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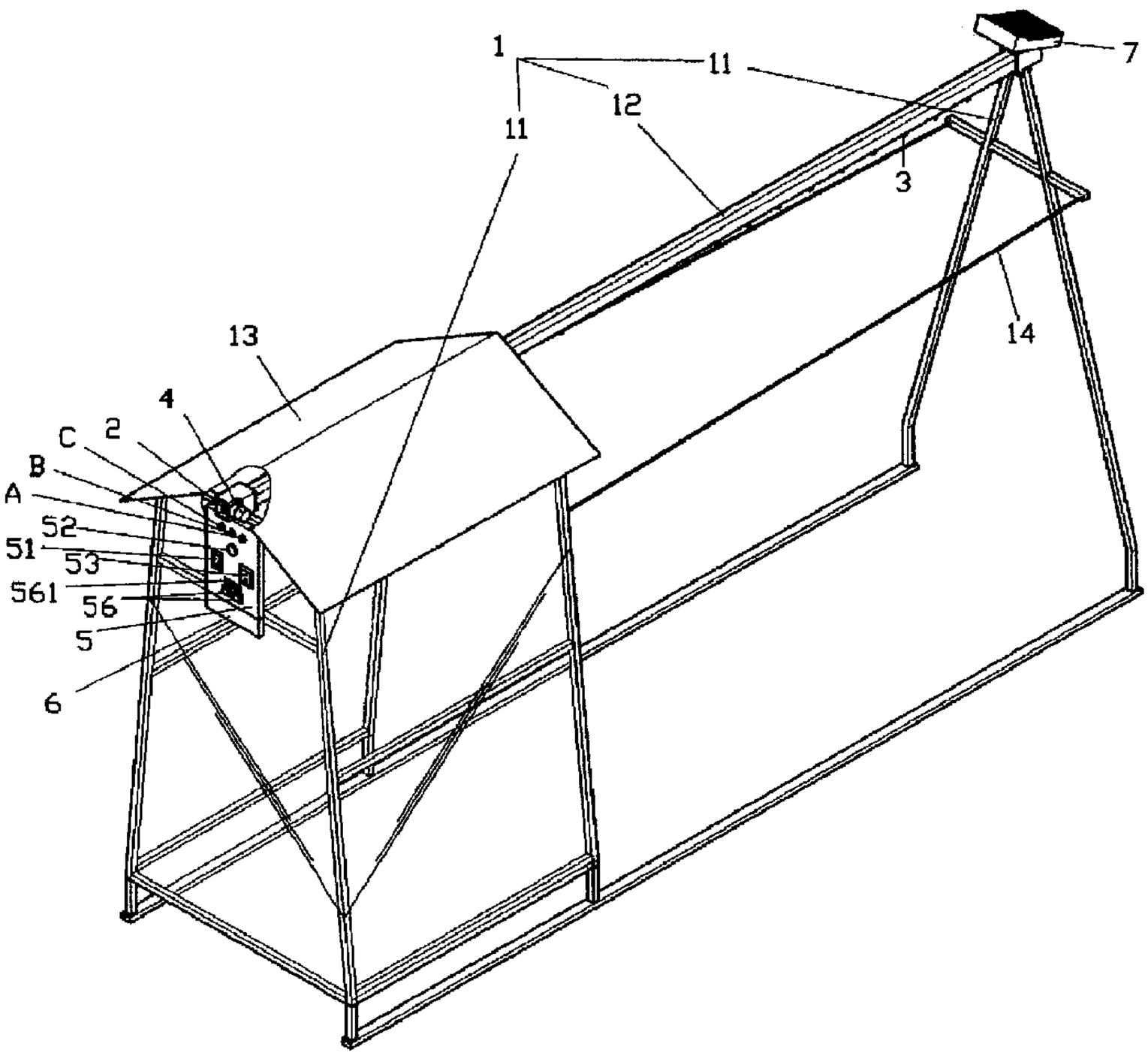
(54) Titre : DISPOSITIF DE PORTE-VETEMENTS PLIABLE
(54) Title: COLLAPSIBLE CLOTHES HANGER STRUCTURE



(57) Abrégé/Abstract:
A collapsible clothes hanger structure includes a frame, a transmission unit, a hanging unit, a motor and a control unit. The frame comprises a rail and a tent to cover a portion of the rail. The transmission unit and the hanging unit are disposed in the rail. The

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(57) Abrégé(suite)/Abstract(continued):
motor is linked to the transmission unit to control the hanging unit to slide along the rail. The control unit is coupled with a light sensor, a water drop sensor and a timer to collect signals and to control the motor accordingly.

ABSTRACT

A collapsible clothes hanger structure includes a frame, a transmission unit, a hanging unit, a motor and a control unit. The frame comprises a rail and a tent to cover a portion of the rail. The transmission unit and the hanging unit are disposed in the rail. The motor is linked to the transmission unit to control the hanging unit to slide along the rail. The control unit is coupled with a light sensor, a water drop sensor and a timer to collect signals and to control the motor accordingly.

COLLAPSIBLE CLOTHES HANGER STRUCTURE

BACKGROUND OF THE INVENTION

Field of the Invention

The present invention relates to a collapsible clothes hanger structure, and more particularly to a clothes hanger structure which enables to collapse or to extend automatically under preset conditions.

Description of the Prior Art

A conventional automatic clothes hanger comprises a main body having a platform extending outwardly for a motor and a control circuit to be secured and connected thereon. The platform is provided with a support frame and accessories. The support frame is provided with a micro switch and a sensor at respective ends to detect the weather and control the clothes hanger to extend or to collapse.

Another conventional automatic clothes hanger comprises a basic frame, a swivel frame, an adjusting frame and a fixture, and is incorporated with a sensor to extend or to collapse the clothes hanger. The swivel frame is linked to activate simultaneously to assist the clothes hanger to extend or to collapse.

The above-mentioned clothes hangers comprise a sensor to detect the weather, however, they are not defined with weather conditions, thus they can not work properly.

SUMMARY OF THE INVENTION

The present invention provides a collapsible clothes hanger structure to react when the real-time weather has changed, which comprises:

a frame comprising a pair of supporting legs and a rail, said rail being secured between said supporting legs, a tent being provided on said frame, said tent covering a portion of said rail;

a transmission unit comprising a transmission gear meshing with a transmission belt, said transmission gear and said transmission belt being disposed in said rail;

a hanging unit disposed in said rail;

a motor connected to and driving said transmission unit in said rail to control said hanging unit to slide along the rail; and

a control unit coupled with a light sensor, a water drop sensor, and a timer, said control unit collecting signals from any of said light sensor, said water drop sensor, and said timer to control said motor and said hanging unit.

Preferably, said rail comprises contact points at respective ends to control activation of said motor when in touch with said hanging unit, said contact points being electrically connected to said control unit.

Preferably, said control unit further comprises a manual control key to control said motor.

Preferably, said timer is electrically connected with a time display panel.

Preferably, said control unit comprises a remote controller.

Preferably, said motor and said control unit are electrically connected to a battery.

Preferably, said battery is electrically connected to a solar energy board.

Preferably, said solar energy board comprises a receiving unit to collect signals from said light sensor, said water drop sensor, and said timer, said signals then being transmitted to said control unit to activate said motor accordingly.

Preferably, said hanging unit comprises an active hanger and a number of driven hangers, said active hanger being secured to said transmission belt, said driven hangers having holes for said transmission belt to insert and to extend there through, said active hanger and said driven hangers having slots for pulling straps to insert and to extend there through, a block being provided at a center portion of each said slot, each of said pulling straps having a securing end and a terminal end, said securing end and said terminal end being larger in size than each said slot.

Preferably, said hanging unit comprises an active hanger and a number of driven hangers, each of said active hanger and said driven hangers comprising a shaft, said shaft having a center portion meshing with a connecting section and two exposed ends, a pair of rollers being provided on said two exposed ends of said shaft, said rollers having recesses meshing with a pair of rail straps in said rail, said active hanger and said driven hangers having slots for pulling straps to insert and to extend there through.

Preferably, a locating rope is provided between said supporting legs and

said tent.

It is desirable to provide a collapsible clothes hanger structure, which may be adjusted to control the clothes hanger automatically or manually.

It is also desirable to provide a collapsible clothes hanger structure, which is activated when the light has changed.

It is also desirable to provide collapsible clothes hanger structure, which is activated when rain drop is detected.

It is also desirable to provide a collapsible clothes hanger structure, which is activated by the timer.

