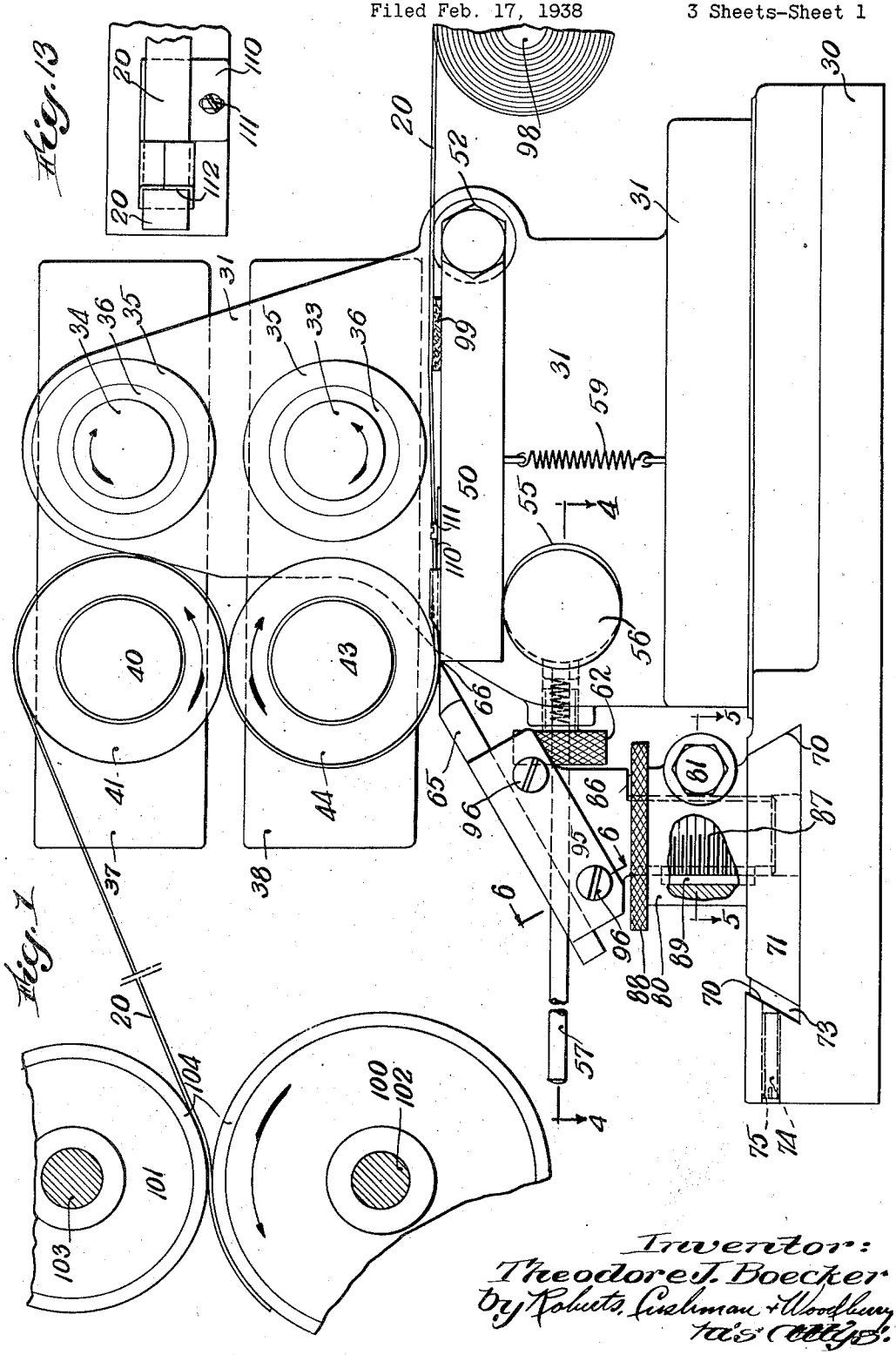
Aug. 29, 1939. T. J. BOECKER 2,170,920

APPARATUS FOR SKIVING STRIP MATERIAL

Filed Feb. 17, 1938 3 Sheets-Sheet 1



