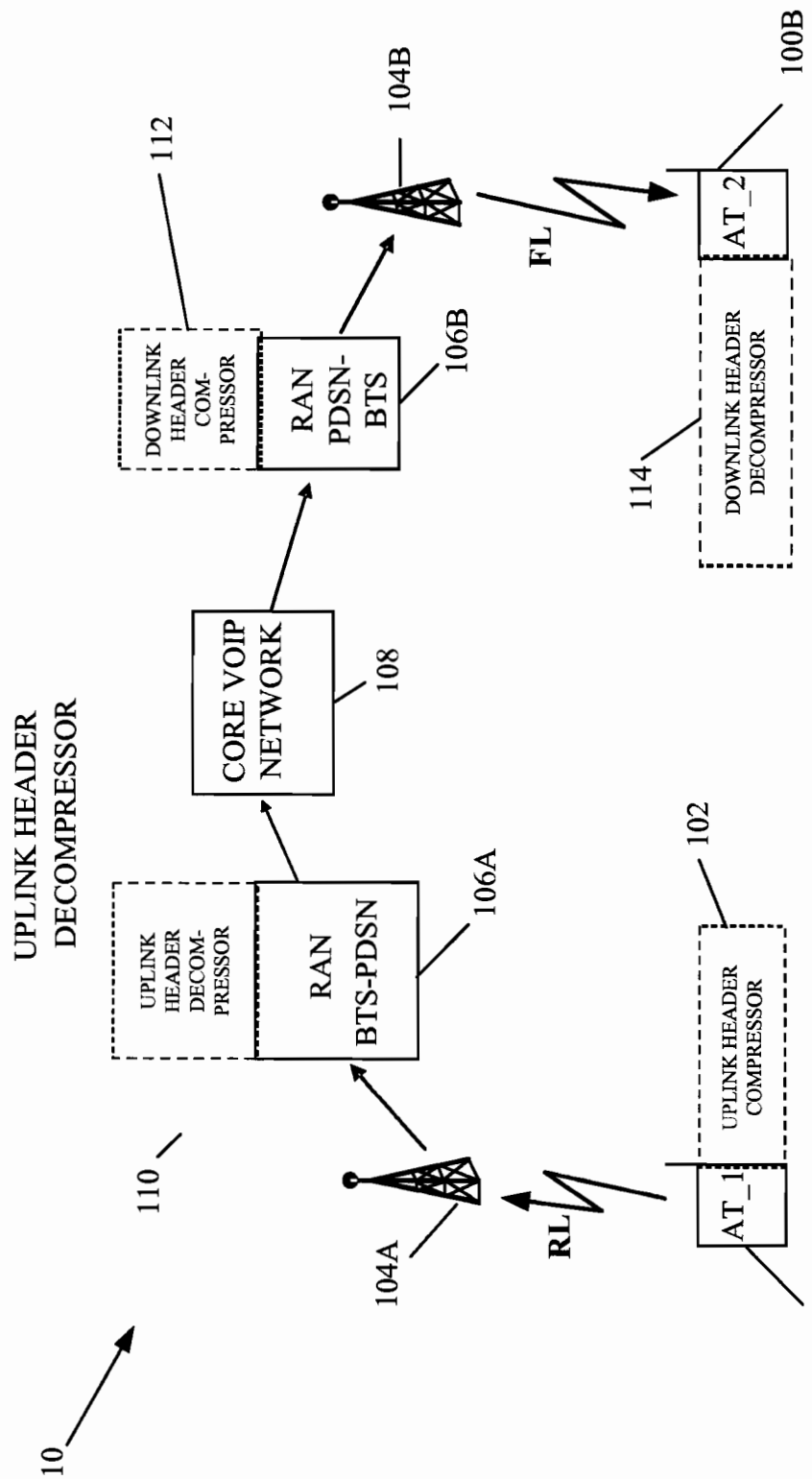
10
UPLINK HEADER DECOMPRESSOR
110
104A
RL
UPLINK HEADER DECOM-PRESSOR
RAN BTS-PDSN
106A
CORE VOIP NETWORK
108
DOWNLINK HEADER COM-PRESSOR
112
RAN PDSN-BTS
106B
104B
FL
AT_1
UPLINK HEADER COMPRESSOR
102
100A
AT_2
DOWNLINK HEADER DECOMPRESSOR
114
100B

FIG. 1

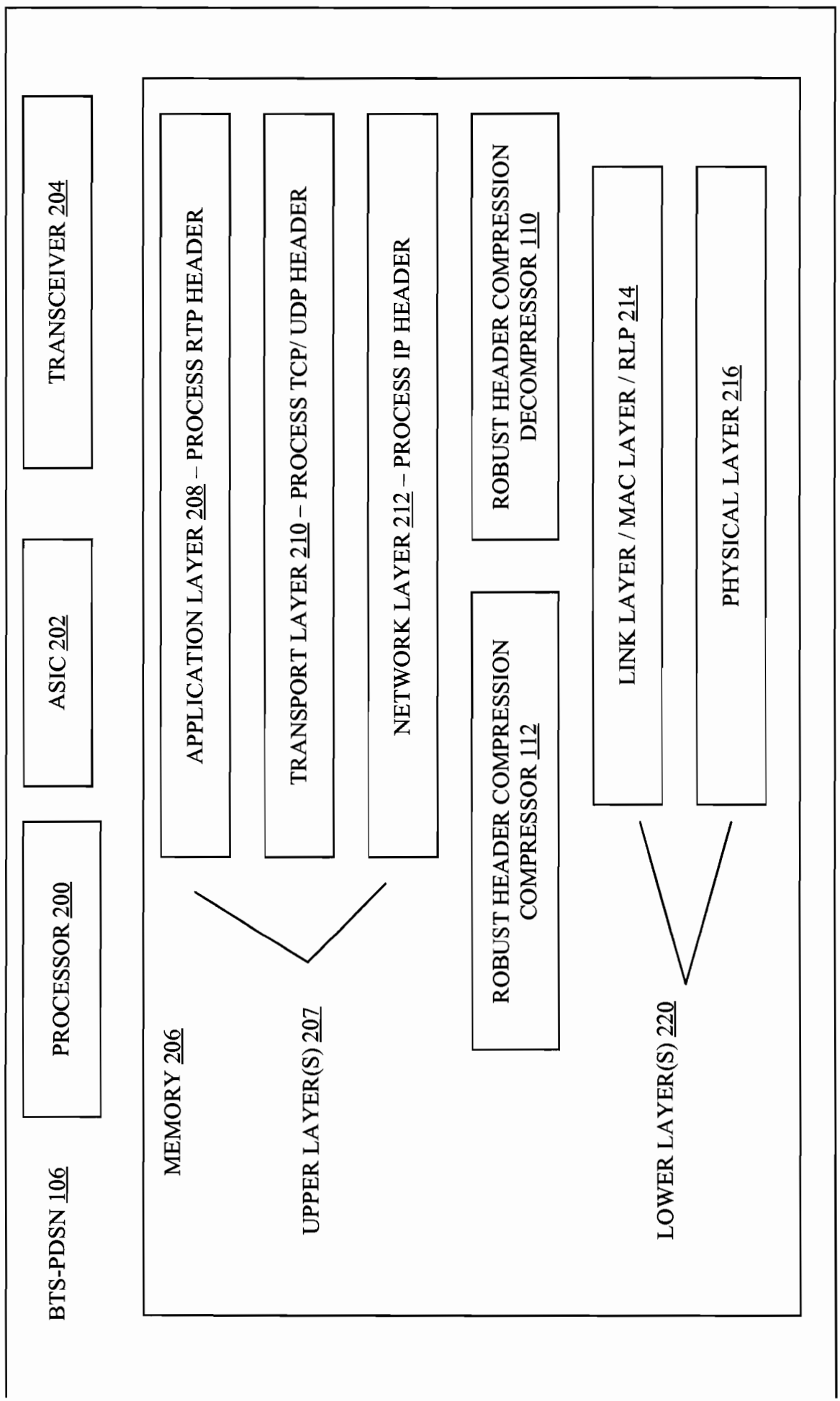
BTS-PDSN 106
PROCESSOR 200
ASIC 202
TRANSCEIVER 204
MEMORY 206
APPLICATION LAYER 208 – PROCESS RTP HEADER
TRANSPORT LAYER 210 – PROCESS TCP/ UDP HEADER
NETWORK LAYER 212 – PROCESS IP HEADER
UPPER LAYER(S) 207
ROBUST HEADER COMPRESSION COMPRESSOR 110
ROBUST HEADER COMPRESSION DECOMPRESSOR 110
LINK LAYER / MAC LAYER / RLP 214
PHYSICAL LAYER 216
LOWER LAYER(S) 220

