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2,155,945

CORD LOCKING APPARATUS FOR VENETIAN BLINDS

Filed March 17, 1938

FIG. 1

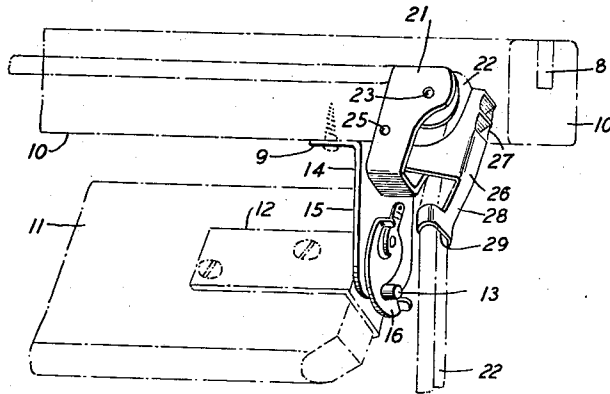


FIG. 2

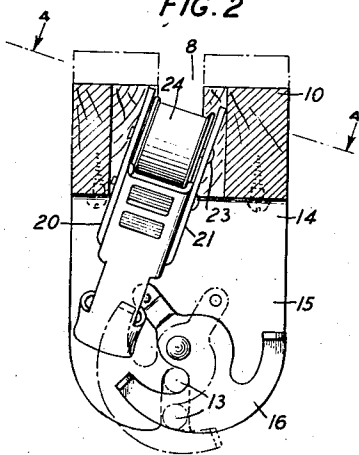


FIG. 3

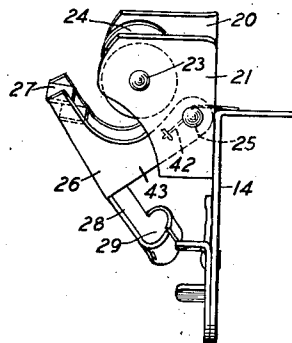


FIG. 4

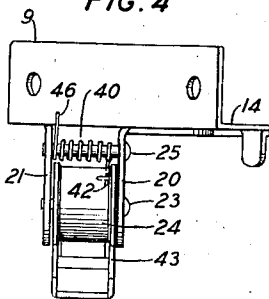


FIG. 5

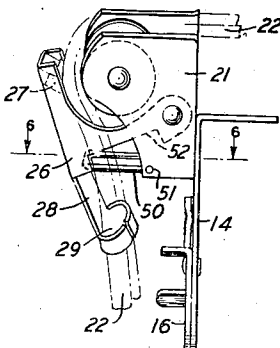
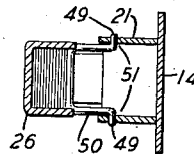


FIG. 6



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CORD LOCKING APPARATUS FOR
VENETIAN BLINDS

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7 Claims. (Cl. 156—17)

This invention relates to Venetian blind apparatus, and more particularly to an automatic device for locking a Venetian blind in desired positions.

5 All forms of cord locking devices used at the present time and characterized as automatic or self-locking mechanisms include a rotatable locking-member for locking and releasing a cord utilized to raise and lower a Venetian blind. The
10 movement of the cord is translated from a horizontal to a vertical direction, or vice versa, by being passed over a sheave which is operatively associated with the locking-member to wedge the cord therebetween in such manner that, in fac-
15 ing the assembled device, the locking-member is disposed on the right-hand side of the vertical portion of the cord accessible to the hand of the operator. In releasing the cord, preliminary to the lowering of a blind, the locking-member is
20 moved in a releasing direction out of contact with the cord solely by the force of gravity and at times during the lowering of the blind the cord tends to contact the locking-member in the manner described immediately below thereby to be
25 wedged on the sheave in the well known manner to prevent further lowering movement of the blind.

