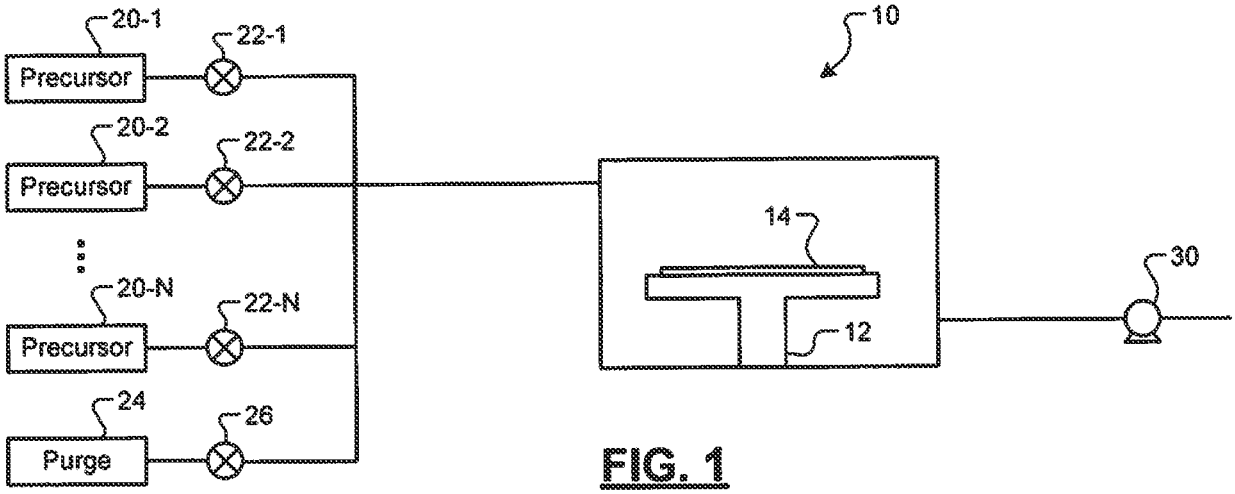

FIG. 1
Prior Art

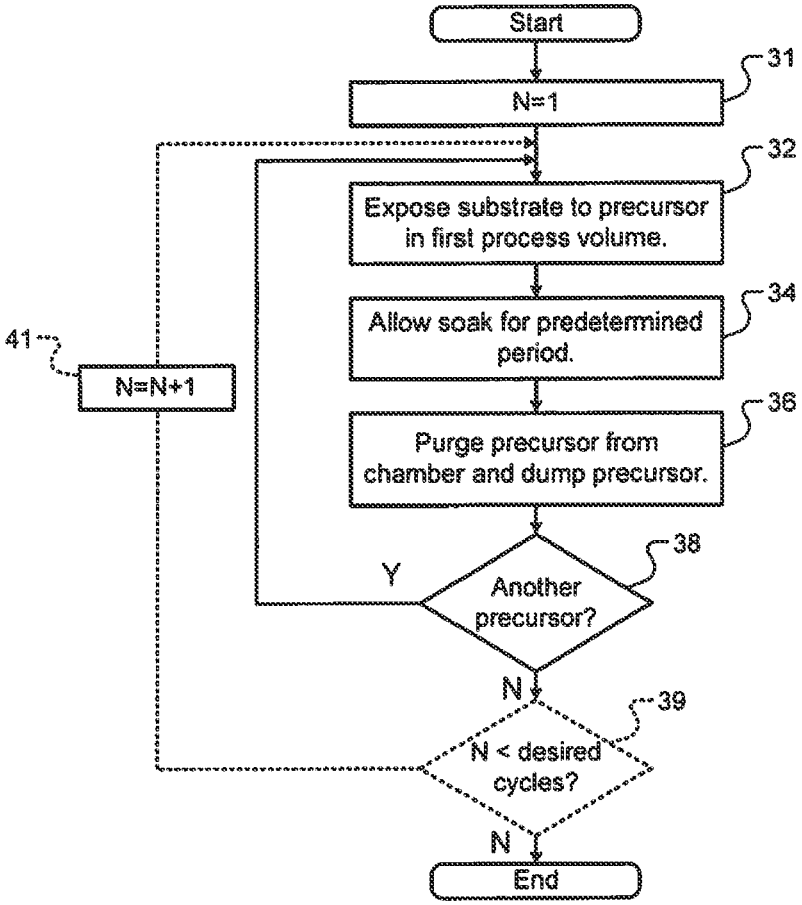

FIG. 2
Prior Art

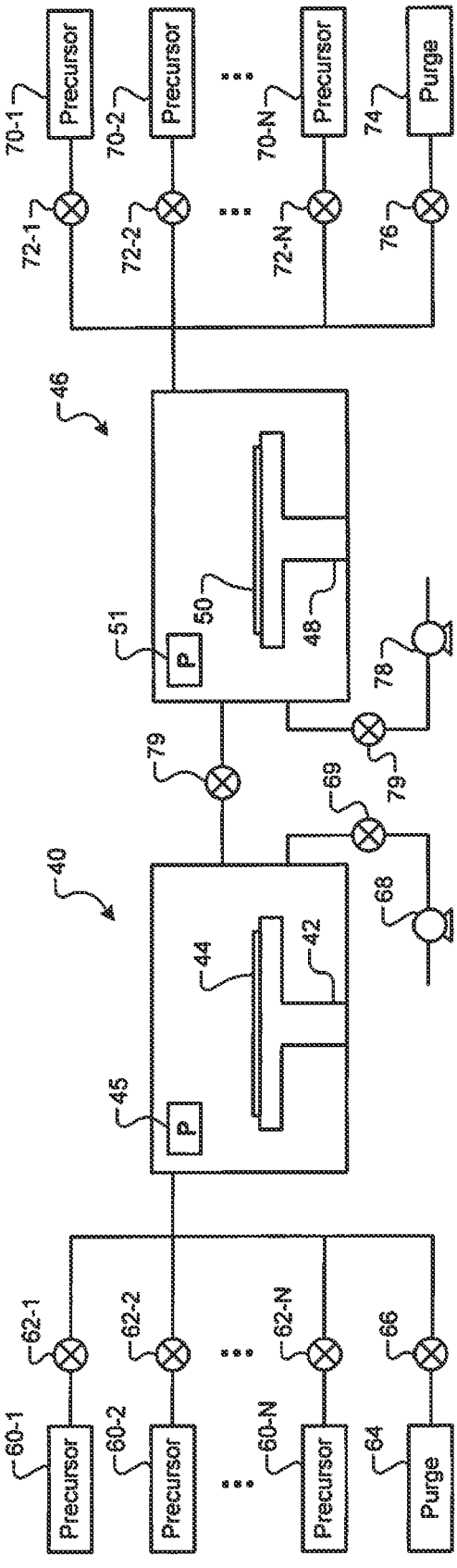

FIG. 3

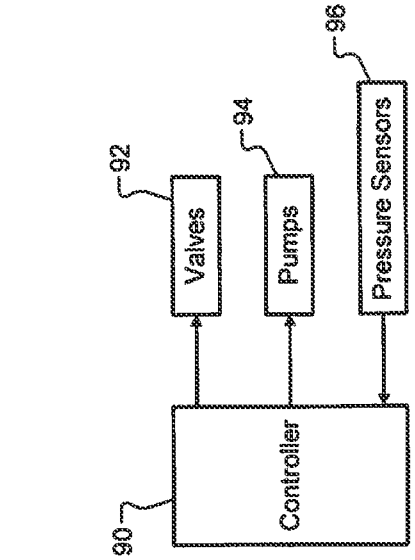

FIG. 5

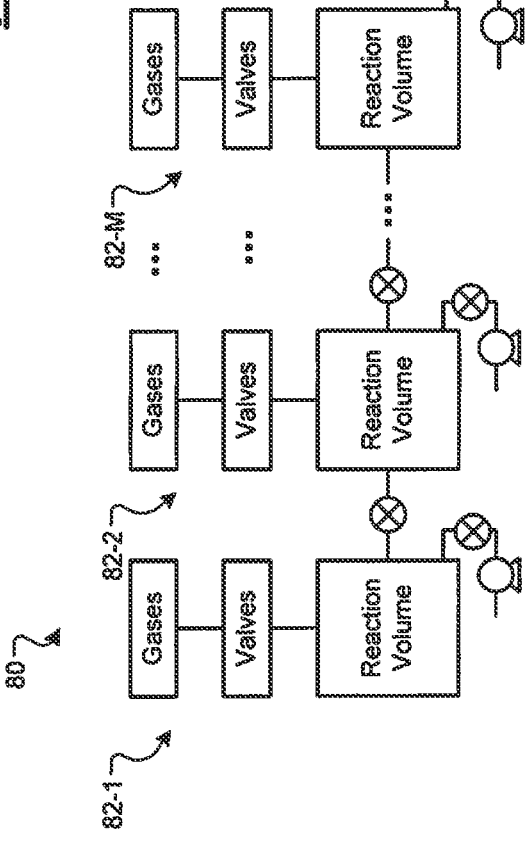

FIG. 4

