Nov. 19, 1963 G. A. LOMBARD 3,111,164

VENETIAN BLINDS

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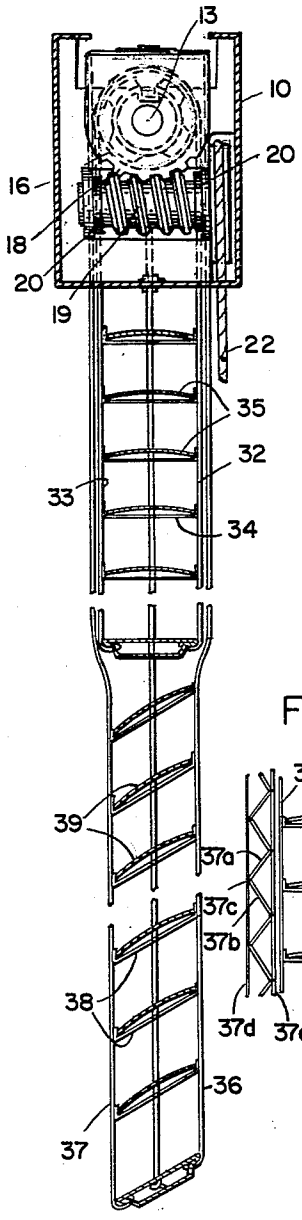


FIG. 2

FIG. 1

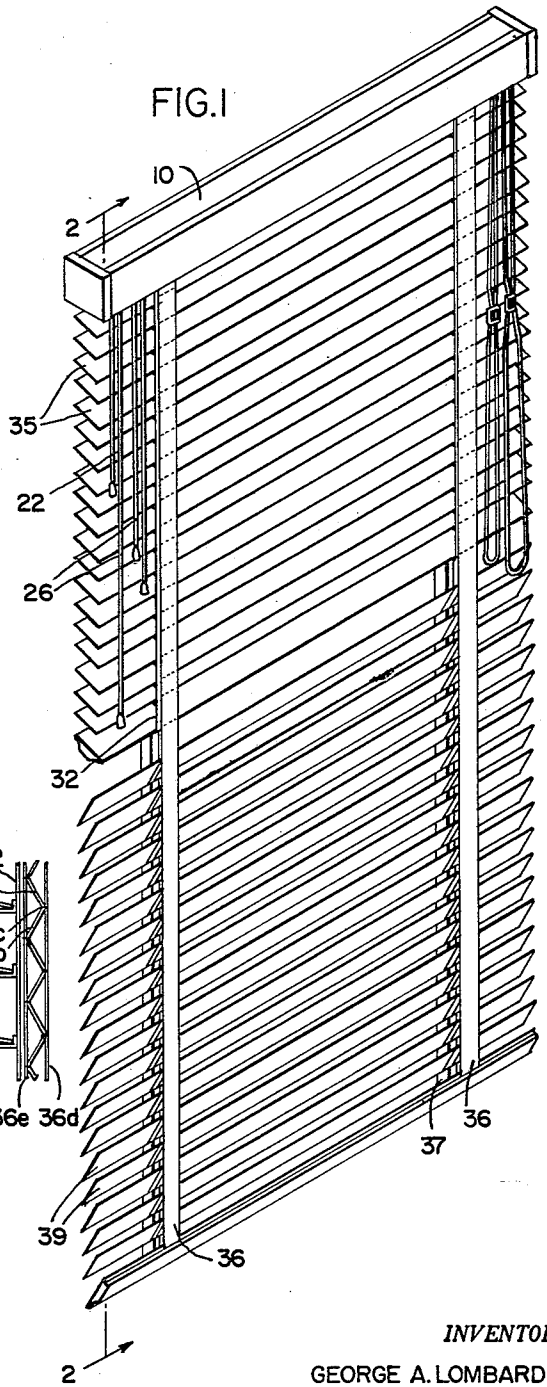
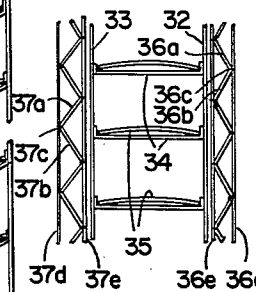


