Aug. 31, 1954 B. WALKER ET AL 2,687,770

VENETIAN BLIND TILT CONTROL

Filed Oct. 21, 1949

Fig. 1.

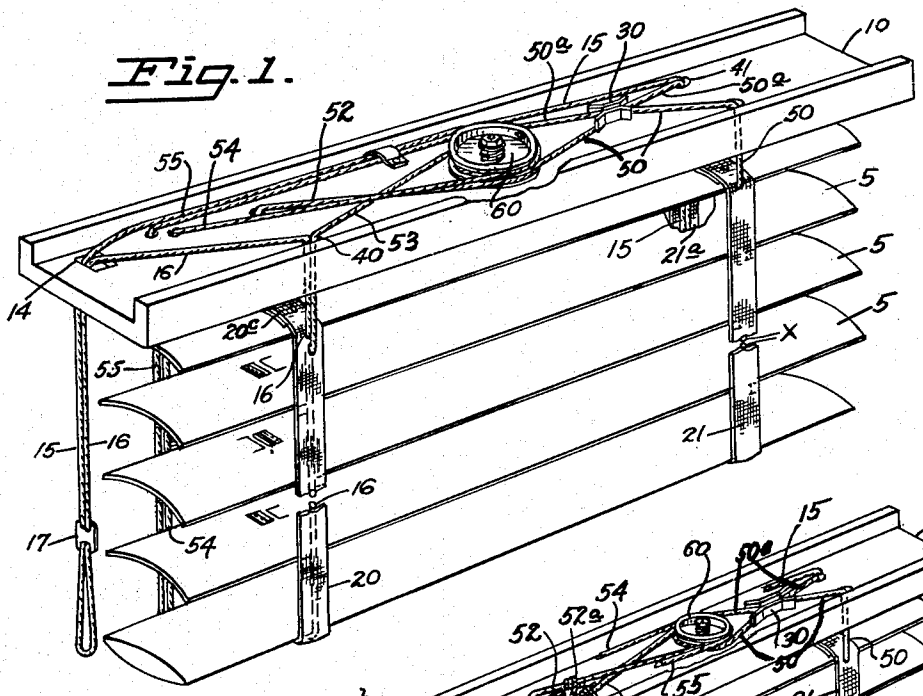


Fig. 2.

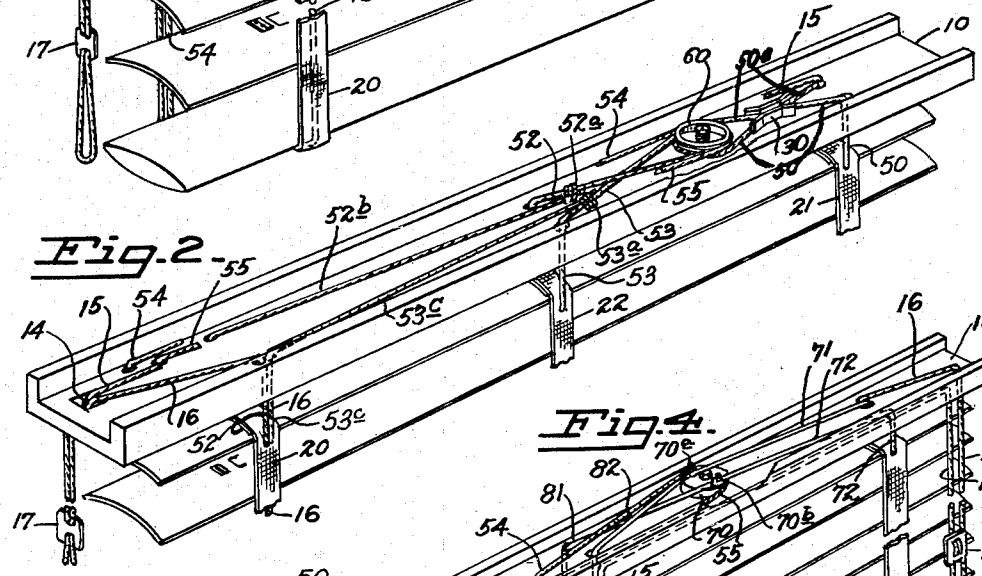


Fig. 3.

