Oct. 19, 1971 B. WESTBERG 3,613,193

APPARATUS FOR MOUNTING VENETIAN BLIND SLATS

Filed Feb. 7, 1969 4 Sheets-Sheet 1

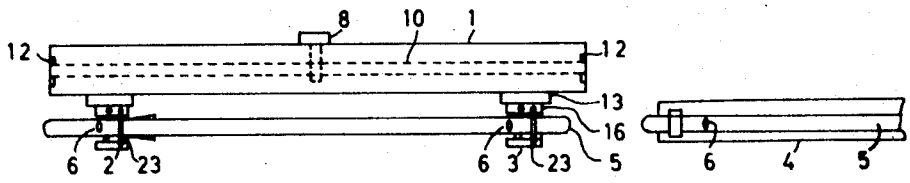

FIG.1

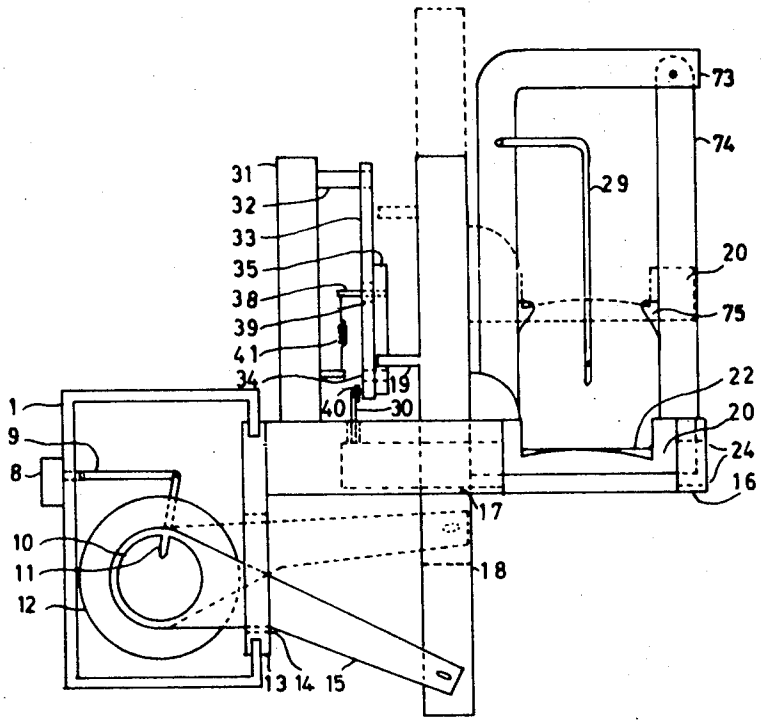

FIG.2

APPARATUS FOR MOUNTING VENETIAN BLIND SLATS

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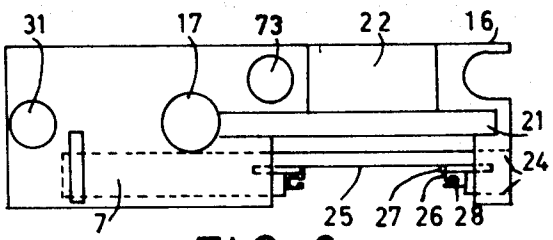

