

Jan. 30, 1962

J. A. ANDERSON ET AL

3,018,824

WINDOW SHADE FASTENING MEANS

Filed April 1, 1957

4 Sheets-Sheet 1

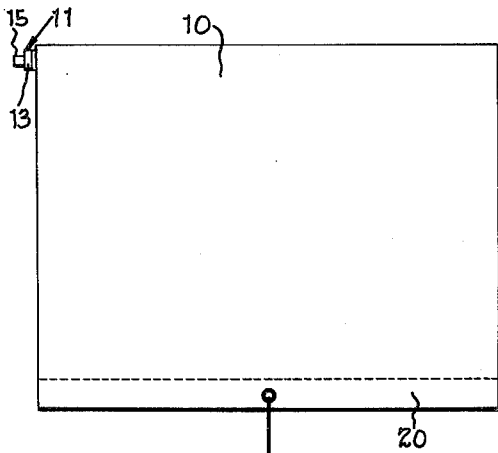


*Fig. 1*

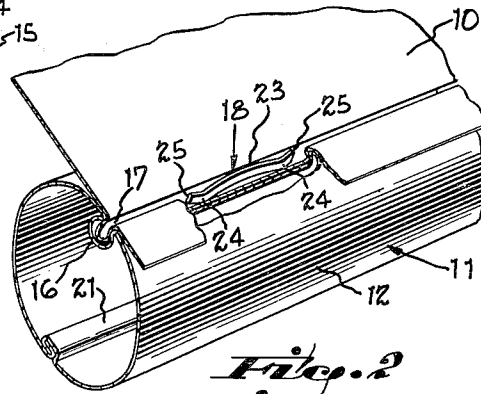


*Fig. 2*

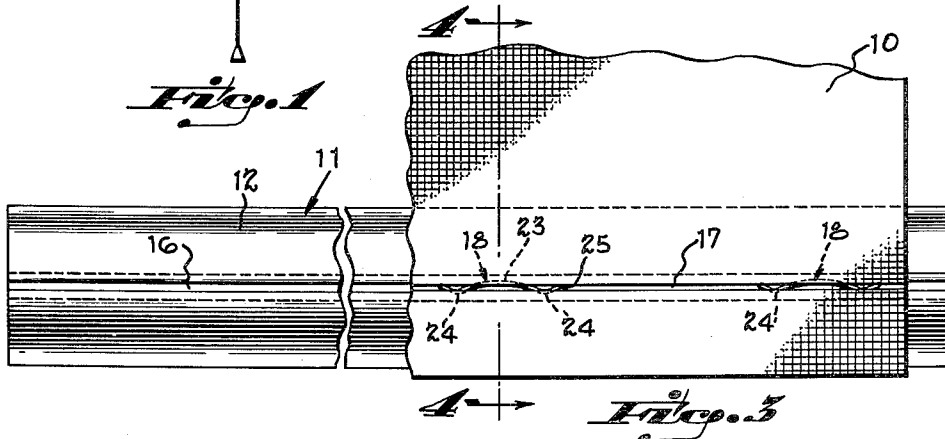


*Fig. 3*

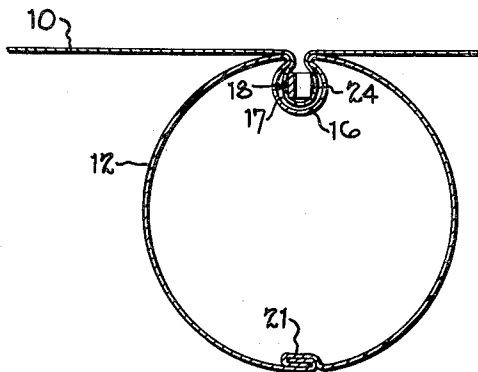


*Fig. 4*

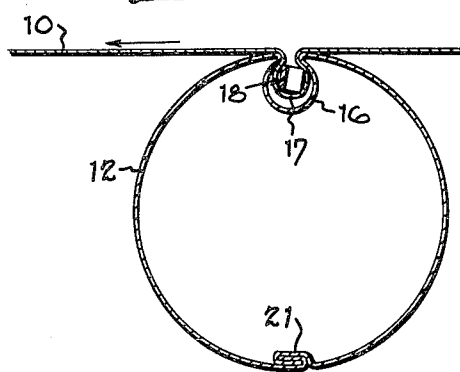


*Fig. 5*

INVENTORS.

James A. Anderson.  
Sterling S. Bushnell, Jr.  
Wood, Herron & Evans.  
ATTORNEYS.

