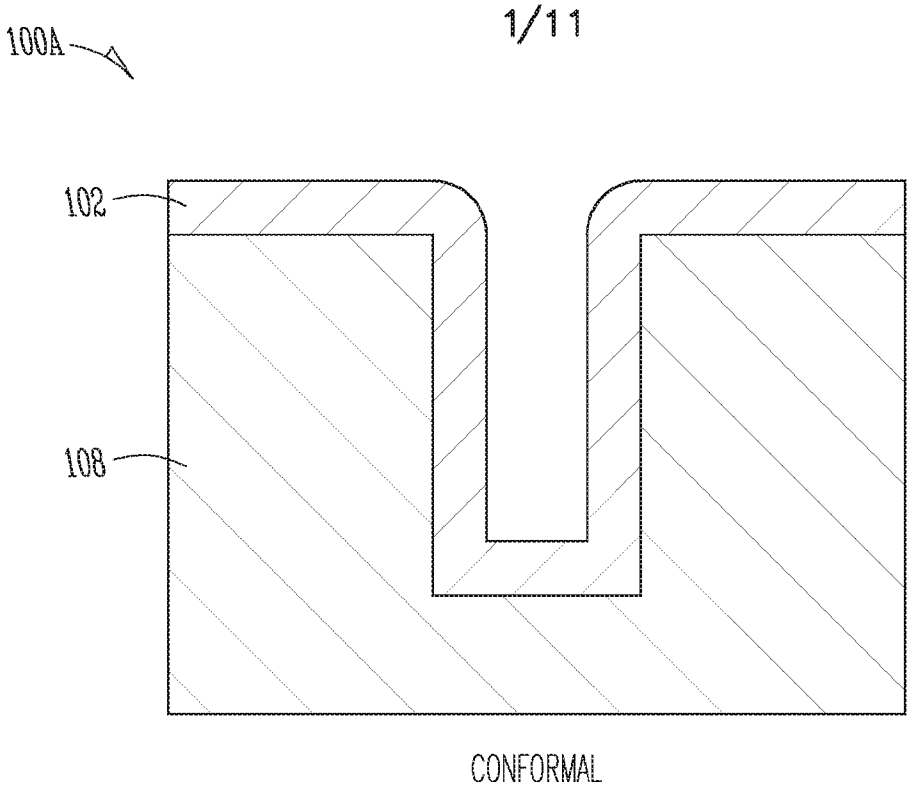


Fig. 1A

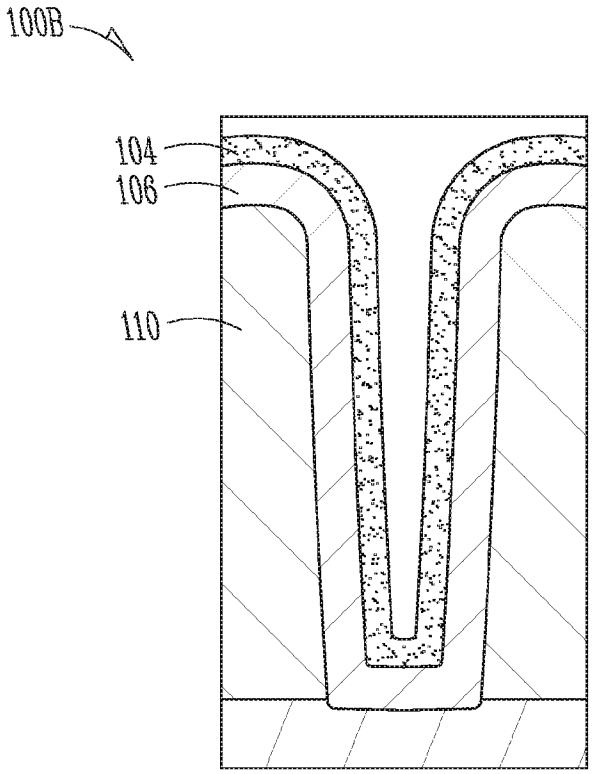


Fig. 1B

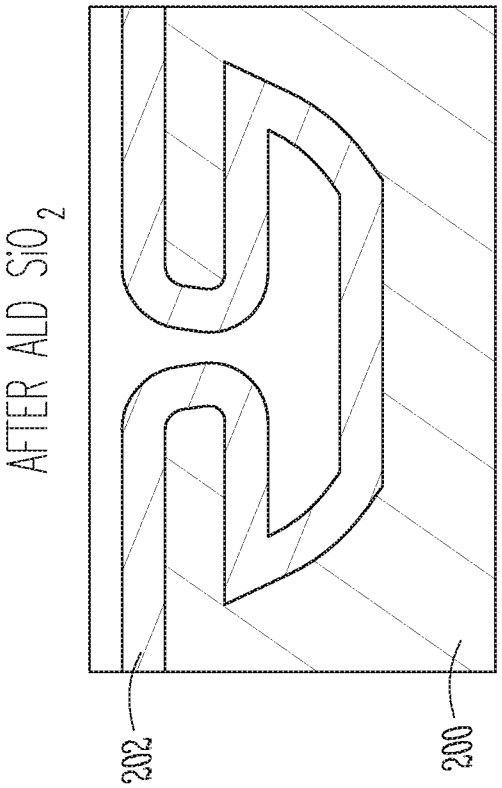


Fig.2B

