

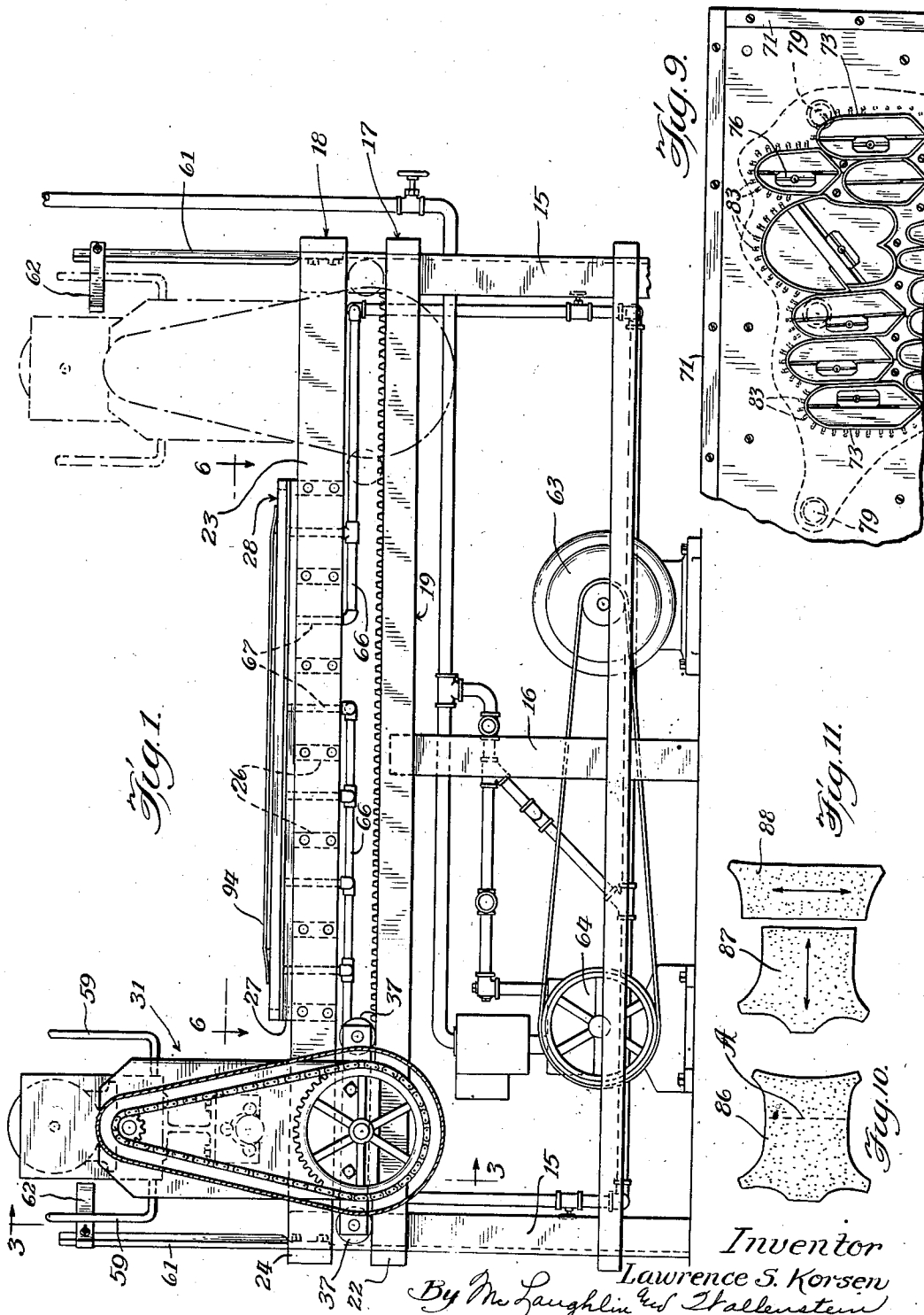
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L. S. KORSEN
CUTTING OF LEATHER

2,217,060

Filed Aug. 4, 1938

5 Sheets-Sheet 1



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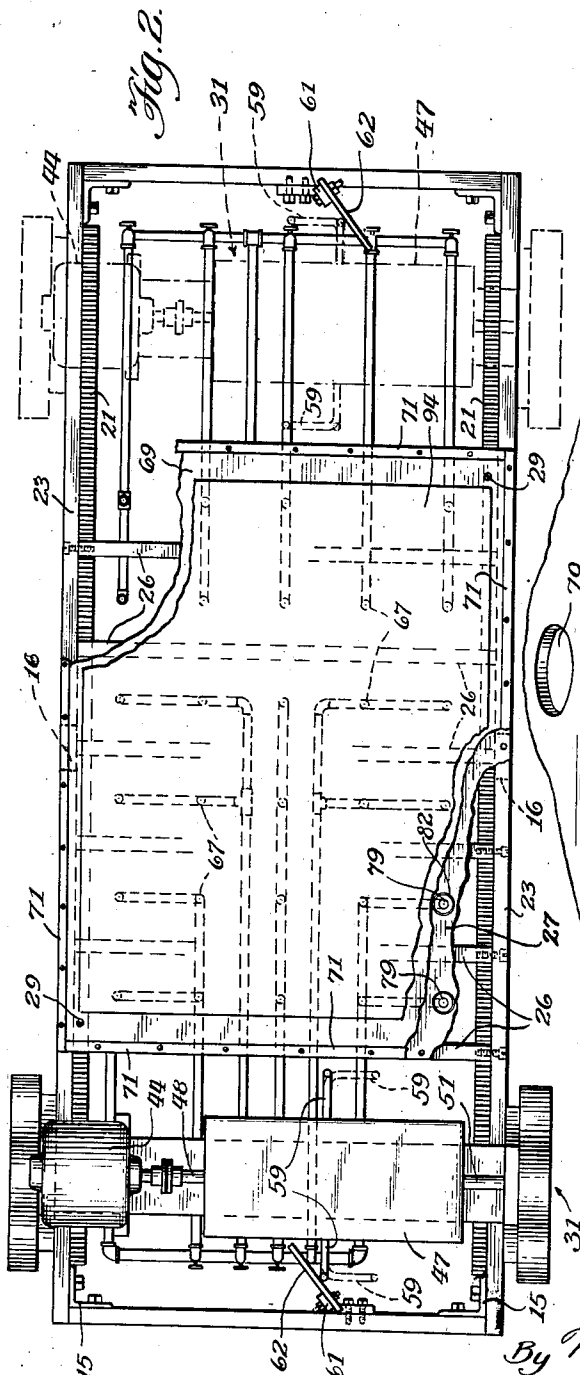


Fig. 2.

