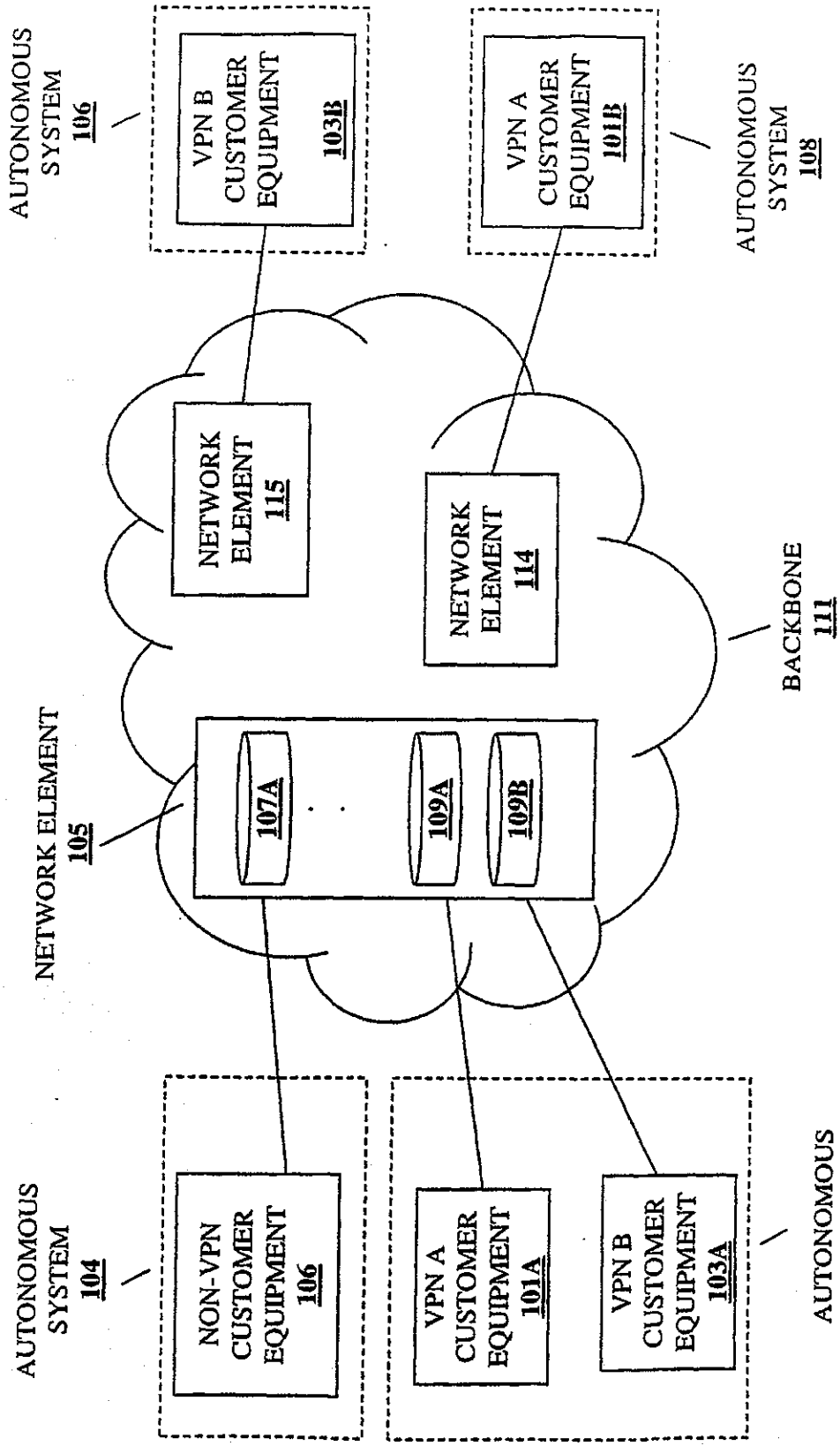

AUTONOMOUS SYSTEM 106
VPN B CUSTOMER EQUIPMENT 103B
VPN A CUSTOMER EQUIPMENT 101B
AUTONOMOUS SYSTEM 108
NETWORK ELEMENT 115
NETWORK ELEMENT 114
BACKBONE 111
NETWORK ELEMENT 105
107A
109A
109B
AUTONOMOUS SYSTEM 104
NON-VPN CUSTOMER EQUIPMENT 106
VPN A CUSTOMER EQUIPMENT 101A
VPN B CUSTOMER EQUIPMENT 103A
AUTONOMOUS SYSTEM 102

