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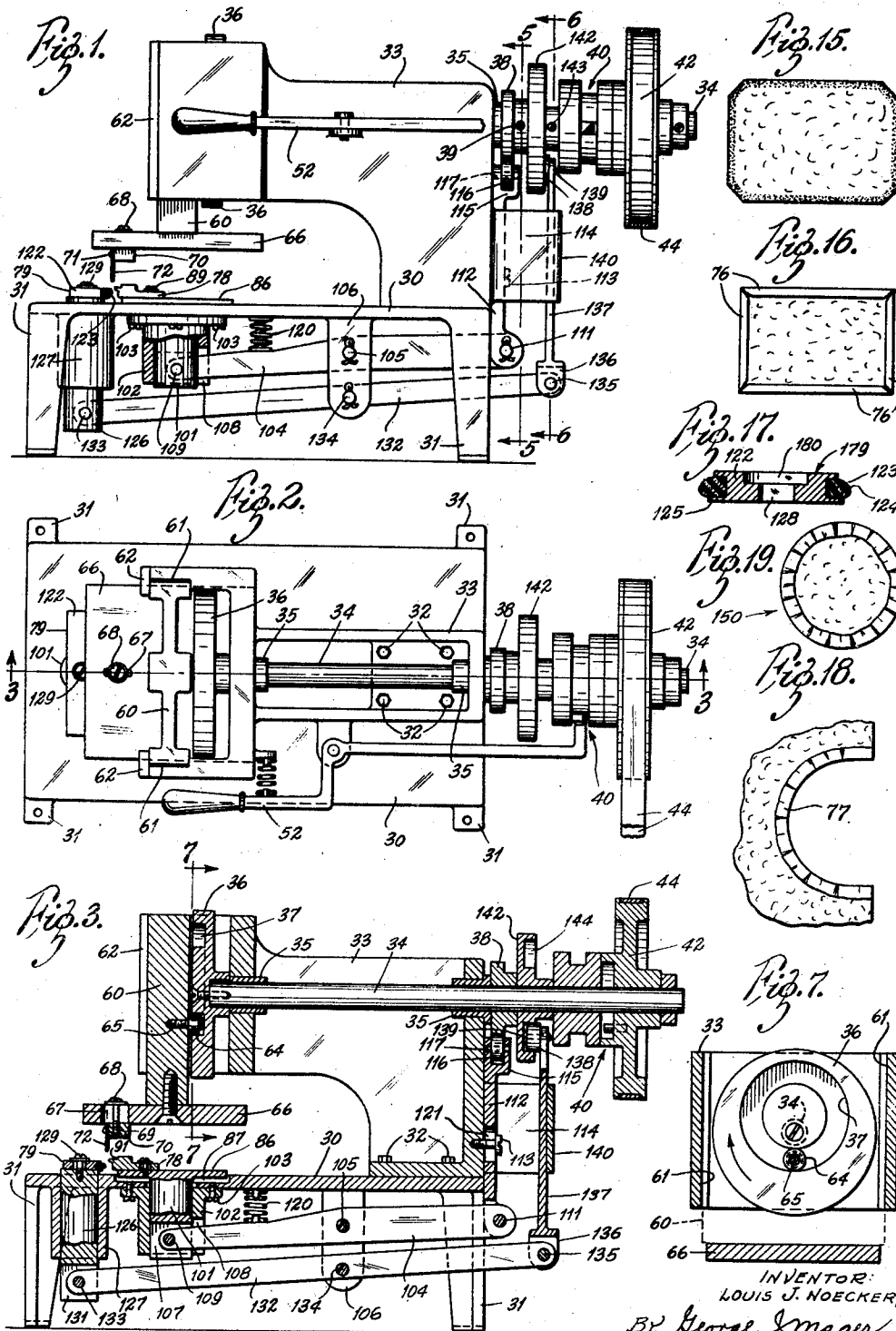
L. J. NOECKER

