Feb. 27, 1940. S. R. BOND ET AL 2,192,002

VENETIAN BLIND CORD-CONTROLLING ORGANIZATION

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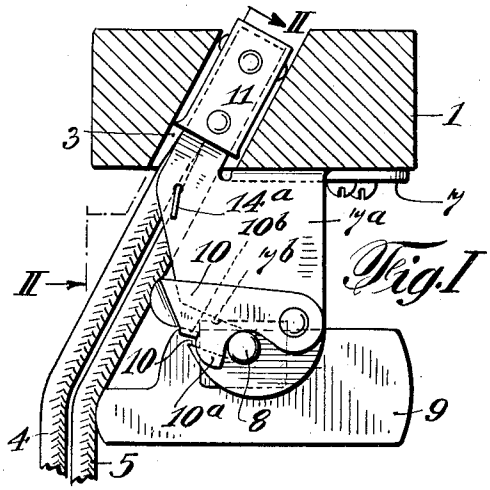


Fig. I

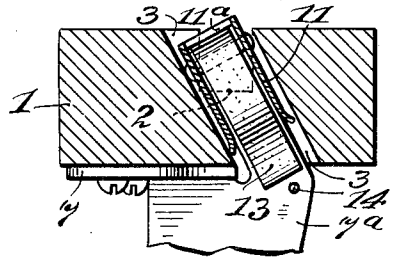


Fig. III

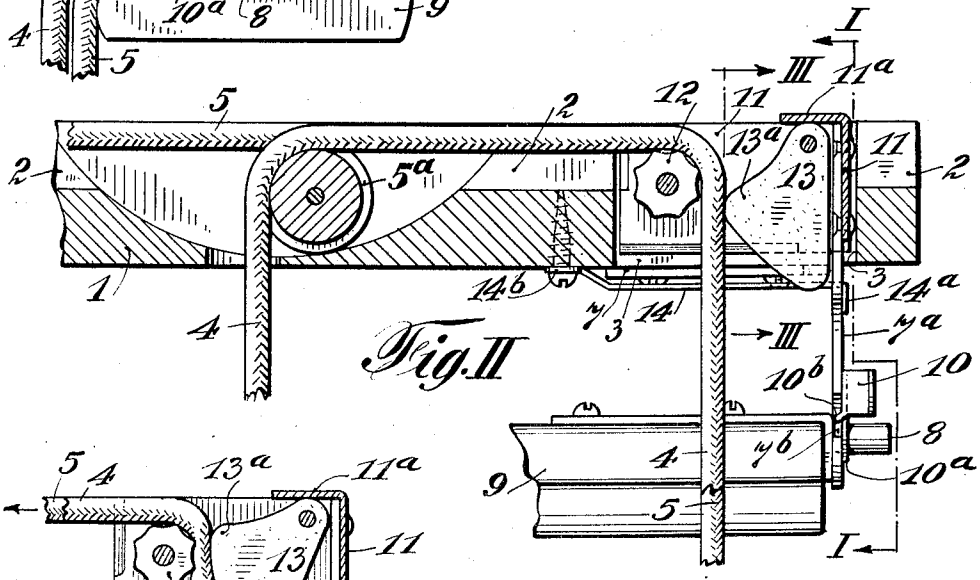


Fig. II

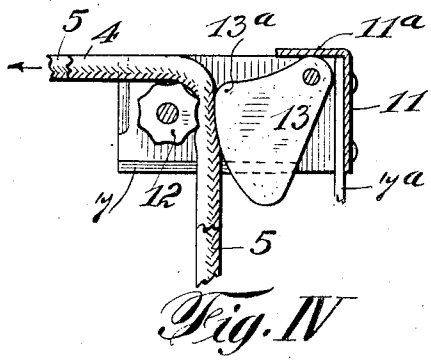


Fig. IV

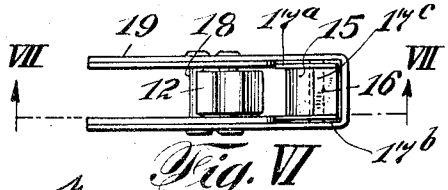


Fig. VI

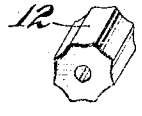


Fig. V

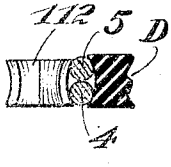


Fig. VIII

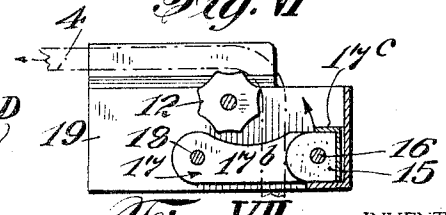


Fig. VII

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VENETIAN BLIND CORD-CONTROLLING ORGANIZATION

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2 Claims. (Cl. 156—17)

This invention relates to Venetian blinds, and particularly to an organization for controlling the cords used for raising and lowering the blind.