FIG. 1

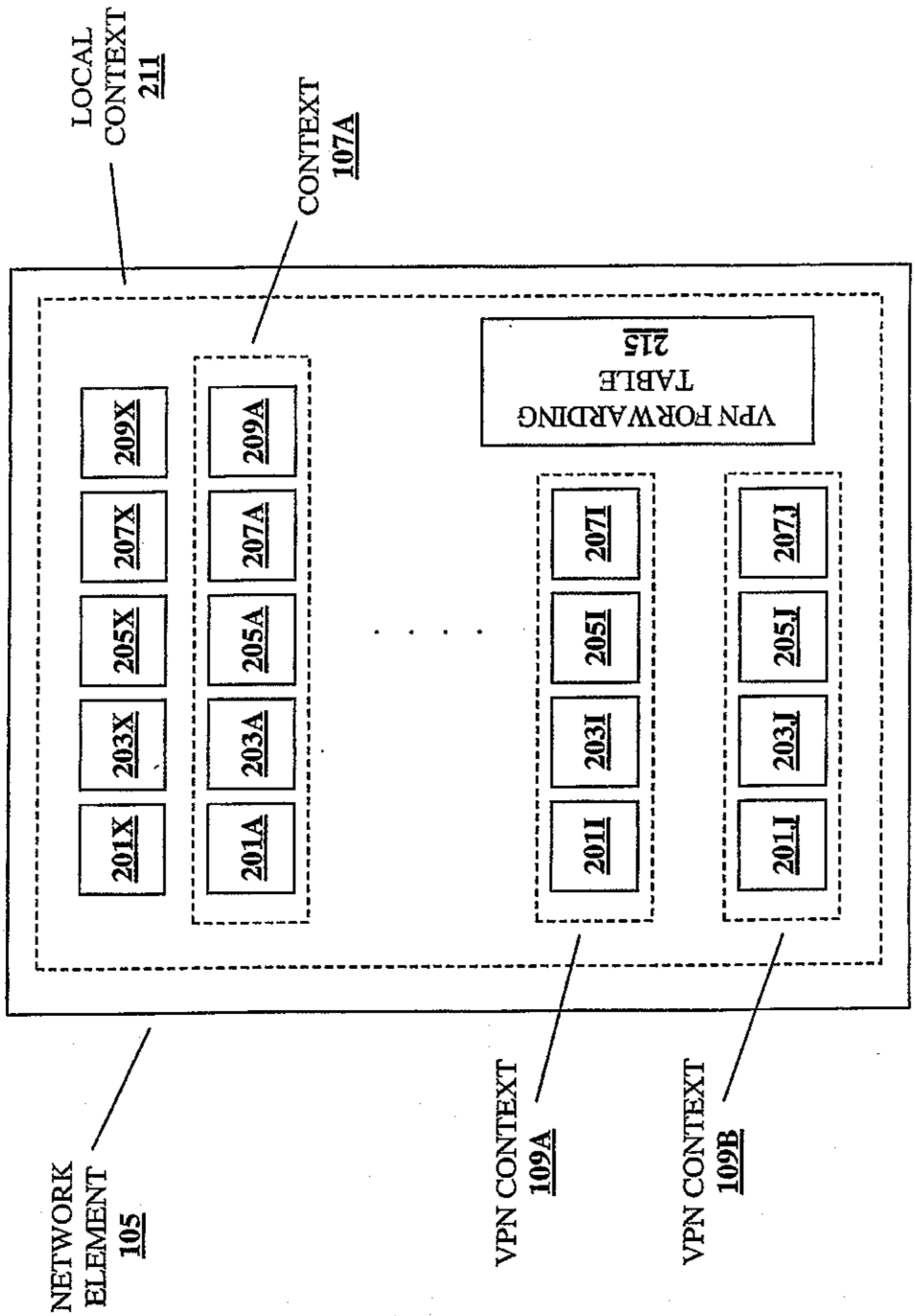

LOCAL CONTEXT 211
CONTEXT 107A
VPN FORWARDING TABLE 215
201X
203X
205X
207X
209X
201A
203A
205A
207A
209A
201I
203I
205I
207I
201J
203J
205J
207J
NETWORK ELEMENT 105
VPN CONTEXT 109A
VPN CONTEXT 109B

FIG. 2A

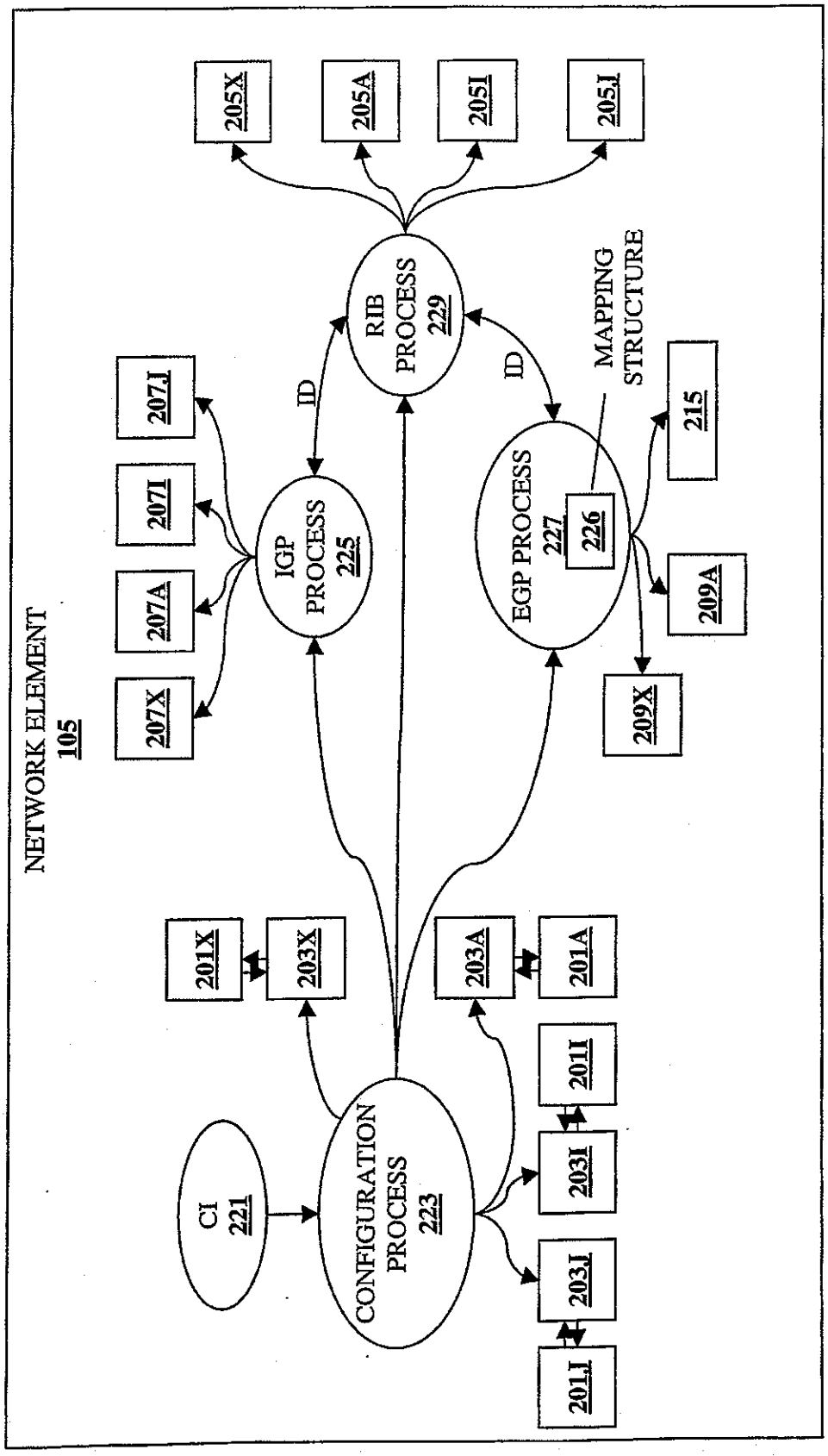

NETWORK ELEMENT
105
205X
205A
205I
205J
RIB PROCESS
229
ID
ID
MAPPING STRUCTURE
207J
207I
207A
207X
IGP PROCESS
225
EGP PROCESS
227
226
215
209A
209X
201X
203X
203A
201A
201I
203I
203J
201J
CI
221
CONFIGURATION PROCESS
223