It is still further desirable to provide a collapsible clothes hanger structure, which is activated manually.

It is still further desirable to provide a collapsible clothes hanger structure, which can be controlled remotely.

It is still further desirable to provide a collapsible clothes hanger structure, which provides a solar energy board that enables to transfer light into energy to save electric power, corresponding to the concept of environmental protection.

It is still further desirable to provide a collapsible clothes hanger structure, which provides a hanging unit that does not require any fastener, which is easy to install and to work precisely.

It is still further desirable to provide a collapsible clothes hanger structure, which provides a tent to protect the clothes from getting wet by rain or humid.

It is still further desirable to provide a collapsible clothes hanger structure, which provides a locating rope between the supporting legs and the tent so as to secure clothes on the hangers.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a perspective view of the preset invention;

Fig. 2 is a side view of the present invention, partially sectioned;

Fig. 3 is a partial enlarged view of the present invention;

Fig. 4 is a perspective view of a control unit of the present invention;

Fig. 5 is a partial enlarged view of the present invention showing a water drop sensor, a control unit and a solar energy board;

Fig. 6 is an exposed view of a hanging unit of the present invention;

Fig. 7 is a cross-sectional view showing the hanging unit is secured in a rail;

Fig. 8 is a diagram of an operation of the present invention;

Fig. 9 is a side view of the present invention in a collapsed status;

Fig. 10 is an enlarged view showing the hanging unit in a collapsed status; and

Fig. 11 is a perspective view showing a solar energy board facing another direction.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

As shown in Figs. 1 through 5, a preferred embodiment of the present invention comprises a frame 1, a transmission unit 2, a hanging unit 3, a motor 4, a control unit 5, a battery 6 and a solar energy board 7.

The frame 1 comprises a pair of supporting legs 11 and a rail 12. The rail 12 is secured between the supporting legs 11. A tent 13 is provided on the frame 1 and covers a portion of the rail 12 to protect clothes from being wet by rain or dew. A locating rope 14 is provided between the supporting legs 11 and the tent 13, which protects the clothes from dangling around.

The transmission unit 2 comprises a transmission gear 21 meshing with a transmission belt 22. Both the transmission gear 21 and the transmission belt 22 are disposed in the rail 12 of the frame 1. By changing the direction of the transmission gear 21, the transmission belt 22 changes its moving direction.

The hanging unit 3, as shown in Figs. 3 and 6, comprises an active hanger 3A and a number of driven hangers 3B which are mounted in the rail 12 in sequence. The active hanger 3A located at the outmost end is secured to the transmission belt 22, while the driven hangers 3B are secured by extending the transmission belt 22 through a hole 31B of each driven hanger 3B. The active hanger 3A and the driven hangers 3B have hanging holes 31A and 32B for a clothes hanger to hang thereon. The active hanger 3A and the driven hangers 3B further have slots 32A and 33B for pulling straps 31 to extend through. Blocks 321A and 331B are provided at the center portions of the slots 32A and 33B. Every two adjacent hangers (including the active hanger 3A and the driven hangers 3B) are connected by an independent pulling strap 31 which comprises a securing end 311 and a terminal end 312. Both the securing end 311 and the terminal end 312 are larger in size than the slots 32A ad 33B. The securing end 311 is secured to

the block 321A, and the terminal end 312 is able to engage with the block 331B or disengage from the block 331B.

The motor 4 is connected to the transmission gear 21 of the transmission unit 2 and outputs a power to link the hanging unit 3 to slide along with the transmission belt 22 through the transmission gear 21, as shown in Fig. 1.

The control unit 5, as shown in Figs. 1, 4 and 5, comprises a power switch 51, an automatic control key 52, a manual control key 53, a light sensor 54, a water drop sensor 55, and a timer 56 which is electrically connected with a time display panel 561. Any of the light sensor 54, the water drop sensor 55, and the timer 56 can trigger the motor 4 to activate the transmission belt 22 through the transmission gear 21 to slide the hanging unit 3 to stay within the tent 13 or to extend outwardly. The automatic control key 52 controls the light sensor 54, the water drop sensor 55, and the timer 56. The light sensor 54, the water drop sensor 55, and the timer 56 may be activated by pressing the manual control key 53 as well to activate the transmission belt 22 to control the hanging unit 3 through activation of the motor 4.

The control unit 5 further comprises a malfunction light A, a charging light B, and a battery weak signal light C, as shown in Fig.1. When the malfunction light A fleshes, indicating an abnormal operation, the power will be shot down itself. When the charging light B is flashing, it implies the solar energy board is charging. When the battery weak signal light is flashing, it implies either the solar energy board has not been charging for a period of time or the battery is not working and it requires to be replaced with another one. The control unit 5 further comprises a lighting system (not shown in the

drawings) which is activated automatically for 10 minutes.

The motor 4 and the control unit 5 are electrically connected to the battery 6, and the battery 6 is electrically connected to the solar energy board 7 which transforms the light into electric power to be saved in the battery 6.

The rail 12 is provided with a pair of contact points 121 at respective ends thereof. The contact points 121 are electrically connected to the control unit 5. The contact points 121 are designed for the hanging unit 3 to contact so as to control the motor 4.

When the light sensor 54 detects the light is weak, it will transmit a signal to the control unit 5. When the water drop sensor 55 detects water drops, it will transmit a signal to the control unit 5.

Fig. 5 is a perspective view of the water drop sensor 55, the control unit 5 and the solar energy board 7. When water drops on the water drop sensor 55, a positive wire 551 and a negative wire 552 will be conducted and a signal will be transmitted to the control unit 5 to collapse the hanging unit 3.

As shown in Figs. 6 and 7, each of the active hanger 3A and the driven hangers 3B comprises a pair of shafts 32. Each shaft 32 has a central portion meshing with a connecting section 33 and two ends exposed outwardly. The exposed ends of the shaft 32 are provided with rollers 34. Each roller 34 has a recess 35. The rail 12 comprises a pair of rail straps 122 therein for engagement of the recesses 35 of the rollers 34 so as to assist the rolling of the active hanger 3A and the driven hangers 3B along the rail 12. The active hanger 3A is secured to the transmission belt 22 and is linked to

move along with the transmission belt 22.

The active hanger 3A and the driven hangers 3B do not need any fasteners to be mounted with the rollers 34 to slide along the rail 12. The recesses 35 of the rollers 34 are disposed on the rail straps 122 of the rail 12, allowing the rollers 34 to roll along without detaching from the shafts 32.

To expand the hanging unit 3 of the present invention, as shown in Figs. 2, 3, and 6, when the transmission belt 22 moves outward from the tent 13, the active hanger 3A will be pulled by the transmission belt 22, and the adjacent driven hanger 3B will also be pulled till the pulling strap 31 reaches to its limits. The securing end 311 and the terminal end 312 of the pulling strap 31 engage with the block 321A in the slot 32A and the block 331B in the slot 33B and are stopped thereat. The subsequent driven hangers 3B are also pulled by the same way.

To collapse the hanging unit 3 of the present invention, as shown in Figs. 9 and 10, the transmission belt 22 moves towards the tent 13, which links the active hanger 3A to move the same direction as well till the terminal end 312 disengages from the block 331B of the adjacent driven hanger 3B and forces the driven hanger 3B to move along. One by one all of the driven hangers 3B will be brought to move the same direction until they are collapsed in the tent 13.

The present invention is designed to operate either in automatic or in manual methods, as shown in Fig. 8. The control unit 5 comprises the automatic control key 52 and the manual control key 53. The manual control key 53 is composed of receiving and sending directions to activate the motor 4

to do the job. The motor 4 will be stopped when the manual key 53 is released. This allows the user to control and adjust the distance. The automatic control key 52 is activated by the light sensor 54, the water drop sensor 55 and the timer 56 to activate the motor 4.

The present invention further comprises the battery 6 and the solar energy board 7, as shown in Figs. 5 and 8, to provide electric power to the control unit 5 and the motor 4. The solar energy board 7 comprises a receiving unit 71 to collect signals from the light sensor 54, the water drop sensor 55 and the timer 56 and then transfer to the control unit 5 which in turn activates the motor 4 accordingly.

