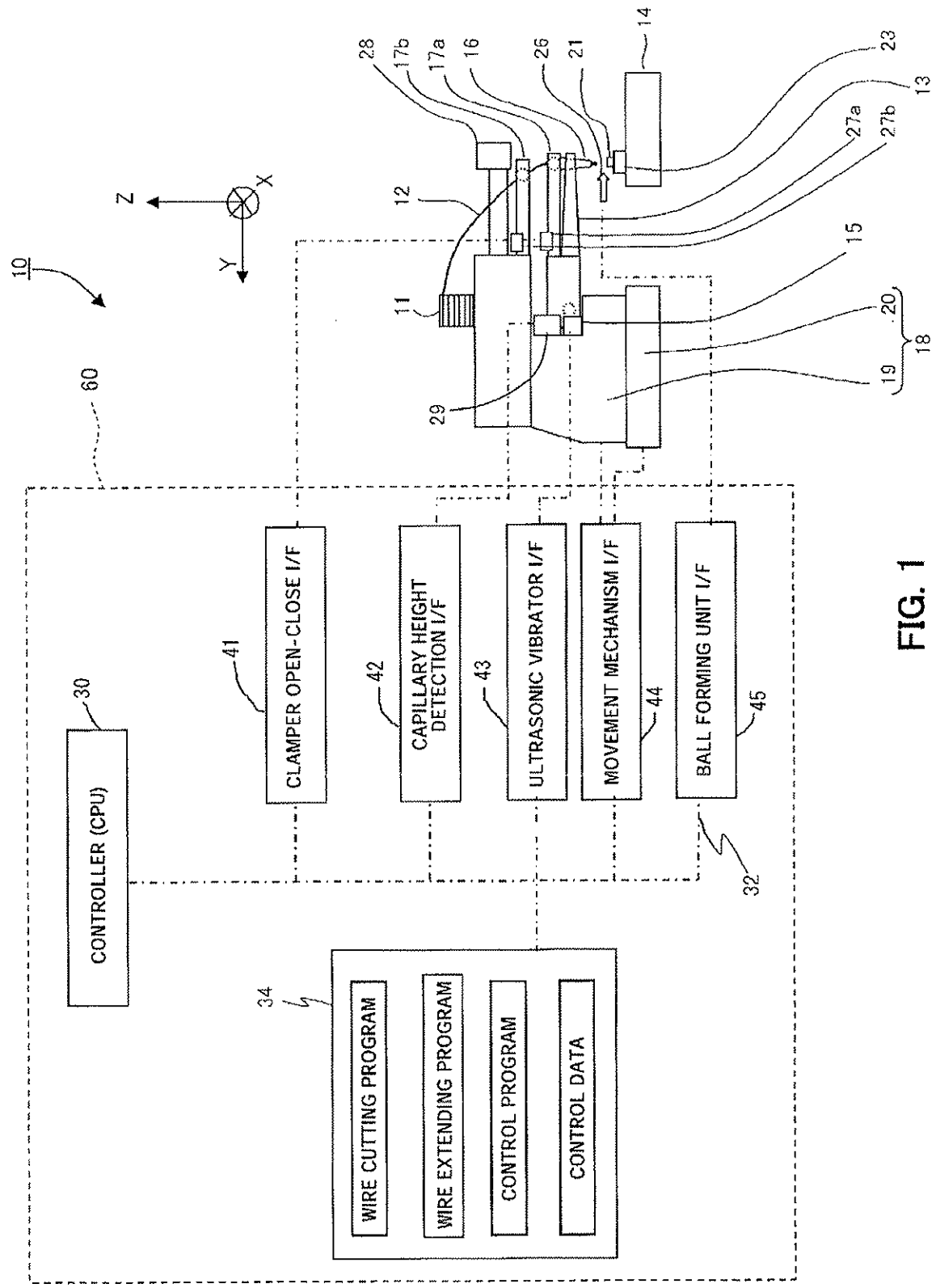

10
60
Z
X
Y
11
12
13
14
15
16
17a
17b
18
19
20
21
23
26
27a
27b
28
29
CONTROLLER (CPU)
30
CLAMPER OPEN-CLOSE I/F
41
CAPILLARY HEIGHT DETECTION I/F
42
ULTRASONIC VIBRATOR I/F
43
MOVEMENT MECHANISM I/F
44
BALL FORMING UNIT I/F
45
32
34
WIRE CUTTING PROGRAM
WIRE EXTENDING PROGRAM
CONTROL PROGRAM
CONTROL DATA

