

F. F. WRIGHT & H. G. CRISWELL.
MACHINE FOR MAKING WINDOW SHADES.

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992,323.

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Fig. 1.

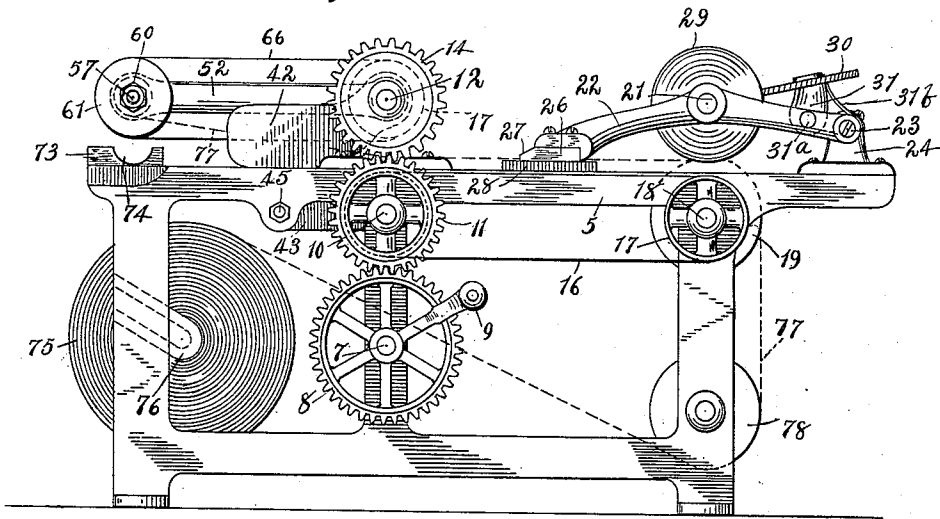


Fig. 2.

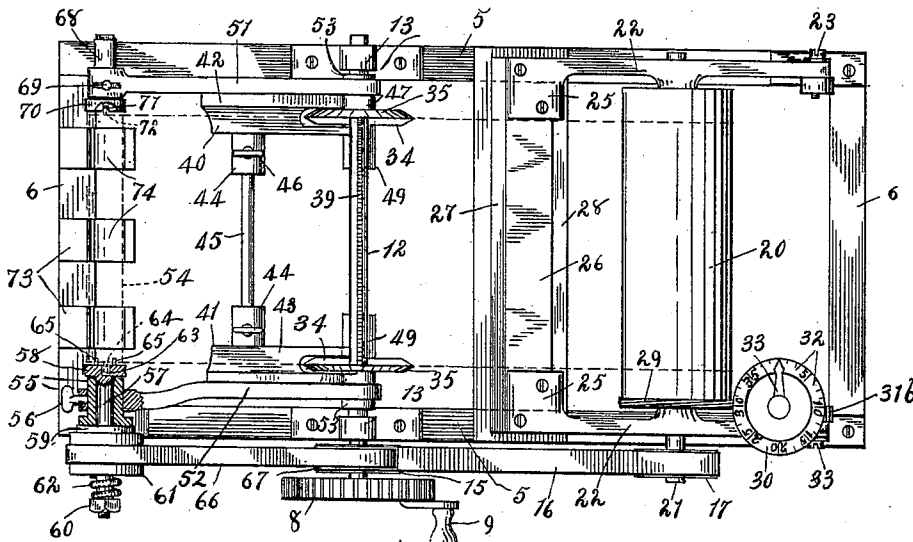
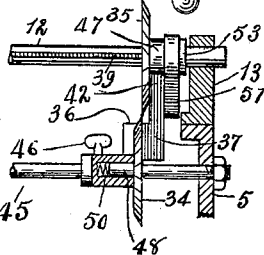


Fig. 3.



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UNITED STATES PATENT OFFICE.

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MACHINE FOR MAKING WINDOW-SHADES.

992,323.

