June 11, 1946. M. J. NARDULLI 2,401,770

VENETIAN BLIND

Filed Nov. 15, 1943

Fig. 1

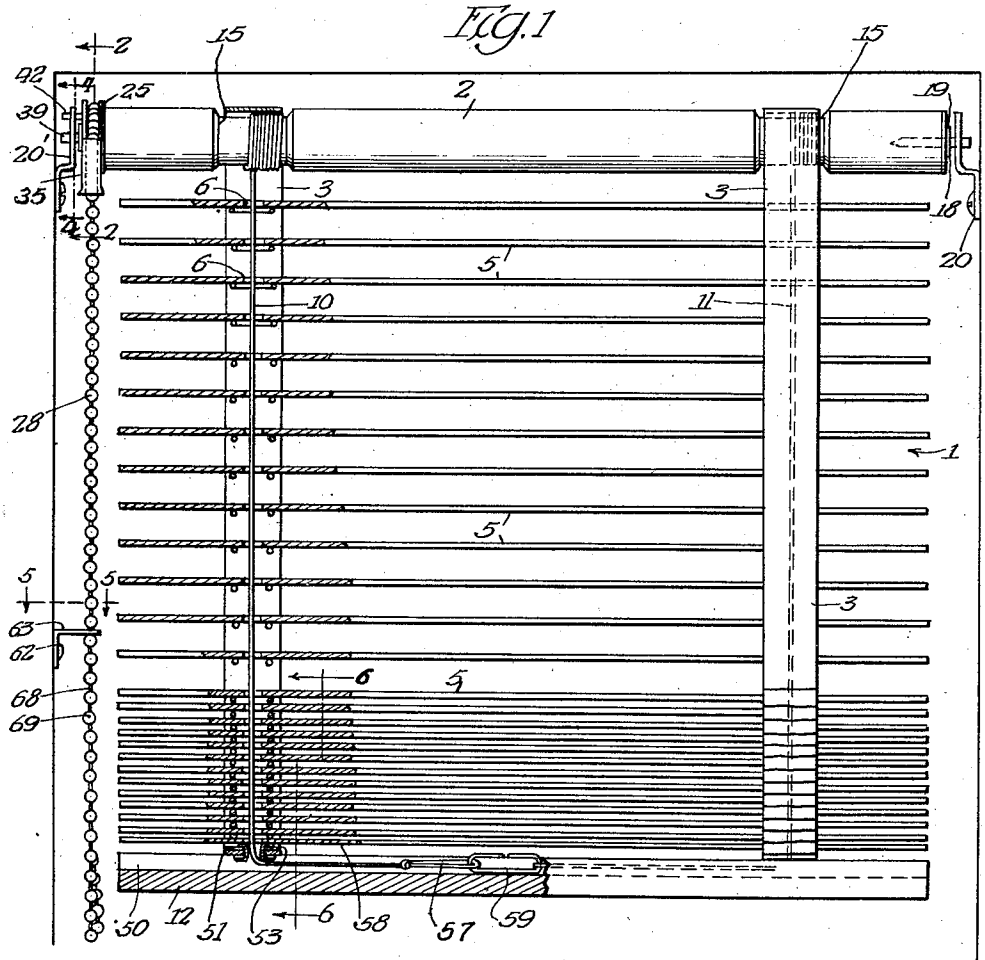


Fig. 2

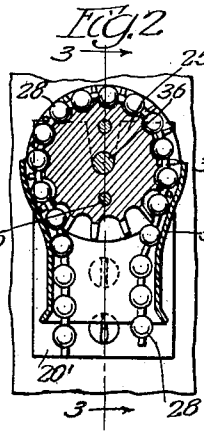


Fig. 3

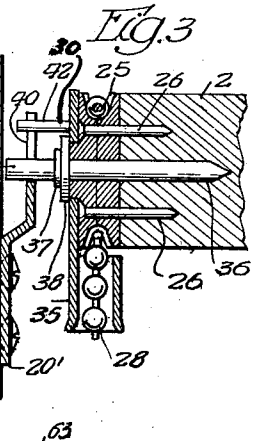


Fig. 4

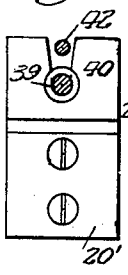


Fig. 6

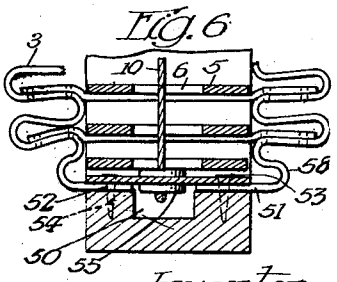
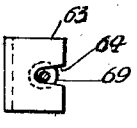


Fig. 5



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Patented June 11, 1946

2,401,770

UNITED STATES PATENT OFFICE

2,401,770

VENETIAN BLIND

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Application November 15, 1943, Serial No. 510,411

13 Claims. (Cl. 160—168)

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This invention relates to Venetian blinds.

