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(54) **SUNSHADE APPARATUS**

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Description

[0001] This invention relates to a sunshade apparatus according to claim 1 and to a method according to claim 11.

[0002] Sunshade apparatuses are used to control the brightness of a room interior by screening the light rays which filter through windows.

[0003] Sunshade apparatuses comprise a plurality of slats which are guided by a first and a second guide to slide along a direction of movement, generally parallel to the vertical direction. The plurality of slats is also orientable about a tilt axis parallel to a longitudinal direction along which they have their maximum extension. Varying the slat tilt also varies the level of screening from the light rays. In particular, the slats can be oriented between a first limit position (fully open position), where they are parallel to each other and perpendicular to the vertical direction, and a second limit position (closed position) where they are substantially parallel to each other and parallel to the vertical direction. At the second limit position, the slats are also in contact with each other.

[0004] In sunshade apparatuses, a single lifting shaft is used to transmit the rotation responsible for lowering the sunshade and tilting the slats. However, since the rotation needed to tilt the slats is much smaller than that needed to completely lower the sunshade, a clutch has to be provided to disengage the motion of the lifting shaft from the slat tilting system when the slats have reached the first or the second limit position.

[0005] In sunshade apparatuses of this kind, when the sunshade apparatus is lowered to an intermediate position, slat tilt can be varied by rotating the lifting shaft in a rotation direction for retracting the sunshade through an angle of rotation of the lifting shaft corresponding to the desired variation of tilt (the variation along the vertical direction is negligible). Thus, the closer the slats are to the second limit position, the more the adjustment range at intermediate positions increases.

[0006] These solutions, however, lead to damage to the slats due to scraping while they are being lowered, particularly on account of dust and abrasive dirt.

[0007] In some prior art sunshade apparatuses, such as, for example, the one described in document EP2224091A2, to prevent the slats from rubbing against each other, the clutch is disengaged when slat tilt is less than the second limit position. In these solutions, a disengagement lever which contributes to disengaging the lifting shaft from the tilting system is moved by a spring tab which is tripped when the sunshade is at a certain vertical height.

[0008] This solution is, however, very complex to make and to assemble. Moreover, the presence of movable components increases the probability of wear and the need for maintenance.

[0009] EP1052365A2 provides an operating mechanism which can raise, lower and tilt slats of a venetian blind, particularly an outside blind mounted externally of a building, and which comprises: a support body for rotatably receiving a rotatable drive shaft; a releasable clutch mechanism having at least a first element mounted for rotation by the drive shaft and a second element releasably engaged with the first element for moving the slats between opposite first and second angular positions; means defining the first and second angular positions; arresting means on the support body adapted to cooperate with the second element for establishing the opposite first and second angular positions; a retractable stop engageable with the second element to arrest the second element in an intermediate position between the opposite first and second positions and a lost motion mechanism interposed between the drive shaft and the retractable stop for engaging the retractable stop with the second element only after a predetermined number of revolutions of the drive shaft.

[0010] The aim of this disclosure is to provide a sunshade apparatus and a method for tilting a plurality of slats to overcome the above mentioned disadvantages of the prior art.

[0011] This aim is fully achieved by the sunshade apparatus and the method for tilting a plurality of slats of this disclosure as characterized in the appended claims.

[0012] According to an aspect of it, this disclosure provides a sunshade apparatus.

[0013] The sunshade apparatus comprises a plurality of slats. Each slat of the plurality of slats tilts about a tilt axis parallel to a longitudinal direction. Each slat of the plurality of slats has a first and a second end. The first and the second end are operatively coupled to a first and a second lateral guide, respectively. The first and second lateral guides are configured to guide the slats along a direction of movement. In an embodiment, the direction of movement is transverse to the longitudinal direction.

[0014] The sunshade apparatus comprises a motor. The apparatus comprises a lifting shaft. The lifting shaft is coupled to the motor.

[0015] In an According to the invention, the sunshade apparatus comprises a tilt pulley. The tilt pulley is connected to the slats to rotate them about the respective tilt axes.

[0016] According to the invention, the apparatus comprises a clutch. The term "clutch" (or coupling, or rotary connector) is used to extend the scope of protection to any mechanical component capable of connecting in rotation with each other two mechanical parts, be they coaxial or one surrounding the other.

[0017] According to the invention, the apparatus comprises a spring clutch. The spring clutch surrounds the lifting shaft. The spring clutch is interposed between the lifting shaft and the tilt pulley along a radial direction perpendicular to an axis of rotation of the lifting shaft.

[0018] The spring clutch includes a first locking end. The spring clutch includes a second locking end. The first and second locking ends are each movable along a respective working trajectory. The working trajectory is the trajectory in space defined by the respective locking

end when the lifting shaft is set in rotation.

[0019] According to the invention, the spring clutch is fixed to the tilt pulley to constrain in rotation to the lifting shaft. In an embodiment, the spring clutch is selectively fixable to the shaft to constrain it in rotation to the lifting pulley. In an embodiment, the apparatus comprises a detent system.

[0020] The detent system comprises a first detent. The first detent is configured to intercept the first locking end of the spring clutch (in a first rotation direction of the lifting shaft). The detent system comprises a second detent. The second detent is configured to intercept the second locking end of the spring clutch. The second detent is configured to intercept the second locking end of the spring clutch in a second rotation direction of the lifting shaft. The second rotation direction is opposite to the first rotation direction. The detent system comprises a third detent. The third detent is configured to intercept the first locking end. The third detent is configured to intercept the first locking end at an intermediate position. In an embodiment, the intermediate position is located along the working trajectory of the first locking end, upstream of the first detent in the first rotation direction of the lifting shaft.

[0021] In an embodiment, the sunshade apparatus comprises a release element. The release element is movable between an activated position and a deactivated position. At the activated position, the release element is in contact with the first locking end of the spring clutch to move it. At the deactivated position, the release element is clear of the first locking end. The presence of the release element allows the first locking end to move out of alignment with the detents so that the clutch can be engaged as required.

[0022] In an embodiment, the release element is configured to cause the first locking end to move away from the third detent.

[0023] The movement away from the third detent allows the first locking end to continue turning in the first rotation direction towards the first detent along the respective working trajectory. That means the slats are kept in a safe tilted condition so that they do not damage each other while they are being lowered, until they reach a predetermined vertical height where the first locking end starts turning with the lifting shaft again to tilt the slats until they are completely closed.

[0024] In an embodiment, the release element is configured to cause the first locking end to move longitudinally.

[0025] In an embodiment, the apparatus comprises a control unit, configured to control the sunshade. In an embodiment, the control unit is configured to instruct the release element to move from the deactivated position to the activated position, and vice versa.

[0026] In an embodiment, the apparatus comprises a transmission element. The transmission element is connected to the plurality of slats. The transmission element may be a chord or a belt or, preferably, a chain. In an embodiment, the apparatus comprises a lifting pulley. The lifting pulley may be a sprocket, a friction drum or any gear capable of transmitting a torque received from the lifting shaft to the transmission element. The lifting pulley is connected to the lifting shaft. The lifting pulley is connected to the transmission element to allow driving the slats along the direction of movement.

[0027] In an embodiment, the release element is connected to the transmission element. The term "connected" is not intended as limited to a direct connection where the release element is positioned on the transmission element. In an embodiment, for example, the release element might be located at a fixed position relative to the transmission element. In such an embodiment, the transmission element might comprise an activating element configured to come into contact with the release element to trip it so it changes from the activated position to the deactivated position.

[0028] In an embodiment, the release element is positioned on the transmission element. In an embodiment, the release element is positioned on the transmission element at a release position. That way, the release element is configured to intercept the first locking end at a limit position of the slats along the direction of movement. In this document, the term "total unwinding length" is used to mean the distance between the last slat when the apparatus is fully retracted and the last slat when the apparatus is fully extended. The unwinding length may also be defined in relation to a specific position of the slats along the direction of movement: that is to say, as the distance between the last slat when the apparatus is fully retracted and the last slat is at the specific position along the direction of movement.

[0029] In an embodiment, the limit position of the slats is the position along the direction of movement corresponding to an unwinding length greater than half the total unwinding length. In an embodiment, the limit position of the slats is the position along the direction of movement corresponding to an unwinding length whose ratio to the total unwinding length is greater than 7:10. In an embodiment, the limit position of the slats is the position along the direction of movement corresponding to an unwinding length whose ratio to the total unwinding length is greater than 8:10. That way, it is possible to prevent contact between the slats for a large part of the downstroke of the apparatus.

[0030] In an embodiment, the release element is a wedge.

[0031] In an embodiment, the first locking end is at a locked position, in contact with the first detent, when the second locking end is at a free position, where the second locking end is free to move along the respective working trajectory. In other words, when the first locking end is in contact with the first detent or with the third detent, the second locking end is detached from (or, in any case, does not strike) the second detent. In an embodiment, the second locking end is at a locked position, in contact with the second detent, when the first locking end is at a

free position, where the first locking end is free to move along the respective working trajectory. In other words, when the second locking end is in contact with the second detent, the first locking end is detached from (or, in any case, does not strike) the third detent.

[0032] In an embodiment, the detent system comprises a locking wall. The locking wall surrounds the lifting shaft. In an embodiment, the locking wall comprises a first guide. In an embodiment, the first locking end is slidable on the first guide to define the respective working trajectory. In an embodiment, the locking wall comprises a second guide. In an embodiment, the second locking end is slidable on the second guide to define the respective working trajectory.

