

Nov. 7, 1944.

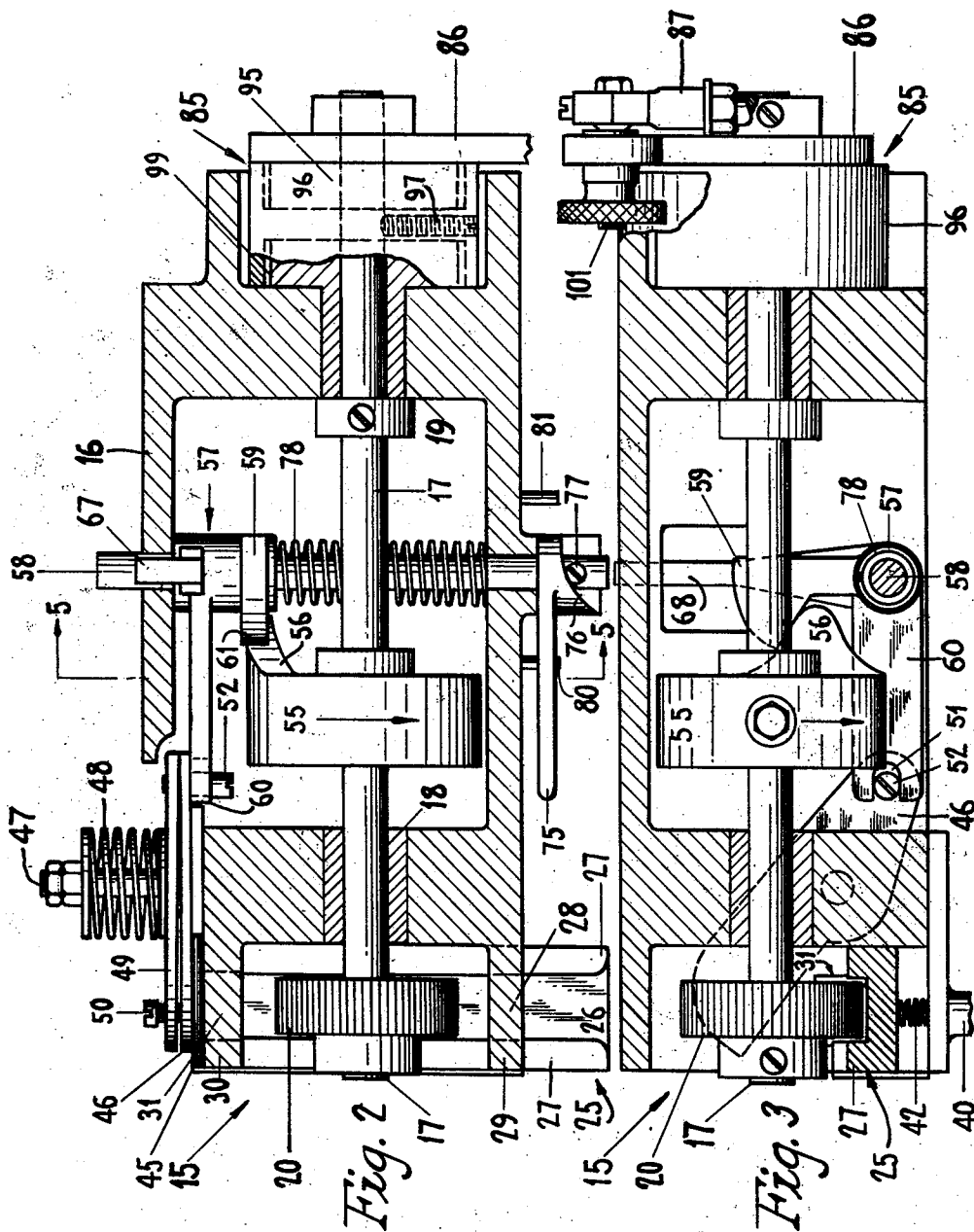
J. GALKIN

2,362,437

STRIP SHEARING ATTACHMENT

Filed June 11, 1941

5 Sheets-Sheet 2



JOSEPH GALKIN
INVENTOR.

BY *Joseph Blacker*

ATTORNEY.