2,440,113

MACHINE FOR TURNING AND BINDING THE EDGES OF LEATHER

Filed Aug. 12, 1946

2 Sheets-Sheet 1



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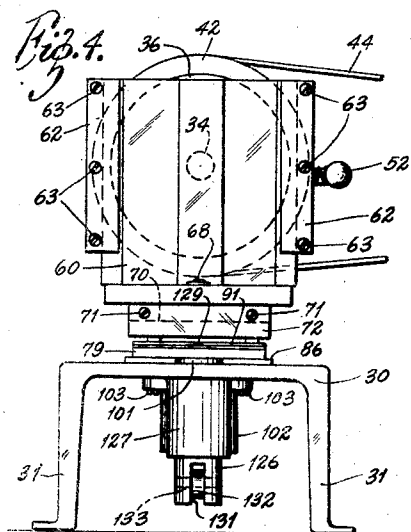
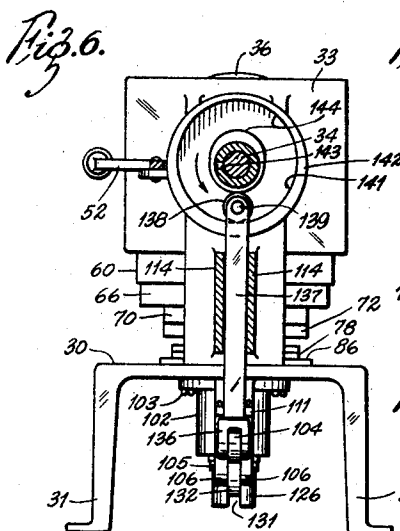
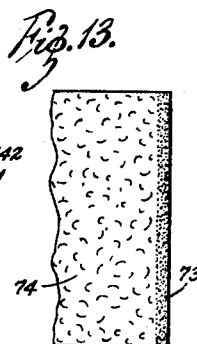
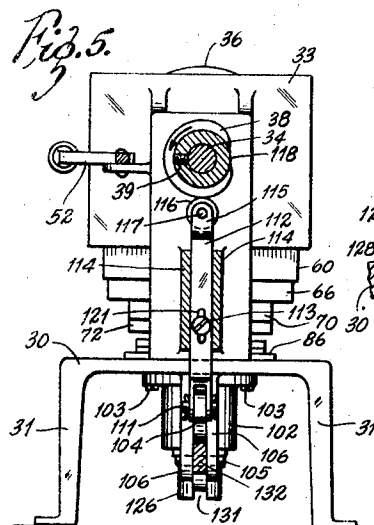
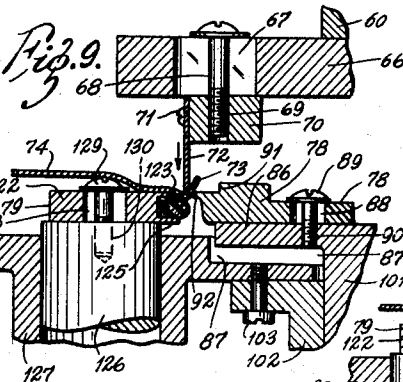
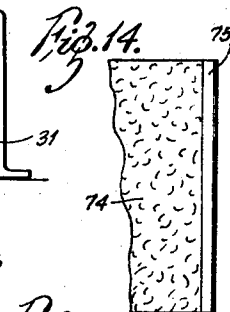
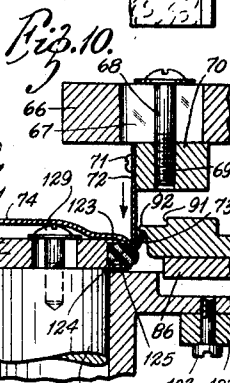
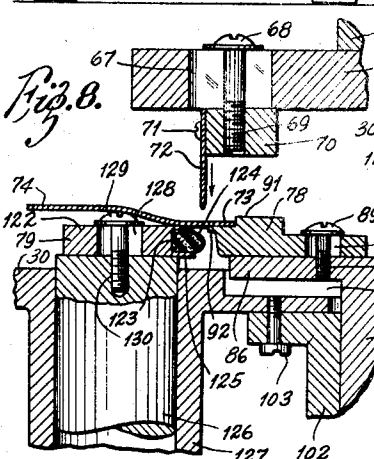
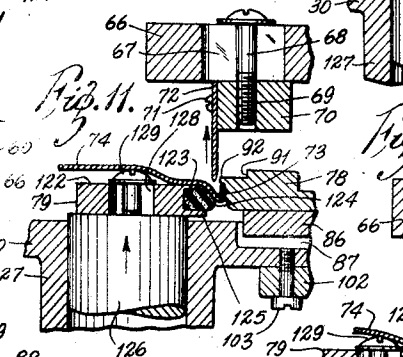
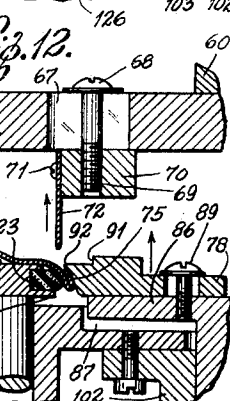
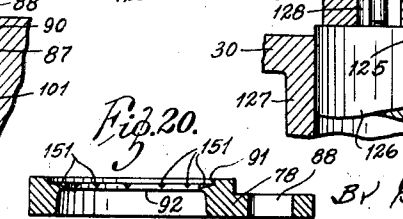
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MACHINE FOR TURNING AND BINDING THE EDGES OF LEATHER

