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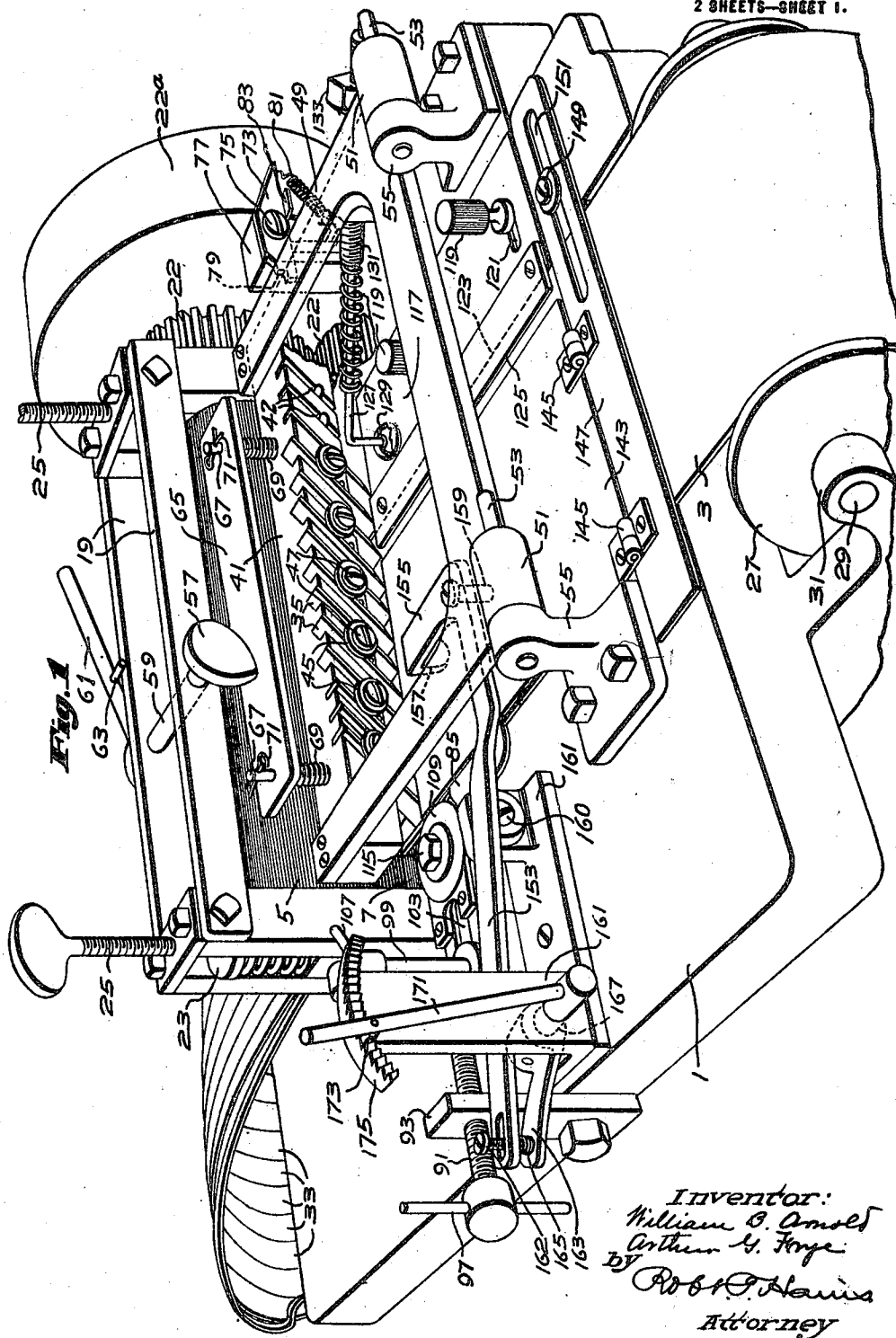
WELT SLITTING MACHINE.

APPLICATION FILED DEC. 10, 1917.

1,318,341.

Patented Oct. 7, 1919.

