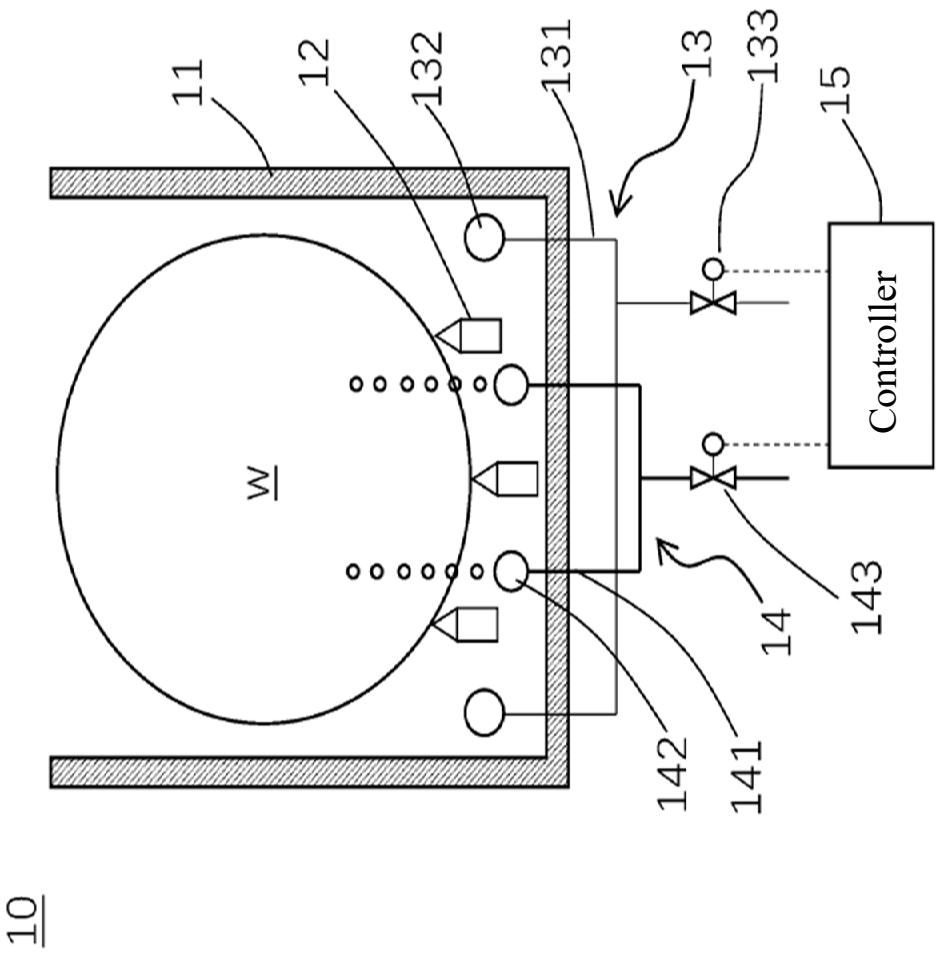


FIG. 1

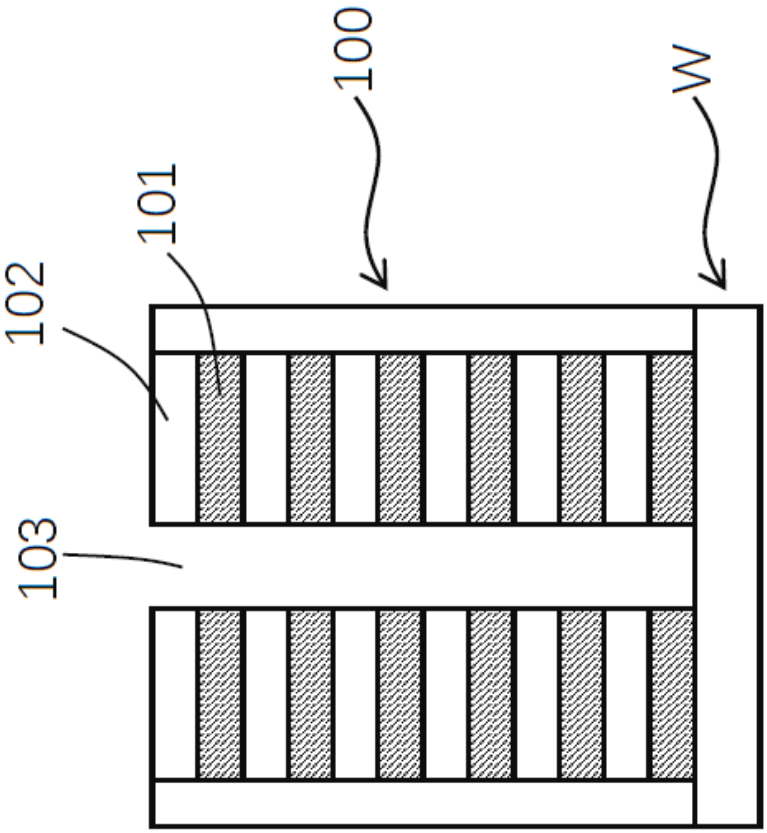


FIG. 2

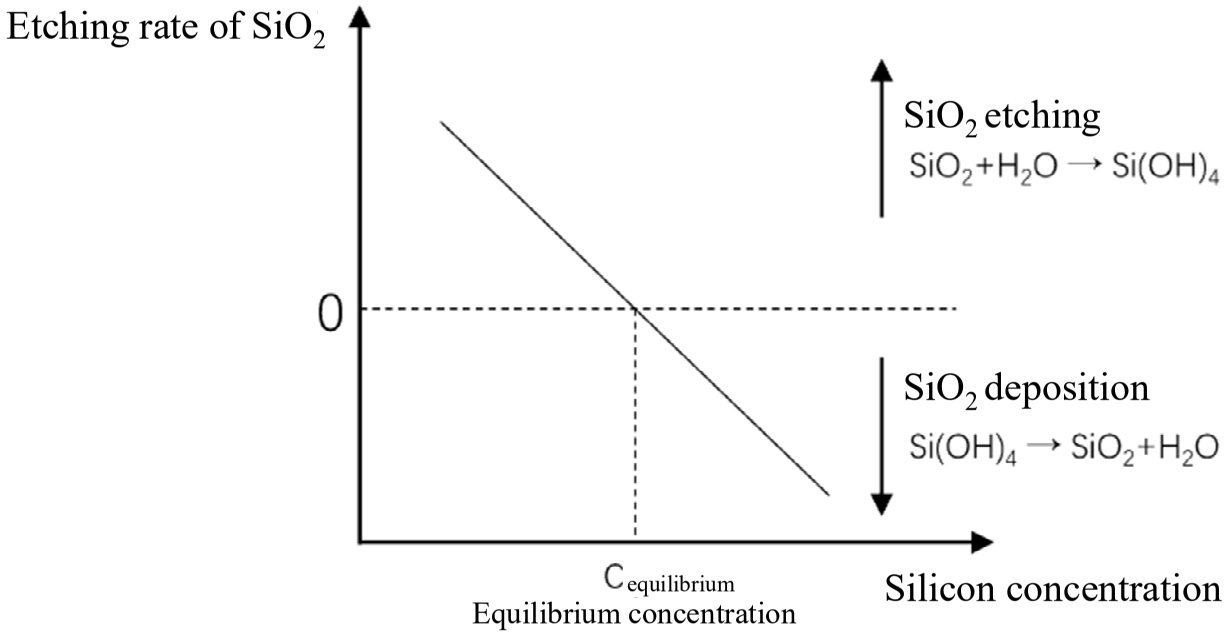

Etching rate of SiO_2
SiO_2 etching
$SiO_2+H_2O \rightarrow Si(OH)_4$
0
SiO_2 deposition
$Si(OH)_4 \rightarrow SiO_2+H_2O$
$C_{equilibrium}$
Equilibrium concentration
Silicon concentration

