FIG. 1A

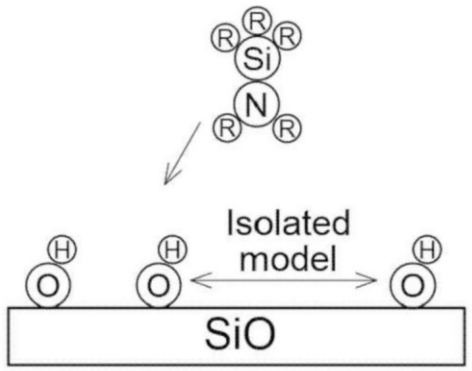


FIG. 1B

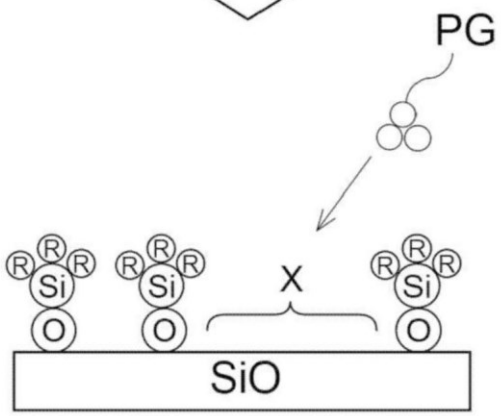


FIG. 1C

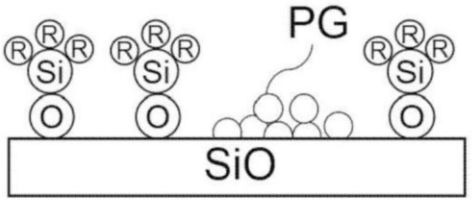


FIG. 2A

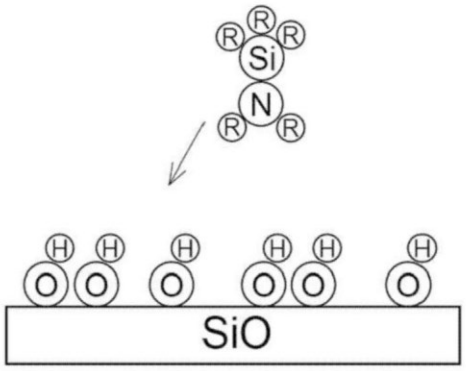


FIG. 2B

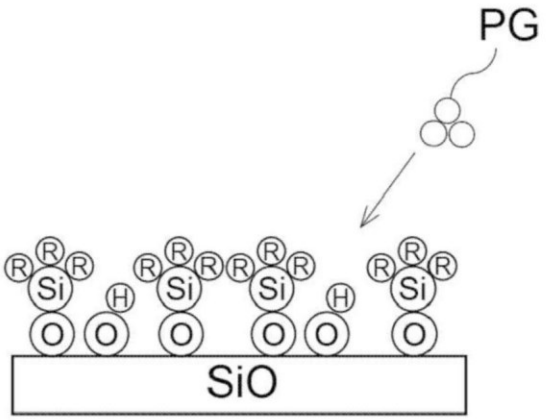


FIG. 2C

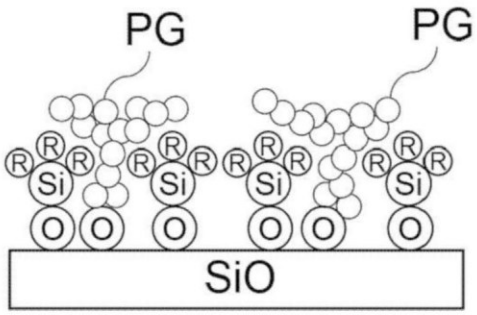


