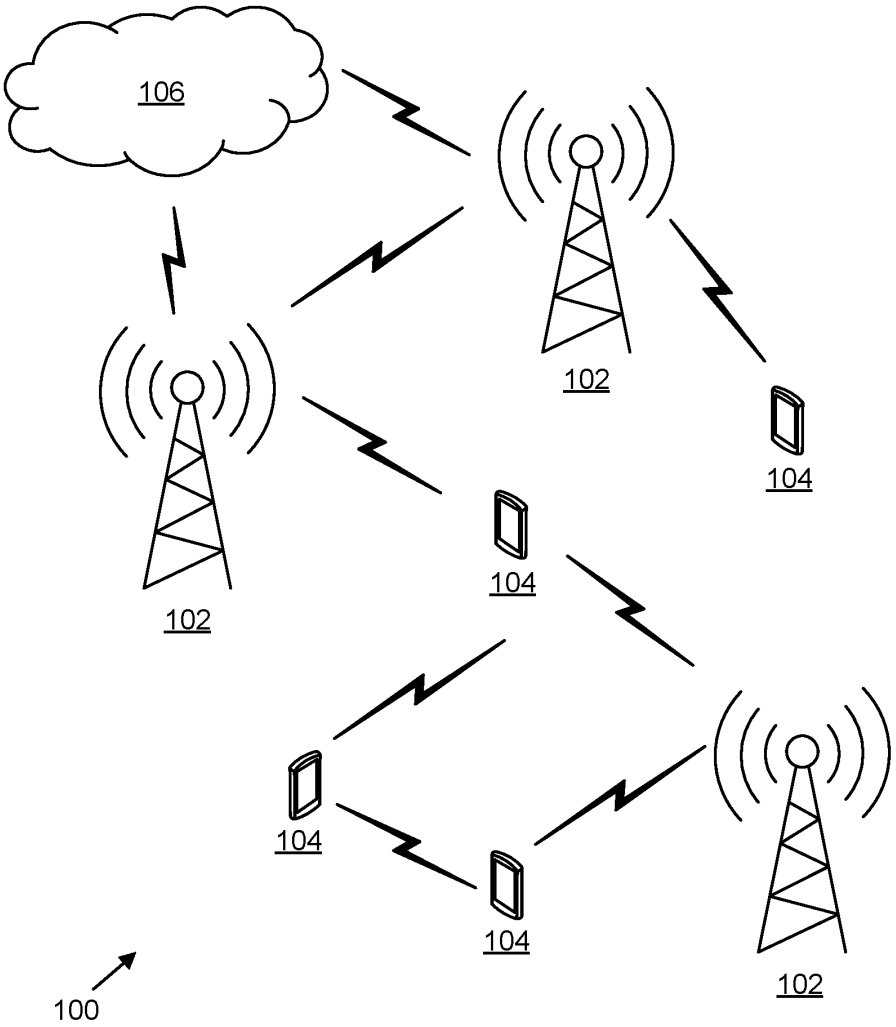


FIG. 1

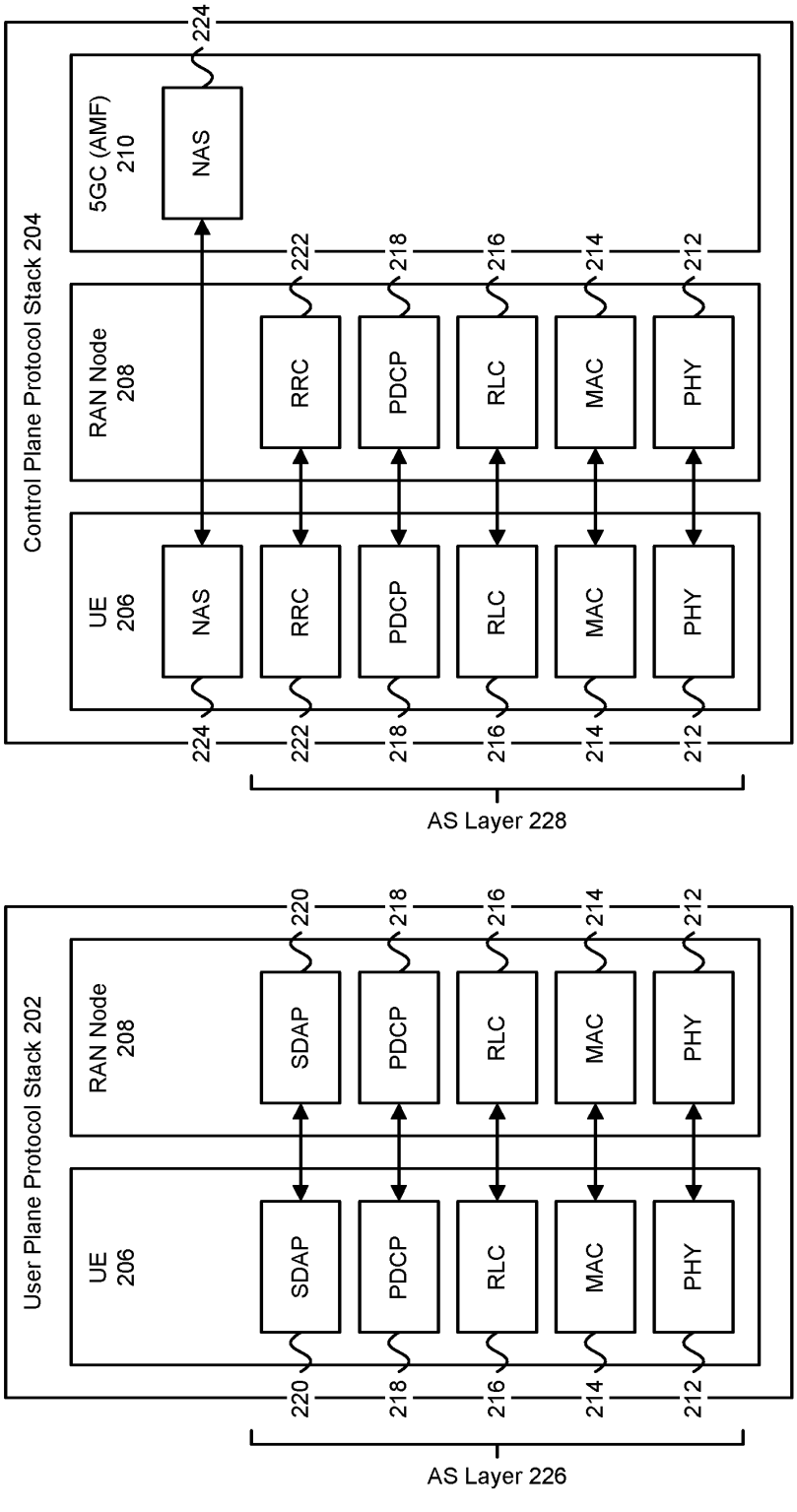

Control Plane Protocol Stack 204
5GC (AMF) 210
NAS
224
RAN Node 208
RRC
PDCP
RLC
MAC
PHY
222
218
216
214
212
UE 206
NAS
RRC
PDCP
RLC
MAC
PHY
224
222
218
216
214
212
AS Layer 228
