CLAIMS

1. A sunshade apparatus (1) comprising:

- a plurality of slats (2), each tilting about a respective longitudinal axis and having a first and a second end operatively coupled to a first and a second lateral guide, configured to guide the slats (2) along a direction of movement;
- a connecting mechanism (7) configured to connect together the slats (2) and rotate them about their respective longitudinal axes;
- a lifting shaft (6), coupled to a motor (13);
- a first lift pulley (8), coupled to the lifting shaft (6), and a second lift pulley (8a);
- a lifting element (9) connected to the first and the second lift pulley (8,8a), in a closed loop configuration, and connected to a last slat (2a), distal from the lifting shaft (6), to move the slats (2) in the direction of movement;
- a tilt pulley (11), connected to the connecting mechanism to actuate it in order to modify the tilt of the slats (2), and operatively connected to the lifting shaft (6) by means of a clutch (14), so that a rotation of the lifting shaft (6) in a first direction causes the tilt pulley (11) to rotate up to a configuration of maximum or minimum tilt of the slats (2) and a further rotation of the lifting shaft (6) in the first direction causes the tilt pulley (11) to slip on the clutch (14),

characterized in that the tilt pulley (11) is idle relative to the lifting shaft (6) and is connected to the first lift pulley (8) through the clutch (14), and wherein the clutch (14) comprises an annular friction element, defining at least one surface of contact perpendicular to an axis of rotation of the lifting shaft (6), and wherein the sunshade apparatus (1) comprises a coupling spring (22) configured to apply pressure on the contact surface.

2. The sunshade apparatus (1) according to claim 1, wherein the clutch (14) is interposed between the tilt pulley (11) and the first lift pulley (8).

3. The sunshade apparatus (1) according to any one of the preceding claims, wherein the rotation of the lifting shaft (6) in an extending rotation direction causes the slats (2) to move along the direction of movement, between a gathered configuration and an extended configuration, and causes a corresponding rotation of the slats (2) about their longitudinal axes in the closing rotation direction, from the configuration of maximum tilt to the configuration of minimum tilt.

4. The sunshade apparatus (1) according to any one of the preceding claims, comprising a stroke limit stop element (15), which rotates as one with the tilt pulley (11) and which is configured to stop the tilt pulley (11) from rotating when at least one predetermined angular stroke limit position is reached.

5. The sunshade apparatus (1) according to claim 6, wherein the stroke limit stop element (15) is configured to stop the tilt pulley (11) from rotating when at least a first and a second predetermined angular stroke limit position are reached, wherein the first angular stroke limit position corresponds to the configuration of maximum tilt of the slats (2) and the second angular stroke limit position configuration corresponds to the minimum tilt of the slats (2).

6. The sunshade apparatus (1) according to any one of the preceding claims, comprising a connecting structure to connect the lifting element (9) to the last slat (2a), wherein the connecting structure defines a clearance along the direction of movement, between the lifting element (9) and the last slat (2a), so that the last slat (2a) is movable along the direction of movement relative to a stretch of the lifting element (9) to which it is connected, between a first and a second end position.

7. The sunshade apparatus (1) according to claim 6, wherein the connecting structure comprises a lifting carriage (10) fixed to the last slat (2a) and movably connected to the lifting element (9) to define the clearance.

8. The sunshade apparatus (1) according to claim 6 or 7, wherein the

connecting structure comprises an activating element, configured to inhibit operation of the motor (13), movable between a deactivated configuration and an active configuration in response to a relative movement of the last slat (2a) relative to the lifting element (9) in a direction for gathering the plurality of slats (2), opposite to the extending direction.

9. The sunshade apparatus (1) according to claim 8, comprising an optical stop device wherein an emitter (17) and a receiver (18) define an optical path (19), and wherein the activation element, when changing from the deactivated configuration to the active configuration, interrupts the optical path (19) inhibiting operation of the motor (13).

10. The sunshade apparatus (1) according to any one of the preceding claims, wherein the lifting shaft (6) is coupled to the motor (13) to rotate at a first speed, in a condition of driving the lifting shaft (6) on the tilt pulley (11), and at a second speed greater than the first, in a condition of slipping of the tilt pulley (11) relative to the lifting shaft (6).

11. The sunshade apparatus (1) according to any one of the preceding claims, wherein each slat (2) comprises at least one guide (5) integral with the slat (2) and extending along the longitudinal axis of the slat (2), and wherein the connecting mechanism (7) comprises a plurality of elements (4) for moving the slats (2), operatively associated with the first and second ends of the slats (2), in such a way that each slat (2) is coupled to a first movement element (4), at the first end, and to a second movement element (4), at the second end, and wherein the apparatus comprises, for each slat, a first and a second locking element (23), configured to lock the slat (2) to the first and second movement element (4), respectively, and wherein the first and second locking elements (23) are slidably coupled to the guide (5) to be movable along the longitudinal direction of extension of the slat, between a position of non-interference with the movement element (4) and a position for coupling and locking to the respective movement element (4).

12. A method of using a sunshade apparatus (1)

according to any of claims 1-11,

wherein the method comprises the following steps:

- moving the slats (2) between the gathered configuration and the extended configuration;
- tilting the slats (2) between the minimum and maximum tilt configurations, by means of a tilt pulley (11),

wherein a rotation of the lifting shaft (6) in an extending rotation direction causes movement of the slats (2) towards the extended configuration and tilting of the slats (2) towards the minimum or, vice versa, maximum tilt configuration, and a rotation of the lifting shaft (6) in a gathering rotation direction causes movement of the slats (2) towards the gathered configuration and tilting of the slats towards the maximum or, vice versa, minimum tilt configuration,

characterized in that it comprises the following steps:

- moving and simultaneously tilting the slats (2), until reaching the configuration of minimum or maximum tilt of the slats (2), with the lifting shaft (6) driving the tilt pulley (11);
- moving the slats (2) without varying the tilt, when the slats (2) are in the minimum or maximum tilt configuration and movement is towards the extended or gathered configuration, respectively, or vice versa, wherein the rotation of the lifting shaft (6) causes the tilt pulley (11) to slip relative to the lifting shaft (6), wherein the tilt pulley (11) is idle relative to the lifting shaft (6) and is connected to the first lift pulley (8) through a clutch (14), and wherein pressure is applied on a contact surface of an annular friction element of the clutch (14), through a spring (22).

13. The method according to claim 12, comprising a step of inhibiting the operation of the motor (13), in response to a relative movement of the last

slat (2a) relative to the lifting element (9) along the direction of movement, in the direction of gathering the plurality of slats (2).

14. The method according to claim 12 or 13, wherein the step of moving the slats (2) between the gathered configuration and the extended configuration corresponds to a first angle of rotation of the lifting shaft (6) and wherein the step of tilting the slats (2) between the maximum and minimum tilt configurations corresponds to a second angle of rotation of the lifting shaft (6), characterized in that the second angle of rotation is smaller than the first angle of rotation by at least one order of magnitude.