FIG. 2

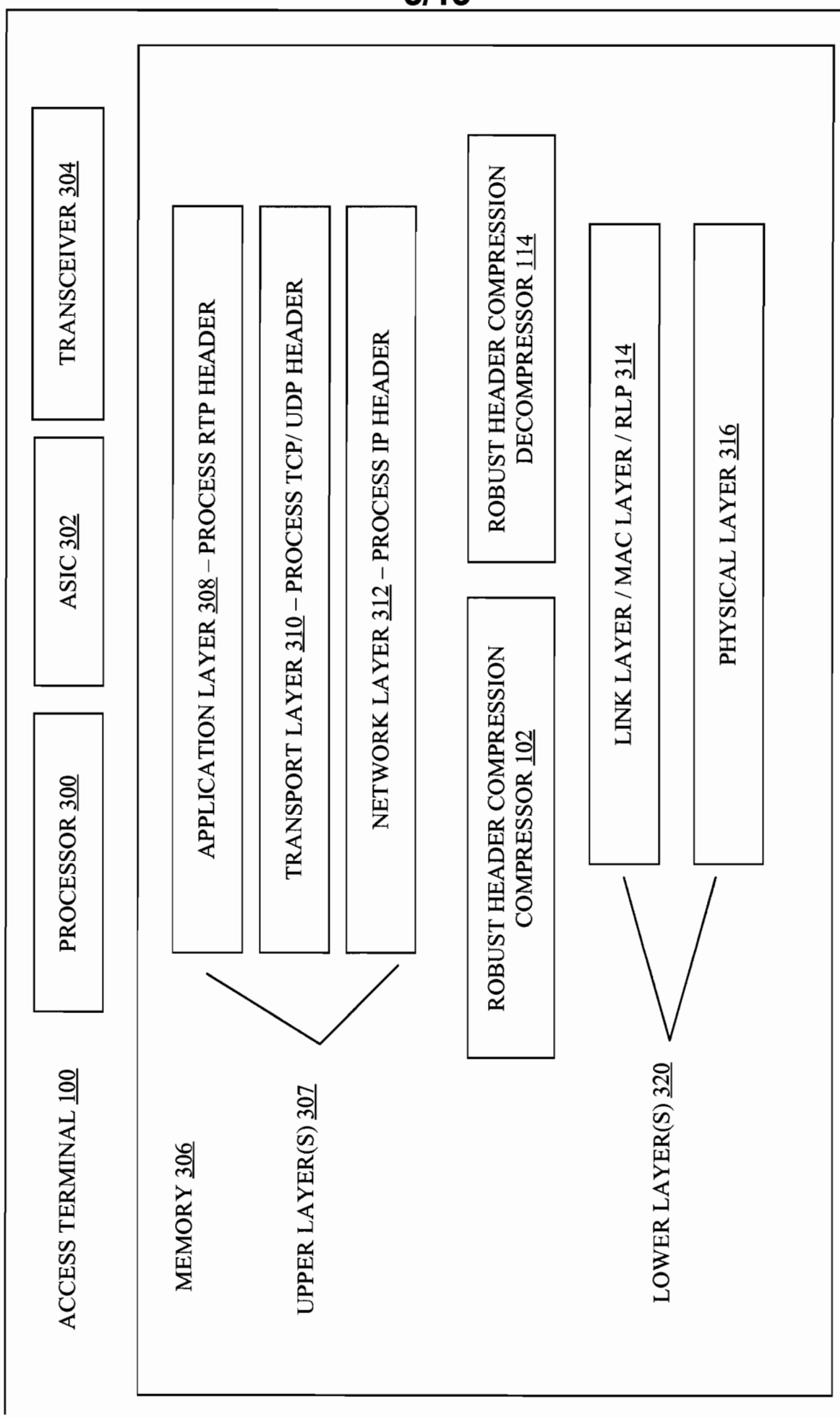
ACCESS TERMINAL 100
PROCESSOR 300
ASIC 302
TRANSCEIVER 304
MEMORY 306
APPLICATION LAYER 308 – PROCESS RTP HEADER
TRANSPORT LAYER 310 – PROCESS TCP/ UDP HEADER
NETWORK LAYER 312 – PROCESS IP HEADER
UPPER LAYER(S) 307
ROBUST HEADER COMPRESSION COMPRESSOR 102
ROBUST HEADER COMPRESSION DECOMPRESSOR 114
LINK LAYER / MAC LAYER / RLP 314
PHYSICAL LAYER 316
LOWER LAYER(S) 320