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J. GALKIN

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STRIP SHEARING ATTACHMENT

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5 Sheets-Sheet 3

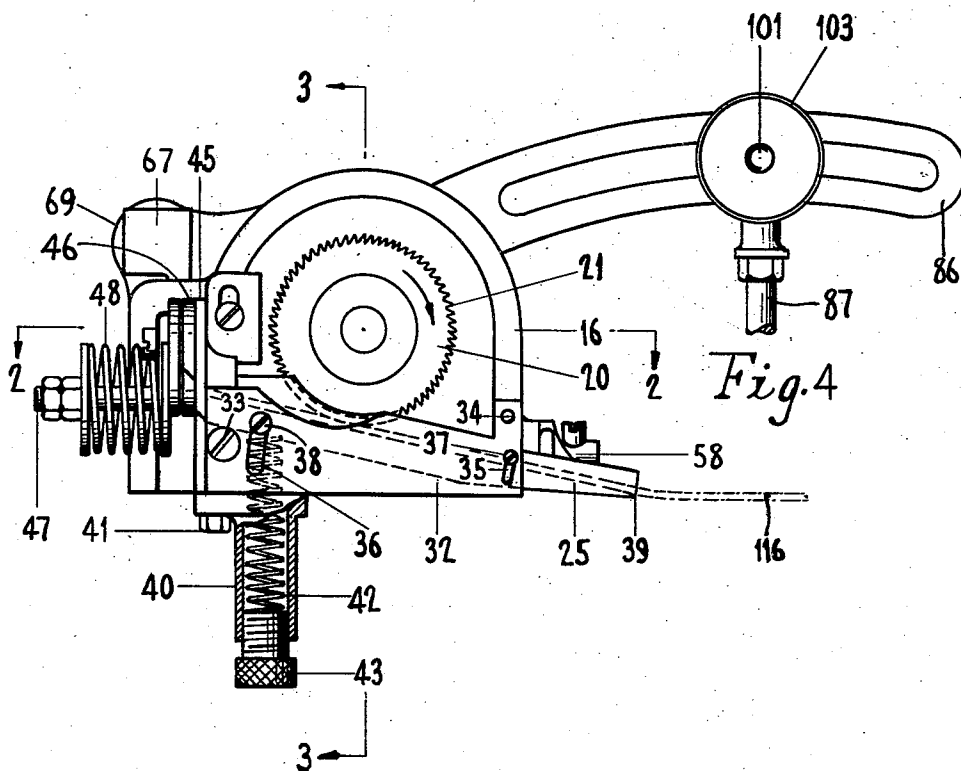


Fig. 4

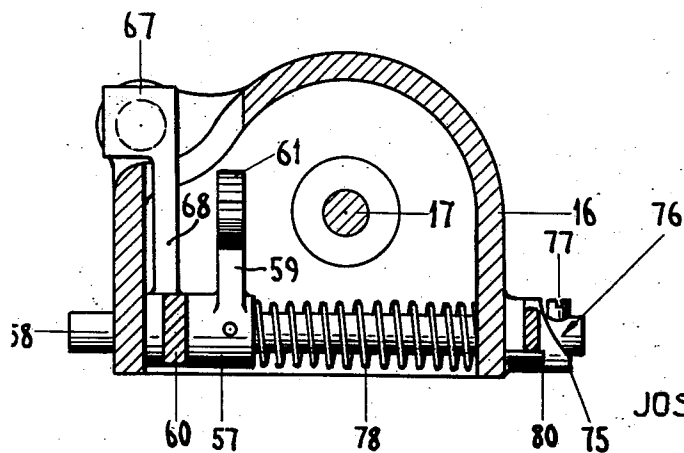


Fig. 5

JOSEPH GALKIN
INVENTOR.

BY *Joseph Blacker*

ATTORNEY.

Nov. 7, 1944.