To operate the present invention, as shown in Fig. 9, the user presses the power switch 51 of the control unit 5, adjusts the timer 56 through the time display panel 561 to set the time, and then presses either the manual control key 53 or the automatic control key 52 to activate the motor 4 which in turn activates the transmission gear 21 and the transmission belt 22 to push the active hanger 3A and the driven hangers 3B outwardly. When the active hanger 3A reaches to one contact point 121 of the rail 12, the motor 4 will be stopped. To collapse the present invention, when the most inward driven hanger 3B is in contact with the other contact point 121 of the rail 12, the motor 4 will be stopped, as shown in Fig. 2.

The direction of the solar energy board 7 may be changed to direct the sun shine, as shown in Fig. 11.

The operation of the present invention can be categorized as follows:

1. timer mode: the time can be preset to extend or to collapse the hangers;

2. manual mode: the manual control key is pressed to extend or to collapse the hangers;

3. automatic mode: the automatic control key is pressed to activate the light sensor, the water drop sensor and the timer to control the hangers.

The present invention may further comprise a remote controller which can activate the control unit (5) remotely.

The control unit 5, the motor 4, the light sensor 54, the water drop sensor 55 and the timer 56 are operated by either wire (cable, network) or wireless (wireless network, Bluetooth, frequency modulation) transmission.

WHAT IS CLAIMED IS:

1. A collapsible clothes hanger structure comprising:

a frame comprising a pair of supporting legs and a rail, said rail being secured between said supporting legs, a tent being provided on said frame, said tent covering a portion of said rail;

a transmission unit comprising a transmission gear meshing with a transmission belt, said transmission gear and said transmission belt being disposed in said rail;

a hanging unit disposed in said rail;

a motor connected to and driving said transmission unit in said rail to control said hanging unit to slide along the rail; and

a control unit coupled with a light sensor, a water drop sensor, and a timer, said control unit collecting signals from any of said light sensor, said water drop sensor, and said timer to control said motor and said hanging unit.

2. The collapsible clothes hanger structure, as recited in claim 1, wherein said rail comprises contact points at respective ends to control activation of said motor when in touch with said hanging unit, said contact points being electrically connected to said control unit.

3. The collapsible clothes hanger structure, as recited in any one of claims 1 to 2, wherein said control unit further comprises a manual control key to control said motor.

4. The collapsible clothes hanger structure, as recited in any one of claims 1 to 3, wherein said timer is electrically connected with a time display panel.

5. The collapsible clothes hanger structure, as recited in any one of claims 1 to 4, wherein said control unit comprises a remote controller.

6. The collapsible clothes hanger structure, as recited in any one of claims 1 to 5, wherein said motor and said control unit are electrically connected to a battery.

7. The collapsible clothes hanger structure, as recited in claim 6, wherein said battery is electrically connected to a solar energy board.

8. The collapsible clothes hanger structure, as recited in claim 7, wherein said solar energy board comprises a receiving unit to collect signals from said light sensor, said water drop sensor, and said timer, said signals then being transmitted to said control unit to activate said motor accordingly.

9. The collapsible clothes hanger structure, as recited in any one of claims 1 to 8, wherein said hanging unit comprises an active hanger and a number of driven hangers, said active hanger being secured to said transmission belt, said driven hangers having holes for said transmission belt to insert and to extend there through, said active hanger and said driven hangers having slots for pulling straps to insert and to extend there through, a block being provided at a center portion of each said slot, each of said pulling straps having a securing end and a terminal end, said securing end and said terminal end being larger in size than each said slot.

10. The collapsible clothes hanger structure, as recited in any one of claims 1 to 8, wherein said hanging unit comprises an active hanger and a number of driven hangers, each of said active hanger and said driven hangers comprising a shaft, said shaft having a center portion meshing with a connecting section and

two exposed ends, a pair of rollers being provided on said two exposed ends of said shaft, said rollers having recesses meshing with a pair of rail straps in said rail, said active hanger and said driven hangers having slots for pulling straps to insert and to extend there through.

11. The collapsible clothes hanger structure, as recited in any one of claims 1 to 10, wherein a locating rope is provided between said supporting legs and said tent.