Venetian blinds generally consist of an upper supporting member from which a number of ladder tapes depend, said ladder tapes supporting the usual flexible wood or metal slats or louvers. At the bottom of the blind there is mounted a bottom rail which is supported by two or more elevating cords that extend vertically through openings in the respective slats and are generally concealed by the ladder tapes. The arrangement is such that upward pulling upon the cords raises the toe rail and successively raises the slats from the bottommost slat upwardly. In a conventional Venetian blind it is difficult to remove the individual slats, as for the purpose of cleaning the same. It is one of the objects of the present invention to provide a Venetian blind constructed to facilitate removal of the slats for cleaning and the like purposes, and replacement thereof. This is accomplished, in the preferred embodiment of the present invention, by arranging the elevating cords so that their lower ends are releasably secured together to constitute both cords one loop which may be readily severed to withdraw the cords through the slats.

It is a further object of the present invention to provide an improved means for securing the ladder tapes to the bottom or toe rail in such a manner as to facilitate removal of the tapes from the toe rail, as may be necessary for cleaning the ladder tapes.

It is a still further object of the present invention to provide a Venetian blind of the type wherein the vertical position of the blind and the angular position of the slats may be controlled from a single cord, or pair of cords, without requiring the use of a separate gear type tilter mechanism.

It is a still further object of the present invention to provide a blind of the above mentioned character, that is, one wherein the raising and the tilting are controlled by a single cord or loop and in which the blind may be raised or lowered readily. This is accomplished by making the head member of the Venetian blind in the form of a cylindrical roller to which the ends of the elevating cords are attached and upon which the ladder tapes rest by frictional engagement. This roller has at one end thereof a sprocket type pulley wheel rigidly secured thereto. The roller with its pulley wheel are provided with aligned mounting pins at opposite ends thereof for mounting the blind so that the Venetian blind may be mounted in much the same manner as an ordinary window shade roller is mounted.

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The attainment of the above and further objects of the present invention will be apparent from the following specification taken in conjunction with the accompanying drawing forming a part thereof.

In the drawing:

Figure 1 is a front view, in partial section, of a Venetian blind constructed in accordance with the principles of the present invention;

Figure 2 is a fragmentary sectional view of the lifting mechanism, taken along the line 2—2 of Figure 1;

Figure 3 is a sectional view taken along the line 3—3 of Figure 2;

Figure 4 is a fragmentary sectional view taken along the line 4—4 of Figure 1;

Figure 5 is a fragmentary sectional view taken along the line 5—5 of Figure 1; and

Figure 6 is a fragmentary sectional view taken along the line 6—6 of Figure 1.

Reference may now be had more particularly to Figure 1. The Venetian blind, indicated in general by the reference numeral 1, comprises a head member 2 in the form of a solid wooden cylindrical roller, similar to an ordinary window shade roller, except that the usual window shade spring is omitted, and certain other changes hereinafter more fully set forth are incorporated therein. The blind includes two ladder tapes, indicated at 3—3, of a conventional construction, which ladder tapes rest upon and are supported by the head member 2 but are not secured to the head member. They may be supported from the head member in any desired manner as shown, for instance, by way of example, in my United States Patent No. 2,209,234, issued July 23, 1940, or in United States Patent No. 2,175,549, issued October 10, 1939.

A number of slats or louvers 5 are supported from the ladder tapes in a manner usual in Venetian blinds. The slats 5 may be made of wood, metal or plastic and are generally flexible. Each slat has an opening 6 therein at each end. The openings of the superposed slats are in alignment. An elevating cord 10 extends through the openings at one end of the blind, and a similar elevating cord 11 extends through the openings at the opposite end of the blind. The cords 10—11 support a toe rail 12 in a manner to be presently more fully set forth. The head member 2 has two peripheral grooves 15—15 formed therein forming reduced portions at the places where the tapes 3—3 hang from the roller. These grooves are of a width only very slightly greater than the width of the tape and are preferably roughened

and slightly conical or dish shaped. The upper end of each elevating cord 10 is fastened to the head member. This may be accomplished in any desired manner. For instance, the end of the cord may be threaded through a very small hole formed in the grooves 15 of the roller, and then knotted to prevent its retraction from the hole. The ladder tapes rest on the roughened tapered reduced portions 15 of the head member. Thus upon turning of the head member the elevating cords are wound thereon or unwound therefrom but the tapes are not wound on the roller. The roller merely slides with respect to the tapes. The frictional engagement of each tape with the roller during rotation of the roller causes one end of the tape to be pulled more than the other end is pulled, depending on the direction of rotation of the roller, and thus causes tilting of the slats in the same manner as in my Patent No. 2,209,234, to which reference may be had.

