

Dec. 4, 1928.

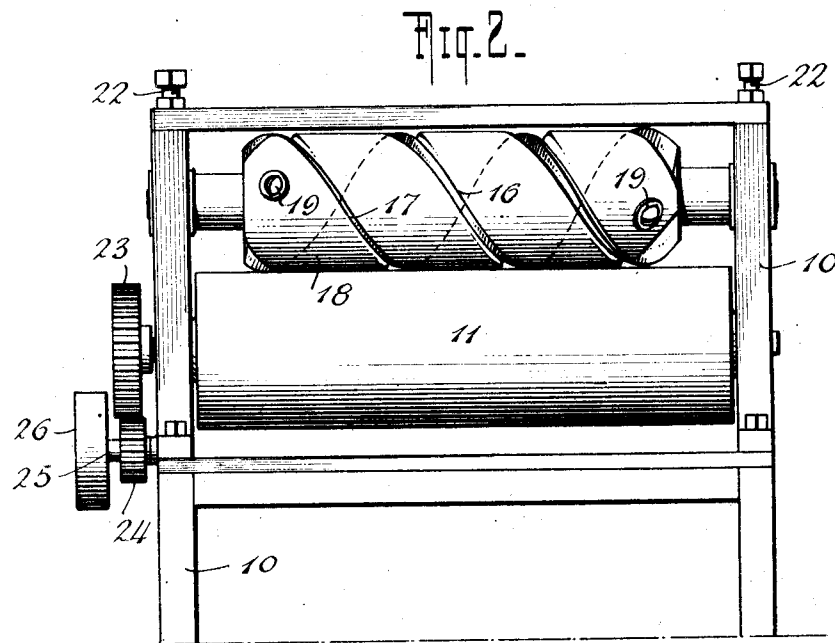
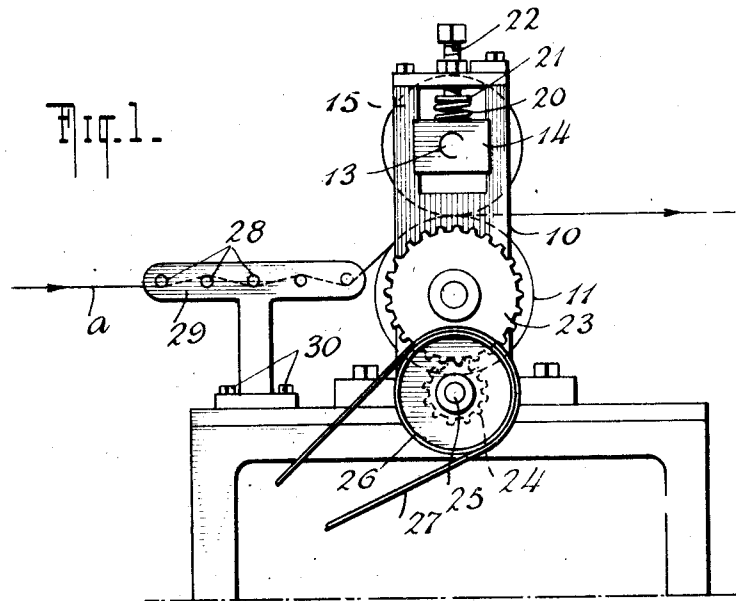
1,693,589

A. C. BOLTON

BIAS CUTTING MACHINE

Filed July 7, 1927

2 Sheets-Sheet 1



INVENTOR
ANDREW C. BOLTON
BY
Stok, Kehlent & Farley
ATTORNEYS

Dec. 4, 1928.

