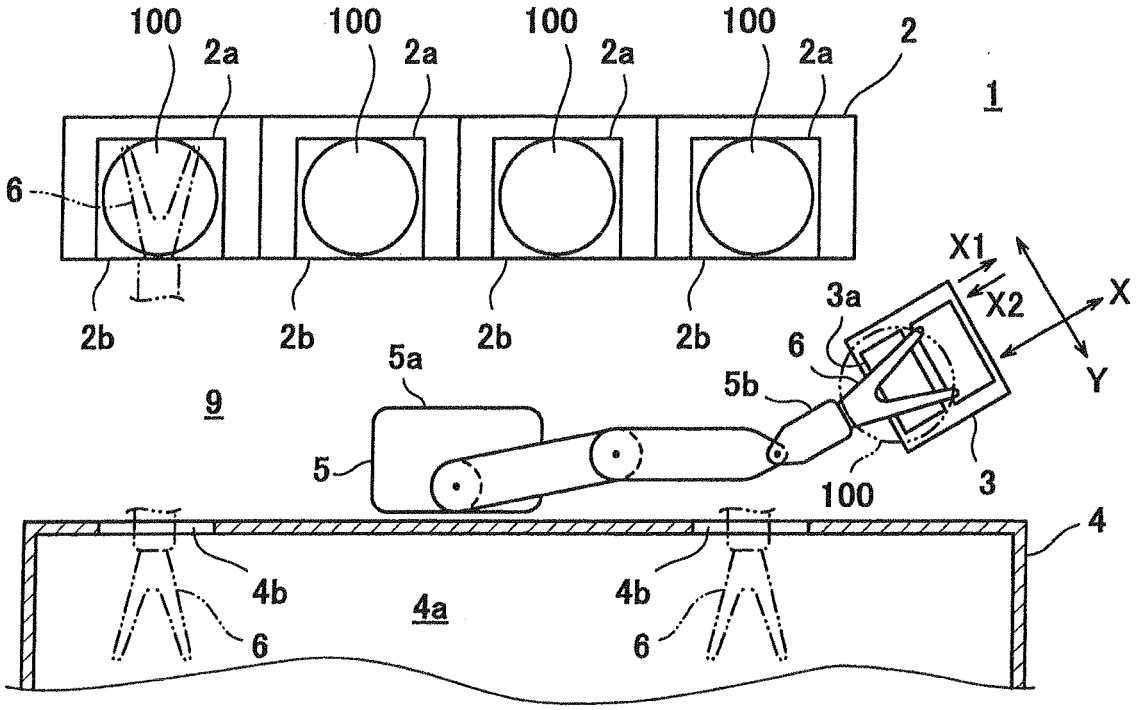
100
2a
2
1
6
2b
X1
X2
X
Y
3a
5a
5b
9
5
100
3
4
4b
4a
6

Fig. 1

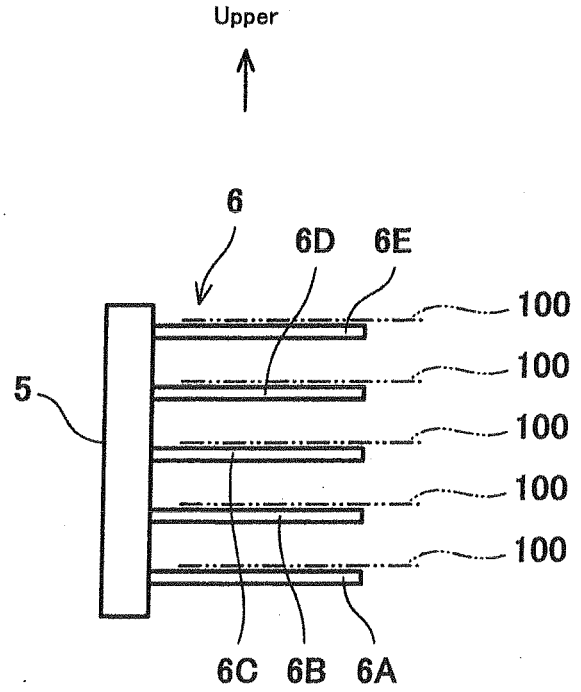
Upper
6
6D
6E
100
5
6C
6B
6A

Fig. 2

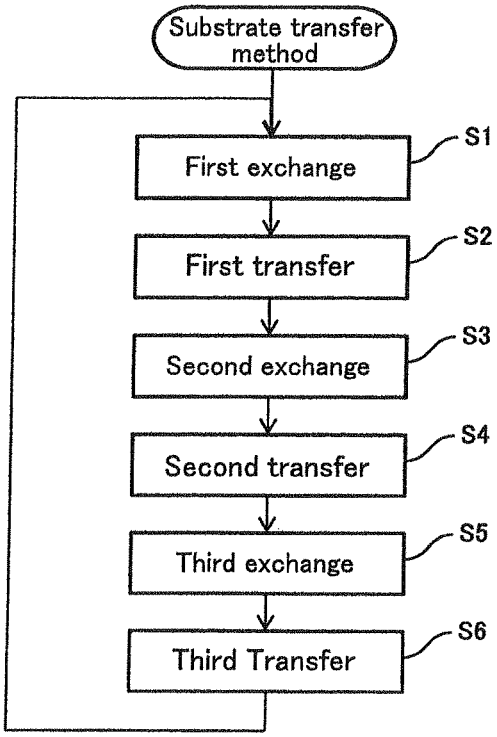
Substrate transfer method
First exchange
S1
First transfer
S2
Second exchange
S3
Second transfer
S4
Third exchange
S5
Third Transfer
S6

Fig. 3

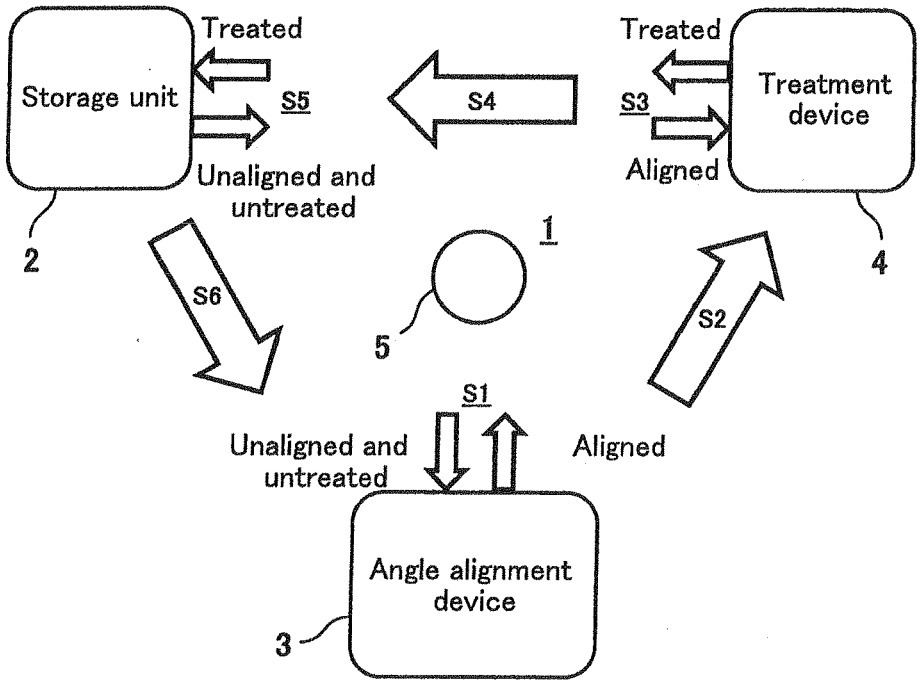
Storage unit
Treated
S5
Unaligned and untreated
2
S6
S4
Treated
S3
Aligned
Treatment device
4
1
5
S2
S1
Unaligned and untreated
Aligned
Angle alignment device
3

Fig. 4

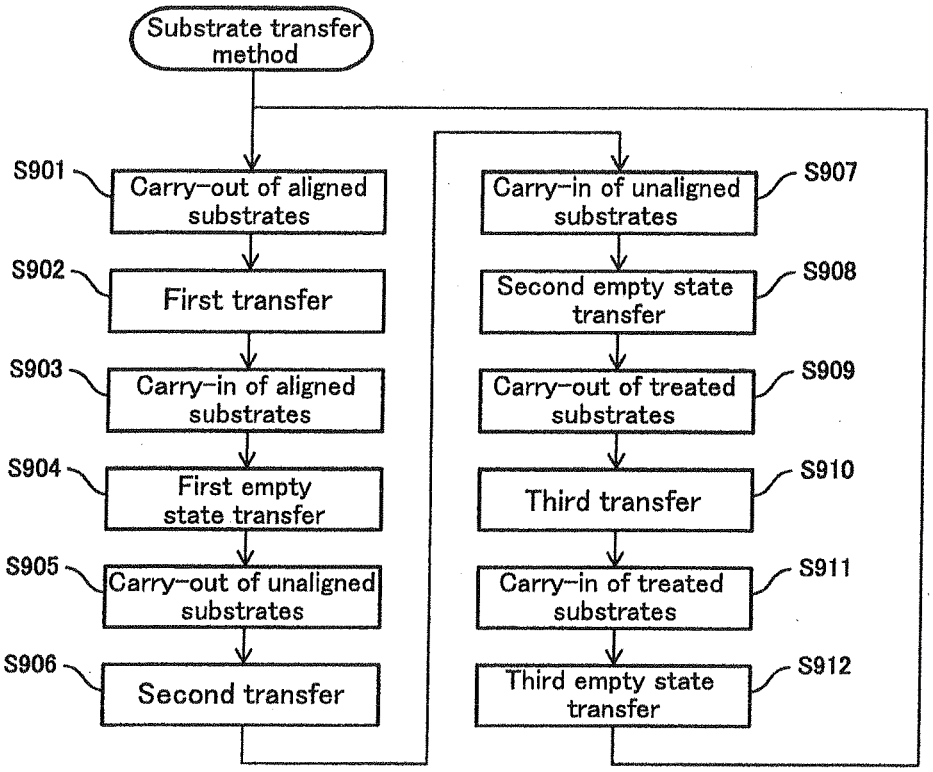
Substrate transfer method
S901
Carry-out of aligned substrates
S902
First transfer
S903
Carry-in of aligned substrates
S904
First empty state transfer
S905
Carry-out of unaligned substrates
S906
Second transfer
S907
Carry-in of unaligned substrates
S908
Second empty state transfer
S909
Carry-out of treated substrates
S910
Third transfer
S911
Carry-in of treated substrates
S912
Third empty state transfer

