April 2, 1946. A. R. SYLVANUS 2,397,765

VENETIAN BLIND

Filed April 5, 1944

Fig. 1.

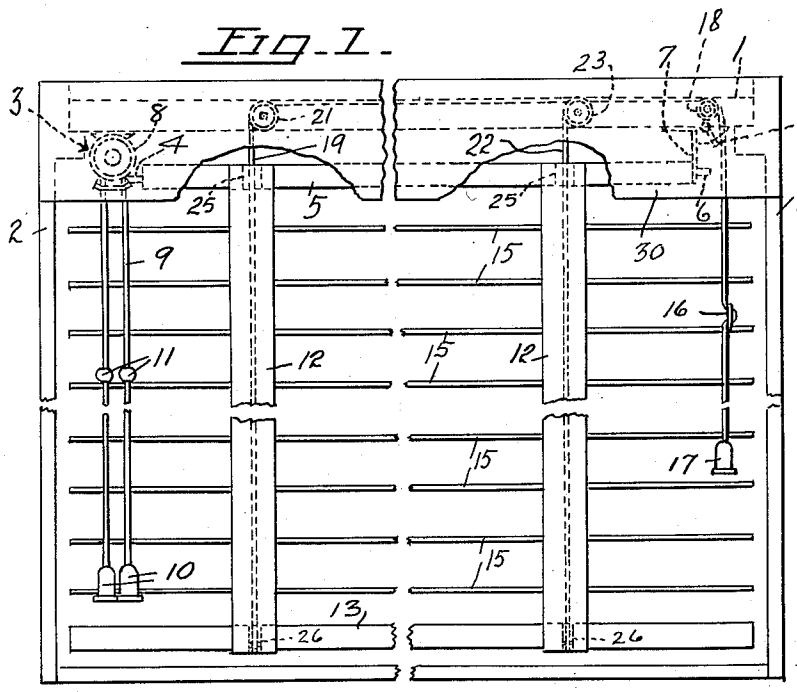


Fig. 5.

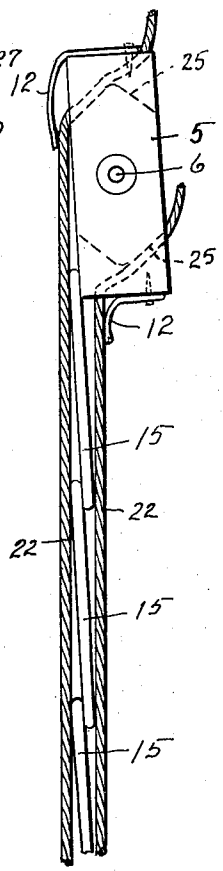


Fig. 2.

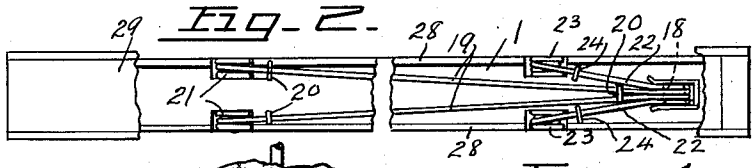


Fig. 3.

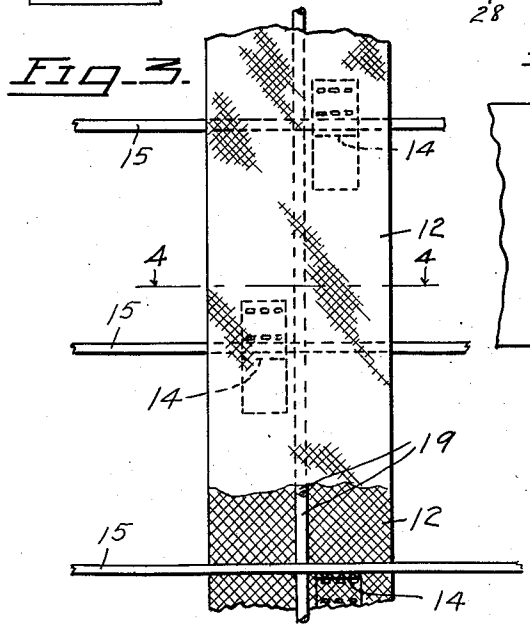
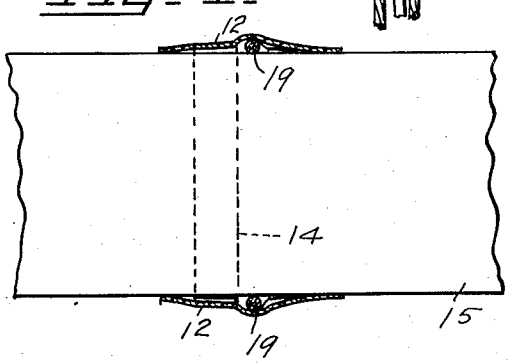