User Plane Protocol Stack 202
RAN Node 208
SDAP
PDCP
RLC
MAC
PHY
220
218
216
214
212
UE 206
SDAP
PDCP
RLC
MAC
PHY
220
218
216
214
212
AS Layer 226
200

FIG. 2

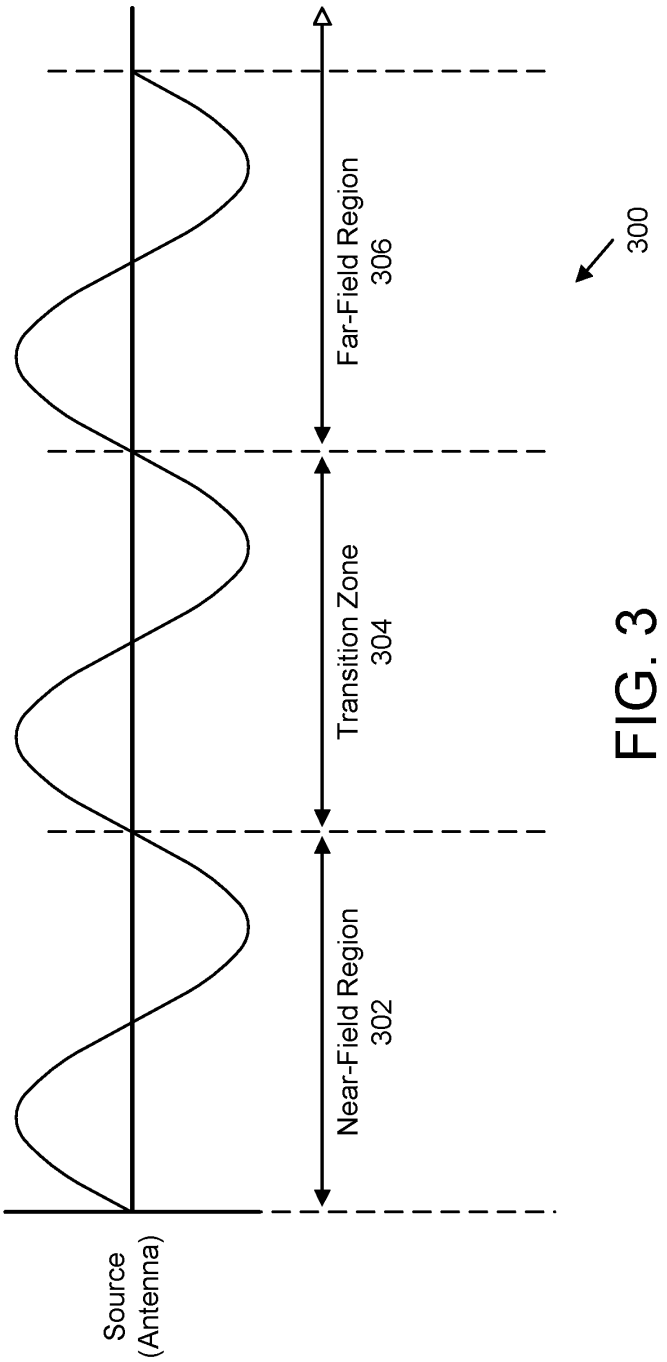

Far-Field Region
306
300
Transition Zone
304
Near-Field Region
302
Source
(Antenna)