J. GALKIN

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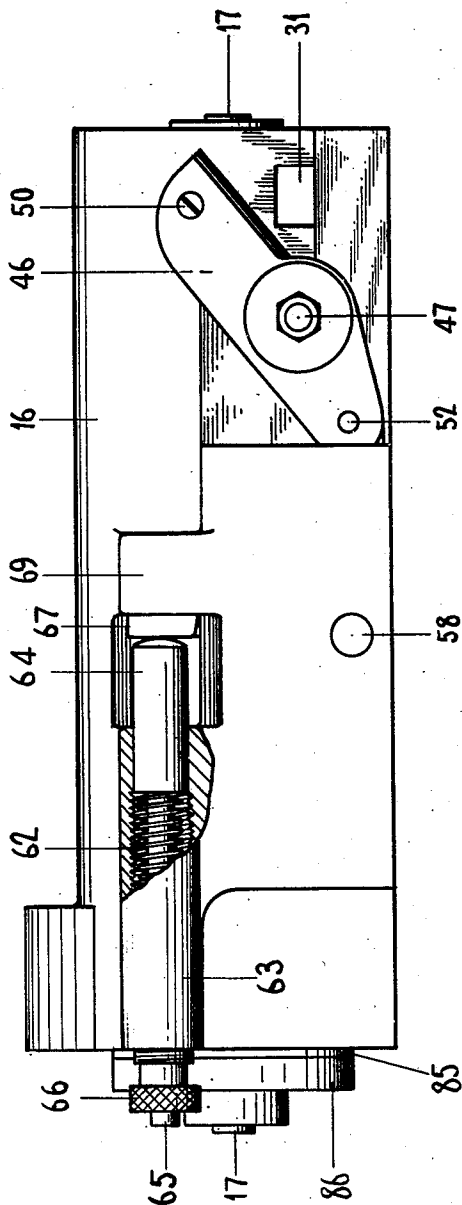


Fig. 6

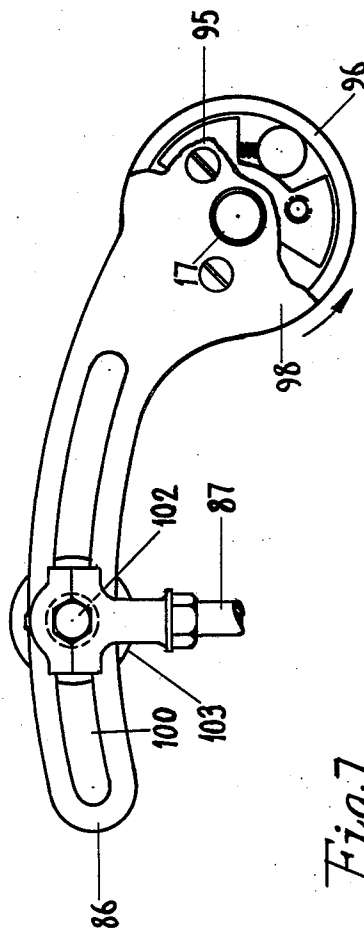


Fig. 7

JOSEPH GALKIN
INVENTOR.

BY *Joseph Blacker*
ATTORNEY

Nov. 7, 1944.