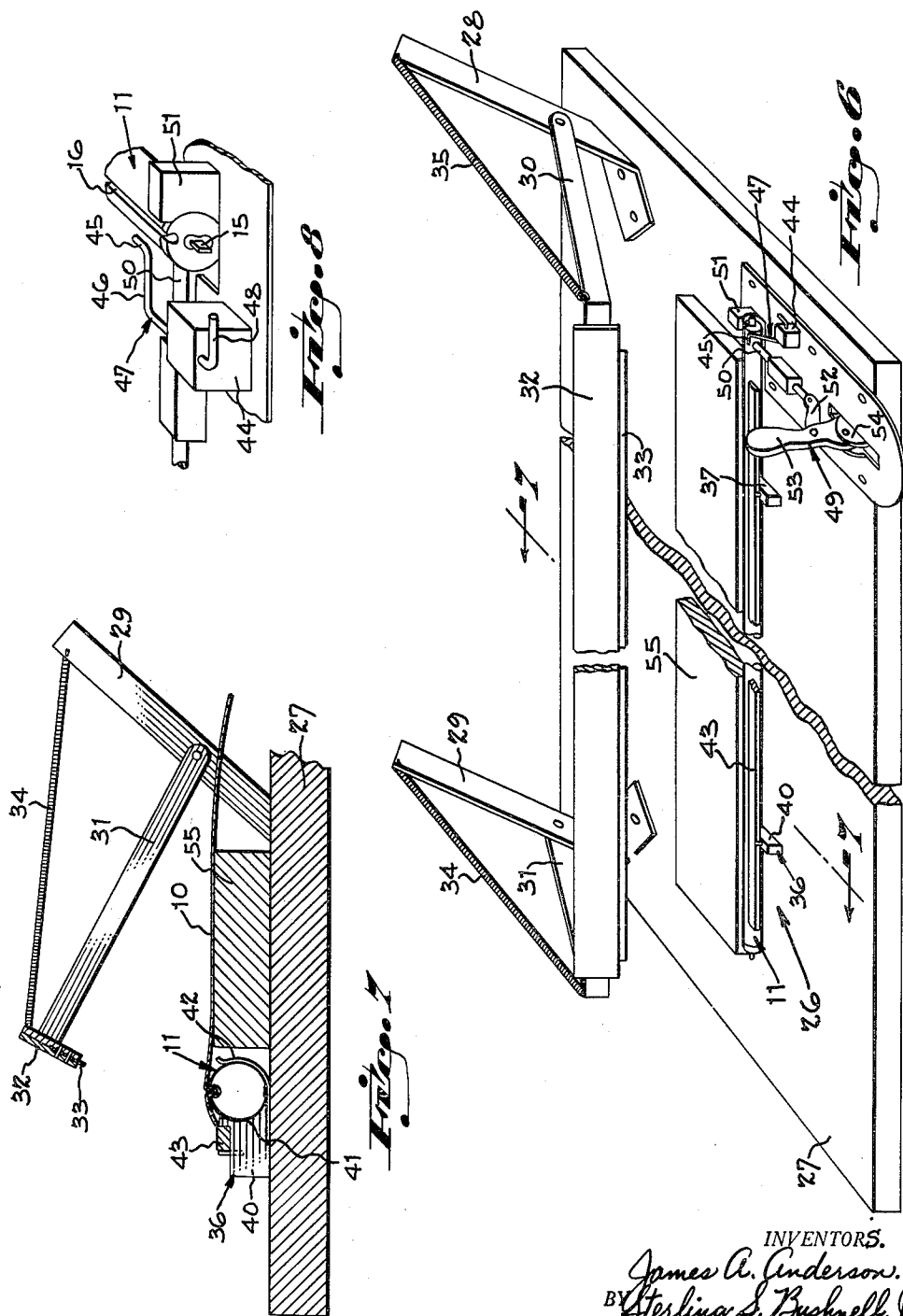
Jan. 30, 1962

J. A. ANDERSON ET AL  
WINDOW SHADE FASTENING MEANS

3,018,824

Filed April 1, 1957

4 Sheets-Sheet 2



INVENTORS.  
James A. Anderson.  
BY Sterling S. Bushnell, Jr.  
Wood, Herron & Evans.  
ATTORNEYS.