FIG. 3

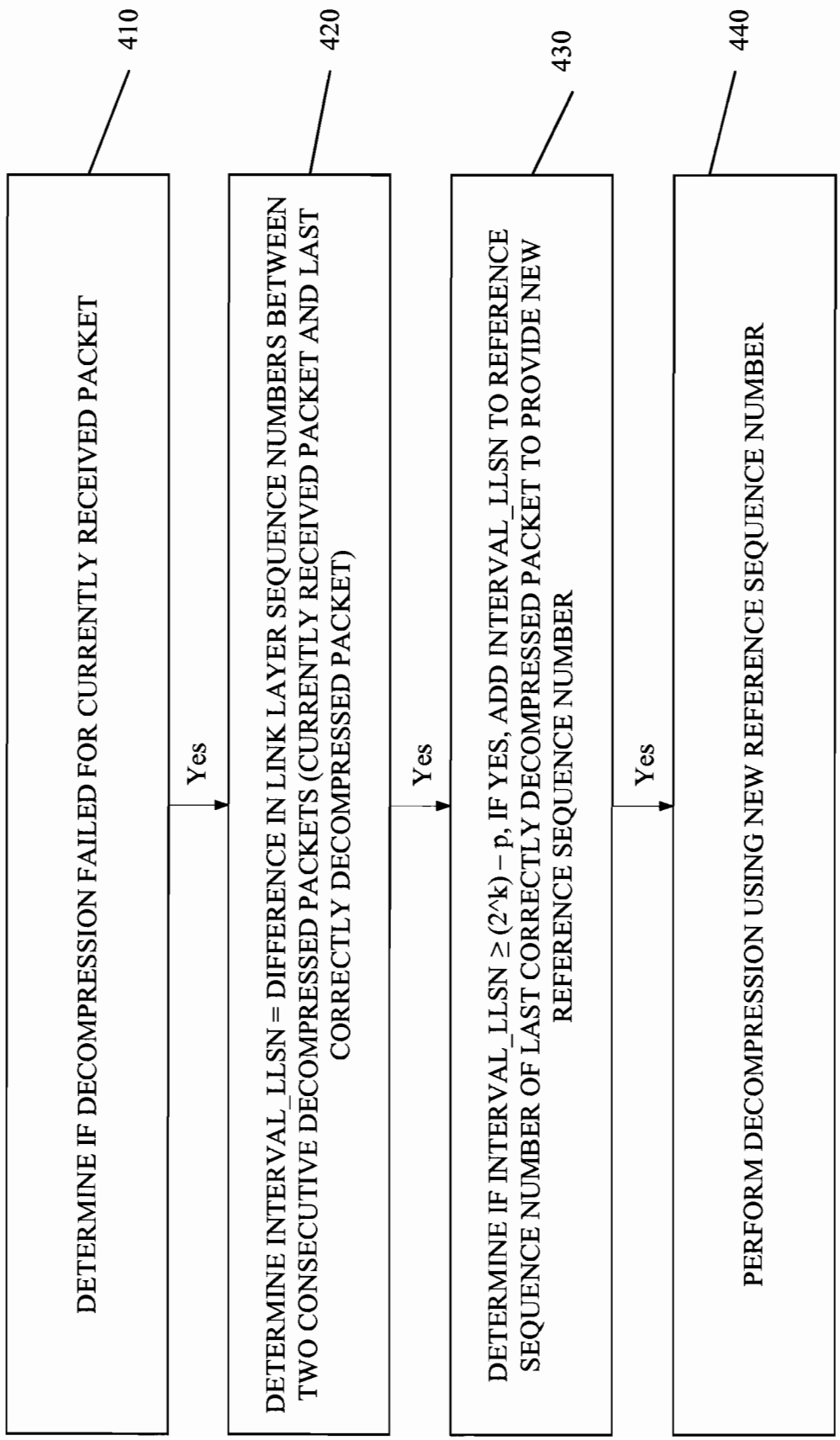
410
DETERMINE IF DECOMPRESSION FAILED FOR CURRENTLY RECEIVED PACKET
Yes
420
DETERMINE INTERVAL_LLSN = DIFFERENCE IN LINK LAYER SEQUENCE NUMBERS BETWEEN TWO CONSECUTIVE DECOMPRESSED PACKETS (CURRENTLY RECEIVED PACKET AND LAST CORRECTLY DECOMPRESSED PACKET)
Yes
430
DETERMINE IF INTERVAL_LLSN ≥ (2^k) – p, IF YES, ADD INTERVAL_LLSN TO REFERENCE SEQUENCE NUMBER OF LAST CORRECTLY DECOMPRESSED PACKET TO PROVIDE NEW REFERENCE SEQUENCE NUMBER
Yes
440
PERFORM DECOMPRESSION USING NEW REFERENCE SEQUENCE NUMBER

FIG. 4

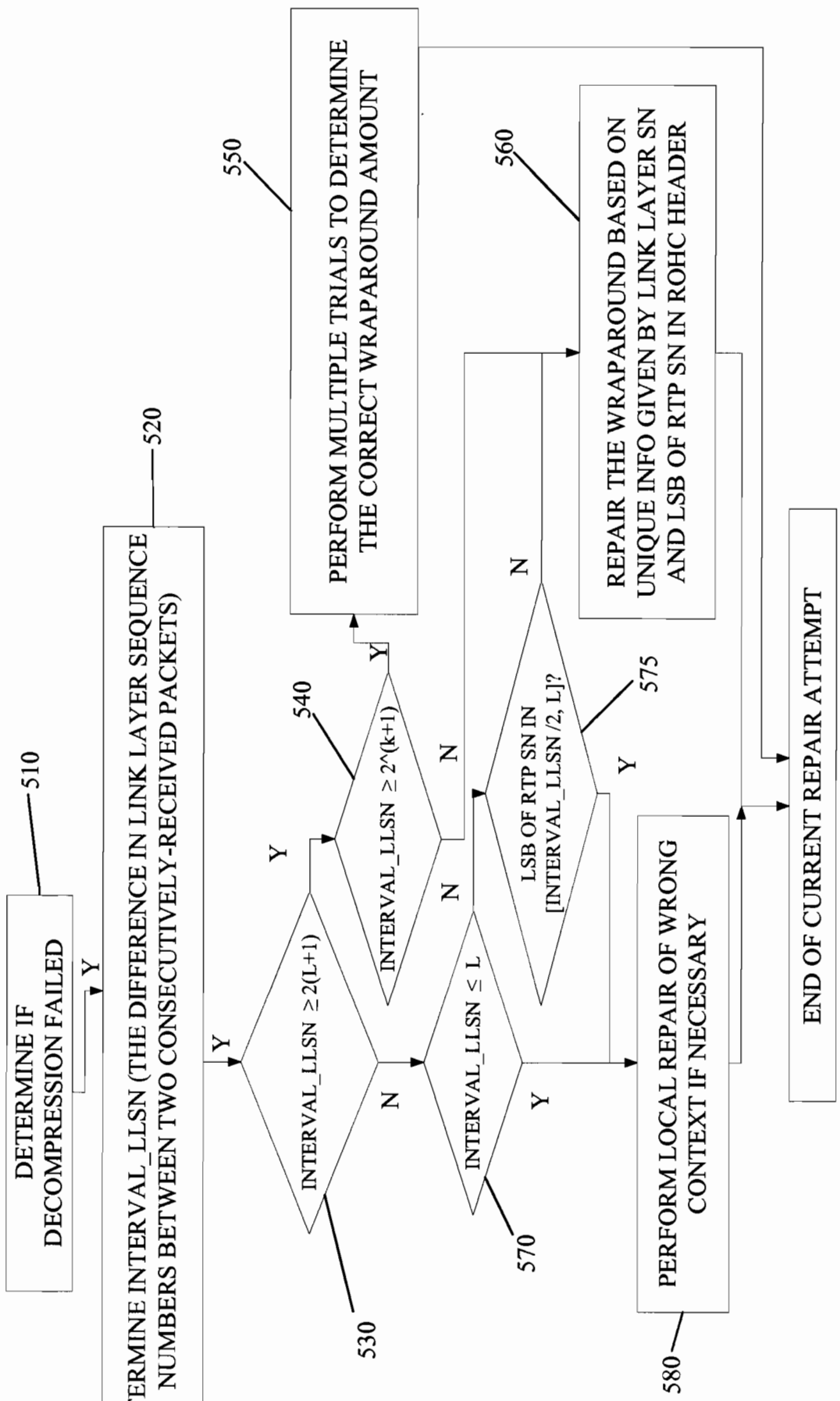
DETERMINE IF DECOMPRESSION FAILED
510
Y
DETERMINE INTERVAL_LLSN (THE DIFFERENCE IN LINK LAYER SEQUENCE NUMBERS BETWEEN TWO CONSECUTIVELY-RECEIVED PACKETS)
520
Y
INTERVAL_LLSN ≥ 2(L+1)
530
N
Y
INTERVAL_LLSN ≥ 2^(k+1)
540
N
Y
PERFORM MULTIPLE TRIALS TO DETERMINE THE CORRECT WRAPAROUND AMOUNT
550
INTERVAL_LLSN ≤ L
570
Y
LSB OF RTP SN IN [INTERVAL_LLSN /2, L]?
575
N
Y
REPAIR THE WRAPAROUND BASED ON UNIQUE INFO GIVEN BY LINK LAYER SN AND LSB OF RTP SN IN ROHC HEADER
560
PERFORM LOCAL REPAIR OF WRONG CONTEXT IF NECESSARY
580
END OF CURRENT REPAIR ATTEMPT