FIG. 1

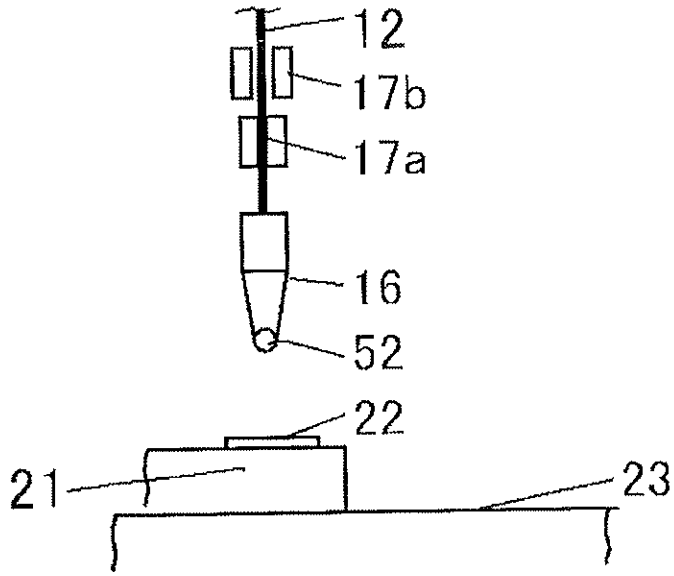


FIG. 2A

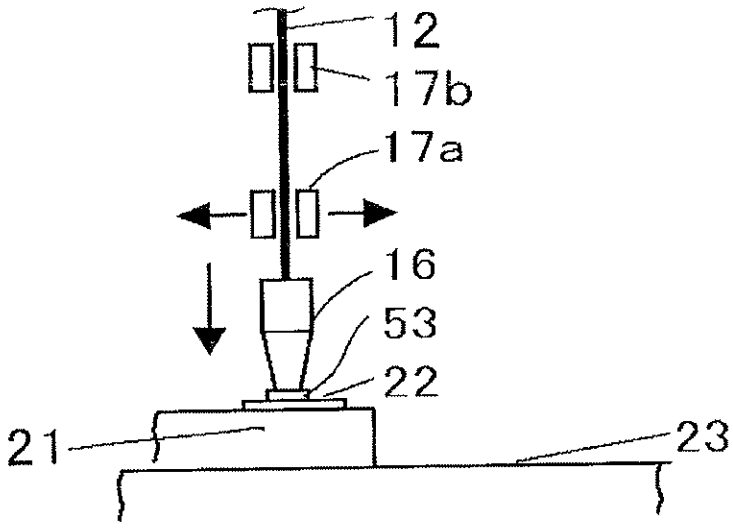


FIG. 2B

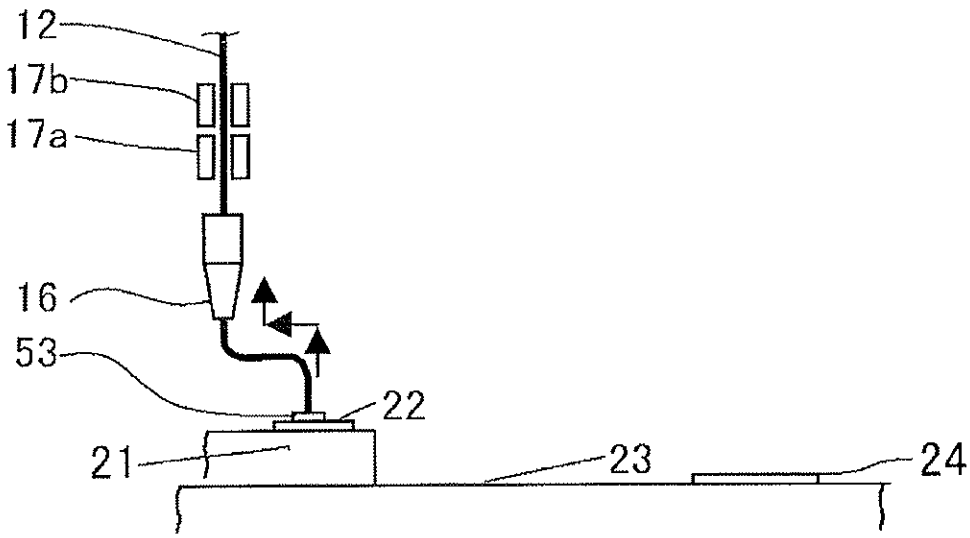