Aug. 29, 1939. T. J. BOECKER 2,170,920

APPARATUS FOR SKIVING STRIP MATERIAL

Filed Feb. 17, 1938 3 Sheets-Sheet 2

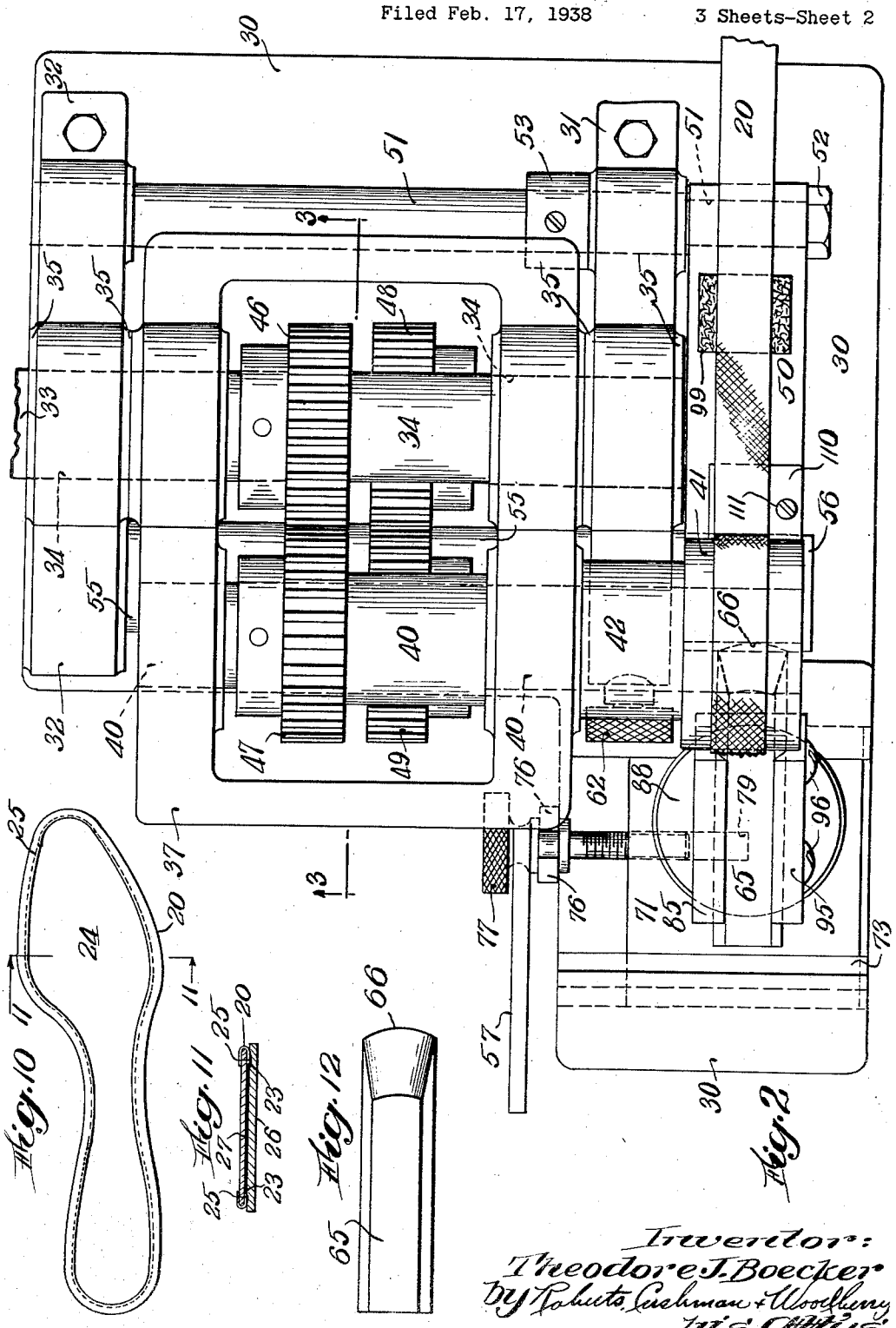


Fig. 2

Fig. 10