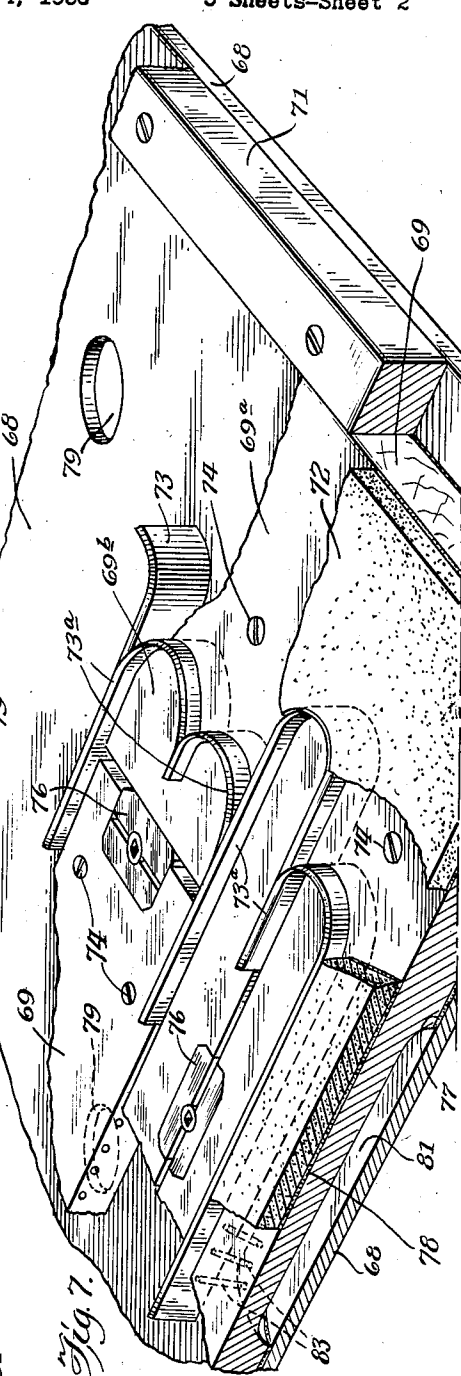


Fig. 7.

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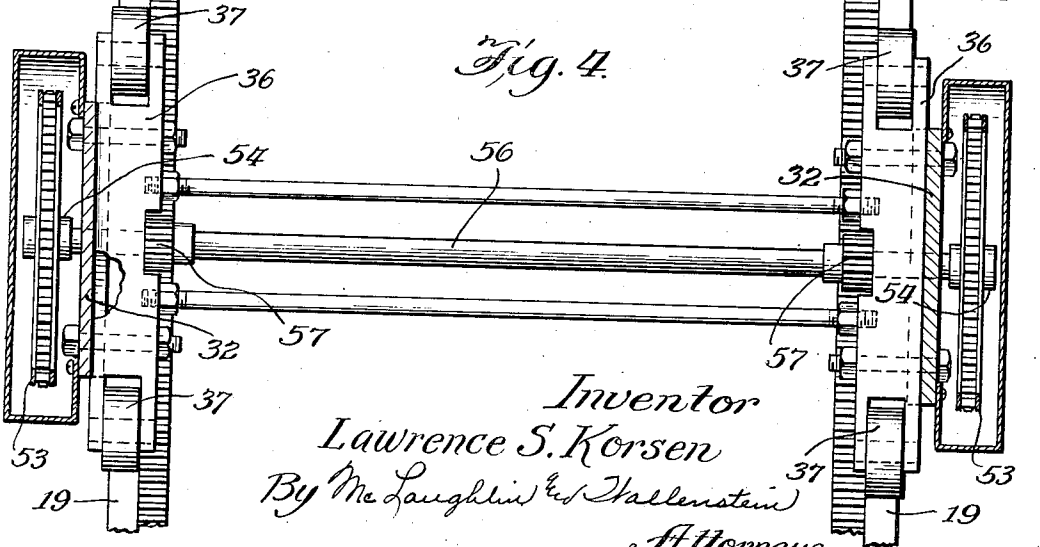
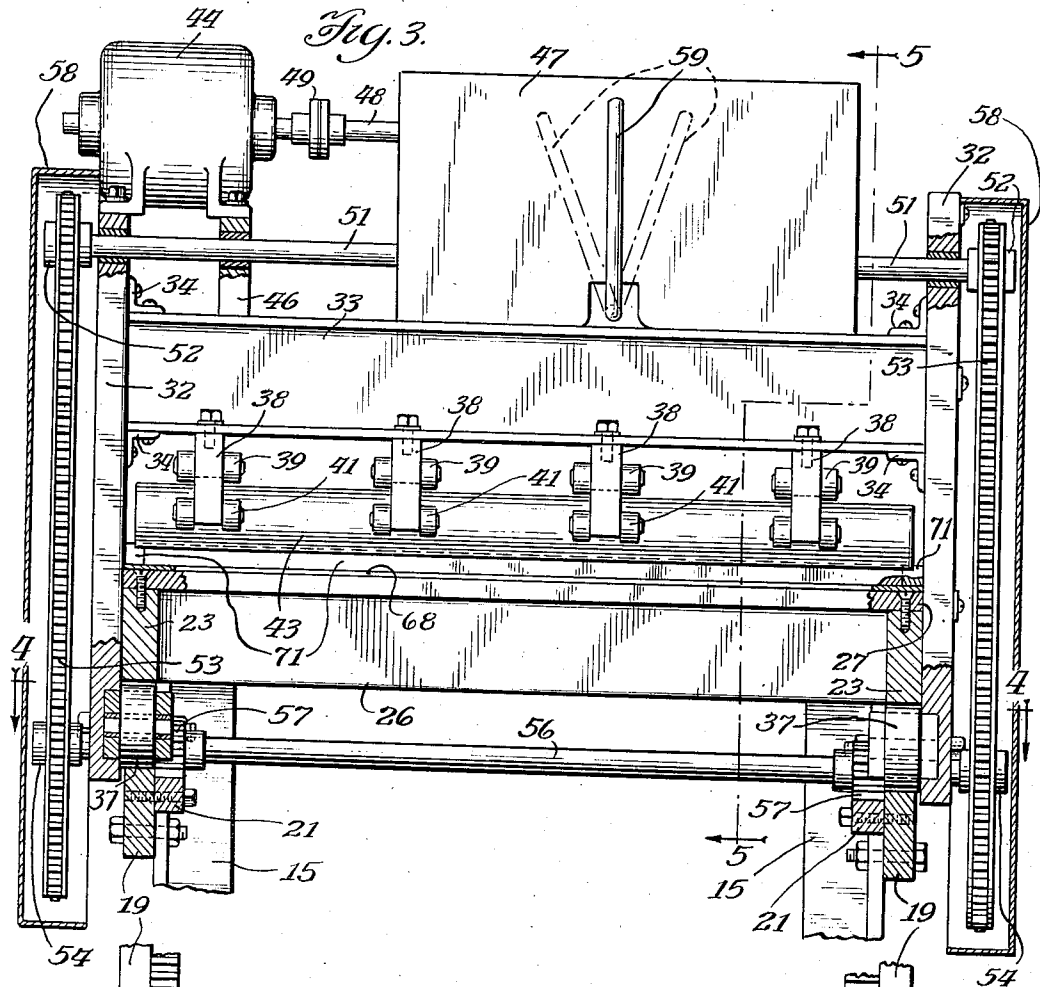
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5 Sheets-Sheet 3