Fig. 5

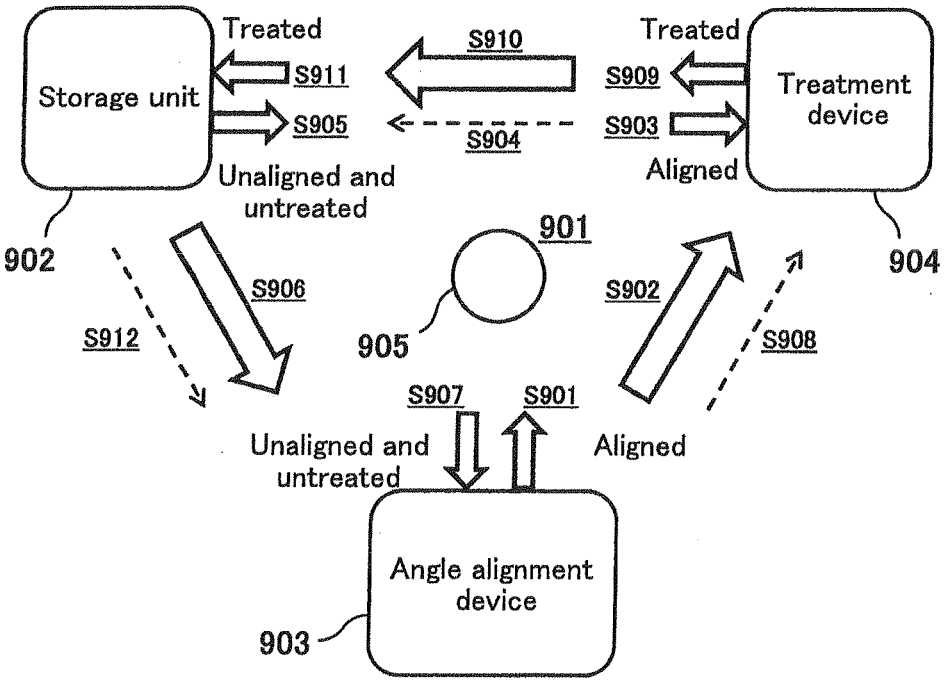
Storage unit
902
Treated
S911
S905
Unaligned and untreated
S910
S904
Treated
S909
S903
Aligned
Treatment device
904
901
905
S906
S912
S902
S908
S907
S901
Unaligned and untreated
Aligned
Angle alignment device
903

Fig. 6

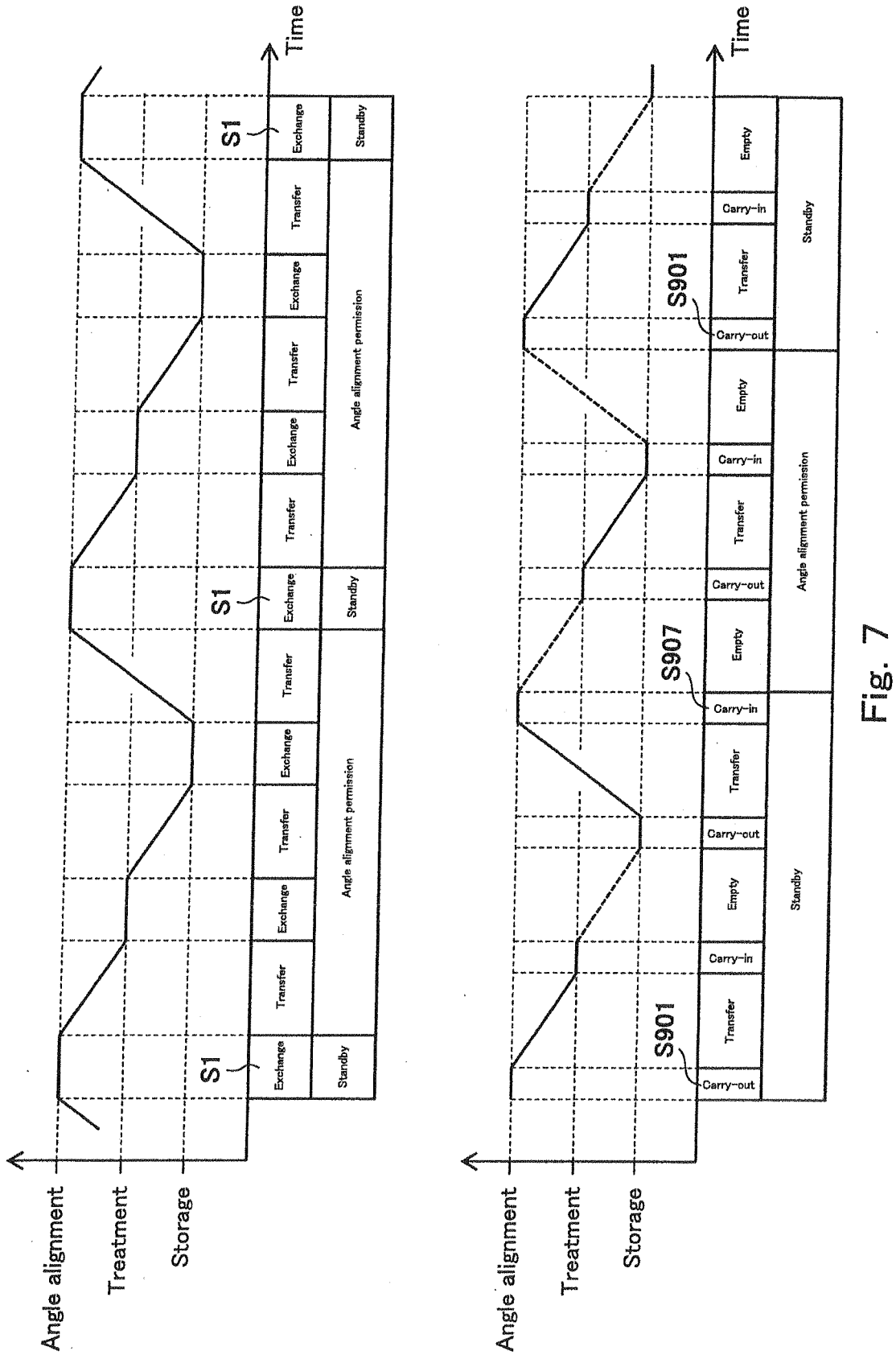
Angle alignment
Treatment
Storage
Time
S1
S1
S1
Exchange
Transfer
Standby
Angle alignment permission
S901
S907
S901
Carry-in
Carry-out
Empty