[0033] In an embodiment, the first guide comprises a first limit stop, defining the first detent. In an embodiment, the second guide comprises a second limit stop, defining the second detent. In other words, the first and the second limit stops are defined by an end piece (limit stop) of the first and second guides, respectively. In an embodiment, the working trajectory of the first locking end comprises a first circular stretch. In an embodiment, the working trajectory of the first locking end comprises a second circular stretch. In an embodiment the working trajectory comprises a third stretch, extending in a longitudinal direction. In an embodiment, the second circular stretch is longitudinally offset relative to the first circular stretch. The first circular stretch is connected to the second circular stretch by the third stretch.

[0034] In an embodiment, the clutch comprises a first spring. The first spring has a respective first end piece which defines the first locking end. The first spring has a respective second end piece which is connected to the tilt pulley. The clutch comprises a second spring. The second spring has a respective first end piece which is connected to the tilt pulley. The second spring has a respective second end piece which defines the second locking end.

[0035] In an embodiment, the tilt pulley is disposed along the longitudinal direction, at an intermediate position between the first spring and the second spring.

[0036] In an embodiment, the apparatus comprises a connecting mechanism, configured to connect the tilt pulley to the slats. In an embodiment, the connecting mechanism comprises a cord. The cord has a first branch and a second branch. In an embodiment, the connecting mechanism comprises a plurality of rockers. The rockers of the plurality each include a fixing profile. Each fixing profile is connected to a respective slat. The rockers of the plurality each include a first end, connected to the first branch of the cord. The rockers of the plurality each include a second end, connected to the second branch of the cord.

[0037] According to an aspect of it, this disclosure also provides a method for adjusting the tilt of a plurality of slats in a sunshade apparatus.

[0038] The method comprises a step of moving the plurality of slats along a direction of movement. The step of moving comprises a step of moving downwards, in which the slats are unwound from a closed position to a fully open position. The step of moving comprises a step of retracting, in which the slats are retracted from the fully open position to the closed position.

[0039] The method comprises a step of firstly rotating a lifting shaft, connected to a motor, in a first rotation direction. The rotation in the first rotation direction allows moving the plurality of slats along the direction of movement in an unwinding direction. In other words, the step of firstly rotating allows performing the step of moving the slats downwards.

[0040] The method comprises a step of secondly rotating a lifting shaft, connected to a motor, in a second rotation direction, to move the plurality of slats along the direction of movement in a retracting direction. In other words, the step of secondly rotating allows performing the step of retracting the slats.

[0041] The method comprises a step of (selectively) coupling a tilt pulley to the lifting shaft through a clutch. In other words, the method comprises a step of providing a tilt pulley coupled to the lifting shaft through a clutch. The clutch may be a spring clutch which includes a first locking end and a second locking end which move along respective working trajectories by effect of a rotation of the lifting shaft.

[0042] The method comprises a step of rotating the tilt pulley.

[0043] The method comprises a step of first disengaging of the spring clutch. In the step of first disengaging of the spring clutch, when the lifting shaft rotates in the first rotation direction and a first detent intercepts the first locking end.

[0044] The method comprises a step of second disengaging of the spring clutch. In the step of second disengaging of the spring clutch, when the lifting shaft rotates in the second rotation direction and a second detent intercepts the second locking end.

[0045] The method comprises a step of third disengaging of the spring clutch, when the lifting shaft rotates in the first rotation direction and a third detent intercepts the first locking end at an intermediate position along the working trajectory of the first locking end upstream of the first detent in the first rotation direction. The step of third disengaging allows the slats to not reach the fully closed position as soon as they start moving downwards.

[0046] In an embodiment, the method comprises a step of releasing. In the step of releasing, a release element is moved from a deactivated position, where it is clear of the first locking end, to an activated position, where it moves the first locking end of the spring clutch to set the tilt pulley in rotation again.

[0047] The step of releasing allows the slats to delay their being fully closed.

[0048] In an embodiment, the release element, in the step of releasing, touches the first locking end and causes it to move longitudinally.

[0049] In an embodiment, the second locking end, in

the step of first disengaging, is free to move along a second guide. In an embodiment, the first locking end, in the step of second disengaging, is free to move along a first guide. In an embodiment, the spring clutch comprises a spring assembly, including a first spring, defining the first locking end, and a second spring, defining the second locking end and connected in series to the first spring. In this embodiment, when the first spring strikes the first detent or the third detent, the first spring and the second spring are released and disengage the tilt pulley from the lifting shaft. In this embodiment, when the second spring strikes the second detent, the first spring and the second spring are released and disengage the tilt pulley from the lifting shaft.

[0050] This and other features will become more apparent from the following description of a preferred embodiment, illustrated purely by way of nonlimiting example in the accompanying drawings, in which:

- Figure 1 is a schematic perspective view of a part of a sunshade apparatus;
- Figure 2 is a schematic perspective view of an internal part of the sunshade apparatus of Figure 1;
- Figure 3 is another schematic perspective view of the internal part of the sunshade apparatus of Figure 1;
- Figure 4 is a schematic cross section of the sunshade apparatus of Figure 1;
- Figure 5 is a perspective view of internal components of the sunshade apparatus of Figure 1.

[0051] With reference to the accompanying drawings, the numeral 1 denotes a sunshade apparatus. The apparatus 1 comprises a housing. The housing 2 comprises a base support 21. The housing comprises a cover 22. The cover 22 is coupled to the base support 21. In an embodiment, the cover 22 has a circular shape. In an embodiment, the cover 22 has a prismatic shape. The cover 22 comprises a first guide 22A. The cover 22 comprises a second guide 22B. The first guide 22A and the second guide 22B on the cover 22 are spaced from each other along a longitudinal direction L.

[0052] The apparatus comprises a plurality of slats 100. The plurality of slats 100 is configured to move along a direction of movement S, perpendicular to the longitudinal direction L and parallel to the direction of the weight force. Each slat of the plurality of slats 100 is configured to rotate about a respective tilt axis I, parallel to the longitudinal direction L, in such a way as to vary its orientation. Each slat of the plurality of slats 100 comprises a first end 100A and a second end (not illustrated).

[0053] The apparatus comprises a lifting shaft 3. The apparatus comprises a motor 4. The motor 4 is connected to the lifting shaft 3 to set it in rotation. The apparatus comprises a lifting pulley 5. In an embodiment, the lifting pulley 5 is connected to the lifting shaft 3 to rotate as one therewith. In an embodiment, the lifting pulley 5 is connected to the lifting shaft 3 by a grooved profile 51. The grooved profile 51 engages a matching groove 31 on the lifting shaft 3.

[0054] In an embodiment, the lifting pulley 5 comprises a toothed portion 52.

[0055] The apparatus 1 comprises a transmission element 6. In an embodiment, the transmission element 6 is a chain.

[0056] The toothed portion 52 of the lifting pulley 5 is coupled to the transmission element 6 to transmit a drive torque which it receives from the motor 4.

[0057] In an embodiment, the transmission element 6 is connected to the plurality of slats 100 to move them along the direction of movement S. Preferably, the plurality of slats 100 is movable along the direction of movement S with the first end 100A and the second end engaged in a first and a second guide which are, respectively, parallel to the direction of movement S.

[0058] In an embodiment, the apparatus comprises a tilt pulley 7. In an embodiment, the lifting pulley is coaxial with the lifting shaft 3. In an embodiment, the lifting pulley 7 is selectively constrained to the lifting shaft 3 in rotation.

[0059] In an embodiment, the lifting pulley 7 comprises a plurality of teeth 71, extending along the radial direction relative to the axis of rotation of the lifting shaft 3. In an embodiment, the plurality of teeth 71 is disposed on a first circular crown 71A of the tilt pulley 7 and on a second circular crown 71B of the tilt pulley 7, spaced from each other along the longitudinal direction L. In an embodiment, the first circular crown 71A and the second circular crown 71B are angularly offset about the axis of rotation of the lifting shaft 3. This offset between the first circular crown 71A and the second circular crown 71B defines catch zones 72 which are spaced along the circumference of the tilt pulley 7.

[0060] In an embodiment, the apparatus comprises a connecting mechanism 8. The connecting mechanism 8 is configured to connect the plurality of slats 100 to the tilt pulley 7.

[0061] In an embodiment, the connecting mechanism 8 comprises a cord 81. The cord is trained around the tilt pulley 7. The cord comprises a first branch 81A and a second branch 81B.

[0062] In an embodiment, the cord 81 comprises a plurality of detents 82 connected thereto and spaced from each other along the cord 81.

[0063] In an embodiment, each catch zone 72 of the tilt pulley 7 is coupled to a respective detent 82 of the plurality to engage the cord 81 and transmit a torque supplied by the motor 4.

[0064] In an embodiment, the connecting mechanism 8 comprises a plurality of rockers 83. Each rocker 83 of the plurality is connected to a respective slat 100 of the plurality.

[0065] In an embodiment, each rocker 83 comprises a respective fixing profile 83A, a respective first connecting end 83B and a respective second connecting end 83C.

[0066] The fixing profile 83A is connected to the respective slat 100. The first connecting end 83B is con-

nected to a respective detent 82, which is disposed on the first branch 81A of the cord 81. The second connecting end 83C is connected to a respective detent 82, which is disposed on the second branch 81B of the cord 81.

[0067] In an embodiment, each rocker 83 is configured to rotate the respective slat 100 about the respective tilt axis I when the tilt pulley 7 rotates.