Specification of Letters Patent.

Patented May 16, 1911.

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To all whom it may concern:

Be it known that we, FRANK F. WRIGHT and HARRY G. CRISWELL, citizens of the United States, residing at Aurora, in the county of Kane and State of Illinois, have invented certain new and useful Improvements in Machines for Making Window-Shades, of which the following is a specification.

Our invention relates to the manufacture of window shades and has particular reference to apparatus designed to facilitate the application of shade material to the supporting roller.

The chief objects of the improvements which constitute the subject matter of this application for patent are:—to produce a simple and efficient apparatus to aid in attaching window shade material to a roller; to provide an indicator whereby any particular length of cloth required for a shade may be quickly and accurately determined, and conveniently severed from the supply roll; to furnish cutters so arranged that the margins of the shade will be automatically trimmed to produce a shade of the required width, and to arrange devices to facilitate the turning of the hem.

Further objects, stated more in detail, are:—to furnish means for facilitating the tacking of the shade cloth to a shade roller; to provide means for rotating the shade roller to wind the shade thereon, said rotating means having a friction gear introduced therein to compensate for inequalities in the relative rotary movements of the co-acting mechanisms, and to supply means whereby the indicator used for measuring the length of cloth passed through the feed rollers may be temporarily disengaged from the operative gearing for resetting.

We accomplish the desired results by means of the apparatus illustrated in the accompanying drawing which forms a part of this application, the details of construction being disclosed in the following views.

Figure 1 is a side elevation of our improved machine for making shades with a supply of shade material shown in operative position, the course of the web being indicated by a dotted line; Fig. 2 is a top plan view of the machine with the supply roll removed, the relation of the web of cloth to be operated upon being indicated in dotted outlines, and Fig. 3 is a fragmentary view

showing the right hand pair of cutters and their carriage in rear elevation.

Referring to the details of the drawing, the numeral 5 indicates the sides and 6 the cross pieces of a rectangular frame, upon which is transversely mounted a main or driving shaft 7. One end of this shaft projects outside the frame and carries a drive gear wheel 8, and a crank 9, for manually operating the machine. Directly above the main shaft is a counter shaft 10, journaled in the side members 5 of the frame, and carrying a pinion 11, which meshes with the drive gear 8, the said pinion being smaller in diameter than the drive gear to give an increased speed. Immediately above the shafts 7 and 10 is a third shaft 12, also extending transversely to the machine, and journaled in brackets 13, mounted upon the upper margins of the frame sides. One end of the said shaft 12 has keyed thereon a pinion 14, of the same size as the said pinion 11 and meshing therewith.

Upon the shaft 10, between the pinion 11 and the frame, is mounted a pulley 15, connected by a belt 16 to a similar pulley 17, mounted upon the end of a transverse shaft 18, located near the rear end of the machine and at the same height as the shaft 10. The shaft 18 carries a lower feed roller 19, which extends entirely across the frame between the sides. Directly above this roller is an upper coöperating feed roller 20, mounted upon a shaft 21, having its ends journaled in rock-arms 22 arranged above each side frame member 5. The rear portion of each arm 22 is pivoted at 23 in brackets 24 secured to the upper face of the members 5. The front ends of said rock-arms are inclined downwardly toward the frame and are furnished with inwardly extending projections 25, connected by a transverse bar 26, having its front margin 27 suitably beveled to form a straight edge for a purpose that will appear later. Directly beneath the bar 26 is a metal plate 28, furnished with zinc cutting strips (not shown). The ends of this cutting plate are supported upon the sides of the frame, and the bar 26 is secured to the projections 25 at an inclination that will allow the straight edge or bar 26 to lie flat upon the cutting plate. One end of the upper feed roller is supplied with a threaded flange 29 forming a worm gear which meshes with a toothed dial 30, journaled on

an arm 31, pivoted at 31^a to the adjacent rock-arm 22, a flat spring 31^b fixed to said rock arm serving to yieldingly hold the disk in mesh with the worm gear, so that said arm 31 may be thrown back to release the disk for resetting. The face of the disk is furnished with a suitable scale 32, an index hand 33, mounted on the pivot of the dial, serving to indicate the angular movement of the latter when turned by the rotation of the upper feed roller.

