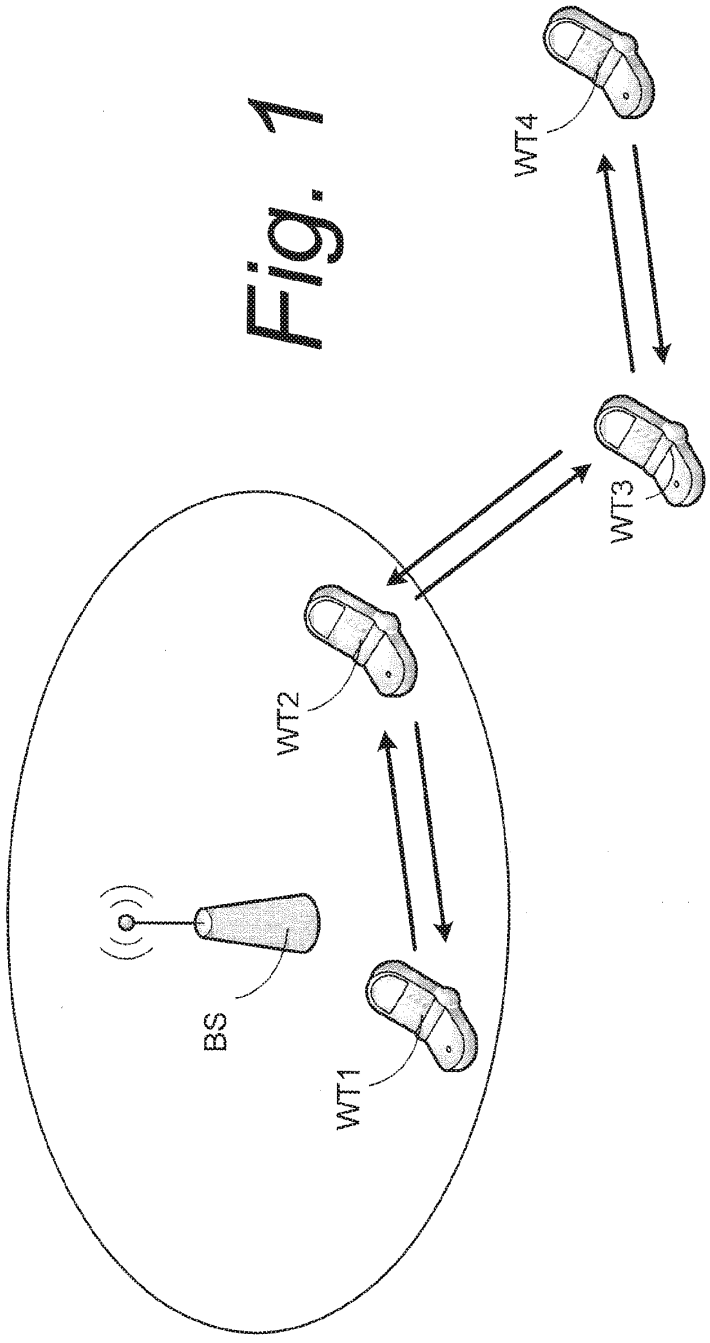
Fig. 1



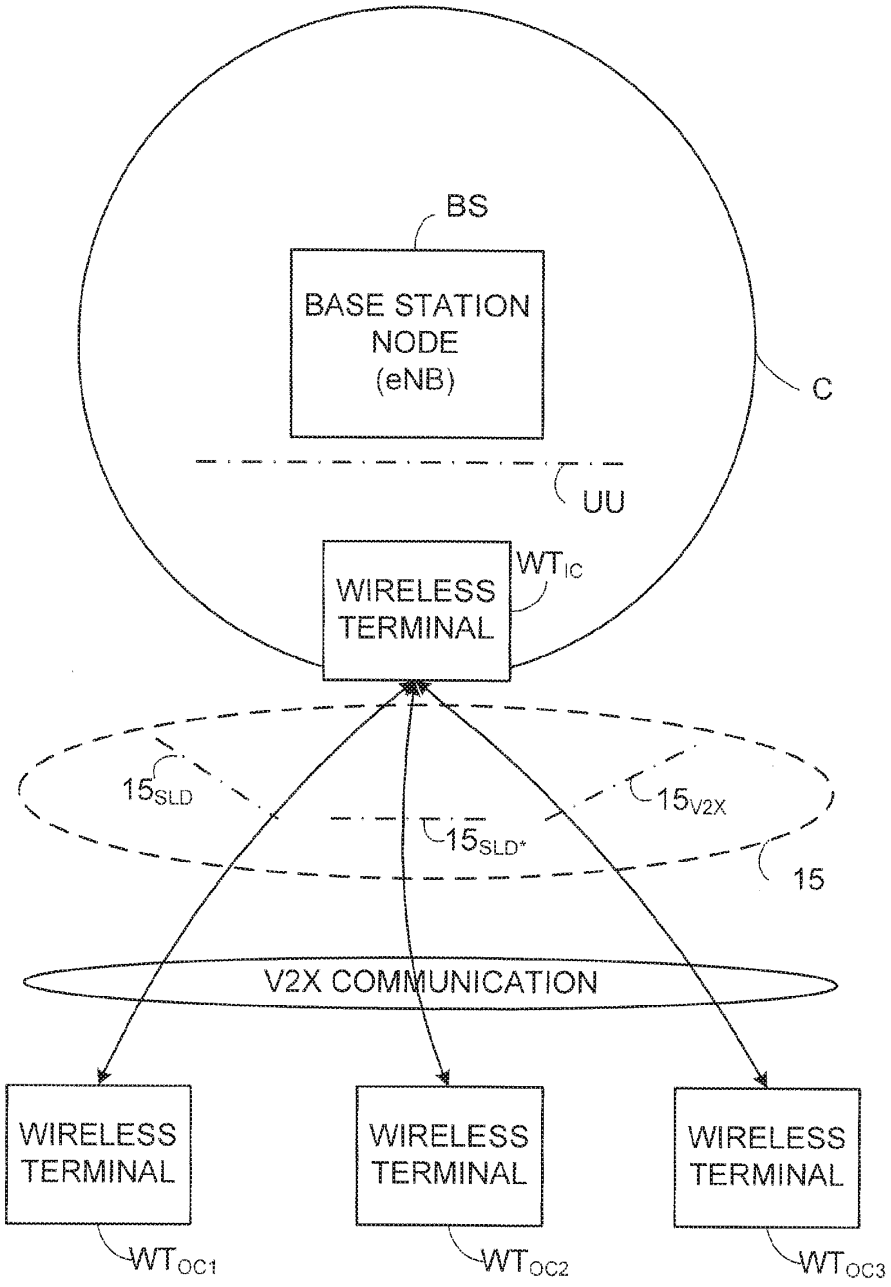

BS
BASE STATION NODE (eNB)
C
UU
WIRELESS TERMINAL
WTIC
15SLD
15V2X
15SLD*
15
V2X COMMUNICATION
WIRELESS TERMINAL
WIRELESS TERMINAL
WIRELESS TERMINAL
WTOC1
WTOC2
WTOC3

