Figure 1

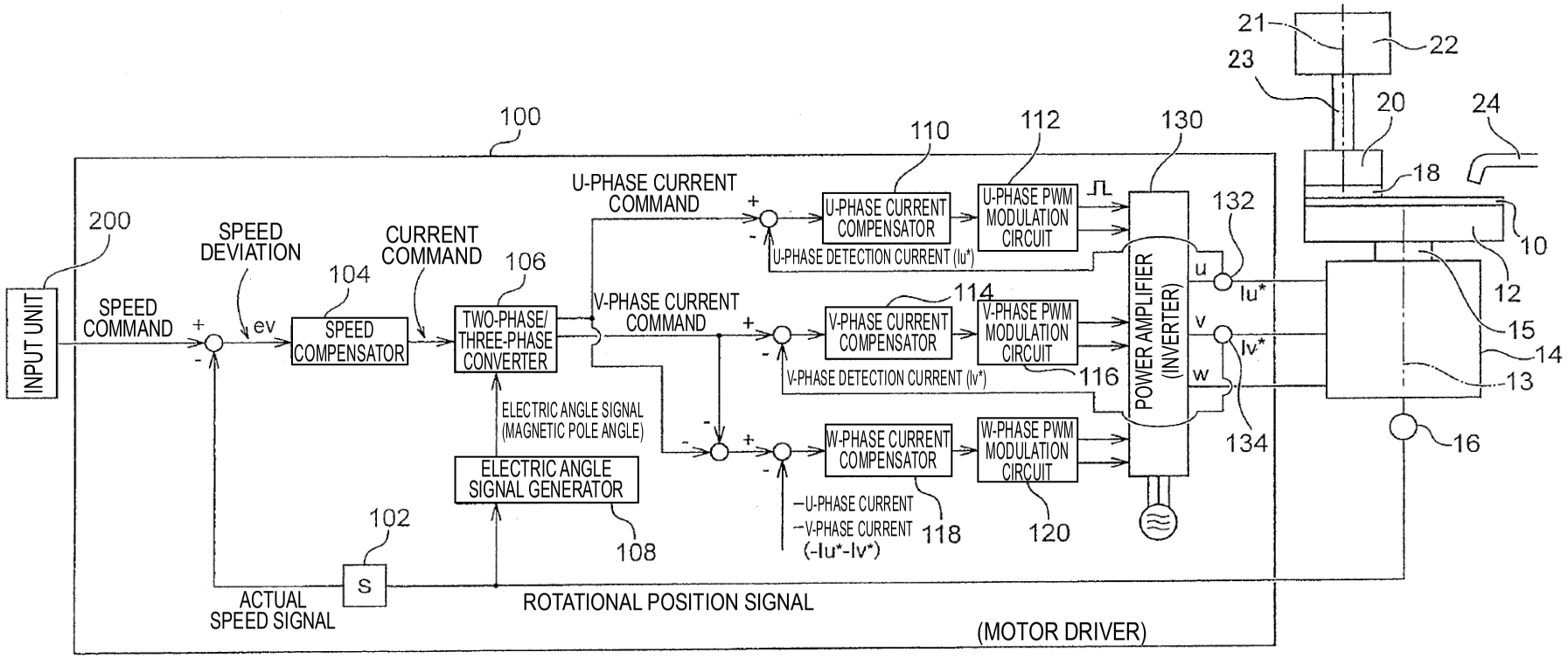

100
200
INPUT UNIT
SPEED COMMAND
SPEED DEVIATION
ev
104
SPEED COMPENSATOR
CURRENT COMMAND
106
TWO-PHASE/ THREE-PHASE CONVERTER
U-PHASE CURRENT COMMAND
V-PHASE CURRENT COMMAND
110
U-PHASE CURRENT COMPENSATOR
112
U-PHASE PWM MODULATION CIRCUIT
U-PHASE DETECTION CURRENT (Iu*)
114
V-PHASE CURRENT COMPENSATOR
V-PHASE PWM MODULATION CIRCUIT
116
V-PHASE DETECTION CURRENT (Iv*)
W-PHASE CURRENT COMPENSATOR
W-PHASE PWM MODULATION CIRCUIT
118
120
−U-PHASE CURRENT
−V-PHASE CURRENT
(-Iu*-Iv*)
130
POWER AMPLIFIER (INVERTER)
u
v
w
132
134
Iu*
Iv*
ELECTRIC ANGLE SIGNAL (MAGNETIC POLE ANGLE)
ELECTRIC ANGLE SIGNAL GENERATOR
108
102
S
ACTUAL SPEED SIGNAL
ROTATIONAL POSITION SIGNAL
(MOTOR DRIVER)
21
22
23
20
24
18
10
12
15
14
13
16

