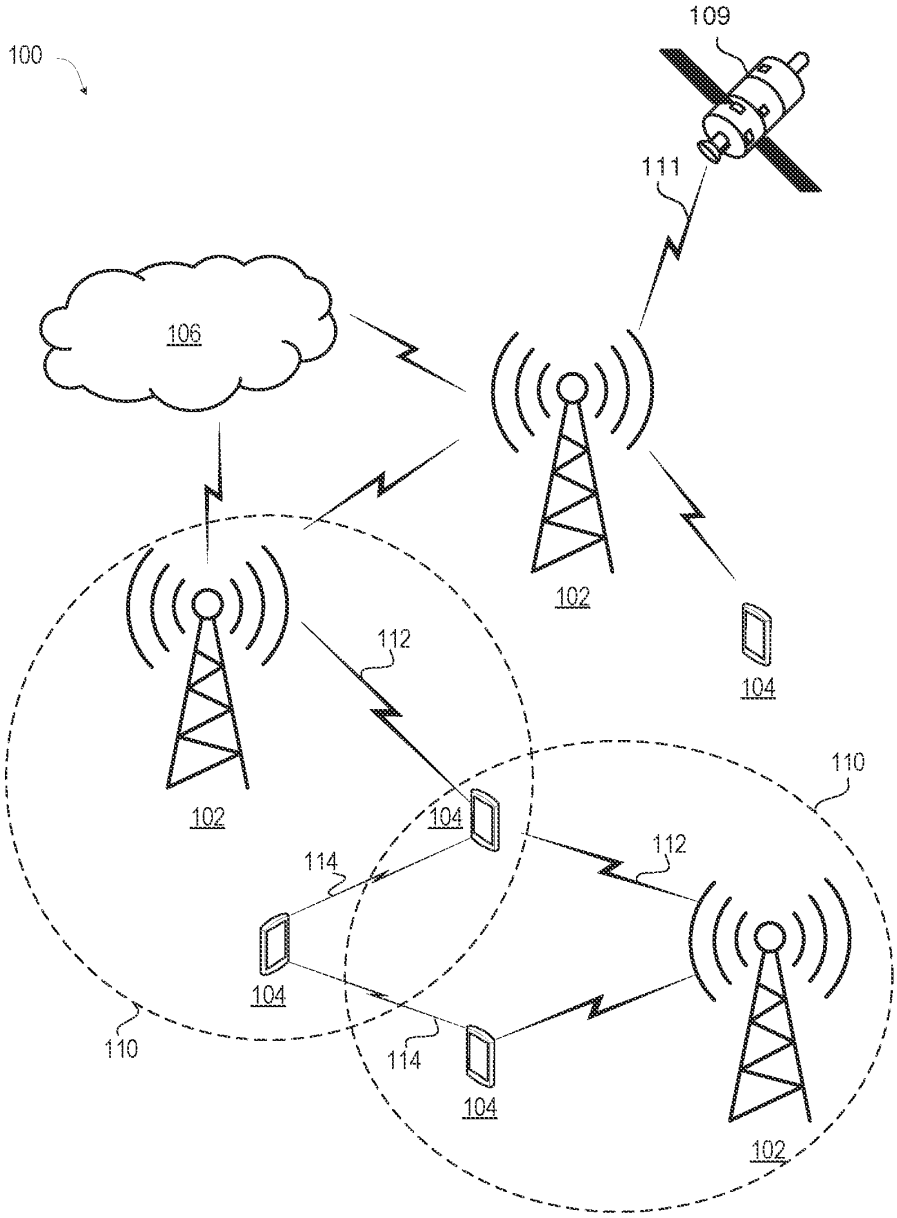

100
109
111
106
102
104
112
102
104
110
114
104
112
110
114
104
102

Figure 1

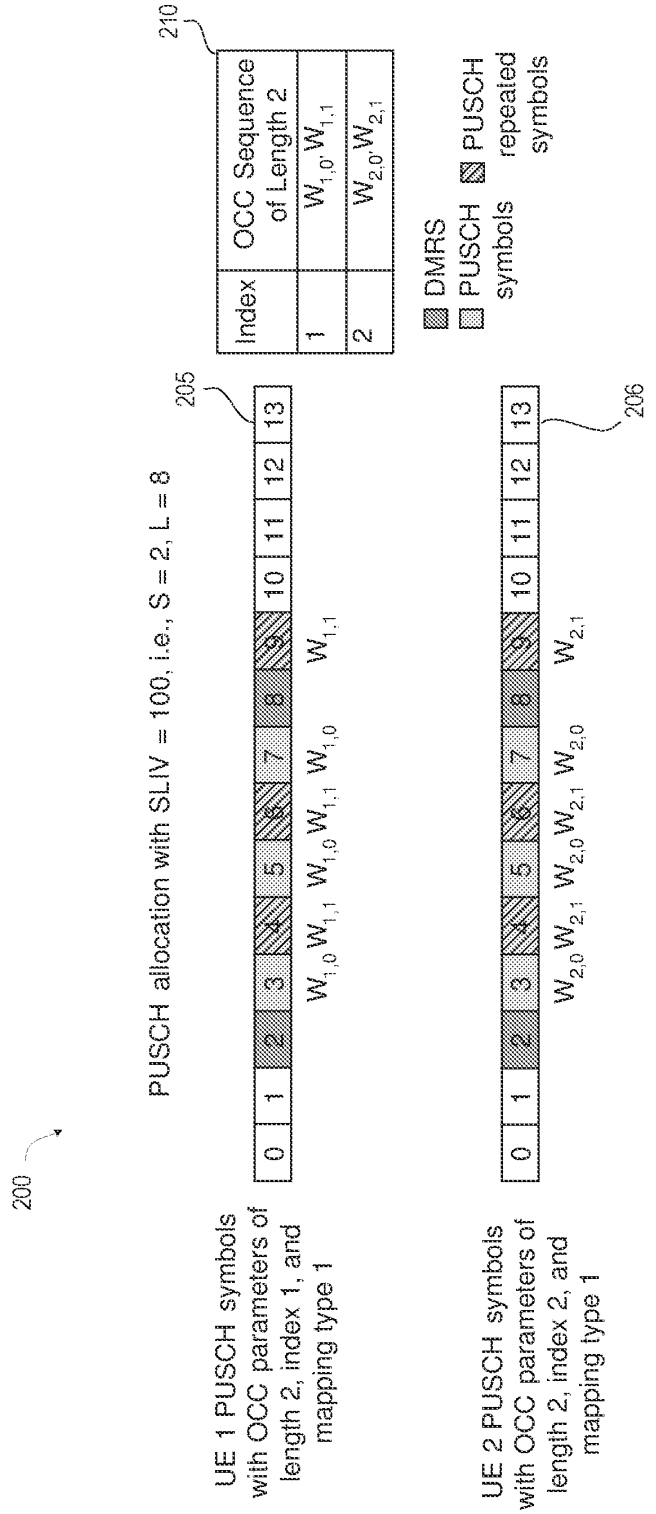

200
PUSCH allocation with SLIV = 100, i.e., S = 2, L = 8
205
0 1 2 3 4 5 6 7 8 9 10 11 12 13
$W_{1,0}$ $W_{1,1}$ $W_{1,0}$ $W_{1,1}$ $W_{1,0}$ $W_{1,1}$
UE 1 PUSCH symbols with OCC parameters of length 2, index 1, and mapping type 1
0 1 2 3 4 5 6 7 8 9 10 11 12 13
$W_{2,0}$ $W_{2,1}$ $W_{2,0}$ $W_{2,1}$ $W_{2,0}$ $W_{2,1}$
UE 2 PUSCH symbols with OCC parameters of length 2, index 2, and mapping type 1
206
210
Index
OCC Sequence of Length 2
1
$W_{1,0}$ $W_{1,1}$
2
$W_{2,0}$ $W_{2,1}$
DMRS
PUSCH symbols
PUSCH repeated symbols