FIG. 3

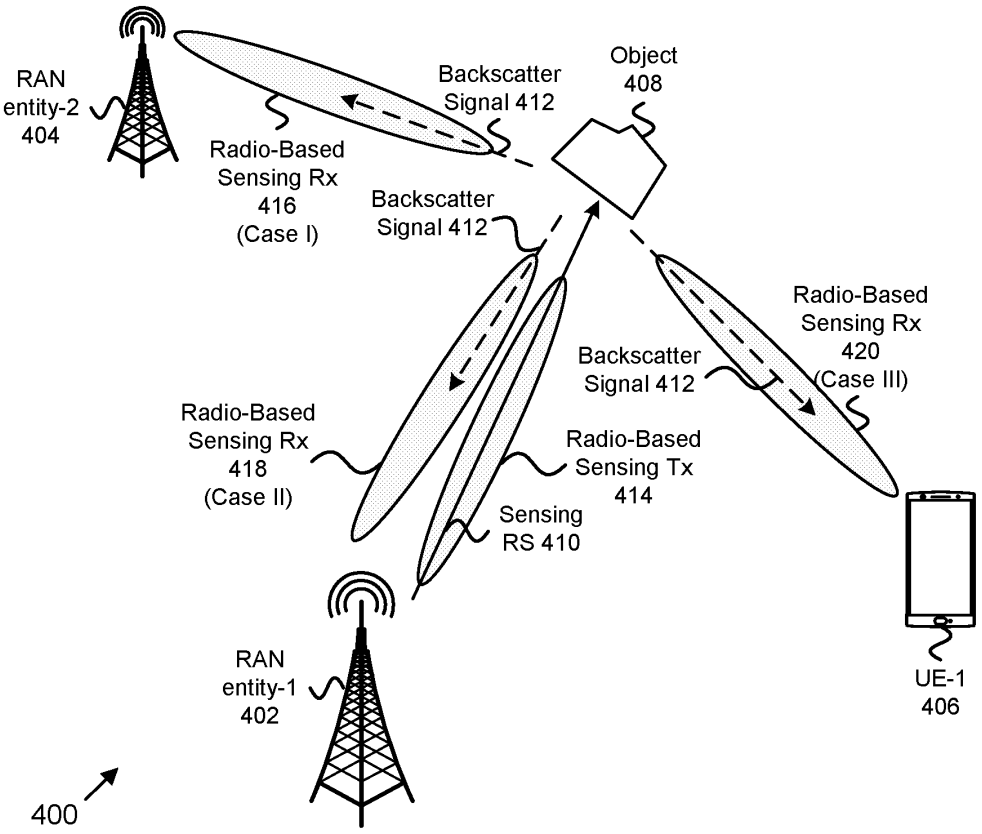

RAN
entity-2
404
Backscatter
Signal 412
Object
408
Radio-Based
Sensing Rx
416
(Case I)
Backscatter
Signal 412
Radio-Based
Sensing Rx
420
(Case III)
Backscatter
Signal 412
Radio-Based
Sensing Rx
418
(Case II)
Radio-Based
Sensing Tx
414
Sensing
RS 410
RAN
entity-1
402
UE-1
406
400

FIG. 4A

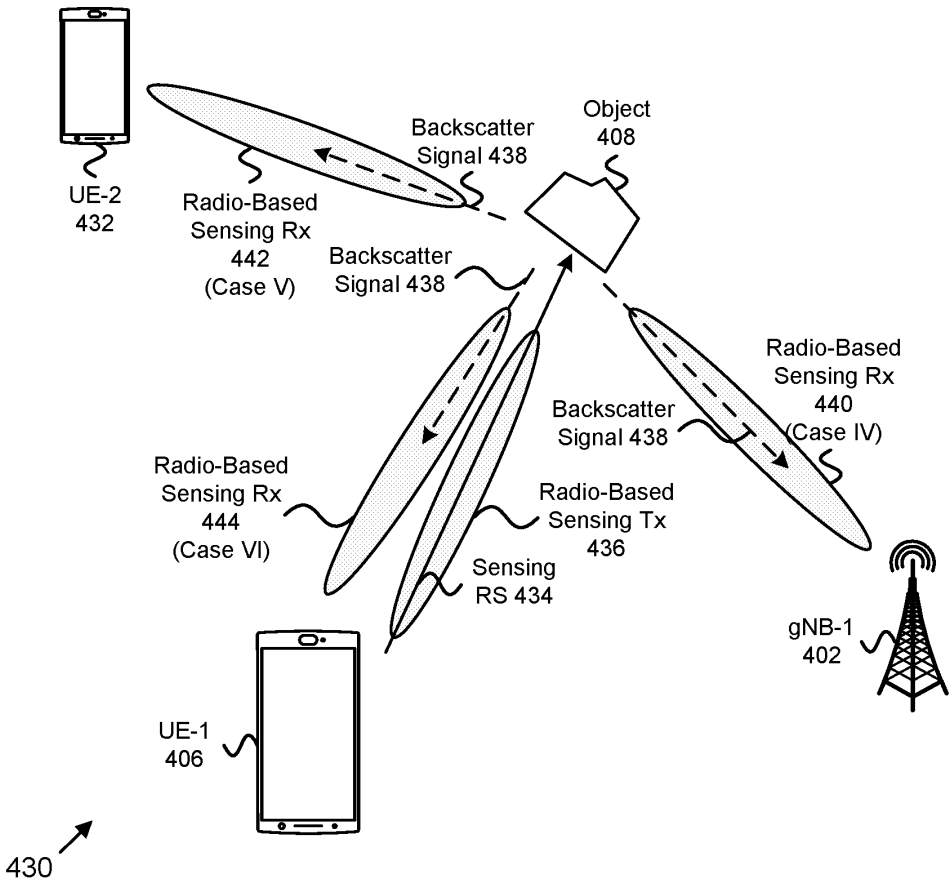

UE-2
432
Radio-Based
Sensing Rx
442
(Case V)
Backscatter
Signal 438
Object
408
Backscatter
Signal 438
Radio-Based
Sensing Rx
440
(Case IV)
Backscatter
Signal 438
Radio-Based
Sensing Rx
444
(Case VI)
Radio-Based
Sensing Tx
436
Sensing
RS 434
gNB-1
402
UE-1
406
430

