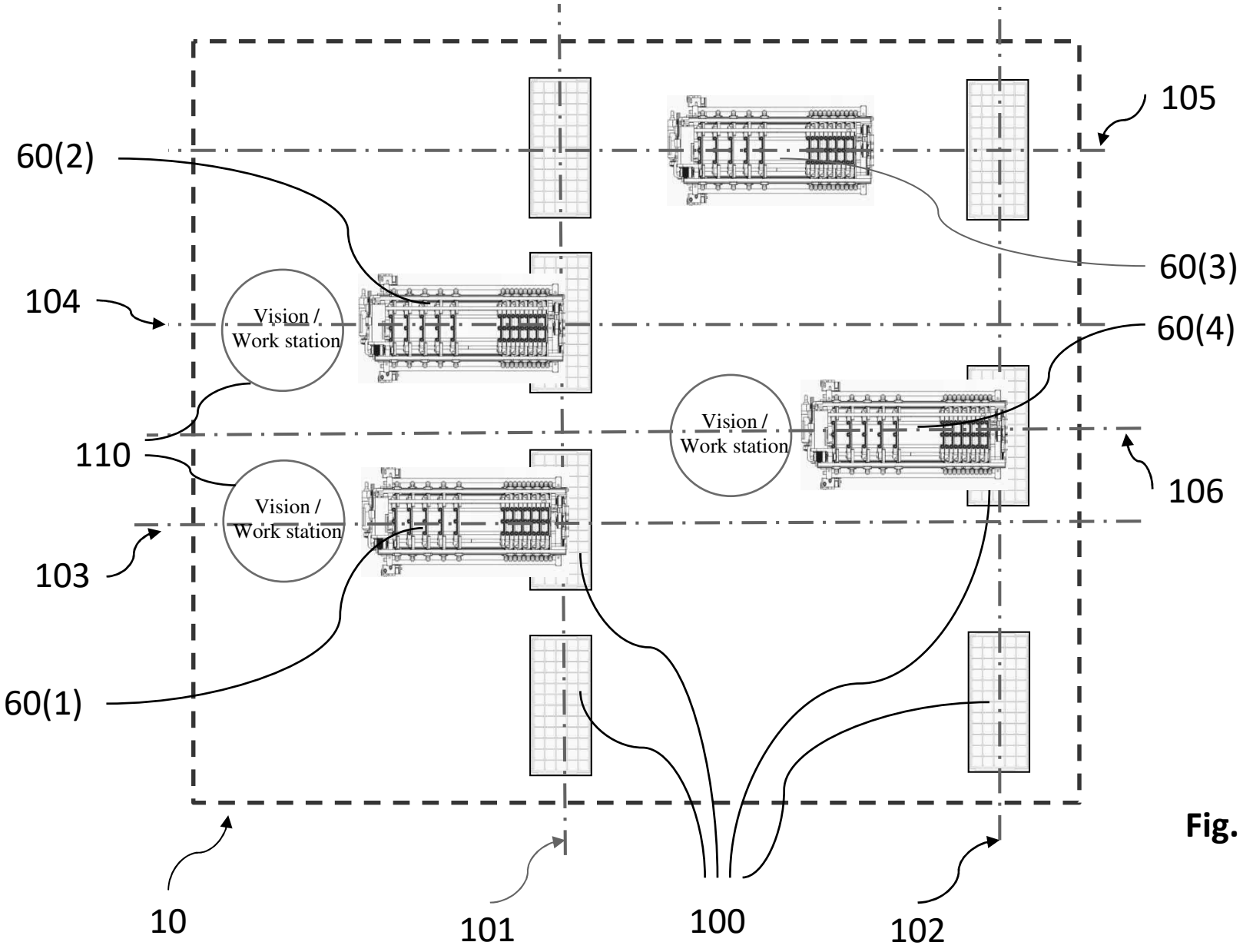

60(2)
105
60(3)
104
Vision /
Work station
60(4)
110
Vision /
Work station
106
Vision /
Work station
103
60(1)
10
101
100
102

Fig. 1

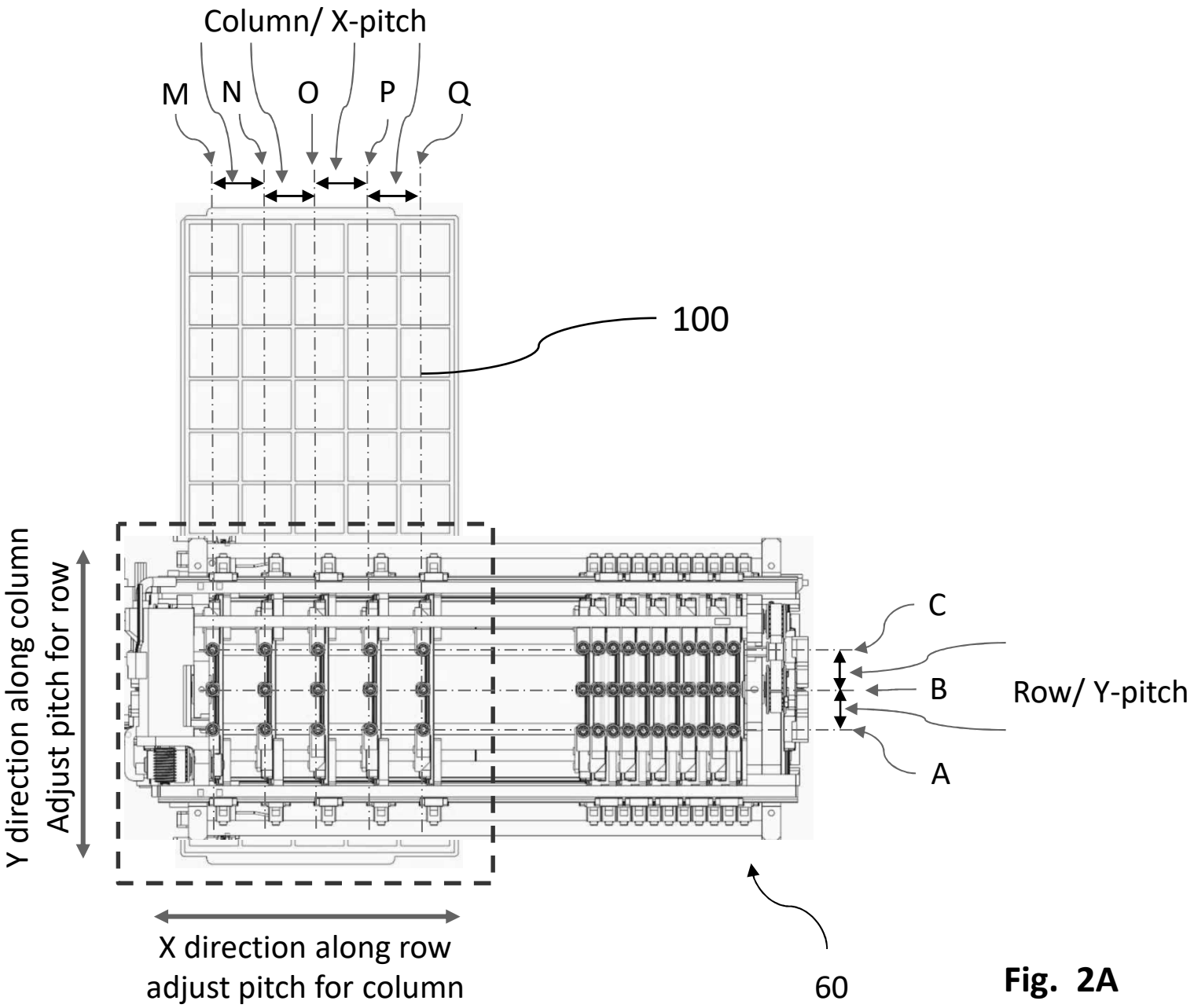

Column/ X-pitch
M
N
O
P
Q
100
C
B
A
Row/ Y-pitch
Y direction along column
Adjust pitch for row
X direction along row
adjust pitch for column
60