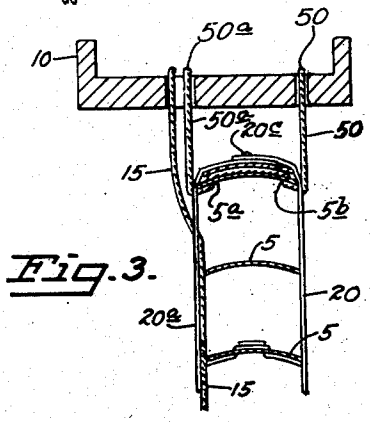
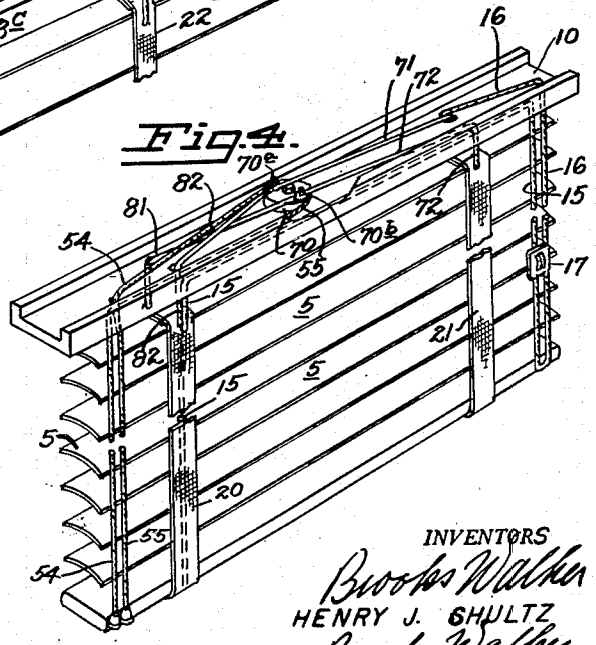


Fig. 4.



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VENETIAN BLIND TILT CONTROL

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8 Claims. (Cl. 160—176)

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This invention pertains to improvements in the control mechanism for Venetian blinds and means whereby the tilt rail, the tilt rail pivot support and tilt rail tilting and cord equalizing mechanism are eliminated. It provides means whereby the unsightly shortness of the tilt rail compared with the full length slats is eliminated. In this construction the top slats extend clear to the length of other slats and are all controlled for tilting in either direction. The center of the bottom rail pivots during the slat tilting operation so that the bottom rail does not raise or lower any more than with the conventional tilt rail.

A further object of the invention is to provide a means whereby the slat pile and head member will be more compact when raised by the elimination of the tilt rail and the required space above the tilt rail for its pivotal operation. By applicants' structure, the slat pile can be compressed tightly against the head member which with a fascia type blind will nest most of the slats behind the usual width of the fascia when in the raised position.

Another feature of the invention is the improved control of the tilting of the slat support ladder tape through the cross connections whereby the front face of one ladder tape is connected with the rear face of the next ladder tape and the rear face of the first ladder tape is connected with the front face of the second ladder tape in such a way that the weight of the blind is balanced, and yet a control of this cross connection through an equalizing wheel or pivoted arm gives a satisfactory and simple control of the tilting of the slats.

Another feature of the invention is a control of the tilt of the ladder tapes by means of two pull cords at the front of the blind but without the necessity of cord locks, equalizing means, etc., in connection with the tilt control.

Another feature of the invention is the control of the cross connections so that the slats will be substantially parallel with the head member in all positions of tilt in either direction.

Another feature is the simplified tilt control and compactness of the structure.

Further features of the invention will be more clearly pointed out in the accompanying claims and specifications.

We have illustrated our invention by way of example in the accompanying drawings in which:

Figure 1 shows a perspective view of a Venetian blind incorporating one form of the invention.

Figure 2 is a perspective view of a portion of a

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wider blind involving more than two tapes, partially cut away so as to show only the top portion of the blind and control mechanism, and illustrates another form of the invention.

Figure 3 is a sectional view taken at the center of the right-hand ladder tape of Figure 1, cut away to show only the upper portion of the blind.

Figure 4 shows another form of the invention.

In all figures, like numerals of reference refer to the corresponding parts.