It is necessary to provide means for trimming the shade cloth to various widths as required, and as both margins must be trimmed in some cases to remove the ragged or uneven edges, we provide two pairs of rotatable disk cutters 34, 35, arranged upon opposite sides of the machine and adapted to be moved laterally to regulate the distance between them. The upper disk 35 of each pair is splined upon the shaft 12, the latter having a feather 39, which permits the cutters to be moved longitudinally on the shaft while rotating therewith. The said cutters are adjusted upon the shaft by means of carriages or carriers 40, 41, arranged upon the left and right hand sides of the machine, respectively.

Each carrier is cast in a single piece, comprising a vertical portion 42; and a horizontal portion 43 forming a right angle with the part 42. The portion 43 has an integral boss or sleeve 44, slidably mounted on a rod 45, extending transversely between the frame members 5, and provided with a set screw 46. The rear end of the horizontal portion 43 of the carriage also has a laterally projecting box or sleeve 49, in which the spindle 48 of the corresponding lower cutter 34 is mounted. The said carriers or carriages are furnished with levers or arms 51, 52, each pivoted at its rear end upon the spindle of the corresponding upper cutter disk, adjacent the sleeve 47, a retaining collar 53 on the said spindle holding the arm in position, so that they will move with their respective carriers when the latter are adjusted in the manner hereinafter described.

After the cloth has been trimmed it will travel over the horizontal portion 43 of the body of the carrier, as indicated at 36, Fig. 3, while the severed portion will pass upon the outer side and along the face 37 of the vertical portion 42, which is inclined downwardly. The purpose of the rock arms 51, 52, is to support the shade roller 54 indicated in dotted outlines in Fig. 2, to which the shade is to be tacked or otherwise attached, provision being made to admit rollers varying in length, and to permit of turning the roller to roll up the shade cloth thereon, and also to allow the roller to be gradually elevated as the diameter of the material wound thereon increases, the latter movement being permitted by the pivotal

attachment of the arms upon the spindles. The other results above mentioned are secured by the following mechanism:—The forward end of the arm 52 is provided with a slidable sleeve or bushing 55, secured in adjusted position by a set screw 56. The said bushing forms a box in which is mounted a live spindle or bearing 57 provided with a head 58 upon the inner end, while a retaining collar 59 is fixed on the spindle outside of the bushing. The outer end of the spindle 57 is threaded and provided with a nut 60, and between this nut and the collar 59 is mounted a loose pulley 61, the inner side of which is adapted to frictionally engage the face of the collar 59, a spring 62 between the nut 60 and the pulley serving to keep the two surfaces in contact to form a friction drive for the spindle. The spindle head 58 is furnished with an axial recess or socket 63, to receive the pintle 64 of the spring end of the roller, and two diametrically disposed pins 65 project from the face of the spindle head to engage the roller so that the latter will rotate with the spindle, which receives motion through a belt 66 from a pulley 67 mounted on the shaft 12. The forward end of the left rock-arm 48 is provided with a dead spindle or bearing 68, adjustably secured in the said arm by a set screw 69. The spindle 68 has a head 70, similar to the head of the live spindle 57, and in like manner furnished with a socket 71 to receive the fixed pintle 72 of the shade roller. Beneath the location of the shade roller are arranged a series of blocks 73, attached to the main frame, and having concave recesses 74 in which the roller is supported when held in operative position between the spindles 57 and 68.