Fig. 2A

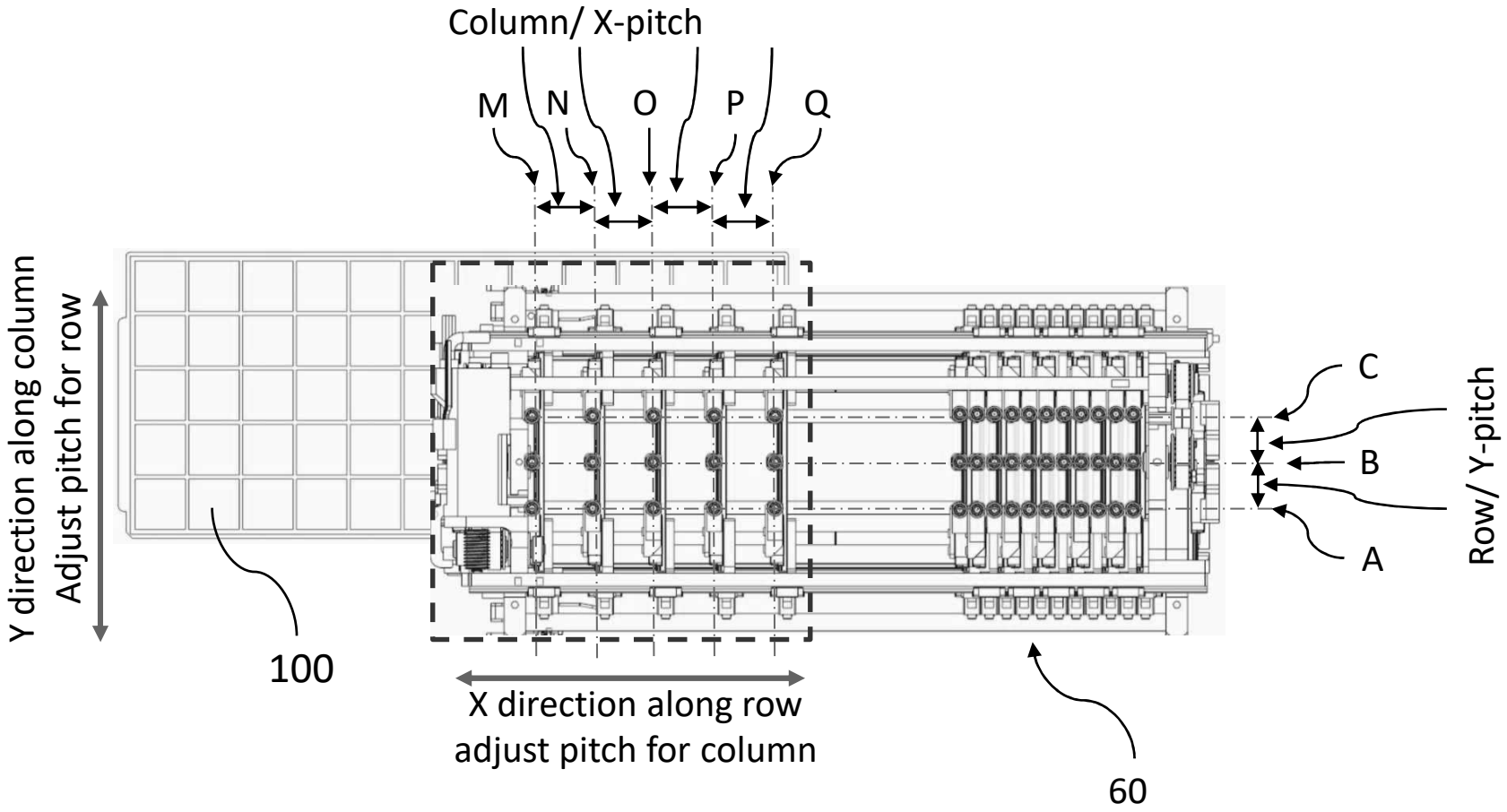

Column/ X-pitch
M
N
O
P
Q
Y direction along column
Adjust pitch for row
100
X direction along row
adjust pitch for column
60
C
B
A
Row/ Y-pitch

Fig. 2B

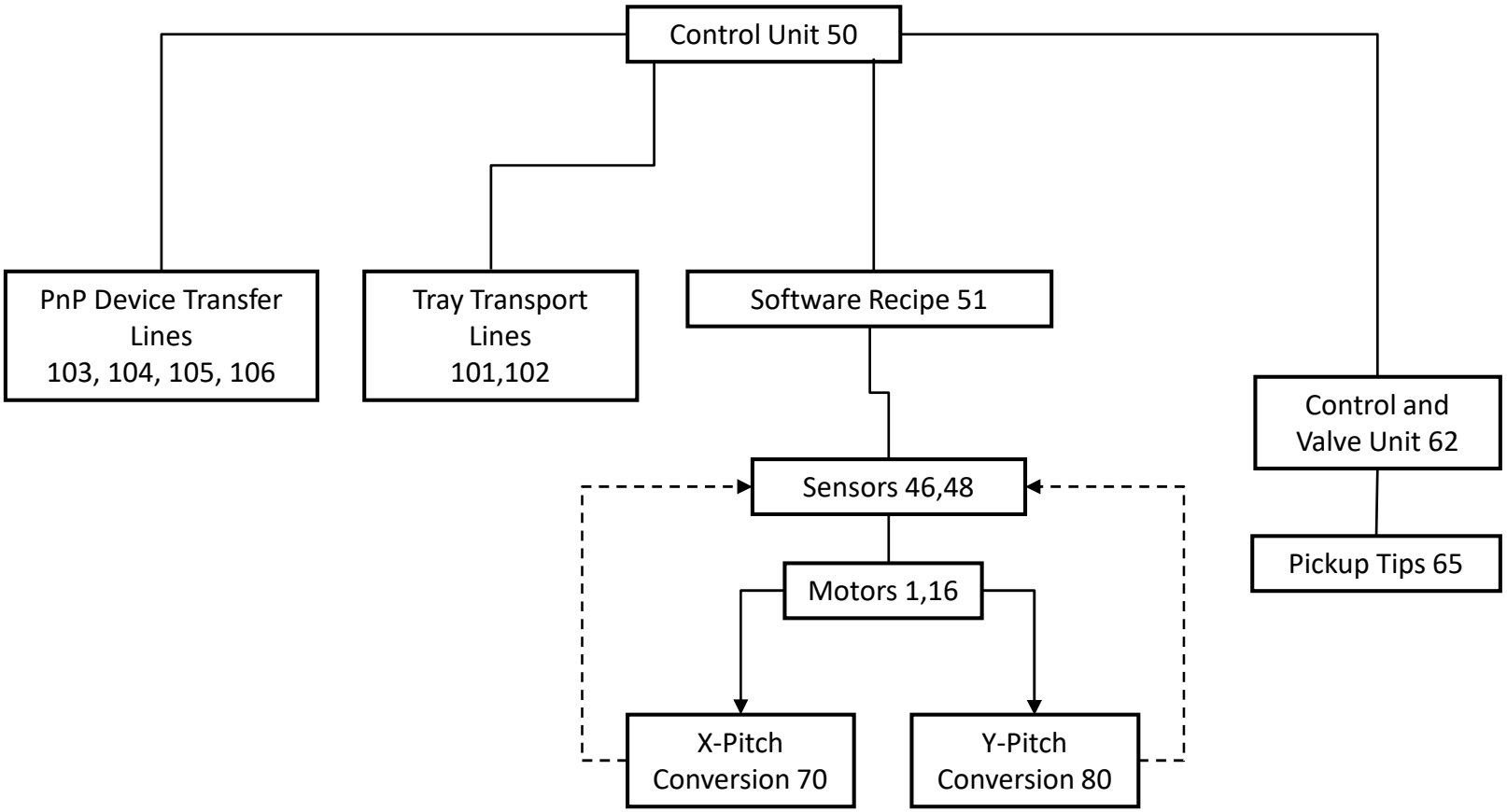

Control Unit 50
PnP Device Transfer Lines 103, 104, 105, 106
Tray Transport Lines 101,102
Software Recipe 51
Control and Valve Unit 62
Sensors 46,48
Pickup Tips 65
Motors 1,16
X-Pitch Conversion 70
Y-Pitch Conversion 80

