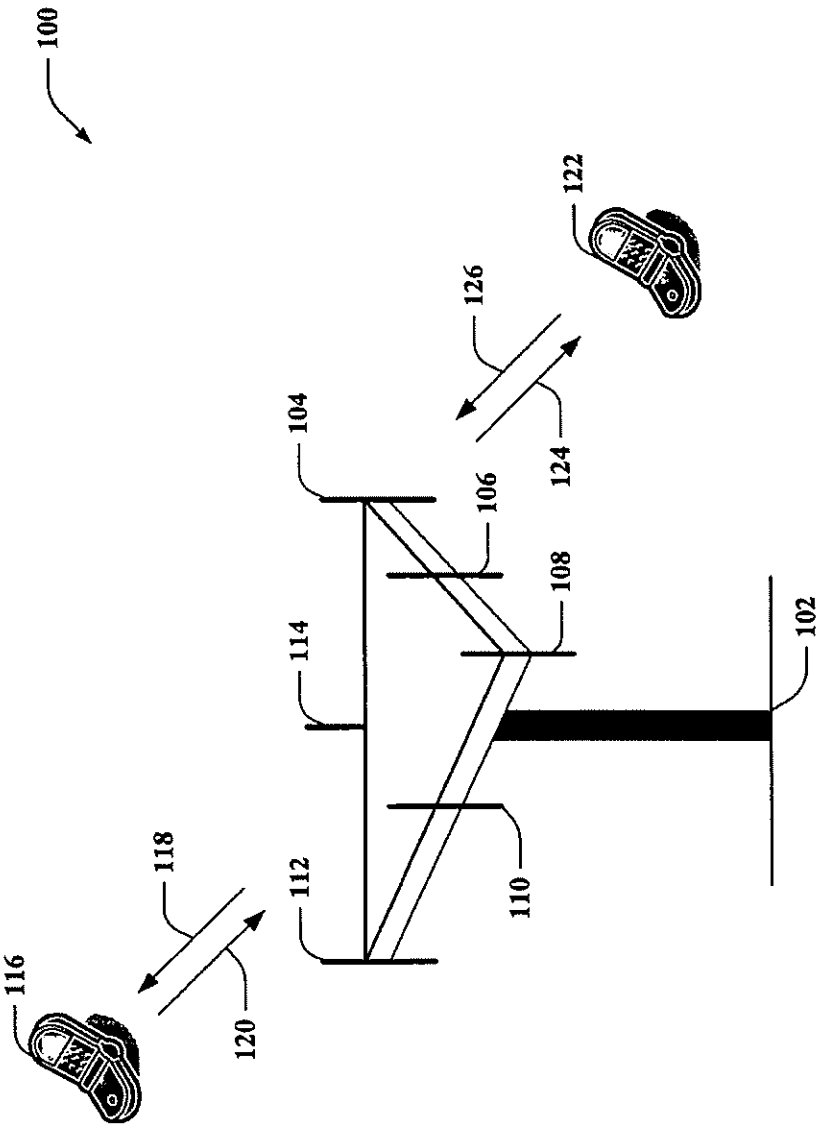

FIG. 1

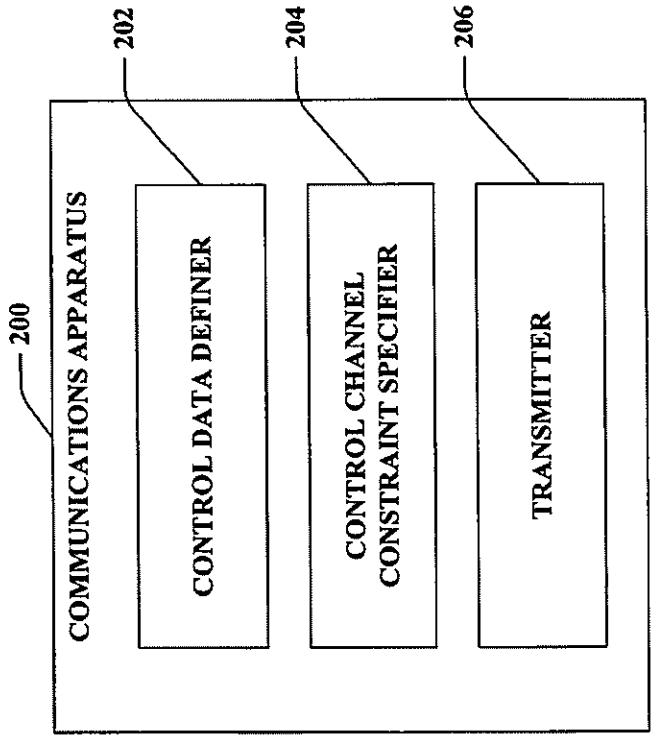
200
COMMUNICATIONS APPARATUS
202
CONTROL DATA DEFINER
204
CONTROL CHANNEL CONSTRAINT SPECIFIER
206
TRANSMITTER

