June 19, 1934. G. BOULTON 1,963,071

TRIMMING MACHINE

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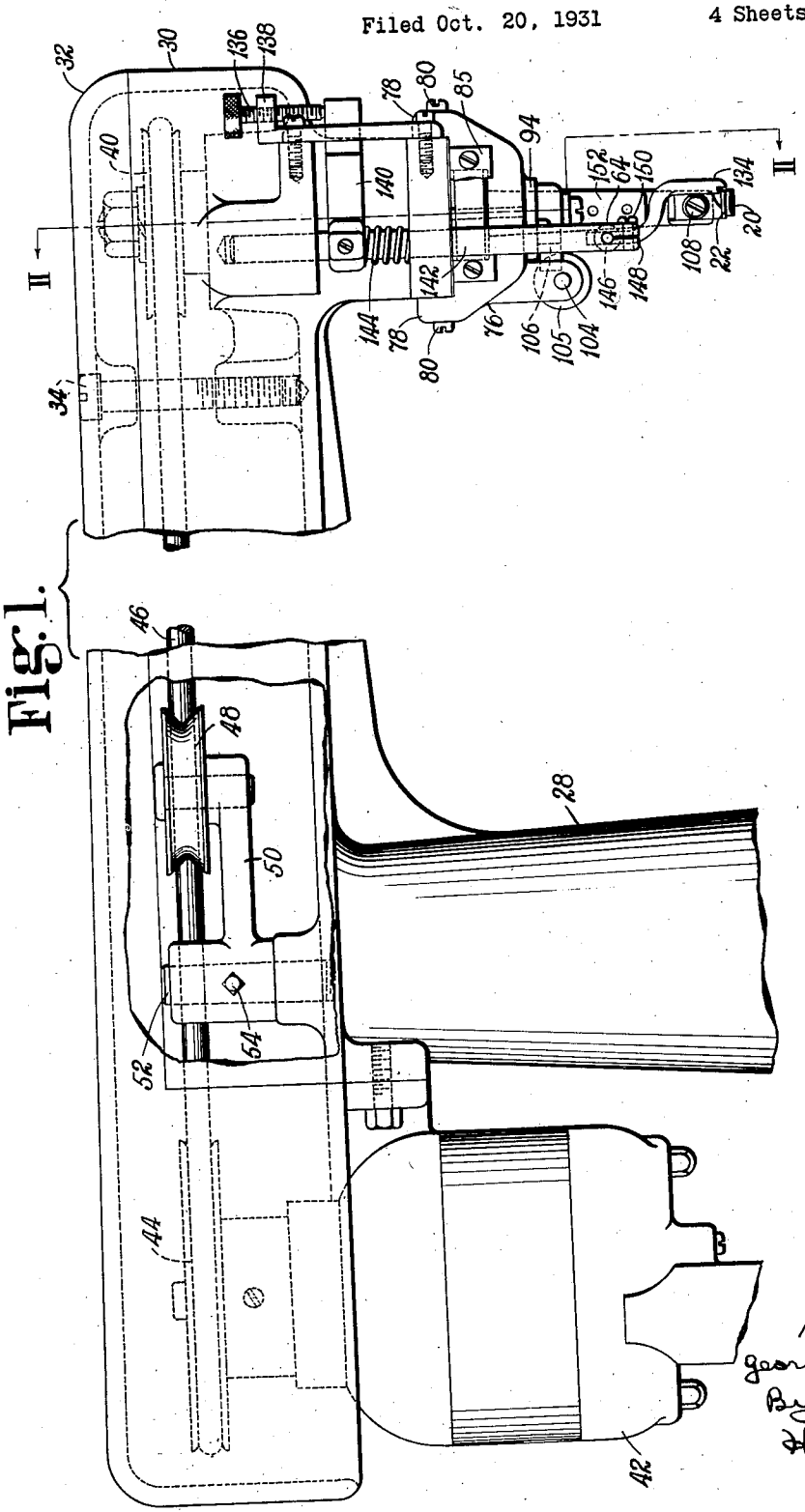

Fig. 1.

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Fig. 2.