FIG. 2B

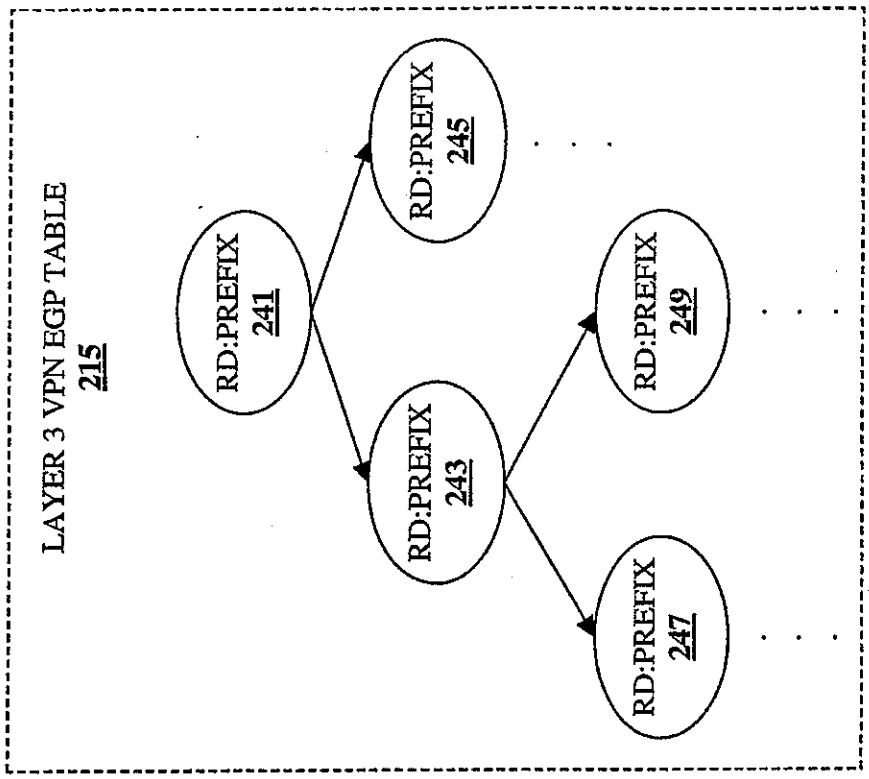

LAYER 3 VPN EGP TABLE
215
RD:PREFIX
241
RD:PREFIX
245
RD:PREFIX
243
RD:PREFIX
249
RD:PREFIX
247
MAPPING STRUCTURE
226
VPN-CONTEXT ID → RD
VPN-CONTEXT ID → RD

FIG. 2C

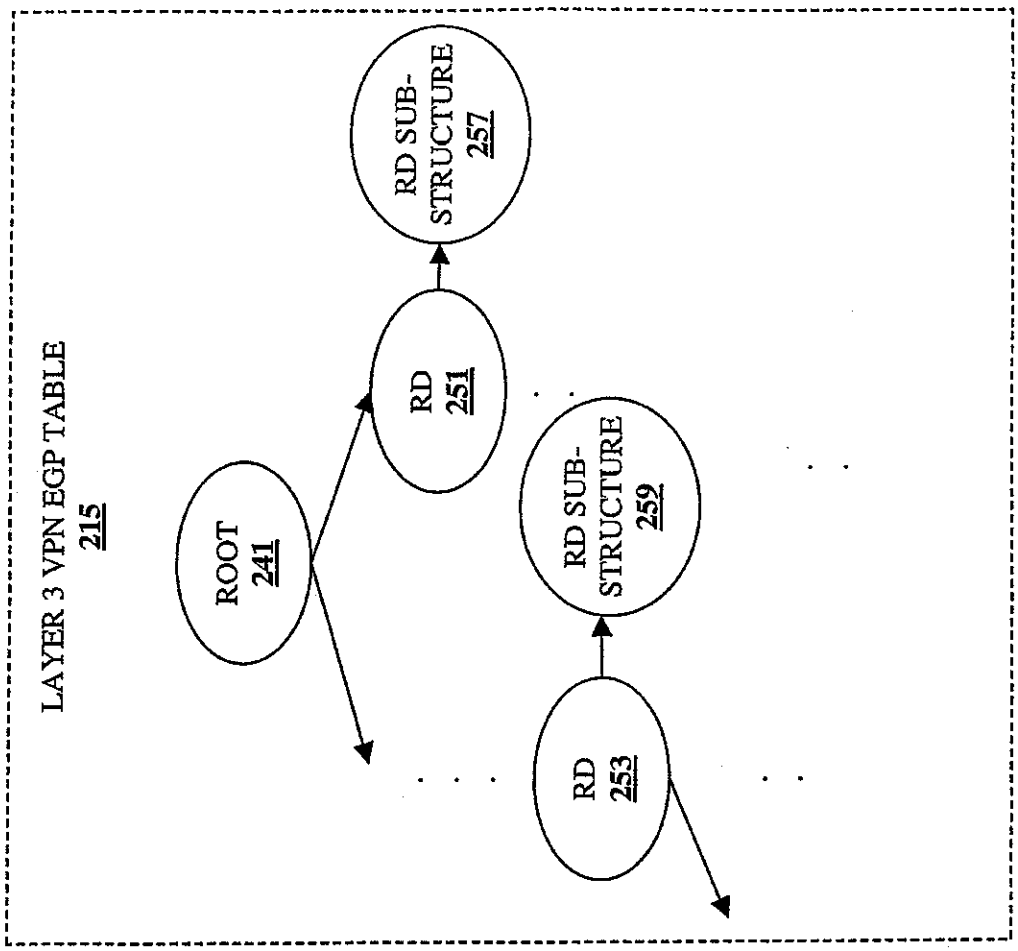
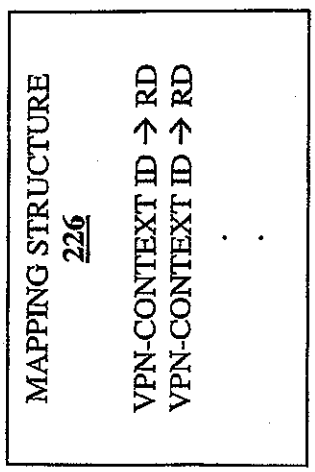