As a blind is being lowered from its uppermost or entirely contracted position, the weight
30 of the blind suspended on the cord and opposing a controlling force supplied by an operator to the cord is normally sufficient to nullify the tendency of the cord to come in contact with the locking-member. This, of course, permits a
35 lowering movement of the blind. As the blind approaches its lowermost or fully extended position, the weight thereof is increasingly transferred from the cord to a textile ladder included in the blind thereby correspondingly reducing
40 the weight on the cord. Thus, the controlling force supplied by an operator to the cord is insufficient as opposed to the reduced weight of the blind suspended on the cord to overcome the tendency of the cord to come in contact with the
45 locking-member.

Consequently, the cord will be wedged between the sheave and the locking-member to prevent further lowering movement of the blind. As the blind opens gradually from the top downward the aforementioned locking is caused to occur
50 inadvertently before the lowermost portion of the blind is extended. Accordingly, the lowermost portion of the blind will remain unextended until the free end of the cord is oscillated by
55 the operator to release the inadvertent wedging

thereof between the sheave and the locking-member. Obviously such situation is not only a nuisance but it is also hazardous in that too violent oscillation of the cord by impulsive operators can cause serious damage to the blind assembly.

It is an object of the present invention to provide for a Venetian blind a cord-locking arrangement that allows at all times a lowering movement thereof in an expeditious manner until a fully-extended condition is attained.

It is another object of the invention to provide for a Venetian blind a cord-locking device that is automatic in operation irrespective of the amount of blind that is unextended.

It is a further object of the invention to provide for a Venetian blind a cord-locking arrangement that precludes inadvertent locking of a pull-cord.

It is still another object of the invention to provide for a Venetian blind a cord-locking device in which a pull-cord is so controlled that inadvertent locking thereof is prevented.

It is a still further object of the invention to provide for a Venetian blind a cord-locking device in which the weight of an unextended portion of the blind is adequate at all times to effect further extension of the blind until a fully-extended condition thereof is achieved.

It is also still another object of the invention to provide for a Venetian blind a cord-locking device that requires but a single cord-releasing operation for each portion of the blind that is extended.

It is also a further object of the invention to provide for a Venetian blind a cord-locking device which is exclusively controlled by an operator for effecting lockings of a pull-cord during lowering or extending movements of the blind.

In a preferred form the invention comprises a sheave over which a cord is trained to effect raising and lowering movements of a Venetian blind. Associated with the sheave is a yoke provided with transverse corrugations that press the cord on the periphery of the sheave so as to wedge the cord therebetween for locking a blind in desired positions. Depending from the yoke is an integral portion that serves to guide the cord away from the sheave and toward a position suitable for an operator to produce thereby desired movement of the blind. Operatively connected with the yoke is a spiralled spring that actuates the yoke in a positive manner in a direction away from the sheave during all occasions involving raising or lowering movements

of the blind. This permits a movement of the cord over the sheave under the exclusive control of an operator.

The invention will be more readily understood from the following description taken together with the accompanying drawing in which:

Fig. 1 is a perspective view showing the invention incorporated in a Venetian blind assembly;

Fig. 2 is a front elevation of the invention;

Fig. 3 is a side elevation of the invention;

Fig. 4 is a view taken along lines 4-4 in Fig. 2;

Fig. 5 is a side elevation showing an alternate form of the invention, and

Fig. 6 is a view taken along the lines 6-6 in Fig. 5.

Referring to Fig. 1 a header bar 10 is mounted in a window casing in a well known manner, not shown. Disposed beneath the header bar is a tilt bar 11 provided with a supporting member 12 attachable thereto and formed with a journal 13. The tilt bar is rotatably supported on one end by disposing the journal 13 in a bearing embodied in an adjustable device 14, which is attachable to the under surface of the header bar, and on the opposite end by a tilting mechanism, not shown, which is preferably of the type disclosed in my Patent No. 2,108,939 issued February 22, 1938. The adjustable device 14 comprises a bracket 15 and a member 16 rotatably mounted thereon, both of which cooperate to provide for the tilt bar drops of $1\frac{1}{2}$ and $1\frac{3}{4}$ inches in the manner disclosed in applicant's copending application, Serial No. 196,325 filed March 17, 1938. It is understood that the slats and textile ladder forming the blind are assembled and attached to the tilt bar in the well known manner, and further that the longitudinal axis of the journal 13 coincides with the axis of rotation of the tilt bar.