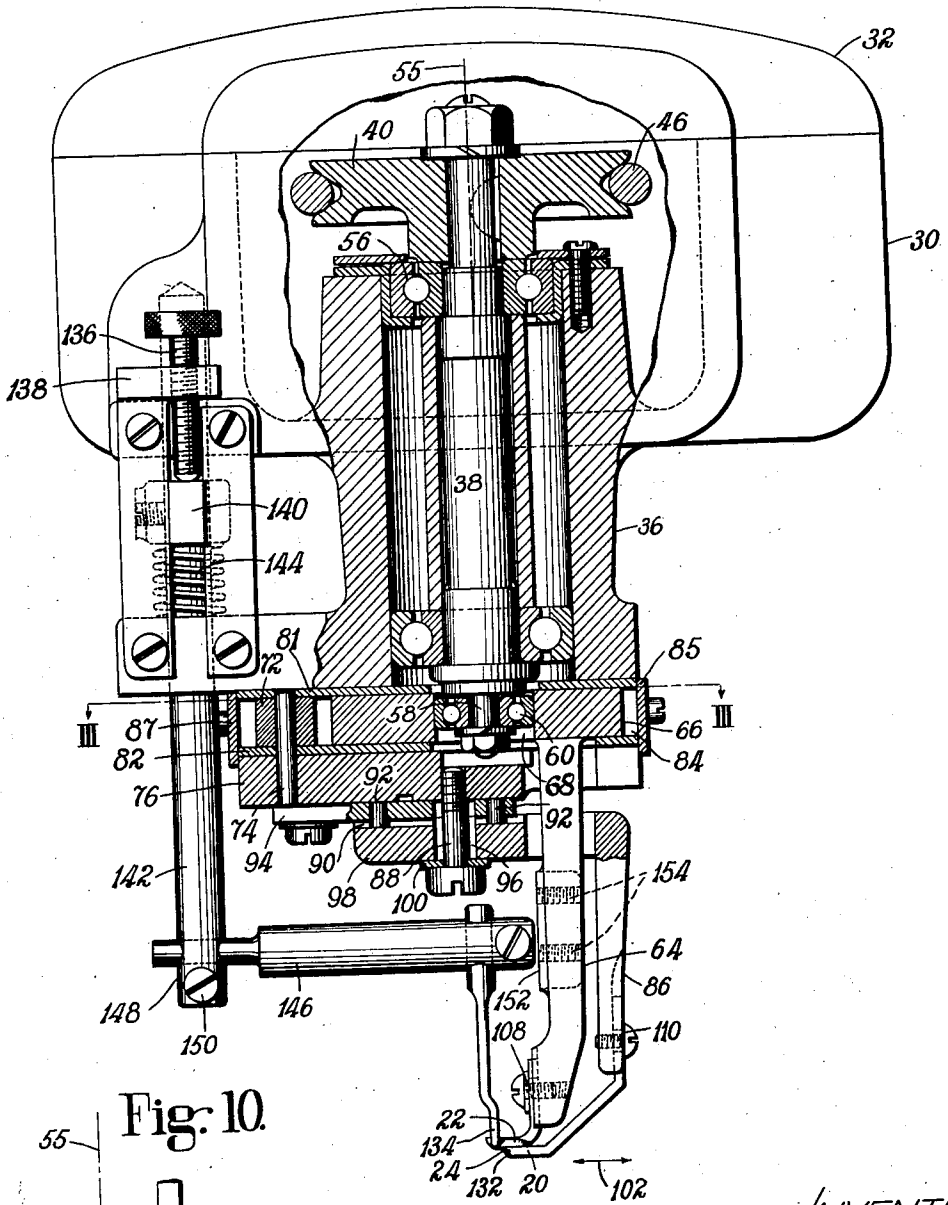
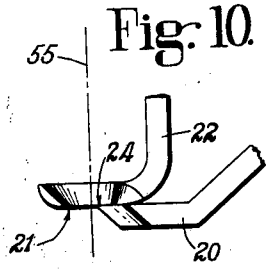


Fig. 10.



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TRIMMING MACHINE

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Fig. 3.

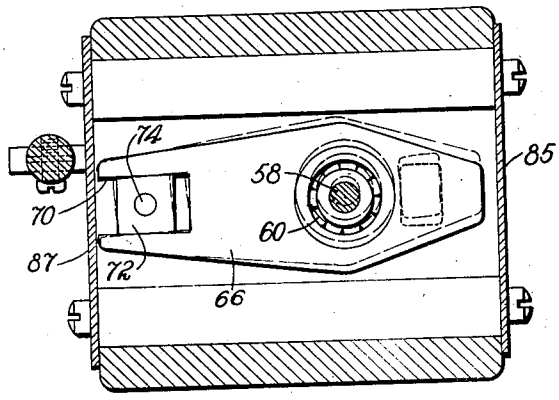

Fig. 7.

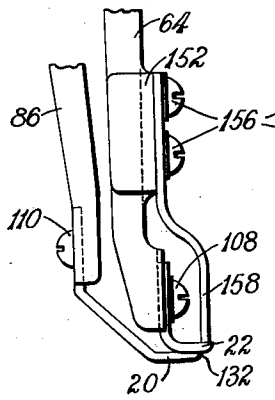

Fig. 6.

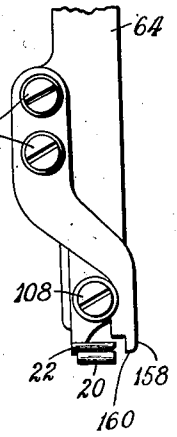

Fig. 4

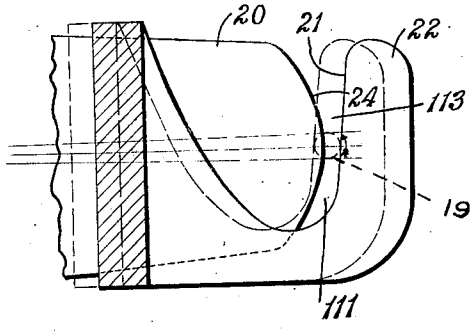

Fig. 5.

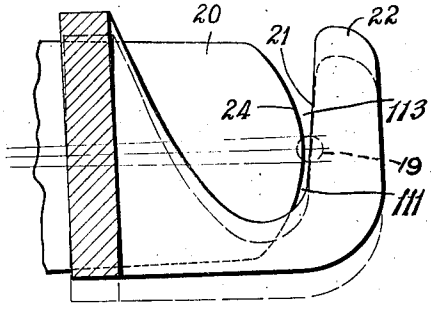

Fig. 9.

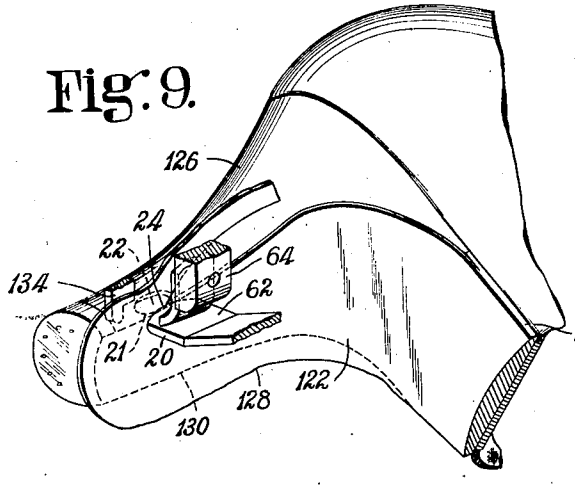

Fig. 8.

