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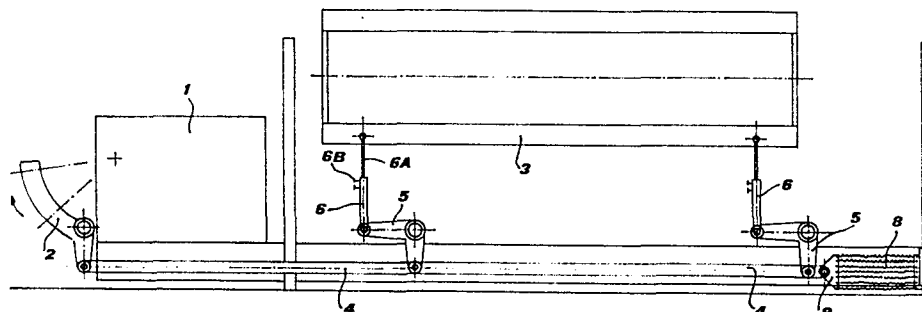
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(54) **Heald frames control linkage in weave machines.**

(57) In a weave machine of negative type, the heald frames are controlled by means of a linkage comprising: a rigid bar controlled by said machine; a plurality of angle levers which are pi-

voted to the loom frame, are hinged to said bar and are connected by connecting rods to the heald frame; and spring return means acting on said rigid bar.



"HEALD FRAMES CONTROL LINKAGE IN WEAVE MACHINES"

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This invention relates to those devices mounted on weaving looms for determining the shed formation in accordance with the required weave for the fabric being formed.

Device of this type are known to generally comprise a mechanism or "dobby" provided with a series of control members governed by a reading device, which receives programmed instructions contained in punched cards, in a punched paper tape or in a drum or chain with points. Each of these dobby members is connected to a heald frame, each heald being formed from an eye traversed by one of the warp threads. The selective vertical movement of these frames causes opening of the warp threads to allow passage of the weft threads in accordance with a prechosen programme corresponding to the pattern or weave to be obtained.

Conventional dobbies comprise those of positive type in which the frames are driven positively upwards and downwards to overcome the reaction of the taut warp threads, and those of negative type in which said drive is in a single direction, in opposition to elastic return components. The present invention relates to dobbies of the second type.

Known construction of such dobbies of negative type already exist, in which the heald frames are pulled upwards (or downwards) by a pair of cables and returned to their low (or high) position by springs which act on rocker arms connected to the frames. These methods used up to the present time in weaving give rise to various drawbacks in that the cables tend to stretch against the action of the springs, so changing the level of the frame. It is therefore necessary to continuously reset the original position of the frames by adjusting tensioning devices disposed at the end of the cables.

The present invention obviates this drawback by means of a

linkage characterised by comprising a rigid bar controlled by said machine; a plurality of angle levers which are pivoted to the loom frame, are hinged to said bar and are connected by connecting rods to the heald frame; and spring return means acting on said rigid bar.

The invention is represented on the accompanying drawings which show overall diagrammatic views of some preferred embodiments thereof, one for each of Figures 1 to 5, of which a detailed description is given hereinafter by way of example.

In figure 1, the reference numeral 1 indicates the weaving machine (negative dobby) with its control lever 2, and the reference numeral 3 indicates the heald frame.

According to the invention, the frame 3 is controlled by the lever 2 from below by way of a rigid bar 4 and a system of angle levers 5 and connecting rods 6.

According to the invention, the angle levers 5 are pivoted at their angle to the loom frame at 7, and have their ends hinged to the bar 4 and connecting rods 6. These latter are adjustable, being formed with a telescopic extension 6A which can be locked in various positions by means of screws 6B.

Rotating the control lever 2 clockwise, in accordance with the arrow, causes the frame 3 to rise.

For its return to its lowered position, the arrangement of Figure 1 comprises a series of return springs 8 acting substantially axially on the bar 4 by way of a swivel-mounted connector 9.

The aforesaid embodiment has the great advantage that the return springs 8 act directly on the pull bar 4 and thus the articulated joints of the levers 5 support no extra load due to the return effect of the springs, the entire tension of the springs being supported only by the pull bar 4 and by the weaving machine 1. Moreover, the lever arrangement is such that the bar 4

operates under tension. The method is therefore very rational and effective.

In the embodiment of Figure 2, one of the angle levers of the linkage is replaced by a T lever 10 pivoted at its cross-point 11 to the loom frame and hinged at the end of its shank to the bar 4 and at one end of its arm to a connecting rod 6. The action of the return springs 8, which are disposed perpendicular to the bar 4, is applied at 12 to the other end of the arm of said T lever by way of a swivel-mounted connector 9.