A cord-locking device 20 comprising a U-shaped member 21 having spaced apart legs of equal length is suitably fastened to an upper portion of the adjustable supporting device 14 at an angle relative to the header bar. This angle substantially corresponds with the line of pull of lifting cord 22 whose actuations for raising and lowering a Venetian blind will be more fully explained hereinafter. Mounted in an upper and forward position of the U-shaped member is a transverse pin 23 on which is journaled an idler sheave 24.

Disposed in a lower and rearward portion of the U-shaped member is a transverse pin 25 on which is rotatably mounted a locking yoke 26 formed with a plurality of transverse corrugations 27 in an upper portion thereof. The locking yoke also includes an integral depending portion 28 which terminates in a substantially rectangular opening 29. The lifting cord passes upward from the hand of an operator through the opening 29 to extend between the periphery of the sheave and the corrugations and to continue in a left-hand direction in a longitudinal groove 3 formed in the header bar. The lifting cord terminates in the blind, not shown, so that raising and lowering movements of the Venetian blind are accomplished in the well known manner.

Actuating the lifting cord raises or lowers the blind to desired positions at each of which it can be locked by swinging the cord slightly in a counter-clockwise direction (Fig. 1). This moves the locking yoke in the same direction causing the corrugations thereof to engage the lifting cord. As actuating force applied by an operator to the lifting cord is relaxed, the weight of the unextended portion of the blind causes a force of ten-

sion to be applied to the lifting cord. This tension functions in a direction opposite to the force initially originating with the operator and tends to actuate the lifting cord to move the locking yoke farther in a counter-clockwise or locking direction whereby the lifting cord is wedged between the corrugations and the periphery of the sheave. However, in order to lower the blind the operator supplies to the lifting cord a force to oppose the force due to the weight of the unextended portion of the blind and in such magnitude that the tendency of the locking yoke to wedge the lifting cord is nullified. The force due to the unextended portion of the blind decreases in magnitude as the blind approaches a completely extended position for the reason that as the blind is extended the weight of the slats is transferred from the lifting cord to the textile ladder.

So when it is desired to move the blind from say, for example, three-quarter to complete extension, the portion of the lifting cord in the hand of the operator is actuated in a clockwise direction (Fig. 1) and at the same time a relatively slight pulling force is applied thereto. This tends to move the locking yoke in a clockwise direction (Fig. 1) and, as a consequence thereof, the corrugations are moved out of engagement with the portion of the lifting cord passing over the sheave. This allows the lifting cord free to move across the sheave. The pulling force supplied by the operator to the cord is then partially relaxed. This permits the weight of the lifting cord to be applied to the locking yoke substantially in the vicinity of the opening 29 as the lifting cord emerges therefrom (Fig. 1). As a result, the locking yoke is caused thereby to move in a counter-clockwise or locking direction (Fig. 1) and again there is a tendency for the lifting cord to be wedged between the corrugations and the sheave to prevent further movement of the lifting cord. Accordingly, there is a tendency to arrest descent of the blind.

The above partial relaxation of pulling force on the part of the operator is an attempt to supply a force sufficient to oppose the force occasioned by the weight of the unextended portion of the blind so as to overcome the tendency of the locking yoke to wedge the lifting cord in the manner aforedescribed. Now, however, the force due to the weight of the unextended portion of the blind is so small that, as the operator endeavors to supply an opposing controlling force in the manner mentioned above, the weight of the lifting cord is adequate to cause the locking yoke to wedge the lifting cord on the sheave. Consequently, the blind is inadvertently locked in the three-quarter position due to this inadvertent wedging of the lifting cord. To move the blind therefrom to the fully extended position it will be necessary to quickly oscillate the portion of the lifting cord in the hand of the operator. This has the effect of intermittently freeing the lifting cord from the corrugations as the former passes over the sheave. Accordingly, the blind is caused to be lowered from the three-quarter position to the entirely extended position in a substantially incremental manner. As previously mentioned this is not only undesirable from a nuisance standpoint but it is also dangerous for the reason that too violent oscillation of the cord by an impulsive operator may result in the dislodgement of the blind assembly from the window casing. Of course it is equally undesirable to overcome the previously described difficulty by pulling-up the blind to a substantial height and

