C. H. RICHARDSON.

MACHINE FOR CUTTING SHEET MATERIAL INTO STRIPS.

APPLICATION FILED MAY 5, 1915.

1,200,136.

Patented Oct. 3, 1916.

2 SHEETS—SHEET 1.

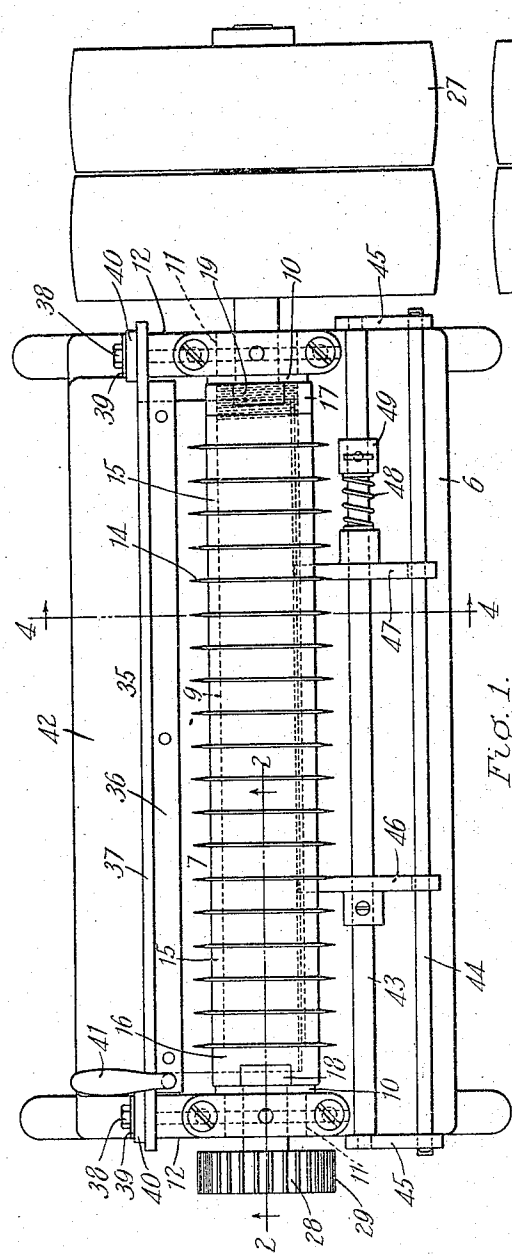


Fig. 1.

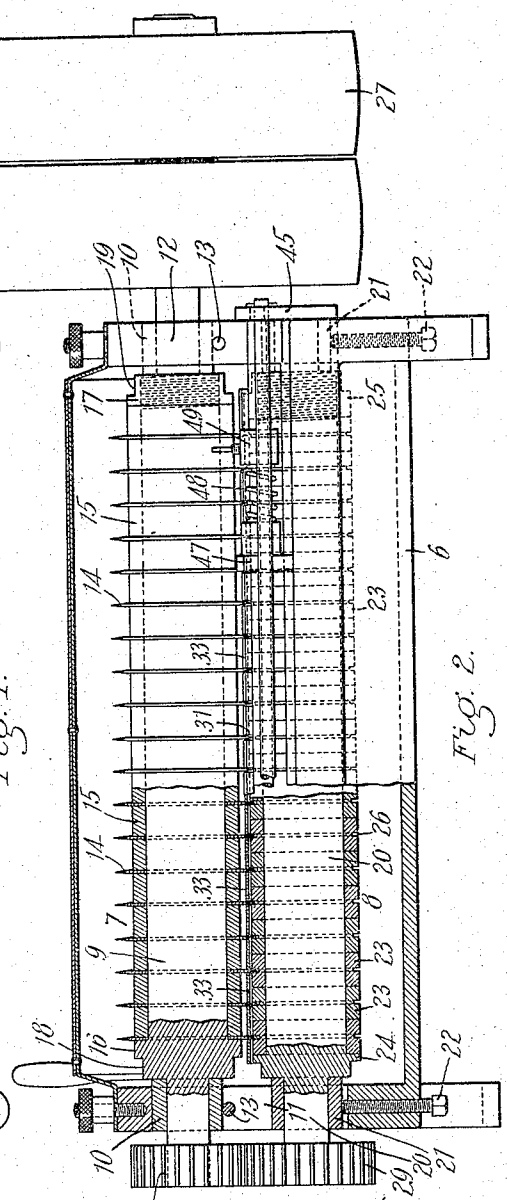


Fig. 2.