[0068] As regards the connection of the slat 100 (that is, of each slat of the plurality of slats 100) to the fixing profiles 83A of the rockers 83 (disposed at the opposite ends of the slat 100, which act as elements for moving the slat 100), different technical solutions are possible.

[0069] In a possible embodiment, a fixing system is used whereby sliders that are slidably coupled to the slat are moved, as described, for example, in patent document WO2016/103123A1, in the name of this Applicant.

[0070] In another embodiment, the slat 100 (each slat 100) is provided with a pair of through holes at each end of it. The pair of through holes is located in a zone of the slat which, in use, is superposed on the respective fixing profile 83A (or supporting foot, or movement element).

[0071] Also, the apparatus 1 (or the system for fixing the slats 100 to the respective fixing profiles 83A) comprises, for each slat 100, a first and a second locking element which are removably connectable to the slat 100 and to the respective fixing profile 83A to lock the slat 100 and the respective fixing profile 83A securely (but removably) to each other. The first and second locking elements each include a pair of pins connected to a bridge; the bridge extends along a first direction and the pins are spaced from each other along the first direction; the pins protrude from the bridge in the same direction, transversely to the first direction. Preferably, the pins are connected to opposite ends of the bridge. The pins (of each locking element) are configured to be inserted (preferably snugly or, if necessary, pressure fitted) into a respective pair of through holes on the slat 100 (that is to say, they are configured to be engaged in a respective pair of through holes in the slat 100). In a possible embodiment, the apparatus 1 (or the system for fixing the slats 100 to the respective fixing profiles 83A) might also comprise, for each slat 100, a first and a second locking counter-element, configured to be removably connected to a respective locking element; in use, when the locking counter-element is coupled to the respective locking element, a portion of the slat 100 and a portion of the fixing profile 83A are interposed between the (bridge of the) locking element and the respective locking element. In an embodiment, the locking counter-element includes a plate defining two hollows (or holes, either through holes or blind holes). The hollows are shaped to receive the pins of the locking element (by slotting or pressure fitting). The hollows of the locking counter-element are spaced at the same spacing as the pins of the locking element. Preferably, the spacing is at least 5 mm and, still more preferably, is at least 10 mm.

[0072] The embodiment for connecting the slat 100 to the fixing profiles 83A of the rockers 83 (through a locking element provided with spaced pins) is advantageous because it allows the slats 100 to be connected to the fixing profiles 83A quickly and easily, securing the slats 100 particularly firmly to the respective fixing profiles 83A.

[0073] Hence, this disclosure also provides a system for fixing the slats 100 to the respective fixing profiles 83A in a sunshade apparatus and a sunshade apparatus provided with this fixing system, according to one or more of the features described above.

[0074] More specifically, this disclosure provides a sunshade apparatus comprising: at least one slat 100 having two pairs of through holes at the opposite ends of it; at least one fixing profile 83A configured to be coupled to one end of the slat (to constitute a movement element for moving the slat 100); (at least) a first and a second locking element, configured to engage respective pairs of holes of the slat 100 to lock the slat securely and removably to the respective fixing profile 83A. Preferably, the locking counter-elements and, if necessary, one or more of the features described above are also used.

[0075] This disclosure provides a method for assembling a slat 100 in a sunshade apparatus 1 having at least one movement element for moving a fixing profile 83A and a locking element for removably connecting the slat 100 to the fixing profile 83A.

[0076] The method comprises the following steps: preparing two pairs of through holes at opposite ends of each slat 100; positioning the slat 100 to rest on a first and a second fixing profile 83A in such a way that each pair of holes is superposed on a portion of the respective fixing profile 83A; coupling a first and a second locking element to the slat 100 by engaging each first and second locking element to a respective pair of holes of the slat 100 to lock the slat securely and removably to the respective fixing profile 83A. Preferably, the locking counter-elements and, if necessary, one or more of the features described above are also used.

[0077] In an embodiment, the apparatus 1 comprises a detent system. In an exemplary embodiment, the detent system 9 is defined by a cover 22 of the housing 2.

[0078] In an embodiment, the detent system 9 comprises a first detent 91 and/or a second detent 92 and/or a third detent 93.

[0079] In an embodiment, the first guide 22A is defined by a first groove on the cover 22 having a respective perimeter. The perimeter of the first groove comprises a first longitudinal stretch, a second longitudinal stretch and a third longitudinal stretch. The first longitudinal stretch of the first groove defines the first detent 91. The third longitudinal stretch of the first groove defines the third detent 93.

[0080] In an embodiment, the second guide 22B is defined by a second groove on the cover 22 having a respective perimeter. The perimeter of the second groove comprises a respective first longitudinal stretch and a respective second longitudinal stretch. The first longitudinal stretch of the second groove defines the second detent 92.

[0081] In an embodiment, the apparatus comprises a clutch. The clutch comprises a first locking end and a second locking end.

[0082] The clutch may be a spring clutch 10. In an embodiment, the spring clutch 10 is connected to the tilt pulley 7. In an embodiment, the spring clutch 10 is connected to the lifting shaft 3. In an embodiment, the spring clutch 10 is pre-compressed. In an embodiment, the spring clutch 10 comprises a first spring 11 and a second spring 12. The first spring 11 and/or the second spring 12 are preloaded. In an embodiment, the first spring 11 and/or the second spring 12 are torsion springs and are fitted round the lifting shaft 3. The first spring 11 and the second spring 12 are smaller in diameter than the lifting shaft 3 so that when they are fitted on it they exert a radial force on it which increases a frictional force between the spring clutch and the lifting shaft 3.

[0083] In an embodiment, the first spring 11 and the second spring 12 each comprise a respective first end piece 11A, 12A and second end piece 11B, 12B.

[0084] In an embodiment, the first end piece 11A of the first spring 11 defines the first locking end of the spring clutch 10.

[0085] In an embodiment, the second end piece 12B of the first spring 12 defines the second locking end of the spring clutch 10.

[0086] The second end piece 11B of the first spring 11 is connected to the tilt pulley 7. The first end piece 12A of the second spring 12 is connected to the tilt pulley 7.

[0087] In an embodiment, the first end piece 11A of the first spring 11 is configured to move on the first guide 22A along a respective working trajectory defined by the rotation of the lifting shaft 3.

[0088] In an embodiment, the second end piece 12B of the second spring 12 is configured to move on the second guide 22B along a respective working trajectory defined by the rotation of the lifting shaft 3.

[0089] Thus, the first detent 91 is configured to intercept the first end piece 11A of the first spring 11 when the lifting shaft rotates in a first rotation direction V1. The third detent 93 is configured to intercept the first end piece 11A of the first spring 11 when the lifting shaft rotates in a first rotation direction V1 at a position upstream of the first detent 91 along the working trajectory in the first rotation direction V1.

[0090] The second detent is configured to intercept the second end piece 12B of the second spring 12 when the lifting shaft rotates in a second rotation direction V2.

[0091] In an embodiment, the apparatus 1 comprises a release element 60. The release element 60 is movable between an activated position, where it is in contact with the first end piece 11A of the first spring 11, and a deactivated position, where it is clear of the first end piece 11A of the first spring 11.

[0092] The release element 60 is configured to move the first end piece 11A of the first spring 11. The release element is configured to move the first end piece 11A of the first spring 11 longitudinally to allow the first end piece 11A of the first spring 11 to bypass the third detent 93 and continue along the working trajectory as far as the first detent 91.

[0093] In an embodiment, the release element is a wedge 61. In an embodiment, the wedge 61 is connected to the transmission element 6. In such a case, the wedge is connected to the side of the transmission element which faces the first end piece 11A of the first spring 11.

[0094] In other embodiments, the wedge 61 is connected to the cover 22 and/or to the base support 21. In this embodiment, the wedge may be activated by the transmission element 6.

[0095] In an embodiment, the wedge 61 is positioned on the transmission element 6 at a predetermined position so that it comes into contact with (moves, preferably along the longitudinal direction L) the first end piece 11A of the first spring 11 at position along the direction of movement S where the slats 100 are almost fully extended.

[0096] In an embodiment, the apparatus comprises a tongue. The tongue is coupled to the fixing profile 83A to allow the slat 100 to be connected to the respective rocker 83.

[0097] In an embodiment, the fixing profile 83A comprises two openings. In an embodiment, the tongue comprises two tabs. In an embodiment, each of the two tabs is configured to be coupled to a respective opening of the fixing profile 83A.

[0098] According to an aspect of it, this disclosure also provides a method for tilting a plurality of slats in a sunshade apparatus.

[0099] The method comprises a step of moving a plurality of slats 100 along a direction of movement S. The step of moving comprises a step of moving the plurality of slats 100 downwards. In the step of moving downwards, the slats 100 are extended from an upper limit position, where the slats 100 are closely packed together, to a lower limit position, where the slats 100 are fully extended. The step of moving comprises a step of retracting the plurality of slats 100. In the step of retracting, the slats 100 are retracted from the lower limit position to the upper limit position.

[0100] In an embodiment, the method comprises a step of guiding, in which a first and a second end of each slat of the plurality 100 are guided, as they move downwards and/or are retracted, by a first and a second lateral guide, respectively.

[0101] The method comprises a step of rotating a lifting shaft 3. The step of rotating comprises a first step of rotating and a second step of rotating. In the first step of rotating, the lifting shaft 3 rotates in a first rotation direction V1. In the second step of rotating, the lifting shaft 3 rotates in a second rotation direction V2.

[0102] The rotation of the lifting shaft 3 is functional to the downward movement and retraction of the slats 100. The first step of rotating contributes to the step of moving the slats 100 downwards. The second step of rotating contributes to the step of retracting the slats 100.

