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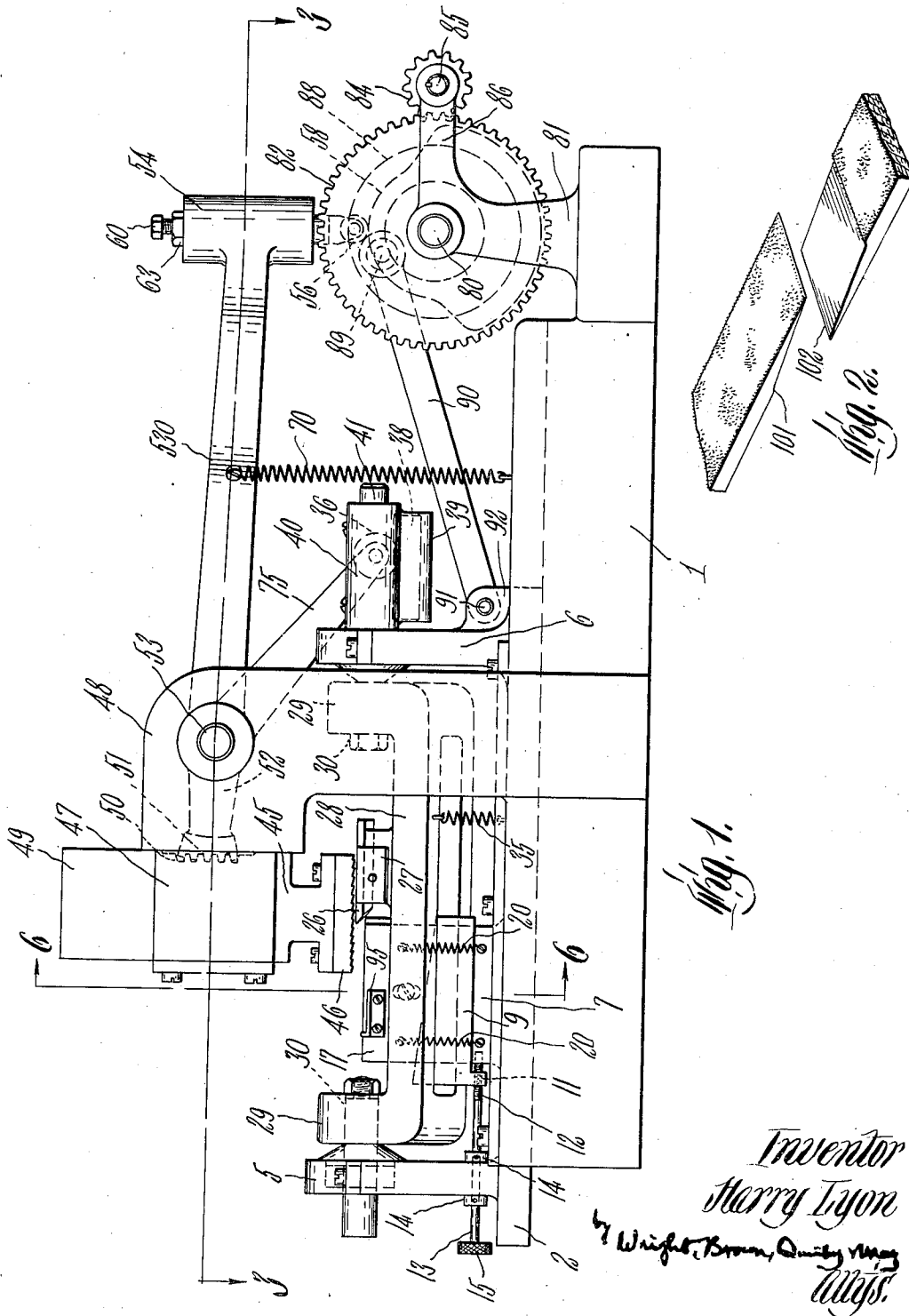
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METHOD OF AND MACHINE FOR SKIVING

