Jan. 15, 1952 B. WALKER 2,582,301

VENETAIN BLIND

Filed Nov. 10, 1948 2 SHEETS—SHEET 1

Fig. 1.

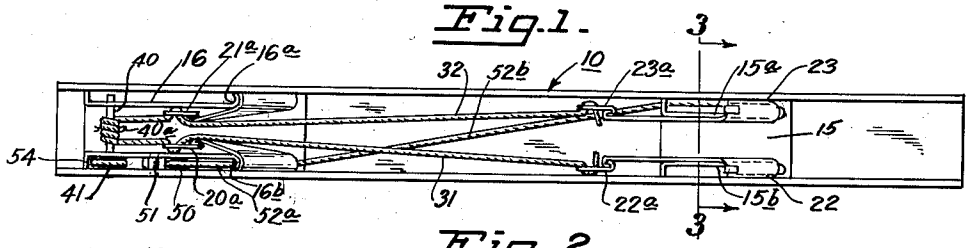


Fig. 2.

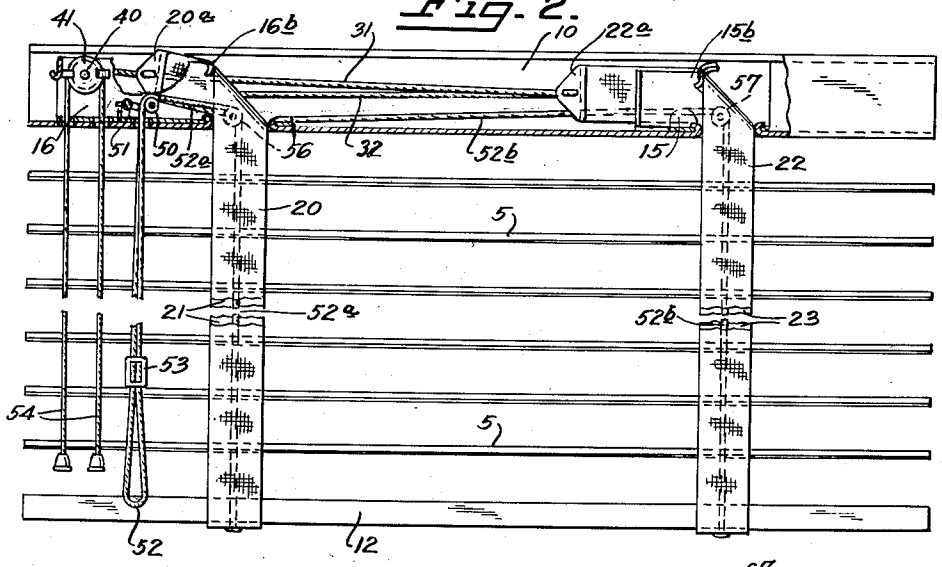


Fig. 4

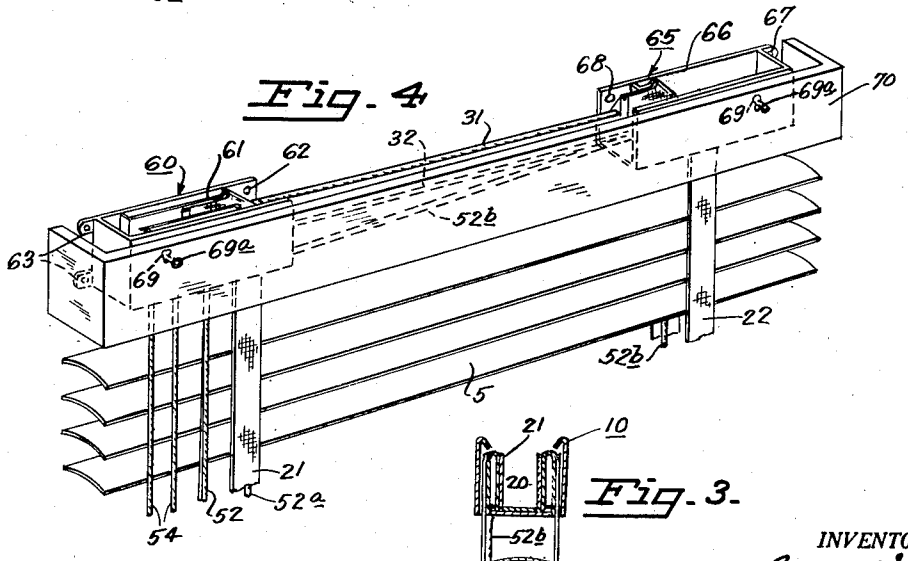


