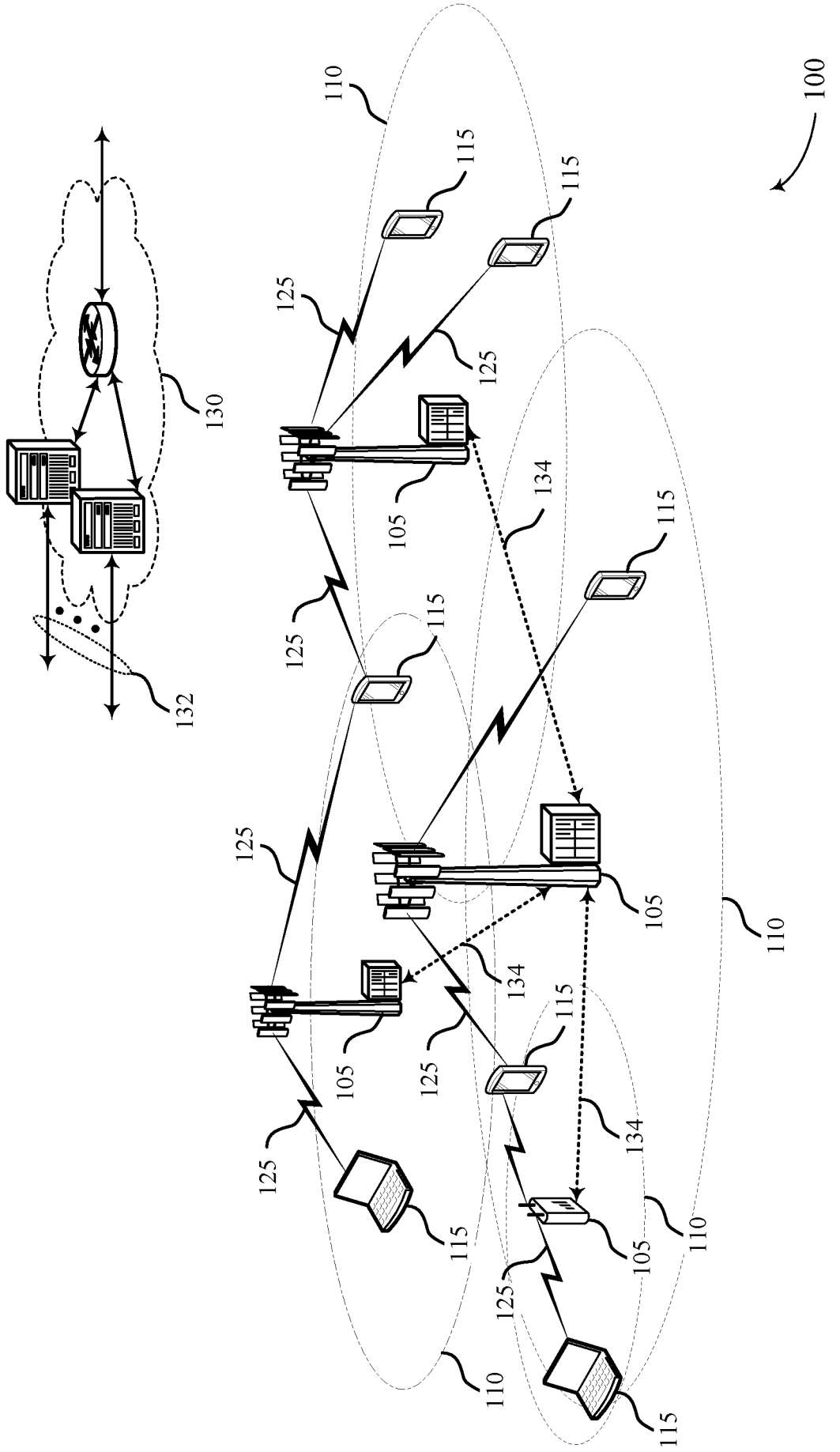


FIG. 1

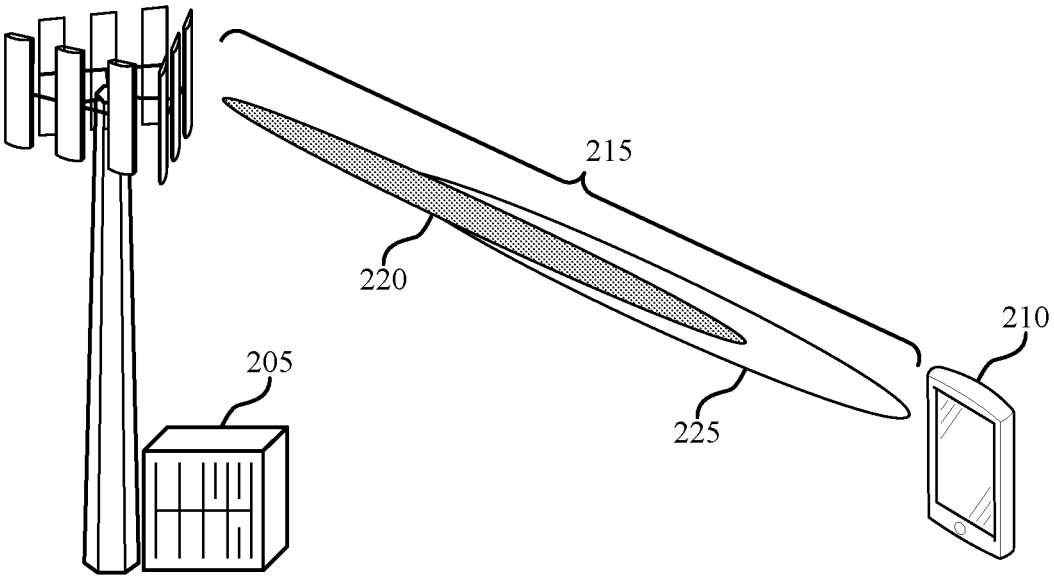


FIG. 2

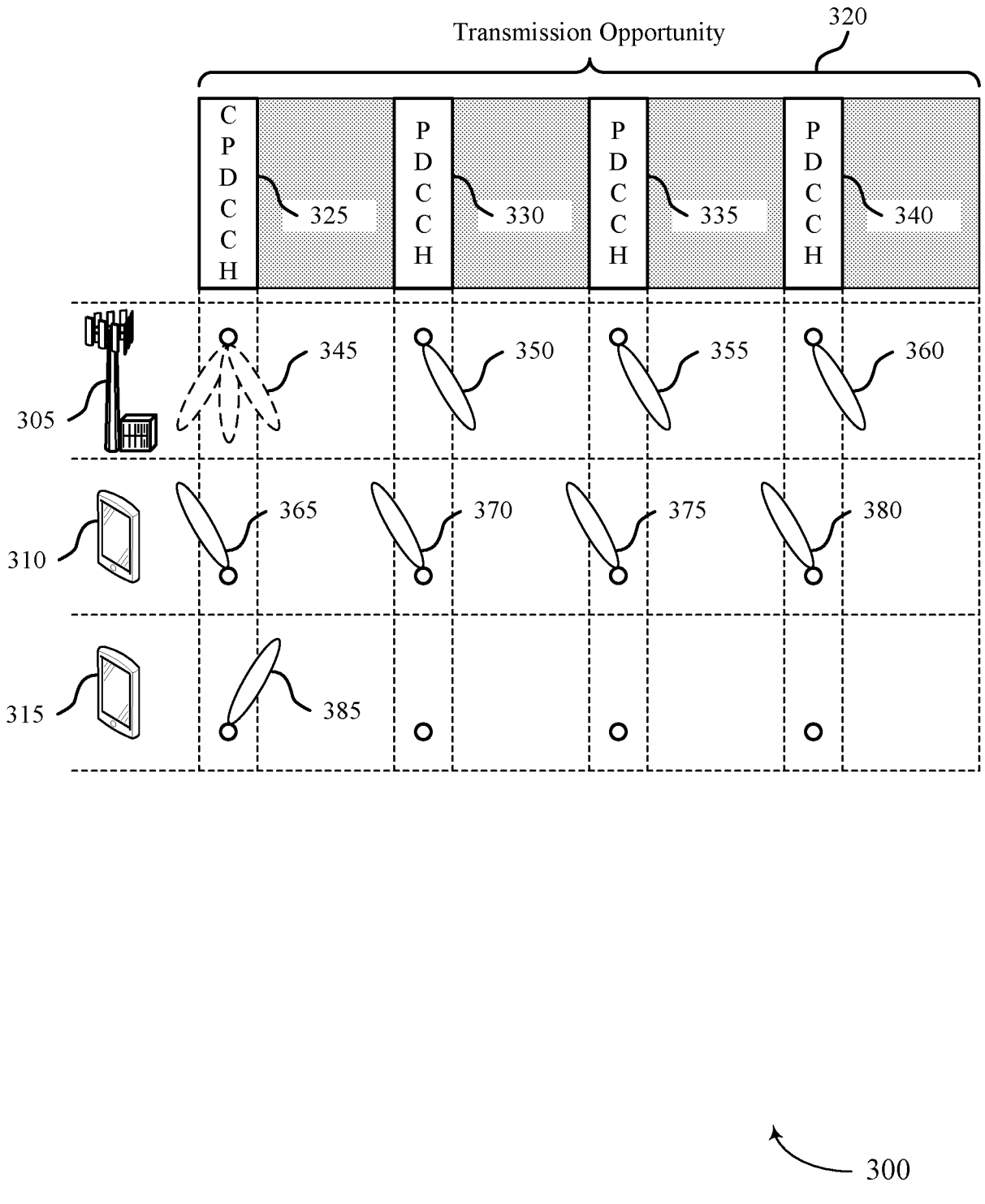

Transmission Opportunity
320
CPDCCH
325
PDCCH
330
PDCCH
335
PDCCH
340
305
345
350
355
360
310
365
370
375
380
315
385
300