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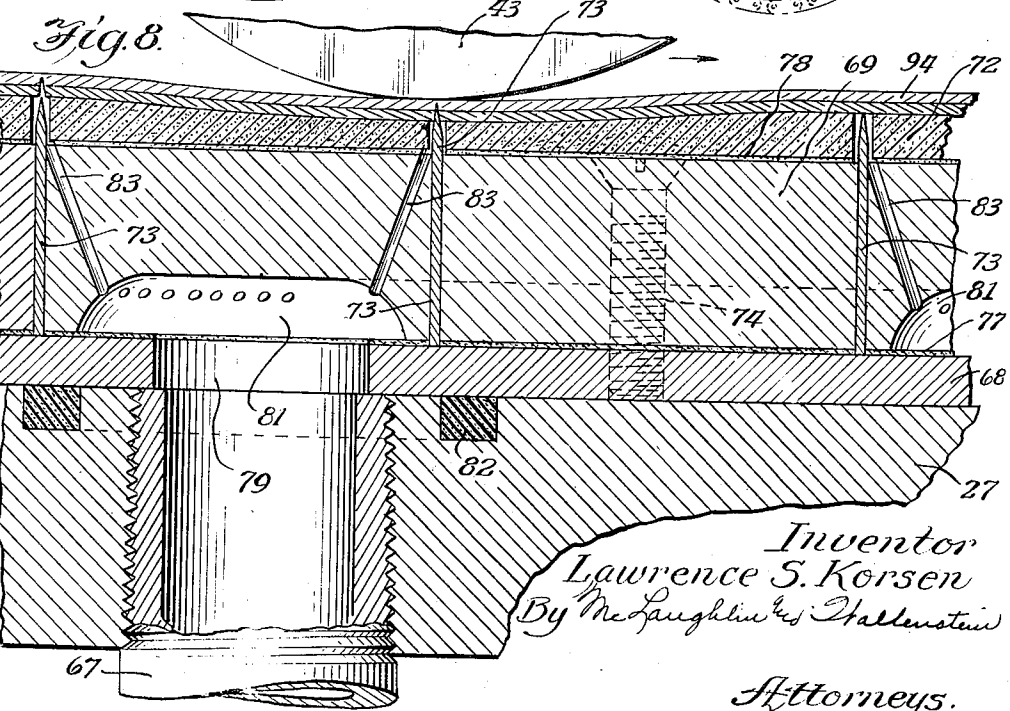
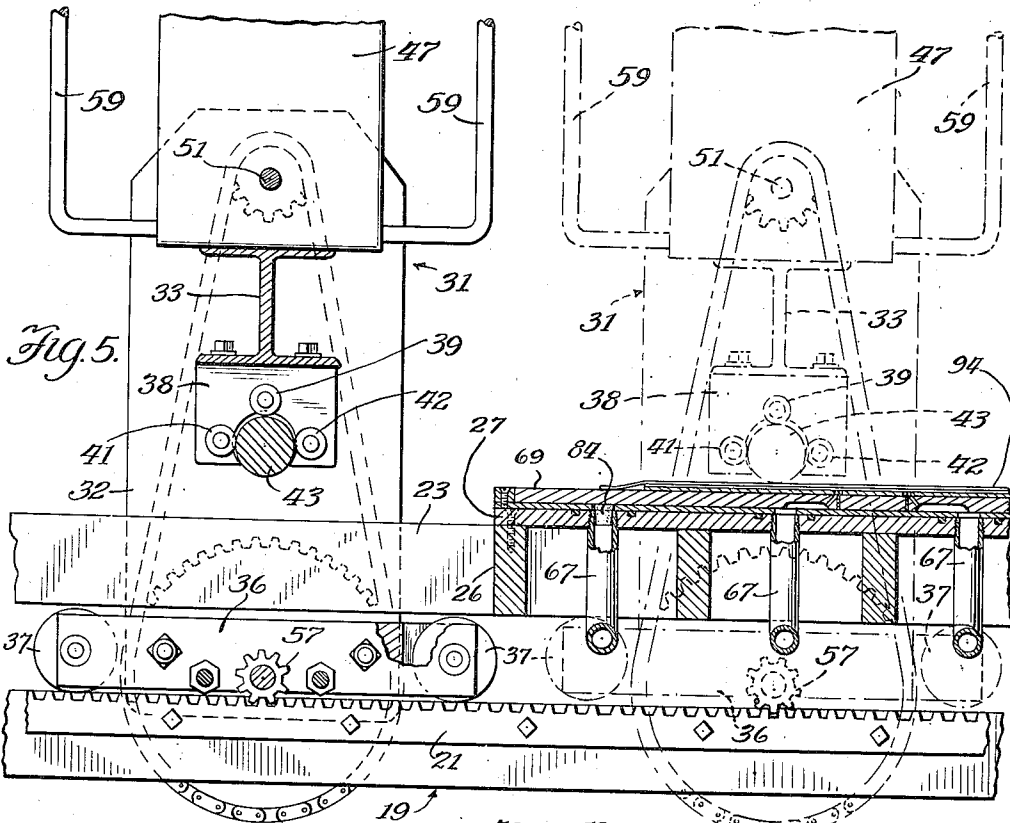
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5 Sheets-Sheet 4



