Oct. 7, 1924. 1,510,656

E. E. CLEMENTS

STRIP CUTTING ATTACHMENT

Filed Sept. 17, 1921 2 Sheets-Sheet 1

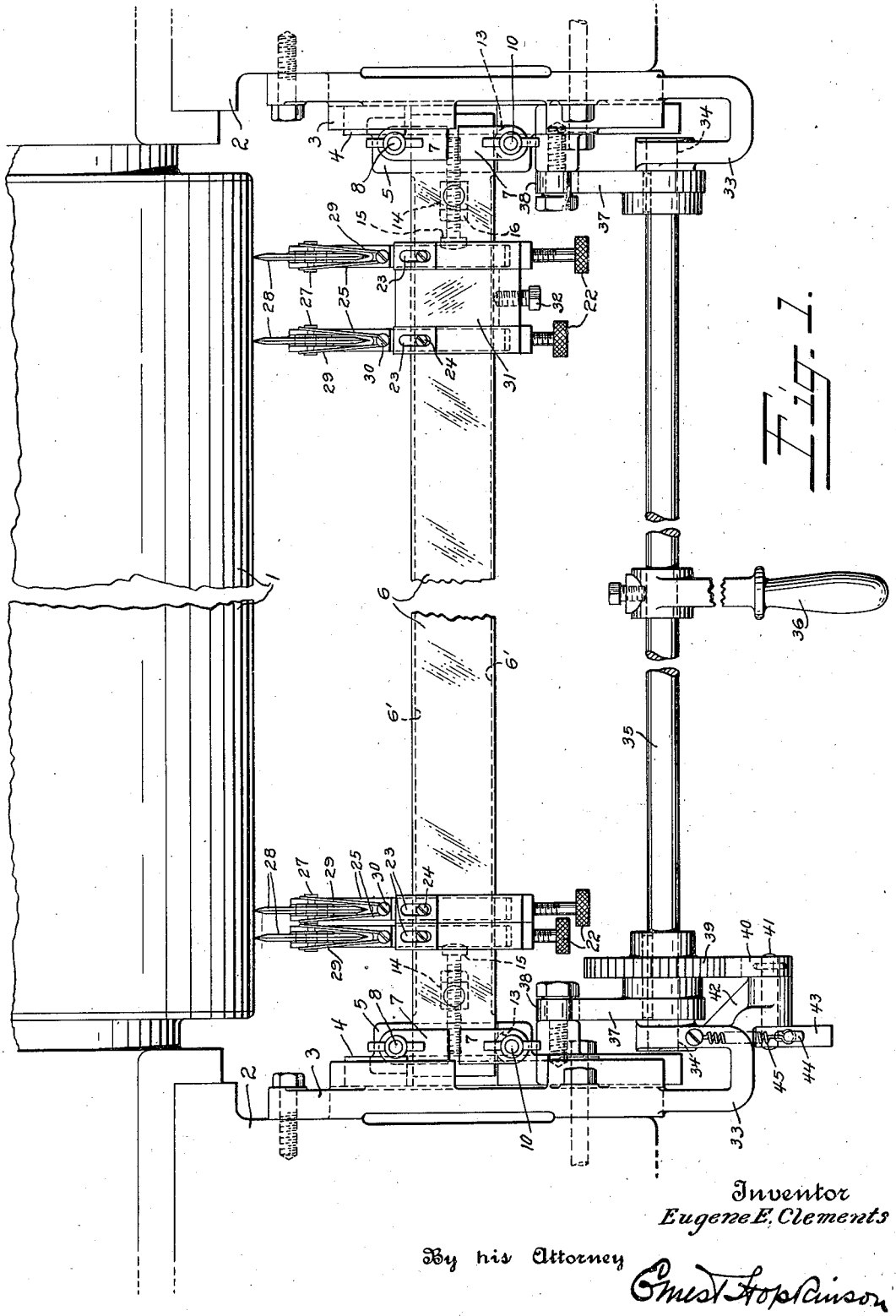


Fig. 1.