[0103] In an embodiment, the method comprises a step of interlocking, in which the lifting shaft is constrained in rotation to a lifting pulley 5, responsible for the movement along the direction of movement S.

[0104] In the step of moving, the lifting shaft 3 is moved by a motor 4. The lifting pulley 5 rotates as one with the lifting shaft 3. The lifting pulley 5 entrains in rotation a transmission element 6 which is connected to the plurality of slats 100 to move them along the direction of movement S.

[0105] In an embodiment, the method comprises a step of engaging (coupling) the lifting shaft 3 to a tilt pulley 7. The tilt pulley 7 is responsible for tilting the plurality of slats 100 about a tilt axis I which is parallel to the axis of rotation of the lifting shaft 3. In the step of engaging, a clutch - preferably a spring clutch 10 - surrounds the lifting shaft 3. In the step of engaging, the spring clutch 10 exerts a force on the lateral surface of the lifting shaft 3, in practice creating a coupling by pressure (by friction).

[0106] In the step of engaging, the spring clutch is constrained to the tilt pulley 7, which is coaxial with the lifting shaft 3.

[0107] In an embodiment, the spring clutch 10 comprises a first spring 11 and a second spring 12. The first spring 11 and the second spring 12 are constrained to the tilt pulley 7.

[0108] In the step of engaging, a second end piece 11B of the first spring 11 is connected to the tilt pulley 7. In the step of engaging, a first end piece 12A of the second spring 12 is connected to the tilt pulley 7.

[0109] The step of engaging (the method) comprises a step of preloading the spring clutch 10. In an embodiment, in the step of engaging, the first spring 11 and the second spring 12 are preloaded.

[0110] Thus, in the step of moving downwards and in the step of retracting, the tilt pulley 7, the lifting shaft 3 and the spring clutch 10 rotate as one for at least an angle of rotation of the lifting shaft 3.

[0111] The method comprises a step of tilting. In the step of tilting, the tilt pulley 7 rotates to tilt the slats 100 about the tilt axis I.

[0112] In the step of tilting, a cord 81 is entrained by the tilt pulley 7. In the step of tilting, the cord 81 is connected to the tilt pulley 7 by a plurality of detents 82, coupled to respective catch zones 72 of the tilt pulley 7.

[0113] In the step of tilting, a first branch 81A and a second branch 81B slide on the tilt pulley 7 to tilt the slats 100.

[0114] In the step of tilting, a plurality of rockers 83 rotates to tilt the plurality of slats 100. In the step of tilting, each rocker of the plurality of rockers 83 is connected to the first branch 81A of the cord 81 at a first connecting end 83B and to the second branch 81B of the cord 81 at a second connecting end 83C. In the step of tilting, each rocker of the plurality of rockers 83 also entrains in rotation the corresponding slat 100 to which it is connected by a fixing profile 83A.

[0115] In an embodiment, the method comprises a first step of disengaging. In the first step of disengaging, a first locking end of the clutch strikes a first detent 91 of a detent system 9. In the first step of disengaging, a first end piece 11A of the first spring 11 of the spring clutch 10 strikes the first detent 91. In the first step of disengaging, the first locking end of the clutch strikes the first detent 91 of the detent system 9 when the lifting shaft 3 rotates in the first rotation direction V1.

[0116] In an embodiment, the method comprises a second step of disengaging. In the second step of disengaging, a second locking end of the clutch strikes a second detent 92 of a detent system 9. In the second step of disengaging, a second end piece 12B of the second spring 12 of the spring clutch 10 strikes the second detent 92. In the second step of disengaging, the second locking end of the clutch strikes the second detent 92 of the detent system 9 when the lifting shaft 3 rotates in the second rotation direction V2.

[0117] In an embodiment, the method comprises a third step of disengaging. In the third step of disengaging, the first locking end of the clutch strikes a third detent 93 of the detent system 9. In the third step of disengaging, a first end piece 11A of the first spring 11 of the spring clutch 10 strikes the third detent 93. In the third step of disengaging, the first locking end of the clutch strikes the third detent 93 of the detent system 9 when the lifting shaft 3 rotates in the first rotation direction V1 and at a position upstream of the first detent along a working trajectory of the first locking end in the rotation direction V1.

[0118] In other words, in the step of moving downwards, the tilt pulley 7 rotates as one with the lifting shaft 3 until the first locking end (the first end piece 11A of the first spring 11 of the spring clutch 10) of the clutch meets the third detent 93. When the first locking end of the clutch meets the third detent 93, the spring clutch 10 is released, thus disengaging the lifting shaft 3 from the tilt pulley 7.

[0119] In an embodiment, the method comprises a step of re-engaging. In the step of re-engaging, a release element 60 moves the first locking end (the first end piece 11A of the first spring 11 of the spring clutch 10) to allow it to bypass the third detent 93. In the step of re-engaging, the release element 60 moves the first locking end along the longitudinal direction L. In an embodiment, in the step of re-engaging, a wedge 61 (release element 60) located on the transmission element 6 moves the first locking end (the first end piece 11A of the first spring 11 of the spring clutch 10) longitudinally.

[0120] Thus, after the step of re-engaging, the clutch is once again engaged with the lifting shaft 3, thereby setting the tilt pulley 7 in rotation again to continue the tilting of the slats 100 to completion, until it strikes the first detent 91.

[0121] When the first locking end (the first end piece 11A of the first spring 11 of the spring clutch 10) meets the first detent 91, the spring clutch 10 is released and disengages the tilt pulley 7 from the lifting shaft 3. In effect, the slats 100 are tilted as much as possible and further rotation would damage the slats 100.

[0122] When the lifting shaft 3 reverses its rotation and starts rotating in the second rotation direction V2, the step of retracting is started. At the start of the step of retracting, the second locking end (the second end piece 12B of the second spring 12 of the spring clutch 10) is not in contact with the second detent and thus the tilt pulley 7 rotates as one with the lifting shaft 3 until the second locking end (the second end piece 12B of the second spring 12 of the spring clutch 10) meets the second detent 92. The second locking end (the second end piece 12B of the second spring 12 of the spring clutch 10) meets the second detent 92 when the slats have already reached their minimum tilt, necessary to retract and gather up all the slats 100. The step of retracting continues with the slats kept at constant tilt.

Claims

1. A sunshade apparatus (1) comprising:

- a plurality of slats (100), each tilting about a tilt axis (I) parallel to a longitudinal direction (L) and having a first and a second end operatively coupled to a first and a second lateral guide, respectively, configured to guide the slats (100) along a direction of movement (S), the direction of movement (S) being transverse to the longitudinal direction (L);
- a motor (4);
- a lifting shaft (3), coupled to the motor (4);
- a tilt pulley (7) connected to the slats (100) to rotate them about the respective tilt axes (I);
- a spring clutch (10) surrounding the lifting shaft (3) and including a first locking end (11A) and a second locking end (12B), each movable along a respective working trajectory, wherein the spring clutch (10) is fixed to the tilt pulley (7) to constrain it in rotation to the lifting shaft (3);
- a detent system (9), including a first detent (91), configured to intercept the first locking end (11A) of the spring clutch (10) in a first rotation direction (V1) of the lifting shaft (3), a second detent (92), configured to intercept the second locking end (12B) of the spring clutch (10) in a second rotation direction (V2) of the lifting shaft (3), opposite to the first rotation direction (V1), and a third detent (93) configured to intercept the first locking end (11A) at an intermediate position along the working trajectory of the first locking end (11A), upstream of the first detent (91) in the first rotation direction (V1) of the lifting shaft (3),

wherein said sunshade apparatus further comprises a release element (60), movable between an activated position, where said release element (60) is in contact with the first locking end (11A) of the spring clutch (10) to move it, and a deactivated position, where said release element (60) it is clear of the first locking end (11A), wherein the release element (60) is configured to cause the first locking end (11A) to move away from the third detent (93) to allow the first locking end (11A) to continue turning in the first rotation direction (V1) towards the first detent (91) along the respective working trajectory.

2. The apparatus (1) according to claim 1, wherein the release element (60) is configured to cause the first locking end (11A) to move longitudinally.

3. The apparatus (1) according to any of the preceding claims, comprising a transmission element (6), connected to the plurality of slats (100), and a lifting pulley (5), connected to the lifting shaft (3) and to the transmission element (6) to allow the slats (100) to move along the direction of movement (S).

4. The apparatus (1) according to claim 3, wherein the release element (60) is connected to the transmission element (6).

5. The apparatus (1) according to claim 4, wherein the release element (60) is positioned on the transmission element (6) at a release position to intercept the first locking end (11A) at a limit position of the slats (100) along the direction of movement (S), avoiding contact between the slats (100) during the downward movement of the apparatus (1).

6. The apparatus (1) according to any one of the preceding claims, wherein the first locking end (11A) is at a locked position, in contact with the first detent (91) or with the third detent (93), when the second locking end (12B) is at a free position, where the second locking end (12B) is free to move along the respective working trajectory, and wherein the second locking end (12B) is at a locked position, in contact with the second detent (92), when the first locking end (11A) is at a free position, where the first locking end (11A) is free to move along the respective working trajectory.

7. The apparatus (1) according to any one of the preceding claims, wherein the detent system (9) comprises a locking wall (22) surrounding the lifting shaft (3), and wherein the locking wall (22) comprises a first guide (22A), in which the first locking end (11A) is slidable to define the respective working trajectory, and a second guide (22B) in which the second locking end (12B) is slidable to define the respective working trajectory.

