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(54) Control mechanism, particularly for information displayers with interchangeable boards

(57) The invention concerns an control mechanism, particularly for information displayers with interchangeable boards, provided with a higher board supporting loader (2) and a lower board supporting loader (3), each board supporting loader being provided with a respective control mechanism, said control mechanism comprising a hooking element (5), operated by first operation means (6), for the dragging of a board (4) while is wound and of a board (4) while is unwound, at least a first microswitch (8) provided along the vertical path of said hooking element (6), controlling the stop of said first operation means (6), a wheel (10), rotating by said operation means, provided with a number of eccentric peripheral surfaces (11), substantially equidistant, and in number corresponding to the number of boards (4) provided on the respective board supporting loader (2, 3), at least a second microswitch (12) interacting with said eccentric surfaces (11), pre-programmed control means being provided determining the motion of a pitch of said wheel (10) having the eccentric surfaces in a direction to release the wound board (4), up to bring the first eccentric surface (11) in engagement with said second microswitch (12), the motion of said wheel (10) in the opposite direction of a number of pitches sufficient to bring the same in engagement with said second microswitch (12) the eccentric surface (11) corresponding to the following board (4) to be brought shown, the stop of said second operation means and the start of the first operation means (6) in the opposite direction with respect to the preceding.

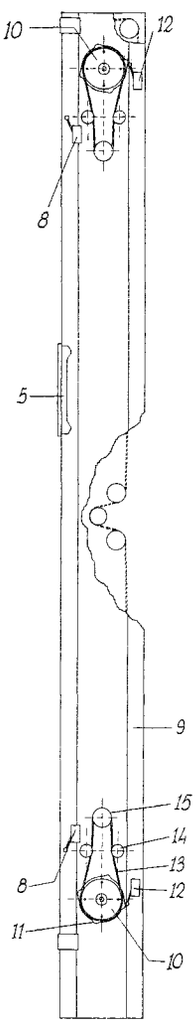

FIG. 2

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Description

The present invention relates to an control mechanism, particularly for information displayers with interchangeable boards.

More particularly, the invention concerns a mechanism allowing the realisation of the change of the boards in a displayer of the above kind in a precise and reliable way.

As it is well known, during last years a remarkable diffusion of information displayers allowing the change of the message occurred, particularly in the advertising sector.

A first kind of displayer is that one providing different horizontal elements with a triangular cross-section, that can rotate about their horizontal axis, in such a way that synchronously rotating the different faces, it is possible to modify the message visible to the public according a pre-established timed sequence.

Obviously, this kind of device is rather limitative, since the number of messages that can be viewed is limited to three, and they can be viewed according to a rigid sequence.

Furthermore, it is difficult to replace the messages, since it is necessary the complete substitution of the viewer device.

A second kind of displayer for different images already known and available on the market is that comprising a sheet wound on a roll and upon which different messages in sequence are provided.

In this case, if the number of messages is limited only by the length of the sheet and by the dimensions of the device, it is evident that remarkable limitations exist for the displaying sequence. In fact, the sequence is rigidly constrained to the order by which the different messages are placed on the sheet, so that they cannot be proposed according to a casual order.

Furthermore, it is always necessary to replace the whole sheet to replace the messages.

In view of the above, in the European patent N° 0 649 554, assigned to the Applicant, an innovative solution for an information displayer has been described to solve all the problems according to the prior art.

Particularly, the solution described and claimed allows to provide a high number of different messages according to a casual sequence and that can be singularly replaced.

These results are obtained, as it can be decuced from claim 1 of the granted patent, by an information displayer with interchangeable boards, comprising at least a loader of boards provided with means to take out said nth boards; means to grasp the board to be displayed; and means to bring in a display position and to bring back the same into a container, characterised in that said boards are selectively interchangeable, said loaders are releasably coupled to the displayer, so that they can be replaced with other ones containing different boards, in that said loaders have a stepping motion, with a number of steps corresponding to the number of boards provided, and in that the movement is obtained by a stepping motor controlled by a preprogrammed microprocessor.

Now, the Applicant has realised a solution allowing to operate a displayer having the features as described in the European patent in a still more precise and reliable way.

Obviously, the solution according to the present invention can be used also for different devices with respect to the one mentioned in the above mentioned European patent, having the same problems.