FIG. 3

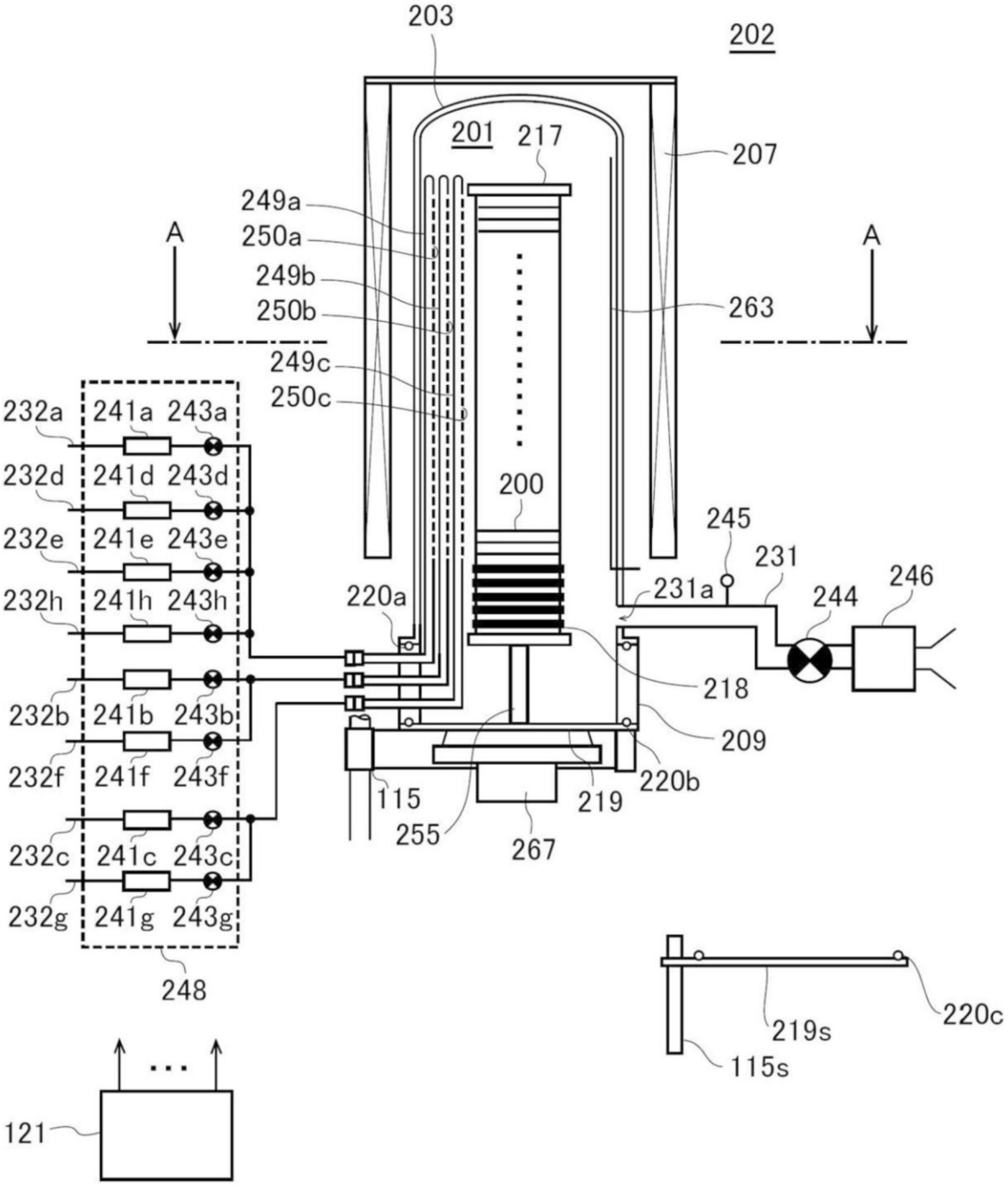

203
202
201
217
207
249a
250a
249b
250b
263
A
A
249c
250c
232a
241a
243a
232d
241d
243d
200
232e
241e
243e
245
231
246
232h
241h
243h
220a
231a
244
218
232b
241b
243b
209
232f
241f
243f
220b
115
219
255
267
232c
241c
243c
232g
241g
243g
248
220c
219s
115s
121