8. The apparatus (1) according to claim 7, wherein the first guide (22A) comprises a perimeter having a respective first longitudinal stretch, defining the first detent (91), and wherein the second guide (22B)

comprises a perimeter having a respective first longitudinal stretch, defining the second detent (92), and wherein the working trajectory of the first locking end (11A) comprises a first circular stretch and second circular stretch, offset longitudinally relative to the first circular stretch.

9. The apparatus (1) according to any one of the preceding claims, wherein the spring clutch (10) comprises a first spring (11), having a respective first end piece (11A), defining the first locking end (11A), and a respective second end piece (11B), connected to the tilt pulley (7), and wherein the clutch comprises a second spring (12) having a respective first end piece (12A), connected to the tilt pulley (7), and a respective second end piece (12B), defining the second locking end (12B).

10. The apparatus (1) according to claim 7, wherein the tilt pulley (7) is disposed along the longitudinal direction (L), at an intermediate position between the first spring (11) and the second spring (12).

11. A method for adjusting the tilt of a plurality of slats (100) in a sunshade apparatus (1), comprising the following steps:

- moving the plurality of slats (100) along a direction of movement (S);
- firstly rotating a lifting shaft (3), connected to a motor (4), in a first rotation direction (V1), to move the plurality of slats (100) along the direction of movement (S) in an unwinding direction;
- secondly rotating a lifting shaft (3), connected to a motor (4), in a second rotation direction (V2), to move the plurality of slats (100) along the direction of movement (S) in a retracting direction;
- providing a lifting shaft (3) coupled to a titl pulley (7) through a spring clutch (10) which includes a first locking end (11A) and a second locking end (12B) which move along respective working trajectories by effect of a rotation of the lifting shaft (3);
- rotating the tilt pulley (7);
- firstly disengaging the spring clutch (10), when the lifting shaft (3) rotates in the first rotation direction (V1) and a first detent (91) intercepts the first locking end (11A);
- secondly disengaging the spring clutch (10), when the lifting shaft (3) rotates in the second rotation direction (V2) and a second detent (92) intercepts the second locking end (12B);
- thirdly disengaging the spring clutch (10), when the lifting shaft (3) rotates in the first rotation direction (V1) and a third detent (93) intercepts the first locking end (11A) at an intermediate position along the working trajectory of the first locking end (11A) upstream of the first detent (91) in the first rotation direction (V1);

wherein the method comprises a step of releasing, where a release element (60) is moved from a deactivated position, where it is clear of the first locking end (11A), to an activated position, where it moves the first locking end (11A) of the spring clutch (10) to set the tilt pulley (7) in rotation again, wherein the release element (60) moves away the first locking end (11A) from the third detent (93) to allow the first locking end (11A) to continue turning in the first rotation direction (V1) towards the first detent (91) along the respective working trajectory.

12. The method according to claim 11, wherein a transmission element (6), connected to the plurality of slats (100) and to a lifting pulley (5), which is connected to the lifting shaft (3), transmits a movement along the direction of movement (S) to the plurality of slats (100).

13. The method according to claim 11 or claim 12, wherein the release element (60), in the step of releasing, touches the first locking end (11A) and causes it to move longitudinally.

Patentansprüche

1. Sonnenblendenvorrichtung (1), umfassend:

- eine Vielzahl an Lamellen (100), von denen eine jede um eine Kippachse (I) parallel zu einer Längsrichtung (L) gekippt wird und ein erstes und ein zweites Ende aufweist, jeweils betriebswirksam gekuppelt mit einer ersten und einer zweiten Seitenführung, ausgelegt, um die Lamellen (100) entlang der Bewegungsrichtung (S) zu führen, wobei die Bewegungsrichtung (S) quer zur Längsrichtung (L) angeordnet ist;
- einen Motor (4);
- eine Hebewelle (3), die mit einem Motor (4) gekuppelt ist;
- eine Kipprolle (7), die mit den Lamellen (100) verbunden ist, um diese um die jeweiligen Kippachsen (I) zu drehen;
- eine Federkupplung (10), die die Hebewelle (3) umgibt und ein erstes Verriegelungsende (11A) und ein zweites Verriegelungsende (12B) einschließt, die jeweils entlang einer jeweiligen Arbeitsbahn bewegbar sind, wobei die Federkupplung (10) an der Kipprolle (7) fixiert ist, um diese bei der Drehung an der Hebewelle (3) festzuspannen;
- ein Arretierungssystem (9), einschließend eine erste Arretierung (91), die ausgelegt ist, um das erste Verriegelungsende (11A) der Federkupplung (10) in einer ersten Rotationsrichtung (V1)

der Hebewelle (3) abzufangen, und eine zweite Arretierung (92), die ausgelegt ist, um das zweite Verriegelungsende (12B) der Federkupplung (10) in einer zweiten Rotationsrichtung (V2) der Hebewelle (3) abzufangen, die der ersten Rotationsrichtung (V1) entgegengesetzt ist, und eine dritte Arretierung (93), die ausgelegt ist, um das erste Verriegelungsende (11A) an einer Zwischenposition entlang der Arbeitsbahn des ersten Verriegelungsendes (11A) vor der ersten Arretierung (91) in der ersten Rotationsrichtung (V1) der Hebewelle (3) abzufangen, wobei die Sonnenblendenvorrichtung zudem ein Freigabeelement (60) umfasst, das zwischen einer aktivierten Position, in der das Freigabeelement (60) mit dem ersten Verriegelungsende (11A) der Federkupplung (10) ihn Kontakt ist, um dieses zu bewegen, und einer deaktivierten Position, in der das Freigabeelement (60) vom ersten Verriegelungsende (11A) frei liegt, bewegbar ist, wobei das Freigabeelement (60) ausgelegt ist, um zu bewirken, dass sich das erste Verriegelungsende (11A) wegführend von der dritten Arretierung (93) bewegt, um dem ersten Verriegelungsende (11A) zu erlauben, sich weiterhin in die erste Rotationsrichtung (V1) hinführend zur ersten Arretierung (91) entlang der jeweiligen Arbeitsbahn zu drehen.

2. Vorrichtung (1) nach Anspruch 1, wobei das Freigabeelement (60) ausgelegt ist, um zu bewirken, dass sich das erste Verriegelungsende (11A) längsseitig bewegt.

3. Vorrichtung (1) nach einem der vorhergehenden Ansprüche, umfassend ein Antriebselement (6), das mit der Vielzahl von Lamellen (100) verbunden ist, und eine Heberolle (5), die mit der Hebewelle (3) und dem Antriebselement (6) verbunden ist, um den Lamellen (100) zu erlauben, sich entlang der Bewegungsrichtung (S) zu bewegen.

4. Vorrichtung (1) nach Anspruch 3, wobei das Freigabeelement (60) mit dem Antriebselement (6) verbunden ist.

5. Vorrichtung (1) nach Anspruch 4, wobei das Freigabeelement (60) auf dem Antriebselement (6) an einer Freigabeposition positioniert ist, um das erste Verriegelungsende (11A) an einer Endlagenposition der Lamellen (100) entlang der Bewegungsrichtung (S) abzufangen, wobei der Kontakt zwischen den Lamellen (100) während der Abwärtsbewegung der Vorrichtung (1) vermieden wird.

6. Vorrichtung (1) nach einem der vorhergehenden Ansprüche, wobei sich das erste Verriegelungsende (11A) an einer verriegelten Position in Kontakt mit der ersten Arretierung (91) oder mit der dritten Arretierung (93) befindet, wenn sich das zweite Verriegelungsende (12B) an einer freien Position befindet, in der sich das Verriegelungsende (12B) frei entlang der jeweiligen Arbeitsbahn bewegen kann, und wobei sich das zweite Verriegelungsende (12B) an einer verriegelten Position in Kontakt mit der zweiten Arretierung (92) befindet, wenn sich das erste Verriegelungsende (11A) an einer freien Position befindet, in der sich das erste Verriegelungsende (11A) frei entlang der jeweiligen Arbeitsbahn bewegen kann.

7. Vorrichtung (1) nach einem der vorhergehenden Ansprüche, wobei das Arretierungssystem (9) eine Verriegelungswand (22) umfasst, die die Hebewelle (3) umgibt, und wobei die Verriegelungswand (22) eine erste Führung (22A) umfasst, in der das erste Verriegelungsende (11A) verschiebbar ist, um die jeweilige Arbeitsbahn zu definieren, und eine zweite Führung (22B), in der das zweite Verriegelungsende (12B) verschiebbar ist, um die jeweilige Arbeitsbahn zu definieren.

8. Vorrichtung (1) nach Anspruch 7, wobei die erste Führung (22A) einen Umfang umfasst, aufweisend ein jeweiliges erstes Längsteilstück, definierend die erste Arretierung (91), und wobei die zweite Führung (22B) einen Umfang umfasst, aufweisend ein jeweiliges erstes Längsteilstück, definierend die zweite Arretierung (92), und wobei die Arbeitsbahn des ersten Verriegelungsendes (11A) ein erstes kreisförmiges Teilstück und ein zweites kreisförmiges Teilstück umfasst, das längsseitig gegenüber dem ersten kreisförmigen Teilstück versetzt ist.

