CORD DRUM AND TRAVERSE FOR VENETIAN BLINDS

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Cord Drum and Traverse for Venetian Blinds

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This invention relates to reduction drives, and more particularly to a drive useful for a Venetian blind for effecting the tilting of the slats of the blind. Although the invention about to be described is described in conjunction with use on Venetian blinds, it will be appreciated that its usefulness is not limited thereto. This application is a division of my copending application, Ser. No. 753,216, filed June 7, 1947, now Patent No. 2,641,145 of June 9, 1953.

Hereinafore, it has been most common to provide a Venetian blind which included a head rail for securing the same to the window casing. Below the headrail and supported in suitable bearings therefrom was a tilt rail including cord and ladder tapes. The ladder tapes in turn supported the slats. In order to close a blind of this character, the tilt rail is tilted which causes the ladder tapes to be raised on one side and lowered on the other, tilting the slats. Many different means have been proposed for tilting the head rail including cords snubbed around the tilt rail and gear drives operated by a cord and connected to the tilt rail.

Inasmuch as separate head and tilt rails take up considerable space, it is desirable to combine them into one unit. One means contemplated is the use of a hollow head rail with the tilting mechanism disposed inside. This type of mechanism makes the utilization of a proper tilting mechanism somewhat complicated, difficult and expensive.

By my present invention, I have provided a drive for a tilt mechanism which is simple and economical to manufacture, easy to install and free from service difficulties after installation.

Another disadvantage of the prior mechanism resided in the ability to maintain proper alignment of the cords for effecting the tilting. These cords had a tendency, to run-up on one another and otherwise become tangled and immobilize the operating mechanism. By my present invention I provide an improved cord guide wherein there is no possibility of the cord being displaced or tangled.

Still other advantages of the invention, and the invention itself, will become more apparent from the following description of some embodiments thereof, which description is illustrated by the accompanying drawings and forms a part of the specification.

In the drawings:
Fig. 1 is an elevational view of the mechanism, the front wall of the housing being broken away;
Fig. 2 is a view of the control mechanism removed from the housing;
Fig. 3 is a view taken from a plane indicated by the line 3—3 of Fig. 2;
Figs. 4 and 5 are side and edge elevational views of the cord guide removed from the drum;
Fig. 6 is an elevational view of a cord drum used in my invention, with the cord removed;
Fig. 7 is a section taken on the line 7—7 of Fig. 6; and
Fig. 8 is a view showing the cord secured in place, the cord guide being shown in section.

Referring to the drawings, throughout which parts, are designated by like reference characters, and more particularly to Fig. 1, there is illustrated one end of a head rail for a Venetian blind illustrating its manner of attachment to a window casing.

As illustrated, the head rail includes a U-shaped channel member which includes side walls 11 and a bottom 12. The channel member is of a length sufficient to extend between the side walls of a window casing and is adapted to be disposed adjacent the top of the window casing. As shown best in Fig. 1, the rail is adapted to be removably supported in suitable brackets 14 which are secured to the window casing 13 by screws 15. These brackets may also be channel shaped, in order that the rail may be slid in and out quickly and easily. When the rail is in the desired position, it is held in place by screws 16 which extend through slots in the brackets and are threaded into the bottom wall 12 of the rail.

As is well known to those versed in the art, the blind proper includes two or more ladder tapes which support slats. The blind may be opened and lowered in any well-known manner as by cords 20 which extend upward through a cord lock 21 into the rail and are trained over the sheaves 22 provided by brackets disposed on the bottom of the head rail. The cords then extend downward between the side strips of each ladder tape and are secured to a bottom rail, not shown. All of the foregoing, as well as the mode of operation, is well known to those versed in the art and is more clearly shown in my copending application. Suffice to say, when the cords are pulled, being attached to the bottom rail, the slats are raised. They are held in the raised position by the cord lock 21 which can be of any conventional form or such as is shown in my Patent No. 2,304,934 of December 15, 1942.

As previously stated, the closing of the blind is effected by lowering one side of the ladder tape and simultaneously raising the other side. This has previously been effected by the use of a tilt rail to which the upper ends of the tape were secured, the tilt rail being disposed below the head rail. In this instance, the ends of the tape extend upward through openings in the bottom wall of the head rail and are secured to a tilt member which is tilted by the rod 29.

The tilt member is mounted on the hexagonal rod 29 which extends lengthwise of the head rail, one end being journaled in a bearing not shown, and the other end supported by the tilting mechanism as shown in Fig. 1. The operation of the tilt member is effected by pulling a cord, which is trained around a pulley or drum and which drum operates through a gear reduction to rotate the rod.

The drum for receiving the cord is illustrated in Figs. 6 to 8 inclusive and its manner of utilization illustrated in Figs. 1 and 2. As can best be seen in Fig. 6, it includes a pair of circular end members 30 and 31 which support therebetween a cylindrical drum 32, the drum being of smaller diameter than the end plates which extend outward from the drum to provide flanges at the ends.

A shaft 33 is provided, for the drum at the axis thereof, one end adapted to be rotatably journaled in and supported by an angle bracket 36, Fig. 1, the inner end the arm 36 of which carries the bearing 37. The other end of the shaft is journaled in the rod 29 which, in turn, is carried by a gear reduction drive mechanism journaled in the bracket 38.