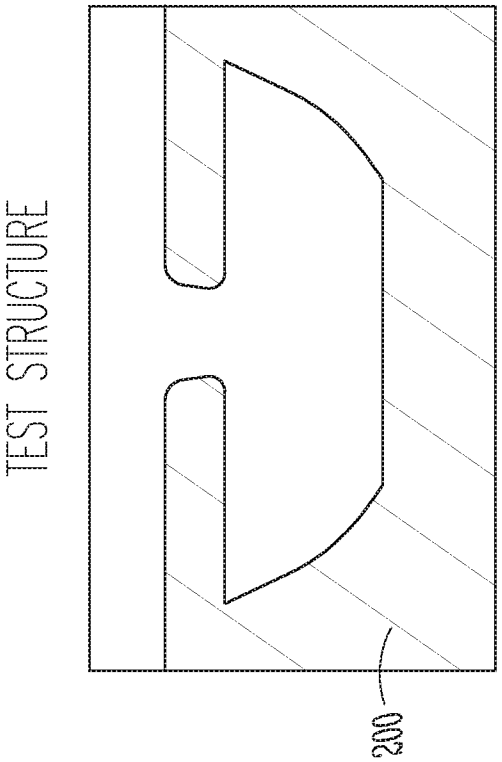


Fig.2A

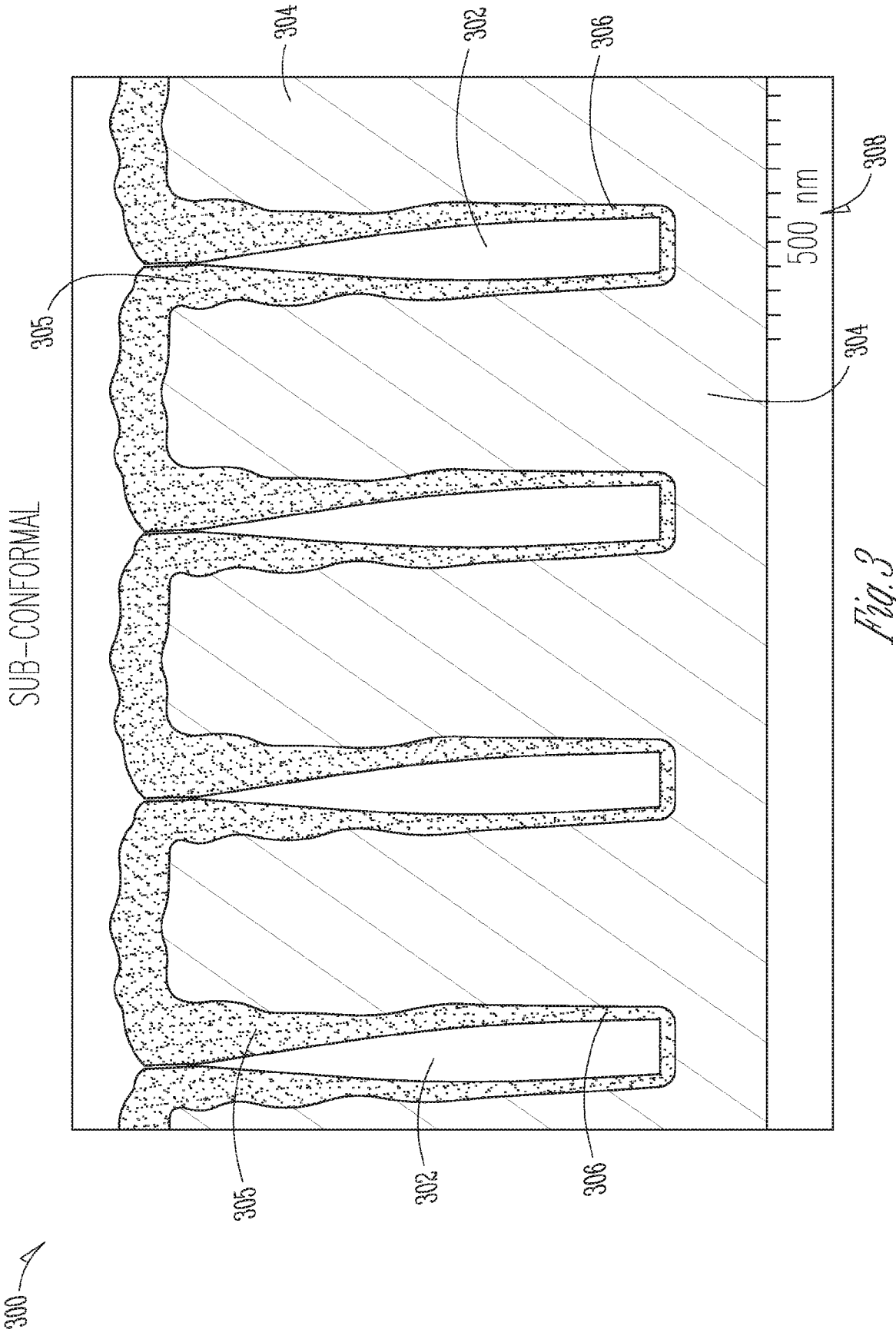


Fig. 3

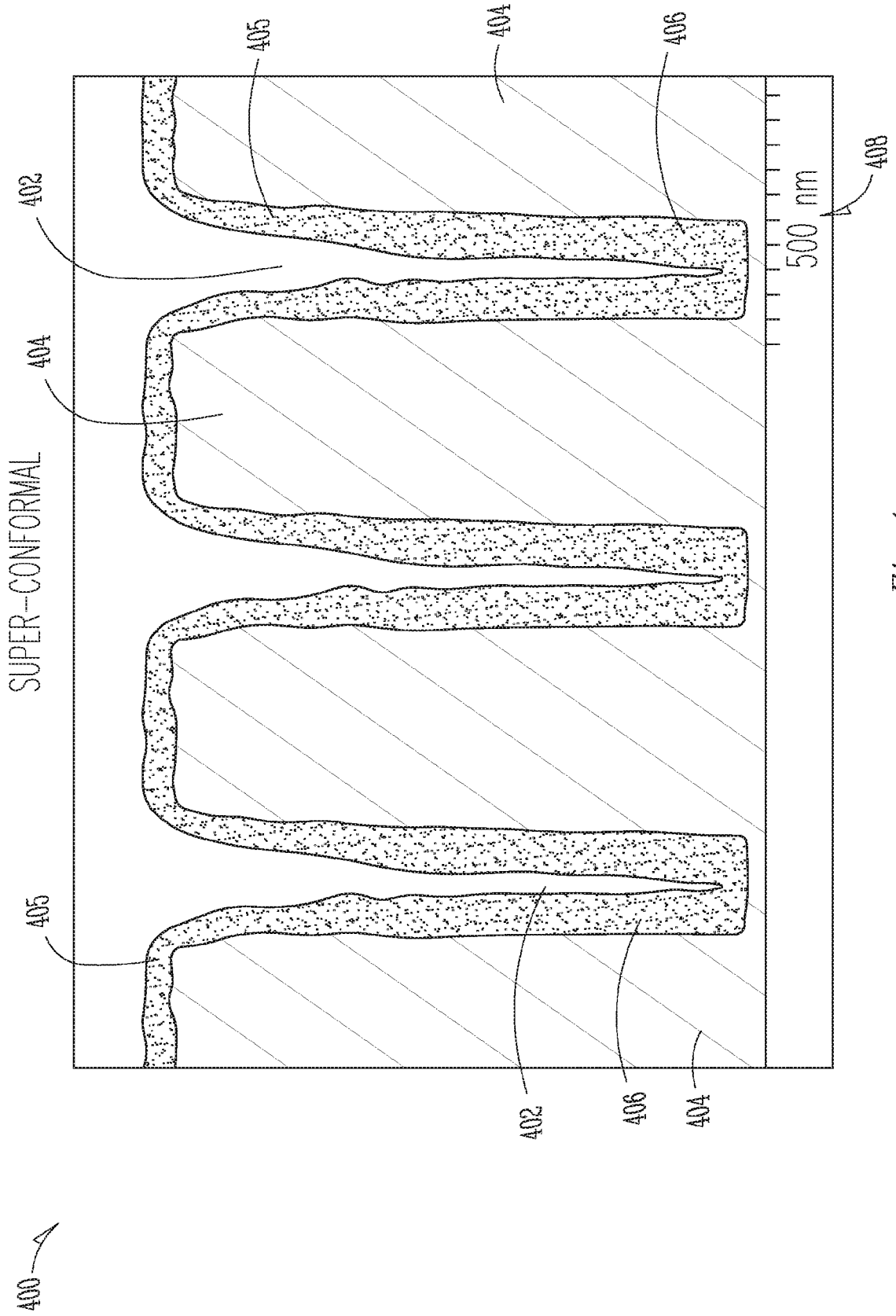


Fig. 4