Filed Oct. 29, 1936

3 Sheets-Sheet 1



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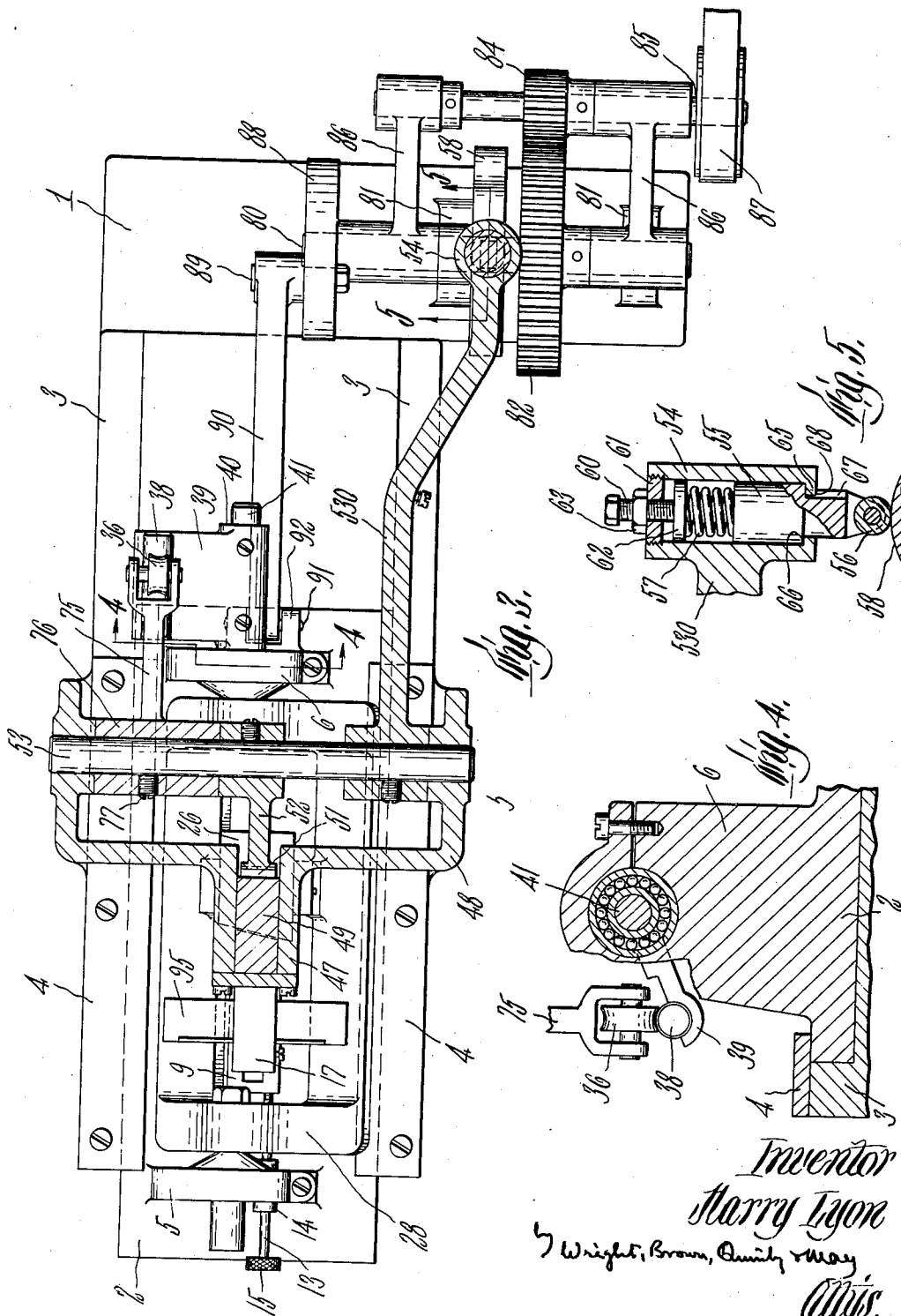
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