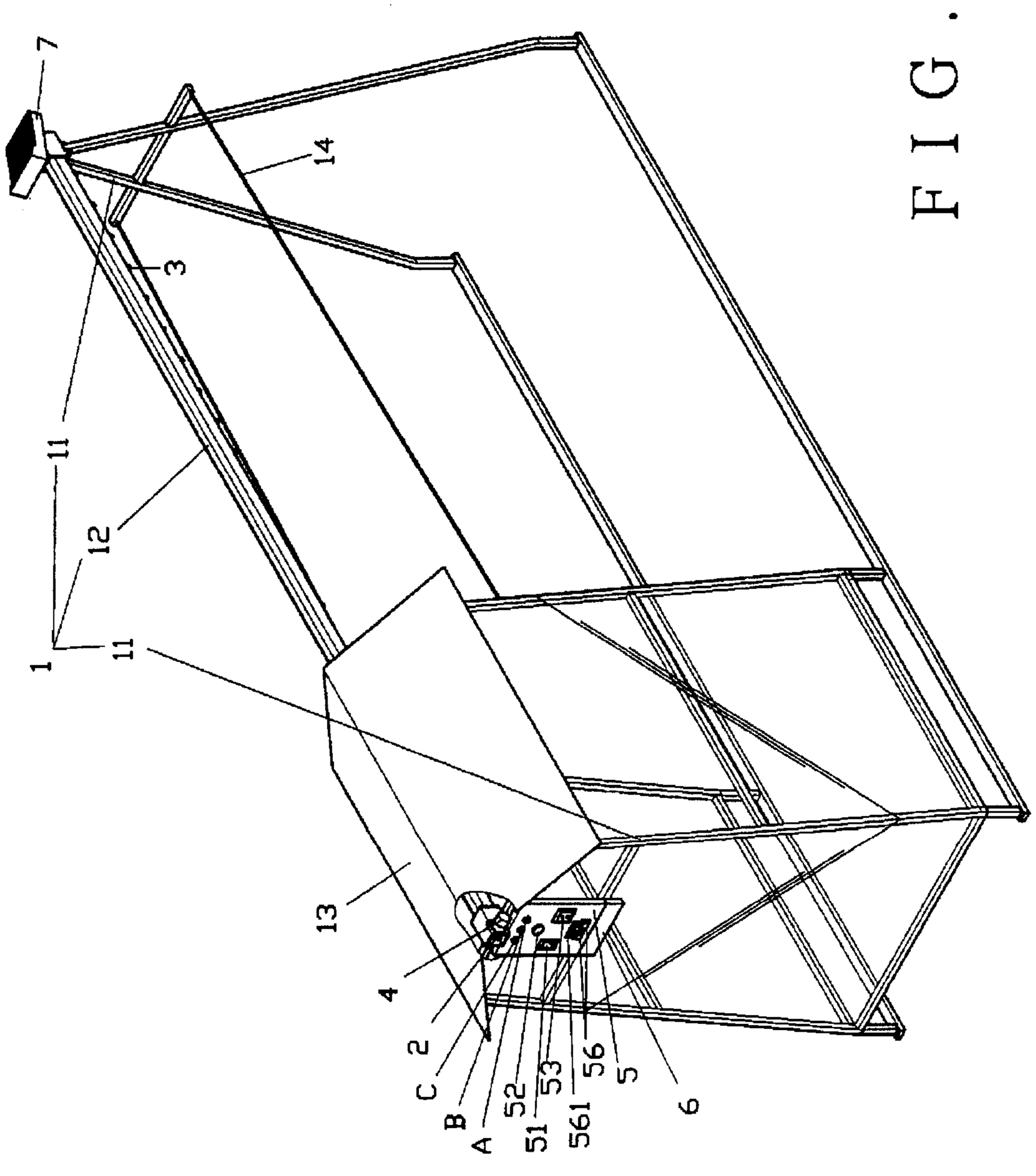


FIG. 1

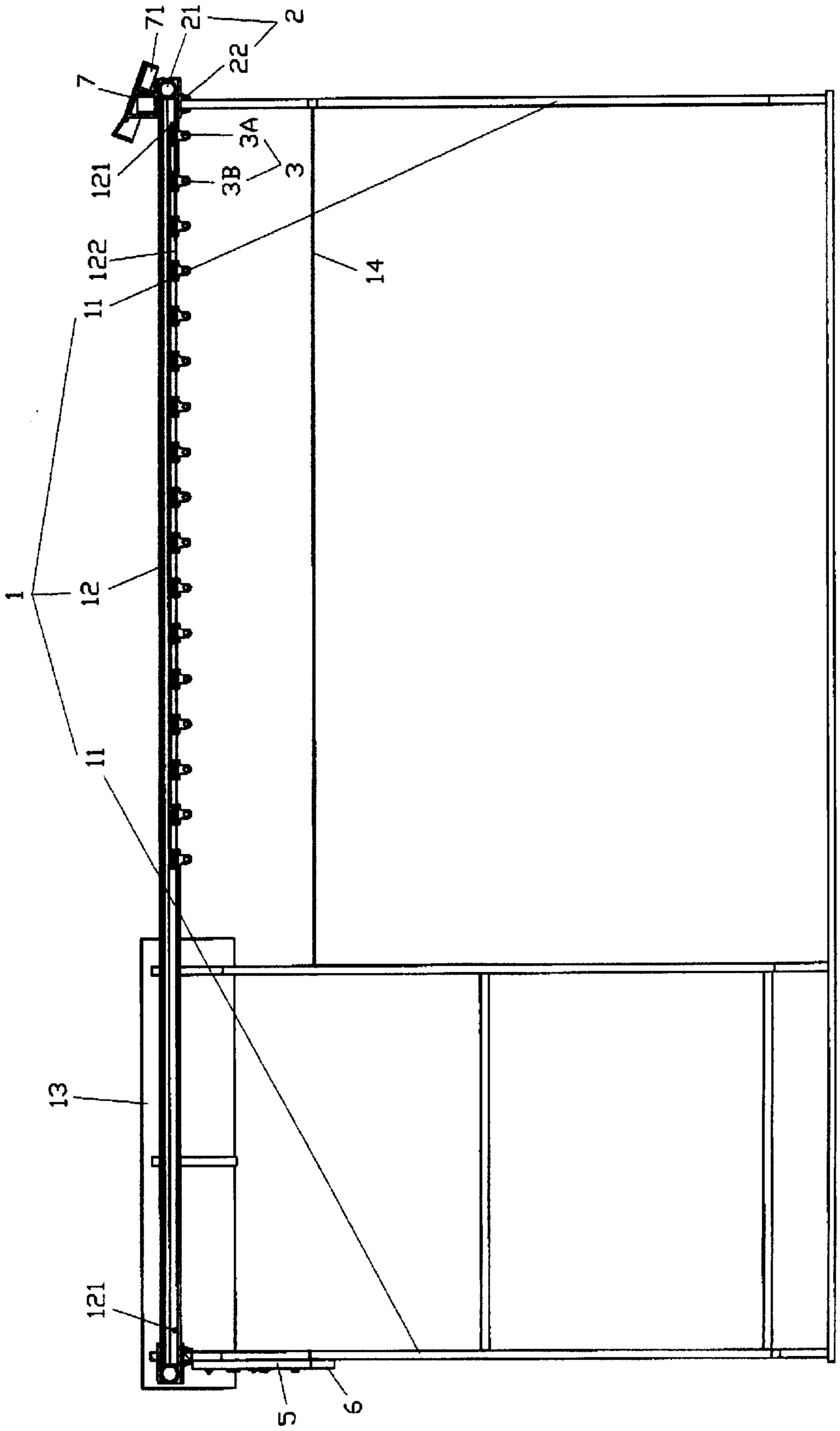
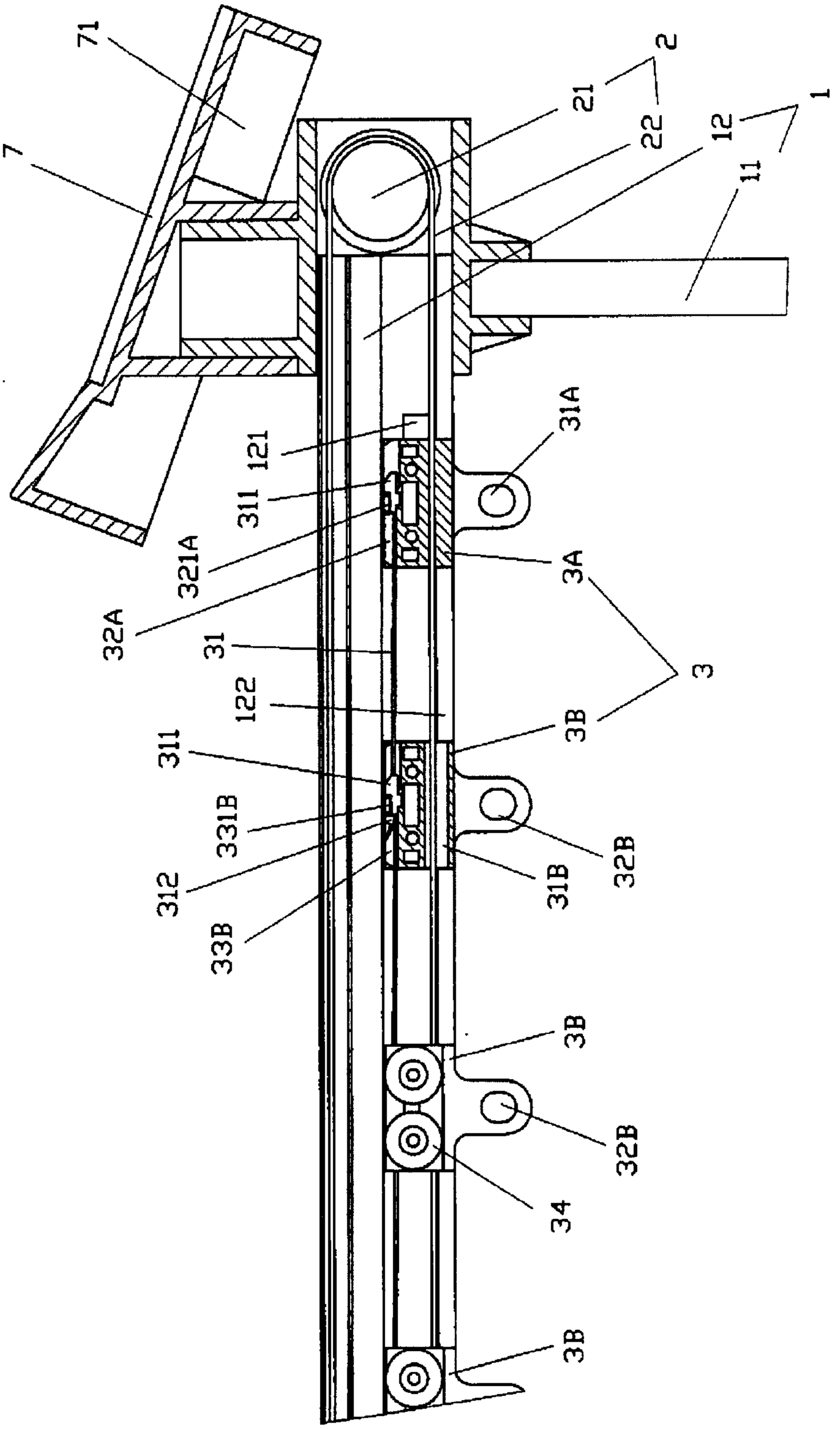


FIG. 2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7
21
22
2
1
12
11
121
311
321A
32A
31
122
312
331B
33B
31A
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3B
32B
31B
34