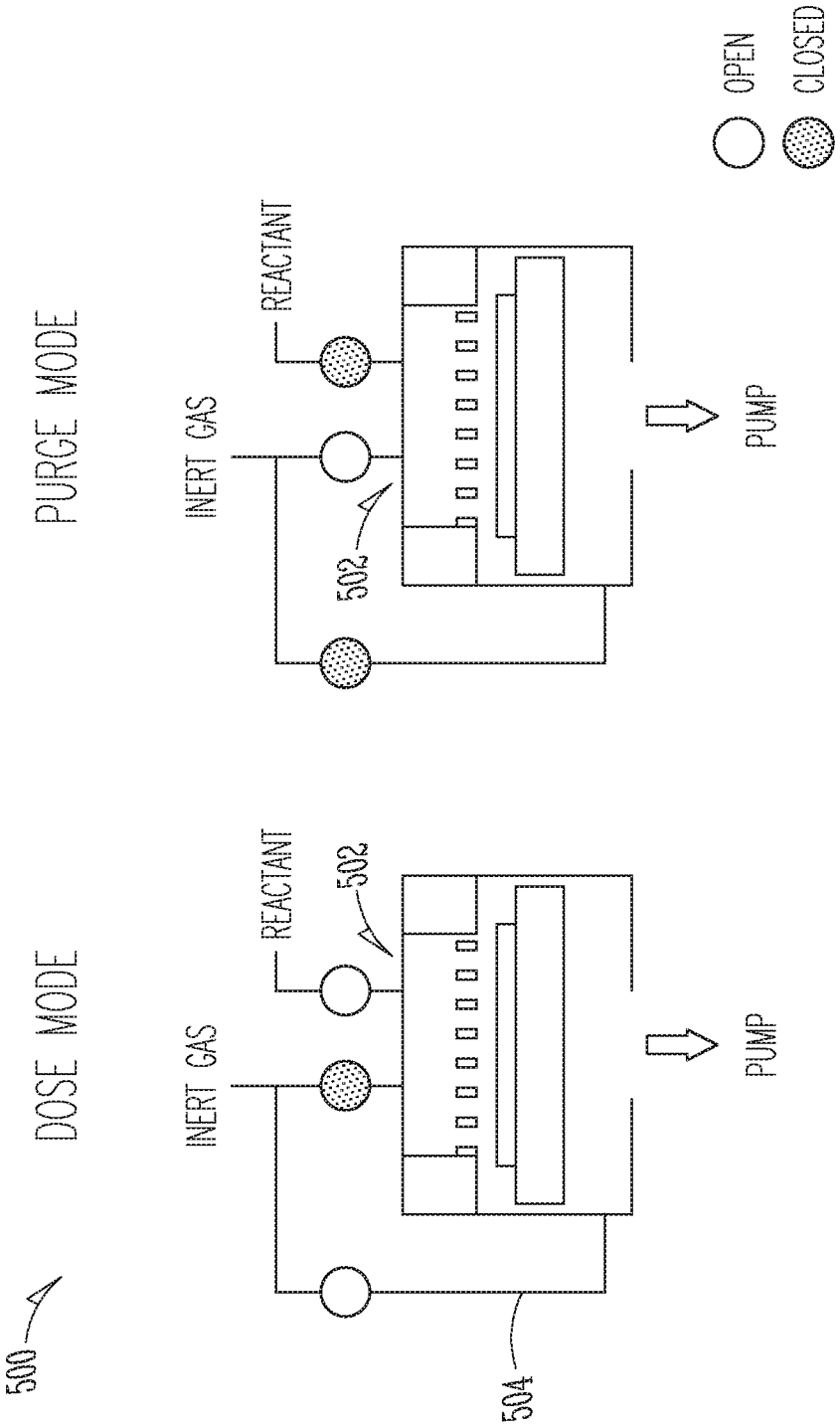

500
PURGE MODE
INERT GAS
REACTANT
502
PUMP
OPEN
CLOSED
500
DOSE MODE
INERT GAS
REACTANT
502
PUMP
504

Fig. 5

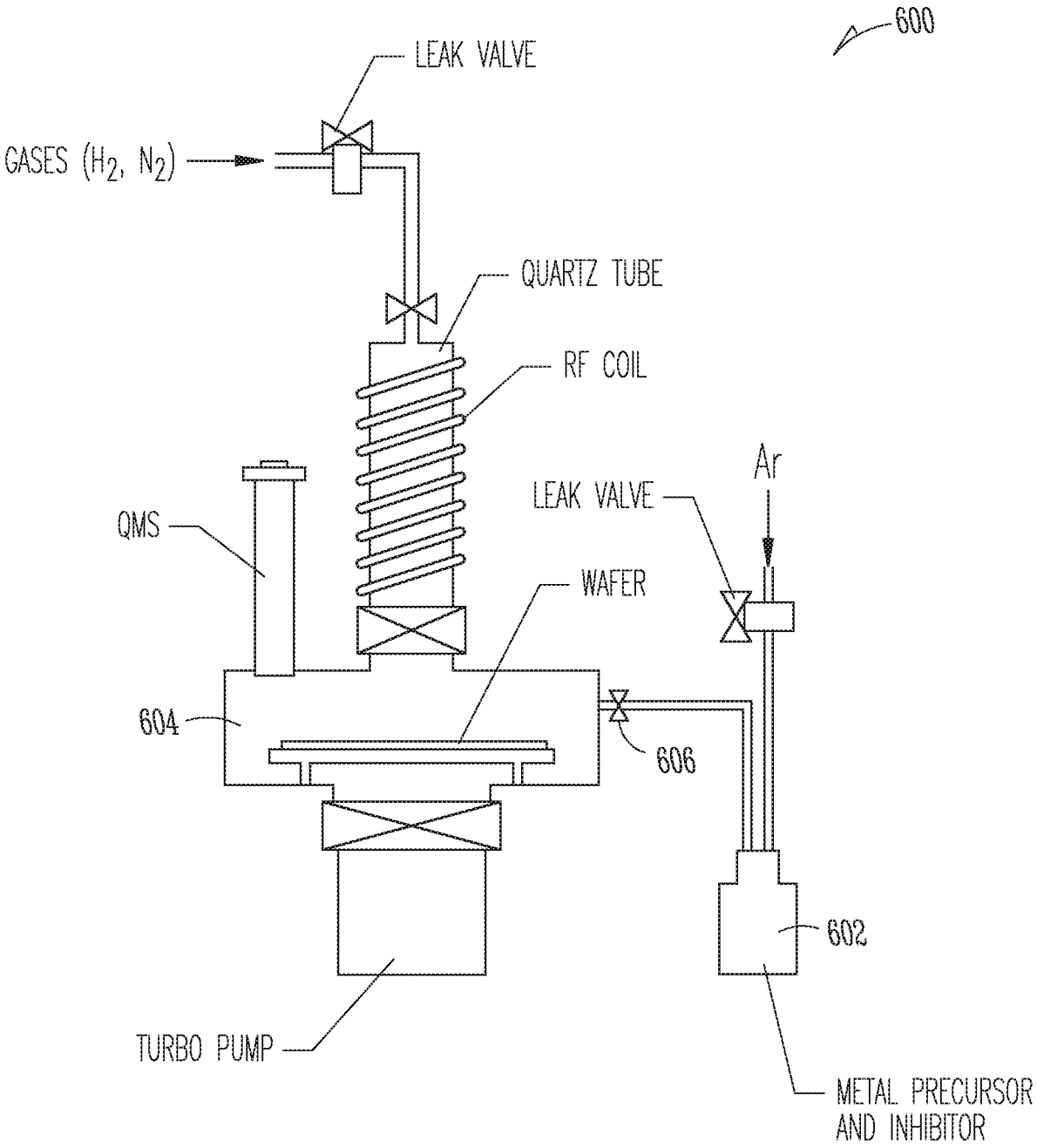