Fig. 3.

INVENTOR.

BY Brooks Walker

Jan. 15, 1952 B. WALKER 2,582,301

VENETAIN BLIND

Filed Nov. 10, 1948 2 SHEETS—SHEET 2

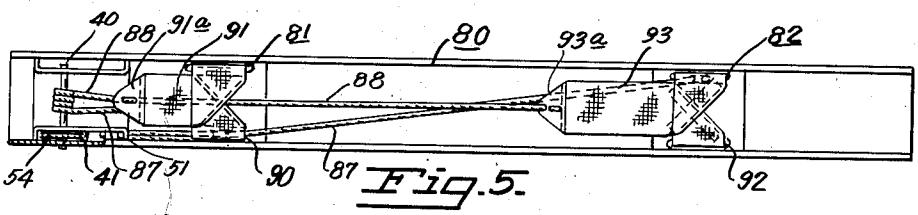


Fig. 5.

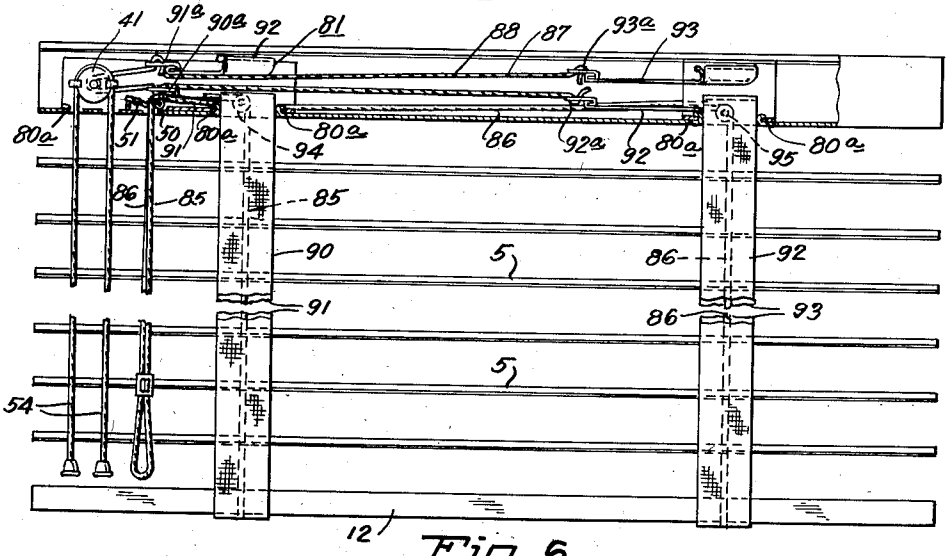


Fig. 6.