Fig. 7

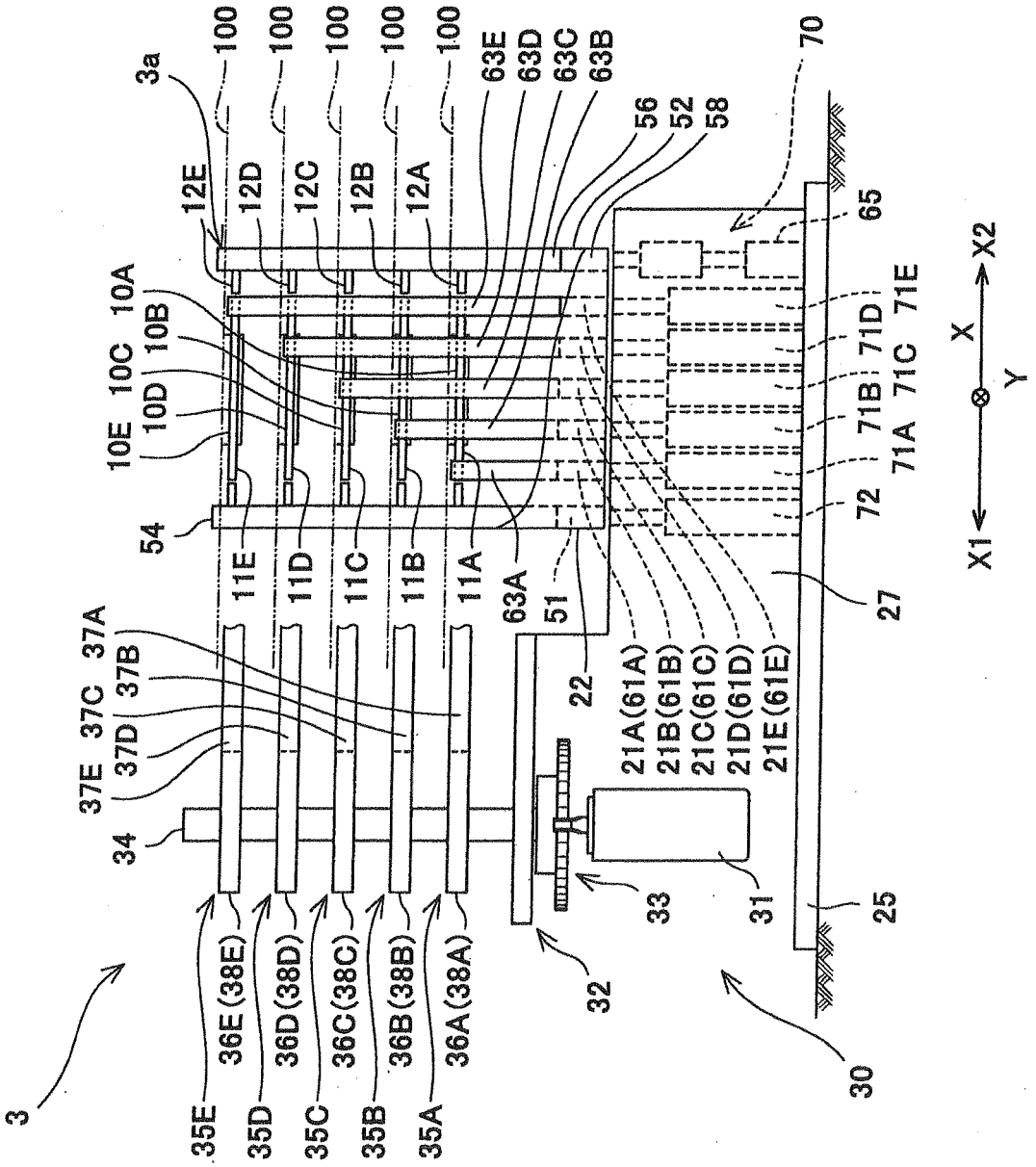
3
3a
100
12E
12D
12C
12B
12A
10A
10B
10C
10D
10E
54
11E
11D
11C
11B
11A
63E
63D
63C
63B
63A
56
52
58
70
65
71E
71D
71C
71B
71A
72
27
51
22
21A(61A)
21B(61B)
21C(61C)
21D(61D)
21E(61E)
37A
37B
37C
37D
37E
34
35E
35D
35C
35B
35A
36E(38E)
36D(38D)
36C(38C)
36B(38B)
36A(38A)
32
33
31
25
30
X
X1
X2
Y

Fig. 8

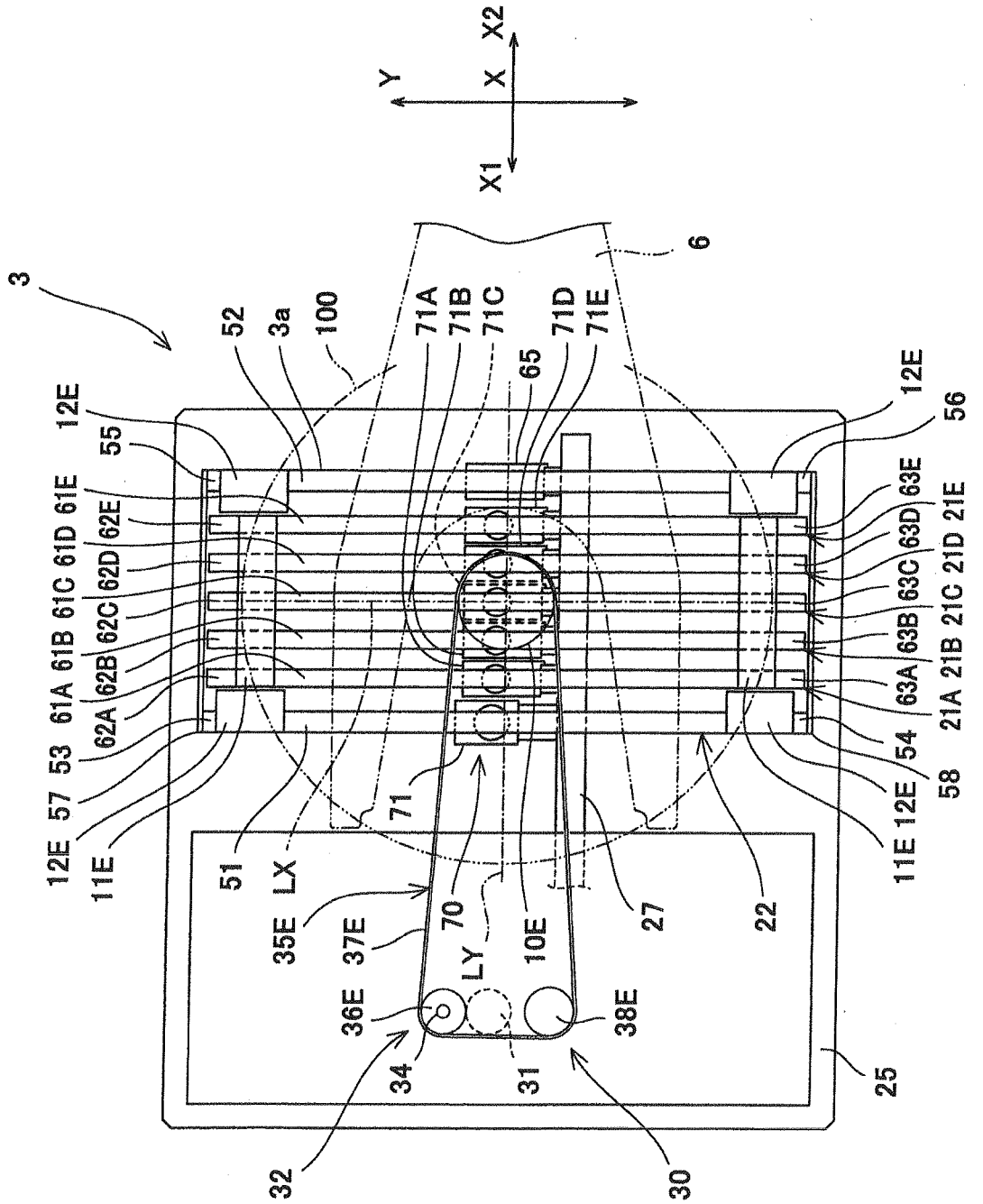
Y
X
X2
X1
3
6
52
3a
100
71A
71B
71C
65
71D
71E
12E
55
61E
62E
61D
62D
61C
62C
61B
62B
61A
62A
53
57
12E
11E
51
LX
35E
37E
36E
34
32
70
LY
71
10E
31
27
22
38E
30
25
56
63E
63D
63C
63B
63A
21E
21D
21C
21B
21A
54
58
11E 12E

Fig. 9

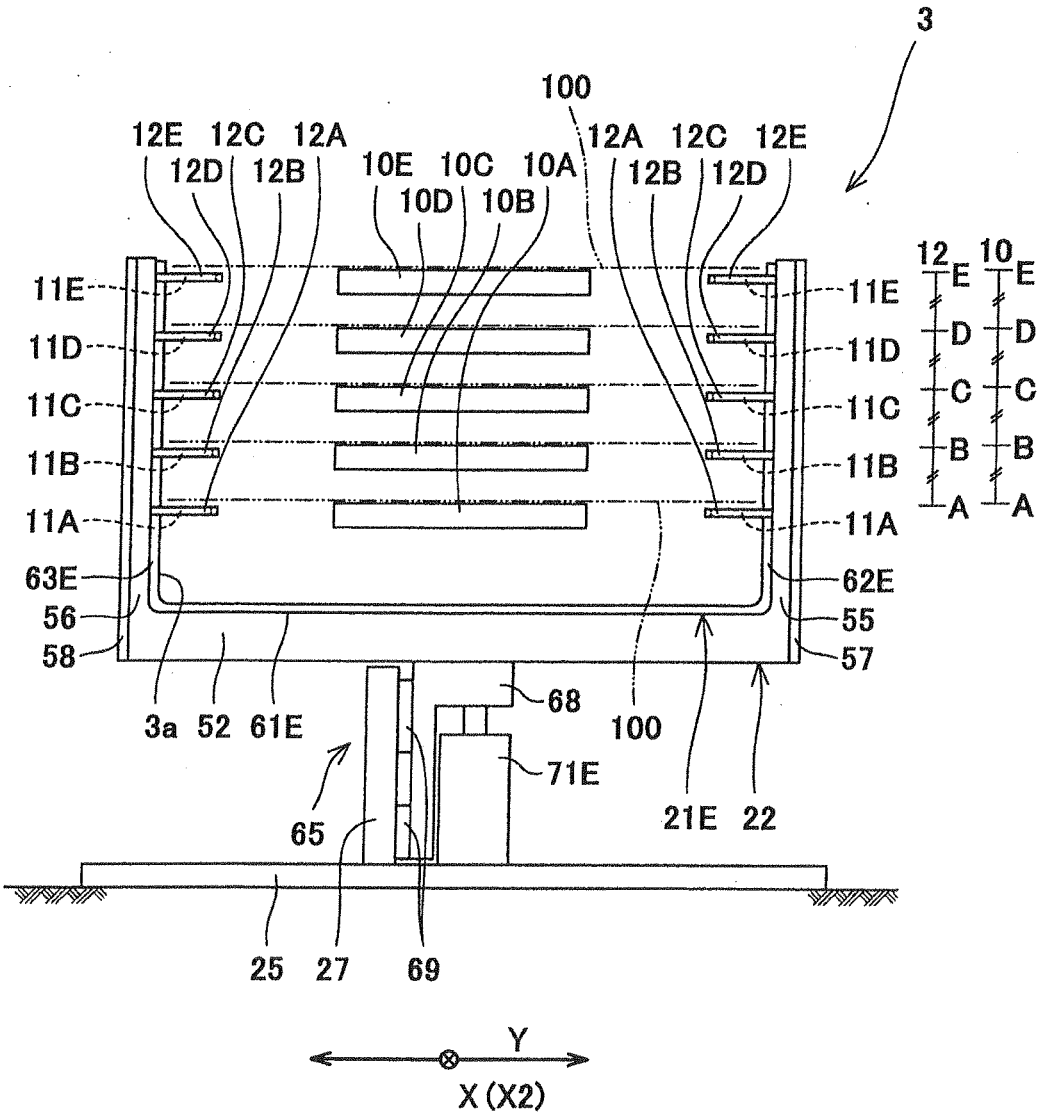
3
100
12E 12C 12A
12D 12B
10E 10C 10A
10D 10B
12A 12C 12E
12B 12D
12 E D C B A
10 E D C B A
11E
11D
11C
11B
11A
63E
56
58
62E
55
57
3a 52 61E
68
100
71E
65
21E 22
25 27 69
Y
X (X2)