FIG. 3

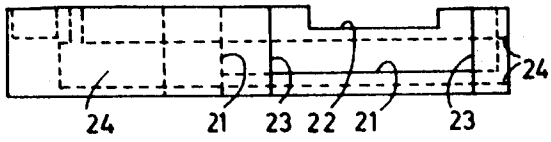

FIG. 4

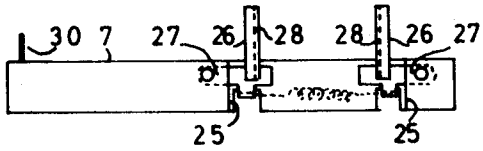

FIG. 5

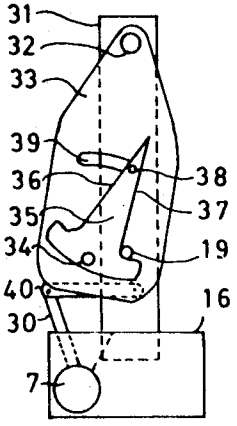

FIG. 6

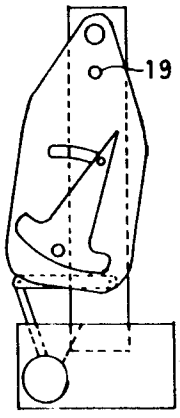

FIG. 7

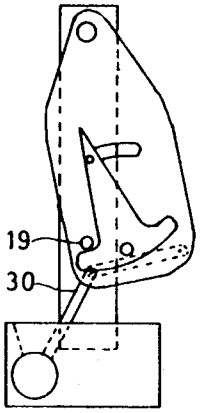

FIG. 8

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APPARATUS FOR MOUNTING VENETIAN BLIND SLATS

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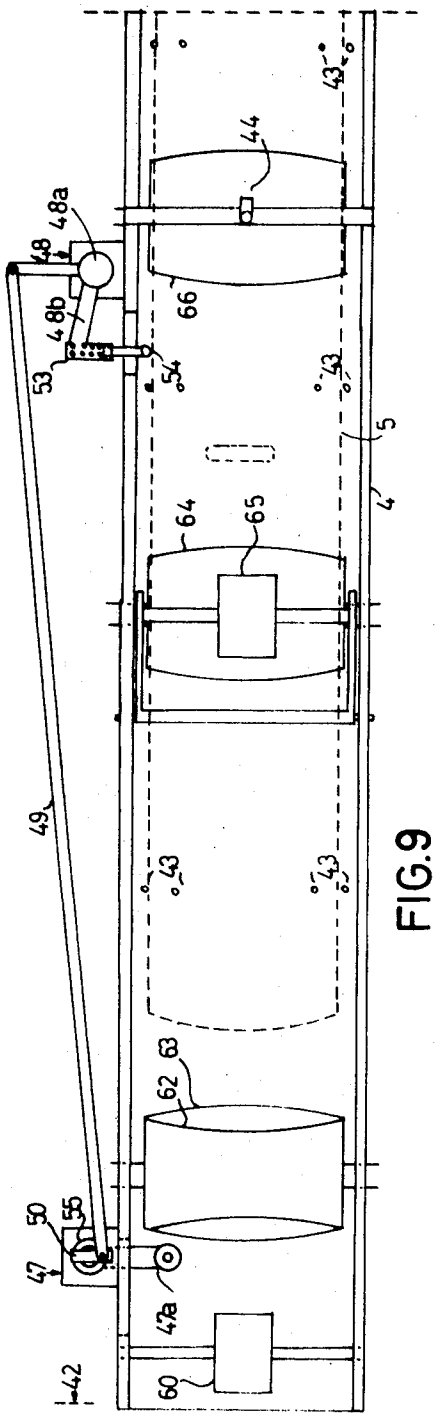

