

D. D. FROTHINGHAM.

CUTTER.

APPLICATION FILED APR. 24, 1908.

937,208.

Patented Oct. 19, 1909.

2 SHEETS—SHEET 1.

Fig. 2.

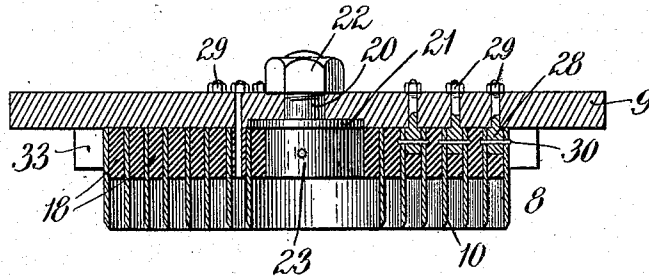
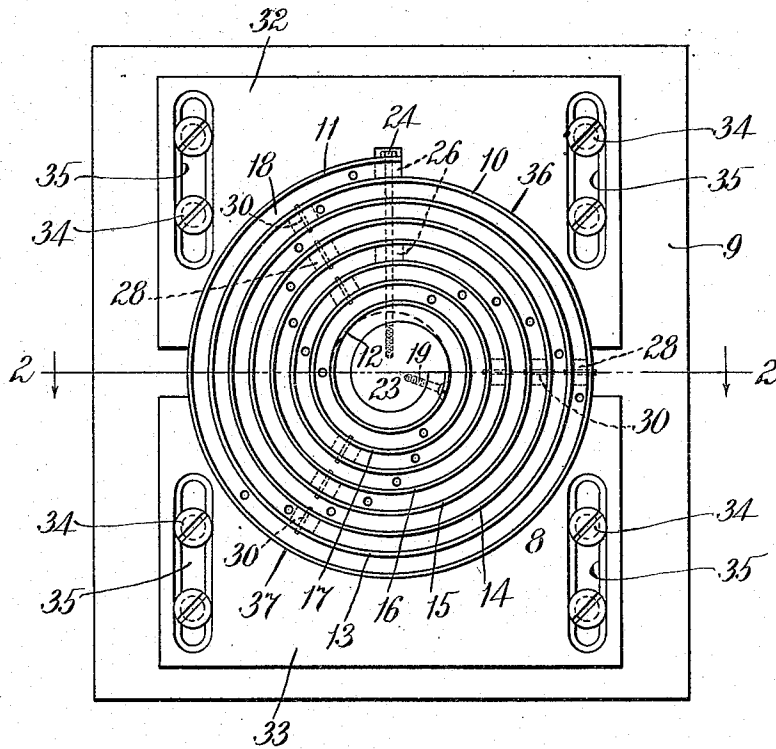


Fig. 1.



Witnesses:

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By his attorney,
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2 SHEETS—SHEET 2.