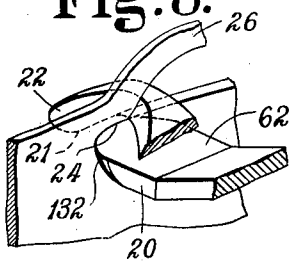

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Fig. 11.

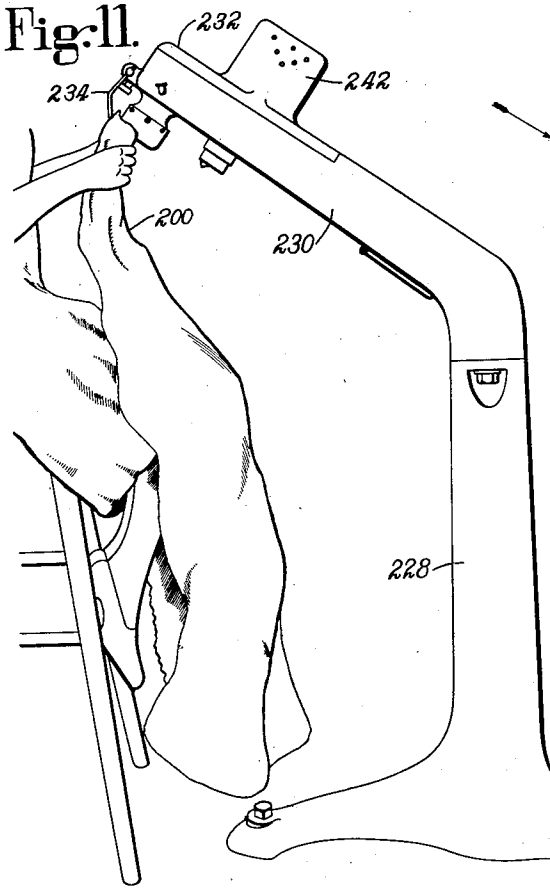
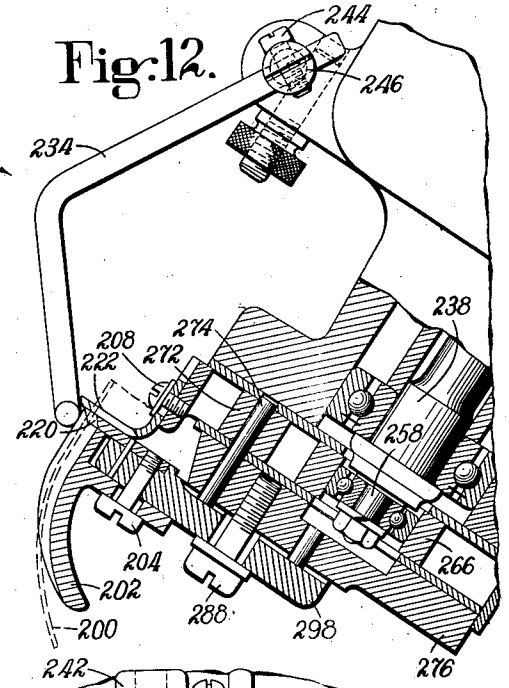


Fig. 12.



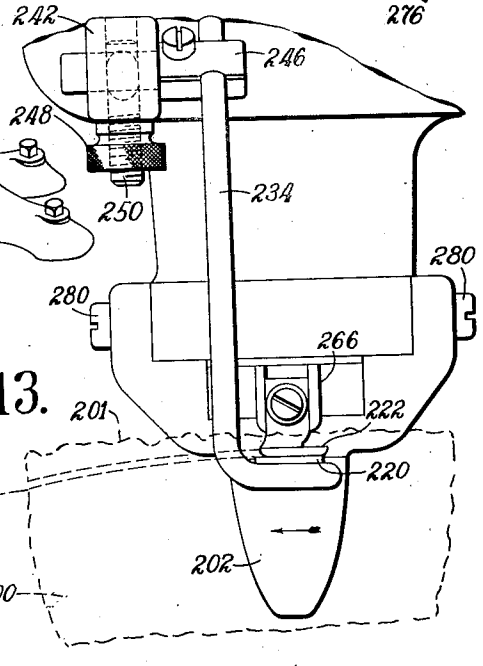


Fig. 13.

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Patented June 19, 1934

1,963,071

UNITED STATES PATENT OFFICE

1,963,071

TRIMMING MACHINE

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Application October 20, 1931, Serial No. 569,940

25 Claims. (Cl. 164—47)

This invention relates to machines for trimming flexible sheet material such for example as hides, sheets of rubber, and certain parts of boots and shoes; and is herein illustrated as embodied in a trimming mechanism of the general type of that shown in United States Letters Patent No. 1,578,293, granted March 30, 1926 to Charles B. Spalsbury, which is particularly adapted to trim projecting edges of heel breast covers flush with the breast edges of heels to which the covers have been attached.

One object of this invention is to provide an improved cutting mechanism that will quickly and effectively trim flexible sheet material along crooked lines as well as along straight lines.

Another object of the invention is to provide an improved machine of the general type of that disclosed in the patent referred to above, which may be used to trim heel breast covers flush with edges of covered heels.