FIG. 2

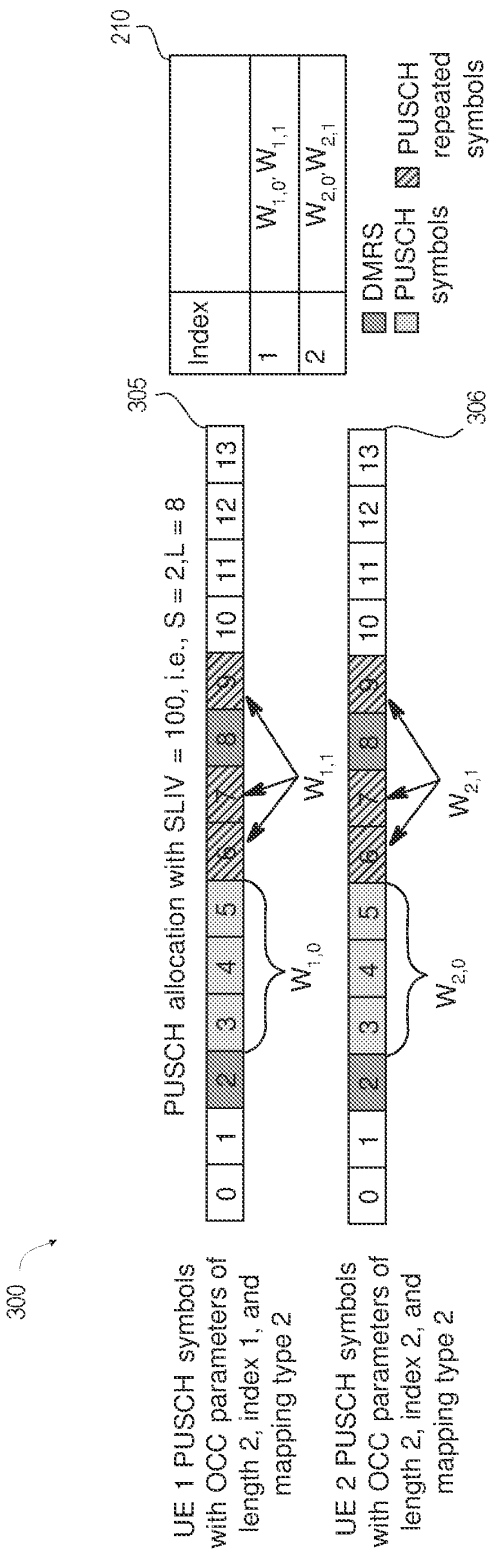

300
UE 1 PUSCH symbols with OCC parameters of length 2, index 1, and mapping type 2
UE 2 PUSCH symbols with OCC parameters of length 2, index 2, and mapping type 2
PUSCH allocation with SLIV = 100, i.e., S = 2,L = 8
0 1 2 3 4 5 6 7 8 9 10 11 12 13
305
306
$W_{1,0}$
$W_{1,1}$
$W_{2,0}$
$W_{2,1}$
210
Index
1
$W_{1,0}, W_{1,1}$
2
$W_{2,0}, W_{2,1}$
DMRS
PUSCH symbols
PUSCH repeated symbols