Fig. 12

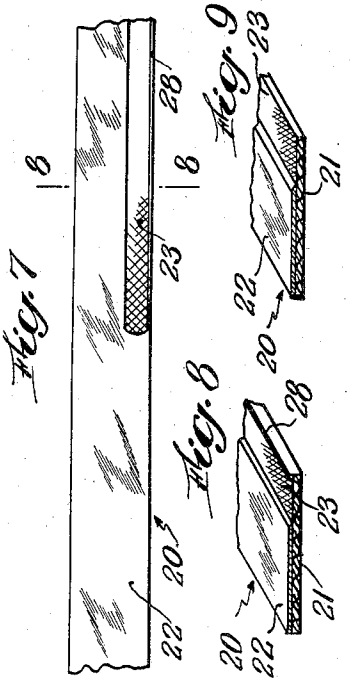
Fig. 11

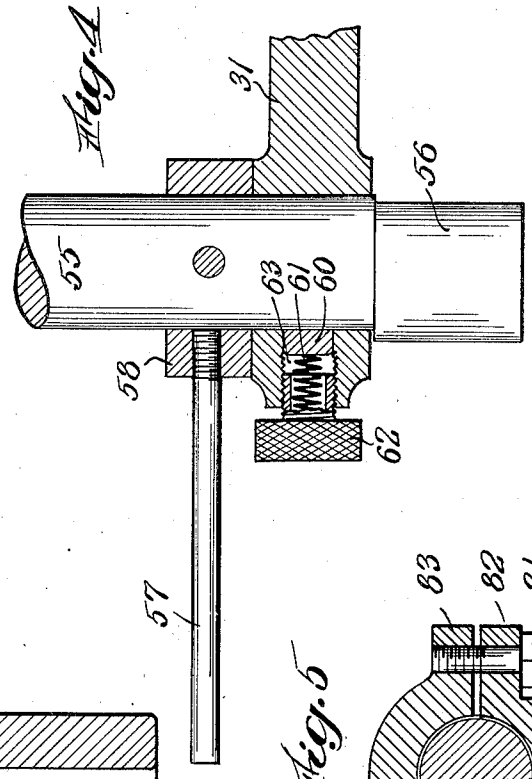
Inventor:
Theodore J. Boecker
By Roberts, Cushman & Woodbury
His Attys.