600
LEAK VALVE
GASES (H_2, N_2)
QUARTZ TUBE
RF COIL
Ar
LEAK VALVE
QMS
WAFER
604
606
602
TURBO PUMP
METAL PRECURSOR
AND INHIBITOR

Fig. 6

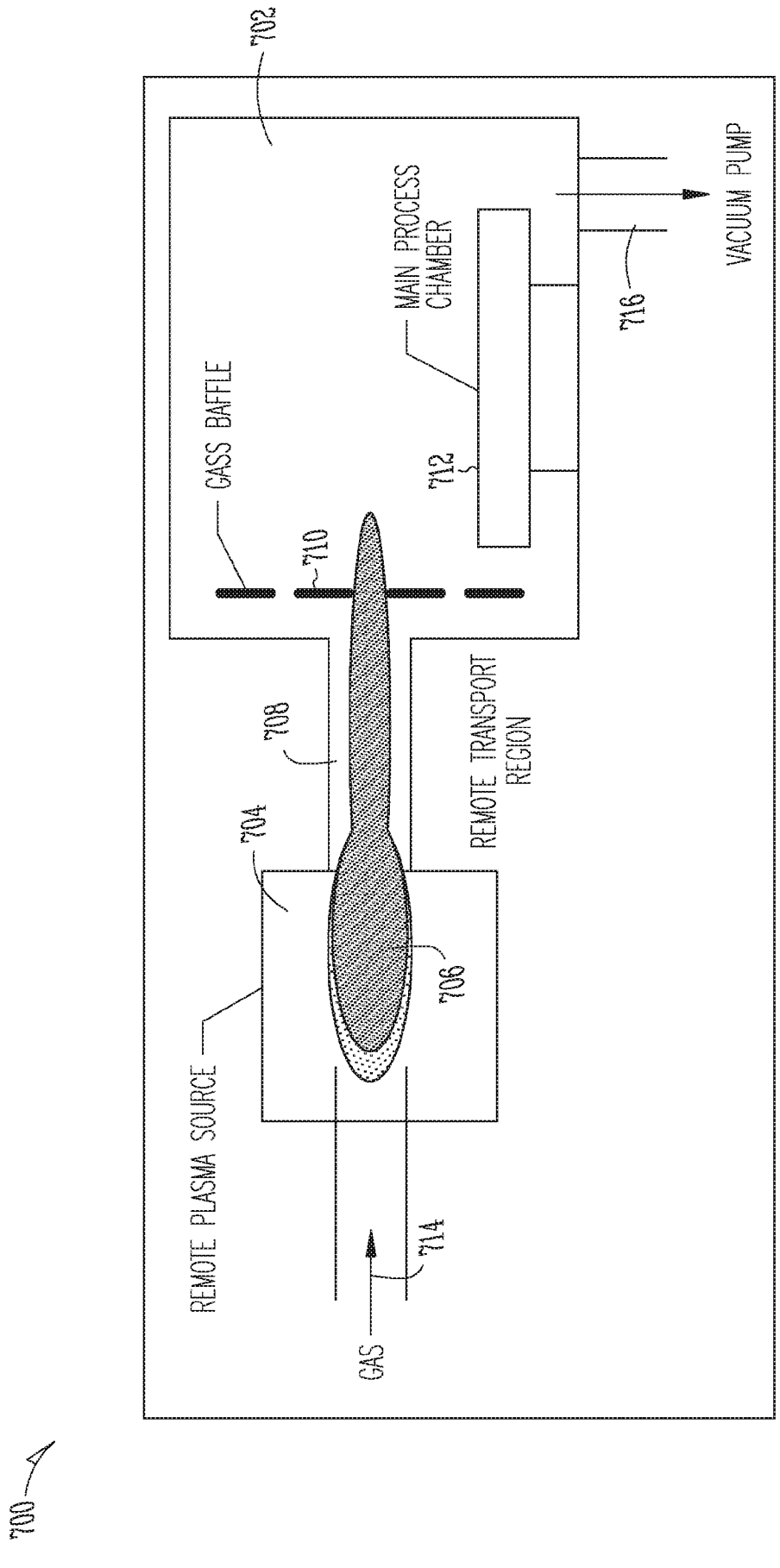

700
702
VACUUM PUMP
716
MAIN PROCESS CHAMBER
712
GASS BAFFLE
710
708
REMOTE TRANSPORT REGION
704
706
REMOTE PLASMA SOURCE
714
GAS