2 SHEETS—SHEET 1.



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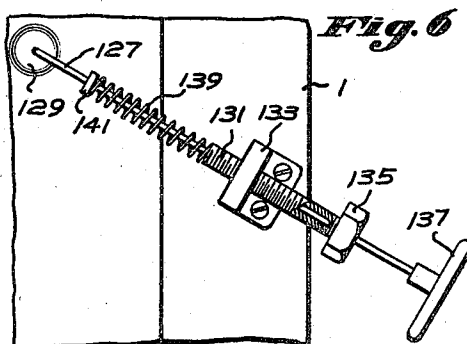
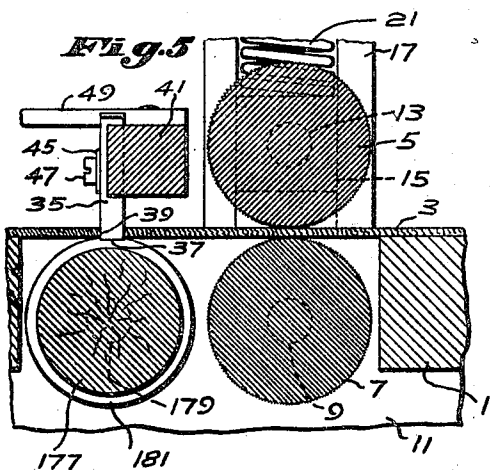
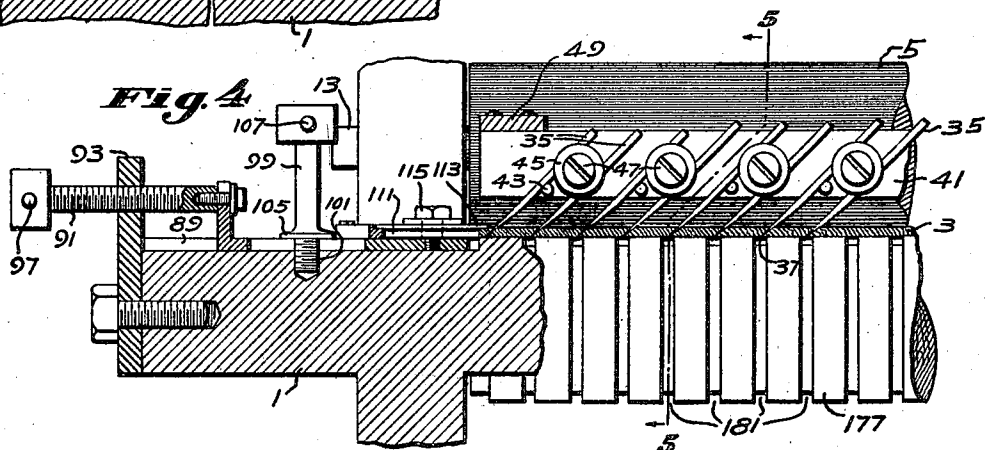
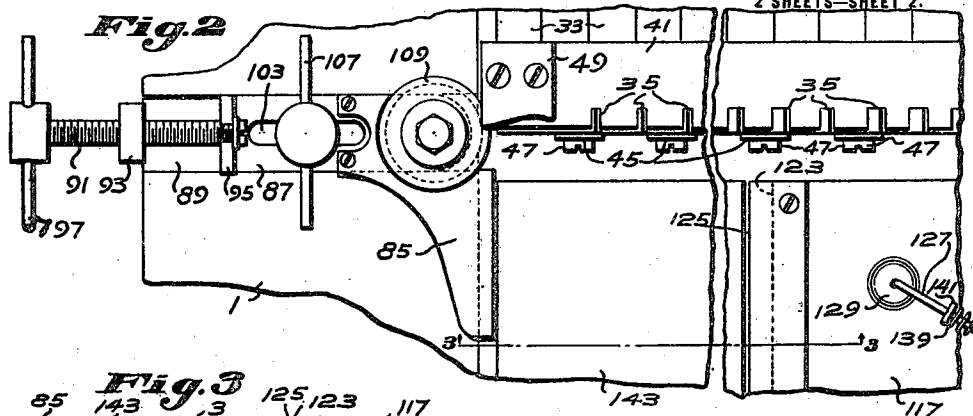
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Inventor:
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UNITED STATES PATENT OFFICE.

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WELT-SLITTING MACHINE.