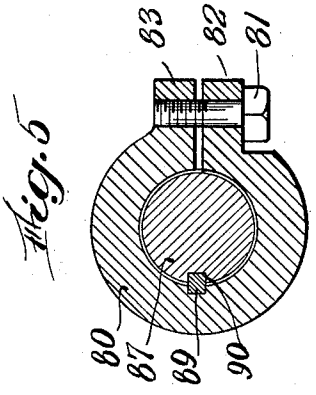
Aug. 29, 1939. T. J. BOECKER 2,170,920

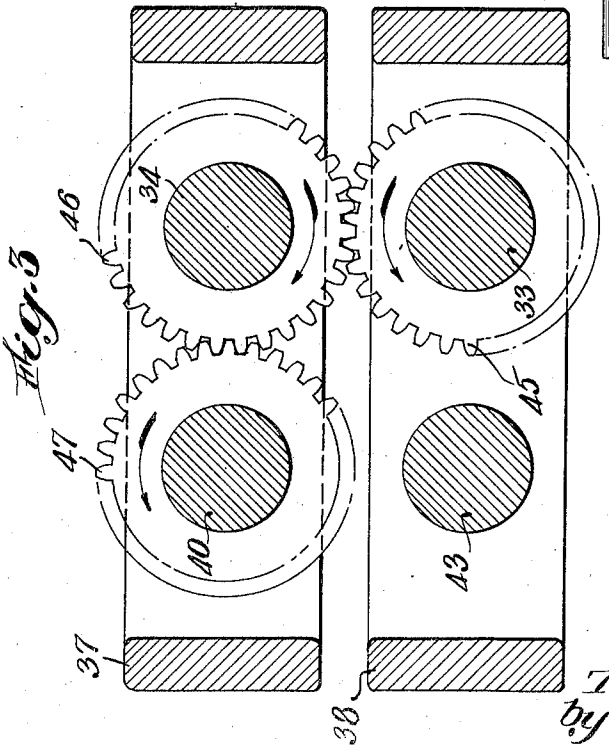
APPARATUS FOR SKIVING STRIP MATERIAL

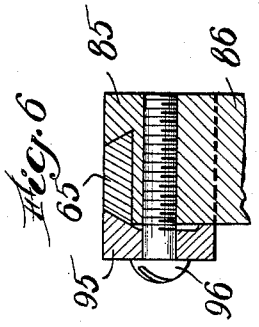
Filed Feb. 17, 1938 3 Sheets-Sheet 3











Inventor:
Theodore J. Boecker
by Roberts, Cushman & Woodbury
his Attys.

Patented Aug. 29, 1939 2,170,920

UNITED STATES PATENT OFFICE

2,170,920

APPARATUS FOR SKIVING STRIP MATERIAL

Theodore J. Boecker, Melrose, Mass., assignor to Haley Cate Rockwood Company Inc., Everett, Mass., a corporation of Massachusetts

Application February 17, 1938, Serial No. 191,018

5 Claims. (Cl. 12—1)

This invention relates to machines for skiving strip material, such for example as an artificial leather tape used in the manufacture of shoes.

In manufacturing shoes, large quantities of artificial leather tape are used. This tape consists of a woven, braided or the like fabric tape, one surface of which is coated with a pyroxlin or the like coating material which gives a leather-like or finished appearance to the coated face of the strip. The tape is arranged in strip form and is wound in rolls containing many yards thereof. The shoe manufacturer uses the tape to give a finished appearance to various parts of the shoe which are exposed to view. In many cases, it is necessary to adhesively secure other parts of the shoe to a portion of the coated surface of this tape and since adhesives do not satisfactorily adhere to the smooth coating it is necessary for the manufacturer to remove the coating from those portions of the tape to which the adhesive will be applied and to leave untouched those portions of the coating which will be exposed to view in the completed shoe. The coating must be removed in such a manner that the portions which remain are not in any way marred or injured and also in such a manner that the strength of the fabric of the tape is not injured.

The principal object of the invention is to provide a machine which automatically and continuously skives a pre-determined portion of an unlimited length of strip material. Other objects are to provide a simple and efficient means for feeding the strip material to and past the skiving means; to provide a simple and efficient means for adjusting the depth to which the coating is skived away and to provide a simple and efficient means to adjust the skiving means for skiving different portions of the strip material and also for skiving various widths of strip material.

Further objects relate to the construction and mode of operation and will be apparent from a consideration of the following description and the accompanying drawings which exemplify one embodiment of the invention chosen for the purpose of illustration. In the drawings:

Fig. 1 is a side elevation, with parts broken away and shown in section, of a machine embodying this invention;

Fig. 2 is a top plan view of the machine shown in Fig. 1;

Fig. 3 is a partial section on the lines 3—3 of Fig. 2;

Fig. 4 is a partial section on the lines 4—4 of Fig. 1;

Fig. 5 is a enlarged section on the lines 5—5 of Fig. 1;

Fig. 6 is an enlarged section on the lines 6—6 of Fig. 1;

Fig. 7 is an enlarged plan view of a segment of strip material showing an unskived and a skived portion thereof;

Fig. 8 is an enlarged perspective view looking at a segment of the strip material construed on the lines 8—8 of Fig. 7;

Fig. 9 is a perspective view similar to Fig. 8 but showing the strip material skived completely to one edge;

Fig. 10 is a top plan view of an innersole with strip material stitched around its edge;

Fig. 11 is a section on the lines 11—11 of Fig. 10 showing the outersole and the skived portion of the strip material; and

Fig. 12 is a top plan view of a knife blade; and

Fig. 13 is a top plan view of the strip material guide and underlying support.