Fig. 2

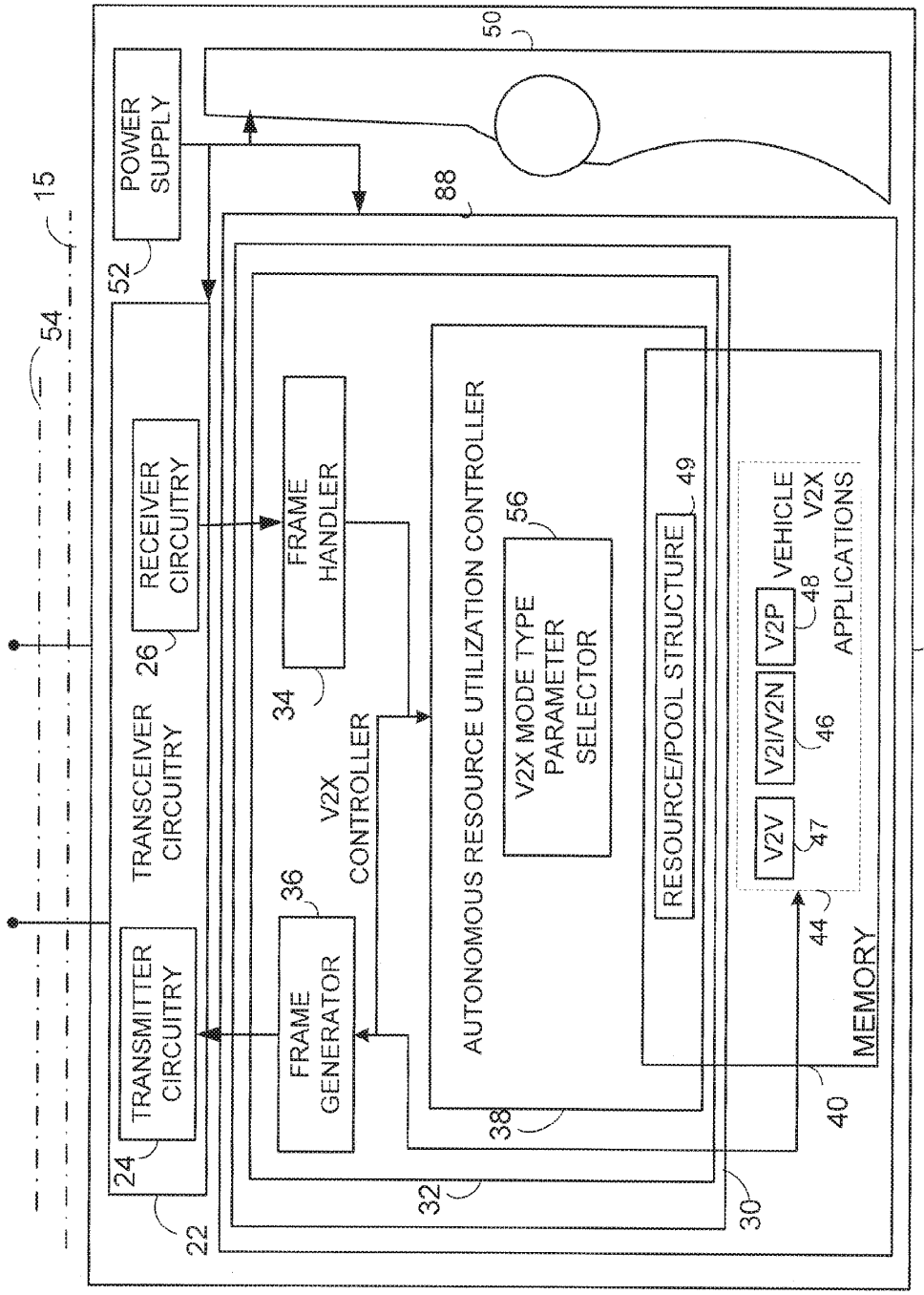

15
54
50
POWER SUPPLY
52
88
TRANSCEIVER CIRCUITRY
RECEIVER CIRCUITRY
26
FRAME HANDLER
34
V2X CONTROLLER
AUTONOMOUS RESOURCE UTILIZATION CONTROLLER
V2X MODE TYPE PARAMETER SELECTOR
56
RESOURCE/POOL STRUCTURE
49
V2V
47
V2I/V2N
46
V2P
48
VEHICLE V2X APPLICATIONS
TRANSMITTER CIRCUITRY
24
FRAME GENERATOR
36
MEMORY
44
40
38
32
30
22
20

Fig. 3A

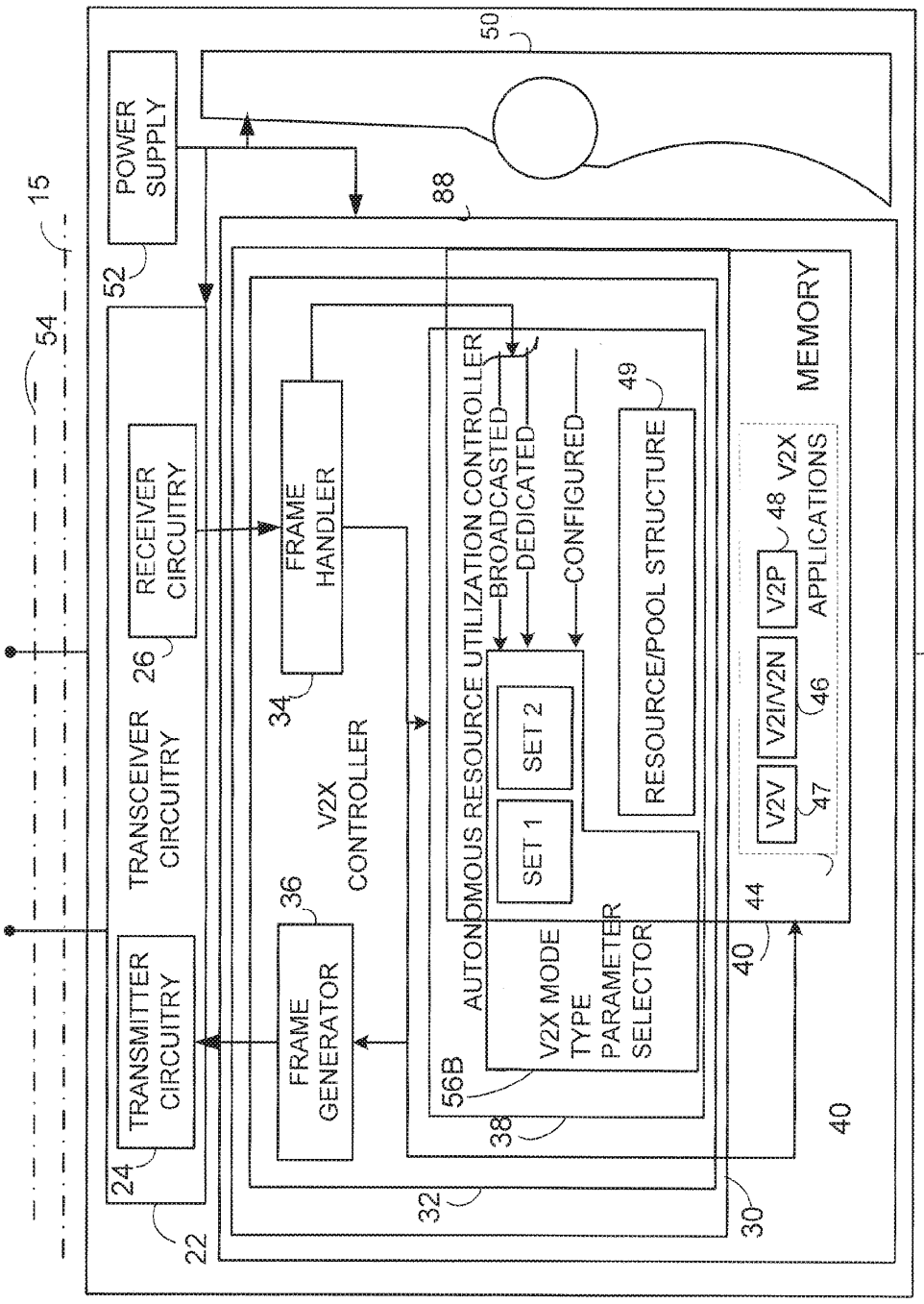

20B
50
POWER SUPPLY
52
88
15
54
TRANSCEIVER CIRCUITRY
RECEIVER CIRCUITRY
26
FRAME HANDLER
34
V2X CONTROLLER
AUTONOMOUS RESOURCE UTILIZATION CONTROLLER
BROADCASTED
DEDICATED
CONFIGURED
SET 1
SET 2
49
RESOURCE/POOL STRUCTURE
MEMORY
V2X APPLICATIONS
48
V2P
V2I/V2N
46
V2V
47
36
FRAME GENERATOR
56B
V2X MODE TYPE PARAMETER SELECTOR
38
44
40
24
TRANSMITTER CIRCUITRY
22
32
30
40