LAYER 3 VPN EGP TABLE
215
ROOT
241
RD
251
RD SUB-STRUCTURE
257
RD SUB-STRUCTURE
259
RD
253

FIG. 2D


MAPPING STRUCTURE
226
VPN-CONTEXT ID → RD
VPN-CONTEXT ID → RD

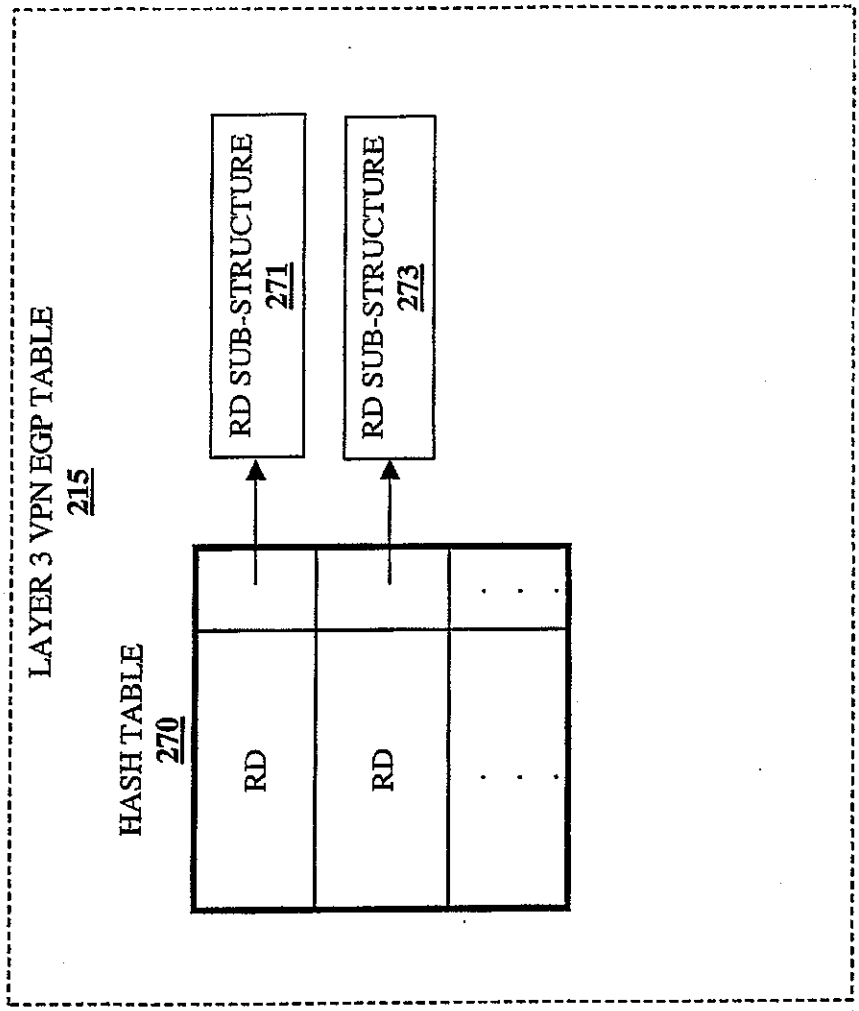

LAYER 3 VPN EGP TABLE
215
HASH TABLE
270
RD
RD
RD SUB-STRUCTURE
271
RD SUB-STRUCTURE
273
MAPPING STRUCTURE
226
VPN-CONTEXT ID → RD
VPN-CONTEXT ID → RD

FIG. 2E

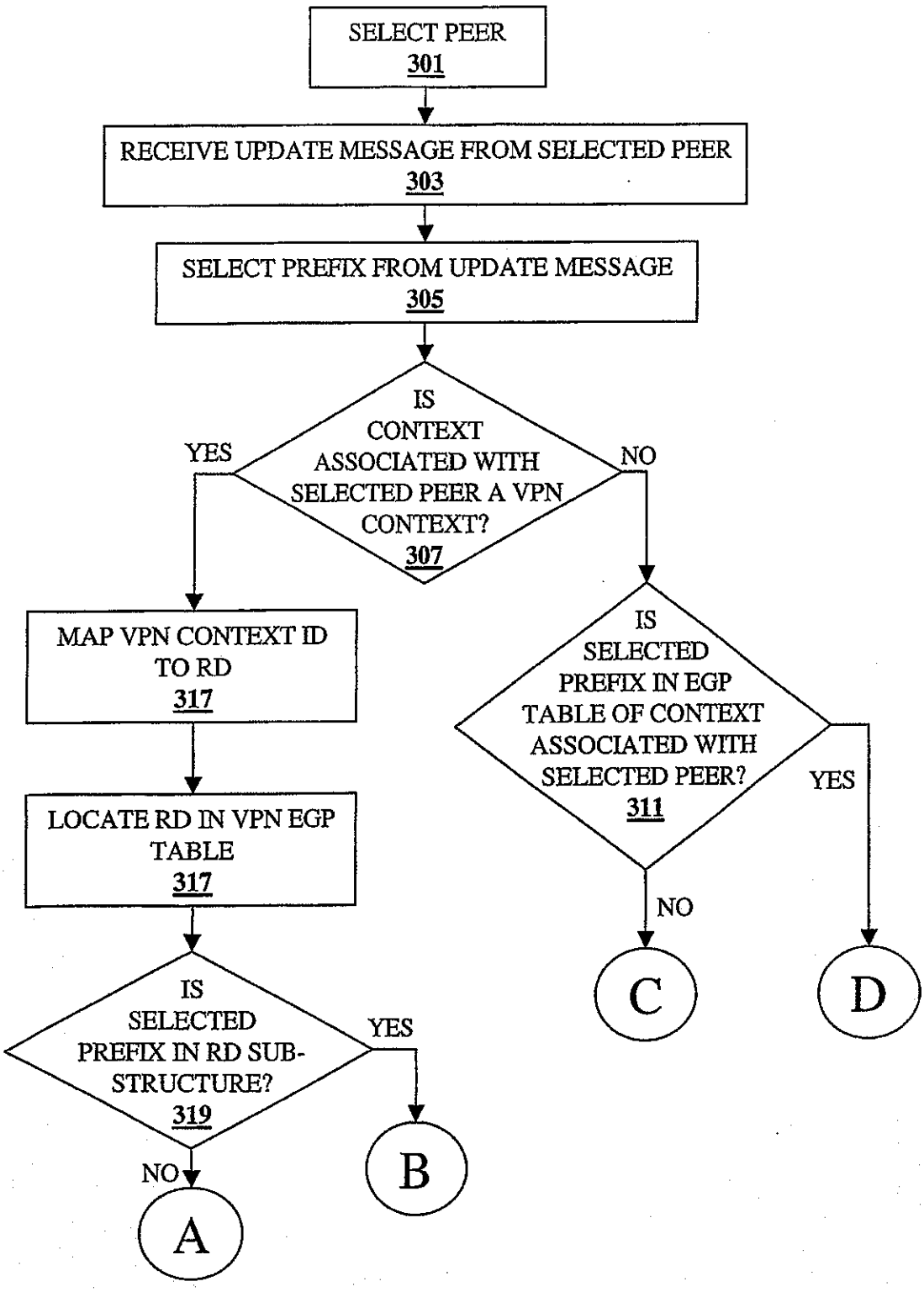

SELECT PEER
301
RECEIVE UPDATE MESSAGE FROM SELECTED PEER
303
SELECT PREFIX FROM UPDATE MESSAGE
305
IS CONTEXT ASSOCIATED WITH SELECTED PEER A VPN CONTEXT?
307
YES
NO
MAP VPN CONTEXT ID TO RD
317
LOCATE RD IN VPN EGP TABLE
317
IS SELECTED PREFIX IN RD SUB-STRUCTURE?
319
YES
NO
A
B
IS SELECTED PREFIX IN EGP TABLE OF CONTEXT ASSOCIATED WITH SELECTED PEER?
311
YES
NO
C
D