Fig. 4.



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VENETIAN BLIND

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2 Claims. (Cl. 160—168)

This invention relates to Venetian blinds and has for several of its objects a construction in which the slats are stronger than heretofore, a Venetian blind in which any of the slats is quickly removable from the blind without disturbing any of the remaining structure or the other slats whereby broken or injured slats may be replaced and whereby the slats may be quickly removed, cleaned and replaced. A still further object is the provision of structure in a Venetian blind that enables the slats to be more tightly closed than heretofore when they are tilted to closed position.

Heretofore in Venetian blinds of the type supporting slats on cross tabs that are secured between pairs of ladder tape the slats have been perforated for the lifting cords, thus preventing removal or replacement of any one or more slats without taking down the blind and disassembling it. This structure also greatly weakens the slats and frequent breakage occurs at the openings. Furthermore the cleaning of the slats is practically impossible due to interference produced by the ladder tape, cross tabs and lifting cords, and due to the fact that the slats are held fairly close together. Any cleaning that is attempted also results in objectionable soiling of the ladder tape, cross tabs and lifting cords. The lifting cords in themselves provide spacers between adjacent slats in the blind when the slats are tilted to closed position, which result is highly objectionable inasmuch as the blind cannot be effectively closed insofar as light is concerned.

With my invention the slats are of generally uniform length and width and are not secured in place by cords extending through them, hence each slat can be slipped out of the blind and thoroughly cleaned and replaced. Also the slats can be inverted in the blind as may be desired without removal therefrom. Inasmuch as the slats of my blind are imperforate and are preferably merely straight slats of uniform width, there is no difficulty in replacing a broken or injured slat, inasmuch as the width, length and thickness are the only dimensions to be considered. The elimination by me of the structure requiring passage of the lifting cords through the slats permits the slats to tilt to tightly closed position. The only element that is between the adjacent slats in my blind are the cross tabs on which the slats are supported, and as these are almost of paper thinness, the seal between adjacent overlapping marginal surfaces of adjacent slats is practically perfect.

From the foregoing brief explanation it will be seen that my invention overcomes the most serious objections to conventional Venetian blinds. Other objects and advantages will appear in the drawing and description.

In the drawing:

Fig. 1 is an elevational view of a Venetian blind in open position supported in a frame, part of said blind being broken away, and the view being broken in length and width to facilitate positioning the same on the shell.

Fig. 2 is a plan view of the blind of Fig. 1, partly broken away to reveal the head rail and lifting cords.

Fig. 3 is an enlarged fragmentary view of a part of the blind of Fig. 1 showing the ladder tape, slats, lifting cords and cross tabs, one of the latter being in section.

Fig. 4 is a sectional view taken along line 4—4 of Fig. 3.

Fig. 5 is an end elevational view of the tilt rail and a few of the slats shown in closed position. To avoid confusion the ladder tape and cross tabs are omitted where they respectively extend past the slats and between them, but the lifting cords are shown. This view is merely illustrative of the action of the lifting cords in contributing to the tight closing of the blinds.

In detail, the blind illustrated in the drawing comprises a head rail 1 that may be secured rigidly to the jambs 2 of any door or window frame. The entire weight of the remaining elements of the blind is carried by this head rail.

Secured to the head rail at one end thereof is a worm gear tilt device 3 that carries a rotary shaft 4 that is in turn secured to one end of a tilt rail 5, while the opposite end of the tilt rail carries a tilt rail pivot 6 journalled in a tilt rail bracket 7. The bracket 7 is also secured to the head rail, and said pivot and shaft 4 are coaxial with the tilt rail 5 while the tilt rail is spaced below the head rail 1 and is parallel therewith.