Inventor
Eugene E. Clements

By his Attorney
Ernest Hopkinson

Oct. 7, 1924. 1,510,656

E. E. CLEMENTS

STRIP CUTTING ATTACHMENT

Filed Sept. 17, 1921 2 Sheets-Sheet 2

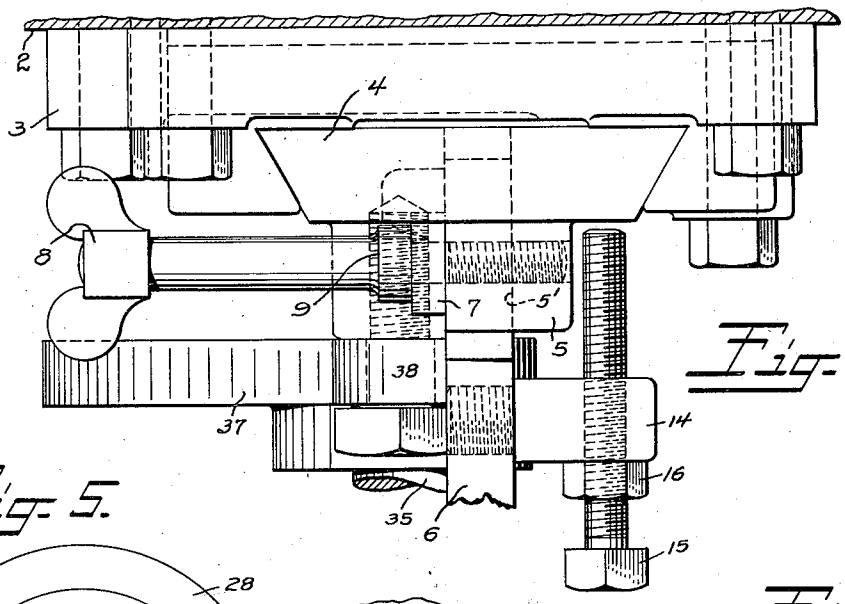


Fig. 4.

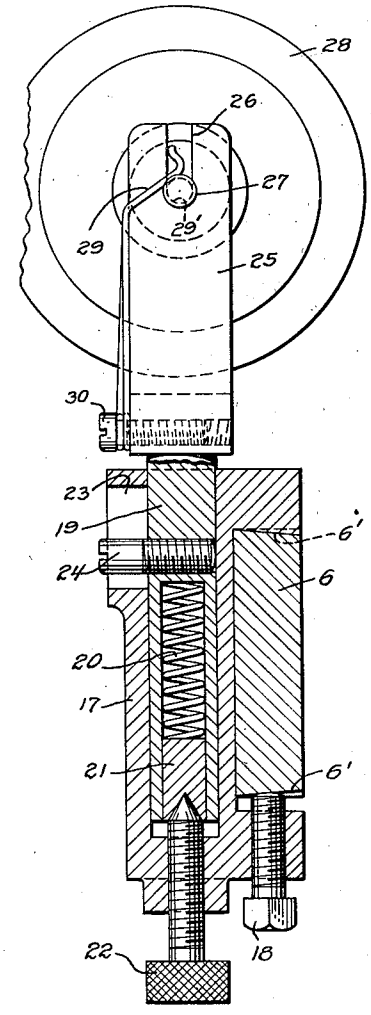


Fig. 5.

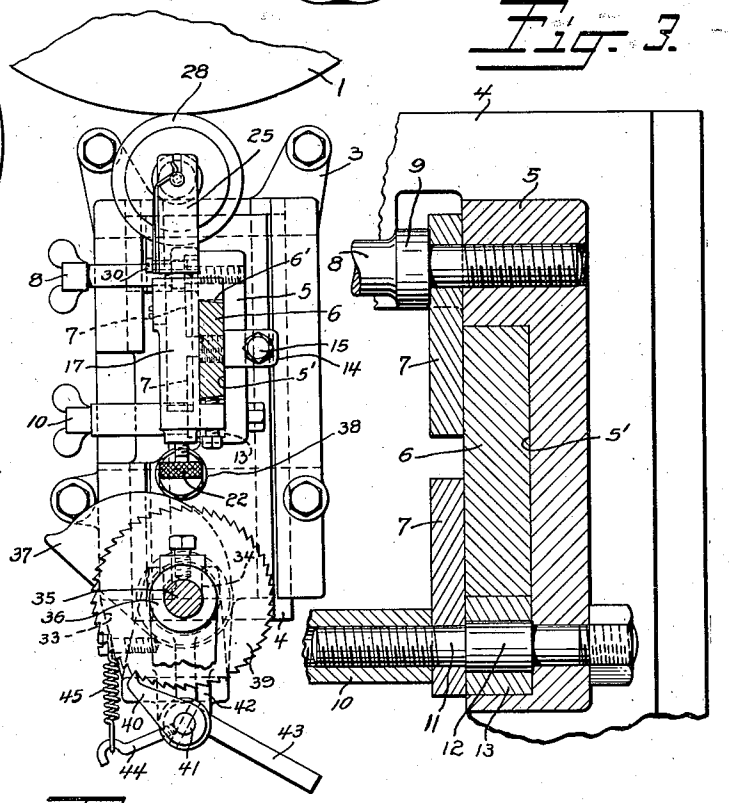


Fig. 3.