1,318,341.

Specification of Letters Patent.

Patented Oct. 7, 1919.

Application filed December 10, 1917. Serial No. 206,365.

To all whom it may concern:

Be it known that we, WILLIAM B. ARNOLD and ARTHUR G. FRYE, citizens of the United States, and residents of North Abington, county of Plymouth and State of Massachusetts, have invented an Improvement in Welt-Slitting Machines, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

The invention hereinafter described relates to slitting machines and more particularly to machines for slitting a sheet of leather into strips to produce welts for boots and shoes.

To efficiently slit the sheet so as to produce strips of uniform width is a difficult operation owing to the toughness of the leather, the tendency of the leather to pucker, and the friction of the leather on the sides of the cutters as they wedge into the leather. Where large rotary disk cutters are used, their body portions have been of substantial thickness to furnish the requisite strength, and their active peripheral cutting portions have been tapered so that on entering the leather they wedge into the same and squeeze or compress the leather between the cutters, thereby causing so much friction between the cutters and leather that the latter is bulged and distorted. This effect is increased by the rotating cutters which grip and pull the leather, and since the friction on some of the cutters will at times be greater than the friction on others, the pull on some portions of the leather is greater than on others. As a consequence, the leather is fed irregularly and poor work is produced.

One of the objects of the present invention is to provide a machine having strong and simple cutters constructed and arranged to efficiently cut the leather into strips without the objections referred to.

Another object is to provide improved feeding means for the leather which will grip the full width of the leather and uniformly pull the same past the cutters to slit the leather.

Another object is to provide means for so guiding the leather that the slits will be made parallel to one edge of the sheet of leather and produce strips of uniform width throughout.

And still another object of the invention is to provide means for holding the leather in flat condition as it is fed to the cutters.

The character of the invention may be best understood by reference to the following description of one good form thereof shown in the accompanying drawings, wherein:—

Figure 1 is a perspective view of the slitting machine shown herein as embodying the invention;

Fig. 2 is a plan view showing guiding devices for the sheet of leather;

Fig. 3 is a sectional detail taken on line 3—3 of Fig. 2;

Fig. 4 is a vertical section showing guiding devices for the leather, the series of slitting blades, and the grooved roller beneath the blades, and receiving the ends thereof which project beneath the leather;

Fig. 5 is a vertical section taken on line 5—5 of Fig. 4; and

Fig. 6 is a plan of a spring-pressed guide for one edge of the leather.

Referring to the drawings, the machine shown therein as an exemplification of the invention comprises a bed plate 1 having suitable means thereon for feeding a sheet of leather 3 over the upper surface thereof. In the present instance of the invention, this means comprises a pair of upper and lower feed rolls 5 and 7 (Figs. 1, 4 and 5) having fine corrugations extending longitudinally thereof, adapted to grip and positively feed the leather throughout the entire width thereof. The lower roll is mounted on a shaft 9 journaled in bearings in the frame 11 beneath the bed plate, and the upper roll is mounted on a shaft 13 journaled in bearings in boxes 15 movable vertically in guideways in standards 17 mounted on the bed plate, and having their upper ends connected by horizontal bars 19. The rolls are driven by intermeshing gears 22 fast on their shafts, one of the latter being driven

by a pulley 22^a. The upper roll is pressed downward toward the lower roll by helical springs 21 confined between the boxes 15 and followers 23 which may be adjusted to vary the tension of the springs by screws 25 threaded in the upper ends of the standards 17. The sheet of leather may be led into the machine over a flanged roller 27 (Fig. 1) on a shaft 29 journaled in bearings in brackets 31 located at the feeding-in end of the machine.

To slit the sheet of leather into strips 33 as it is fed through the machine, a series of slitting cutters may be provided, in the present instance of the invention, in the form of blades 35 (Figs. 4 and 5) having sharp ends 37 to project into the leather and sharp side edges 39 to slit the leather. The active cutting portions of the blades are so thin that they do not materially wedge into the leather and produce objectionable friction between the leather and blades. Suitable means may be provided to furnish adequate support for the shanks of the blades, preferably, up to a point adjacent to the active cutting ends of the blades. This support, in the present instance, is in the form of a carrier or bar 41 having a series of grooves 42 therein for receiving the shanks of the blades, said shanks being held in said bar by wedge pins 43 and washers 45 held in tight engagement with edges of said shanks by screws 47 threaded into said bar, a single washer and screw being desirably located between and serving to secure a pair of blades to said bar. In the present form of the invention, the blades are arranged obliquely to the plane of the leather, in order to produce welt strips having opposed beveled edges, as disclosed in U. S. Letters Patent, No. 1,122,845, granted to me, December 29, 1914.