FIG. 3

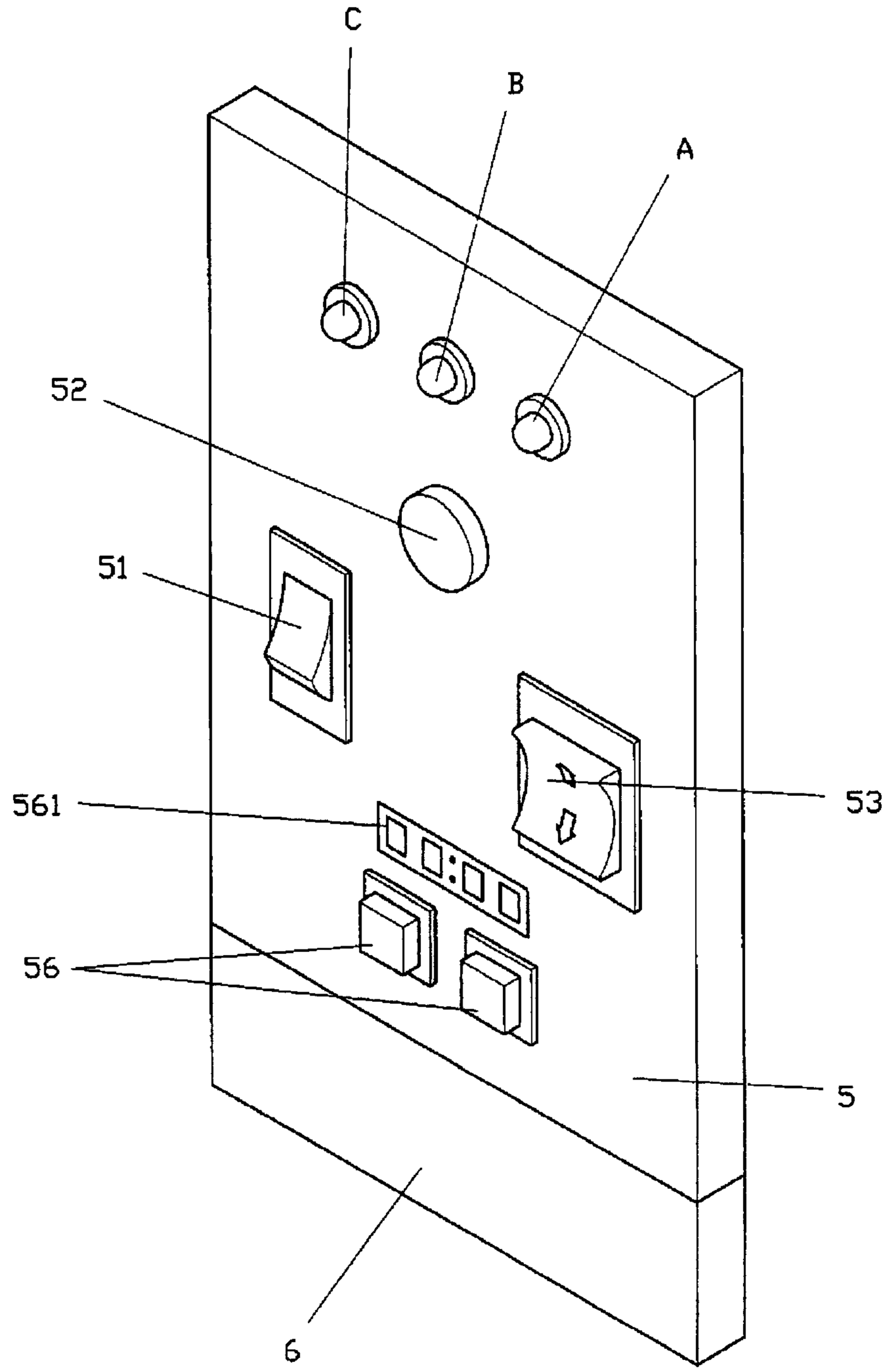


FIG. 4

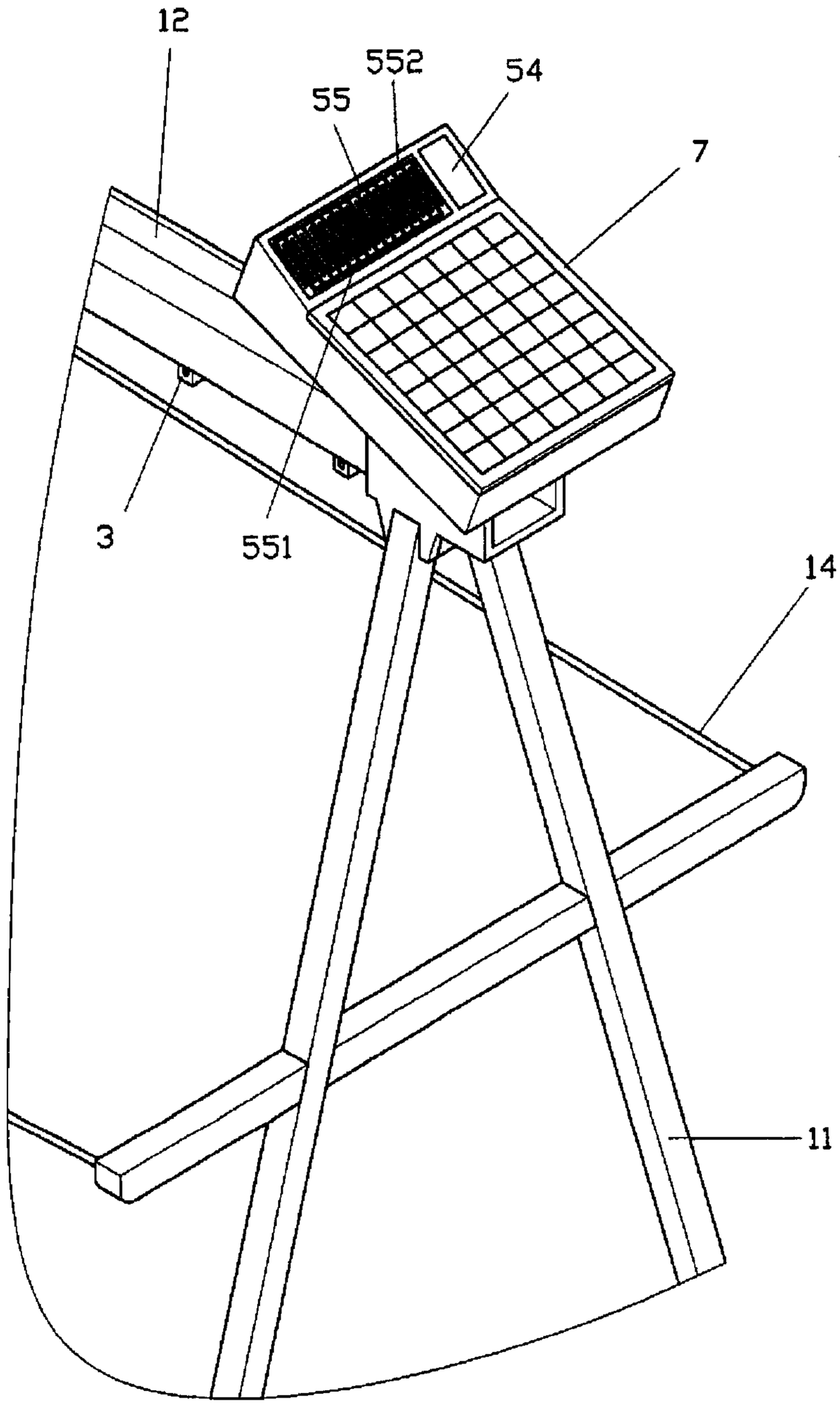
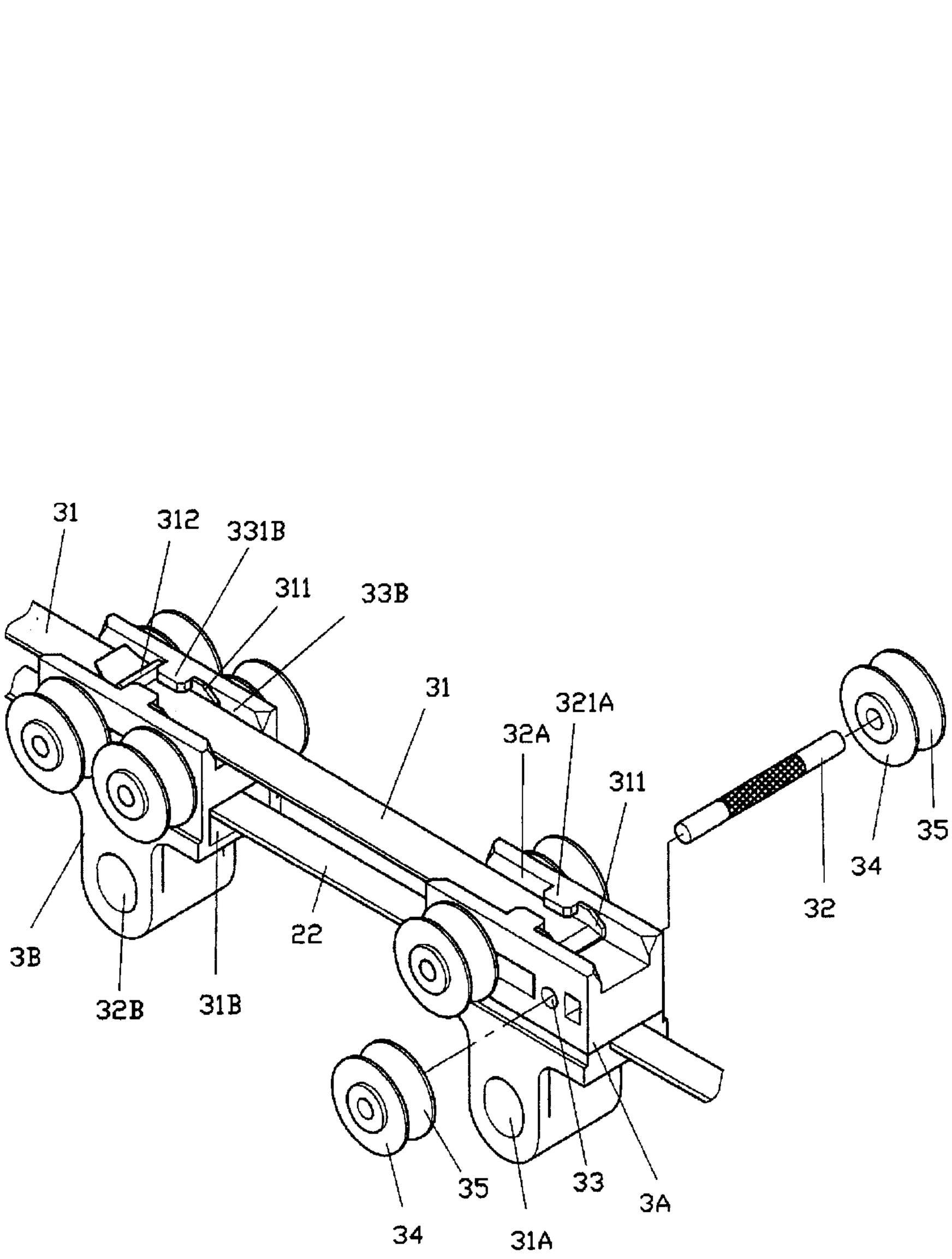