Fig. 2.

Inventor
Eugene E. Clements

By his Attorney
Ernest Hopkinson

Patented Oct. 7, 1924. 1,510,656

UNITED STATES PATENT OFFICE.

EUGENE E. CLEMENTS, OF NEW HAVEN, CONNECTICUT, ASSIGNOR TO L. CANDEE & COMPANY, A CORPORATION OF CONNECTICUT.

STRIP-CUTTING ATTACHMENT.

Application filed September 17, 1921. Serial No. 501,369.

To all whom it may concern:

Be it known that I, EUGENE E. CLEMENTS, a citizen of the United States, and a resident of New Haven, county of New Haven, and State of Connecticut, have invented certain new and useful Improvements in Strip-Cutting Attachments, of which the following is a full, clear, and exact description.

This invention relates to a strip cutting attachment, more particularly to an attachment for calender rolls whereby the sheeted stock may be cut into strips prior to leaving the calender.

A large number of strip cutting devices are in use in the various arts for cutting paper, cloth, sheet rubber, and other materials, but numerous difficulties have been found in these devices, particularly when applied to the cutting of calendered rubber stock into strips. The calender rolls are very heavy and after use for a time considerable end play develops in their bearings, which may amount to as much as an eighth of an inch. As a result, if the strip cutting attachment, which is ordinarily secured to the calender frame, cannot partake of this end play with the calender roll, the stock is not evenly cut and there is undue wear and tear on the surface of the roll and on the cutting devices. A further difficulty has been that, while these strip cutting attachments have been made so that they may be moved away from the roll or to inoperative position when not in use, the attachment as a whole is still in the way and interferes considerably with the use of the calender for other purposes.

An object of my invention is to provide an improved strip cutting attachment for calender and similar rolls.

Another object is to provide means whereby wear on the surface of the rolls by the cutting mechanism may be equalized.

Still another object is to provide means for so mounting the cutting mechanism that it may partake of the end play of the calender roll.

A further object is to provide a mounting for the strip cutting mechanism such that it may be readily withdrawn to an inoperative position or entirely removed when desired.

For a detailed disclosure of the invention reference is had to the accompanying specification and drawings, in which latter:

Fig. 1 is a fragmentary view of a calender showing my strip cutting attachment applied to one of the rolls.

Fig. 2 is a transverse sectional view through the attachment;

Fig. 3 is a detail sectional view illustrating the manner in which the cutter supporting bar is mounted;

Fig. 4 is a broken away detail top plan view; and

Fig. 5 is a sectional view illustrating the manner in which the individual cutter elements are constructed and secured to the supporting bar.

Referring to the drawings the numeral 1 designates a roll, in the present instance a calender roll, to which my cutting attachment is applied, and 2 the frame of the calender. Attached to the frame at each side adjacent the roll is a bracket 3 having a dovetail groove, in which groove is mounted a slide block 4. Extending from each slide block is a lug or projection 5 channeled as shown at 5′ in Fig. 3, in which channels are disposed the ends of a cross-bar 6, which cross-bar is beveled or inclined at its upper and lower edges as shown at 6′ in Figs. 1 and 5 for a purpose to be later described. The cross bar 6 is removably and slidably held at each end in the channels 5′ by means of upper and lower retaining plates 7. Each upper retaining plate is secured to the corresponding lug 5 by means of a thumb screw 8 passing through the plate 7 and threaded into the lug 5, said thumb screw being provided with an enlargement or flange 9 to engage the plate 7. Each lower retaining plate 7 is held in position by means of a tapped thumb nut 10 into which is threaded a bolt 11 passing through the lug 5 from the front side thereof and also through the retaining plate, the bolt being provided with an enlargement 12 between which and the thumb nut 10 the plate 7 is held. The enlargement 12 also

forms a bearing for a small roller 13 on which the end of the cross bar 6 rests. Adjacent each end of the cross bar 6 a stud 14 is threaded thereinto, which stud is provided with a threaded opening through which passes an adjusting screw 15, which latter may be held in adjusted position in the stud 14 by means of the lock nut 16.