FIG. 4B

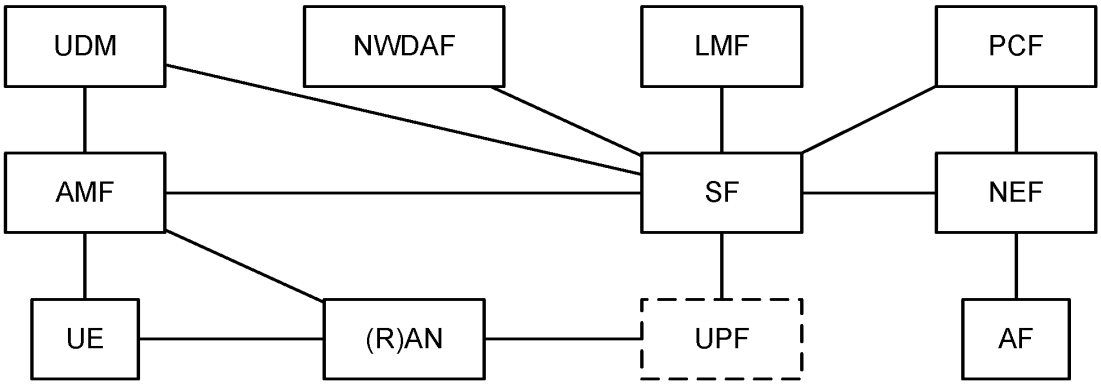

UDM
NWDAF
LMF
PCF
AMF
SF
NEF
UE
(R)AN
UPF
AF
500

FIG. 5A

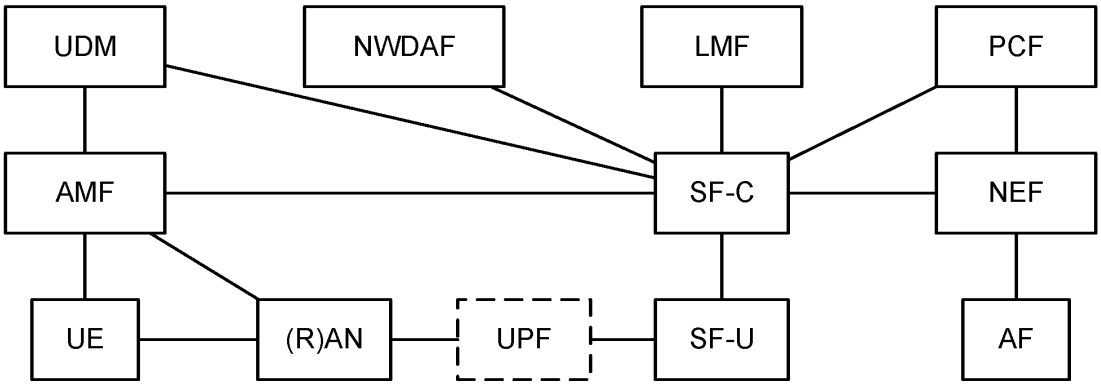

UDM
NWDAF
LMF
PCF
AMF
SF-C
NEF
UE
(R)AN
UPF
SF-U
AF
510

FIG. 5B

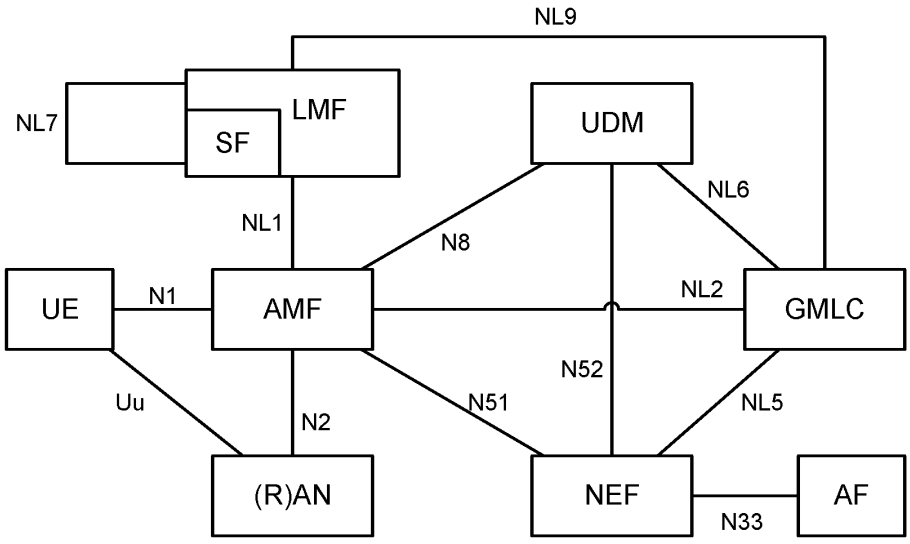

NL9
NL7
LMF
SF
UDM
NL6
NL1
N8
UE
N1
AMF
NL2
GMLC
N52
Uu
N2
N51
NL5
(R)AN
NEF
AF
N33
520

FIG. 5C

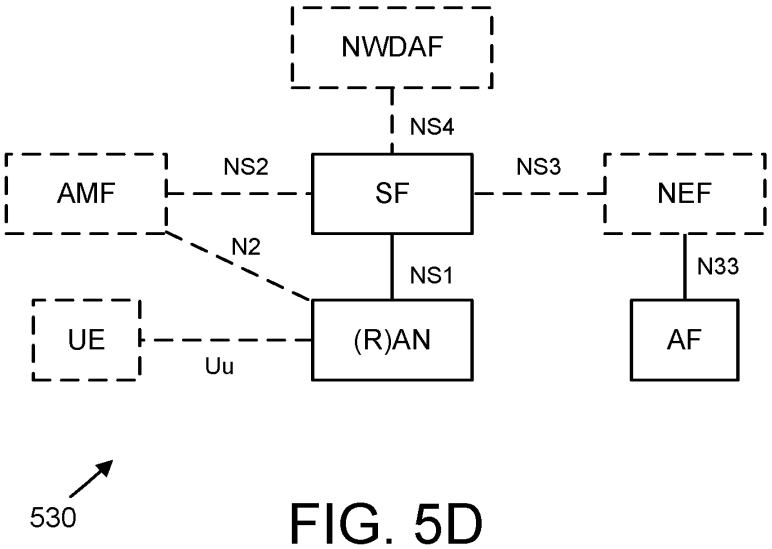

NWDAF
NS4
AMF
NS2
SF
NS3
NEF
N2
NS1
N33
UE
Uu
(R)AN
AF
530

FIG. 5D

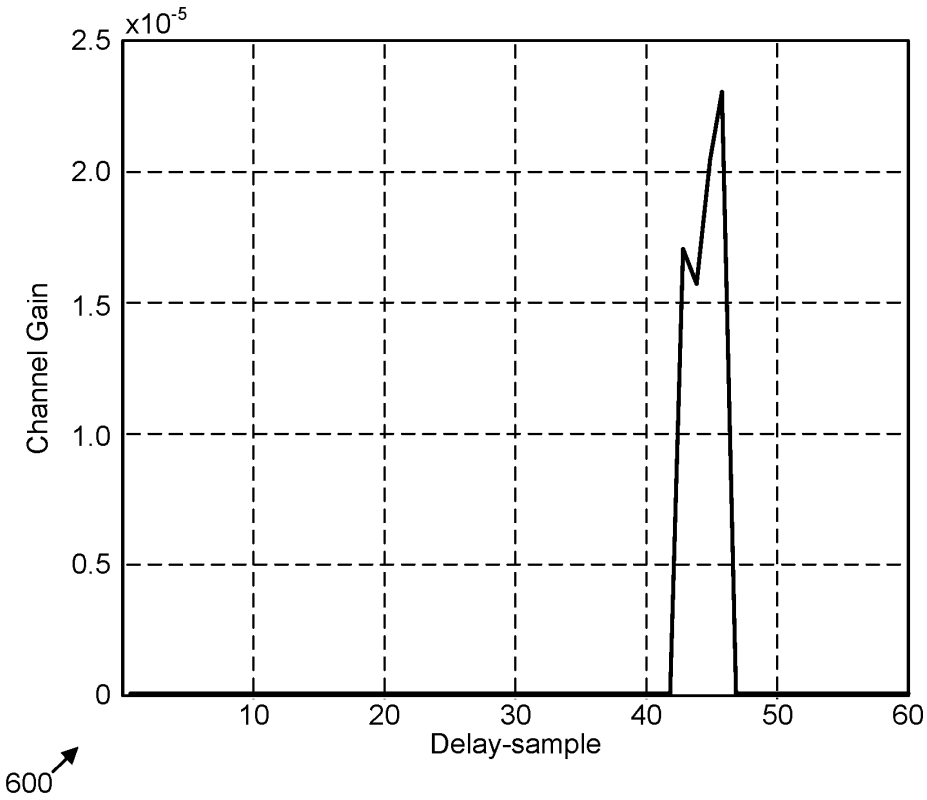

