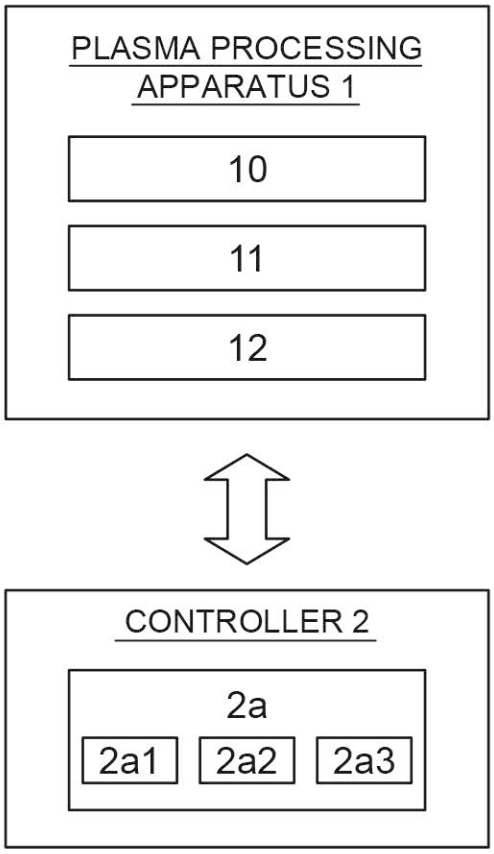
Fig.1


PLASMA PROCESSING APPARATUS 1
10
11
12
CONTROLLER 2
2a
2a1
2a2
2a3

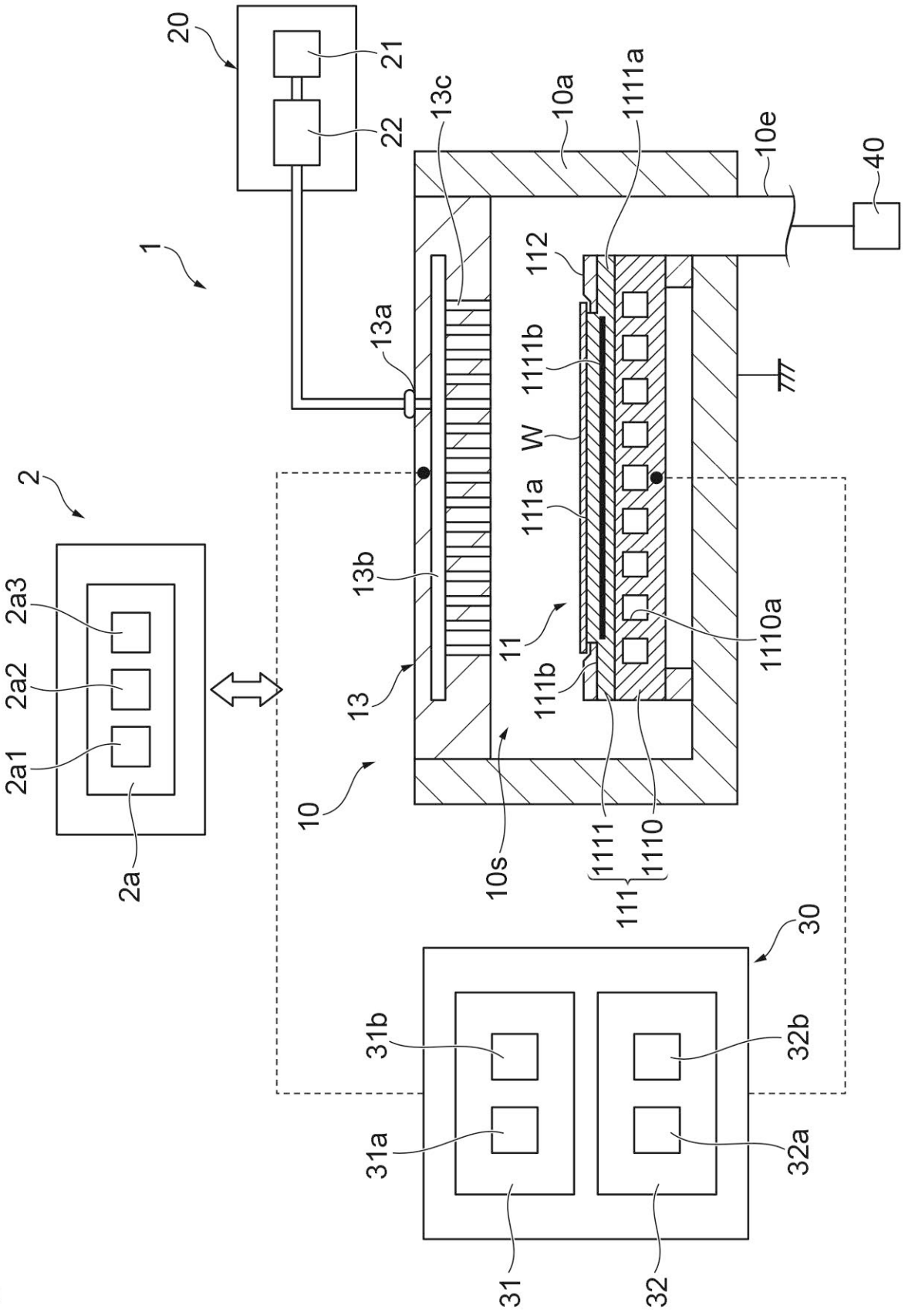

20
21
22
13c
10a
1111a
10e
40
1
112
13a
1111b
W
111a
13b
11
1110a
13
111b
10
10s
1111
1110
111
30
31b
32b
31a
32a
31
32
2
2a3
2a2
2a1
2a