Mounted on the cross-bar 6 is a series of cutting elements which are identical in all respects and a description of one of which will suffice. A plunger housing or bracket 17 (Fig. 5), is cut away or channeled at its rear side to fit over cross bar 6 and is held rigidly in position on the cross bar by means of the set screw 18 engaging the latter. The upper wall of the channel is inclined to fit the inclined portion 6′ of the cross-bar. Movable in the housing is a plunger 19 the lower end of which is bored out, to receive a coil spring 20 which presses at one end against the end of the bore and at the other end against the bearing piece 21, which latter is engaged by the adjustment screw 22 threaded in the housing 17. The coil spring 20 tends to normally force the plunger out of the housing and to limit this movement the housing is provided at its front with a slot 23 in which moves a stop screw 24 threaded into the plunger. At its upper end the plunger is forked as shown at 25, and each fork is slotted at its extremity as shown at 26 to provide a bearing for the shaft 27 of the cutter disk 28. The free ends of the forked spring 29 rest in grooves 29′ on the shaft 27 to retain the latter in position, while the other end of the spring is secured to the plunger by the screw 30. The cutters may be secured in any adjusted position along the bar 6, and in order to more readily space them predetermined distances apart, spacers 31 may be provided which may be secured to the bar 6 by set screws 32 in a manner similar to the plunger housings 17.

Each bracket 3 at its lower end is provided with an extension 33 bent backwardly in a U-shape, and the free end of this extension is slotted or forked as shown at 34 in Fig. 2 to provide a bearing for the cam shaft 35, which latter may be actuated by the handle 36. Mounted on the cam shaft 35 adjacent each end is a cam 37 with which cooperates a cam roll 38 mounted on the corresponding slide block 4. In order to maintain the cam shaft and cams in adjusted position a ratchet wheel 39 is also mounted on the shaft 35, with which cooperates a pawl 40 pinned to a shaft 41 having a bearing in a bracket 42 depending from the extension 33. Also pinned to the shaft 41 is the hub of an operating arm 43 for the pawl and threaded into this hub is a hooked arm 44 to which is secured one end of a coil spring 45 the other end of which is secured to the extension 33.

In use the cams 37 are operated by the cam shaft 35 and handle 36 to raise the slide blocks 4 through the cam rolls 38 connected to the blocks, thereby raising the cross bar 6 with its associated cutters into operative relation to the calender roll. By means of the adjusting screws 22 the pressure of the individual cutter disks 28 on the calender roll may be varied to suit conditions, and by means of the set screws 18 the individual cutting elements may be secured in any desired spaced relation on the cross bar 6. Due to the slidable mounting of the cross bar 6 in the lugs 5 on slide blocks 4 the cutting elements as a whole may move longitudinally of the roll axis so as to take the same end play as the roll, and by means of the adjusting screws 15 this end play of the cross bar 6 and cutters may be properly adjusted, it being only necessary that the sum of the distances between the ends of the adjusting screws 15 and slide blocks 4 be equal to the total end play of the calender roll. When this end play increases the play of the cross bar 6 can be correspondingly increased by slightly retracting the adjusting screws 15. By reason of this adjustment an accurate cutting of the strip is insured, and any lateral friction between the cutting elements and the calender roll causing undue wear of these parts is eliminated. Moreover, by adjusting the screws 15 to move the bar 6 to the right or left relatively with respect to the calender roll the point of impact of each cutting element on the roll may be varied without disturbing the relative position of the cutting elements collectively, thereby preventing undue wear of a cutting element at any one point on the calender roll. In making such an adjustment it is also, of course, necessary to allow sufficient end play of the cross bar 6 to compensate for the end play of the calender roll. When it is desired to withdraw the cutting attachment to inoperative position, all that is necessary is to free the pawl 40 from the ratchet 39 by means of the handle 43 and by operating the handle 36 lower the cross bar 6 and associated cutters. If, however, it is desired to use the calender for other purposes for any considerable length of time or for purposes in which the cutting attachment will be in the way, it is only necessary to loosen the thumb screw 8 and nut 10 and turn the retaining plates 7 on their pivots, when the cross bar 6 and associated cutters can be removed. This being done the cam shaft 35 and its associated parts may also be removed if desired by merely lifting it out of the bracket bearings 34, when unobstructed access can then be had to the calender. It will thus be seen that the attach-

ment can be removed and replaced without in any way disturbing the adjustment of the cutters on the bar or the adjustment of the bar with respect to the calender roll.

