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(54) **The method of venetian blinds control and the device for performing this method**

(57) The method of venetian blinds control, in particular window venetian blinds, where rotating of the venetian blinds (3) is performed by motorized device (1), which fixtures (131, 132) of the drive unit (13) are attached to loops of draw-links (21, 22) of the control (2), while opening/closing of the venetian blinds (3) is performed by the movement of both fixtures (131, 132). The device (1) incorporates the electronic control unit (1), which processes signals of the switch (111) and provides movement of fixtures (131, 132) of the drive unit (13) with attached draw-links (21, 22) of the control (2) of the venetian blinds (3) by means of the motor (12).

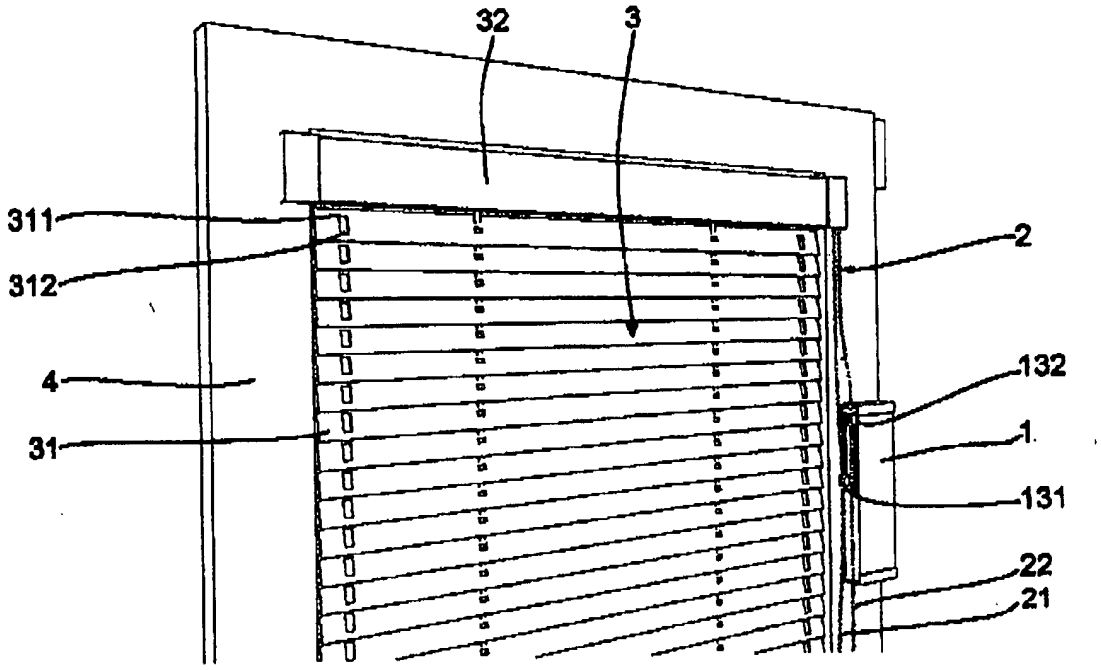

Fig. 1

EP 2 479 375 A2

Description

Field of the invention

[0001] The present invention relates to the method of venetian blinds control, in particular window venetian blinds, and the device for performing this method.

Description of the related art

[0002] Nowadays, there are several known methods of venetian blinds control as well as constructions for performing them.

[0003] These methods include in particular method of control of venetian blinds, placed in particular in windows, which is based on the design residing in that the venetian blinds comprises of the set of interconnected slats, while such interconnection enables rotating thereof from vertical into horizontal position. Ends of the control element, comprising in particular of ball chain or string, which can advantageously form a loop, are attached to the join of slat's back part and slat's front part. Rotating slats from opened horizontal position, when most sunlight penetrates through a venetian blinds, to closed vertical position, when least sunlight penetrates through a venetian blinds, is performed by manual grasping of back/front part of the loop of this control element and pulling thereof.

[0004] Disadvantage of this method and the design is in particular the fact that the control requires access of a person to a window in specific time moment of the need to open or close the venetian blindss and it does not allow to control venetian blindss from other place in the premises or without presence of a person in the premises.

