Aug. 4, 1931. W. FAIRCHILD 1,817,481

GUARDED CUTTER

Filed July 13, 1929

Fig. 1.

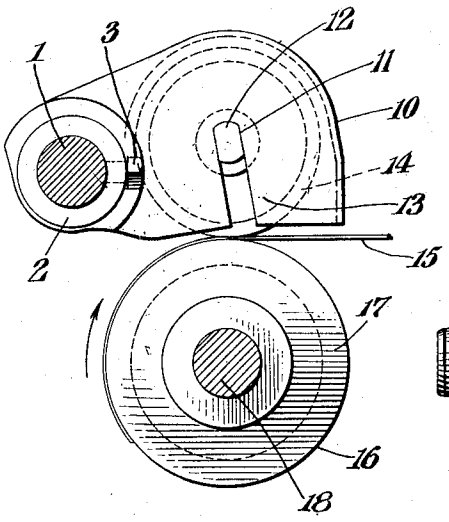


Fig. 2.

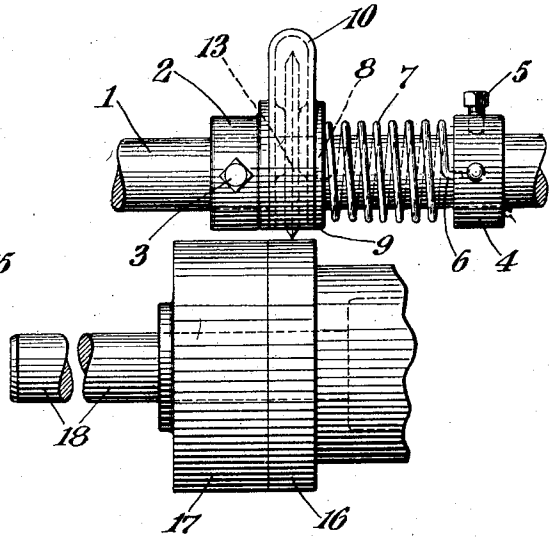


Fig. 3.

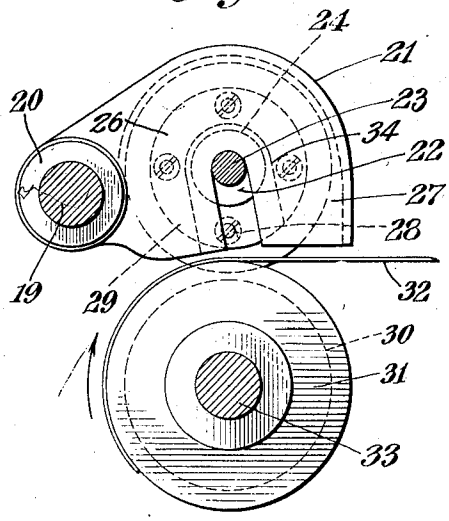
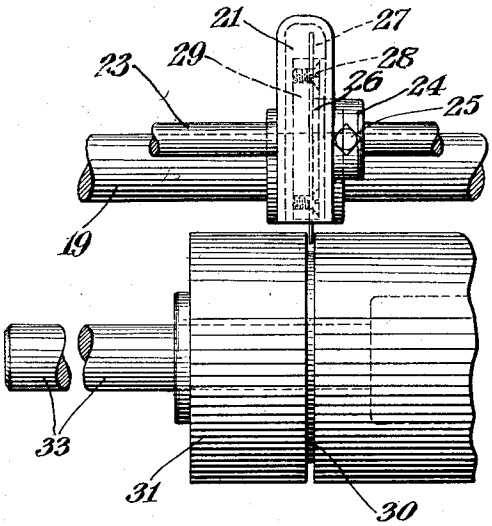


Fig. 4.



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UNITED STATES PATENT OFFICE

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GUARDED CUTTER

Application filed July 13, 1929. Serial No. 377,965.

My invention relates particularly to guarded cutters, that is to say, cutters or slitters which are so guarded as to obviate accidents and which are applicable to many different types of machines but particularly paper cutting machines.

The object of my invention is to provide guarded cutters which are so constructed as to effectively guard the cutter and in such a manner as to permanently and effectively guard the operator of the same from injury.

Another object is to so construct the same as to prevent distortion of the web of material, such as paper, on which the cutter operates.

Another object is to provide an effective drive for the cutter without necessarily applying a separate or direct driving mechanism for the cutter.

Still another object is to mount the cutter with a minimum number of parts and with as low a cost of construction as possible.

A further object is to retain the parts permanently in their intended position without liability to lose their adjustment.

Further objects of my invention will appear from the detailed description of the same hereinafter.

While my invention is capable of embodiment in many different forms, for the purpose of illustration I have shown only certain forms of the same in the accompanying drawings, in which

Figure 1 is a side elevation of a cutter and the supporting roll for the same made in accordance with my invention;

Figure 2 is a front elevation of the same;

Figure 3 is a side elevation of a modified form of my invention; and

Figure 4 is a front elevation of the same.