Fig. 10

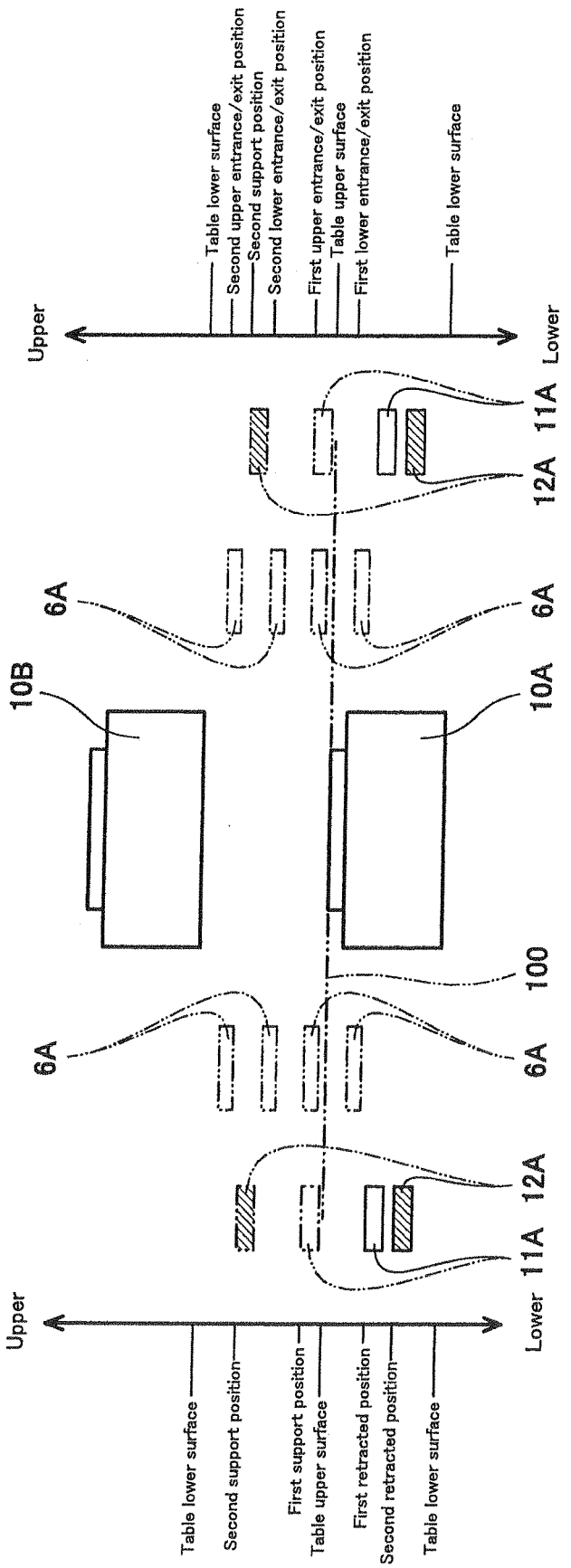
Upper
Table lower surface
Second upper entrance/exit position
Second support position
Second lower entrance/exit position
First upper entrance/exit position
Table upper surface
First lower entrance/exit position
Table lower surface
Lower
12A
11A
6A
10B
10A
100
Y
X
Upper
Table lower surface
Second support position
First support position
Table upper surface
First retracted position
Second retracted position
Table lower surface
Lower

Fig. 11

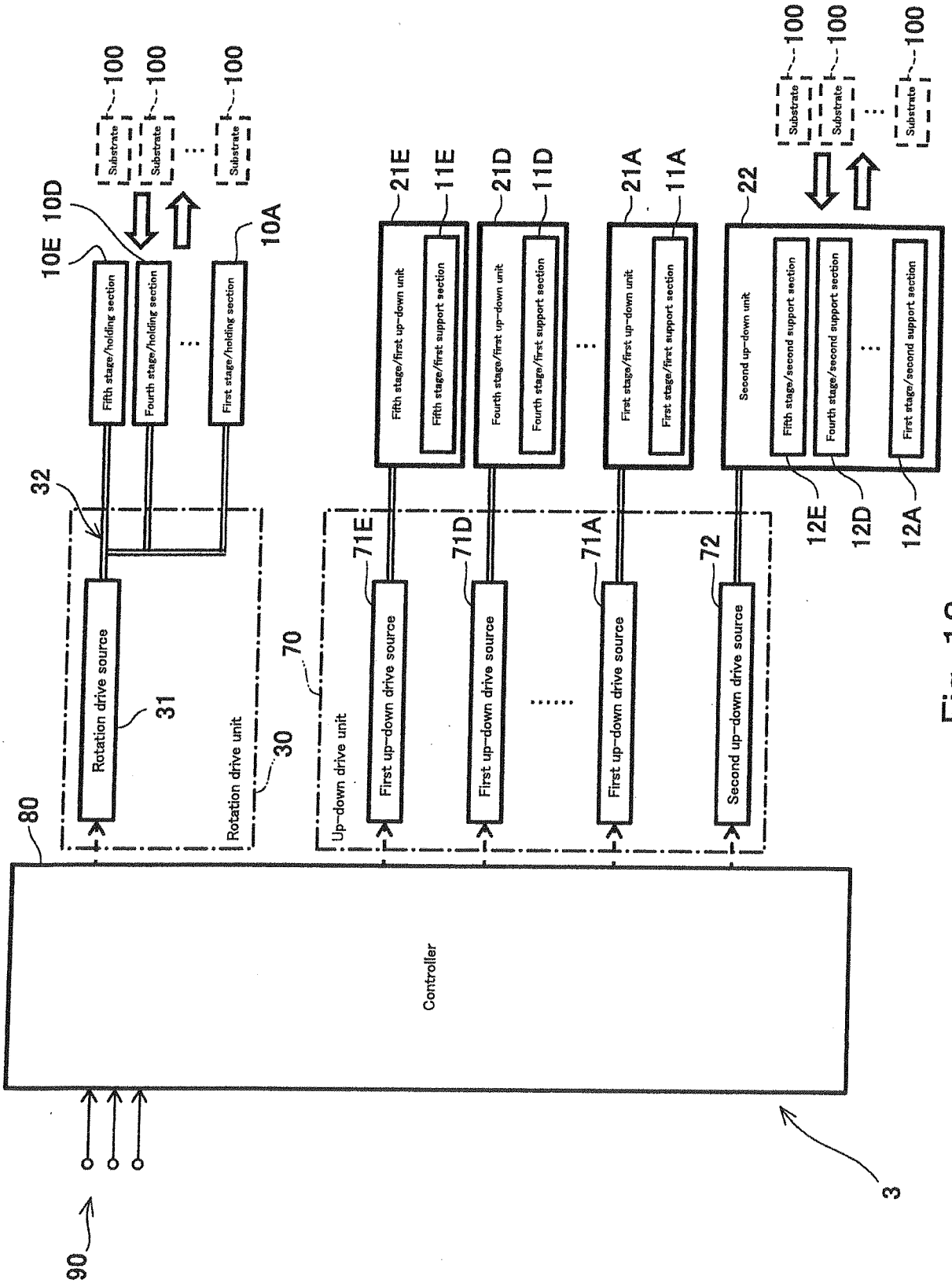
Substrate
100
10E
10D
10A
Fifth stage/holding section
Fourth stage/holding section
First stage/holding section
32
Rotation drive source
31
Rotation drive unit
30
80
Controller
90
3
70
Up-down drive unit
71E
71D
71A
72
First up-down drive source
Second up-down drive source
21E
11E
21D
11D
21A
11A
22
Fifth stage/first up-down unit
Fifth stage/first support section
Fourth stage/first up-down unit
Fourth stage/first support section
First stage/first up-down unit
First stage/first support section
Second up-down unit
Fifth stage/second support section
Fourth stage/second support section
First stage/second support section
12E
12D
12A

