Fig. 1

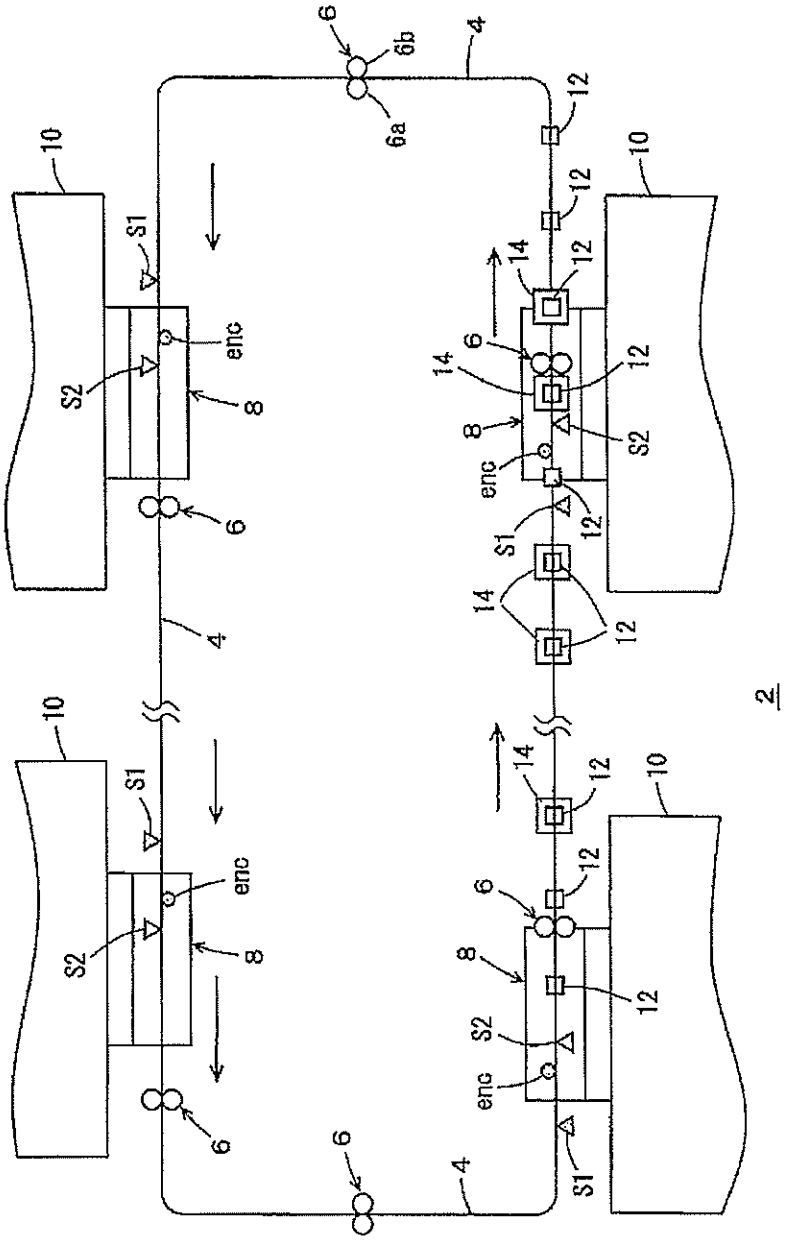


Fig. 2

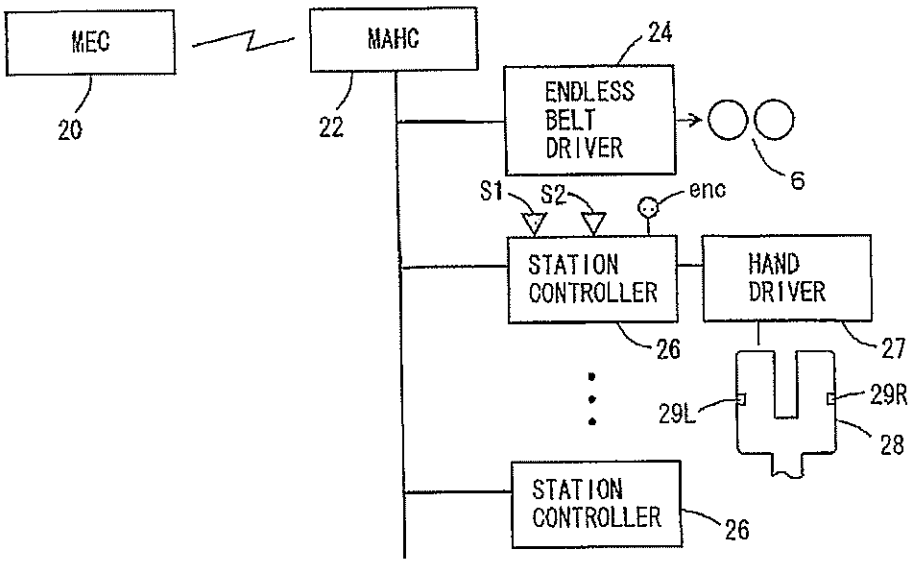

MEC
20
MAHC
22
24
ENDLESS
BELT
DRIVER
6
S1
S2
enc
STATION
CONTROLLER
26
HAND
DRIVER
27
29L
29R
28
STATION
CONTROLLER
26