In the drawings, referring first to Figures 1 and 2, I have shown a cutter such as is applicable to a machine of the type shown in the patent of Seth Wheeler, No. 1,393,415, granted October 11, 1921. This comprises a transverse supporting shaft 1 having thereon an adjustable sleeve 2, held in place by screw 3, acting as a supporting abutment for the cutter. Spaced away from the sleeve 2 there is a spring-supporting sleeve 4 adapted to be adjusted into its desired position by means of a screw 5. The sleeve 4 has secured into the side thereof the end 6 of a helical spring 7 surrounding the shaft 1, the other end of which 8 extends into a hub 9 for exerting a downward torsional pressure on a cutter supporting housing 10 closed at the top and open at the bottom and having journal receiving slots 11 on the two sides thereof. In the slots 11 there is supported a transverse shaft 12 for rotatably carrying a circular or disc-shaped cutter 13 having a wedge-shaped edge 14 for cutting and separating the web of material such as paper 15, on which the cutter operates. The web of paper 15 is supported upon a hardened steel ring 16 which is carried on the outside of a roller 17 which is supported upon a shaft 18. It will be understood, of course, that if desired the shafts 1 and 18 may be of sufficient length to support a plurality of said cutters 13 and rings 16 for simultaneously cutting the web 15 longitudinally in a number of different places. The shaft 18 is driven from any suitable source of power and thereby drives the cutter by contact therewith. Thus in the form of invention shown in Figs. 1 and 2 the shaft 12, and with it the cutter 13, are carried by the guard 21 and are locked in place against movement axially of shaft 1 by the guard screw 3.

In the form of my invention shown in Figures 3 and 4 I have provided a cutter guard supporting shaft 19 of the same type as the shaft 1 and adapted to be introduced into cutting machines, as, for example, paper cutting machines, as previously described in connection with said shaft 1. Shaft 19 passes through a hub 20 of a cutter guard 21 closed at the top and open at the bottom, and which is provided with opposing slots 22 for rotatably receiving a transverse shaft 23 which extends entirely across the machine and may or may not be driven by any suitable gearing or any other desired source of power. The said shaft 23 is provided with a hub 24 designed to be secured thereon in adjusted position by a screw 25, the same being provided with a flange 26 to which a disc-shaped slitting cutter 27 is secured by four screws 28

passing through flange 26 and through the cutter into a retaining ring 29 located on the other side of the disc 27 and inside of the guard 21. The guard 21 has a large recess 34 to straddle hub 24 and in this form of device the guard is loose on shaft 19 and is held against play axially on the shaft by locking the set screw 25. The outer edge of the disc-shaped cutter passes downwardly into a slot 30 on a web-supporting roll 31 arranged for supporting a web of paper 32 thereon, the roll 31 being carried by a shaft 33 which may be driven from any suitable source of power. It will be understood here again that the shafts 23 and 33 may be so arranged as to provide a plurality of slitting discs 27 with corresponding grooves 30 at different points along the shafts according to the number of places where the web of paper is desired to be cut.

In the operation of my invention it will be understood, referring first to Figures 1 and 2, that the web of paper 15 which is supported by the roll 17 will be continuously fed forwardly in the direction of the arrow and will be supported and cut by the wedge-shaped disc knife 3 which is rotated by contact with the periphery of the hardened steel ring 16, the workman being at all times protected from injury due to the presence of the guard 10, which not only encloses the disc-shaped cutter 3 but supports the same for rotation therein. The construction is such, furthermore, that once the parts have been adjusted by means of the screws 3 and 5 and the sleeves 2 and 4 in which they are carried, the said parts will retain indefinitely their intended position and with the desired amount of torsion from the spring 7, which exerts the desired degree of pressure from the cutting disc 3 on to the ring 16. In this manner danger to the workman due to the parts loosening their adjustment or altering their position as a result of the continued operation of the machine is minimized.

In the form of my invention shown in Figures 3 and 4 the parts operate in a similar manner except that in this instance the slitter 27 may, although it may not, be driven directly by means of the shaft 23 from any suitable source of power and the weight of the slitter 27 with the guard 21 is sufficient to carry it well within the slot 30 of the web-supporting roll 31 so as to effectively slit the web of paper continuously as it passes the cutter. In this instance the adjustment of the slitter 27 transversely of the machine is secured by the proper adjustment of the hub 24 by means of the screw 25. Also in this instance replacement of the slitter 27 may be effected by the removal of the screws 28 and the attached parts for the insertion of a new slitting disc.

In the above forms of my invention it will be understood also, as above referred to, that the construction is such as to contemplate the use of a plurality of the cutting or slitting discs on the same shafts, corresponding arrangements being made from the web-supporting roll to provide for the same.

While I have described my invention above in detail, I wish it to be understood that many changes may be made therein without departing from the spirit of the same.

I claim:—

1. In combination a disc-shaped rotary cutter, an integral guard enclosing the exposed portion thereof, a shaft on which the guard is supported, located beyond the periphery of the cutter, said shaft having a spring thereon connected to the guard for exerting torsional force thereon and adjustable sleeves secured to said shaft for determining the relative position of the spring and cutter.

2. In combination a rotary cutter, a shaft extending across said cutter outside the periphery thereof, a guard to enclose the exposed portion of said cutter carried by said shaft and movable longitudinally thereof, a shaft extending through the guard and carrying the cutter, and means at the outside of said guard for fixedly positioning said guard and said cutter longitudinally relative to said first shaft.

3. A structure as specified in claim 2 in which such guard positioning means is directly connected with said guard and fixes said guard relative to said first shaft.

4. A structure as specified in claim 2 in which such guard positioning means is directly connected with said cutter and fixes said cutter relative to said second shaft.

5. In combination a rotary cutter, a roll with which the cutter co-operates, a shaft for the cutter, a guard for the cutter adapted to bear against said shaft at the sides of said cutter, and a pivoted mounting for said guard located beyond the periphery of the cutter adapted to cause the guard to press said cutter shaft towards said roll.

6. A structure as specified in claim 5 in which a spring is provided to tension said guard and cutter shaft towards said roll.

In testimony that I claim the foregoing, I have hereunto set my hand this 1st day of July, 1929.

WILLIAM FAIRCHILD.