To facilitate the introduction of successive sheets of leather into the machine, the carrier for the blades may be mounted to move toward and from the bed plate. To accomplish this, in the present instance, a frame 49 (Fig. 1) may be provided having ends secured to the opposite ends of the carrier bar, and hinge bosses 51 adapted to rock and slide axially on pins 53 carried by brackets 55 mounted on the bed plate.

Suitable means may be provided to press and maintain the blades down into the leather, in the present instance, in the form of a cam 57 (Fig. 1) fast on one end of a shaft 59 journaled in bearings in the horizontal bars 19, referred to, connecting the standards, the opposite end of said shaft having a handle 61 fast thereon. Rocking movement of the handle in opposite directions may be limited by a pin 63 on the handle adapted to engage one of the horizontal bars 19. The cam 57 engages the upper surface of a presser bar 65 having ends mount-

ed to slide on studs 67 secured to and projecting upwardly from the blade carrier bar 41, referred to. Helical springs 69 encircle said studs and are confined between said presser bar and blade carrier bar. Upward movement of the presser bar may be limited by cotter pins 71 in the upper ends of said studs. The construction is such, that when the handle 61 is rocked in a clockwise direction (Fig. 1), it will cause the cam 57 to thrust the presser bar 65 downward and the latter through the springs 69 will yieldingly press the blade carrier bar downward. When the handle is rocked in a counterclockwise direction, it will release the pressure on the blade carrier bar. The cam shaft 59 may be sufficiently long to allow axial movement thereof for drawing the cam 57 inward toward the horizontal bars 19 to a position where it will disengage the presser bar 65, and not interfere with the rocking of the blade carrier and its frame upward away from the bed plate.

When a sheet of leather to be slitted into strips is introduced into the machine, the blade carrier is rocked downward to bring the sharp ends of the blades into engagement with the leather. The pressure on the carrier produced by rocking the handle 61 as described, forces the sharp ends of the blades down into the leather, and since the blades are oblique to the plane of the leather, as they are forced therein, they will move laterally somewhat toward the left of Fig. 1, this movement being permitted by the sliding of the hinge bosses 51 on the pins 53.

To hold the blades and their carrier in this position, in the present instance, a locking device is provided in the form of a trigger 73 (Fig. 1) pivotally mounted on a pin 75 on a bracket 77 secured to the bed plate. One end of this trigger has a notch or shoulder 79 to engage the right edge of the frame 49, and the other end of the trigger is connected by a coil spring 81 with the bracket on the bed plate, the rocking movement of the trigger by the spring being limited by a stop 83 on the bracket. The construction is such, that the spring will automatically rock the latch into position to lock the frame against movement toward the right of Fig. 1, when said frame has been rocked downward to cause the slitting blades to penetrate into the leather the extent required. When it is desired to rock the carrier and frame upward, the trigger may be manually adjusted out of engagement with the edge of the frame 49.

Suitable guiding means may be provided for the edges of the leather to insure the production of slits parallel with one edge of the leather. To accomplish this, in the present exemplification of the invention, a guide 85 (Figs. 1, 2, 3 and 4) may be pro-

vided fast on a slide 87 mounted in a groove 89 in the bed plate, and adapted to be adjusted by a screw 91 threaded in a bracket 93 mounted on the bed plate, and having one end swiveled to a flange 95 projecting upwardly from said slide, the opposite end of said screw being provided with a suitable handle 97. The construction is such, that rotation of the screw will shift the slide in its groove to locate the guide 85 in the position desired. To secure the slide in its different positions of adjustment, a locking screw 99 may be provided having an end 101 projecting through an elongated slot 103 in said slide and tapped in said bed plate, and a flange 105 adapted to engage the upper surface of the slide adjacent the slot. Adjustment of the screw is facilitated by a handle 107. When the slide has been set in the position desired, the handle is turned, thereby tightening the screw and pressing the slide firmly into the bottom of its groove.