Fig.2

Fig.3

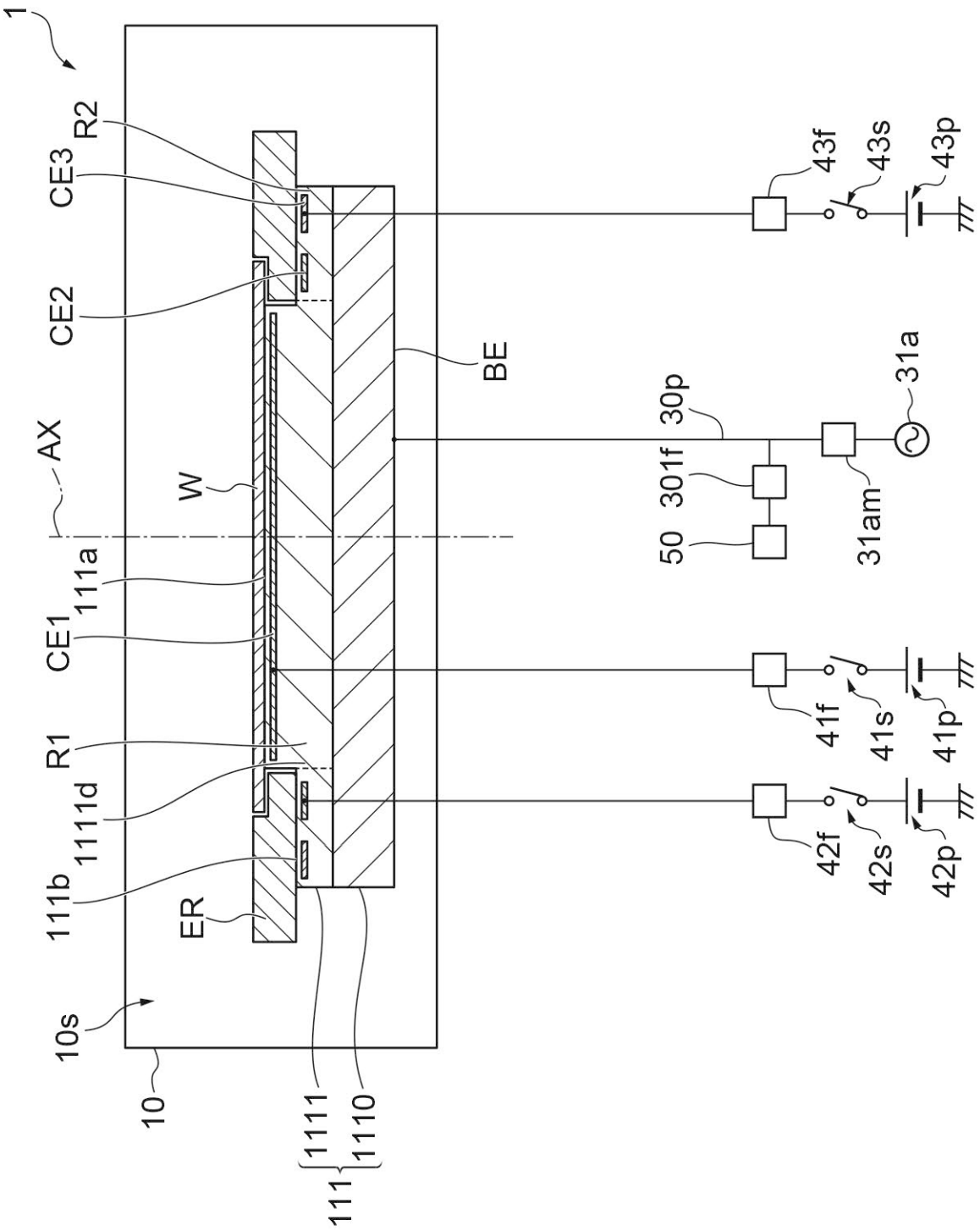

1
R2
CE3
CE2
AX
W
CE1
111a
R1
1111d
111b
ER
10s
10
1111
1110
111
BE
30p
301f
50
31a
31am
43f
43s
43p
41f
41s
41p
42f
42s
42p

Fig.4

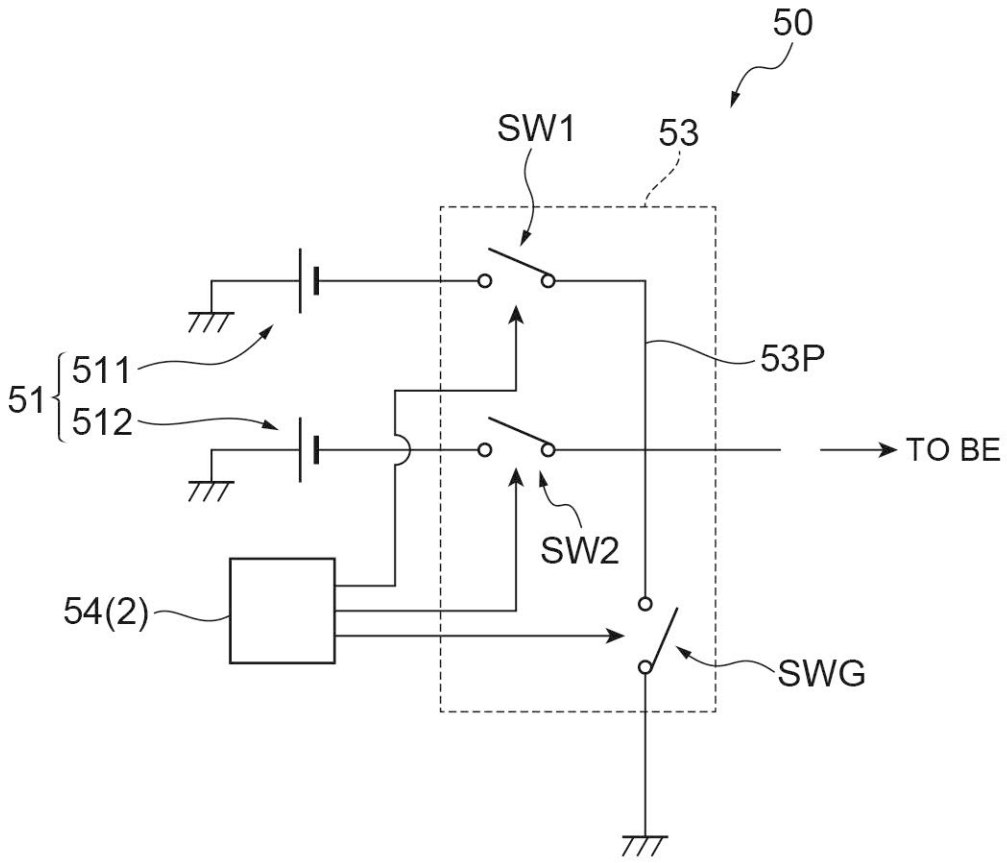


Fig.5

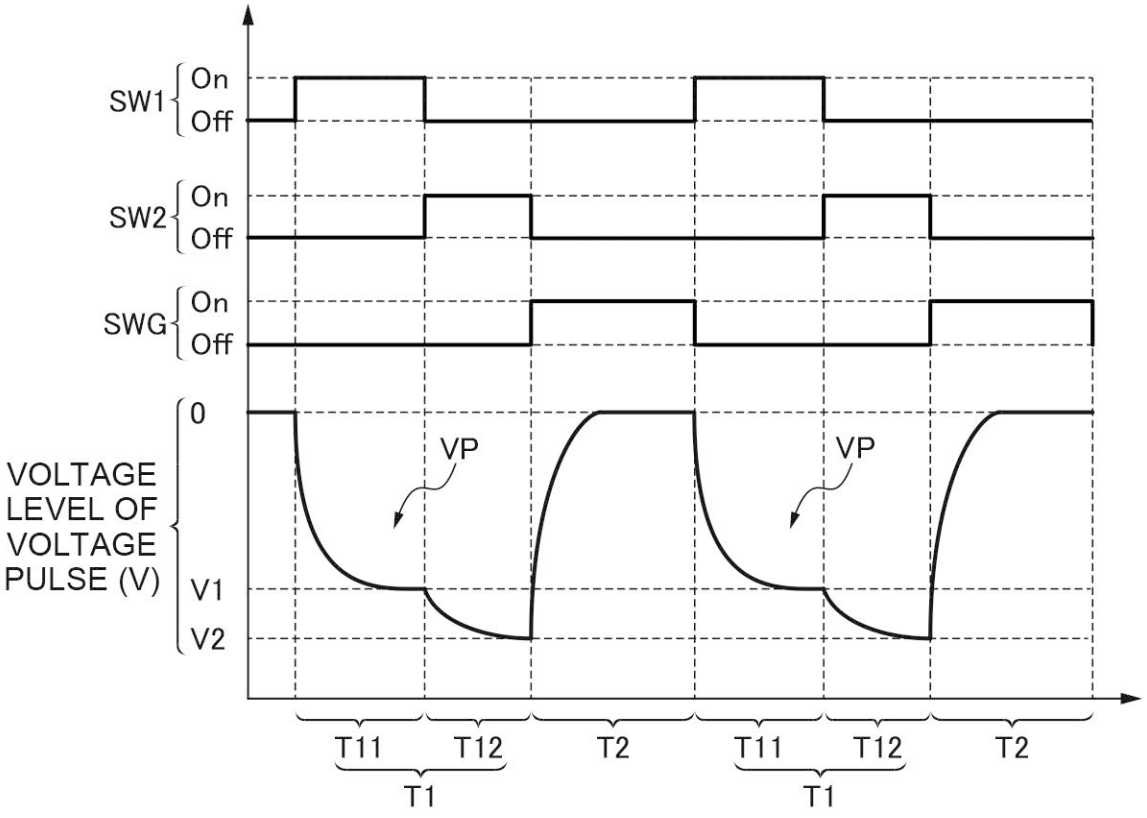
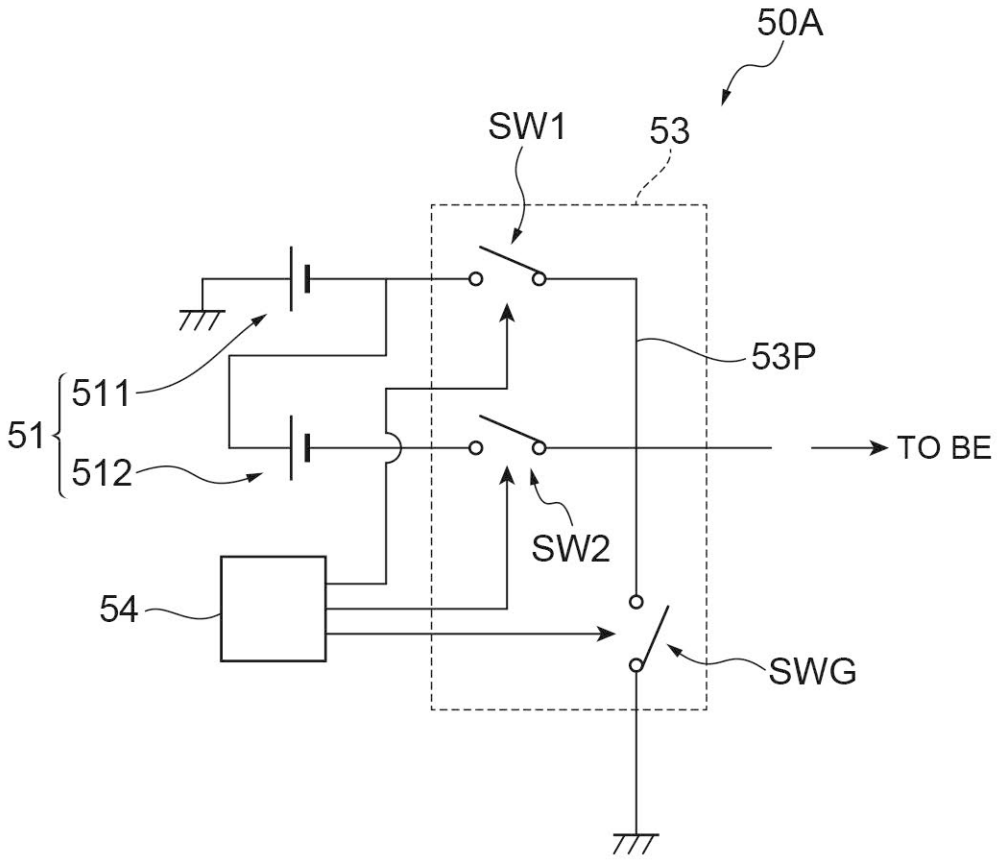