FIG. 3

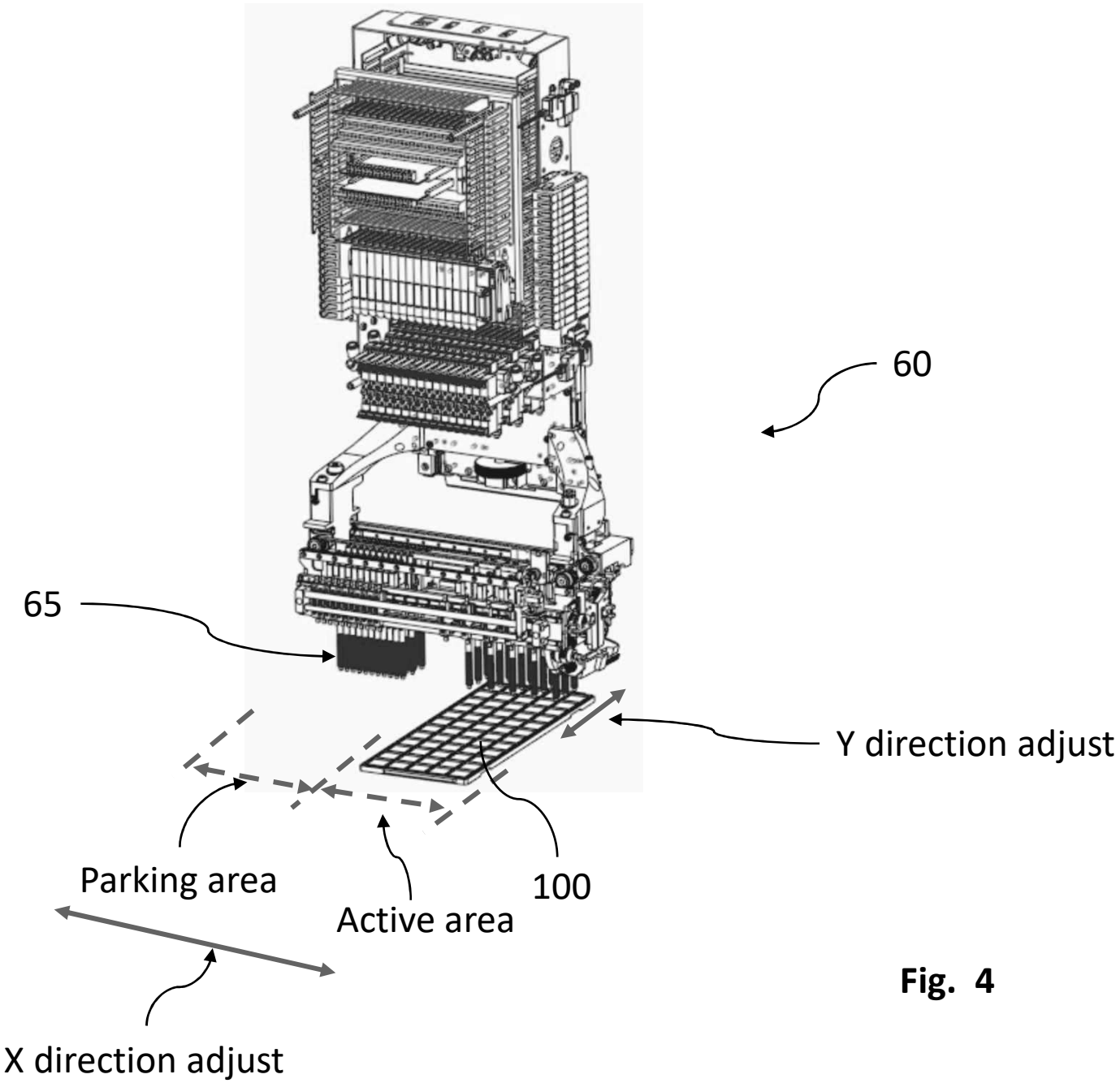

60
65
Y direction adjust
Parking area
Active area
100
X direction adjust

Fig. 4

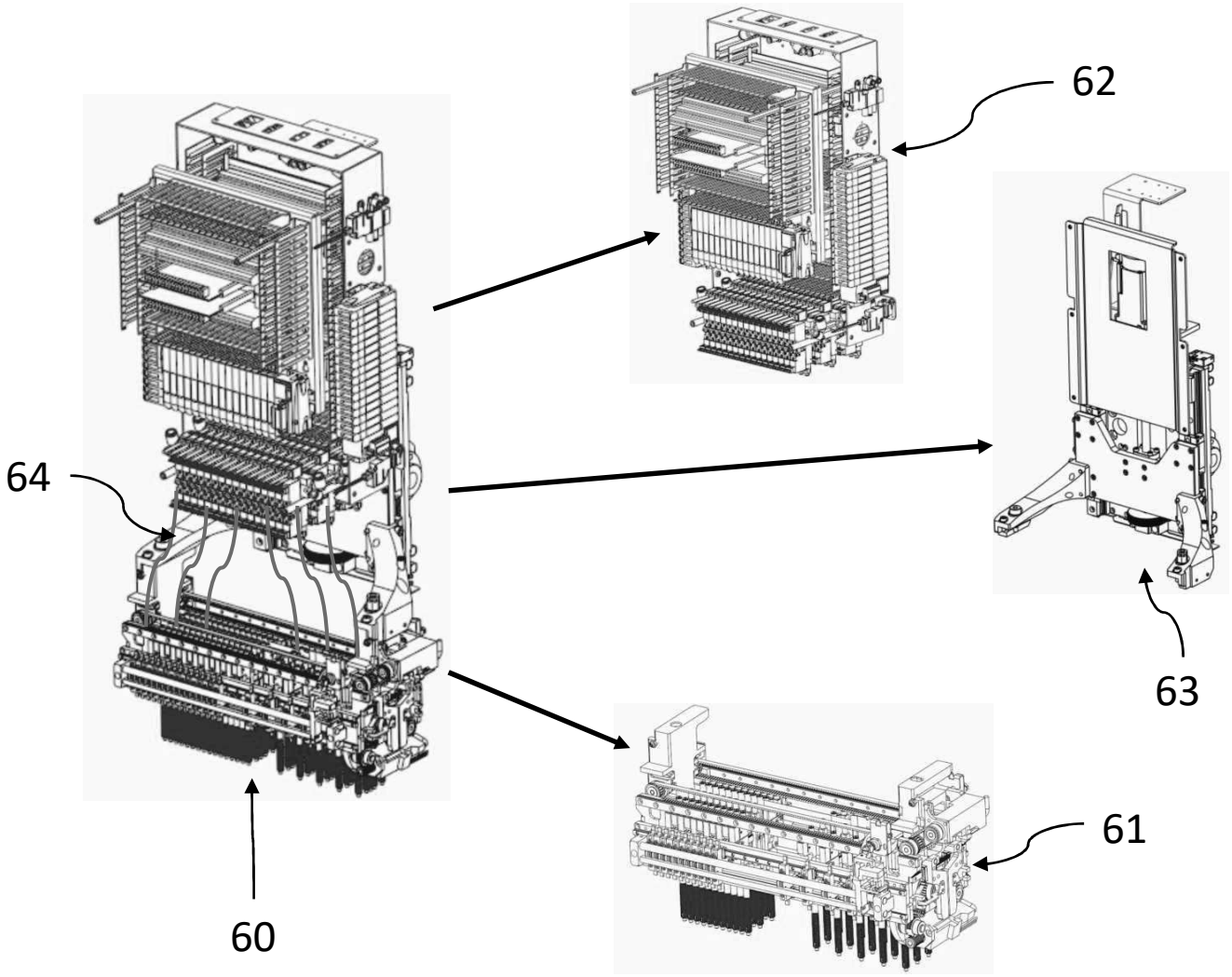


Fig. 5