FIG. 5

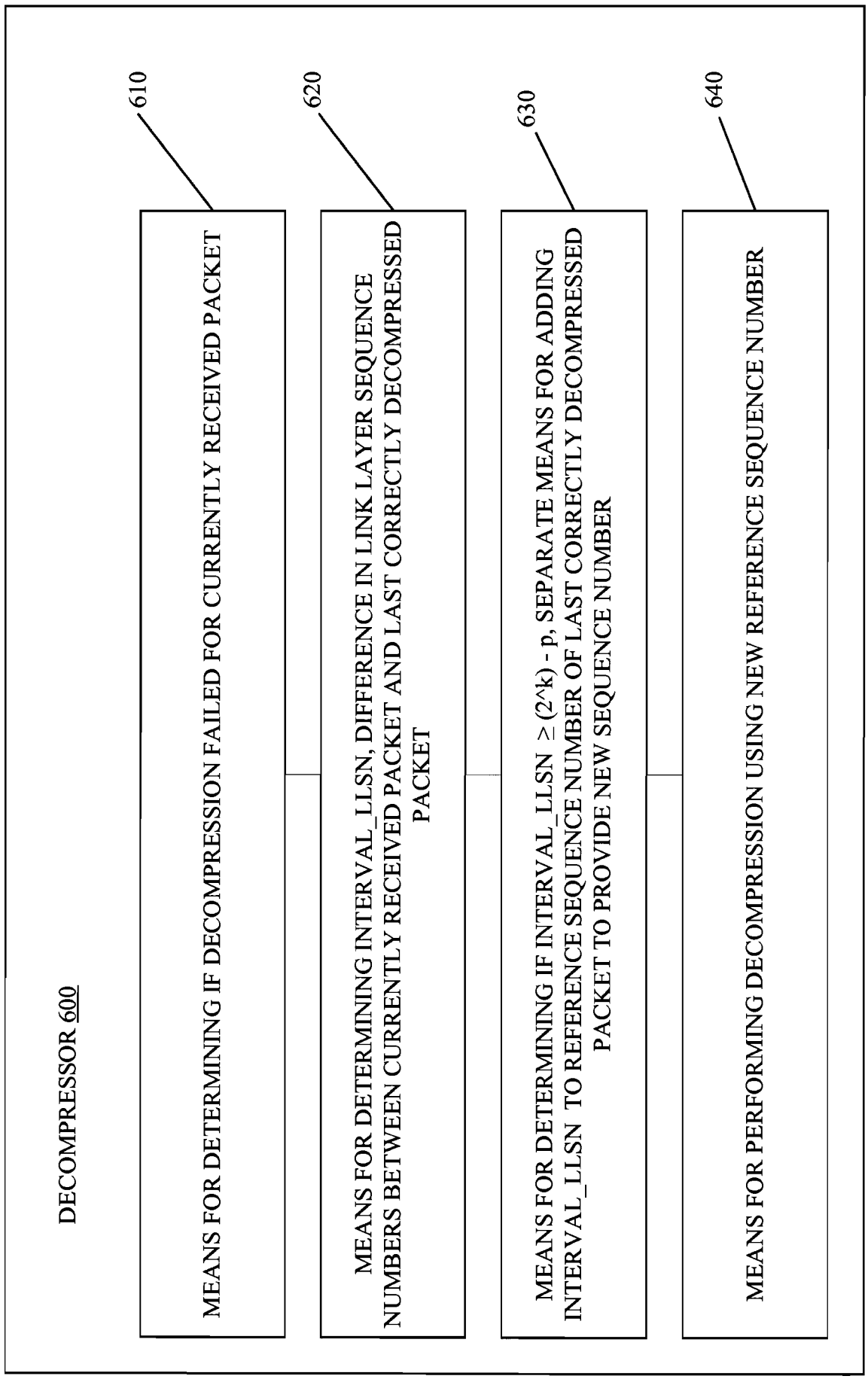
DECOMPRESSOR 600
610
MEANS FOR DETERMINING IF DECOMPRESSION FAILED FOR CURRENTLY RECEIVED PACKET
620
MEANS FOR DETERMINING INTERVAL_LLSN, DIFFERENCE IN LINK LAYER SEQUENCE NUMBERS BETWEEN CURRENTLY RECEIVED PACKET AND LAST CORRECTLY DECOMPRESSED PACKET
630
MEANS FOR DETERMINING IF INTERVAL_LLSN ≥ (2^k) - p, SEPARATE MEANS FOR ADDING INTERVAL_LLSN TO REFERENCE SEQUENCE NUMBER OF LAST CORRECTLY DECOMPRESSED PACKET TO PROVIDE NEW SEQUENCE NUMBER
640
MEANS FOR PERFORMING DECOMPRESSION USING NEW REFERENCE SEQUENCE NUMBER