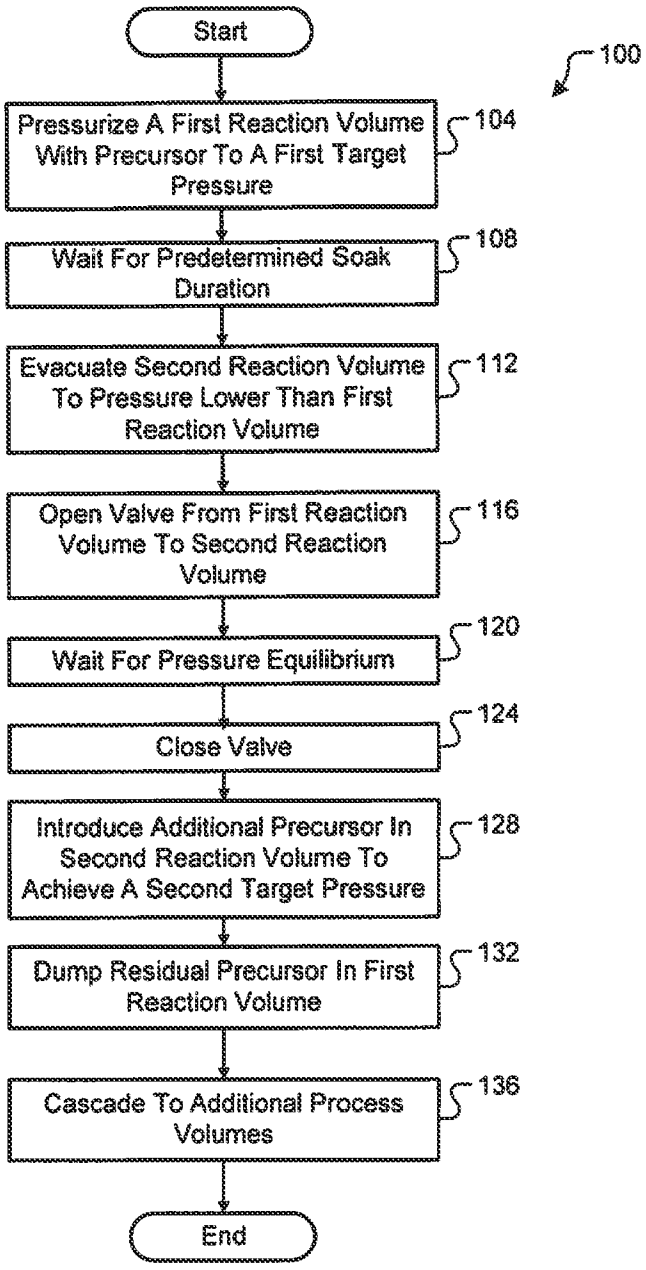
Start
100
Pressurize A First Reaction Volume With Precursor To A First Target Pressure
104
Wait For Predetermined Soak Duration
108
Evacuate Second Reaction Volume To Pressure Lower Than First Reaction Volume
112
Open Valve From First Reaction Volume To Second Reaction Volume
116
Wait For Pressure Equilibrium
120
Close Valve
124
Introduce Additional Precursor In Second Reaction Volume To Achieve A Second Target Pressure
128
Dump Residual Precursor In First Reaction Volume
132
Cascade To Additional Process Volumes
136
End