J. GALKIN

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5 Sheets-Sheet 5

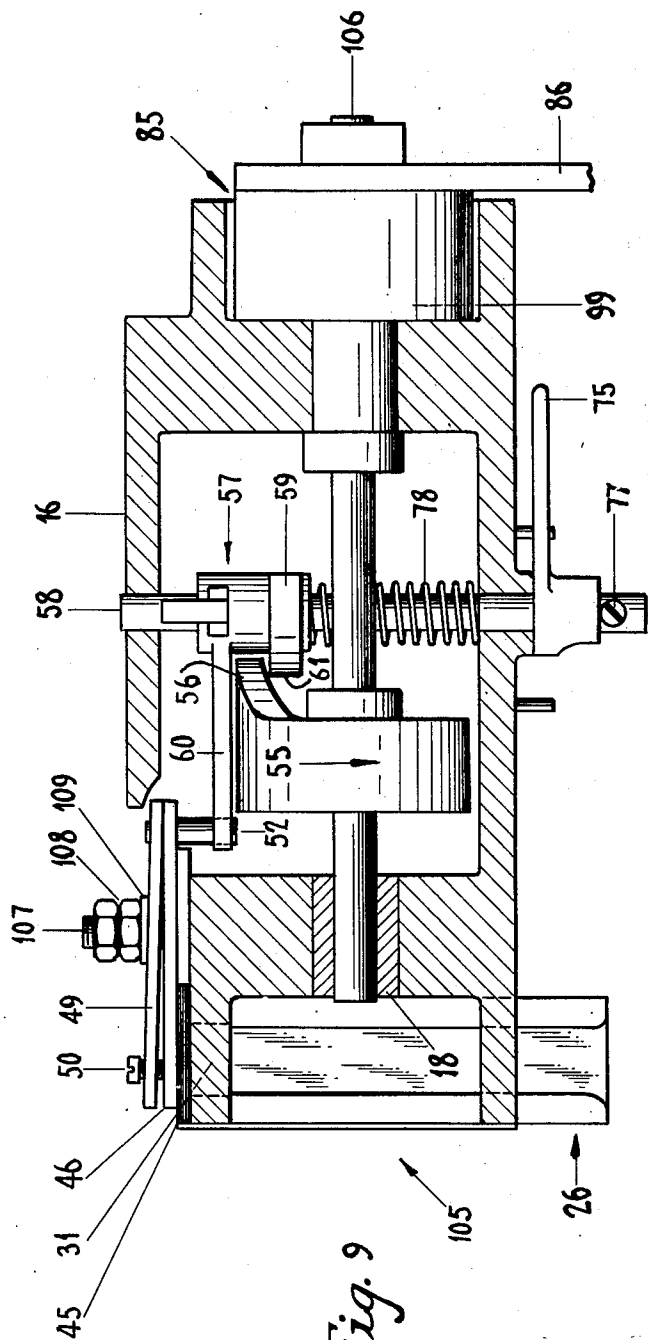


Fig. 9

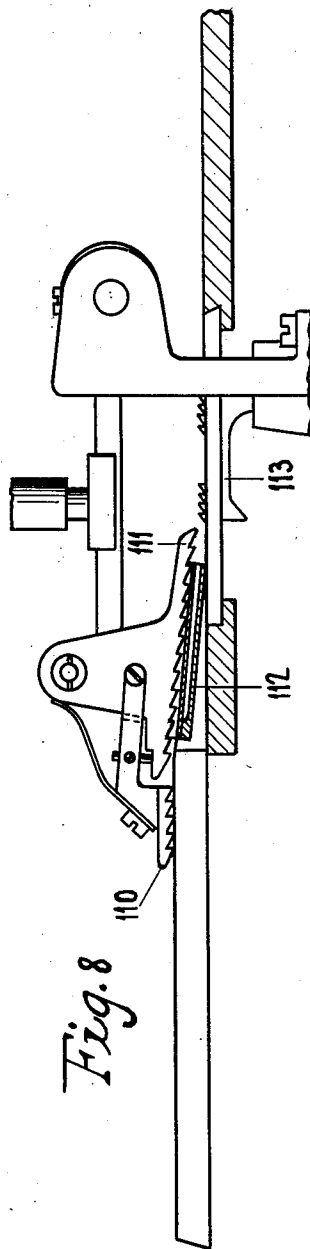


Fig. 8

JOSEPH GALKIN
INVENTOR.

BY *Joseph Blacker*

ATTORNEY.

UNITED STATES PATENT OFFICE

2,362,437

STRIP SHEARING ATTACHMENT

Joseph Galkin, New York, N. Y.

Application June 11, 1941, Serial No. 397,529

2 Claims. (Cl. 164—17.5)

This invention relates to a strip cutting mechanism adapted for application to a sewing machine for making stitched belt loop strip material, and whereby the strip is cut into predetermined lengths.

An object of this invention is to provide a strip cutting mechanism driven by the main shaft of the sewing machine and having a pivotally mounted shear blade which is held in open position by a spring-actuated lever, and to provide a cam fixed to the shaft of the said mechanism for quickly actuating and quickly releasing the said lever and shear blade so as to permit continuous feeding of the strip without interruption by the shear and without exerting undue pressure on the sewing machine mechanism.

Another object of this invention is to provide a shifting lever for at will shifting the lever out of engagement with the cam during operation of the machine, to permit a spring acting upon the lever to yieldingly hold the movable shear blade out of cutting engagement.

Another object of this invention is to provide a guide wheel having teeth, and a flat channel-shaped guide plate resiliently pressed tangentially against the guide wheel to cause the wheel to lightly engage a belt loop strip being fed so as to guide the belt loop strip from the feed-dogs to the shear blades.

With the above and other objects in view, the invention will be hereinafter more particularly described, and the combination and arrangement of parts will be shown in the accompanying drawings and pointed out in the claims which form part of this specification.

Reference will now be had to the drawings, wherein like numerals of reference designate corresponding parts throughout the several views, in which:

Figure 1 is a top plan view of the strip cutting mechanism as applied to my belt loop sewing machine.