Fig. 12

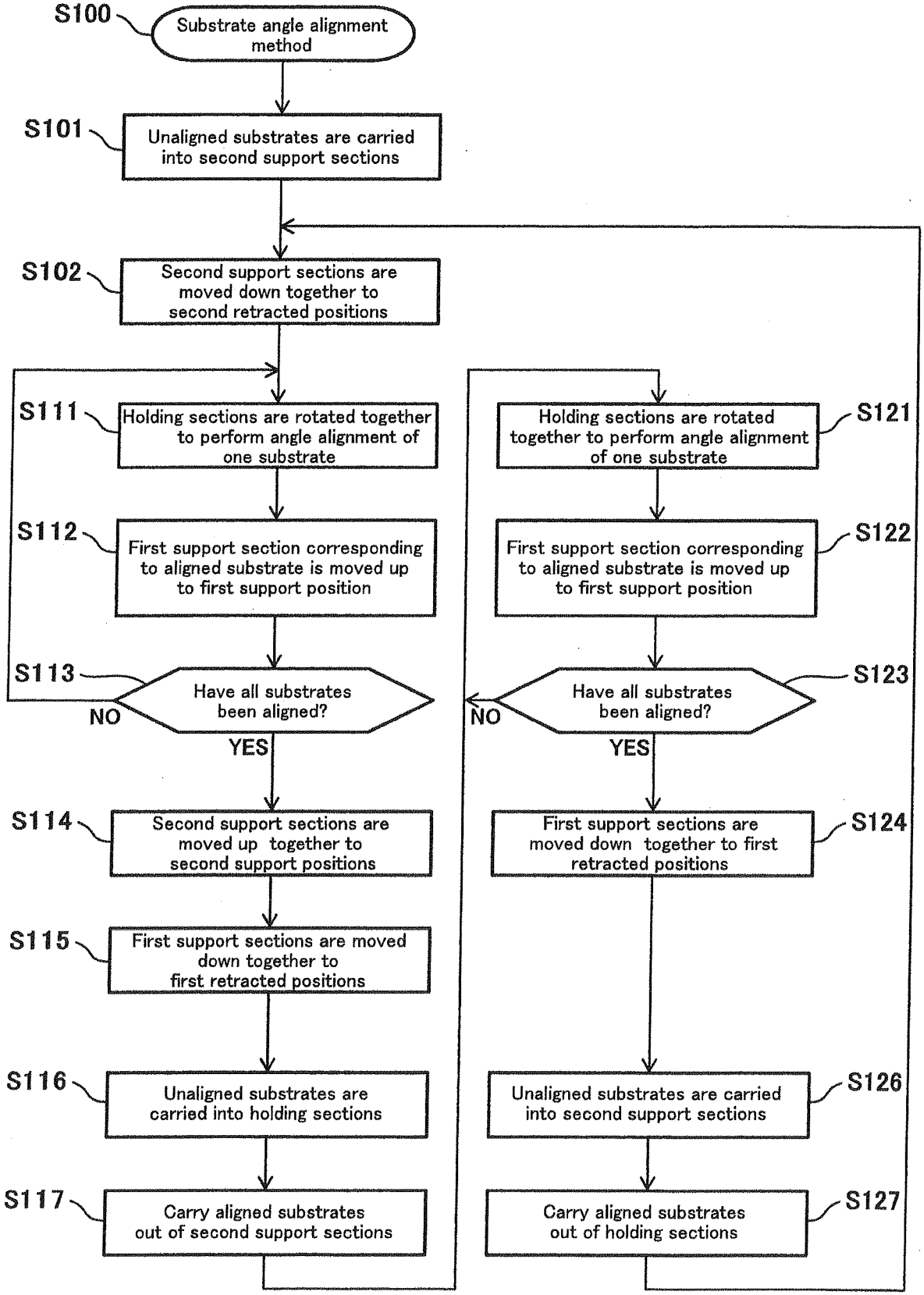
S100
Substrate angle alignment method
S101
Unaligned substrates are carried into second support sections
S102
Second support sections are moved down together to second retracted positions
S111
Holding sections are rotated together to perform angle alignment of one substrate
S112
First support section corresponding to aligned substrate is moved up to first support position
S113
Have all substrates been aligned?
NO
YES
S114
Second support sections are moved up together to second support positions
S115
First support sections are moved down together to first retracted positions
S116
Unaligned substrates are carried into holding sections
S117
Carry aligned substrates out of second support sections
S121
Holding sections are rotated together to perform angle alignment of one substrate
S122
First support section corresponding to aligned substrate is moved up to first support position
S123
Have all substrates been aligned?
NO
YES
S124
First support sections are moved down together to first retracted positions
S126
Unaligned substrates are carried into second support sections
S127
Carry aligned substrates out of holding sections

Fig. 13

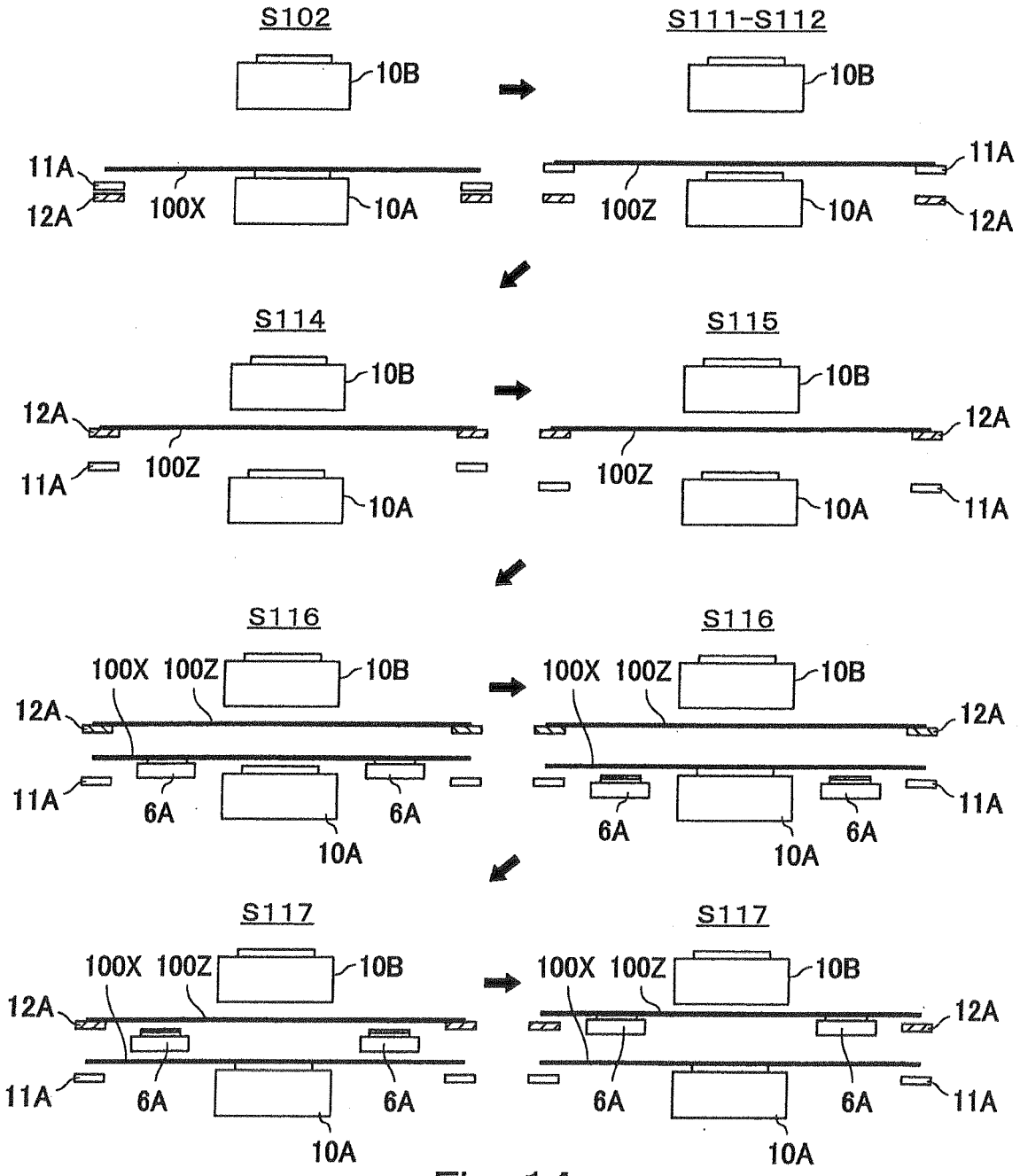
S102
10B
11A
12A
100X
10A
S111-S112
10B
11A
100Z
10A
12A
S114
10B
12A
11A
100Z
10A
S115
10B
12A
100Z
10A
11A
S116
100X 100Z
10B
12A
11A
6A
6A
10A
S116
100X 100Z
10B
12A
11A
6A
6A
10A
S117
100X 100Z
10B
12A
11A
6A
6A
10A
S117
100X 100Z
10B
12A
11A
6A
6A
10A