FIG. 2

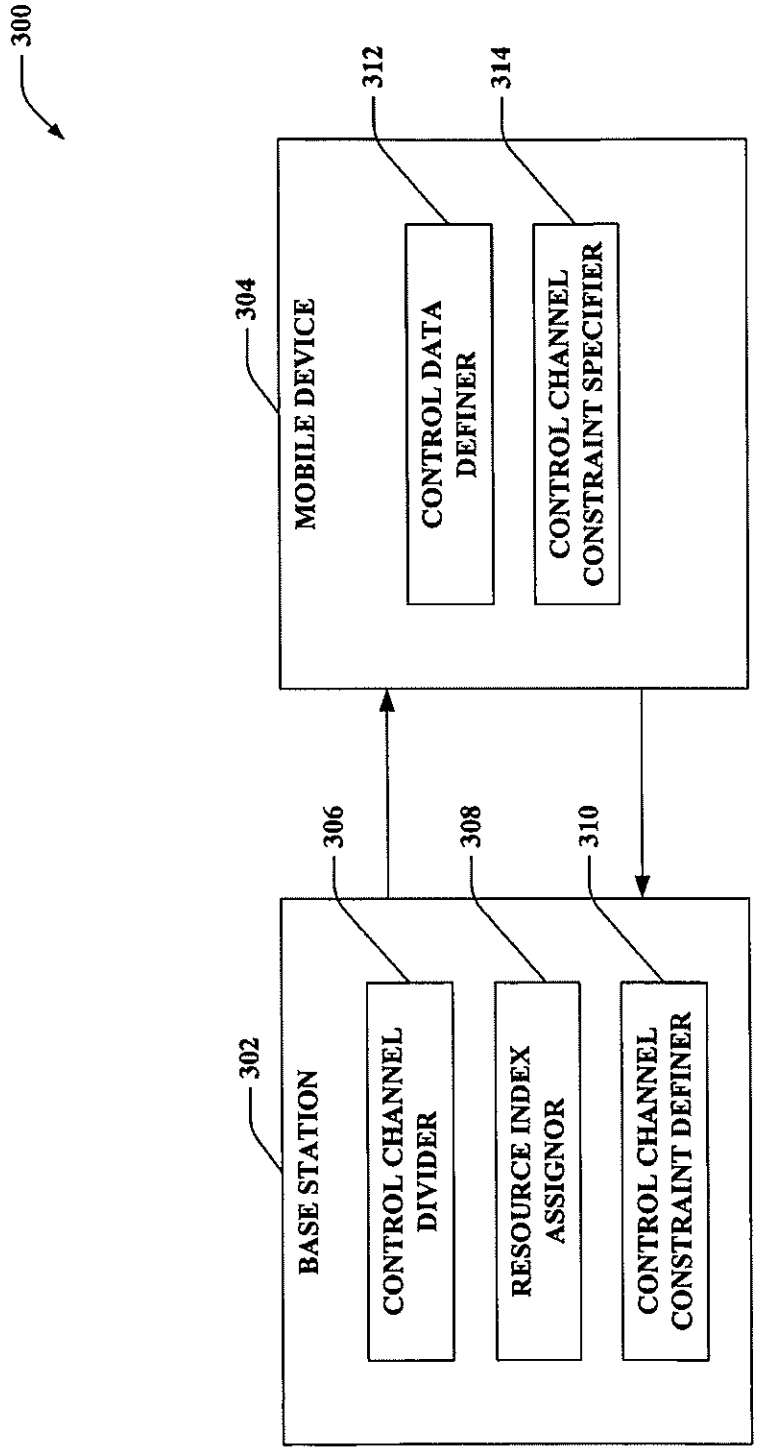
300
312
314
304
MOBILE DEVICE
CONTROL DATA DEFINER
CONTROL CHANNEL CONSTRAINT SPECIFIER
306
308
310
302
BASE STATION
CONTROL CHANNEL DIVIDER
RESOURCE INDEX ASSIGNOR
CONTROL CHANNEL CONSTRAINT DEFINER