Fig. 3B

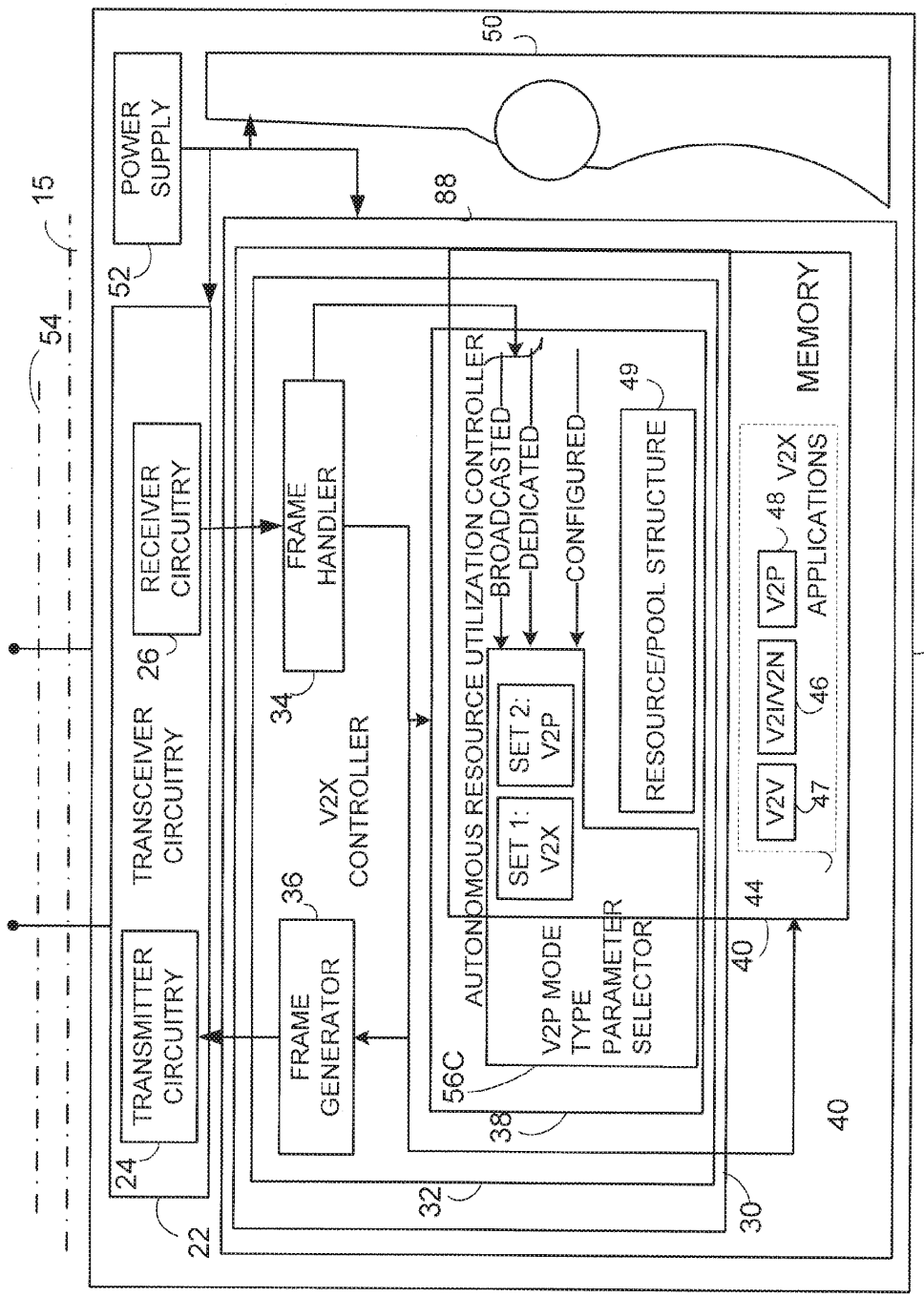

15
54
50
POWER SUPPLY
52
88
TRANSCEIVER CIRCUITRY
RECEIVER CIRCUITRY
26
FRAME HANDLER
34
V2X CONTROLLER
AUTONOMOUS RESOURCE UTILIZATION CONTROLLER
BROADCASTED
DEDICATED
CONFIGURED
SET 1: V2X
SET 2: V2P
RESOURCE/POOL STRUCTURE
49
MEMORY
V2X APPLICATIONS
V2P
48
V2I/V2N
46
V2V
47
TRANSMITTER CIRCUITRY
24
FRAME GENERATOR
36
V2P MODE TYPE PARAMETER SELECTOR
56C
38
44
40
40
32
30
22
20B

Fig. 3C

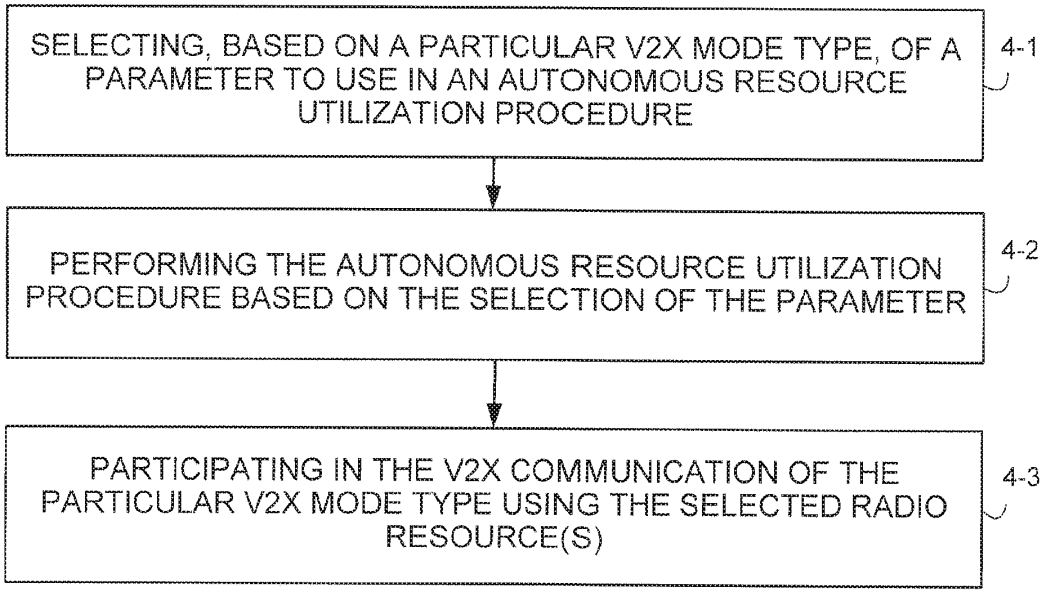

SELECTING, BASED ON A PARTICULAR V2X MODE TYPE, OF A PARAMETER TO USE IN AN AUTONOMOUS RESOURCE UTILIZATION PROCEDURE
4-1
PERFORMING THE AUTONOMOUS RESOURCE UTILIZATION PROCEDURE BASED ON THE SELECTION OF THE PARAMETER
4-2
PARTICIPATING IN THE V2X COMMUNICATION OF THE PARTICULAR V2X MODE TYPE USING THE SELECTED RADIO RESOURCE(S)
4-3

Fig. 4A

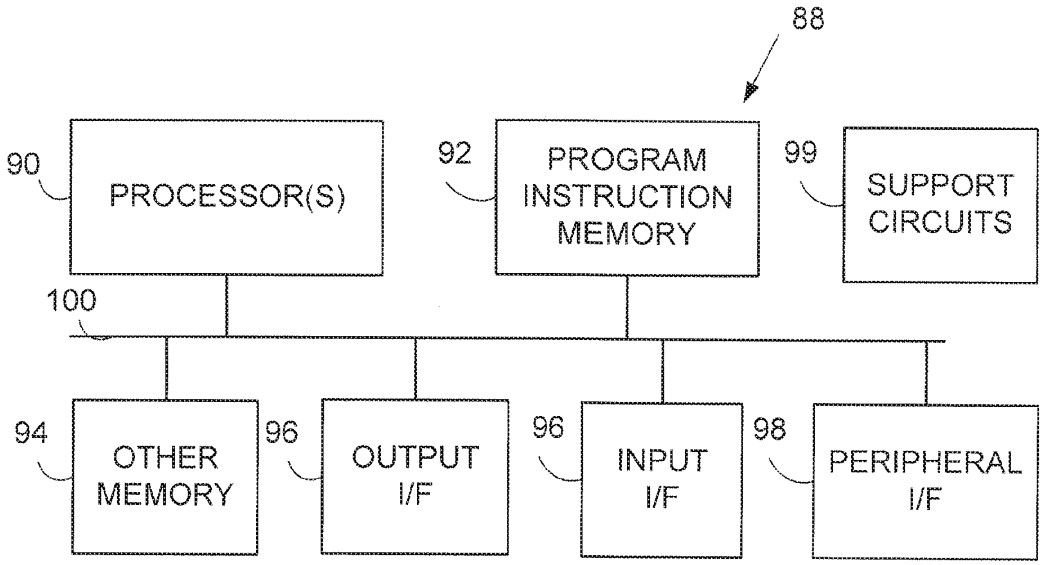

88
90
PROCESSOR(S)
92
PROGRAM INSTRUCTION MEMORY
99
SUPPORT CIRCUITS
100
94
OTHER MEMORY
96
OUTPUT I/F
96
INPUT I/F
98
PERIPHERAL I/F