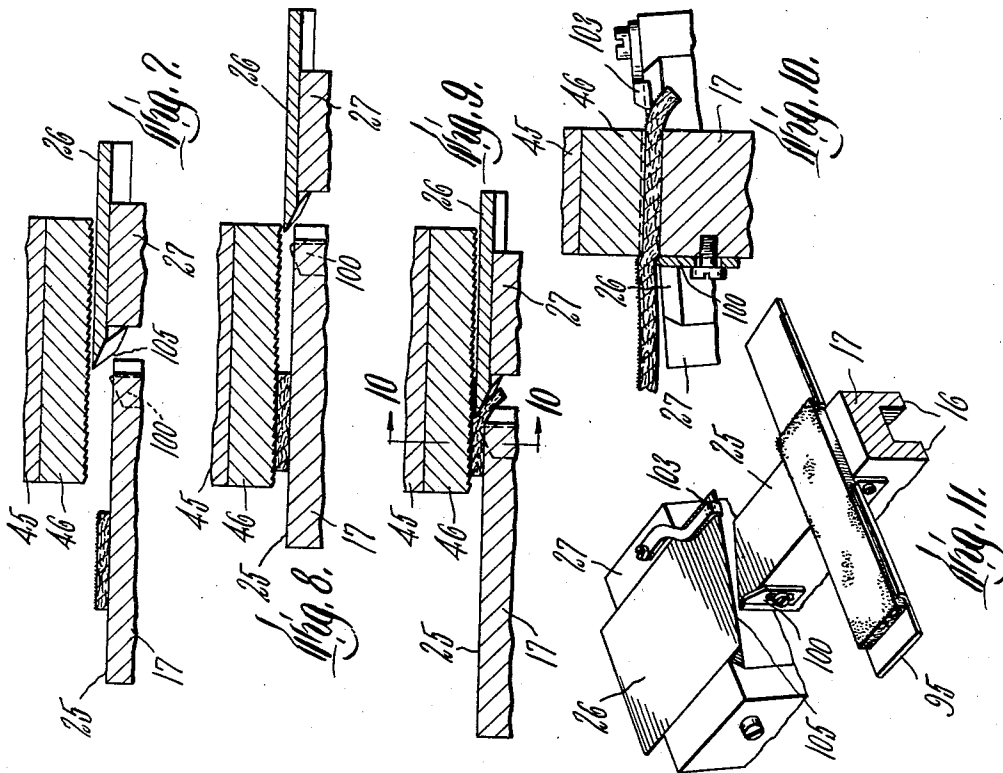
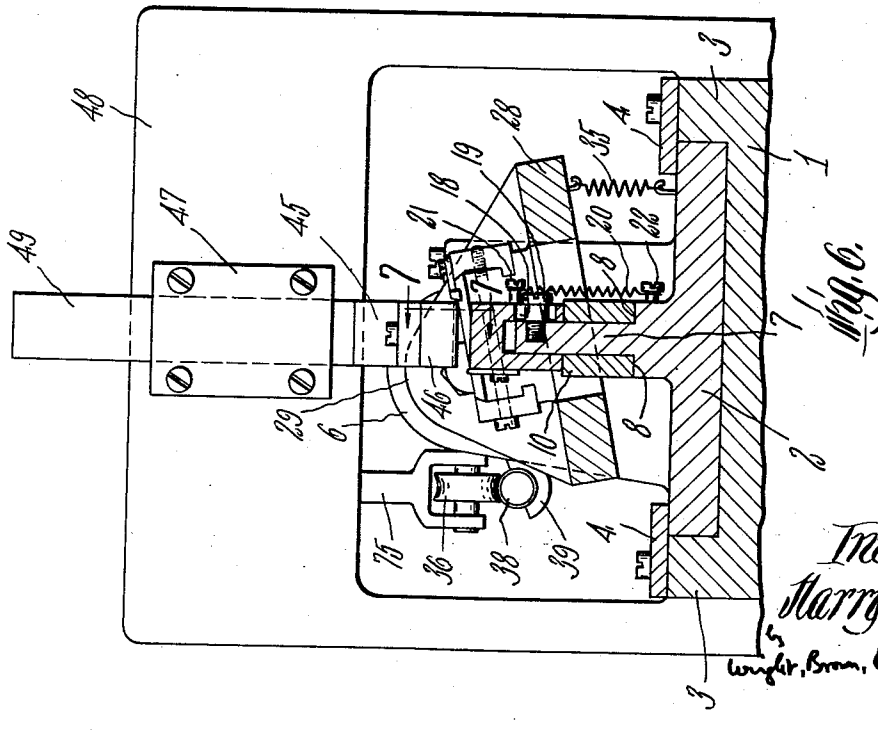
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UNITED STATES PATENT OFFICE