FIG. 4

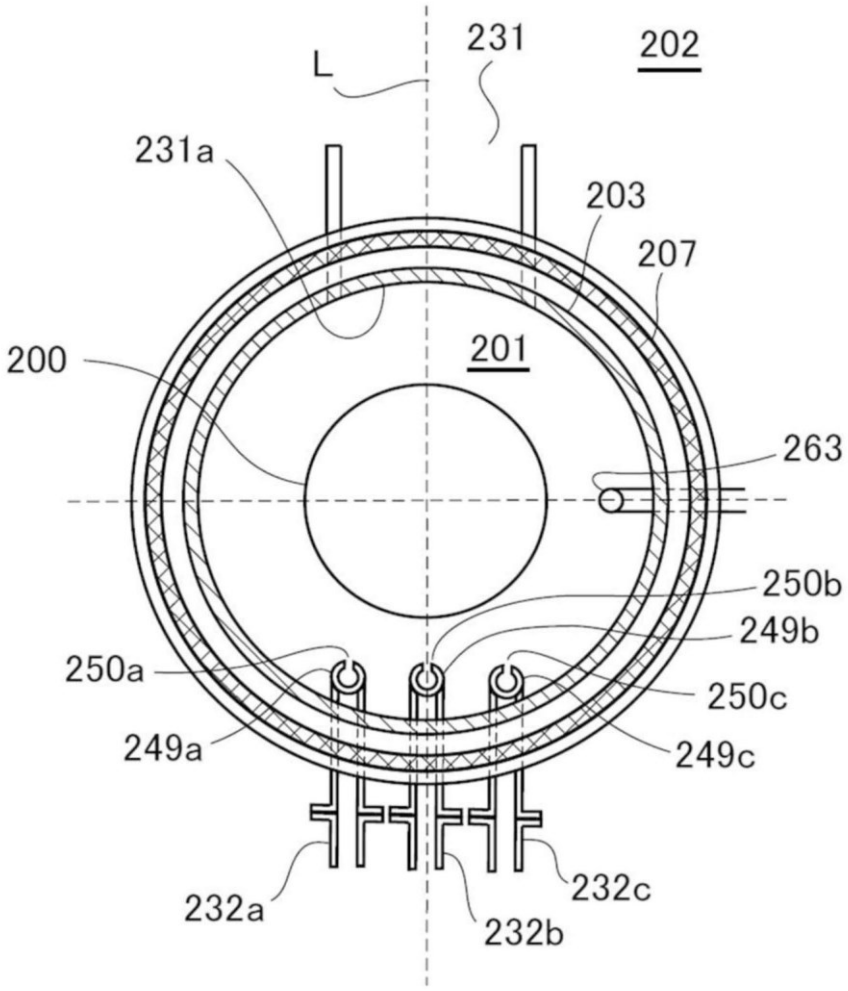

L
231
202
231a
203
207
200
201
263
250b
249b
250a
250c
249a
249c
232a
232b
232c

FIG. 5

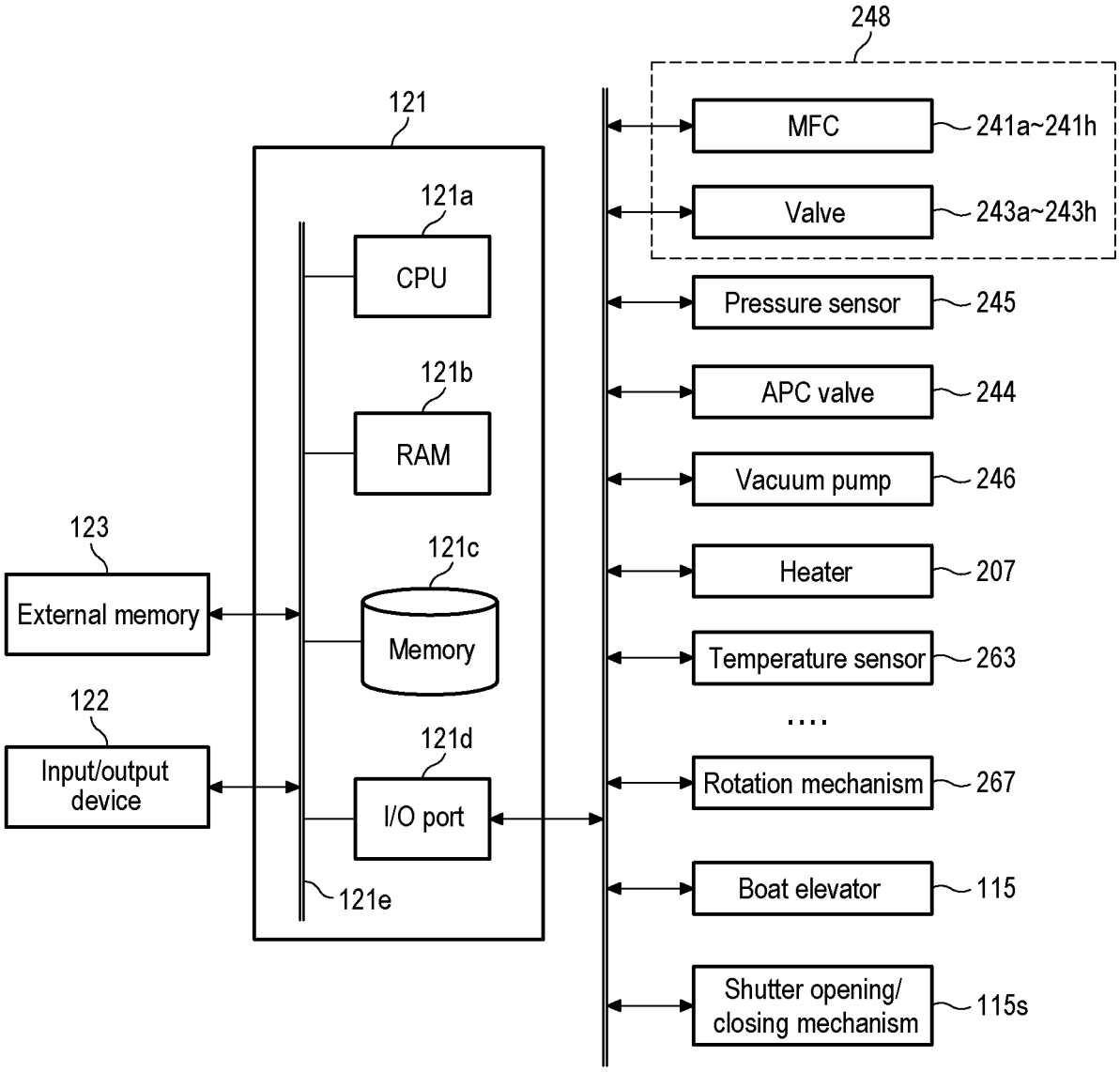

248
121
MFC
241a~241h
121a
Valve
243a~243h
CPU
Pressure sensor
245
121b
APC valve
244
RAM
Vacuum pump
246
123
121c
Heater
207
External memory
Memory
Temperature sensor
263
....
122
121d
Rotation mechanism
267
Input/output device
I/O port
Boat elevator
115
121e
Shutter opening/ closing mechanism
115s