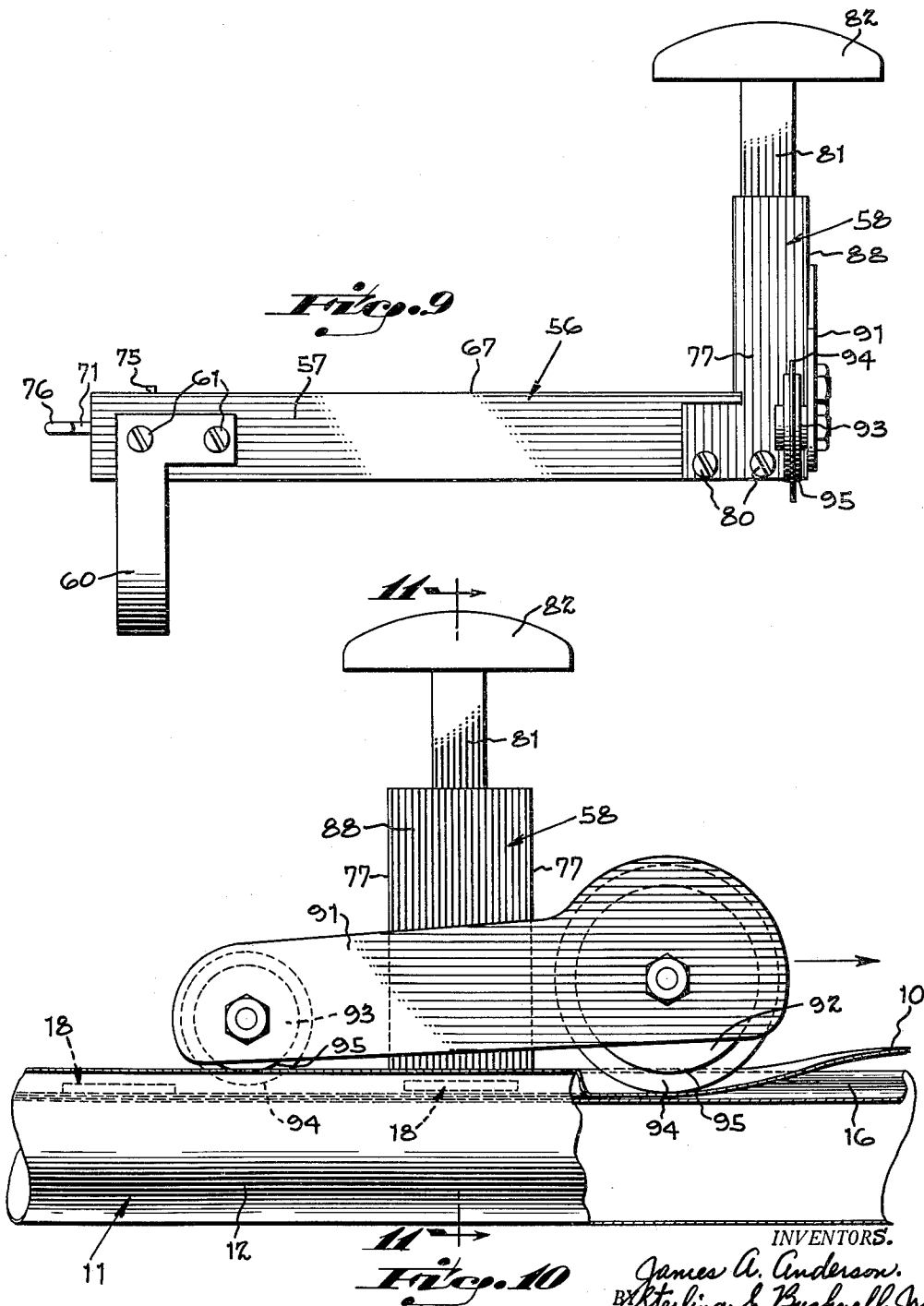
Jan. 30, 1962

J. A. ANDERSON ET AL  
WINDOW SHADE FASTENING MEANS

3,018,824

Filed April 1, 1957

4 Sheets-Sheet 3

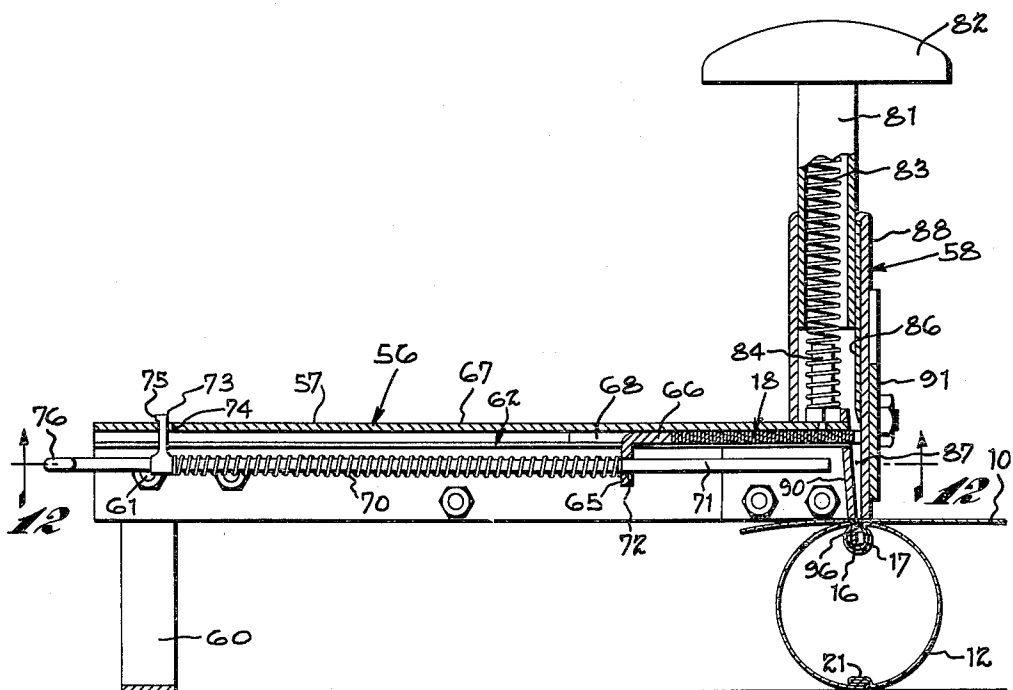
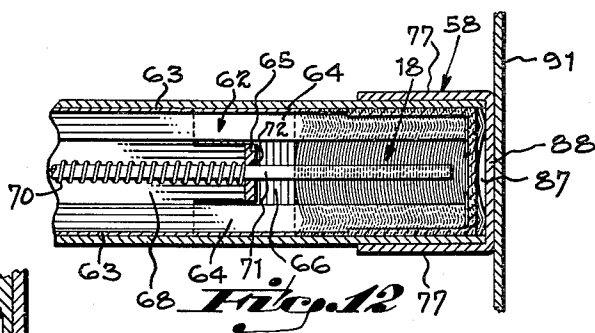
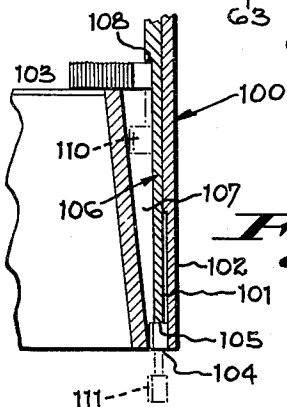