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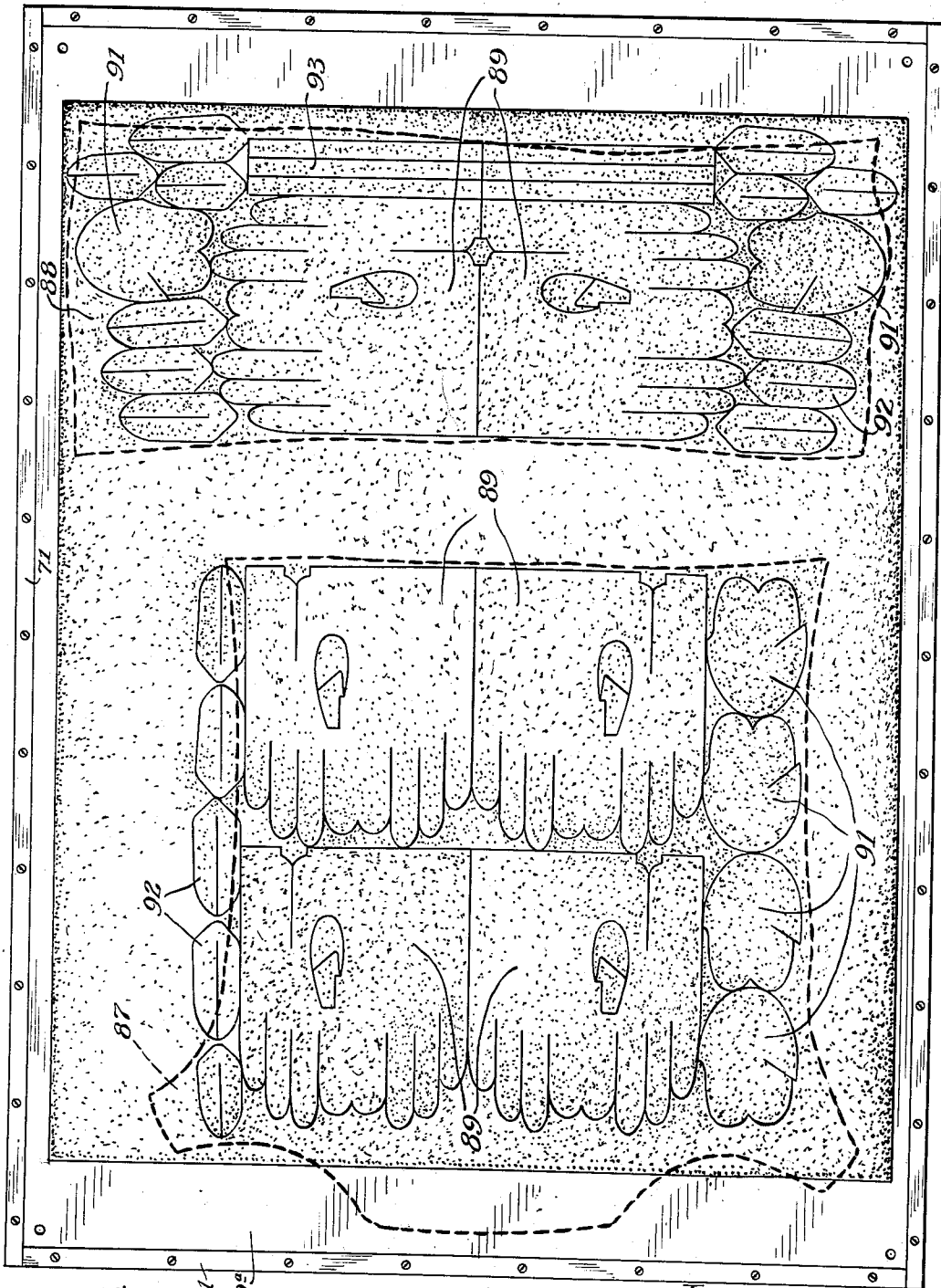


Fig. 6.

71

69°

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UNITED STATES PATENT OFFICE

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CUTTING OF LEATHER

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Application August 4, 1938, Serial No. 223,030

20 Claims. (Cl. 164—17)

This invention relates to the art of cutting leather patterns, particularly from leather having a natural tendency to stretch, and it is of especial importance in the cutting of patterns for leather gloves from relatively thin leather of the type usually employed for this type of article.

Gloves are frequently made from a relatively thin leather which has a definite grain and this grain is not uniform in direction in hides from which the glove patterns are cut. While this relatively thin leather has some elasticity and "stretch" in any direction, there is always one direction, depending upon the grain, in which the leather should be stretched and can be extended by stretching operations to a fairly large percentage of its original dimension. The direction in which this "stretch" takes place is not uniform in a hide, running generally transversely across the buttock portion of the hide, and longitudinally in the greater portion of the back and shoulder portion of the hide. In making articles such as gloves, it is essential that this "stretch" be taken out of the leather, and also that in the completed glove the grain runs in substantially the same direction with respect to the fingers, palm and back of the hand. For example, if the pattern has not been properly cut, one finger or several fingers in the glove may stretch as much as an inch or more beyond the intended length thereof so that the glove no longer fits the person wearing it. As a consequence, in cutting leather gloves the usual practice has been to produce single dies corresponding in outline to the pattern to be cut, these single dies being relatively heavy and furnished with a striking surface so that they may be placed down over a section of leather and struck with a heavy mallet, usually weighing eight to ten pounds, in order to cut the pattern. The cutters, who are required to be highly skilled in their trade, take the leather, stretch it out fully while moist, and lay the die over a portion of the leather large enough to produce the piece or pattern to be cut, in the meantime checking the grain of the leather so that this grain will run in the proper direction, and then strike the cutting tool with the mallet. So far as I am aware, the only improvement in the cutting of leather which has been made and which has been used at all in the glove industry is merely a modification or refinement of this extremely old method referred to. This involves the use of the so-called "clicker" machine and, following this method, the leather is laid out by hand in

exactly the same way, stretched and the same general type of cutting tool placed over a section of the leather. The difference lies in the use of a mechanical counterpart of the mallet. In general practice, there is a relatively heavy arm which can be swung in position over the table where the operator is working, and by operation of a suitable treadle or the like he can bring this arm sharply down over the tool in the same way that the mallet was brought down to cut out the single pattern which he has laid out. In the method employing the mallet as well as in the so-called "clicker" method, the operator must make his selection, determine the grain, hold the leather in properly stretched position as he places the cutting tool in position, and, in general, use the judgment which his experience dictates to him in carrying on his work. While the operators become skilled, they are not all of equal ability, human judgment is apt to interfere with the production of a perfect product, the wastage of leather is relatively great, and the time consumed is relatively long.

This invention is concerned with improvements in the cutting especially of glove leather and is particularly directed to an improved method, improved equipment with which some of the steps of the method are performed, and an improved die particularly adaptable for the accomplishment of the purpose. The problems which I have had to overcome are, in part, suggested hereinabove and, in part, known to those skilled in the art. The problems further will be more apparent from a consideration of the description which follows disclosing the manner in which I attain the objects which I set out to accomplish.