A modification of the embodiment of Figure 2 is shown in Figure 3. This linkage uses two modified angle levers 5 comprising a protuberance 5A to which the action of return spring 8, in this case inclined to the bar 4, is applied by way of swivel-mounted connectors 9.

Figure 4 shows a further scheme for controlling the heald frame from below, in which the rocker control lever and the first angle lever of the system are combined into a single toggle-joint lever 13 connected to the frame 3 by a connecting rod 6. There are also one or more other angle levers 5 and connecting rods 6 between the bar 4 and frame 3. In this case, the control system acts by lowering the frame 3, and the return springs 8 are mounted - axially to the bar 4 - in such a manner as to return the frame 3 to its raised position.

Finally, Figure 5 shows a system for controlling the frame 3 from above. Again in this case, the control lever and first angle lever of the system are combined into a single toggle-joint lever 14 connected to the frame 3 by a connecting rod 6, one or more other angle levers 5 also being provided. The return springs 8 are disposed in such a manner as to return the heald frame 3 from its raised position to its lowered position, the weaving machine thus driving the frame only upward. The connection between the lever 14 and levers 5 is again made by means of a rigid bar 4 (on which the

springs 8 act axially), and the connecting rods 6 which connect the lever 5 and 14 to the frame 3 are also rigid.

Many other embodiments are also possible, and these fall within the scope of the present invention.

CLAIMS

1) A linkage for weaving machines of negative type, characterised by comprising: a rigid bar controlled by said machine; a plurality of angle levers which are pivoted to the loom frame, are hinged to said bar and are connected by connecting rods to the heald frame; and spring return means acting on said rigid bar.

2) A linkage as claimed in claim 1), wherein the spring means act axially on said rigid bar.

3) A linkage as claimed in claim 1), wherein said connecting rods are of adjustable length.

4) A linkage as claimed in claim 1), wherein the spring means act perpendicularly to said rigid bar, on a right-angled appendix of one of said angle levers.

5) A linkage as claimed in claim 1), wherein the spring means act obliquely to said rigid bar, on protuberances of one of the arms of said angle levers.

6) A linkage as claimed in claim 1), wherein one of said angle levers is combined with the control lever of the weaving machine.