9. Vorrichtung (1) nach einem der vorhergehenden Ansprüche, wobei die Federkupplung (10) eine erste Feder (11) umfasst, aufweisend ein erstes jeweiliges Endstück (11A), definierend das erste Verriegelungsende (11A), und ein jeweiliges zweites Endstück (11B), das mit der Kipprolle (7) verbunden ist, und wobei die Kupplung eine zweite Feder (12) umfasst, aufweisend ein erstes jeweiliges Endstück (12A), das mit der Kipprolle (7) verbunden ist, und ein zweites jeweilige Endstück (12B), definierend das zweite Verriegelungsende (12B).

10. Vorrichtung (1) nach Anspruch 7, wobei die Kipprolle (7) entlang der Längsrichtung (L) an einer Zwischenposition zwischen der ersten Feder (11) und der zweiten Feder (12) angeordnet ist.

11. Verfahren zum Justieren der Neigung einer Vielzahl von Lamellen (100) in einer Sonnenblendenvorrichtung (1), umfassend die folgenden Schritte:

- Bewegen der Vielzahl von Lamellen (100) ent-

lang einer Bewegungsrichtung (S);
- erstens Drehen einer Hebewelle (3), die mit einem Motor (4) verbunden ist, in eine erste Rotationsrichtung (V1), um die Vielzahl von Lamellen (100) entlang der Bewegungsrichtung (S) in eine Abrollrichtung zu bewegen;
- zweitens Drehen einer Hebewelle (3), die mit einem Motor (4) verbunden ist, in eine zweite Rotationsrichtung (V2), um die Vielzahl von Lamellen (100) entlang der Bewegungsrichtung (S) in eine Einfahrrichtung zu bewegen;
- Bereitstellen einer Hebewelle (3), die mit einer Kipprolle (7) durch eine Federkupplung (10) verbunden ist, die ein erstes Verriegelungsende (11A) und ein zweites Verriegelungsende (12B) einschließt, die sich entlang jeweiliger Arbeitsbahnen durch die Wirkung einer Drehung der Hebewelle (3) drehen;
- Drehen der Kipprolle (7);
- erstens Ausrücken der Federkupplung (10), wenn sich die Hebewelle (3) in die erste Rotationsrichtung (V1) dreht und eine erste Arretierung (91) das erste Verriegelungsende (11A) abfängt;
- zweitens Ausrücken der Federkupplung (10), wenn sich die Hebewelle (3) in die zweite Rotationsrichtung (V2) dreht und eine zweite Arretierung (92) das zweite Verriegelungsende (12B) abfängt;
- drittens Ausrücken der Federkupplung (10), wenn sich die Hebewelle (3) in die erste Rotationsrichtung (V1) dreht und eine dritte Arretierung (93) das erste Verriegelungsende (11A) an einer Zwischenposition entlang der Arbeitsbahn des ersten Verriegelungsendes (11A) vor der ersten Arretierung (91) in der ersten Rotationsrichtung (V1) abfängt,

wobei das Verfahren einen Schritt zum Freigeben umfasst, in dem ein Freigabeelement (60) von einer deaktivierten Position, in der es vom ersten Verriegelungsende (11A) frei liegt, in eine aktivierte Position, in der es das erste Verriegelungsende (11A) der Federkupplung (10) bewegt, bewegt wird, um die Kipprolle (7) erneut in Drehung zu versetzen, wobei sich das Freigabeelement (60) wegführend vom ersten Verriegelungsende (11) von der dritten Arretierung (93) bewegt, um dem ersten Verriegelungsende (11A) zu erlauben, sich weiterhin in die erste Rotationsrichtung (V1) hinführend zur ersten Arretierung (91) entlang der jeweiligen Arbeitsbahn zu drehen.

12. Verfahren nach Anspruch 11, wobei ein Antriebselement (6), das mit der Vielzahl von Lamellen (100) und einer Heberolle (5) verbunden ist, die mit der Hebewelle (3) verbunden ist, eine Bewegung entlang der Bewegungsrichtung (S) auf die Vielzahl von Lamellen (100) überträgt.

13. Verfahren nach Anspruch 11 oder Anspruch 12, wobei das Freigabeelement (60) im Freigabeschritt das erste Verriegelungsende (11A) berührt und bewirkt, dass sich dieses längsseitig bewegt.

Revendications

1. Dispositif de pare-soleil (1), comprenant :

- une pluralité de lamelles (100), chacune s'inclinant autour d'un axe d'inclinaison (I) parallèle à une direction longitudinale (L) et ayant une première et une seconde extrémité couplées de manière opérationnelle à un premier et un second guide latéral, respectivement, configurés pour guider les lamelles (100) le long d'une direction de mouvement (S), la direction de mouvement (S) étant transversale à la direction longitudinale (L) ;
- un moteur (4) ;
- un arbre de levage (3), couplé au moteur (4) ;
- une poulie d'inclinaison (7) reliée aux lamelles (100) pour les faire tourner autour des axes d'inclinaison respectifs (I) ;
- un embrayage à ressort (10) entourant l'arbre de levage (3) et incluant une première extrémité de verrouillage (11A) et une seconde extrémité de verrouillage (12B), chacune mobile le long d'une trajectoire de travail respective, dans lequel l'embrayage à ressort (10) est fixé à la poulie basculante (7) pour la contraindre en rotation à l'arbre de levage (3) ;
- un système d'encliquetage (9), incluant un premier encliquetage (91), configuré pour intercepter la première extrémité de verrouillage (11A) de l'embrayage à ressort (10) dans une première direction de rotation (V1) de l'arbre de levage (3), un deuxième encliquetage (92), configuré pour intercepter la deuxième extrémité de verrouillage (12B) de l'embrayage à ressort (10) dans une deuxième direction de rotation (V2) de l'arbre de levage (3), opposé au premier sens de rotation (V1), et un troisième encliquetage (93) configuré pour intercepter la première extrémité de verrouillage (11A) en correspondance d'une position intermédiaire le long de la trajectoire de travail de la première extrémité de verrouillage (11A), en amont du premier encliquetage (91) dans le premier sens de rotation (V1) de l'arbre de levage (3),

dans lequel ledit dispositif de pare-soleil comprend en outre un élément de libération (60), mobile entre une position activée, où ledit élément de libération (60) est en contact avec la première extrémité de

verrouillage (11A) de l'embrayage à ressort (10) pour la déplacer, et une position désactivée, où ledit élément de libération (60) est dégagé de la première extrémité de verrouillage (11A), dans lequel l'élément de libération (60) est configuré pour amener la première extrémité de verrouillage (11A) à s'éloigner du troisième encliquetage (93) pour permettre à la première extrémité de verrouillage (11A) de continuer à tourner dans le premier sens de rotation (V1) vers le premier encliquetage (91) le long de la trajectoire de travail respective.

2. Dispositif (1) selon la revendication 1, dans lequel l'élément de libération (60) est configuré pour provoquer le mouvement longitudinal de la première extrémité de verrouillage (11A).

3. Dispositif (1) selon l'une quelconque des revendications précédentes, comprenant un élément de transmission (6), relié à la pluralité de lamelles (100), et une poulie de levage (5), reliée à l'arbre de levage (3) et à l'élément de transmission (6) pour permettre aux lamelles (100) de se déplacer le long de la direction de mouvement (S).

4. Appareil (1) selon la revendication 3, dans lequel l'élément de libération (60) est relié à l'élément de transmission (6).

5. Dispositif (1) selon la revendication 4, dans lequel l'élément de libération (60) est positionné sur l'élément de transmission (6) en correspondance d'une position de libération pour intercepter la première extrémité de verrouillage (11A) en correspondance d'une position limite des lamelles (100) le long de la direction de mouvement (S), évitant le contact entre les lamelles (100) pendant le mouvement descendant du dispositif (1).

6. Dispositif (1) selon l'une quelconque des revendications précédentes, dans lequel la première extrémité de verrouillage (11A) est dans une position verrouillée, en contact avec le premier encliquetage (91) ou avec le troisième encliquetage (93), lorsque la deuxième extrémité de verrouillage (12B) est dans une position libre, où la deuxième extrémité de verrouillage (12B) est libre de se déplacer le long de la trajectoire de travail respective, et dans lequel la deuxième extrémité de verrouillage (12B) est dans une position verrouillée, en contact avec le deuxième encliquetage (92), lorsque la première extrémité de verrouillage (11A) est dans une position libre, où la première extrémité de verrouillage (11A) est libre de se déplacer le long de la trajectoire de travail respective.

7. Dispositif (1) selon l'une quelconque des revendications précédentes, dans lequel le système d'encliquetage (9) comprend une paroi de verrouillage (22) entourant l'arbre de levage (3), et dans lequel la paroi de verrouillage (22) comprend un premier guide (22A), dans lequel la première extrémité de verrouillage (11A) peut coulisser pour définir la trajectoire de travail respective, et un deuxième guide (22B) dans lequel la deuxième extrémité de verrouillage (12B) peut coulisser pour définir la trajectoire de travail respective.

8. Dispositif (1) selon la revendication 7, dans lequel le premier guide (22A) comprend un périmètre ayant une première portion longitudinale respective, définissant le premier encliquetage (91), et dans lequel le second guide (22B) comprend un périmètre ayant une première portion longitudinale respective, définissant le second encliquetage (92), et dans lequel la trajectoire de travail de la première extrémité de verrouillage (11A) comprend une première portion circulaire et une seconde portion circulaire, décalées longitudinalement par rapport à la première portion circulaire.