Fig. 14

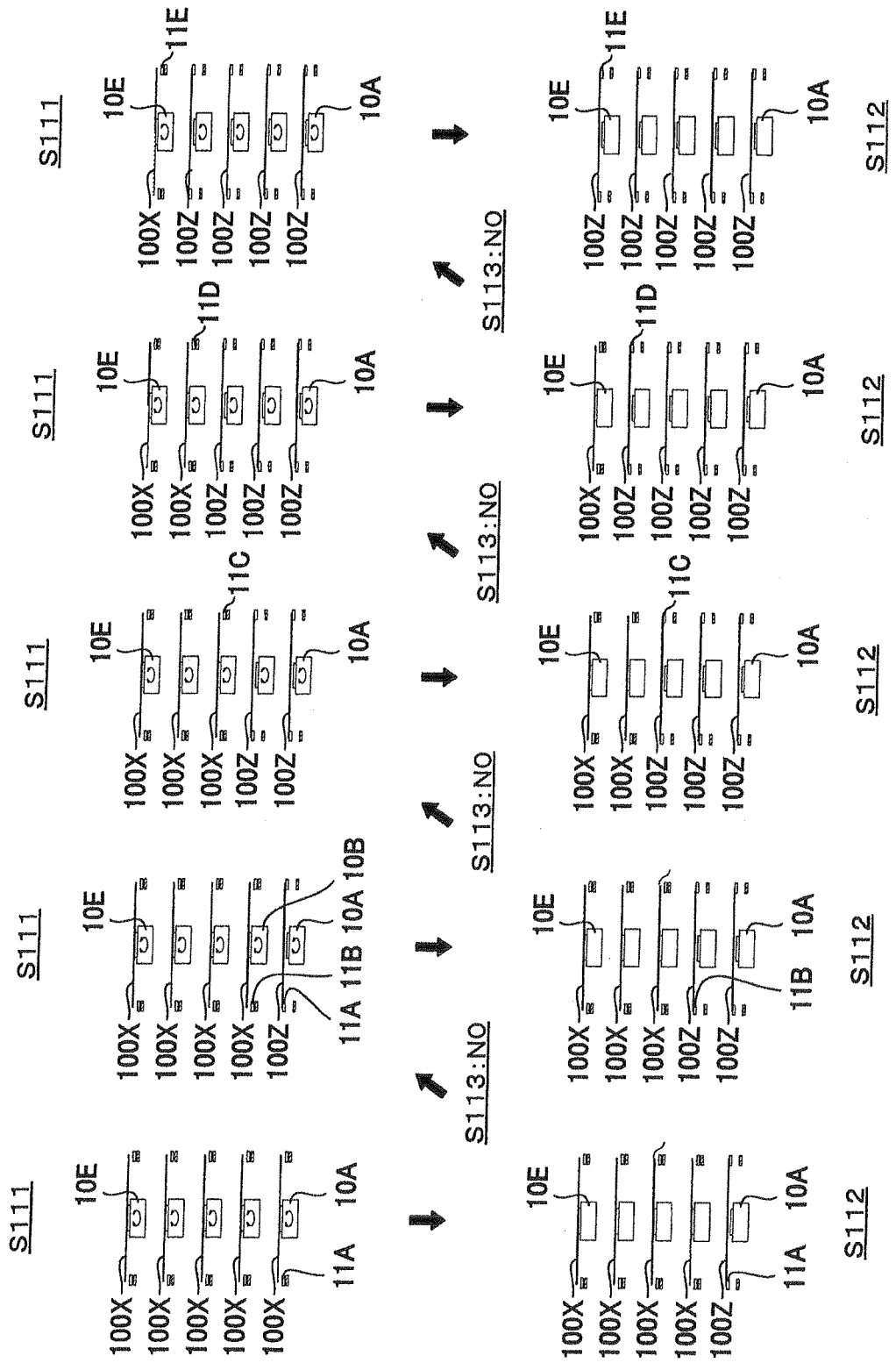

Fig. 15

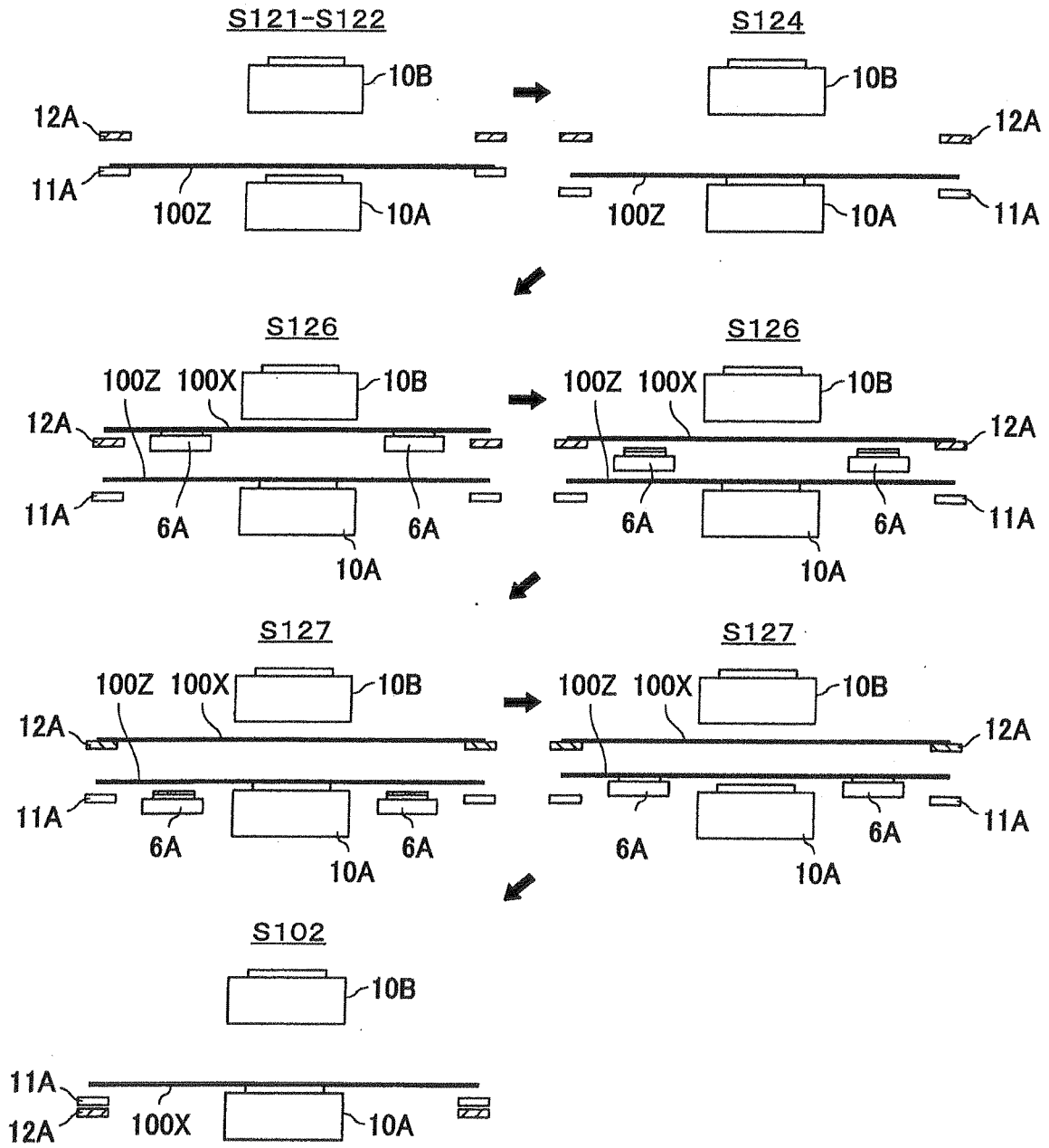
S121-S122
10B
12A
11A
100Z
10A
S124
10B
12A
100Z
10A
11A
S126
100Z
100X
10B
12A
11A
6A
6A
10A
S126
100Z
100X
10B
12A
6A
6A
11A
10A
S127
100Z
100X
10B
12A
11A
6A
6A
10A
S127
100Z
100X
10B
12A
6A
6A
11A
10A
S102
10B
11A
12A
100X
10A

Fig. 16

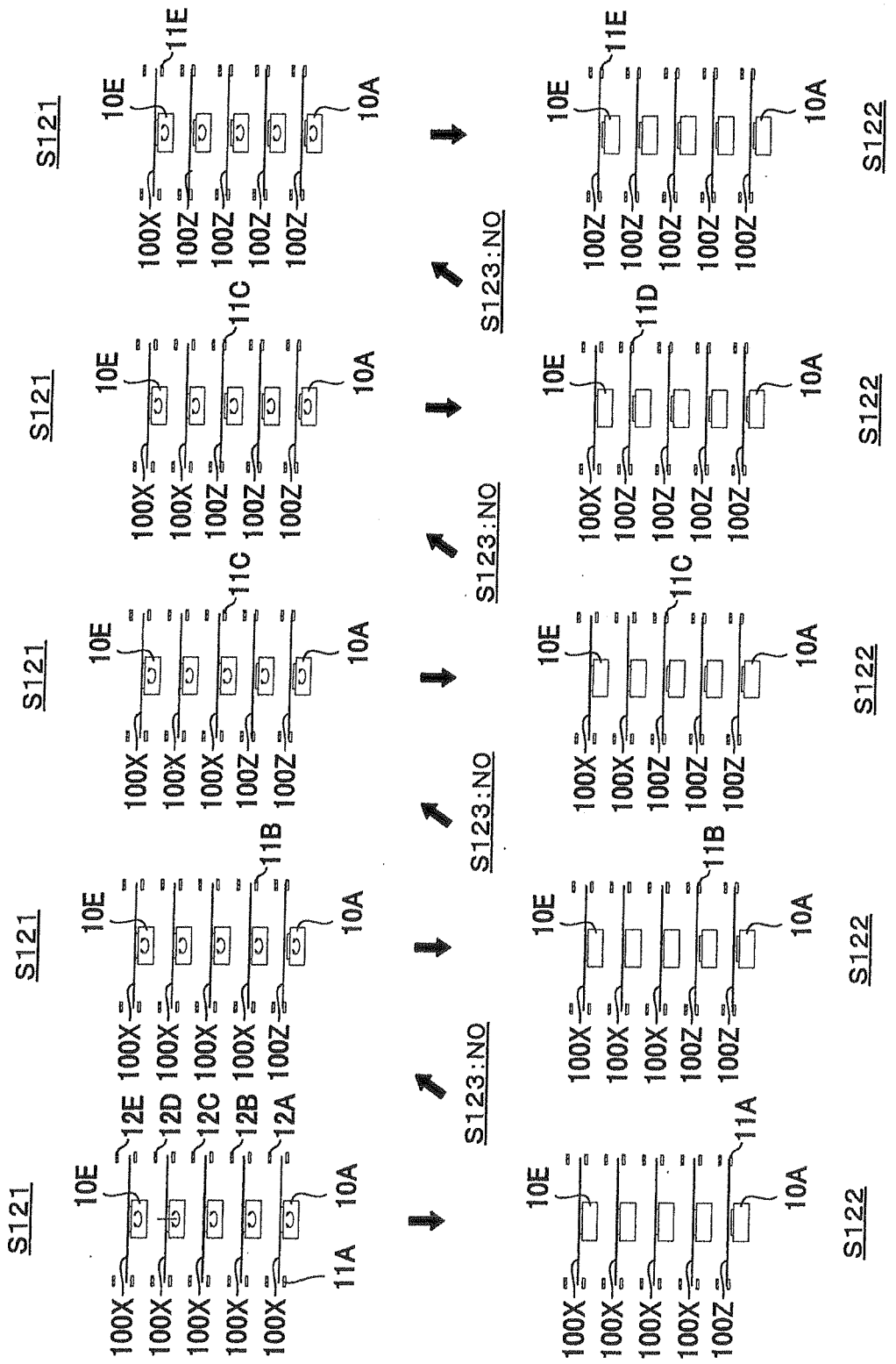
S121
S122
S123:NO
10E
10A
11A
11B
11C
11D
11E
12A
12B
12C
12D
12E
100X
100Z