[0005] The method of venetian blinds control and the device for performing thereof, partially eliminating described disadvantages, is also known. Its design is based on that there is mechanical device, incorporating rotating shaft with electromotor, installed in the headrail of venetian blindss, where joins of back and front parts thereof end. This devices ensures venetian blindss tipping into desired position, while its electrical part of the control is usually installed near window frame.

[0006] The disadvantage is complicatedness of the design and assembly with interventions into window frame and vicinity of the window to install wiring, what is adversely reflected in costs for its effectuating.

Disclosure of the invention

[0007] Mentioned disadvantages are eliminated to the substantial degree by the method of venetian blinds control and the device for performing this method, in particular for window venetian blinds, which is usually affixed by a headrail in the upper part of the frame and where a draw-link, comprising in particular of ball chain/string loop, is used as controlling element, and which is based on that rotating of venetian blinds slats set is actuated by the driving unit of motorized device. This device performs transmission of rotary movement of the motor to linear movement of front and back fixture, which are attached to opposite parts of the controlling loop.

[0008] Opening and closing of venetian blinds is performed by movement of both fixtures. Movement of the back fixture with attached back draw-link is counter-directional and mutually synchronized with the movement of the front fixture with attached front draw-link.

[0009] The device for performing the method of venetian blinds control comprises of electronic control unit, which is attached to the motor and this motor is connected to the drive unit.

[0010] There is front and back fixture provided on the drive unit for attaching venetian blinds control. The control unit is also connected to the battery and directional switch, which is either mechanical or electronic element with possibility of remote control and advantageously also incorporating light sensor and/or time switch with the possibility of programing switching schedule.

[0011] The drive unit advantageously consists of the set of rack-and-pinion gear, alternatively also of the set of trapezoidal gear, the set of belt gear or the set of spring gear.

[0012] The advantage of the described method and the device is in the simplicity of the design enabling automation of the venetian blinds control process and simple installation, as well as the possibility to attach the device to already installed manually controlled venetian blindss.

Overview of figures on drawings

[0013] The design is further elucidated on enclosed drawings, where:

Fig. 1 shows complete set of installed venetian blinds with the device for venetian blinds control;
Fig. 2 shows block diagram of device wiring;
Fig. 3 shows internal configuration of the device with rack-and-pinion gear of the drive unit;
Fig. 4 shows internal configuration of the device with trapezoidal gear of the drive unit;
Fig. 5 shows internal configuration of the device with belt gear of the drive unit;
Fig. 6 shows internal configuration of the device with spring gear of the drive unit;

Examples of the invention embodiments

Example 1

[0014] The constructional design of the system for performing the method of venetian blinds control is shown on the Fig. 1, where the motorized device 1 is attached on the frame 4 of the window. The venetian blinds 3 itself consists of the set of slats 31 and is affixed by means of the headrail 32 of the venetian blinds 3 in the upper part of the frame 4 of the window. Set of slats 31 has its back

part 311 mutually interconnected and running into back draw-link 21 of the control 2 and its front part 312 mutually interconnected and running into front draw-link 22 of the control 2. The control 2 is made of ball chain and forms a loop by its connected bottom part (not shown on the drawings).

[0015] Back draw-link 21 of the control 2 is placed in detachable manner into back fixture 131 of the drive unit 13 of the device 1 and front draw-link 22 of the control 2 is placed in detachable manner into front fixture 132 of the drive unit 13 of the device 1.

[0016] The device 1 (shown on the Fig. 2) consists of the control unit 11 with battery 14 and directional switch 111 connected thereto. Connection of the directional switch 111 to the control unit 11 is realized by wire connection, while the directional switch 111 is a mechanical switch and/or light sensor and/or temperature sensor and/or time switch (not shown on drawings).

[0017] The motor 12 is connected to the control unit 11 and the drive unit 13 with back fixture 131 and front fixture 132 is connected to the motor 12.

[0018] As shown on the Fig. 3, fixtures 131, 132 of the drive unit 13 are connected to the motor 12 by the set of rack-and-pinion gear 133, consisting of two opposite rack bars 1331 and cog wheel (pinion) 1332 placed on the motor axle 12.