9. Dispositif (1) selon l'une quelconque des revendications précédentes, dans lequel l'embrayage à ressort (10) comprend un premier ressort (11), ayant une première pièce d'extrémité respective (11A), définissant la première extrémité de verrouillage (11A), et une seconde pièce d'extrémité respective (11B), reliée à la poulie d'inclinaison (7), et dans lequel l'embrayage comprend un second ressort (12) ayant une première pièce d'extrémité respective (12A), reliée à la poulie d'inclinaison (7), et une seconde pièce d'extrémité respective (12B), définissant la seconde extrémité de verrouillage (12B).

10. Dispositif (1) selon la revendication 7, dans lequel la poulie d'inclinaison (7) est disposée le long de la direction longitudinale (L), en correspondance d'une position intermédiaire entre le premier ressort (11) et le second ressort (12).

11. Procédé pour régler l'inclinaison d'une pluralité de lamelles (100) dans un dispositif de pare-soleil (1), comprenant les étapes suivantes :

- déplacer la pluralité de lamelles (100) le long d'une direction de déplacement (S) ;
- faire tourner d'abord un arbre de levage (3), relié à un moteur (4), dans un premier sens de rotation (V1), pour déplacer la pluralité de lamelles (100) le long de la direction de mouvement (S) dans une direction de déroulement ;
- deuxièmement, faire tourner un arbre de levage (3), relié à un moteur (4), dans un deuxième sens de rotation (V2), pour déplacer la pluralité de lamelles (100) le long de la direction de mouvement (S) dans une direction de rétraction ;

- fournir un arbre de levage (3) couplé à une poulie d'inclinaison (7) par l'intermédiaire d'un embrayage à ressort (10) qui inclut une première extrémité de verrouillage (11A) et une seconde extrémité de verrouillage (12B) qui se déplacent le long de trajectoires de travail respectives sous l'effet d'une rotation de l'arbre de levage (3) ;
- faire tourner la poulie d'inclinaison (7) ;
- débrayer d'abord l'embrayage à ressort (10), lorsque l'arbre de levage (3) tourne dans le premier sens de rotation (V1) et qu'un premier encliquetage (91) intercepte la première extrémité de verrouillage (11A) ;
- deuxièmement, désengager l'embrayage à ressort (10), lorsque l'arbre de levage (3) tourne dans le deuxième sens de rotation (V2) et qu'un deuxième encliquetage (92) intercepte la deuxième extrémité de verrouillage (12B) ;
- troisièmement, désengager l'embrayage à ressort (10), lorsque l'arbre de levage (3) tourne dans le premier sens de rotation (V1) et qu'un troisième encliquetage (93) intercepte la première extrémité de verrouillage (11A) dans une position intermédiaire le long de la trajectoire de travail de la première extrémité de verrouillage (11A) en amont du premier encliquetage (91) dans le premier sens de rotation (V1) ;

dans lequel le procédé comprend une étape de libérer, où un élément de libération (60) est déplacé d'une position désactivée, où il est dégagé de la première extrémité de verrouillage (11A), dans une position activée, où il déplace la première extrémité de verrouillage (11A) de l'embrayage à ressort (10) pour remettre la poulie d'inclinaison (7) à nouveau en rotation, dans lequel l'élément de libération (60) éloigne la première extrémité de verrouillage (11A) du troisième encliquetage (93) pour permettre à la première extrémité de verrouillage (11A) de continuer à tourner dans la première direction de rotation (V1) vers le premier encliquetage (91) le long de la trajectoire de travail respective.

12. Procédé selon la revendication 11, dans lequel un élément de transmission (6), relié à la pluralité de lamelles (100) et à une poulie de levage (5), qui est reliée à l'arbre de levage (3), transmet un mouvement le long de la direction de mouvement (S) à la pluralité de lamelles (100).

13. Procédé selon la revendication 11 ou la revendication 12, dans lequel l'élément de libération (60), lors de l'étape de libérer, touche la première extrémité de verrouillage (11A) et provoque son déplacement longitudinal.

Fig.2

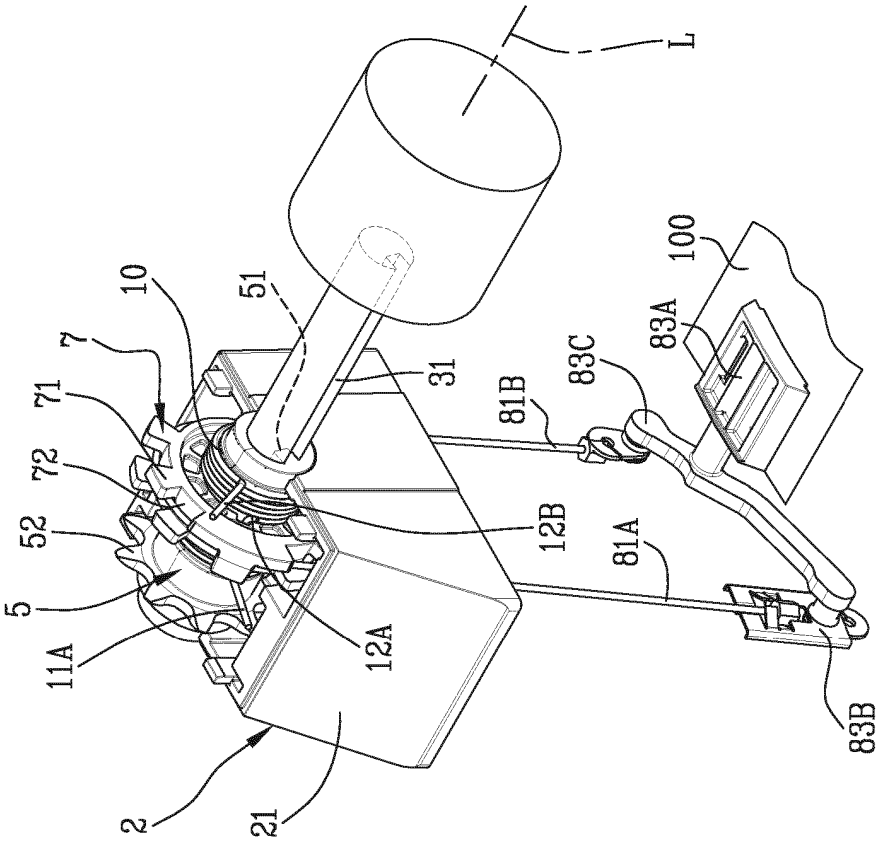
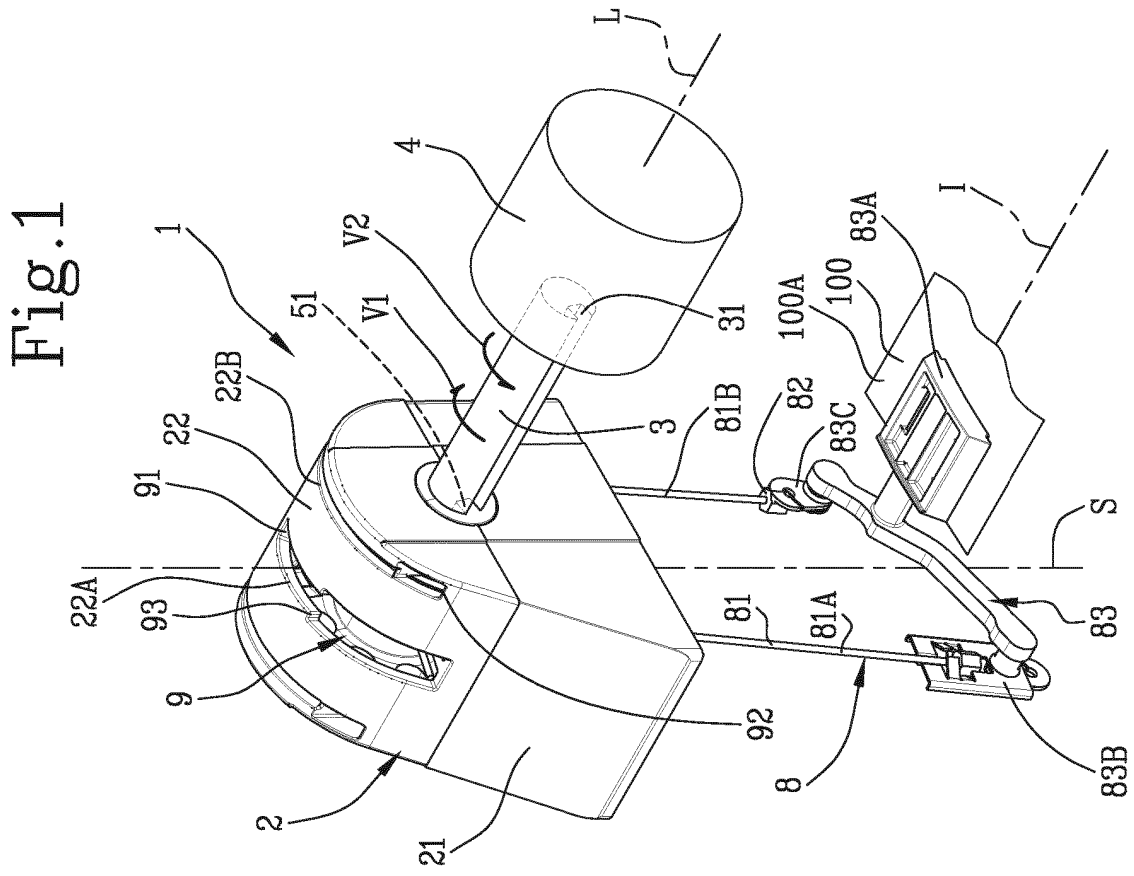
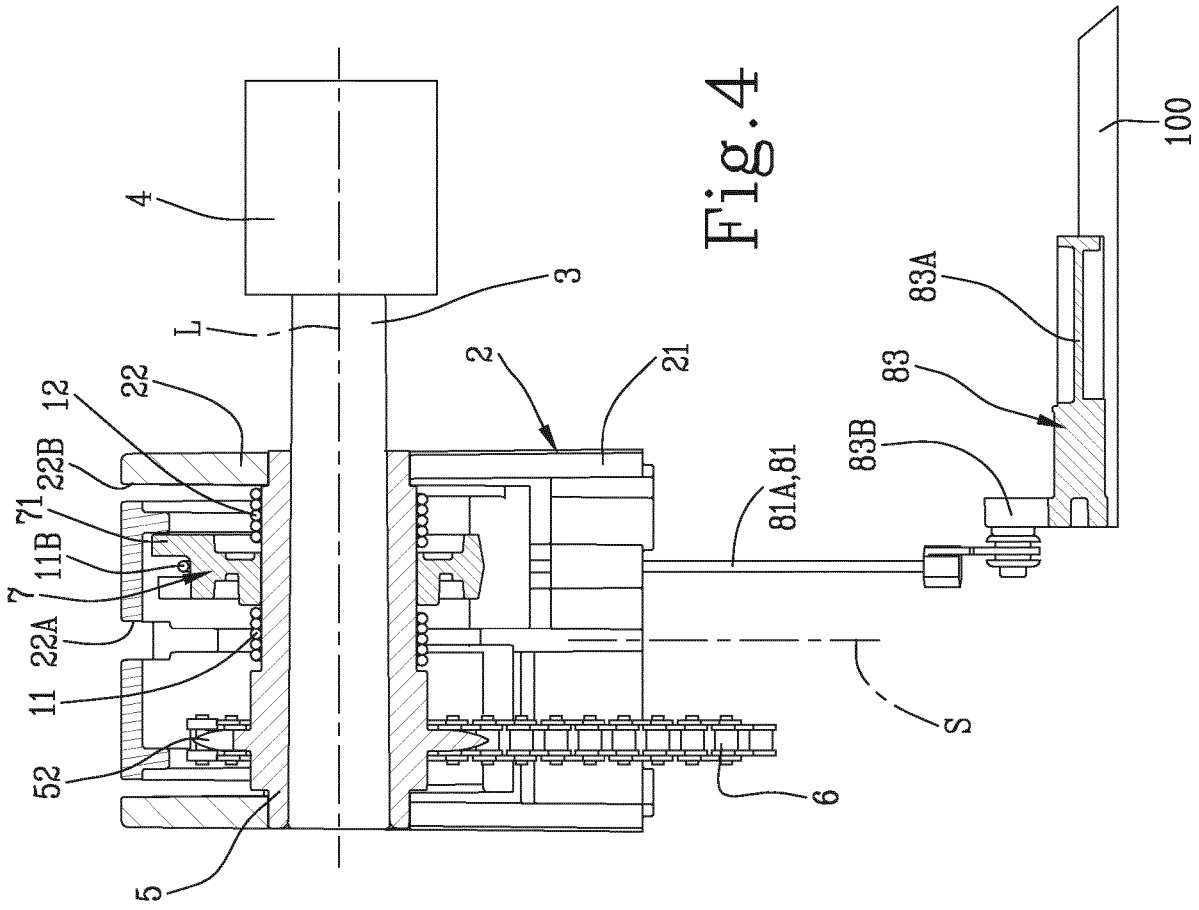