SW1
On
Off
SW2
On
Off
SWG
On
Off
0
VOLTAGE LEVEL OF VOLTAGE PULSE (V)
V1
V2
VP
VP
T11
T12
T2
T11
T12
T2
T1
T1

Fig.6



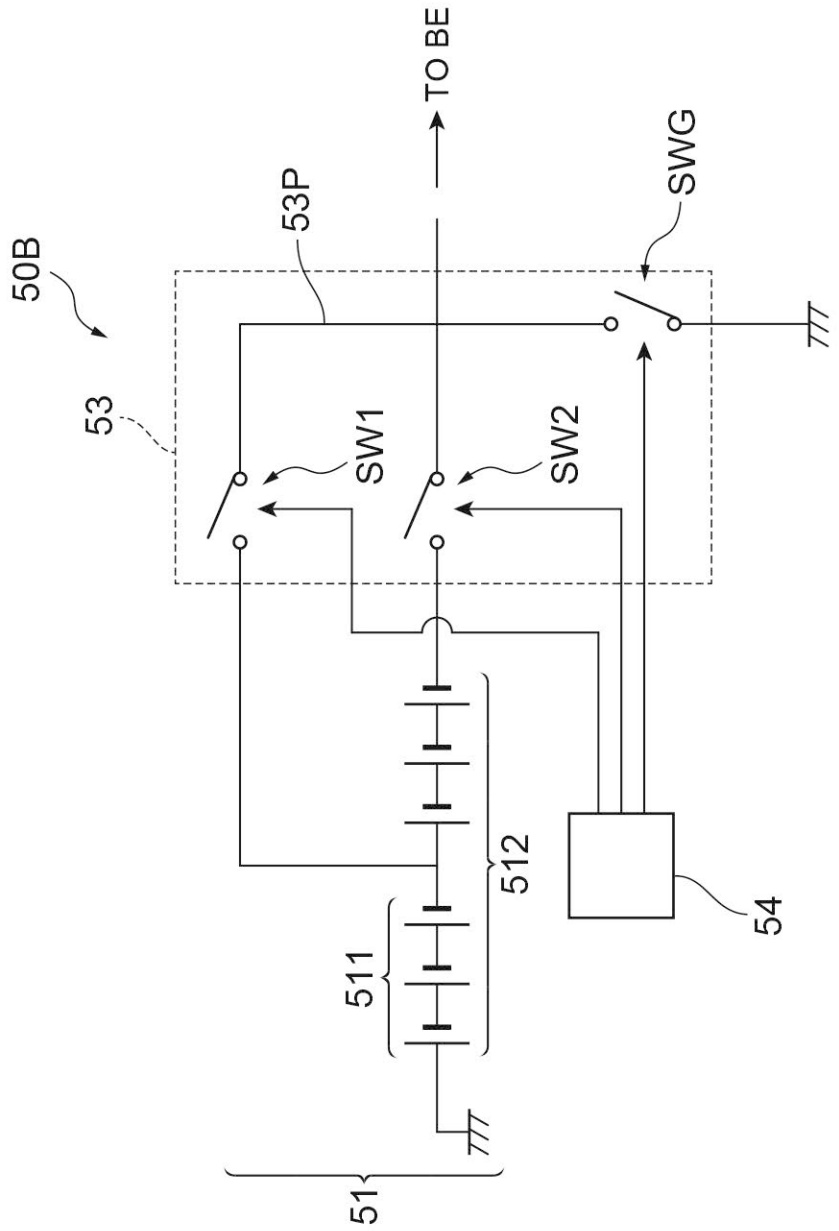


Fig.7

Fig.8

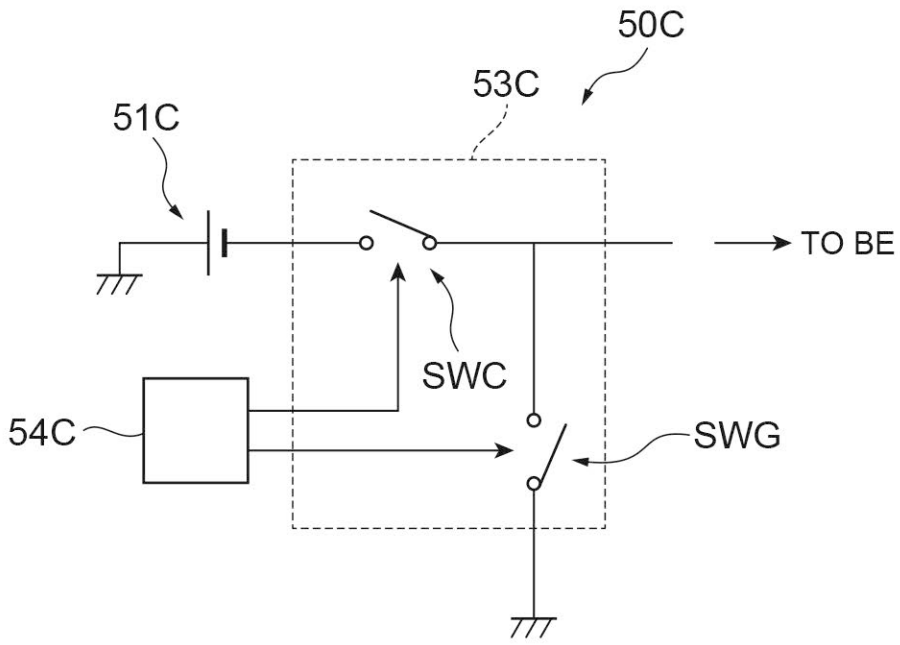


Fig.9

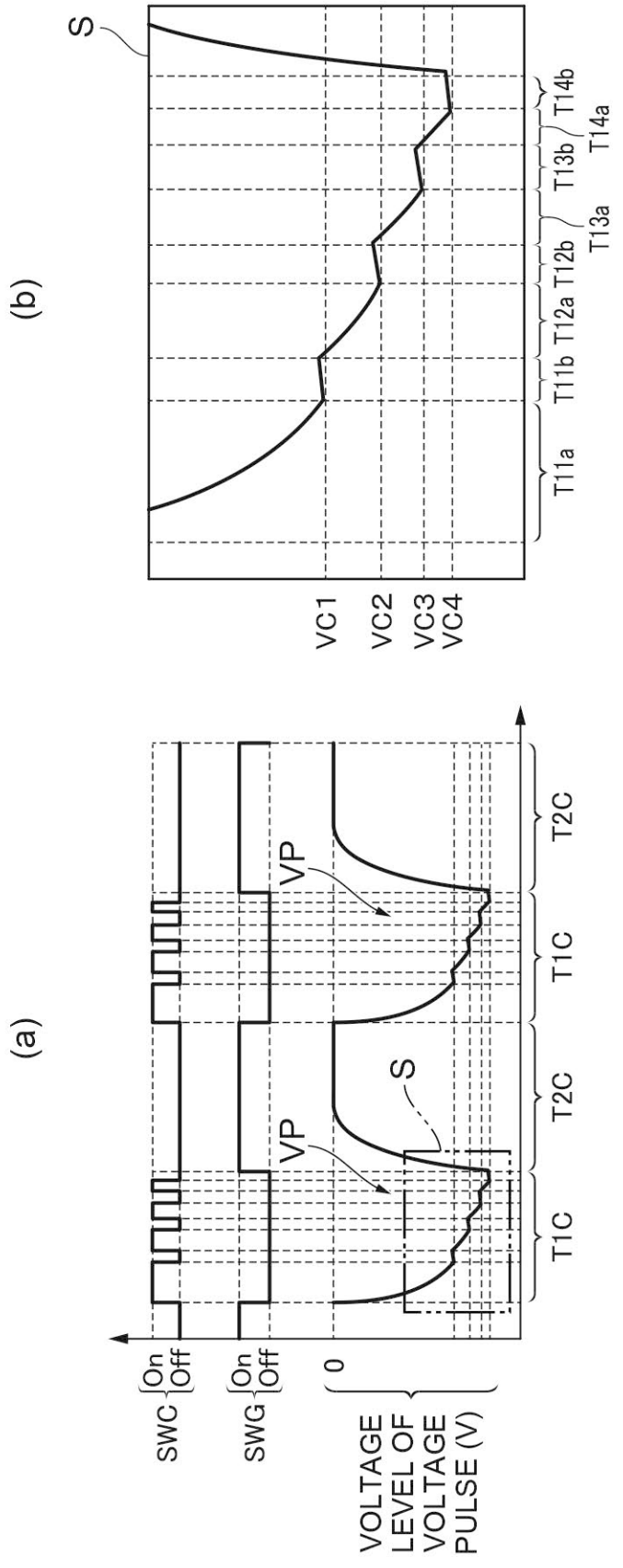
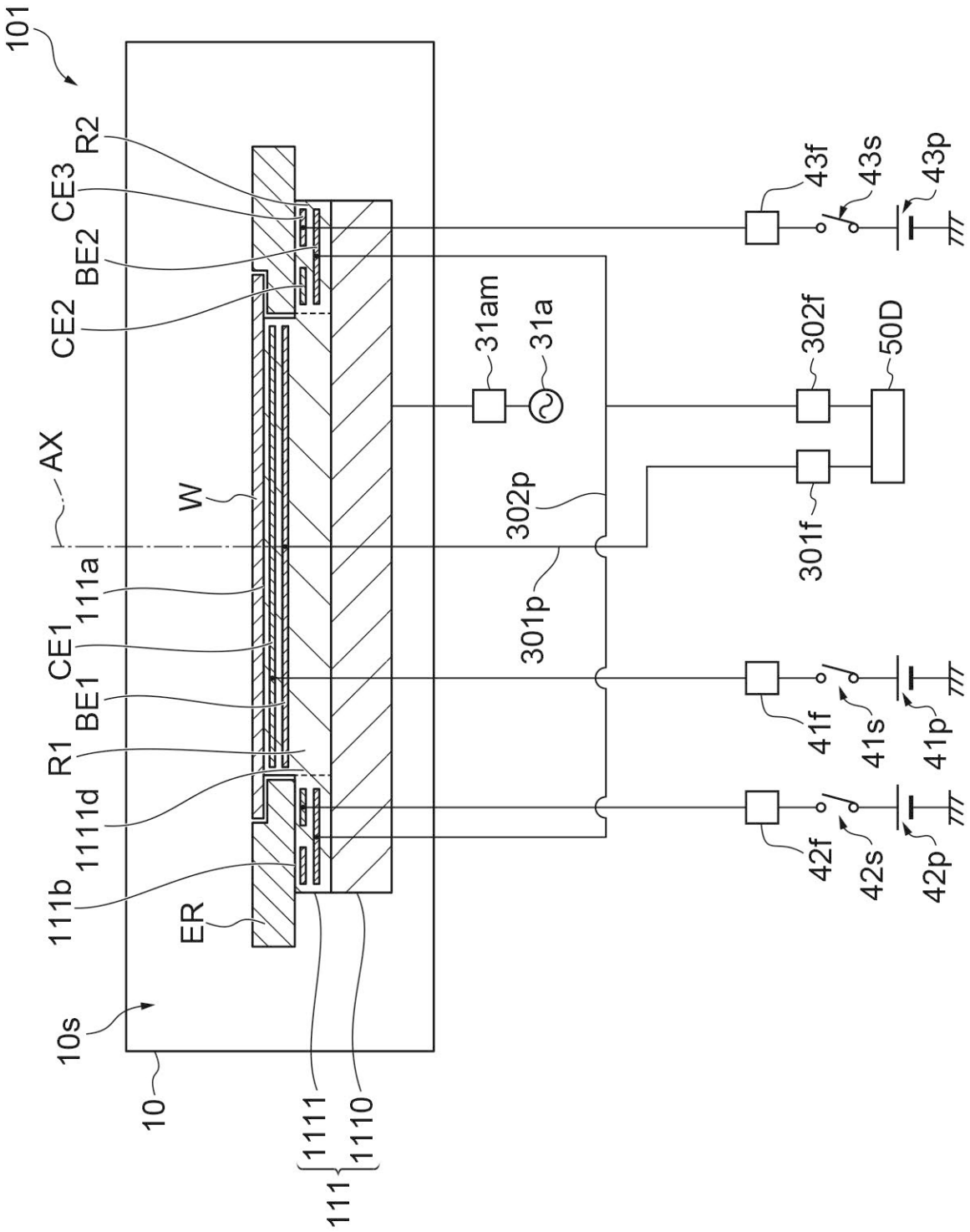

(a)
SWC
On
Off
SWG
On
Off
VOLTAGE LEVEL OF VOLTAGE PULSE (V)
0
VP
VP
S
T1C
T2C
T1C
T2C
(b)
S
VC1
VC2
VC3
VC4
T11a
T11b
T12a
T12b
T13a
T13b
T14a
T14b

Fig.10


101
R2
CE3
BE2
CE2
AX
W
111a
CE1
BE1
R1
1111d
111b
ER
10s
10
1111
1110
111
31am
31a
302p
301p
43f
43s
43p
302f
50D
301f
41f
41s
41p
42f
42s
42p