x10-5
2.5
2.0
1.5
1.0
0.5
0
Channel Gain
10
20
30
40
50
60
Delay-sample
600

FIG. 6

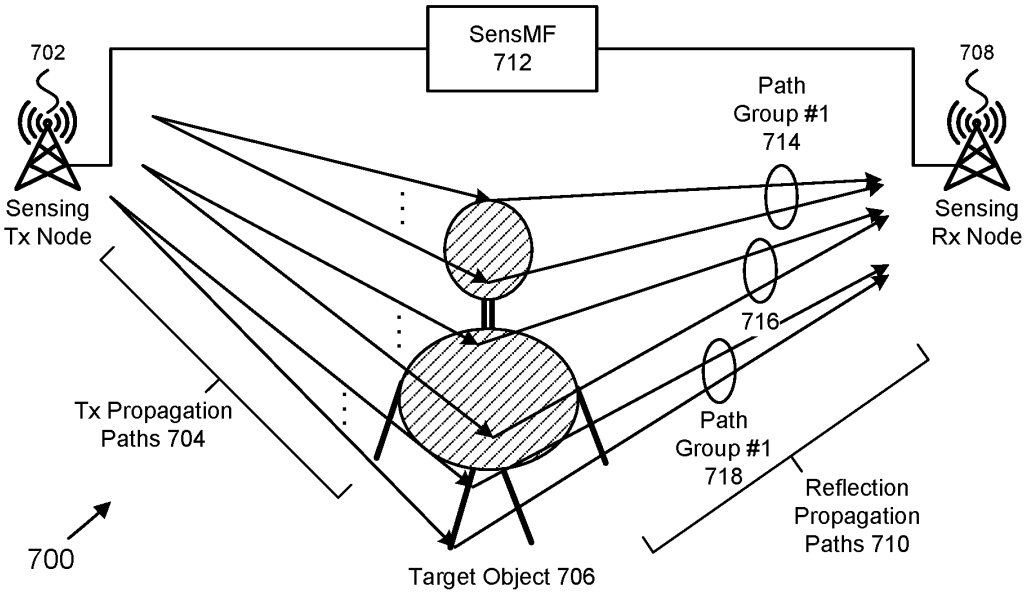

SensMF
712
702
708
Path
Group #1
714
Sensing
Tx Node
Sensing
Rx Node
716
Tx Propagation
Paths 704
Path
Group #1
718
Reflection
Propagation
Paths 710
700
Target Object 706

FIG. 7

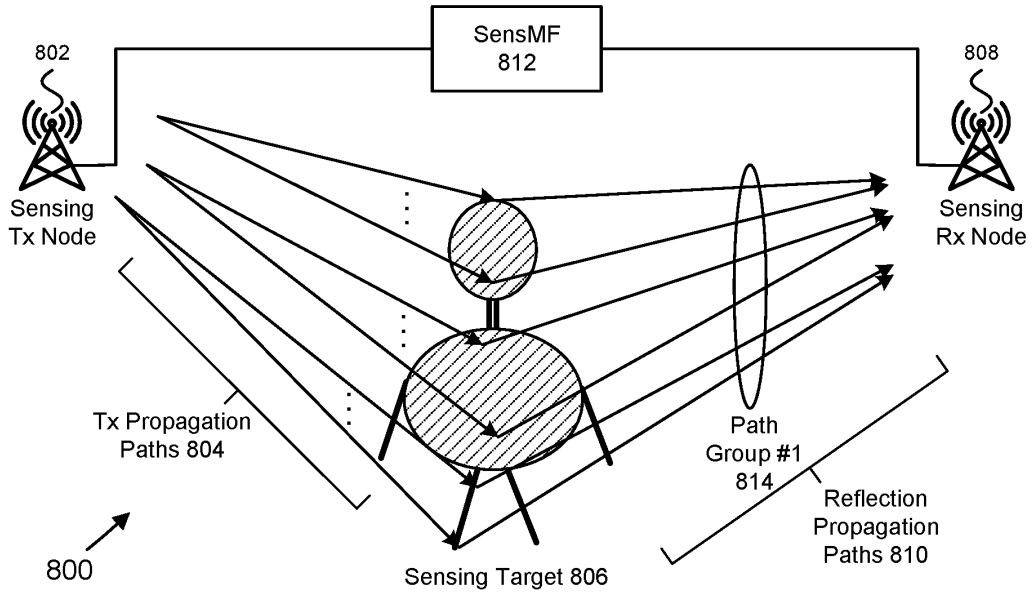

SensMF
812
802
808
Sensing
Tx Node
Sensing
Rx Node
Tx Propagation
Paths 804
Path
Group #1
814
Reflection
Propagation
Paths 810
800
Sensing Target 806