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METHOD OF AND MACHINE FOR SKIVING

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This invention relates to methods of and machines for skiving strip material, and more particularly the ends of such material to form mating bevels such that the strips may be assembled and cemented together to form a continuous strip. This may be done, for example, to unite strips of leather in continuous form as may be desired when making continuous welting for shoes or the like.

One of the objects of this invention is to produce a straight cut, avoiding the use of a roll to feed the work to the knife. By this means any inaccuracies due to the conformation of the work being skived to a curved surface are avoided.

Another object is to provide automatically for a change of the angle of bevel in the scarf in accordance with the thickness of the work. This change may be proportional, or less or more than proportional to the thickness variations as desired. More than proportional produces a thicker end edge, the thicker the stock, which is often desirable.

A further object is to cut crosswise of the length of the strip by a reciprocating motion and to so form the knife edge that a shear cut is produced.

Still another object is to clamp the work over a substantial area during the skiving operation either against a supporting table or against the knife.

Further objects and advantages will appear from a more complete description of an embodiment of the invention shown in the accompanying drawings in which

Figure 1 is a side elevation of the machine.

Figure 2 is a perspective view showing one manner in which the mating faces of two strips may be skived by the machine.

Figure 3 is a horizontal section on line 3—3 of Figure 1.

Figures 4 and 5 are detail sections on lines 4—4 and 5—5, respectively, of Figure 3.

Figure 6 is a detail vertical section on line 6—6 of Figure 1.

Figure 7 is a detail section on line 7—7 of Figure 6.

Figures 8 and 9 are views similar to Figure 7, but showing the relations of the parts in successive stages of a skiving operation.

Figure 10 is a detail section on line 10—10 of Figure 9.

Figure 11 is a fragmentary perspective showing the relationship of certain of the parts to the work prior to the skiving operation.

Referring to the accompanying drawings, at 1 is indicated a machine bed on which is mounted

a slide 2. As shown this slide is carried between upstanding side edges 3 of the bed, and is held in position by strips 4 secured to the upper faces of the extensions 3, and projecting over the top face of the slide. This slide is provided with spaced upstanding bracket portions 5 and 6 and between them is provided with a central upstanding rib 7 provided with horizontal shoulders 8 near its lower edge. Riding on these shoulders 8 is a bifurcated wedge block 9, the forks 10 of which engage on opposite sides of the rib 7 above the shoulders 8. This wedge block, as shown in Figure 1, has a threaded extension 11 at one end through which is passed the threaded portion 12 of a shaft 13. This shaft 13 is journaled through the bracket 5 and is held from axial motion relative thereto as by the collars 14 secured to the shaft at opposite faces of the bracket 5. By turning the knurled head 15 at the outer end of the shaft 13, the wedge block may be moved axially along the shoulders 8.

The upper inclined face of this wedge block engages beneath correspondingly beveled flanges 16 on a work support 17 which is of inverted U cross section. This work support is provided in one of its flanges with a vertical slot 18 through which extends a guide screw 19 threaded into the upper portion of the rib 7. Means such as a pair of springs 20 engaging at their upper ends on suitable pins 21 secured to the work support 17 and to pins 22 secured to the rib 7 beneath the shoulders 8, serve to hold the work support down as far as is permitted by the engagement of its flanges with the wedge member 9. This mounting provides means for adjusting the upper face 25 of the work support with reference to the skiving knife 26, as will later appear. This skiving knife is shown as held by a knife block 27 carried by a rocker member 28. This member 28 has upstanding ears 29 at opposite ends which are carried on aligned pivot elements 30 journaled in the brackets 5 and 6. The pivotal axis is shown in Figure 6 as offset laterally of the rib 7 so as to fix the tilting axis of the knife substantially at one edge and close the top face of the work support, holding a rod 38 supported by an arm 39 extending from a sleeve 40 fixed to the journaled element 41 carried by the rocker member 28 on the opposite side of the bearing bracket 6 against a grooved roller 36. The position of this roller 36 is determined by means later to be described.