[0019] Description of the method of venetian blinds 3 control is based on conditions when slats 31 (shown on the Fig. 1) are placed in vertical position, when least light penetrates through venetian blinds 3, while the back fixture 131 of the device 1 with attached chain of the back draw-link 21 of the control 2 is in the lower position and the front fixture 132 of the device 1 with attached chain of the front draw-link 22 of the control 2 is in the upper position.

[0020] To achieve conditions, when required amount of light penetrates through the venetian blinds 3, an instruction by touch on the directional switch 111 through mechanical switch or electronic impulse of another elements of the directional switch 111 (not shown on the drawings) is sent to the control unit 11, which switches on the motor 12 for certain time period, when the cog wheel 1332 turns and moves rack bars 1331 with fixtures 131, 132 to defined positions. The back fixture 131 with attached back draw-link 22 and the front fixture 132 with attached front draw-link 22 are moved in opposite directions and slats 31 of the venetian blinds 3 are turned thereby into required positions.

[0021] To achieve initial position, the process is repeated with the difference that different instruction is sent by the directional switch 111.

Example 2

[0022] This example is identical to the example 1 with such difference, that as indicated on the Fig. 4, fixtures 131, 132 of the drive unit 13 are connected to the motor 12 (shown on the Fig. 2) by the set of belt gear 134, consisting of cogged belt 1342, on which fixtures 131, 132 are attached, and two pulleys 1341, of which one is placed on the motor 12 axle and the directional switch 111 is connected to the control unit 11 wirelessly (not shown on the figure).

[0023] When the motor 12 is switched on for certain time period, cogged pulley 1341 with the belt 1342 turns and moves fixtures 131, 132 into defined positions.

Example 3

[0024] This example is identical to the example 1 with such difference, that as indicated on the Fig. 5, fixtures 131, 132 of the drive unit 13 are connected to the motor 12 (shown on the Fig. 2) by the set of trapezoidal gear 135, consisting of trapezoidal bar 1352, divided into two parts with counter-directional threads, on which fixtures 131. 132 are attached, and which is attached to the trapezoidal fixture 1351 from one side and placed from the other side by couplings 1353 on the motor 12 axle.

[0025] When the motor 12 is switched on for certain time period, trapezoidal bar 1352 turns and moves fixtures 131, 132 into defined positions.

Example 4

[0026] This example is identical to the example 1 with such difference, that as indicated on the Fig. 6, fixtures 131, 132 of the drive unit 13 are connected to the motor 12 (shown on the Fig. 2) by the set of spring gear 136, consisting of double-torsion spring 1362, inside which fixtures 131 132 are placed, and which is attached to the spring fixture 136 from one side and placed from the other side on the motor 12 axle by spring coupling 1361.

[0027] When the motor 12 is switched on for certain time period, the spring 1362 turns slightly and fixtures 131, 132 are moved by means of counter threads into defined positions.

[0028] Mentioned examples are not the only application examples of the method and the device according to this technical design, while also mutual combination of described examples parts is not excluded.

Claims

1. The method of venetian blinds control, in particular window venetian blinds, which is usually affixed by a headrail in the upper part of the frame and where a draw-bar, comprising in particular of ball chain/string loop, is used as controlling element, **characterized in that** rotating of the set of slats (31) of the venetian blinds (3) is performed by the drive unit (13) of the motorized device (1), which carries out transmission of rotary movement of the motor (12) to linear movement of fixtures (131, 132), where both fixtures (131, 132) of the drive unit (13) are attached to counter-moving parts of the draw-link loop (21, 22) of the

control unit (2), while opening/closing of venetian blinds (3) is performed by the movement of both fixtures (131, 132),

2. The method of venetian blinds control according to the claim 1, **characterized in that** the movement of the back fixture (131) with attached back draw-link (21) is counter-directional and mutually synchronized with the movement of the front fixture (132) with attached front draw-link (22).

3. The device for performing the method according to the claim 1, **characterized in that** it comprises of the electronic control unit (11), connected to the motor (12) and this motor (12) is connected to the drive unit (13), which has two fixtures (131, 132) provided for attaching two draw-links (21, 22) of the control (2) of the venetian blinds (3), while the control unit (11) is also connected to the battery (14) and directional switch (111).