FIG. 6

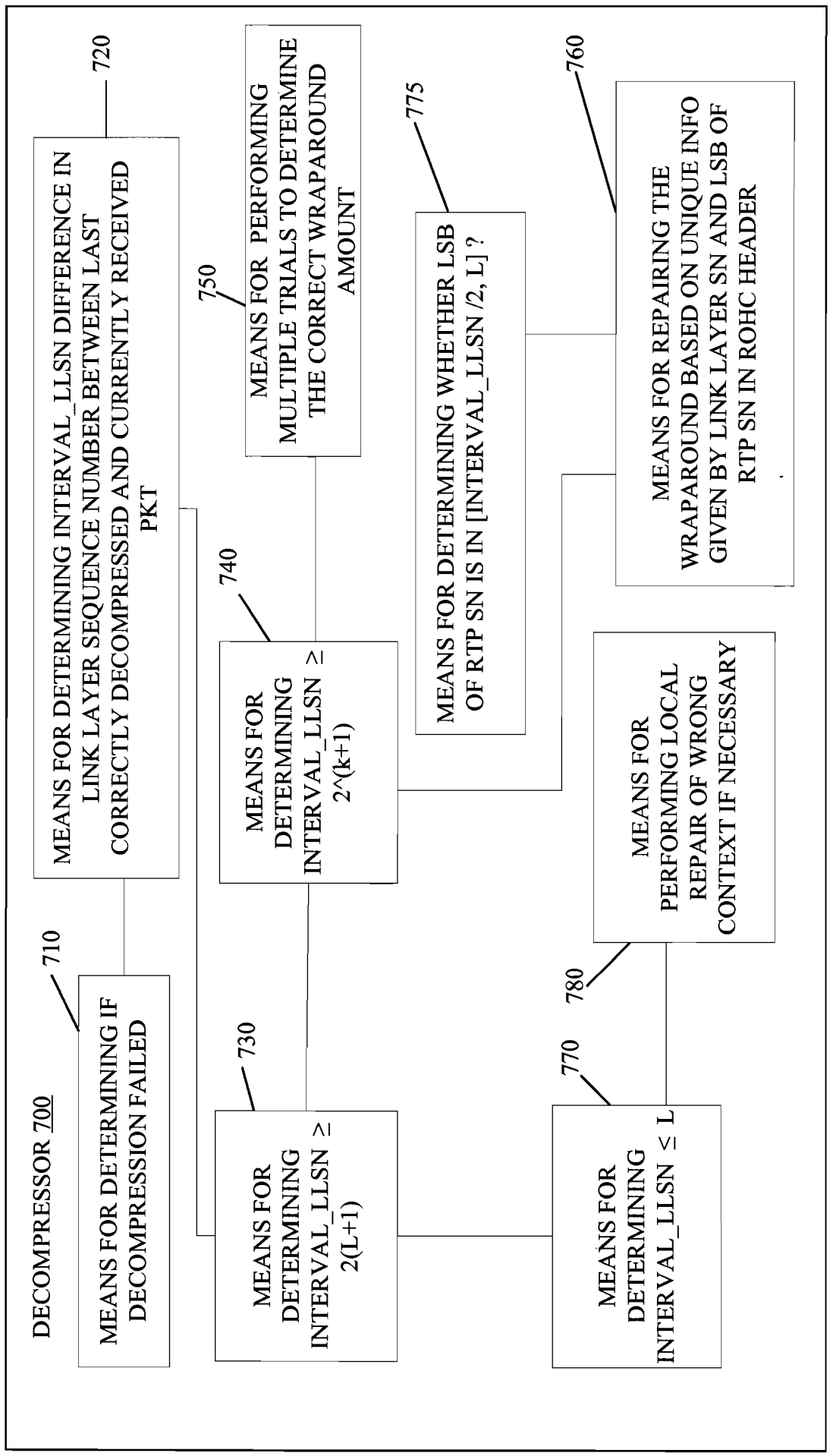
DECOMPRESSOR 700
MEANS FOR DETERMINING IF DECOMPRESSION FAILED
710
MEANS FOR DETERMINING INTERVAL_LLSN DIFFERENCE IN LINK LAYER SEQUENCE NUMBER BETWEEN LAST CORRECTLY DECOMPRESSED AND CURRENTLY RECEIVED PKT
720
MEANS FOR DETERMINING INTERVAL_LLSN ≥ 2(L+1)
730
MEANS FOR DETERMINING INTERVAL_LLSN ≥ 2^(k+1)
740
MEANS FOR PERFORMING MULTIPLE TRIALS TO DETERMINE THE CORRECT WRAPAROUND AMOUNT
750
MEANS FOR DETERMINING INTERVAL_LLSN ≤ L
770
MEANS FOR PERFORMING LOCAL REPAIR OF WRONG CONTEXT IF NECESSARY
780
MEANS FOR DETERMINING WHETHER LSB OF RTP SN IS IN [INTERVAL_LLSN /2, L] ?
775
MEANS FOR REPAIRING THE WRAPAROUND BASED ON UNIQUE INFO GIVEN BY LINK LAYER SN AND LSB OF RTP SN IN ROHC HEADER
760

FIG. 7

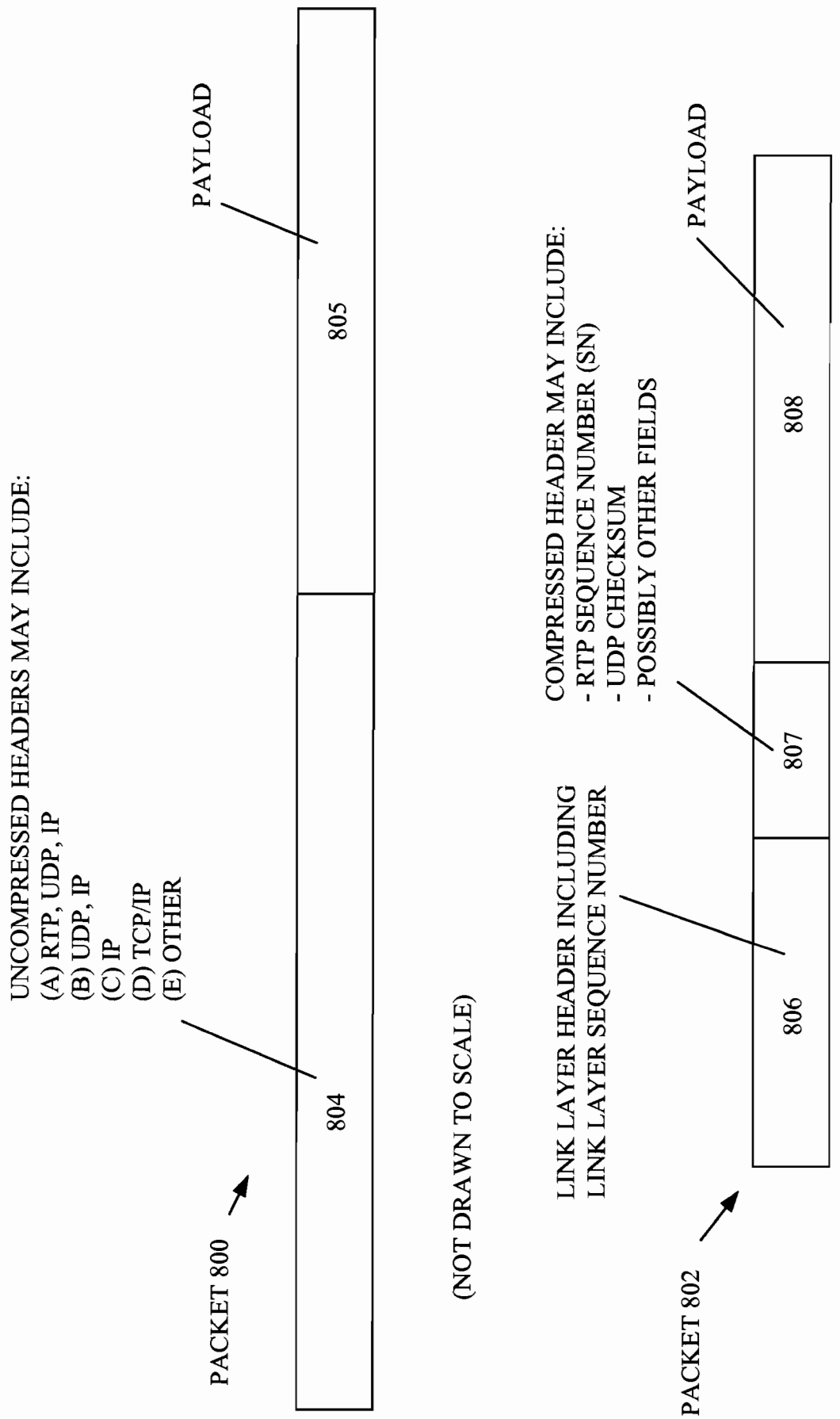
PACKET 800
804
805
PAYLOAD
UNCOMPRESSED HEADERS MAY INCLUDE:
(A) RTP, UDP, IP
(B) UDP, IP
(C) IP
(D) TCP/IP
(E) OTHER
(NOT DRAWN TO SCALE)
PACKET 802
806
807
808
PAYLOAD
LINK LAYER HEADER INCLUDING
LINK LAYER SEQUENCE NUMBER
COMPRESSED HEADER MAY INCLUDE:
- RTP SEQUENCE NUMBER (SN)
- UDP CHECKSUM
- POSSIBLY OTHER FIELDS