The cloth or material for the shades is supplied in bolts or rolls, and one of these rolls, indicated by the numeral 75, is suspended in the machine by passing a suitable shaft or bar through the bolt, the ends of the bar being then placed in grooved hangers 76 secured to the inner faces of the frame sides near the front end of the machine, care being taken that the bolt is so arranged that the cloth will unroll from the upper side and toward the rear of the frame, as shown in Fig. 1, the path of the shade material as it passes through the machine being indicated by the dotted line 77.

Having thus entered fully into the details of construction a general description of the operation of the machine will now be given.

Up to the present time the work of trimming and attaching shade cloth to the roller has been chiefly accomplished by practically unaided hand work and the procedure has been comparatively slow and subject to frequent mistakes, owing to variations in the measurements required for the different sizes of windows. A demand has arisen for more

accuracy than is obtained by using the regular stock shade and as the conditions require different sizes and variations in the manner of hanging the shades in relation to the window casings, hand work has been inadequate to fulfil the requirements, since the cloth must be trimmed with accurately parallel sides and the ends truly squared, and properly tacked to the roller in order to insure a sufficiently perfect working of the shade curtain. The bolt of material 75 having been suspended in the brackets or hangers 76 in the manner described, the machine is threaded with the cloth by passing the end of the web 77 under an idle roller 78, mounted in the rear of the frame, and then up and over the lower feed roller 19, the top feed roller 20 having been previously thrown back on its centers 23 out of the way so that the cloth can be readily passed between the two rollers. The cloth is then brought forward until it lies upon the cutting plate or support 28. The straight edge 27 is now let down upon the cloth upon the cutting plate by moving the arms 22, which will bring the feed rollers into contact with the web of cloth between them. The next step will be to trim the forward end of the shade, which is done by drawing a sharp knife along the straight edge, severing the cloth and insuring a square end. This completes the process of threading of the machine which has to be done only when a new supply roll is placed in the hangers. The next step is to place a curtain roller which has been cut to the proper length, between the spindles 57 and 68, with the spring end of the roller to the right, and the pintle at this end engaging the socket in the head of the live spindle. The left hand carrier is then slid inward until the other pintle of the roller rests in the socket 71. The thumb screw 46 is then tightened, and the dial 30 set to 0. The feed rolls are now set in motion by turning the crank 9, and this moves the web forward until it meets the cutters, and these, rotated through the pinions 11 and 14, will trim the margins of the cloth as it advances, producing a shade of the proper width to fit the shade roller which has been placed in the machine. The crank is turned until the forward end of the cloth has reached the shade roller, under which it passes. Stopping the machine the end of the cloth is now tacked upon the roller in the usual manner. When this is done the crank 9 is again turned, and through the medium of the belt 66 and friction drive the shade roller is rotated winding thereon the trimmed shade, the movement being continued until the dial 30 indicates the required length for the shade. A guide mark for folding the hem is then made by drawing a pointed instrument along the straight edge, to form a slight crease, and the crank revolved a short dis-

tance until the desired amount of cloth for the hem has passed the straight edge, when the material is severed by drawing a knife point along the straight edge as at the beginning. The crank is now turned until all the piece which has been cut from the bolt has passed through the cutters. The thumb screw 46 is then loosened and the carrier drawn back to release the shade roller which is removed and another substituted, when the above described procedures are repeated to make and mount another shade.

It will be noted that the feature 39 extends entirely across the machine, the object of this being to allow the left hand carrier to be moved to any desired extent toward the right hand so that shades of exceedingly narrow width may be cut. The adjustable feature of the roller supporting devices at the ends of the arms 51, 52, is for the purpose of permitting the end of the roller to be shifted relatively to the margin of the cut goods so that when tacked upon said roller the edge of the shade may be close to the end or at a suitable distance therefrom to suit the requirements. While the left hand carrier may be shifted clear across the machine, the one at the right is to be moved only sufficiently to trim the inequality from the margin, and to prevent the belt 66 from slipping from the pulley 61 during this shifting movement, the latter pulley is made in the form of a drum of sufficient width so that some portion of the latter will always be in line with the pulley 67.