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2 Sheets-Sheet 2



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2,440,113

MACHINE FOR TURNING AND BINDING THE
EDGES OF LEATHER

Louis J. Noecker, St. Clair, Mo.

Application August 12, 1946, Serial No. 689,897

10 Claims. (Cl. 69—1)

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The present invention relates generally to a machine for use, particularly, in the shoe industry. It is an improvement over the type illustrated and described in Letters Patent No. 2,198,456, granted to me on April 23, 1940.

Broadly, therefore, the general objects of this invention are analogous to those set forth in my said patent. The attainment of these objects, however, with the mechanism of the present invention, is greatly facilitated, and imperfect turning and binding operations are reduced to a minimum.

The turning and binding operations referred to obtain in the shoe and kindred leather goods industries, where pieces of leather of various contours, and which present a raw or unfinished edge or edge portions, are turned or folded inwardly and permanently bound against the main body portion of the leather, with the result that the unfinished edge portions are transformed into smooth, finished edges.

In carrying out the invention, a quick-drying adhesive is applied to a narrow marginal portion of the leather along the raw or unfinished edge prior to submitting the piece to the action of the machine. There the marginal edge is turned or folded in and bound by pressure, all in one continuous cycle, against the main body of leather, so that when the piece is removed from the machine the former raw edge has been replaced by a smooth, finished edge which is permanent and requires no stitching, except for ornamental purposes, if desired.

In my said patent, a forming die provided with a resilient blade which terminates in an inwardly curved lower edge performs the dual function of initially creasing the leather adjacent the raw edge thereof on a first downward stroke of said blade, and then applying pressure to the folded edge on a second downward stroke of the blade, in cooperation with a stationary forming block assembly and a vertically reciprocable pressure plate.

In other words, without entering into a lengthy description of the operation set forth in detail in said patent, it may be said that the finished edge is produced by pressure exerted against the folded portion from above; that is to say, the turned adhesively coated marginal portion of the leather is pressed firmly against the body portion thereof.

The improved mechanism of the present invention is characterized by an operative action which applies the pressure from below. That is to say, the body portion of the leather piece adjacent

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the coated raw marginal edge is pressed firmly against the latter in a single stroke.

Further, the curved lower edge of the resilient blade referred to is dispensed with, the blade of the present invention having creasing functions only.

Again, the vertically reciprocable pressure plate of said patent, although in a sense retained in the present mechanism, functions in a different manner, as does the forming block mounted thereon.

The most important particular improvement of the instant device, however, resides in a combined anvil and pressure plate member mounted on a vertically reciprocable plunger, which, in cooperation with the blade and forming block of the present invention, produces a more accurately and definitely finished edge through the medium of pressure applied from below, in combination with a flexible or resilient component of said anvil, as will be seen.