FIG. 6

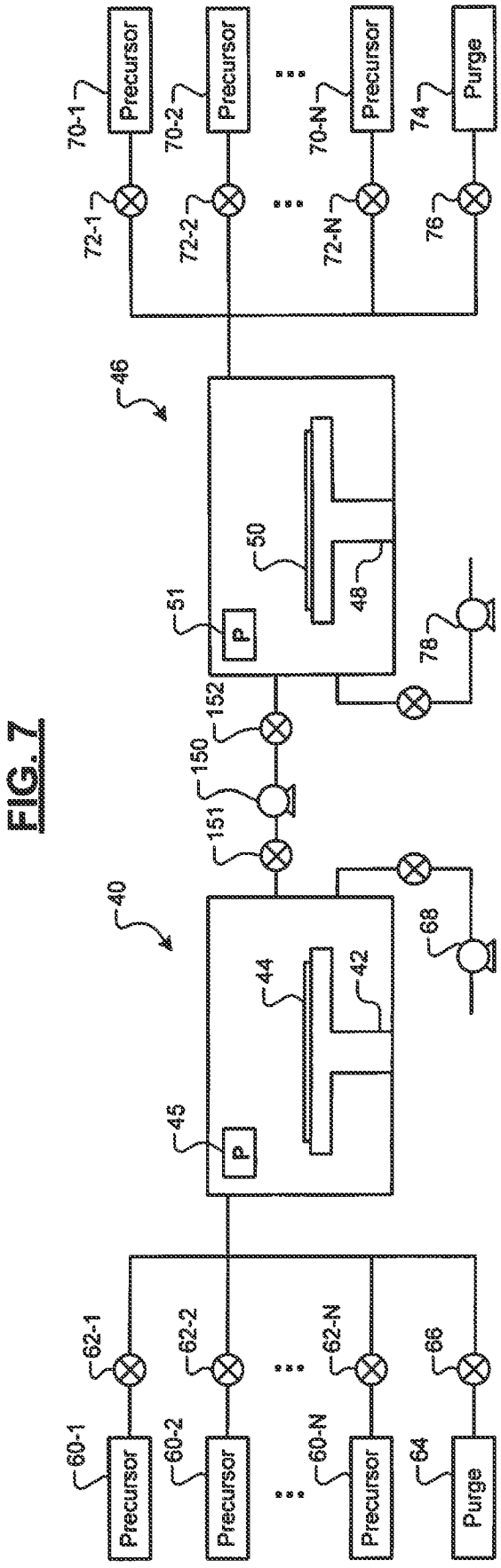
Precursor
Precursor
Precursor
Purge
70-1
70-2
70-N
74
72-1
72-2
72-N
76
46
50
48
51
P
78
152
150
151
40
68
44
42
45
P
62-1
62-2
62-N
66
60-1
60-2
60-N
64
Precursor
Precursor
Precursor
Purge

FIG. 7

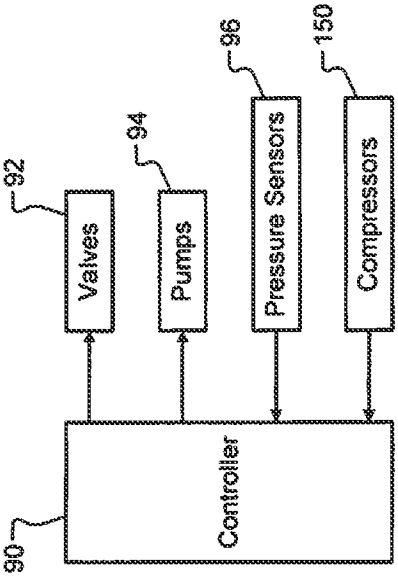
Valves
Pumps
Pressure Sensors
Compressors
Controller
92
94
96
150
90

