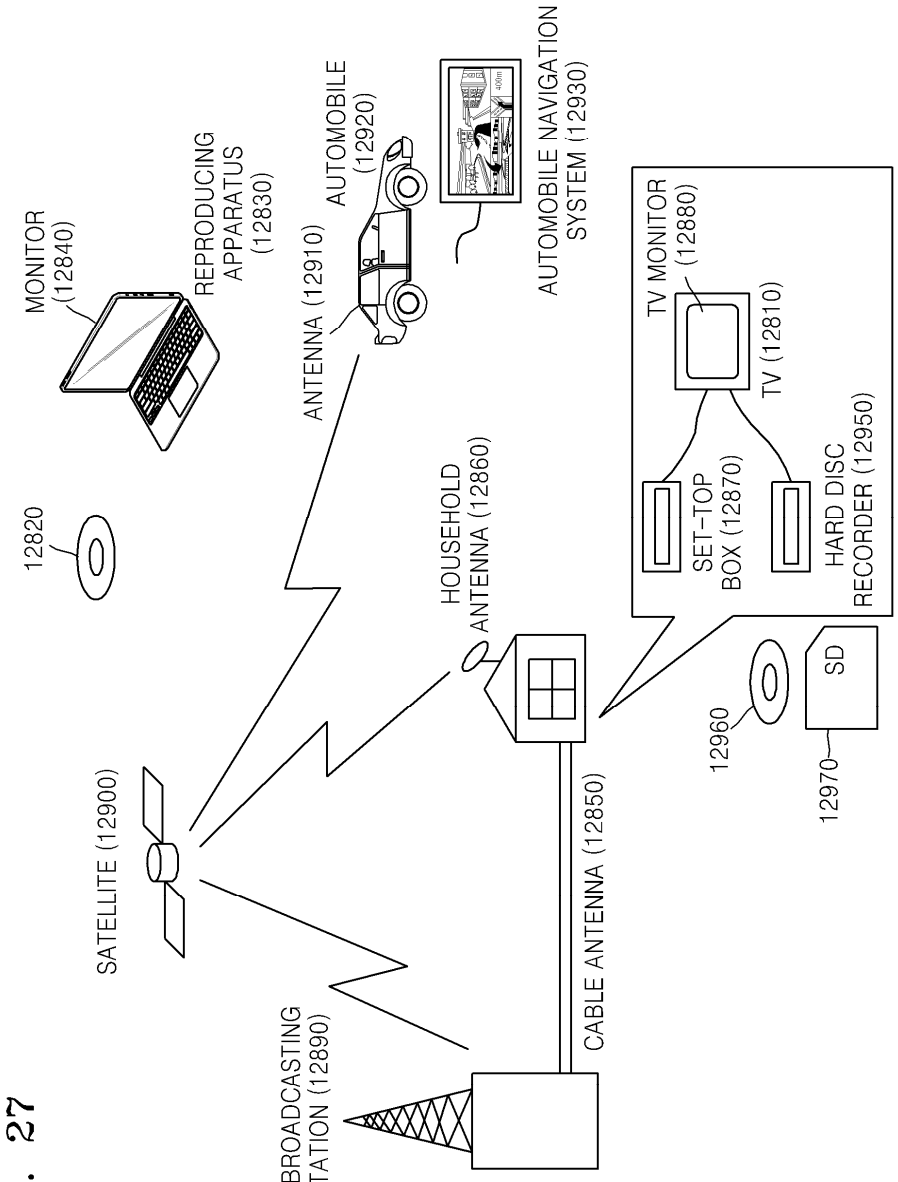
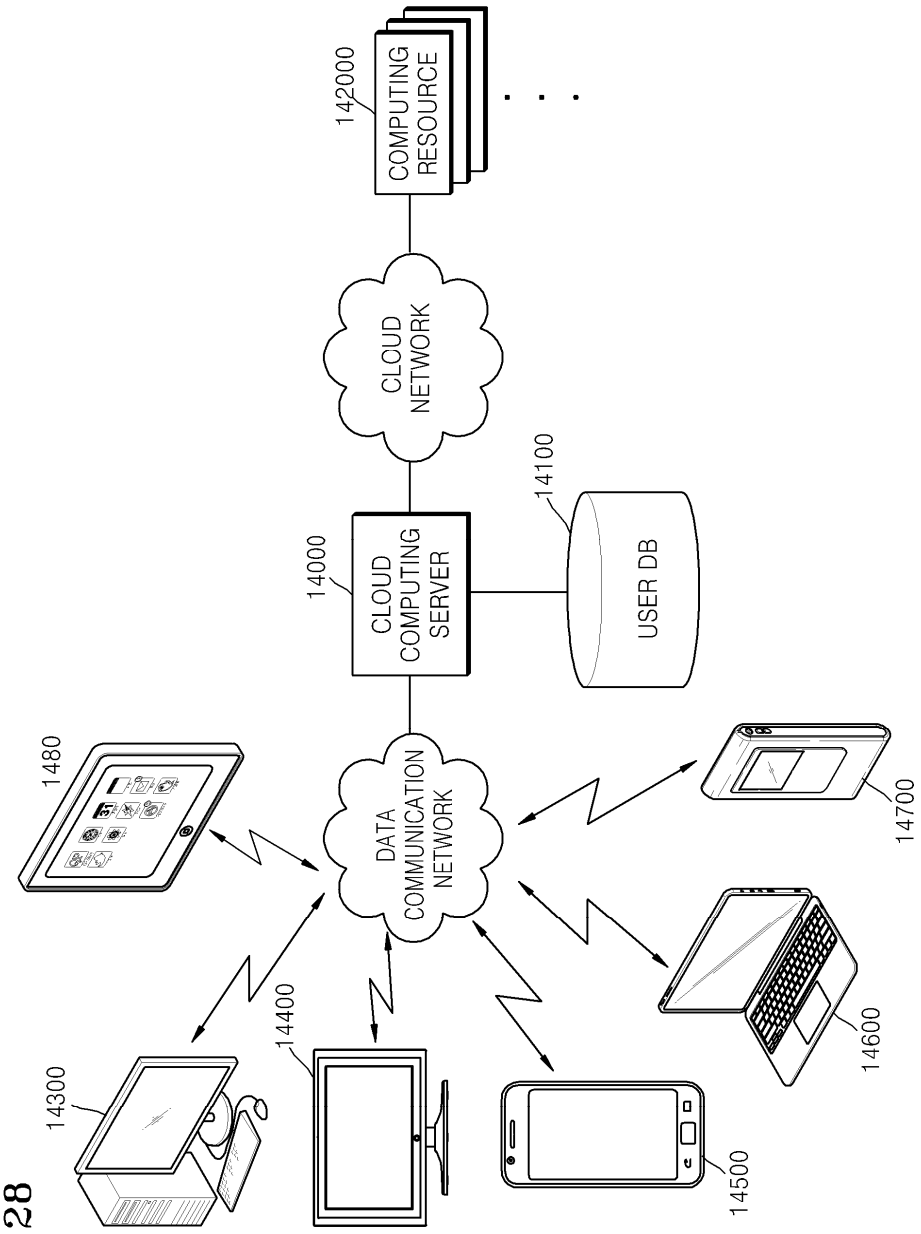

MONITOR (12840)
REPRODUCING APPARATUS (12830)
12820
ANTENNA (12910)
AUTOMOBILE (12920)
AUTOMOBILE NAVIGATION SYSTEM (12930)
HOUSEHOLD ANTENNA (12860)
TV MONITOR (12880)
TV (12810)
SET-TOP BOX (12870)
HARD DISC RECORDER (12950)
SATELLITE (12900)
CABLE ANTENNA (12850)
12960
SD
12970
BROADCASTING STATION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

FIG. 28


142000
COMPUTING RESOURCE
CLOUD NETWORK
14100
USER DB
14000
CLOUD COMPUTING SERVER
DATA COMMUNICATION NETWORK
1480
14700
14600
14400
14300
14500