In general, my method comprises preparing the ordinary entire hide of leather as it comes to the glove manufacturer, that is, having it damp enough to stretch readily to substantially the full extent, preferably initially stretching it longitudinally of its length, then cutting said stretched hide into two pieces or sections along the line which separates the transversely running grain from the longitudinally running grain, and then stretching the section having said transversely running grain in the direction of said grain. Then, utilizing a special die in the form of a flat bed, the leather is placed into proper position to be cut, and then, preferably using a backing of suitable material such as relatively thin fiber board for the protection of the cutting knives, vertical pressure is exerted

against the knife faces to cut substantially the entire hide completely in one operation. The die is formed with a top surface of resilient material and a bottom layer or layers of rigid material supporting upstanding knives in the shape of the patterns to be cut and projecting part way through slits of similar configuration formed in the top surface of resilient material. Suction is provided by suitable means over substantially the entire surface of resilient material on which the leather is placed, so that when the leather is stretched out in the proper manner it will be held in place on the die by suction. In one portion of the hide as it is laid out on the die, the patterns as determined by the position of the knives run longitudinally of the machine, that is, with the grain of that piece of the hide, while in the other piece of hide, the patterns run transversely of the machine. The patterns, in general, are contiguous so that there is little or no wastage between patterns, one knife blade cutting the outline of two patterns where these patterns coincide. The knives having the outline of the patterns are preferably so set in the die that the palms and backs, including the front and back of the fingers, are cut from the center of the hide which is the strongest and best leather, and the fourchettes and other small pieces are cut around the sides of the hides. Furthermore, since hides are not of uniform width, I design the die in such a way as to utilize substantially all of the hides of maximum width, so that hides of less width will not entirely cover the portion of the die carrying the knives. To further utilize as much of the leather as possible, I so distribute the cutting knives in the die that parts which cannot readily be cut from scrap material are arranged on one side, thus assuring that these portions are taken from a full clean hide in the normal cutting operation. Thus in a design of glove where a separate thumb pattern is utilized, I arrange the thumbs along one side of the die and the fourchettes along the other side of the die with the palms and backs in the center. Then if the hides are running relatively narrow and the number of fourchettes cut are insufficient to provide the proper number for all of the remaining parts cut, these fourchettes are readily supplied from the small amounts of scrap material which remain. While it is highly preferable that the hide be initially stretched before it is cut into a plurality of sections, in certain cases, the hide may be cut and then the hide sections may be stretched in their proper directions prior to placement on the cutting die.

The complete description of my invention as it relates to the machine, the method and the die structure will be described hereinafter in connection with the accompanying drawings showing preferred embodiments of the invention.

In the drawings—

Fig. 1 is a side elevational view, partly broken away, and showing a modified position of some of the parts in dotted lines, this view showing one embodiment of the completed machine,

Fig. 2 is a plan view of the machine shown in Fig. 1, some portions being broken away to illustrate structural details,

Fig. 3 is a sectional view taken on the line 3—3 of Fig. 1, looking in the direction of the arrows, and showing some of the parts in end elevation,

Fig. 4 is a fragmentary plan section taken on

the line 4—4 of Fig. 3, looking in the direction of the arrows,

Fig. 5 is an enlarged irregular sectional view, partly in elevation, taken along the line 5—5 of Fig. 3 looking in the direction of the arrows, this figure also carrying dotted lines to illustrate a further position of some of the parts,

Fig. 6 is an enlarged plan view showing the bed of the die and indicating by dotted lines a representative position of a hide on the face of the die,

Fig. 7 is a fragmentary perspective view of a portion of the die with some of the parts broken away to illustrate structural features.

Fig. 8 is an enlarged fragmentary sectional view partly in elevation showing certain features of the die and illustrating the cutting operation.

Fig. 9 is a fragmentary plan view further showing certain features of the die,

Fig. 10 is a small plan view showing the general outline of a full hide; and

Fig. 11 shows the appearance of the same hide after it has been cut into two pieces and stretched preparatory to cutting the patterns therefrom in accordance with my method.

For convenience, I shall first refer to the mechanism shown in Figs. 1 to 5, inclusive. This includes a framework adapted to set on the floor or similar plane surface and including legs 15 on the four corners and side legs 16; these legs being secured to rectangularly disposed frame members generally indicated by the reference characters 17 and 18. As shown particularly in Fig. 2, the legs 15 are of angular cross section and disposed within the corners of the rectangular frame members 17 and 18 while the legs 16 are disposed on the outside so as not to interfere with the free movement of parts as will appear subsequently. Rectangular frame member 17 has side members 19 to which racks 21 are secured, and end members 22 secured by suitable means to the ends of the members 19. The rectangular frame member 18 comprises side members 23 and end members 24, cross members 26 being secured between the side members 23. The side members 23 and cross members 26 together support a bed plate 27 to which a die generally indicated by the reference character 28 is secured by suitable means such as screws 29 at the four corners.

Mounted on the frame member for movement entirely across the frame is a carriage generally indicated by the character 31. This carriage comprises a pair of side plates 32 between which an I-beam 33 is secured by means of triangular brackets 34. These parts comprise the main frame of the carriage. Secured to the bottom of side plates 32 are bearing blocks 36 in which rollers 37 are journaled, these rollers adapted to roll and support the carriage along the upper surfaces of the side members 19, or being adapted to engage the underside of side members 23 of the main frame in a manner and for a purpose which will be brought out as the description progresses.

Secured on the underside of the I-beam 33 are a plurality of roller supporting brackets 38 each supporting one of a series of rollers 39—39, 41—41, and 42—42. These rollers 39, 41, and 42 function as combination pressure and guide rollers, and to this end engage a loosely held large roller 43 which is adapted to pressure engage the top of the die 28 as the carriage moves across it (see Fig. 5, dotted portion).

To propel the carriage, I provide a motor 44 suitably supported on one top edge of one side member 32 and a base member 45 projecting up-

wardly from the I-beam 33. A gear housing 47 has its driven shaft 48 projecting in line with the motor shaft and secured thereto through a coupling 49. The exact arrangement of the gear housing, of course, is of no particular significance so far as the present invention is concerned, but by means well known in the art drive from shaft 48 is communicated to a shaft 51, extending entirely through the gear housing, this shaft 51 being journaled in the side members 32 and in the motor base member 46. Sprocket gears 52 are secured to opposite ends of the shaft 51 and drive chains 53, meshing with larger sprocket gears 54. The sprocket gears 54 are carried on the ends of a transverse shaft 56, journaled in the carriage frame and carrying pinions 57 which mesh with the racks 21. Guards 58, if desired, may in the usual manner be placed over the sprocket gears and chains.

Thus, it will be seen by this arrangement that the pinions 57 may be driven from motor 44 at any desired speed consistent with accepted mechanical practices. The gear arrangement in the gear case 47 may be such as initially to produce some reduction in speed, and the sprocket chain drive arrangement is such as further to decrease the speed. The resulting action is such that when the drive is initiated a fairly rapid but not too rapid movement of the entire carriage takes place to effect a cutting action of the leather on the die through the engagement of roller 43, all as will be more fully pointed out hereinafter.

The carriage is adapted to be moved in either direction, and to this end I provide an activating member extending through the gear case and formed with two upstanding handles or shaft levers 59, which, when directly vertical in the position shown in full lines in Fig. 3, will disconnect the drive entirely. At opposite ends of the machine, I provide standards 61 equipped with deflecting arms 62, facing in opposite directions. Thus when the handle 59 is moved to one dotted line position of Fig. 3, the carriage will be moved in one direction until the handle 59 engages a deflecting arm 62 to restore the handle to its vertical position and arrest the progress of the carriage by disconnecting the clutch provided in the gear housing. When, now, the carriage is to be propelled in the opposite direction it will be found impossible to move the handle 59 in any direction except one which will cause it to be moved in the opposite direction, that is, to the other dotted line position shown in Fig. 3. The process then repeats itself as the carriage is alternately moved from one end of the machine to the other.