then suddenly releasing the pull force to allow the blind to fall with a bang. Such inadvertent locking of the lifting cord is in the prior art an objectionable feature that is avoided in a manner that will now be explained.

Therefore, this invention contemplates a cord-locking arrangement in which the force due to the weight of an unextended portion of the blind will always be sufficient to cause a lowering of the blind when pulling-force supplied by an operator to the lifting cord is relaxed for this purpose. In other words, this invention contemplates a cord-locking apparatus wherein a positive force is permanently applied to the locking yoke 26 so as to normally move the latter away from the cord-guiding sheave 24 to permit a free movement of the lifting cord thereover during all occasions involving a lowering of a Venetian blind from say, for example, a three-quarter to a complete extension. This amount is selected for the purposes of illustration and is understood to include any unextended portion that per se is unable to supply a force necessary to oppose that supplied by an operator so as to keep the locking yoke out of engagement with the lifting cord during lowering movements of the blind as mentioned above.

Referring to Figs. 3 and 4, a coiled spring 40 is mounted on transverse pin 25 in such manner that one free end engages the horizontal portion 9 of the adjustable supporting device 14 while the other free end 42 is suitably fastened to a right-hand leg 43 of the locking yoke 26. As seen in Fig. 3 the spring tends at all times to move the locking yoke 26 in a counter-clockwise or non-locking direction, that is, in a direction away from the cord-guiding sheave 24. The force inherent in the spring for this purpose is predetermined such that it will at least nullify the force due to the weight of the lifting cord applied to the portion 28 of the locking yoke 26 and tending to cause an inadvertent locking of the blind in the manner described hereinbefore.

It is therefore contemplated that the spring should serve the purpose mentioned above during the interval when the force due to the weight of the unextended portion of the blind is relatively close to zero value. In other words, the spring functions to permit a free movement of the lifting cord over the cord-guiding sheave during the period when the force due to the unextended portion of the blind is inadequate to cooperate with the opposing force supplied by an operator to overcome or nullify the force due to the weight of the lifting cord and per se tending to cause an inadvertent wedging of the lifting cord in the manner aforementioned. It is therefore evident that the weight of any unextended portion will now be adequate to cause the blind to drop to its complete extension during all occasions when the lifting cord is actuated for the purpose of effecting a lowering movement of a Venetian blind. Accordingly, the nuisance and hazardous aspects hereinbefore mentioned are obviated.

Figs. 5 and 6 illustrate an alternate form of the invention. As shown in Fig. 6 a U-shaped member 50 is mounted in aligned openings 51, 51, provided in the opposite legs of a lower and forward portion of the U-shaped member 21. If necessary a portion of the locking yoke 26 is cut out as at 52 to permit a free movement thereof. As the member 50 is resilient, the parallel legs thereof are flexed toward each other for the purpose of disposing oppositely projecting por-

tions 49, 49 in the openings 51, 51. The member 50 serves to guide the lifting cord in such manner that a force due only to a portion of the weight of the latter is applied to the cord-locking yoke. Consequently, clockwise or locking movement of the locking yoke is caused only to a limited extent (Fig. 5). Such movement is predeterminedly limited by so positioning the U-shaped member 50 that free movement of the lifting cord across the cord-guiding sheave is permitted at all times during a lowering of a Venetian blind in the manner hereinbefore described. That is to say that while certain clockwise or locking movement of the cord-locking member 26 is allowed the lifting cord is so controlled that such movement is insufficient to cause inadvertent wedging of the lifting cord by the corrugations in the manner aforescribed. Consequently, inadvertent locking of the blind is obviated.