FIG. 3

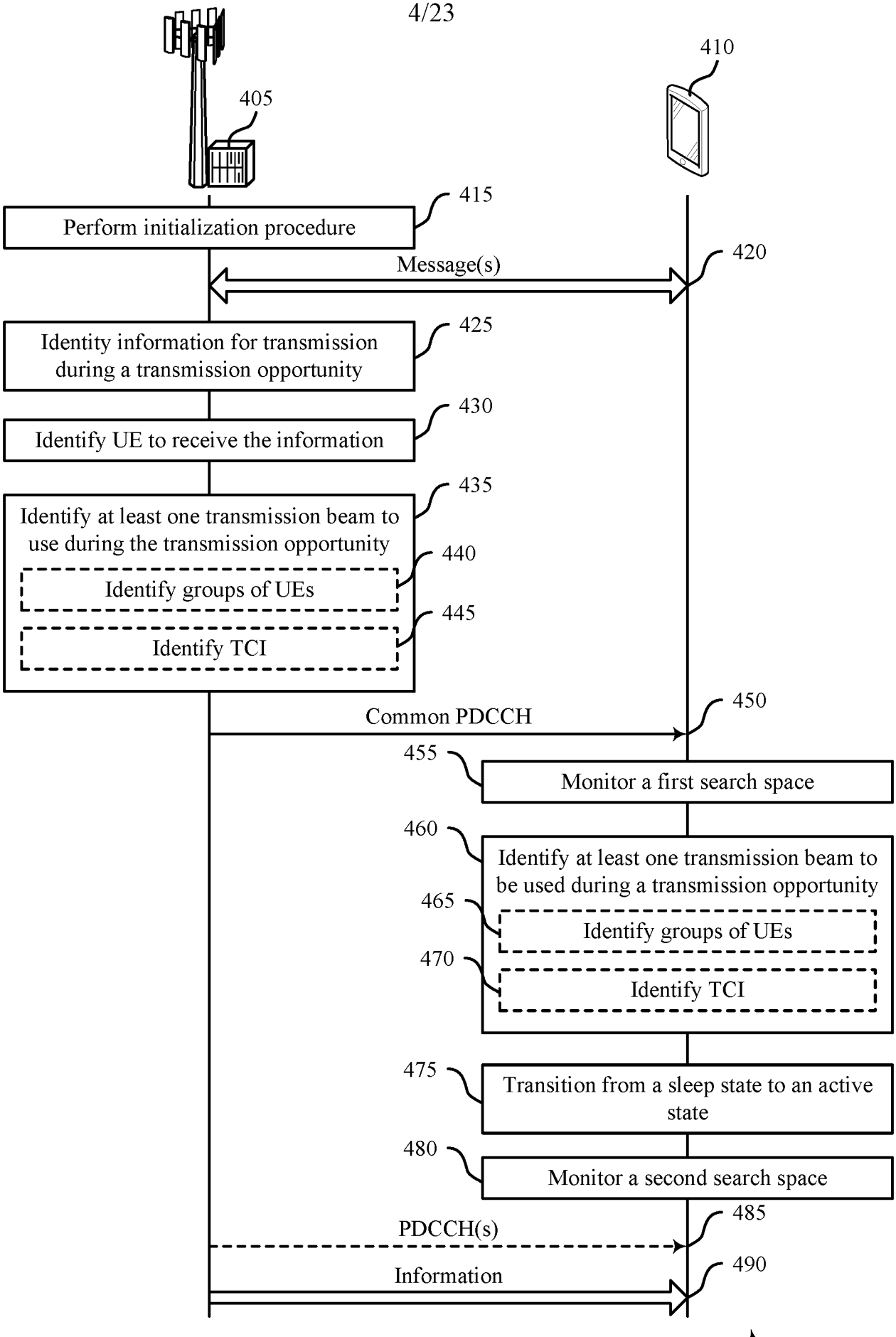

405
410
415
Perform initialization procedure
Message(s)
420
425
Identity information for transmission during a transmission opportunity
430
Identify UE to receive the information
435
Identify at least one transmission beam to use during the transmission opportunity
440
Identify groups of UEs
445
Identify TCI
Common PDCCH
450
455
Monitor a first search space
460
Identify at least one transmission beam to be used during a transmission opportunity
465
Identify groups of UEs
470
Identify TCI
475
Transition from a sleep state to an active state
480
Monitor a second search space
PDCCH(s)
485
Information
490
400

FIG. 4

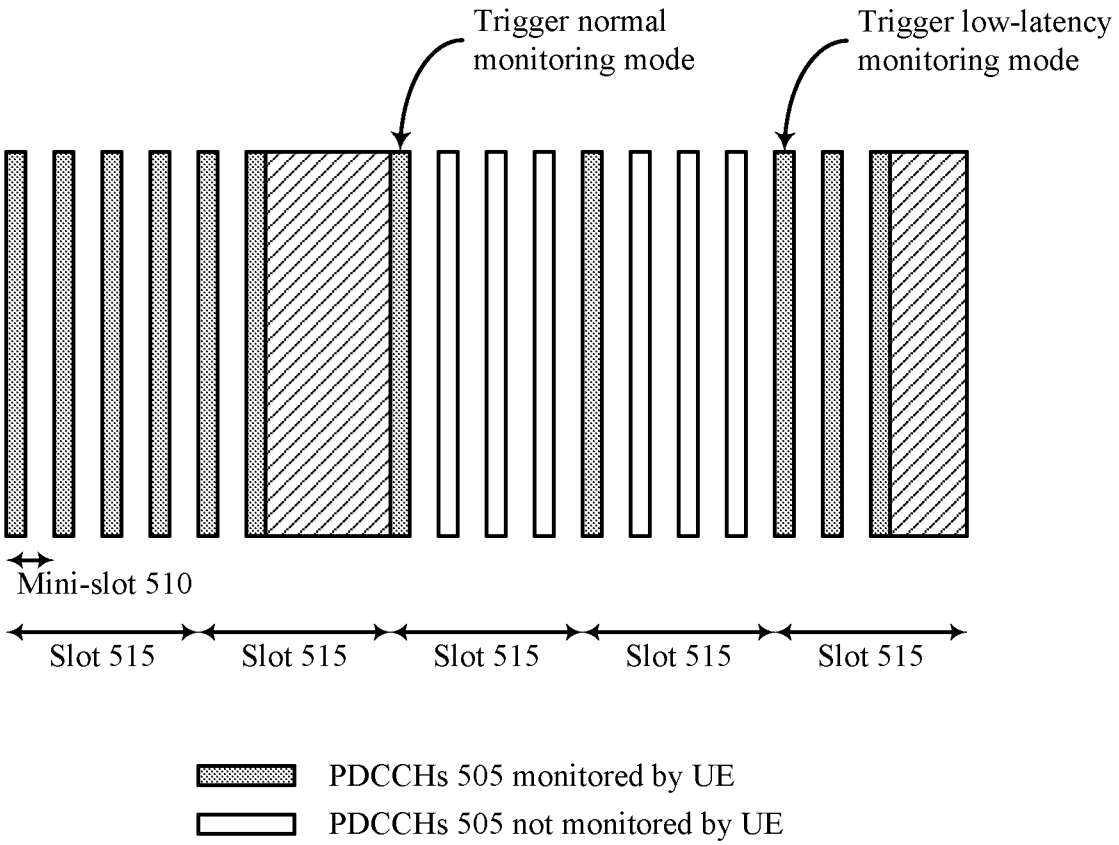

Trigger normal monitoring mode
Trigger low-latency monitoring mode
Mini-slot 510
Slot 515
Slot 515
Slot 515
Slot 515
Slot 515
PDCCHs 505 monitored by UE
PDCCHs 505 not monitored by UE
500