INVENTORS.  
James A. Anderson.  
BY Sterling S. Bushnell, Jr.  
Wood, Herron & Evans.  
ATTORNEYS.

J. A. ANDERSON ET AL  
WINDOW SHADE FASTENING MEANS

# WINDOW SHADE FASTENING MEANS

4 Sheets-Sheet 4



**INVENTORS.**

James A. Anderson.  
BY Sterling S. Bushnell, Jr.  
Wood, Heiron & Evans.  
ATTORNEYS.

1

3,018,824

## WINDOW SHADE FASTENING MEANS

James A. Anderson and Sterling S. Bushnell, Jr., Muskegon, Mich., assignors to Breneman-Hartshorn, Inc., Cincinnati, Ohio, a corporation of Ohio  
Filed Apr. 1, 1957, Ser. No. 649,813  
2 Claims. (Cl. 160—394)

This invention relates to window shades and is particularly directed to means for fastening window shades to shade rollers.

It is a primary object of the present invention to provide means for readily and economically fastening a window shade to a shade roller. In brief, the invention contemplates the provision of a roller having an undercut longitudinal groove adapted to receive a fold of shade material and a plurality of expansible fastener elements inserted within the folded edge of the curtain. The fastener elements are of a reverse bend configuration and when in a relaxed or expanded condition are substantially wider than the mouth of the groove so that the fastening elements clamp the folded shade material beneath the undercut groove and prevent radial withdrawal of the material.

More particularly, it is a concept of the present invention to provide a shade attaching clip formed from a flat strip of resilient material, such as spring steel. This strip is bent to form a central bowed portion and two reversely bent endwise portions. In accordance with the present invention, the strip is wider than the constricted portion of the roller groove and includes four sharp corners formed on the ends of the reversely bent endwise segments.

These clips are adapted to be inserted into an undercut roller groove by compressing the clip to a width less than the constricted opening in the groove and then forcing the clip radially inwardly into the enlarged portion of the groove where the clip expands behind the undercut walls. When assembling a shade and roller using the present clips, a transverse crease or fold of the shade material is forced into the roller groove; and thereafter a plurality of clips are driven radially into the groove at spaced intervals.

The present clips are somewhat smaller than the enlarged portions of the groove and hence are rotatable within the groove. This contributes to a unique and extremely effective clamping action on the shade material to prevent radial withdrawal of the shade material even when the shade is placed under substantial tension. More particularly, when the shade is pulled, the relatively sharp corners at the ends of the clips tend to bite into the shade cloth, or at least, provide points of high local pressure. These points serve as pivot or fulcrum points about which the clips rotate in response to the turning movement applied to the reverse bends of the clips. Rotation of the clips brings the wide dimension of the strips across the groove constriction so that the shade is positively locked in place by a mechanical lock independent of the resilient bends in the clips.

The present clip configuration is also advantageous since it permits ready replacement of the shade upon a roller. It will be readily be appreciated that the roller represents a substantial portion of the cost of a window shade and that rollers are very durable and can be used for indefinite periods, while the flexible shade material is much more apt to become soiled, torn, or otherwise damaged. Consequently, it is common practice when a window shade becomes unsightly to remove the window shade material from the roller and replace it with a new length of material. This can readily be accomplished with the present shade construction by merely sliding the

2

old shade longitudinally of the roller to withdraw the shade crease and clips from the undercut groove. Thereafter, the crease of a new strip of shade material is placed in the groove and clips inserted as described above.

Another important advantage of the present clip is that it can readily be inserted in a roller groove by means of a simple, inexpensive driving tool. By the use of such a tool, all of the clips used to secure a shade can be inserted in the roller in just a few seconds; thereby, greatly reducing the cost of window shade units over those in which conventional fastening means are employed.