The edge of the leather should always pass a predetermined distance from the slitting blade nearest said edge. To insure this relation between said edge and blade in the present instance, a guide roller 109 may be provided having a portion 111 to engage the edge of the leather, and a flange 113 to overlie the margin of the leather adjacent said edge. This guide roller may be pivotally mounted on a pin 115 secured to the slide 87. The location of the roller is such, that it actively engages the edge of the leather in line with the slitting blades and at a point offset somewhat to the right of the active edge of the guide 85, as will be noted in Fig. 2. As a consequence, as the edge of the leather is fed from the guide 85 to the roller, it will be deflected slightly to the right and will always be pressed firmly against the roller, thereby insuring the formation of the slit parallel with and at a predetermined distance from the edge of the leather.

To thrust the leather toward the left of Fig. 2 and press the same against the guide 85 and roller 109, suitable guiding means is provided for the opposite edge of the leather, in the present instance, in the form of a plate 117 (Figs. 1, 2 and 6) mounted on the bed plate and guided by screws 119 projecting through slots 121 in said plate and threaded into the bed plate. The guide plate 117 has an active guiding edge 123 and a member 125 adapted to overlap the margin of the leather adjacent its edge. To press the guide plate 117 toward the left, a rod 127 may have a downwardly bent end connected to a nub 129 extruded from the plate, said rod projecting through a hollow screw 131 (Fig. 6) threaded in a bracket 133 mounted on the bed plate. The screw has a head 135 and the rod has a handle 137 for

adjusting the same. A coil spring 139 is confined between one end of the screw 131 and a collar 141 fast on the rod, and tends to shift the rod and the guide plate to the left. The screw 131 may be adjusted in its bracket to vary the tension of the spring as required. The construction described is such, that the guide plate 117 is pressed toward the left and engages one edge of the leather sheet and insures engagement of the opposite edge thereof with the guide 85 and roller 109. Preferably, the spring-pressed rod 127 is connected to the guide plate 117 at a point adjacent the edge of said plate which is nearest the slitting blades, and almost in line with the guide roller 109. As a consequence, the pressure on the guide plate 117 occurs principally adjacent the end thereof nearest the slitting blades, and insures a direct pressure of the leather against the roller in line with the cutting blades. When it is desired to introduce a leather sheet into the machine, the rod handle 137 is grasped and pulled outward against the resistance of the spring 139, thereby allowing sufficient room between the guides for the opposite edges of the leather to permit introduction of the latter between them.

The sheet of leather fed toward the slitting blades should be held down flat against the bed plate so as to prevent buckling thereof when pressed between the edge guides therefor. For this purpose a presser plate 143 (Figs. 1 and 2) may be provided connected by hinges 145 with a bar 147 mounted on the bed plate and adjustably connected thereto by a screw 149 entered through an elongated slot 151 in said bar. The construction is such, that the presser plate may be rocked upward to facilitate introduction of the leather sheet into the machine, as required.

To force said presser plate down onto the leather sheet, a lever 153 (Fig. 1) may be provided, having a foot 155 with a toe 157 and a heel in the form of a screw 159 adapted to engage the presser plate to distribute the pressure thereon. This lever is fulcrumed intermediate its end on a pin 160 on a bracket 161 mounted on the bed plate. Said lever projects laterally away from the leather and an end thereof is connected by a screw 162 with an arm 163, a spring 165 being confined between said lever and arm. The arm 163 is mounted fast on a stud shaft 167 journaled in a bearing in the bracket 161, a handle 171 being secured to said shaft. To lock this handle in different positions of adjustment, it has a dog 173 thereon adapted to engage a toothed sector 175 on the upper end of the bracket. The construction is such, that the handle may be rocked to the right and press the arm 163 upward, thereby compressing the spring 165 and rocking the lever 153 so as to press its foot 155 down

toward the presser plate and maintain the pressure on the latter required.