4. The device according to the claim 3, **characterized in that** the drive unit (13) comprises of the set of rack-and-pinion gear (133).

5. The device according to the claim 3, **characterized in that** the drive unit (13) comprises of the set of trapezoidal gear (134).

6. The device according to the claim 3, **characterized in that** the drive unit (13) comprises of the set of belt gear (135).

7. The device according to the claim 3, **characterized in that** the drive unit (13) comprises of the set of spring gear (136).

8. The device according to any of the claims 3 to 7, **characterized in that** the directional switch (111) comprises of mechanical switch and/or light sensor and/or temperature sensor and/or time switch.

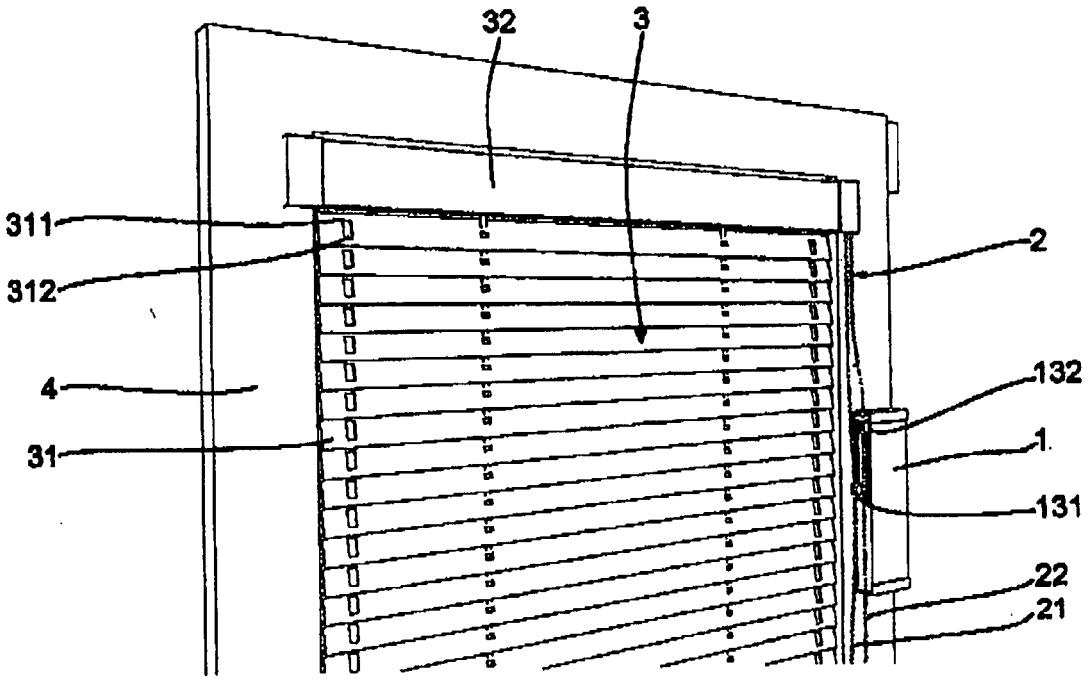

Fig. 1

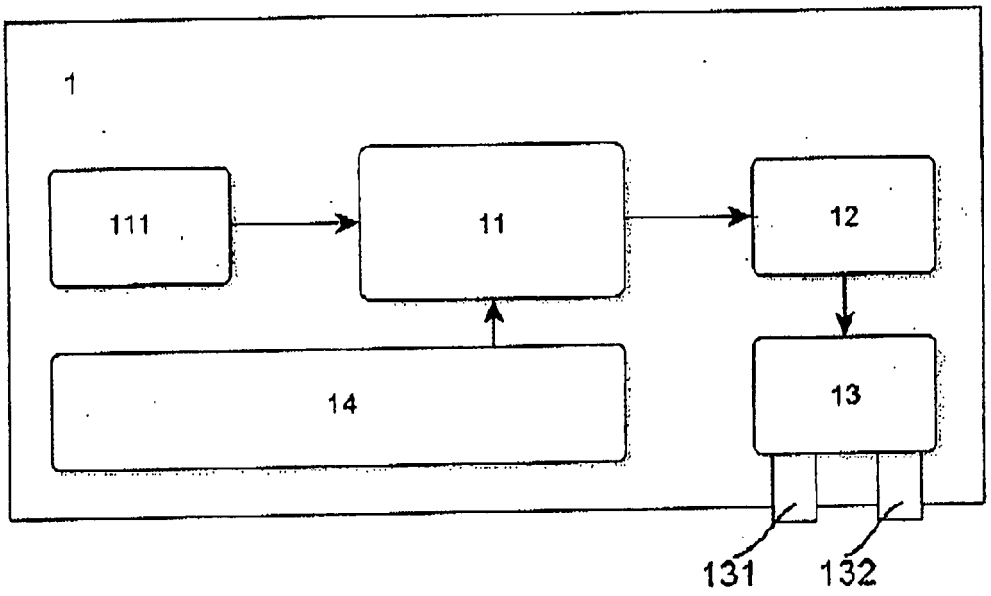