Fig.13

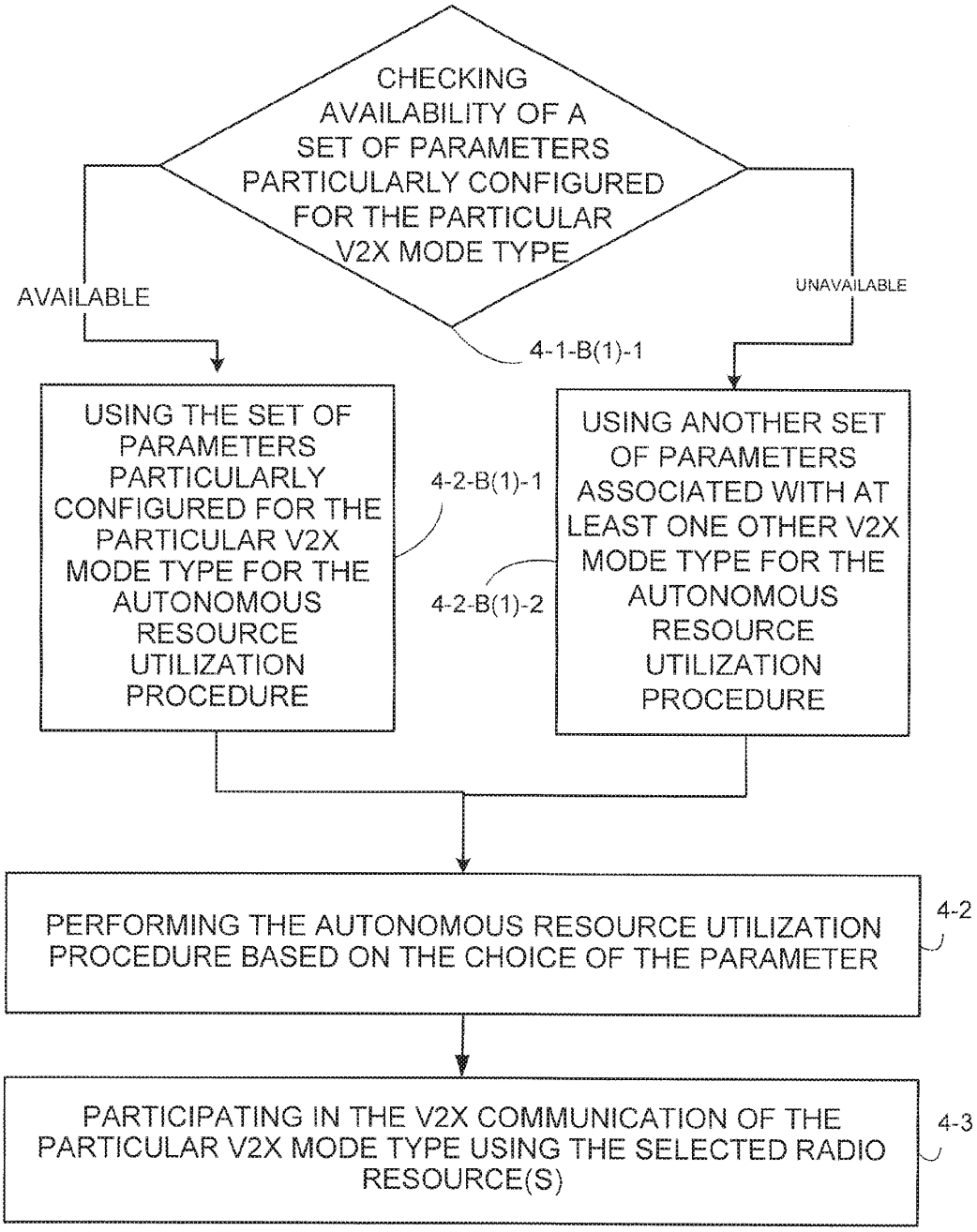

CHECKING AVAILABILITY OF A SET OF PARAMETERS PARTICULARLY CONFIGURED FOR THE PARTICULAR V2X MODE TYPE
AVAILABLE
UNAVAILABLE
4-1-B(1)-1
USING THE SET OF PARAMETERS PARTICULARLY CONFIGURED FOR THE PARTICULAR V2X MODE TYPE FOR THE AUTONOMOUS RESOURCE UTILIZATION PROCEDURE
4-2-B(1)-1
4-2-B(1)-2
USING ANOTHER SET OF PARAMETERS ASSOCIATED WITH AT LEAST ONE OTHER V2X MODE TYPE FOR THE AUTONOMOUS RESOURCE UTILIZATION PROCEDURE
PERFORMING THE AUTONOMOUS RESOURCE UTILIZATION PROCEDURE BASED ON THE CHOICE OF THE PARAMETER
4-2
PARTICIPATING IN THE V2X COMMUNICATION OF THE PARTICULAR V2X MODE TYPE USING THE SELECTED RADIO RESOURCE(S)
4-3

Fig. 4B(1)

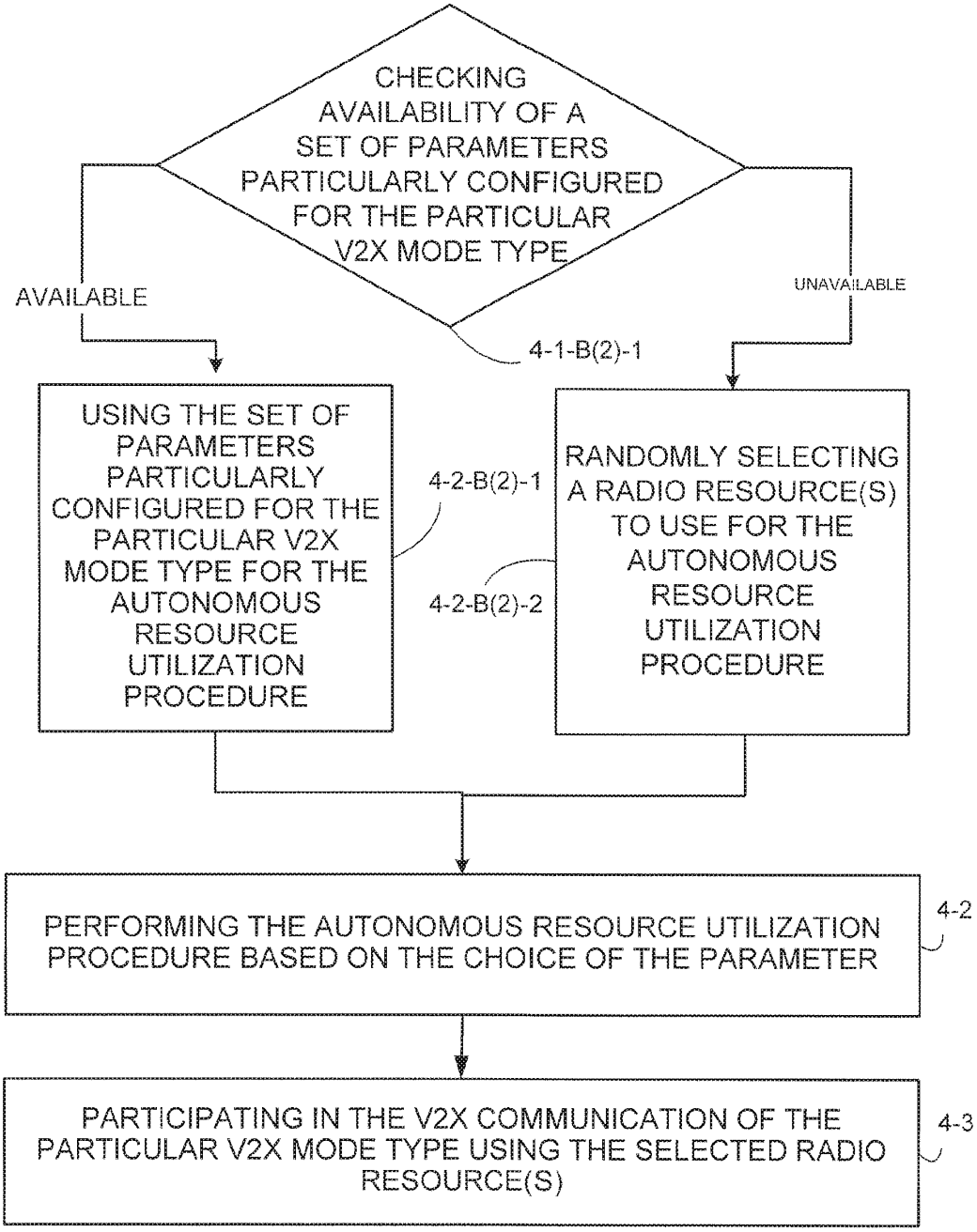

CHECKING AVAILABILITY OF A SET OF PARAMETERS PARTICULARLY CONFIGURED FOR THE PARTICULAR V2X MODE TYPE
AVAILABLE
UNAVAILABLE
4-1-B(2)-1
USING THE SET OF PARAMETERS PARTICULARLY CONFIGURED FOR THE PARTICULAR V2X MODE TYPE FOR THE AUTONOMOUS RESOURCE UTILIZATION PROCEDURE
4-2-B(2)-1
RANDOMLY SELECTING A RADIO RESOURCE(S) TO USE FOR THE AUTONOMOUS RESOURCE UTILIZATION PROCEDURE
4-2-B(2)-2
PERFORMING THE AUTONOMOUS RESOURCE UTILIZATION PROCEDURE BASED ON THE CHOICE OF THE PARAMETER
4-2
PARTICIPATING IN THE V2X COMMUNICATION OF THE PARTICULAR V2X MODE TYPE USING THE SELECTED RADIO RESOURCE(S)
4-3

Fig. 4B(2)