FIG. 5

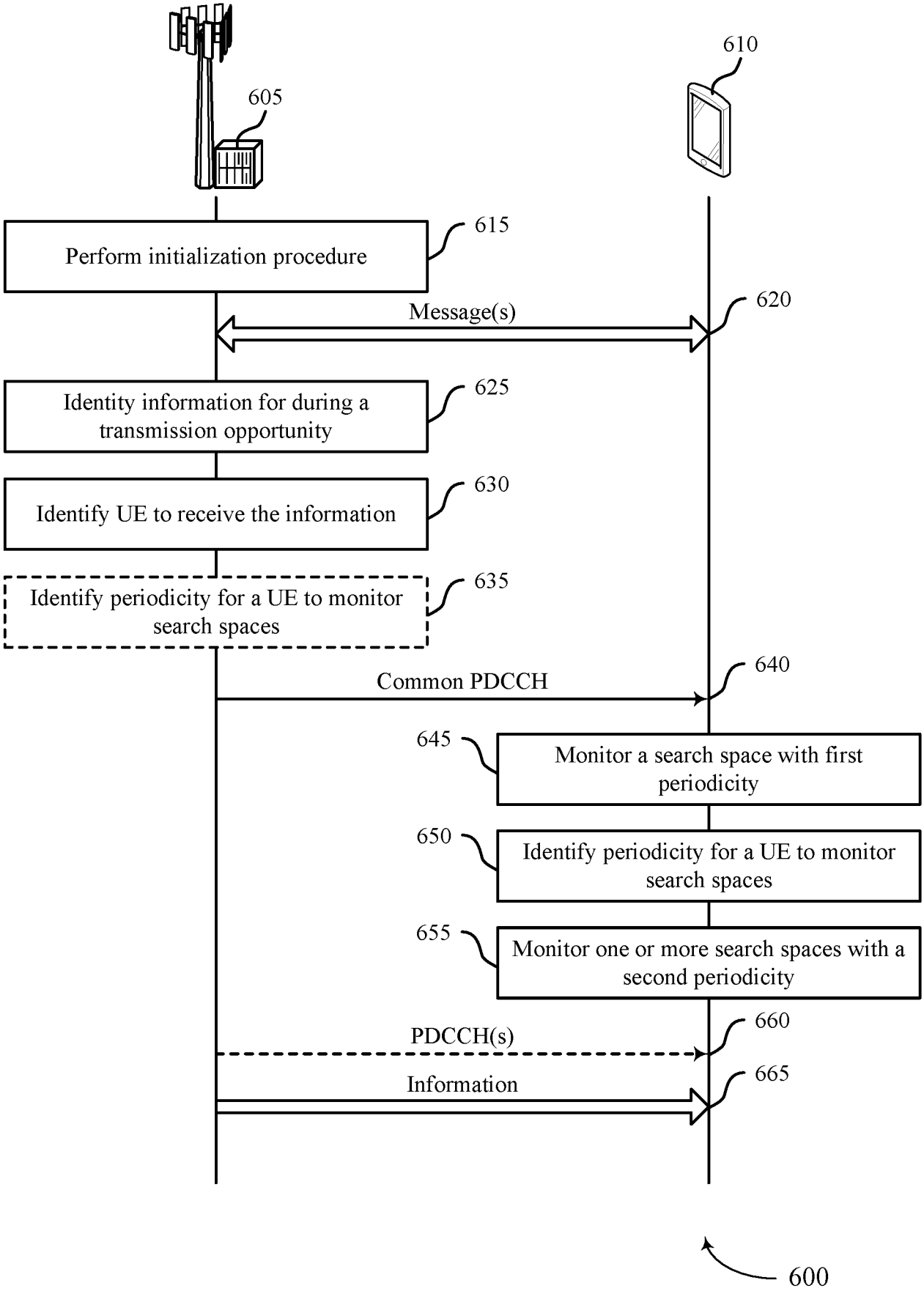

605
610
Perform initialization procedure
615
Message(s)
620
Identity information for during a transmission opportunity
625
Identify UE to receive the information
630
Identify periodicity for a UE to monitor search spaces
635
Common PDCCH
640
645
Monitor a search space with first periodicity
650
Identify periodicity for a UE to monitor search spaces
655
Monitor one or more search spaces with a second periodicity
PDCCH(s)
660
Information
665
600

FIG. 6

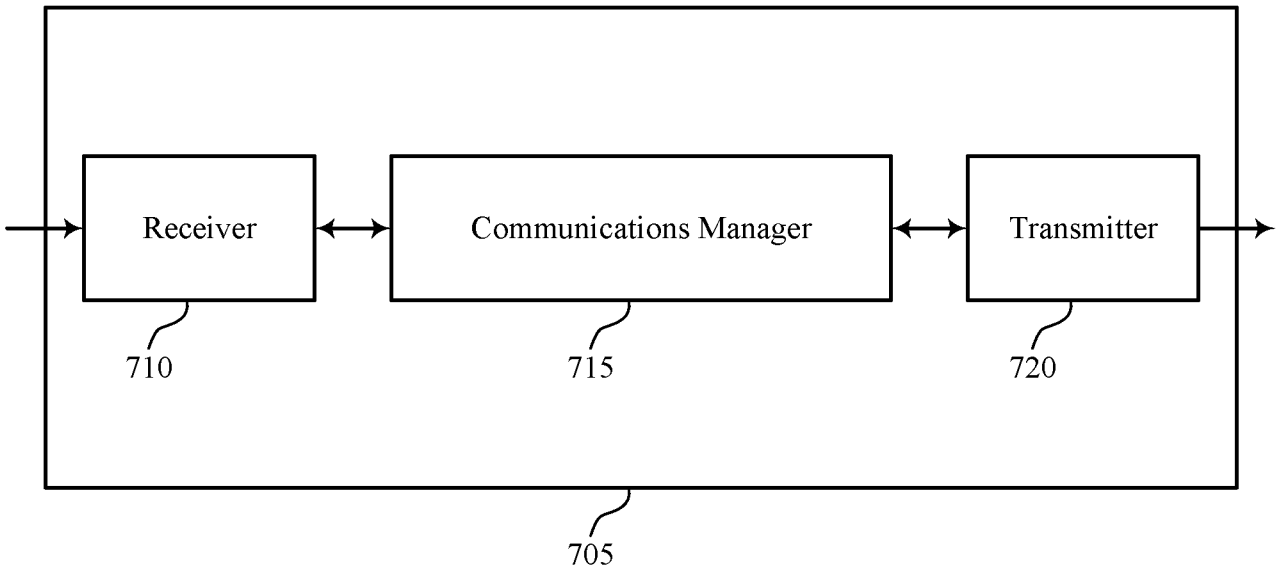

Receiver
Communications Manager
Transmitter
710
715
720
705
700

FIG. 7

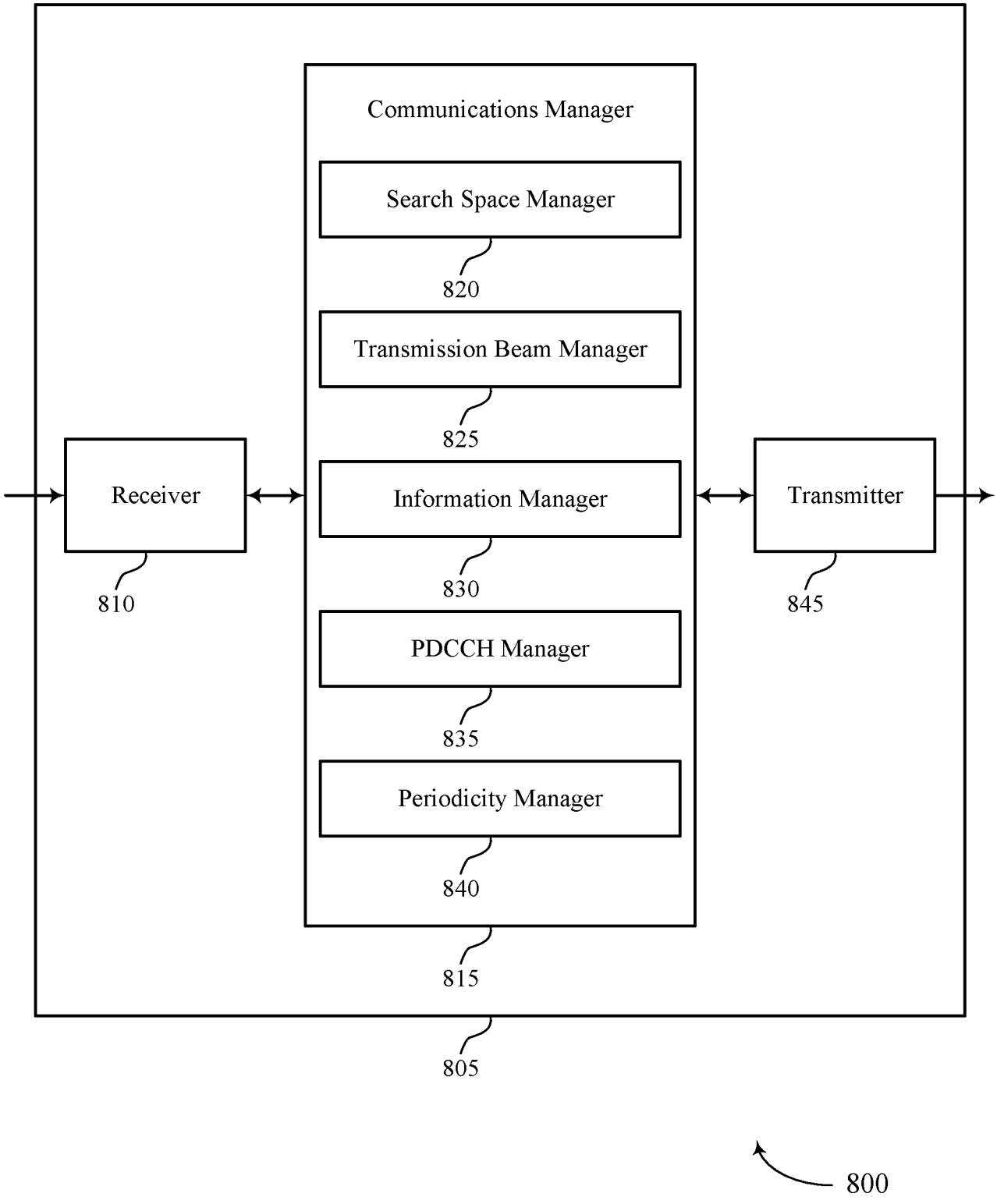

Communications Manager
Search Space Manager
820
Transmission Beam Manager
825
Receiver
Information Manager
Transmitter
810
830
845
PDCCH Manager
835
Periodicity Manager
840
815
805
800