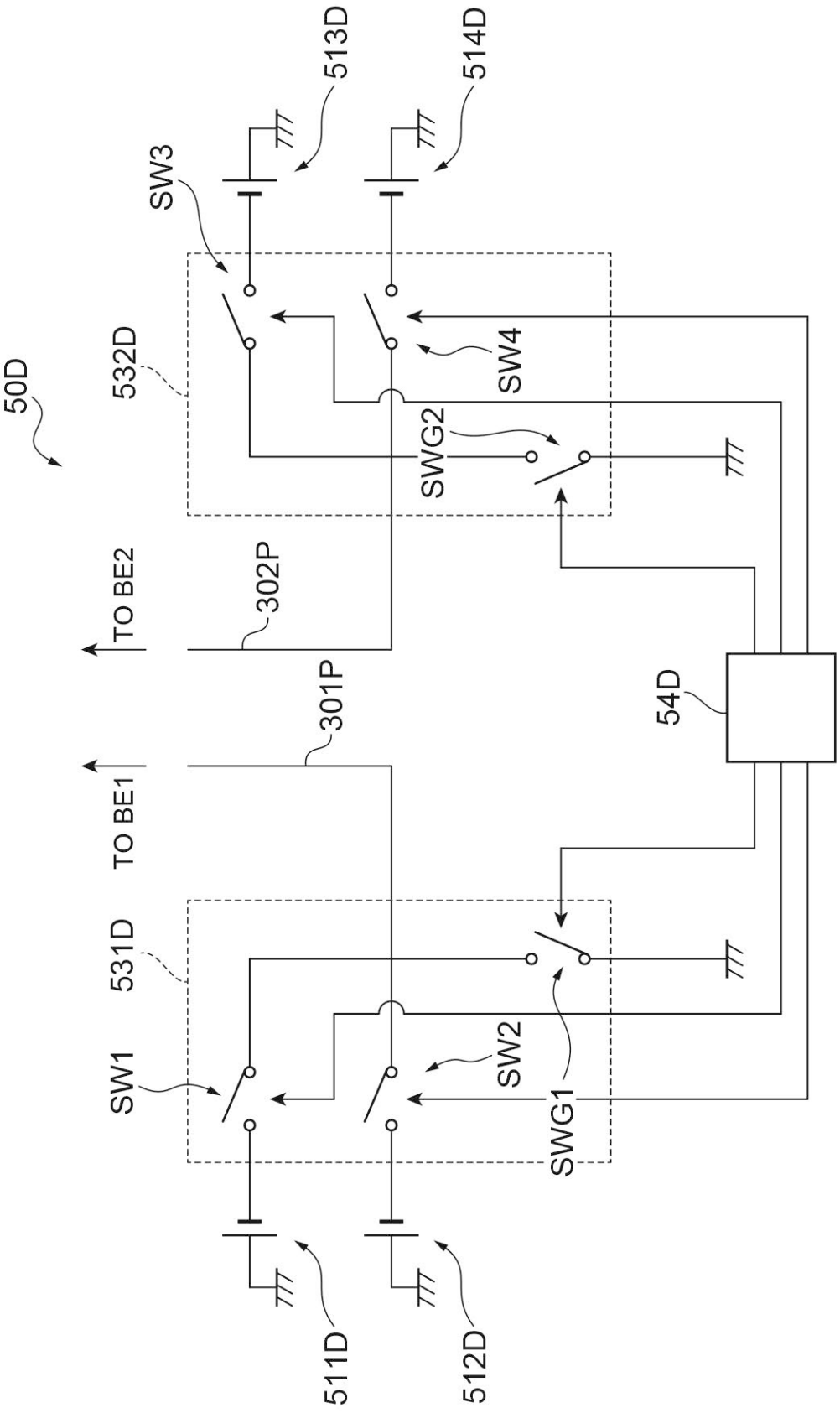
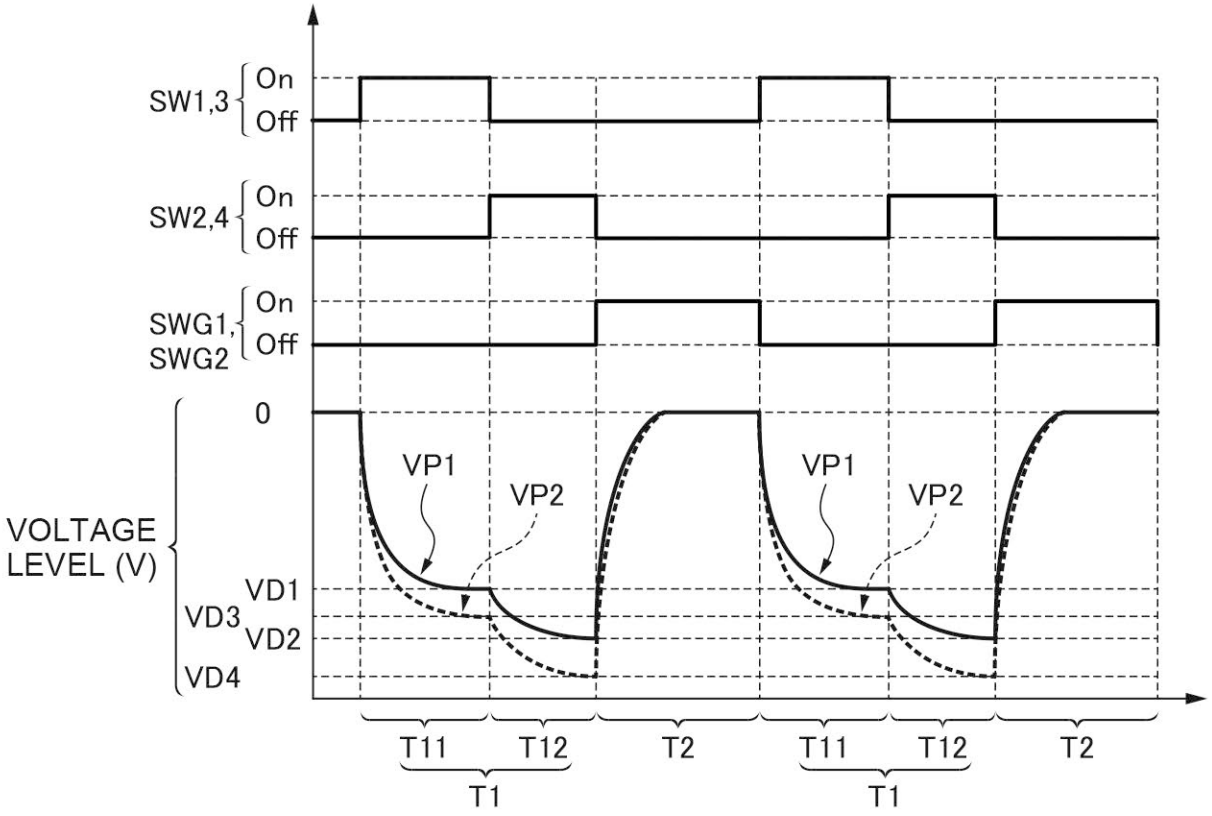

50D
532D
513D
514D
SW3
SW4
SWG2
TO BE2
302P
301P
TO BE1
54D
531D
SW1
SW2
SWG1
511D
512D

Fig.11

Fig.12


SW1,3
On
Off
SW2,4
On
Off
SWG1,
SWG2
On
Off
VOLTAGE
LEVEL (V)
0
VP1
VP2
VP1
VP2
VD1
VD3
VD2
VD4
T11
T12
T2
T11
T12
T2
T1
T1