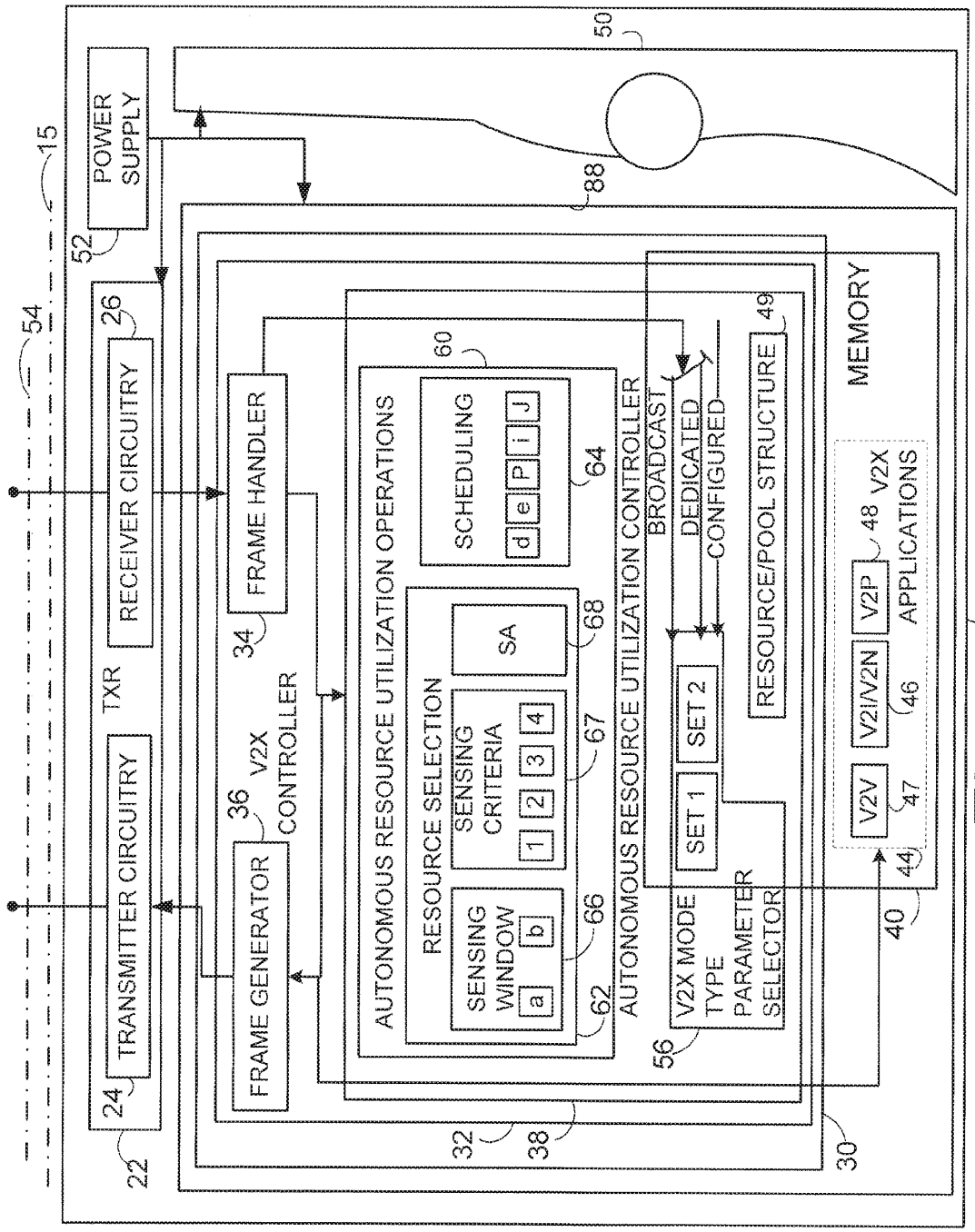

POWER SUPPLY
52
50
88
15
54
26
RECEIVER CIRCUITRY
TXR
TRANSMITTER CIRCUITRY
24
22
FRAME HANDLER
34
V2X CONTROLLER
36
FRAME GENERATOR
AUTONOMOUS RESOURCE UTILIZATION OPERATIONS
60
SCHEDULING
d e P i J
64
RESOURCE SELECTION
SENSING CRITERIA
1 2 3 4
67
SA
68
SENSING WINDOW
a b
66
62
AUTONOMOUS RESOURCE UTILIZATION CONTROLLER
BROADCAST
DEDICATED
CONFIGURED
SET 1
SET 2
V2X MODE TYPE PARAMETER SELECTOR
56
RESOURCE/POOL STRUCTURE
49
MEMORY
V2V
47
V2I/V2N
46
V2P
48
V2X APPLICATIONS
44
40
32
38
30
20

Fig. 5

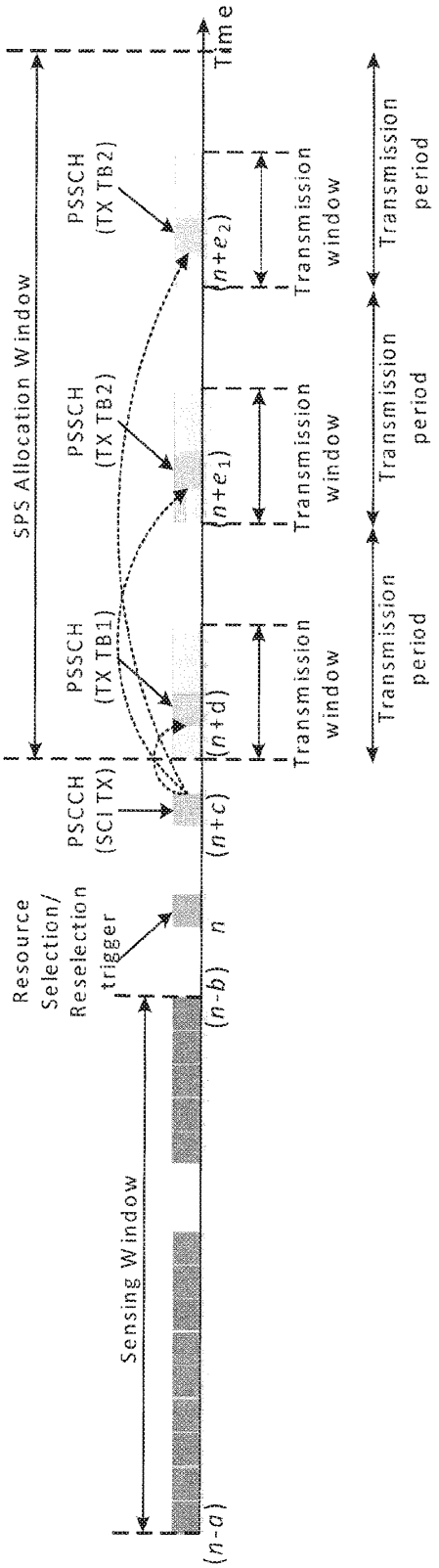

Time
SPS Allocation Window
Sensing Window
Resource Selection/ Reselection trigger
PSCCH (SCI TX)
PSSCH (TX TB1)
PSSCH (TX TB2)
PSSCH (TX TB2)
(n-a)
(n-b)
n
(n+c)
(n+d)
(n+e1)
(n+e2)
Transmission window
Transmission window
Transmission window
Transmission period
Transmission period
Transmission period

Fig. 6

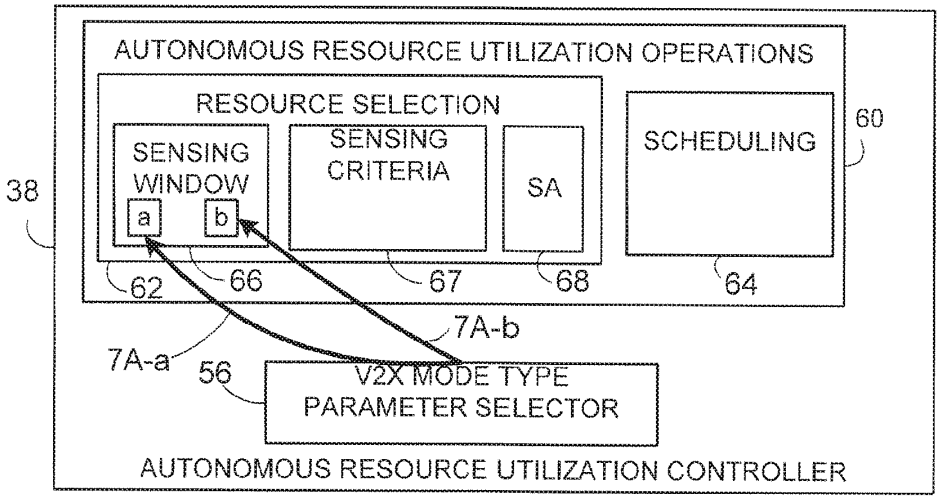

AUTONOMOUS RESOURCE UTILIZATION OPERATIONS
RESOURCE SELECTION
SENSING WINDOW
a
b
SENSING CRITERIA
SA
SCHEDULING
60
38
62
66
67
68
64
7A-a
7A-b
56
V2X MODE TYPE PARAMETER SELECTOR
AUTONOMOUS RESOURCE UTILIZATION CONTROLLER

Fig. 7A

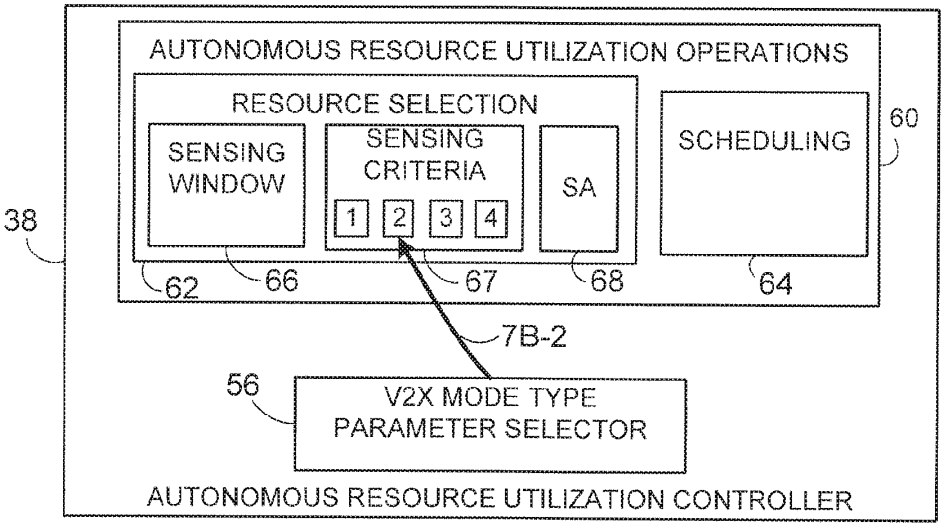

AUTONOMOUS RESOURCE UTILIZATION OPERATIONS
RESOURCE SELECTION
SENSING WINDOW
SENSING CRITERIA
1
2
3
4
SA
SCHEDULING
60
38
62
66
67
68
64
7B-2
56
V2X MODE TYPE PARAMETER SELECTOR
AUTONOMOUS RESOURCE UTILIZATION CONTROLLER