FIG. 6

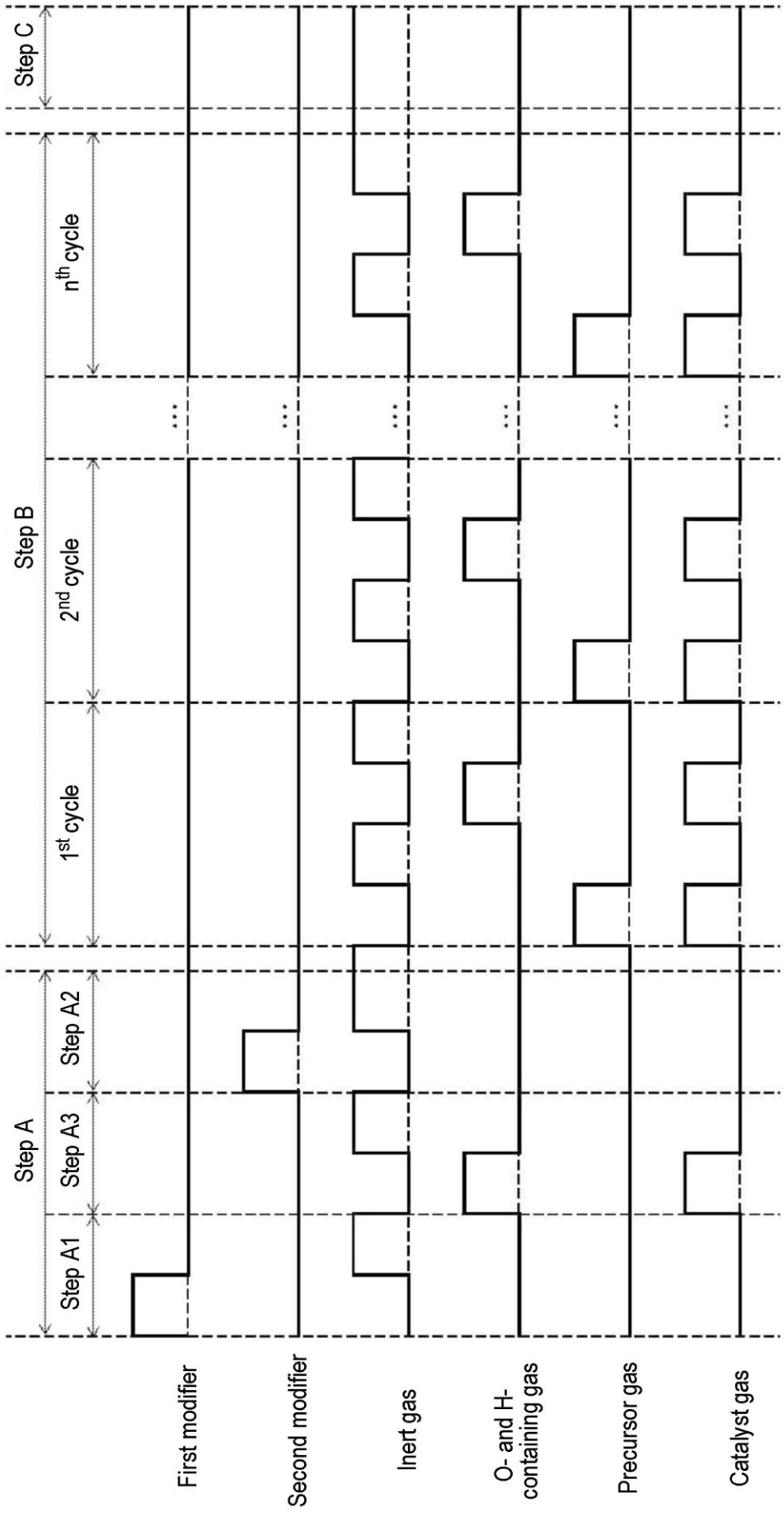

Step A
Step A1
Step A2
Step A3
Step B
1st cycle
2nd cycle
nth cycle
Step C
First modifier
Second modifier
Inert gas
O- and H-containing gas
Precursor gas
Catalyst gas