FIG. 3A

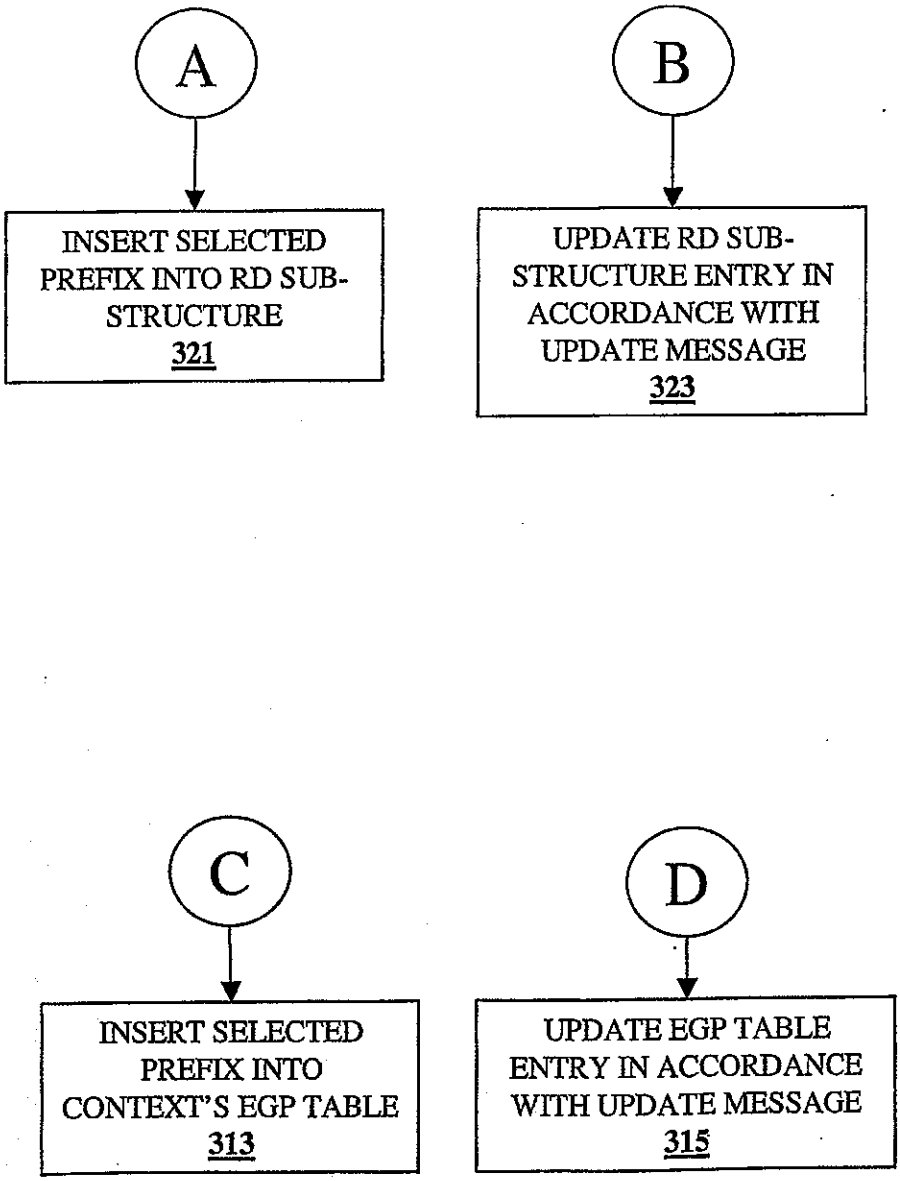

A
INSERT SELECTED PREFIX INTO RD SUB-STRUCTURE
321
B
UPDATE RD SUB-STRUCTURE ENTRY IN ACCORDANCE WITH UPDATE MESSAGE
323
C
INSERT SELECTED PREFIX INTO CONTEXT'S EGP TABLE
313
D
UPDATE EGP TABLE ENTRY IN ACCORDANCE WITH UPDATE MESSAGE
315

FIG. 3B

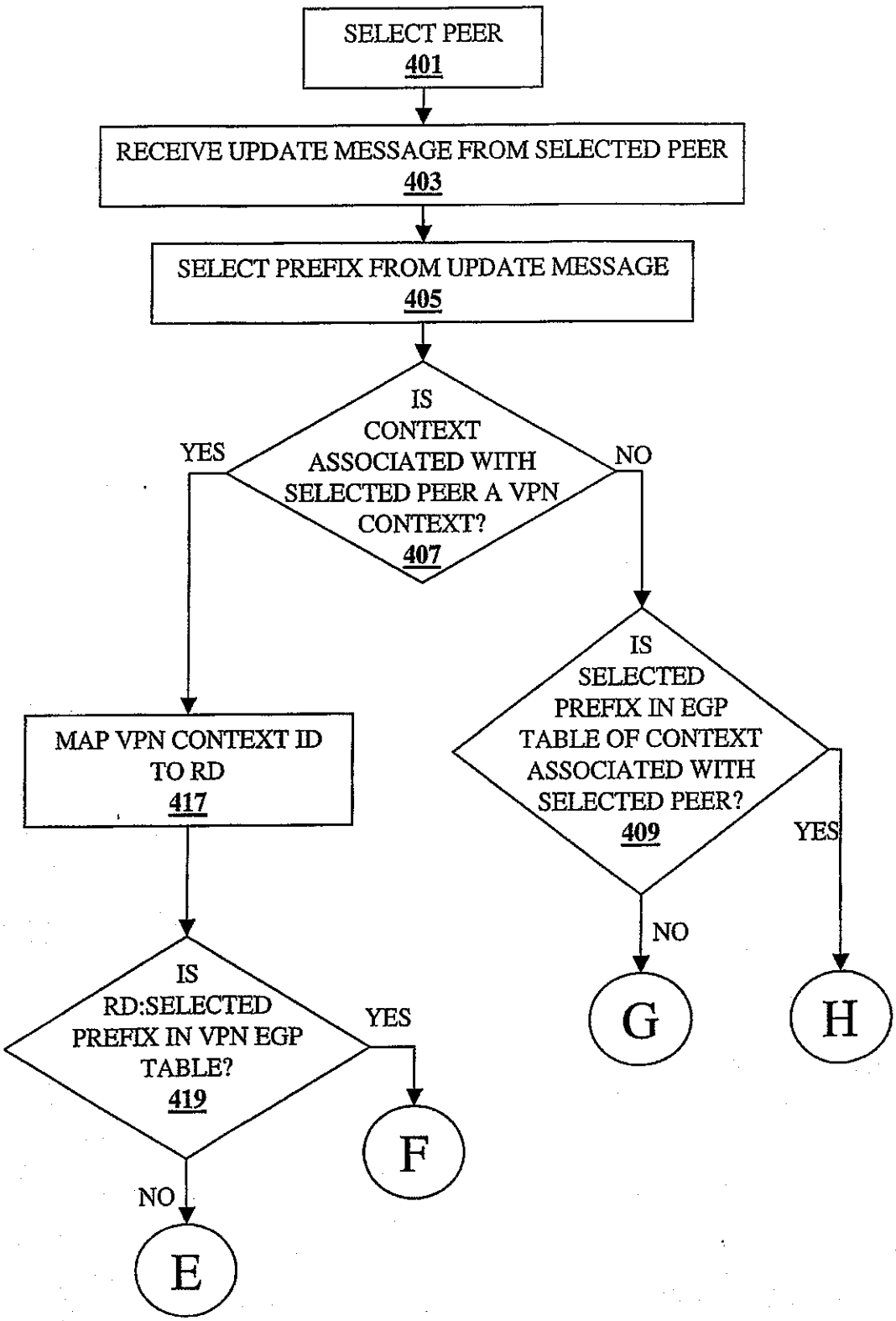

SELECT PEER
401
RECEIVE UPDATE MESSAGE FROM SELECTED PEER
403
SELECT PREFIX FROM UPDATE MESSAGE
405
IS CONTEXT ASSOCIATED WITH SELECTED PEER A VPN CONTEXT?
407
YES
NO
MAP VPN CONTEXT ID TO RD
417
IS SELECTED PREFIX IN EGP TABLE OF CONTEXT ASSOCIATED WITH SELECTED PEER?
409
YES
NO
IS RD:SELECTED PREFIX IN VPN EGP TABLE?
419
YES
NO
G
H
F
E

