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C. S. EVANS

2,796,927

VENETIAN BLIND

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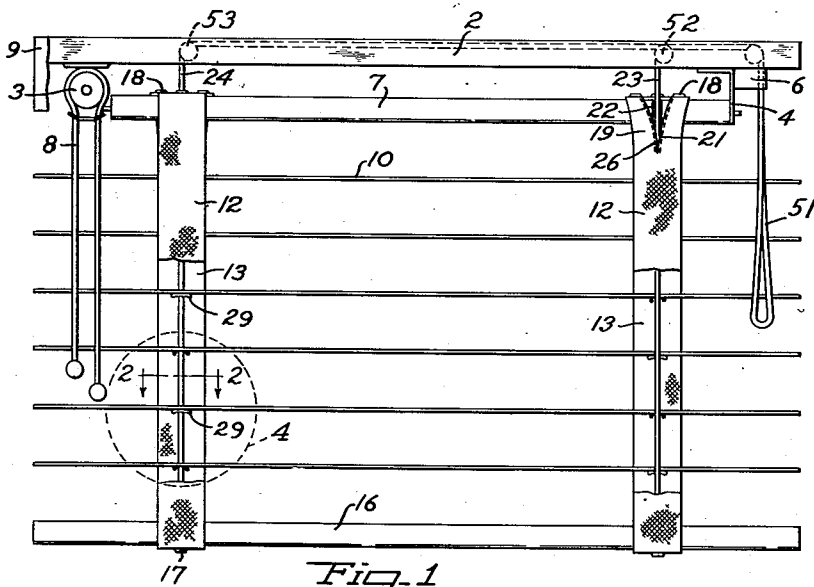


Fig. 1

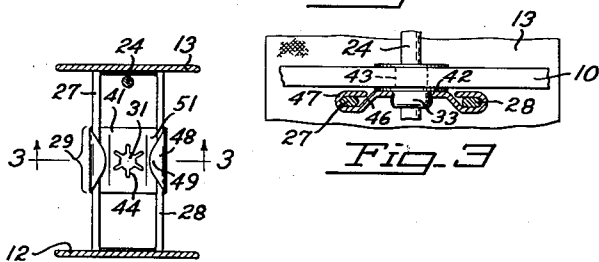


Fig. 2

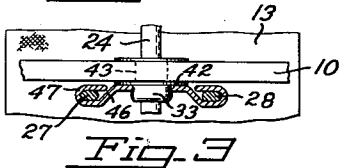


Fig. 3

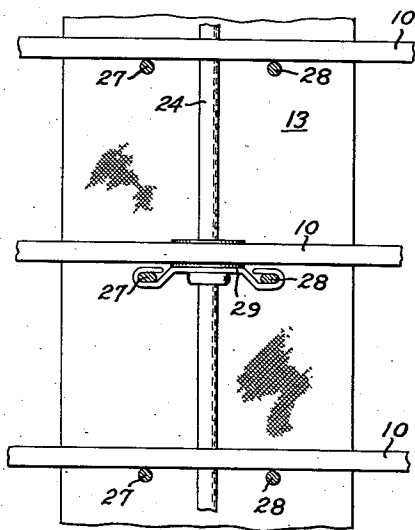


Fig. 4

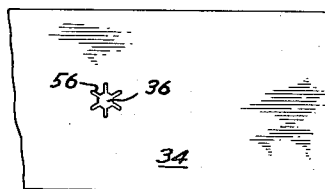


Fig. 5

INVENTOR
Charles S. Evans

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VENETIAN BLIND

Charles S. Evans, Atherton, Calif., assignor to Calnetian Blinds, Incorporated, Oakland, Calif., a corporation of California

Continuation of application Serial No. 719,347, December 31, 1946. This application March 24, 1953, Serial No. 344,270

2 Claims. (Cl. 160—178)

This application is a continuation of my copending application Serial Number 719,347, filed December 31, 1946, now forfeited.

My invention relates to Venetian blinds, and the broad purpose of the invention is to provide a Venetian blind structure in which the slats are readily removed for cleaning and repairs. Another object is the provision of a Venetian blind in which the slats maintain a correct alignment and parallelism at all times. Another object, and one bearing directly on durability and easy, smooth operation, is the elimination of friction between the lifting cords and other parts, which is the direct cause of breakage of cords and sluggish operation. Another object is to secure the even folding of the ladder tape between the stacked slats when the blind is raised. Still another object is to get the slats of the blind closer together when the blind is closed.