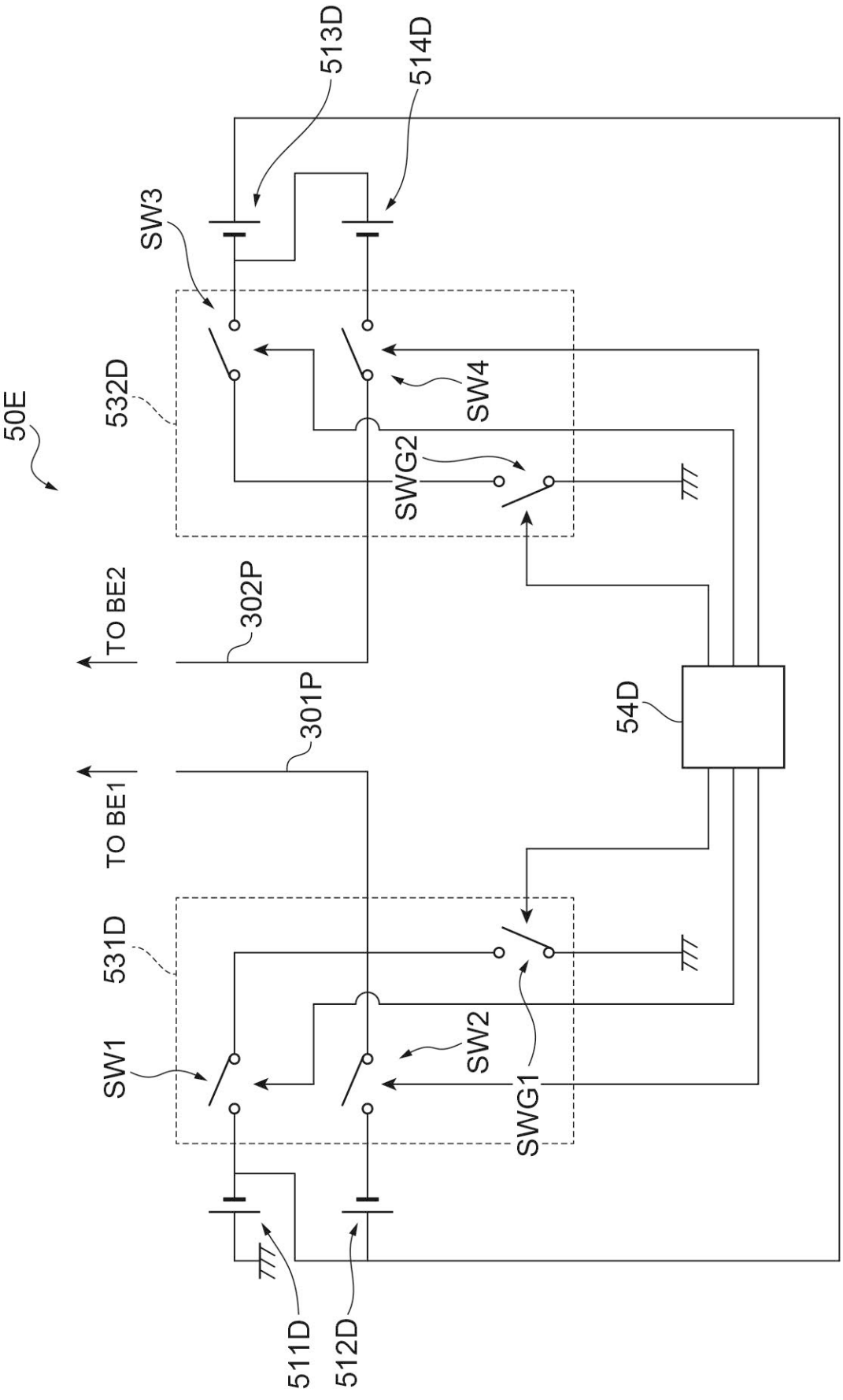

513D
514D
SW3
532D
50E
SW4
SWG2
TO BE2
302P
301P
54D
TO BE1
531D
SW1
SW2
SWG1
511D
512D

Fig.13

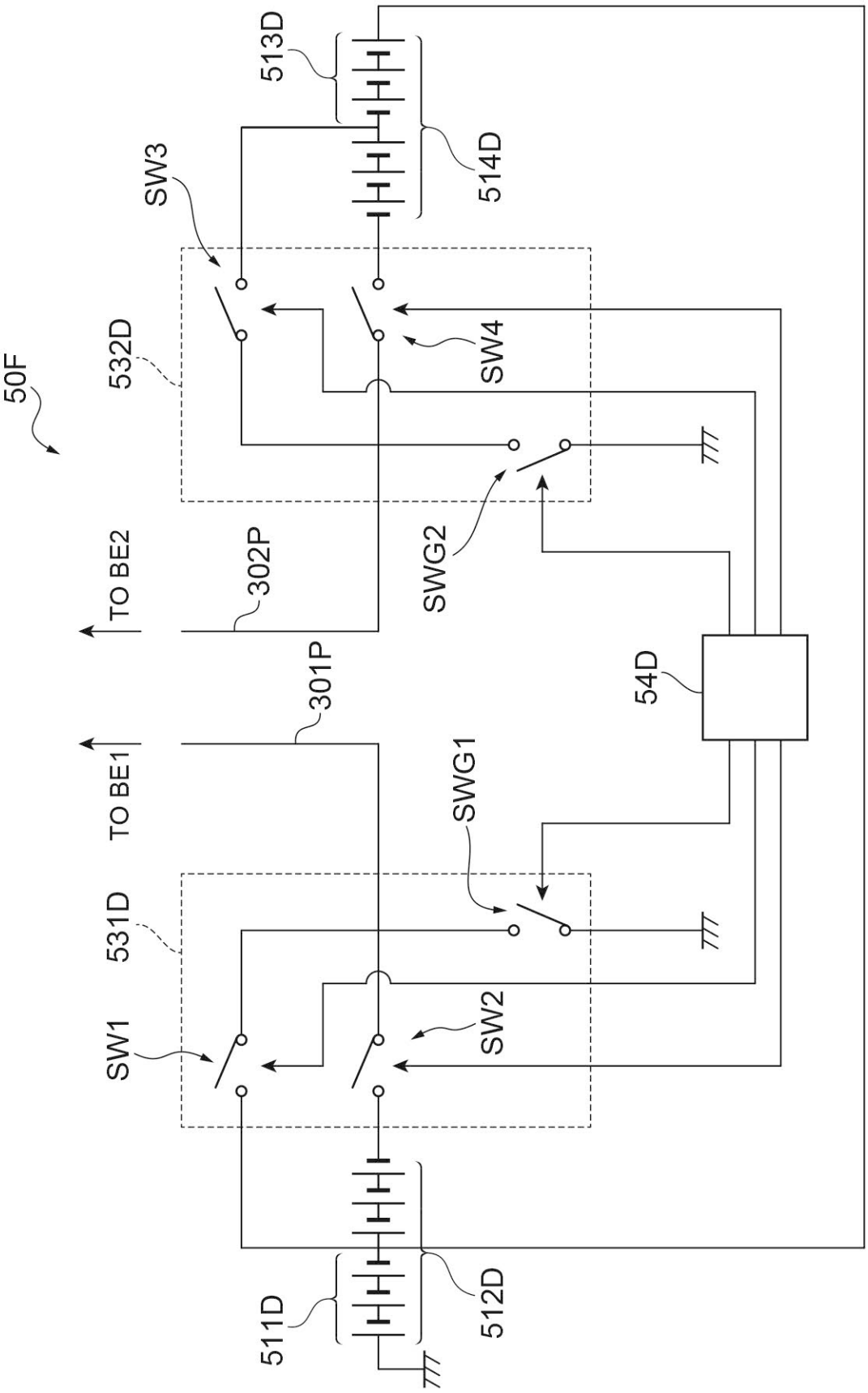

50F
513D
514D
SW3
SW4
532D
SWG2
TO BE2
302P
301P
54D
TO BE1
SWG1
531D
SW1
SW2
511D
512D

Fig.14

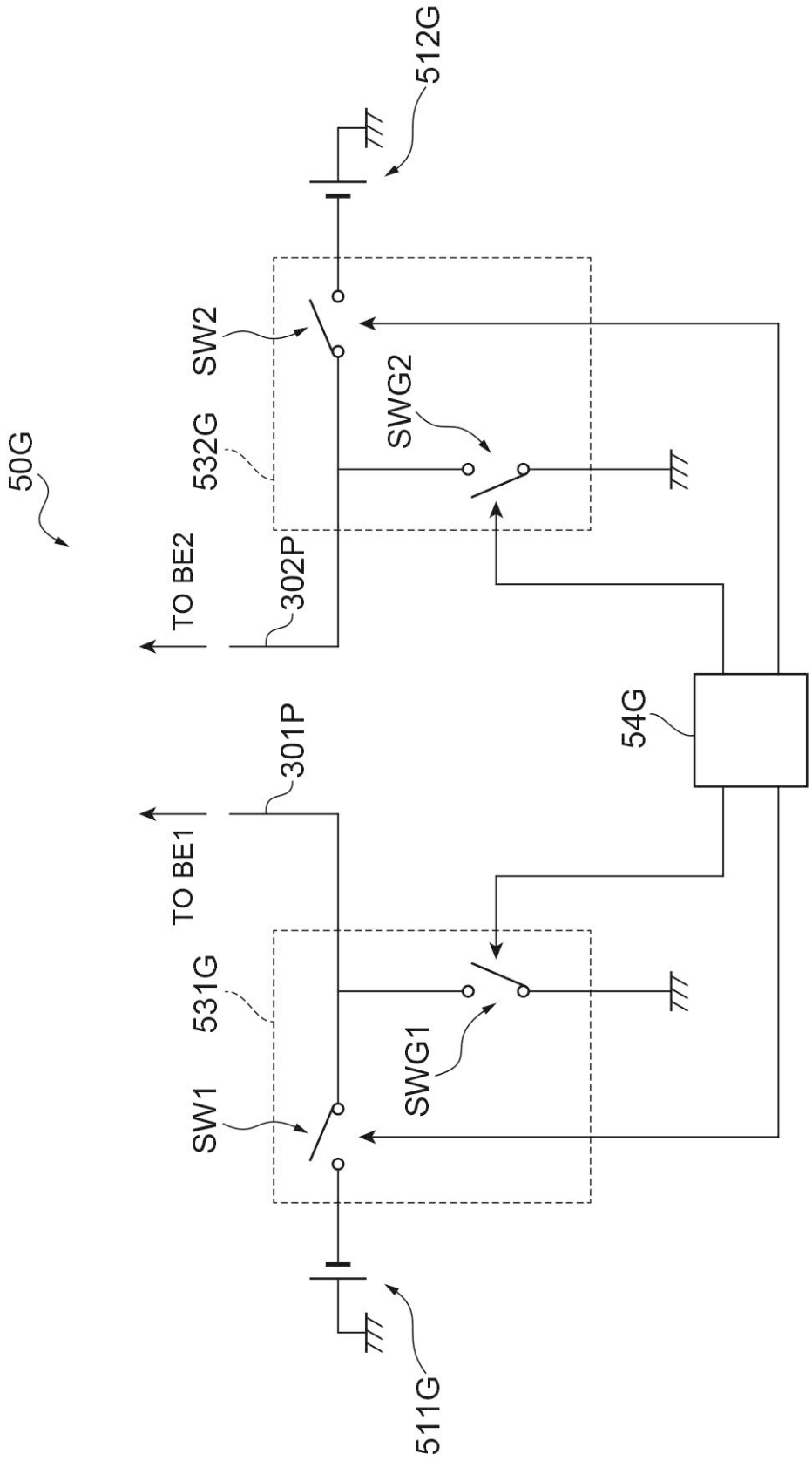