The top face 25 of the work support 17 is smooth so that the work can be slid thereover

against the edge of the knife 26, and cooperating with this work support and the knife to hold the work in position, is an upper presser member 45. As shown this presser member is provided with a foot 46 roughened to provide ratchet-like serrations which may engage with the flesh side of a leather strip to be skived to hold it from sliding motion relative to the presser member, and while the slide is moved therebeneath to bring the knife edge against the work. This presser member 45 is slidably mounted in a suitable guideway 47 carried by a yoke frame 48 which straddles the slide 2 and which may, if desired, form a portion of the base member 1. The presser member 45 is shown as provided with a stem 49 provided with rack teeth 50 on its rear face with which meshes a toothed segment 51 on one end of an arm 52. This arm 52 is secured to a pivot shaft 53. Also secured to the shaft 53 is a rearwardly extending arm 530 having a socket portion 54 in which is slidably mounted a plunger 55 (see Figure 5), carrying journaled thereon at its lower end a cam roller 56. A spring 57 exerts pressure against the upper face of the plunger 55 to hold the roller 56 down against a cam member 58, and the amount of pressure exerted by this spring is adjustable by means of a screw 60 threaded through a cover member 61 of the socket portion 54 and engaging on an abutment plate 62 which rests on the upper face of the spring 57. A check nut 63 may be used to fix the screw 60 in adjusted position, and an internal shoulder 65 of the socket portion determines the downward limit of motion of the plunger 55, which is provided with a mating shoulder portion 66. The plunger may be provided with a slot 67 within which may be engaged a key portion 68 on the shoulder 65 to hold the plunger against rotation.

The cam roll 56 is normally held into contact with the wedge cam 58, as by a spring 70 engaging the arm 530 at its upper end and a portion of the base 1 at its lower end.

The roller 36 hereinbefore mentioned is journaled at the lower end of an arm 75 which is provided with a sleeve portion 76 at its forward end secured to the rock shaft 53 as by means of a set screw 77. Thus as the presser member 45 is raised and lowered relative to the work table, the rocker member 28 is rocked on its pivot to vary the inclination of the cutting edge of the knife so that when the presser member is brought down into engagement with the upper face of the work to be skived, the angularity of the knife edge is adjusted for the particular thickness of the work, the thinner the work the less the inclination of the knife. Varying the proportions of the parts determines the amount of tilt of the knife with respect to the position of the presser member 45 so that any desired relationship between the two may be produced, the tilting of the knife being directly proportional to the thickness of the work which limits the downward motion of the presser member, or greater or less than proportional as may be desired. Where it is greater than proportional, the thicker the work the more pronounced is the shoulder at the rear end of the scarf, which is often desirable.

The cam 58 which moves the presser member 45 up and down to release or engage the upper face of the work is shown as carried by a rotary shaft 80 journaled in bracket portions 81 of the machine base. It may be provided with a large gear 82 which meshes with a driving pinion 84 on a drive shaft 85. This drive shaft may be suitably supported in bracket portions 86 on the

machine frame and at one end is shown as carrying a belt pulley 87 by which it may be driven. This shaft 80 at its rear end is provided with a crank disk 88 having a crank pin 89, and a link 90 engaging over this crank pin is pivotally connected as at 91 at its forward end between ears 92 on the slide 2. The presser being lifted, the piece, such as a leather strip to be skived, is placed on the top of the work support 25 in the position shown in Figure 11, with its flesh side up, and preferably in guided relation to a gage 95 which may be secured to the member 17 at the desired angle to determine the angle of the scarf produced by the machine with relation to the length of the work. As shown this gage is arranged to cut the scarf directly across and at right angles to the length of the work.