All of the moving parts of the machine are so coordinated as to operate in a cycle at the will of the operator. Suitable clutch mechanism is provided whereby an attendant may cause the moving components to function in proper sequence, and then be automatically arrested in movement at the end of each cycle.

Pieces of leather of various contours and sizes may be submitted to the action of the machine, it being necessary only to mount the proper combination of blade, forming block, and anvil, on the vertically reciprocable parts of the machine. The mounting means for these elements are finely adjustable so that an extremely accurate setup is obtainable.

Additional advantages and features will be apparent or explained in the following description of the preferred embodiment of the machine illustrated in the accompanying drawings, in which:

Fig. 1 is a side elevational view of the machine as it appears at the end of a cycle, the parts being in position for the reception of a piece of leather;

Fig. 2 is a top plan view of Fig. 1;

Fig. 3 is a vertical sectional view taken substantially on the line 3—3 of Fig. 2;

Fig. 4 is a front elevational view of the machine;

Fig. 5 is a rear elevational view partly in section, being taken on the line 5—5 of Fig. 1;

Fig. 6 is a similar view taken on the line 6—6 of Fig. 1;

Fig. 7 is a vertical sectional view taken on the line 7—7 of Fig. 3;

Fig. 8 is a vertical sectional view, on an enlarged scale, of a portion of Fig. 3, a piece of leather being shown in position with a turning and binding operation cycle being assumed to have just begun;

Figs. 9, 10 and 11 are similar views illustrative of successive steps in the turning and binding operation cycle;

Fig. 12 is a similar view illustrative of the final step in said cycle, the parts being in the position they occupy just prior to the completion of the cycle;

Fig. 13 is a fragmentary view of a piece of leather to one of whose marginal edges a quick-drying adhesive has been applied, as indicated by stippling;

Fig. 14 is a similar view of the same piece after it has been acted upon by the machine of the present invention;

Fig. 15 is a view of a rectangular piece of leather whose corners have been cut off, and whose four marginal edges have applied thereto a quick-drying adhesive, as indicated by stippling;

Fig. 16 is a view of the same piece after it has been subjected to the action of my machine;

Fig. 17 is a vertical sectional view taken centrally of a combined anvil and pressure member employed to obtain the result portrayed in Fig. 16;

Fig. 18 is a fragmentary view similar to Fig. 14 illustrating a finished edge of a different configuration;

Fig. 19 is a plan view of a leather disc whose peripheral edge has been finished; and

Fig. 20 is a vertical sectional view of a forming block employed in the operation producing the result portrayed in Fig. 19.

Referring now more particularly to Figs. 1 to 6, inclusive, it is noted that some of the components embodied in the instant invention are similar to those of said patent, and will therefore be designated by the same reference characters herein.

Thus the numeral 30 indicates the base or work table portion of the machine, which is provided with supporting legs or standards 31. Rigidly mounted on said base by means of bolts 32 is a frame or housing 33 which supports a rotatable horizontal shaft 34 in suitable bearings 35. One complete revolution of said shaft constitutes a cycle.

Rigidly secured to the forward end of the shaft 34, as by a key and screw, is a circular cam plate or disc 36, having a cam groove 37 formed therein. Adjacent the rear bearing 35 the shaft has a cam disc 38 affixed thereto by a set screw 39.

In order to cause shaft 34 to make one complete revolution, and then to be automatically arrested, a clutch mechanism is provided together with means to operate the same. The clutch mechanism, generally designated 40, and the operating means therefor, including a manually operable lever 52, are identical in every respect with the arrangement illustrated and described in detail in my said patent.

Said clutch mechanism is operable in conjunction with a continuously rotating pulley 42, driven by a belt 44 from any suitable source of power, and at a predetermined speed, all as clearly described in said patent.

A vertically reciprocable crosshead 60 operates in guideways 61 formed in the housing 33, plates 62, held in place by screws 63, retaining said crosshead in said guideways, as illustrated.