FIG. 8

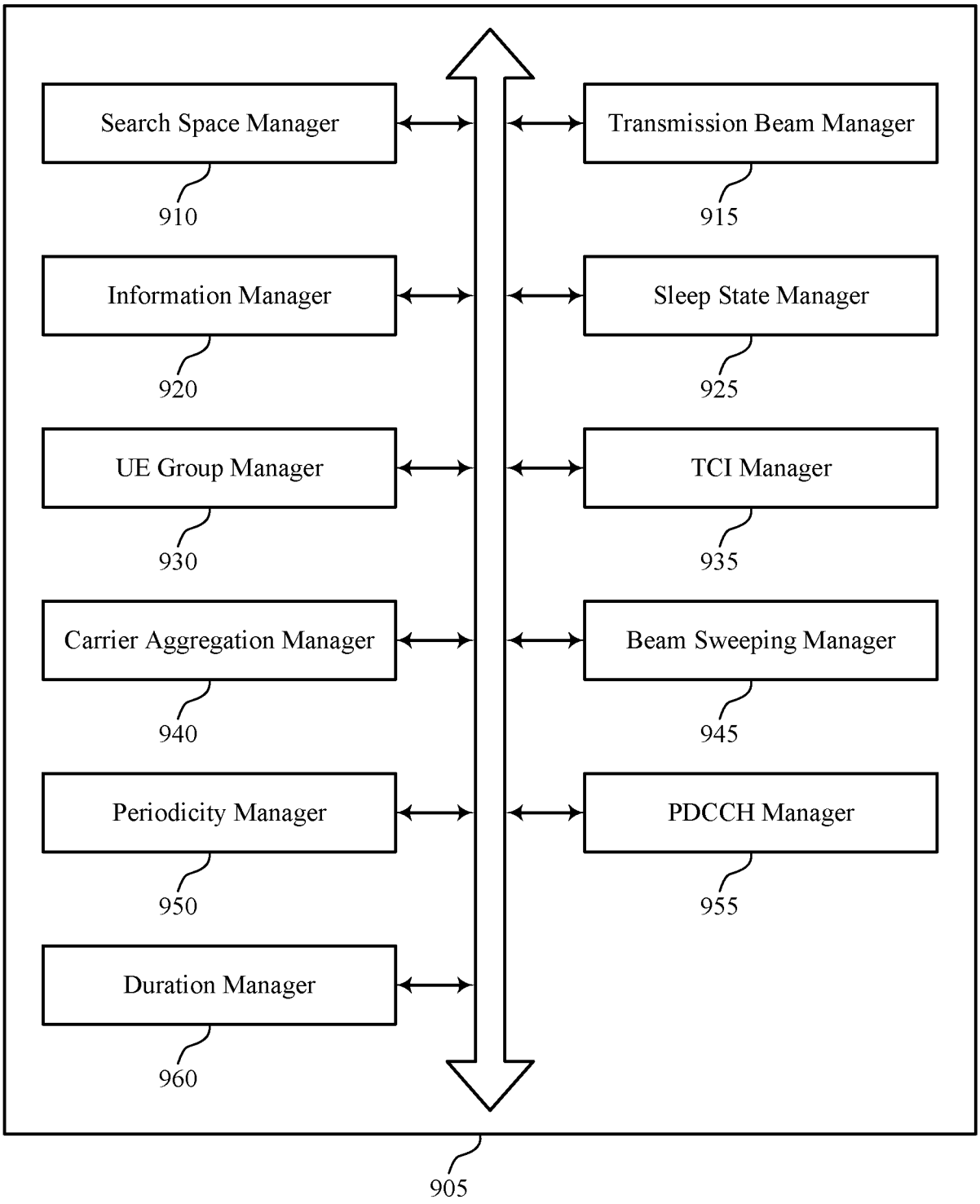

Search Space Manager
910
Transmission Beam Manager
915
Information Manager
920
Sleep State Manager
925
UE Group Manager
930
TCI Manager
935
Carrier Aggregation Manager
940
Beam Sweeping Manager
945
Periodicity Manager
950
PDCCH Manager
955
Duration Manager
960
905
900

FIG. 9

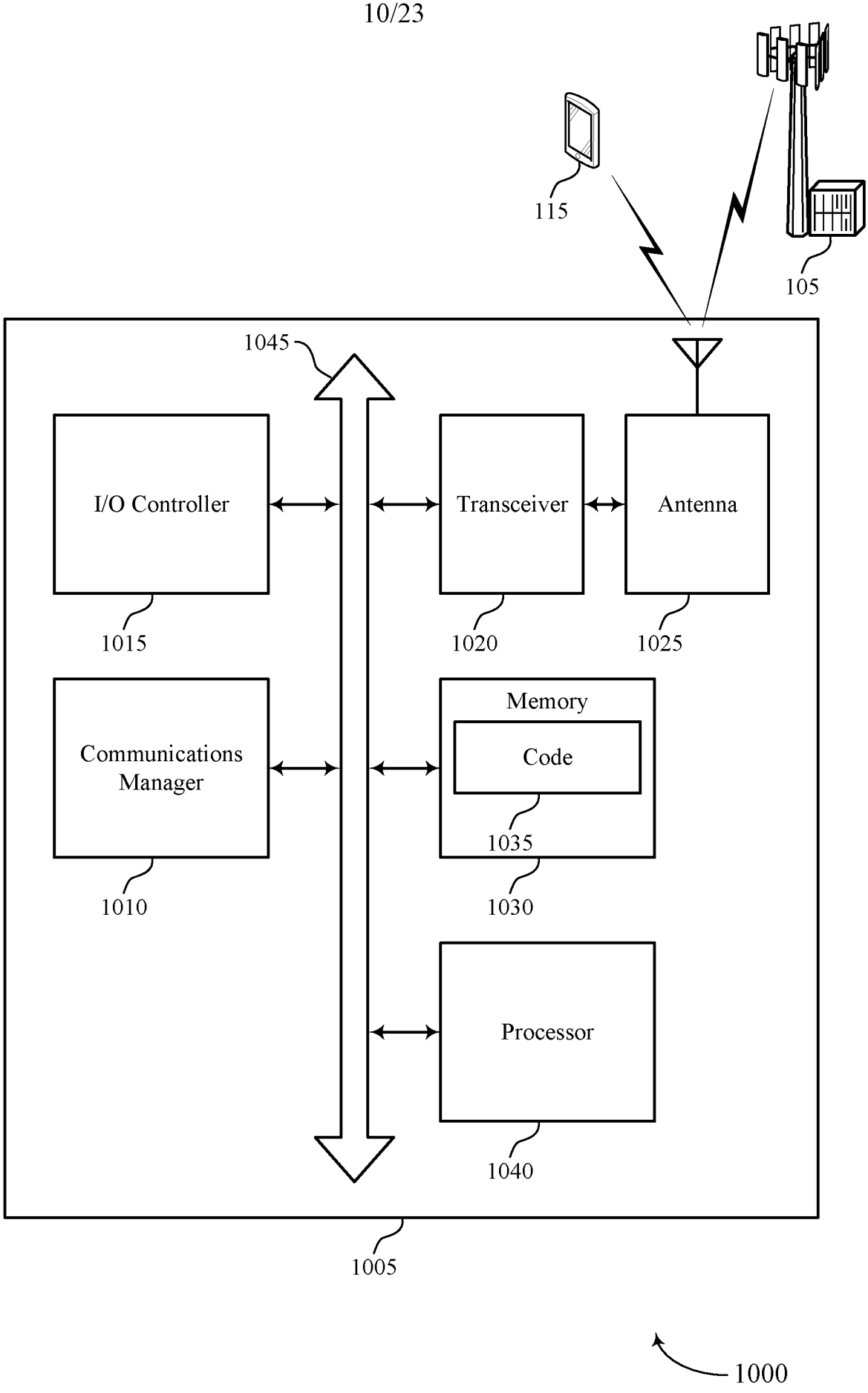

115
105
1045
I/O Controller
Transceiver
Antenna
1015
1020
1025
Communications Manager
Memory
Code
1035
1010
1030
Processor
1040
1005
1000