With the above objects in view, and in accordance with a feature of this invention, there is provided a pair of trimming cutters having incurved and outcurved edges, respectively in shearing relation, and means for causing relative movement of the cutters in an orbital path to trim material fed between them.

In the illustrated construction a hook-shaped blade is mounted for movement in an orbital path relative to a stationary blade in order to move its cutting edge away from the cutting edge of the stationary blade so as to open the blades, and then, upon retraction of the movable blade, to sever flexible sheet material fed between the open blades. The movable cutter blade is secured to a pitman which is operated by a rotary eccentric, the illustrated arrangement of this cutter with respect to the pitman being such that the cutter blade moves approximately in a circular orbit. Nevertheless, by changing the location of the movable cutter with respect to the pitman, the cutter may be caused to move in an elliptical orbit. By moving the cutter in an orbital path, the material is severed by a draw shearing cut which trims with a minimum amount of pull on the material and insures a smoothly trimmed edge.

When flexible material is trimmed by shearing cutters there is a tendency for converging portions of the cutters to force material being trimmed in a direction opposite to the direction of feed of the material and thus to form a ripple in the material just ahead of the portion being trimmed. The presence of the ripple interferes with the proper feeding of the work to the machine and causes a rough edge to be formed by the cutters. With this in view and in accordance with another feature of this invention, the illustrated machine is provided with two blades, one of which is movable in an orbital path, having cooperating shearing edges opposed portions of which converge to form a throat into which material to be trimmed may be fed, and other portions of which are so related as to counteract the tendency of said converging portions to force material being trimmed in a direction counter to the direction of feed of the material.

In order to adapt the machine particularly to the trimming of heel breast covers or flaps, the stationary cutting blade of the illustrated machine is sharply convex to approximate the heightwise curvature of the lip portion of the breast of the heel thereby to prevent the pulling of the flap away from the heel breast and is undercut after the manner of the stationary cutter blade of the Spalsbury patent in order that the heel may be laterally tilted to trim the flap by a beveling cut. In accordance with another feature of the invention, one of the machines herein illustrated may be provided with a movable member positioned adjacent to and immediately ahead of the forwardmost point of travel of the moving blade and adapted to engage the side of the heel, the breast of which is engaged by the stationary blade, thereby to guide the work, said member serving as a combined guard and gage which is especially useful in assisting the operator to present the heel to the machine.

The drawings also illustrate a modification in which generic features of the invention are embodied in a machine more especially useful for severing ragged or uneven edges of sheet material such as hides or skins.

In the drawings,

Fig. 1 is a front view of the top portion of one type of machine embodying the present invention, a portion of the frame being broken away to show details of the interior construction, and another portion being omitted to save space;

Fig. 2 shows a section taken through the operating head of the machine along line II—II of Fig. 1;

Fig. 3 is a sectional view of a portion of the cutter operating mechanism taken along line III—III of Fig. 2;

Fig. 4 is a diagrammatic view illustrating the relative positions of the stationary and the movable cutters of the illustrated machine at the innermost and the outermost points of travel of the movable cutter;

Fig. 5 is a diagrammatic view similar to that of Fig. 4, but showing the relative positions of the cutters at the rearmost and the foremost points of travel of the movable cutter;

Figs. 6 and 7 are front and side views, respectively, of the machine equipped with a guard which is secured to the movable cutter;

Fig. 8 is a perspective view illustrating a piece of flexible sheet material in the process of being trimmed by the cutters;

Fig. 9 is a perspective view showing a shoe the heel breast-flap of which is being trimmed in the illustrated machine;

Fig. 10 is an enlarged side view of the cover receiving portion of the cutters;

Fig. 11 is a side elevation of a machine embodying generic features of the invention in a design intended more particularly for severing ragged edges of hides and skins;

Fig. 12 is a vertical section on a larger scale of the trimming mechanism arranged as in Fig. 11; and

Fig. 13 is a front elevation of the trimming mechanism viewed as indicated by an arrow in Fig. 12.

The illustrated trimming mechanism comprises a stationary cutter, blade, or shearing block 20 and a hook-shaped cutter or blade 22 which is mounted for movement in an orbital path represented by a circle 19 (Figs. 4 and 5) to project its elongated cutting edge 21, which may be incurved, beyond an outcurved or salient cutting edge 24 of the stationary cutter 20 and on its retractive movement to cooperate with the stationary cutter to shear flexible sheet material 26 (Fig. 8) fed between the cutters.

The operating parts of the machine shown in Figs. 1 to 10 are supported upon a standard 28 having at its upper end a horizontally extending housing including a lower portion 30 which is formed integral with the standard 28 and cover portion 32 which may be secured to the lower portion 30 by screws 34.

The outer end of the lower portion 30 of the housing is provided with a downwardly extending bearing housing 36 which supports mechanism for imparting an orbital movement to the cutter 22 and includes a rotary shaft 38 (Fig. 2) to the upper end of which a pulley 40 is keyed. Power to drive the pulley 40 is supplied by a motor 42 (Fig. 1) which is equipped with a pulley 44 connected by a belt 46 to the pulley 40. The belt 46 carried by the pulleys 40 and 44 may be tightened through the use of a pulley 48 mounted upon a swivel 50 which is pivotally supported upon a stud 52 of the machine frame. In order to set the pulley 48 against the belt 46 the operator, after releasing a screw 54, which is in threaded relation with the swivel 50, forces the pulley 48 against the belt 46 and sets the same in place by tightening the screw 54.

As above stated the illustrated cutting mechanism is similar in many respects to that disclosed in the patent referred to above (United States Letters Patent No. 1,578,293, granted in the name of Charles B. Spalsbury on March 30, 1926). In the latter, however, the movable hook-shaped cutter executes rectilinear reciprocation as distinguished from movement in an orbital path.