FIG. 2C

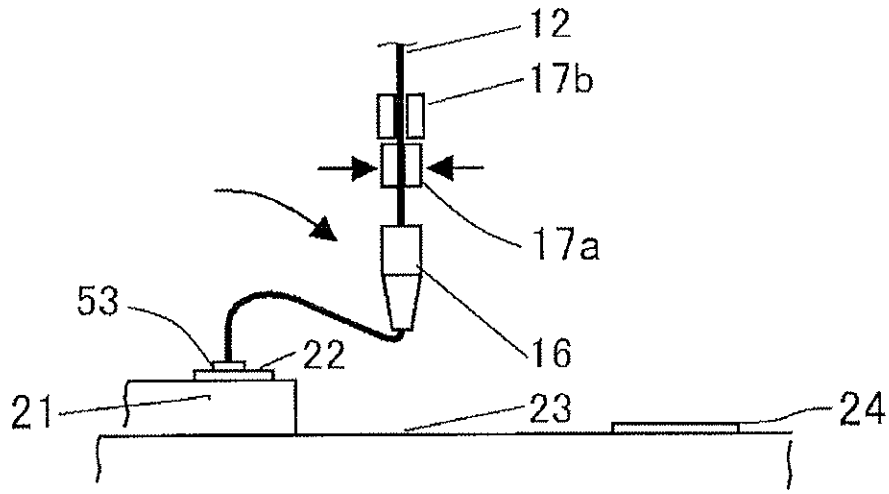


FIG. 2D

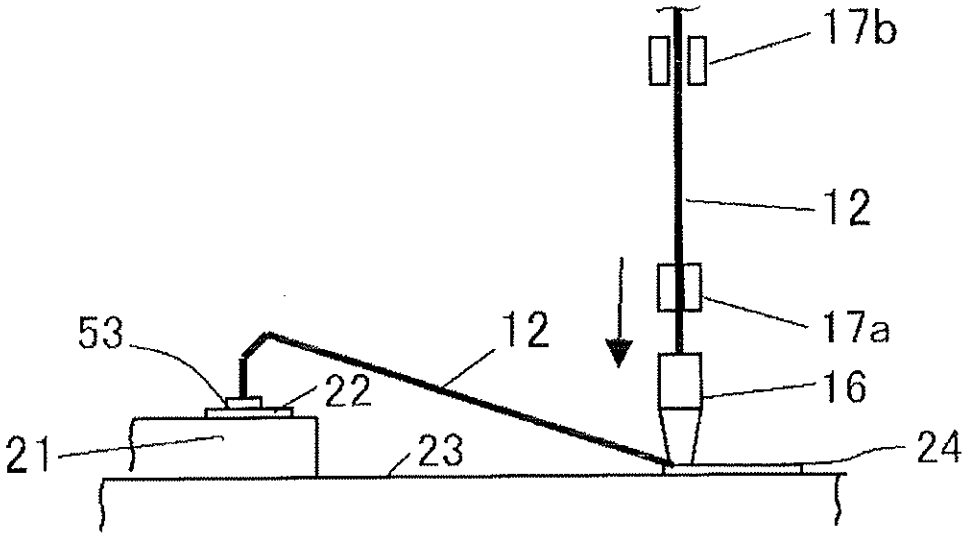


FIG. 2E