FIG. 8

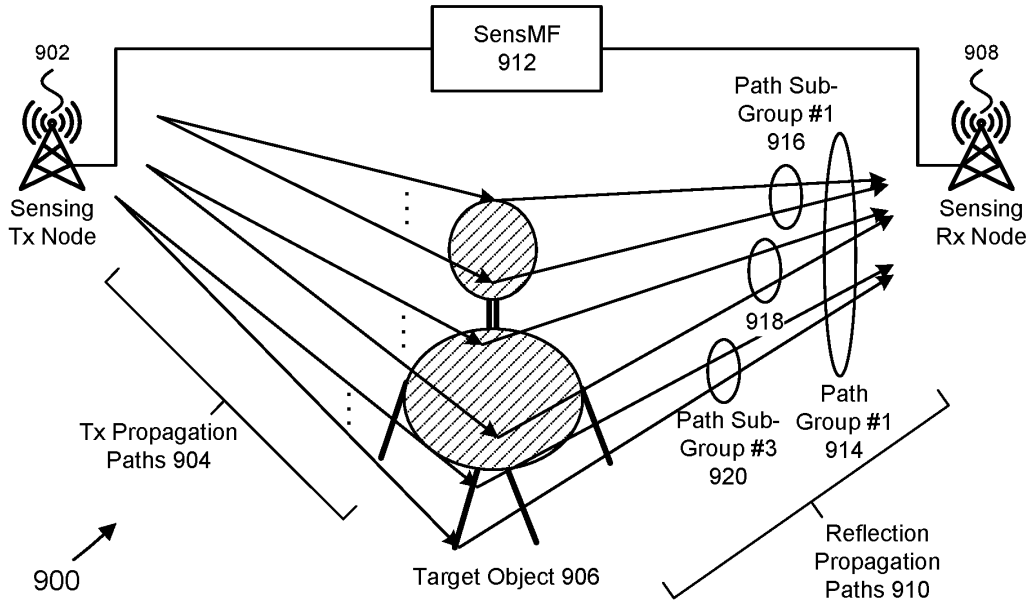

SensMF
912
902
908
Path Sub-
Group #1
916
Sensing
Tx Node
Sensing
Rx Node
918
Tx Propagation
Paths 904
Path Sub-
Group #3
920
Path
Group #1
914
Reflection
Propagation
Paths 910
900
Target Object 906

FIG. 9

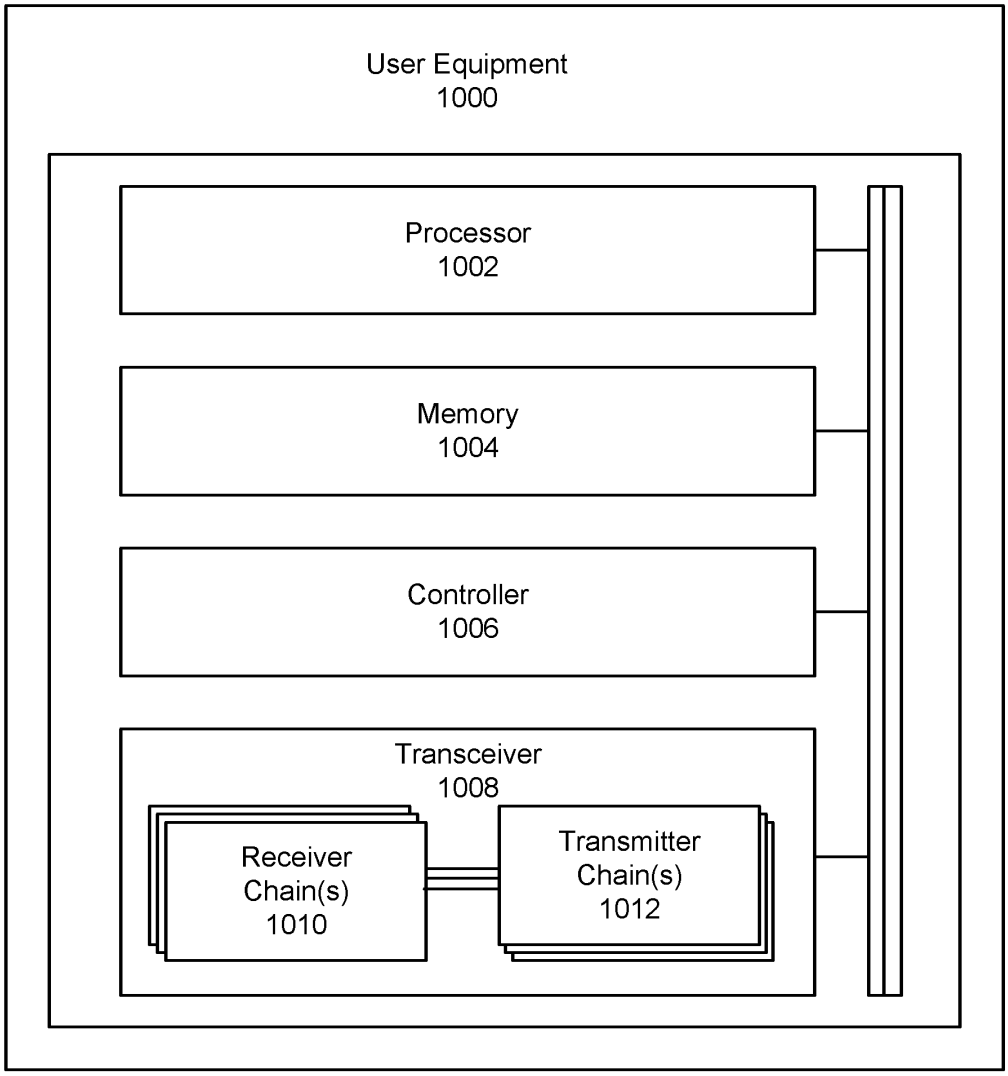

User Equipment
1000
Processor
1002
Memory
1004
Controller
1006
Transceiver
1008
Receiver
Chain(s)
1010
Transmitter
Chain(s)
1012