Figure 2

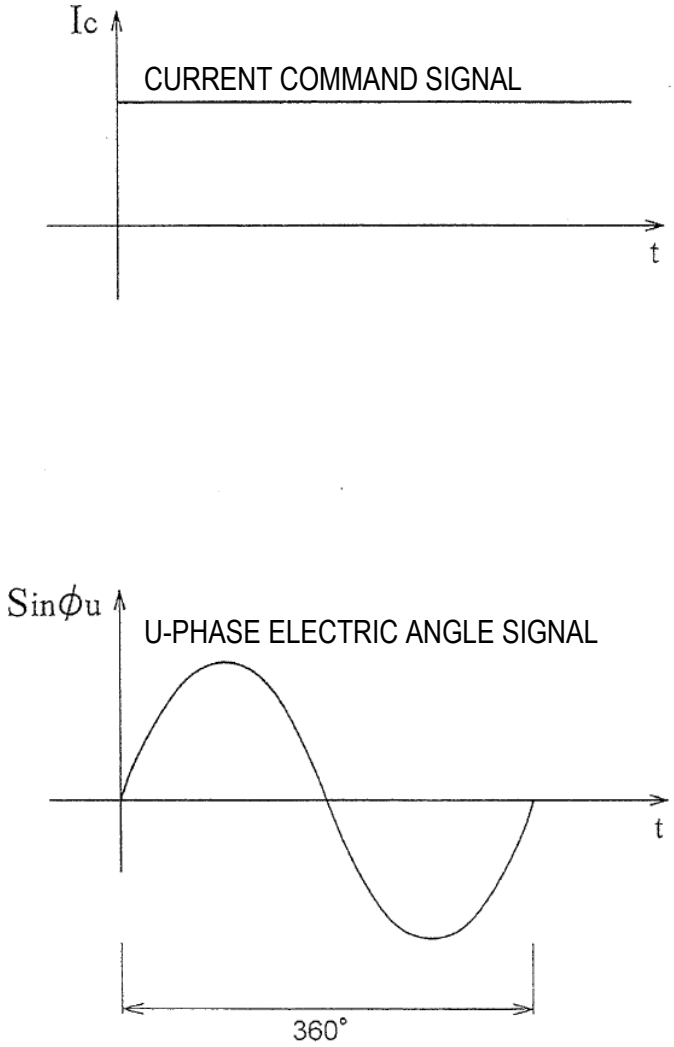

Ic
CURRENT COMMAND SIGNAL
t
Sinϕu
U-PHASE ELECTRIC ANGLE SIGNAL
t
360°

Figure 3

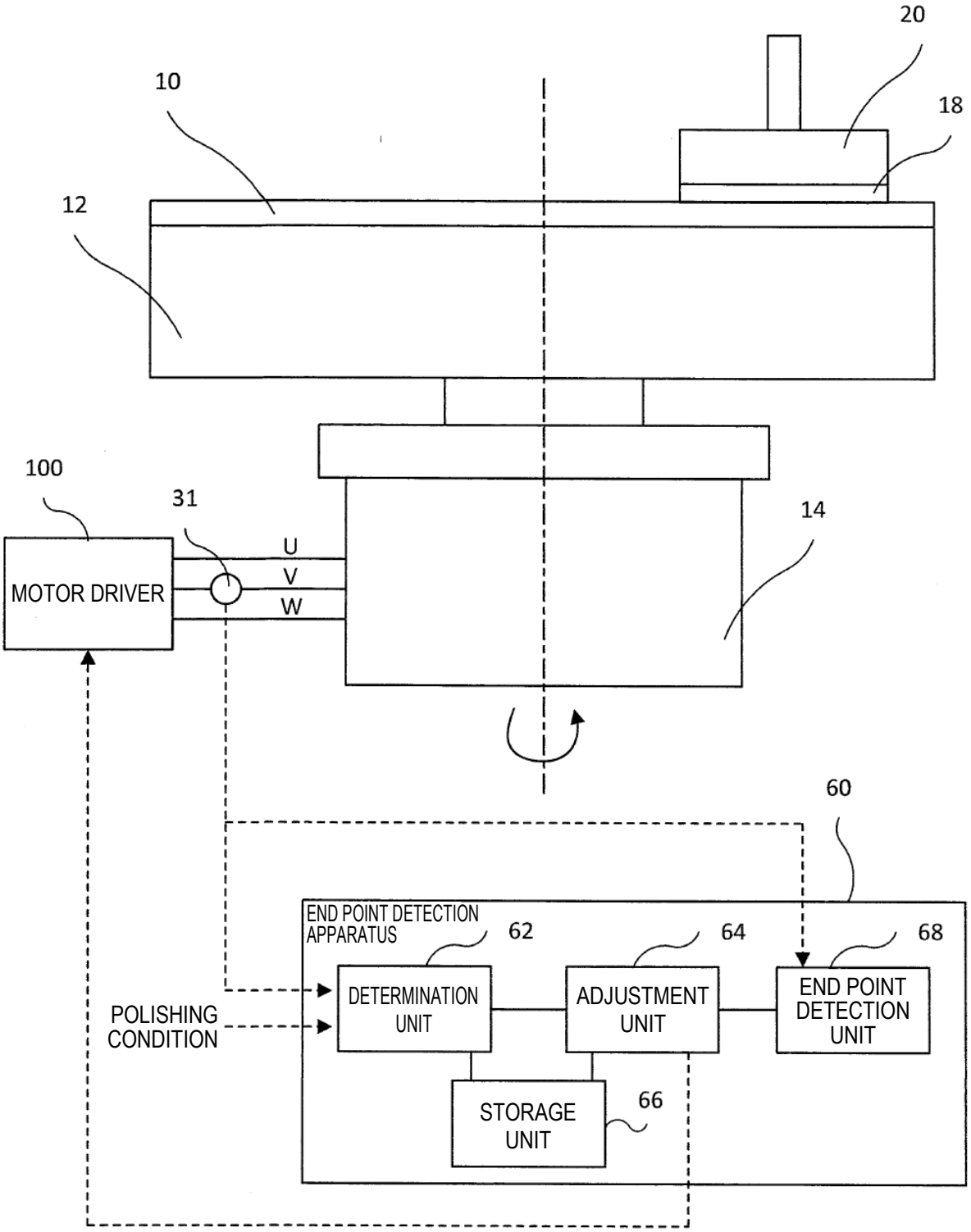

20
10
18
12
100
31
14
U
V
W
MOTOR DRIVER
60
END POINT DETECTION APPARATUS
62
64
68
DETERMINATION UNIT
ADJUSTMENT UNIT
END POINT DETECTION UNIT
POLISHING CONDITION
STORAGE UNIT
66

Figure 4

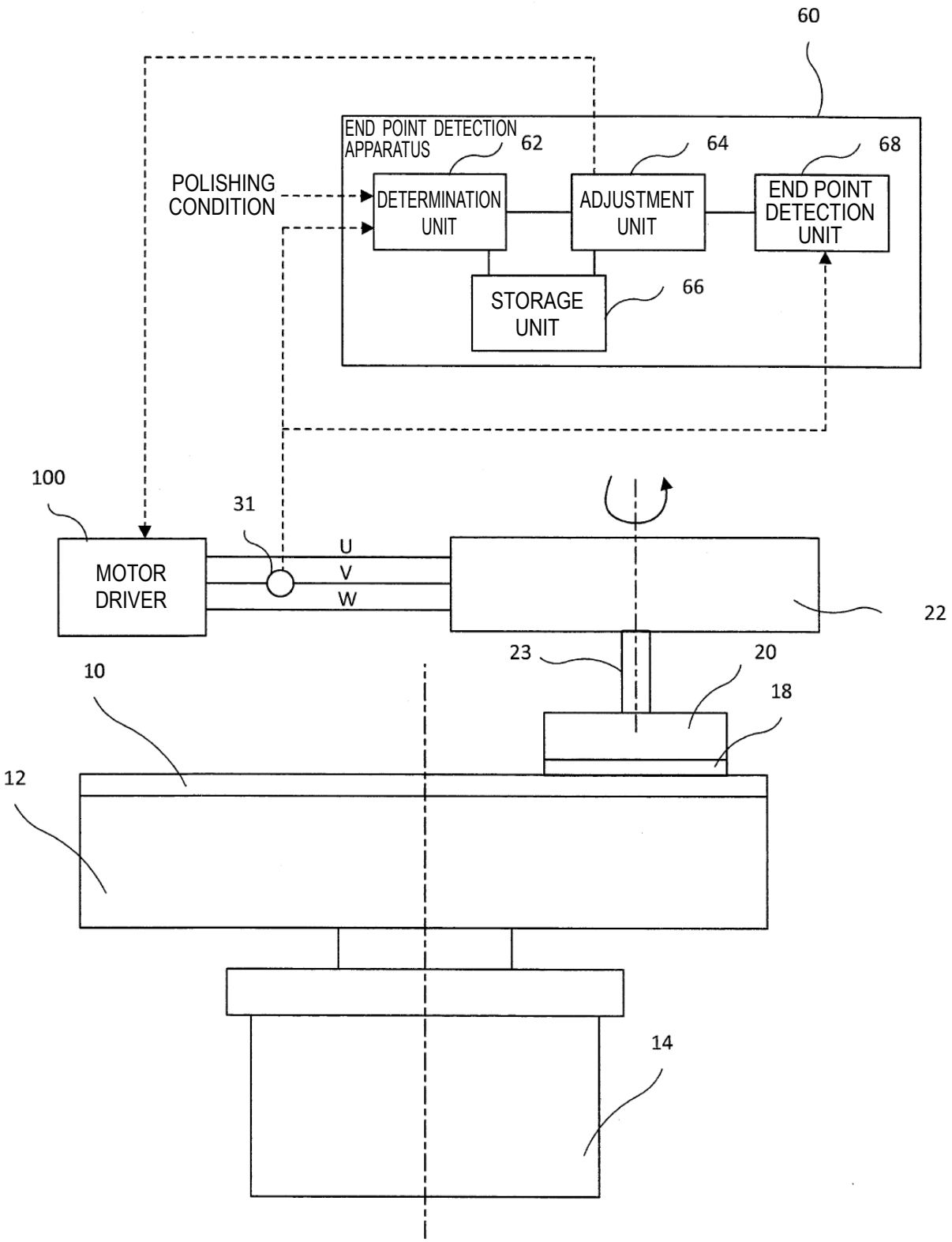

60
END POINT DETECTION APPARATUS
62
64
68
POLISHING CONDITION
DETERMINATION UNIT
ADJUSTMENT UNIT
END POINT DETECTION UNIT
STORAGE UNIT
66
100
31
MOTOR DRIVER
U
V
W
22
23
20
18
10
12
14