It is a collateral object of the present invention to provide apparatus for mechanically creasing shade material and inserting it within a roller groove; and apparatus for inserting clips within the groove, whereby, the time required to assemble a shade and roller is minimized.

More particularly, a shade creasing device of the present invention includes brackets for releasably holding an empty roller, a registering device including a movable finger adapted to be brought into engagement with the roller groove when the roller is properly oriented, and a blade-like member adapted to engage shade material placed over the roller groove and force it radially into the groove.

The clip driver of the present invention includes a chamber or magazine adapted to hold a plurality of clips and a plunger carrying a blade adapted to engage the endmost clip and force it outwardly through a tapered passageway in which the clip is compressed to a width less than the width of the slot. The plunger blade is further adapted to pass outwardly beyond the clip driving housing to force the clip into the roller groove.

The clip driving tool further includes two spaced wheels mounted on either side of the plunger blade. Each of these wheels includes a radially extending flange adapted to pass into the roller groove and flanges adapted to track upon the periphery of the roller. These wheels thus perform the double function of supporting the clip driving tool in proper alignment with the roller groove, and simultaneously, holding the shade material within the groove. Furthermore, in small shops where the cost of a separate creasing tool is not justified, the clip driving tool can initially be shifted along the roller so that the wheels function to crease the shade material and force it into the groove preparatory to the insertion of clips.

These and other objects and advantages of the present invention will be more readily apparent from a consideration of the following detailed description of the drawings illustrating a preferred embodiment of the invention.

In the drawings:

FIGURE 1 is a front elevational view of a window shade and roller secured together in accordance with the present invention;

FIGURE 2 is a partial perspective view of a shade and roller, a portion of the shade and roller being broken away to show details of a spring clip;

FIGURE 3 is a partial elevational view of the shade and roller of FIGURE 1 showing details of the roller groove and clips;

FIGURE 4 is a cross-sectional view taken along line 4—4 of FIGURE 3;

FIGURE 5 is a cross-sectional view similar to FIGURE 4 showing the pivotal movement of a spring clip when the shade is placed under tension;

FIGURE 6 is a perspective view of a preferred form of a shade creasing mechanism;

FIGURE 7 is a cross-sectional view taken along line 7—7 of FIGURE 6;

FIGURE 8 is an enlarged perspective view of the roller groove aligning device of the shade creasing apparatus;

FIGURE 9 is a side elevational view of the clip driving apparatus;

FIGURE 10 is an elevational view partially broken away showing the manner in which the clip driver engages a shade and roller;

FIGURE 11 is a cross-sectional view taken along line 11—11 of FIGURE 10;

FIGURE 12 is a cross-sectional view taken along line 12—12 of FIGURE 11; and,

FIGURE 13 is a partial cross-sectional view, similar to FIGURE 11 of a modified form of clip driver.

One preferred form of window shade 10 and roller 11 constructed in accordance with the present invention are shown in FIGURES 1-5. As there shown, roller 11 includes a generally cylindrical main body section 12, the outer ends of which carry heads 13 and 14 having outwardly extending shafts 15 adapted to be received in conventional wall brackets. The roller further carries a suitable spring actuated rotating means mounted within body portion 12. The construction of heads 13 and 14 and the spring actuated rotating means constitutes no part of the present invention; consequently, these elements are not disclosed in detail. Main body section 12 of roller 11 is provided with a longitudinally extending undercut groove 16 adapted to receive a transverse fold 17 of shade 10, the shade material being secured in the groove by means of expansible clips 18 as explained below. It is to be understood that shade 10 can be formed of any suitable material, such as cloth, paper, or plastic and that the shade preferably includes a pocket 20 formed adjacent to the lower edge of the shade for receiving a stiffening slat (not shown).

More particularly, roller body 12 is preferably formed of sheet metal which is bent in substantially tubular shape, the longitudinal edges of the sheet metal body being joined together as at 21 by any suitable form of lock seam. Roller body 12 is also bent to form longitudinal undercut groove or dovetail slot 16 having a narrow portion adjacent to the periphery of the roller. Shade 10, carried by the roller is of generally rectangular configuration and is adapted to be wound about the roller 11 in a conventional manner. The manner in which shade 10 is joined to roller 11 is best shown in FIGURES 2-5. As there shown, the upper portion of the shade is creased to form a transverse fold or small loop 17 which is inserted in longitudinal groove 16 of the roller.