FIG. 3

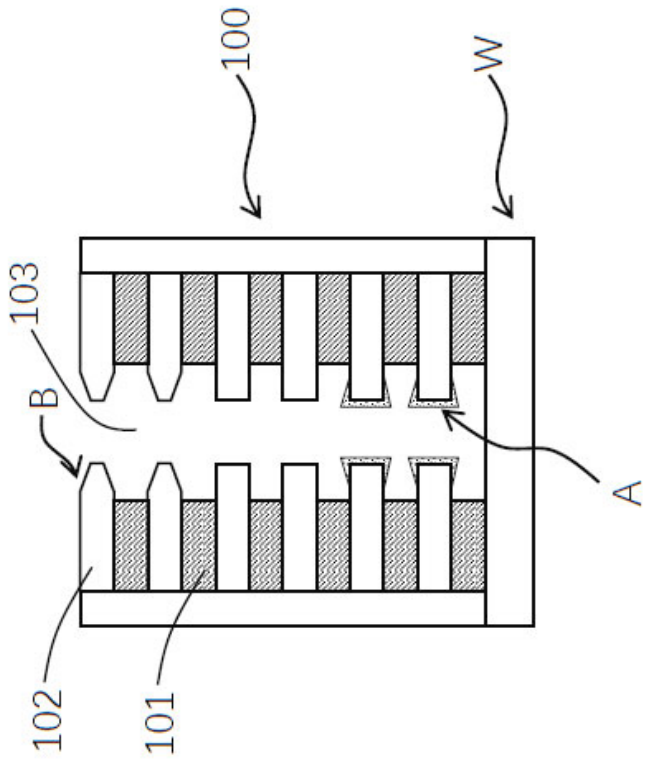


FIG. 4

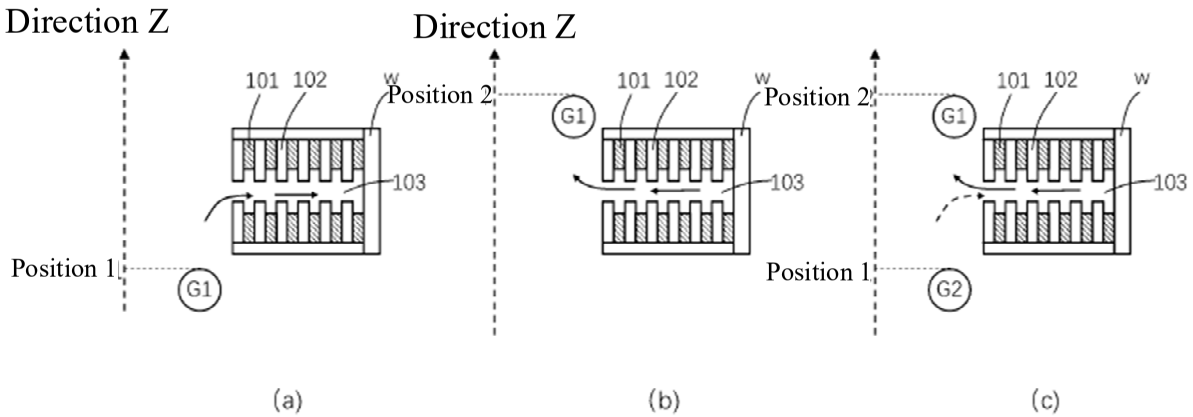

Direction Z
101
102
W
Position 2
103
Position 1
G1
(a)
Direction Z
101
102
W
G1
Position 2
103
(b)
101
102
W
Position 2
G1
103
Position 1
G2
(c)