Figure 5

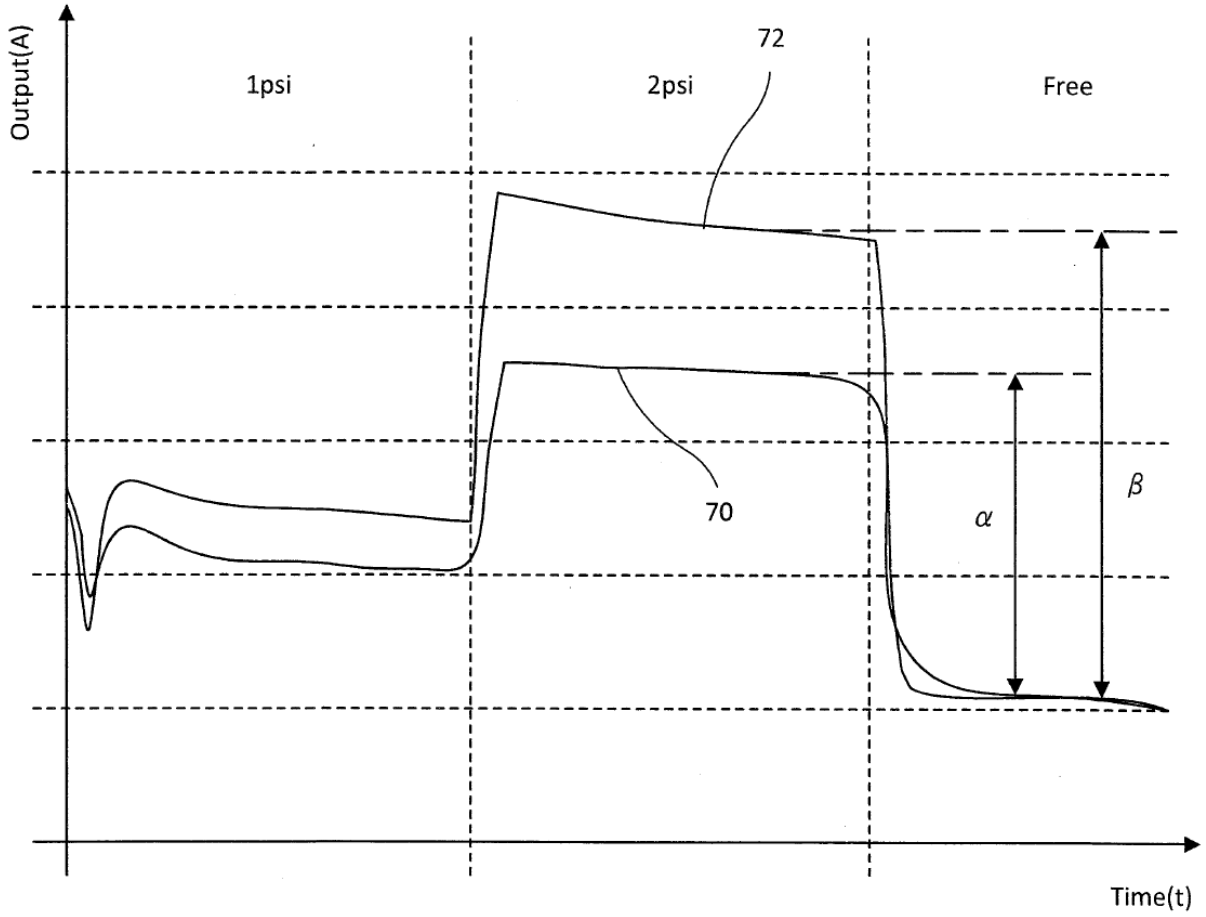


Figure 6

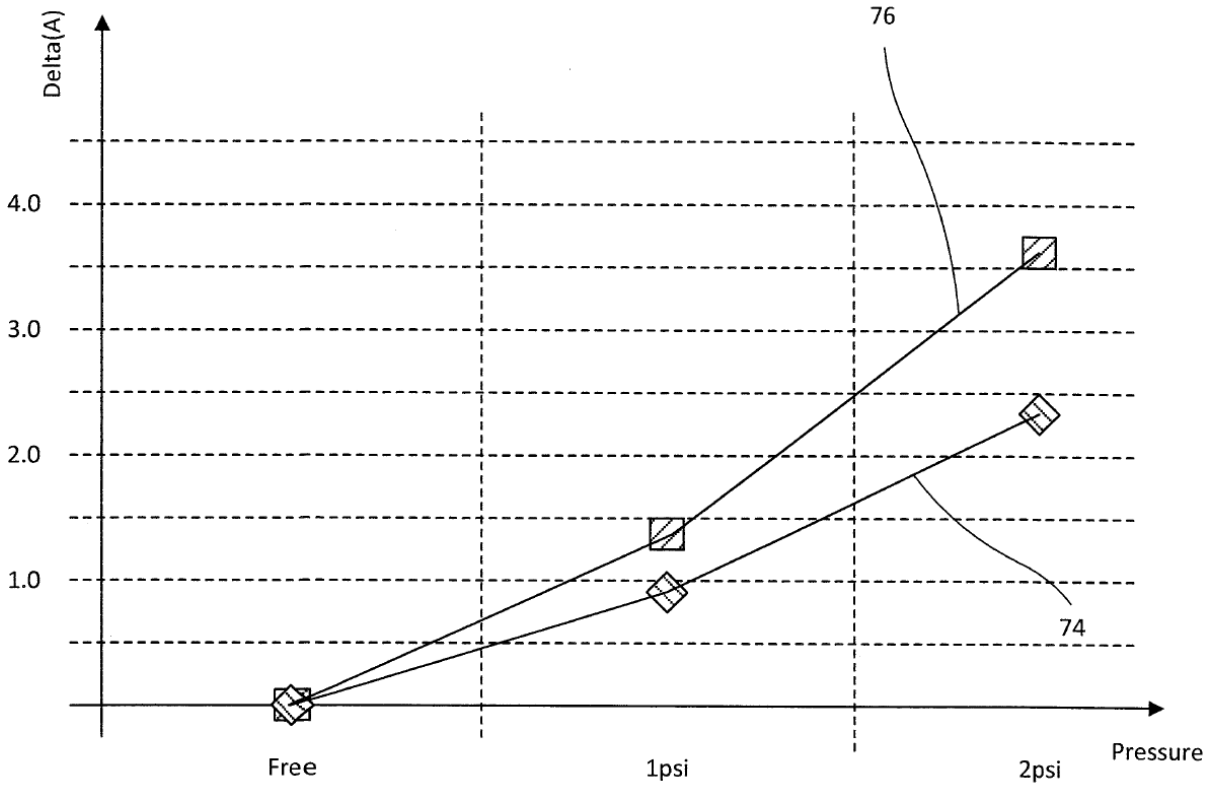
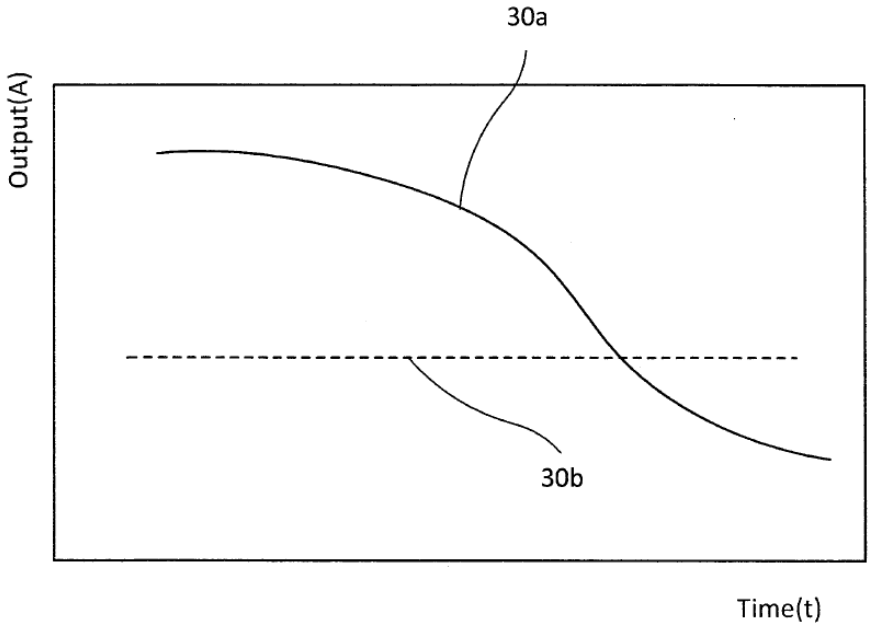