Motion is imparted to the crosshead by means

of the cam member 36 in cooperation with a roller 64 rotatably mounted on a stud 65 fixed to said crosshead, the roller working in the cam groove 37. Unlike the corresponding cam groove of my patent aforesaid, the instant cam groove 37 is circular and eccentric to the shaft 34.

Secured to the lower end of the crosshead by screws or otherwise is a horizontally disposed plate 66, provided with means whereby a selected creasing blade supporting block may be removably and adjustably mounted thereon.

For example, as illustrated particularly in Figs. 2, 3, and 8 to 12, inclusive, the plate may be provided with a narrow longitudinal slot 67, through which a screw 68 may pass to enter a threaded aperture 69 in a suitable blade supporting block 70. Obviously, although only a single slot 67 is illustrated, more than one slot may be provided in the plate 66.

Secured to the block 70, by screws 71 or in any other manner, is a creasing blade 72 of relatively thin, spring metal, whose contour may assume various shapes, and which in some instances may be made in sections or provided with serrations if desired.

In the embodiment illustrated, the blade 72 is straight, that is, adapted to transform the unfinished edge portion 73 of the leather 74 portrayed in Fig. 13 into the smooth, finished edge portion 75 illustrated in Fig. 14. In order to produce the smooth, finished edges 76, shown in Fig. 16, four similar blades secured to a rectangular supporting block 70 may be utilized, as is understood. A unitary blade, rectangular in top plan, is also feasible. In order to produce the finished edge 77 of Fig. 18, an arcuate blade 72 would be employed.

To produce the finished edges referred to above, and others not illustrated, it is, of course, necessary that a complementary forming block 78 and a complementary combined anvil and pressure applying member 79 be associated with each selected creasing blade.

The forming block 78 illustrated is adjustably and removably mounted on a vertically reciprocable, horizontally disposed plate 86, working in a recess 87 provided therefor in the base 30, as shown. The block is provided with a narrow elongated slot 88 through which a screw 89 may pass to enter a threaded aperture 90 in the plate 86.

The guide block includes a raised gauge portion 91 against which the attendant abuts the unfinished edge of leather to be turned, and a protruding lip portion 92 along that upper edge thereof which lies in proximity to the anvil 79.

The plate 86 is formed integrally with, or permanently secured to, a vertical plunger 101, working in a cylinder 102 secured to the underside of the base 30 by screws 103. Means for raising and lowering said plunger include a lever 104 pivoted at 105 between a pair of ears 106 depending from the underside of said base. The lower end portion of the plunger 101 is slotted at 107 in alignment with a vertical slot 108 formed in the cylinder 102. The forward end of the lever 104, passing through the slot 108 and into the slot 107, is pivotally secured to the plunger 101 at 109.

The other end of the lever has a pivotal connection 111 with a vertically disposed bar 112 on the rear wall of housing 33, which is held in place by a screw 113 and a pair of guides 114 formed on said wall. The upper end of the bar has a bifurcated portion 115 which supports a cam roller 116 on a horizontal pin 117.

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As shown particularly in Fig. 5, the cam 38, previously referred to, is generally circular in form, and is provided with an indented or receding portion 118. A spring 120, bearing against lever arm 104 at its lower end and against the underside of the base 30 at its upper end, maintains the roller 116 in constant engagement with the cam 38. A slot 121 in bar 112, through which screw 113 passes, permits vertical movements of the bar 112.

The combined anvil and pressure applying member 79 comprises a solid plate portion 122 and a resilient portion 123, the latter being provided with a rounded, or somewhat arcuately formed, edge portion 124, as illustrated. The portion 122 is preferably of metal such as brass or aluminum, while the portion 123 is preferably of rubber, or a synthetic equivalent thereof.

As shown in the drawings, the marginal portion of the plate 122 is recessed or grooved to receive the resilient member 123, the latter being permanently bonded thereto. As best seen in Figs. 8 to 12, inclusive, the lower supporting portion 125 of the plate for the resilient component 123 is preferably extended laterally to better sustain said component when the member 79 functions in its anvil capacity, as will appear.