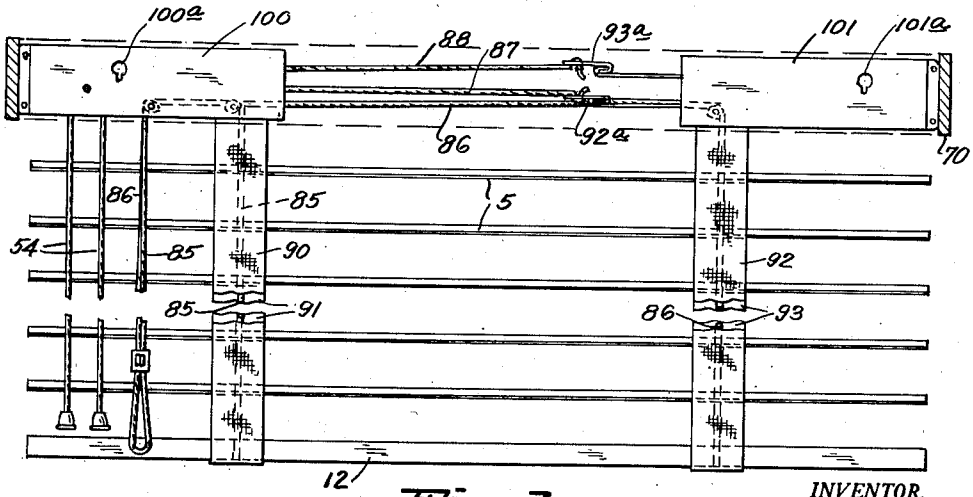


Fig. 7.

INVENTOR.

Brooks Walker

Patented Jan. 15, 1952

2,582,301

UNITED STATES PATENT OFFICE

2,582,301

VENETIAN BLIND

Brooks Walker, Piedmont, Calif.

Application November 10, 1948, Serial No. 59,305

5 Claims. (Cl. 160—174)

1

This invention pertains to Venetian blinds and improvements in the parts for operating same. The invention includes improvements in the tilting and lifting mechanism where "closed" head rails are employed. The invention also covers universal brackets in which the tilting and lifting mechanism is enclosed for installation on blinds of varying widths by spacing apart the two containers of the components.

The invention covers a simplified method of tilting a blind by virtue of sliding the flexible side members of the ladder tape around an inclined angled slide so that a pull on the side member of the ladder tape lengthwise of the head rail will effect a raising or lowering of the side members of the ladder tapes where it supports the slats.

Other forms of the invention involve a more compact head rail in which the angle slides, over which the side members of the ladder tape slide in changing direction, are laid down in a horizontal position in order to effect a shallower head rail or ladder tape operating components.

The invention also covers a simplified method of controlling the tilt mechanism wherein a cord operated shaft winds up on one side to pull up the sides of the ladder tapes toward the room while at the same time unwinding another cord attached to the side members of the ladder tapes on the window side of the blind to effect a relative movement of the two sides of the ladder tape to effect a tilting of the slats in either direction without materially changing the height of the center of the slats during such tilting operation. This construction may be used with lift cords in the center of the slats and going through conventional route holes or with offset lift cords as shown herein similar to those shown in my U. S. Patent No. 2,200,349. The slats may be removable by use of tongues as shown in my U. S. Patent No. 2,311,716, or any other suitable slat securing means may be used.

Other objects of the invention will be more clearly pointed out in the accompanying specifications and claims.

I have illustrated my invention by way of example in the accompanying drawings, in which:

Figure 1 is a plan view of a Venetian blind head rail operating mechanism, showing one form of the invention.

Figure 2 is a side elevation, partly cut away, of the design shown in Figure 1.

Figure 3 is a reduced scale end view, partly cut away, of a portion of the construction taken at section 3—3 of Figure 1.

2

Figure 4 is a partially cut away perspective view of a portion of a blind showing another form of the invention.

Figure 5 is a plan view of top of a head rail showing another form of the invention.

Figure 6 is a side elevation view of a portion of a blind, partially cut away, of the construction as shown in Figure 5.

Figure 7 is a side view, partly cut away, of another construction showing a further modification of the invention.

In all views, like numerals of reference refer to corresponding parts throughout said views.

In Figures 1, 2, and 3, I have shown a closed head rail 10 made of metal or suitable material with inturned upper edges for stiffness, and cut out at the bottom for the passage of the lifting cords 52*a* and 52*b*, as well as the side members 20, 21, 22, and 23 of the ladder tapes which support the slats 5. The bottom of the ladder tapes are attached at their bottom end to bottom rail 12 which may be of any suitable construction.