It is therefore specific object of the present invention an control mechanism, particularly for information displayers with interchangeable boards, provided with a higher board supporting loader and a lower board supporting loader, each board supporting loader being provided with a respective control mechanism, said control mechanism comprising a hooking element, operated by first operation means, for the dragging of a board while is wound and of a board while is unwound, at least a first microswitch provided along the vertical path of said hooking element, controlling the stop of said first operation means, a wheel, rotating by said operation means, provided with a number of eccentric peripheral surfaces, substantially equidistant, and in number corresponding to the number of boards provided on the respective board supporting loader, at least a second microswitch interacting with said eccentric surfaces, preprogrammed control means being provided determining the motion of a pitch of said wheel having the eccentric surfaces in a direction to release the wound board, up to bring the first eccentric surface in engagement with said second microswitch, the motion of said wheel in the opposite direction of a number of pitches sufficient to bring the same in engagement with said second microswitch the eccentric surface corresponding to the following board to be brought shown, the stop of said second operation means and the start of the first operation means in the opposite direction with respect to the preceding.

Preferably, according to the invention, said hooking element has two distinct zones of interference with said first microswitch, the first interference determining the slowing down of said first operation means and the second interference determining the stop of said first operation means and the start of said second operation means.

Always according to the invention, said hooking element provides an interference zone, a further microswitch being provided vertically aligned with said at least first microswitch, the first microswitch determining the slowing down of said first operation means and the further microswitch determining the stop of said first operation means and the start of said second operation means.

Furthermore, according to the invention, said second operation means operates a wheel rotating by a pulley couple whit a motor shaft and a transmission belt

between said wheel and said pulley.

Preferably, according to the invention, idle wheels can be provided to stress said transmission belt.

Still according to the invention, a mechanical limit switch can be provided for the motion in any direction of said wheel with eccentric surfaces.

Preferably, according to the invention, said mechanical limit switch provides a slider movable in a substantially transverse direction, thrusted in a first direction by the interaction of a shaped tongue having a pin, provided on the same slider, the number of pins corresponding to the number of eccentric surfaces, up to the interference with a further microswitch, substantially provided aligned with said second microswitch, the stroke in this direction being delimited by a mechanical stop, and returned, in the opposite direction, following to the inversion of the rotation direction of the pulley with eccentric surfaces, by return elastic means.

Always according to the invention, the movements of said first and second operation means are controlled by control programmable electronic means.

The present invention will be now described, for illustrative but not limitative purposes, according to its preferred embodiments, with particular reference to the figures of the enclosed drawings, wherein:

figure 1 shows a front view of an image displayer with interchangeable boards provided with a first embodiment of the mechanism according to the invention;

figure 2 shows a partially broken away lateral view of the mechanism of figure 1;

figure 3 shows a partially broken away lateral view of a second embodiment of the mechanism according to the invention; and

figure 3 shows a particular of the mechanism of figure 3.

Referring first to figures 1 and 2 of the enclosed drawings, it is shown an image displayer 1 with interchangeable boards.

As already mentioned, the invention will be described with particular reference to an image displayer with interchangeable boards, but it is well evident that the mechanism according to the invention can be adopted also on a different kind of device.

Image displayer 1 comprises two loaders 2 and 3, respectively upper and lower, each bearing four wound boards 4. Obviously the number of the boards 4 can also be different.

Said displayer further provides a dragging mechanism 5 to which a board of the lower loader 3 and a board 4 of the upper loader 2, which are respectively brought into exposition and wound again about the loader and vice versa.

When the board 4 to be displayed is completely extracted from its roll, the hooking mechanism 5 must hook the board of the upper loader 2 or of the lower loader 3 that will have to be then brought into exposition.

The motion of the two boards 4 hooked by the mechanism 5 is controlled by the motor 6.

A reinforcement element 7 is back provided for each board 4.

As to the hooking and releasing device of the board 4 to the mechanism 5, it is subject matter of a parallel patent application.

The choose of the board 4 to be shown is controlled by a preprogrammed microprocessor, not shown, in this way allowing to have the possibility of the casual showing mentioned before.

However, displayer 1 must provide a mechanism allowing to release the board 4 previously displayed, in the position on the free loader 2 or 3 and thus rotating the loader of the sufficient angle to allow to bring the established board 4 into exposition.

In fact, it is not sure that the board 4 to be shown is that following on the loader 2 or 3, so that in the case shown in figure it would be sufficient a rotation of 90°, or different in case the provided number of boards 4 is different.