FIG. 3

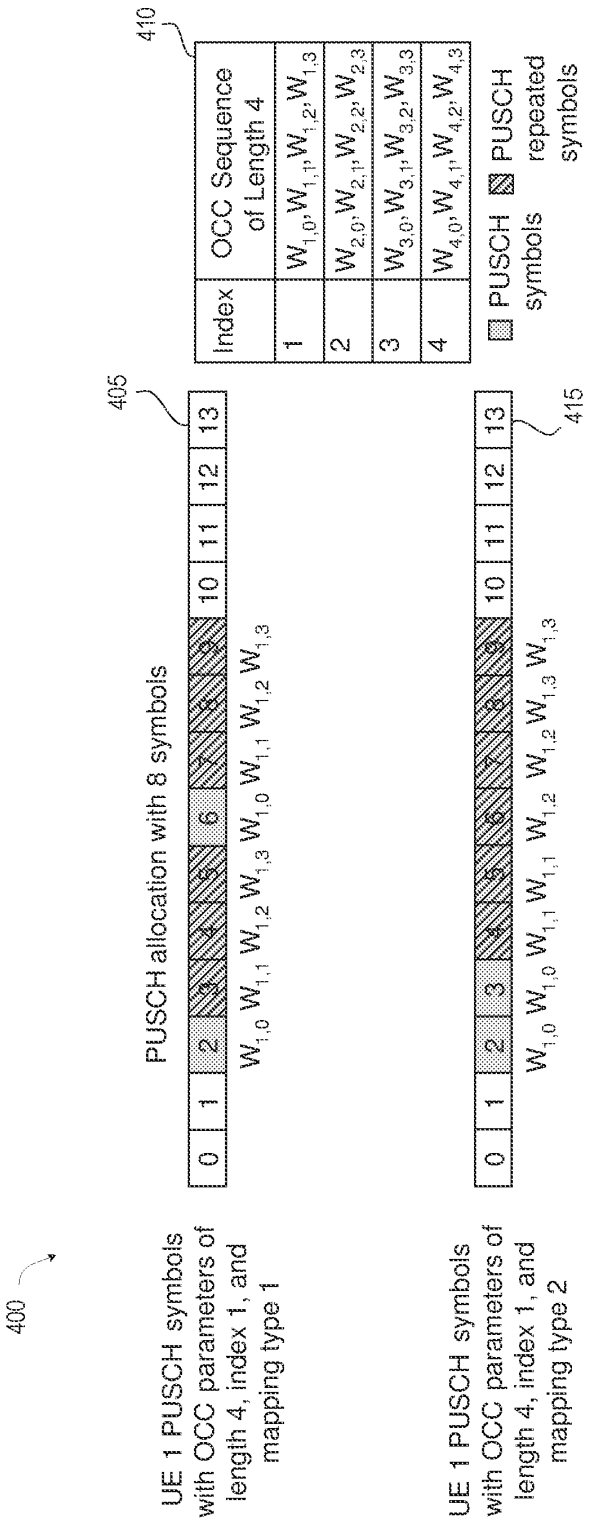

400
UE 1 PUSCH symbols with OCC parameters of length 4, index 1, and mapping type 1
PUSCH allocation with 8 symbols
405
0 1 2 3 4 5 6 7 8 9 10 11 12 13
$W_{1,0}$ $W_{1,1}$ $W_{1,2}$ $W_{1,3}$ $W_{1,0}$ $W_{1,1}$ $W_{1,2}$ $W_{1,3}$
UE 1 PUSCH symbols with OCC parameters of length 4, index 1, and mapping type 2
0 1 2 3 4 5 6 7 8 9 10 11 12 13
$W_{1,0}$ $W_{1,0}$ $W_{1,1}$ $W_{1,1}$ $W_{1,2}$ $W_{1,2}$ $W_{1,3}$ $W_{1,3}$
415
410
Index
OCC Sequence of Length 4
1 $W_{1,0}, W_{1,1}, W_{1,2}, W_{1,3}$
2 $W_{2,0}, W_{2,1}, W_{2,2}, W_{2,3}$
3 $W_{3,0}, W_{3,1}, W_{3,2}, W_{3,3}$
4 $W_{4,0}, W_{4,1}, W_{4,2}, W_{4,3}$
PUSCH symbols
PUSCH repeated symbols

FIG. 4

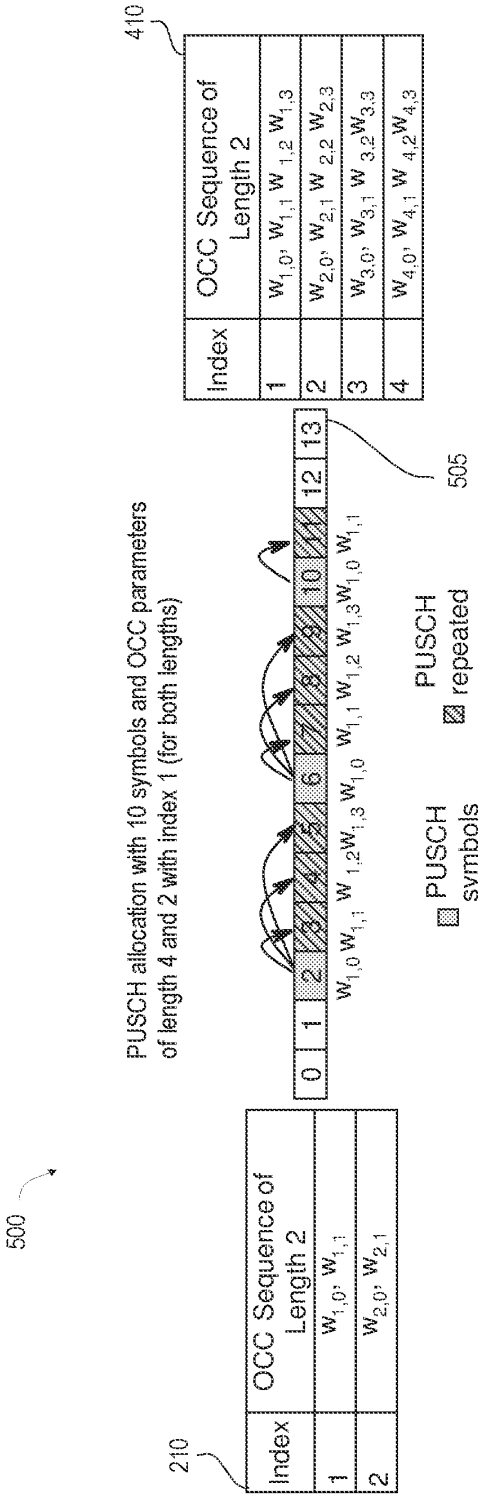

500
210
Index
OCC Sequence of Length 2
1
$w_{1,0}$, $w_{1,1}$
2
$w_{2,0}$, $w_{2,1}$
PUSCH allocation with 10 symbols and OCC parameters of length 4 and 2 with index 1 (for both lengths)
0 1 2 3 4 5 6 7 8 9 10 12 13
$w_{1,0}$ $w_{1,1}$ $w_{1,2}$ $w_{1,3}$ $w_{1,0}$ $w_{1,1}$ $w_{1,2}$ $w_{1,3}$ $w_{1,0}$ $w_{1,1}$
PUSCH symbols
PUSCH repeated symbols
505
410
Index
OCC Sequence of Length 2
1
$w_{1,0}$, $w_{1,1}$ $w_{1,2}$ $w_{1,3}$
2
$w_{2,0}$, $w_{2,1}$ $w_{2,2}$ $w_{2,3}$
3
$w_{3,0}$, $w_{3,1}$ $w_{3,2}$ $w_{3,3}$
4
$w_{4,0}$, $w_{4,1}$ $w_{4,2}$ $w_{4,3}$