In Figures 1 and 3, we have shown a head member **10** and a series of slats **5** in which a very limited number are shown as compared with the number usually used in a blind in order that the drawing may be more simplified. Lift cords **15** and **16** go through cord lock **14** and pass through prepared openings **40** and **41**, which have been drilled and reamed with a tool such as shown in the co-pending application of Brooks Walker, Serial No. 124,076, filed October 28, 1949, which first drills a hole through the head member (which may be of some compressible material such as wood) and then compresses the wood and burnishes the top of the hole to a radius equivalent to that provided with a good-sized pulley. This allows cord passage through this specially prepared hole with a greatly reduced friction, which has been found to be very similar in operation to the reduced friction provided with conventional pulleys in the usual Venetian blind construction. In some instances, it is further desirable to turn the head piece over and use the drilling tool likewise on the lower face of the head member to provide a rounded contour where the cord leaves the head member. All cord passage holes through the head member are preferably prepared with this type of tool, though any suitable type of slide or pulley may be used if desired.

At the upper end of the ladder tape, the two sides of the ladder are stapled or clipped together as at **20***c* where the side members are joined over the top slat. The two ends **50** and **50***a* of a single cord pass through holes **5***a* and **5***b* in top slat **5** of the blind or through holes in a clip disposed above or below said slat. Cord ends **50** and **50***a* pass through the side members of ladder tape **20** in order to go through the holes in the top slat or clip. This anchors the tilt control cords **50** and **50***a* to the top slat or clip. In this construction, the top slat may not be removable and provides the support for ladder tape **21** and the slats which rest on its cross rungs.

A similar attachment is provided for tape **20** including cord ends **52** and **53**. These tilt control cords **50** and **50***a* and **52** and **53** are joined at a

center control wheel 60 where the control cords preferably make one turn on the wheel or are attached to the wheel so that end 50 and 52 move in unison to raise or lower the room side member of ladder tapes 20 and 21 in unison while cords 50a and 53, respectively, control the rear side members 20a and 21a to effect a closing of the blind in either direction of tilt of the slats 5 when moved into the fully tilted position by control cords 54 and 55. These control cords 54 and 55 pass through the head member 10 and are available at one side of the blind for controlling the tilt of the slats. These control cords 54 and 55 pass around wheel 60 and are secured to it or to one of the other cords which are secured to it to effect a suitable control for control wheel 60 and the ladder tape 20 and 21.

Since the wrap of cords 52 and 53 on wheel 60 because of their crossing each other is more than would be true with cords 50 and 50a which do not necessarily cross, a slide 30 is provided which brings cords 50 and 50a closely together at a point about the same distance from wheel 60 as the crossover point of cords 52 and 53. It can be seen that by the use of a crossover control wheel 60, the blind tilting is controlled so that the whole blind at the ladder tape 21 end will not move differently from the blind at the ladder tape 20 end and so that the slats will always remain parallel with the head member and will tilt in unison. The slats 5 are secured to the cross rung by tongues 5a.

In Figure 2 we have shown a construction wherein the head member 10 is longer and there are three ladder tapes 20, 21, and 22. Two blind lifting cords 15 and 16 pass through cord stop 14 and may be kept in proper relationship by equalizer 17. All three ladder tapes must be supported in the same manner as ladder tapes 20 and 21, as shown in Figures 1 and 3. Therefore, additional ladder tape supporting cords 52b and 53c must be attached at 52a and 53a to tilt cord 52 and 53 respectively. By similar structure, any number of additional ladder tapes may be supported by connecting their tilt control cords to the main cords coming from the tilt control wheel 60, or to an enlarged wheel direct. To prevent stretching, wires or wire cables may be used in place of cords. Adjustments in attachments 52a and 53a may be desirable.