Figure 2 is a longitudinal sectional view, the section being taken as on line 2—2 in Figure 4.

Figure 3 is a longitudinal sectional elevation, the section being taken as on line 3—3 in Figure 4.

Figure 4 is an end elevation of the mechanism.

Figure 5 is a cross-sectional view, the section being taken as on line 5—5 in Figure 2.

Figure 6 is a rear view of the strip cutting mechanism.

Figure 7 is an end view, partly broken away to show a clutch mechanism.

Figure 8 is a side elevation showing two top

feed-dogs and a lower feed-dog used in the sewing machine for positive feeding.

Figure 9 is a longitudinal cross-sectional view, showing a modified strip cutting mechanism.

In the illustrated embodiment of the invention, the numeral 10 indicates the work supporting base of a sewing machine comprising the usual standard 11 having a head (not shown) in which two spaced needles 12 and a looper cooperate to form interlock stitching. The material worked upon is held down by a presser-foot 13 resting on a needle plate 14 secured to the work supporting base 10. The sewing machine relates to improvements whereby belt loops for trousers are automatically produced in a single operation by mechanism which cuts scraps of cloth into strips and folds said strips into belt loop form and feeds said folded material with upper and lower feed-dogs. The sewing machine 10 makes stitched belt loop material in strip form and is fully disclosed in my patent application for Belt loop sewing machine, Serial No. 340,577, filed June 14, 1940, Patent Number 2,262,547. The present application relates to a mechanism 15 for cutting the belt strip into predetermined lengths.

The mechanism 15 comprises a housing 16 having a shaft 17 rotatably mounted in bearings 18, 19. A guide wheel 20 having saw shaped teeth 21 has been fixed at one end of the shaft 17.

As best shown in Figures 2 and 3, I have provided an elongated guide plate 25 having a flat upper work supporting surface 26 and upright side walls 27. The guide plate 25 extends into the housing 16 through an opening 28 in the front wall 29 and terminates at the inner face of the rear wall 30 in alignment with a rectangular opening 31 in said rear wall.

A plate 32 is fixed to one end portion of the housing 16 by a screw 33 and a pin 34. The plate 32 has through slots 35 and 36 providing passage therethrough for screws 37 and 38 extending outwardly from the guide plate 25. It will be seen that the guide plate 25 may be swung about its outer end 39 into and out of contact with a tangential point on the lower periphery of the guide wheel 20. A flanged bracket 40 fixed to the lower face of the housing 16 by bolts 41 has an elongated opening for a coil spring 42. An adjusting nut 43 in the threaded lower end of the bracket 40 functions to raise the spring 41 in pressure contact with the guide plate 25 and forces the work supporting surface 26 of said plate in resilient engagement with the guide wheel 20.

The shear comprises a stationary blade 45 fixed to the rear wall 30 of the housing 16 and having a horizontal cutting edge in alinement with the lower side of the rectangular opening 31. A movable blade 46 has been mounted on a pivot 47 and is pressed into cutting engagement with the fixed blade 45 by a spring 48.

A reinforcing plate 49 has been mounted on the pivot 47 between the movable blade 46 and the spring 48. The plate 49 has a screw 50 threaded therein and contacting with the movable blade. The plate 49 serves for causing a maximum pressure on the outermost point of the shear blades.

The means for actuating the movable shear blade 46 may comprise a cam 55 which is fixed on and rotated by the shaft 17. The nose 56 of the cam 55 is positioned to face in the direction of the axis and parallel to the shaft 17. A shear actuating lever 57 has been fixed to a rock shaft 58 slidably mounted in the housing 16 below the shaft 17. The lever 57 has an arm 59 which has a movement parallel with the axis of the shaft 17. The free end of the arm 59 is disposed in the path of rotation of the nose 56 of the cam 55. The nose of the cam engages the free end of the arm 59 and causes a horizontally positioned shear actuating lever member 60 to rise. The lever member 60 has a slot 61 in engagement with the head of a screw 52 threaded into the non-cutting end of the movable blade 46. Upward movement of the slotted end of the lever member 60 causes a swinging movement of the movable shear blade 46 into cutting engagement with the stationary shear blade.