FIG. 5

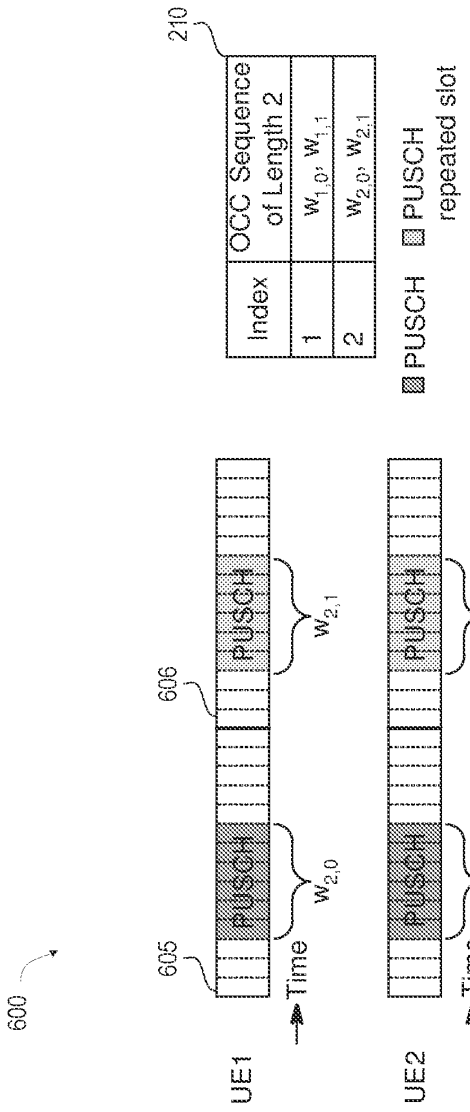

600
UE1
UE2
Time
Time
605
606
PUSCH
PUSCH
PUSCH
PUSCH
$w_{2,0}$
$w_{2,1}$
$w_{2,0}$
$w_{2,1}$
210
Index
OCC Sequence of Length 2
1
$w_{1,0}$, $w_{1,1}$
2
$w_{2,0}$, $w_{2,1}$
PUSCH
PUSCH repeated slot