The shaft 38 is supported for rotation about an axis 55 upon bearings 56 and carries at its lower end an eccentrically mounted pin 58 upon which a roller bearing 60 is mounted. The moving cutter 22 is constructed and arranged lightly to contact with the upper surface 62 (Fig. 8) of the stationary cutter 20 and is secured to a depending arm 64 of a pitman, lever, or cutter carrier 66 having a recessed portion 68 of proper size to receive the roller bearing 60 and having a bifurcated portion 70 (Fig. 3) of sufficient width to receive slidingly a block 72 mounted upon a pin 74 carried by a casing 76. The casing 76 is provided with side flanges 78 (Fig. 1) which overlap the bearing housing and are secured thereto by screws 80 and also by screws (not shown) which pass through the casing and into the bottom of the bearing housing. The inside, top and bottom portions of the casing 76 are provided with shims 81 and 82 respectively which form a recess 84 in which the pitman may slide as the eccentric pin 58 is rotated.

In the illustrated machine the cutter 22 is located substantially in line with the axis of the pin 58 and it will be clear that as the pitman 66 is operated by the roller bearing 60, the cutter 22 will move in substantially a circular orbit. The shape of the orbital path of the cutter may be varied by changing the position of the cutter with respect to the pitman. The front and the rear portions of the recess 84 may be closed by cover plates 85 and 87, respectively, which are screwed to the casing 76.

The stationary cutter or blade 20 is supported by a depending carrier 86 which is secured to the bottom of the casing 76 by a screw 88 and is provided with a slot 90 shaped to receive a pair of studs 92 projecting from a plate 94 screwed to the bottom of the casing 76. The screw 88, which is in threaded relation with the casing 76, passes through an enlarged opening 96 in a horizontal projecting portion 98 of the carrier 86 and carries a washer 100, which overlaps the opening 96, and engages the lower face of the horizontally extending portion 98. Adjustment of the carrier 86 relatively to the cutter 22 in the direction indicated by arrows 102 (Fig. 2) is effected by loosening the screw 88 and by then turning another screw 104 (Fig. 1), which is in threaded relation with the casing 76 and has an enlarged head 105 shaped to fit within a slot in the horizontally extending portion 98 of the carrier 86, until the stationary cutter 20 is properly adjusted relatively to the cutter 22. The screw 88 is then tightened to clamp the carrier 86 against the plate 94.

In order to insure that the movable cutter 22 will engage the face 62 of the cutter or shearing block 20, the cutters 22, 20 may be adjusted relatively to their respective supports through the slot and screw connections 108, 110, respectively.

In order to cut sharp curves in sheet material it is desirable that each bite taken by the shearing cutter shall be short and in the illustrated machine the cutters 20, 22 are of such shape and the orbital movement is of such magnitude that during each cycle of the cutter 22 a fairly short cut is produced. The speed of the machine, however, is such that the sheet material may be fed as fast as it is practical for the operator to feed the same when trimming straight runs such as overflow of large rubber bags or skins such as are used to make shoe uppers.

The opposing cutting edges 21 and 24 have converging portions which form a throat 111 constructed and arranged to facilitate the feeding of flexible sheet material into a neck portion 113, which is slightly wider than the thickness of material being trimmed when the cutter 22 is at its outermost position (Fig. 4). It will be noted that the portions spaced from the ends

of the cutting edges first contact to initiate a cut through the flexible material which is positioned between the cutters and that upon continued movement of the cutter 22 in its orbital path, the portions of the cutting edges, which form the neck and are located rearwardly of the portions which initiate the cut, are brought into overlapping relation before the converging portions of the cutting edges which form the throat 111 overlap each other. With the above arrangement the engagement of the cutters with the portions of the material which are being trimmed in the neck holds the work against the tendency of the converging portions of the cutting edges to force material in a direction counter to the direction of feed of the material.

The illustrated machine may be used advantageously to trim covers applied to shoe parts and is illustrated (Fig. 9) in its application to the trimming of a heel breast covering flap 122 of a Louis heel 126.

A heel breast covering flap 122 is split from the sole 124 of a shoe and after the heel 126 has been applied to the shoe, the flap is secured to the breast of the heel and the portions 128 of the flap projecting beyond the breast edges 130 of the heel are trimmed flush with the breast edges.

In order to guide the shoe past the cutting edges 21, 24 in a path corresponding to the heightwise curvature of the breast of the heel, the stationary cutter or block 20, which is constructed and arranged to engage the breast of the heel, is constructed with a small radius of curvature and in order to permit the shoe to be tilted widthwise of the heel during the trimming operation, the block 20 is also undercut to form a surface 132 (Fig. 8). In presenting the shoe to the cutters the breast corners 130 of the heel may be accidentally fed between the cutting edges 21, 24 with the result that the heel covering is so severed that the wood heel will be exposed to view. Accordingly, in order to permit the operator quickly to present the heel to the cutters 20, 22 without the possibility of cutting heel covering portions of the cover, the illustrated machine is provided with a guard 134 which also serves as a gage and is positioned immediately ahead of the forwardmost point of travel of the cutter 22 and is shaped and arranged to engage the side of the heel adjacent to the breast edge with which the flap is being trimmed flush.