A pulley 8 is connected with the drive worm gear of the device 3 and the worm gear is in mesh with a gear on shaft 4. Inasmuch as the device 3 is common in practically all Venetian blinds, the gears are not shown, it being understood that upon rotation of the pulley 8 in one direction or the other will cause a corresponding rotation of the tilt rail 5. A tilting cord 9 passes over pulley 8 and may be endless or it may carry cord pulls 10 at its depending ends that are within easy reach of an operator. Upon pulling one of the cord pulls the pulley will be rotated in a direction for closing the blind, as will be later explained. The usual stops 11 on cord 9 limit the

movement of the cord in opposite directions to prevent placing an excessive strain on the blind once it is closed.

The tilt rail 5 may have various shapes, but herein it is indicated as being an elongated rectangular strip of greater width than thickness. To the opposite longitudinal edges of said rail, and near the opposite ends thereof are pairs of opposed ladder tape 12, one pair being adjacent each end of the rail. This tape depends from the said opposite edges and the lower ends of said pairs are secured to opposite edges of a bottom rail 13, said bottom rail being the same width as the tilt rail. Thus the ladder tape 12 of each pair thereof is held in vertically extending, opposed, parallel relationship when fully extended by the weight of the bottom rail 13.

Cross tabs 13, preferably interwoven at their ends with the ladder tape and extending between the pairs of such tape at uniform intervals therealong, function as supports for the slats of the blind. When the ladder tape of each pair thereof is spaced the maximum width, as occurs when the greatest width of the tilt and bottom rails is horizontal, the tabs 14 are also horizontal. When the tilt rail is tilted, the bottom rail and cross tabs are correspondingly tilted, thus any slats on said cross tabs would be tilted likewise, which principle and structure is substantially identical in all Venetian blinds.

The structure described above is old, no claim being specifically made thereto or to any of the elements thereof.

In my structure the slats 15 that are positioned on the cross tabs 14 are not perforated as in conventional slats, and their widths and lengths are generally uniform, except in openings of unusual outline there may be unusual variations. However this latter circumstance does not affect my invention. The width of the slats may be substantially the same as the width of the tilt rail and bottom rail, and the cross tabs are spaced on each ladder tape the proper distance apart to enable overlapping of the longitudinally extending marginal portions of each slat with the adjacent marginal portions of the slats respectively positioned adjacent thereto when the tilt rail is tilted to close the blind.

In order to enable the use of imperforate slats, and at the same time to provide means for raising the blind, I provide two pairs of lifting cords, or four cords in all, said cords being grouped together along one of the ends of the slats 15 and connected by a conventional cord equalizer 16, while their ends may be connected by a cord pull 17. By "imperforate" I mean the absence of the usual enclosed openings or slots heretofore commonly provided for each lifting cord.

The above four cords extend through an opening in one end of head rail 1 (Figs. 1, 2) and over a pulley 18 rotatably secured in said opening. One pair of cords 19 then extends divergently from pulley 18 and through guides 20 (Fig. 2) to pulleys 21 that are rotatably carried by said head rail at points at opposite sides thereof directly over the upper ends of one of the pairs of ladder tape 12. These pulleys 20 are adjacent the end of the head rail that is remote from pulley 18.

The other pair of cords is designated 22 and extend divergently from pulley 18 over the upper side of the head rail 1 to pulleys 23 that are respectively positioned at opposite sides of said head rail at points substantially over the upper ends of the ladder tape nearest pulley 18. These cords pass through guide members 24 on their way to pulleys 23 from pulley 18.

From pulleys 21, 23 the pairs of cords 19, 22 respectively extend downwardly and through outwardly opening recesses 25 in opposite edges of the tilt rail 5 (Figs. 1, 5) and over the outer sides of which recesses extend the ends of the ladder tape 12. From recesses 25 the said pairs of cords extend downwardly across the outer opposite sides of the slats 15 and bottom rail 13 and under said bottom rail 13. The opposite edges and underside of said bottom rail is grooved to receive said cord so that the latter is flush with the outer surface of the bottom rail. The grooving at one of the edges of said bottom rail is indicated at 26 in Fig. 1. While each of the cords 19, 22 is described as being a pair, it is to be understood that each cord is preferably single but is doubled on itself with the central portion slidable in the grooves in bottom rail 13 and with the opposite free ends terminating in the cord pull 17. Thus upon pulling downwardly on the cord pull 17, the bottom rail 13 will be lifted and the slats will be piled thereon successively and in series as the pull on the cord pull continues. The slidability of the lifting cords relative to the bottom rail where the former pass under said rail insures automatic equalization of the weight on the cords of each pair, hence there is no tendency of the lifting cords to tilt the bottom rail when the blind is raised by pulling on the lifting cords.