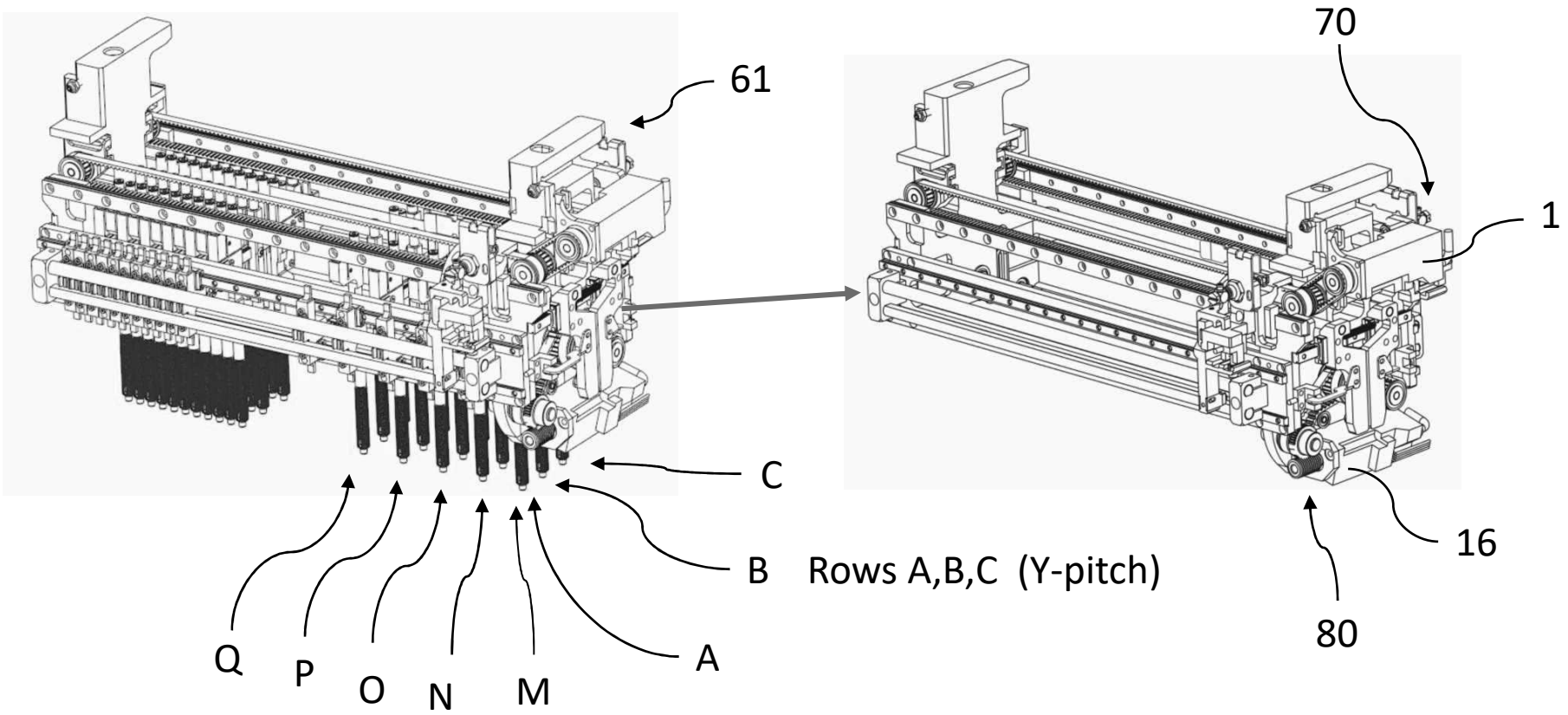


Fig. 6

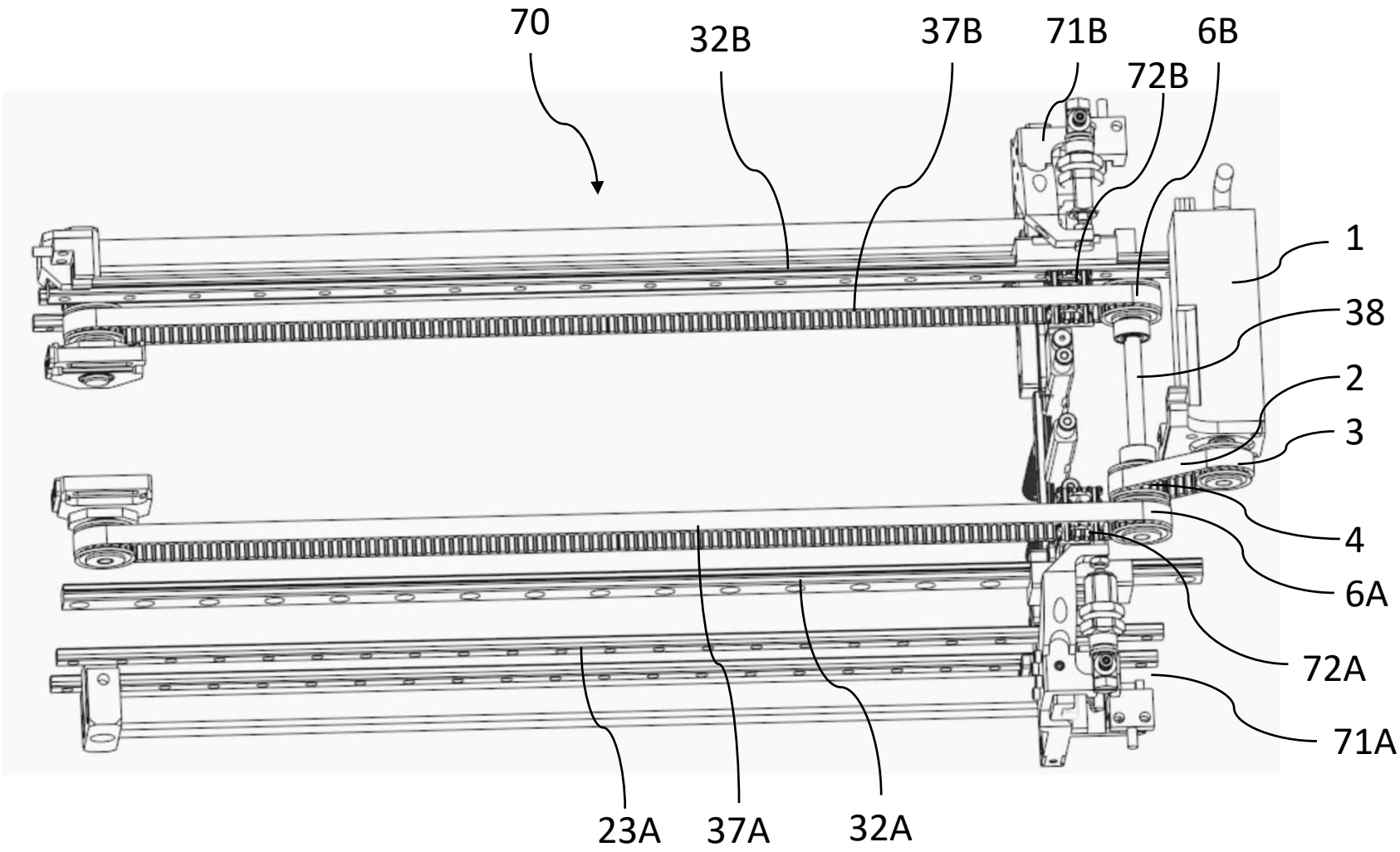


Fig 7

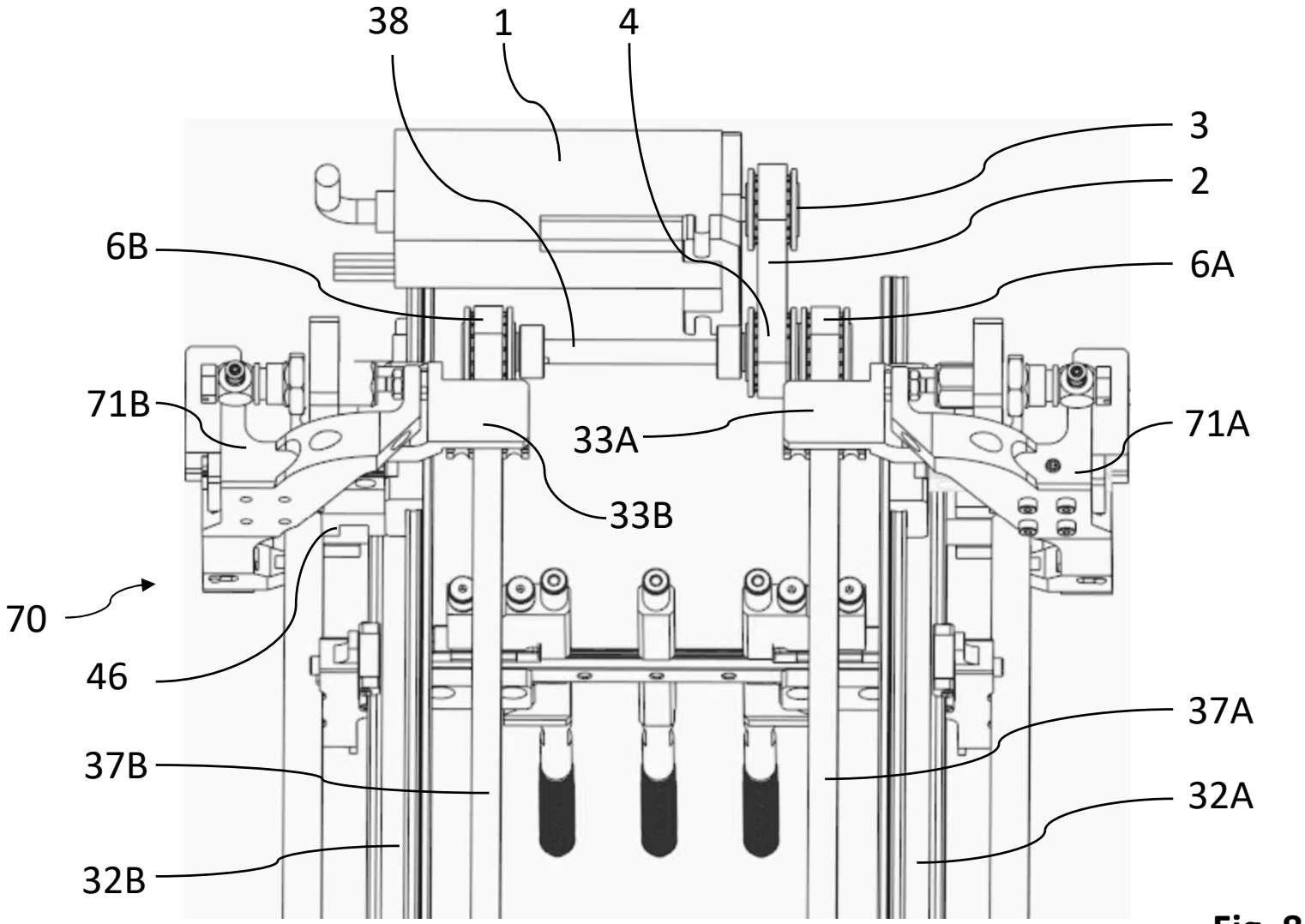


Fig. 8

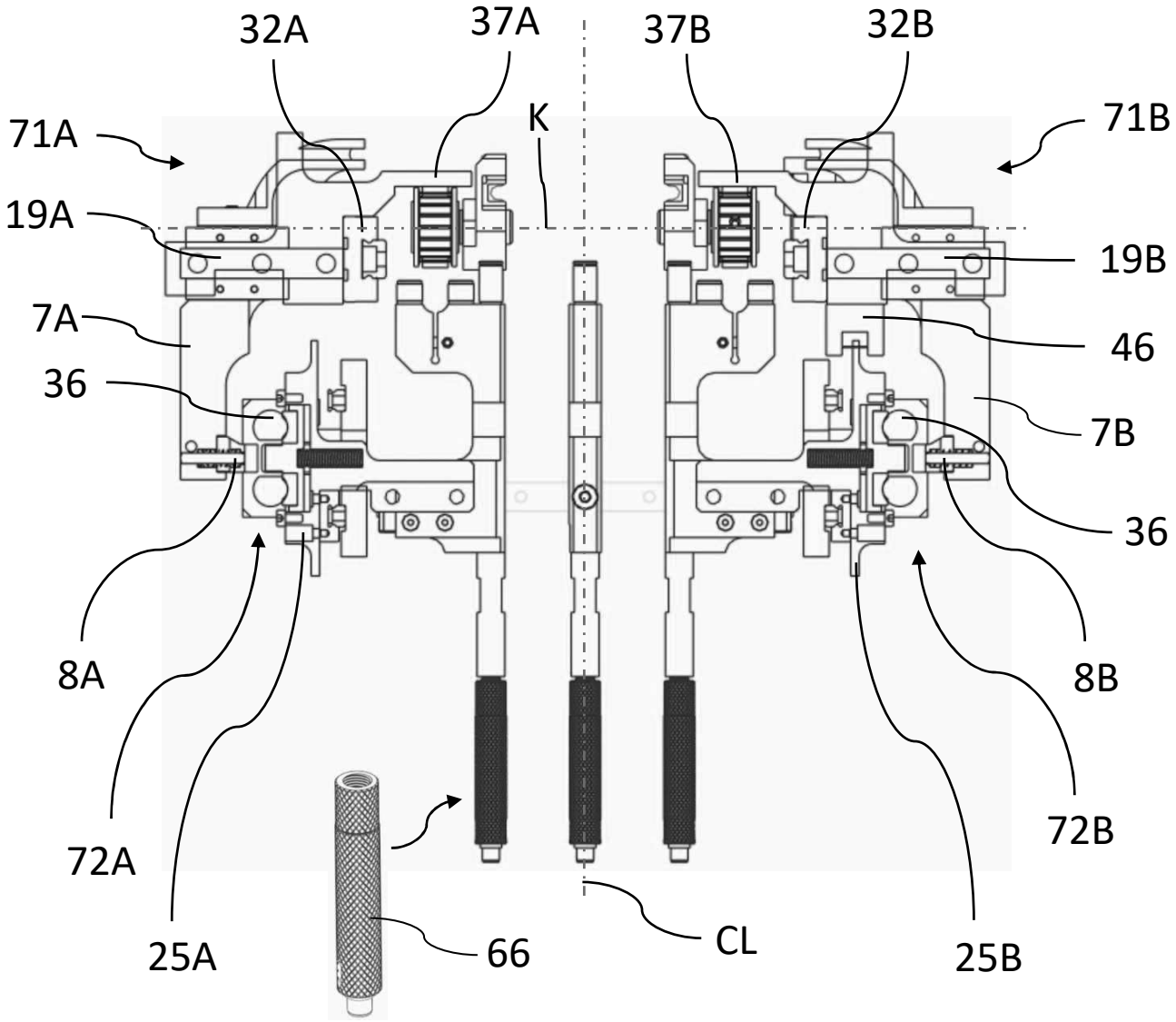

32A
37A
37B
32B