Fig. 3

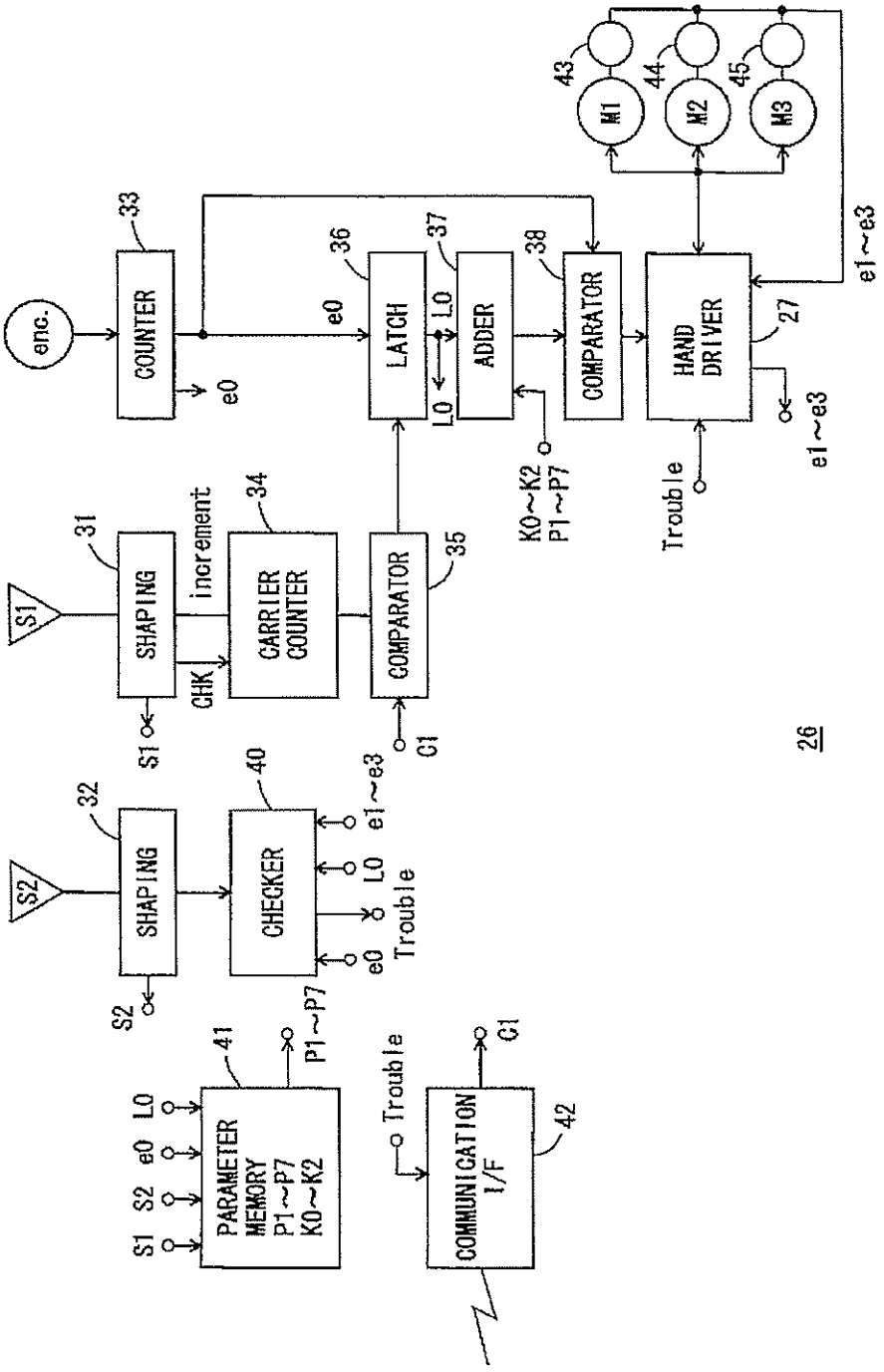

enc.
COUNTER
33
e0
LATCH
36
37
LO
ADDER
38
COMPARATOR
HAND DRIVER
27
e1~e3
M1
M2
M3
43
44
45
K0~K2
P1~P7
Trouble
S1
SHAPING
31
increment
CARRIER COUNTER
34
CHK
COMPARATOR