FIG. 5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312
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311
33B
31
321A
32A
311
35
34
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32B
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35
33
3A
34
31A
3

FIG.6

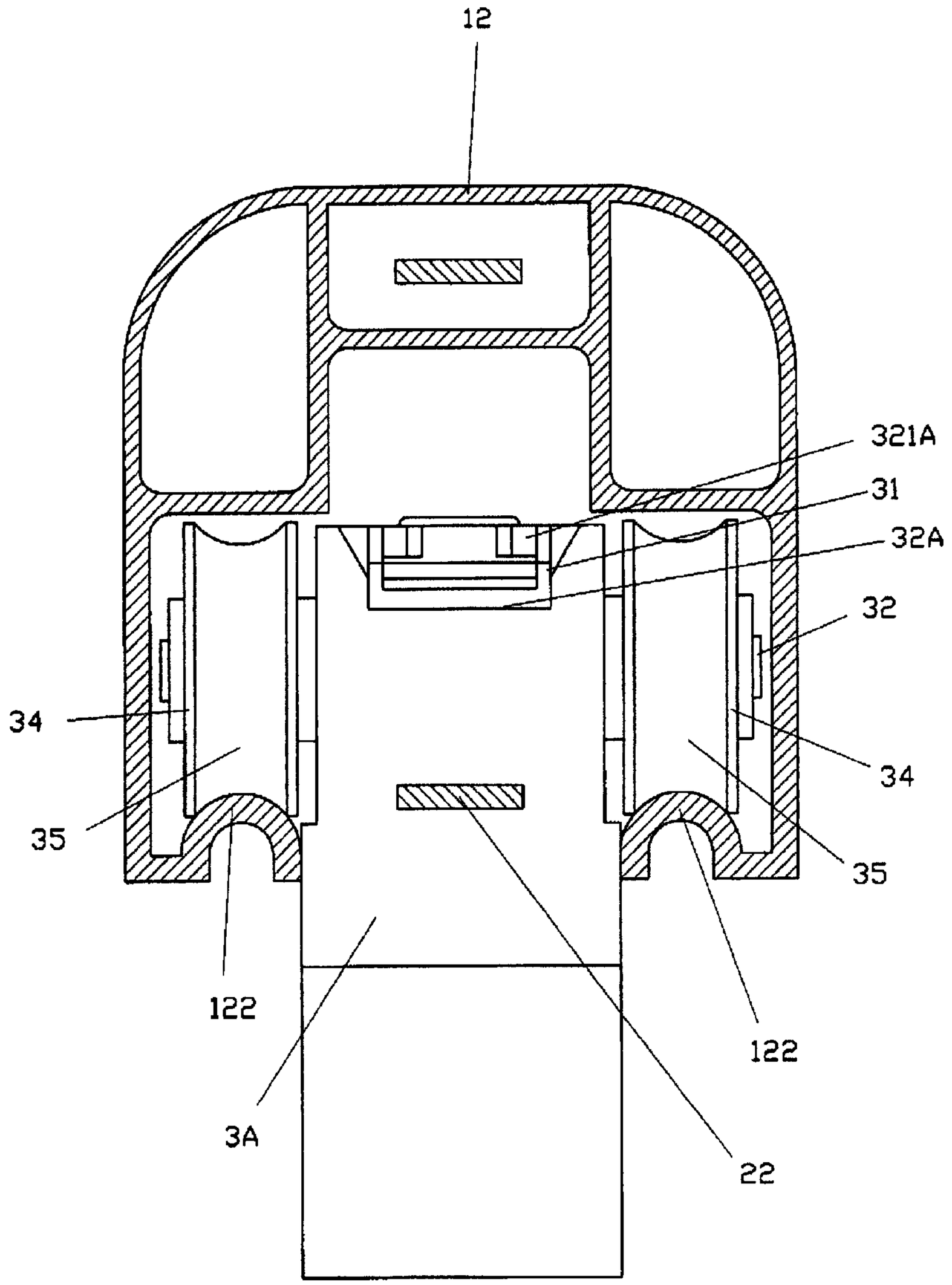

FIG. 7

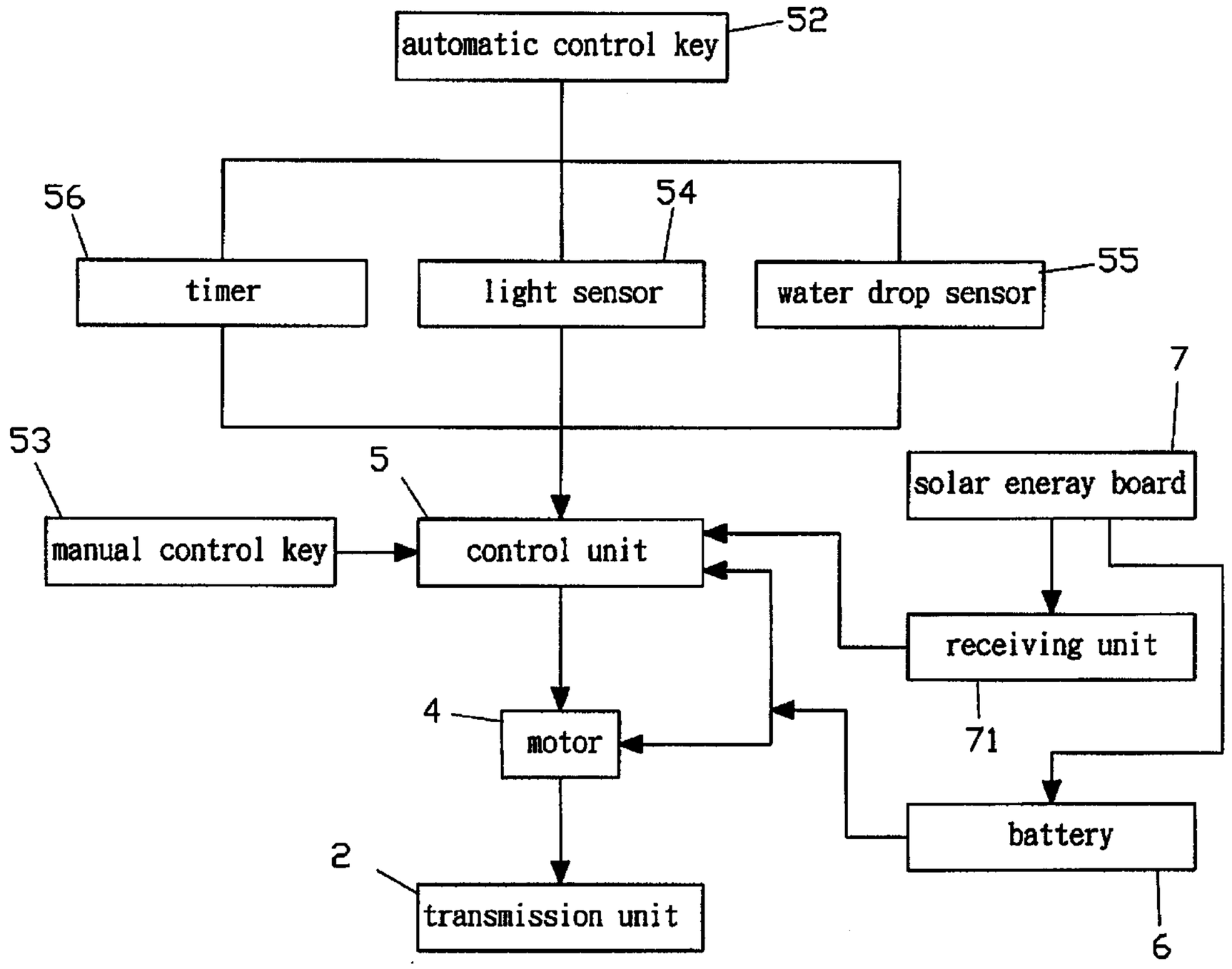
automatic control key
52
56
54
55
timer
light sensor
water drop sensor
7
53
5
manual control key
control unit
solar eneray board
receiving unit
4
motor
71
battery
2
transmission unit
6