Below the machine, or in any other suitable location, I provide an electric motor 63 driving an air pump 64, having its intake and exhaust so arranged as to place a vacuum on pipe lines 66 to which a plurality of vertical upwardly extending pipe lines 67 (see Figs. 1 and 8) are secured. Any suitable drive means is provided between the pump and motor, but it is unnecessary for my present purposes to describe in detail the exact manner in which the vacuum pump equipment is operated.

Reference may now be made to Figs. 6 to 9, inclusive, for a full understanding of the arrangement of the improved die assembly. As previously mentioned, I provide a die which is generally rigid, and which when mounted on the base plate is substantially immovable and non-compressible except that forming a part of such die is an upper surface formed of resilient ma-

terial such as sponge rubber provided with a plurality of slits arranged in the form of patterns into which, from the lower rigid base, cutting knives project in such a manner that when pressure is applied to the die as a whole the knives will project upwardly through the slits or, considering the action from another angle, the resilient material will compress downwardly to uncover the knives, and the knives will then engage the leather against which pressure is exerted by the loosely supported roller 43 to cut the leather along the outlines established by the positions of the knives. The upper surface of the die during normal times, therefore, is unobstructed and the operator can freely work to arrange the hide in the position required in the performance of our method. Vacuum means are provided, however, associated with the system previously referred to for holding the leather down to the position to which it has been adjusted on top of the resilient upper surface of the die. Preferably, I provide passageways through the more rigid under-ports of the die which place the interior of pipes 67 in communication with the slits through which the knives extend, and since the knives together define the cutting surface of the die, the leather is therefore held adequately in any position to which an operator may wish to adjust it.

Referring now to the drawings, the die proper comprises a flat metal plate 68 which rests directly on the bed plate 27, and above which is supported an intermediate layer of substantially rigid material generally indicated by the reference character 69 (see Figures 7 and 8). This portion 69 is preferably a relatively compact layer of plywood or material having the same general properties. A marginal member 71 is secured to the plate 68 and entirely surrounds the layer 69 to assist in holding this layer in position and to further rigidify the die for handling purposes. Above the portion 69 is the resilient top layer 72 formed of suitable material such as sponge rubber. The knives 73 have their bottom unsharpened edges resting on plate 68 and project entirely through the layer 69 and up into slits provided in the resilient top layer 72. I provide special means for securing the knives in position and provide for evacuation around their sharpened top edges as will now be shown.

Looking now particularly at Fig. 7, it will be seen that the knives, while of plane cross section, if any particular point be taken, are shaped by bending them to the outline of the pattern desired. To illustrate the manner of supporting the knives reference may be had to the portion of the knife indicated by the reference character 73a. On one side of this portion of the knife system is a formed block of wood or the like 69a secured by a screw 74 to plate 68, and also prevented from moving in a generally right-hand direction when looking at Fig. 7, by the position of the marginal member 71. It may be noted that the portion indicated by the reference character 69a may comprise a relatively large section of the die, or it may comprise a relatively small section, depending upon the arrangement of the knives. At the opposite side of the knife portion 73a is a portion of the layer 69 identified by the reference character 69b. This portion, when the die is being assembled, is movable and is engaged by one movable member of a quoin 76 of the general type sometimes employed to lock up a printing form. The quoin 76 is backed by a portion of the layer 69 which is also

rigidly secured in position as indicated by the presence of the screws 74. By placing the parts in the general position shown and actuating the quoin in a manner well known in arts in which this type of a device is used, the portion 69b is forced in a generally right hand direction to engage the knife portion 73a snugly and hold it in the position in which the pattern requires. This same general arrangement is shown at the left-hand portion of Fig. 7 where a quoin is employed between two movable portions of the layer 69 which, however, engage portions of the knife system backed by other portions of the layer 69 sufficiently rigid to hold the knives in the positions desired. By proper utilization of the quoins, where the knives are positioned relatively close to each other (it being understood that Fig. 7 shows only a small part of the die), the position of the knives may also be adjusted.

Between the plate 68 and the intermediate layer 69, I provide a layer of cement 77 such as an ordinary good grade of rubber cement. This is provided mainly to ensure holding a vacuum, that is, to prevent drawing air through those portions of the die which are not required to be evacuated such as directly longitudinally between the top surface of plate 68 and the bottom surface of the intermediate layer 69. Similarly, a layer of cement 78 is provided between the top surface of the intermediate layer 69 and the bottom surface of the resilient top member 72.

The resilient layer 72, if formed of sponge rubber as is preferred, has its top and bottom surfaces provided with a substantially imperforate skin so as to confine the vacuum, created in a manner to be pointed out, within the area associated with the tops of the knives. In Fig. 8, for convenience of illustration, the slits in the layer 72 into which the knives project are shown relatively wide but in actual practice it is preferred that these slits be very narrow and be formed by the substantial abutment of contiguous edges of the material 72. The resilient layer 72 may be formed and placed in position in a number of ways, a suitable arrangement being first to prepare the lower portion of the die with the knives in position, apply the cement layer 78, place an imperforate layer corresponding to the layer 72 over the tops of the knives and square with the die proper, and force the layer down into position, cutting the slits through which the knives project in the act of applying it in position.

I have referred to the use of vacuum to hold the cut and stretched hide in the position in which it is desired to place it on the face of the die, and brought out that, through the vacuum lines 66 and 67, a plurality of relatively small openings through the die is connected to the vacuum side of the pump 64. This arrangement may take various forms, but I have found that a very simple and desirable expedient is to utilize the relatively small slits surrounding the knife blades for this purpose. The manner in which the vacuum lines are connected to the die structure is brought out clearly in Fig. 8. As there shown, the top of each of the pipes 67 is threaded into the bed plate 27, and immediately above pipe 67 an opening 79 is provided through the plate 68. It will be understood that there is an opening 79 above each pipe 67 to place the interior of the pipe in communication with a hollowed-out portion 81 in the intermediate layer 69 which, as previously described, is preferably plywood or some similar substance. To effect a seal between the bed plate

27 and the plate 68, a gasket or packing gland 82 is provided, preferably made of rubber and normally somewhat thicker in section than the vertical space which it occupies. Communicating with each hollowed-out portion 81 is a plurality of relatively small passageways 83 extending up through the layer 69 to points approximately coinciding with the position of the knives 73. It will be recalled that the layer 69 is cemented to the plate 68 and the upper resilient layer 72 is cemented to the layer 69, to prevent an intake of air and loss of vacuum, and confining the evacuated portion to the slits in the upper resilient layer 72 into which the knives project. By an examination of Fig. 6, it is clear that these slits occupy the entire surface of the die over which a hide is expected to be placed for cutting, and accordingly wherever the hide may be placed on the face of the die, it will be held with adequate firmness in proper position. The degree of vacuum is increased by the application of the hide in position, and the capacity of the pump is such that even though there will be some leakage of air through such slits in the die as are not covered by the hide, this leakage will not be sufficient to prevent building up of sufficient vacuum to hold the hide properly.