Fig. 7B

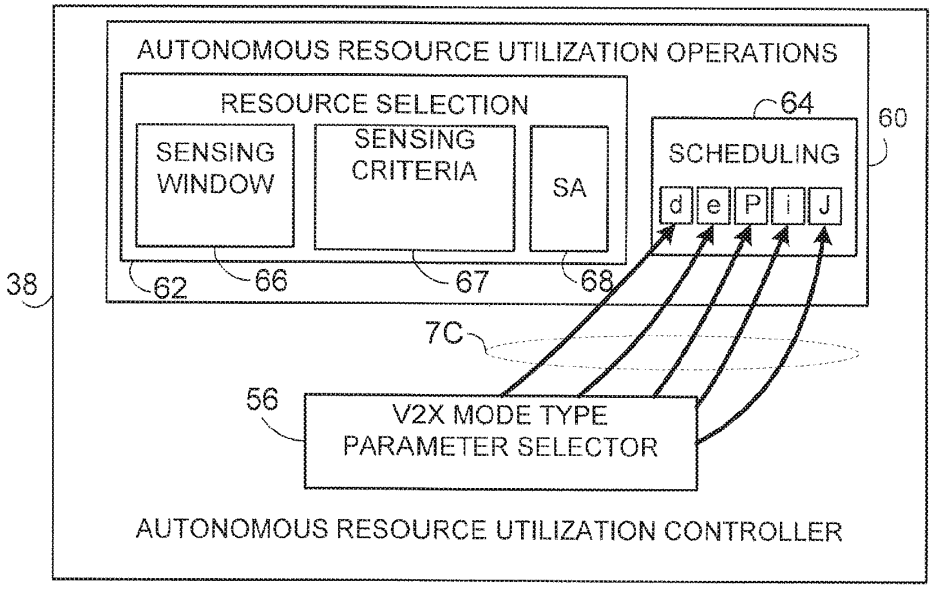

AUTONOMOUS RESOURCE UTILIZATION OPERATIONS
RESOURCE SELECTION
SENSING WINDOW
SENSING CRITERIA
SA
64
SCHEDULING
d e P i J
60
38
62
66
67
68
7C
56
V2X MODE TYPE PARAMETER SELECTOR
AUTONOMOUS RESOURCE UTILIZATION CONTROLLER

Fig. 7C

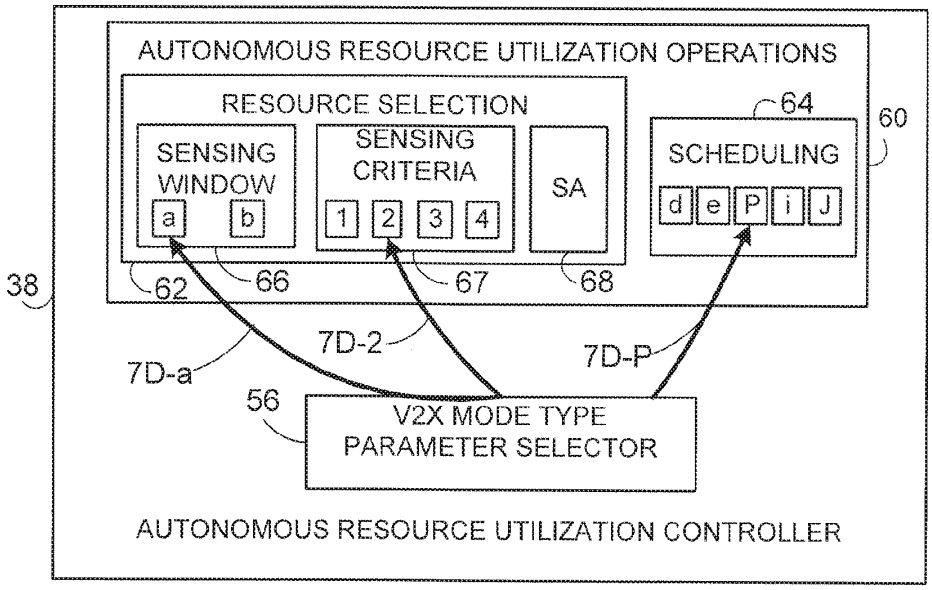

AUTONOMOUS RESOURCE UTILIZATION OPERATIONS
RESOURCE SELECTION
SENSING WINDOW
a b
SENSING CRITERIA
1 2 3 4
SA
64
SCHEDULING
d e P i J
60
38
62
66
67
68
7D-a
7D-2
7D-P
56
V2X MODE TYPE PARAMETER SELECTOR
AUTONOMOUS RESOURCE UTILIZATION CONTROLLER

Fig. 7D

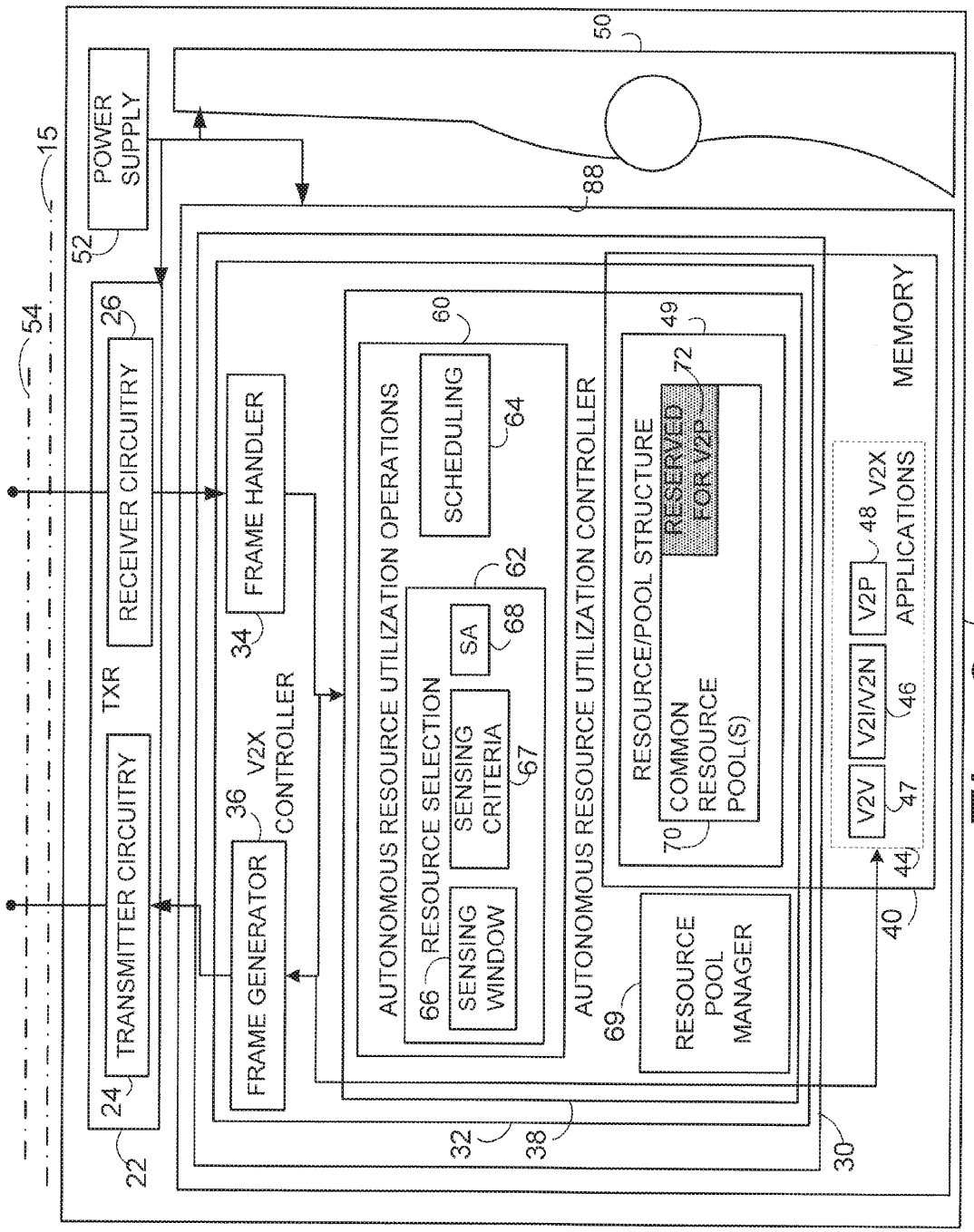

15
50
POWER SUPPLY
52
88
54
26
TXR
RECEIVER CIRCUITRY
TRANSMITTER CIRCUITRY
24
22
FRAME HANDLER
34
V2X CONTROLLER
36
FRAME GENERATOR
AUTONOMOUS RESOURCE UTILIZATION OPERATIONS
60
SCHEDULING
64
RESOURCE SELECTION
62
SENSING CRITERIA
67
SA
68
SENSING WINDOW
66
AUTONOMOUS RESOURCE UTILIZATION CONTROLLER
RESOURCE/POOL STRUCTURE
49
RESERVED FOR V2P
72
COMMON RESOURCE POOL(S)
70
RESOURCE POOL MANAGER
69
MEMORY
V2X APPLICATIONS
V2V
47
V2I/V2N
46
V2P
48
44
40
32
38
30