Figure 7


30a
Output(A)
30b
Time(t)

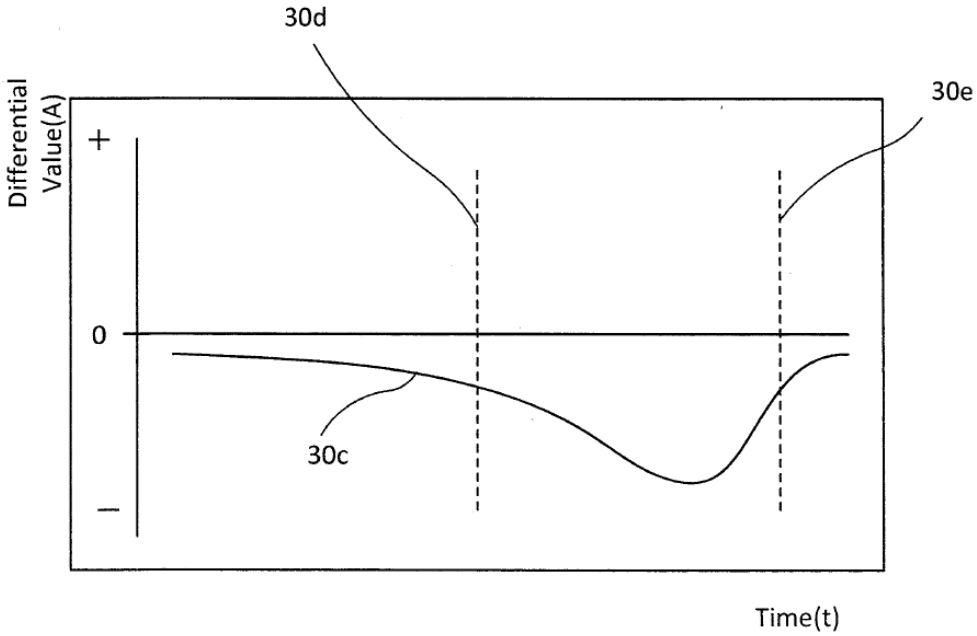

30d
30e
Differential Value(A)
+
0
−
30c
Time(t)

Figure 8

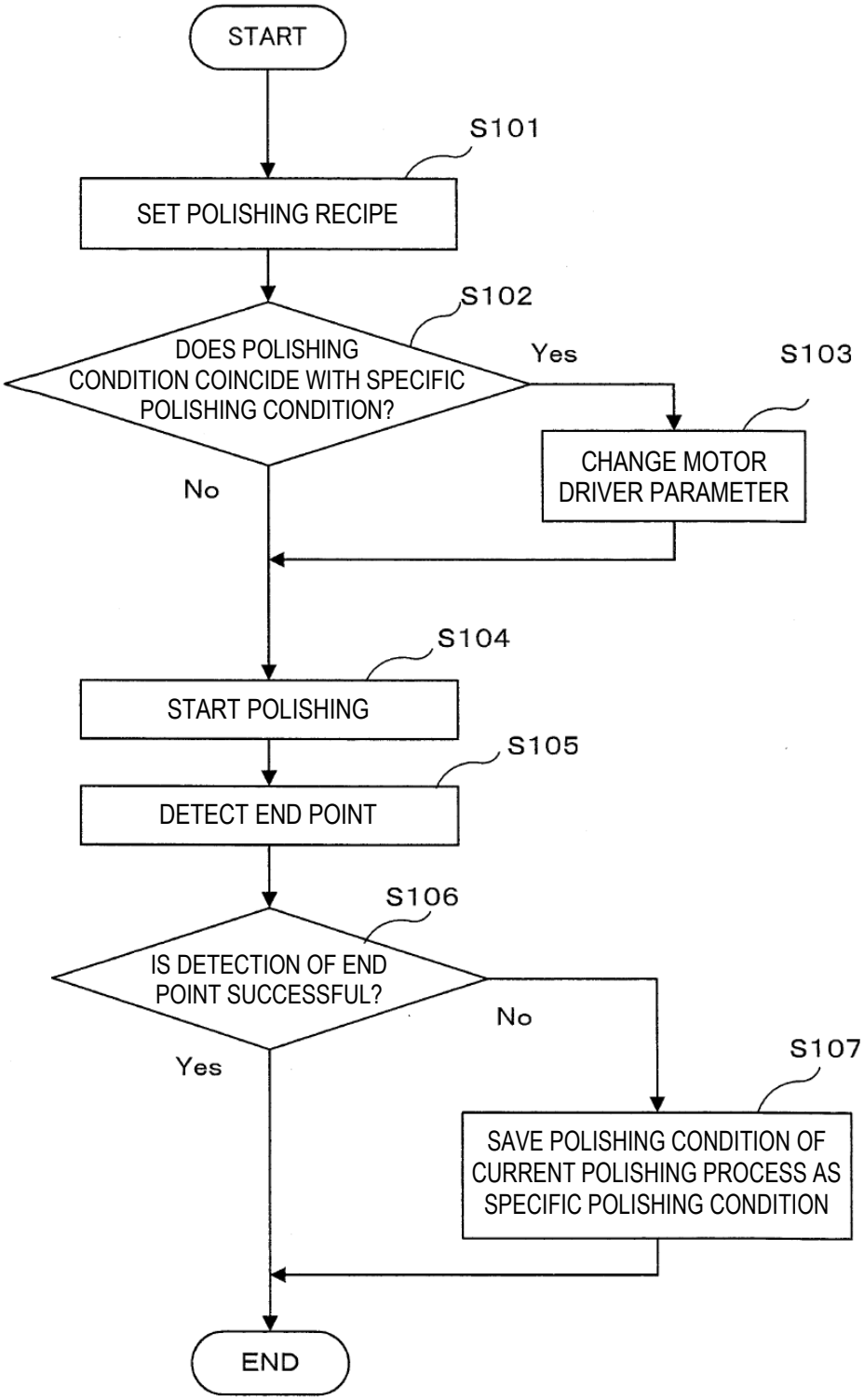

START
S101
SET POLISHING RECIPE
S102
DOES POLISHING CONDITION COINCIDE WITH SPECIFIC POLISHING CONDITION?
Yes
S103
CHANGE MOTOR DRIVER PARAMETER
No
S104
START POLISHING
S105
DETECT END POINT
S106
IS DETECTION OF END POINT SUCCESSFUL?
No
Yes
S107
SAVE POLISHING CONDITION OF CURRENT POLISHING PROCESS AS SPECIFIC POLISHING CONDITION
END