The work being in this position, rotation of the shaft 80 then acts through the cam 58 to bring the presser 45 down against the upper face of the work with a pressure determined by the initial vertical setting of the work support and the tension of the spring 57. This pressing member engaging the flesh side of the work firmly holds it against movement relative to the presser member 45 and the final downward limit of motion of the presser member, as determined by the thickness of the work, determines the angularity of the knife 26, the edge of which, it will be noted, is positioned adjacent to and facing one edge of the work support 25. The presser member is held down during the completion of the stroke in one direction of the slide 2 as effected by rotation of the crank pin 89, and the work being held by the presser member 45 against motion with the work support and the knife, is caused to be cut by the knife as shown in successive positions in Figures 7, 8, and 9. The knife is forced into and across the stationary work, the work support receding from beneath the work as it moves with the knife, the work being held stationary by its engagement with the roughened foot 46 of the presser member 45. The presser member 45 holds the work during the entire pressing action either against the upper face of the work support which slips beneath it or the upper face of the knife.

These figures also show certain refinements of considerable importance. It is desirable that a shoulder be formed at the inner edge of the scarf for the reception of the edge of the mating scarf of the piece which is to be secured thereto. For this purpose, assuming the work being introduced from the left as shown, a work-engaging element 100 is secured to the edge of the work support, this element having its top edge projecting above the upper face 25 of the work support and offsetting the work just in advance of the knife edge as shown in Figure 10, so that the knife cuts a shoulder 101 in the grain side of the work, as shown in Figure 2, to receive the thin edge 102 of the mating piece which is to be cemented thereto. Likewise, in order to provide a clean cut end edge of the scarf portion and to prevent the waste piece of material from catching in the knife edge, it is desirable to deflect the end of the work projecting through between the presser member 45 and the work support 17. For this purpose a deflector element 103 is shown as secured to the rocker member 28 in position to deflect the end of the work away from the knife edge just in advance of the cutting action.

In order that the mating ends of the two pieces of work may be exactly complementally cut, the two pieces of work may be presented from opposite sides of the work table. Thus for a piece

to mate the piece shown in Figure 11 where the work is extended in from the left hand side, the second piece would be extended into the position from the right hand side. In order also to provide for a smooth cut, the knife edge 105 may be inclined laterally so as to provide for a shearing cut across the work, this inclination being from the perpendicular to the direction of relative movement between the knife and the work.

From the foregoing description of an embodiment of this invention, it should be evident to those skilled in the art that various changes and modifications may be made without departing from the spirit or scope of the invention as defined by the appended claims.

I claim:

1. A skiving machine comprising a flat work support, a skiving knife having a cutting edge positioned at one side of said support and arranged at an angle to the plane of its work-supporting face, and means actuable to move the work relative to the support and knife against said cutting edge to skive the work.

2. A skiving machine comprising a support for work to be skived, a knife tilted with reference to said support to bring its cutting edge to the desired skiving angle and arranged to completely sever the work, said cutting edge being located adjacent to and facing one edge of said support, a member for holding the work against said support and formed to grip said work, and means for relatively moving said support and knife and said member to effect skiving of the work.

3. A skiving machine comprising a support for work to be skived, a knife tilted to bring its cutting edge to the desired skiving angle, said cutting edge being located adjacent to and facing one edge of said support, and means for moving said support and knife with reference to the work on said support to skive the work.

4. A machine of the class described, comprising a work support having a smooth top face for slidably supporting work, a clamp non-slidably engaging the top face of the work, a knife, and means for moving said knife and support relative to the work and clamp to cause said knife to cut the work.

5. A machine of the class described comprising a work support, a knife having a cutting edge positioned at one side of said support and facing work supported thereon, means for holding the work, and means actuable to move said support and knife while the work is held by said holding means to bring the edge of the knife against and cut the work.