Fig. 8 20(8)

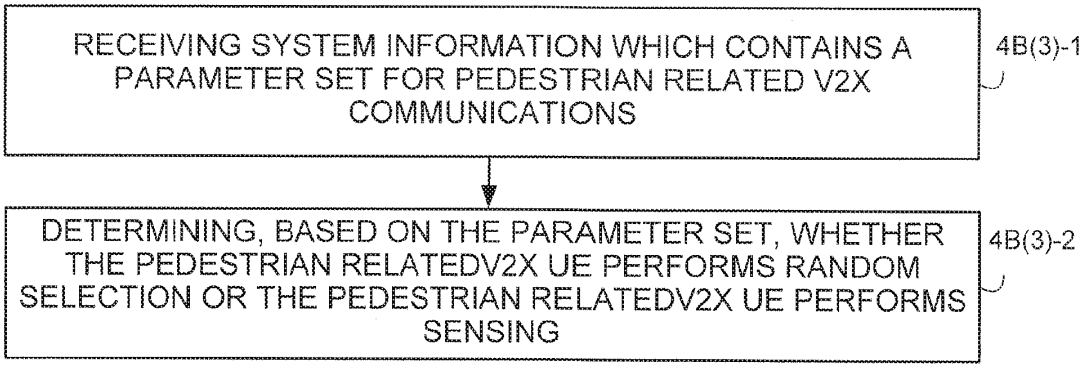

RECEIVING SYSTEM INFORMATION WHICH CONTAINS A PARAMETER SET FOR PEDESTRIAN RELATED V2X COMMUNICATIONS
4B(3)-1
DETERMINING, BASED ON THE PARAMETER SET, WHETHER THE PEDESTRIAN RELATEDV2X UE PERFORMS RANDOM SELECTION OR THE PEDESTRIAN RELATEDV2X UE PERFORMS SENSING
4B(3)-2

Fig. 4B(3)

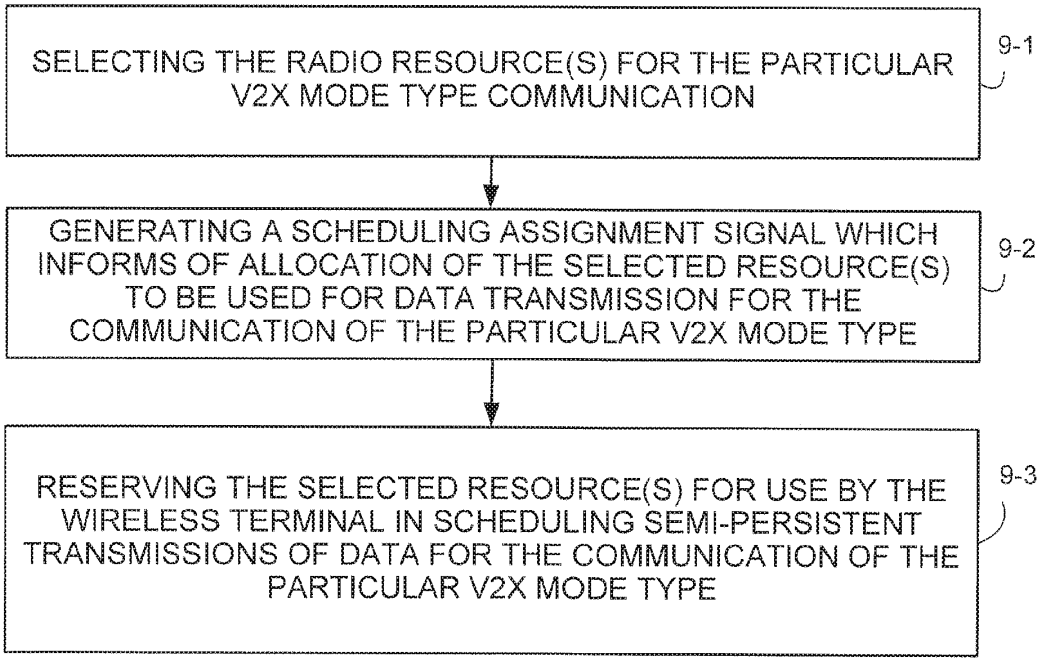

SELECTING THE RADIO RESOURCE(S) FOR THE PARTICULAR V2X MODE TYPE COMMUNICATION
9-1
GENERATING A SCHEDULING ASSIGNMENT SIGNAL WHICH INFORMS OF ALLOCATION OF THE SELECTED RESOURCE(S) TO BE USED FOR DATA TRANSMISSION FOR THE COMMUNICATION OF THE PARTICULAR V2X MODE TYPE
9-2
RESERVING THE SELECTED RESOURCE(S) FOR USE BY THE WIRELESS TERMINAL IN SCHEDULING SEMI-PERSISTENT TRANSMISSIONS OF DATA FOR THE COMMUNICATION OF THE PARTICULAR V2X MODE TYPE
9-3

Fig. 9

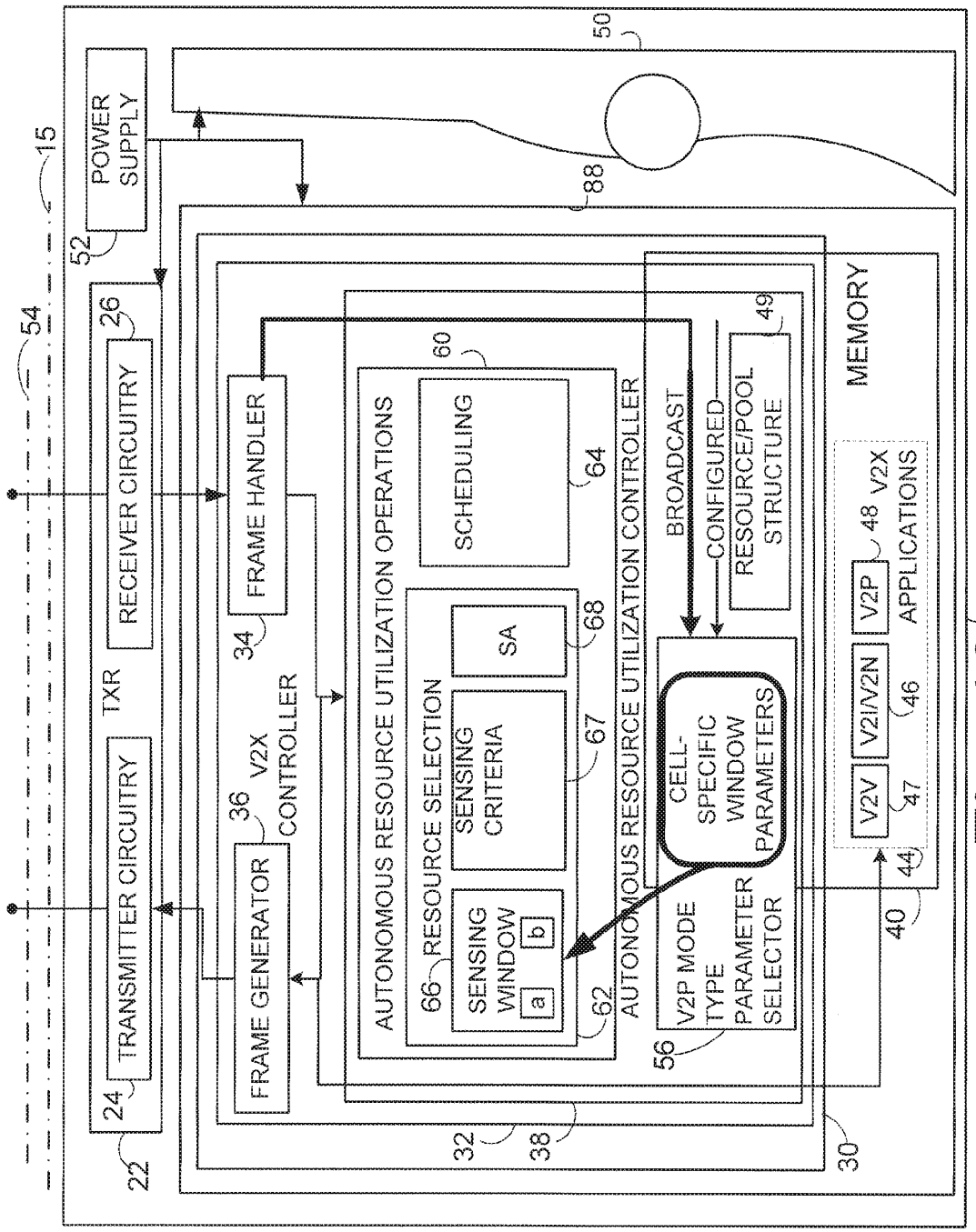

15
POWER SUPPLY
52
50
88
54
26
RECEIVER CIRCUITRY
TXR
TRANSMITTER CIRCUITRY
24
22
FRAME HANDLER
34
V2X CONTROLLER
36
FRAME GENERATOR
AUTONOMOUS RESOURCE UTILIZATION OPERATIONS
60
SCHEDULING
64
RESOURCE SELECTION
66
SENSING WINDOW
a
b
62
SENSING CRITERIA
67
SA
68
AUTONOMOUS RESOURCE UTILIZATION CONTROLLER
BROADCAST
CONFIGURED RESOURCE/POOL STRUCTURE
49
CELL-SPECIFIC WINDOW PARAMETERS
V2P MODE TYPE PARAMETER SELECTOR
56
MEMORY
V2V
47
V2I/V2N
46
V2P
48
V2X APPLICATIONS
44
40
32
38
30
20(10)