35
C1
S2
SHAPING
32
CHECKER
40
PARAMETER MEMORY P1~P7 K0~K2
41
COMMUNICATION I/F
42
26

Fig. 4

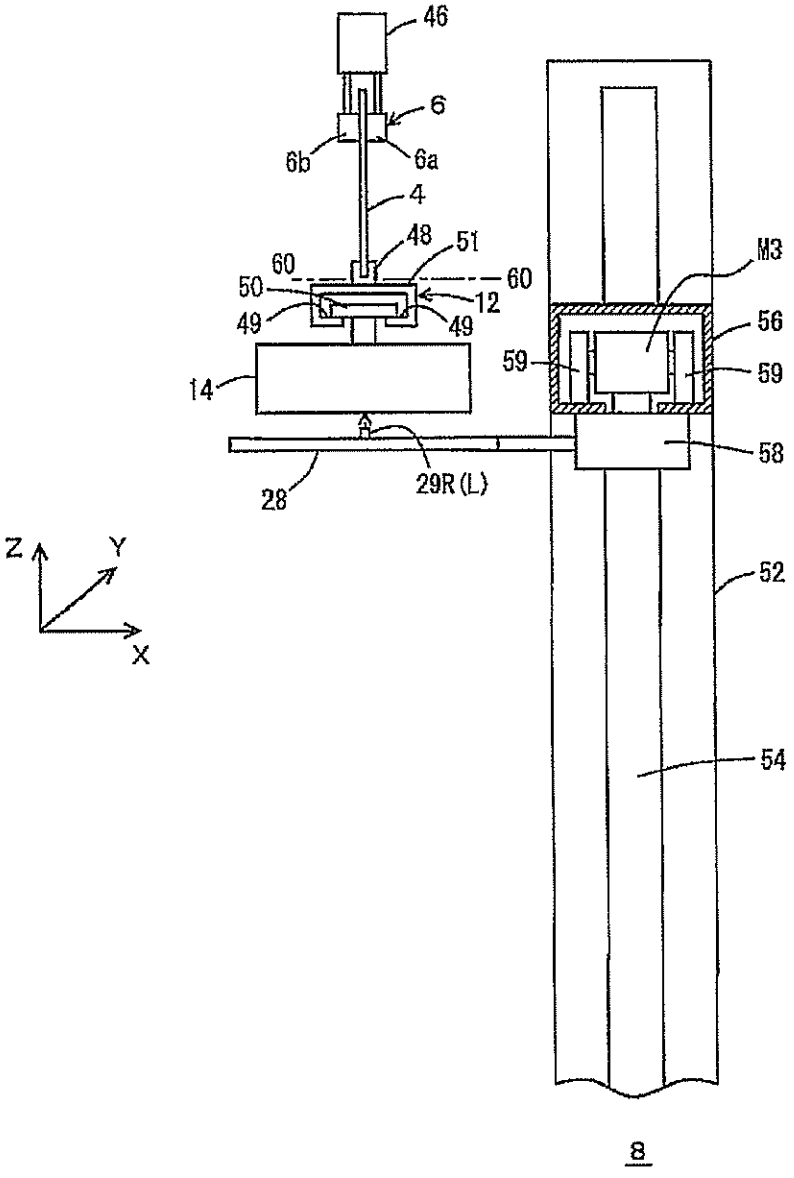
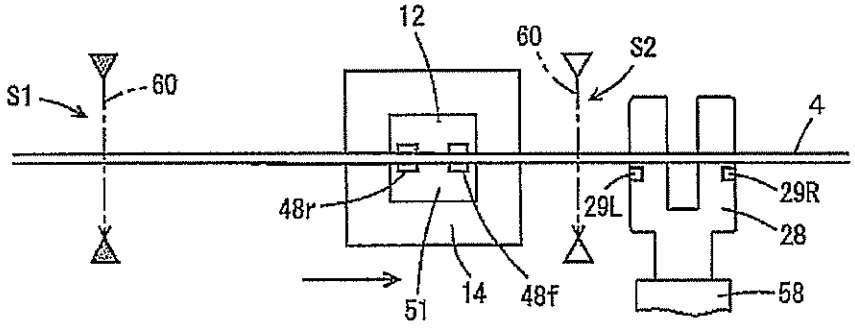
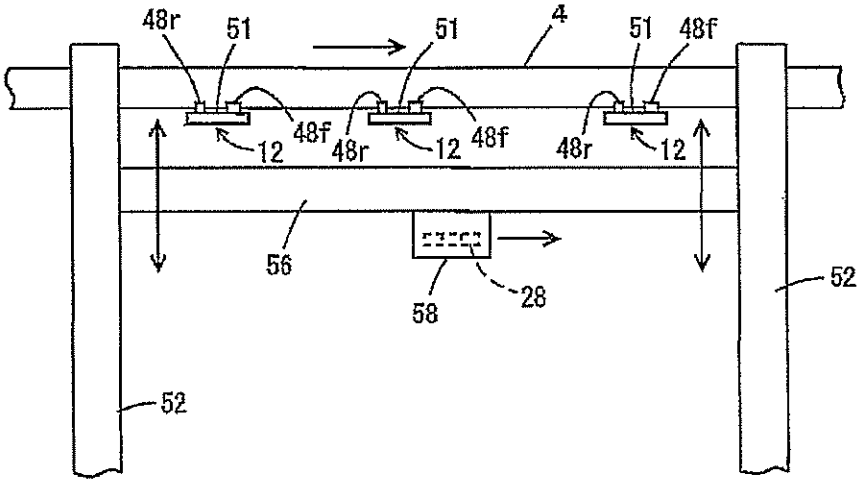