L
10
51
7
71
72
52
5
11A
2
21
12A
31
12B
81B
83C
83A
100
81A
83B

Fig.1


L
4
1
V2
51
V1
22B
22
91
22A
93
9
2
21
92
3
31
81B
82
83C
100A
100
83A
I
S
81
81A
8
83
83B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12
22
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5
6
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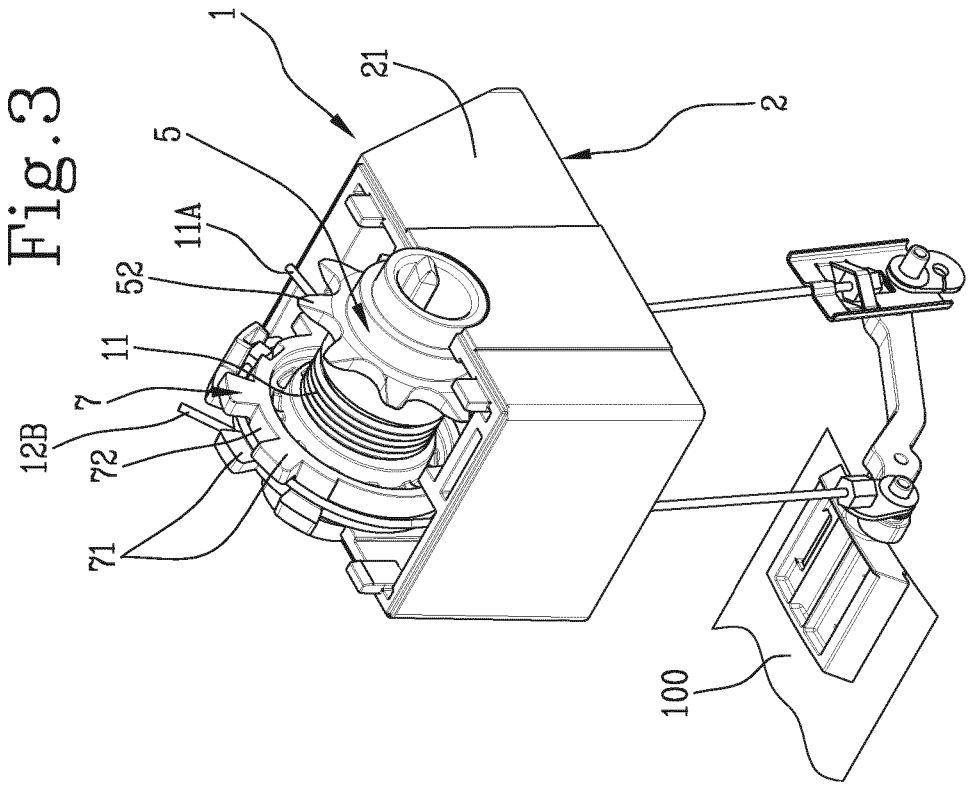
81A,81
83B
83
83A
100

Fig.4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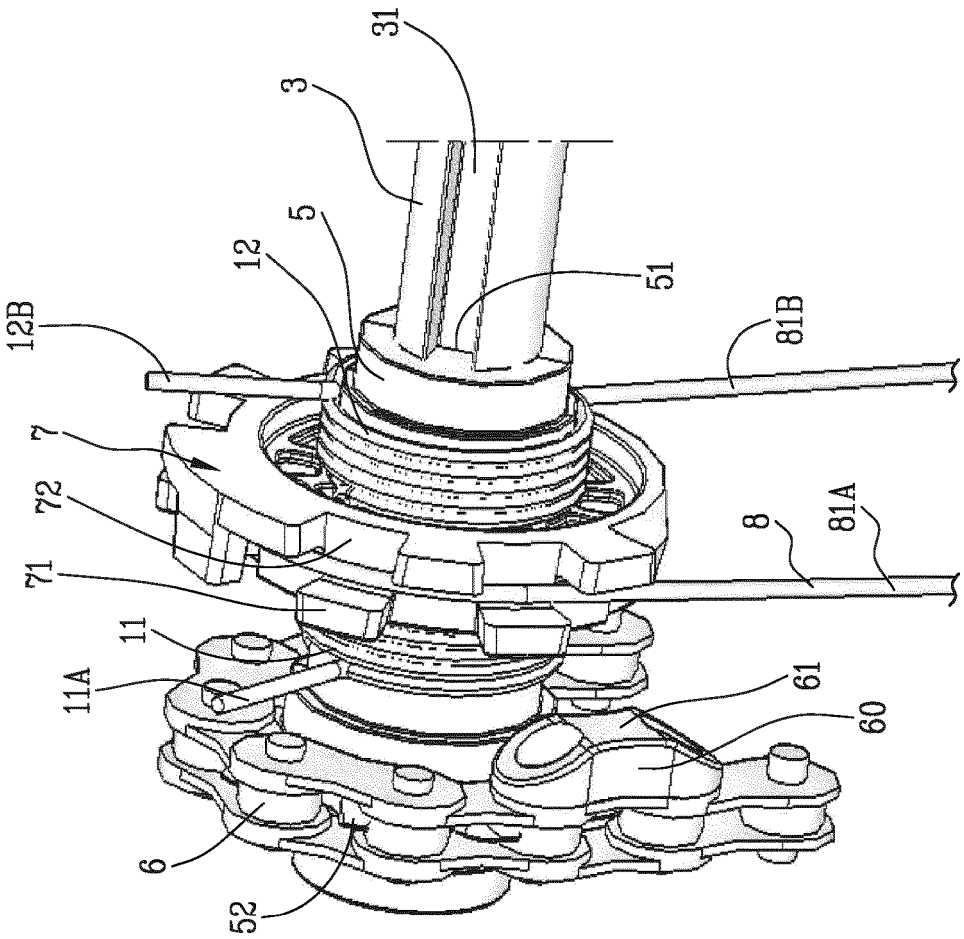
2
5
11A
52
11
7
12B
72
71
100

Fig.3

Fig.5



REFERENCES CITED IN THE DESCRIPTION

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