FIG. 8

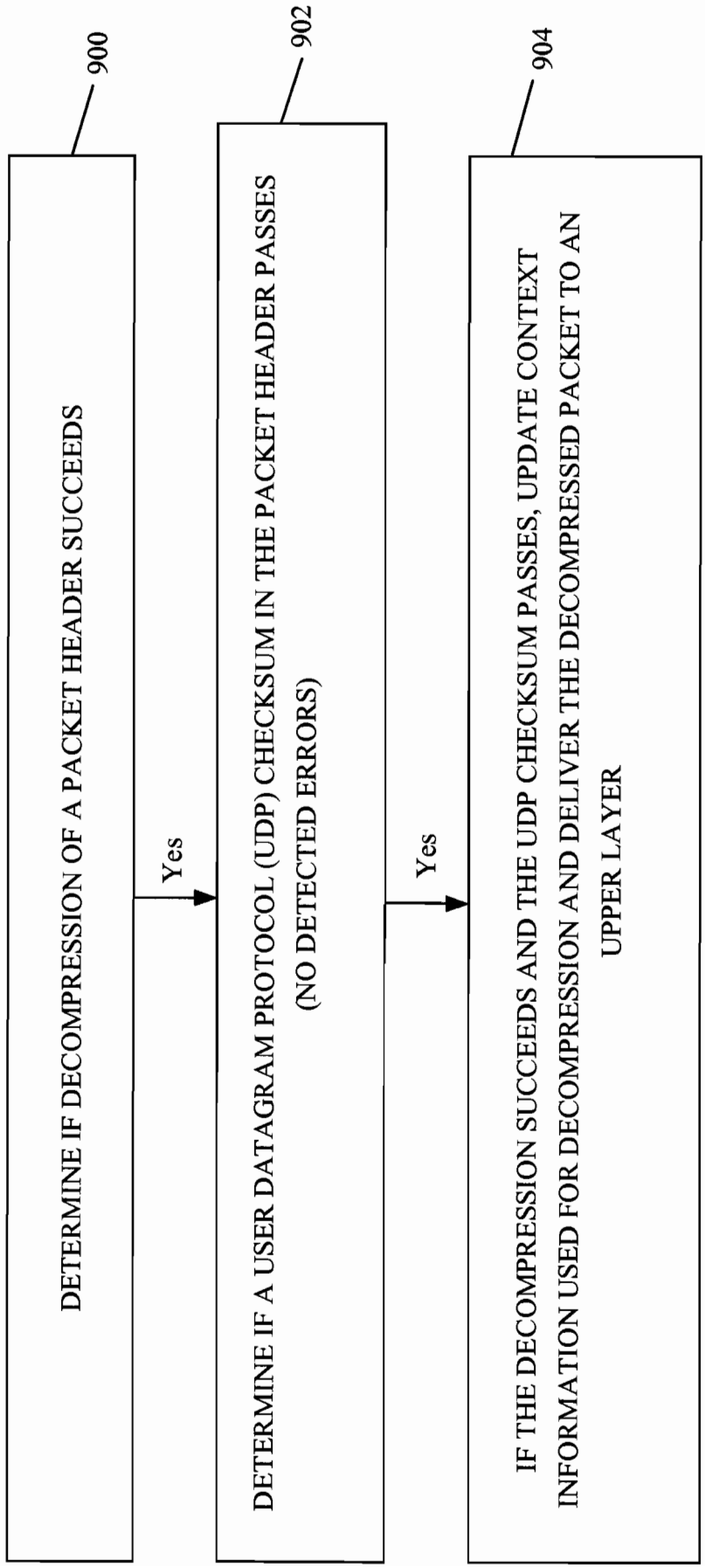
900
DETERMINE IF DECOMPRESSION OF A PACKET HEADER SUCCEEDS
Yes
902
DETERMINE IF A USER DATAGRAM PROTOCOL (UDP) CHECKSUM IN THE PACKET HEADER PASSES
(NO DETECTED ERRORS)
Yes
904
IF THE DECOMPRESSION SUCCEEDS AND THE UDP CHECKSUM PASSES, UPDATE CONTEXT INFORMATION USED FOR DECOMPRESSION AND DELIVER THE DECOMPRESSED PACKET TO AN UPPER LAYER