FIG. 3



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FIG. 4

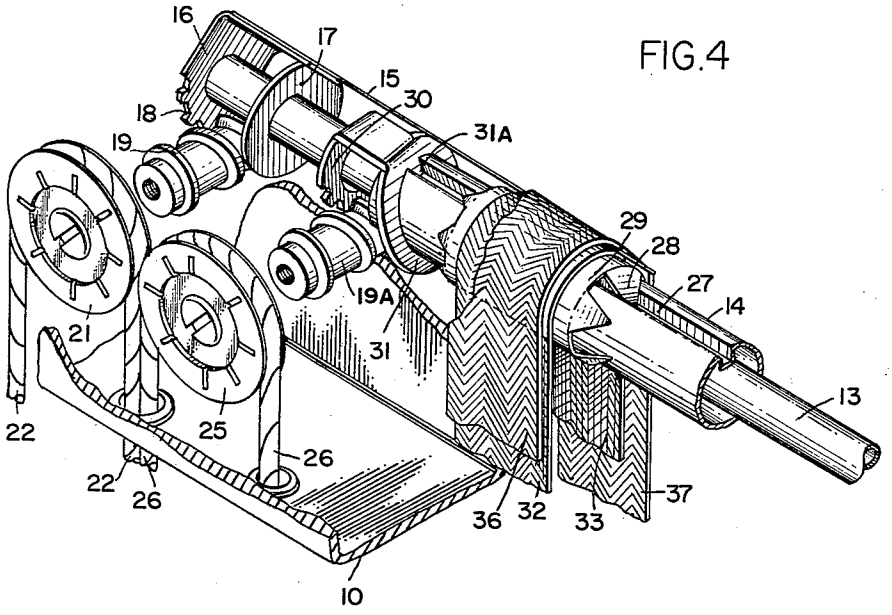
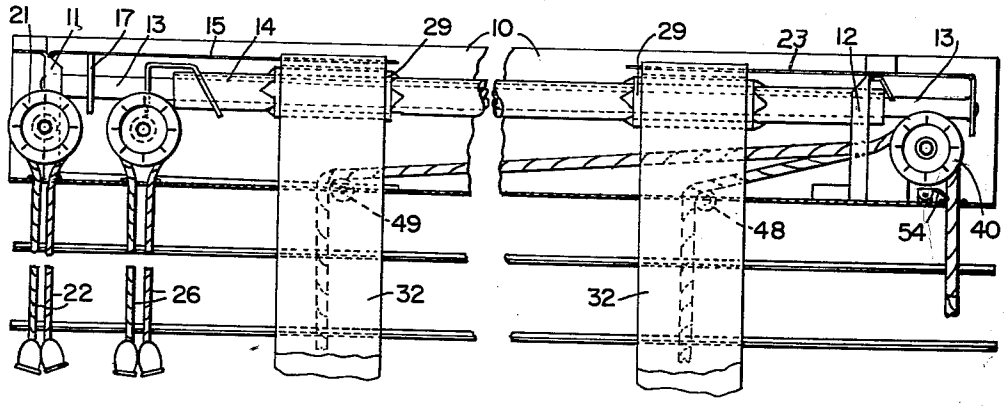