The fold 17 is held firmly within the groove by means of a plurality of expansible fastening members, or clips, 18 inserted within the loop 17 and groove 16. The clips are effective to hold the shade fold against radial removal by their engagement with the undercut portions of the longitudinal groove. As best shown in FIGURE 2, each of the clips 18 is formed of a strip of resilient material, such as spring steel; the strip preferably being slightly wider than the mouth, or constricted portion of groove 16. Each of the clips 18 is configured to form a central bowed portion 23 and two reversely bent, short endwise portions 24. When in its relaxed or expanded state, the clip is wider than the mouth of groove 16 so that, as best shown in FIGURE 3, central bowed portion 23 is adapted to engage the undercut portion on one side of the groove while reverse bends 24 are adapted to engage the undercut portion on the opposite side of the groove. As explained in detail below, the clips are inserted radially of the groove by compressing each clip until it is appreciably narrower than the constricted portion of the slot and can readily be forced into the slot where it is released and springs back to its natural double bowed shape as shown in FIGURE 3. The number of clips used to hold a shade and the exact longitudinal spacing of the clips along the grooves is not critical. We have found that clips spaced from two to six inches from one another provide a firm securance between the shade and roller.

In the preferred embodiment of the clip, ends 25 are cut straight across, that is, at right angles to the length of the clip. Four sharp corners are thus formed on each

end of the clip which greatly enhance the restraining action of the clips. More particularly, as shown in FIGURES 2-4, when a clip is inserted in fold 17 and no appreciable tension is applied to the shade, the clip resides in a generally radial plane; and since the groove is of greater cross-sectional size and the clip, the fold or pocket 17 is not forced against the side walls of the groove 16 as shown in FIGURE 4. However, when the shade is pulled, the shade material on one side of loop 17 tends to pull bow 23 toward the mouth of the slot. Simultaneously, the two outer corners of the clip are forced against the opposite undercut edge of the groove, while the two lower edges of the clip tend to become embedded in the material and an appreciable turning moment is applied to the clip causing it to rotate in a clockwise direction as shown in FIGURE 5. If sufficient pulling force is applied to the shade, the clip will rotate to a position in which the width of the clip lies across the slot and an absolute mechanical lock due to the width of the strip and independent of any bending of the clip is provided.

While the present clips effectively prevent radial withdrawal of the shade, they do permit ready disengagement of the shade by longitudinal movement in the event that it should become desirable to replace the shade. That is, since the roller and spring mechanism constitute a substantial portion of the cost of a complete window shade unit, it is a common practice when the shade material becomes soiled, torn, or otherwise damaged to remove the shade material from the roller and replace it with a new strip of material. In the present shade construction, this is quickly and easily accomplished by sliding the old shade longitudinally of the roller to withdraw fold 17 and clips 18 from the undercut groove. Thereafter, the fold of a new strip of shade material is inserted in the groove and a plurality of clips are driven in place.

One preferred form of shade creasing device 26 for mechanically inserting a fold 17 of material in undercut groove 16 is shown in FIGURES 6, 7 and 8. As there shown, shade creaser 26 comprises a base or table 27 supporting spaced upstanding brackets 28 and 29. These brackets, in turn, carry pivotal arms 30 and 31 which support an elongated creaser bar 32 having a depending blade 33 adapted to enter longitudinal groove 16 of a roller. Tension springs 34 and 35 respectively interconnect brackets 28 and 29 and arms 30 and 31 for spring urging creaser bar 32 upwardly to the position shown in FIGURES 6 and 7.

Table 27 also carries a roller aligning clamp 36 adapted to receive a roller 11. As best shown in FIGURE 7, this aligning clamp includes a bar 40 having arcuate face 41 adapted to engage the surface of roller 11. The clamp also includes a curved spring arm 42 spaced from face 41 of bar 40 and adapted to embrace the opposite side of roller 11 to clamp the roller against face 41. A cloth gage bar 43 is bolted or otherwise mounted on clamping bar 40 and on block 37. This bar extends longitudinally of roller 11 and provides means for readily determining when the upper edge of the window shade material is correctly positioned relative to the roller.

In addition to these members, creasing device 26 includes a groove registering device for automatically locating the groove of the roller so that it will receive blade 33 when an operator pivots creaser bar 32 downwardly. One preferred form of registering mechanism, as shown in FIGURES 6 and 8, includes a block 44 mounted upon base 27. This block rotatably supports a locating finger 45 formed on arm 46 of a rod 47. Rod 47 is journaled in block 44 and includes a handle 48 for rotating the rod to swing finger 45 into and out of engagement with roller groove 16.

Base 27 also carries a releasable clamping mechanism, such as toggle clamp 49 effective to hold roller 11 in position after it has been properly oriented. In the embodiment shown, this clamp includes a retractable arm 50 adapted to clamp roller 11 against a fixed arcuate jaw

5

member 51. Arm 50 is connected through link 52 to handle 53 pivotally mounted upon brackets 54.

In operation, an operator first places an empty roller 11 in clamps 36 and 37. The operator then rotates finger 45 downwardly by turning handle 48, and rotates roller 11 within the clamps until finger 45 is brought into registry with groove 16. He then shifts handle 53 to lock the roller in position. Thereafter the operator grasps the end of a cut length of shade material from a stack of cut and hemmed shade cloths (not shown) placed behind the creaser bar; the operator then pulls this edge of the material over the support block 55, and across the top of the roller, until the edge of the strip lies along the cloth gage bar 43. Finally, the operator presses on bar 32 to rotate the bar downwardly so that blade 33 engages the cloth and forces it into groove 16. Thereafter, bar 32 is pivoted upwardly, the cloth remaining in the groove in condition to receive clips 18.