FIG. 4A

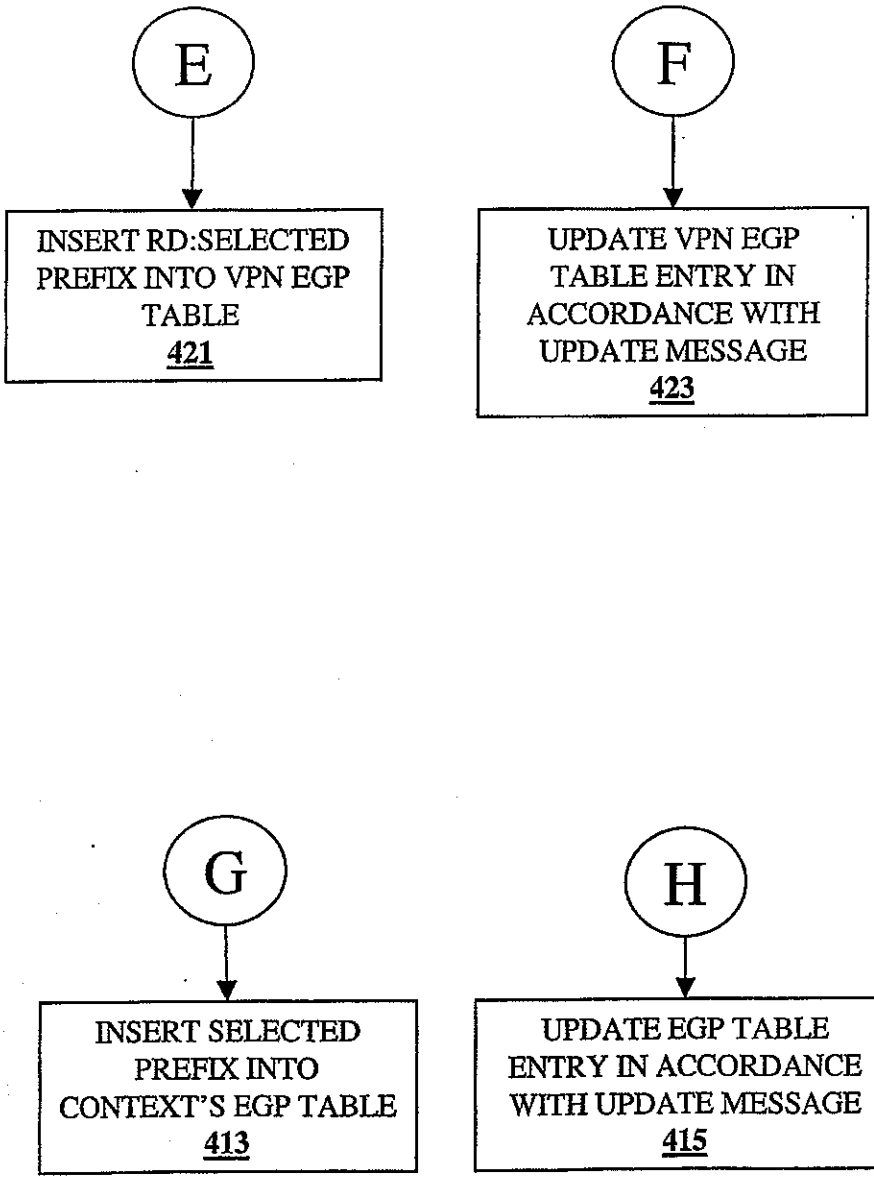

E
INSERT RD:SELECTED PREFIX INTO VPN EGP TABLE
421
F
UPDATE VPN EGP TABLE ENTRY IN ACCORDANCE WITH UPDATE MESSAGE
423
G
INSERT SELECTED PREFIX INTO CONTEXT'S EGP TABLE
413
H
UPDATE EGP TABLE ENTRY IN ACCORDANCE WITH UPDATE MESSAGE
415