Suitable means is provided to support the leather directly beneath the slitting blades, in the present instance, in the form of a roller 177 (Figs. 4 and 5) of wood or other suitable material mounted on a shaft 179 journaled in bearings in the frame 11, and having a series of circumferential grooves therein for receiving the ends of the slitting knives which may project somewhat beneath the sheet of leather. The construction is such, that the leather is properly supported beneath the slitting blades while permitting the blades to cut entirely through the leather and without injury to said blades.

The operation of the machine will be readily understood from the foregoing description. The sheet of leather to be cut into strips is introduced into the machine over the roller 27 beneath the bar 147, thence beneath the presser plate 143, and thence over the wooden roller 177, and the leading end of the sheet is introduced between the feed rolls 5 and 7. Then the slitting blade carrier is rocked down to present the ends of the blades to the leather, and they are forced therein by adjustment of the cam 57. As the blades pass through the leather, they will shift laterally somewhat to the left, and the latch 73 will automatically snap into place to hold the frame for the carrier in position. The handle 137 is released, thereby allowing the spring 139 to press the sheet of leather firmly against the guide 85 and the guide roller. The handle 171 is rocked to the right of Fig. 1 to produce the pressure on the plate 143 required, and the leather is fed through the machine, the feed rolls serving to pull the sheet of leather past and between the slitting blade and causing the active cutting edges 39 of said blades to cut the sheet of leather into strips with smooth, clean cut edges and of uniform width throughout.

The cutters shown have been selected as one good means for carrying the invention into practical effect, but other cutters may be used within the invention.

It will be understood that the invention is not limited to the specific embodiment shown, but that various deviations may be made therefrom without departing from the spirit and scope of the appended claims.

Claims:

1. A slitting machine, comprising in combination, opposed rolls for feeding material between them, a plurality of blades offset to the rear of said rolls for slitting said material into separate strips as it is pulled past said blades by said rolls, means to hold said blades in fixed positions, and means to guide the material as it is fed past said blades.

2. A slitting machine, comprising, in combination, opposed rolls for feeding material between them, a plurality of blades offset

to the rear of said rolls for slitting said material into separate strips as it is pulled past said blades by said rolls, a guide member for the material opposed to said blades and having grooves for receiving the ends of the blades projecting through the material, said blades having sharp edges for slitting the material, and means to hold said blades in fixed positions.

3. A slitting machine, comprising in combination, opposed rolls for feeding material between them, a plurality of blades offset to the rear of said rolls for slitting said material into separate strips as it is pulled past said blades by said rolls, a guide roll opposed to said blades and having circumferential grooves for receiving the ends of said blades, the latter having sharp edges for slitting the material, and means to hold said blades in fixed positions.

4. A slitting machine, comprising in combination, a plurality of oblique blades for slitting said material into separate strips having beveled edges, means to hold said blades in fixed oblique positions, opposed rolls in advance of said blades for pulling the material past said blades, and means to guide the material as it is fed by said rolls.

5. A slitting machine, comprising in combination, a support, means to feed material along said support, a carrier, a plurality of blades held by said carrier oblique to the plane of said support and having edges for slitting said material into strips, a member opposed to said blades to receive the ends of said blades projecting beyond the surface of the material, and means to guide the material as it fed past said blades by said feeding means.

6. A slitting machine, comprising in combination, a plurality of blades having sharp ends for penetrating a sheet of material and sharp edges for slitting the material into strips, means to force said ends into the material, means to feed the material relatively to said blades, and means to guide the material as it is so fed.

7. A slitting machine, comprising in combination, a plurality of blades having sharp ends for penetrating a sheet of material, a carrier for said blades, the latter having sharp edges between said ends and carrier for slitting the material into strips, means operating through said carrier to force said ends into the material, means to feed the material past said blades, and means to guide the material.

8. A slitting machine, comprising in combination, a carrier having a series of transverse recesses therein, a plurality of blades having shanks seated in said recesses, sharp ends for penetrating a sheet of material, and sharp edges projecting beyond said carrier for slitting said material into strips, means operating through said carrier to force said

ends into the material, means to feed the material past said blades, and means to guide the material as it is fed.

9. A slitting machine, comprising in combination, a support for a sheet of material, a plurality of blades for slitting said material into strips, a carrier for said blades movable toward and from said support to bring the blades into and out of active position, means to feed the material through the machine, and means to guide the material.

