Sept. 29, 1953 H. KRUGLICK 2,653,558

RUFFLING MACHINE

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FIG. 1

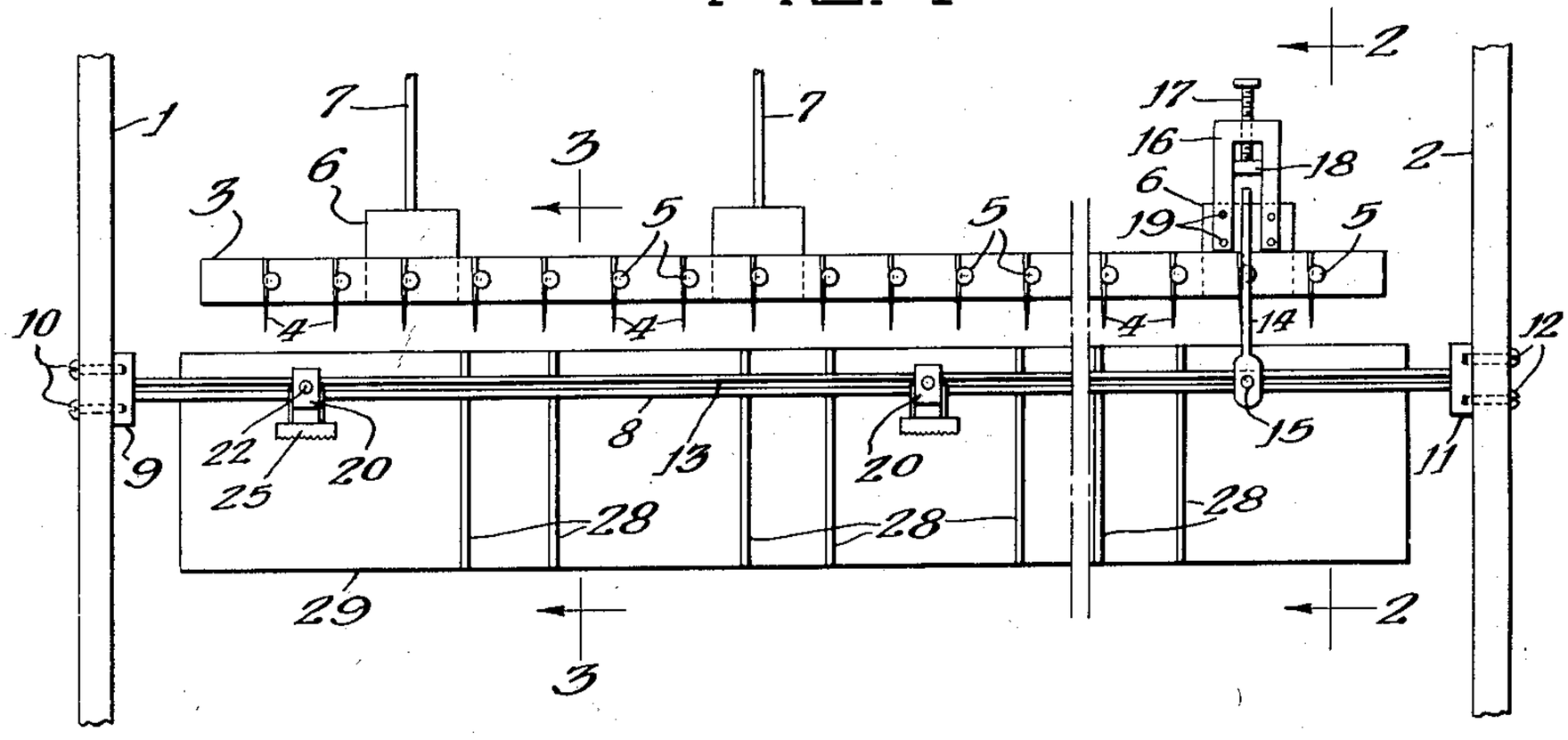

FIG. 2