FIG. 9

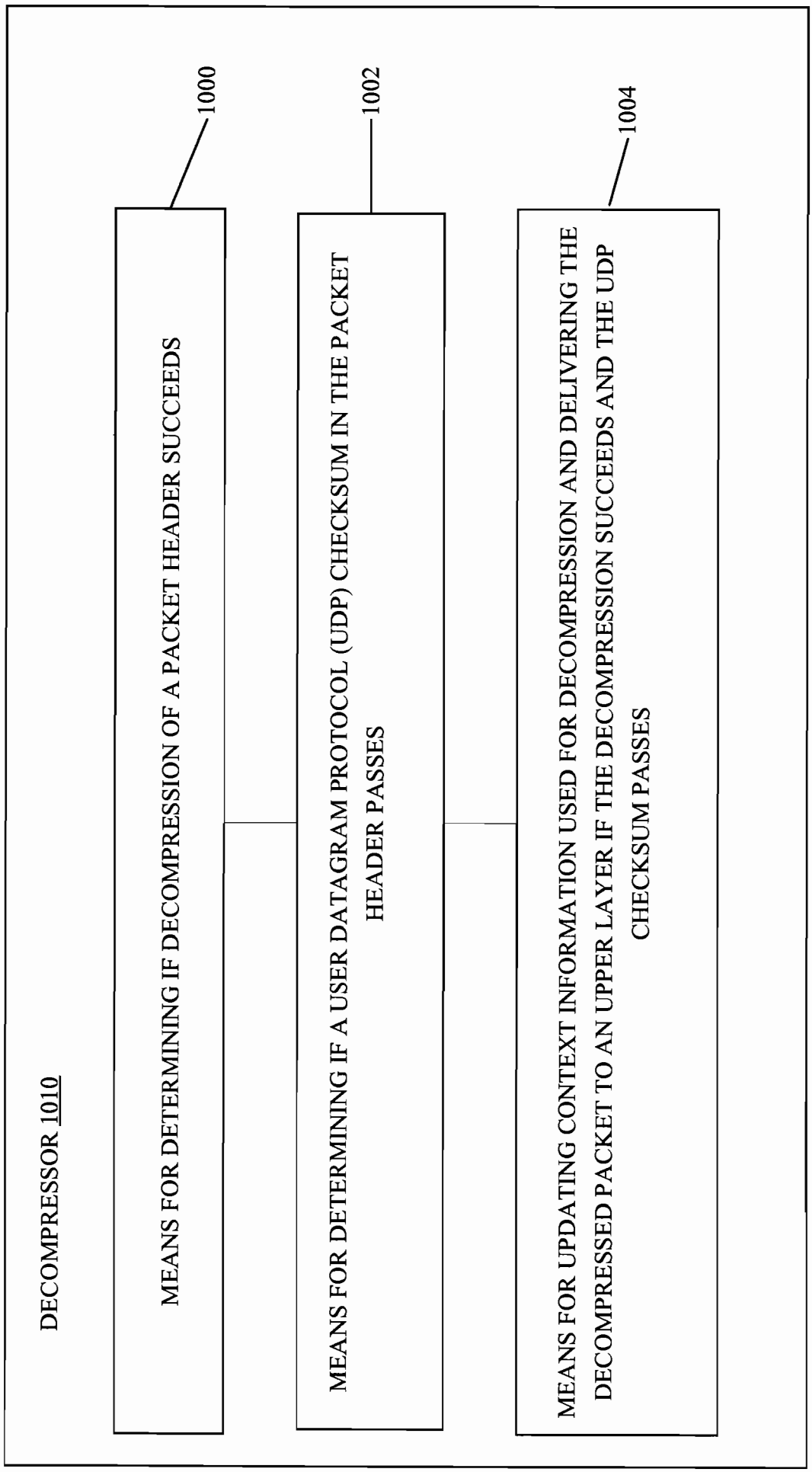
DECOMPRESSOR 1010
1000
MEANS FOR DETERMINING IF DECOMPRESSION OF A PACKET HEADER SUCCEEDS
1002
MEANS FOR DETERMINING IF A USER DATAGRAM PROTOCOL (UDP) CHECKSUM IN THE PACKET HEADER PASSES
1004
MEANS FOR UPDATING CONTEXT INFORMATION USED FOR DECOMPRESSION AND DELIVERING THE DECOMPRESSED PACKET TO AN UPPER LAYER IF THE DECOMPRESSION SUCCEEDS AND THE UDP CHECKSUM PASSES

FIG. 10

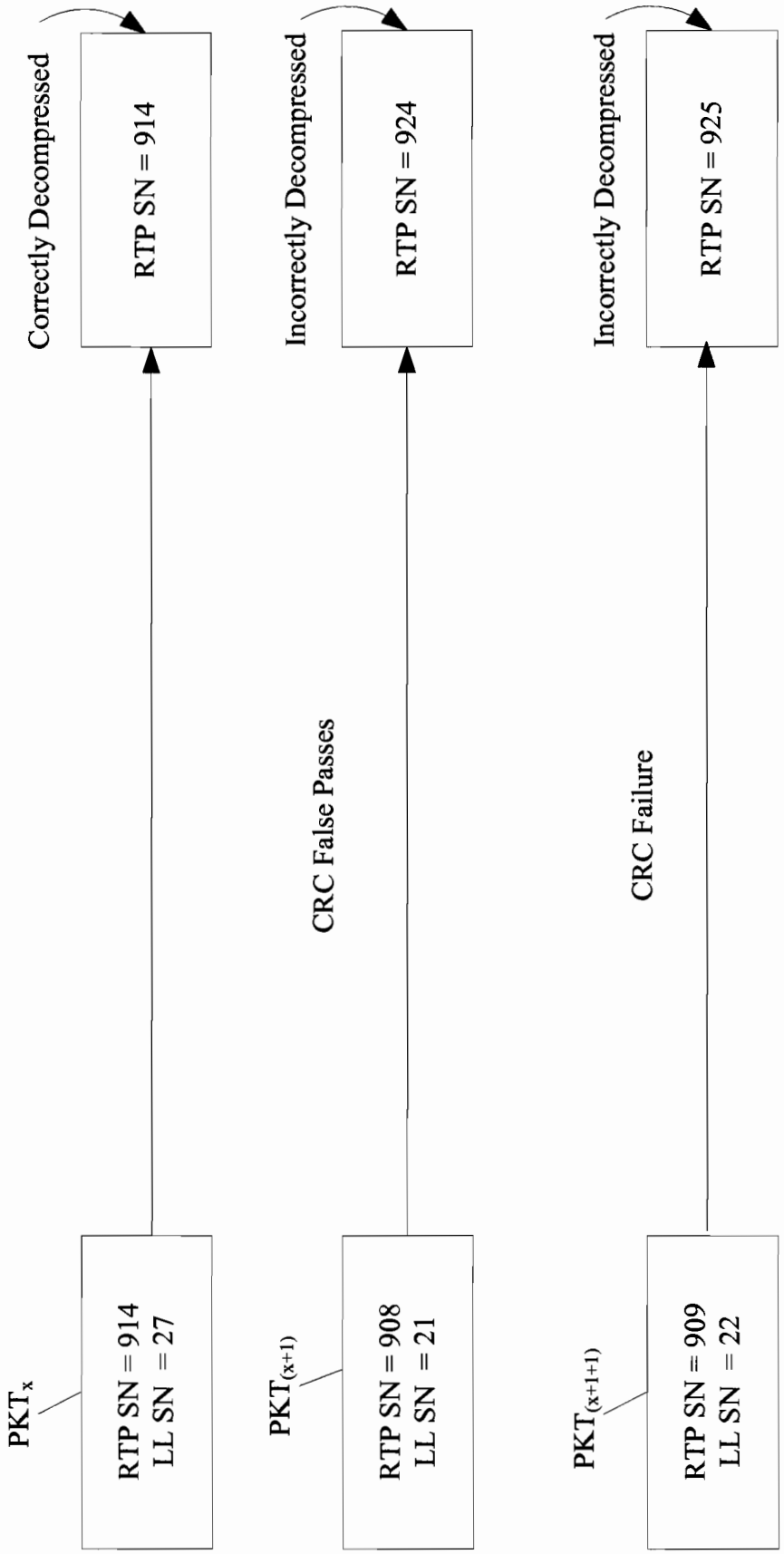
PKT$_x$
RTP SN = 914
LL SN = 27
Correctly Decompressed
RTP SN = 914
PKT$_{(x+1)}$
RTP SN = 908
LL SN = 21
CRC False Passes
Incorrectly Decompressed
RTP SN = 924
PKT$_{(x+1+1)}$
RTP SN = 909
LL SN = 22
CRC Failure
Incorrectly Decompressed
RTP SN = 925