The body of the drum is provided with a longitudinally extending slot 40, the ends of which extend a short distance circumferentially forming notches 41 extending in opposite directions at opposite ends of the drum. An
outwardly curved tongue 42 is provided opposite each notch and extends toward and above the notch. A shallow notch 43 is provided adjacent the base of each tongue.

The tilt cord 44 is secured to the drum as shown in Fig. 8 by forcing a portion of the cord, preferably a section in the middle of the cord, into the slot 41 under the tongue; it then extends lengthwise of the drum inside and below the slot 40 coming out through the slot 41 on the other end. The notch 43 assists in permitting insertion of the cord, which operation would otherwise be interfered with by the opposite guide, as well as adding resiliency to the tongue. The ends of the cord, therefore, extend from the slot in opposite directions. These ends are then wound around the drum in opposite directions to fill the space between the flanges 30—31. In the drawings, Figs. 1 and 2 show the cords as having some space between the convolutions. This space ordinarily is not present since the cord convolutions are normally juxtaposed to each other.

In operation, the drum being rotatably supported, when one cord is pulled, the end pulled is unwound from the drum causing it to turn, and the other end at the same time is wound up on the drum.

Guide means is provided to prevent tangling of the cords, to guide them in their winding and unwinding movement, and to prevent them from winding up on top of each other. As best shown in Figs. 4 and 5, it comprises a thin ring-like body 45 having an opening of slightly larger diameter than the drum. The lower end of the ring is provided with cord guiding members which are formed integral with the ring by bending tongues 48 from the blank over on opposite sides to form closed substantially tubular channels 49 which open at the outer end of said cord.

The guide is placed on the drum during assembly, the two ends of the cord wrapped around the drum until they abut the guide, after which they are threaded through the channels on opposite sides of the guide. The bottom ends of the channels are flared outwardly at 49 to provide a smooth guiding entrance and exit for the cords and prevent wear and fraying thereof.

The notch 43 enables the cord to be inserted when the ring 46 is in place. One manner in which this may be effected is that the end of the cord is inserted in the slot 41, the ring 46 moved over beyond the notch 43 and the cord then brought up the other side of the ring through the notch 43. The proper desired length of cord being used, the cord is then slid in the slot and notch to approximately the middle of the cord, and then it is forced down below the slot 49 and brought up through the opposite end slot 41. The cord is then wound up on opposite sides of the guide until the drum is filled with the convolutions, after which the ends of the cord are threaded through the guides 49. Thereafter, when one of the cords is pulled, the guide separates the winding and unwinding sections sliding longitudinally of the drum as the windings increase on one side and decrease on the other. In this manner, the cord parts, as they leave and/or wind on the drum, are guided by the guide in an extremely smooth and regular manner. The drum is thus rotated in a direction depending upon which cord is pulled.

As previously stated, a bearing bracket supports one end of the drum. The other end of the drum, as can best be seen in Fig. 3 is provided with an eccentrically disposed bearing journal 52, adapted to receive and support therein a drive gear of the reduction arm, all of which is clearly shown in my patent application.

It will thus be seen that I have provided a cord rotated mechanism for driving the gear drive which is simple in operation, economical to produce and wherein the cord may be changed by persons of little mechanical ability. By this invention, the drum may be rotated smoothly for several revolutions and there is no danger of it becoming tangled, and it is not pulled off when the limit of rotation is reached in either direction.

Having thus described my invention, I am aware that numerous and extensive departures may be made therefrom without departing from the scope or spirit of the invention as defined in the appended claims.

I claim:

1. A cord rotated drum comprising a barrel, end flanges for the barrel, a cord secured to the barrel extending into the barrel adjacent one flange and longitudinally of the barrel below the surface thereof and out of the barrel adjacent the other flange, the ends of said cord being wound around the barrel in opposite directions, a guide for separating the convolutions of one end of the cord from those on the other end comprising a ring slidably disposed on the barrel, guide means supported by said ring and formed to receive said cord therethrough, said guide means opening on opposite sides of said ring to receive the cord as it comes off of or onto the barrel.

2. A cord rotated drum comprising a barrel, end flanges for said barrel, cord means secured in said barrel and having ends extending from said flanges and wrapped around said barrel in opposite directions toward each other, a guide comprising a ring portion disposed around said barrel between abutting convolutions of said oppositely wound cord ends, guide means for said cord ends carried by said ring and said cord ends being trained through said guide means, said cords adapted to impart a rotational movement to the barrel when one of them is pulled to unwrap one cord from the barrel and wrap the other cord on the barrel and said guide means being slidable longitudinally of the barrel between the wrapping and unwrapping convolutions and to separate the one set of convolutions from the other.

3. A cord rotated drum including a barrel, end flanges for said barrel, said barrel being formed with a slot extending longitudinally thereof and terminating in portions extending circumferentially in opposite directions, tongues on said barrel extending in opposite directions over said slots and notches formed in said slots adjacent said tongues, a cord having its mid portion disposed in the barrel below said slot and extending out of the barrel through said end portions of said slot, said tongues directing the cord ends in opposite directions, said cord ends being wrapped around said barrel in opposite directions toward each other, guide means including a ring disposed on said barrel between the abutting convolutions of said cord ends, said cord ends being carried by said ring and including separate channels for each cord end opening on opposite sides of said ring, said cords being trained through said channels and when pulled adapted to unwrap and unwind from said barrel said cord guide separating and preventing interference between the wrapping and unwrapping convolutions.

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