Any automatic stop may be associated with the pulley 18, such as the pivoted stop 27 that is adapted to automatically pinch the cords between the outer end of the stop and the side of the passageway in head rail 1 through which said lifting cords extend upon swinging the cord pull 17 to the left as seen in Fig. 1, after raising the blind to the desired height, and then releasing the pull on the cords. This stop is old and is well known in the art.

The upper side of head rail 1 may be recessed to provide upstanding flanges 28 along its opposite longitudinal edges, thereby providing a wide channel in which the cords may lie on their way from pulley 18 to pulleys 21, 23 respectively. A cover piece 29 may extend over said cords and pulleys (Fig. 2), and a front piece 30 (Fig. 1) may extend vertically across the tilt rail 5 to cover said rail as well as the tilting device 3 and bracket 7. This structure also is conventional.

From the foregoing description it will be seen that any one of the slats 15 may be quickly pulled from the blind and inverted, reversed end for end, or replaced, as desired, without interfering with any of the other structure or other elements of the blind. Thus the slats may be easily and thoroughly washed without wetting or soiling the ladder tape 12 or cross tabs 14. Also there is no such weakness as occurs in the conventional structure that requires perforations, such as closed slots extending transversely across the slats.

The cords 19, 22 are inconspicuous and are practically invisible to anyone observing the blind where they have about the same color as the ladder tape. The ladder tape tends to hug the slats along their longitudinal edges as seen in Fig. 4, thus concealing the cords.

In closing the blind, the only material that is between adjacent slats is the cross tabs that are practically of paper-like thinness, hence have no effect toward tending to space the slats. There-

fore the slats close tightly as seen in Fig. 5, and the cords facilitate or contribute toward making a tight seal instead of spacing the slats as occurs where the lifting cords extend through the slats.

The cords are centered along each of the ladder tapes by reason of the alternate offsetting of the cross tabs, as best seen in Fig. 3. This prevents shifting of the cords from the center of the ladder tape.

The illustration is not to be taken as being necessarily restrictive of the invention, inasmuch as it merely shows a preferred form of the invention.

Having described the invention, I claim:

1. In a Venetian blind having a plurality of pairs of opposed vertically extending ladder tapes each pair of which is provided with vertically spaced thin cross tabs supporting horizontally extending slats thereon in a vertical row, said slats being free from securement to said ladder tapes, means for tilting said slats to overlapping relation of opposite marginal portions of adjacent slats for closing said blind, a plurality of pairs of smooth lifting cords for said slats each of which cords is free from securement to said slats and is positioned between one of said tapes and said slats and outwardly of said slats whereby said slats will move into tight closing relationship with each other upon actuation of said lifting cords.

2. In a Venetian blind having a horizontal tilt rail and two pairs of ladder tapes suspended therefrom with the tapes of each of said pairs in opposed relation adjacent opposite end portions of said rail, a rigid, horizontal head rail spaced above said tilt rail and parallel thereto, a lifting cord extending longitudinally of each tape substantially centrally thereof closely adjacent the opposedly facing side of each tape with respect to the other tape of each pair, cross tabs connecting the tapes of each pair, a vertical row of horizontal slats supported at their end portions on the tabs connecting said pairs of tapes, the said cords being between said slats and said tapes, and a horizontal bottom rail below said row of slats to which the lower ends of said ladder tapes and said lifting cords are fastened, spaced pairs of pulleys positioned along opposite edges of said head rail respectively above the upper ends of said tapes, notches in opposite edges of said tilt rail, said cords being respectively positioned in said notches and extending vertically and parallel from said pulleys to said bottom rail when said blind is fully open and the sides of the said slats are horizontal.

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