One end of the roller 2 has a pin 18 secured therein and extending axially thereof. The pin 18 is of the type usually employed at the end of a window shade roller and consists merely of a headless nail of copper or the like having a washer or collar 19 secured thereto for limiting the extent to which it may be driven into the end of the roller. The pin 18 extends into a slotted bracket 20 that is nailed to the sash of the window adjacent the top thereof. The bracket has a vertical slot therein for receiving and supporting the pin while permitting free rotation thereof.

At its opposite end the roller 2 has a metal pulley or sprocket wheel 25 secured thereto in any desired manner as, for instance, by means of two nails 26—26 that extend through holes in the sprocket wheel and into the roller 2. The sprocket wheel is mounted with its center coincident with the longitudinal axis of the roller head member 2 and comprises a grooved pulley having notches in the sides thereof spaced apart to enter between consecutive beads of a beaded chain 28, so that the chain is in mesh with the sprocket and a pull upon the chain in one direction or the other will cause a corresponding rotation of the sprocket and of the roller head member 2 to which the sprocket is secured. The sprocket has a short centrally located circular hub or boss 30 projecting therefrom. A guard member 35 has a central opening therein that fits over the hub so that the guard member is supported by the hub of the sprocket but the sprocket may turn with respect to the guard member. A nail or pin 36 with an integral flange 37 extends through a washer 38 and through the hub 30 and the sprocket wheel 25 and is nailed into the roller 2 at the longitudinal axis of the roller 2 and in alignment with the nail or pin 18. The pin 36 has a circular stud 39 projecting therefrom for mounting the blind in a bracket 20' identical with the bracket 20 and nailed or secured to the window sash frame. The bracket 20' has a vertically extending open top slot 40 for receiving the pin or stud 39 which forms a trunnion for mounting the blind. The guard 35 has, optionally, a pin 42 which projects therefrom and extends into the same slot 40 and thus holds the guard against rotation when the sprocket wheel is turned.

As previously stated, the toe rail 12 is supported by the elevating cords 10—11. For this purpose the toe rail, which is a comparatively rigid member, has a longitudinally extending groove 50 in the top surface thereof. The lower ends 51—52 of the ladder tape rest upon the top surface of the toe rail and are held in place by a small rectangular or square plate 53 that overlies the ends 51—52 of the ladder tape and is nailed to the toe rail by nails 54 that pierce and extend through the bottom of the ladder tape. Each one of the rectangular plates 53 has a central perforation therethrough which may be smoothed by a short eyelet 55. The two cords 10—11 extend through the eyelets in the corresponding plates 53 and lie in the channel groove 50 where they are releasably secured together in any desired manner. In Figure 1 I have shown one manner of securing them together. This consists in forming loops 57 at the meeting ends of the elevating cords and securing the loops together by a short clip 59 which, if desired, may readily be disengaged from the loops. Any other means for releasably securing the end of the cords 10—11 may be used. When the end of the elevating cord is disengaged from the clip 59 the elevating cord may be pulled through the slats so that when both such cords are pulled out of a slat the slat may be removed from the rest of the blind by shifting the slat longitudinally of the blind.

The groove 50 in the top of the toe rail may be concealed by means of a slat 58 which is similar to the slats 5 and which is located between the top of the bottom rail and the lowermost rung of the ladder tape, as illustrated in Figure 6. This slat 58 has a hole 6 therein, the same as the slats 5. This slat 58 may rest freely upon the plates 53—53 or, if desired, it may be nailed in place by the same nails 54 that secure the plates 53 in place. If the bottom slat 58 is nailed in place, then it is possible to omit the plates 53 entirely, since the nails 54, by passing through the slat 58 and through the ends 51—52 of the ladder type, secure the slats and the ladder tape in place.