FIG.9

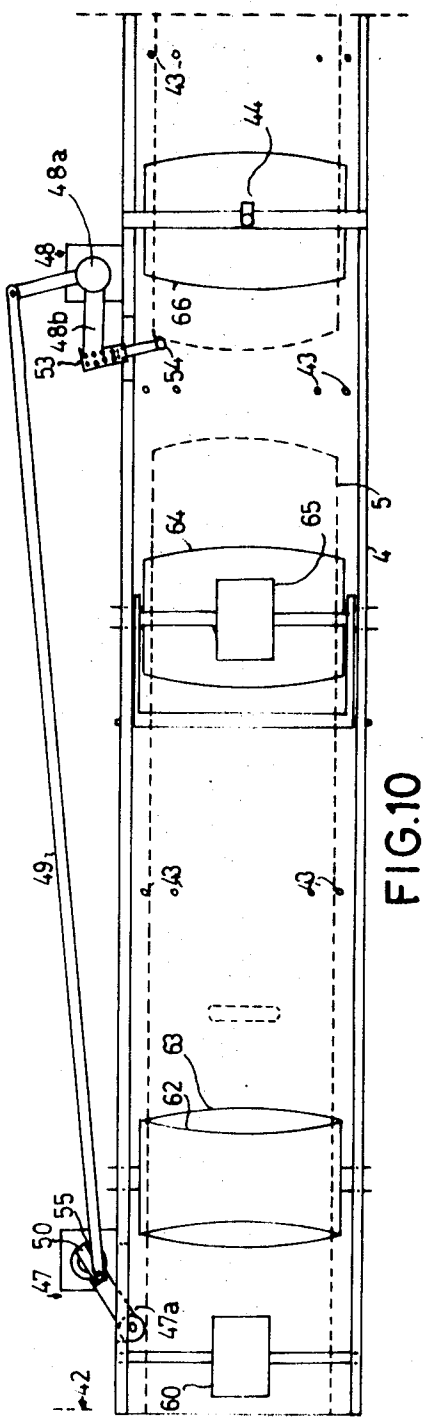

FIG.10

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APPARATUS FOR MOUNTING VENETIAN BLIND SLATS

Filed Feb. 7, 1969 4 Sheets-Sheet 4

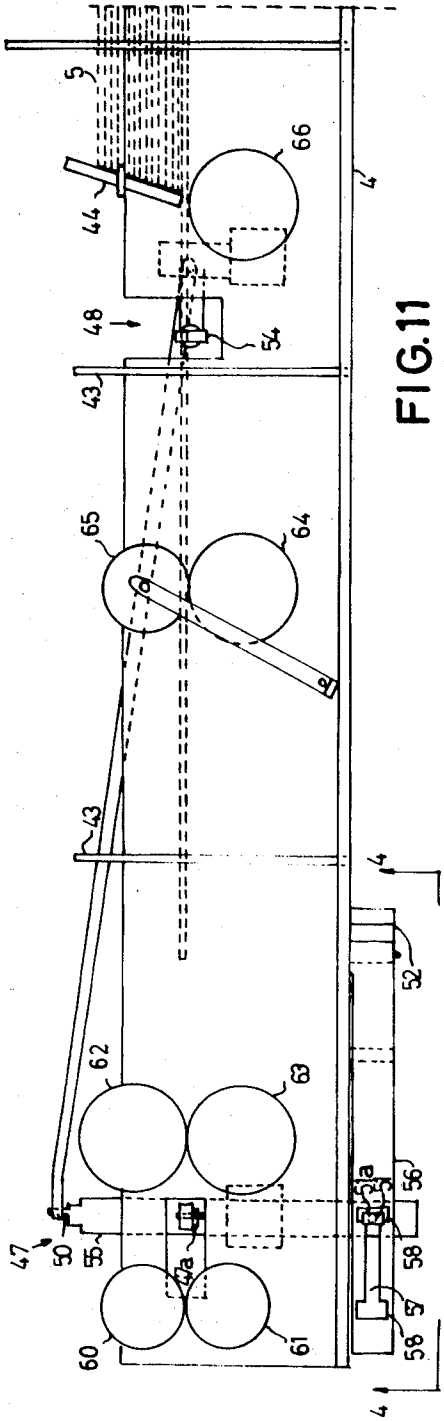

FIG.11

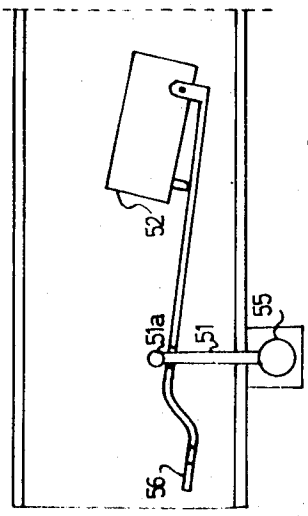

FIG.12

United States Patent Office

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Patented Oct. 19, 1971

3,613,193

APPARATUS FOR MOUNTING VENETIAN BLIND SLATS

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Filed Feb. 7, 1969, Ser. No. 797,499
Claims priority, application Sweden, Feb. 9, 1968, 1,746/68
Int. Cl. B23p *19/04*
U.S. Cl. 29—24.5 9 Claims

ABSTRACT OF THE DISCLOSURE

A Venetian blind assembling apparatus for inserting Venetian blind slats in aligned openings in cord ladders. During insertion of successive slats, the cross cords of the ladders are positioned alternately to respectively one side and the other side of the usual lift-cord-receiving holes formed in opposing end portions of each slat. Thus, during mounting of the lifting cords in the Venetian blind, they are inserted in a zig-zag configuration between the cross cords of the cord ladders.

Venetian blind assembling apparatus are known which insert the lifting cords zig-zag between the cross cords of the cord ladders supporting the individual slots. Venetian blinds assembled by means of this known type of apparatus exhibit good dimensional stability. In a known embodiment of this type of apparatus there is provided a lifting arm feeding individual slats from a starting position in which the lifting cord openings of the slat are positioned above the cross cords of the cord ladders to an upper position in which the assembled slats are collected. The successive positioning of the cross cords of the cord ladders to positions on one side or the other of the lifting cords openings in the individual slats is brought about by guiding the lifting arm in its upward movement in V-shaped or X-shaped tracks. As the one end of the lifting arm is journaled on a stationary pivot and as the other end of the lifting arm in its upward movement lifts the slats which together with the respective cord ladder section the slats will be angularly turned about the stationary pivot whereby the two longitudinal cords of the cord ladders will move with different speed causing the cross cords to deviate from the horizontal position and, after a number of oscillations of the lifting arm, to interfere with the path in which the slats are inserted into starting position.