FIG. 10

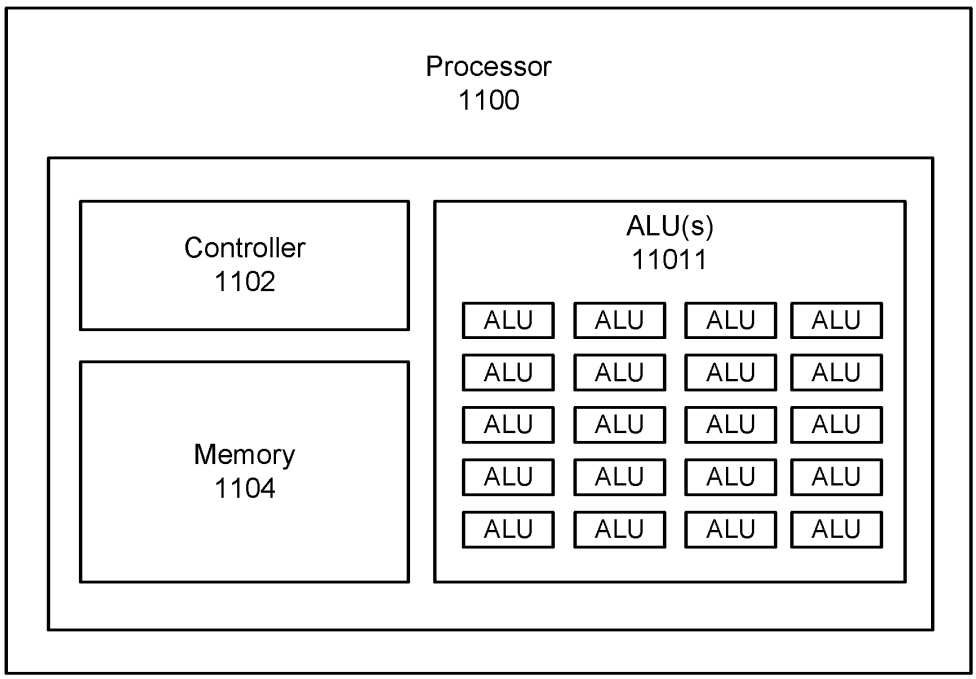

Processor
1100
Controller
1102
Memory
1104
ALU(s)
11011
ALU
ALU
ALU
ALU
ALU
ALU
ALU
ALU
ALU
ALU
ALU
ALU
ALU
ALU
ALU
ALU
ALU
ALU
ALU
ALU