A short locking bracket 62 is provided for releasably holding the bead chain. This bracket consists of an angle member the vertical side of which is secured to the window sash and the horizontal flange 63 of which extends from the sash towards the Venetian blind. The horizontal flange of this bracket has a narrow slot 64 therein at the outer end thereof, which slit is of a width sufficient to receive the small wires 68 between adjacent balls or beads 69 of the bead chain, but is of a width appreciably less than the diameter of the beads. Thus if the bead chain is inserted into the slot 64 the bead chain 28 is held against vertical movement.

To raise or lower the blind it is merely necessary to shift one end of the endless loop of the bead chain 28 out of the slot 64 in the bracket 62. One or the other of the two sides of the looped bead chain 28 may then be lowered, as by exerting a pull thereon, thus also raising the opposite side of the looped bead chain 28 and turning the roller 2. This causes the roller 2 to wind or unwind the elevating cords 3 and raise or lower the toe rail 12 and the slats above it. When the desired elevation of the toe rail is reached it is then possible to procure the desired inclination of the slats by merely turning the sprocket wheel 25 in the opposite direction a small amount. Such small movement of the sprocket in the opposite direction causes the roller to turn a small amount with a corresponding relative vertical movement of the two sides of each ladder tape, thereby changing the inclination of the slats in the same manner that a corresponding movement of the ladder tape pro-

duces a corresponding tilting in the inclination of the slats of the Venetian blind of my said Patent No. 2,209,234, to which reference may be had. When the desired angle of inclination of the slats is attained one side of the beaded chain is again inserted into the slot **64** of the bracket **62** to hold the chain against further movement and hold the blind in the desired elevated position.

When it is desired to disassemble the blind, as for the purpose of cleaning the same, it is merely necessary to release the loops **57** from the clip **59**. This then permits withdrawal of the elevating cords from the toe rail and from the successive slats, thereby permitting removal of the slats. If it is desired to wash the ladder tapes they may readily be separated from the toe rail. This is accomplished by merely removing the plates **53** by withdrawing the nails **54**, and thus permitting separation of the toe rail from the ladder tapes. The upper ends of the ladder tapes may be removed from the roller **2** by merely sliding them lengthwise along the roller.

In compliance with the requirements of the patent statutes I have here shown and described a preferred embodiment of my invention. It is, however, to be understood that the invention is not limited to the previse construction here shown, the same being merely illustrative of the principles of the invention.

What I consider new and desire to secure by Letters Patent is:

1. A Venetian blind comprising ladder tapes, a plurality of slats supported by the tapes, a toe rail, means comprising separate plates on the toe rail associated with each tape for securing the lower ends of the ladder tapes to the upper surface of the toe rail, the lower ends of the ladder tapes terminating between the associated plate and the upper surface of the toe rail, and means passing through the plates and ladder tapes and into the toe rail for securing the tapes and the plates to the toe rail, and a Venetian blind slat between the toe rail and the lowermost rung of the ladder tapes.

2. A Venetian blind comprising ladder tapes, a plurality of slats supported by the tapes, a toe rail, means associated with each tape for securing the lower ends of the ladder tapes to the upper surface of the toe rail, the lower ends of the ladder tapes terminating between said means and the upper surface of the toe rail, said means including a Venetian blind slat overlying the toe rail, and nails passing through the last mentioned slat and ladder tapes and into the toe rail for securing the tapes to the toe rail, and a Venetian blind slat between the toe rail and the lowermost rung of the ladder tapes.

3. A Venetian blind comprising ladder tapes, a plurality of slats supported by the tapes, an elevating cord associated with each ladder tape, a toe rail, means comprising separate plates on the toe rail associated with each tape for securing the lower ends of the ladder tapes to the upper surface of the toe rail, the lower ends of the ladder tapes terminating between the associated plate and the upper surface of the toe rail, and means passing through the plates and ladder tapes and into the toe rail for securing the tapes and the plates to the toe rail, the upper surface of the toe rail having a central longitudinal groove therein, said plates having openings therethrough, the elevating cords constituting a loop passing freely through the openings in the plates and extending in said groove.

4. A Venetian blind comprising ladder tapes,

a plurality of slats supported by the tapes, an elevating cord associated with each ladder tape, a toe rail, means comprising separate plates on the toe rail associated with each tape for securing the lower ends of the ladder tapes to the upper surface of the toe rail, the lower ends of the ladder tapes terminating between the associated plate and the upper surface of the toe rail, means passing through the plates and the ladder tapes and into the toe rail for securing the tapes and the plates to the toe rail, the upper surface of the toe rail having a central longitudinal groove therein, said plates having openings therethrough, the elevating cords constituting a loop passing freely through the openings in the plates and extending in said groove, and a covering for the longitudinal groove.