In the present instance the attachment has been shown as applied to the last roll of a calender and in a vertical position for cutting the stock into strips just prior to leaving the calender, but it is obvious that the position of the attachment may be varied as long as the longitudinal axes of the individual cutting elements are disposed radially of the roll with which they are to coact. The attachment has also been found very efficient in freeing the stock from air bubbles when calendering a heavy stock such as is used for soles. When used for this purpose it is secured to one of the intermediate rolls of the calender and the individual cutting elements are set close together. The slitting action opens up any air pockets or bubbles in the stock and allows the air to escape, while the plastic mass reunits into a homogeneous body before leaving the calender. While the attachment is particularly adapted for cutting rubber stock on calender rolls, it is obvious that it is not limited in its application to this purpose, and may be used for cutting other materials in a manner well known in the art, and I therefore do not wish to be limited to the construction disclosed otherwise than as set forth in the appended claims.

Having thus described my invention, what I claim and desire to protect by Letters Patent is:

1. A strip cutting attachment for a roll, comprising cutting means coacting with the roll, and means whereby the cutting means may have a limited free movement in operation longitudinally of the roll axis and synchronous with side movements in either direction of said roll in its bearings.

2. A strip cutting attachment for a roll, comprising cutting means coacting with the roll, means whereby the cutting means may have a limited free movement in operation longitudinally of the roll axis and synchronous with side movements in either direction of said roll in its bearings, and means for varying the extent of such movement.

3. A strip cutting attachment for a calender roll, comprising a plurality of cutting elements yieldably urged toward the roll, means whereby the cutting elements when in operation may have a limited free movement longitudinally of the roll axis and synchronous with side movements in either direction of said roll in its bearings, and means for moving the cutting elements toward or from the roll.

4. A strip cutting attachment for a calender roll, comprising channeled brackets adjacent the ends of the roll, slide blocks adjustable in said brackets, means for adjusting the slide blocks, a cross bar freely slidable in said slide blocks, a series of rotatable cutters mounted on said bar, and means for individually yieldably urging the cutters toward the roll.

5. A strip cutting attachment for a calender roll, comprising channeled brackets adjacent the ends of the roll, slide blocks adjustable in said brackets, means for adjusting the slide blocks, a cross bar freely slidable in said blocks, means for limiting the sliding movement of said bar, a series of rotatable cutters mounted on said bar, and means for yieldably urging said cutters toward the roll.

6. A strip cutting attachment for a calender roll, comprising channeled brackets adjacent the ends of the roll, slide blocks adjustable in said brackets, means for adjusting the blocks, a cross bar freely slidable in said blocks, adjustable means for limiting the movement of said bar, a series of rotatable cutters adjustably mounted on said bar, and means for yieldably urging said cutters toward the roll.

7. A strip cutting attachment for a calender roll, comprising channeled brackets adjacent the ends of the roll, slide blocks mounted in the channels thereof, means for adjusting the slide blocks removably mounted in said brackets, a cross bar removably and slidably mounted in said slide blocks, a series of cutter supports removably mounted on said bar, rotary cutters mounted on said supports, and yieldable means for urging said cutters toward the roll.

8. A strip cutting attachment for a calender roll, comprising a pair of brackets adapted to be secured to the calender frame adjacent each end of the roll, each bracket having a guideway therein and a forked bearing, a slide block mounted in each guideway, a bar slidably supported by said slide blocks parallel to the roll, means for limiting the sliding movement of said bar, a plurality of cutters supported on said bar and coacting with the roll, a cam shaft removably mounted in said forked bearings, cams on said shaft, cam rollers mounted on said slide blocks and coacting with said cams, and means for actuating said cam shaft.

9. A strip cutting attachment for a calender roll, comprising brackets having guideways disposed adjacent the ends of the roll, slide blocks mounted in the guideways, means for moving said slide blocks, a cross-bar slidably mounted in the slide blocks, cutters carried thereby and coacting with the roll, and adjusting screws carried by the cross-bar and coacting with the

slide blocks to limit the movement of said bar.

10. A strip cutting attachment for calender rolls, comprising brackets attached to the calender frame, a cutter support removably carried thereby and movable both longitudinally and radially of the roll, cutters on said support, and actuating means for imparting one of said movements to the support also removably carried by said brackets.

Signed at New Haven, Connecticut, this 12th day of Sept., 1921.

EUGENE E. CLEMENTS.