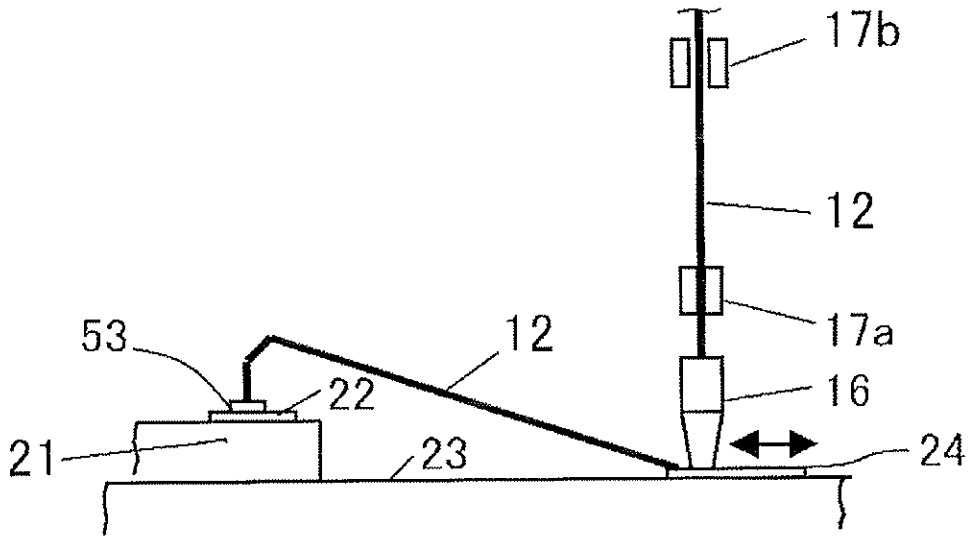


FIG. 2F

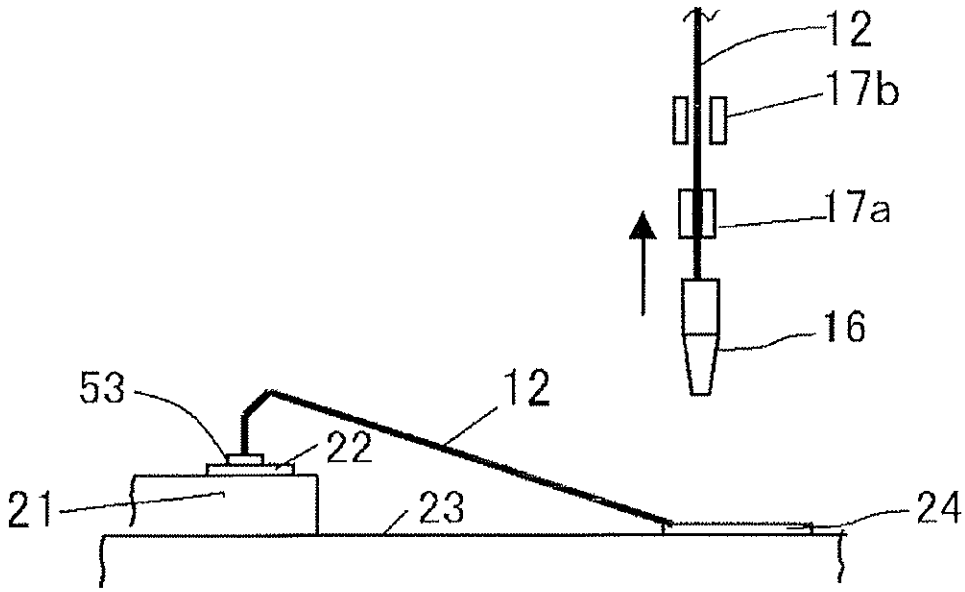


FIG. 2G

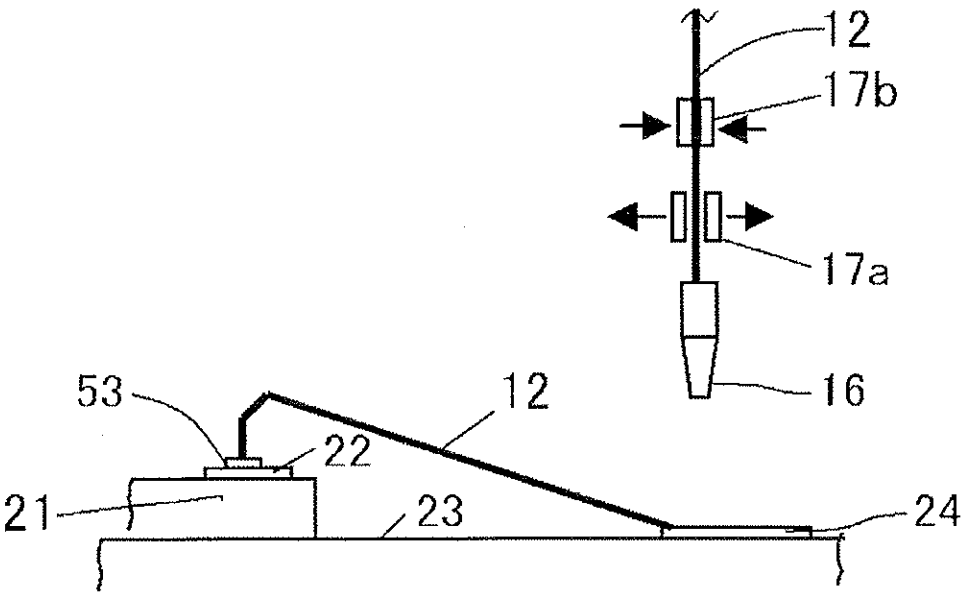