6. A skiving machine comprising a support for work to be skived, a skiving knife having a cutting edge positioned above the supporting face of said support and facing one edge thereof, and means for adjusting the angular relation of said knife to said face about an axis substantially in alinement with said face.

7. A skiving machine comprising a support for work to be skived, a skiving knife having a cutting edge positioned above the supporting face of said support and facing one edge thereof, and means for adjusting the angular relation of said knife to said face about an axis substantially in alinement with said face and adjacent to one end of said edge.

8. A skiving machine comprising a support for work to be skived, a knife tilted with reference to said support to bring its cutting edge to the desired skiving angle at one side and above the supporting face of said support, means for mov-

ing said work relative to the knife to skive work, and means for clamping said work against said support and said knife during the skiving operation.

9. A skiving machine comprising a support for work to be skived, a knife tilted with reference to said support to bring its cutting edge to the desired skiving angle at one side and above the supporting face of said support, means for moving said work relative to the knife to skive work, means for clamping said work against said support and said knife during the skiving operation, and means for deflecting the work in advance of the knife edge in position to produce a shoulder on the work at the inner margin of the scarf.

10. A skiving machine comprising a support for work to be skived, a knife tilted with reference to said support to bring its cutting edge to the desired skiving angle at one side and above the supporting face of said support, means for moving said work relative to the knife to skive the work, means for clamping said work against said support and said knife during the skiving operation, and means for deflecting the end portion of the work being skived away from the cutting edge of said knife.

11. A skiving machine comprising a support for work to be skived, a member movable toward and from said support to clamp the work thereagainst and to release the work, a skiving knife having its cutting edge presented at one side of said support, means supporting said knife for rocking to determine the skiving angle, and connections between said clamp member and supporting means causing the angle of said knife to be determined by the spacing of said member from said work support.

12. A skiving machine comprising members for engaging opposite faces of work to be skived, one of said members having a smooth face over which the work may slide and the other member having a face conditioned for frictional gripping engagement with the work, a skiving knife having a cutting edge arranged adjacent to one edge of said smooth-faced member, and means for relatively moving said knife and smooth-faced member with respect to said other member to skive the work.

13. A skiving machine comprising a support across which a strip of material to be skived may be placed, a knife arranged along one side of said support and having a cutting edge tilted to a skiving angle and arranged at one side of said strip, and means for moving said knife and support relative to said strip laterally of the length of said strip and through the full width of said strip to cause said knife to skive the strip from side to side, said knife edge being inclined to the perpendicular to the direction of skiving motion to produce a shearing cut.

14. A skiving machine comprising a bed, a slide movable on said bed, a work support on said slide, a knife support pivoted to said slide on an axis substantially parallel to its sliding direction, a skiving knife carried by said knife support and presenting a cutting edge adjacent to one side of said work support, a presser member movable toward and from said work support to clamp and release work thereon, operative connections between said presser member and knife support to vary the tilting angle of said knife edge with movement of said presser member, and means actuable to move said presser member to clamp the work and then to move said slide to cause the work to be skived, said presser member having a

rough face to hold the work and said work support having a smooth face to slip beneath the work.

15. A skiving machine comprising a bed, a slide movable on said bed, a work support on said slide, a knife support pivoted to said slide on an axis substantially parallel to its sliding direction, a skiving knife carried by said knife support and presenting a cutting edge adjacent to one side of said work support, a presser member movable toward and from said work support to clamp and release work thereon, operative connections between said presser member and knife support to vary the tilting angle of said knife edge with movement of said presser member, means actuable to move said presser member to clamp the work and then to move said slide to cause the work to be skived, said pressure member having

a rough face to hold the work and said work support having a smooth face to slip beneath the work, and a gage member carried by said work support determining the angular relation of the work to the direction of sliding motion of said slide to thereby determine the angularity of the scarf cut with relation to the length of the work.

16. The method of skiving a strip of leather, which comprises supporting said strip on its grain side for sliding motion relative to its support, exerting non-sliding gripping pressure against the flesh side of said strip, and sliding said strip and said support relatively and said strip relative to and against the edge of a skiving knife to skive said strip while said gripping pressure is exerted.

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