Fig. 7

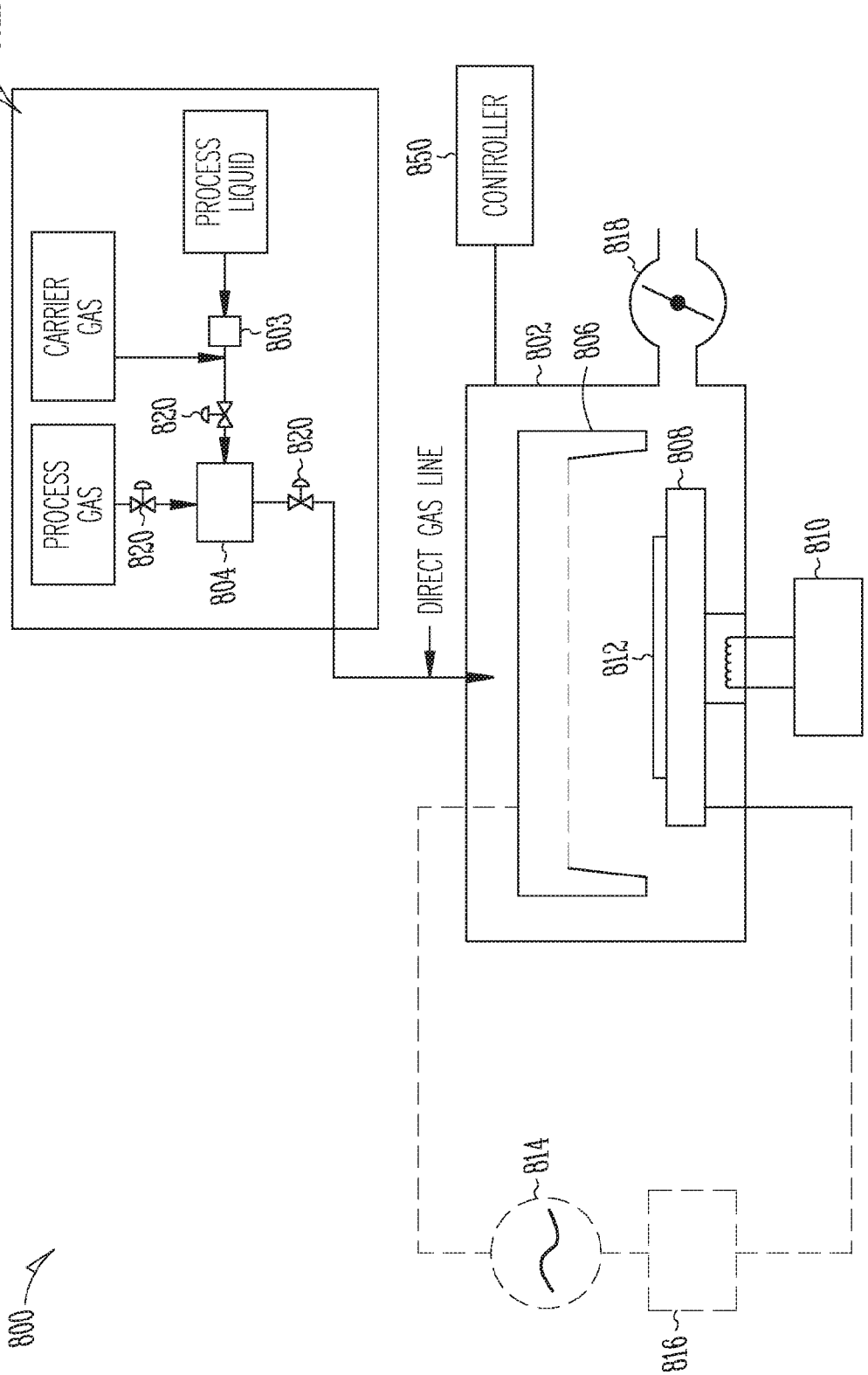

801A
PROCESS LIQUID
CARRIER GAS
PROCESS GAS
803
820
820
820
804
850
CONTROLLER
818
802
806
808
DIRECT GAS LINE
810
812
814
816
800