FIG. 8

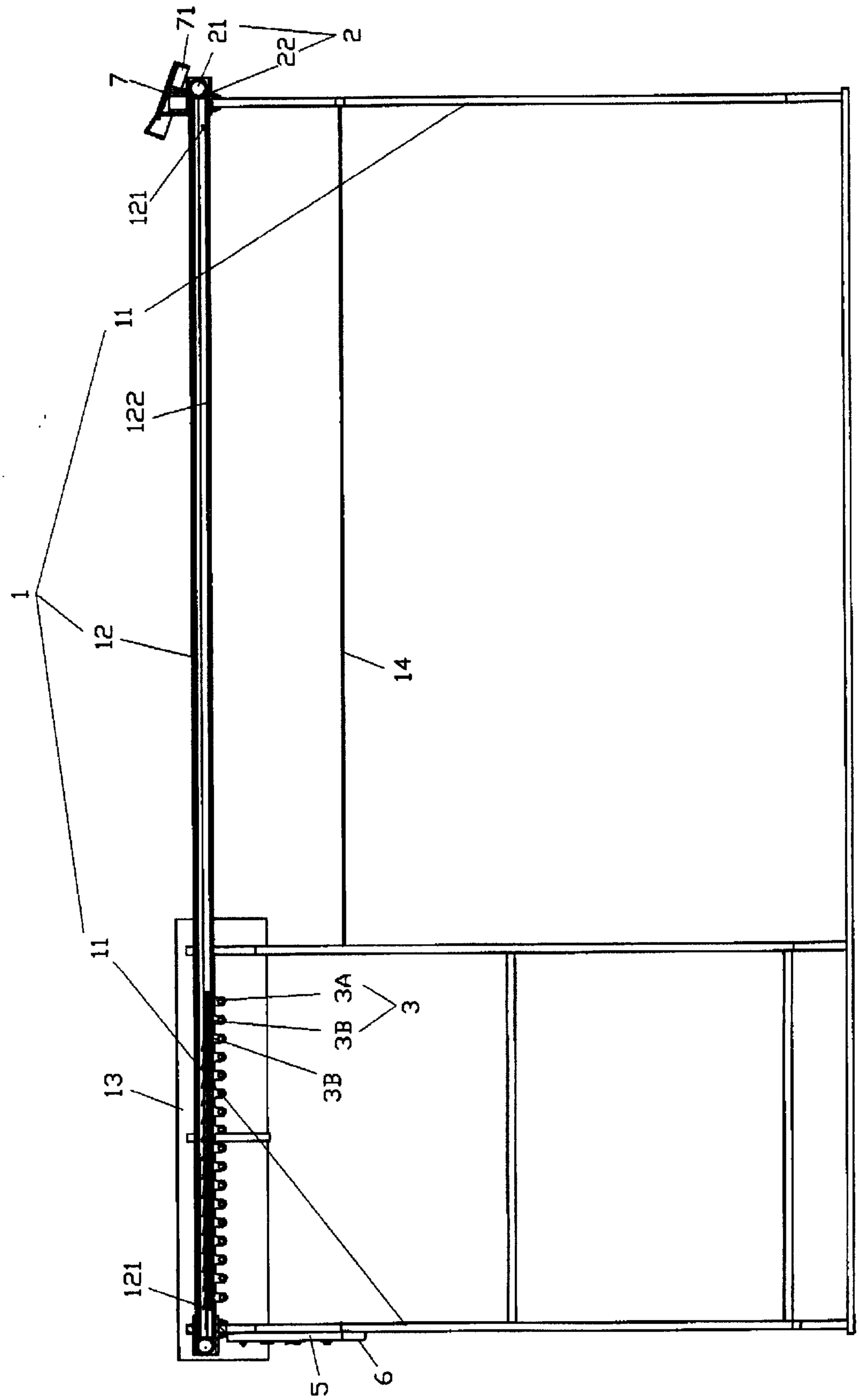

FIG. 9

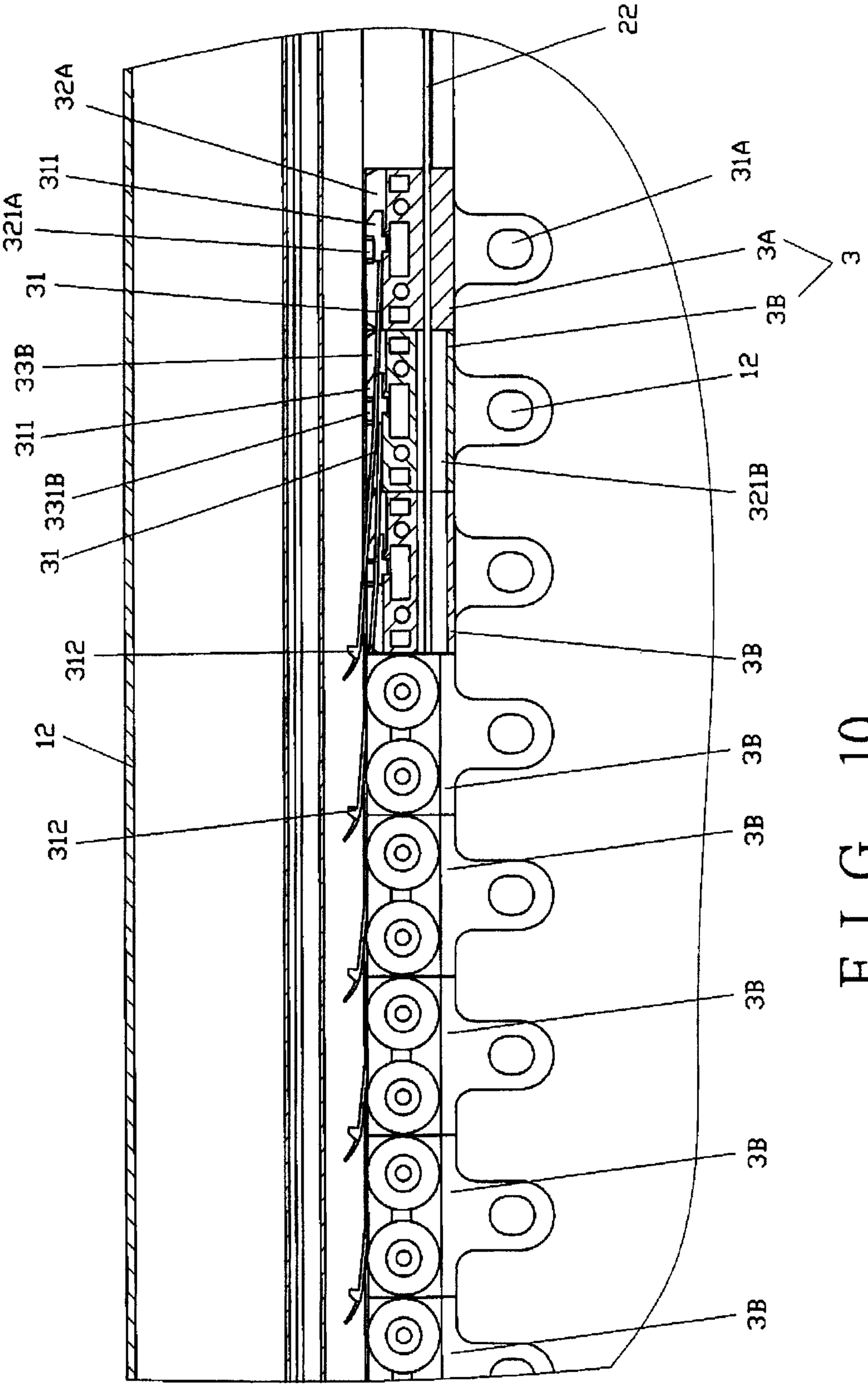
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FIG. 10