FIG. 6

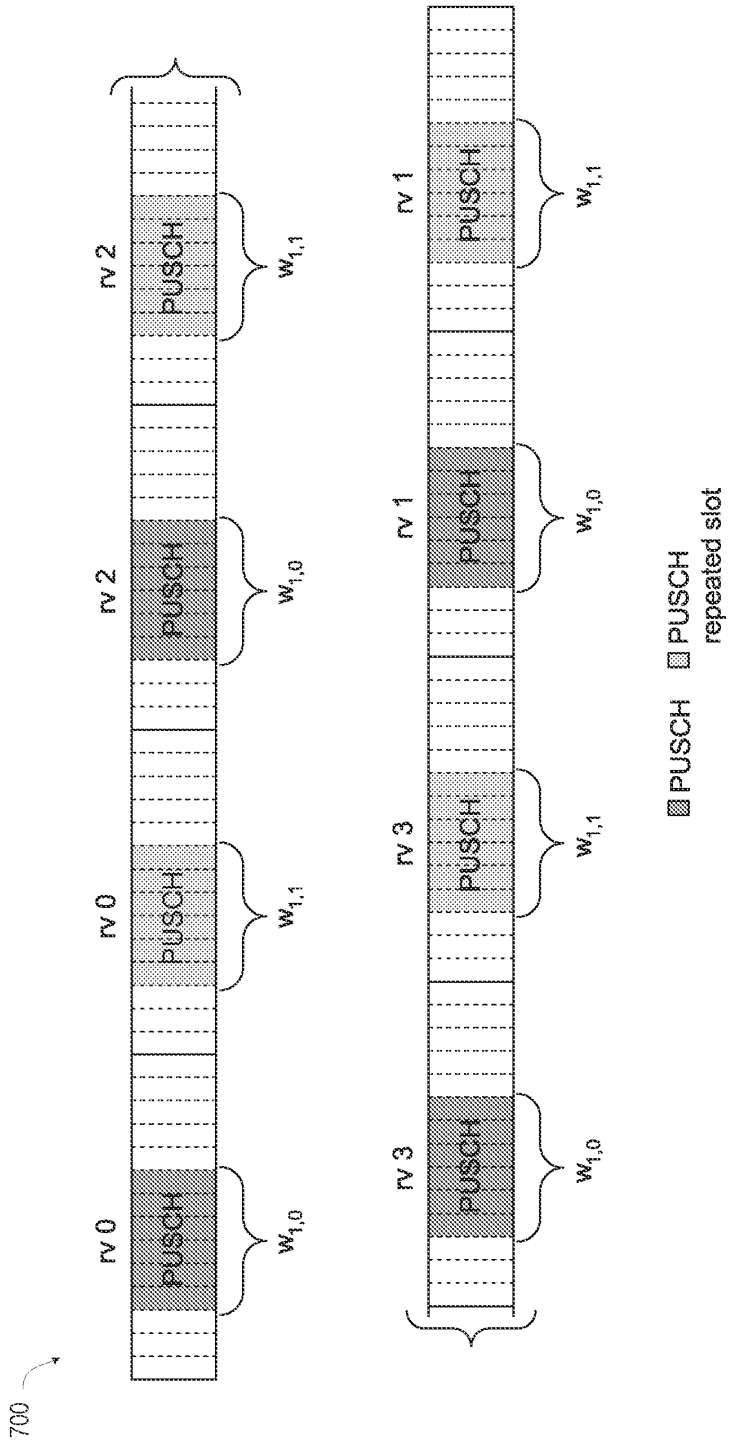

700
rv 0
PUSCH
$w_{1,0}$
rv 0
PUSCH
$w_{1,1}$
rv 2
PUSCH
$w_{1,0}$
rv 2
PUSCH
$w_{1,1}$
rv 3
PUSCH
$w_{1,0}$
rv 3
PUSCH
$w_{1,1}$
rv 1
PUSCH
$w_{1,0}$
rv 1
PUSCH
$w_{1,1}$
PUSCH
PUSCH
repeated slot

FIG. 7

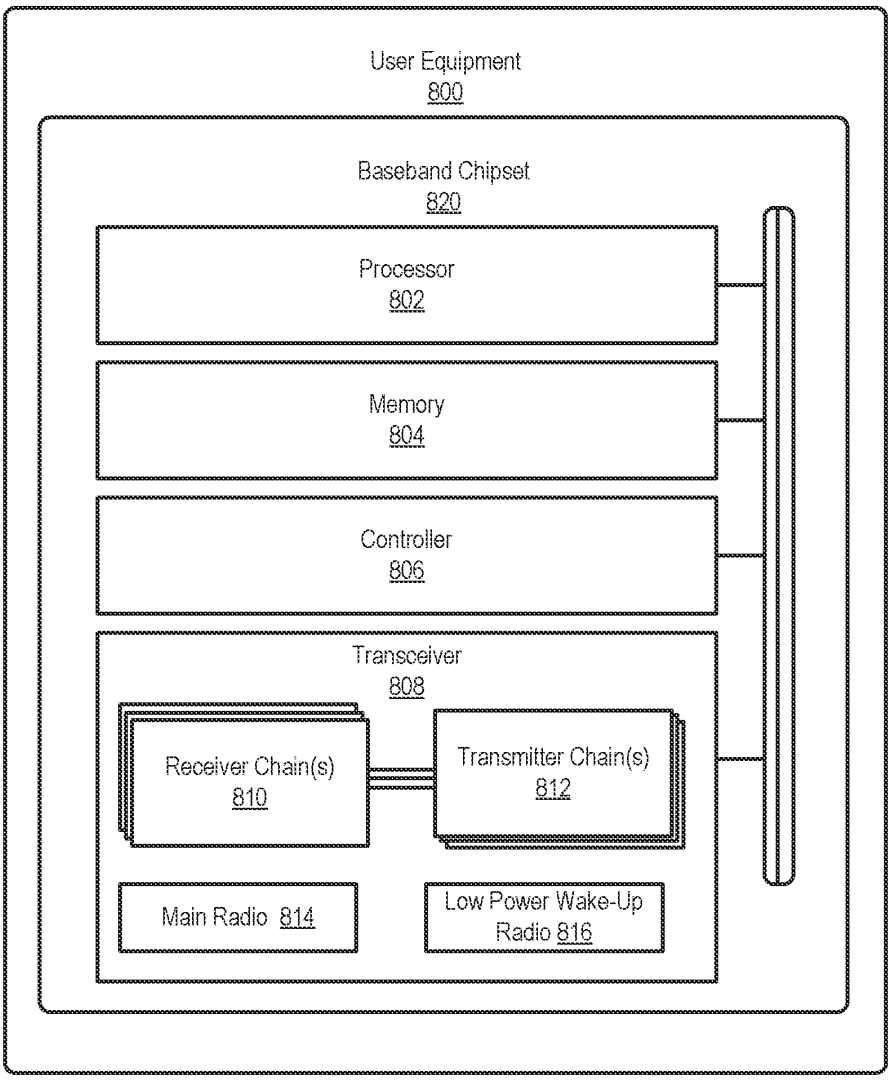

User Equipment
800
Baseband Chipset
820
Processor
802
Memory
804
Controller
806
Transceiver
808
Receiver Chain(s)
810
Transmitter Chain(s)
812
Main Radio 814
Low Power Wake-Up Radio 816