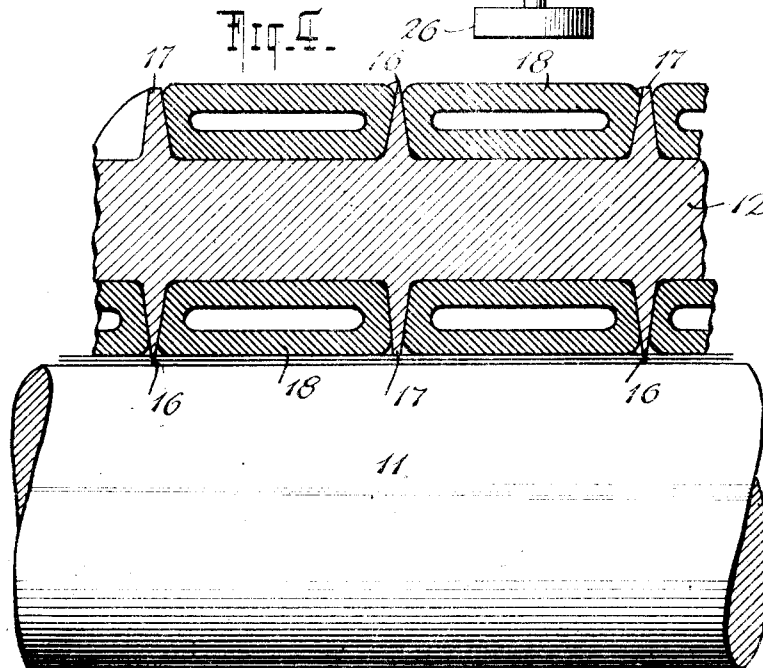
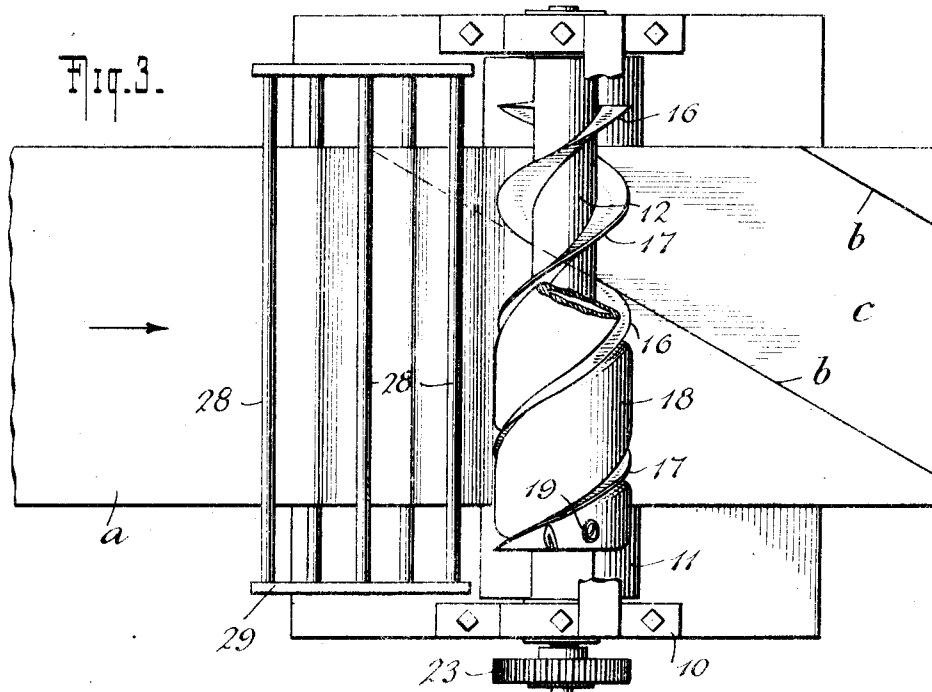
1,693,589

A. C. BOLTON

BIAS CUTTING MACHINE

Filed July 7, 1927

2 Sheets-Sheet 2



INVENTOR
ANDREW C. BOLTON
BY
John H. Kellum & Son
ATTORNEYS.

UNITED STATES PATENT OFFICE.

ANDREW C. BOLTON, OF MIAMI, FLORIDA.

BIAS-CUTTING MACHINE.

Application filed July 7, 1927. Serial No. 203,925.

The invention relates to bias cutting machines designed to cut travelling webs of fabric and other material on the bias into individual bias cut sections, and more particularly to cutting tacky and impregnated fabrics on the bias for use in the manufacture of rubber hose, pneumatic tires and the like.

The object of the invention is to provide a machine of the indicated class which is constructed in a simple manner with a minimum of parts and is arranged to operate in an accurate and reliable manner. Other objects will appear from the description hereinafter and the features of novelty will be pointed out in the claims.

In the accompanying drawings which illustrate an example of the invention without defining its limits, Fig. 1 in a side elevation of the machine; Fig. 2 is a front elevation thereof; Fig. 3 is a plan view with parts broken away for clearness, and Fig. 4 is a fragmentary view illustrating elements of the machine in detail.

As shown in the drawings, the machine comprises a supporting frame 10 of suitable form and dimensions, upon which a movable platen 11 is mounted; in the illustrated example, the platen 11 is in the form of a roll journaled upon the frame 10, as shown in Figs. 1 and 2. The machine further includes a drum 12 having trunnions 13 at its opposite ends journaled in blocks 14, vertically slidable in guides 15 on the frame 10. The drum 12 is located above and in registry with the platen 11 and is provided with a cutting knife 16, which extends spirally about the drum 12 and comprises an integral part thereof. In the preferred arrangement, a flange 17 extends spirally about the drum 12 between the convolutions of the cutting knife 16 and in spaced relation thereto as shown in Fig. 3; the flange 17 is likewise an integral part of the drum 12 and with the knife 16 defines a spiral channel extending about and lengthwise of the drum 12. The latter, in addition, is provided with a yielding cushion which, in the illustrated example, comprises a strip of rubber tubing 18, flattened out and spirally wound about the drum 12 between the convolutions of the knife 16 and the flange 17, or, in other words, in the spiral channel formed by said knife and flange; if desired, this tubing 18 may be replaced by a cushion of solid rubber or other suitable material. The opposite ends of the cushion 18 are secured in place in any suitable manner as by means of fasten-