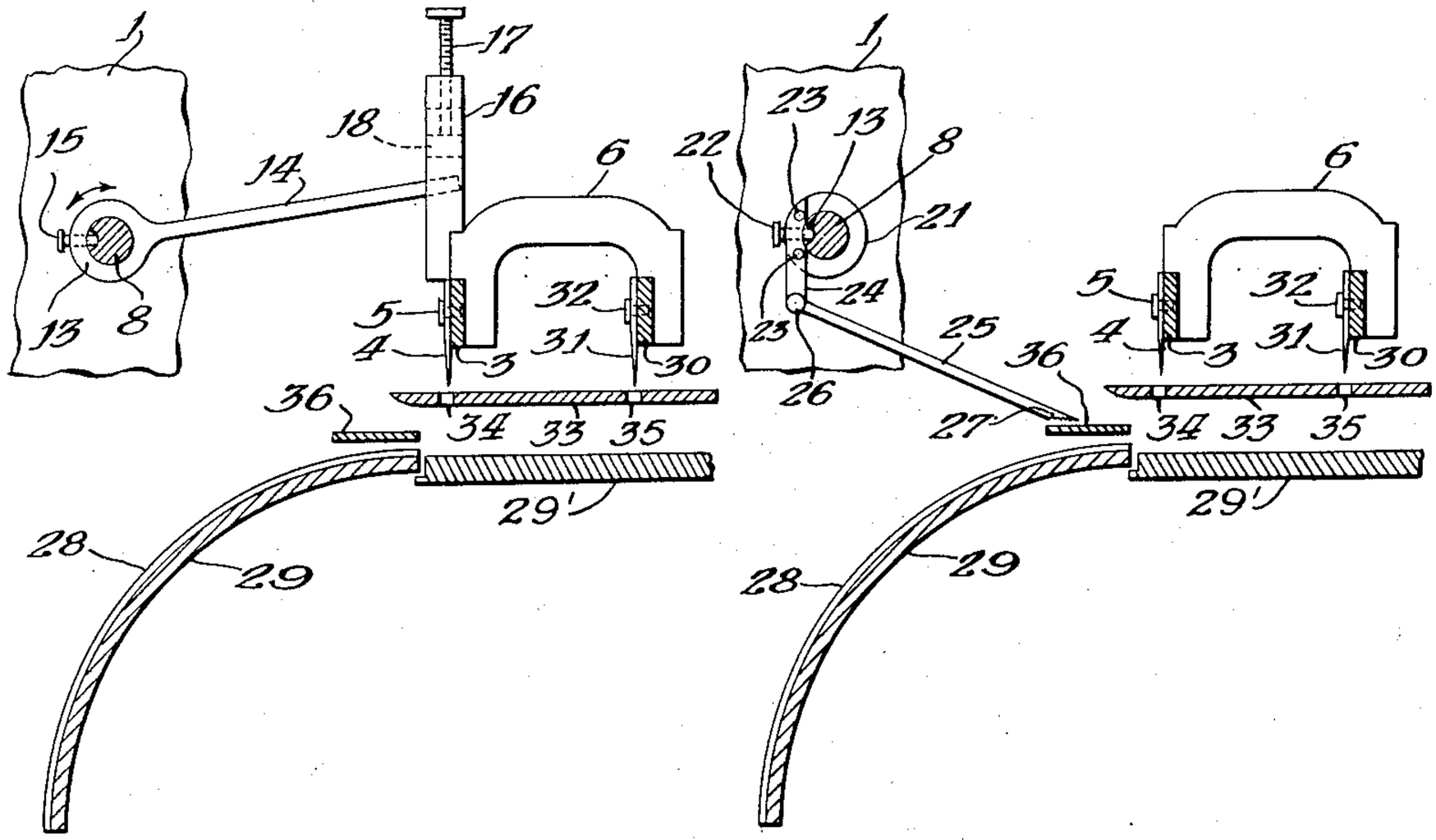

FIG. 3

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FIG. 4