FIG. 3

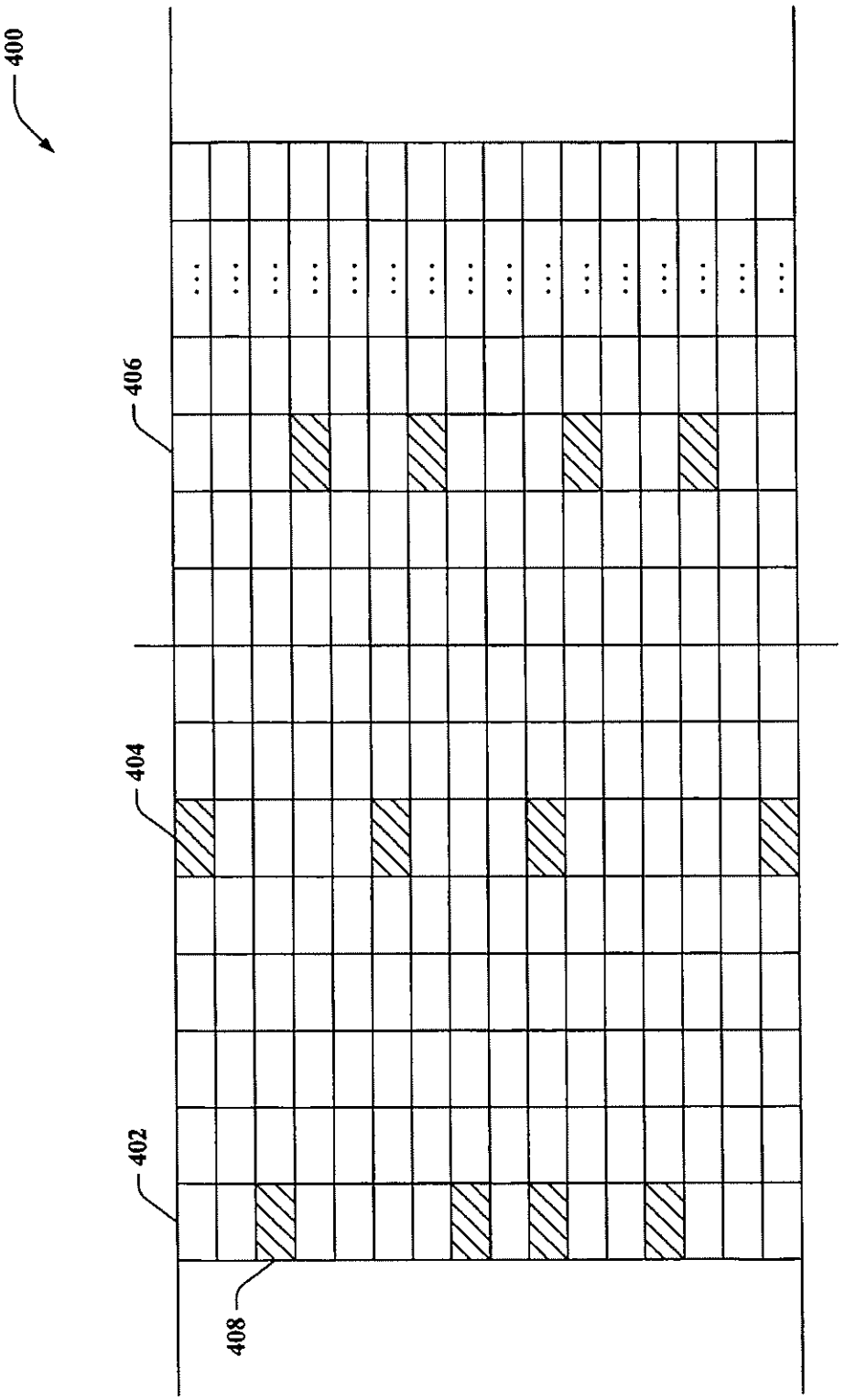

FIG. 4

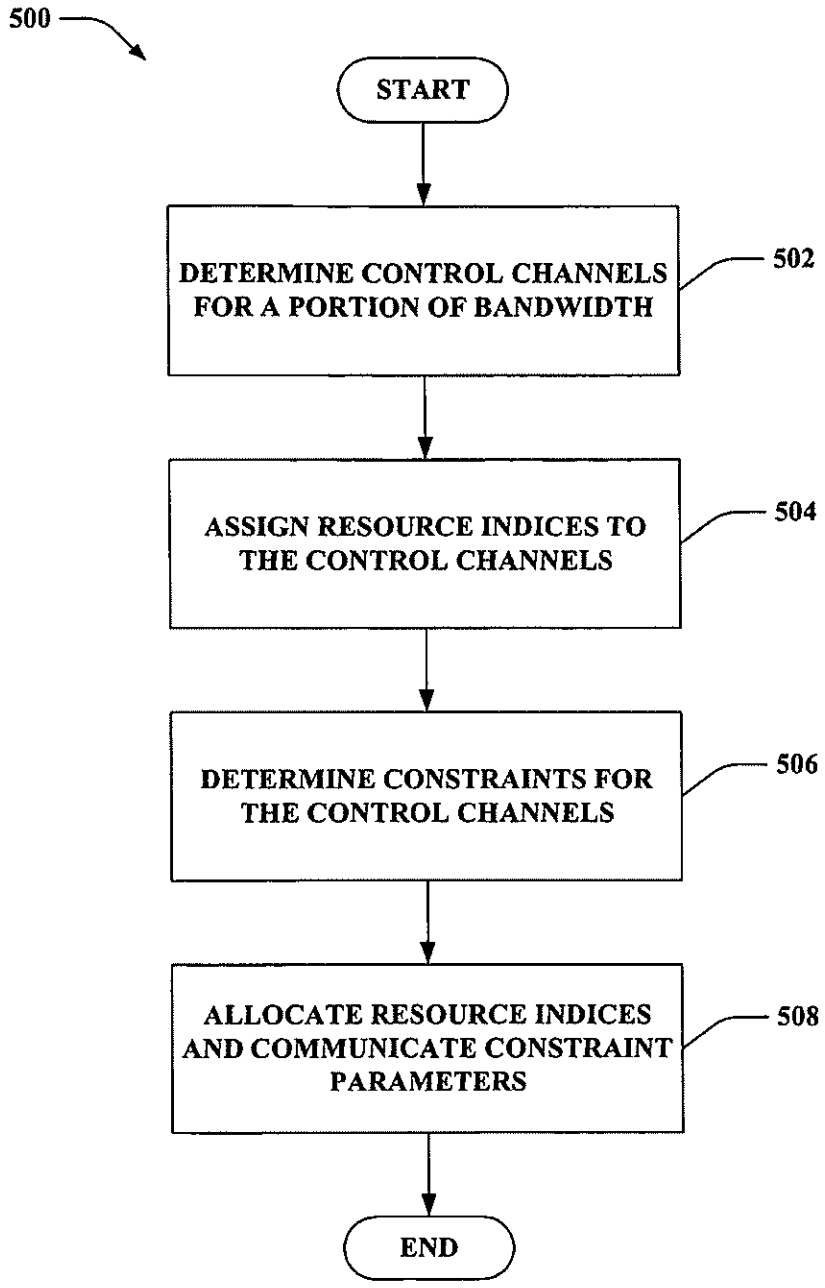
500
START
DETERMINE CONTROL CHANNELS FOR A PORTION OF BANDWIDTH
502
ASSIGN RESOURCE INDICES TO THE CONTROL CHANNELS
504
DETERMINE CONSTRAINTS FOR THE CONTROL CHANNELS
506
ALLOCATE RESOURCE INDICES AND COMMUNICATE CONSTRAINT PARAMETERS
508
END