The movable shear blade 46 is returned to its noncutting position, shown in Figure 6, as soon as the cam nose 56 moves away from under the free end 61 of the arm 59. This swinging movement is accomplished by a spring 62, shown in Figure 6, which is housed in a cylindrical extension 63 at the upper elevation of the housing 16. The spring 62 bears against the head 64 of an elongated rod 65 mounted in the extension 63. A hollow threaded member 66 serves for adjusting the pressure of the head 64 against a square shaped upper end portion 67 of an upright arm 68 of the lever 57 and forces the portion 67 of the lever arm 68 against a lug 69 formed on the housing 16.

An important feature of the strip cutting mechanism 15 resides in means for at will shifting the lever 57 to bring the free end 61 of the arm 59 out of the path of rotation of the nose 56 of the cam 55 and the shear blade 46 out of cutting engagement. The shifting means comprises a shifting lever 75 rotatably mounted on the rock shaft 58 and having a cam surface 76 angularly positioned with the axis of the rock shaft 58. A pin 77 fixed at one end of the rock shaft is in engagement with the cam surface 76. A spring 78 on the shaft 58 and interposed between the front wall of the housing and the lever 57 holds the arms 59 in position for actuation by the cam, and the pin 77 in contact with the cam surface 76. The operator may, by swinging the shifting lever 75 to the right, shift the lever 57 and the free end 61 of the arm 59 out of the path of rotation of the cam nose 56 and permit the spring-actuated head 64 to swing down the lever member and thus raise and hold the movable shear blade 46 in noncutting position.

Pins 80 and 81 projecting from the lower portion of the housing 16, on opposite sides of the shifting lever 75, serve to predetermine the throw

of the said lever in opposite directions. When the lever 75 is shifted to the right, the free end 61 of the arm 59 is brought out of the path of rotation of the nose 56 of the cam 55 and this movement causes the movable shear blade 46 to stay out of cutting engagement to permit the formation of long belt loop strips when desired.

The belt loop cutting mechanism herein described is particularly designed for cutting lengths of stitched belt loop strip fabric made from scrap material or pieces of fabric of various lengths. The disengaging feature of the movable shear blade is particularly desirable because it permits the operator to repeatedly throw the movable cutting blade into and out of operation. The operator is thus enabled to throw in the movable shear blade at any particular moment so as to start shearing substantially at the beginning of each length and thereby make a maximum number of belt loops from the particular strip having belt loop portions of unequal lengths.

Step-by-step rotation of the shaft 17 is synchronism with the feed-dogs of the sewing machine and the feed roller 20 is effected by a roller friction clutch 85. The clutch 85 is actuated by an arm 86 and a pitman 87 having its lower end in engagement with an eccentric 88 on the main shaft 89 of the sewing machine.

A clutching detent carrier 95 is freely mounted for oscillation on the shaft 17. The carrier 95 is also freely mounted within a casing 96 fixed to the shaft 17 by means of a screw 97 shown in Figure 2. A cover plate 98 forming a continuation of the arm 86 is fastened to the clutching detent carrier 95.

In order to prevent reverse movement of the shaft 17, I have provided a braking detent carrier 99 freely mounted within the casing 96, as shown in Figure 7. The braking detent carrier 99 is integral with the bearing 19 and thus fixed to the housing 16.

The clutch detent carrier 95 and the braking detent carrier 99 are mounted on the shaft 17 to work in opposite directions and may be in the form shown and described in Patent No. 1,985,406 issued to Nathan B. Galkin, dated December 25, 1934.

The clutch arm 86 has an arcuate slot 100 for receiving a screw 101 at the upper end of the pitman 87. One end of the screw 101 terminates in a ball-jointed connection 102. A nut 103 on the screw 101 serves for clamping the screw 101 and the ball-jointed connection in any desired position along the length of the slot 100.

Attempts have been made to operate belt loop shearing mechanisms by driving connection from the feed rocker which normally forms part of the regular feeding mechanism of the sewing machine. It has however been found in practice that the said mechanism wears excessively and causes an overthrow and even breaks under the stresses imposed thereon when shearing heavy fabric. I have found that an eccentric secured to the main shaft of the sewing machine is fully adapted to safely transmit the driving torque necessary for practical operating conditions.