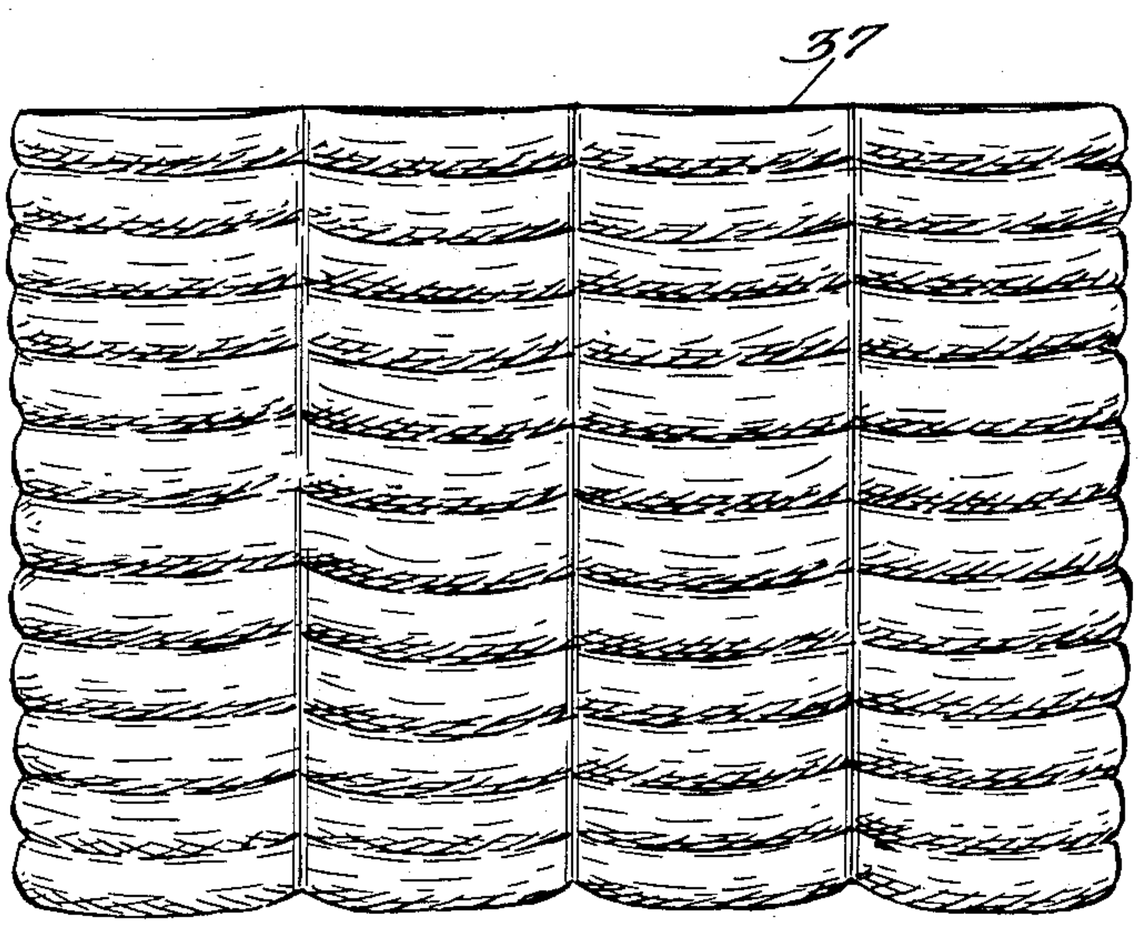
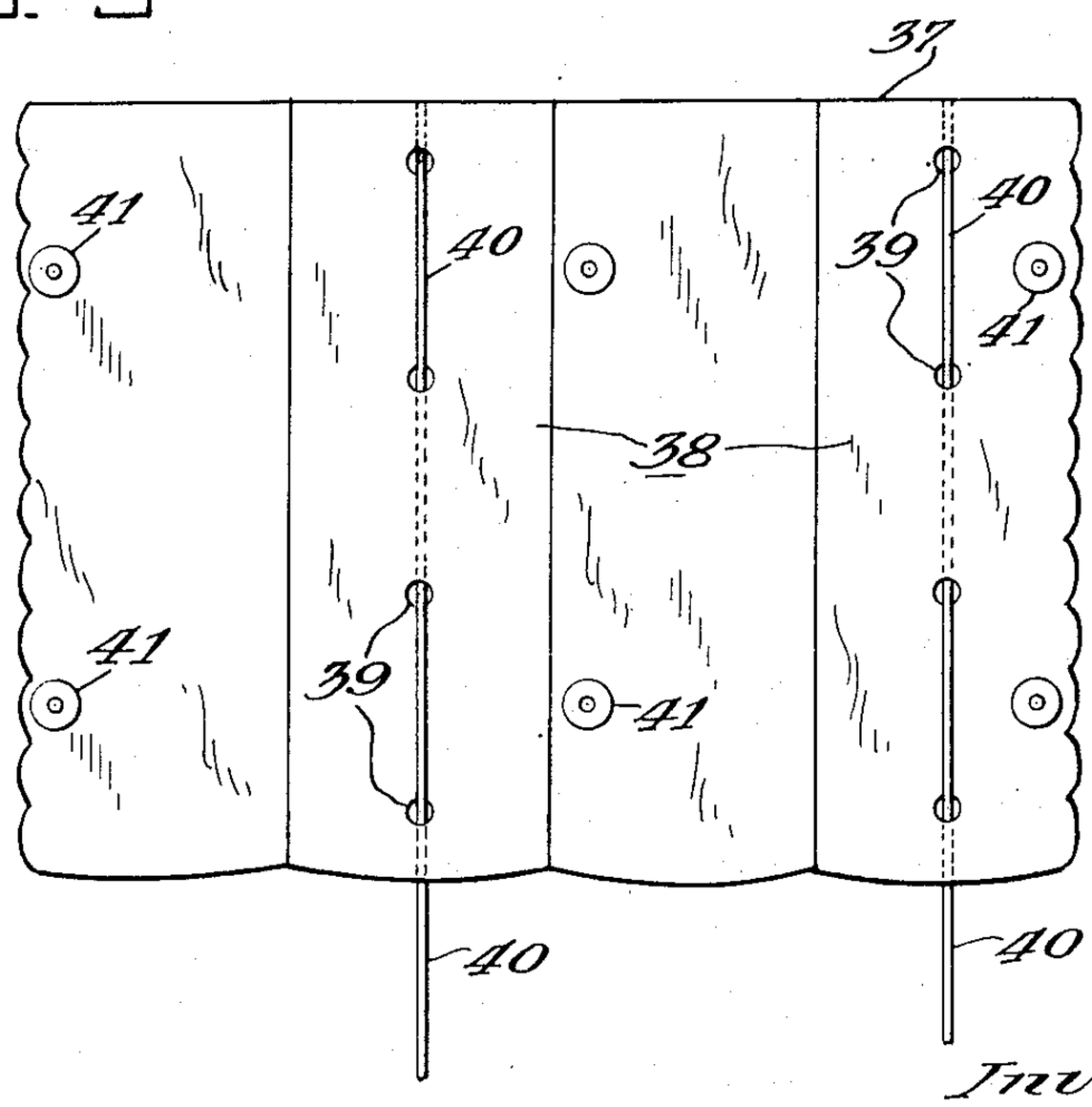