FIG. 8

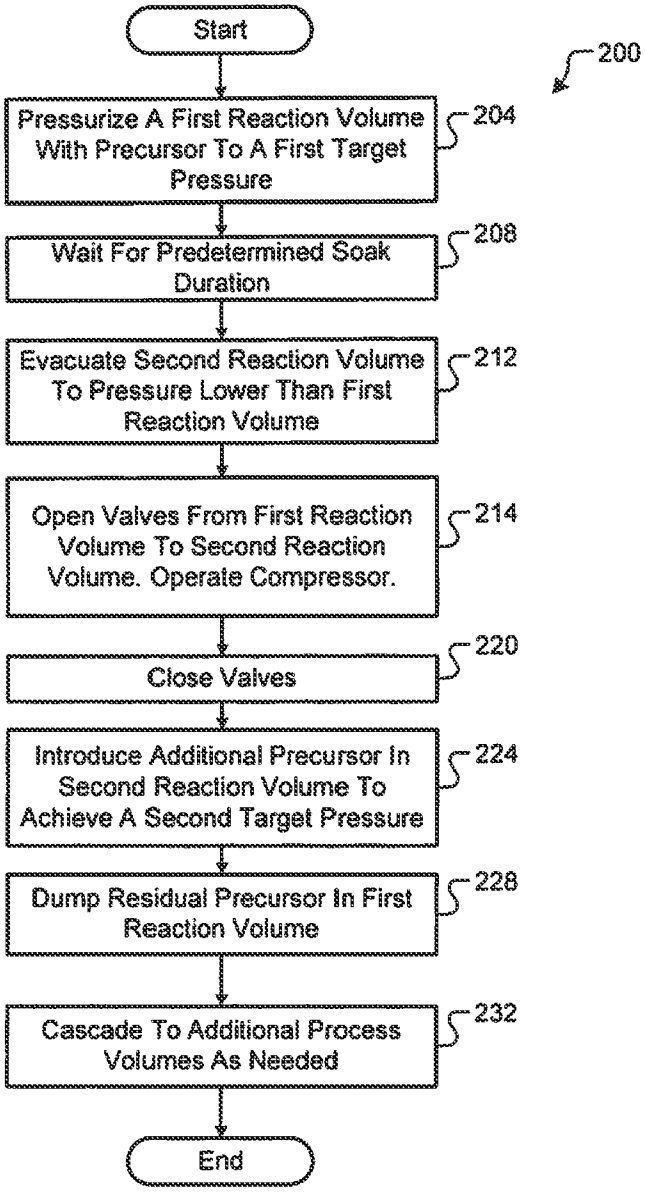
Start
200
Pressurize A First Reaction Volume With Precursor To A First Target Pressure
204
Wait For Predetermined Soak Duration
208
Evacuate Second Reaction Volume To Pressure Lower Than First Reaction Volume
212
Open Valves From First Reaction Volume To Second Reaction Volume. Operate Compressor.
214
Close Valves
220
Introduce Additional Precursor In Second Reaction Volume To Achieve A Second Target Pressure
224
Dump Residual Precursor In First Reaction Volume
228
Cascade To Additional Process Volumes As Needed
232
End

FIG. 9

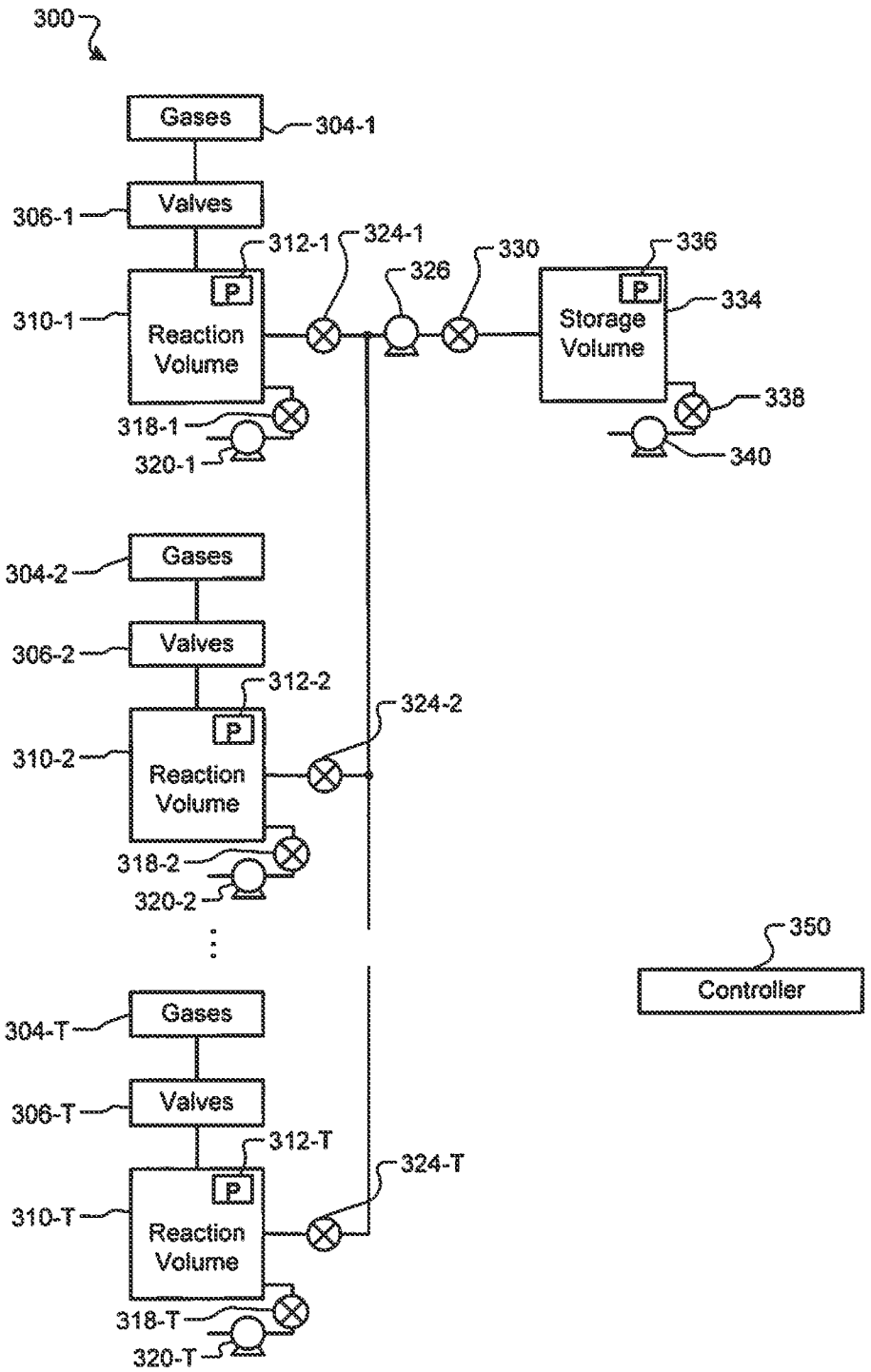
300
Gases
304-1
Valves
306-1
312-1
324-1
330
336
326
P
310-1
Reaction Volume
Storage Volume
334
318-1
320-1
338
340
304-2
Gases
306-2
Valves
312-2
324-2
310-2
Reaction Volume
318-2
320-2
350
Controller
304-T
Gases
306-T
Valves
312-T
324-T
310-T
Reaction Volume
318-T
320-T