FIG. 2H

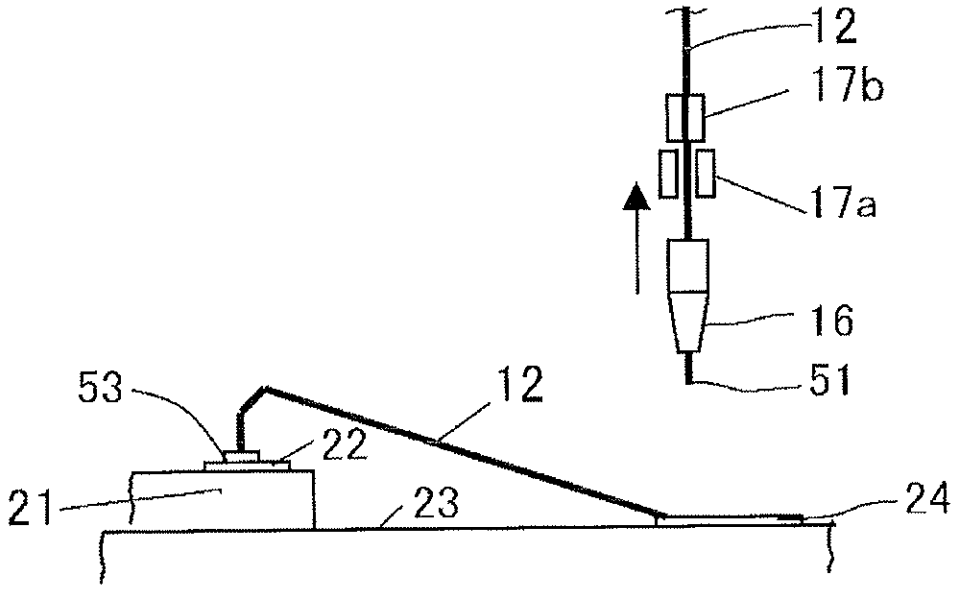


FIG. 2I

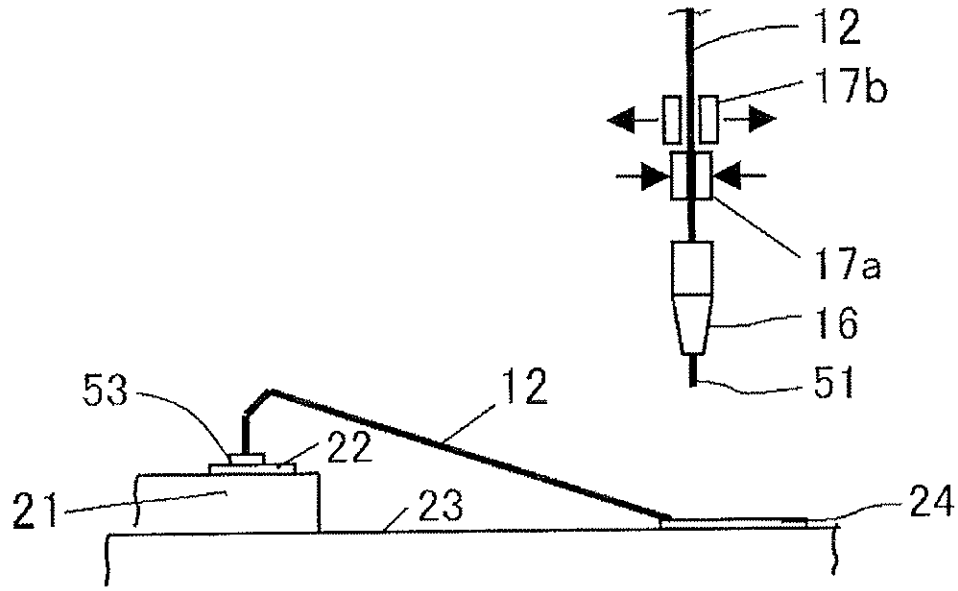


FIG. 2J