FIG. 7A

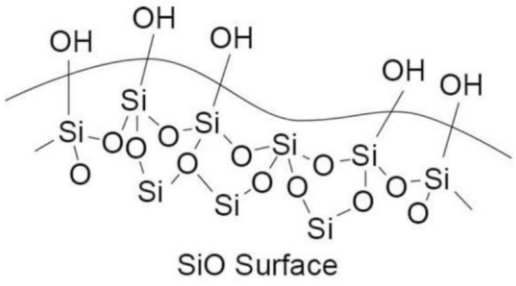


FIG. 7B

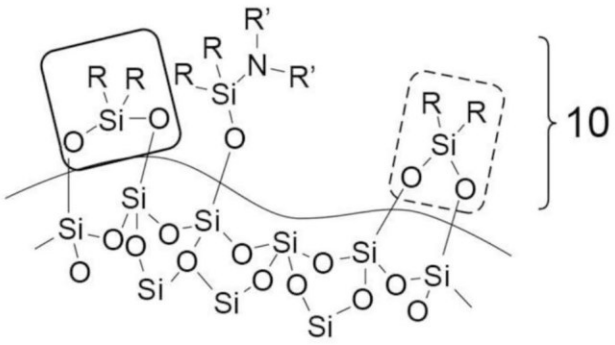


FIG. 7C

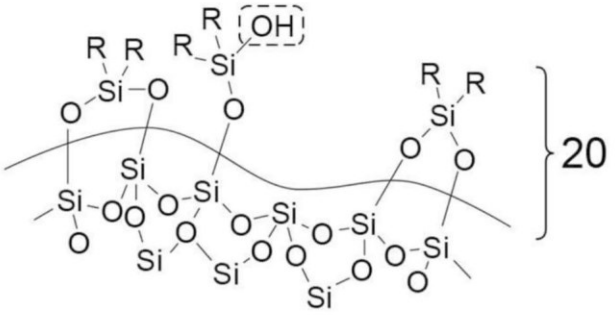


FIG. 7D

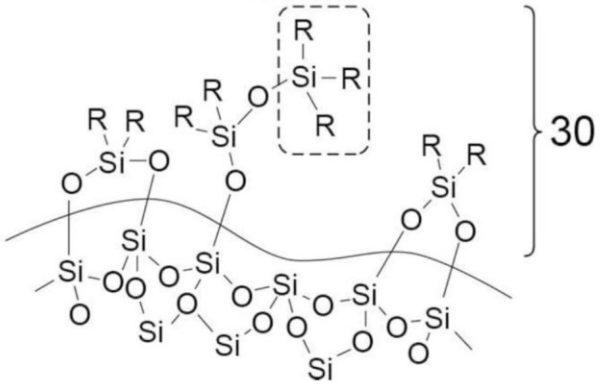


FIG. 8A

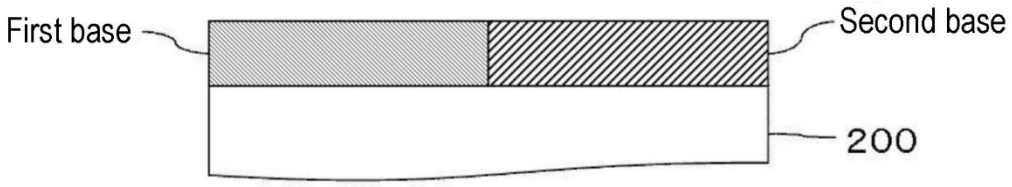


FIG. 8B

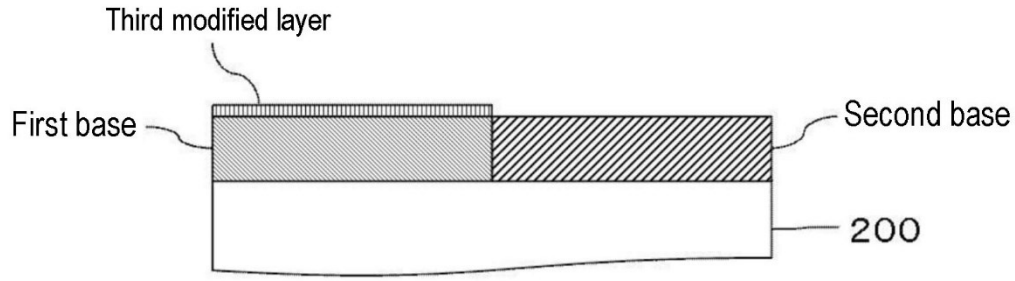


FIG. 8C