It will be appreciated that the creasing apparatus shown is susceptible of many modifications without departing from the general principles of construction. Thus, for example, while the specific registering device shown includes a rotatably mounted locating finger, it is contemplated that the locating finger can be mounted for longitudinal sliding movement into and out of the roller groove if desired. Similarly, while in the embodiment shown, bar 32 is hand operated, power means such as an air cylinder or an electric solenoid can be provided for operating this bar if desired.

A preferred form of a clip driving device 56 is shown in FIGURES 9-12. This device is effective to compress a clip 18 so that the clip can be inserted radially through the constricted portion of slot 17 and introduced into the creased shade material within the slot. Clip driver 56 includes a channel shaped casing, or outer track member 57, carrying an upright body member 58 adjacent to its forward end and a depending supporting foot 60 adjacent to its rear end. In the embodiment shown, the supporting foot is constituted by a generally U shaped strip bolted to the sides of channel member 57 by means of bolts 61.

Housing member 57 also carries inner tracks 62. These tracks are preferably formed of sheet metal strips bent at right angles to form a first wall section 63 lying against the inner surface of a wall of housing member 57 and an inwardly extending flange portion 64. The flange portions of the two inner track members are spaced from one another to accommodate depending arm 65 of pusher plate 66, this plate being of generally U shaped configuration and being mounted for sliding movement between the inner rail flanges 64 and housing member 57. This space between flanges 64 of the inner rails and top wall 67 of casing 57 constitutes a clamp receiving chamber or magazine 68 adapted to store a plurality of clips 18, the clips extending transversely across the chamber with the arcuate center portions 23 of the clips being disposed toward the front end of the driver. Pusher plate 66 abuts the end clip and is urged by means of a spring 70 against the clips to keep them compacted against one another. As best shown in FIGURE 11, spring 70 is wound about pusher rod 71 which passes through an aperture 72 formed in depending arm 65. The spring is compressed between this arm and an upwardly extending finger 73 carried by the pusher arm and adapted to pass upwardly through an aperture 74 formed in wall 67 of casing 57. Finger 73 is provided with a lip 75 for preventing accidental dislodgement of the finger. The outer end of rod 71 is configured to form a handle 76 for manipulating the rod and withdrawing it when the driver is to be reloaded with clips.

Upright body member 58 is generally of rectangular cross-section and includes two flanges 77 which embrace housing member 57, these flanges being secured to the housing member by means of bolts 80. A post or plunger member 81 of square cross-section is reciprocally mounted within the upright body member 58, the post carrying a

6

handle 82 mounted on the upper end of the post. A compression spring 83 is mounted within the post and is compressed between handle 82 and a stud 84 secured in any suitable manner to wall 67 of casing 57. Plunger 81 also carries a depending pusher blade 86 disposed for vertical movement within upright body member 58. As best shown in FIGURE 11, when handle 82 is depressed to press plunger 81 downwardly, pusher blade 86 engages the endmost clip and forces the clip downwardly through a gradually narrowing chamber 87 formed between front wall 88 of the upright body and a downwardly slanting guide plate 90 mounted within the forward wall of casing 57.

A cross arm 91 is bolted or otherwise secured to front wall 88 of the vertical body member. This cross arm rotatably supports spaced wheels 92 and 93 adapted to track in a groove 18 of a roller 11. Each of the wheels 92 and 93 includes a radially extending marginal flange 94 adapted to enter groove 16 and press the shade material toward the bottom of the groove. Each of the rollers also includes shoulders 95 adapted to track upon the wall of the roller adjacent to the groove. When the shade material has been inserted into the roller as by means of the device shown in FIGURE 6, the spaced wheels on opposite sides of clip discharge opening 96 not only support the opening in proper alignment with groove 16, but also function to hold the shade material firmly within the groove. As handle 82 is depressed, blade 86 engages the forwardmost clip 18 and forces that clip downwardly between guide plate 90 and the front wall of casing 57. The width of the passageway between these members gradually decreases until at discharge opening 96 the clip is compressed, or straightened, to a width substantially narrower than the constriction in groove 16. As handle 82 is depressed still further, pusher blade 86 extends downwardly through the discharge opening and forces clip 18 into groove 16 of the roller. After it has been inserted in the groove, clip 18 springs outwardly beneath the undercut lips of the groove to hold the shade material in place.

However, in the event that the present fastening means is to be used in a very small shop in which the cost of a separate creasing tool is not warranted, the present clip driver is additionally adapted to perform the creasing function as well as the clip inserting function. When the tool is used in this manner, the roller is placed upon a table or other supporting surface with roller groove 16 facing upwardly and a suitable length of shade material aligned with the roller and extending across groove 16. Wheels 92 and 93 are then placed over the groove and handle 82 is pressed downwardly to force the shade material into the groove. As the clip driving tool is shifted longitudinally of the roll, the operator periodically presses an additional amount to eject a clip through opening 96 into the fold of material previously forced into the roller groove by wheel 92.