FIG. 5

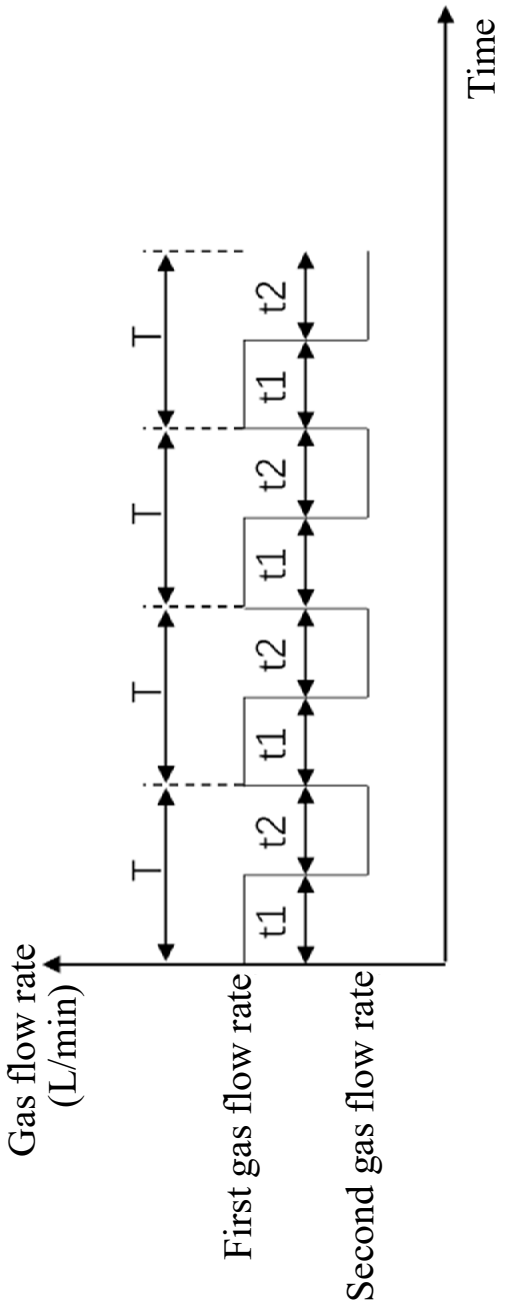

Gas flow rate
(L/min)
First gas flow rate
Second gas flow rate
Time
T
t1
t2

FIG. 6

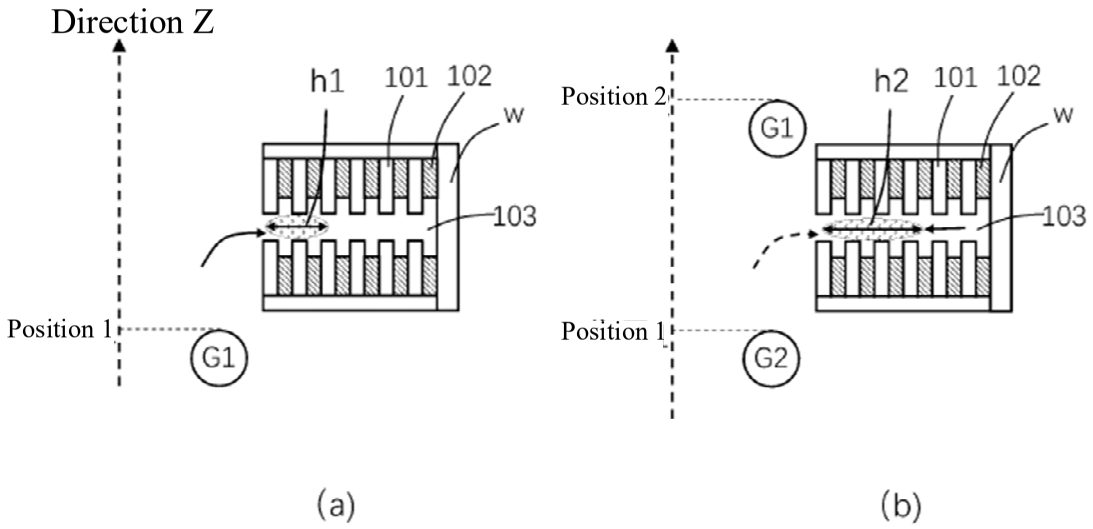

Direction Z
h1
101
102
w
103
Position 1
G1
(a)
Position 2
G1
h2
101
102
w
103
Position 1
G2
(b)