The mechanism according to the invention is symmetrically provided both for the upper loader 2 and for the lower loader 3, so that it will be described only with reference to one of the two, on the figures being provided the same reference number.

Laterally, along the displayer 1 a microswitch 8 is provided which interferes with said hooking mechanism 5 of the boards 4.

Along the ascent or descent stroke of the mechanism 5 a double interference with the microswitch 8 occurs: the first one sends a slowing down control to the motor 6, since indicates the approaching to the limit switch, the second one determining a stop control of the same motor 6.

On the shaft of the loader 2 or 3 a pulley 10 is provided outward the frame of the displayer 1, said pulley having peripherally four eccentric surfaces 11 (or in any case a number corresponding to the number of boards 4 provided on the loader 2 or 3) suitable to interact with a second microswitch 12.

Said pulley 10 is rotated by a toothed belt 13 passing between two idle wheels 14, a second pulley 15, powered by a motor (not shown) always controlled by said microprocessor.

After the signal from the stop microswitch 8 of the motor 6, the microprocessor will rotate the pulley 10 of 90°, to release the board 4 previously shown, until the following surface of the pulley interferes with the microswitch 12.

Now the rotation of the pulley 10 is inverted, making the pulley rotating of 90° (or 180° or 270° according to the control deriving from the microprocessor) to hook a different board 4 to be shown.

The rotation will occur until the corresponding eccentric surface of the pulley 10 interferes with the microswitch, and then the motor operating the pulley 15 is

stopped and the motor 6 dragging the displayed boards 4 is activated.

Coming now to describe the solution shown in figures 3 and 4, the same number reference will be used for the corresponding parts.

As it can be noted, this solution provides a mechanical limit switch 16 for the motion of the pulley 10 provided with eccentric surfaces 11.

The mechanical limit switch 16 is transversely movable, until interacting with a microswitch 17, at the bottom provided aligned with said limit switch 12, in such a way to determine the inversion of the rotation of the pulley 10, once the suitable eccentric surface 11 is brought to interact with the microswitch 12.

The transverse stroke of the mechanical limit switch 16 is bucked by the spring 18.

Furthermore, the limit switch 16 provides a shaped tongue 19 which interacts with pins 20 provided on the pulley 10, offset in a way corresponding to the eccentric surfaces 11.

Observing now figure 4, when the pulley rotates in a clockwise direction, the pin 20 acts on the straight surface of the tongue 19, thrusting the limit switch 16 rightward, until it interacts with the microswitch 17. Stroke of the microswitch 16 is in any case limited by the pin 21 within the slot 22 of the limit switch 16.

Microswitch 17 determines the inversion of the motion of the pulley 10, which will now rotate in a anticlockwise direction, bringing the following pin 20 beyond the tongue 19, sliding along the sloped surface of the tongue 19, to properly hook the following board.

In the solution shown in figures 3 and 4, the dragging mechanism 5 has a single interference surface, in this case two different microswitches, respectively 8 and 23 being provided, for the slowing down and the stop of the same mechanism.

Obviously, said solution can also be provided in the embodiment of figures 1 and 2, as well as the solution providing a single microswitch 8 can be provided in the embodiment shown in figures 3 and 4.

The present invention has been described for illustrative but not limitative purposes, according to its preferred embodiments, but it is to be understood that modifications and/or changes can be introduced by those skilled in the art without departing from the relevant scope as defined in the enclosed claims.

Claims

1. Control mechanism, particularly for information displayers with interchangeable boards, provided with a higher board supporting loader and a lower board supporting loader, each board supporting loader being provided with a respective control mechanism, said control mechanism being characterised in that it comprises a hooking element, operated by first operation means, for the dragging of a board while is wound and of a board while is unwound, at least a first microswitch provided along the vertical path of said hooking element, controlling the stop of said first operation means, a wheel, rotating by said operation means, provided with a number of eccentric peripheral surfaces, substantially equidistant, and in number corresponding to the number of boards provided on the respective board supporting loader, at least a second microswitch interacting with said eccentric surfaces, preprogrammed control means being provided determining the motion of a pitch of said wheel having the eccentric surfaces in a direction to release the wound board, up to bring the first eccentric surface in engagement with said second microswitch, the motion of said wheel in the opposite direction of a number of pitches sufficient to bring the same in engagement with said second microswitch the eccentric surface corresponding to the following board to be brought shown, the stop of said second operation means and the start of the first operation means in the opposite direction with respect to the preceding.