Various locks have heretofore been proposed for locking the raising and lowering cords of a Venetian blind, and some of such locks operate quite well. However, it is desirable to increase the ease and convenience with which the cords may be manipulated, increase the positiveness of the lock, and diminish the care which is required in handling the cords during locking or unlocking.

An object of the present invention is to provide a Venetian blind cord-controlling organization which facilitates manipulation of the lift cords in raising and lowering the blind.

Another object of the invention is to provide a cord lock which may be easily and conveniently operated, and is positive in holding.

A further object of the invention is to provide a cord lock which readily and firmly holds the cords without chewing or damaging the cords.

Various specific and detailed objects of the invention will be apparent to those skilled in the art from the following disclosure of two illustrative embodiments of the invention.

Fig. I of the drawing is a vertical cross section through the suspension bar of a Venetian blind embodying the present invention. The section is taken approximately on the line I—I of Fig. II.

Fig. II is a longitudinal section through the suspension bar, taken in general on the line II—II of Fig. I.

Fig. III is a cross section in a vertical plane, taken approximately on the line III—III of the Fig. II. This view shows the locking dog in cord-release position.

Fig. IV is a detail sectional view showing the cord lock as in Fig. II, but with the dog in cord locking position.

Fig. V is an isometric view of the corrugated pulley shown in Figs. II, IV, VI and VII.

Fig. VI is a plan view of a cord lock casing having a modified locking structure incorporated therein.

Fig. VII is a longitudinal section through the modified cord lock, taken in general on the line VII—VII of Fig. VI.

Fig. VIII is a detail view, partially in section, showing a modified pulley.

A suspension bar 1 is provided on its top surface with a longitudinal channel 2; and adjacent to the right hand end of the bar there is an inclined passage 3, which leads from the channel 2 to the bottom of the bar. It will be understood that as usual the suspension bar 1 is mounted on brackets at the top of a window frame, and that the conventional assembly of tilting slats is suspended from the suspension bar 1. Operating cords 4 and 5 for raising the blind pass upwardly through holes in the suspension bar to the channel 2, over pulleys such as pulley 5a, and thence longitudinally in channel 2 to the right hand end of the bar where they pass downwardly through cord-controlling mechanism.

A stamped sheet metal bracket 7 is screwed or otherwise secured to the under-surfaces of the suspension bar 1, adjacent to inclined passage 3. This bracket has a depending leg 7a which is slotted at 7b to receive the pintle 8 which is attached to one end of the tilt slat 9. It will be understood, of course, that the tilt slat 9 is the uppermost slat in the conventional assembly of tilting slats, and that the other slats of the blind are supported from and articulated with the tilt slat 9. Pivoted to the bracket leg 7a is a retainer lever 10 which detachably secures the pintle 8 in slot 7b. Retainer lever 10 has a nose 10a which, in the position shown in the drawing, projects across slot 7b and holds the pintle 8 in place; and the retainer also has a finger 10b which is adapted to engage the upper edge of slot 7b to prevent accidental movement of the retainer 10 to a position permitting removal of the pintle 8. However, when it is desired to remove the pintle, retainer lever 10 can be flexed to the right sufficiently to permit finger 10b to move alongside of bracket leg 7a so that the pintle may be removed from the slot.

Positioned in inclined passage 3 is a frame formed as an inclined hollow cord lock casing 11, which is conveniently made of sheet metal and attached to the bracket 7. If desired the hollow casing 11 may be stamped integral with the bracket 7. At one side of the hollow casing 11 a corrugated pulley 12 is rotatably mounted on an axis extending transversely of the casing. At the other side of the casing there is a pivotally mounted rubber locking dog 13 having a nose portion 13a which faces the pulley 12. The casing 11 includes a rigid flange 11a which extends over the locking dog 13, and which will be referred to later.

The two lift cords 4 and 5 pass side-by-side over the pulley 12 and downwardly between the pulley and the locking dog 13. As will be seen from the Fig. I the inclination of the casing 11 is such that the line of the axis of the casing

passes in front of the tilt slat 9. Thus, the lift cords extend in a straight line from the casing 11 to a point in front of the tilt slat 9; so that the cords are readily manipulated without any catching of the cords on the end of the tilt slat. Suitable means may be used to keep the cords in parallelism and prevent twisting of the cords in or near the casing 11. The means shown is a spring wire 14 which passes between cords 4 and 5, and which has a bent end 14a that is hooked through a hole in bracket leg 7a. The other end of the wire has a looped end 14b which is screwed to the suspension bar 1.