Fig. 10

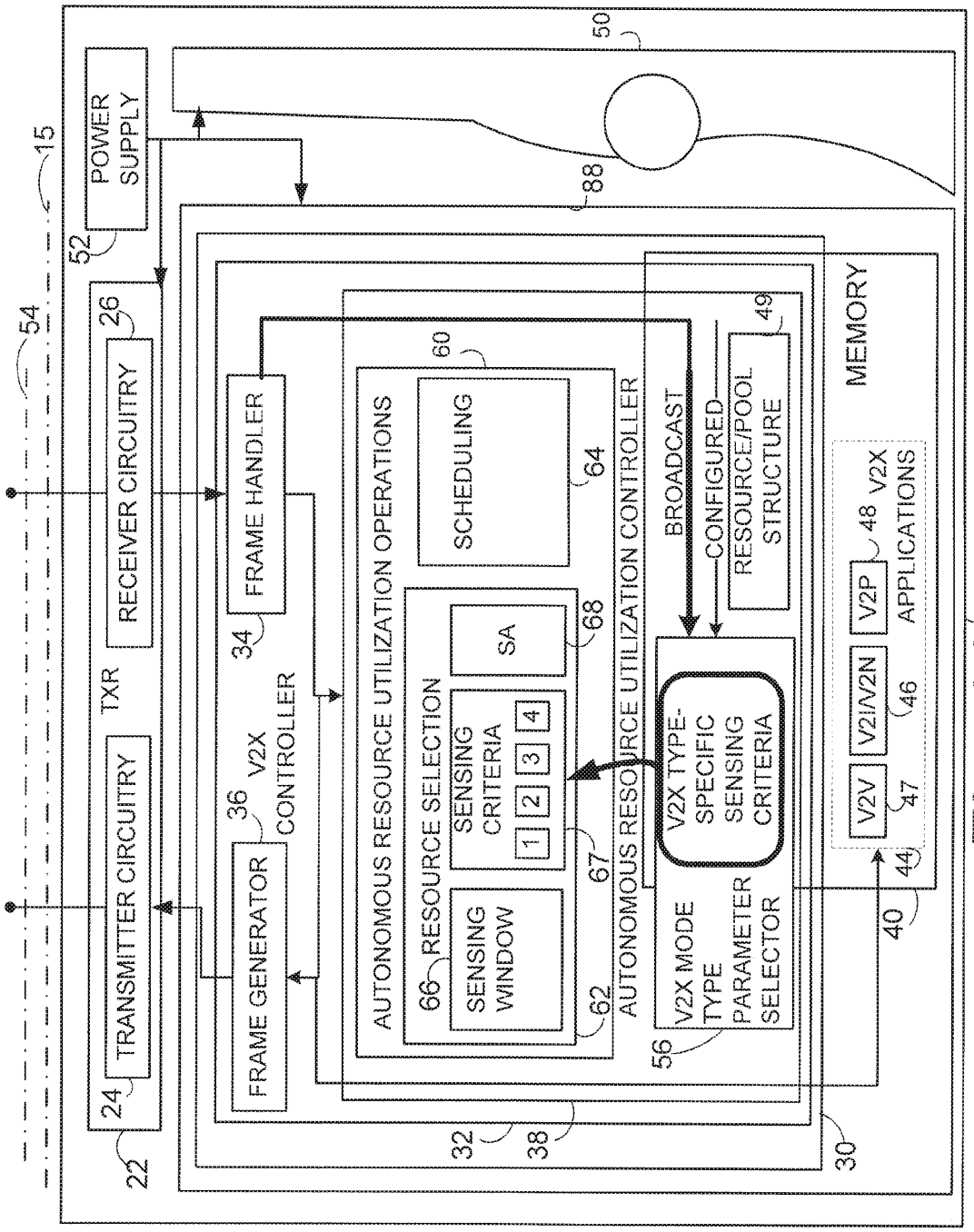

15
50
88
POWER SUPPLY
52
54
26
TXR
RECEIVER CIRCUITRY
TRANSMITTER CIRCUITRY
24
22
FRAME HANDLER
34
V2X CONTROLLER
36
FRAME GENERATOR
AUTONOMOUS RESOURCE UTILIZATION OPERATIONS
60
SCHEDULING
64
RESOURCE SELECTION
66
SENSING WINDOW
SENSING CRITERIA
1
2
3
4
SA
68
62
67
AUTONOMOUS RESOURCE UTILIZATION CONTROLLER
BROADCAST
CONFIGURED RESOURCE/POOL STRUCTURE
49
V2X TYPE-SPECIFIC SENSING CRITERIA
V2X MODE TYPE PARAMETER SELECTOR
56
MEMORY
V2V
47
V2I/V2N
46
V2P
48
V2X APPLICATIONS
44
40
32
38
30

Fig. 11 20(11)

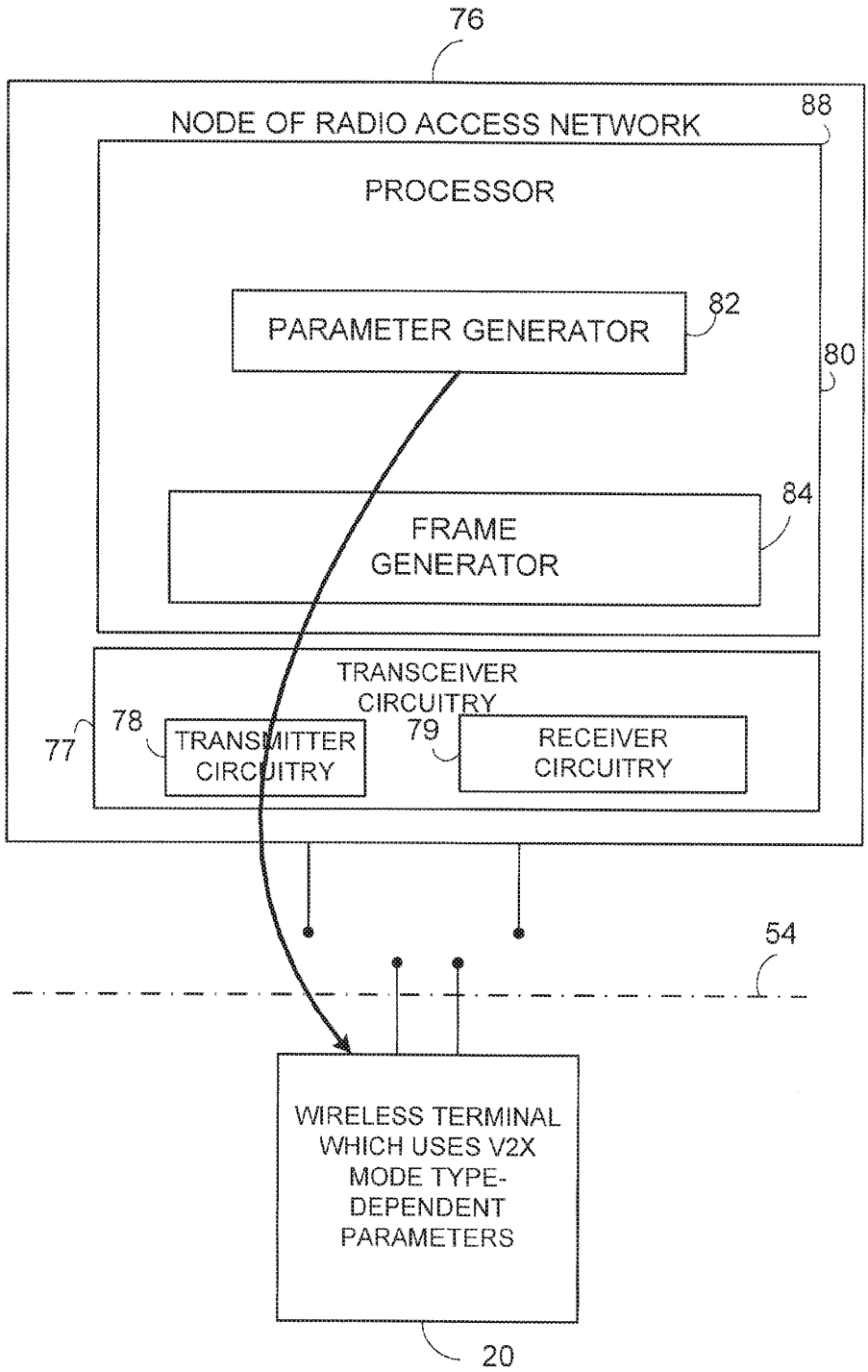

76
NODE OF RADIO ACCESS NETWORK
88
PROCESSOR
PARAMETER GENERATOR
82
80
FRAME GENERATOR
84
TRANSCEIVER CIRCUITRY
77
78
TRANSMITTER CIRCUITRY
79
RECEIVER CIRCUITRY
54
WIRELESS TERMINAL WHICH USES V2X MODE TYPE-DEPENDENT PARAMETERS
20

Fig. 12