2. Control mechanism according to claim 1, characterised in that said hooking element has two distinct zones of interference with said first microswitch, the first interference determining the slowing down of said first operation means and the second interference determining the stop of said first operation means and the start of said second operation means.

3. Control mechanism according to claim 1, characterised in that said hooking element provides an interference zone, a further microswitch being provided vertically aligned with said at least first microswitch, the first microswitch determining the slowing down of said first operation means and the further microswitch determining the stop of said first operation means and the start of said second operation means.

4. Control mechanism according to one of the preceding claims, characterised in that said second operation means operates a wheel rotating by a pulley couple whit a motor shaft and a transmission belt between said wheel and said pulley.

5. Control mechanism according to one of the preceding claims, characterised in that idle wheels are provided to stress said transmission belt.

6. Control mechanism according to one of the preceding claims, characterised in that a mechanical limit switch is provided for the motion in any direction of said wheel with eccentric surfaces.

7. Control mechanism according to claim 7, character-

ised in that said mechanical limit switch provides a slider movable in a substantially transverse direction, thrusted in a first direction by the interaction of a shaped tongue having a pin, provided on the same slider, the number of pins corresponding to the number of eccentric surfaces, up to the interference with a further microswitch, substantially provided aligned with said second microswitch, the stroke in this direction being delimited by a mechanical stop, and returned, in the opposite direction, following to the inversion of the rotation direction of the pulley with eccentric surfaces, by return elastic means.

8. Control mechanism according to one of the preceding claims, characterised in that on said wheel 3 or 4 equidistant eccentric surfaces are provided.

9. Control mechanism according to one of the preceding claims, characterised in that the movements of said first and second operation means are controlled by control programmable electronic means.