FIG. 10

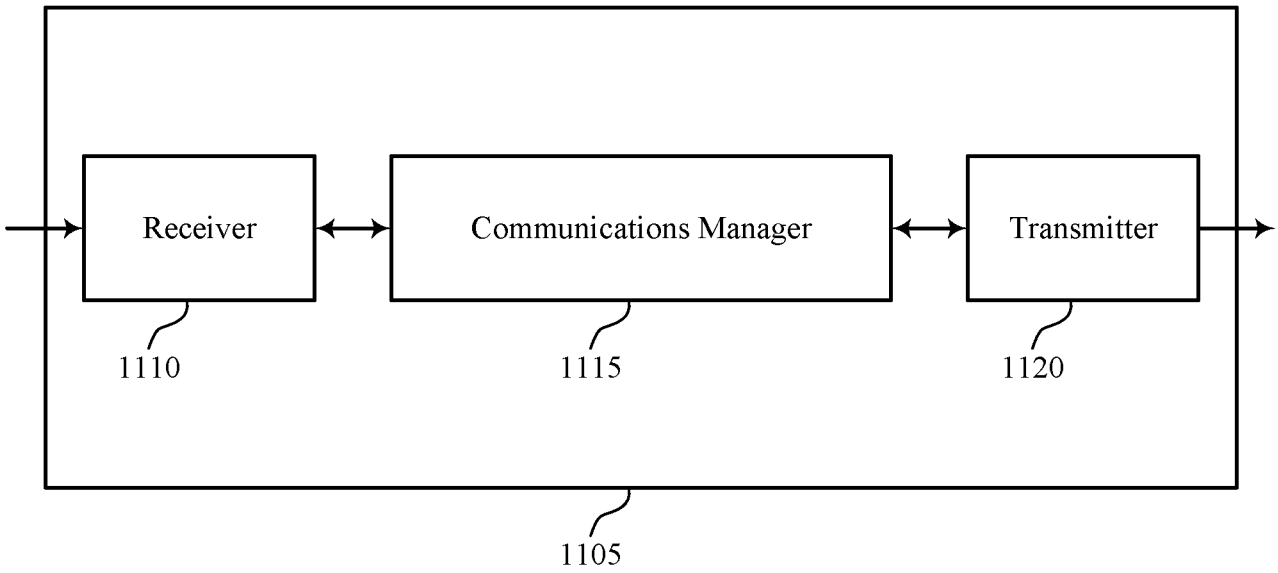

Receiver
Communications Manager
Transmitter
1110
1115
1120
1105
1100

FIG. 11

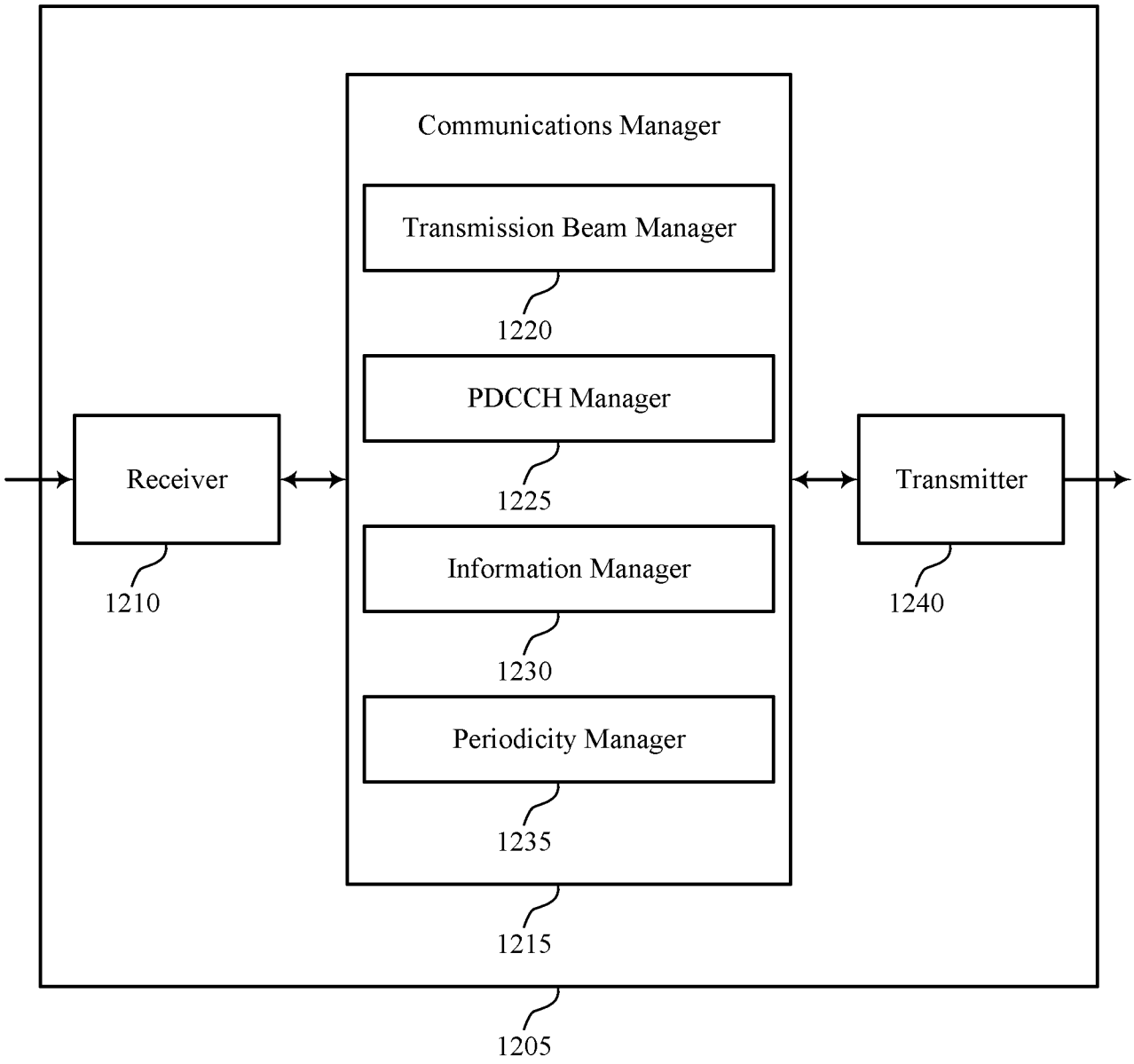

Communications Manager
Transmission Beam Manager
1220
PDCCH Manager
1225
Information Manager
1230
Periodicity Manager
1235
1215
Receiver
1210
Transmitter
1240
1205
1200

FIG. 12

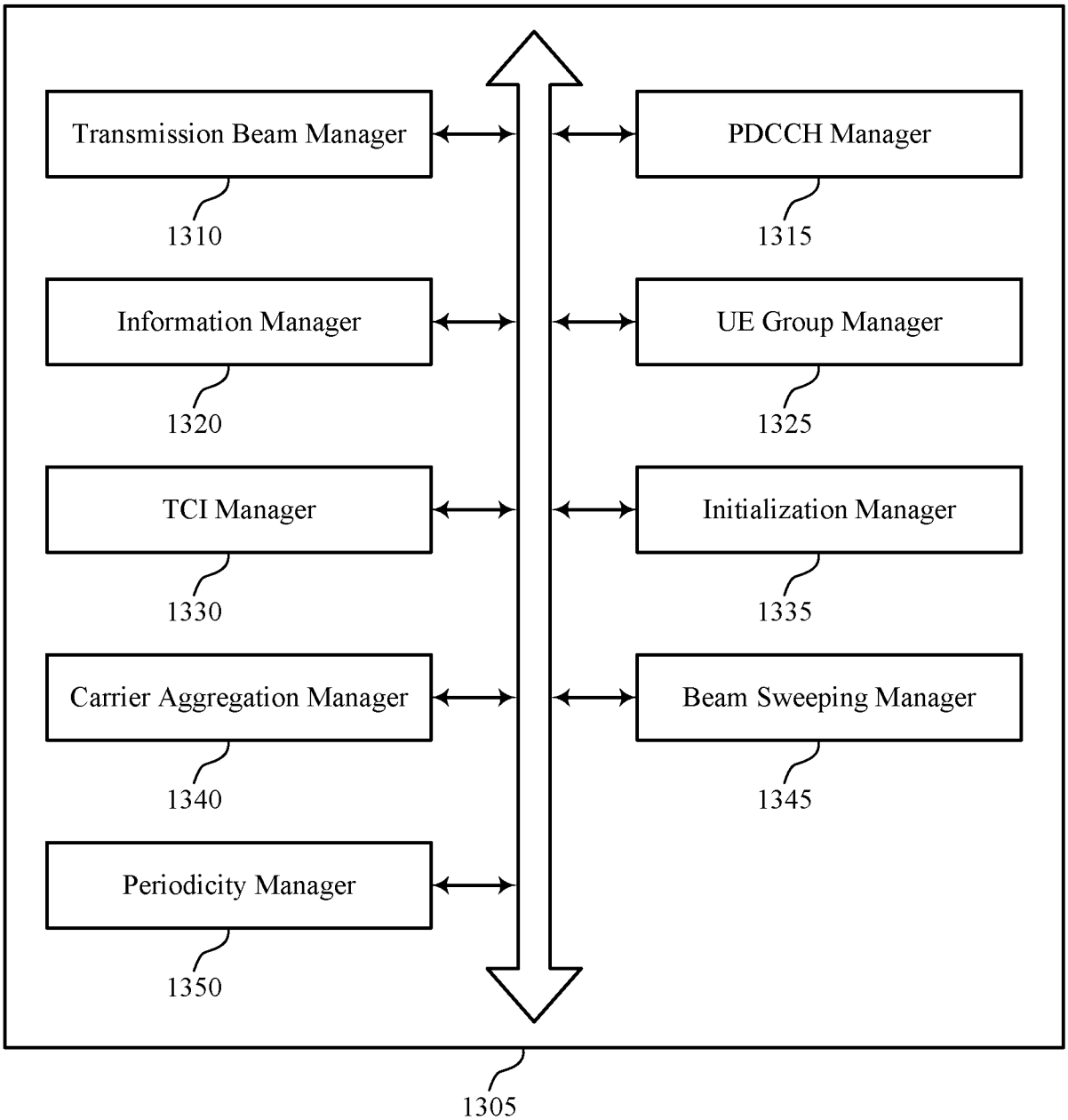

Transmission Beam Manager
1310
PDCCH Manager
1315
Information Manager
1320
UE Group Manager
1325
TCI Manager
1330
Initialization Manager
1335
Carrier Aggregation Manager
1340
Beam Sweeping Manager
1345
Periodicity Manager
1350
1305
1300