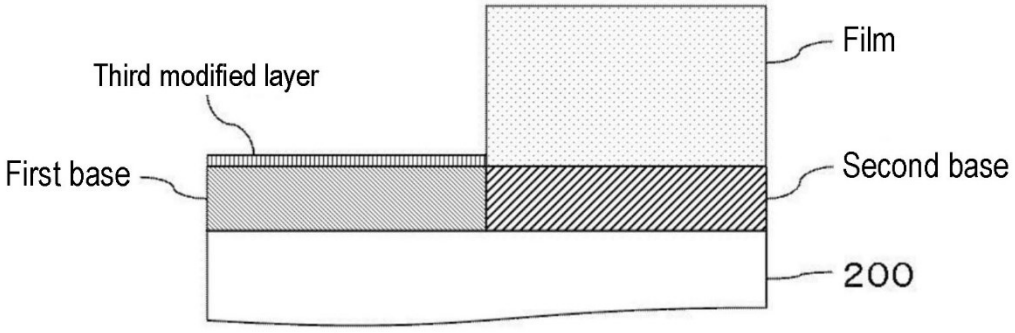


FIG. 8D

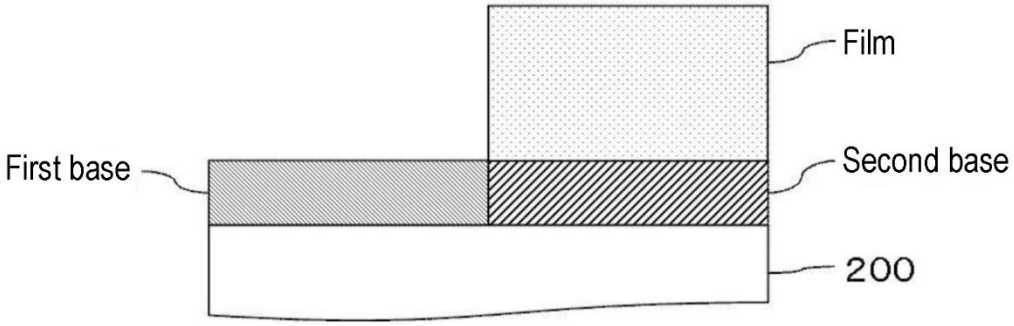
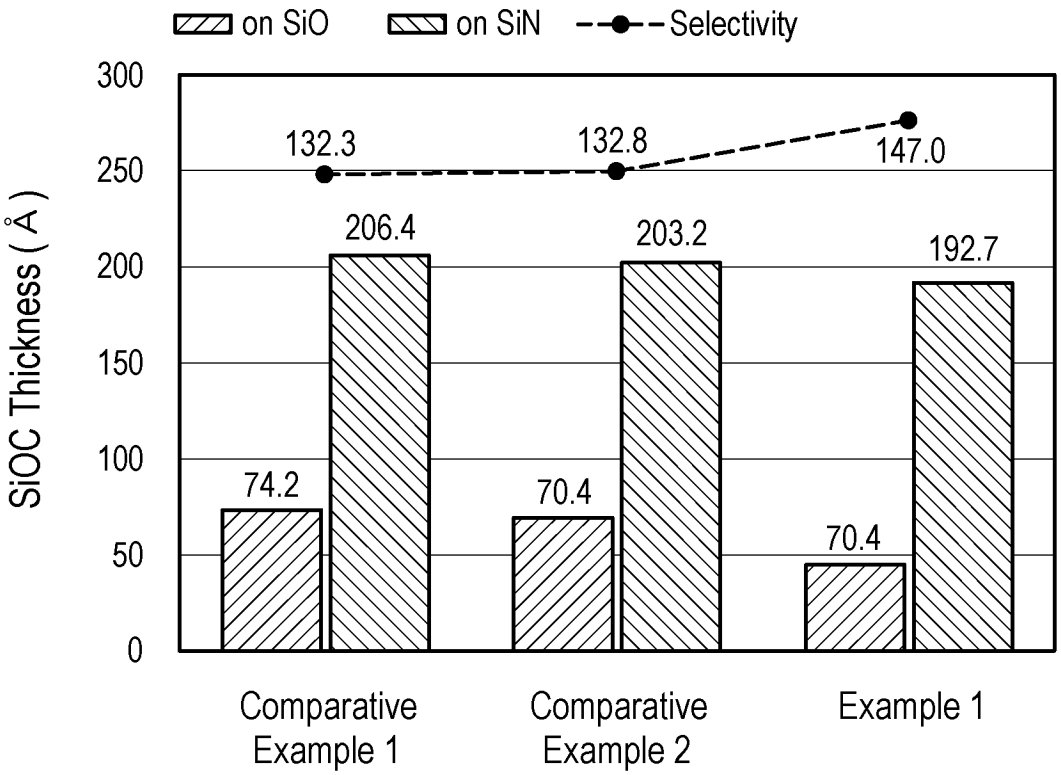

Film
First base
Second base
200

FIG. 9


on SiO
on SiN
Selectivity
SiOC Thickness (Å)
300
250
200
150
100
50
0
132.3
132.8
147.0
206.4
203.2
192.7
74.2
70.4
70.4
Comparative Example 1
Comparative Example 2
Example 1