In order to eliminate this drawback the present apparatus is provided with a vertically disposed, rising and descending slat lifter adapted to lift slats from a starting position to an upper position in which the slats are collected, the plane through the longitudinal axis of symmetry of the slats all the time being horizontal. Due to this the longitudinal cords of the cord ladders are drawn upwardly in equal lengths whereby the cross cords always will remain in a horizontal position preventing the slat path from becoming blocked and enabling the apparatus to be operated continuously.

The object of the invention is an apparatus for mounting Venetian blind slats which by means of a slat feeder have been inserted into aligned openings in cord laders. The apparatus comprises a frame and slat mounting units which are preferably shiftable in the longitudinal direction of the frame and adapted successively to lift individual slats and cord ladders sections from a starting position to an upper position in which the mounted slats are stored. The apparatus is characterized by the fact that each slat mounting unit comprises a slat lifter adapted successively to lift individual slats and cord ladder sections from the starting position in a straight path to the upper

position, a variator tripped by the slat lifter being adapted to position cord ladder guides in such a way that the cross cords of the cord ladders alternately are positioned to respectively the one and the other side of the lifting cord openings provided in the slats.

The slat feeder adapted to insert slats into aligned openings in cord ladders acts to trigger the slat mounting unit for lifting of individual slats synchronously with the substantially horizontal feeding of a slat from the slat feeder.

As will appear from the following description the apparatus according to the invention is easily adjustable for assembling Venetian blinds of different types as far as width and length of the slats is concerned, such adjustment only requiring exchange of a few parts.

For a more detailed explanation of the invention reference is made to the enclosed drawings in which FIG. 1 is a plan view of the apparatus according to the present invention, FIG. 2 is an elevation of the apparatus, FIG. 3 is a plan view of the ataching plate of the mounting unit, FIG. 4 is a front elevation of the attaching plate shown in FIG. 3, FIG. 5 is a front elevation of the cord ladder guide, FIGS. 6, 7 and 8 are side elevations of the variator plate including its longitudinal connection with the cord ladder guide shown in FIG. 5, FIG. 9 is a partial plan view of a slat feeder in one position, FIG. 10 is a partial plan view of the slat feeder in another position. FIG. 11 is an elevation of the slat feeder and FIG. 12 is a bottom view of the slat feeder.

As shown in FIG. 1 the apparatus according to the invention comprises a frame **1** carrying slat mounting units **2** and **3** for lateral shifting displacement along the frame. The number of slat mounting units **2** and **3** may be increased according to the number of lifting cord openings **6** provided on each slat. Slats **5** are advanced in a path from a slat feeder **4** to be brought to a standstill by suitable arrangements, not shown, as soon as the lifting cord openings **6** are in position above cord ladder guides **7** provided on each slat mounting unit **2**, **3**. As soon as the slat feeder **4** has discharged a slat in its entire length the slat feeder **4** will transmit an electric signal actuating an electromagnet **8** which in turn actuates a link device **9** provided on a rod **10** rotatably journaled in the frame and provided with a longitudinal track **11**. Suitably the rod is journaled in ball bearings **12** at both ends of the frame. A plate **13** adapted to slide along one side of the frame is provided with an opening **14** through which an arm **15** extends. Arm **15** is adapted to slide along rod **10** and to engage track **11** whereby the arm will be forced to turn together with rod **10** without sliding movement in an axial direction when electromagnet **8** is actuated and thereby via link device **9** transmits a turning movement to rod **10**. Plate **13** is welded to a mounting plate **16** (FIGS. 2, 3 and 4). A slat lifter **18** is adapted to move through a vertical bore **17** of the mounting plate, said slat lifter at its lower end being pivotally connected to the outer end of arm **15**. The slat lifter **18** is guided in its vertical rising and descending movement by suitable guides (not shown). By means of the slat lifter **18** the slat supported on a slat carrier **20** is lifted from a starting position (shown in full lines in FIG. 2) to an upper position (shown in broken lines in FIG. 2) due to the swinging movement of arm **15**. A guide pin **19** provided at the upper end of slat lifter **18** acts via a variator **33** and a link device **30**, **40** to move the cord ladder freely suspended in a cord ladder guide **7** alternately to one side and the other side of the lifting cord opening **6** depending on successive downward movements of the slat lifter **18**. In the starting position the slat carrier is received in a recess **21**, provided in the mounting plate **16**. The upper curved edge of the slat

carrier **20** in the starting position is disposed below a slat track **22** guiding the slat in its movement from the slat feeder **4** to the starting position. On either side of the slat track rods **73, 74** are provided delimiting a storing compartment for assembled slats. The rods are provided with a spring-biased dog **75** supporting every lifted slat in the upper position. Rod **74** is suitably pivoted to the upper end of rod **73** whereby after assembling of a sufficient number of individual slats to form a Venetian blind such assembly easily may be removed from the storing space opened by outward swinging of rod **74**.