46
6
6b
6a
4
48
51
60
60
50
12
49
49
14
28
29R (L)
M3
56
59
59
58
52
54
8
Z
Y
X

Fig. 5



8

Fig. 6



8

Fig. 7

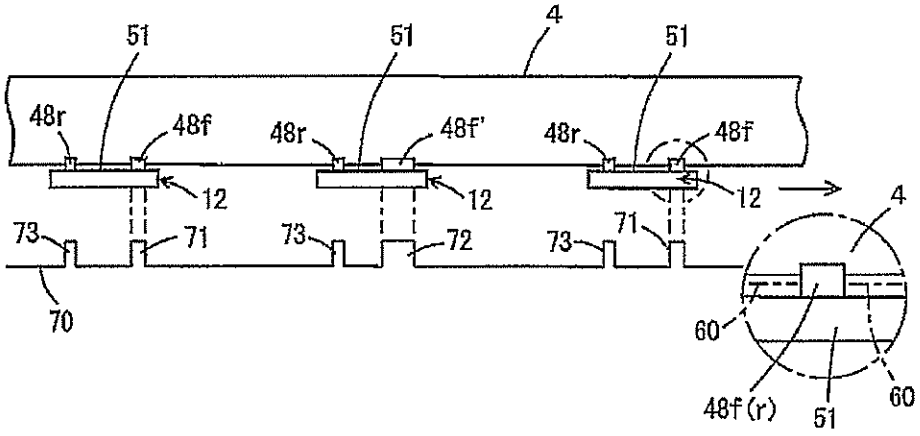


Fig. 8

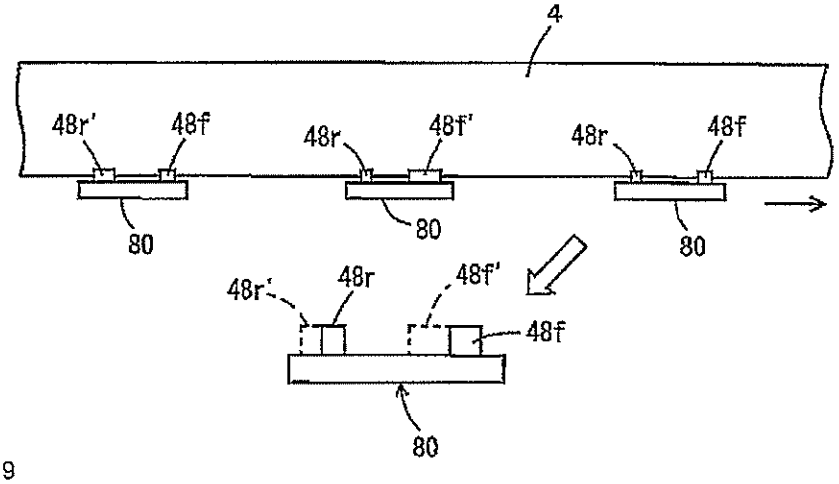

4
48r'
48f
48r
48f'
48r
48f
80
80
80
48r'
48r
48f'
48f
80

Fig. 9

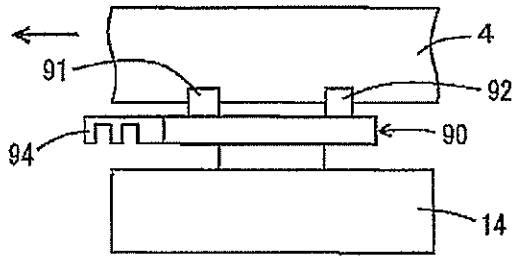

4
91
92
90
94
14

Fig. 10

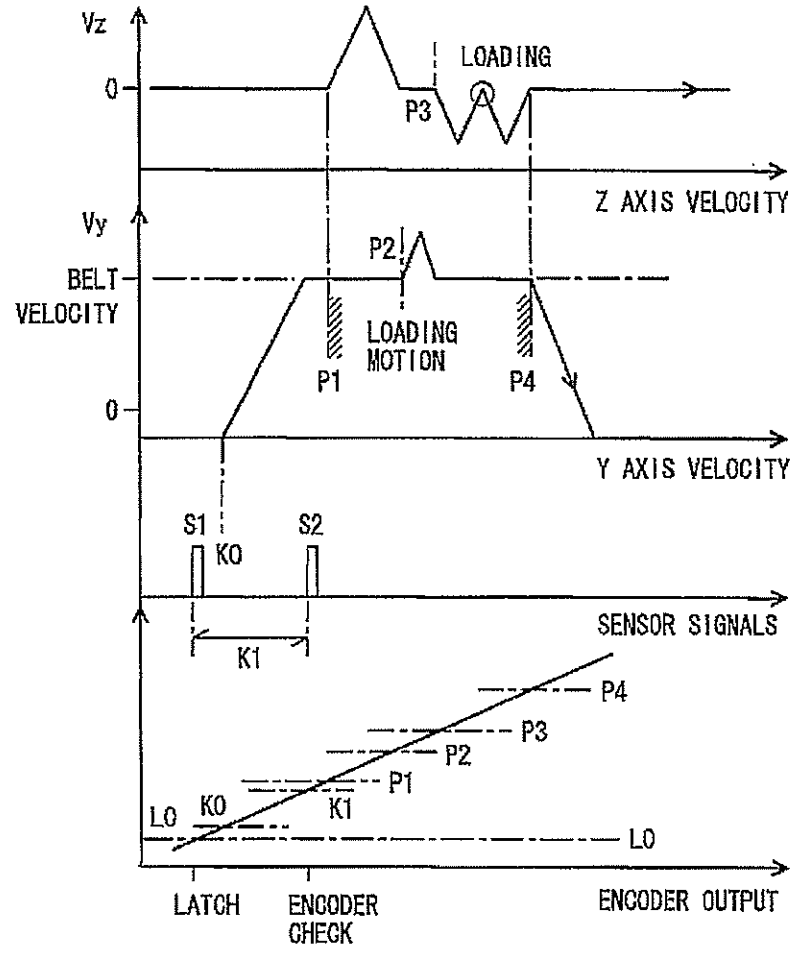

Vz
0
LOADING
P3
Z AXIS VELOCITY
Vy
P2
BELT
VELOCITY
LOADING
MOTION
P1
P4
0
Y AXIS VELOCITY
S1
S2
K0
SENSOR SIGNALS
K1
P4
P3
P2
P1
L0
K0
K1
L0
LATCH
ENCODER
CHECK
ENCODER OUTPUT