In the practice of my invention, the bed plate with the remaining portions of the machine may be regarded as fixtures, the dies, including the plate 68 and everything lying above it, being changed when the patterns to be cut and the style of glove to be fabricated are changed. As a consequence, I provide an ample number of leads 67 and, where desired, effect control of the vacuum by closing up these leads by suitable means such as by the use of a stopper 84 (see Fig. 5). This stopper may extend through an opening 79 in the plate 68 and into the top of the aligned pipe 67, in the manner shown in the drawing.

In the practice of my invention, I take a properly prepared hide 86 (see Fig. 10), stretch it in the direction of its length, and then cut it along the dotted line A which, in effect, separates the hide in two sections in which the grain runs in opposite directions. These two portions are indicated separately by the reference characters 87 and 88 in Fig. 11. The portion 88 is then stretched in the direction indicated by the double headed arrows in this figure and the two hide sections are ready to be placed on the die for cutting. The two hide sections next are laid out in the fashion illustrated in Fig. 6 where a particular style of glove pattern is shown by the appearance of the slits. As there illustrated, there are six combination palm and back patterns 89, those associated with the section 87 of the hide running preferably longitudinally of the machine and those associated with section 88 of the hide running preferably transversely of the machine. This arrangement may be modified, if desired, but it is preferred to operate as described since said preferred procedure takes advantage of the grain of the leather. It will be noted that thumb patterns 91 all lie along one side, and on the opposite side are fourchette patterns 92, in the longitudinally running die portion. A somewhat similar arrangement is employed in the transversely running die portion except that fourchettes and thumb patterns appear on each side of the die, this being possible because of the stretch of the leather and the fact that usually a good portion of the leather will be found on both sides of a piece corresponding to the piece 88. At the extreme

back of the hide provision is made for cutting straps 93 in this particular design. Normally, straps can be cut from scrap pieces of leather somewhat inferior in grade to that which must be employed on palms and backs, and while as many straps as possible are cut from the hide, should the hide not be quite large enough to include all of the straps as indicated in the drawings, and should the leather at this point have minor imperfections, the necessary straps can still be obtained from scrap material. The whole layout of the die, therefore, is such that from the best portion of the hide all of the more important parts of the patterns are preferably cut, and the portions of the glove which can be cut from scrap material are obtained so far as possible at each cutting operation but the remainder of such patterns as may be required are cut from scrap material by the usual hand processes employed before the developments of my invention.

As the leather is laid out on the die in the manner shown in Fig. 6, it is held by vacuum in the exact position in which the operator places it. A layer of cardboard 94 (Fig. 8) is then preferably laid over the top of the die so as to cover the leather, the handle 59 is moved to the "on" position, and the carriage with the roller 43 is moved across the face of the die from one end of the machine to the other. During this operation, the rollers 37 engage the underside of the frame members 23 as the roller 43 rides up over the top of the die. The roller 43 in the meantime is wedged up against the small rollers 39 which take the upward thrust with the result that, in effect, there is a squeezing pressure of the die-base and portion of the frame between the roller 39 and the roller 43. This produces the cutting action shown graphically in Fig. 8, which has already been referred to and which need not be described in further detail. When the carriage reaches its extreme of movement, it is automatically stopped by the handle 59 engaging one of the deflecting arms 82. The cardboard 94 is removed, the cut leather taken off the die and the machine is ready for another operation.

By means of my invention, it has been possible to produce more consistently high grade gloves than have been made heretofore by the hand process, the labor is decreased enormously, and the number of gloves which can be cut from a given number of square feet of hides is greatly increased. As illustrative of the tremendous economic advantages emanating from the practice of my invention in connection with the cutting of patterns for men's leather gloves, the saving in material, that is, leather, has averaged from 5% to 12% over existing procedures in the art with which I am familiar. This is brought about, among other reasons, by virtue of the fact that there is no wastage such as has heretofore resulted from imperfections and flaws in the hides. The arrangement of the die and the utilization of other features of my invention make it possible for the operator to so arrange the hide on the die as to reduce loss from flaws in the leather to a minimum. Because of the substantially perfect die layout which is made possible, there is little or no wastage or scrap material between the patterns such as occurs when the methods used heretofore are employed. Not only is there a marked saving in leather, but the practice of my invention results in a saving of labor costs of the order of 35% to 50% over methods now in use.

The above description is illustrative and many

details are brought out for a full understanding of those skilled in the art. The invention in its various phases, however, is limited only by the scope of the appended claims.

What I claim as new and desire to protect by Letters Patent of the United States is:

1. The method of producing leather glove patterns which includes the steps of dividing a hide into a plurality of pieces in accordance with the grain thereof and wherein each of said pieces is stretched in a direction determined by the grain thereof so that substantially all slack thereof is taken up, holding such pieces in position, and then cutting a plurality of glove patterns from each of said pieces in a single cutting operation.

2. The method defined in claim 1 wherein said pieces of hide are held in position by vacuum during said cutting operation.

3. The method of producing leather glove patterns which comprises stretching a hide in the direction of its length, cutting said stretched hide into two parts, stretching in the direction of its grain that part whose grain is transverse of the length of the original hide, holding said part by vacuum means effective against one side thereof and then cutting a plurality of patterns therefrom in a single cutting operation.

4. The method of producing leather glove patterns which includes the steps of cutting a hide into parts each of which has a grain running in substantially only a single direction, stretching one of said pieces in the direction of its grain, holding said piece in position by applying vacuum at a plurality of places beneath the piece, and then cutting said piece into a plurality of patterns in a single operation, utilizing substantially the entire area of said piece whereby wastage of leather is essentially eliminated.

5. The method of producing leather glove patterns which comprises providing a die equipped with a plurality of cutting knives arranged in patterns and provided with vacuum means for holding a hide in position thereon, stretching a hide section in accordance with its grain, placing the hide section over the die whereby substantially the entire area of the hide section is encompassed in an area occupied by a predetermined number of said knives and held in position by said vacuum means, and applying substantially vertical pressure on the hide section whereby to cut a plurality of patterns therefrom.

6. The method as defined in claim 5 wherein palms and backs are cut from generally center portions of the hide and fittings including fourchettes and the like from generally edge portions of the hide, whereby, should a single hide fail to produce an adequate quantity of fittings, such fittings may be cut subsequently from scrap material resulting from a first cutting operation.