FIG. 13

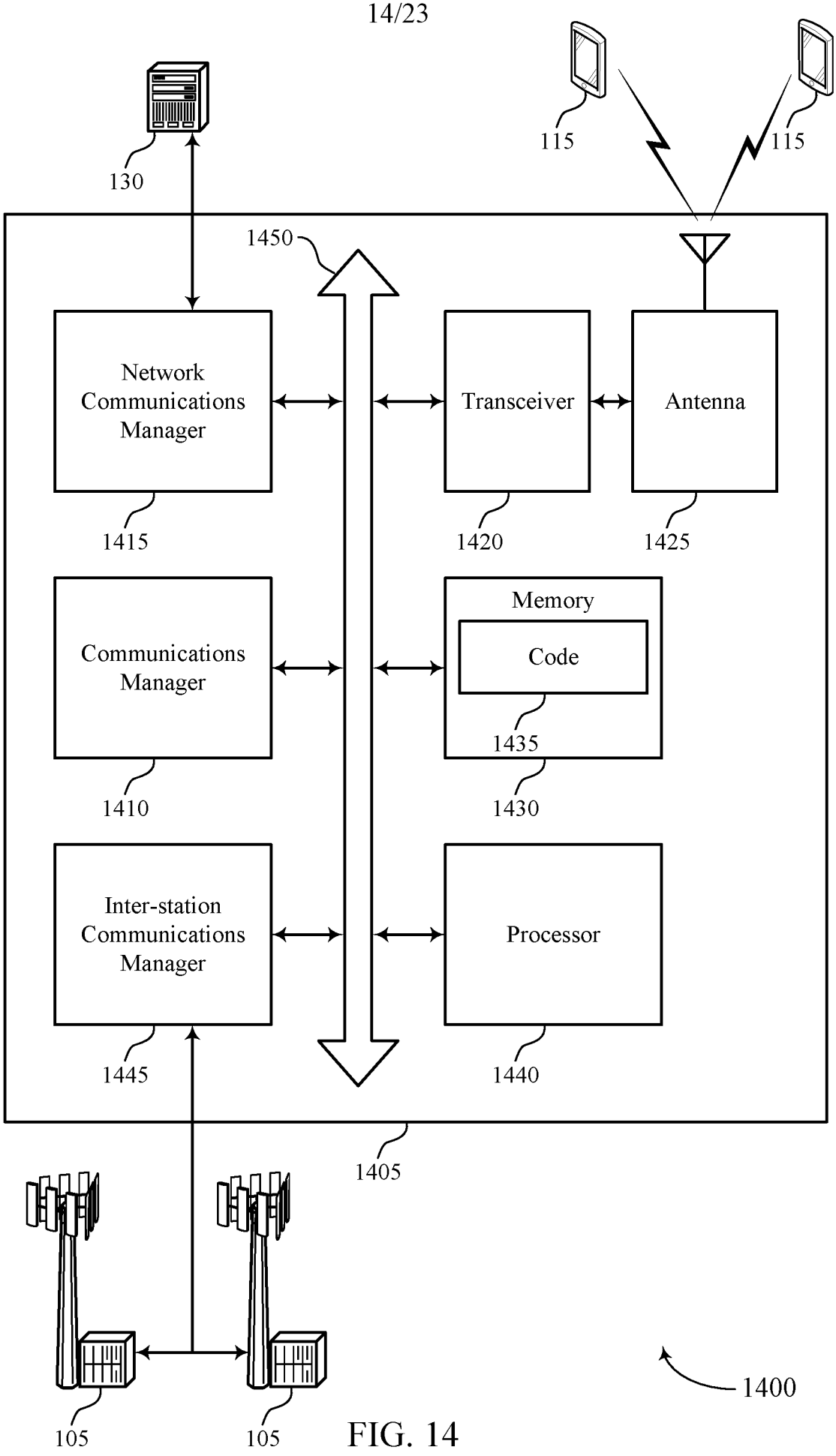

130
115
115
1450
Network Communications Manager
Transceiver
Antenna
1415
1420
1425
Communications Manager
Memory
Code
1435
1410
1430
Inter-station Communications Manager
Processor
1445
1440
1405
105
105
1400

FIG. 14

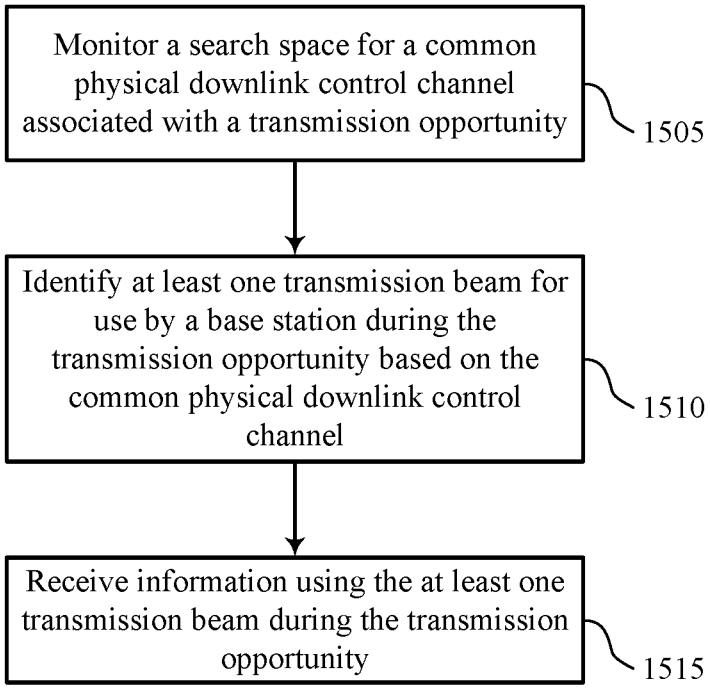

Monitor a search space for a common physical downlink control channel associated with a transmission opportunity
1505
Identify at least one transmission beam for use by a base station during the transmission opportunity based on the common physical downlink control channel
1510
Receive information using the at least one transmission beam during the transmission opportunity
1515
1500

FIG. 15

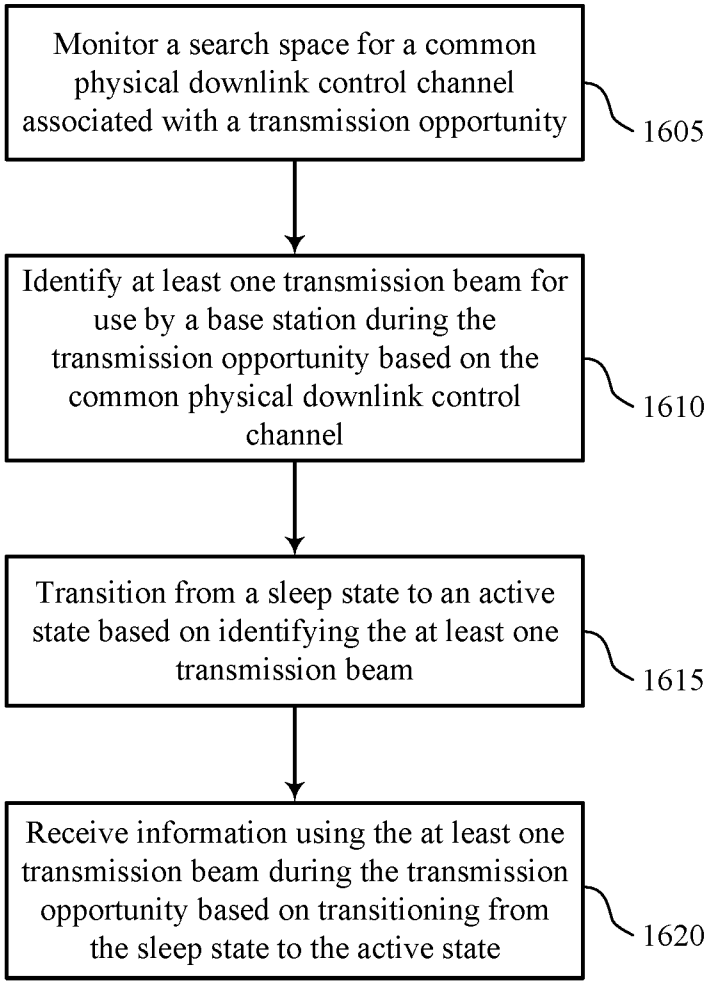

Monitor a search space for a common physical downlink control channel associated with a transmission opportunity
1605
Identify at least one transmission beam for use by a base station during the transmission opportunity based on the common physical downlink control channel
1610
Transition from a sleep state to an active state based on identifying the at least one transmission beam
1615
Receive information using the at least one transmission beam during the transmission opportunity based on transitioning from the sleep state to the active state
1620
1600