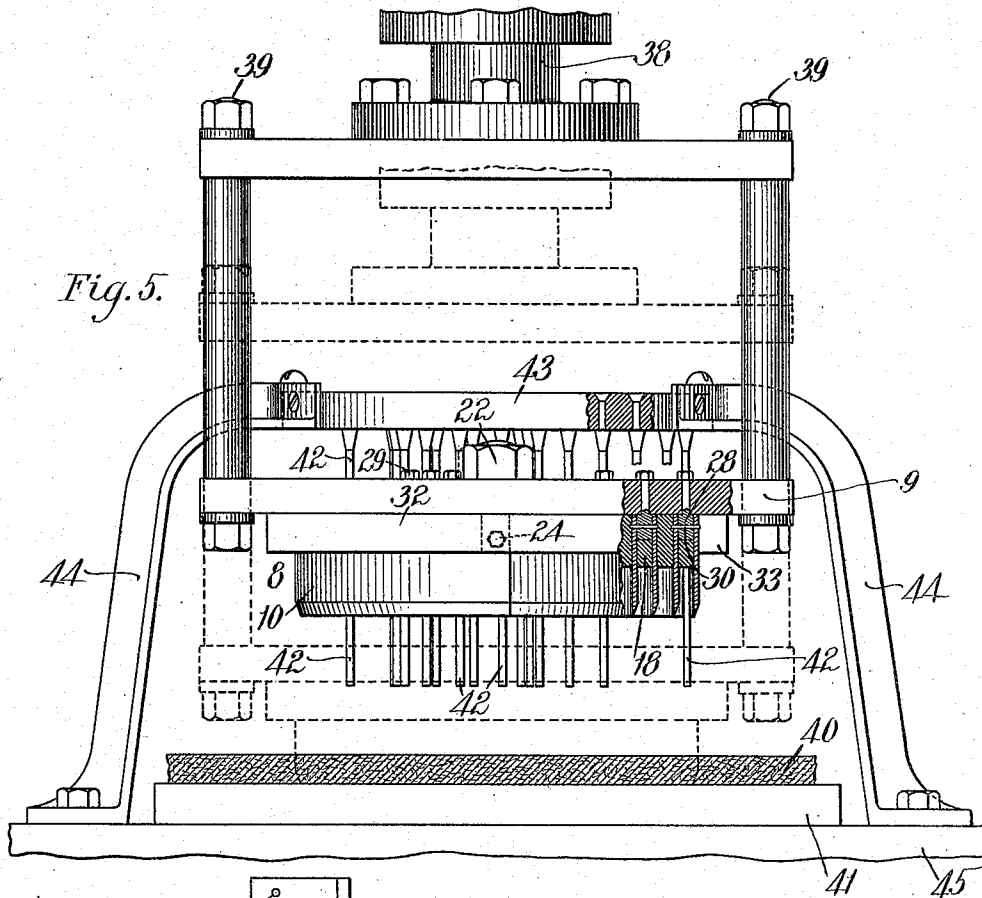


Fig. 5.

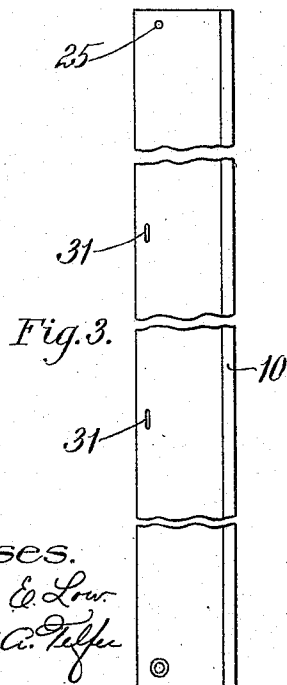


Fig. 3.

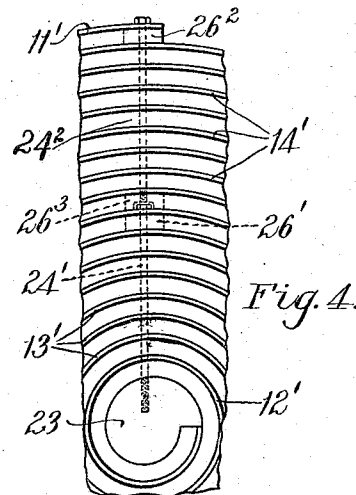


Fig. 4.

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UNITED STATES PATENT OFFICE.

DANIEL D. FROTHINGHAM, OF SALEM, MASSACHUSETTS.

CUTTER.

937,208.

Specification of Letters Patent.

Patented Oct. 19, 1909.

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To all whom it may concern:

Be it known that I, DANIEL D. FROTHINGHAM, a citizen of the United States, residing at Salem, in the county of Essex and State of Massachusetts, have invented new and useful Improvements in Cutters, of which the following is a specification.

This invention relates to an improved cutter adapted to be used in combination with a machine for cutting out strips of material from a sheet of said material. The cutter is particularly adapted for cutting long strips and narrow strips of leather from a piece of sheet leather; these strips of leather being used for shoe laces, leather belting, bell cords such as are used in railway cars, and in fact for any use in which it is desired to cut without waste a long strip of material from a sheet of the same.

The invention consists in a cutter formed and constructed as hereinafter described and particularly as pointed out in the claims.

Referring to the drawings: Figure 1 is an underneath plan of my improved cutter. Fig. 2 is a sectional elevation taken on line 2-2 of Fig. 1. Fig. 3 is a detail side elevation of the cutter as it appears before it is bent in spiral form, the same being broken away to save space in the drawings. Fig. 4 is an enlarged plan of a portion of a cutter, illustrating a modified means for attaching the spiral blade to the holder. Fig. 5 is a front elevation, partly broken away and shown in section, of my improved cutter illustrating the same attached to a portion of a working machine.

Like numerals refer to like parts throughout the several views of the drawings.

Referring to Figs. 1, 2 and 3, 8 is a cutter constructed in accordance with my invention and consisting of a holder 9, a cutter blade 10 formed of a metal strip, with one edge thereof preferably sharpened, said metal strip being bent to form a spiral having an outer convolution 11, an inner convolution 12 and intermediate convolutions 13, 14, 15, 16 and 17.