Fig. 17

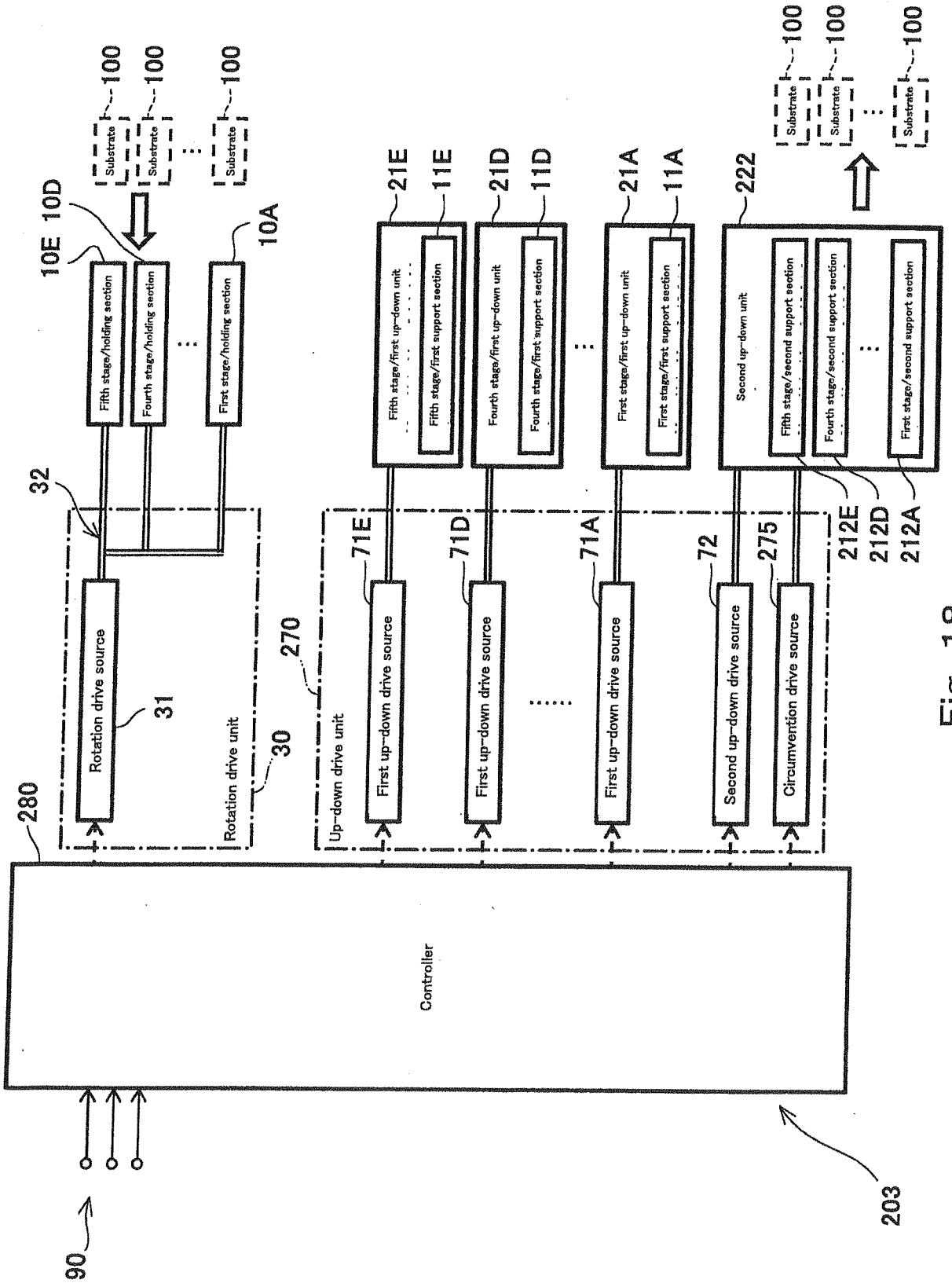
90
280
Controller
203
Rotation drive unit
30
Rotation drive source
31
32
Fifth stage/holding section
Fourth stage/holding section
First stage/holding section
10E
10D
10A
Substrate
100
Up-down drive unit
270
First up-down drive source
71E
71D
71A
Second up-down drive source
72
Circumvention drive source
275
Fifth stage/first up-down unit
Fifth stage/first support section
21E
11E
Fourth stage/first up-down unit
Fourth stage/first support section
21D
11D
First stage/first up-down unit
First stage/first support section
21A
11A
Second up-down unit
222
Fifth stage/second support section
Fourth stage/second support section
First stage/second support section
212E
212D
212A

Fig. 18

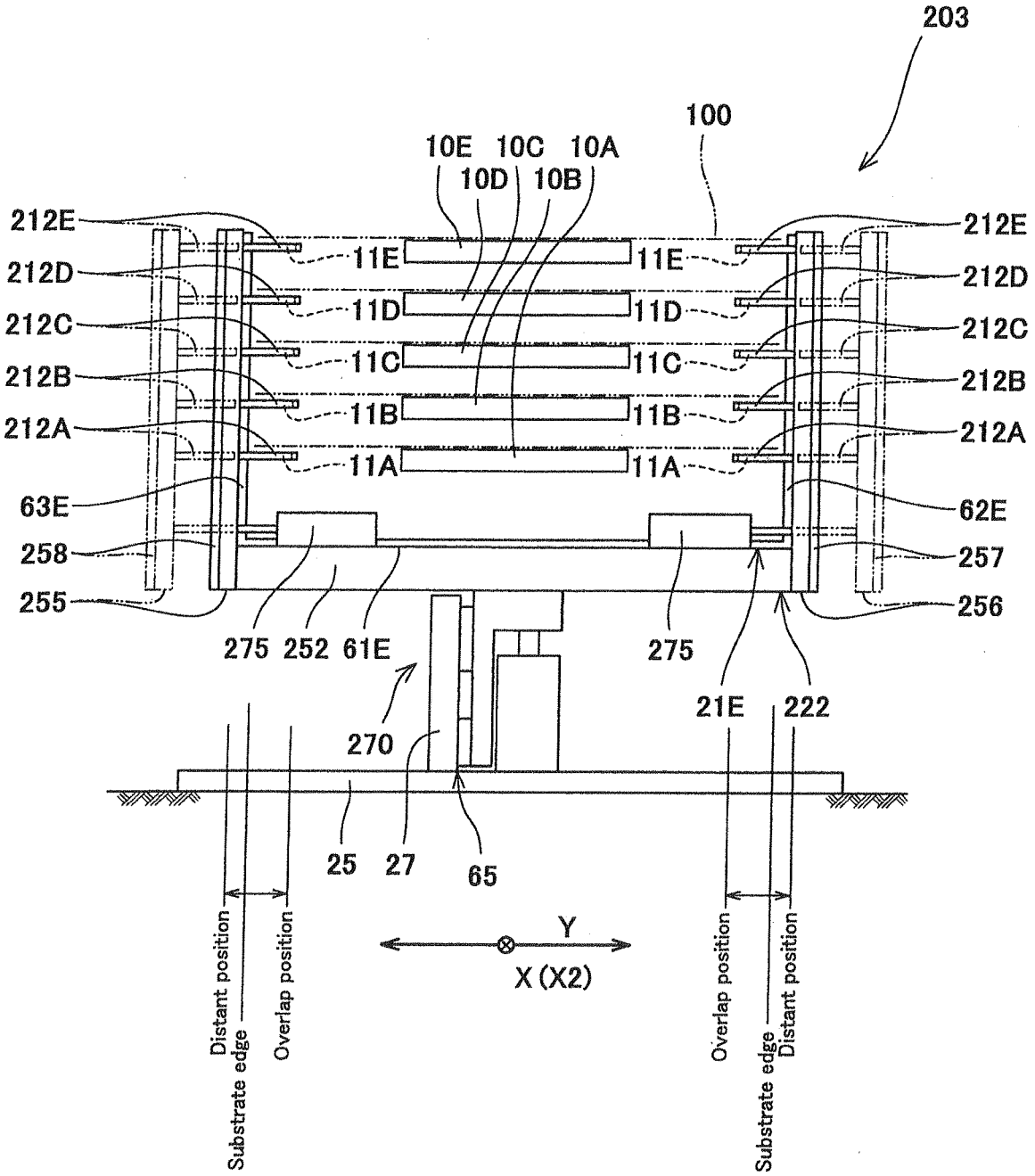
203
100
10E
10C
10A
10D
10B
212E
212D
212C
212B
212A
11E
11D
11C
11B
11A
63E
258
255
62E
257
256
275
252
61E
275
21E
222
270
25
27
65
Y
X (X2)
Distant position
Substrate edge
Overlap position
Overlap position
Substrate edge
Distant position