FIG. 4B

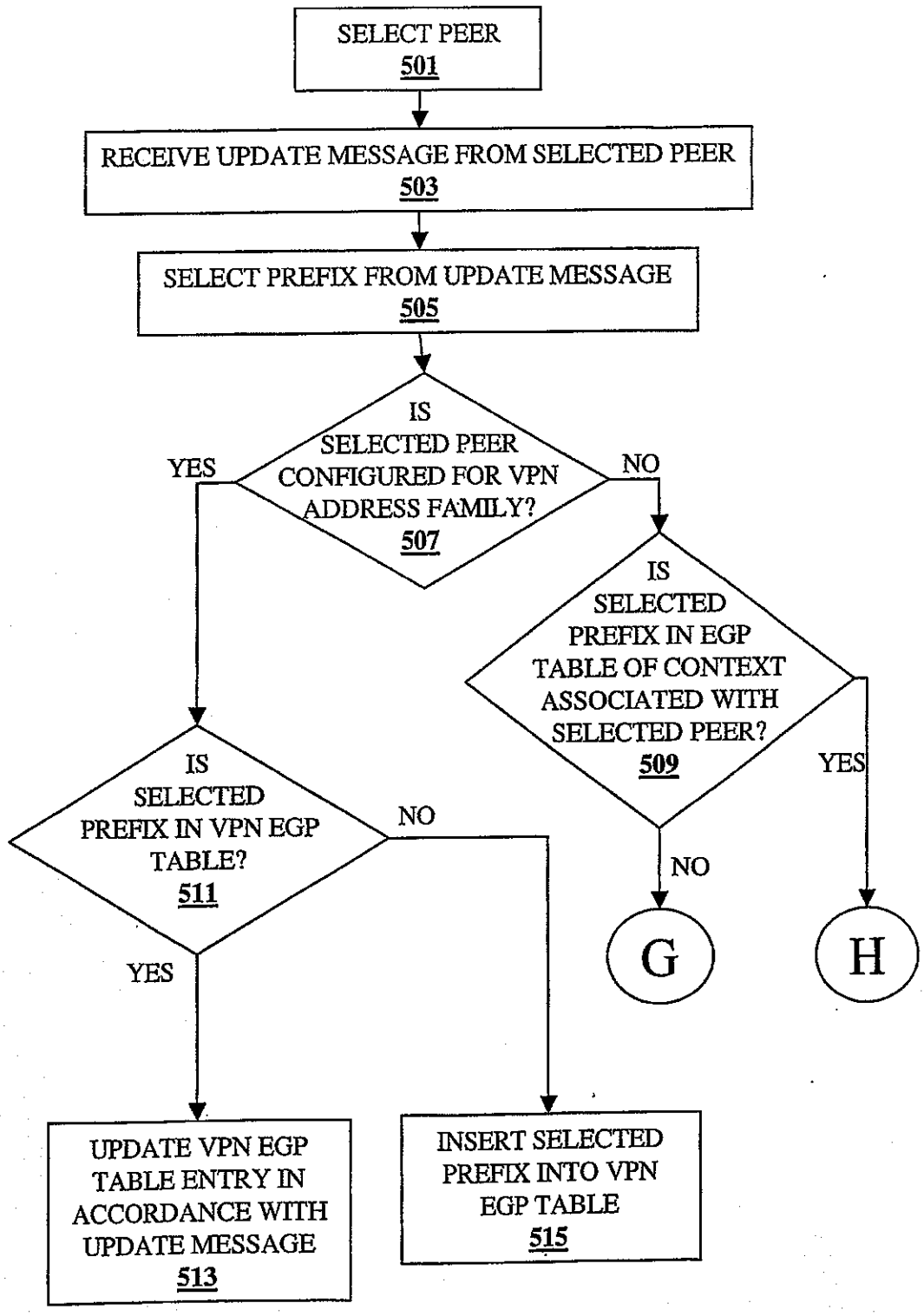

SELECT PEER
501
RECEIVE UPDATE MESSAGE FROM SELECTED PEER
503
SELECT PREFIX FROM UPDATE MESSAGE
505
IS SELECTED PEER CONFIGURED FOR VPN ADDRESS FAMILY?
507
YES
NO
IS SELECTED PREFIX IN EGP TABLE OF CONTEXT ASSOCIATED WITH SELECTED PEER?
509
YES
NO
G
H
IS SELECTED PREFIX IN VPN EGP TABLE?
511
NO
YES
UPDATE VPN EGP TABLE ENTRY IN ACCORDANCE WITH UPDATE MESSAGE
513
INSERT SELECTED PREFIX INTO VPN EGP TABLE
515

FIG. 5

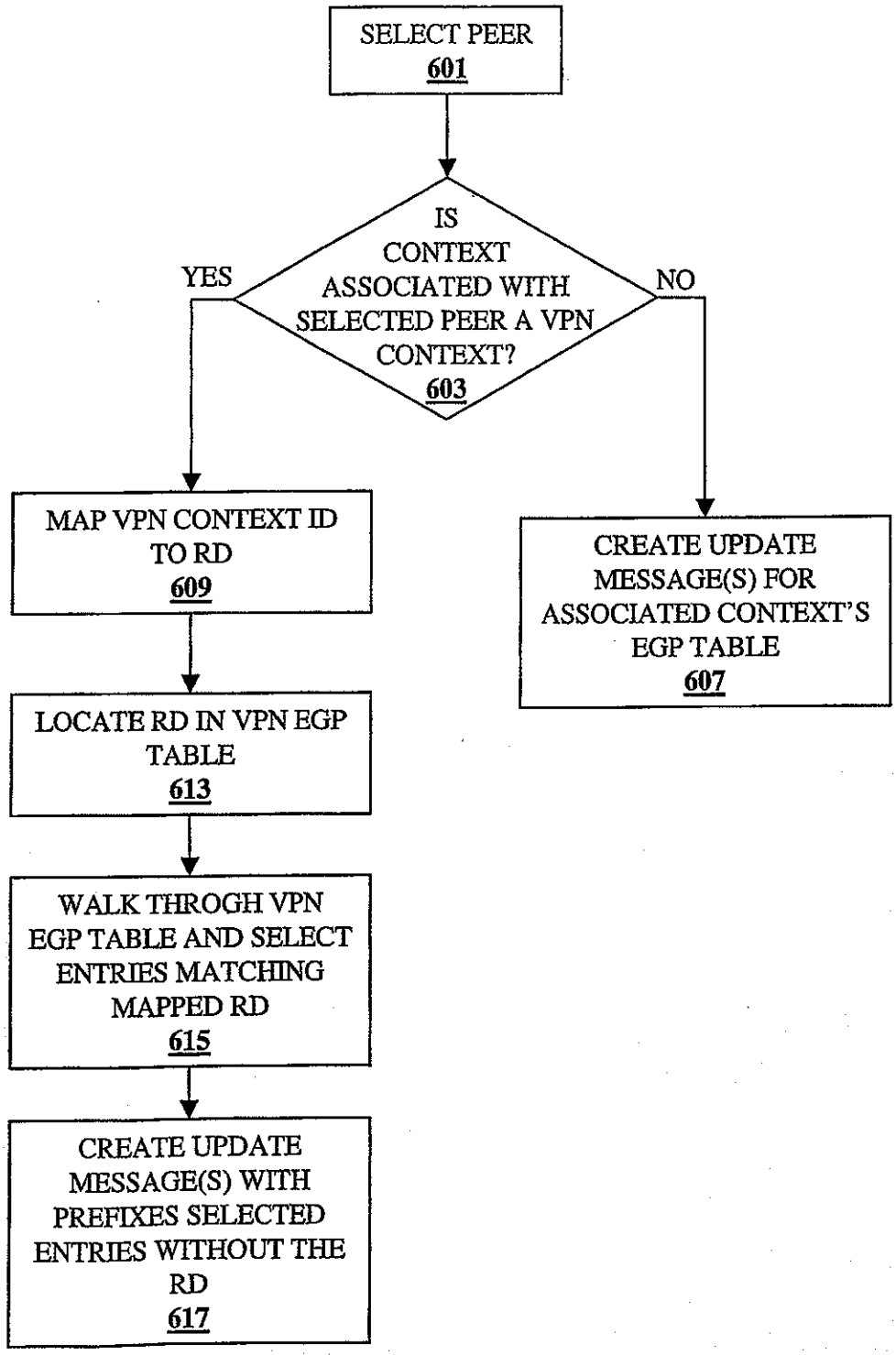

SELECT PEER
601
IS CONTEXT ASSOCIATED WITH SELECTED PEER A VPN CONTEXT?
603
YES
NO
MAP VPN CONTEXT ID TO RD
609
LOCATE RD IN VPN EGP TABLE
613
WALK THROGH VPN EGP TABLE AND SELECT ENTRIES MATCHING MAPPED RD
615
CREATE UPDATE MESSAGE(S) WITH PREFIXES SELECTED ENTRIES WITHOUT THE RD
617
CREATE UPDATE MESSAGE(S) FOR ASSOCIATED CONTEXT'S EGP TABLE
607