FIG. 5



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Patented Sept. 29, 1953

2,653,558

UNITED STATES PATENT OFFICE

2,653,558

RUFFLING MACHINE

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Application September 24, 1949, Serial No. 117,580

5 Claims. (Cl. 112—132)

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This invention relates to a ruffling machine and more particularly to a machine for ruffling or shirring fabrics. The machine of the present invention is particularly suitable for ruffling curtains, draperies and the like.

Ruffled curtains and draperies as at present manufactured requires a considerable amount of hand work and thus the cost thereof is high. The present invention offers a novel machine for accomplishing the ruffling operation mechanically, with a minimum of hand operations, and thereby considerably reduces the cost of manufacture.

In a preferred embodiment of the present invention, the ruffled curtain, drapery or the like will have draw strings at the back thereof and thereby can be raised or lowered as desired. In this manner the curtain can replace the more expensive Venetian blinds at present in use in many homes, offices, factories, etc. This is a novel curtain or drapery article of manufacture, produced by the novel machine of the present invention, and therefore is also being so claimed in the present application.

The novel construction of the present invention may be applied to any suitable multiple needle sewing or stitching machine and broadly comprises a rocking bar positioned in front of the needle rack. Means attached to said bar effect the rocking motion of the bar in response to the vertical motion of the needle rack, and said means are adjustable to control the extent of movement of said bar. Spaced along the length of said bar are means, including a serrated blade, to ruffle the fabric and hold the same in position until sewing or stitching thereof is accomplished. In a preferred embodiment, a double stitching machine, having a pair of needles positioned one behind the other, is employed, thereby producing a double stitched ruffled fabric.

In still another preferred embodiment, a tape material having openings therein for draw strings is simultaneously sewed on the back of the curtain, drapery or the like. Means are provided in the novel machine of the present invention to retain the tape in position while it is being fed to the needles. Other means are also provided to prevent the tape material from being ruffled during the sewing operation. Thus, the novel fabric will comprise a ruffled curtain, drapery or the like, with tape sewed on the back, the tape being extended and not ruffled. The tape will be stitched along its two edges by a pair of adjoining needles, the needles will clear

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the openings in the tape and leave them free for the draw strings. The draw strings may be inserted in the openings before, during or after the sewing operation as desired.

The invention is further described in connection with the accompanying drawings which illustrate a preferred embodiment of the invention.

Figure 1 is a front elevation of the pertinent portions of a multiple needle sewing machine and illustrates the novel ruffling construction attached thereto.

Figure 2 is a sectional view taken along lines 2—2 of Figure 1.

Figure 3 is a sectional view taken along lines 3—3 of Figure 1.

Figure 4 is a front view of a portion of the finished ruffled fabric.

Figure 5 is a back view of a portion of the finished ruffled fabric and illustrates the draw strings in position. This view also illustrates snaps positioned horizontally across the back of the fabric for use in the manner to be hereinafter set forth.

Like parts in the different figures of the drawings have been assigned the same reference numerals in order to simplify the description of the drawings.

Referring to Figure 1 of the drawings, only pertinent portions of a multiple needle sewing or stitching machine are shown. As hereinbefore set forth, the novel construction of the present invention may be applied to any suitable sewing or stitching machine and no novelty is being claimed herein for the sewing or stitching machine per se. Therefore, in the interest of simplicity, the remaining details of the sewing or stitching machine are omitted from the present description and drawings. These omitted details are well known and are adequately described in the prior art.

Referring again to Figure 1 of the drawings, the sewing machine comprises frame members 1 and 2. Needle rack 3 contains a multiplicity of needles 4 held in position by screws 5. Rack 3 is attached through yokes 6 to connecting rods 7 and thereby to suitable motivating means, not illustrated, whereby the necessary power is transmitted to rack 3 to effect the desired vertical movement thereof. The sewing machine will also contain suitable racks, not illustrated, to hold the spools of thread and also suitable cross pieces, not illustrated, to guide the thread from the spools to the needles, as well as the usual bobbins and related mechanism, not illustrated,

beneath the needles to complete the sewing operation.

An additional advantage to the machine sewed ruffled fabric of the present invention over the hand sewed fabric of the past is that the machine sewing provides a locked stitch which will not become completely unraveled should the thread tear. As is well known, hand sewing provides a continuous thread which may completely unravel in the event that the thread is torn.