Fig. 2

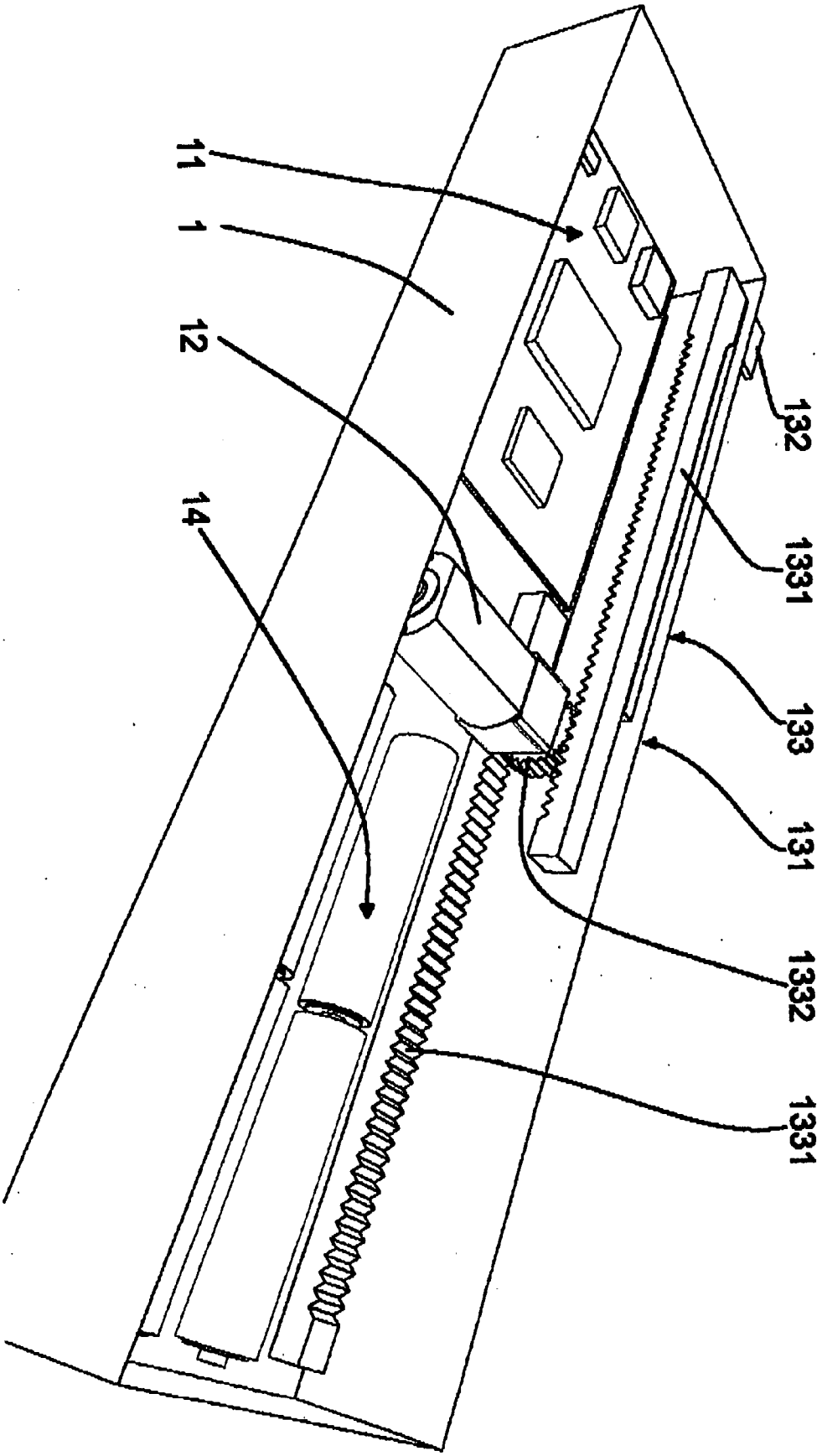

Fig. 3

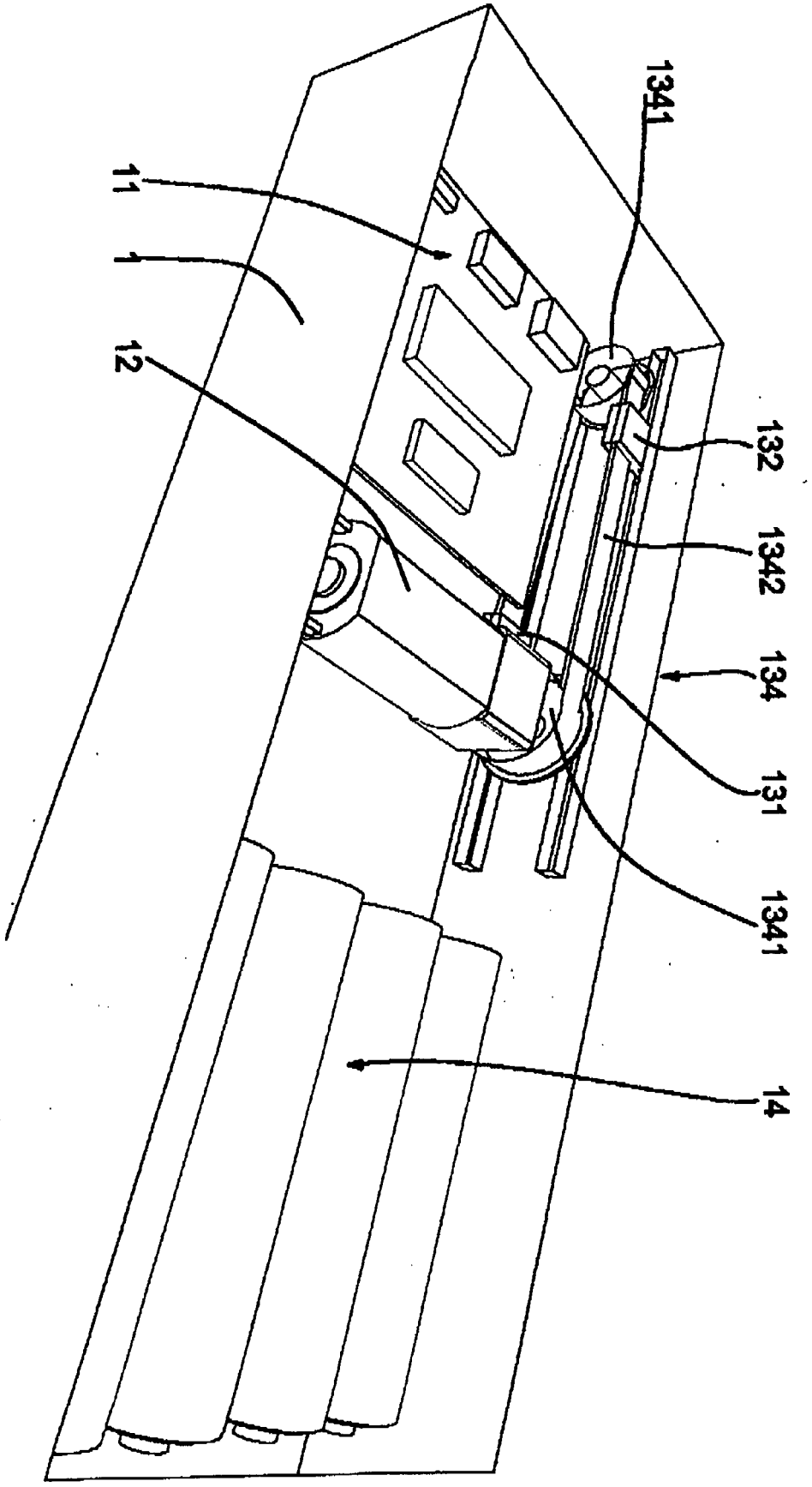

Fig. 4

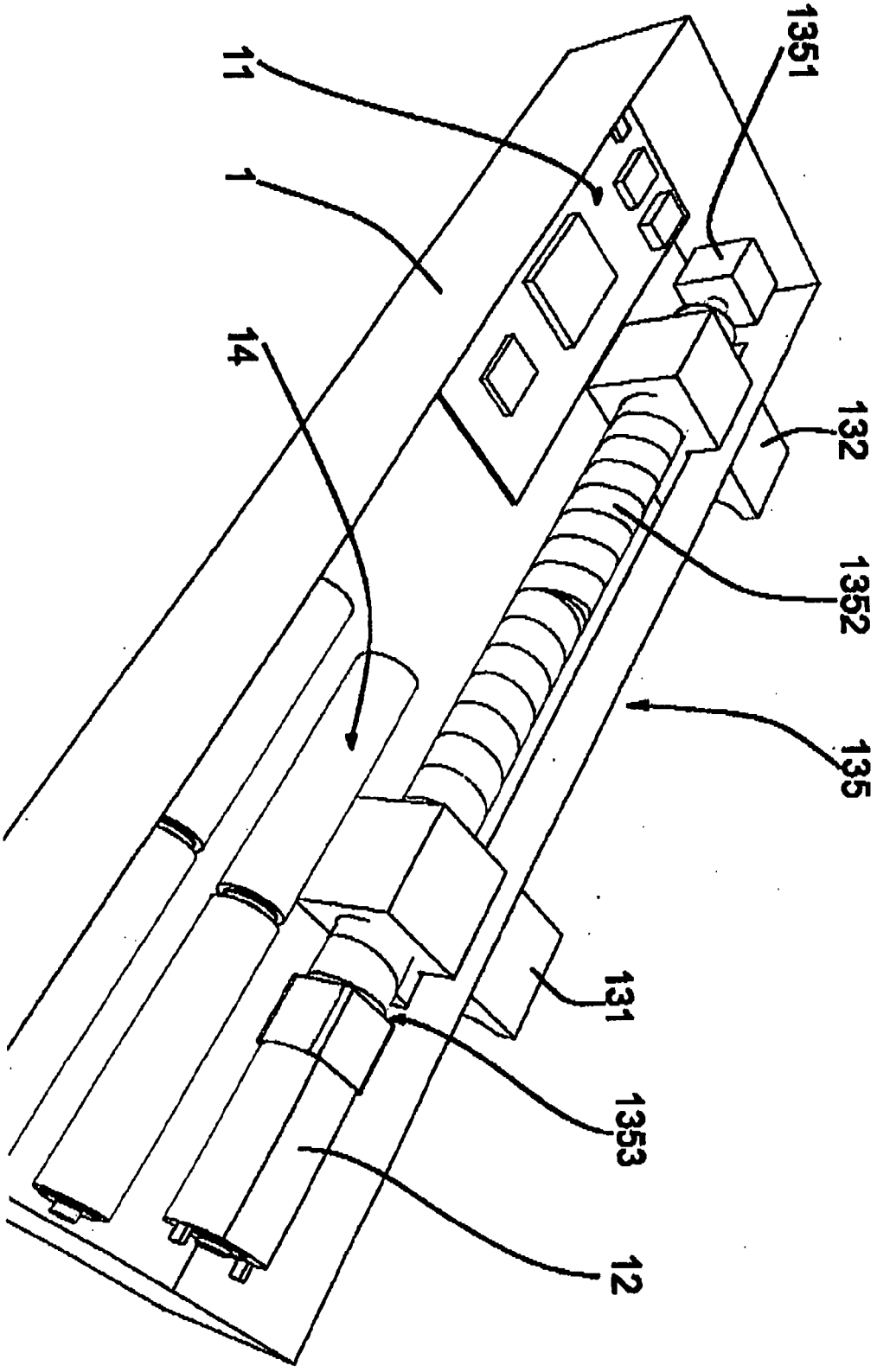

Fig. 5

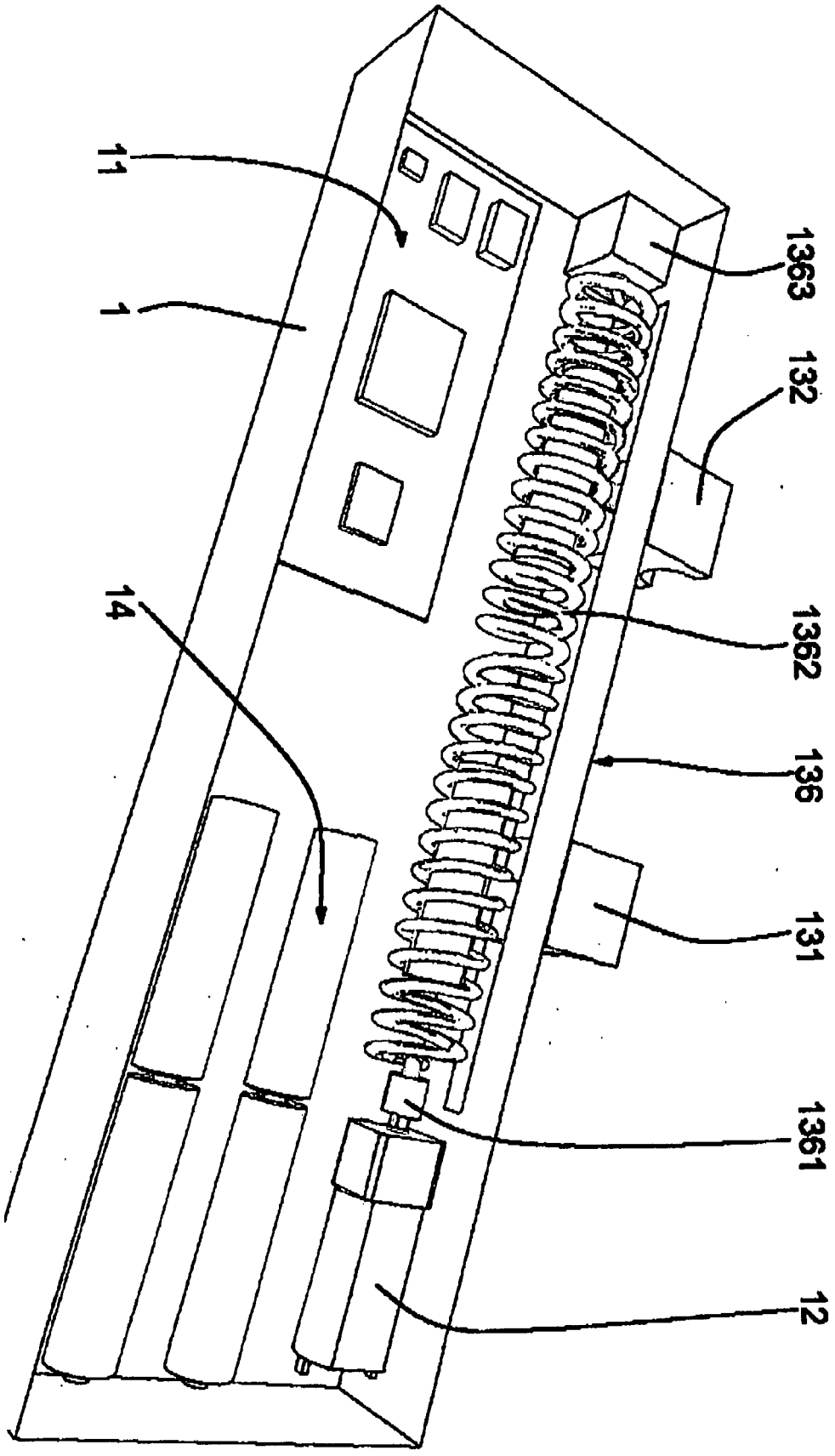

Fig. 6