5. A Venetian blind comprising ladder tapes, a plurality of slats supported by the tapes, an elevating cord associated with each ladder tape, a toe rail, means comprising separate plates on the toe rail associated with each tape for securing the lower ends of the ladder tapes to the upper surface of the toe rail, the lower ends of the ladder tapes terminating between the associated plate and the upper surface of the toe rail, means passing through the plates and ladder tapes and into the toe rail for securing the tapes and the plates to the toe rail, the upper surface of the toe rail having a central longitudinal groove therein, said plates having openings therethrough, the elevating cords constituting a loop passing freely through the openings in the plates and extending in said groove, and a covering for the longitudinal groove, said covering comprising a slat similar to the first mentioned slats.

6. A Venetian blind comprising ladder tapes, a plurality of slats supported by the tapes, an elevating cord associated with each ladder tape, a toe rail, means associated with each tape for securing the lower ends of the ladder tapes to the upper surface of the toe rail, the lower ends of the ladder tapes terminating between said means and the upper surface of the rail, said means including a Venetian blind slat overlying the toe rail, and nails passing through the last mentioned slat and ladder tapes and into the toe rail for securing the tapes to the toe rail, the upper surface of the toe rail having a central longitudinal groove therein, said plates having openings therethrough, the elevating cords constituting a loop passing freely through the openings in the last mentioned slat and extending in said groove.

7. A Venetian blind comprising ladder tapes, a plurality of slats supported by the tapes, a pair of spaced elevating cords, a toe rail, perforate plates secured on the top of the toe rail, the upper surface of the toe rail having a central longitudinal groove therein extending from plate to plate, the elevating cords constituting a loop passing freely through openings in the plates and extending in said groove.

8. A Venetian blind comprising ladder tapes, a plurality of slats supported by the tapes, a pair of spaced elevating cords, a toe rail the upper surface of which has a central longitudinal groove therein, and means rigidly securing the lowermost blind slat to the top of the toe rail, the elevating cords constituting a loop passing freely through openings in the slat and extending in said groove.

9. A Venetian blind comprising ladder tapes, a plurality of slats supported thereby, a pair of spaced elevating cords extending through the

slats, a toe rail the upper surface of which has a central longitudinal groove therein, the lower ends of the cords being releasably secured together to constitute a loop, said loop lying in the groove, and means overlying the toe rail for holding the loop in the groove while permitting longitudinal movement of the loop in the groove.

10. A Venetian blind comprising ladder tapes, a plurality of slats supported thereby, a pair of spaced elevating cords extending through the slats, the lower ends of the cords being releasably secured together to form a loop whereby upon releasing the ends of the cords from one another the slats may be removed from the rest of the blind, a toe rail, and means for suspending the toe rail from the looped cords while permitting the looped cords to slide lengthwise of the toe rail.

11. A Venetian blind comprising in combination a plurality of slats, a supporting roller, ladder tapes supporting the slats, said tapes being supported by and looped over the roller and mechanically separate therefrom so that upon turning of the roller it can slip with respect to the tapes, elevating cords secured to the roller so that upon continuous rotation of the roller the cords are wound about the roller to change the elevation of the bottom of the blind, aligned mounting pins at opposite ends of the roller, brackets having slots therein for receiving the pins and supporting them to support the roller, and means supported by the roller for rotating the roller.

12. A Venetian blind comprising in combination a plurality of slats, a supporting roller, ladder tapes supporting the slats, said tapes being supported by and looped over the roller and mechanically separate therefrom so that upon turning of the roller it can slip with respect to the tapes, elevating cords secured to the roller so that upon continuous rotation of the roller the cords are wound about the roller to change the elevation of the bottom of the blind, aligned mounting pins at opposite ends of the roller, brackets having slots therein for receiving the pins and supporting them to support the roller, and means supported by the roller for rotating the roller, said last means comprising an operating wheel and a cord looped around the wheel and in driving relationship thereto.

13. A Venetian blind comprising in combination a plurality of slats, ladder tapes associated therewith to support the same, a supporting roller over which the tapes are looped in frictional relation to the roller to tilt the slats upon rocking of the roller, said roller being continuously rotatable through more than 360° in frictional sliding relation to the tapes, said roller having elevating cords secured thereto which are wound about the roller to change the elevation of the bottom of the blind, aligned trunnions at opposite ends of the roller, brackets having slots therein for receiving the trunnions and rotatably supporting both of them to support the roller, and means for rotating the roller and its associated trunnions in the bearings.

MICHAEL J. NARDULLI.