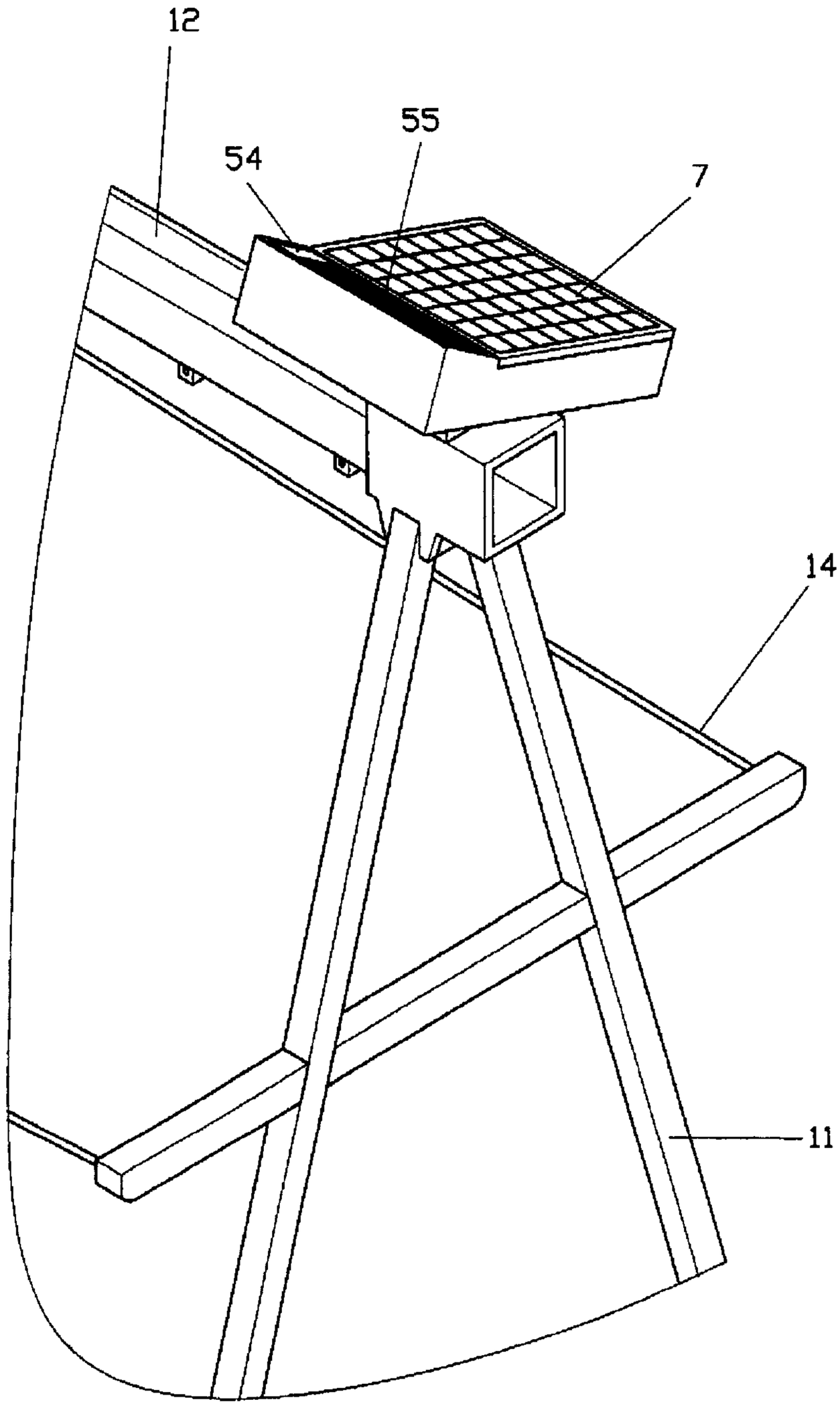
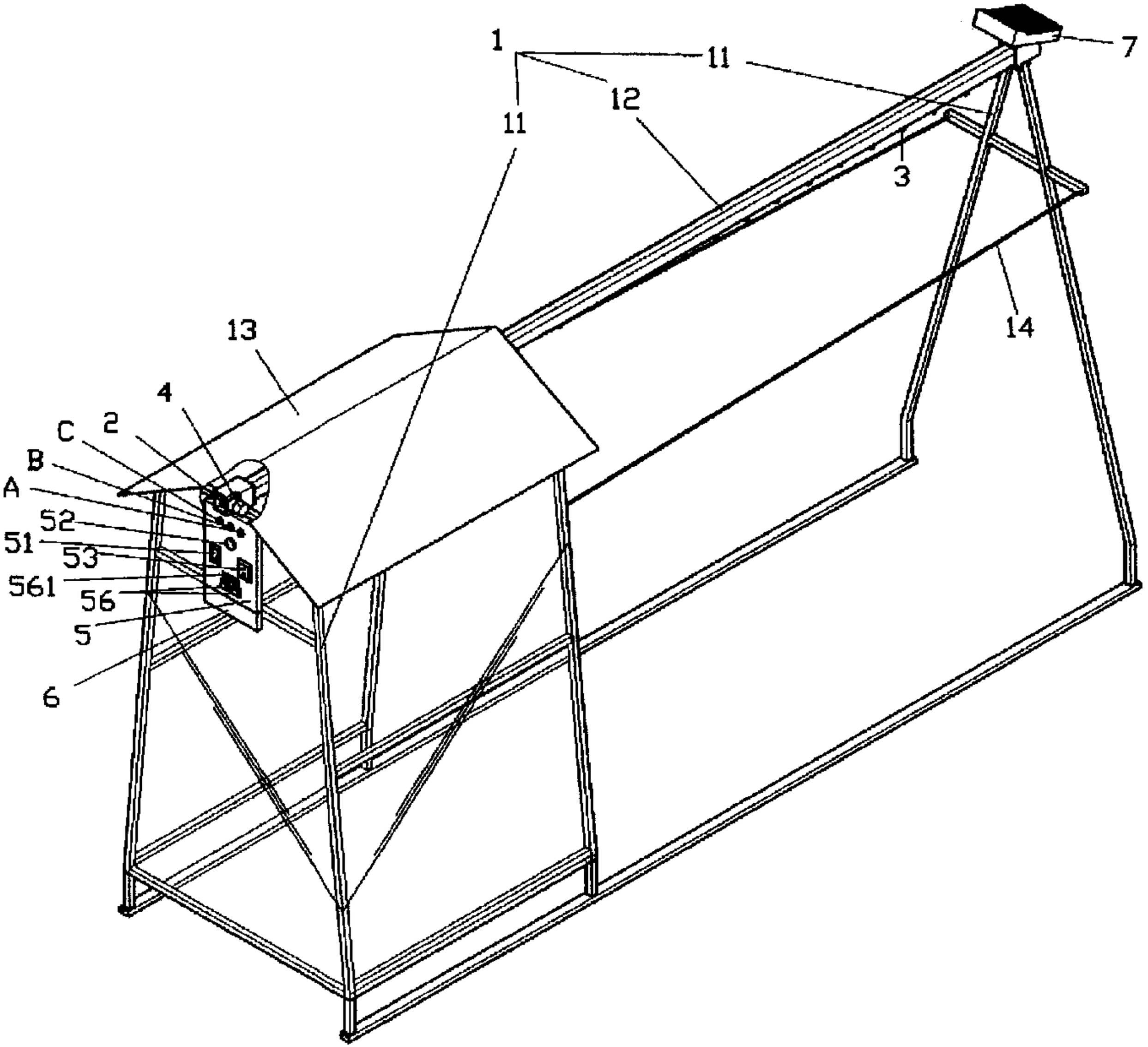


FIG. 11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