FIG. 16

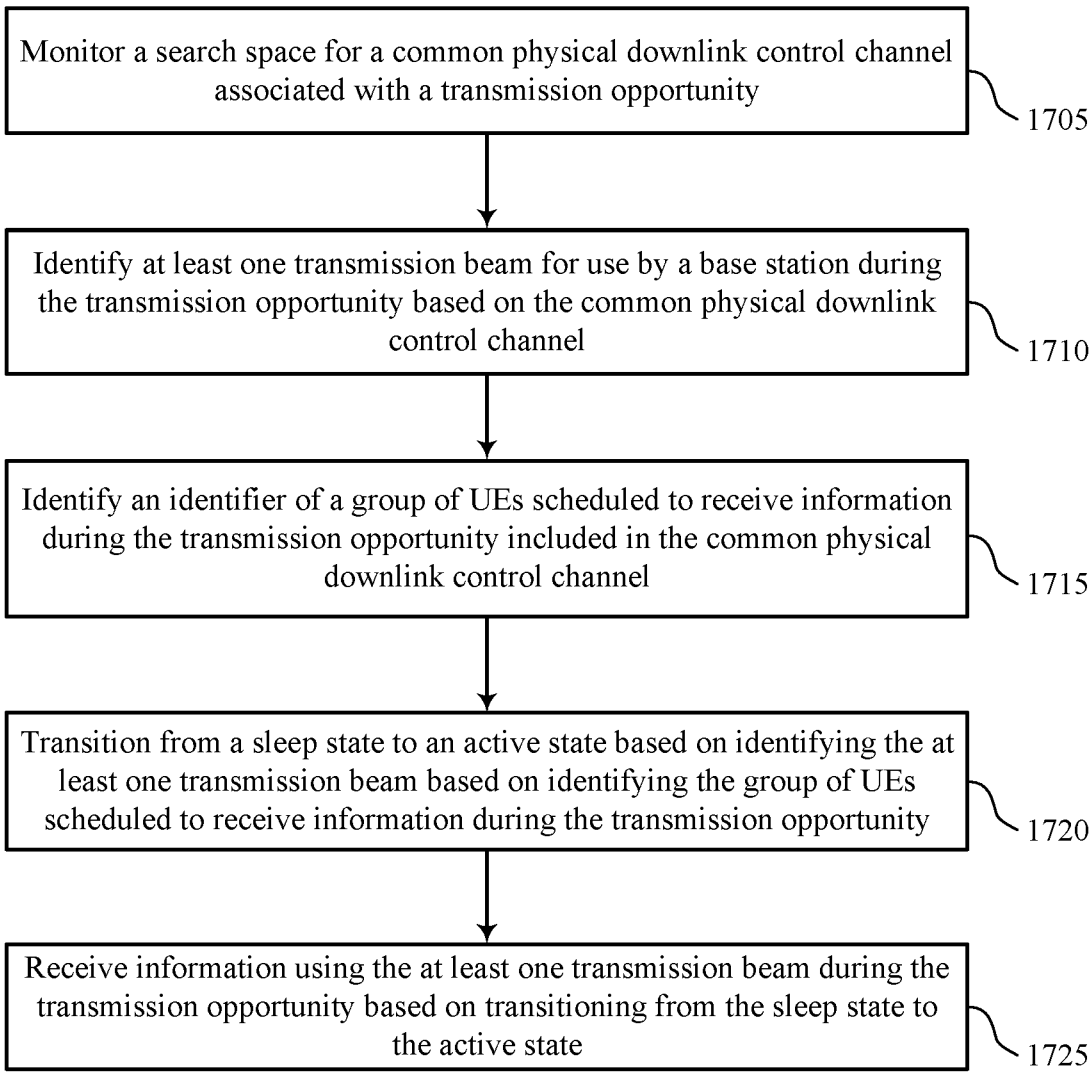

Monitor a search space for a common physical downlink control channel associated with a transmission opportunity
1705
Identify at least one transmission beam for use by a base station during the transmission opportunity based on the common physical downlink control channel
1710
Identify an identifier of a group of UEs scheduled to receive information during the transmission opportunity included in the common physical downlink control channel
1715
Transition from a sleep state to an active state based on identifying the at least one transmission beam based on identifying the group of UEs scheduled to receive information during the transmission opportunity
1720
Receive information using the at least one transmission beam during the transmission opportunity based on transitioning from the sleep state to the active state
1725
1700

FIG. 17

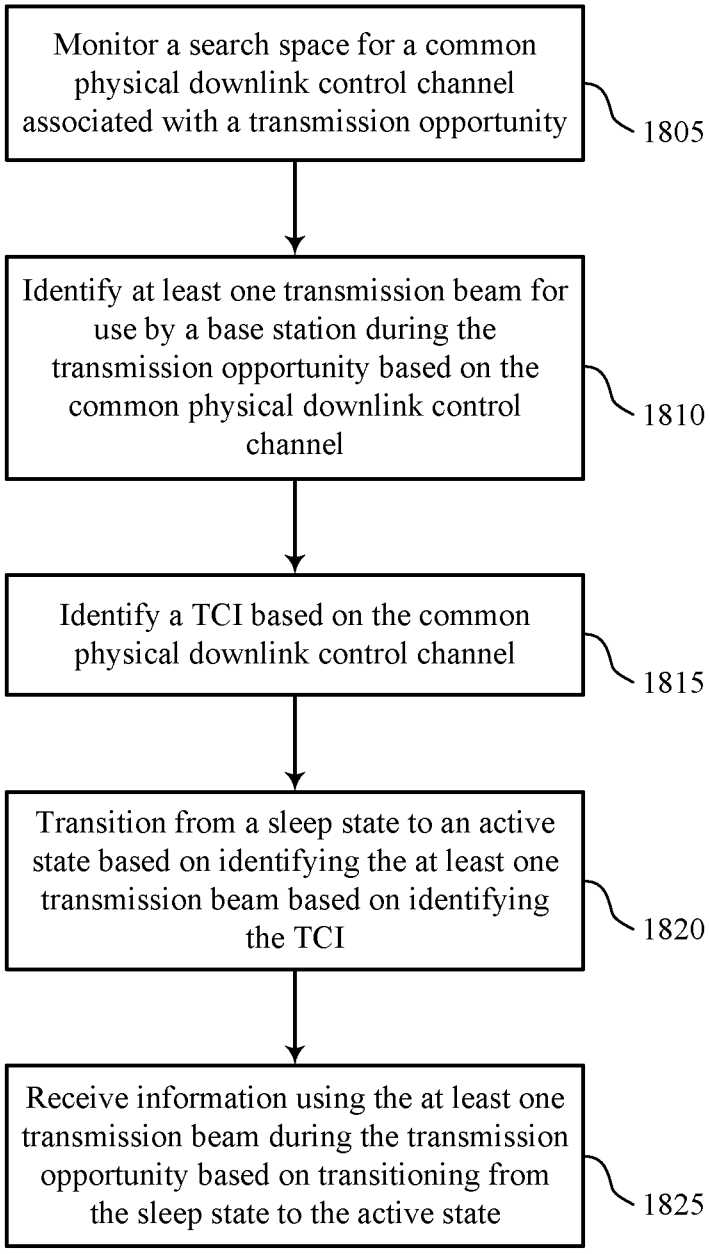

Monitor a search space for a common physical downlink control channel associated with a transmission opportunity
1805
Identify at least one transmission beam for use by a base station during the transmission opportunity based on the common physical downlink control channel
1810
Identify a TCI based on the common physical downlink control channel
1815
Transition from a sleep state to an active state based on identifying the at least one transmission beam based on identifying the TCI
1820
Receive information using the at least one transmission beam during the transmission opportunity based on transitioning from the sleep state to the active state
1825
1800

FIG. 18

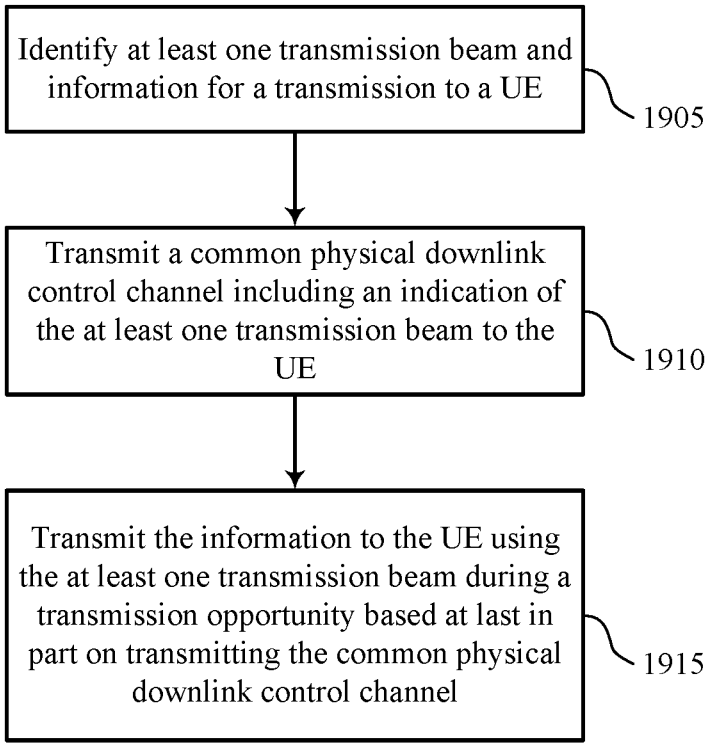

Identify at least one transmission beam and information for a transmission to a UE
1905
Transmit a common physical downlink control channel including an indication of the at least one transmission beam to the UE
1910
Transmit the information to the UE using the at least one transmission beam during a transmission opportunity based at last in part on transmitting the common physical downlink control channel
1915
1900

FIG. 19

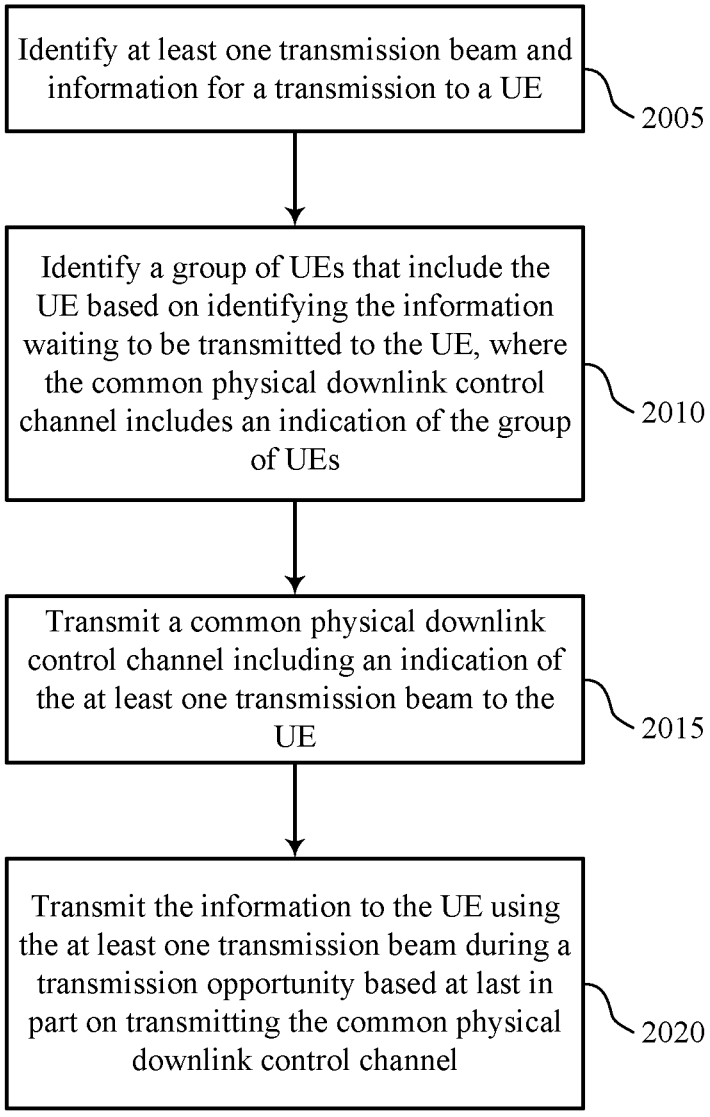

Identify at least one transmission beam and information for a transmission to a UE
2005
Identify a group of UEs that include the UE based on identifying the information waiting to be transmitted to the UE, where the common physical downlink control channel includes an indication of the group of UEs
2010
Transmit a common physical downlink control channel including an indication of the at least one transmission beam to the UE
2015
Transmit the information to the UE using the at least one transmission beam during a transmission opportunity based at last in part on transmitting the common physical downlink control channel
2020
2000