Inventor:

Charles H. Richardson,

by his attorney, Charles J. Goodwin.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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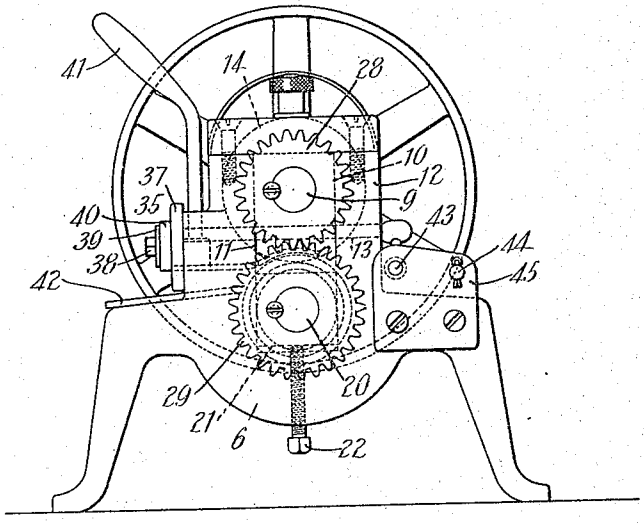


Fig. 3.

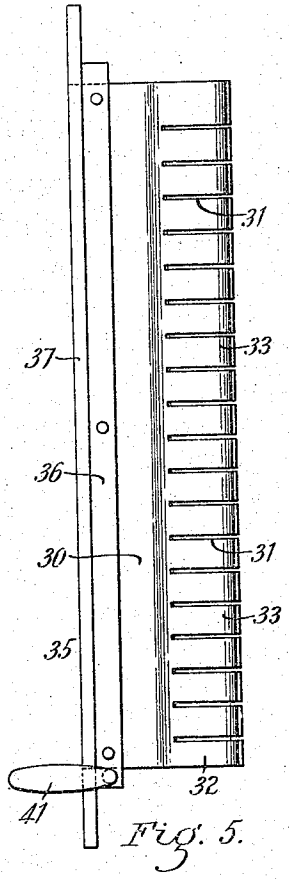


Fig. 5.

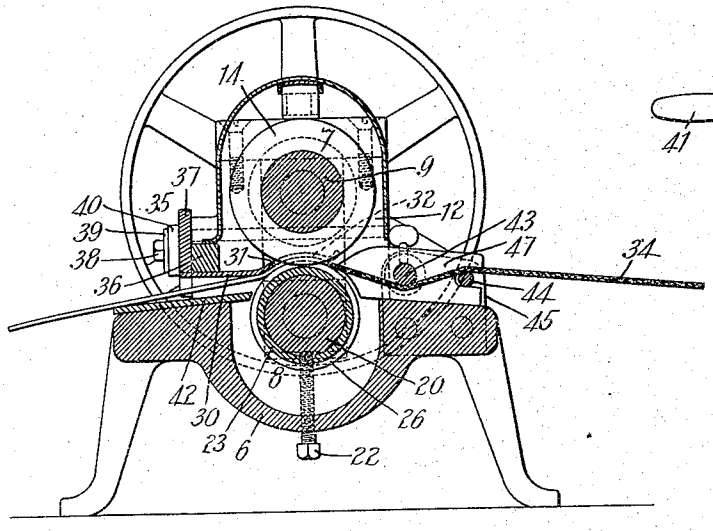


Fig. 4.

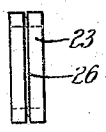


Fig. 6.

Inventor.