A strip of sheet material 18, of less width than that of the metal strip forming the cutter blade 10, is interposed between the adjacent convolutions of said cutter blade, thus gaging the space between said convolutions and determining the width of the strip of leather or other material which is to be cut. The strip 18 may be formed of leather, rub-

ber or any desired material and the inner end of said strip, together with the inner end of the cutter blade 10, is fastened by a screw 19 to a portion of a stud 20. The stud 20 has a flange 21 thereon and is clamped against the holder 9 by means of a nut 22 having screw-threaded engagement therewith. The portion 23 of said stud projects from the face of the holder 9 and has a periphery of spiral form. The outer end of the cutter blade 10 is fastened by a pin or bolt 24 to the projecting head 23 of the stud 20. Said pin 24 extends transversely of the cutter blade 10 and through holes 25 provided therein. Said pin also projects through ears 26, 26 which are shouldered to form a cylindrical portion which extends through the holder 9 and are clamped to said holder by nuts. The pin 24, therefore, acts to hold the outer end of the spiral cutter blade 10 to the holder and also serves the purpose of attaching the intermediate convolutions of the spiral to the holder. The intermediate convolutions of the spiral cutter blade are still further attached to the holder by means of the ears 28, 28 provided with cylindrical stems which project through the holder 9 and are clamped thereto by means of nuts 29, 29. Pins 30, 30 extend transversely of the ears 28 and through holes or slots 31, 31 formed in the cutter blade 10. The cutter blade 10 is still further firmly held and connected to the holder 9 by clamp plates 32, 33. These clamp plates are adjustably fastened to the holder by means of screws 34, 34 which project through slots 35, 35 provided in said clamp plates and have screw-threaded engagement with the holder 9. The clamp plates 32 and 33 are recessed at 36, and 37, respectively, to receive and fit against the outer convolution 11 of the cutter blade 10.

In assembling the parts of the cutter, the cutter blade 10 and the metal strip 18 are first fastened to the head 23 of the stud 20 by means of a screw 19. Said cutter blade and strip are then wound upon the head 23 and around each other, as shown in Fig. 1, and at intervals the ears 28, 28 are attached to the holder 9 by inserting the stem of the ear through the holder and clamping the same thereto by means of one of the nuts 29. Another convolution of the cutter blade is then wound around and outside the ear 28 which has just been fastened to the holder

9, as described, and one of the transverse pins 30 is then driven through a hole in the ear and through two of the holes or slots 31 in the adjacent convolutions of the cutter blade. In this way these ears are attached to the holder from time to time at suitable intervals and the cutter blade is fastened thereto. The outer end of the cutter blade is fastened to the ears 26, 26 and to the head 23 by the long pin or bolt 24. The clamp plates 32, 33 are finally fastened to the holder 9 and adjusted to the proper position to clamp the outer convolution 11 in position and held in said position by means of screws 34 34. The holes 31, 31 are preferably made in the form of slots so that they may more easily align with the holes in the ears through which the transverse fastening pins are passed.

In cutters of very large diameter it may become necessary to use more than one of the long pins which connect the outer end of the spiral to the head 23, and in such case two or more of these long pins may be used, depending upon the diameter of the cutter.

In Fig. 4 I have illustrated a modified form of my invention in which is illustrated the means employed where cutters of large diameter are used, for securing the outer end of the blade to the holder and for securing the different convolutions of the cutter blade to the holder. Referring now to Fig. 4, 23 is the head of the central stud 20, 11' the outer convolution, 12' the inner convolution of the cutter blade, and 13', 14' the intermediate convolutions. It will be seen that the intermediate convolutions 13' and the inner convolution 12' are fastened to the head 23 by the pin 24' which extends through an ear 26' and is screw-threaded at its inner end to engage said head 23 of the stud 20. The remaining intermediate convolutions 14' and the outer convolution 11' are fastened to the holder by the bolt 24² which extends through said convolutions and through the ears 26² and 26³, said ears being fastened, as hereinbefore described, to the holder.

In using my improved cutter, the same is preferably fastened to a movable head or plunger 38 (Fig. 5) by means of bolts 39, said head having a reciprocatory movement imparted thereto by suitable mechanism. The material 40 to be cut is placed upon a wooden cutter block 41. Ejectors 42 are provided which consist of pins fastened to a stationary plate 43 supported upon brackets 44 fast to the base 45 of the machine. The ejectors 42, 42 extend through holes in alignment therewith provided in the holder 9 and extending through the strip 18, these holes in the holder being arranged in a spiral path between the adjacent convolutions of the cutter blade.

The general operation of the machine is as

follows: The material 40 is placed upon the cutter block 41, a reciprocatory motion is imparted to the plunger 38 which moves the cutter downwardly from the position shown in full lines (Fig. 5) to that shown in dotted lines therein, the cutter blade being forced through the material 40 and against the upper surface of the cutter block 41. In its return or upward movement, the leather or other material which has been cut is forced out from between the convolutions of the cutter blade by the stationary pins or ejectors 42.