FIG. 20

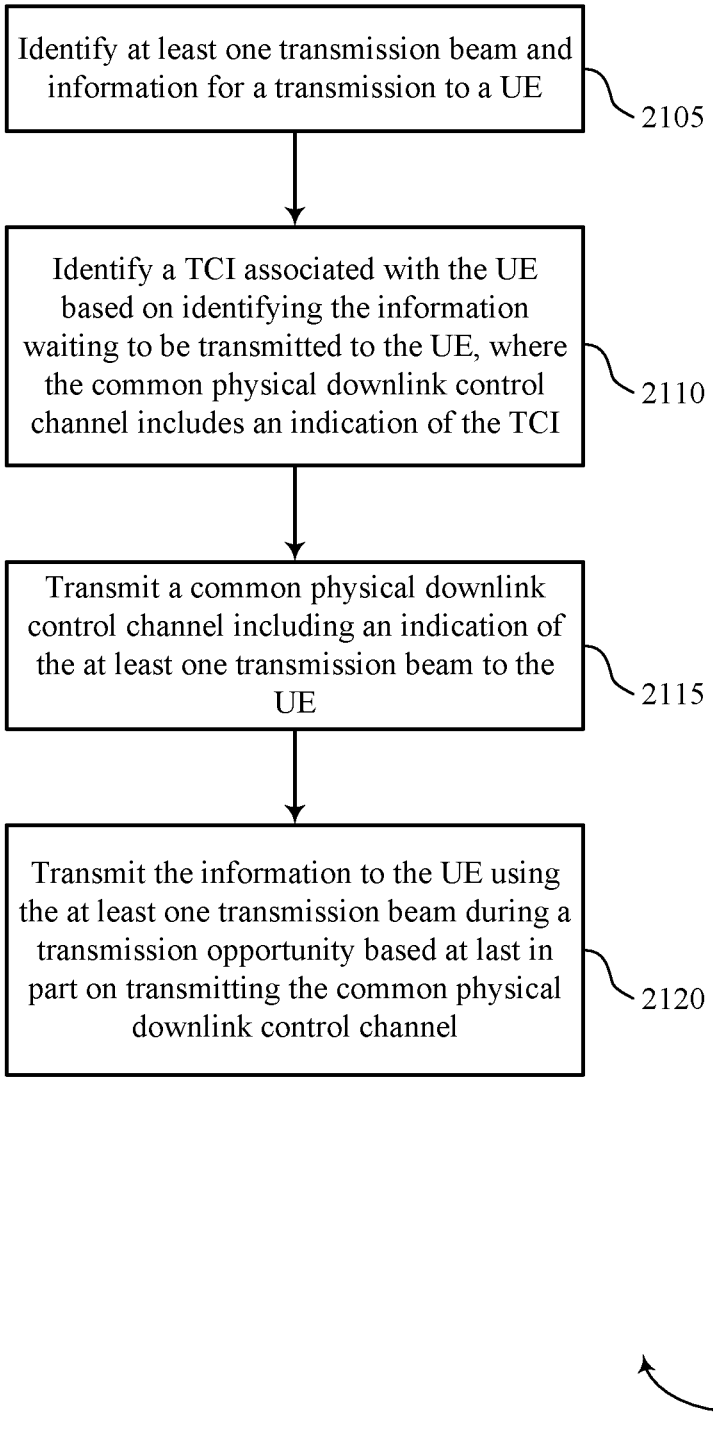

Identify at least one transmission beam and information for a transmission to a UE
2105
Identify a TCI associated with the UE based on identifying the information waiting to be transmitted to the UE, where the common physical downlink control channel includes an indication of the TCI
2110
Transmit a common physical downlink control channel including an indication of the at least one transmission beam to the UE
2115
Transmit the information to the UE using the at least one transmission beam during a transmission opportunity based at last in part on transmitting the common physical downlink control channel
2120
2100

FIG. 21

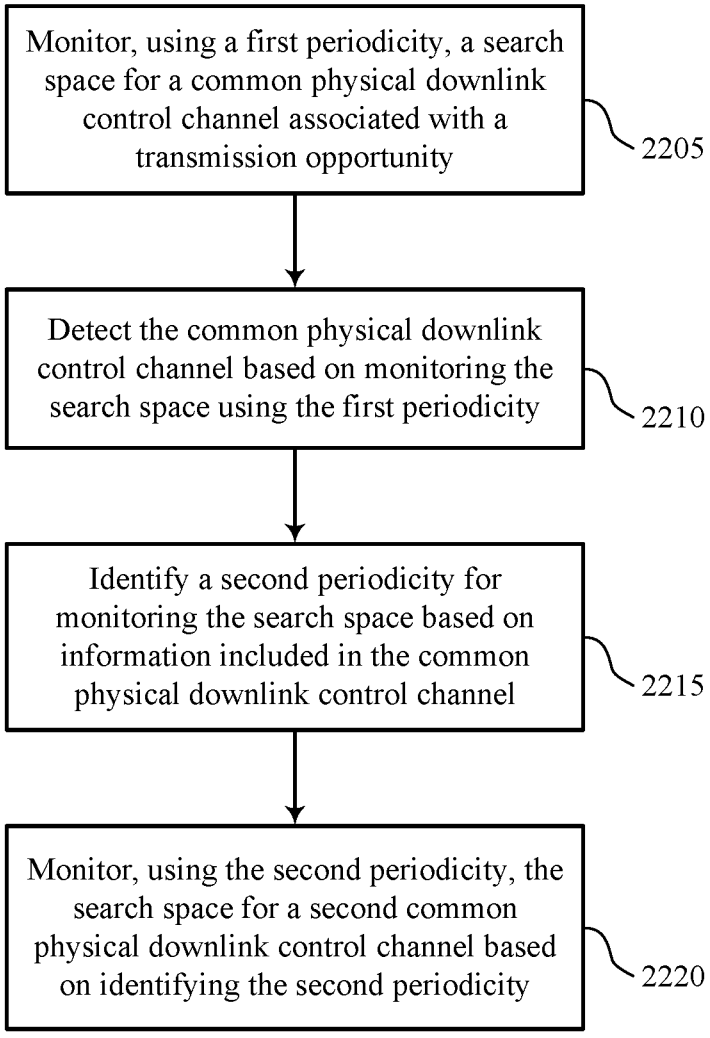

Monitor, using a first periodicity, a search space for a common physical downlink control channel associated with a transmission opportunity
2205
Detect the common physical downlink control channel based on monitoring the search space using the first periodicity
2210
Identify a second periodicity for monitoring the search space based on information included in the common physical downlink control channel
2215
Monitor, using the second periodicity, the search space for a second common physical downlink control channel based on identifying the second periodicity
2220
2200

FIG. 22

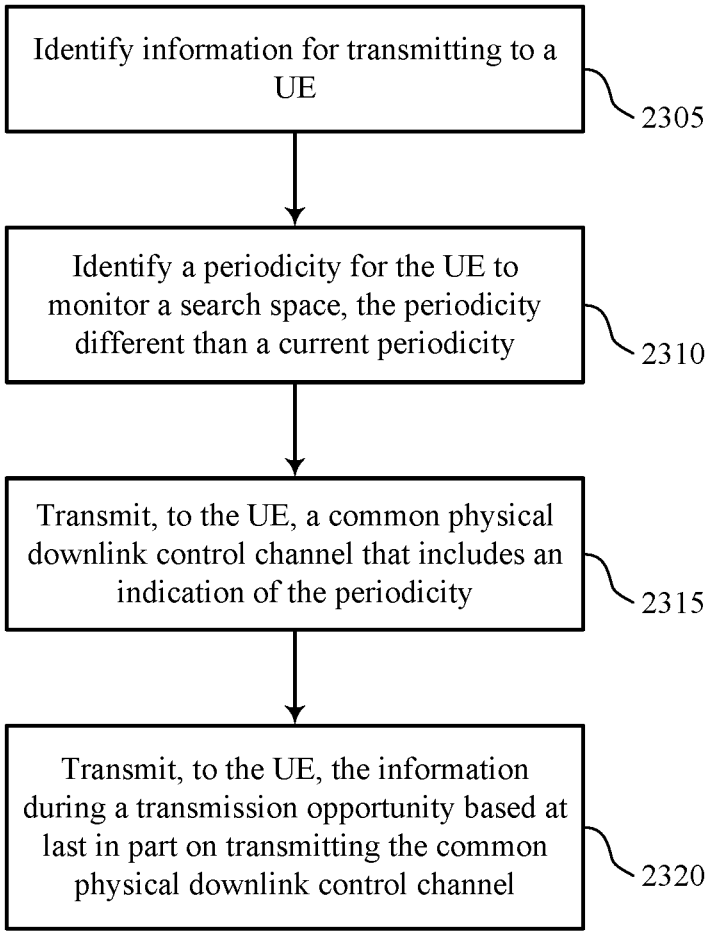

Identify information for transmitting to a UE
2305
Identify a periodicity for the UE to monitor a search space, the periodicity different than a current periodicity
2310
Transmit, to the UE, a common physical downlink control channel that includes an indication of the periodicity
2315
Transmit, to the UE, the information during a transmission opportunity based at last in part on transmitting the common physical downlink control channel
2320
2300

FIG. 23