7. A die of the character and for the purpose described comprising a lower portion of relatively rigid material, knife members disposed in the form of patterns supported in said lower portion and projecting upwardly therefrom, a resilient upper portion having slits into which said knives project, top edges of said knives normally lying below the level of the upper surface of said resilient material and adapted to be exposed by compression of the resilient material, whereby said die has a smooth upper surface for the arrangement of material thereon prior to cutting the same, and means providing a plurality of openings which communicate with said slits adjacent said knife members whereby a vacuum may be drawn at said openings to hold material

in place on said die during a cutting operation.

8. A die of the character and for the purpose described comprising a lower plate, an intermediate layer of substantially rigid material and an upper layer of resilient material, said intermediate layer being formed of a plurality of parts generally shaped to correspond to a pattern to be cut, knives lying between said parts in the form of patterns having their lower edges engaging said lower plate and projecting upwardly into slits provided in said resilient material, means for causing said parts of the intermediate layer to grip opposite sides of said knives, and means providing a plurality of openings which communicate with said slits adjacent said knives whereby a vacuum may be drawn at said openings to hold material in place on said die during a cutting operation.

9. A die of the character and for the purpose described, comprising a lower plate, an intermediate layer of substantially rigid material, an upper layer of resilient material, knives shaped in the form of a pattern supported in the die and having their upper edges extending into slits provided in the resilient material, a plurality of hollowed out portions in said intermediate layer, a plurality of relatively small passageways extending from said hollowed out portion to apertures provided in said resilient material, a pipe having its interior in communication with said hollowed out portion, means for drawing a vacuum on said pipe, and means for sealing said layers of material together whereby suction is created through a plurality of such passageways and effective at the top surface of said resilient material.

10. In the cutting of patterns for leather gloves and the like, a frame, a die supported on said frame, said die having a plurality of cutting members projecting substantially at right angles to the face of the die, vacuum means for holding material on said die, and means for applying pressure to the top of said die for cutting glove material supported thereon.

11. Apparatus as defined in claim 10 wherein said last-mentioned means comprises a roller adapted to engage with pressure above said die, a movable carriage adapted to propel said roller, and roller means forming a part of said carriage adapted to engage said frame beneath the die whereby said upper roller engages said die with a squeezing action as it progresses across the same.

12. In apparatus for cutting patterns for leather and the like, a frame, a bed plate carried by said frame, a plurality of vacuum lines threaded through said bed plate, a die carried on said bed plate having apertures in the top surface thereof communicating with said vacuum lines, a plurality of cutting knives carried by said die and having cutting edges projecting therefrom, said die provided with an upper resilient layer normally covering cutting edges of said knives, and means for exerting a pressure downwardly on said die whereby to expose the knife edges and cut leather carried on the die into patterns determined by the position of the knives.

13. In apparatus for cutting patterns for leather gloves, a frame including a pair of longitudinal members on each side thereof and spaced vertically from each other, a bed plate carried on the upper portion of said frame, a die positioned on said bed plate, a carriage having rollers normally engaging the upper surface of the lower of said longitudinal members and a roller carried in a position slightly below the top face of said

die, and means for moving said carriage longitudinally across the surface of said die whereby said carriage rollers engage the lowermost surface of the top pair of longitudinal members and the die-engaging roller engages the upper portion of the die providing a squeezing action.

14. Apparatus as defined in claim 13 including a plurality of pressure rollers carried by said carriage and engaging above said die-engaging roller and a plurality of rollers engaging on each side of said die-engaging roller, said die-engaging roller being floating whereby it is free to align itself fully with the top of the die surface.

15. A method of cutting glove patterns from a leather hide comprising cutting said hide into two sections in which the direction of stretch runs oppositely, stretching each of said sections in its proper direction, disposing said sections, spaced from each other, over a die provided with cutting knives defining a plurality of at least palm and back glove portions, maintaining said sections in firm contact with said die, and exerting pressure against said sections to force the cutting knives of said die through said sections whereby a plurality of patterns is simultaneously cut therefrom.

16. A method of cutting glove patterns from a leather hide with a minimum of wastage which comprises providing two stretched sections of said hide in one of which sections the direction of stretch is longitudinal and in the other of which sections the direction of stretch is transverse of the length of the hide, disposing said stretched sections, spaced from each other, over a die provided with cutting knives defining the shapes of the patterns desired, said die being so constructed and arranged that it defines a multiple of palms and backs, and a multiple of fittings, maintaining said sections in firm contact with said die, and exerting pressure against said sections to force the cutting knives of said die through said sections whereby the aforementioned number of palms and backs, and fittings, is cut therefrom in a single cutting operation.

17. A method of cutting patterns for leather gloves and the like from a leather hide with a minimum of wastage which comprises providing two stretched sections of said hide in which the direction of stretch runs oppositely, placing at least one of said sections upon a die provided with a series of knife-like members defining a plurality of patterns, maintaining said section in firm contact with said die, and then providing relative movement, longitudinally of said die, between the die and a pressure member whereby the knife-like members of the die pass through said section to cut a plurality of patterns from said section in a single cutting operation.

18. A method of cutting patterns for gloves and the like from a leather hide with a minimum of wastage which comprises dividing said hide to produce a plurality of stretched sections each of which has a grain running in substantially only a single direction, mounting at least one of said stretched sections on a die having an essentially flat resilient surface and a plurality of knives having cutting edges spaced slightly below the upper surface of said die and defining a plurality of glove patterns, holding said section tightly against said die, and applying pressure against said resilient surface of said die whereby the said knife edges are exposed and serve to cut the section into a plurality of glove patterns.

19. A method of cutting leather patterns from a flexible, relatively thin leather hide with a

minimum of wastage which includes subdividing said hide to provide at least two stretched sections in each of which the grain runs in substantially only a single direction, mounting at least one of said stretched sections on a die having an essentially flat resilient surface and a plurality of knives having cutting edges spaced slightly below the upper surface of said die and defining a plurality of desired patterns, holding said section tightly against said die, and applying pressure against said resilient surface of said die whereby the said knife edges are exposed and serve to cut the sections into a plurality of said patterns, the operation and the arrangement of the die being such as to cut a substantially maximum number of said patterns from said section in one cutting operation.

20. A method of cutting leather patterns from

a flexible, relatively thin leather hide with a minimum of wastage which includes cutting said hide into a plurality of sections each of which has a grain running in substantially only a single direction and stretching each of said sections in the direction of the grain thereof, mounting said stretched sections, spaced from each other, on a die having an essentially flat surface and a plurality of knives having cutting edges defining a plurality of desired patterns, holding said sections tightly against said die, and applying pressure against said surface of said die whereby the said knife edges serve to cut the sections into a plurality of said patterns, the operation and the arrangement of the die being such as to cut a substantially maximum number of said patterns from the single hide in one cutting operation.

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