Figure 9

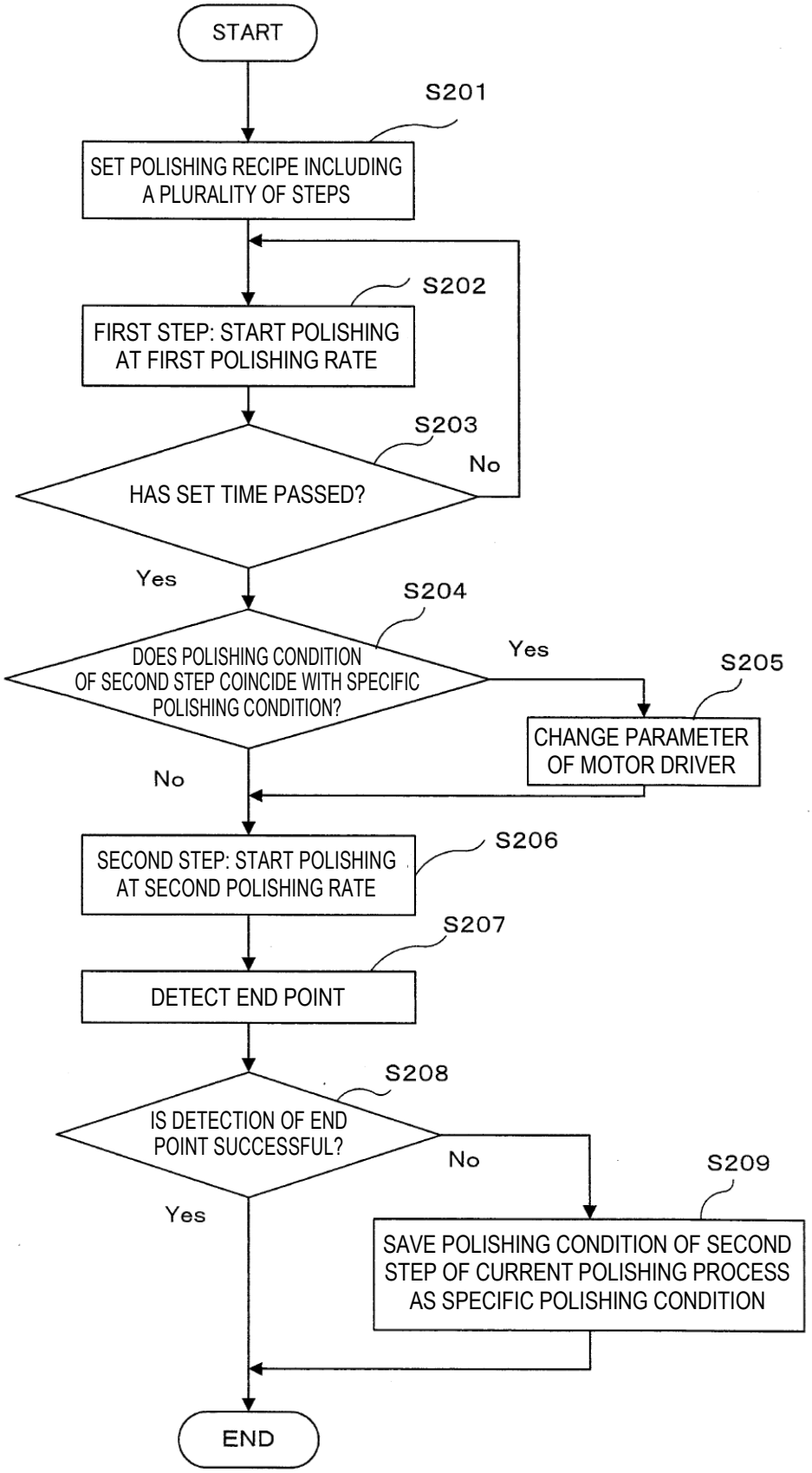

START
S201
SET POLISHING RECIPE INCLUDING A PLURALITY OF STEPS
S202
FIRST STEP: START POLISHING AT FIRST POLISHING RATE
S203
HAS SET TIME PASSED?
No
Yes
S204
DOES POLISHING CONDITION OF SECOND STEP COINCIDE WITH SPECIFIC POLISHING CONDITION?
Yes
S205
CHANGE PARAMETER OF MOTOR DRIVER
No
S206
SECOND STEP: START POLISHING AT SECOND POLISHING RATE
S207
DETECT END POINT
S208
IS DETECTION OF END POINT SUCCESSFUL?
No
S209
Yes
SAVE POLISHING CONDITION OF SECOND STEP OF CURRENT POLISHING PROCESS AS SPECIFIC POLISHING CONDITION
END