FIG. 7

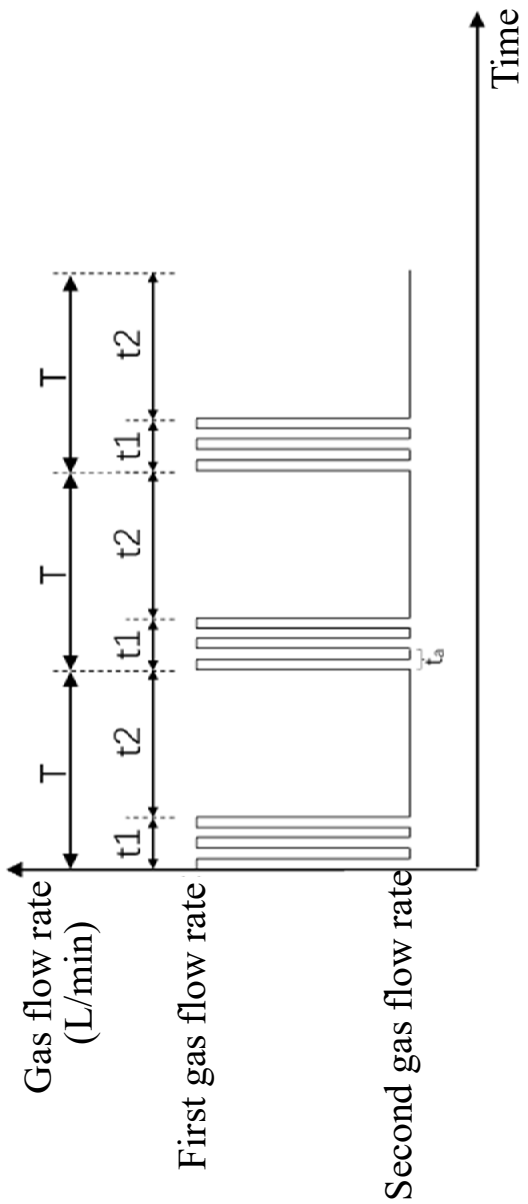

Gas flow rate
(L/min)
First gas flow rate
Second gas flow rate
Time
T
T
T
t1
t2
t1
t2
t1
t2
ts

FIG. 8

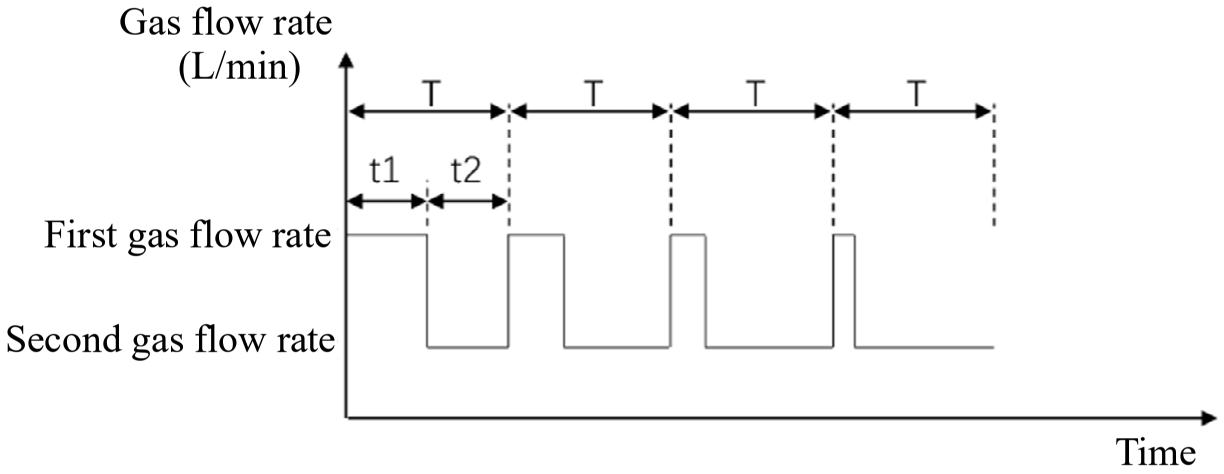

Gas flow rate
(L/min)
T
T
T
T
t1
t2
First gas flow rate
Second gas flow rate
Time

FIG. 9