FIG. 5

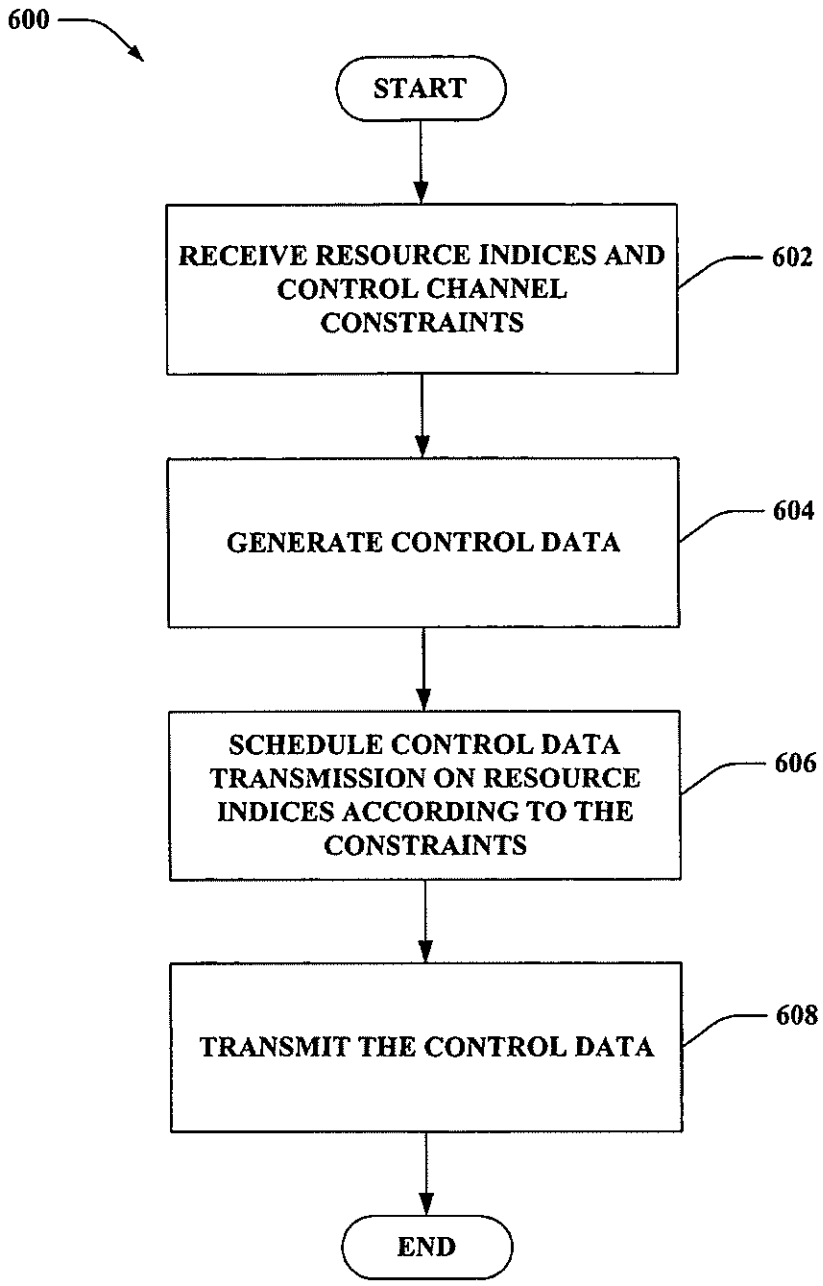
600
START
RECEIVE RESOURCE INDICES AND CONTROL CHANNEL CONSTRAINTS
602
GENERATE CONTROL DATA
604
SCHEDULE CONTROL DATA TRANSMISSION ON RESOURCE INDICES ACCORDING TO THE CONSTRAINTS
606
TRANSMIT THE CONTROL DATA
608
END