The invention possesses other objects, some of which with the foregoing will be set forth at length in the following description wherein is explained that form of the invention which has been selected for illustration in the drawings accompanying and forming a part of this specification. It is to be understood that the invention is not limited to the form shown in the drawings since the invention as set forth in the claims may be embodied in a plurality of forms.

In the Venetian blind structure now common throughout the United States manufacture of parts and their assembly is a tedious and expensive procedure; the cost being out of proportion to worth and durability of the blind as it is finally hung in the window of the user. Moreover, when installed, cleaning is so nearly impossible, that it is usually neglected; and repair and replacement of parts are generally beyond the capacity of anyone but a specialist.

My invention is directed to the correction or lessening of several of these limitations and faults, by providing a construction in which each slat is demountably carried in the ladder tape so that it can be detached and lifted out to be cleaned, or replaced if damaged. While maintaining a ready detachability, it is also inherent in the construction that the slats tend toward alignment and parallelism at all times instead of misalignment and uneven spacing.

An experience common to most users of Venetian blinds is the fraying and breakage of the lifting cords due to abrading against the slats. Another is failure of the blind to drop to its full length, and great resistance in lifting, due to the cumulative effect of many small frictional contacts between the lifting cord and slats and rung tapes of the ladder. This condition has been overcome in my invention by a construction in which the lifting cords are substantially free of frictional drag on the rung tapes, and have only slight contact or none at all with the slats and other parts.

Important in the construction is the support of each slat in each ladder tape on a set of spaced twin rung tapes or cords, and the detachable securement of each

slat to at least one set of the supporting rung tapes. The rung tapes are spaced apart in the horizontal plane; and of course are secured at their ends to the vertical front and rear webs of the ladder. This spacing of the twin rung tapes insures an ample freeway for the lifting cord which extends between them; and because the slats are secured to the twin rung tapes and thereby connected to the front and rear webs, there is no tendency at all for the rung tapes to be pushed or bear against the lifting cord and thus by the cumulative effect of many small frictions impede the raising and lowering of the blind.

The use of twin rung tapes to support the slats has other advantages over the single tape of the common staggered type. They are more satisfying mechanically and artistically; and because of the even tension applied to the vertical front and rear webs in a horizontal line at each junction point, the vertical webs fold evenly in a neat, aligned pack when the blind is raised, instead of in an uneven and unsightly jumble, as frequently experienced with the staggered type of ladder tape.

Referring to the drawings:

Figure 1 is a front elevation of a short Venetian blind embodying my invention. Portions of the front vertical web of the ladder are omitted to disclose the parts behind it.

Figure 2 is a sectional view of the ladder tape taken in a horizontal plane indicated by the line 2—2 of Figure 1, the slat being removed to disclose the twin rung tapes or cords, and the slide carrying the ring member of the snap fastener with which a demountable connection between rung tapes and slat is secured.

Figure 3 is a fragmentary view in elevation of a wooden slat demountably connected to the slide, the slat carrying the stud member of the fastener. The twin cross tapes appear in vertical section. The view is on an enlarged scale.

Figure 4 is an elevation partly in vertical section, showing on an enlarged scale that portion of Figure 1 which is enclosed by the dotted circle 4.

Figure 5 is a plan view of one end of a slat made of thin steel instead of wood and embodying the eye of a snap fastener.

A Venetian blind generally includes a series of thin horizontal parallel slats, with mechanism for adjusting their vertical position to vary the amount of window opening covered; and mechanism for tilting the slats with reference to the horizontal plane in order to vary the degree of opening of the blind. My present invention is not concerned with either the lifting cord lock or the tilting mechanism; excellent devices for those purposes having long been available. These portions of the blind embodied in my invention will therefore be referred to, but not explained in detail.

My blind comprises a ceiling board 2 having a tilting head 3 of common worm gear type at one end, and a bracket 4 at the other end forming part of the cord lock 6. A tilt rail 7 is supported between the tilting head 3 and the bracket; and cords 8 hanging down on the left side of the blind, provides means for turning the tilt rail. A molding 9 secured to the ceiling board extends across the front of the structure and conceals the tilt rail, tilting head and cord lock.

Detachably secured to the tilt rail near each end is a ladder tape in which the slats 10 are hung and demountably secured. Each ladder tape comprises front and rear vertical webs 12 and 13 respectively, extending downwardly from the tilt rail to the bottom rail 16. A detachable fastening means 17 preferably of snap fastener type, secures the end of each web to the bottom rail.