Fig. 8

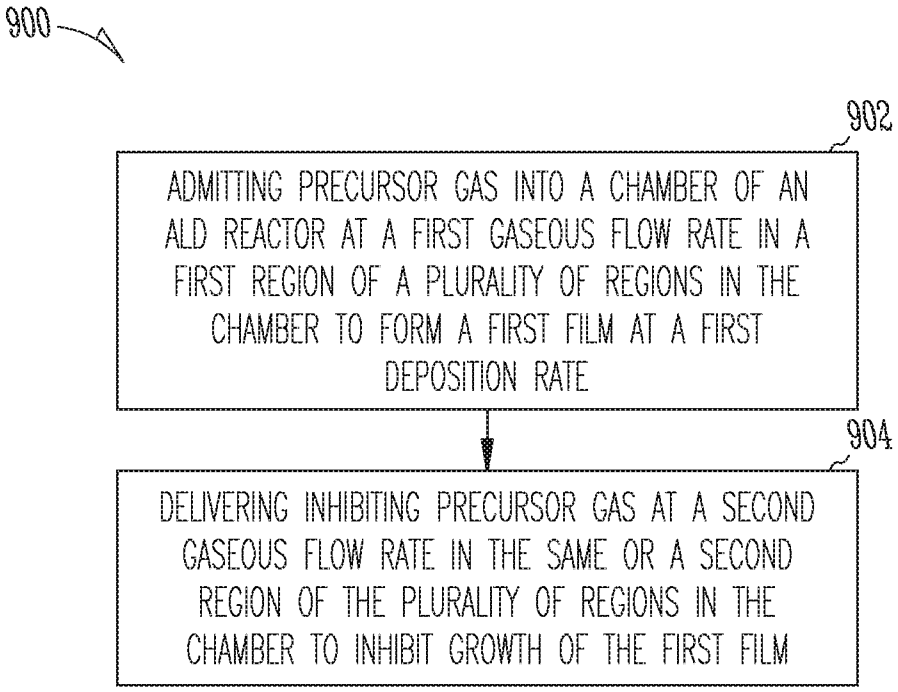

900
902
ADMITTING PRECURSOR GAS INTO A CHAMBER OF AN ALD REACTOR AT A FIRST GASEOUS FLOW RATE IN A FIRST REGION OF A PLURALITY OF REGIONS IN THE CHAMBER TO FORM A FIRST FILM AT A FIRST DEPOSITION RATE
904
DELIVERING INHIBITING PRECURSOR GAS AT A SECOND GASEOUS FLOW RATE IN THE SAME OR A SECOND REGION OF THE PLURALITY OF REGIONS IN THE CHAMBER TO INHIBIT GROWTH OF THE FIRST FILM

Fig. 9

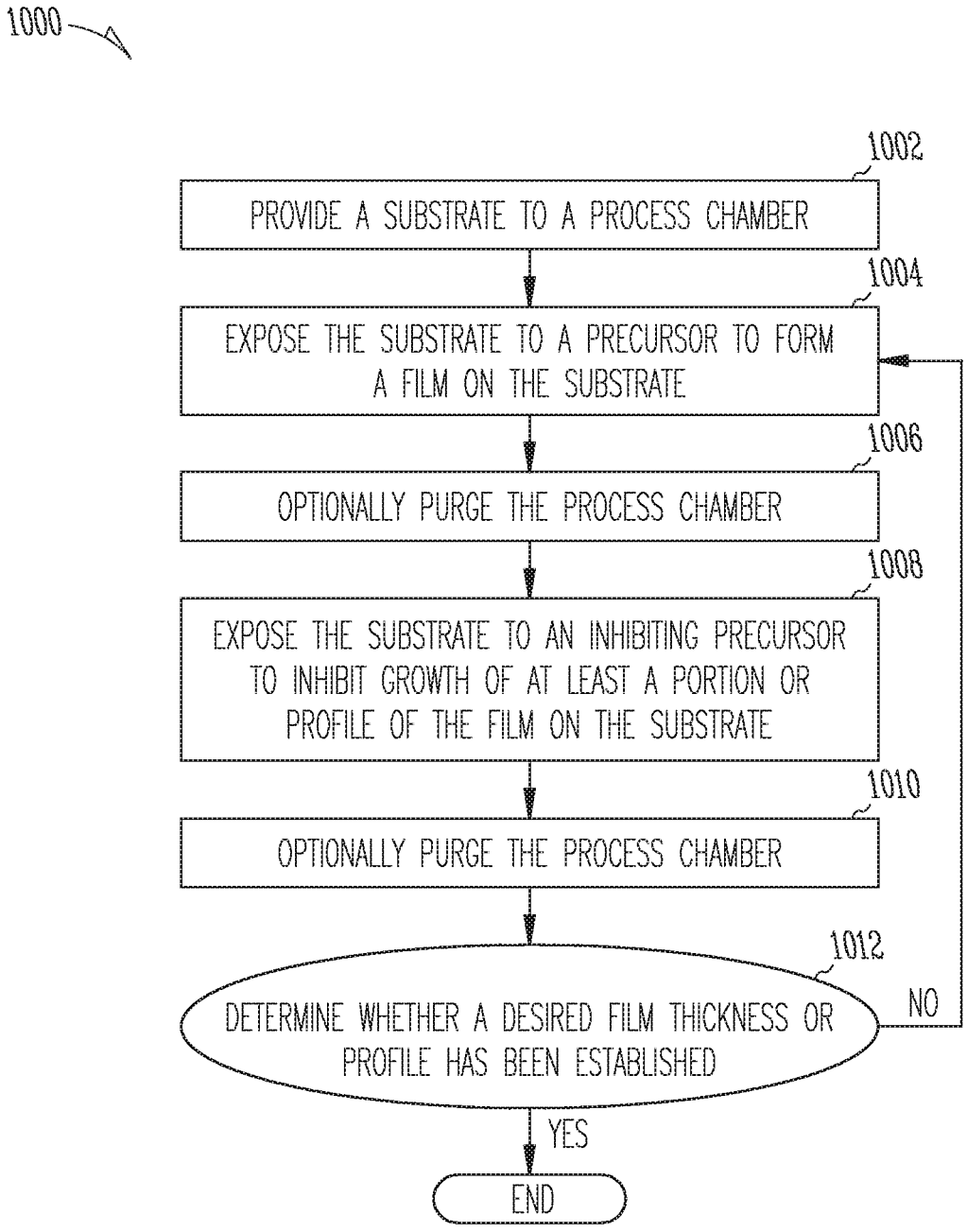

1000
1002
PROVIDE A SUBSTRATE TO A PROCESS CHAMBER
1004
EXPOSE THE SUBSTRATE TO A PRECURSOR TO FORM A FILM ON THE SUBSTRATE
1006
OPTIONALLY PURGE THE PROCESS CHAMBER
1008
EXPOSE THE SUBSTRATE TO AN INHIBITING PRECURSOR TO INHIBIT GROWTH OF AT LEAST A PORTION OR PROFILE OF THE FILM ON THE SUBSTRATE
1010
OPTIONALLY PURGE THE PROCESS CHAMBER
1012
DETERMINE WHETHER A DESIRED FILM THICKNESS OR PROFILE HAS BEEN ESTABLISHED
NO
YES
END