It is understood that the invention is capable of modifications other than those disclosed herein, and the scope thereof together with such modifications is defined in the appended claims.

What is claimed is:

1. In a cord locking device for a Venetian blind comprising a header bar, a cord extending through the header bar for raising and lowering the blind, means attachable to the header bar for guiding the cord, means associated with the guiding means for downwardly projecting the cord and responsive to actuations of the cord to cooperate with the guiding means to lock the cord for arresting movements of the blind; means moving the associated means in a direction opposite to the direction which a property of the cord is tending to move the associated means thereby rendering the property of the cord ineffective to cause inadvertent cooperativeness between the guiding and associated means.

2. In a cord locking device for a Venetian blind comprising a header bar, a cord extending through the header bar for raising and lowering the blind, means attachable to the header bar for guiding the cord, means associated with the guiding means for downwardly projecting the cord and responsive to actuations of the cord to cooperate with the guiding means to lock the cord for arresting movements of the blind; means moving the associated means in a direction opposite to the direction of locking for retarding the responsiveness of the associated means to a property of the cord tending to move the associated means in a direction of locking to cause inadvertent cooperation between the guiding means and the associated means.

3. In a cord locking device for a Venetian blind comprising a header bar, a cord extending through the header bar for raising and lowering the blind, means attachable to the header bar for guiding the cord, means rotatably mounted on the guiding means for downwardly projecting the cord and responsive to actuations of the cord to move toward and away from the guiding means for locking and releasing the cord, respectively; means operatively associated with the rotatable means for causing movement thereof away from the guiding means to compensate for a property of the cord tending to move the rotatable means toward the guiding means to cause inadvertent locking of the cord.

4. In a cord locking device for a Venetian blind comprising a header bar, a bracket attachable to the header bar, a U-shaped member mounted on the bracket, a sheave journaled in an upper

portion of the U-shaped member, a cord trained over the sheave for raising and lowering the blind, a yoke rotatably mounted in a lower portion of the U-shaped member and including a toothed portion disposed substantially opposite the sheave, the yoke being responsive to actuations of the cord to wedge the cord between the toothed portion and the sheave for locking the Venetian blind in desired positions; means for actuating the yoke and thereby the toothed portion away from the sheave to prevent inadvertent wedging of the cord in response to certain actuations thereof.

5. In the cord locking device for a Venetian blind according to claim 4 in which the actuating means comprises a torsion spring operatively associated with the yoke.

6. A locking device for a Venetian blind comprising a cord for actuating the blind, means for guiding the cord, means associated with the guiding means for downwardly projecting the cord and responsive to actuations of the cord for wedging the cord therebetween, and means actuating the associated means away from the guiding means while at the same time a property of the cord is tending to move the associated means toward the guiding means to prevent inadvertent wedging of the cord.

7. In a Venetian blind cord lock comprising a header bar, a cord extending through the header bar for raising and lowering the blind, means for locking the cord comprising an angle member fastened to an undersurface of the header bar at one end thereof, a U-shaped member fastened to the angle member at an uppermost portion thereof and disposed at an angle relative to the header bar, a sheave mounted in an upper forward portion of the U-shaped member for guiding the cord, and a yoke pivotally secured to a lower rearward portion of the U-shaped member comprising an upper portion formed for accommodation on a peripheral portion of the sheave and provided with a plurality of transverse corrugations, and a lower portion for downwardly projecting the cord, the yoke being responsive to actuations of the cord to wedge the cord between a peripheral portion of the sheave and the transverse corrugations to lock the Venetian blind in desired positions; means for moving the yoke in a direction opposite to the direction which a property of the cord is tending to produce movement thereof to prevent the property of the cord from inadvertently causing a wedging thereof.

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