Figure 10

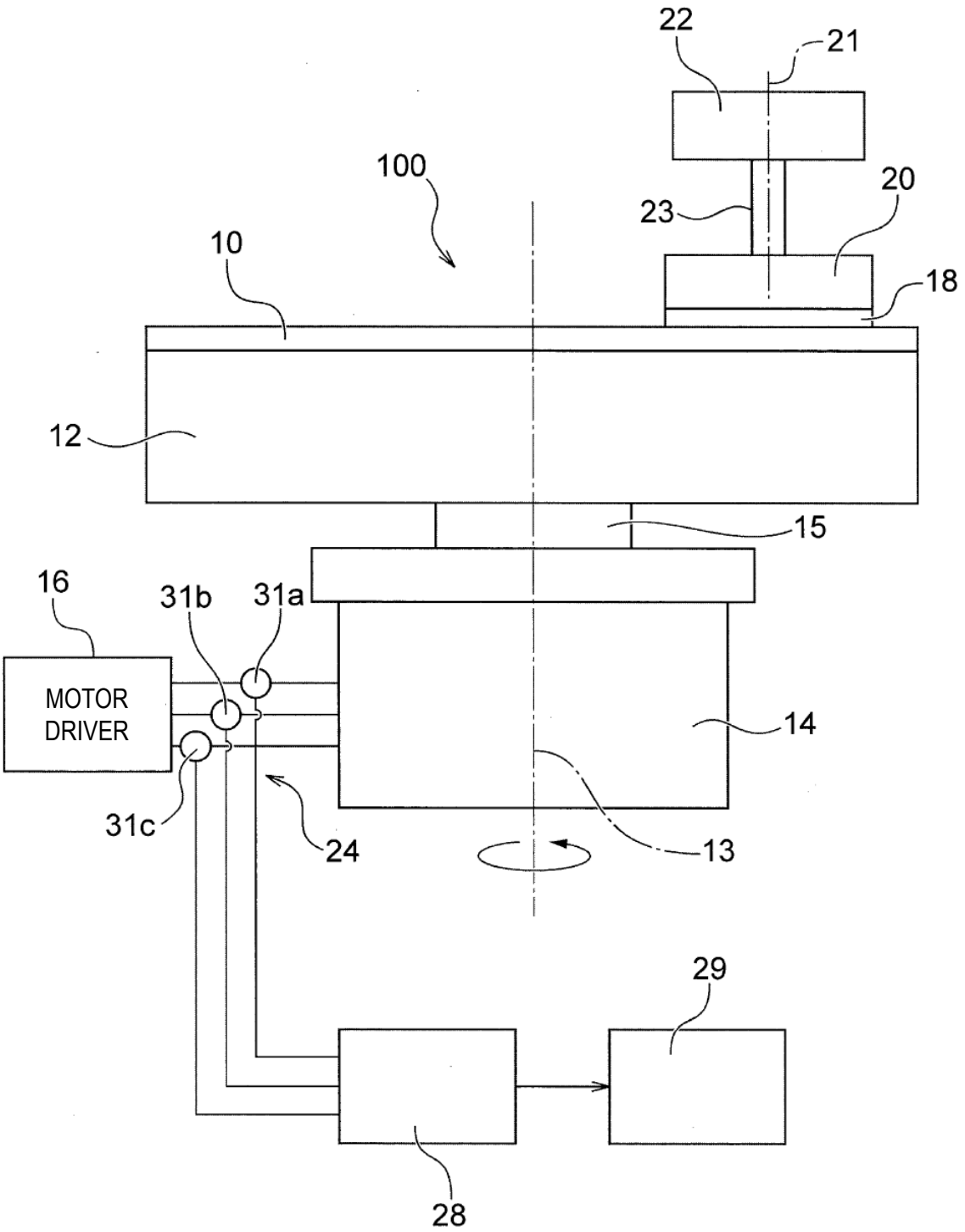

22
21
100
20
23
10
18
12
15
16
31b
31a
MOTOR
DRIVER
14
31c
24
13
29
28

Figure 11

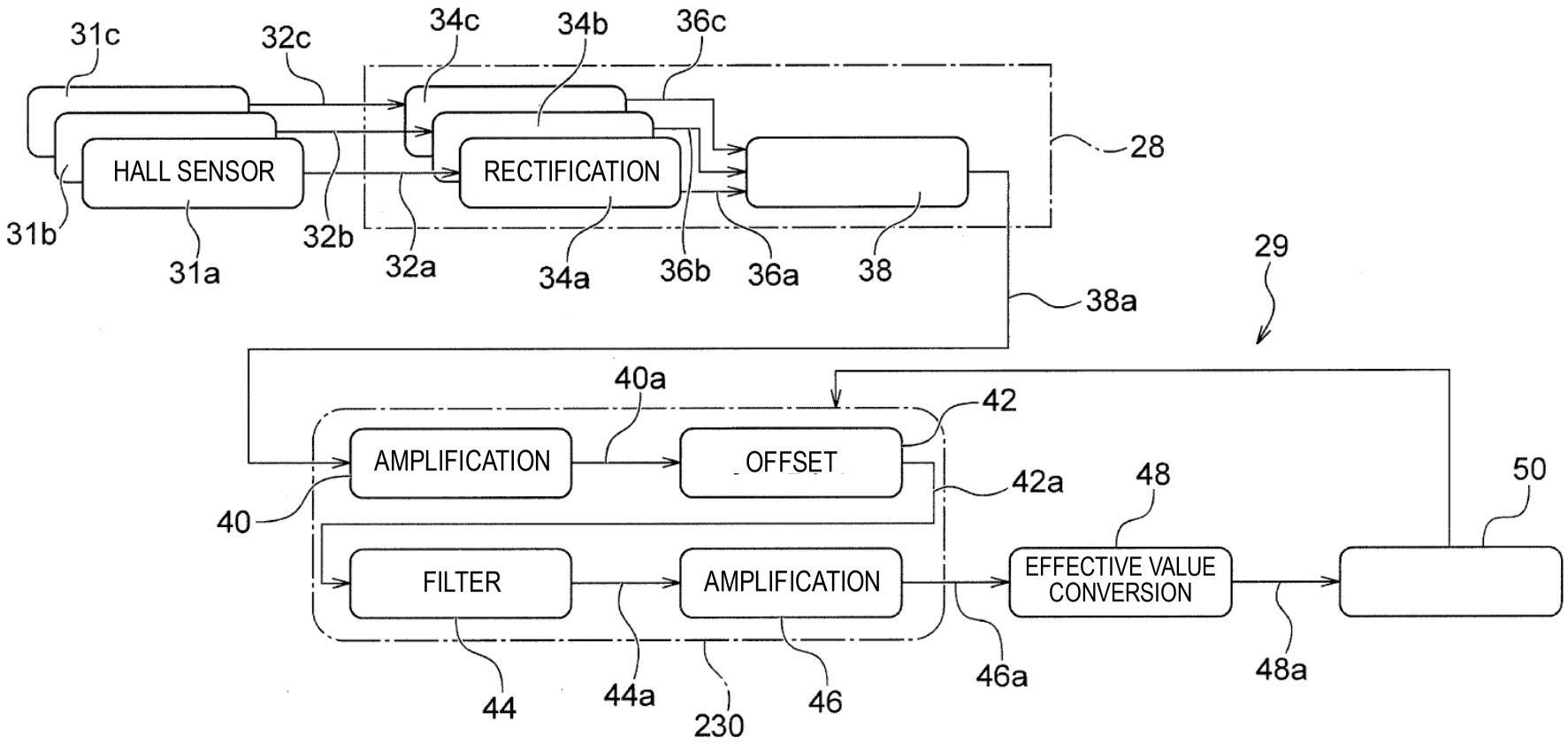

31c
32c
34c
34b
36c
HALL SENSOR
RECTIFICATION
28
31b
31a
32b
32a
34a
36b
36a
38
38a
29
40a
42
AMPLIFICATION
OFFSET
42a
48
50
40
FILTER
AMPLIFICATION
EFFECTIVE VALUE CONVERSION
44
44a
230
46
46a
48a