FIG. 11

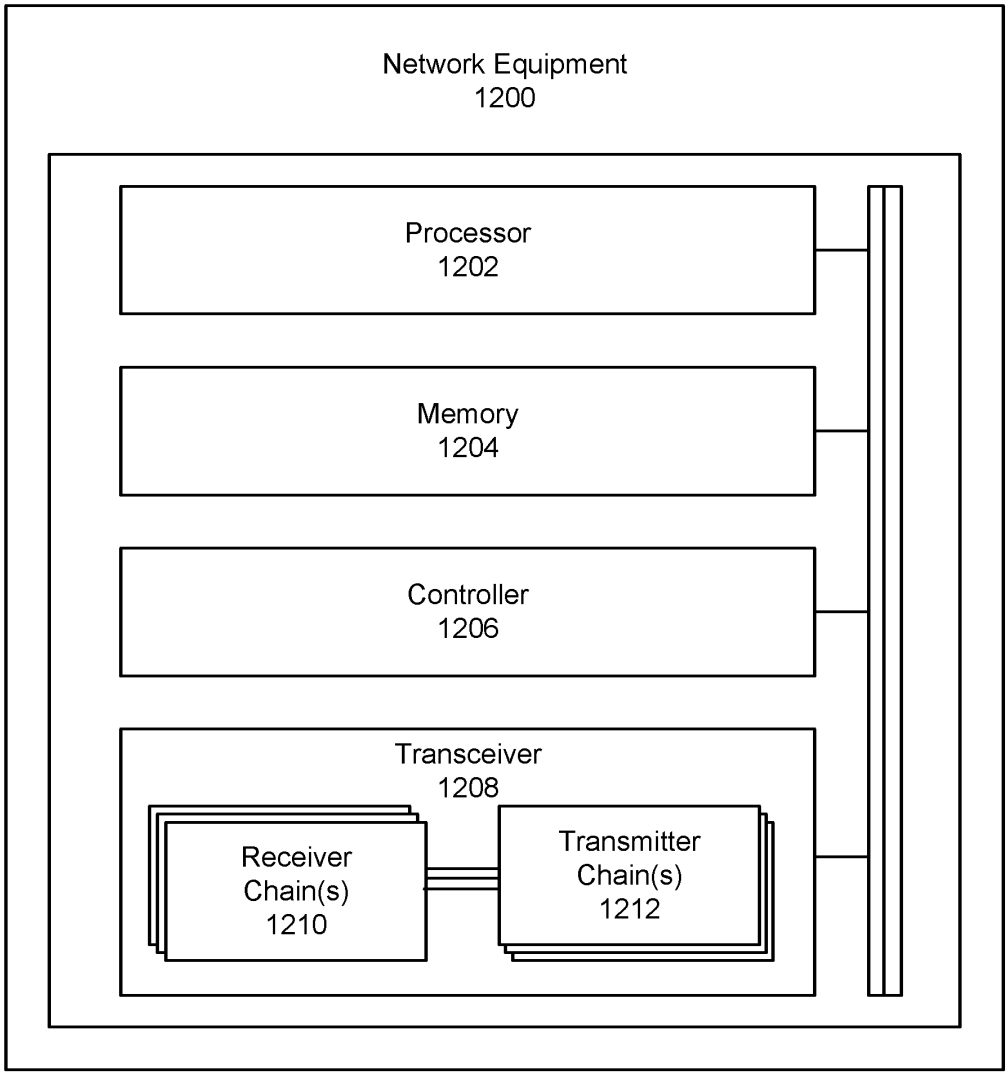

Network Equipment
1200
Processor
1202
Memory
1204
Controller
1206
Transceiver
1208
Receiver
Chain(s)
1210
Transmitter
Chain(s)
1212

FIG. 12

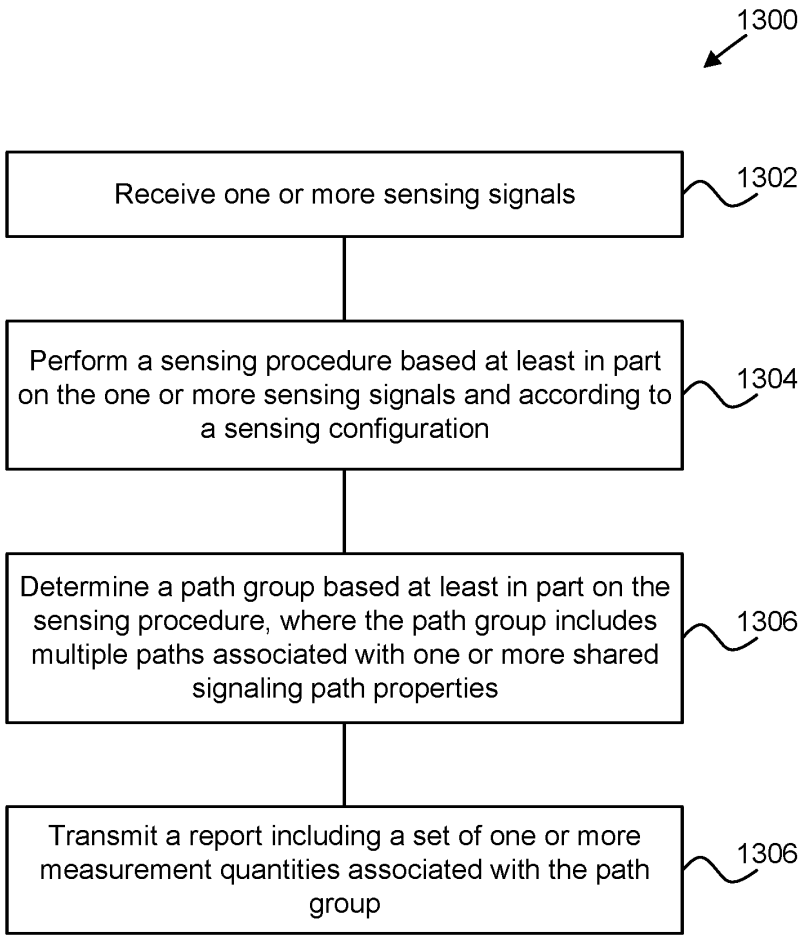

1300
Receive one or more sensing signals
1302
Perform a sensing procedure based at least in part on the one or more sensing signals and according to a sensing configuration
1304
Determine a path group based at least in part on the sensing procedure, where the path group includes multiple paths associated with one or more shared signaling path properties
1306
Transmit a report including a set of one or more measurement quantities associated with the path group
1306

FIG. 13

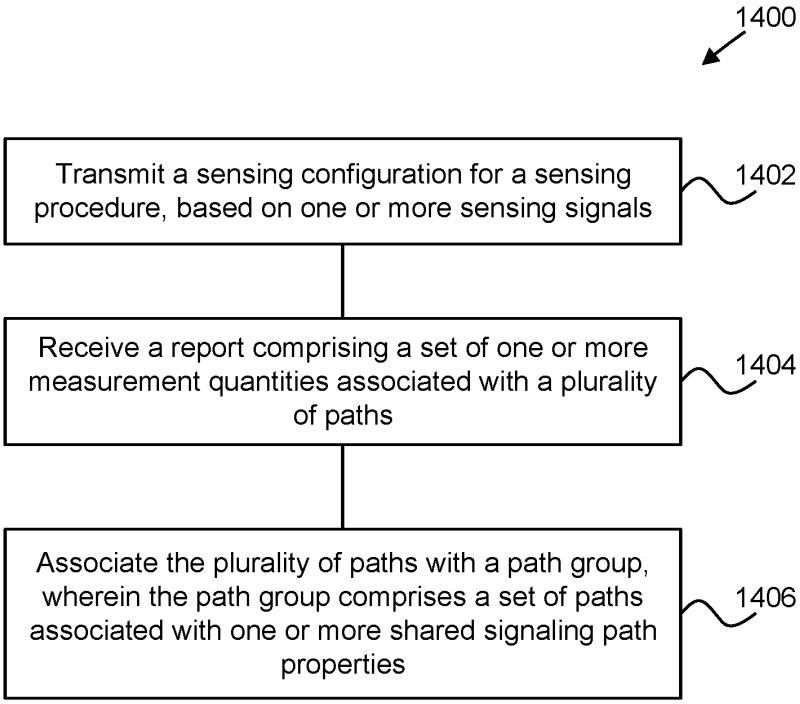

1400
Transmit a sensing configuration for a sensing procedure, based on one or more sensing signals
1402
Receive a report comprising a set of one or more measurement quantities associated with a plurality of paths
1404
Associate the plurality of paths with a path group, wherein the path group comprises a set of paths associated with one or more shared signaling path properties
1406

FIG. 14