10. A slitting machine, comprising in combination, a support for a sheet of material, a plurality of blades for slitting said material into strips, a carrier for said blades movable toward and from said support, means to force said blades into the material, means to guide the material toward said blades, and means to feed said material past said blades.

11. A slitting machine, comprising in combination, a support for a sheet of material, a plurality of oblique blades for slitting said material into strips having beveled edges, a carrier for said blades movable laterally to cause the blades to enter the material, means acting on the carrier to hold the blades in the material, means to feed the material past the blades, and means to guide the material as it is so fed.

12. A slitting machine, comprising in combination, a support for a sheet of material, a plurality of oblique blades for slitting said material into strips having beveled edges, a carrier for the blades, means to press the carrier downward and laterally in one direction to force the blades into the material, means automatically to lock the carrier against movement laterally in an opposite direction, means to feed the material past said blades, and means to guide the material as it is so fed.

13. A slitting machine, comprising in combination, a support for a sheet of material, means to feed the material over said support, a plurality of blades having ends for penetrating the material and edges for slitting the material into strips, a carrier for said blades, means yieldingly to press said carrier and blades toward said support, and means to guide the material as it is fed.

14. A slitting machine, comprising in combination, a support for a sheet of material, means to feed the material over said support, a plurality of blades for slitting the material into strips, means to guide the material as it is fed, and means including a cam for forcing the blades into the material.

15. A slitting machine, comprising in combination, a support for a sheet of material, means to feed the material over said support, leading and advance guides for an edge of said sheet, the advance guide being laterally offset from the other to insure continuous engagement of said edge with said advance

guide, means to press said edge toward said guides, and a plurality of cutters for slitting said sheet into strips.

16. A slitting machine, comprising in combination, a support for a sheet of material, means to feed the material over said support, a leading guide and a roller in advance thereof for engagement with an edge of said sheet, means acting on the opposite edge of said sheet to press the latter against said roller, and a plurality of cutters for slitting the sheet into strips.

17. A slitting machine, comprising in combination, a support for a sheet of material, means to feed the material over said support, leading and advance guides, the latter being offset from the former to deflect and tend to press an edge of the material against said advance guide, means to press said sheet toward said guides, and a plurality of blades located substantially in line with said advance guide for slitting the sheet into strips.

18. A slitting machine, comprising in combination, a support for a sheet of material, means to feed the material over said support, means to guide one edge of said sheet, means to guide the opposite edge of said sheet, means to press one of said guides toward the other, and a plurality of fixed blades for slitting said sheet into strips as it is fed between said guides.

19. A slitting machine, comprising in combination, a support for a sheet of material, means to feed the sheet over said support, guides for opposite edges of said sheet, a roller in advance of one of said guides for guiding one edge of said sheet, means co-operating with one of the guides to yieldingly press the same toward the other guide, and a plurality of blades for slitting the sheet into strips.

20. A slitting machine, comprising in combination, a support for a sheet of material, means to feed the sheet over said support, guides for the edges of said sheet, means to prevent buckling of the sheet between said guides, and a plurality of blades for slitting the sheet into strips.

21. A slitting machine, comprising in combination, a support for a sheet of material, means to feed the sheet over said support, guides for the edges of said sheet, spring pressed means to engage the sheet between said guides to prevent buckling of said sheet, and a plurality of blades to slit the sheet into strips.

22. A slitting machine, comprising in combination, a support for a sheet of material, means to feed the sheet over said support, guides for the edges of said sheet, a plate to engage the upper surface of said sheet between said guides, means to press said plate down on to said sheet, and a plurality of blades in advance of said plate to slit the sheet into strips.

23. A slitting machine, comprising in combination, a bed plate, a pair of rolls to feed a sheet of material over said plate, a roller adjacent said rolls having a series of circumferential grooves therein, a series of fixed blades above said roller, a carrier for said blades, guides for the opposite edges of said sheet, means yieldingly to press one of

said guides toward the other, a plate adapted to rest on the surface of the material between said guides, and means yieldingly to press said plate onto said material.

In testimony whereof we have signed our names to this specification.

WILLIAM B. ARNOLD.
ARTHUR G. FRYE.

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