By snap fastener, I mean a two-part releasable connecting device, comprising an annularly grooved or tapered stud which is fixed on or formed in one of the

parts to be connected, and a resilient ring, usually split, into which the stud may be inserted to be resiliently held thereby, and which is fixed on or formed in the other part.

The upper ends of the ladder tape webs are releasably connected by snap fasteners 18 to the top surface of the tilting rail; the upper end 19 of the vertical web on one side of each ladder tape being split to form a gap 21 which with the groove 22 in the adjacent side of the tilt rail provides a freeway through which the lifting cords 23 and 24 pass. Stitching 26 or other form of binding preserves the cut edges of the web from raveling.

The proportion and arrangement of parts are such that when the tilt rail is horizontal the bottom rail is also horizontal. Extending between the vertical webs 12 and 13 of each ladder tape are the rung tapes or cross tapes on which the slats 10 lie; and these are evenly spaced lengthwise of the webs so that the slats lying thereon will maintain parallelism with each other and with the tilt and bottom rails.

The rung tapes are arranged in pairs 27 and 28; and are formed of twisted cord or a braided tubular body which flattens into a strong, double-thickness, rather narrow cord-like tape. The ends of the cross tapes are woven or sewed to the webs. Slidably and demountably arranged on selected pairs of cross tapes are the snap fastener slides 29. Each slide includes one element of a snap fastener, while the associated slat carries the other element. Economy of manufacture and practical values determine whether the slide shall carry the eye or ring element 31 of the fastener as in Figure 2, or the stud element. Where the slat 10 is of wood as in Figure 3, its thickness makes it preferable to fix the stud element 33 on the slat and the eye element 31 on the slide. The same is true when the slat is made of soft and springless metal such as aluminum. Where the slat 34 is made of thin steel as in Figure 5, the eye element 36 may be formed integrally in the material with suitable dies, the stud then being formed on the slide.

While a slide may be mounted on each set of twin tapes, with an associate fastener element placed on each end of each slat, it is preferred for reasons involving costs of manufacture and ease with which the slats may be detached and taken out, to use but one snap fastener slide to a slat; and to stagger these in the two ladders, so that as to each ladder, alternate slats are secured to the twin tapes, the other end of the fastened slat being unsecured to the twin tapes on which it lies.

The twin cross tapes are symmetrically fixed to the vertical webs, and the fastener element is of course placed an equal distance from the end in all the slats, so that when the slats are connected to the slides each slat is aligned laterally with other slats and with the bottom rail. It is to be noted that the slat is demountably secured by the slide to the twin supporting tapes, and through them to the vertical webs of the ladder. The eye demands alignment of the slats with the ladder webs which are the dominant vertical element in the design formed by the blind as a whole. The twin cross tapes are held taut by the weight of the slat; and since the slat is fastened to the twin tapes, accurate alignment is assured.

The snap fastener slide shown in Figures 2 and 3 comprises a piece of thin sheet metal such as steel or hard brass which possesses a considerable degree of springiness or resilience, so that it tends to retain the shape imparted by the forming dies. It has a central main body portion 41 in the center of which is formed the eye or ring element 31 of a snap fastener. This may vary in detail, but essentially the edges must yield resiliently to receive and retain the head of the stud, which conveniently may comprise the stud-bearing cap 42 on one side of the slat 10, caught by the headed shank 43 which pierces the slat. It has been found that a hole a few thousandths of an inch smaller than the head of the stud, and having six evenly spaced round-end slots 44 extending radially about $\frac{3}{32}$ " into the body material, provide a satisfactory eye element. Other forms of course are available.

From the flat central portion 41, the body of the slide slopes down rather sharply on each side in the portion 46, and then curves around and up in a loop 47 to a flat tab 48, lying in the same plane with center 41. The tab narrows to a rounded point 49, spaced a short distance from the edge of the central portion so that the twin cross tapes can be forced through into the loops, the tabs yielding resiliently when the tapes are pulled into the angle 51 between the sloping portion 46 and the tab edge.

The shape and proportion of parts is such that when the slat is snapped into engagement with the slide, the contact is between the central portion 41 of the slide and the cap 42 of the stud. Movement of the slide along the cross tapes is free so that when the slats are turned at an angle, each slide-secured end falls equally with the opposite end to its natural position in the slanting pocket or bight formed by the cross tapes, thus maintaining parallelism in the slats in all positions.