The guard 134 may be positioned relatively to the cutter 22 by turning a screw 136, which is in threaded relation with a lug 138 attached to the frame of the machine, and has its lower end in engagement with an arm 140 secured to a rod 142 guided for vertical movement in the machine frame and normally urged upwardly against the screw 136 by a spring 144, one end of which engages the arm 140 and the other end of which engages the main frame. The guard 134 may be angularly adjusted relatively to the rod 142 by turning a bar 146 to which the guard 134 is secured relatively to the rod 142 after separating the pronged portions 148 of the rod by use of a screw 150.

In trimming heel breast covering flaps 122 of tough material, it may be desirable to have a guard move with the cutter instead of having it remain stationary as above described. Accordingly, the depending arm 64 is provided with a boss portion 152 having threaded recesses 154 for receiving screws 156 for securing a guard 158 (Figs. 6 and 7) to the moving cutter 22, the guard being formed and arranged so that its foot 160 is located immediately ahead of the leading portion of the cutter 22.

In order to perform the trimming operation, sheet material 26 is fed by hand between the cutting edges, 21, 24 as illustrated in Fig. 8, the cutters 20, 22 being designed to trim sharply curved portions of the material which may be fed as fast as it is practical for the operator to move the same past the cutters.

When operating upon heel breast covering flaps 122, the breast of the heel adjacent to a breast edge 130 beyond which the flap being trimmed projects is engaged by a portion of the undercut surface 132 of the stationary cutter or block 20 and the side of the heel adjacent to the breast edge is engaged by the guard 134 or 158 which also serves as a gage and cooperates with the stationary block 20 to guide the shoe past the cutters.

When using a machine having only one cutter head, it is customary to start the trimming cut along one breast edge at the top lift end of the heel and to progress toward the shank portion of the heel, the cut being continued forwardly of the heel to trim a lateral portion of the shank of the shoe where it is found necessary to joint the lateral portion of the flap with the side of the shank portion of the sole. The opposite projecting portion of the flap is then trimmed flush with the opposite breast edge by starting the trimming cut at the shank portion of the shoe and trimming along the breast edge to the top lift portion of the heel.

The machine may, however, be provided with two cutter heads having cutters of relatively reverse arrangement in order that both projecting portions of a breast flap may be trimmed by starting the trimming operation at the top lift portion of the heel and progressing to the shank portion of the shoe.

Figs. 11, 12 and 13 illustrate a modification of the invention embodied in a machine designed more particularly for severing the ragged edges of sheet materials, such as hides and skins. In this machine the trimming mechanism is inclined and is mounted in an inclined overhanging portion 230 of a frame affixed to a vertical floor standard 228. These features of the frame and the floor standard are designed to provide a suitable unobstructed space for the knees of an operator seated on a stool while engaged in feeding work pieces to the trimming mechanism, the inclined arrangement of the trimming mechanism being intended to provide for presenting the upper margin of a work-piece 200 in a plane substantially at right angles to the operator's line of vision while observing the progress of the operation.

Certain details of construction of the machine about to be described differ from corresponding details of the machine illustrated in Figs. 1 to 10 inclusive, but in both machines the principles of operation of the cutting mechanism are essentially the same. The machine represented in Fig. 11 includes an electric motor enclosed in a housing 242, this housing being formed on a detachable portion 232 of the frame. The electric motor furnishes the power for operating the movable hook-shaped cutter 222, rotation being transmitted from the motor by a belt and pulleys (not shown) to an inclined shaft 238 (Fig. 12). The essential features of the cutter 222 and of the stationary cutter 220 with which it cooperates to execute a draw shearing cut are substantially the

same as those of the cutters 22 and 20 respectively, and the mode of operation is like that hereinbefore described.

An eccentric pin 258 carried by the lower end of the shaft 238 imparts orbital motion to a pitman or lever 266 to which the cutter 222 is affixed by a screw 208. A fixed pin 274 constitutes a fulcrum for the member 266, but the connection between the pin and the member 266 is provided by a block 272 swiveled on the pin and arranged in a slot formed in the member 266. This construction causes the cutter 222 to move in an orbital path that is nearly but not quite circular. The stationary cutter 220 is affixed by a screw 204 to a block 298 which, in turn, is affixed by a screw 288 to a block 276. The block 276 is affixed to the frame 230 by screws 280 (Fig. 13).

Since the operation of severing the ragged margins of hides and skins is one that requires free-hand manipulation of the work-pieces without any definite or predetermined line of cutting, no trimming gage such as that indicated at 134 in Fig. 2 is necessary. Nevertheless, to assist an operator in presenting a work-piece 200 to an inclined shearing couple of the type shown in Figs. 11, 12 and 13 and to guide the upper margin of the work-piece thereto, this machine is provided with an inclined work-support 202, the lower end of which curves downwardly to facilitate bending a draped work-piece so that its upper margin may lie in the desired inclined plane without encountering any obstruction to feeding movement. The work-support 202 is affixed to the block 298 under but adjacent to the stationary cutter 220. As shown in Fig. 12, the screw 204 that secures the stationary cutter to the block 298 serves also to secure the work-support.

To guard against displacement of the upper margin of the work-piece from the work-support, this machine is also provided with a stationary guard 234 that overhangs the work-piece slightly below the plane of the cutters, that is, adjacent to the upper edge of the work-support. As shown, the upper end of the guard 234 is adjustably secured to the frame 230 by a connecting stud 246. One end of the stud 246 is divided by a kerf to provide complemental clamping portions between which the guard is inserted. A screw extending through the clamping portions serves to set up clamping pressure to hold the guard. The other end of the stud 246 extends through a boss 242 on the frame and is secured frictionally therein by a drawbolt 250 and a thumb-nut 248.