Metal brackets 15 and 16 are inserted in the head rail 10 and suitably secured to said head rail by turn clips, rivets, spot welding, or hooking under the upper edge of the top of the head rail, or in any suitable manner. These metal brackets 15 and 16 have two portions 15*a* and 15*b* and 16*a* and 16*b* forming smooth return bends and set at one-half the angle formed between the vertical member of the lifting tape and the substantially horizontal portion of the lifting tape which is pulled toward the tilting shaft 40 as operated by cord pulley 41 and cords 54. The ends of the ladder tapes are attached to metal clips 20*a*, 21*a*, 22*a*, and 23*a*, respectively. These clips engage the full width of the ladder tape to prevent the same from folding and form a suitable cord lock for the connecting cords 31 and 32. These metal clips 20*a* and 22*a* are connected to tilt control cord 31, and tilt control cord 32 is connected to clips 21*a* and 23*a*. These cords 31 and 32 may be the two ends of a continuous cord suitably secured to the tilt control shaft 40 by pin 40*a*, or other suitable means.

Pulley 41 is attached to the end of tilt control shaft 40 and is operated by tilting pull cords 54 which might be wound unto a drum type tilt control pulley with one groove for winding the cords on and the other for winding cords off with a cord anchored in the middle to prevent creep, or bead chain or other suitable chains can be used in the drive to take care of creep, or the cords may be of the continuous type that

can be used regardless of any creep at the pulley. A pulley position reset relative to the shaft may be used to take care of cord creep on the pulley.

The lifting of the blind or collapsing of the slats and lifting of the bottom rail is accomplished by the lift cord **52** with an equalizer **53**. Lift cords **52** pass over a pulley or curve slide **50** and are secured at any desired position of lift by cord stop **51**.

In this construction, the offset cord position is used (as shown in my U. S. Patent No. 2,200,349 which allows removability of the slats) with cord **52***a* passing down on the room side of the slats at the left-hand tape by passing over a pulley **56** located inside of the curved return **16***b* of the metal bracket **16**. The other lift cord **52***b* passes under the lower edge of the metal turn **16***b* and diagonally across the head rail to pulley **57** located at the rear of the inside of the angle return **15***a* of bracket **15**, then passes down adjacent to the inside face of the rear right-hand ladder tape **23** and finally is secured to the bottom rail.

Lift cords **52** could pass through pulleys at the center of the head rail and through route holes at the center of the slats in a construction not here shown. It might be desirable to put the cord stop at the opposite end of the blind from the tilt mechanism in order to get more distance between the cord stop and the center of the closest ladder tape, or to conform to Venetian blind control custom.

The head member pulleys can be outside the side members of the ladder tapes. The cords pass through the ladder tapes near the top slat and go between the slats and the ladder sides to the bottom rail if such a construction is desirable.

By these methods, the blinds may be lifted to any desired position by the lift cords **52** and when in the tilted position, no particular bind is added to the lift cords so that the blinds can still be raised and lowered in the fully or partially tilted position in either direction. The tilting is accomplished by pulling on either side of the tilting cords **54** so as to rotate pulley **41** and attached shaft **40** to unwind tilting control cord **31** when the pulley is rotated in a clockwise direction and thereby lowering the room sides of the ladder tapes **20** and **22** while at the same time winding up on tilt control cord **32** to raise the rear sides of the ladder tapes **21** and **23** to effect a closure of the blind with the window edges of the slats in the raised position. Pulling on the other cord to rotate pulley **41** in a counterclockwise direction closes the blind in the opposite direction with the window edge of the slats in the lowered position.

In Figure 4, I have shown an alternate construction in which the mechanism is included in two separate containers **60** and **65** which also furnish the support for the facia or cornice **70**. In container **60** is provided the tilt mechanism and lift cord returns, as well as lift cord stop similar to the mechanism shown on the left-hand side of the head rail, as illustrated in Figures 1 and 2.

The metal insert **61** is similar to metal insert **16**.