FIG. 11

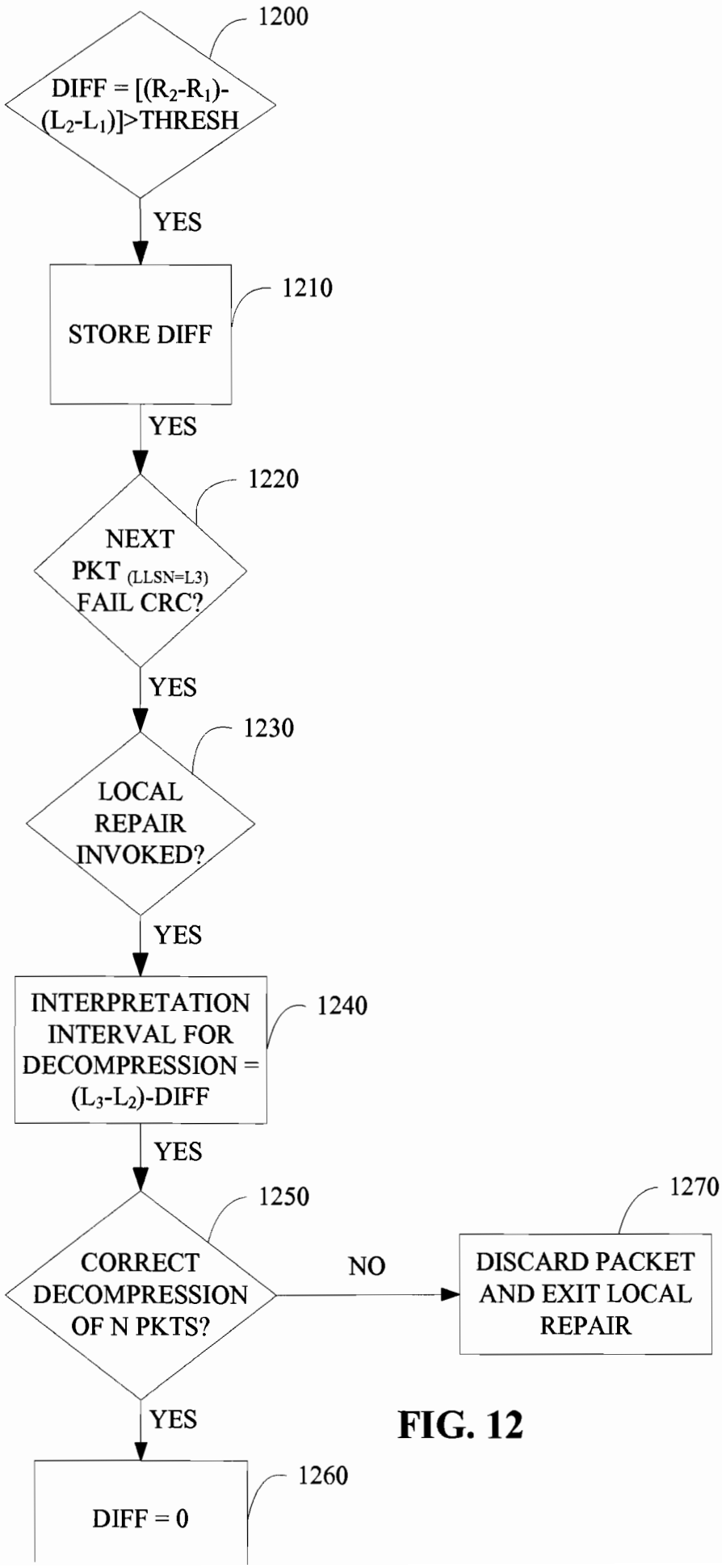
1200
DIFF = [(R2-R1)-(L2-L1)]>THRESH
YES
1210
STORE DIFF
YES
1220
NEXT PKT (LLSN=L3) FAIL CRC?
YES
1230
LOCAL REPAIR INVOKED?
YES
1240
INTERPRETATION INTERVAL FOR DECOMPRESSION = (L3-L2)-DIFF
YES
1250
CORRECT DECOMPRESSION OF N PKTS?
NO
1270
DISCARD PACKET AND EXIT LOCAL REPAIR
YES
1260
DIFF = 0

FIG. 12

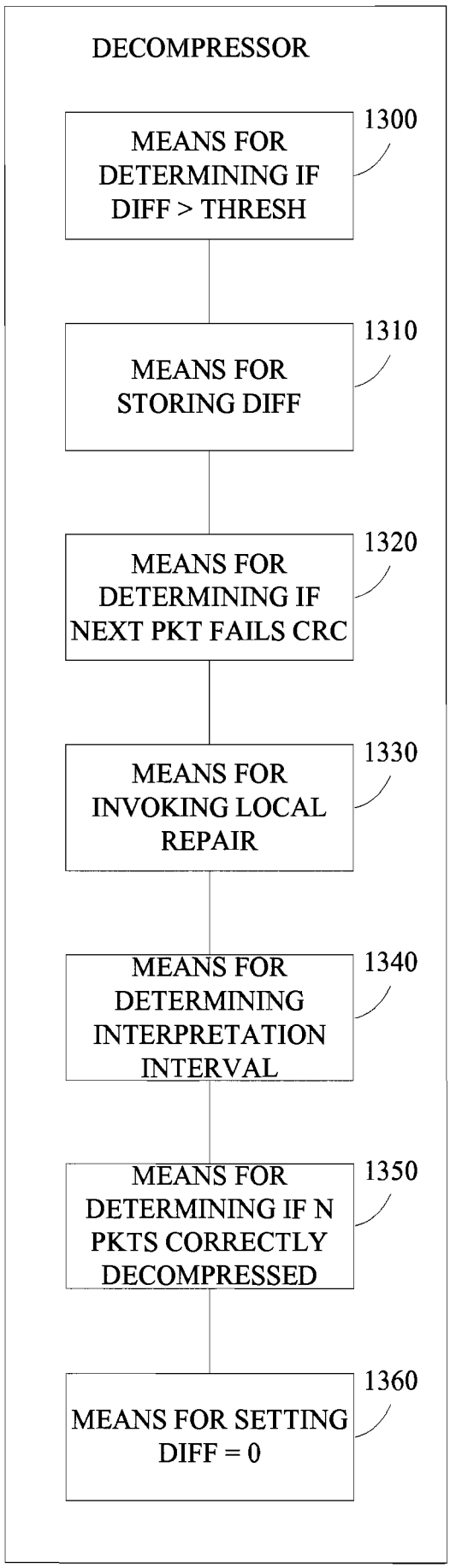
DECOMPRESSOR
MEANS FOR DETERMINING IF DIFF > THRESH
1300
MEANS FOR STORING DIFF
1310
MEANS FOR DETERMINING IF NEXT PKT FAILS CRC
1320
MEANS FOR INVOKING LOCAL REPAIR
1330
MEANS FOR DETERMINING INTERPRETATION INTERVAL
1340
MEANS FOR DETERMINING IF N PKTS CORRECTLY DECOMPRESSED
1350
MEANS FOR SETTING DIFF = 0
1360

FIG. 13