10. Control mechanism according to each one of the preceding claims, substantially as illustrated and described.

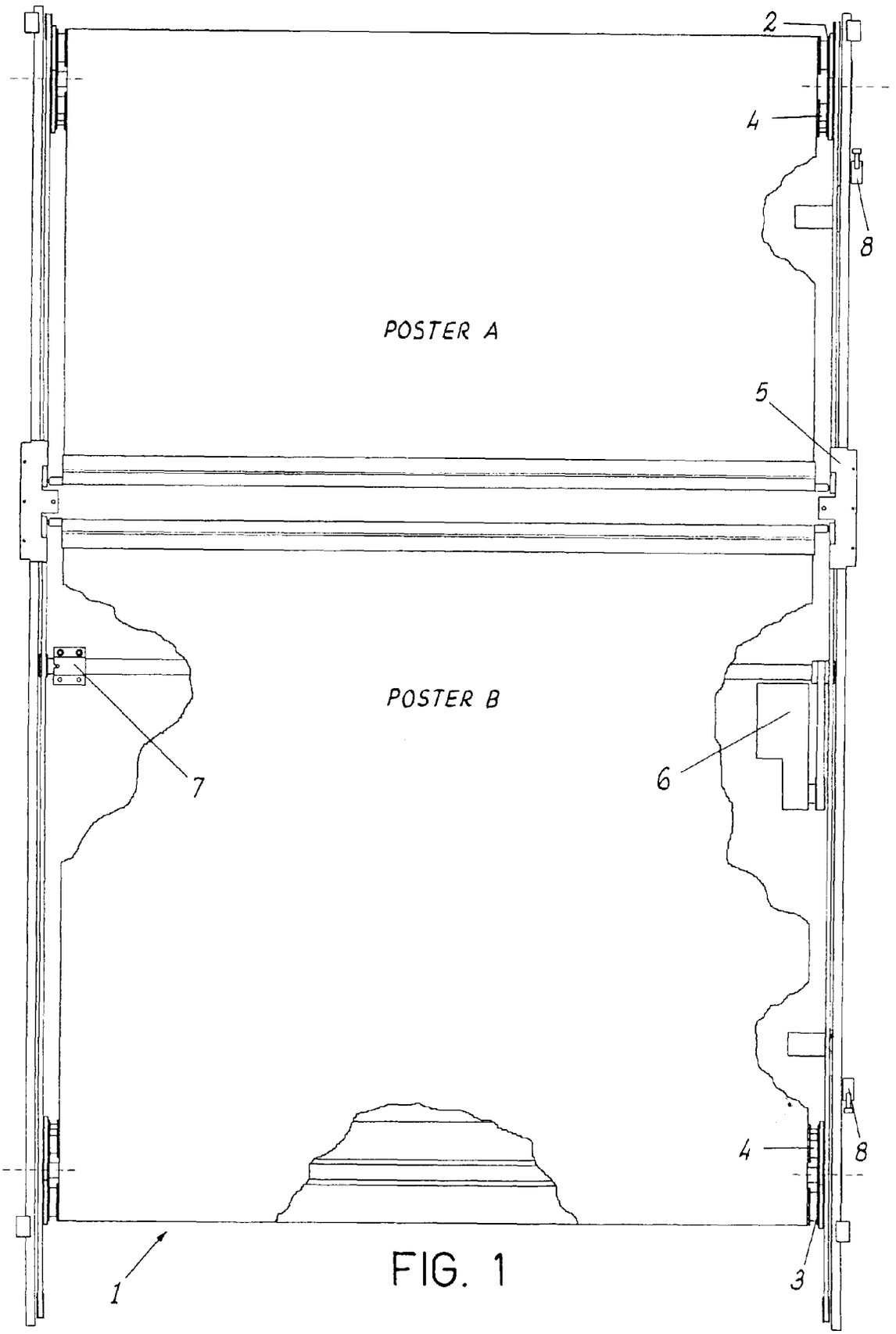