Charles H. Richardson,

by his attorneys, Charles S. Gooding.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

CHARLES H. RICHARDSON, OF DOVER, NEW HAMPSHIRE, ASSIGNOR TO PHILIP C. BROWN, OF DOVER, NEW HAMPSHIRE.

MACHINE FOR CUTTING SHEET MATERIAL INTO STRIPS.

1,200,136. Specification of Letters Patent. Patented Oct. 3, 1916.

Application filed May 5, 1915. Serial No. 26,169.

To all whom it may concern:

Be it know that I, CHARLES H. RICHARDSON, a citizen of the United States, residing at Dover, in the county of Strafford and State of New Hampshire, have invented new and useful Improvements in Machines for Cutting Sheet Material into Strips, of which the following is a specification.

This invention relates to a machine for cutting sheet material into strips and is particularly adapted to be used in connection with machines for cutting sheet material into strips to be used as welts for boots and shoes.

In cutting the leather into strips for the welts, it is necessary that the leather strip to be divided into narrow strips for the welts be made wider than the combined width of the strips into which it is cut by the machine, there being a certain waste on each edge of the material from which the strips are cut. There is, therefore, an excess width or marginal trimming to each piece of material which is stripped which constitutes a waste or loss, and it is the object of this machine to reduce this excess width of marginal material to a minimum.

The machine of my invention embodies two rolls which are geared together, the upper one being provided with circular knives, the peripheries of which rotate in grooves in the lower roll, suitably spaced to receive them, and between the two rolls a pressure member is applied which serves to hold the leather which is being split firmly in position with relation to the knives and with relation to the lower roll. This pressure member also acts as a guard to assist in holding the rotary cutter knives in exact position for the cutting operation. Said pressure member is applied so as to extend between and outside the operative knives in such a manner as to present the leather smoothly to the knives, and hold it firmly on the lower or feed roll during the cutting operation and at the same time, by the close contact of the fingers into which said pressure member is subdivided on opposite sides of each knife, additional means are provided to keep the knives running true in the grooves in the lower roll. These pressure fingers also act to clear the strands or strips from the knives as they are being cut, thus delivering the strands properly at the rear side of the machine. The machine of my invention is also so constructed and arranged that both the rolls are positively driven and the knife roll is placed above the grooved feed roll, the rolls being so driven by gearing, suitably proportioned, that the upper or cutter roll runs at a higher speed than the lower or feed roll, and the knife edges travel faster at the point where they cut the leather than does the peripheral surface of the grooved or sustaining roll. By this arrangement the leather is retarded relatively to the knives so that said knives operate to make a draw cut with a consequent tendency to smooth out the leather as it is being cut and insure better work.

An advantage secured by my improved machine for cutting leather is that, because of the knives being placed above the feed roll, it is only necessary to remove the top cover to expose said knives ready for sharpening. Also the knife roll being fixed as to vertical movement, no springs are necessary between the boxes which sustain the rolls, as the weight of the bottom roll holds it down on elevating or adjusting screws which are utilized to raise and lower said roll relatively to the knives as may be desired. The knives being located above and cutting downwardly result in an advantage which consists in the fact that the leather is pressed downwardly by the double beveled knives upon the supporting or feed roll and tends to run in better position for cutting than when the knives are placed below or cutting upward with the natural gravity of the leather tending to let it sag downward on the knife.

Referring to the drawings: Figure 1 is a plan view of my improved machine for cutting sheet material. Fig. 2 is a front elevation of the same, partly broken away and shown in section on line 2—2 of Fig. 1. Fig. 3 is an end elevation as viewed from the left of Fig. 1. Fig. 4 is a sectional elevation taken on line 4—4 of Fig. 1 showing a piece of material in position to be cut on the machine. Fig. 5 is a plan view of the rocker frame with pressure plate attached thereto. Fig. 6 is a plan view of one of the feed roll collars.