It is very essential that the cutter blade should be held firmly against the holder, both as to the inner and outer convolutions and also as to the intermediate convolutions thereof, for the reason that when the leather is cut the blade is passed through said leather and the cutter blade forced against the cutter block in order to make a good clean cut. Now, upon reversing the movement of the cutter to raise the same, the tendency is for the cutter blade to stick to the cutter block and if each convolution is not firmly fastened to the holder the intermediate convolutions will be drawn out or held downwardly by the cutter block and will then snap partly back, resulting in an absolutely impracticable device. The same trouble results, viz., of the intermediate cutter blades being pushed away from the holder if they are not each held firmly thereto when the leather which has been cut and is between the blades of the cutter is ejected by the ejectors 42, as hereinbefore described, during the upward movement of the cutter. It will, therefore, be understood that the intermediate convolutions of the cutter blade must be held firmly to the holder in order that the device may perform the function for which it is intended.

I have found by practical experience that in the machine to which my improved cutter is attached, it is very desirable that the reciprocatory plunger to which the cutter is attached, should have a reciprocatory movement imparted thereto which, while powerful, is yet slow at the end of its downward movement when the cutting operation is taking place, for the reason that the cutter blade, being very thin, it is desirable and, in fact, essential, in order that the machine should be practically operative, that the force imparted to the cutter during the cutting operation should be slow and powerful, but not a quick, abrupt blow such as would be imparted by a dinking machine or by the blow of a mallet upon a hand die.

It will be noted that the ejectors 42 are arranged in a series of spiral paths, so that while the ejectors of one series are separated from the ejectors of another series by quite a space, the whole surface of the material cut is taken care of and pushed outwardly

from between the blades of the cutter, so that there will be no danger of the same sticking at any portion between said blades and not being cleared therefrom.

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

1. A cutter comprising in its construction a holder, a cutter blade consisting of a metal strip bent to form a spiral having inner, outer and intermediate convolutions, and means interengaging said intermediate convolutions and said holder and positively locking said intermediate convolutions to said holder.

2. A cutter comprising in its construction a holder, a cutter blade consisting of a metal strip bent to form a spiral having a plurality of convolutions, means to fasten the convolutions located between the inner and outer convolutions of said spiral to said holder, and a strip of sheet material of less width than that of said metal strip, interposed between adjacent convolutions of said cutter blade.

3. A cutter comprising in its construction a holder, a cutter blade consisting of a metal strip bent to form a spiral having inner, outer and intermediate convolutions, means to fasten said inner and outer convolutions to said holder, and means interengaging said intermediate convolutions and said holder and positively locking said intermediate convolutions to said holder.

4. A cutter comprising in its construction a holder, a cutter blade consisting of a metal strip bent to form a spiral having three or more convolutions, and means interengaging each and all of said convolutions and said holder and positively locking each and all of said convolutions to said holder.

5. A cutter comprising in its construction a holder, a cutter blade consisting of a metal strip bent to form a spiral having an inner convolution, an outer convolution and one or more intermediate convolutions, and means interlocking with said intermediate convolutions and said holder and positively locking said intermediate convolutions to said holder.

6. A cutter comprising in its construction a holder, a cutter blade consisting of a metal strip bent to form a spiral having an outer convolution, an inner convolution and one or more intermediate convolutions, an ear fast to said holder, and projecting therefrom between two adjacent convolutions, and

means to fasten said adjacent convolutions to said ear.

7. A cutter comprising in its construction a holder, a cutter blade consisting of a metal strip bent to form a spiral having an outer convolution, an inner convolution, and one or more intermediate convolutions, an ear fast to said holder and projecting therefrom between two adjacent convolutions, and a cross-pin extending through said adjacent convolutions and ear.

8. A cutter comprising in its construction a holder, a cutter blade consisting of a metal strip bent to form a spiral having a plurality of convolutions, said metal strip having a plurality of holes therein, and means to fasten said strip to said holder and projecting into said holes.

9. A cutter comprising in its construction a holder, a stud fast to said holder and projecting therefrom, said projecting portion of said stud having a periphery of spiral form, a cutter blade consisting of a metal strip bent to form a spiral, the inner end of said cutter blade fast to said stud, and means to fasten the outer end of said cutter blade to said holder.

10. A cutter comprising in its construction a holder, a stud fast to said holder and projecting therefrom, said projecting portion of said stud having a periphery of spiral form, a cutter blade consisting of a metal strip bent to form a spiral, the inner end of said cutter blade fast to said stud, an ear fast to said holder and a pin extending transversely of said cutter blade fast at its inner end to said stud, extending through said ear and through said cutter blade adjacent to the outer end thereof.

11. A cutter comprising in its construction a holder, a cutter blade consisting of a metal strip bent to form a spiral having a plurality of convolutions, means to fasten the convolutions located between the inner and outer convolutions of said spiral to said holder, and two clamp plates adjustably fastened to said holder, each of said plates recessed to receive and fit against substantially one-half of the outer convolution of said cutter blade.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

DANIEL D. FROTHINGHAM.

Witnesses:

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LOUIS A. JONES.