FIG. 6

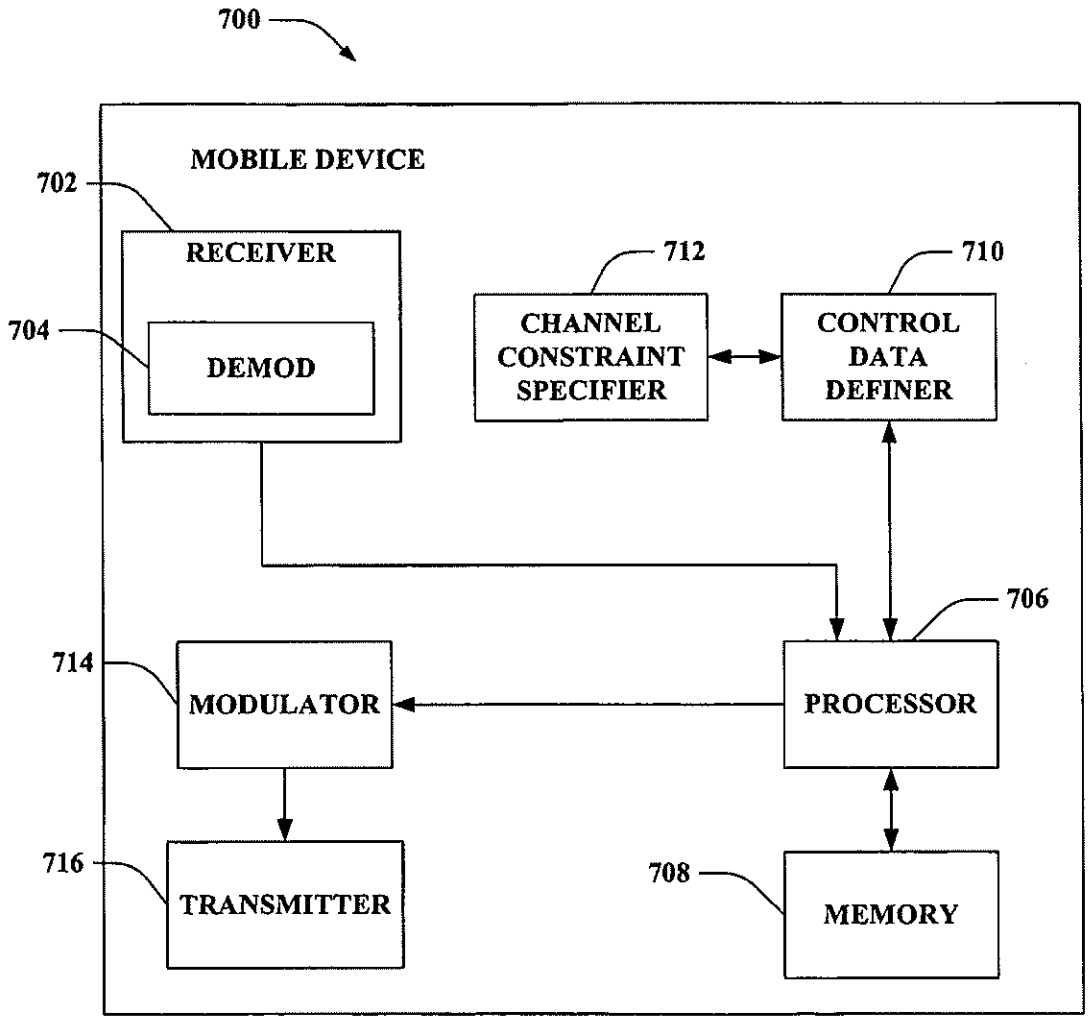
700
MOBILE DEVICE
702
RECEIVER
704
DEMOD
712
CHANNEL CONSTRAINT SPECIFIER
710
CONTROL DATA DEFINER
706
714
MODULATOR
PROCESSOR
716
TRANSMITTER
708
MEMORY