FIG. 10

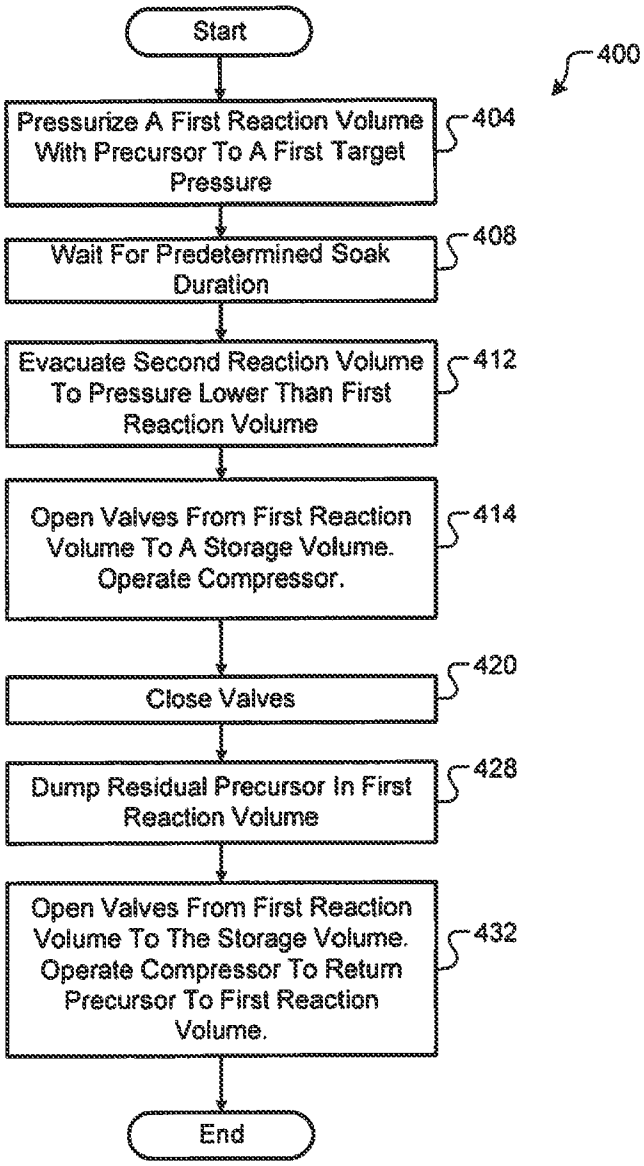
Start
400
Pressurize A First Reaction Volume With Precursor To A First Target Pressure
404
Wait For Predetermined Soak Duration
408
Evacuate Second Reaction Volume To Pressure Lower Than First Reaction Volume
412
Open Valves From First Reaction Volume To A Storage Volume. Operate Compressor.
414
Close Valves
420
Dump Residual Precursor In First Reaction Volume
428
Open Valves From First Reaction Volume To The Storage Volume. Operate Compressor To Return Precursor To First Reaction Volume.
432
End

FIG. 11