In front of recess **21** mounting plate **16** is provided with a further recessed portion **23** and a bore **24** receiving the cord ladder guide **7**. Cord ladder guide **7** comprises a circular rod **7** having a recessed portion **25** (FIGS. 3 and 5), two tube sections **26** being provided at the transverse edges of this recessed portion **25** on rotatably journaled elements **27**. Tube sections **26** are longitudinally slotted at **28**, the cross cords of the cord ladders freely moving through these slots. When a slat is in the starting position the lifting cord openings **6** of the slat are positioned substantially above tube sections **26**. However, in the starting position tube sections **26** are not upright but angularly enclined in relation to a vertical plane extending perpendicularly to the longitudinal axis of symmetry of the slats. When the slat is lifted by a carrier **20** the upper side of the slat will contact a cross cord of the cord ladder. Due to the inclination of tube sections **26** in relation to said plane the cross cord in question will be disposed to one side of the lifting cord opening of the slat. During the upward movement of the slat, which movement of course corresponds to the spacing between two successive cross cords, the cord ladder guide **7** all the time is inclined at the same angle to said vertical plane. At the end of the upward movement the lifting cord openings of the slat are passed by a needle **29** on which the lifting cord of the Venetian blind is held. Thus, the cross cord of the cord ladder in the upper position will be permanently positioned to one side of the lifting cord opening. During the downward movement of the slat lifter **18** guide pin **19** will shift a variator **33** to a different stable equilibrium position and during this movement a link device **30, 40** will position the cord ladder guide **7** in a new starting position, in which tube sections **26** are inclined at the same angle as before in relation to said vertical plane perpendicular to the longitudinal axis of symmetry of the slat, however, on the other side of said plane. Thus, tube sections **26** now have shifted over the cross cord of the cord ladder to the opposite side of the lifting cord opening **6** compared to the position of the preceding cross cord on the slat now supported lowermost on dogs **25**. Slat lifter **18** and thereby the slat supported on slat carrier **20** are rising and come into lifting contact with the cross cord of the cord ladder, causing the needle tip **29** to pass through lifting cord opening **6** for insertion of the lifting cord, the cross cord of the cord ladder in this instance being positioned to the opposite side of the lifting cord opening as compared to the position of the cross cord on the slat lifted immediately before. At the end of the rising movement the slat will laterally displace dogs **75** which during the continued upward movement of the slat carrier **20** will return to the position according to FIG. 2. During the subsequent descending movement of the slat carrier the dogs **75** will intercept the slat lifter recently and hold both slat and the previously assembled slats overlying the latest slat.

The variator **33** will be described by reference to FIGS. 2, 6, 7 and 8. The variator **33** comprises a stationary support rod **31** having a stud **32** about which a variator plate **33** is adapted to swing between two stable equilibrium position (FIGS. 6 and 8). A second stud **34** is attached to the lower part of variator plate **33**, a guide plate **35** being pivotable about said second stud in dependence on the rising and descending movement of the

guide pin **19**. The guide plate **35** is V-shaped with the tip pointing upwardly, an attachment pin **38** for a coil spring **41** being attached to the tip. The attachment pin is movable within an arcuate opening **39** in the variator plate **33**. While one end of coil spring **41** is attached to the end of attachment pin **38** the other end of the spring is attached in a suitable way to the support rod **31** below the level of attachment pin **38**. Due to this and to the curved shape of opening **39** the variator plate **33** will have two stable positions of equilibrium. Pivotally attached to the lower part of variator plate **33** is a link arm **40** which at the free end is pivotally connected to the free end of a link arm **30** the other end of which is attached to the cord ladder guide **7**.

When the slat lifter **18** is in the starting position (FIG. 2), guide pin **19** of slat lifter **18** is in contact with a guide edge **37** of guide plate **35** (FIG. 6). When guide pin **19** moves upwardly to the position shown in FIG. 7, the stable equilibrium of the variator plate in one of its two stable positions of equilibrium will not be disturbed and, accordingly, the link arrangement **30, 40** will not alter the position of ladder cord guide in which the upper ends of tube sections **26** are positioned to one side of the lifting cord openings **6** in the slats. However, when the slat lifter **18** after a rising movement returns to its starting position, guide pin **19** will engage the other guide edge **36** of guide plate **35** and during continued downward movement of guide pin **19** guide plate **35** will be forced to pivot about pin **34**. Due to this the variator plate will be tipped over from the one stable equilibrium position to the other. In this new starting position the upper ends of tube sections **26** are positioned to the opposite side of lifting cord opening **6** and cord ladder guide **7** will maintain this position throughout the next rising movement of slat lifter **18**. Due to the fact that slat lifter **18** and thereby also slat carrier **20** are moving in a straight path upwardly (and downwardly) the two longitudinal cords of the cord ladder always will be pulled upwardly in identical increments whereby the cross cords will be prevented from extending obliquely in relation to the slat path in a position in which they might form an obstruction preventing the slats from being transferred to starting position.