FIG. 7

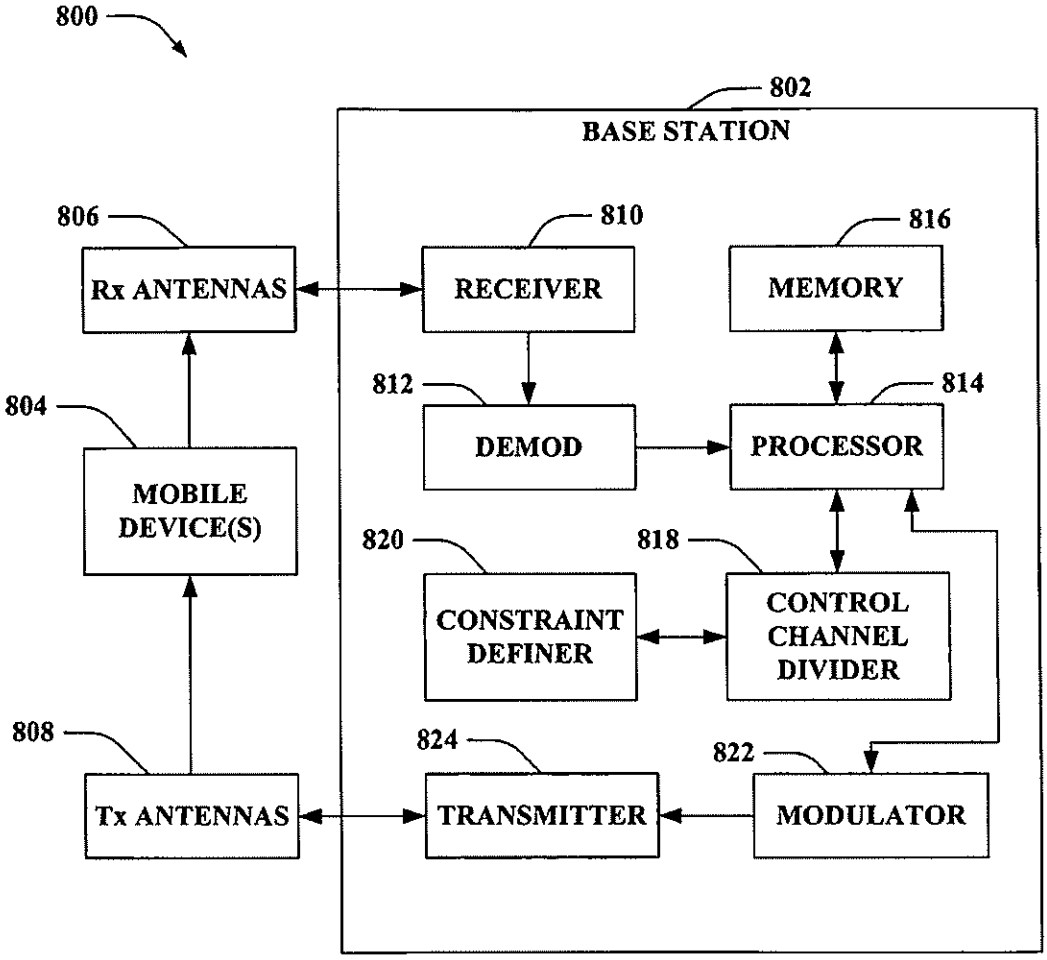
800
802
BASE STATION
806
Rx ANTENNAS
810
RECEIVER
816
MEMORY
812
DEMOD
814
PROCESSOR
804
MOBILE DEVICE(S)
820
CONSTRAINT DEFINER
818
CONTROL CHANNEL DIVIDER
808
Tx ANTENNAS
824
TRANSMITTER
822
MODULATOR

FIG. 8

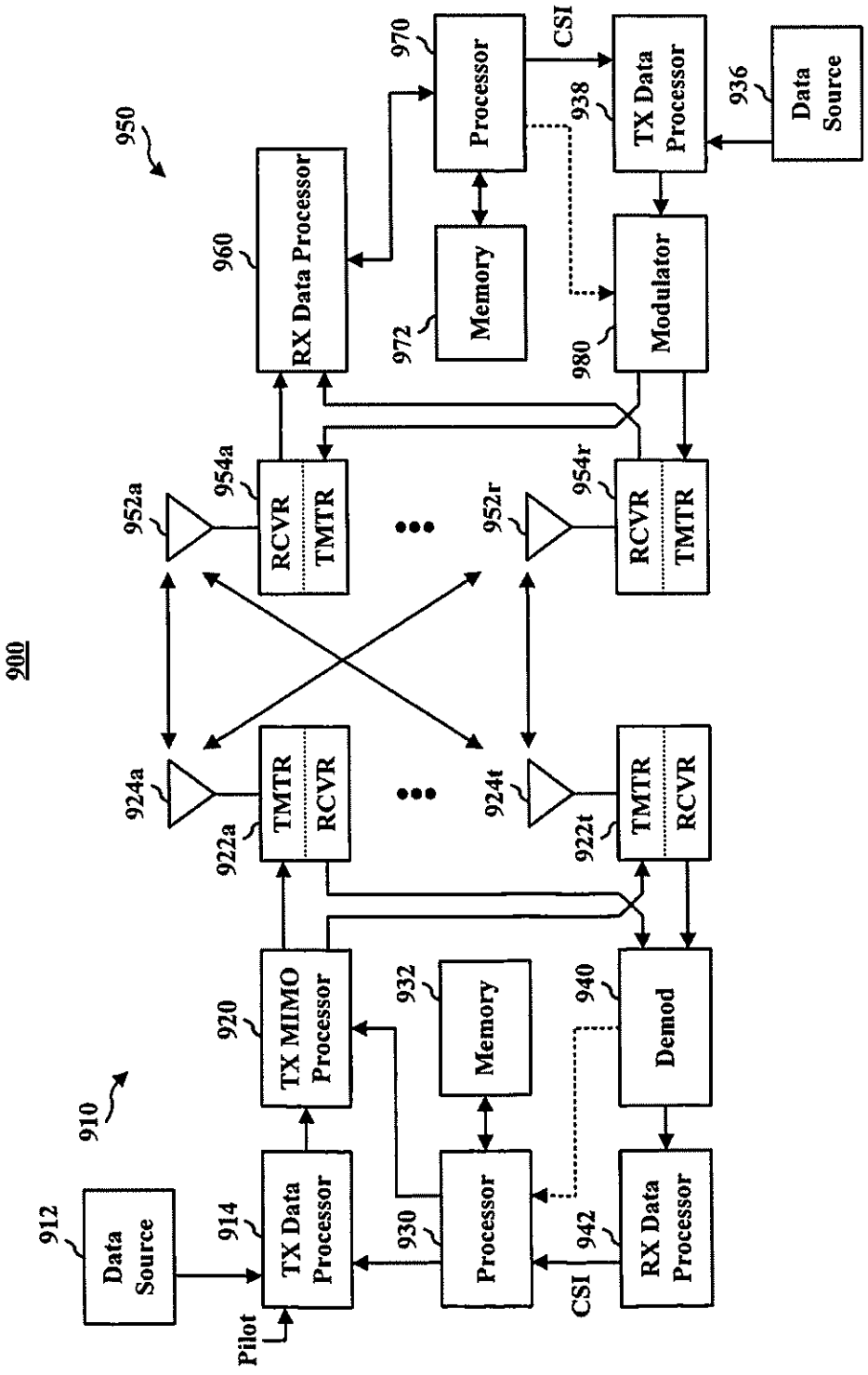
200
910
912
Data Source
914
TX Data Processor
Pilot
920
TX MIMO Processor
922a
TMTR
RCVR
924a
924t
922t
930
Processor
932
Memory
940
Demod
942
RX Data Processor
CSI
950
952a
952r
954a
954r
RCVR
TMTR
960
RX Data Processor
970
Processor
CSI
938
972
Memory
980
Modulator
TX Data Processor
936
Data Source