71A
K
71B
19A
19B
7A
46
36
7B
36
8A
8B
72A
72B
25A
66
CL
25B

Fig. 9

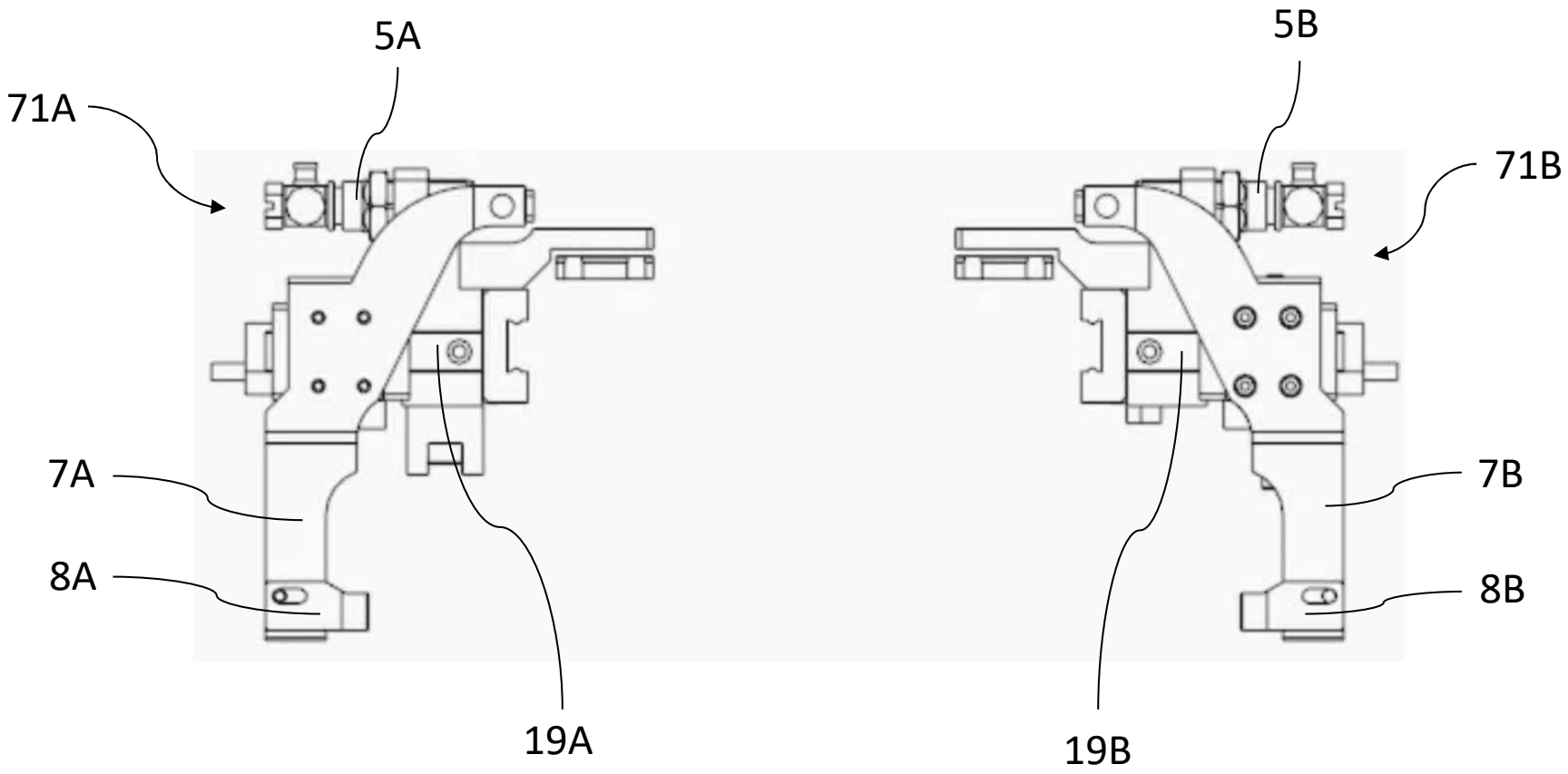


Fig. 10A

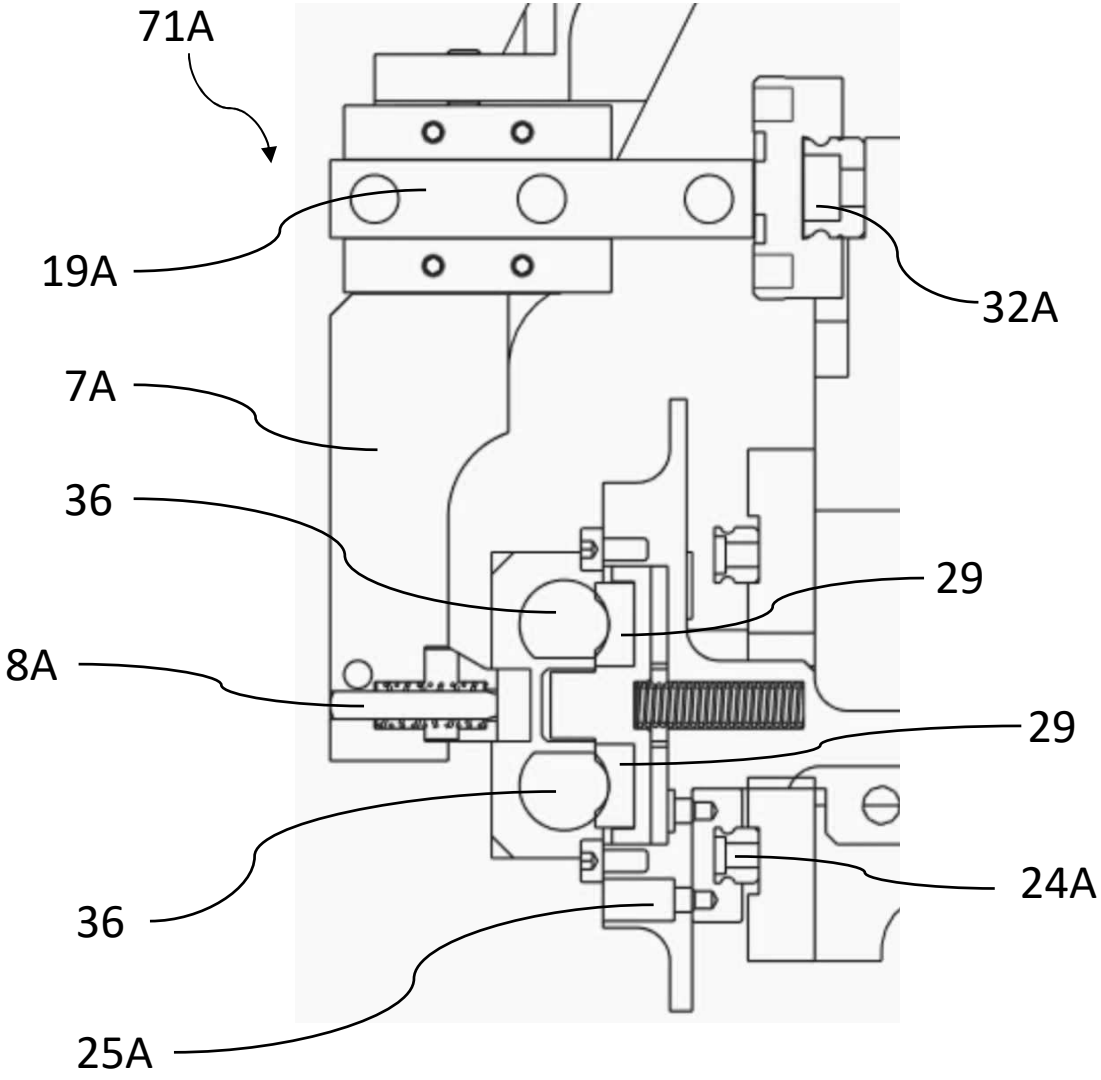


Fig. 10B