FIG. 5



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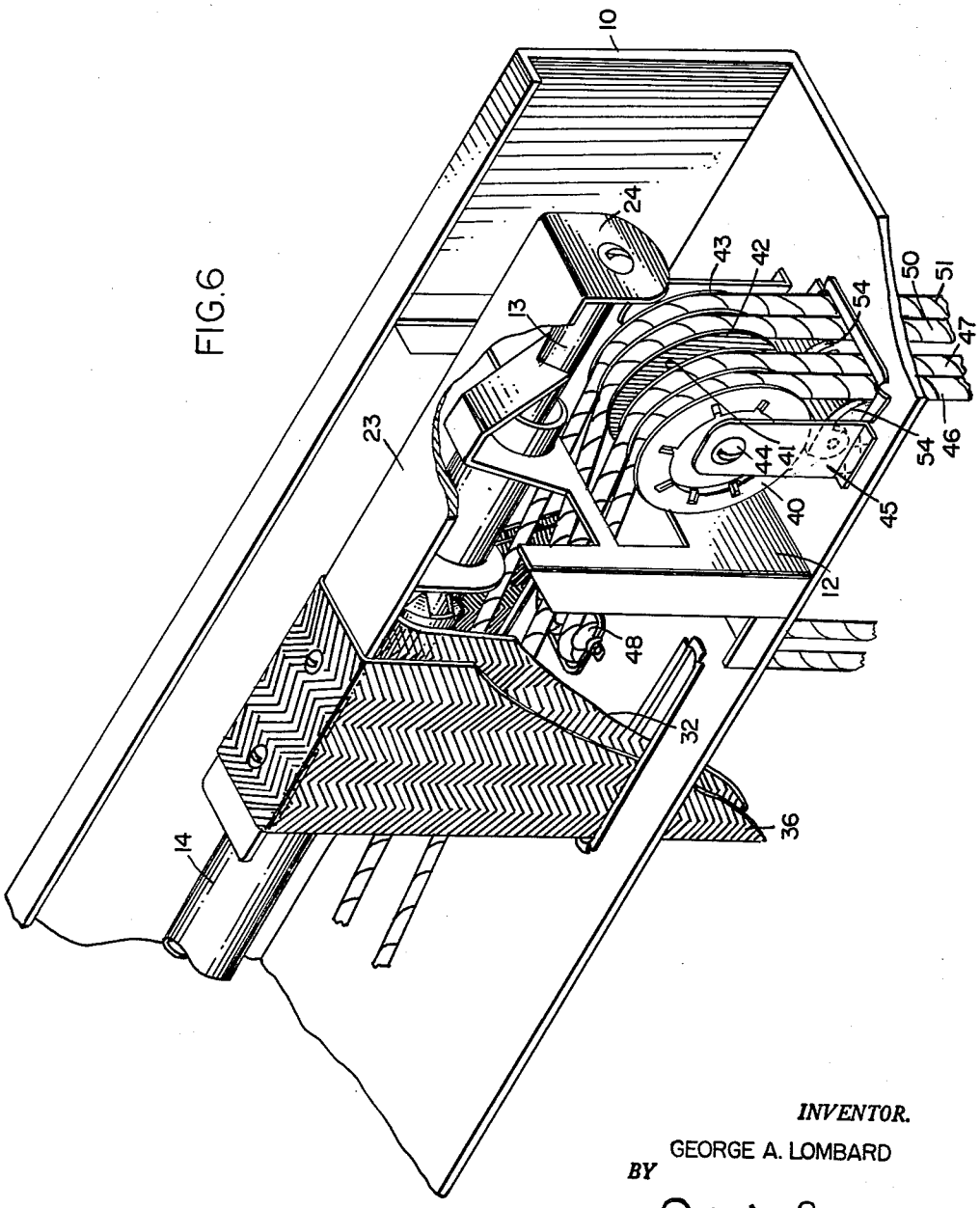
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FIG.6



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3,111,164

VENETIAN BLINDS

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2 Claims. (Cl. 160—115)

The present invention relates to Venetian blinds and particularly to such blinds having vertically arranged sections, the slats of each set being tiltable into desired positions independently of those of any other section.

Venetian blinds are widely used both in residences and in office buildings to afford increased privacy, control of outside light admitted by a window, and control of air circulation when the associated window is open. In conventional Venetian blinds, all the slats may be tilted between overlapping positions and approximately horizontal positions and these may be raised from the bottom.

There are, however, various situations where conventional Venetian blinds do not meet all requirements. One example of such inadequacy is where it is desired that the lower half of the window be shielded to ensure privacy without interference with light transmission through the upper part thereof. In another exemplary situation, it might be desired to block, to a maximum extent, the transmission of light through the upper part of the window and to have the slats of the lower part so tilted as to permit air to circulate therethrough to a desired extent.