Having thus described our invention, what we claim as new, is:—

1. In a machine for making window-shades, a main supporting frame, rotatable cutters, frames supporting said cutters and adjustable transversely on said main frame, means for detachably supporting a shade-roller, said means connected with the cutter supporting frames and adjustable thereby, and means for simultaneously rotating said cutters and shade-roller supports.

2. In a machine for making window-shades, a main supporting frame, rotatable cutters, means supporting said cutters and adjustable transversely, on said frame, rotatable means for supporting a shade roller, said means connected with and adjustable by the cutter supporting means, common means for operating said cutters and shade-roller supports, means for feeding shade material to said cutters and roller, and means for indicating the lengths of material fed to said cutters.

3. In a machine for trimming, rolling and measuring fabric, a main frame, means supporting a roll of fabric, means for clamping the free end of said fabric, said means adapted to serve as a guide and straight-edge for the fabric, frames independently adjustable transversely on said main frame, shade-

roller supports connected with said frames and adjustable therewith, cutters mounted on said frames and adjustable therewith, common means for rotating said cutters and
 5 roller supports, means for feeding the fabric through said machine, and means for measuring the fabric as it is fed through the machine.

4. In a machine for the purpose specified,
 10 the combination of means for supporting a bolt of shade material, feed rollers, an indicator operatively connected with one of the feed rollers, a cutting board, a straight edge pivotally mounted and adapted to normally
 15 rest upon the cutting board, adjustable means for trimming the margins of the shade material, means for supporting a shade-roller, and friction gearing for rotating said shade-roller.

20 5. In a machine for the purpose specified, the combination with the frame, means for supporting a roll of shade material, and means for feeding the material, of a pair of co-acting rotary cutters, means for adjust-
 25 ing said cutters, said means comprising a carrier, an arm adapted to travel with the carrier, and means connected with said arm for rotatably supporting a shade roller.

6. A machine for the purpose stated, including a frame, means for supporting a roll
 30 of shade material on the frame, arms pivoted on said frame feed rollers, one of said rollers mounted on said arms, an indicator operatively connected with said roller, a straight
 35 edge connected with said arms, a cutting board adapted to support said straight edge, means for trimming the margins of the shade material, means for supporting a shade roller, and means for rotating the roller sup-
 40 porting means.

7. In a machine for the purpose stated, the combination with the frame, means for supporting a roll of shade material, and means

for feeding the material, of two carriers adjustable transversely to the machine, a pair
 45 of coöperating rotary cutters mounted in each of said carriers, an arm connected to each of said carriers, and means attached to said arms for supporting a shade roller.

8. In a machine of the character specified,
 50 the combination with a frame, means for supporting a roll of shade material, and means for feeding the material, of two carriers arranged to move transversely to the machine, a pair of coöperating rotary cut-
 55 ters mounted on each of said carriers, an arm connected to each carrier, bearings carried by the free ends of said arms and adapted to support the pintles of a shade roller, and means for rotating one of said bearings.

9. In a machine of the character specified, the combination of a pair of arms, adapted to be moved laterally, a pair of spindles
 60 mounted in the free ends of said arms, and adapted to support the ends of a shade-roller, and means for rotating one of said spindles, said rotating means including a friction gear.

10. In a machine for making window shades, the combination with means for
 70 holding a roll of shade material, means for feeding the material, and means for trimming the margins of the cut material, of a pair of carriers adjustable transversely to the machine, rock arms attached to said car-
 75 riers, adjustable supports carried by the free ends of said arms adapted to engage the ends of a shade roller, and means for rotating one of said supports.

In testimony whereof we affix our signatures in the presence of two witnesses.

FRANK F. WRIGHT.
 HARRY G. CRISWELL.

Witnesses:

M. E. LOUCKS,
 C. L. LOUCKS.