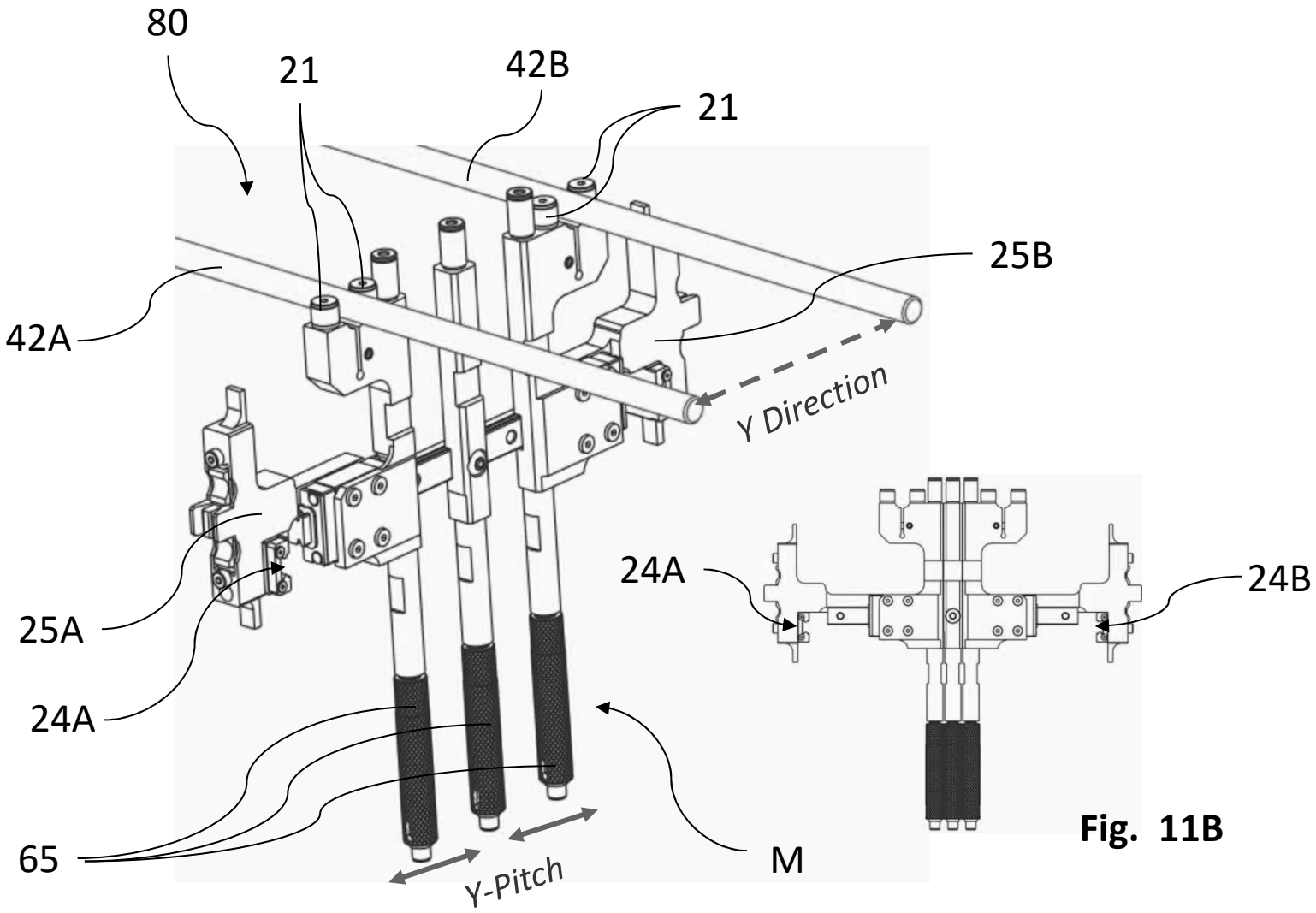


Fig. 11B

Fig. 11A

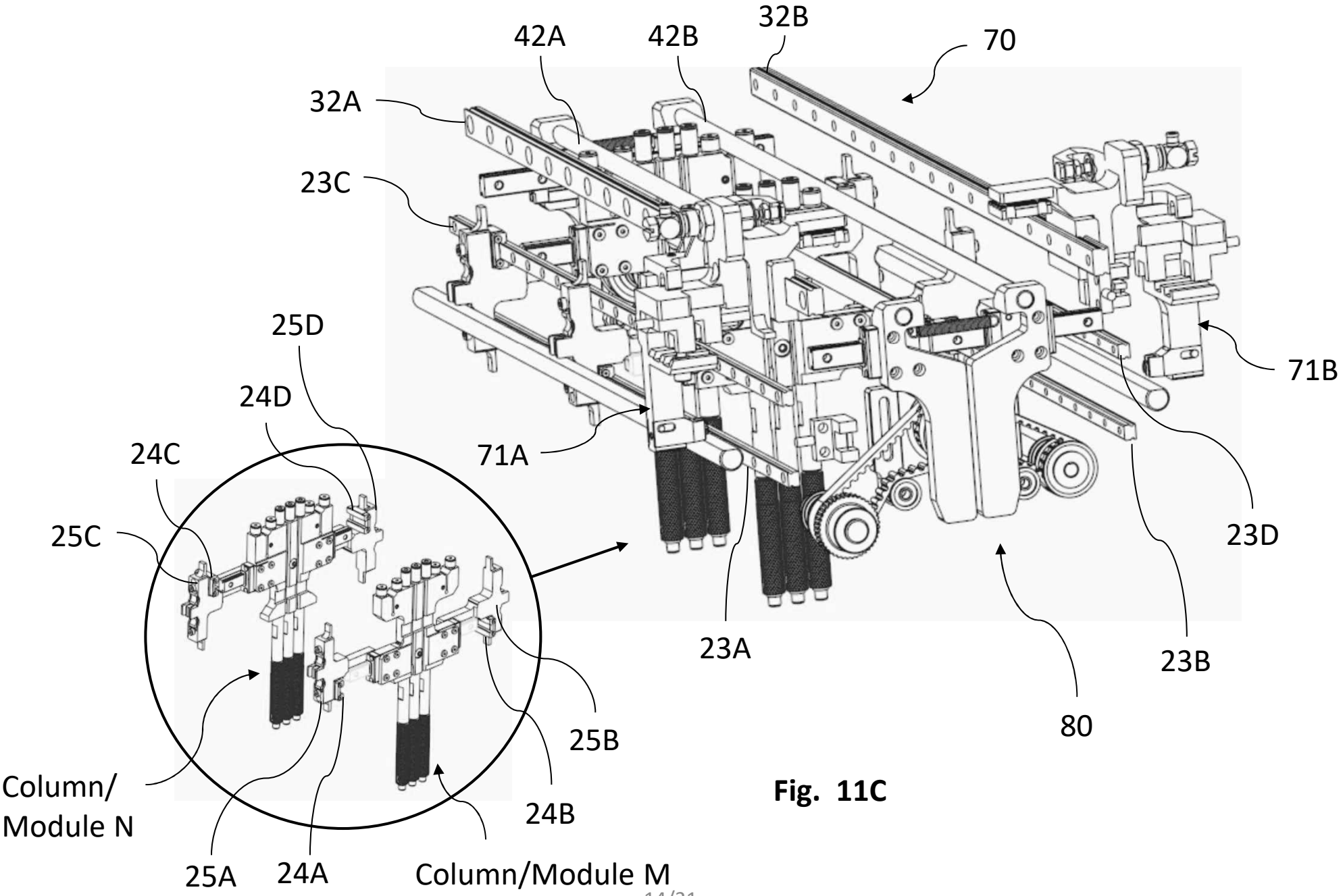

42A
42B
32B
70
32A
23C
25D
24D
24C
25C
71A
71B
23D
23A
23B
80
25B
24B
Column/
Module N
25A
24A
Column/Module M