As shown in Figs. 1, 7, 8 and 9, the elongate strip of artificial leather consists of a woven textile tape 21 and a pyroxylin or other coating 22 bonded to one surface thereof. This coated strip material is frequently about $\frac{9}{1000}$ of an inch in thickness, the textile tape being about $\frac{6}{1000}$ of an inch thick and the pyroxylin coating about $\frac{3}{1000}$ of an inch thick. The strip material is customarily very flexible.

As shown in Figs. 10 and 11 in use the strip material is secured coated side out around the edge of an innersole 24 by stitching 25. The outersole 26 is then cemented to the innersole by a layer of adhesive 27. A skived portion 23 (Figs. 7, 8 and 9) is provided adjacent one edge of the strip material and this skived portion is located at the bottom of the innersole adjacent the face of the outersole and provides a rough exposed surface of fabric tape to which the adhesive readily and securely adheres.

As shown in Fig. 9 this skived portion may extend entirely to one edge but I prefer to leave a thin line of coating 28 between the outer edge of the skived portion 23 and the edge of the strip as shown in Fig. 8. This thin line of coating provides reinforcement for the underlying edge of the tape and prevents fraying thereof.

The embodiment of my invention illustrated in the drawings comprises a horizontal base 30 (Figs. 1 and 2) to which are bolted the parallel vertical frame members 31 and 32. Horizontal shafts 33 and 34 are mounted for rotation in

suitable bearings in the frame members 31, 32. The cast iron frame members 31, 32 are provided with bosses 35 adjacent the bushings 36 which receive the horizontal shafts 33 and 34. The lower shaft 33 extends beyond the frame member 32 (Fig. 2) and communicates with a source of power for rotating it in the direction of the arrow of Fig. 1.

An upper rectangular yoke member 37 is located between the frame members 31, 32 (Figs. 1, 2 and 3). The horizontal shaft 34 passes through transverse annular passages in the longitudinal sides of this yoke member and suitable bearings are provided within said passages to permit rotation of the shaft 34 therein. Directly beneath the yoke member 37 a second yoke 38 is provided and this yoke is identical with the yoke 37. The shaft 33 passes through transverse passages in the longitudinal sides of the yoke 38 which are provided with suitable bearings as in the yoke 37.

A horizontal shaft 40 is mounted for rotation in suitable bearings in transverse passages through the yoke 37 and one end of this shaft 40 extends outwardly from the face of the yoke 37 and has attached thereto the roll 41 which is provided with an integral hub 42 (Fig. 2). Thus the roll 41 and hub 42 rotate with the shaft 40. A similar horizontal shaft 43 is similarly mounted in the lower yoke 38 and this shaft has a combined presser and feed roll 44 (Fig. 1) secured to its protruding end in the same manner as the roll 41 is secured to the shaft 40. This presser and feed roll 44 is preferably provided with a knurled peripheral surface.

The transverse shaft 33 has secured thereto a gear 45 (Fig. 3) which meshes with a gear 46 (Figs. 2 and 3) secured to the shaft 34 and the gear 46 in turn meshes with the gear 47 which is secured to the shaft 40. Thus rotation of the shaft 33 in the direction of the arrow of Fig. 3 causes rotation of the shaft 40 and the attached roll 41 in the direction of the arrows of Figs. 1 and 3.

The driven shaft 33 is provided with a second gear 48 (Fig. 2) which meshes with the gear 49 secured to the shaft 43. Thus when the shaft 33 is rotated in the direction of the arrow of Fig. 1 the shaft 43 and attached presser and feed roll 44 are rotated in the direction of the arrow of Fig. 1.

One end of the substantially horizontal work support 50 (Figs. 1 and 2) is supported by the end of the horizontal rotatable shaft 51 which protrudes from the front face of the frame member 31. This shaft 51 passes through a transverse passage in the work support 50 and transverse passages in the frame members 31 and 32 (Fig. 2) and the work support is removably held on the protruding end of the shaft 51 by the nut 52. Suitable bearings are provided in the transverse passages of the frame members 31 and 32 so that said shaft 51 is free for rotation in said transverse passages. The collar 53 is secured to the shaft 51 to prevent lateral movement of the shaft in one direction and the nut 52 and work support 50 prevent lateral movement of the shaft in the other direction. Thus the work support 50 has one end which is supported for movement with the shaft 51 about the horizontal axis thereof.