Fig. 11

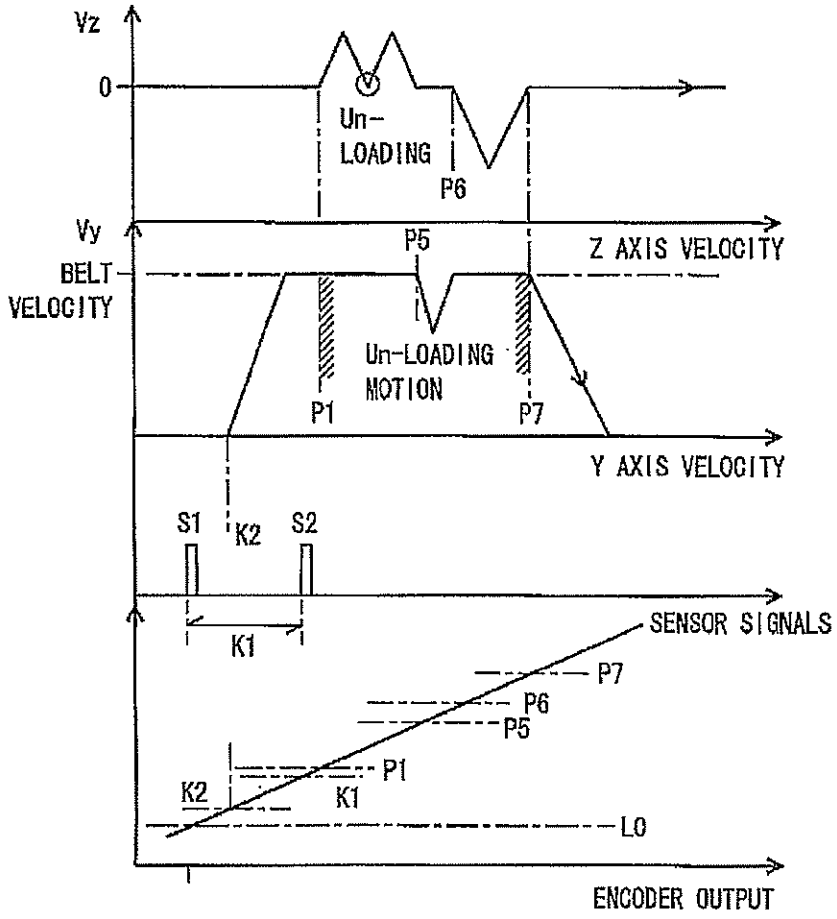

Vz
0
Un-
LOADING
P6
Vy
P5
Z AXIS VELOCITY
BELT
VELOCITY
Un-LOADING
MOTION
P1
P7
Y AXIS VELOCITY
S1
K2
S2
K1
SENSOR SIGNALS
P7
P6
P5
P1
K2
K1
L0
ENCODER OUTPUT