Figure 8

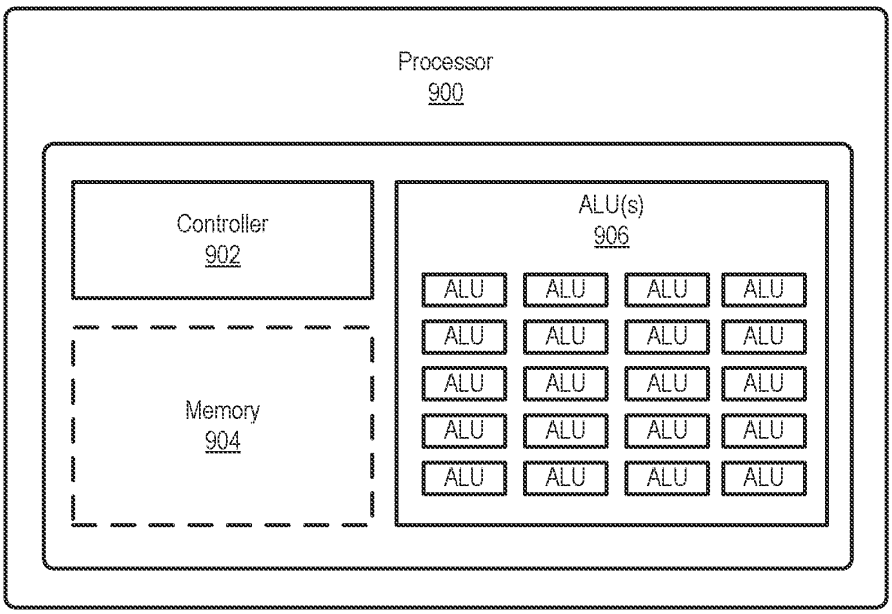

Processor
900
Controller
902
Memory
904
ALU(s)
906
ALU
ALU
ALU
ALU
ALU
ALU
ALU
ALU
ALU
ALU
ALU
ALU
ALU
ALU
ALU
ALU
ALU
ALU
ALU
ALU

Figure 9

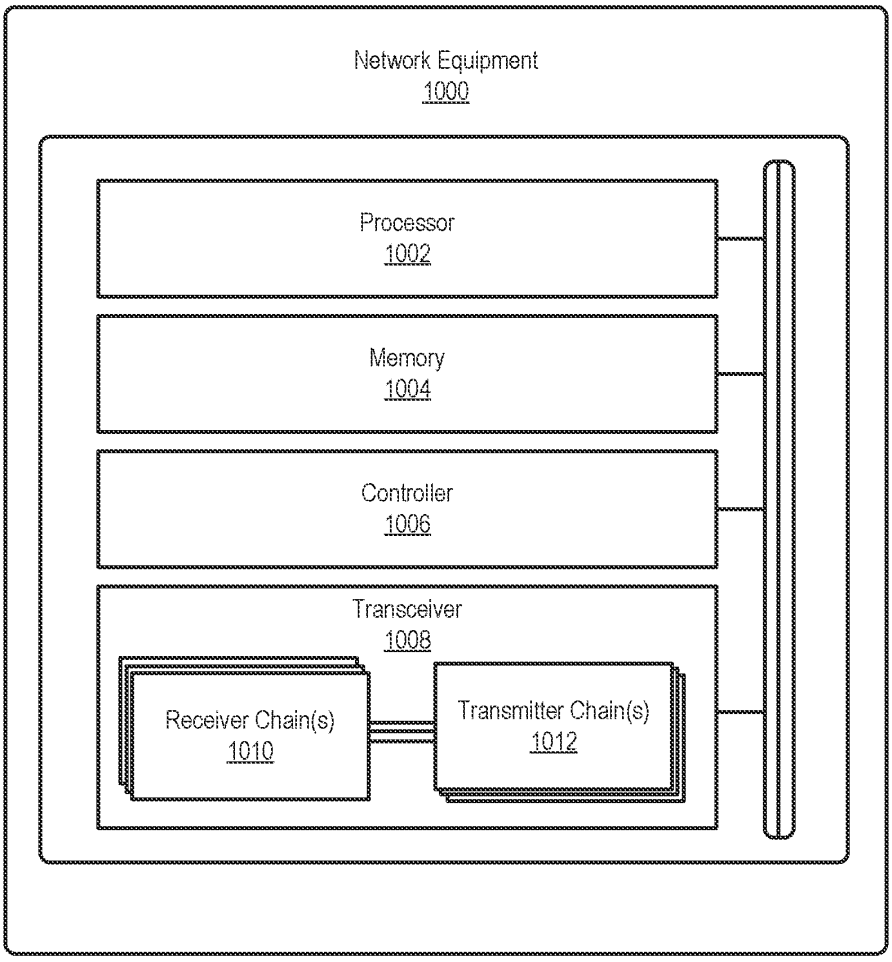

Network Equipment
1000
Processor
1002
Memory
1004
Controller
1006
Transceiver
1008
Receiver Chain(s)
1010
Transmitter Chain(s)
1012