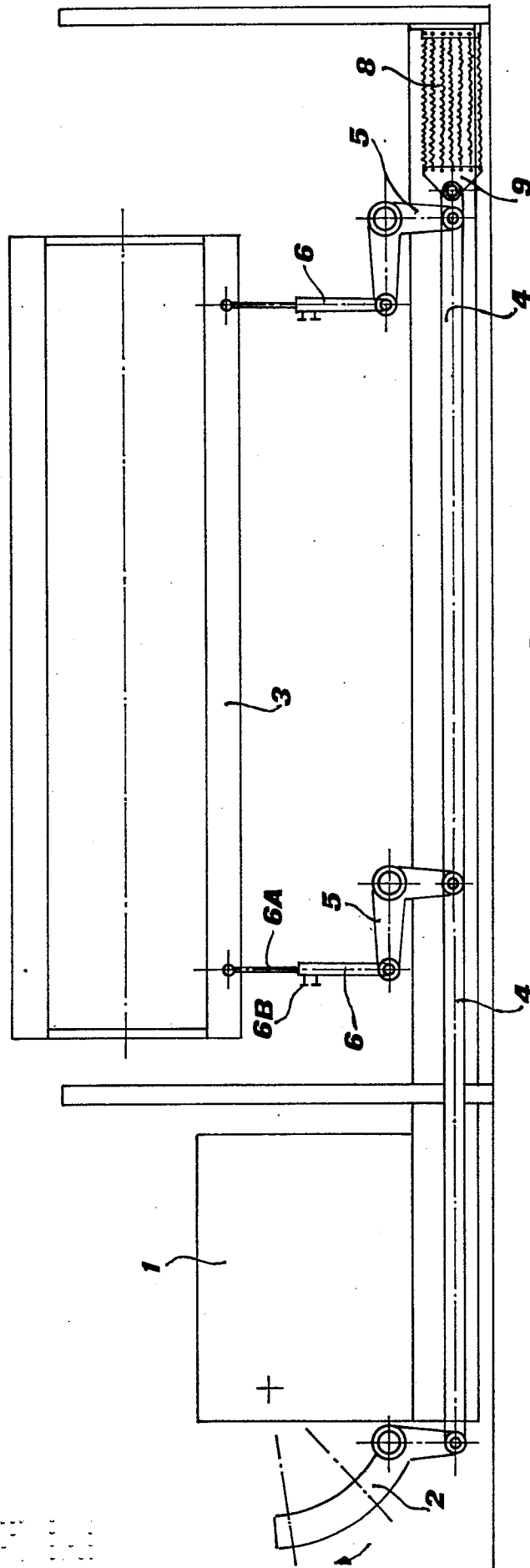


FIG. 1

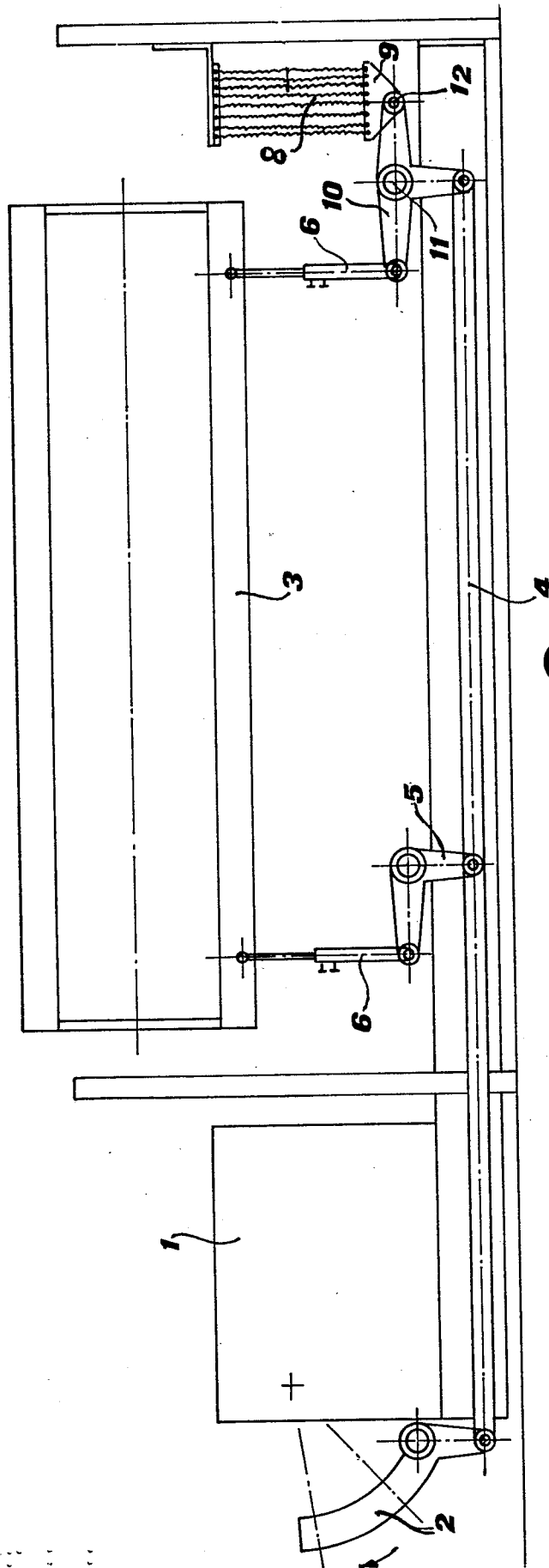


FIG. 2