Fig. 12

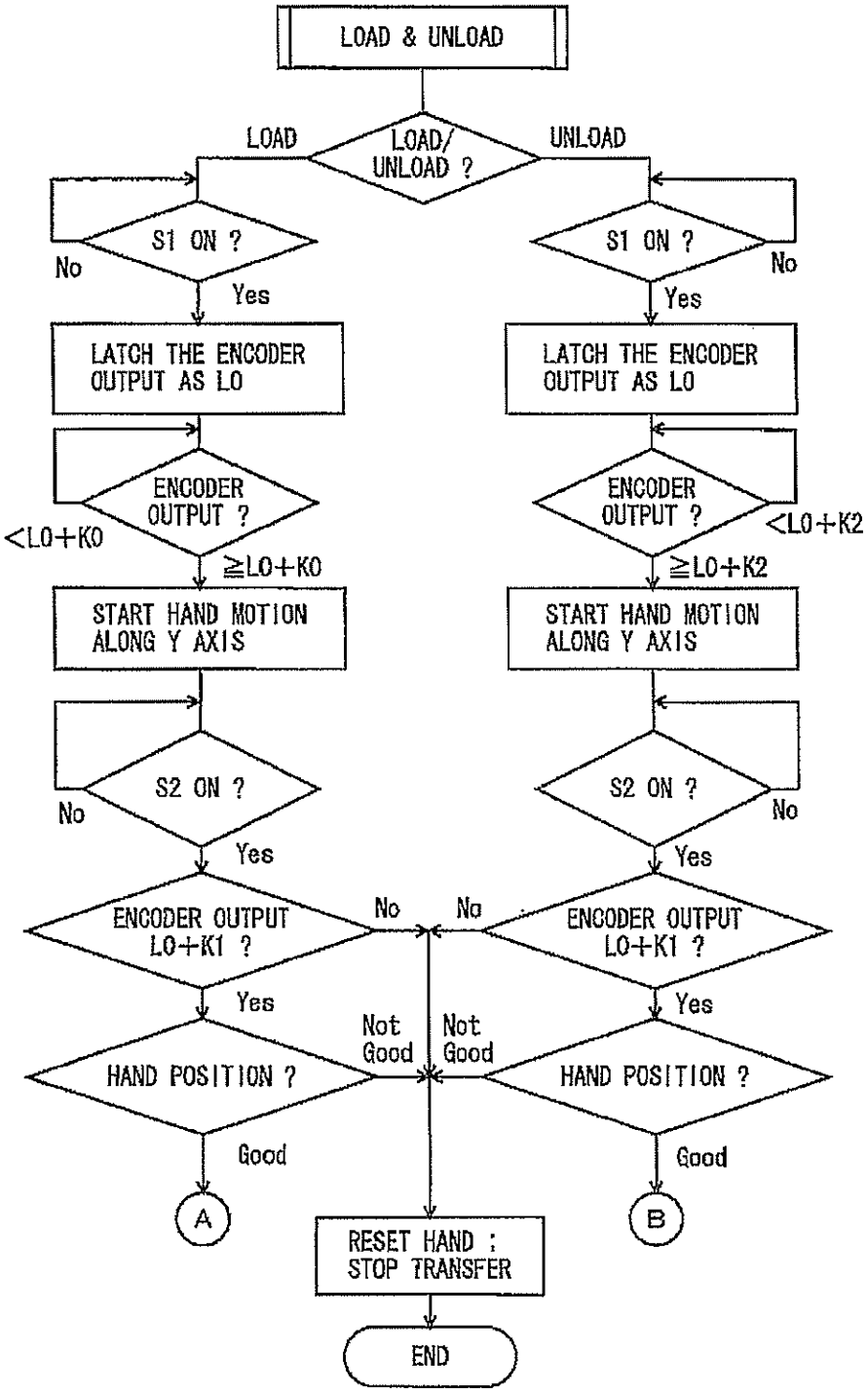