Mounting ears **63** may be turned out from their punch position for securing to a wall or be left in their turned position for securing to the side of a window frame, whichever is more suitable.

Holes **62** may also be used for mounting container **60**.

The other container **65** is mounted at a suitable distance at the other edge of the window and contains the ladder tape direction-changing curved surfaces, as well as the pulley or slide for the lifting cords and holes for suitably securing the box to the window frame as shown at **67** and **68**. If a three or four-tape blind is to be used, containers similar to **65** may be used at the intermediate position with both ends open for the passage of the tilt control cords from one tilt control box to the next.

Metal insert **66** is similar to metal insert **15** shown in Figures 1 and 2. To provide a suitable mounting for the facia or cornice **70**, I have shown some keyhole slots **69** in each metal box and a screw **69***a* secured to the inner face of the facia or cornice **70**. Screw **69***a* can be secured to the facia to a proper depth, inserted through the enlarged portion of the keyhole, and then slid down to the smaller end of the keyhole for proper mounting of the cornice or facia.

If drapery rods are to be used inside the facia, additional spacing must be employed by a suitable spacing bracket to hold the facia or cornice away from the metal box to provide room for the drapery and drapery rod.

Although I have shown metal inserts **15** and **16** with turned edges, the turning of the side members of the lifting tapes may be accomplished very satisfactorily by turning them over a formed wire or rod bracket with the portion of the rod or wire set at the correct angles over which the side members of the ladder tapes may be slid. This accomplishes the substantially right-angle direction change for a horizontal pull control on the side members of the ladder tape to effect a vertical movement of the side members of the ladder tape to control the tilt of the slats in either direction.

In Figures 5 and 6, I have shown another form of the invention, embodying a closed head rail **80** which supports slats **5** and bottom rail **12** on ladder tapes whose side members are shown respectively as **90**, **91**, **92**, and **93** with the usual offset or staggered ladder rungs of woven or strand material or double ladder rungs or any other suitable construction for supporting the slats in staggered relationship. The construction here shown is quite similar to that shown in Figures 1, 2, and 3 except that the metal inserts **81** and **82** are so formed that the side members of the tapes are first folded over a smooth curve to a horizontal position directly at right angles and over the slat pile before they are folded over an angle curve. By this construction a motion of the side members of the ladder tape lengthwise to the closed head will effect a raising and lowering of the vertical portions of the ladder tape which supports the slats to effect a closing operation. This is accomplished by means of tilting control rod **40** connected to tilt control wheel **41**, which wheel is operated by tilt cords **54** which may be cords as shown, chains, or continuous cord to take care of tendency to creep.

Tilt control or actuating cords **87** and **88** are wound around tilt control rod **40** so that when tilt control rod **40** is turned in a clockwise direction as viewed in Figure 6, tilt control cord **80** is unwound and allows the rear face of the ladder tapes **91** and **93** to move downwardly while at the same time cord **87** is wound up on tilt control rod **40** to raise thereby the front faces of the ladder tapes **90** and **92** to effect a tilting control of the slats. By suitably compressing the fold over portions of metal inserts **81** and **82**, the overall height of the tilt rail can be kept at a minimum and somewhat less than the heights required in the construction shown in Figures 1 and 2.

It has been found in practice that suitable

stainless steel or other wires or rods formed in the correct shape form a suitable base over which the ladder tape sides are folded for controlled sliding. The operation of the ladder tapes over even small-diameter piano wires is quite satisfactory as the stainless steel in piano wires does not discolor the ladder tapes and forms a very smooth, slick surface over which they can slide. This construction also allows a minimum of space for the angle fold-over operation of the sides of the ladder tape where they are drawn in toward the center to minimize the overall height of the head rail required for this construction. Appropriate painted, plated, wood, plastic, or other suitable slide surfaces may be used in place of piano wire.