Figure 9 shows a modified strip cutting mechanism 105 without any wheel on the shaft 106 and in which the shaft 106 terminates substantially at the outer face of the bearing 18. Figure 9 shows the shifting lever 75 and the shear actuating lever 57 moved so as to bring the free end 61 of the arm 59 out of the path of rotation of the nose 56 of the cam 55. It will be noted that the slotted lever member 60 has been moved into con-

tacting relation with the outer end of the screw head 52.

The modified strip cutting mechanism 105 has a shaft 106 which terminates at the outer end of the bearing 18. The movable blade 46 has been mounted on a pivot 107 and is held in cutting engagement with the fixed blade 45 by threaded nuts 108 and a washer 109.

Referring to Figures 1 and 8, it will be seen that the sewing machine to which the strip shearing mechanism is preferably applied, comprises a top feed-dog 110 for feeding scrap fabric to duplex shear blades 115, a top feed-dog 111 for feeding trimmed fabric to and through a folder 112 and to the stitching mechanism. The top feed-dogs 110 and 111 are operated in timed relation with a lower feed-dog 113. In practice, these three feeding devices have sufficient power to feed all kinds of fabric without any necessity for a toothed wheel on the drive shaft of the loop cutting mechanism.

The type of cutting mechanism 15 having a guide wheel 21 is used when operating upon fabrics that are soft and fluffy. The teeth 21 are saw-shaped, that is, each tooth has a side that is radially positioned and a side that makes an acute angle with the said radially positioned side. The type of cutting mechanism 105 is used when operating upon fabrics that have a degree of rigidity sufficient to maintain the straight line form of the strip 116 being sheared.

For the purpose of adjusting the arm 86 in relation to the pitman 87, I have provided visible indicia 117 on the upper face of the arm 86 whereby a pointer 118 on the pitman 87 may be used for adjusting the lengths to be cut, such as 2½ inches, 3 inches, 3½ inches, 4 inches, 4½ inches, etc.

In accordance with the patent statutes, I have described and illustrated the preferred embodiment of my invention, but it will be understood that various changes and modifications can be made therein without departing from the spirit of the invention as defined by the appended claims.

I claim:

1. In a device for cutting strip fabric into pieces of predetermined lengths, comprising a shear, a rotary shear actuating shaft having a toothed wheel secured thereto for guiding said strip past said shear, said wheel secured thereto for guiding said strip past said shear, said wheel having teeth, a pivotally mounted guide plate having a flat and inclined upper surface for guiding said strip, means for resiliently contacting said guide plate and said strip with the rear portion

of said wheel for engaging and guiding said strip, a lever actuating means carried by said shear actuating shaft for effecting actuation of said shear during each revolution of said feed wheel, said actuating means in its entirety being non-movable relative to said shear actuating shaft, a lever one extremity of which swings in an arc in a direction substantially parallel to said shaft and being spring-pressed towards said lever actuating means, a further spring acting upon said lever to hold the same in operative engagement with said lever actuating means for transmitting motion from said lever actuating means to said shear, a clutch for actuating said wheel, said guide plate being adapted for bringing said strip into contact with said wheel with a small pressure to permit slippage of said strip and means for at will relatively shifting said lever out of engagement with said lever actuating means during the operation of said machine to permit said spring further acting upon said lever to yieldingly hold said movable shear out of cutting engagement.

2. In a device for cutting positively fed strip fabric into pieces of predetermined length, comprising a shear, a shear actuating shaft having a toothed wheel secured thereto for guiding said strip past said shear, said wheel having teeth, a pivotally mounted guide plate having a flat and inclined upper surface and upright side walls providing a channel for guiding said strip, resilient means for bringing a fabric strip on said flat surface into contact with said wheel, for guiding said strip through said channel, an open face cam carried by said shear actuating shaft for effecting actuation of said shear during each revolution of said wheel, said open face cam in its entirety being non-movable relative to said shear actuating shaft, a lever one extremity of which swings in an arc in a direction substantially parallel to said shaft and being spring-pressed towards said cam, a further spring acting upon said lever to hold the same in operative engagement with said cam for transmitting motion from said shaft to said shear, a clutch for actuating said shaft and said wheel, said guide plate being adapted for bringing said strip into contact with said wheel with a small pressure to permit slippage of said strip, and means for at will relatively shifting said lever out of engagement with said cam during operation of said machine to permit said spring further acting upon said lever to yieldingly hold said shear out of cutting engagement.

JOSEPH GALKIN.