Fig. 11C

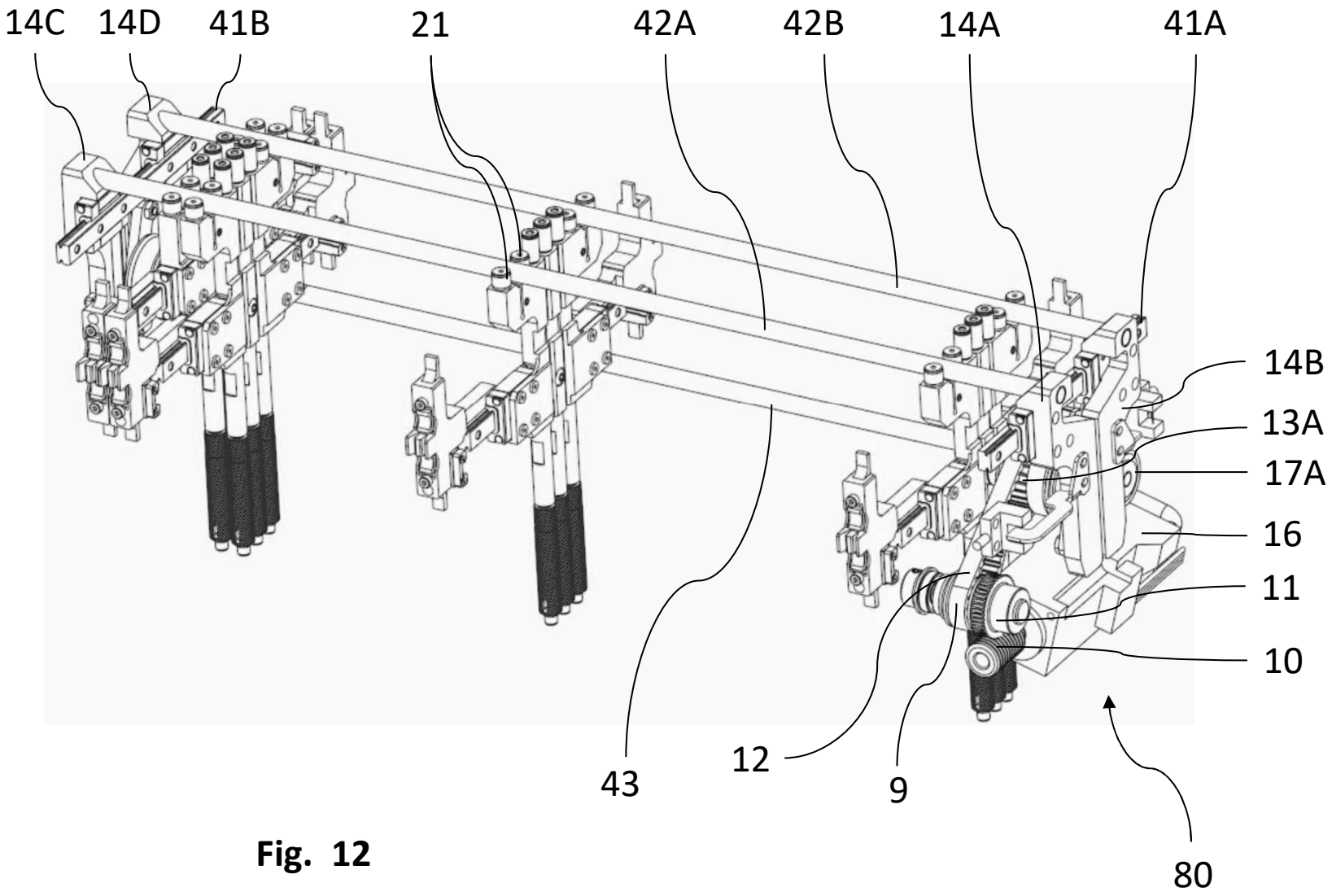


Fig. 12

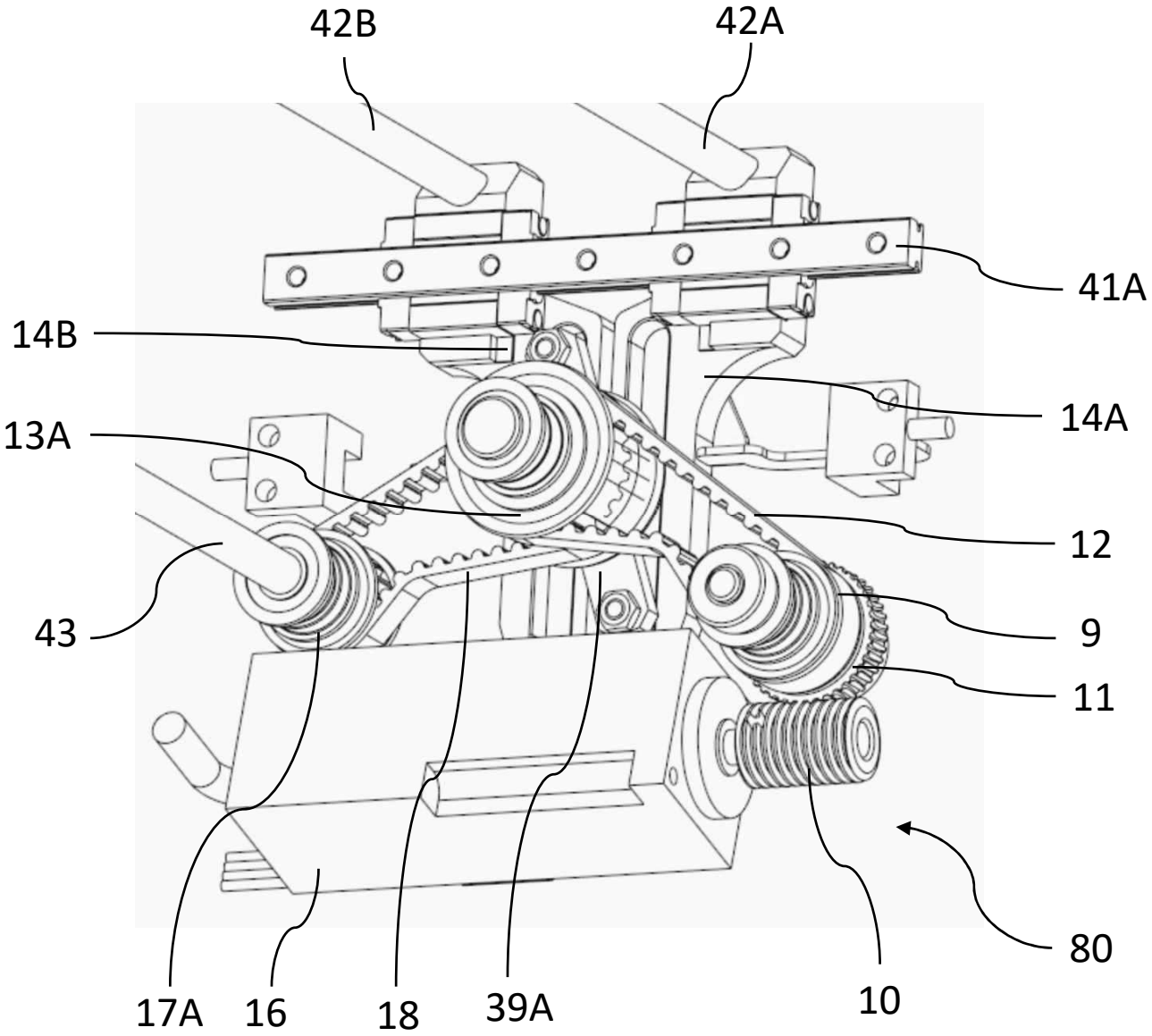


Fig. 13

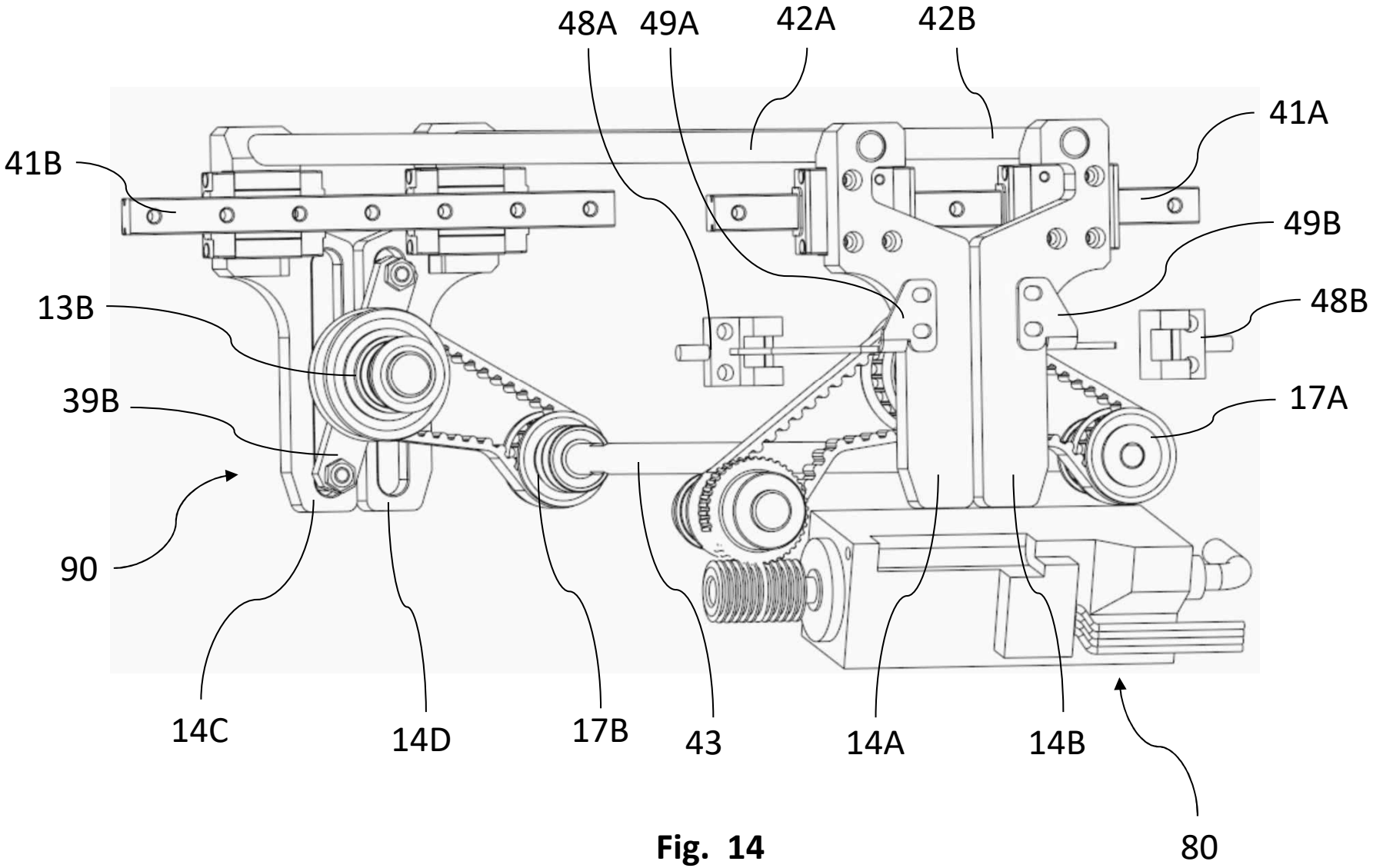

48A
49A
42A
42B
41A
41B
49B
13B
48B
39B
17A
90
14C
14D
17B
43
14A
14B
80

Fig. 14

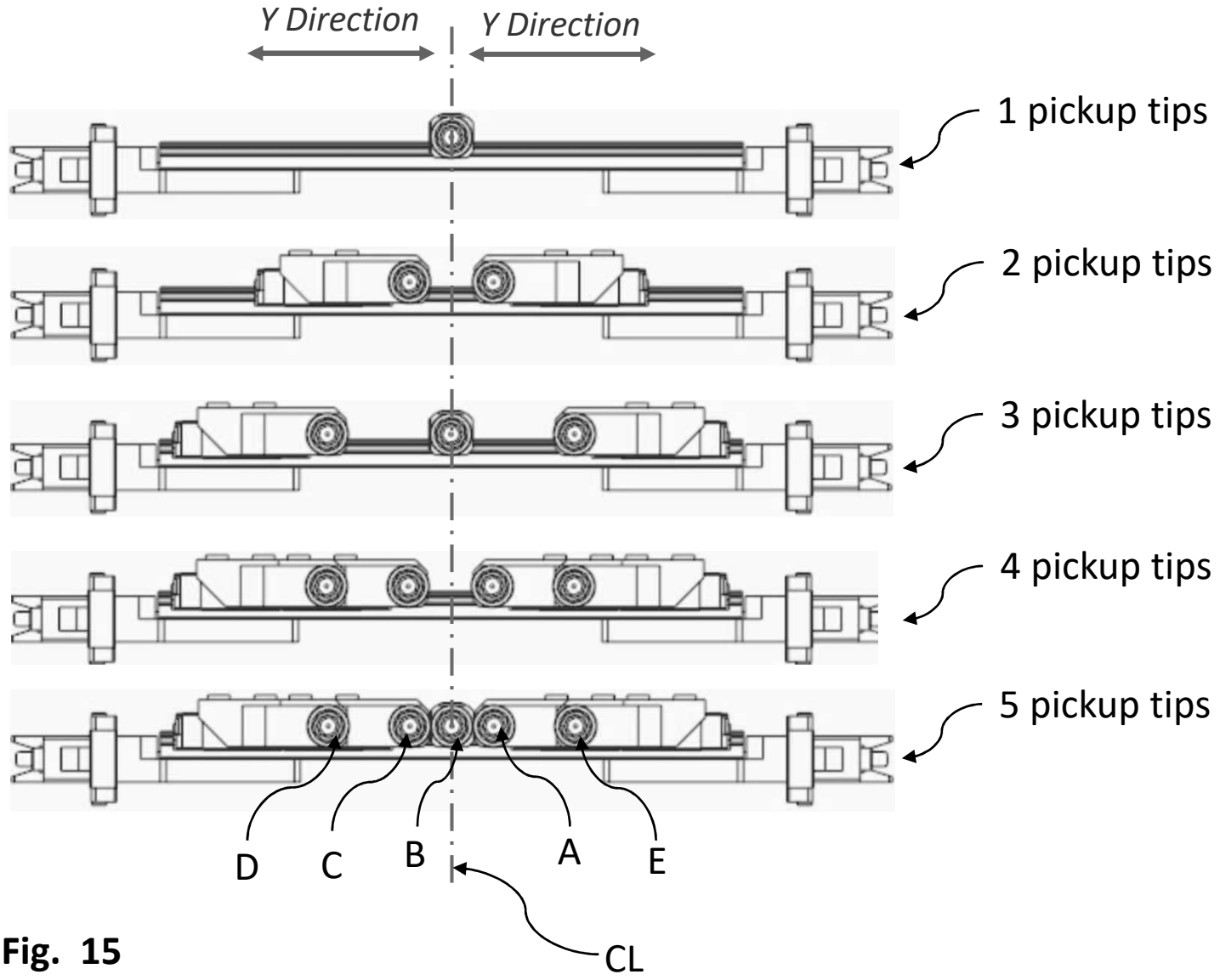

Y Direction
Y Direction
1 pickup tips
2 pickup tips
3 pickup tips
4 pickup tips
5 pickup tips
D
C
B
A
E
CL