Figure 10

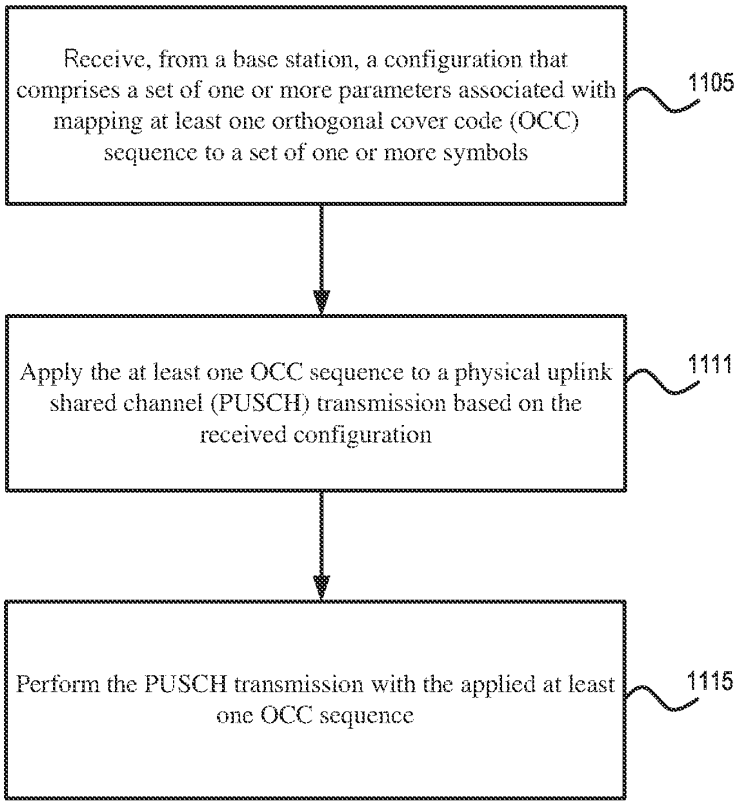

Receive, from a base station, a configuration that comprises a set of one or more parameters associated with mapping at least one orthogonal cover code (OCC) sequence to a set of one or more symbols
1105
Apply the at least one OCC sequence to a physical uplink shared channel (PUSCH) transmission based on the received configuration
1111
Perform the PUSCH transmission with the applied at least one OCC sequence
1115

Figure 11

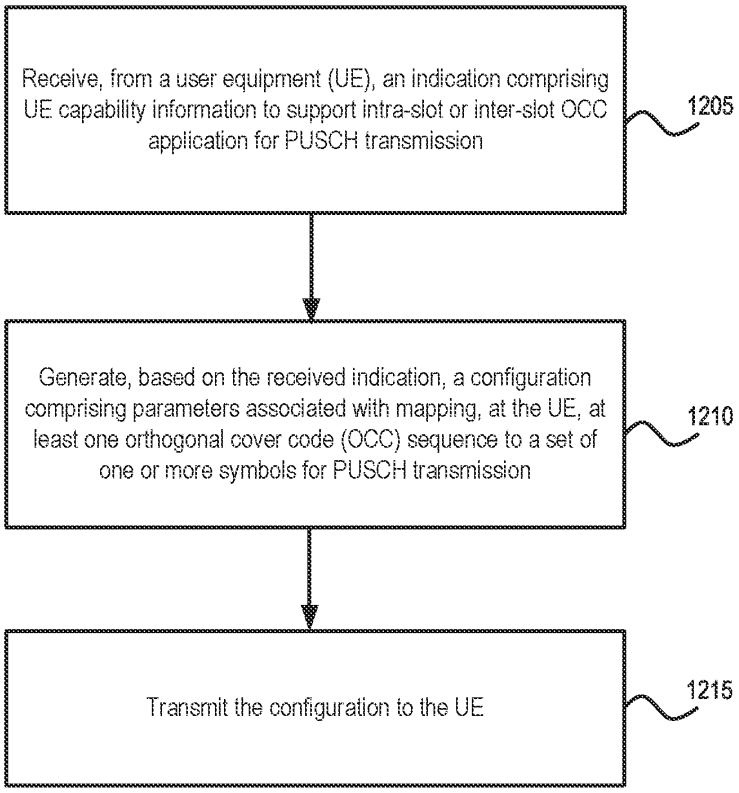

Receive, from a user equipment (UE), an indication comprising UE capability information to support intra-slot or inter-slot OCC application for PUSCH transmission
1205
Generate, based on the received indication, a configuration comprising parameters associated with mapping, at the UE, at least one orthogonal cover code (OCC) sequence to a set of one or more symbols for PUSCH transmission
1210
Transmit the configuration to the UE
1215

Figure 12