In accordance with the present invention, a rocking bar 8 is provided in front of needle rack 3. In the case here illustrated, bar 8 is held in place at one end by means of bearing 9, which in turn is firmly attached to frame member 1 by means of screws 10. At the other end bar 8 is held in place by means of bearing 11 which in turn is firmly attached to frame member 2 by means of screws 12. Bar 8 is grooved through its length as indicated at 13. Positioned on bar 8 is lever 14 which includes a ring portion adapted to fit around bar 8 and to be firmly held thereto by screw 15 which enters into groove 13. Lever 14 at its other end is inserted into member 16 which is firmly attached to needle rack 3 and is raised and lowered in response to the movement of the needle rack. The movement of member 16 in turn raises and lowers lever 14 and thereby effects a rocking motion to bar 8. In the case here illustrated, member 16 comprises an inverted U having set screw 17 to which extended section 18 is attached. The extent of movement of lever 14 is adjusted by raising or lowering set screw 17 and this in turn determines the extent of the rocking motion of bar 8 which in turn determines the fullness of the ruffle.

Member 16, in the case here illustrated, is firmly attached by means of screws or bolts 19 to yoke 6, which also serves to stop the downward motion of lever 14 as is more clearly illustrated in Figure 2. Although only one arrangement of lever 14 and member 16 is illustrated in the drawing, it is understood that two or more of such arrangements may be employed and that they may be positioned on bar 8 and rack 3 as desired.

Referring again to Figure 1 of the drawings, positioned along bar 8 are a plurality of ruffling members 20. As more clearly shown in Figure 3, member 20 comprises a ring section 21 adapted by means of screw 22, which enters into groove 13, to be firmly attached to bar 8. Attached to ring 21 by means of screws or bolts 23 is arm 24 which, in turn, is attached to blade 25, preferably through hinge, spring or other suitable arrangement as indicated at 26 to permit blade member 25 to gather the fabric and hold it in position until the sewing operation is completed, after which blade 25 is free to swing back and then repeat the gathering procedure. For this purpose, blade 25 is preferably serrated at its tip as indicated at 27. When desired a blade 25 also may be attached to lever 14 and thereby serve the dual function of ruffling the fabric and transmitting the source of movement to bar 8.

Although the fabric may be fed by hand, a preferred method is to provide a mechanical arrangement to feed the fabric so that it is sufficiently loose for ruffle blade 25 to readily gather the fabric. This may be accomplished by a pulley arrangement, not shown, connected at one end to the roller, not shown, which pulls the finished fabric and at the other end to the roller feeding the fabric. This multiple pulley arrangement may be a belt or gear design and is set to move the feed roller sufficiently ahead of the puller roller to provide loose fabric for blade 25 to readily gather.

As hereinbefore set forth, in a preferred embodiment of the invention, a tape, having openings for draw strings, is sewed to the back of the fabric. In order to prevent the tape from slipping out of position, raised members 28 are provided on curved member 29. Raised members 28 will be provided in pairs and thereby will prevent the tape from moving horizontally out of line. A pair of raised members will be provided for each row of tape desired and will be positioned in a manner that adjoining needles will stitch the edges of the tape but will not sew the openings in the tape.

Referring to Figure 2 of the drawings, it will be noted, in the case here illustrated, that there are two sets of needles positioned one behind the other. Yoke 6 connects needle rack 3 with needle rack 30 in which needle 31 is held in place by screw 32. As hereinbefore set forth, the double needle construction is a preferred embodiment of the invention because it provides a stronger stitch. However, it is understood that the invention may also be used with a single row of needles.

Beneath needles 4 and 31 is a plate 33 which contains holes 34 and 35 in line with needles 4 and 31 respectively. Plate 33 is preferably bevelled upwardly at its left end in order to more easily receive the fabric being fed on plate 29 beneath plate 33 and on plate 29'. For the reason hereinbefore set forth, the bobbins and other mechanism positioned below plate 33 are omitted from the drawings.