FIG. 6

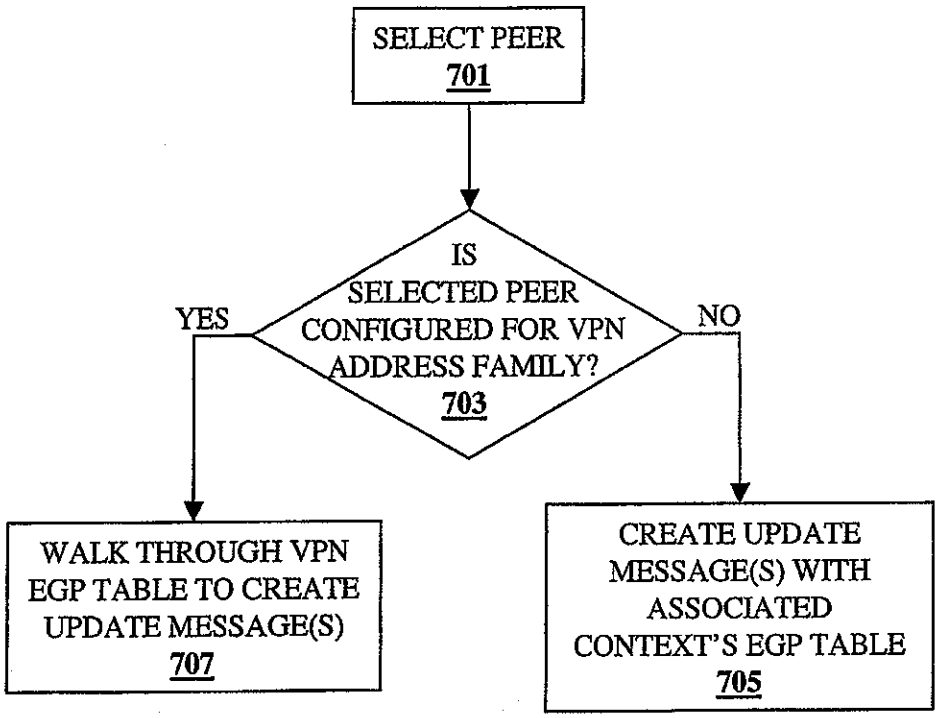

SELECT PEER
701
IS
SELECTED PEER
CONFIGURED FOR VPN
ADDRESS FAMILY?
703
YES
NO
WALK THROUGH VPN
EGP TABLE TO CREATE
UPDATE MESSAGE(S)
707
CREATE UPDATE
MESSAGE(S) WITH
ASSOCIATED
CONTEXT'S EGP TABLE
705

FIG. 7

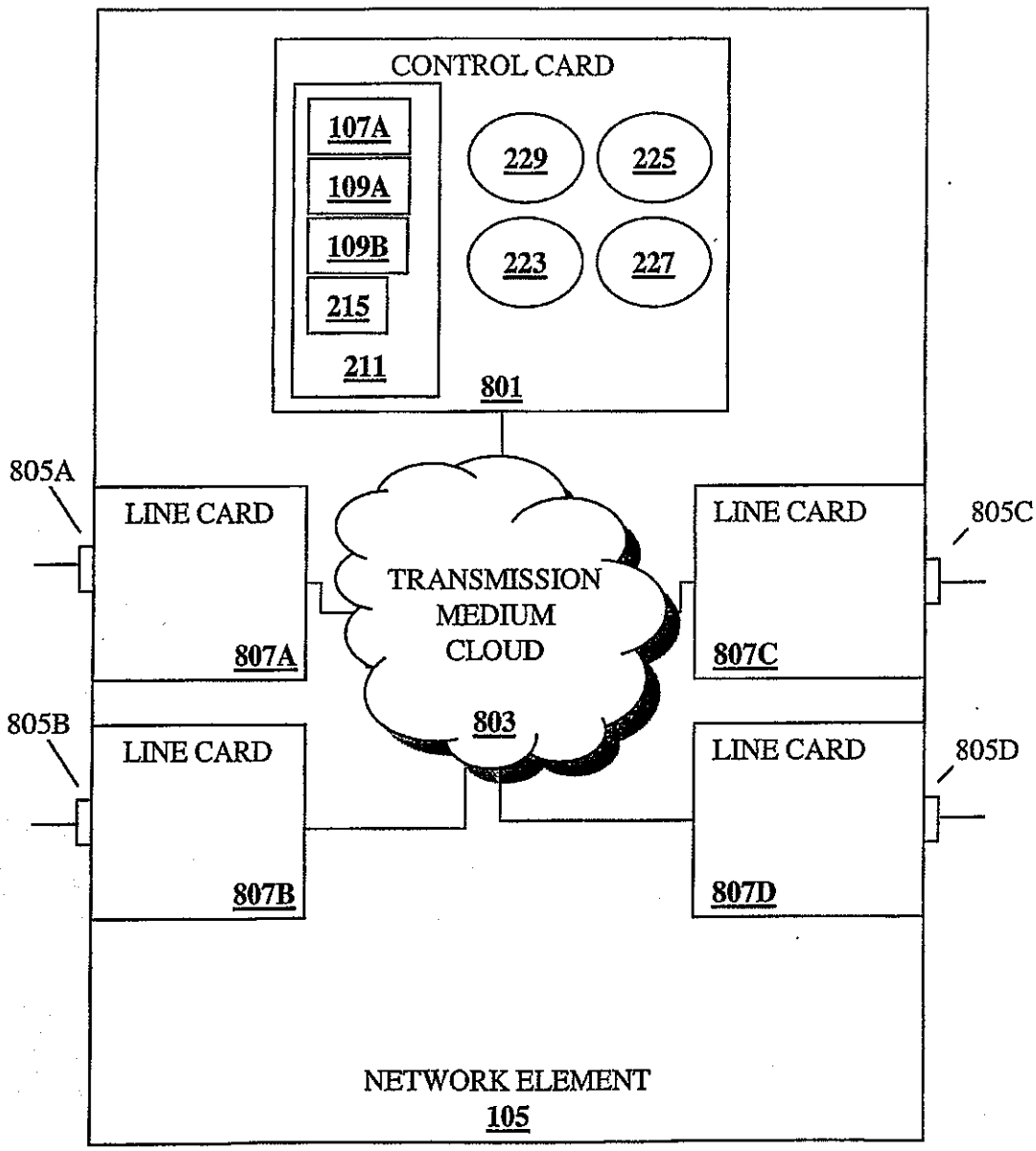

CONTROL CARD
107A
109A
109B
215
211
229
225
223
227
801
805A
LINE CARD
807A
TRANSMISSION MEDIUM CLOUD
803
LINE CARD
807C
805C
805B
LINE CARD
807B
LINE CARD
807D
805D
NETWORK ELEMENT
105

FIG. 8