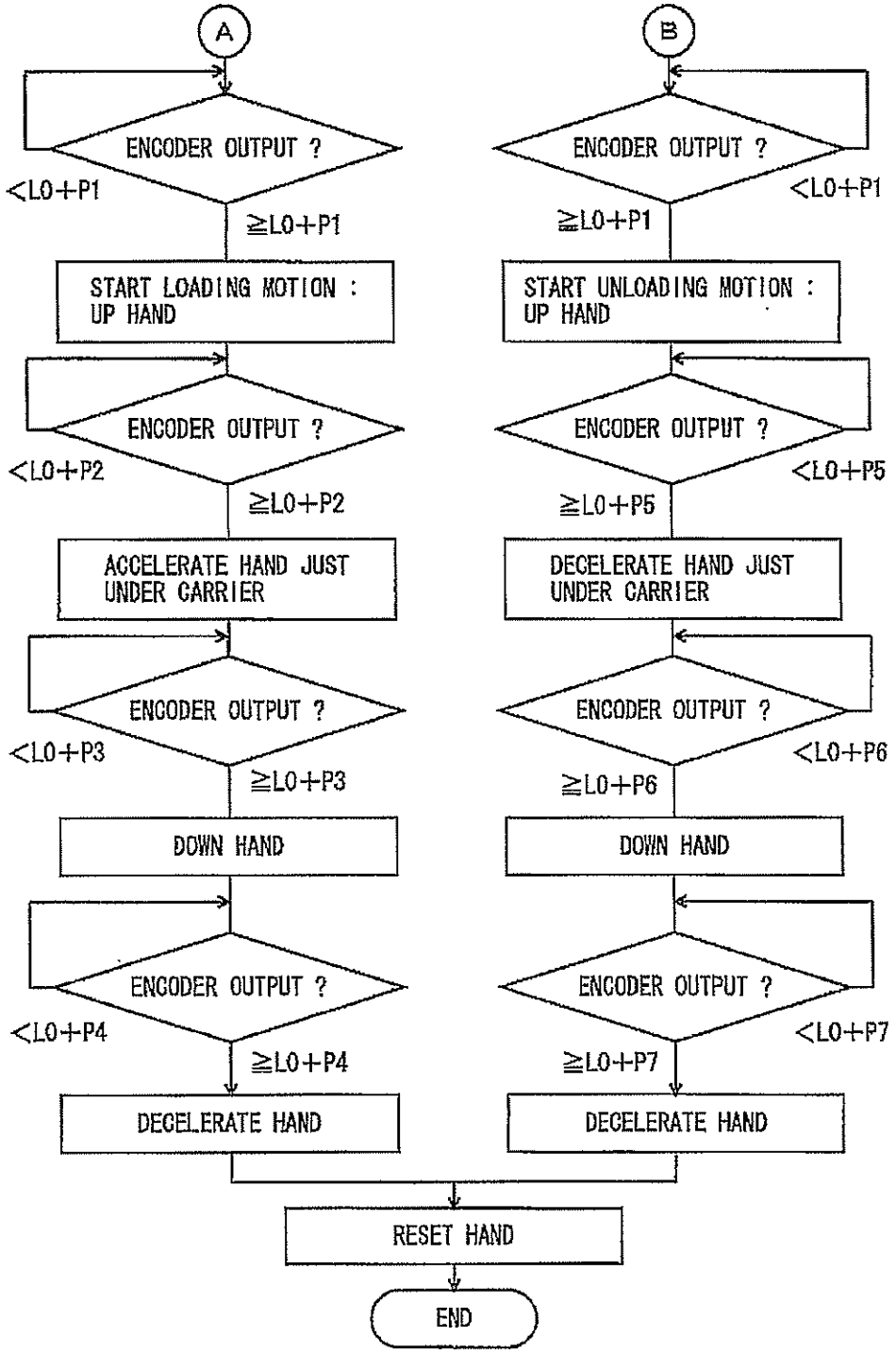