Figure 12

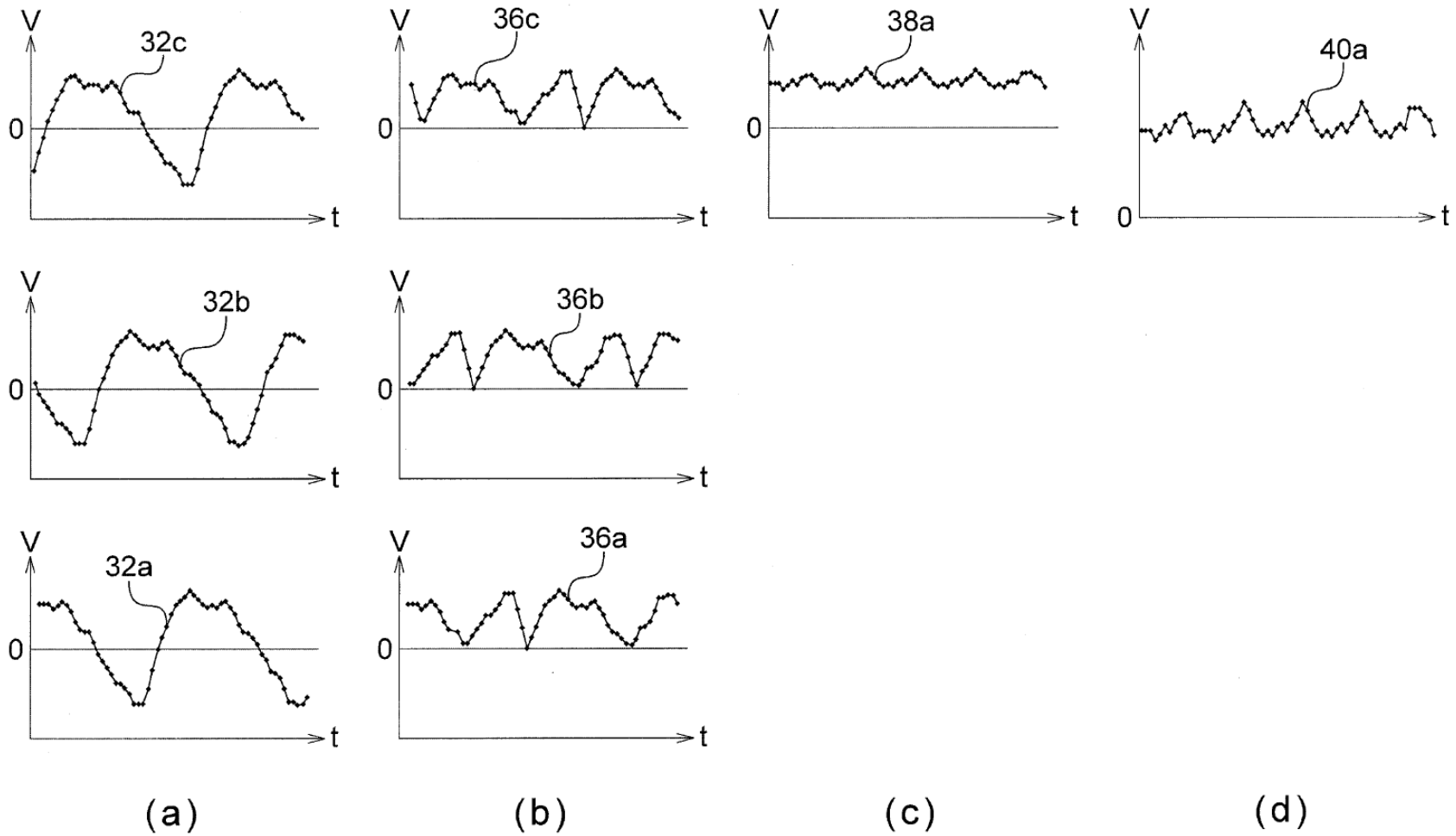

V
32c
0
t
V
36c
0
t
V
38a
0
t
V
40a
0
t
V
32b
0
t
V
36b
0
t
V
32a
0
t
V
36a
0
t
(a)
(b)
(c)
(d)

Figure 13

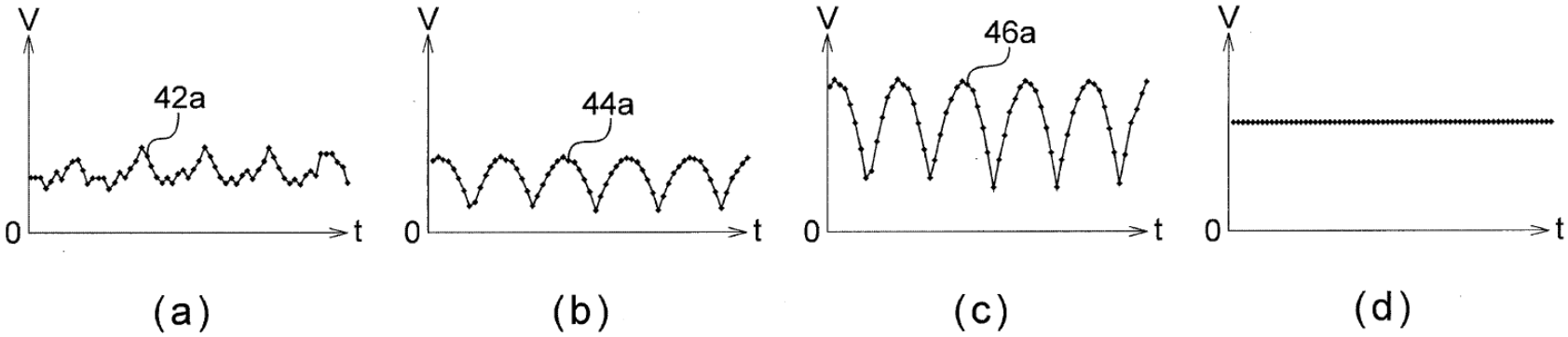


Figure 14

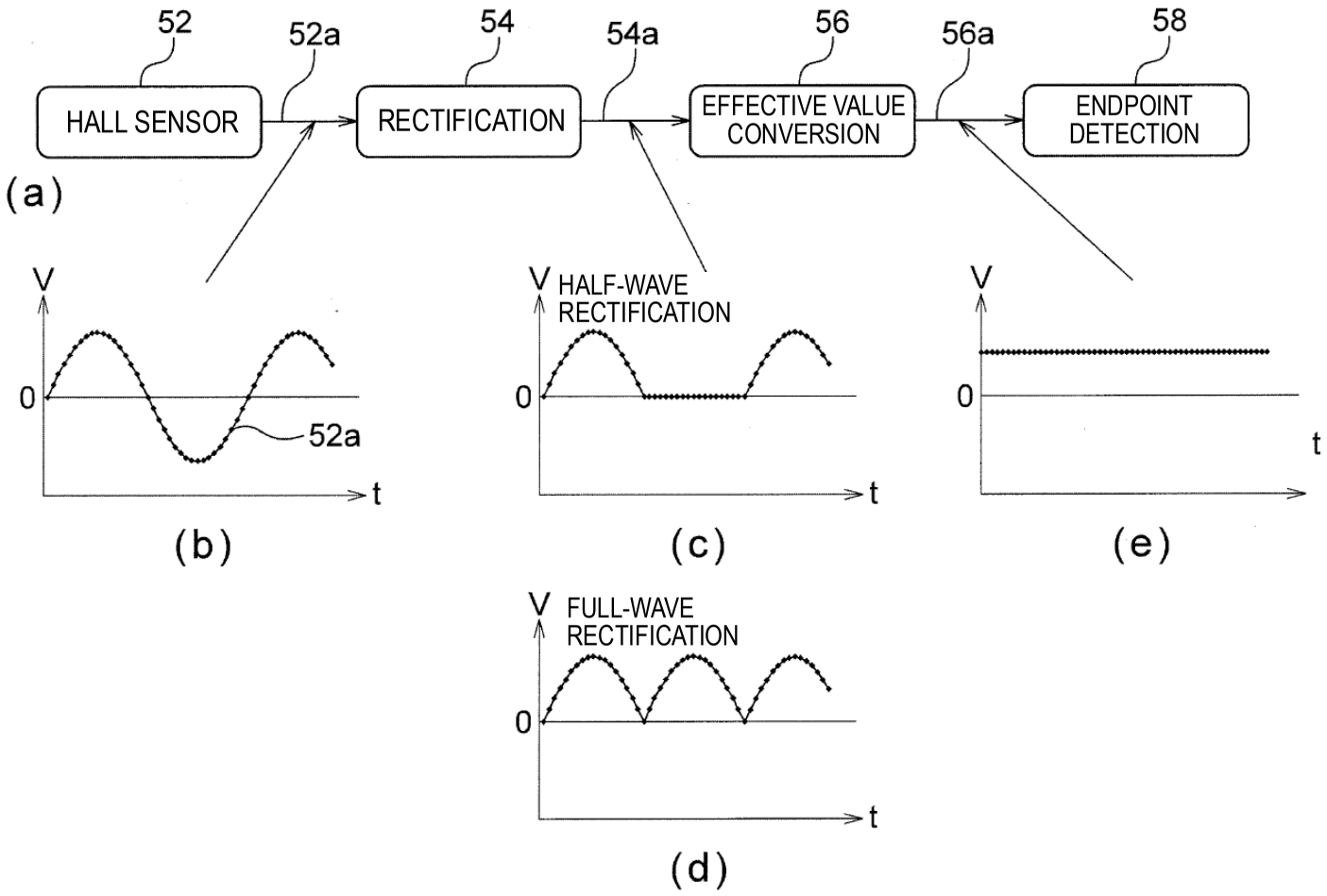

52
52a
54
54a
56
56a
58
HALL SENSOR
RECTIFICATION
EFFECTIVE VALUE CONVERSION
ENDPOINT DETECTION
(a)
V
0
52a
t
(b)
V
HALF-WAVE RECTIFICATION
0
t
(c)
V
0
t
(e)
V
FULL-WAVE RECTIFICATION
0
t
(d)