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

In the drawings 6 is the frame of the machine, 7 is the cutter roll and 8 the feed roll. The cutter roll consists of a shaft 9

journaled to rotate at the opposite ends thereof in boxes 10 supported in slots 11 provided in the ends 12 of the frame by cross pins 13. Double beveled rotary cutters 14 are mounted upon the shaft 9 and are separated one from the other by collars 15. Said collars and cutters are clamped together and forced longitudinally of the shaft 9 toward an annular shoulder 16 upon said shaft by a clamping nut 17 which has screw-threaded engagement with the shaft 9. The shaft 9 is flatted off at 18 adjacent to the shoulder 16 and the nut 17 is flatted off at 19, so that when said nut is being rotated in either direction the shaft can be held stationary by a suitable wrench or tool in order that the cutters may be firmly clamped on the shaft or unclamped therefrom.

It is necessary, in order to make a machine of this character practical, that the cutters should be arranged at different distances apart for cutting different width strips and when this becomes necessary the collars 15, together with the cutters, are removed from the shaft 9 and narrower or wider collars substituted as may be desired, so that the cutters can cut narrow or wider strips of material.

The lower or feed roll 8 consists of a shaft 20 which is mounted to rotate in boxes 21, these boxes being supported in the slots 11 upon adjusting screws 22 whereby said boxes and the lower roll supported thereby may be raised or lowered as may be desired. The shaft 20 has a series of collars 23 mounted thereon and clamped against a flange 24 on the shaft 20 by a nut 25 which has screw-threaded engagement with the shaft 20. Each of the collars 23 has an annular groove 26 provided in its periphery midway between its opposite edges and into these grooves 26 the cutters 14 are arranged to project during the cutting operation. When it is desired to cut narrower or wider strips of leather, the collars 23 are removed at the same time that the cutters and collars 15 are removed and narrower or wider collars are used to correspond with the collars 15 and the cutters 14.

The upper or cutter shaft 9 is driven by a pulley 27 and has fastened thereto a gear 28 which meshes into another gear 29 fast to the feed roll shaft 20. It will be noted that the diameter of the gear 28 is less than that of the gear 29, so that the shaft 20 will make fewer rotations than the shaft 9. Also it will be noted that the diameter of the cutters 14 is greater than the diameter of the feed roll collars 23, so that the peripheral speed of the cutters is greater than the peripheral speed of the collars 23, the result being that the speed of the cutters, at the point where they are cutting the stock is appreciably greater than the speed of the periphery of the roll by which said stock is fed to the cutters.

In order to hold the leather firmly in position while it is being cut and in order also to guide and aid in the correct positioning of the cutters relatively to said stock I provide a pressure plate consisting, preferably, of a plate 30 which is provided with a plurality of slots 31 extending partly across the plate 30 from one edge thereof to receive the edges of the cutters 14. The plate 30 is preferably curved at 32 so as to extend partly around the feed roll 8 adjacent to the periphery thereof and the slots 31 subdivide said plate into a plurality of fingers 33 which perform a double function. One is that of bearing against the leather 34 as it is being cut into strips and the other is to aid in correctly guiding and positioning the knives during the cutting operation. The pressure plate 30 is rigidly fastened to a rocker frame 35 consisting of a bar 36 and a plate 37 which are rigidly fastened together, the plate 37 being loosely supported upon screws 38 which have screw-threaded engagement with the frame of the machine. Between the plate 37 and the heads of the screws 38 there are interposed washers 39 and rubber collars 40 which constitute a yielding means, so constructed and arranged as to press against the plate 37 and by so pressing to force the fingers 33 against the upper surface of the leather 34 as it is being fed between the rolls and cut. The pressure of the rubber 40 against the plate 37 and the resultant pressure of the fingers 33 against the leather may be increased or diminished by turning the screws 38 in one direction or the other as may be desired. A handle 41 is fastened to the rocker frame 35 so that the same may be tipped upon the screws 38 to raise or lower the fingers 33, it being understood that where the screws 38 pass through the plate 37 the holes in said plate are larger than the diameter of the screws, thus making it possible for the plate 37 and the rocker frame as a whole, with the fingers 33 attached thereto, to tip and to be moved toward or away from the leather and feed roll 8.