In Figure 4, I have shown another form of the invention wherein a head rail 10 supports a series of slats by 2 ladder tapes 20 and 21. Ladder tape 20 is attached to tilting cords or wires 81 and 82 in a manner similar to that described in connection with Figures 1, 2 and 3. Ladder tape 21 is similarly attached to tilt control cords or wires 71 and 72. Tilt control drum 70 is controlled manually by tilt cords 54 and 55 hanging down on the room side of the blind passing through prepared holes in head rail 10 and passing around and secured to control drum 70. Control drum 70 carries one offset pivot 70b to which are secured cords 81 and 72, the rear control for ladder tape 20 and the front control for ladder tape 21 respectively. The other equally offset pivot 70a is suitably secured to control cord or wire 82 that controls the front face of ladder tape 20 and also pivot 70a is attached to control cord 71 that controls the rear of ladder tape 21. The slat pile is lifted by lifting cords 15 and 16 which are shown in the offset position as in the other views shown herein though conventional construction could be used by passing these cords through center prepared holes in rail 10 and through conventional route holes in the slats and a central hole in the bottom rail. The advantage of this construction shown in Figure 4 is that the two pivots 70a and 70b move into an on center position when moved into the fully tilted position which provides mechanical advantage to the manual tilt control cords 54 and 55 relative to the other tilt control cords 81 and 82 for ladder tape 20 and 71 and 72 for ladder tape 21. I have shown tilt controls 81, 82, 71 and 72 as wires in place of cords like 54 and 55, though any suitable flexible material may be used within the scope of this invention.

I do not wish in any way to limit myself to the exact details or mode of operation set forth in the specification and drawings for it will be obvious that wide departure may be made in the way of details without departing from the spirit and scope of my invention which is set forth in the following claims.

We claim as our invention:

1. In a Venetian blind, a head rail, a pair of ladder tapes disposed beneath the head rail, said tapes each including side members connected at their upper ends to the uppermost of a plurality of slats supported thereby, a pair of flexible members, having their ends operatively connected to said uppermost slat adjacent the side members of the respective tapes, and a vertical axis pulley supported on said rail with which the intermediate portions of said flexible members are engaged.

2. The structure according to claim 1 wherein said flexible members have their intermediate portions looped about opposite circumferential portions of said pulley and wherein one of said flexible members is crossed intermediate its ends and its intermediate looped portion whereby upon rotation of said pulley in opposite directions the ends of said flexible members at respective opposite sides of said blind will be raised with corresponding tilting of the slats.

3. The structure according to claim 2 together with a slide bracket supported by said head rail and disposed between the ends and intermediate portion of the other flexible member for retaining portions thereof in adjacency.

4. The structure according to claim 1 wherein said pulley is rotatably journalled on a vertical axis and is disposed on said rail intermediate said ladder tapes.

5. The structure according to claim 1 together with a third flexible member having its intermediate portion engaged with the periphery of said pulley, and end portions thereof passing through openings in the head rail and being accessible at one side of the blind for effecting rotation of the pulley in one or the other direction for imparting tilting movement to the slats through said pair of flexible members.

6. The structure according to claim 1, together with a third ladder tape, and a pair of additional flexible members, corresponding ends of said last flexible members being operatively connected to the uppermost slat adjacent the side members of said third ladder tape, and the opposite ends of said last flexible members being connected to respective end portions of one of said pair of flexible members.

7. In a Venetian blind, a head rail, a pair of ladder tapes disposed beneath the head rail, said tapes each including side members connected at their upper ends to the uppermost of a plurality of slats supported thereby, a pulley supported on said rail intermediate said tapes for rotation

about a vertical axis, a pair of pivot members supported on said pulley diametrically thereof, a pair of non-intersecting flexible members having corresponding ends thereof connected to said uppermost slat adjacent one of said tapes and having their opposite ends connected to said pivot members, a second pair of intersecting flexible members having corresponding ends thereof connected to said uppermost slat adjacent the other tape and having their opposite ends connected to said pivot members, and means for imparting rotating movement to said pulley in one direction or the other.

8. In a Venetian blind, a head rail, a pair of ladder tapes disposed beneath the head rail, said tapes each including opposite side members connected to the uppermost of a plurality of slats supported thereby, a pulley supported on the head rail intermediate the tapes for rotation about a vertical axis, a pair of flexible members interconnecting the pulley with opposite edge portions of said uppermost slat adjacent one of said tapes, a second pair of flexible members interconnecting the pulley with opposite edge portions of said uppermost slat adjacent the other tape, the flexible members of one pair thereof being crossed, and means for imparting rotation to the pulley in one or the other direction.

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