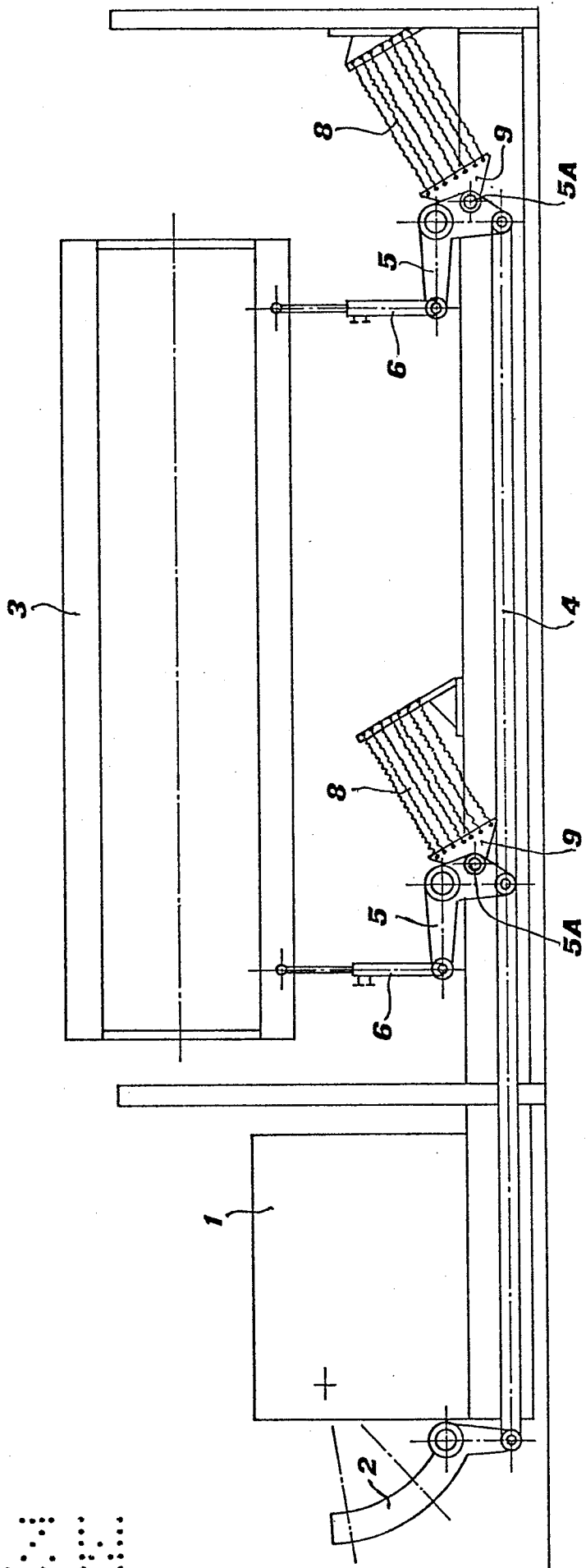


FIG. 3

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