Fig. 15

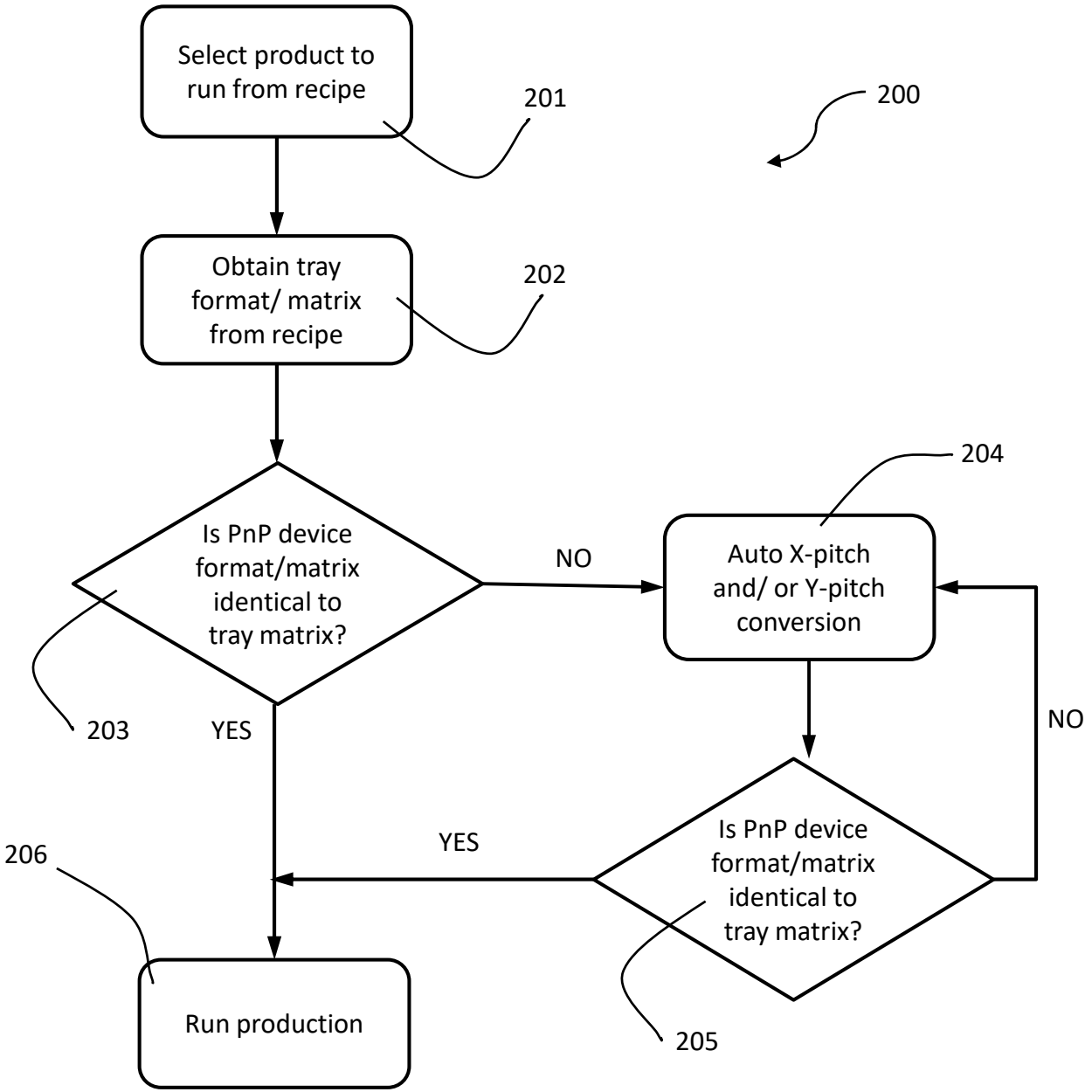

Select product to run from recipe
201
200
Obtain tray format/ matrix from recipe
202
204
Is PnP device format/matrix identical to tray matrix?
NO
Auto X-pitch and/ or Y-pitch conversion
203
YES
NO
206
YES
Is PnP device format/matrix identical to tray matrix?
Run production
205

Fig. 16

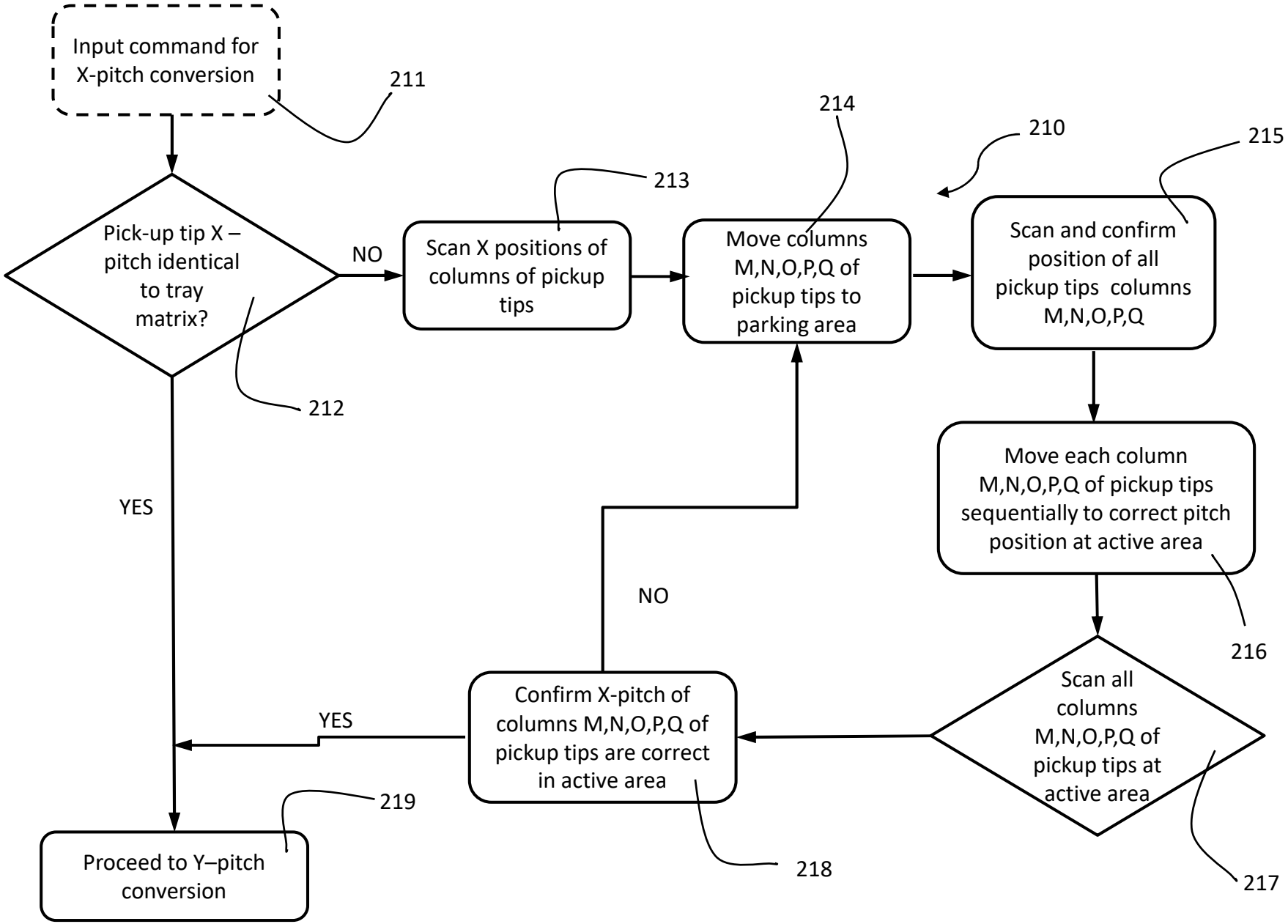

Input command for X-pitch conversion
211
Pick-up tip X – pitch identical to tray matrix?
212
NO
Scan X positions of columns of pickup tips
213
Move columns M,N,O,P,Q of pickup tips to parking area
214
210
Scan and confirm position of all pickup tips columns M,N,O,P,Q
215
Move each column M,N,O,P,Q of pickup tips sequentially to correct pitch position at active area
216
Scan all columns M,N,O,P,Q of pickup tips at active area
217
NO
Confirm X-pitch of columns M,N,O,P,Q of pickup tips are correct in active area
218
YES
YES
Proceed to Y–pitch conversion
219

Fig. 17

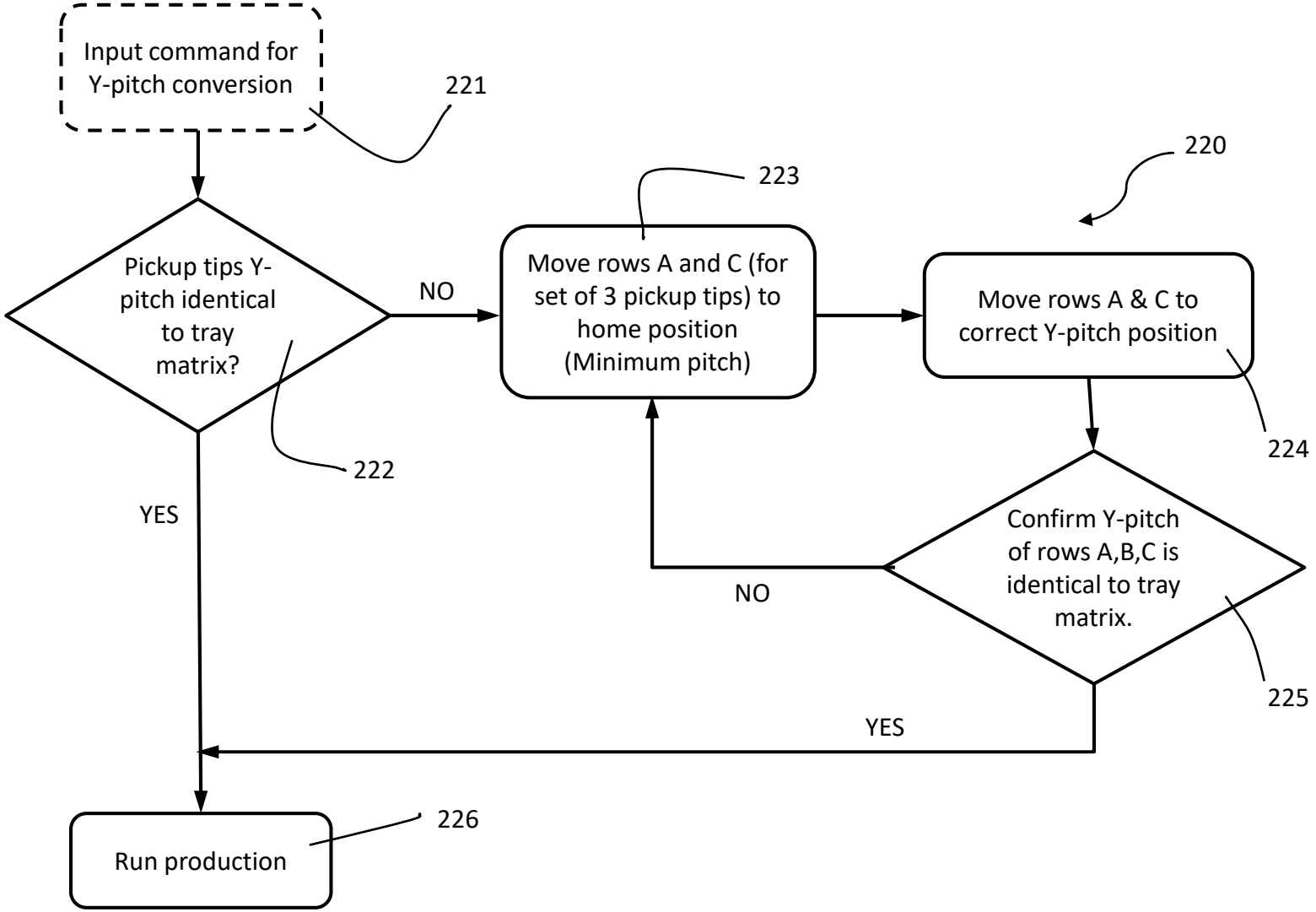

Input command for Y-pitch conversion
221
220
223
Pickup tips Y-pitch identical to tray matrix?
NO
Move rows A and C (for set of 3 pickup tips) to home position (Minimum pitch)
Move rows A & C to correct Y-pitch position
224
222
YES
Confirm Y-pitch of rows A,B,C is identical to tray matrix.
NO
225
YES
Run production
226

Fig. 18