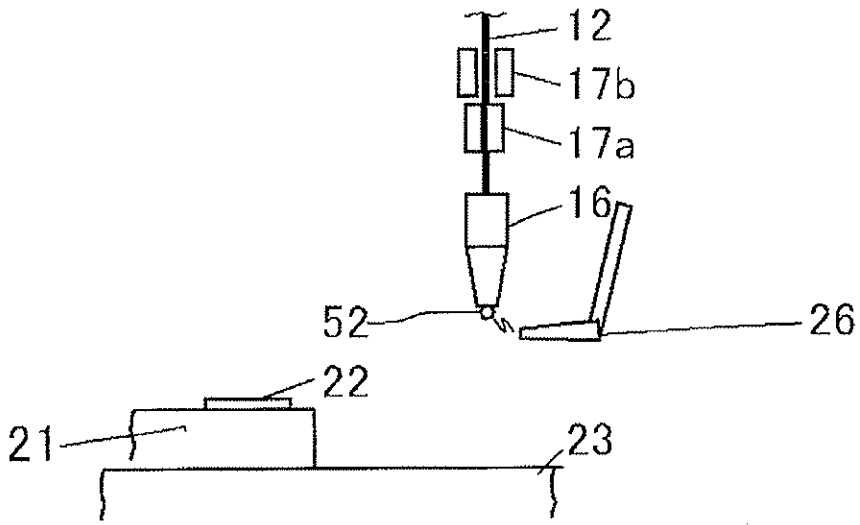


FIG. 2K

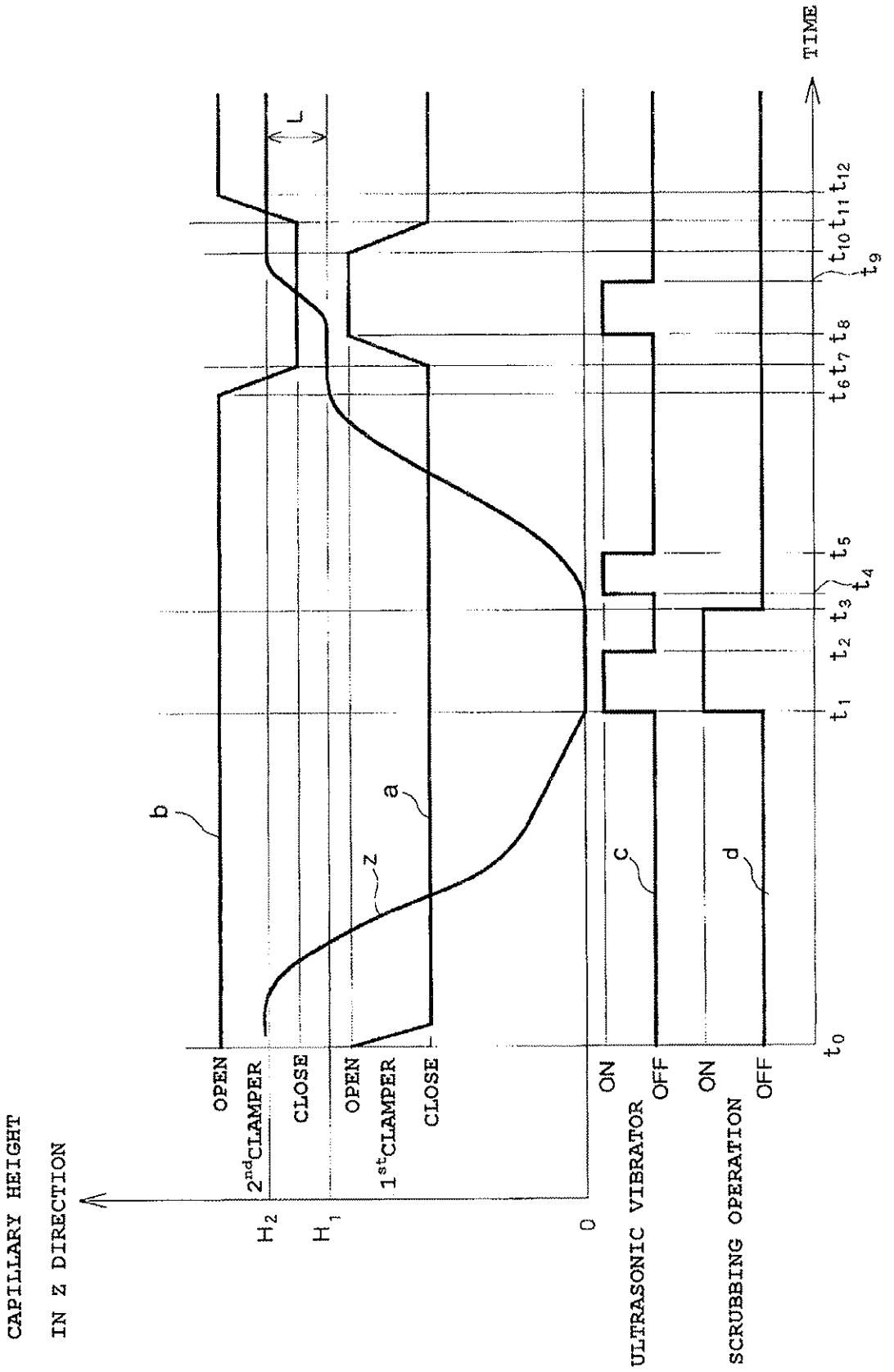

CAPILLARY HEIGHT
IN Z DIRECTION
TIME
OPEN
2nd CLAMPER
CLOSE
OPEN
1st CLAMPER
CLOSE
H2
H1
0
L
b
a
z
c
d
ON
OFF
ULTRASONIC VIBRATOR
ON
OFF
SCRUBBING OPERATION
t0
t1
t2
t3
t4
t5
t6
t7
t8
t9
t10
t11
t12