The horizontal shaft 55 (Figs. 1, 2 and 4) is rotatably mounted in suitable bearings in transverse passages in the frame members 31 and 32. One end of this shaft 55 protrudes from the face of the frame member 31 in the form of an eccentric 56 and the bottom surface of the work support 50 rests upon and is supported by this eccentric as shown in Fig. 1. A coil spring 59 has one end secured to the bottom of the work support 50 and the other end secured to the top of the outstanding flange of the frame member 31. This spring 59 keeps the bottom surface of the work support in contact with the eccentric at all times.

The shaft 55 and eccentric 56 may be manually rotated by means of a handle 57 (Figs. 4, 1 and 2) which is screwed into the collar 58 (Fig. 4) which is rigidly secured to the shaft 55. Thus by raising the end of the handle 57 (Fig. 1) the shaft 55 and eccentric 56 are rotated clockwise (looking at Fig. 1) and the eccentric raises the work support 50 by causing it to move very slowly in a clockwise direction about the horizontal axis of the shaft 51. The entire weight of the rolls 44, 41, the shafts 43 and 40 and of yokes 38, 37, (Fig. 1) is borne by the free end of the work support 50. Hence such a rotating movement of the eccentric also elevates these rolls and shafts since the yokes 38 and 37 are thereby slowly rotated clockwise about the shafts 33 and 34 respectively, the force for such rotation being supplied by the upward movement of the free end of the work support 50 which contacts the periphery of the roll 44 (Fig. 1). To retain the shaft 55 and the eccentric 56 in adjusted and fixed position, a friction shoe 60 (Fig. 4) is provided engaging the periphery of the shaft 55. The necessary pressure is exerted against the exterior of the friction shoe by means of the coil spring 61, one end of which abuts the outer surface of the friction shoe and the other end of which abuts the inner face of the thumb screw 62 (Fig. 4). Thus the friction between the friction shoe 60 and shaft 55 is varied by advancing or retracting the exteriorly threaded stem of the thumb screw 62 which extends into the interiorly threaded passage 63 in the frame member 31.

When the work support 50 is in horizontal position (as shown in Fig. 1) the shafts 40 and 43 are mounted in such a manner that the axes of said shafts are in a plane which coincides with the knife edge end of the work support 50 and which is perpendicular to the work supporting surface of the work support.

A knife blade 65 is provided with a slightly curved knife edge 66 (Figs. 1, 2 and 12) which is located closely adjacent one rectangular end of the work support 50. This knife edge 66 is also located substantially in the plane of the work supporting surface of the work support 50.

An under-cut groove 70 (Fig. 1) is provided in the upper face of the base plate 30 and a horizontal plate 71 (Figs. 1 and 2) which is of dovetail cross section (Fig. 1) is slidably supported in said groove. The plate 71 is given a snug but sliding fit in the groove 70 by means of the gib 73 (Figs. 1 and 2) which is located between one side of said groove 70 and the corresponding side of the said plate 71. A set screw 74 (Fig. 1) is threaded into an interiorly threaded passage 75 in the base plate 30 and one end of said set screw abuts the adjacent side of the gib 73; thus the plate 71 is secured against sliding and is released for sliding movement in the groove 70 by adjustment of this set screw.

A U-shaped member 76 (Fig. 2) is rigidly secured in vertical position to one side of the base plate 30 so that the up-standing arms of said U-shaped member extend above and at right angles to the bottom of the groove 70. The horizontal

stem of the thumb screw 77 fits between the upstanding arms of the U-shaped member 76 and the exteriorly threaded portion of said stem extends into the interiorly adjacent threaded horizontal passage 79 in the plate 71 (Fig. 2.) Thus upon rotation of the thumb screw 77 the plate 71 is slidably actuated in the under-cut groove 70.