From the foregoing discussion of the general principles of the present invention and the above detailed description of a preferred embodiment, those skilled in the art will readily comprehend various modifications to which the invention is susceptible. Thus for example, the clip driver can be modified as shown in FIGURE 13. It is to be understood that the modified clip driver there shown includes all of the elements of the clip driver shown in FIGURES 9-12.

However, modified clip driver 100 differs in two respects from the clip driver described above. In the first place, the modified driver 100 includes an undercut portion 101 formed on front plate 102. This undercut or recessed portion extends approximately half way between the staple magazine 103 and the constricted mouth 104 of the discharge passageway. The depth of this undercut portion is of the order of .01", and is such that the lower or driving edge 105 of blade 106 engages a clip along a line closely adjacent to the major axis of the clip when

compressed. This is highly advantageous since it increases the effectiveness of the blade's driving action on the clip.

A second feature of the modified clip driver 100 shown in FIGURE 13 is the configuration of the blade 106 which provides a more positive feed of clips from the magazine 103 through the discharge chute 107. This modified blade also includes a heavier driving edge which contributes to the durability of the device. Specifically, blade 106 includes a downwardly facing shoulder 108 disposed toward the clip receiving magazine 103. The blade also includes a driving edge 105 extending across the lower edge of the blade; this driving edge is appreciably wider than the driving edge of the clip driving tool shown in FIGURES 9-12.

The modified form of blade provides for a two-step operation in driving each clip. That is, when the plunger is depressed, shoulder 108 is brought into engagement with the end-most clip in the magazine and forces that clip downwardly into the discharge passageway as shown at 110 in FIGURE 13. Simultaneously, the driving edge 105 of the blade engages the clip, forces it into the discharge passageway on the previous actuation of the plunger and forces that clip through the passageway and through restricted opening 104 to the position shown at 111.

When the plunger is retracted under the force of the plunger spring, blade 106 moves upwardly past the clip shown at 110 so that on the next successive depression of the plunger, the driving edge 105 contacts that clip and forces it downwardly through the tapered discharge passageway in which the clip is compressed before it is ejected through the restricted opening 104.

Having described our invention we claim:

1. The combination of a roller having a body portion configuration to form a longitudinal undercut groove, said groove having a narrow portion adjacent to the periphery of said roller and an enlarged portion disposed inwardly of said periphery, a strip of shade material, said strip of shade material having a fold disposed within said groove, and a plurality of fastening clips disposed within said folded material interiorly of said groove, each of said clips comprising a flat strip of resilient material, the width of said flat strip being greater than the narrow portion of said groove, said strip including bent portions

adapted to extend across said groove, the cross-sectional dimensions of each of said clips being smaller than the enlarged portion of said groove, whereby when force is applied to said shade material said clips are rotated within said groove to bring the width dimension of said clips across the narrow portion of said groove to provide a mechanical lock effective to prevent outward withdrawal of said shade material from said groove.

2. The combination of a roller having a body portion configuration to form a longitudinal undercut groove, said groove having a narrow portion adjacent to the periphery of said roller and an enlarged portion disposed inwardly of said periphery, a strip of shade material, said strip of shade material having a fold disposed within said groove, and a plurality of fastening clips disposed within said folded material interiorly of said groove, each of said clips comprising a flat strip of resilient material, the width of said strip being wider than the narrow portion of said groove, said strip including a central bowed portion and two reversely bent endwise portions, said clip further including sharp corners formed on said endwise portions, the cross-sectional dimensions of each of said clips being smaller than the enlarged portion of said groove, whereby when force is applied to said shade material said clips are rotated within said groove to bring the width dimension of said clips across the narrow portion of said groove to provide a mechanical lock effective to prevent outward withdrawal of said shade material from said groove.

#### References Cited in the file of this patent

##### UNITED STATES PATENTS

|           |                 |               |
|-----------|-----------------|---------------|
| 378,090   | Greenman        | Feb. 21, 1888 |
| 783,759   | Record          | Feb. 28, 1905 |
| 1,013,531 | Carmeny         | Jan. 2, 1912  |
| 1,077,154 | Mullaney et al. | Oct. 28, 1913 |
| 1,202,287 | Hartshorn       | Oct. 24, 1916 |
| 1,302,280 | Batchelder      | Apr. 29, 1919 |
| 1,352,372 | Kessler         | Sept. 7, 1920 |
| 1,499,821 | Griffiths       | July 1, 1924  |
| 2,305,375 | Beasley et al.  | Dec. 15, 1942 |
| 2,334,240 | Brockhouse      | Nov. 16, 1943 |
| 2,362,185 | Brammer         | Nov. 7, 1944  |
| 2,716,804 | Johnson         | Sept. 6, 1955 |