An operator's view of the trimming mechanism is represented in Fig. 13 which includes broken lines representing a portion of a work-piece 200. The ragged edge of the work-piece is indicated at 201 and the trimmed edge at 203, the direction of feeding movement being from right to left. The speed of operation of the cutter 222 is so rapid that a hide or skin may be fed as fast as an operator may conveniently do the work. Moreover, the individual cuts are so short that they merge smoothly one with another on curved lines as well as on straight lines of trimming. The inclined arrangement of the trimming mechanism and of the work-support facilitates manipulation of the work-pieces so that the operator may work in an easy and comfortable position.

Having described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:—

1. A trimming machine having, in combination, two opposed cooperating shearing cutters one of which has an outcurved cutting edge and the other of which has an incurved cutting edge, and means for moving one of the cutters in an orbital path to cause flexible material fed between the cutting edges of the cutters to be trimmed by a draw shearing cut.

2. A trimming machine having, in combination, a stationary shear block having an outcurved cutting edge, a cutter having an incurved cutting edge movable over the cutting edge of the block in an orbital path to cooperate with said block to sever by a draw shearing cut flexible material fed between the cutter and the block, and means to move said cutter in said orbital path.

3. A trimming machine comprising a fixed blade having an outcurved cutting edge and a movable hook-shaped blade having a cutting edge in shearing relation with the outcurved cutting edge, and mechanism arranged to operate said hook-shaped blade with an orbital motion to sever material fed between said cutting edges by a draw shearing cut.

4. A trimming machine comprising a fixed blade and a movable hook-shaped blade having cooperative outcurved and incurved cutting edges, respectively, arranged in shearing relation, and mechanism for operating said hook-shaped blade with an orbital motion to sever material fed between said cutting edges.

5. A trimming machine comprising a fixed blade and a movable hook-shaped blade having cooperative cutting edges in shearing relation, and mechanism arranged to operate said hook-shaped blade with an orbital motion to sever by a draw shearing cut material fed between said cutting edges, the cutting edge of said hook-shaped blade being incurved and that of the fixed blade being outcurved.

6. A trimming machine comprising a fixed blade having an outcurved cutting edge and an opposed movable hook-shaped blade in shearing relation, a lever by which said hook-shaped blade is carried disposed at a substantial angle to the plane of said cutting edges, and operating means to impart orbital motion to said lever.

7. A trimming machine for operating upon flexible material comprising a fixed blade having an outcurved cutting edge and an opposing movable hook-shaped blade in shearing relation, a lever by which said hook-shaped blade is carried, and operating means to impart orbital motion to said lever to sever material fed between the blades by a draw shearing cut, the axis of the fulcrum of said lever being behind the cutting edge of said hook-shaped blade.

8. A trimming machine comprising a fixed blade having an outcurved cutting edge, a rotary eccentric operating member the axis of rotation of which is approximately coincident with said cutting edge, a member to impart orbital motion to said operating member, and a hook-shaped blade carried by said member and having a cutting edge opposed to and constructed and arranged to cooperate with the cutting edge of the fixed blade to trim flexible material fed between the cutting edges by a draw shearing cut.

9. A trimming machine comprising a rotary driven operating eccentric, a lever to which orbital motion is imparted by said eccentric, a hook-shaped blade carried by said lever and having a cutting edge arranged to cut toward the axis of rotation of said eccentric, and a fixed blade having an outcurved cutting edge opposed to and constructed and arranged to cooperate with the cutting edge of the hook-shaped blade to trim by a draw shearing cut a breast covering flap of a

heel guided past the cutting edges flush with the breast edges of the heel.

10. A trimming machine comprising a blade-holder, driven means including a rotary operating eccentric by which said blade-holder is caused to execute orbital motion, a hook-shaped blade carried by said blade-holder and having a cutting edge arranged to cut toward the axis of rotation of said eccentric, and a fixed blade having an outcurved cutting edge constructed and arranged to cooperate with the cutting edge of said hook-shaped blade to sever flexible material by a draw shearing cut.

11. A machine for trimming heel breast flaps having, in combination, a block shaped and arranged to engage the covered breast of a heel attached to a shoe and provided with an outcurved shearing edge, an elongated arm located behind the shearing edge and constructed and arranged to support said block, a narrow hook-shaped cutting blade mounted for movement in an orbital path, an elongated bar located behind the shearing edge and constructed to support said cutting blade, and means constructed and arranged to impart an orbital movement to said bar and located at a substantial distance from the blade to permit the lateral margins of the covering flap of the heel to be freely presented between the blade and the shearing edge and to leave a free and unobstructed space around the cutting blade and the shearing block to permit the shoe to be freely moved to perform the flap trimming operation.

12. A machine for trimming heel breast flaps having, in combination, a frame part, a stationary block constructed and arranged to engage the covered breast of a heel attached to a shoe and secured to said frame part and having an extended outcurved cutting edge, a cutter mounted for movement in an orbital path upon the block and comprising a hook having an incurved cutting edge on its inner side constructed and arranged to cooperate with the cutting edge of the block to trim the lateral margins of the covering flap of the heel which are fed between the cutting edges flush with the breast edges of the heel, and mechanism for imparting said movement to the cutter.

13. A trimming machine having, in combination, a depending block provided with an outcurved cutting edge, a cutter having an incurved cutting edge to engage said edge of the block, mechanism for operating the cutter in an orbital path to cause the same to trim by a draw shearing cut a heel breast cover secured to and extending beyond the breast edge of a heel flush with said breast edge as the heel and its projecting cover are moved past the cutter, and a guard positioned immediately in front of the forward point of movement of the cutter and constructed and arranged to engage a side of the heel when the breast of the heel is in engagement with the block to protect the side cover of the heel against being cut and also to assist the block in guiding the heel and its cover past the cutter.