By reference to FIGS. 9, 10, 11 and 12 a description will be given of the arrangement combined with the slat feeder for controlling the actuation of electromagnet **8**. The slat feeder comprises a plurality of aligned motor driven feed rollers **60, 62, 64, 66** operated by means of a common motor (not shown) via belts and pulleys (not shown). The rotational speed of the feed rollers may be controlled by adjusting the speed of the motor or by appropriate choice of the transmission ratio of the pulleys. Positioned between the feed rollers and arranged in pairs along the slat path defined by the feed roller are side guide pins **43** adapted to come into sliding contact with the edges of the slats **5** to guide the slats through the slat path. The side guide pins **43** are inserted into holes the spacing between which transversely of the guide path corresponds to the width of the slats actually handled. A stop element **44** comprising an adjustable plug extending downwardly into the slat path prevents slats in excess of one at a time from being fed forward towards the forward region **42** of the slat feeder. The apparatus may be adjusted for handling slats of a thickness different from a previously treated set of slats by vertically adjusting the plug of the stop element **44** in relation to the upper surface of feed roller **66**, this surface preferably having a low coefficient of friction. Several slats may be placed one upon the other ahead of the stationary stop element to serve as a supply from which slats are extracted from below. Behind the stationary stop element **44** there is provided a first slat scanner **48** (FIGS. 9 and 10) comprising a vertical rod **48*a***, rotatably journaled and rigidly carrying a Z-shaped angular element **48*b***. One of the two parallel arms of said elements **48*b*** carries a sleeve **53** which in its free end holds an outwardly spring-biased plug

54 or the like. At the free end of the other one of said parallel arms there is pivotally attached one end of a connecting rod 49, the other end of which is pivoted to the free end of a guide pin 50 which together with a further guide pin 51 (FIGS. 11 and 12) is rigidly connected to a rotatably journaled vertical rod 55. A second slat scanner 47 comprises a roller freely rotatable on a short rod 47*a*. The short rod 47*a* is rigidly connected to the rotatably journalled rod 55. The second slat scanner 47 is spring-biased in such a way that its roller intersects the slat path. When a slat engages the second slat scanner 47 to displace it laterally out of the slat path in a forwardly directed turning movement, such turning movement by means of the connecting rod 49 is transferred to the first slat scanner 48 which is adjusted into a second position in which the sleeve 53 is turned to such a position that said outwardly extensible plug 54 abuts against the slat passing alongside (cf. FIG. 9). When this slat has passed beyond the first slat scanner 48 the spring-biased plug 54 will be extended from the sleeve 53 (cf. FIG. 10) and prevents the next slat which has been passed by the stationary stop element 44 from passing beyond the first slat scanner 48. This stopping action is maintained until the end of the slat just moving alongside the second slat scanner 47 has reached a point past this scanner. Hereby the second slat scanner 47 is permitted in a return turning movement to revert to its initial position in which the roller intersects the slat path (FIG. 9). This return turning movement is transferred by connecting rod 49 to the first slat scanner 48 which is placed in a first position in which the sleeve 53 is laterally displaced and the plug 54 is in its extended position (FIG. 9). Due to this, the slat previously arrested by plug 54 (FIG. 10) is permitted to pass forwardly towards the second slat scanner whereby the cycle described above is repeated. In this way a forward feed of the slats one by one is obtained.