Figure 15

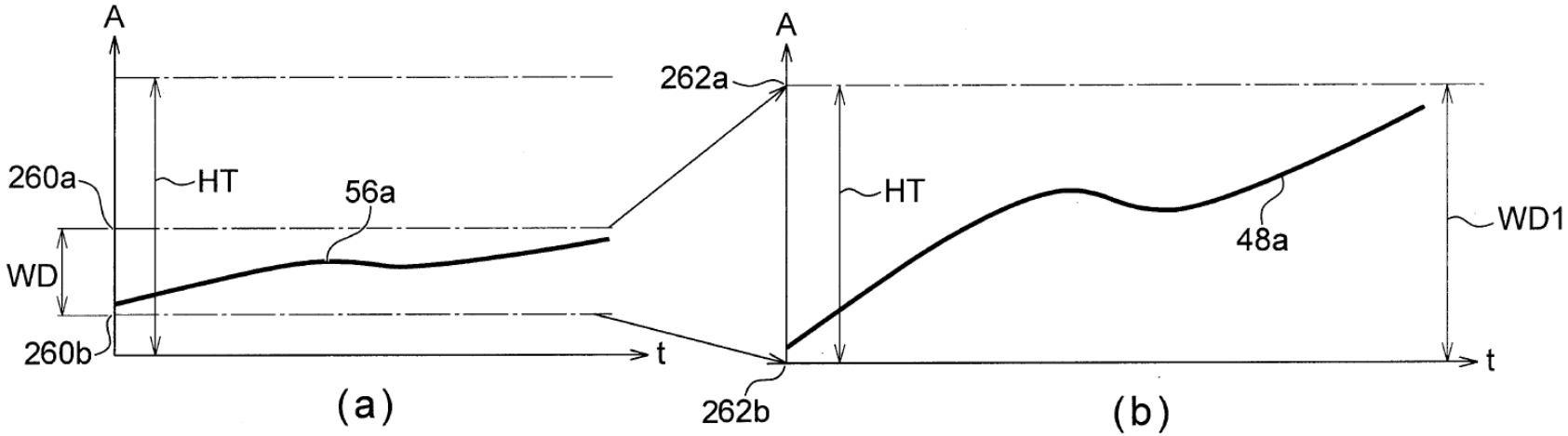


Figure 16

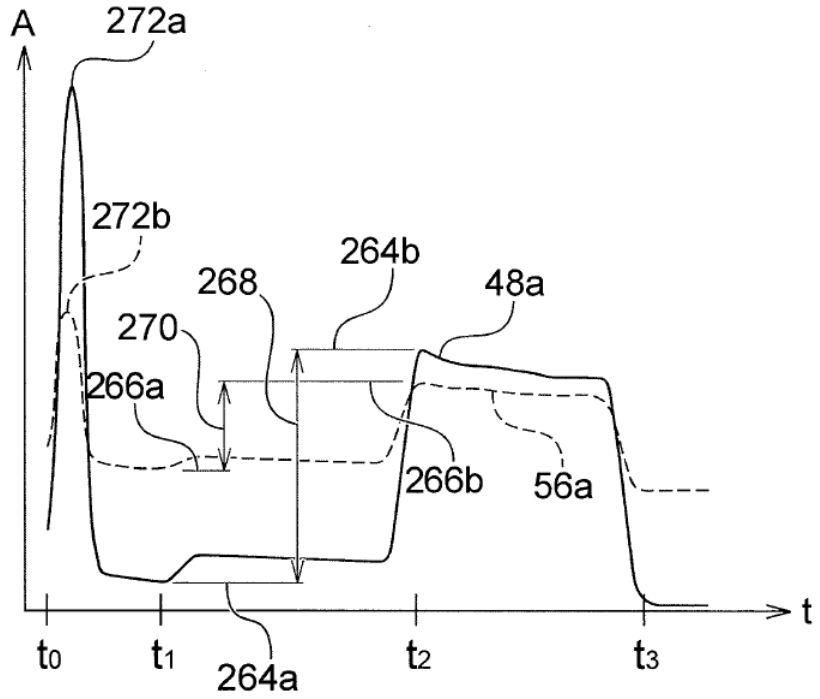


Figure 17

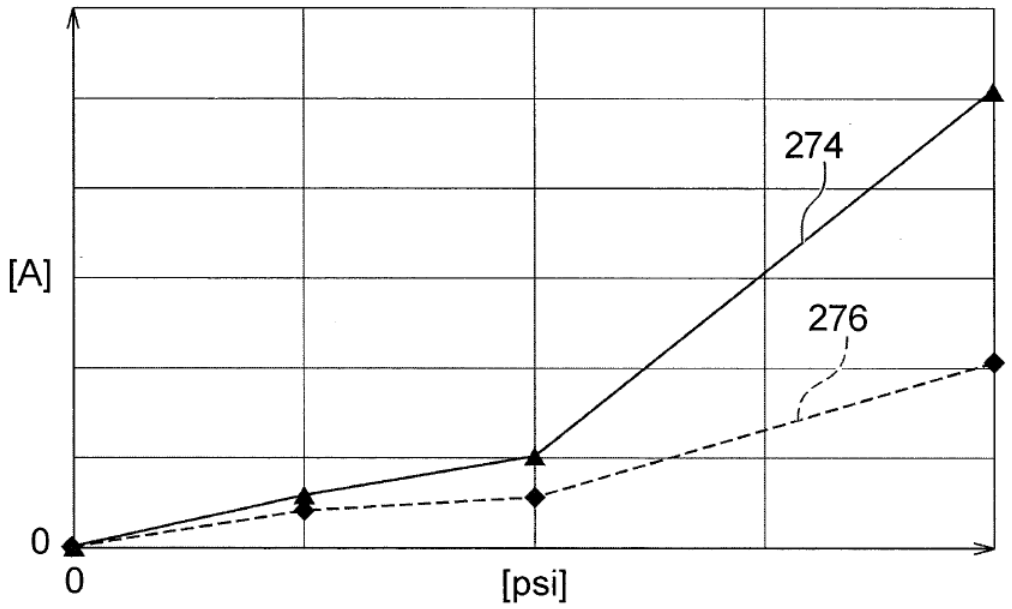


Figure 18

	SETTING VALUE	Max	Min
AMPLIFICATION	x10	200	100
OFFSET	−100	100	0
FILTER		ATTENUATION AT FILTER	0
SECOND AMPLIFICATION	CORRECTION OF PORTION ATTENUATED AT FILTER	100	0

278a 278b 278c 278d 278e 278f 278g 278h 278i 278j 278k 278ℓ

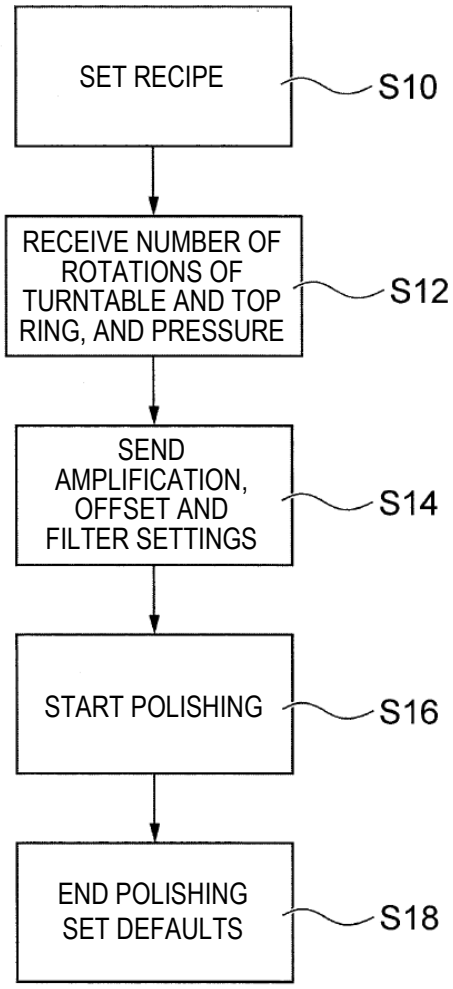



Figure 19