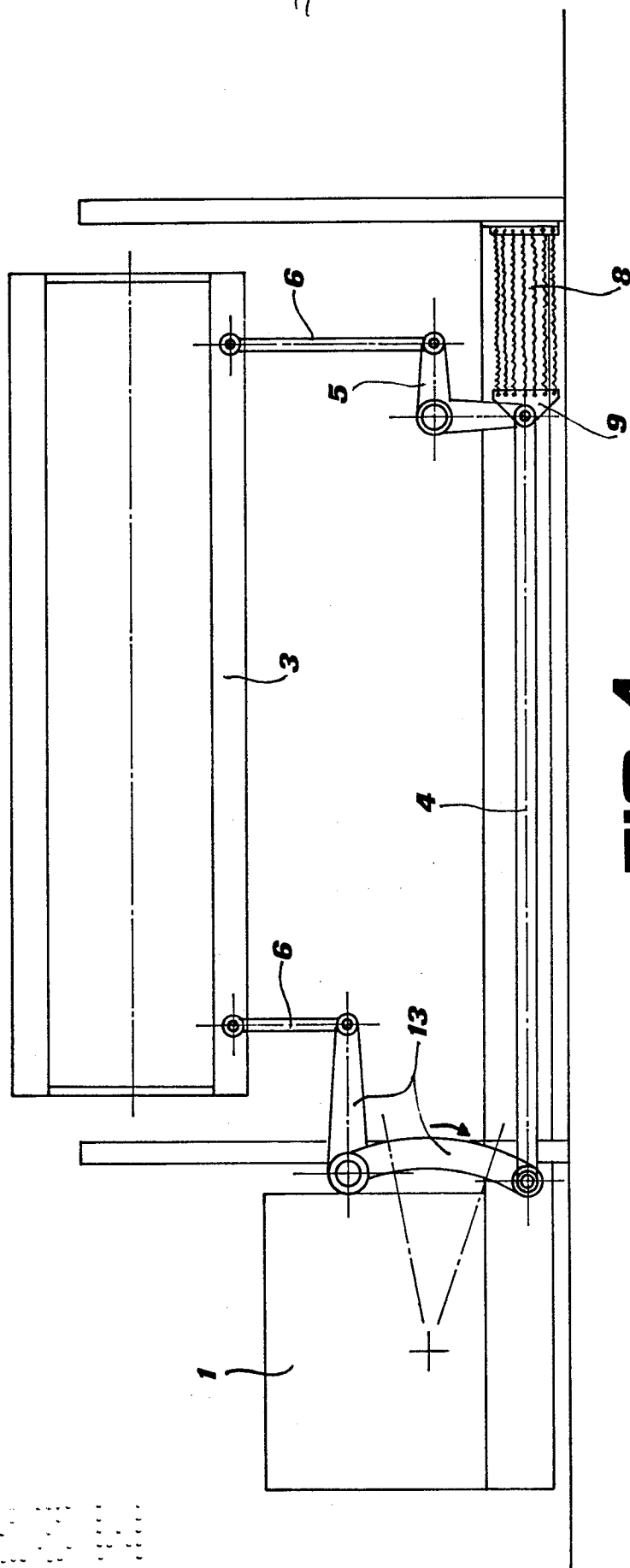
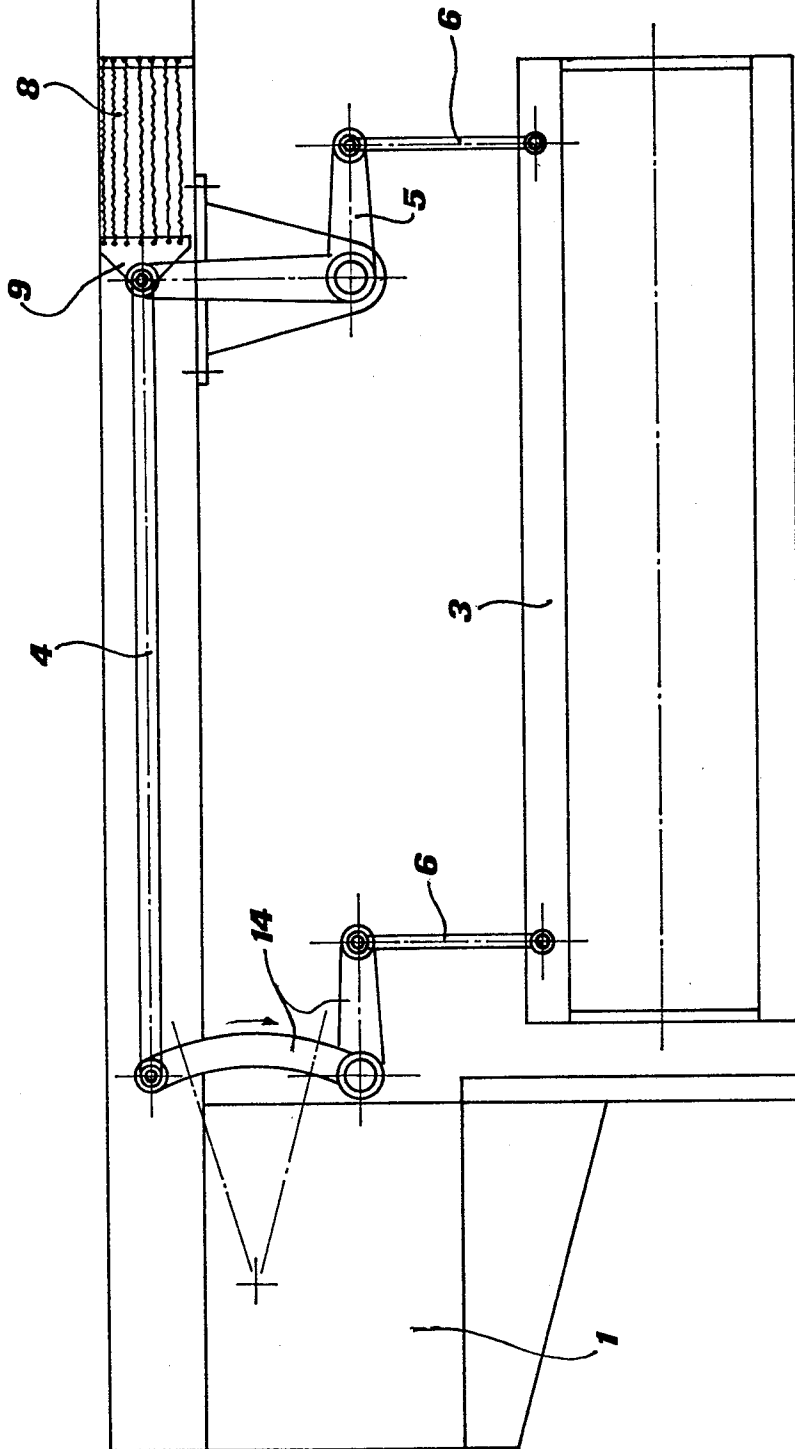


FIG. 4

**FIG. 5**