Fig. 19

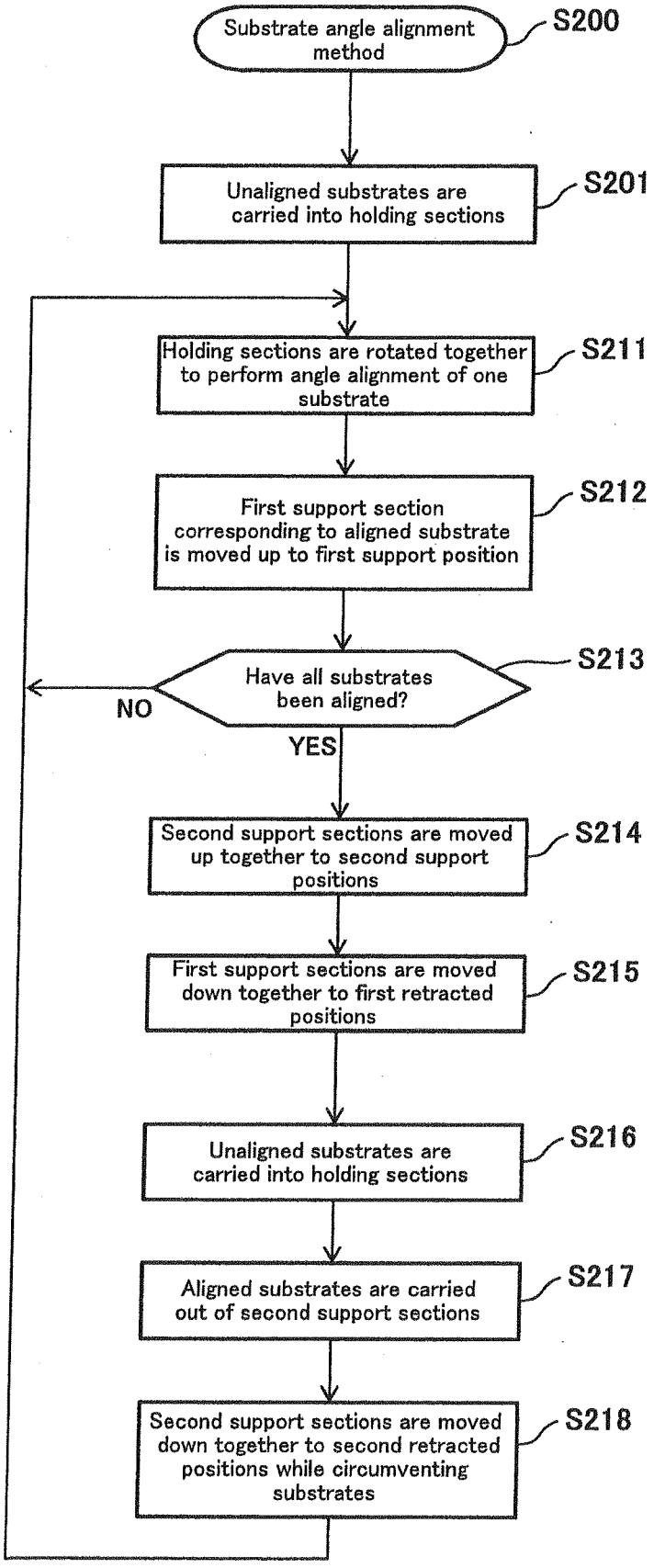
Substrate angle alignment method
S200
Unaligned substrates are carried into holding sections
S201
Holding sections are rotated together to perform angle alignment of one substrate
S211
First support section corresponding to aligned substrate is moved up to first support position
S212
Have all substrates been aligned?
S213
NO
YES
Second support sections are moved up together to second support positions
S214
First support sections are moved down together to first retracted positions
S215
Unaligned substrates are carried into holding sections
S216
Aligned substrates are carried out of second support sections
S217
Second support sections are moved down together to second retracted positions while circumventing substrates
S218

Fig. 20

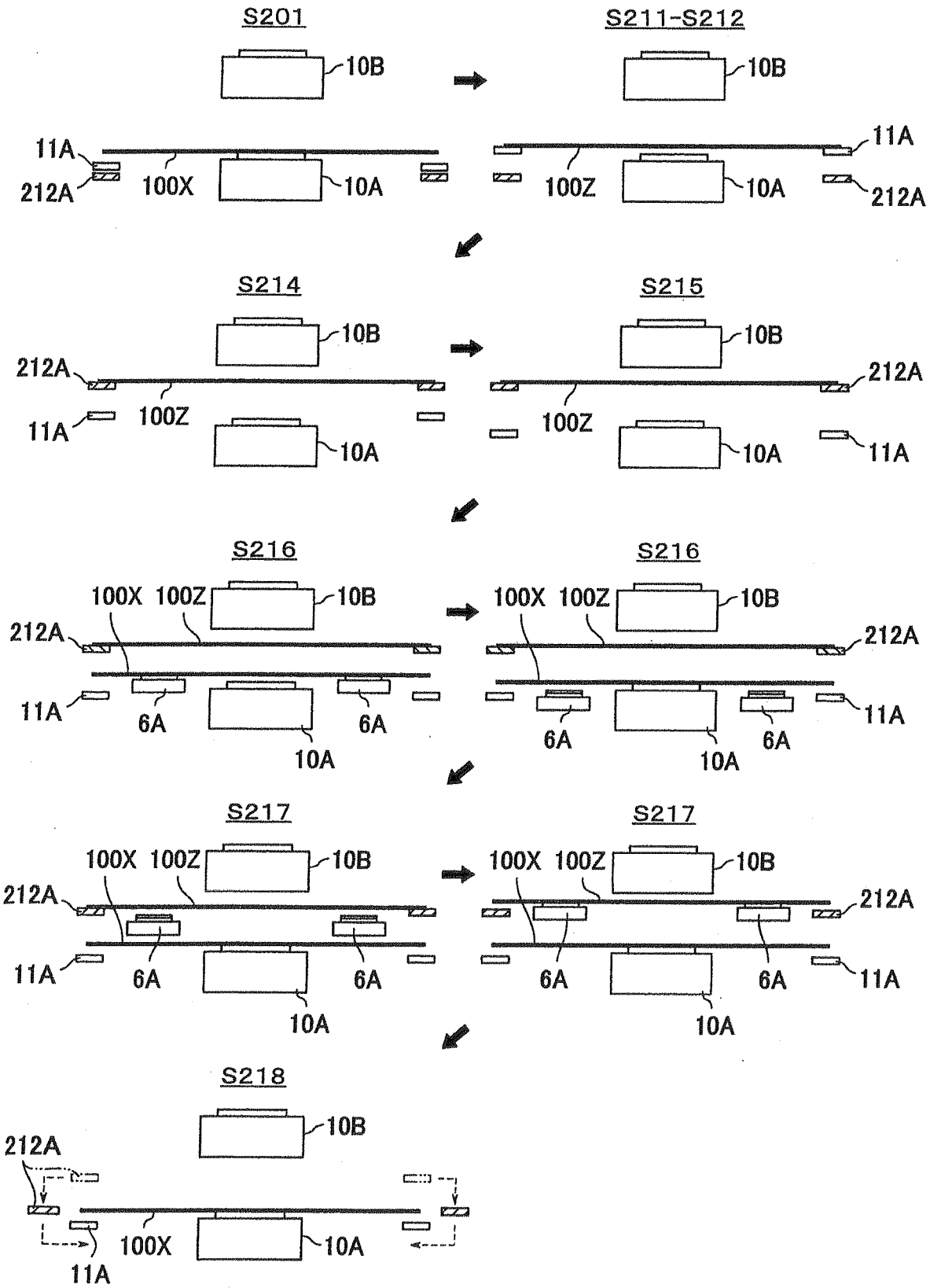
S201
10B
11A
212A
100X
10A
S211-S212
10B
11A
100Z
10A
212A
S214
10B
212A
11A
100Z
10A
S215
10B
212A
100Z
10A
11A
S216
100X 100Z
10B
212A
11A
6A
6A
10A
S216
100X 100Z
10B
212A
6A
6A
10A
11A
S217
100X 100Z
10B
212A
11A
6A
6A
10A
S217
100X 100Z
10B
212A
6A
6A
10A
11A
S218
10B
212A
100X
10A
11A

Fig. 21