Fig. 10

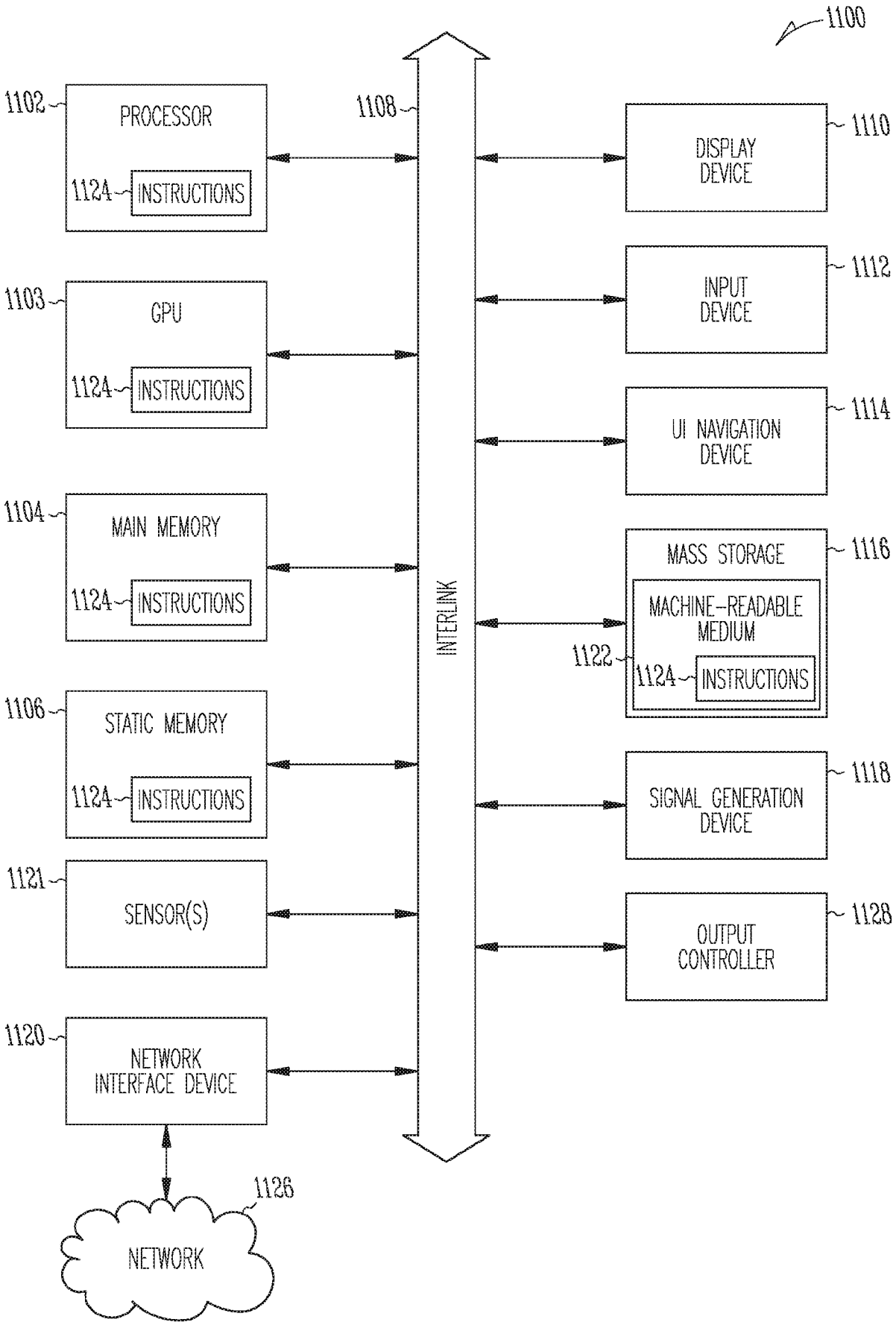

1100
1102
PROCESSOR
1124
INSTRUCTIONS
1103
GPU
1124
INSTRUCTIONS
1104
MAIN MEMORY
1124
INSTRUCTIONS
1106
STATIC MEMORY
1124
INSTRUCTIONS
1121
SENSOR(S)
1120
NETWORK INTERFACE DEVICE
1126
NETWORK
1108
INTERLINK
1110
DISPLAY DEVICE
1112
INPUT DEVICE
1114
UI NAVIGATION DEVICE
1116
MASS STORAGE
MACHINE-READABLE MEDIUM
1122
1124
INSTRUCTIONS
1118
SIGNAL GENERATION DEVICE
1128
OUTPUT CONTROLLER

Fig. 11