FIG. 9

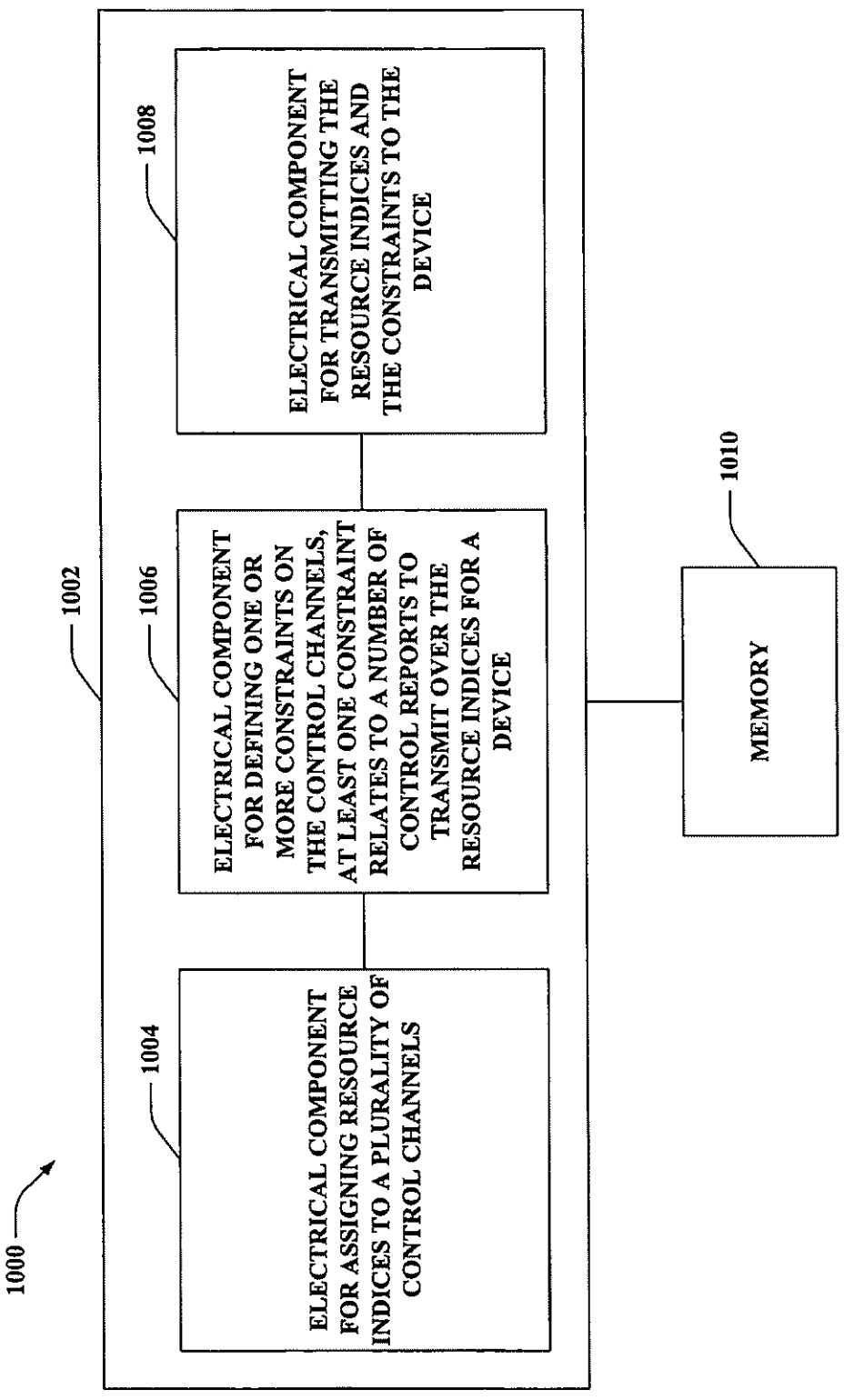
1000
1002
1004
ELECTRICAL COMPONENT FOR ASSIGNING RESOURCE INDICES TO A PLURALITY OF CONTROL CHANNELS
1006
ELECTRICAL COMPONENT FOR DEFINING ONE OR MORE CONSTRAINTS ON THE CONTROL CHANNELS, AT LEAST ONE CONSTRAINT RELATES TO A NUMBER OF CONTROL REPORTS TO TRANSMIT OVER THE RESOURCE INDICES FOR A DEVICE
1008
ELECTRICAL COMPONENT FOR TRANSMITTING THE RESOURCE INDICES AND THE CONSTRAINTS TO THE DEVICE
1010
MEMORY