Metal inserts **81** and **82** may be held in place by crimping over turned up portions of the cut-out in the bottom of the head rail as shown at **80***a*. This serves two purposes in providing a rounded surface which will not tear or catch the sides of the ladder tape and at the same time holds the metal inserts **81** and **82** positively in place in the head rail without the necessity of extra rivets, spot welding, etc., which might show through the paint or add to the cost by requiring extra parts. However, any suitable method may be used for supporting and securing the metal inserts **81** and **82**. Wire or other forms of material over which the side members of the ladder tape may be suitably folded so that controls moving the ends of the ladder tapes horizontally will effect vertical movements of the vertical portions of the ladder tapes for effective tilting control of the slats.

The lifting of the slats may be effected as shown by lift cords **85** and cord stop **51** operating against pulley **50** in the cord stop mechanism, or any other suitable type of cord stop. Pulleys **94** and **95** may be set as shown for offset cord lifts as described in connection with my U. S. Patent No. 2,200,349. The slats may be suitably held in place by tongues which grip the ladder tapes or other suitable slat retaining means may be used. The pulleys **94** and **95** may be located in the position over the center of the slats at the center of the ladder tape and conventional route holes used in the slats. The pulleys **94** and **95** can be placed at any other suitable place which will perform the desired lifting operation, such as near the end of the slats with suitable punches in the slat to receive the lifting cord. The tilt actuating cords **87** and **88** may be of the usual fiber cord type, or they may be of the flexible metal type such as a flexible bronze wire or cable which is less liable to stretch and thereby throw the slats in larger-sized blinds out of alignment with the head rail or out of alignment relative to parallelism of the ladder rung. Clips **90***a*, **91***a*, **92***a*, and **93***a* are attached respectively to the sides of the ladder tapes **90**, **91**, **92**, and **93** and form an adjustable connection for the tilt actuating cords **87** and **88** in a manner similar to that shown in Figures 1, 2, and 3. However, any other suitable means may be used for attaching as cords, tape, ribbon, wire, etc., between the control mechanism and the ends of the ladder tape.

In Figure 7, I have shown a further modification of the general construction as shown in Figures 5 and 6 in which two shorter metal boxes **100** and **101** are used as fairly standard parts which may be varied in the spaced relationship depending upon the length of the blind. Since the ladder tapes are usualy spaced a standard distance from the ends of the slats, these standard boxes **100** and **101** each contain essentially the same mechanism as shown respectively in the

right and left-hand sides of the head rail as shown in Figures 5 and 6, especially the inserts and actuating mechanism connected with the cord controls and slat lift and slat tilt mechanism attached to the metal inserts **81** and **82** of Figures 5 and 6. The tilt cords **54** control the tilt control cords **87** and **88**, and the blind lift cords **85** and **86** control the lift of the blind or collapse of the slats in a manner similar to that described in connection with Figures 5 and 6. As a means of attaching the facia or cornice, keyhole slots **100***a* and **101***a* are shown formed in a suitable manner in boxes **100** and **101**, respectively, to receive a screw head or other device attached to the inner face of the facia or cornice which can be inserted through the larger portion of the keyhole slot and dropped down for a suitable attachment to the lower keyhole. One or more of these may be used, or any other suitable form of attachment, between the cornice and the facia, and the boxes **100** and **101** may be used so that standard boxes **101** and **102** may be employed for a great many widths of blinds. Where three or more tapes are used, auxiliary boxes similar to **101** but with openings at both ends for the passage of the lift and tilt control cords may be used at intermediate stations or intermediate positionings of ladder tapes. Drapery rods and other desirable auxiliaries may also be hung on these two boxes **100** and **101** between the box and the facia or cornice or any other desired position.

In order to prevent light leakage between the top slat and an opening in the window between boxes **101** and **102**, it may be desirable to attach a shorter rear facia between the open ends of the boxes at the rear face of the blind head rail. Boxes **101** and **102** may be wide enough to mount the drapery rods inside these boxes. Boxes **101** and **102** are also designed for use in connection with facias or cornices having dust caps in which the boxes are mounted on the window frame and then the cornices and dust caps are supported on the boxes. The boxes could be mounted inside the facias and dust caps and then the entire assembly is mounted on the window. There is a great variety of arrangements for mounting and assembling of these various parts which are designed for standardization so as not to have any serious manufacturing difficulty or mounting difficulty in connection with the great variety of sizes of blinds which must be made from these various parts.