FIG. 1

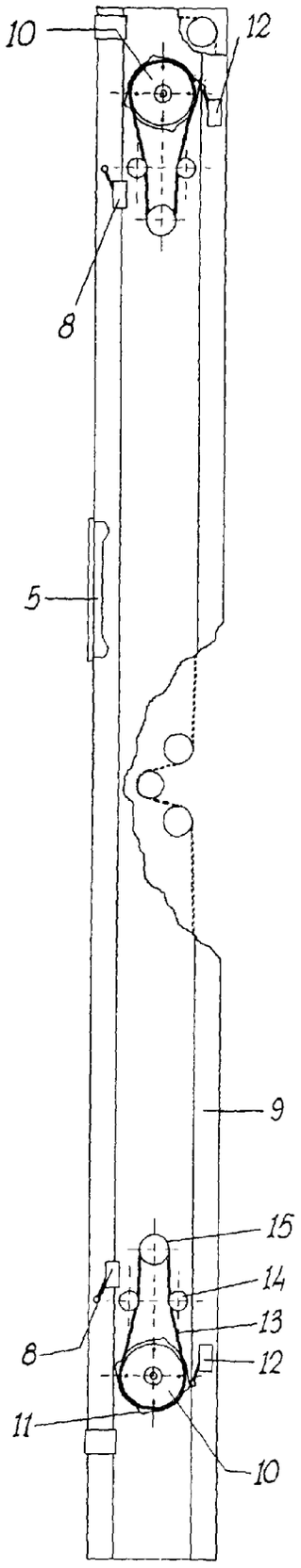

FIG. 2

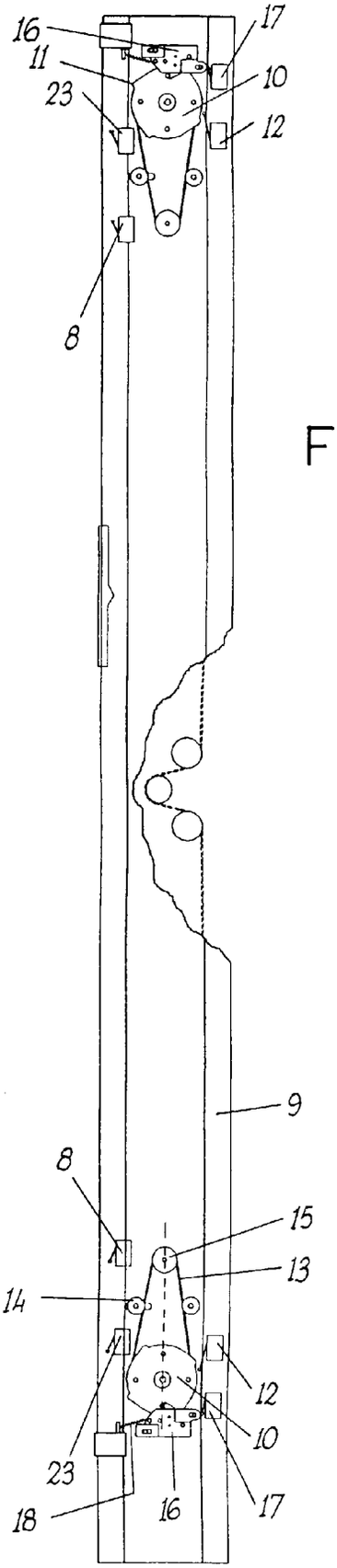

FIG. 3

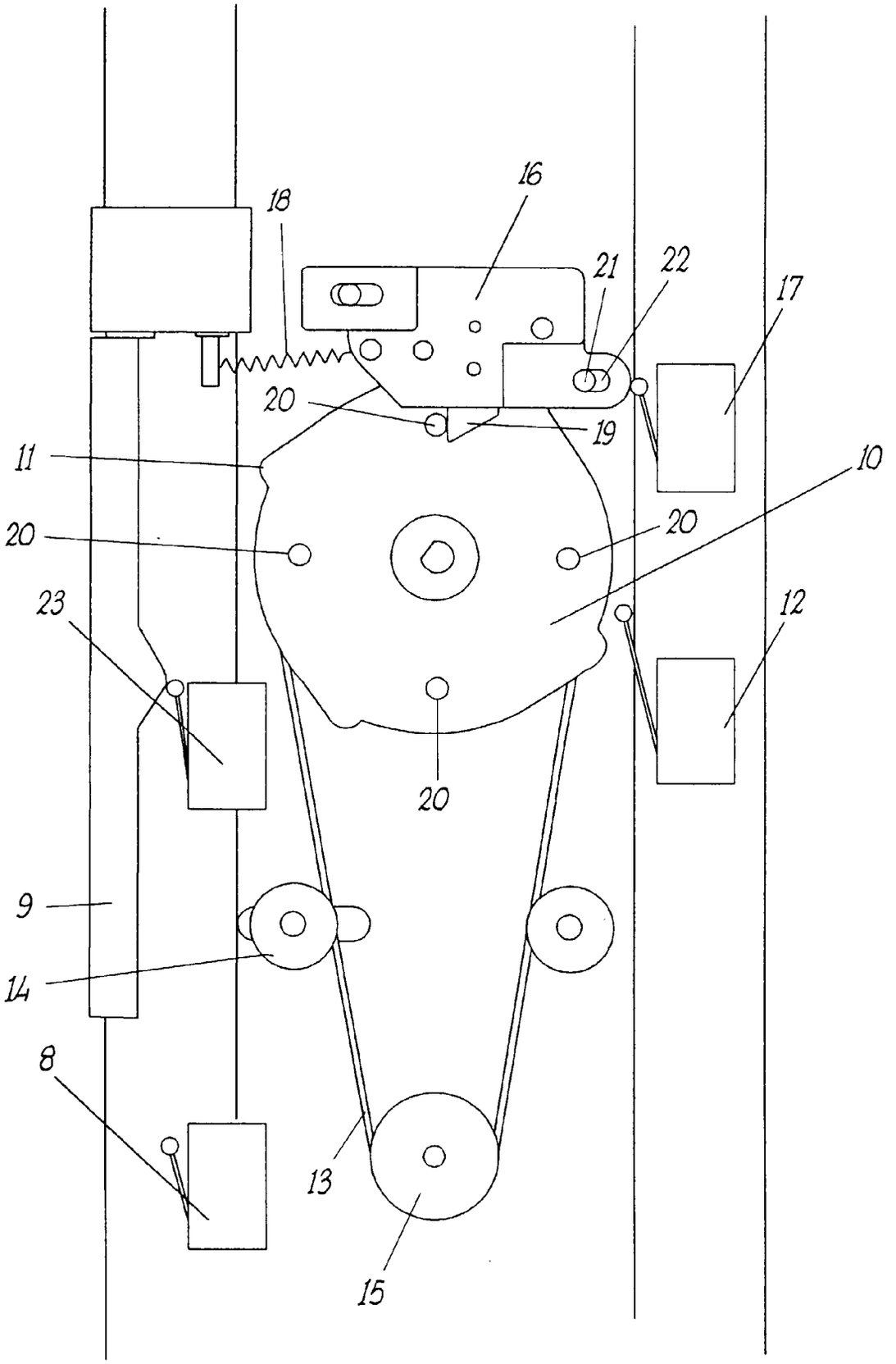

FIG. 4