A plate 42, fast to the frame of the machine, is provided to guide the strips of leather as they pass out of the machine and the leather is guided into the machine by rods 43 and 44 which extend longitudinally of the machine and are supported at their opposite ends in brackets 45 fast to the frame of the machine. The sheet material 34 is guided to the knives furthermore by two edge guides consisting of a stationary edge guide 46 which is rigidly fastened to the rod 43 and by a movable guide 47 which is slidable upon the rod 43 and is held against one edge of the strip of ma-

terial which is to be cut by a spring 48, one end of said spring bearing against the guide 47, the other against a collar 49 which is fastened to the rod 43 (see Fig. 1).

While I prefer to make the pressure fingers 33 integral with the plate 30, it is evident that these fingers may be separate one from the other and all fastened to the rocker frame 35 without departing from the spirit of my invention. I also wish to be understood as not confining myself to the specific means of pressure plate or fingers hereinbefore described, as a variety of means may be employed to press the leather against the guide roll and hold the same in correct position relatively to the knives and cutters without departing from the spirit of my invention.

The general operation of the mechanism hereinbefore described is as follows: The sheet of leather to be cut into strips is inserted between the feed roll 8 and the cutters 14 and beneath the fingers 33. This is accomplished by tipping the rocker frame 35 upon the screws 38 sufficiently to allow the leather to be introduced between the fingers 33 and the feed roll 8. The leather when inserted is passed over the rod 44 and beneath the rod 43 and between the edge guides 46 and 47. The pressure of the edge guide 47 against one edge of the material keeps the opposite edge of the material against the edge guide 46. The rocker frame is released and the fingers 33 press the leather firmly against the feed roll 8. The machine is then started by rotation of the pulley 27 which rotates the upper shaft 9 and through the gears 28 and 29 the lower shaft 20 is rotated. Thus the cutters 14 and the feed roll 8 will be rotated, the cutters moving faster at their cutting points than the periphery of the feed roll, whereby the feed of the leather is less rapid than the movement of the knives at the cutting points. The fingers 33 keep the leather against the feed roll 8 while the cutting operation is being performed and these fingers also assist in the guiding and correct positioning of the cutting edges of the knives. The strips of material are fed out of the machine along the plate 42.

It is evident that without departing from the spirit of my invention a single cutter may be employed and the feed roll provided with a single groove into which said cutter will project, together with a pressure plate to press the leather against the feed roll adjacent to the face of said cutter, and in some instances it will be desirable to embody my invention in a machine having a single cutter and a roll with a single groove in its periphery, where it is desired to cut a single strip at a time from a piece of sheet material.

I claim:

1. A machine for cutting sheet material into strips having, in combination, a feed roll provided with a plurality of annular grooves in its periphery, a plurality of rotary cutters constructed and arranged to project into said grooves, a plurality of fingers arranged to bear against said sheet material, a rocker frame upon which said fingers are supported and yielding means arranged to move said rocker frame in one direction whereby said fingers are caused to press said sheet material against said roll with a yielding pressure.

2. A machine for cutting sheet material into strips having, in combination, a feed roll provided with a plurality of annular grooves in its periphery, a plurality of rotary cutters constructed and arranged to project into said grooves, a plurality of fingers arranged to bear against said sheet material, a rocker frame upon which said fingers are supported and means to rock said rocker frame upon its support whereby said fingers may be moved toward and away from said feed roll.

3. A machine for cutting sheet material into strips having, in combination, a feed roll provided with a plurality of annular grooves in its periphery, a plurality of rotary cutters constructed and arranged to project into said grooves, a plurality of fingers arranged to bear against said sheet material, a rocker frame upon which said fingers are supported, a pair of studs upon which said rocker frame is mounted, said studs having screw-threaded engagement with the frame of said machine and yielding means interposed between said rocker frame and studs whereby said fingers may be pressed against said material with a yielding pressure.

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

CHARLES H. RICHARDSON.

Witnesses:
ARTHUR S. RICHARDSON,
CHAS. H. FOSS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."