When it is desired to change the elevation of the blind, the operator inclines the lift cords slightly toward the pulley 12 and pulls the cords (or pays them out) until the blind is brought to the desired elevation. Then the cords 4 and 5 are inclined slightly toward the locking dog 13, whereupon the cords engage nose 13a and slight upward movement of the cords elevates the locking dog to the locking position shown in Fig. IV. The pulley 12 constitutes an abutment against which the cords are locked, and the dog 13 distorts and wedges the cords tightly against the pulley. As the pulley rotates with the dog moving to locked position, the apices of the pulley corrugations act as high-spots, so that the dog is free to advance an additional increment as a high-spot passes. The next corrugation or high-spot greatly increases the clamping pressure and prevents any slipping of the cords. To release the lock cords it is only necessary to pull downwardly on the cords 4 and 5 which depend from the cord lock.

While we prefer to use a corrugated pulley as shown at 12, we have found that satisfactory results can also be obtained with a plain pulley or roller, i. e. one having a smooth cord engaging face. To obtain the greatest increase of clamping pressure with a corrugated roller, the corrugations should be relatively coarse as shown; and the apices of the corrugations may be spaced apart by a distance approximately equal to the diameter of the cord. Since the dog 13 distorts and yields as it wedges the cords, firm clamping of both cords is assured despite small variations in the size of the two cords 4 and 5.

Under some conditions dog 13 in locking the cords will move to a position higher than that shown in Fig. IV. This may be brought about in several ways, e. g. the cords 4 and 5 may be under-size, the load on the cords may be very heavy, or the dog may be made of very soft rubber to improve the sensitiveness and holding of the lock. In such case the dog moves against flange 11a in the final phases of its distortion, the flanges supporting the dog and preventing it from being crowded above the pulley 11. Of course, the dog is also supported laterally by the sides of the casing 11, which are close against the dog, but do not bind it.

In the modification shown in Fig. VI and VII a small rubber dog 15 is held by a pin 16 in a U-shaped swinging frame 17. This frame has side arms 17a and 17b and is pivoted at 18 to a frame formed as a hollow casing 19, which corresponds to casing 11 in the first form of the invention. The cords pass between pulley 12 and the dog 15 and the operation is similar to the first form of the invention. Preferably, the frame is provided with a projection 17c which supports the rubber dog during distortion, similarly to the support furnished by project 11a in the first form of the invention. The sides of the dog are of course, supported by the two sides 17a and 17b of the swinging frame. It will be understood that in use the casing 19 is preferably attached to a bracket 7 in the same manner as the casing 11 in the first form of the invention. If desired the casing 19 may be stamped integrally with a bracket such as bracket 7.

In Fig. VIII there is shown a modified pulley 112, which differs from pulley 12 only in that its surface is grooved in axial section, instead of being straight in axial section. This circumferential grooving of the pulley causes it to crowd the cords 4 and 5 together when they are clamped. Additionally, the rubber locking dog has a grooved cord-clamping face, as the dog D in Fig. VIII. In such case the dog also tends to crowd the two cords together. In Figs. I to VII the locking dogs are shown with cord-clamping faces which are rectilinear in section perpendicular to the cords, but it will be understood that the dogs of Figs. I to VII may also be made with cord-clamping faces grooved like dog D in Fig. VIII. It will also be understood that either a plain faced dog or a grooved faced dog may be used with any of the types of pulleys, viz. pulley 12, pulley 112, or a non-corrugated pulley having either a plain or a grooved face.

In compliance with the patent statutes we have disclosed the best forms in which we have contemplated applying our invention, but it will be understood that the forms disclosed are illustrative of the invention, and that the scope of the invention is defined by the claims which follow herein.

We claim:

1. A cord lock comprising: a pulley over which a pair of cords pass in side-by-side relation; the cord-engaging surface of the pulley having coarse transverse corrugations; and a pivotally movable rubber locking dog movable by cord contact to wedge the pair of cords against said pulley and into the space between the apices of successive corrugations, the cord-contacting face of the dog being concave to urge the cords toward one another as the dog moves into cord-locking position.

2. A cord lock comprising: a pulley over which a pair of cords pass in side-by-side relation, the cord-engaging surface of the pulley being concave and being provided with transverse corrugations; and a pivotally movable rubber locking dog movable by cord contact to wedge the pair of cords against said pulley and into the space between the apices of successive corrugations, the cord-contacting surface of the dog being also concave.

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