ing screws 19, as shown in Figs. 2 and 3. For the purpose of maintaining the cutting knife 16 and its associated elements in proper operative relation to the platen 11, springs 20 are located between the blocks 14 and washers 21, controlled by adjusting screws 22, adjustably mounted upon the frame 10 at points between the guides 15, as shown in Fig. 1. Any suitable mechanism may be provided for operating the machine, the preferable arrangement being to positively drive the platen 11 and to frictionally transmit its rotative motion to the drum 12 and its associated parts. Thus, in the illustrated example, the platen 11 is connected to move with a gear 23, arranged in mesh with a pinion 24, located upon a stud-shaft 25, journaled on the frame 10 and carrying a pulley 26; the latter is connected by means of a belt 27 with a source of power. In addition to the parts so far described, the machine may include a tension device, consisting of a plurality of bars or rods 28, located in spaced relation upon a support 29, secured upon the frame of the machine by means of bolts 30.

In practice, power is applied to the pulley 26 to bring about a rotation of the platen 11 and to frictionally transmit this rotative movement to the drum 12 and cutting knife 16 by means of the yielding cushion 18, which at this stage is located in surface frictional engagement with the platen 11, as shown in Fig. 2. The degree of frictional engagement developed between the yielding cushion 18 and the platen 11 may be varied by changing the tension of the springs 20 through the medium of the adjusting screws 22. In any case, the adjustment will be such that the cutting knife 16 is located in proper cutting relation to the surface of the platen 11 without, however, exerting any action on such platen, tending to injure the latter or to interfere with the cutting efficiency of the cutting knife 16; it will be noted by reference to Fig. 4 that the flange 17 does not engage the surface of the platen 11. The web of fabric *a* to be cut on the bias is woven through or passed over and under the bars 28 of the tension device, and its end is inserted in the nip between the platen 11 and the resilient cushion 18. As the operation of the machine continues from this point, the web *a* will be drawn or fed between the platen 11 and the cushion 18, the latter, because of its inherent physical characteristics and because of its adjustment with respect to the

platen 11, developing a firm and secure frictional grip upon the web *a*, whereby a reliable and uniform feed of the latter in the linear direction indicated by the arrow in Fig. 3 is brought about. As the web *a* passes over the platen 11, the spiral knife 16 will be rotated about the axis of the drum 12 and will cut the web *a* on the bias as indicated by the lines *b* in Fig. 3. As a result, the web *a* will finally be cut into a plurality of bias strips *c*, which are then stacked or otherwise disposed of for use at the proper time for the purpose for which they are designed. The space between successive bias cuts *b* will be absolutely uniform and equal throughout a given cutting operation, so as to produce bias strips *c* of absolute uniformity as to dimensions and shape; the distance between bias cuts *b* is determined by the type of the spiral along which the cutting knife 16 is arranged on the drum 12. Thus, by substituting drums 12 on which the convolutions of the spiral knives 16 are differently arranged and spaced, any desired distance between bias cuts *b* may be maintained to produce bias strips *c* of any predetermined dimensions. The spiral flange 17 on the drum 12 which, in some cases may be dispensed with, serves the purpose of developing a spiral channel in combination with the knife 16 for the accommodation of the yielding cushion 18 and in addition serves to prevent upward buckling of the fabric web *a* as it passes over the platen 11. During the feed of the web *a*, the rods 28 develop a tension upon said web which prevents faulty feeding thereof and at the same time, said rods serve to maintain said web in a fixed path of forward movement.

The bias cutting machine is extremely simple in construction and comprises a minimum of parts and at the same time is absolutely reliable in operation. The machine is capable of being used for cutting fabrics and other materials capable of being

cut, so as to produce bias cut sections *c*. The machine is particularly adapted for cutting fabrics impregnated with rubber and utilized generally in the manufacture of certain types of rubber hose and certain classes of shoes for pneumatic tires. Because of the arrangement of the spiral knife 16 and spiral flange 17 in combination with the yielding cushion 18, the machine may be efficiently utilized for cutting flimsy fabrics such as silks and the like upon the bias, in a reliable and uniform manner.

Various changes in the specific form shown and described may be made within the scope of the claims without departing from the spirit of the invention.

I claim:

1. A bias cutting machine comprising a frame, a rotatable platen journaled on said frame for feeding the material to be cut, a rotatable drum journaled on said frame, a cutting knife, extending spirally about said drum and comprising an integral part thereof, mechanism for rotating said platen, and yielding means on said drum adjacent to the convolutions of said knife arranged to frictionally transmit the rotative movement of said platen to said drum.

2. A bias cutting machine comprising a frame, a rotatable platen journaled on said frame for feeding the material to be cut, a rotatable drum journaled on said frame, a cutting knife extending spirally about said drum and comprising an integral part thereof, a flange extending spirally about said drum between the convolutions of said knife and comprising an integral part of said drum, and a yielding cushion spirally wound about said drum between the convolutions of said spiral knife and spiral flange and arranged to frictionally transmit the rotative movement of said platen to said drum.

In testimony whereof I have hereunto set my hand.

ANDREW C. BOLTON.