FIG. 10

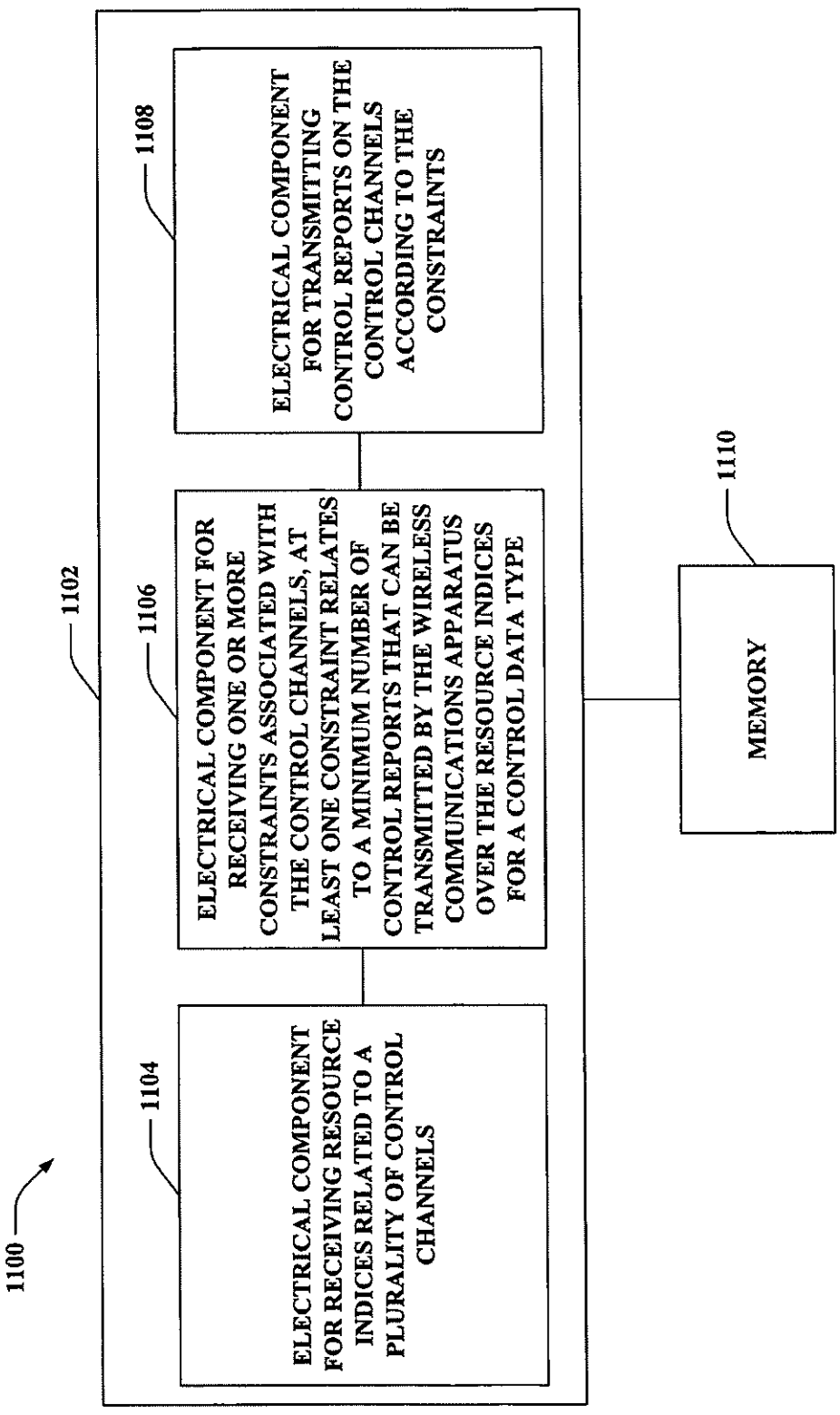
1100
1102
1104
ELECTRICAL COMPONENT FOR RECEIVING RESOURCE INDICES RELATED TO A PLURALITY OF CONTROL CHANNELS
1106
ELECTRICAL COMPONENT FOR RECEIVING ONE OR MORE CONSTRAINTS ASSOCIATED WITH THE CONTROL CHANNELS, AT LEAST ONE CONSTRAINT RELATES TO A MINIMUM NUMBER OF CONTROL REPORTS THAT CAN BE TRANSMITTED BY THE WIRELESS COMMUNICATIONS APPARATUS OVER THE RESOURCE INDICES FOR A CONTROL DATA TYPE
1108
ELECTRICAL COMPONENT FOR TRANSMITTING CONTROL REPORTS ON THE CONTROL CHANNELS ACCORDING TO THE CONSTRAINTS
1110
MEMORY

FIG. 11