The principal objective of the invention is to provide a Venetian blind which is so made as to enable it to be adjusted to meet the above or other similar situations. In accordance with the invention, this objective is attained by providing a Venetian blind including a housing and two sets of slats. Means are provided for the support of each set of slats and each includes a front pair of tapes and a rear pair of tapes. At least one pair of tapes for the lower set of slats has upper portions provided with foldable sections resiliently urged into their folded positions relative to each other. The Venetian blind also has a pair of rotatable supports for each set of slats and these are mounted in the housing with one pair concentric with the other pair and with the corresponding tapes of the tape pairs of each set being carried by a respective one of the pair of supports for that set so that as that pair of supports is turned, one pair of tapes is raised and the other lowered thereby to tilt the associated slats between approximately horizontal and approximately vertical positions independently of the slats of the other set. In practice, one set of supports is in the form of arms overlying the other pair of supports and radially spaced therefrom so that corresponding tapes of the two sets of slats may be vertically alined. While both sets of slats may be raised and lowered by a single means, it is one of the objectives of the invention that separate means be provided for raising and lowering the two sets so that the upper set may be raised independently of the lower set.

In the accompanying drawings, there is shown an illustrative embodiment of the invention from which these and other of its objectives, novel features, and advantages will be readily apparent.

In the drawings:

FIG. 1 is a front perspective view of a Venetian blind in accordance with the invention;

FIG. 2 is a section, on an increased scale, taken approximately along the indicated lines 2—2 of FIG. 1;

FIG. 3 is a fragmentary end view illustrating the self-folding tapes for the slats of the lower set;

FIG. 4 is an enlarged perspective view of part of the mechanisms, in the left hand end of the housing by which the two sets of slats are separately tilted;

FIG. 5 is a fragmentary, vertical section taken approximately lengthwise of the housing; and

FIG. 6 is an enlarged perspective view illustrating part of the mechanisms in the right hand end of the housing.

A Venetian blind illustrated by the drawings has a housing 10 adapted to be mounted in any conventional manner across the top of a window casing, not shown. The housing 10 includes a pair of supports 11 and 12 adjacent the ends thereof for a shaft 13 which extends freely through a shorter hollow shaft 14.

At one end of the shaft 13 there is a support in the form of a flat arm 15 and including members 16 and 17 fast on the shaft 13. The member 16 has teeth 18 meshing with the worm gear 19 supported within the housing 10 by ears 20 and provided with a pulley 21 over which is trained a pull cord 22 enabling the worm gear 19 to be turned in one direction or the other thus to cause the shaft 13 to be partially rotated in either direction. At the other end of the shaft 13, see FIG. 6, there is another support in the form of a flat arm 23 including a downturned tab 24 fastened to the shaft 13.

The housing ears 20 support a second worm gear 19A to one end of which is fastened a pulley 25 over which is trained the pull cord 26 by which it may be turned in either direction. The shaft 14 has a splineway 27 in which a prong 28 at each end of each of the supports 29 is caught. A gear 30 meshes with the worm gear 19A and attached thereto is a ring 31 surrounding the shaft 14 and provided with a tab 31A entrant of the splineway 27.

Secured to the supports 29 are tapes arranged and disposed to provide a front pair of tapes 32 and a rear pair of tapes 33. The tapes 32 and 33 are interconnected by a vertically spaced series of cross tapes 34 and each supports a slat 35 of the upper set. By means of the pull cord 26, the shaft 14 may be partially rotated, in either direction, to enable the slats 35 to be tilted between approximately vertical and approximately horizontal positions.

The arms 15 and 23 have tapes secured thereto which are arranged and disposed to provide a front pair of tapes 36 and a rear pair of tapes 37. These overlie appropriate ones of the tapes 32 and 33 and are interconnected by cross tapes 38, each in support of a slat 39 of the lower set of slats. By means of the pull cord 22, the shaft 13 may be partially rotated in either direction to enable the slats 39 to be tilted between approximately vertical and approximately horizontal positions. The tilting of the slats of either set is independent of the other slats of the other set.