A vertical collar 80 (Figs. 5 and 1) has its lower end secured to the upper face of the plate 71. The interior diameter of the axial passage through this collar 80 is varied by means of the exteriorly threaded bolt 81 which passes through transverse passages in the outstanding arms 82 and 83 (Fig. 5) of the collar 80, the transverse passage in the arm 83 being interiorly threaded.

The knife blade 65 is dovetail in cross section (Fig. 6) and it is supported by the inclined plate 85 which is integral with the vertical member 86 (Figs. 1 and 6). The member 86 is provided with an integral exteriorly threaded vertical shaft 87 (Figs. 1 and 5). This shaft 87 is threaded through the interiorly threaded thumb disk 88 (Fig. 1) and extends loosely into the axial passage of the vertical collar 80 (Fig. 5). The lower face of the disk 88 rests upon the upper end of the collar 80 (Fig. 1).

A vertical key 89 (Figs. 1 and 5) is secured to the wall of the axial passage of the collar 80 and extends loosely into a longitudinal groove 90 in the side of the shaft 87. Thus when the bolt 81 (Fig. 5) is loosened the shaft 87 will freely slide vertically in the axial passage of the collar 80, but the key 89 prevents rotation of said shaft in said passage and thus upon rotation of the disk 88, the shaft 87 and the attached supporting plate 85 are moved vertically up or down in said axial passage and they may be rigidly secured in adjusted vertical position by tightening the bolt 81.

The plate 85 (Figs. 2 and 6) is provided with a longitudinally extending rabbet into which the knife plate fits. The knife plate is secured in this rabbet by a longitudinal side member 95 which has an inclined edge face adapted to abut one of the inclined longitudinal edges of the knife plate as shown in Fig. 6. The side member 95 is removably secured to the plate 85 by two exteriorly threaded screws 96 which extend into corresponding interiorly threaded horizontal passages in the plate 85 (Fig. 6). Thus the plate 85 may be used to support and hold knife blades of varying widths. When it is desired to move the knife edge 66 toward and away from the adjacent end of the work support 50 (Fig. 1), the screws 96 are loosened and the knife is slid along the surface of the rabbet in the plate 85.

The strip material 20 is arranged in a roll with the fabric side out (Fig. 1), and this roll is mounted for rotation about the spindle 98. An oil-saturated felt pad 99 is supported upon the work support 50, and the strip material is drawn across said pad coated side down so that the coated side is slightly oiled before the material passes through the machine. The purpose of the oil is to prevent the coated side from abrasion and adhesion when it contacts the metal parts of the machine.

An adjustable guide 110 (Figs. 1 and 13) for the strip material 20 is secured to the upper surface of the work support 50 by a screw 111 which extends through a longitudinal slot in the guide. The guide is bent to form a longitudinal passage 112, the outer end of which is located as closely adjacent the knife edge end of the work support as is possible without contact between the guide and the periphery of the roll 44.

To thread the machine for operation, the end of the strip material is drawn from the roll across the oil pad 99; it is then passed through the passage 112 in the guide 110; it is then passed between the periphery of the roll 44 and the work supporting surface of the work support 50; it is then passed across and beyond the knife edge 66 and thence partially around the periphery of the roll 44 and between the peripheries of the rolls 44 and 41; it is then passed partially around the periphery of the roll 41 and thence between the peripheries of the rolls 100 and 101.

The roll 100 is mounted for continuous rotation about its horizontal shaft 102 in the direction of the arrow (Fig. 1), said rotation being supplied by any suitable source of power. The roll 101 is mounted for rotation about the horizontal shaft 103 and said roll operates merely as a presser roll to hold the tape against the periphery of the driven roll 100. These rolls 100 and 101 are each provided with peripheral bands of rubber 104 so that the tape will not be marred as it passes between said peripheries.

The roll 100 is driven at a slightly faster peripheral speed than that of the rolls 41 and 44, and thus the rolls 100 and 101 create slight tension in that portion of the tape which extends from the periphery of the roll 41 to the bite of said rolls 100 and 101.