In order to prevent ruffling of the tape material, plate 36 is provided above curved member 29. Thus, in operation, the fabric is fed on curved member 29 over plate 36 where the ruffling occurs, while the tape is fed beneath plate 36 and thereby does not become ruffled.

Figure 3 of the drawings has been described heretofore in connection with the description of Figure 1.

Figure 4 is a front view of a portion of fabric 37 and illustrates the ruffle construction. Preferably a weight, such as a rod or the like, not illustrated, is provided at the bottom of the fabric to prevent the fabric from curling upward.

Figure 5 is a back view of a portion of fabric 37 and illustrates tape material 38 having openings 39 through which strings or cords 40 are drawn. As hereinbefore set forth, strings 40 will permit raising or lowering the fabric and thereby will provide a curtain which may replace Venetian blinds. The spacing of tapes 38 horizontally across the curtain will depend upon the width of the curtain but, in any event, will be positioned along the vertical edges of the curtain.

When desired, snaps 41 may be sewed or stamped horizontally across the back of the curtain. This will permit ruffling the curtain horizontally and thereby will permit using a wide curtain on a narrow window. This may be accomplished, for example, by sewing or stamping female snaps on the back of the curtain and attaching adjoining male snaps to alternate or further removed female snaps. The male snaps may be attached to a strip or band. This will draw in the curtain horizontally and the extra material will tend to drop down and add length to the curtain.

I claim as my invention:

1. A ruffling machine comprising, in combination, a multiple needle arrangement, a horizontal

bar positioned in front of said needle arrangement, a collar firmly attached to said bar, a lever arm firmly attached to said collar, an inverted U-shaped member firmly attached to said multiple needle arrangement, a set screw adjustably attached to said inverted U-shaped member and regulating the free clearance therein, said lever arm extending into said inverted U-shaped member and alternately contacting the lower portion of said set screw and the contiguous portion of said multiple needle arrangement, whereby said lever arm moves in response to the vertical movement of said needle arrangement, and ruffling means attached to said horizontal bar and moving in response to a rocking movement of said bar.

2. The machine of claim 1 further characterised in that said bar is grooved along its length and said collar is firmly attached thereto by means of a screw passing through said collar and entering the groove in said bar.

3. The machine of claim 1 further characterised in that said bar is grooved along its length, a plurality of collars are firmly attached to said bar, each by means of a screw passing through the collar and entering the groove in said bar, an arm firmly attached to each of said collars, a serrated blade pivotally attached to each of said arms, whereby said serrated blades are alternately moved forward and backward.

4. A ruffling machine comprising, in combination, a multiple needle arrangement comprising a needle rack suitably connected to a source of power to exert a vertical motion to said needle rack, an inverted U-shaped member firmly attached to said rack, a set screw attached through the top of said U-shaped member and adapted to adjust the vertical clearance in said inverted U-shaped member, a rotatable grooved bar positioned in front of said rack, a collar firmly

attached to said bar, a lever arm firmly attached to said collar, said lever arm extending into said inverted U-shaped member and alternately contacting the lower portion of said set screw and the contiguous portion of said rack, whereby said lever arm moves in response to the vertical movement of said rack, thereby causing a rocking motion to said bar, a second collar firmly attached to said bar, an arm firmly attached to said second collar, a serrated blade pivotally attached to said arm, whereby said serrated blade is alternately moved forward and backward.

5. A ruffling machine comprising, in combination, a multiple needle arrangement including two rows of needles, one row being positioned parallel to and behind the other row, a horizontal bar positioned in front of said first row of needles, a lever arm firmly attached to said bar, an inverted U-shaped member firmly attached to said multiple needle arrangement, said U-shaped member including means to regulate the free clearance therein, said lever arm extending into said inverted U-shaped member and alternately contacting said means and said needle arrangement, whereby said lever arm moves in response to the vertical movement of said needle arrangement, and ruffling means attached to said horizontal bar and moving in response to a rocking motion of said bar.

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