The guide pin 51 rigidly attached to the second slat scanner is provided with a follower pin 51*a* (FIGS. 11 and 12) adapted to be in alternate sliding engagement with two surfaces of a lever 56 belonging to a switch 52, preferably of the microswitch type. The switch is adapted momentarily to close the circuit of the electromagnet 8 and thereby to trigger the upward movement of the slat lifter. One end of the lever 56 is connected to the break contact of the switch 52 whereas the other end thereof is deformed in an S-curve (FIG. 12). In this end there is provided a longitudinally extending aperture 57 having laterally extended end portions 58 which permit passage of follower pin 51*a* which during movement of guide pin 51 in one direction slides on the one surface of the lever through the extended aperture; when follower pin 51*a* arrives at one of the widened portions 58 it will pass through this portion and thereafter will abut against the opposite surface of the lever. This movement corresponds to the forward turning movement of the second slat scanner 47 which is transferred to the guide pin 51 via the rotatably journaled rod 55. When the return movement of the second scanner 47 takes place the follower pin 51*a* engages the other side of the lever. During this return movement the follower pin will depress lever 56 which now momentarily closes switch 52 during a short period of time, whereby the circuit of electromagnet 8 is closed and the magnet is energized. The excitation of the electromagnet 8 is terminated when the circuit is interrupted again, which will take place as soon as the follower pin 51*a* has reached "depression" on the S-shaped lever. The follower pin continues to engage the other side of the lever until the return movement has been terminated. Then the follower pin will pass through the second enlarged portion 58 of aperture 57 and will thereafter again engage the first surface of the lever. Thus, the switch 52 will momentarily close the circuit of electromagnet 8 as soon as a slat has passed the second slat scanner 47 and the return turning movement of this scanner has started. The short period of time during which the circuit is energized is controlled in part by the shape of the lever 56, the length of guide pin 51 and by the speed of the return turning movement; i.e., the force of the spring acting on the second slat scanner 47. The slats may be fed forward in the slat feeder 4 at an arbitrary speed which may be uniform or accelerated. The time interval between delivery of a slat from the slat feeder and the discharge of the following slat must be longer than or at least the same as, on the one hand, the time required for the rear transverse edge of a slat to pass through the horizontal distance from the outlet opening of the slat feeder to the starting position in the present apparatus in starting position which the lifting cord openings are positioned substantially above the cord ladder guides and, at the other hand, the time required for the slat carrier to perform the rising and descending movement. It should be noted that the rising movement of the slat carrier will not start immediately when the switch 52 transmits an impulse but rather is slightly delayed due to mechanical inertia of the electromagnet and other movable parts of the device. The time lag between transmission of an impulse from the switch 52 and the lifting of a slat by the slat carrier is sufficient to enable the rear end of the slat leaving the slat feeder to arrive at the starting position on the slat carrier.

In the drawings and specification there has been set forth a preferred embodiment of the invention and although specific terms are employed, they are used in a generic and descriptive sense only and not for purposes of limitation.

I claim:

1. Apparatus for mounting Venetian blind slats which, by means of a slat feeding device, are introduced through a slat path into aligned openings in cord ladders, said apparatus comprising an elongate frame, and slat mounting units carried by said frame and adapted for successively lifting individual slats and cord ladder sections from a starting position to an upper position in which the slats are collected in a slat storage space; characterized in that each slat mounting unit comprises a mounting plate having a recess therein, a slat carrier received in said recess in a position below the plane of the slat in the starting position, a slat lifter comprising a vertically reciprocatable rod operatively connected to said slat carrier and adapted successively to lift said slat carrier and individual slats and cord ladder sections from said starting position to said upper position, a guide pin carried by said rod, a cord ladder guide adjacent said mounting plate, and a variator guided and triggered by said guide pin and adapted to actuate said cord ladder guide alternately to place the cross cords of the cord ladder to respectively the one side and the other side of lifting cord openings provided in the slats.

2. An apparatus for mounting Venetian blind slats which, by means of a slat feeding device, are introduced through a slat path into aligned openings in cord ladders, said apparatus comprising an elongate frame, slat mounting units carried by said frame for successively lifting individual slats and cord ladder sections from a starting position to an upper position in which the slats are collected in a slat storing space; characterized in that each slat mounting unit comprises a slat lifter adapted successively to lift individual slats and cord ladder sections from the starting position in a straight path to the upper position, said slat lifter including a vertically reciprocatable rod and a guide pin carried by said rod, a cord ladder guide adjacent said slat lifter, a variator triggered by the slat lifter being adapted to actuate said cord ladder guide alternately to place the cross cord of the cord ladder to respectively the one and the other side of lifting cord openings provided in the slats, said variator comprising a support member rigidly mounted on the slat mounting unit and having a stud on which a variator plate is journaled, a guide plate journaled on a second stud pro-

vided on the lower part of the variator plate, said guide plate having two guide edges against which said guide pin is adapted to slide in alternation during reciprocating movement of said rod, a link arrangement provided on the variator plate and mechanically connected to said cord ladder guide and being adapted to adjust said cord ladder guide to a first position in which the cross cord of the cord ladder is positioned to one side of the lifting cord opening during alternate upward movements of said slat lifter rod, and said link arrangement adjusting said cord ladder guide to a second position in which the cross cord of the cord ladder is positioned to the other side of the lifting cord opening during the intervening upward movements of the slat lifter rod.