After the strip material has been threaded through the machine as described, the knife edge 66 is adjusted to proper position by operation of the thumb disk 88 (Fig. 11), the thumb screw 77 (Fig. 2) and if necessary the screws 96. The knife edge is moved laterally with respect to the work support so that the desired portion of the coating 22 will be skived from the strip material 20 by operation of the thumb screw 77 and the set screw 74. For example, if the skiving is to extend entirely to one edge as shown in Fig. 9, the knife edge will be adjusted laterally to that position relative to that edge of the strip material as it is presented on the work supporting surface of the work support 50. The knife edge should be adjusted (by operation of disk 88, bolt 81 and screw 96) so that it is very slightly above the work supporting surface of the work support 50, and also so that it is very closely adjacent, if not in the plane of, the end of the work support 50. The width of skiving is usually adjusted by selecting a knife blade of the proper width.

After the aforesaid adjustments have been made, the shafts 33 and 102 are set in motion and the roll 44 continuously presses the coated surface of the strip material against the surface of the work support adjacent the knife edge, and also continuously advances the strip material from said work support across and beyond said knife edge. The tape is thus continuously presented to the knife edge 66 in absolutely flat condition and also under tension.

If the knife edge is not skiving deeply enough, the proper adjustment may usually be made while the machine is in operation. This adjustment is made by lowering the work support 50 the desired amount by means of the eccentric 56 which is slowly rotated by manual movement of the handle 57. If the skiving is too deep, the proper adjustment may be made by rotating the eccentric in the opposite direction.

From the foregoing description it will be apparent to persons skilled in the art that I have provided an efficient and novel machine for auto-

matically skiving unlimited lengths of strip material.

I claim:

1. Apparatus for skiving strip material comprising a work support, a knife edge located adjacent one end of said work support, and a combined presser and feed roll mounted for rotation about an axis which is substantially parallel to the work supporting surface of the work support, and which axis is located in a plane which substantially coincides with the knife edge end of said work supporting surface and is substantially perpendicular thereto, whereby the periphery of said roll engages one face of the strip material and presses the opposite face thereof against said work supporting surface adjacent said knife edge, and upon rotation of said roll causes the strip material to advance from said work supporting surface across and beyond said knife edge.

2. Apparatus for skiving strip material comprising a knife edge, a substantially horizontal work support having its work supporting surface substantially flush with said knife edge and one end adjacent said knife edge, a pivotal support for said work support adapted to permit movement of said work support about a substantially horizontal transverse axis, an eccentric engaging said work support at a point spaced from said pivotal support whereby upon movement of said eccentric the height of the work support relative to said knife edge is controlled.

3. Apparatus for skiving strip material comprising a knife edge, a substantially horizontal work support having its work supporting surface substantially flush with said knife edge and one end adjacent said knife edge, a pivotal support for said work support adapted to permit movement of said work support about a substantially horizontal transverse axis, and adjusting means for said work support adapted to control movement of the work support in either direction about said horizontal axis to thereby adjust the height of the work support relative to said knife edge, said adjusting means comprising an eccentric which contacts the lower surface of said work support at a point spaced from said horizontal axis.

4. Apparatus for skiving strip material comprising a substantially horizontal work support, a knife edge located adjacent one end of said work support, means to pivotally support said work support for movement about an axis which is substantially horizontal and substantially parallel to said knife edge end thereof, a combined presser and feed roll supported by the surface of the work support and mounted for rotation about a substantially horizontal axis located in a plane which substantially coincides with the knife edge end of the work support and is substantially perpendicular to the work supporting surface of the work support, and adjusting means for said work support adapted to control movement of the work support in either direction about its said horizontal axis to thereby control adjustment of the height of the work support and the presser roll relative to said knife edge.

5. Apparatus for skiving strip material comprising a stationary work support, a knife edge located adjacent one end of said work support, a combined presser and feed roll for pressing one face of the strip material against the supporting surface of said work support adjacent the knife edge end thereof and for advancing the strip material from said work support across and beyond the knife edge, and means for creating tension in said strip material in the portion thereof which extends from the knife edge end of said work support toward and beyond said knife edge.

THEODORE J. BOECKER.