14. A trimming machine having, in combination, gages spaced from each other and constructed and arranged to engage angularly disposed surfaces of a shoe part to which a cover is attached and beyond which the cover projects, one of said gages comprising a surface terminating in a sharp outcurved cutting edge, a cutter having an incurved cutting edge constructed and arranged for movement on said surface, and means for moving the cutter in an orbital path with respect to the cutting edge of said last-named gage to trim by a draw shearing cut the projecting portion of the cover as the shoe part guided by said gages is moved past the cutter.

15. A trimming machine having, in combination, gages spaced from each other and constructed and arranged to engage angularly disposed surfaces of a heel to which a cover is attached and beyond which the cover projects, one of said gages having an outcurved cutting edge, and a cutter having an incurved cutting edge, and means for moving the cutter over the cutting edge of said one gage in an orbital path to trim by a draw shearing cut the projecting portion of the cover as the heel guided by the gages is moved past the cutter.

16. A trimming machine having, in combination, gages spaced from each other and constructed and arranged to engage the breast and side of a heel to the breast of which a cover is attached and beyond the breast edges of which the cover projects, a stationary outcurved cutting edge formed on one of said gages, and an opposed hook-shaped cutter constructed and arranged to engage said edge, and means for moving the cutter in an orbital path to cause the cutting edge of the cutter to travel lengthwise of and across the cutting edge of said gage to trim the projecting portion of the cover flush with the breast edge of the heel as the heel is guided by said gages past the cutter.

17. A trimming machine having, in combination, a depending cutter block terminating in an outcurved cutting edge, a depending cutter having an incurved cutting edge, means to operate the cutter in an orbital path to move its cutting edge over the cutting edge of the block to trim a piece of material fed between said cutting edges, and means for adjusting the shearing block toward and away from the cutter for accommodating different thicknesses of material.

18. A trimming machine having, in combination, a stationary block provided with a shearing edge, a movable cutter having a cutting edge constructed and arranged to cooperate with the shearing edge to trim a projecting portion of a cover attached to a heel, and a gage mounted for movement with the cutter and positioned immediately ahead of the cutting edge of the cutter progressively to engage the heel as a projecting portion of the cover is fed between the shearing edge and the cutting edge.

19. A trimming machine having, in combination, a stationary block provided with a shearing edge, a cutter mounted for movement in an orbital path and constructed and arranged to cooperate with the shearing edge to trim the projecting portion of a cover attached to the breast of a heel flush with a breast edge of the heel, a gage mounted for movement with and positioned immediately ahead of the cutter and constructed to engage a side of the heel, the breast of which is in engagement with said block to guide the heel and its cover past the cutter during the cover trimming operation.

20. A trimming machine comprising two relatively movable blades having cooperative shearing edges opposed portions of which converge to form a throat into which the material to be trimmed may be fed, and other portions of which, situated beyond the throat, converge toward the throat to counteract the tendency of said first-named converging portions to force the material in the direction counter to the direction of feed,

and means arranged to operate one of said blades with movement that causes its shearing edge to describe an orbital path.

21. A trimming machine having, in combination, a fixed blade provided with a salient cutting edge and a hook-shaped blade having a cutting edge in opposed relation to the cutting edge of the blade, portions of the cutting edges, when in open position, defining a neck of substantially uniform width, and other portions in front of the first-named portions defining a throat which converges toward said neck and through which the work is fed to the neck, and means for imparting movement in an orbital path to the hook-shaped blade.

22. In a trimming machine, a member having a salient cutting edge, a blade provided with a cutting edge which is in opposed relation to the salient cutting edge, mechanism to move said blade in an orbital path, the cutting edge of the blade being so constructed and arranged that when moved in said path it first overlaps the salient cutting edge at a point spaced from the ends of said cutting edge to initiate a cut in flexible material positioned between the cutting edges and upon continued movement successively overlaps portions of the salient cutting edge which are positioned at opposite sides of said point.

23. A trimming machine having, in combination, a gage constructed and arranged to engage the breast of a heel to which a breast flap has been secured and beyond which the margins of the flap extend, said gage comprising a salient cutting edge, a hook-shaped blade provided with an elongated cutting edge arranged in opposed relation to the salient cutting edge, a gage to engage a side of the heel, mechanism to move the hook-shaped blade in an orbital path to cause portions of said cutting edges to engage at a point spaced from the ends of the cutting edge to initiate a cut in the projecting portion of the heel-breast flap of the heel positioned by said gages, and upon continued movement in said path to cause the cutting edges to overlap each other successively at opposite sides of said point in order successively to sever portions of the flap which are located at opposite sides of the initial cut.

24. In a trimming machine, a pair of blades having opposed salient and elongated cutting edges respectively, said cutting edges being constructed and arranged to form a neck of substantially uniform width to receive flexible sheet material and to form a flaring throat to permit material to be fed to said neck, and means to impart an orbital movement to one of the cutting edges to trim material positioned between said cutting edges, the portions of the cutting edges which form said neck being constructed and arranged to grip the material as the blades are making an incision in the material positioned in said throat to counteract the tendency of the throat portion of the blades to force the material in a direction opposite to the direction of feed of the material.

25. A trimming machine having, in combination, a rotary operating eccentric, a cutter carrier engaging said eccentric, a cutter carried by said carrier and having a cutting edge arranged adjacent to the axis about which said eccentric rotates, a cooperating cutter having a cutting edge arranged in shearing relation to that of the first-named cutter, and means arranged to guide a portion of said cutter carrier so that the cutting edge of the cutter carried thereby will travel in a substantially circular orbit.

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