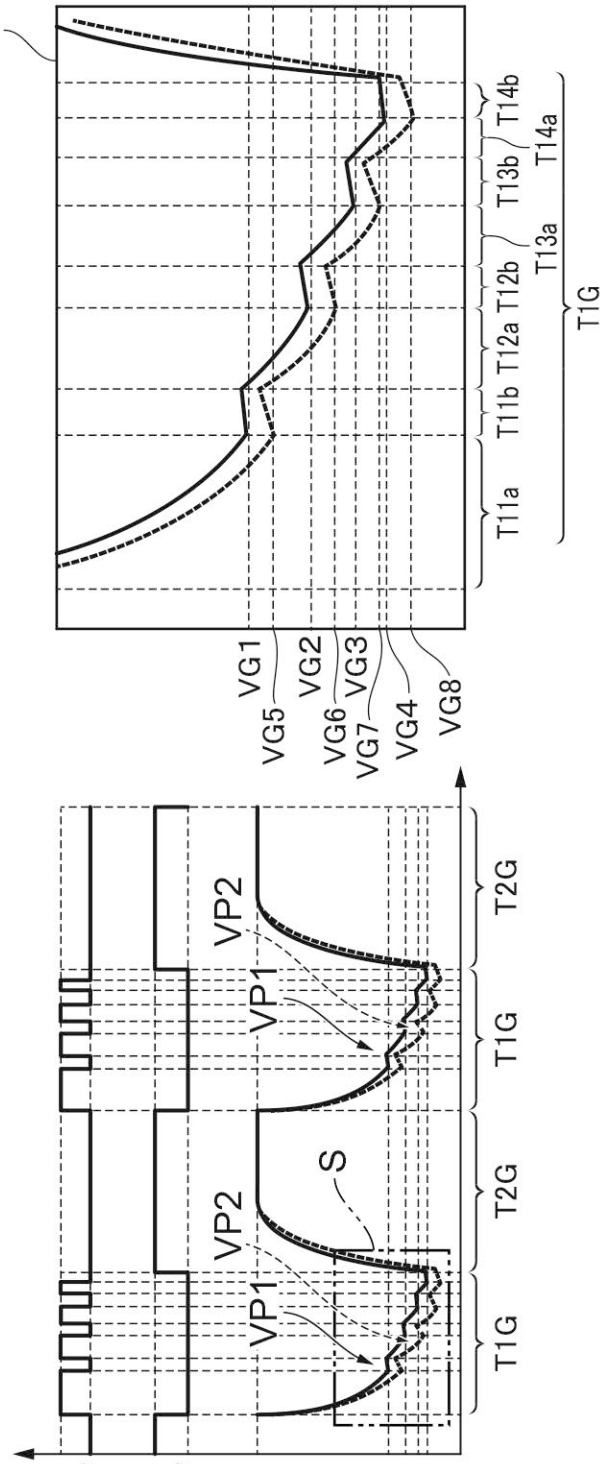

50G
512G
SW2
SWG2
532G
TO BE2
302P
54G
301P
TO BE1
531G
SWG1
SW1
511G

Fig.15

Fig.16


(a)
(b)
SW1,2
On
Off
SWG1,
SWG2
On
Off
0
VOLTAGE
LEVEL (V)
VP1
VP2
VP1
VP2
S
T1G
T2G
T1G
T2G
T1G
S
VG1
VG5
VG2
VG6
VG3
VG7
VG4
VG8
T11a
T11b
T12a
T12b
T13a
T13b
T14a
T14b
T1G