No particular constructions have been prescribed. Great leeway may be employed in the material and construction of the parts, all coming within the scope of this invention.

I claim as my invention:

1. In a Venetian blind, a vertical ladder tape, comprising spaced side members and cross rungs connecting the spaced side members, slats positioned on the cross rungs, a bottom rail, means for adjusting the slats in tilted positions, comprising a head box, spaced guides for the side members positioned in the opposite walls of the head box and inclined in one direction and over which the upper portions of the two side members are guided into the head box and directed in a horizontal direction, a spool, a flexible connector secured at each end to the upper portions of the side members and having its medial portion around the spool and means for turning the spool in opposite directions to cause a tilting of the slats upwardly or downwardly.

2. In a Venetian blind, a vertical ladder tape, comprising spaced side members and cross rungs

connecting the spaced side members, slats positioned on the cross rungs, a bottom rail, means for adjusting the slats in tilted positions, comprising a head box, rectangular brackets secured in each end of the head box, their upturned sides being inclined in one direction, forming guides for each of side members of the ladder tapes and over which the upper portions of the two side members are guided into the head box and directed in a horizontal direction, a spool, a flexible connector secured at each end to the upper portions of the side members and having its medial portion around the spool and means for turning the spool in opposite directions to cause a tilting of the slats upwardly or downwardly.

3. In a Venetian blind, a vertical ladder tape, comprising spaced side members and cross rungs connecting the spaced side members, slats positioned on the cross rungs, a bottom rail, means for adjusting the slats in tilted positions, comprising a facia, horizontally spaced head boxes secured to each end of the facia, inclined guides positioned in each head box for each of the spaced side members each side member being guided in the same horizontal direction, flexible cords connecting the side members entering one head box, with the side members entering the other head box, means for moving the front series of side members in one direction and the back side members in the opposite direction in order to tilt the slats.

4. In a Venetian blind, a vertical ladder tape, comprising spaced side members and cross rungs connecting the spaced side members, slats positioned on the cross rungs, a bottom rail, means for adjusting the slats in tilted positions, comprising a facia, horizontally spaced head boxes secured to each end of the facia, inclined guides positioned in each head box for each of the spaced side members each side member being guided in the same horizontal direction, flexible cords connecting the side members entering one head box, with the side members entering the other head box, a flexible cord attached at one end to the front side members and at the other

end to the back side members, a spool, the medial portion of the flexible cord passing around the spool and means to rotate the spool in either direction to tilt the slats upwardly or downwardly.

5. In a Venetian blind, a vertical ladder tape, comprising sets of spaced side members and cross rungs connecting the spaced side members, slats positioned on the cross rungs, a bottom rail, means for tiltably adjusting the slats, comprising a head box, a first set of spaced guides for the side members in each end of the box, said guide members extending parallel to the side walls of the head box a second set of guide members in each end of the head box, said second set of guide members being inclined in opposite directions so that each set of side members enter the bottom of the box in an upwardly direction pass over the first set of guide members and are directed in opposite horizontal directions, pass over the inclined second set of guide members and are then directed in the same direction, an operating mechanism and means for connecting the front side members to one end of the operating mechanism and the back side members to the other end of the operating mechanism so that the slats may be tilted upwardly or downwardly.

BROOKS WALKER.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
138,761	Potter	May 13, 1873
289,176	Teuteberg	Nov. 27, 1883
1,271,619	Sapper	July 8, 1918
2,054,164	Moseley	Sept. 15, 1936
2,242,697	Duca	May 20, 1941
2,276,898	Walker	Mar. 17, 1942
2,383,640	Kwon	May 19, 1942
2,391,709	Kasan	Dec. 25, 1945