From the foregoing explanation it will be clear that the slats are readily demountable; and that any one or all of them may be detached from the rung tapes by separation of the fastener elements, and then removed from the blind for cleansing or other treatment, after which they may be reinserted and snapped in place. If it is desired to remove the slides, the cross tapes are easily pulled out from under the tabs.

Means are provided for lifting the bottom rail so that as it rises, the slats are successively stacked thereon, until all are collected at the top of the blind between it and the tilt rail. On its upper face the ceiling board is formed with grooves in which lie the two strands of a cord loop 51. One strand forming the lifting cord 23 passes over a pulley 52 and down through the freeway 21—22 in the web and tilt rail, then down between the front edges of the slats and the front web 12, and through the spaces between the ends of the twin tapes supporting each slat, to the bottom rail where it terminates in a knot seated in a recess in the rail where it covered by the lower end of the web.

The other strand forming the lifting cord 24 passes over pulley 53, and extends down similarly, but in rear of the slats and next to the rear web 13. The two lifting cords 23 and 24, secured on opposite sides of the bottom rail are sufficient, but with a particularly long or heavy blind, a lifting cord may be arranged on each side next to the front and rear webs in each ladder tape.

As the blind is pulled up from its lower position to stack the slats on the lower rail, the lifting cord moves smoothly upwardly with no lateral contact with the twin cross tapes since it lies midway between them; and with but light engagement with slat and web. Because each lifting cord, from bottom rail to top pulley, is almost free of frictional drag, except for a slight amount from the web which decreases as the blind is raised, my blind is noticeably easy to operate. Because of the balanced distribution of stresses on the webs, which results from the twin rung tapes, there is no tendency to uneven folding of the webs, which gather into vertically aligned and even folds as the blind rises. This result is materially aided by the securing of the slats to the rung tapes since that construction tends to prevent relative lateral movement of either one while promoting vertical alignment of the slats as the stack forms.

Should it be desired to wash or dry-clean the ladder tapes, the slats are first unsnapped from the slides and removed. The slides are then disengaged from the cross tapes, and the lower snaps 17 are opened to free the lower rail from the bottom of each ladder web. The knotted ends of the lifting cords are next disengaged from the recesses in the bottom face of the rail, and the rail removed. By disengaging the snaps 18 which hold the webs to the tilt rail, both of the ladder tapes may be pulled free, leaving the lifting cords hanging loose from the tilt rail, ready for reassembly of ladder tapes, bottom rail, slides and slats. It will be noted that the assembly of these various parts either in factory or home presents a simple problem,

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so that disassembly of the blind for cleaning or repairs and its quick reassembly is readily accomplished by anyone with a minimum of skill.

For the steel slat 34, Figure 5, a slide carrying a stud is preferable. This construction of slat and slide has a great advantage in low cost of manufacture without the least sacrifice in appearance, security or ease of manipulation.

Like the eye 31 of Figure 2, the eye 36 Figure 5, formed in the steel slat 34, comprises a hole slightly smaller than the head of its companion stud and having round-end radial slots 56 extending into the body of the slat. This construction provides a plurality of short resilient tongues, together constituting a resilient split ring.

When slats are made as in Figure 5, it is preferred to form a fastener element 36—56 at each end of the slat. This may be done at slight extra cost, but it adds a valuable feature in that the slat may be reversed end-for-end in the blind, thus still further simplifying assembly.

I claim:

1. In a Venetian blind having a ladder tape with twin rung tapes, a plate including a snap fastener element, the edge of the plate on each of two opposite sides being looped back upon the plate in a tab tapering to a rounded point spaced from the plate so that a rung tape can be crowded through to free sliding engagement in the loop.

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2. In a Venetian blind, the combination of a ladder tape comprising a pair of webs connected by spaced rung tapes arranged in pairs, slats supported on the rung tapes, at least one snap fastener element on each slat between and spaced from its side edges and adjacent a pair of rung tapes, and a fastener member for supporting the slat on the rung tapes, said fastener member comprising a plate having a snap fastener element detachably and resiliently engageable with said snap fastener element on the slat, the edge of the plate on each of two opposite sides being looped back upon the plate in a tab tapering to a rounded point to adjacent the plate so that a rung tape can be crowded through to free sliding engagement in the loop.

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