FIG. 3

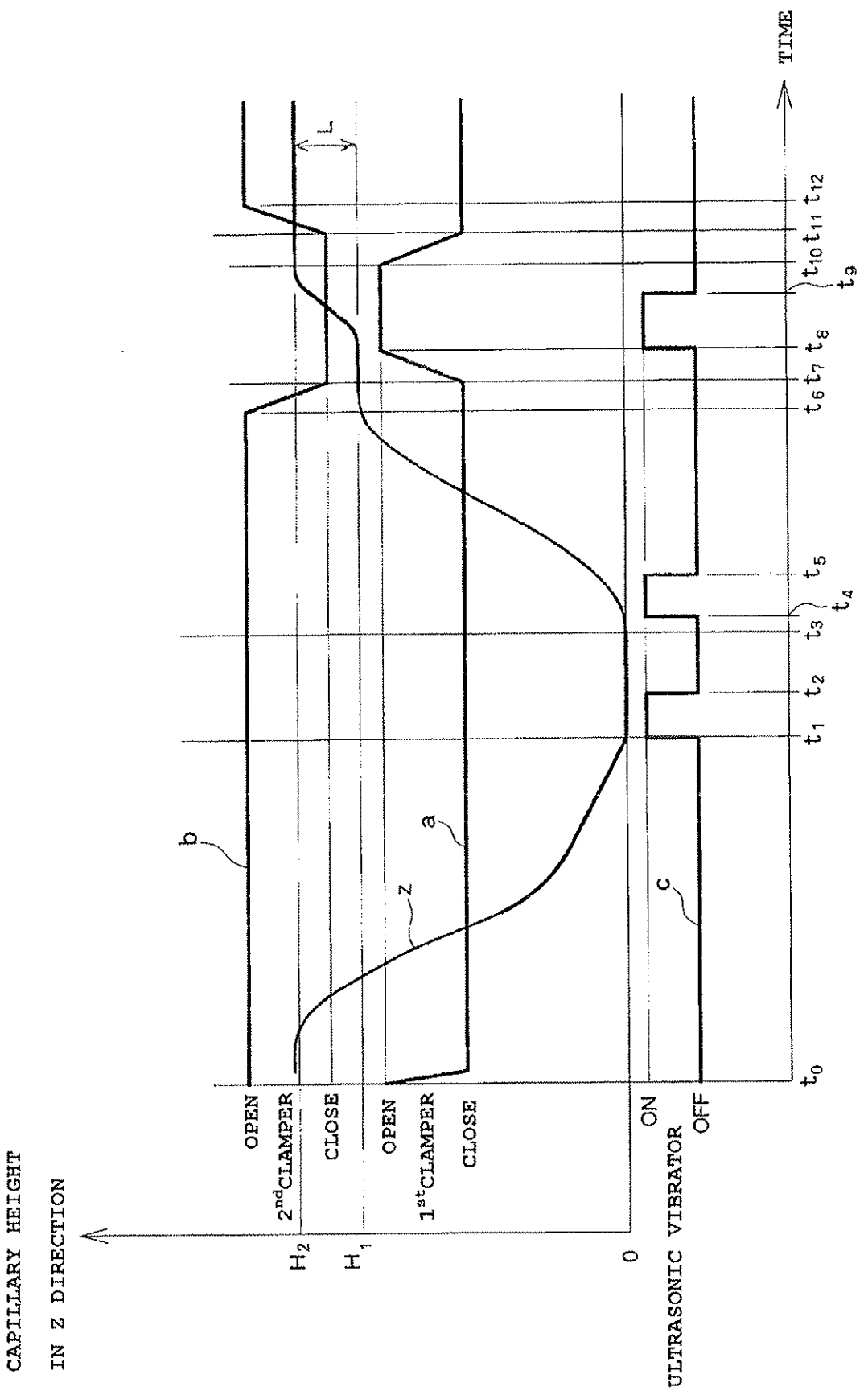

CAPILLARY HEIGHT
IN Z DIRECTION
TIME
OPEN
2nd CLAMPER
CLOSE
OPEN
1st CLAMPER
CLOSE
ON
ULTRASONIC VIBRATOR
OFF
H2
H1
0
L
a
b
c
z
t0
t1
t2
t3
t4
t5
t6
t7
t8
t9
t10
t11
t12

FIG. 4