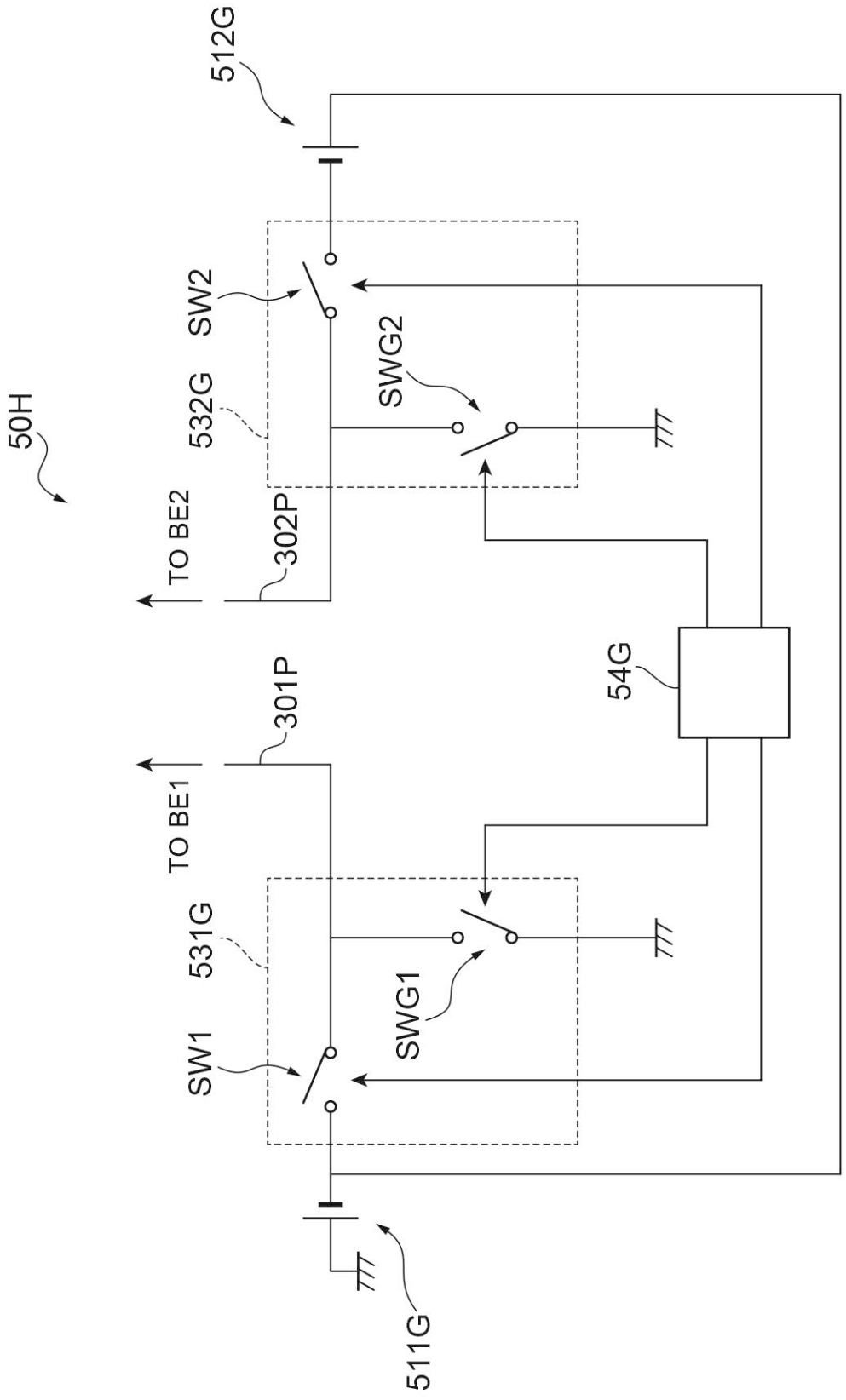

50H
512G
SW2
SWG2
532G
TO BE2
302P
301P
54G
TO BE1
531G
SW1
SWG1
511G

Fig.17

Fig.18

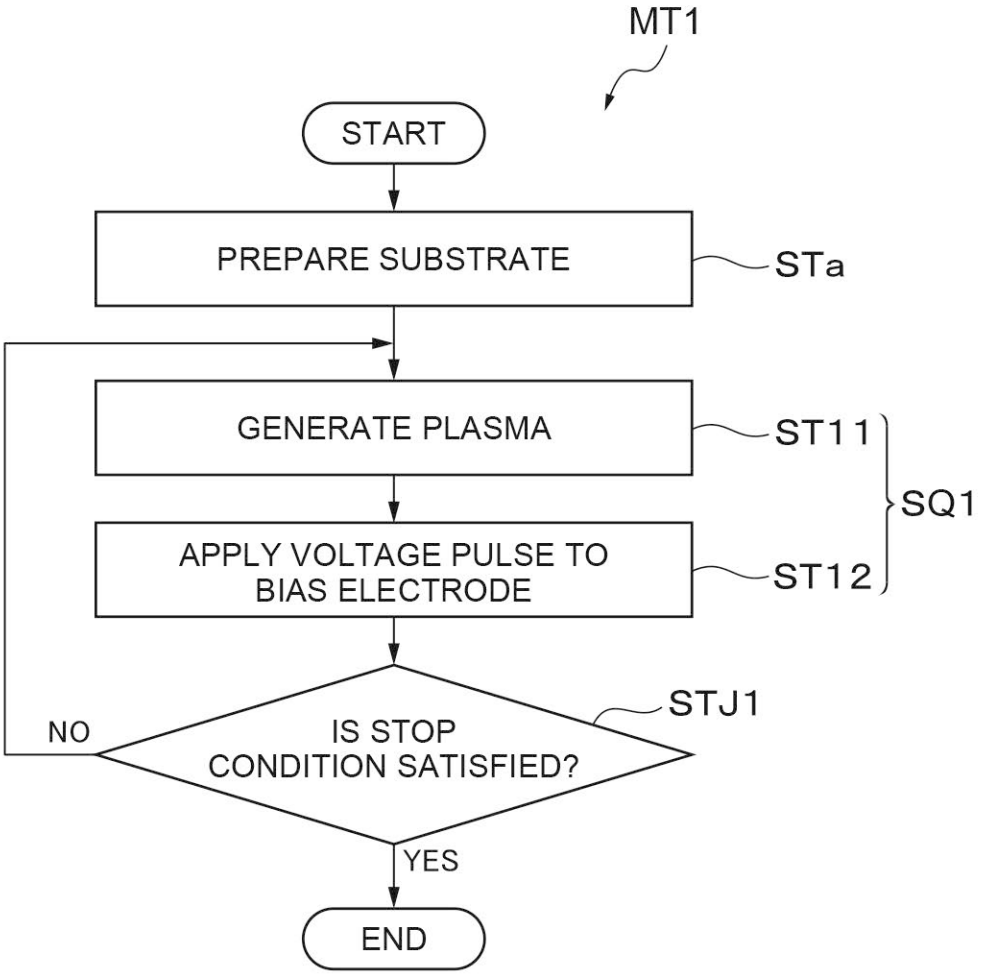
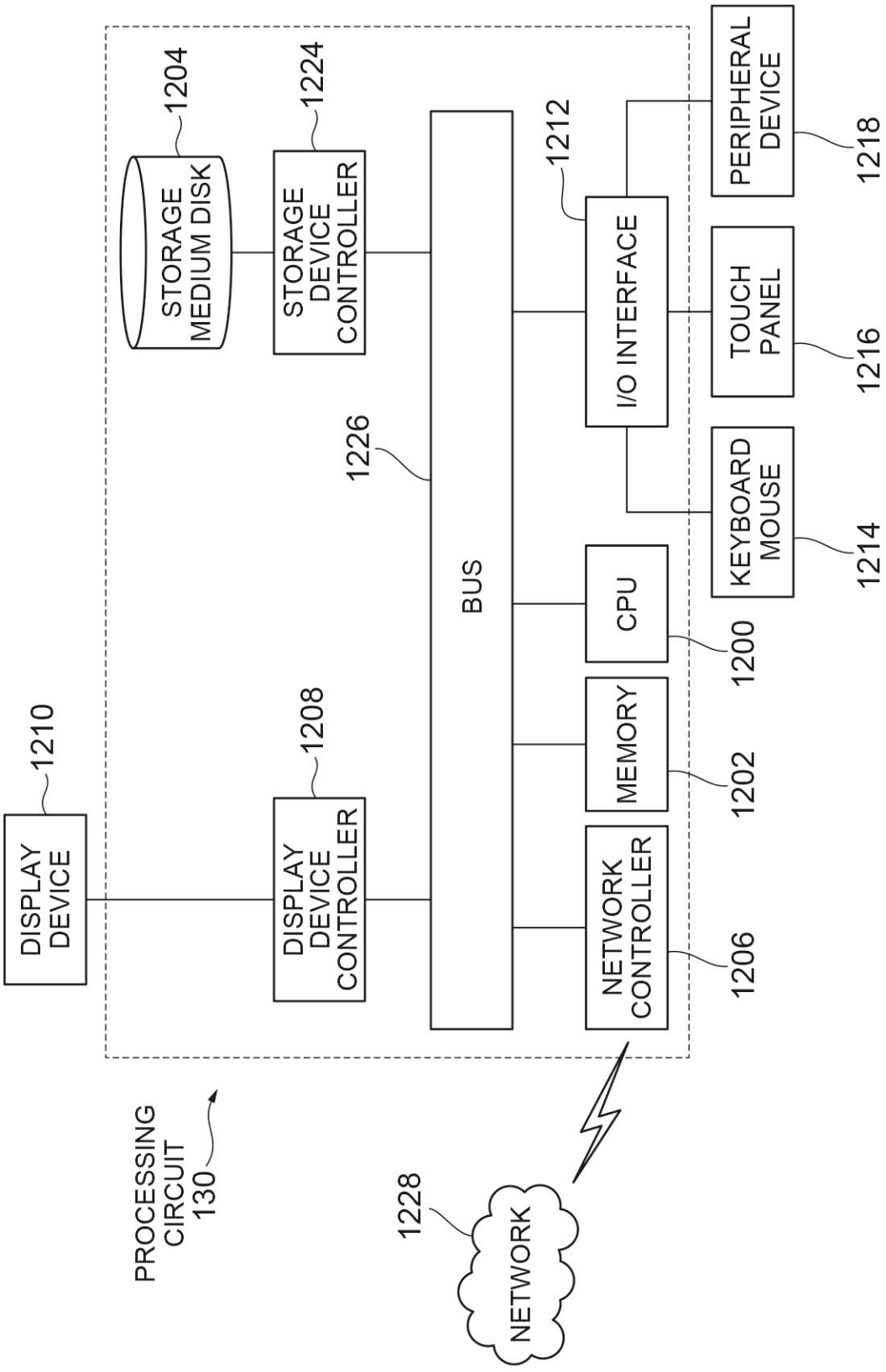

MT1
START
PREPARE SUBSTRATE
STa
GENERATE PLASMA
ST11
APPLY VOLTAGE PULSE TO BIAS ELECTRODE
ST12
SQ1
STJ1
IS STOP CONDITION SATISFIED?
NO
YES
END

Fig.19


PROCESSING CIRCUIT 130
DISPLAY DEVICE
1210
DISPLAY DEVICE CONTROLLER
1208
STORAGE MEDIUM DISK
1204
STORAGE DEVICE CONTROLLER
1224
1226
BUS
1212
I/O INTERFACE
PERIPHERAL DEVICE
1218
TOUCH PANEL
1216
KEYBOARD MOUSE
1214
CPU
1200
MEMORY
1202
NETWORK CONTROLLER
1206
NETWORK
1228