LOAD & UNLOAD
LOAD/ UNLOAD ?
LOAD
UNLOAD
S1 ON ?
No
Yes
S1 ON ?
No
Yes
LATCH THE ENCODER OUTPUT AS L0
LATCH THE ENCODER OUTPUT AS L0
ENCODER OUTPUT ?
<L0+K0
≧L0+K0
ENCODER OUTPUT ?
<L0+K2
≧L0+K2
START HAND MOTION ALONG Y AXIS
START HAND MOTION ALONG Y AXIS
S2 ON ?
No
Yes
S2 ON ?
No
Yes
ENCODER OUTPUT L0+K1 ?
No
No
ENCODER OUTPUT L0+K1 ?
Yes
Yes
Not Good
Not Good
HAND POSITION ?
HAND POSITION ?
Good
Good
A
B
RESET HAND : STOP TRANSFER
END

Fig. 13


A
ENCODER OUTPUT ?
<L0+P1
≧L0+P1
START LOADING MOTION : UP HAND
ENCODER OUTPUT ?
<L0+P2
≧L0+P2
ACCELERATE HAND JUST UNDER CARRIER
ENCODER OUTPUT ?
<L0+P3
≧L0+P3
DOWN HAND
ENCODER OUTPUT ?
<L0+P4
≧L0+P4
DECELERATE HAND
B
ENCODER OUTPUT ?
≧L0+P1
<L0+P1
START UNLOADING MOTION : UP HAND
ENCODER OUTPUT ?
≧L0+P5
<L0+P5
DECELERATE HAND JUST UNDER CARRIER
ENCODER OUTPUT ?
≧L0+P6
<L0+P6
DOWN HAND
ENCODER OUTPUT ?
≧L0+P7
<L0+P7
DECELERATE HAND
RESET HAND
END