3. The apparatus as claimed in claim 2, characterized in that the guide edges of the guide plate include an acute angle at the upwardly directed tip of which there is provided an attachment pin extending through an arcuate opening in the variator plate, one end of a coil spring being attached to said attachment pin, and the other end of said coil spring being attached to said support member whereby the guide plate and the variator plate form a unit adapted to pivot about said pin between two stable equilibrium positions.

4. Apparatus for mounting Venetian blind slats which, by means of a slat feeding device, are introduced through a slat path into aligned openings in cord ladders, said apparatus comprising a frame, slat mounting units carried by said frame for successively lifting individual slats and cord ladder sections from a starting position to an upper position in which the slats are collected in a slat storing space, characterized in that each slat mounting unit comprises a slat lifter adapted successively to lift individual slats and cord ladder sections from the starting position in a straight path to the upper position, a cord ladder guide adjacent said slat lifter, and a variator triggered by the slat lifter being adapted to actuate said cord ladder guide alternately to place the cross cord of the cord ladder to respectively the one and the other side of lifting cord openings provided in the slats, said slat feeder comprising a plurality of aligned motor driven feed rollers for feeding slats from a rear zone to a forward zone, opposed pairs of pins being provided for guiding the slats as they are fed forwardly, characterized by a stationary stop element preventing more than one slat at a time from being fed to the forward zone, and an arrangement being provided for controlling the feeding space between respectively the rear and forward edges of successive slats to the forward zone and for momentary excitation of a switch in dependence on the release of a slat from the slat feeder.

5. The apparatus as claimed in claim 4, characterized in that said arrangement for controlling the feeding space comprises a first rotatably journaled slat scanner positioned behind the stop element and connected via a connecting rod and a guide pin to a second, spring biased, rotatably journaled slat scanner, positioned behind the first slat scanner and connected via a second guide pin to said switch.

6. The apparatus as claimed in claim 5, characterized in that said first slat scanner comprises a rotatably journaled angular element having the form of a Z with two free ends one of which carries a sleeve or the like from which an outwardly spring-biased plug or the like extends, the other one of said free ends being pivotally connected

to one end of said connecting rod, the other end of said connecting rod being connected to said second slat scanner to adjust said sleeve, on the one hand, in a first position with said plug fully extended and said sleeve laterally displaced permitting a slat to pass alongside said first slat scanner and, on the other hand, a second position with said plug in sliding contact with the passing slat, said plug in said second position being partially pushed into said sleeve to be again fully extended from the sleeve after passage of said slat to intercept said slat path while the sleeve still is in its second position, thereby to control the distance at which a following slat is fed forward in relation to the rear edge of the preceding slat.

7. The apparatus as claimed in claim 6, characterized in that said second slat scanner comprises a slat feeler or the like which is rigidly connected to a rotatably journaled rod or the like adapted to hold said feeler in a first position intercepting said slat path and provided with two rigid guide pins, one of which is pivotally connected with said connecting rod whereas the other one is in sliding contact with said switch, a slat passing said second slat scanner acting to displace with a forward turning movement said flat feeler to a second position while at the same time the slat feeler, by means of said one guide pin and said connecting rod, positions said first slat scanner into its second position with said plug in sliding contact with a slat, and a spring device operatively associated with said second slat scanner and operable in the absence of a slat to restore said feeler in a return turning movement to its first position while at the same time restoring said sleeve of said first slat scanner to its first position.

8. The apparatus as claimed in claim 4, characterized in that the guide pins are adjustable in pairs slidingly to receive between them slats of different widths.

9. The apparatus as claimed in claim 4, characterized in that said switch is provided with a lever, one end of which is firmly connected to said switch, whereas the other end of said lever is slightly S-curved and provided with a substantially elongate hole having enlarged end portions permitting passage of a follower pin provided on the free end of said guide pin, said follower pin being in sliding contact during the forward turning movement of said second slat scanner with one surface of said lever while being in sliding contact with the other surface of said lever during the return movement of said rod to close said switch for a certain period of time, an electromagnet operatively connected to said slat lifter for raising the same from said starting position to said upper position upon energization of said electromagnet, and said switch being connected to said electromagnet for momentarily energizing said electromagnet simultaneously with the discharge of a slat from said slat feeder.

References Cited

UNITED STATES PATENTS

2,827,686	3/1958	Adelman	29—24.5
2,893,106	7/1959	Rosenbaum	29—24.5
2,917,810	12/1959	Wilson	29—24.5
3,292,232	12/1966	Nilsson	29—24.5

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