In the embodiment of the invention illustrated by the drawings, each set of slats can also be raised or lowered independently of the other set. As may best be seen in FIG. 6, there are two double pulleys 40, 41 and 42, 43 mounted on a shaft 44 carried by supports 45. Pull cords 46 and 47 are trained over appropriate parts of the pulleys 40, 41 with the cords 46 and 47 also being trained over the pulleys 48 and 49, respectively, and passing freely through the slats of the two sets and caught on the lowermost slat 39 of the lower set. Pull cords 50 and 51 are trained over appropriate parts of the pulley 42, 43 and also being trained over the pulleys corresponding to but located behind the pulleys 48 and 49 and passing freely through the slats 35 of the upper set and anchored to the lowermost slat thereof. Below each of the pulleys 40, 41 and 42, 43 are pivoted brakes 54 each pivoted by an appropriate cord against the pulley to prevent a raised set of slats from dropping unless the pull cord is held from contact therewith.

It will be appreciated that when the uppermost set of slats is raised, the tapes 32 and 33 are caught there-

between and folded as with conventional Venetian blinds. When, however, the lower set of slats is fully raised, the tapes **36** and **37** would present a problem were it not for the fact that, in the zone of the upper set of slats, they are formed, as by suitable impregnations into sections such as the sections **36***a* and **36***b* and **37***a* and **37***b* interconnected by hinge lines **36***c* and **37***c*. These sections are covered by elastic tapes **36***d* and **36***e* and **37***d* and **37***e* with the outer of these sections being connected to every other hinge line **36***c*, **37***c* and the inner of them being connected to the intermediate hinge lines. This construction may best be seen in FIG. 3 and it will be noted that as the sections are straightened out, the elastic tapes are stretched while, as the lower set of slats is raised, the sections fold and the elastic tapes contract.

From the foregoing, it will be appreciated that Venetian blinds, in accordance with the invention, are well adapted to meet a wide variety of situations where conventional Venetian blinds would fail to give the desired service.

I claim:

1. In a Venetian blind, a housing, upper and lower sets of slats, means supporting the slats of each set with one set above the other, said supporting means including a pair of front tapes and a pair of rear tapes, a pair of rotatable supports for each set of slats, the supports of one pair being concentric with those of the other pair, said pairs of supports being mounted in said housing, the lower set of slats being attached to the outer support and the tapes for the upper set of slats being attached to the inner support, corresponding tapes of corresponding pairs of tapes of both sets being disposed in vertical alinement with the tapes for the lower set of slats overlying corresponding ones of the tapes for the upper set of slats, the turning of either support changing the angular relationship of the set of slats connected thereto, means to raise the lower set of slats, and means to raise the upper set of slats independently of said lower set of slats and the raising means therefor, at least one pair of the tapes for the lower set of slats including upper portions each provided with foldable sections resiliently urged into their folded positions relative to each other.

2. In a Venetian blind, a housing, upper and lower sets of slats, means supporting the slats of each set with one set above the other, said supporting means including a pair of front tapes and a pair of rear tapes, a pair of rotatable supports for each set of slats, the supports of one pair being concentric with those of the other pair, said pairs of supports being mounted in said housing, the lower set of slats being attached to the outer support and the tapes for the upper set of slats being attached to the inner support, corresponding tapes of corresponding pairs of tapes of both sets being disposed in vertical alinement with the tapes for the lower set of slats overlying corresponding ones of the tapes for the upper set of slats, the turning of either support changing the angular relationship of the set of slats connected thereto, means to raise the lower set of slats, and means to raise the upper set of slats independently of said lower set of slats and the raising means therefor, the upper part of said tapes for the lower set of slats including a series of foldable sections each separated from the other by a transverse fold line, and front and rear elastic means, the front means joining said sections to fold along every other fold line and the rear means joining said sections to fold along the intermediate fold lines.

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