The member 79 is removably and adjustably mounted on the upper end of a vertical plunger 126 reciprocable in a cylinder 127 depending from said base portion 30. To this end, an elongated slot 128 is formed in the plate 122, and a screw 129 may pass therethrough to enter a threaded aperture 130 in the upper end of said plunger.

The lower end of plunger 126 is slotted as at 131 to receive the forward end of a lever or arm 132 pivotally connected thereto as at 133. The lever 132 has a pivotal connection 134 intermediate its ends with the depending ear members 106, said connection being in vertical alignment with but below the pivotal connection 105 of the lever 104.

The other end of the lever 132 has a pivotal connection 135 with the lower bifurcated portion 136 of a vertically disposed bar 137 on whose upper end a cam roller 138 is rotatably mounted on a stud or pin 139, as best seen in Figs. 3 and 6.

A web or connecting portion 140, integral with the guide members 114, is provided to maintain the bar 137 in proper vertical position, so that the roller 138 operates in a cam groove 141 formed in one face of a cam disc 142. Said disc is secured to the shaft 34 as by a set screw 143, and thus revolves with said shaft.

The configuration of the cam groove 141 is portrayed in Fig. 6. It is generally circular and eccentric to the shaft 34, and is preferably so designed that at one stage in each cycle the portion 144 thereof has a particular function which will be described hereinafter.

In Fig. 17, a modified anvil and pressure applying member 179 is illustrated as exemplary of numerous other such members which are contemplated in conjunction with complementary forming blocks and creasing blades. In order that the piece of leather illustrated in Fig. 15 may lie flat on said member 179, a recess 180 is provided whereby the head of a mounting screw 129 may be disposed below the plane of the upper surface of said member.

The operation of the machine is as follows:

Assuming that the piece of leather 74 of Fig. 13 is to have its edge 73 turned and bound to produce the finished edge 75 of Fig. 14, a suitable paste or cement is first applied to the sur-

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face adjacent said edge 73, as indicated by the stippling.

The leather 74, as illustrated particularly in Fig. 8, is then placed in position with its paste-treated side up and with its edge 73 in contact with the gauge 91.

The operator now, by pressing the lever 52 inwardly, causes the clutch mechanism 40 to function so that a single complete revolution of shaft 34 is had, whereupon said shaft is automatically arrested, thus completing a cycle.

Assuming further that the moving parts of the mechanism are properly coordinated, the creasing blade 72, through the medium of the roller 64 and the cam groove 37, immediately begins to descend, and continues its descent until just prior to approximately the mid-cycle it is in the position portrayed in Fig. 9. At such time, it is seen that the creasing edge of the blade impinges upon the leather adjacent the pasted margin thereof, the resilient portion 123 of the anvil member 79 cooperating to firmly grip or pinch the leather between said blade and said portion 123, whereby slippage of the leather is obviated.

The creasing blade 72 continues its descent until the mid-cycle, the anvil now descending simultaneously therewith through the medium of the roller 138, cam groove 141, bar 137, lever 132, and plunger 126.

When the mid-cycle point is reached, the free marginal edge 73 of the leather springs outwardly into engagement with the underside of the lip 92 of the forming block. This action is particularly illustrated in Fig. 10.

Next, the creasing blade begins to ascend, and shortly thereafter the member 79 also. In other words, the ascent of the creasing blade is under way at the time the ascent of the member 79 is initiated. This "dwell," or stationary interval, is effected by the configuration of the portion 144 of cam groove 141, portrayed in Fig. 6, so that the relative position of the parts at the time the member 79 begins to ascend may be seen in Fig. 11.

Thus far, that is during the movements illustrated in Figs. 8, 9 and 10, the forming block 78 has remained stationary, the concentric portion of the cam 38, which cam controls its reciprocation in conjunction with the roller 116, bar 112, lever 104, and plunger 101, having been in engagement with said roller.

However, at approximately the time when the Fig. 11 position of the parts obtains, the roller 116 is entering the indented portion 118 of the cam whereby the plate 86 and the forming block 78 mounted thereon are caused to descend under the action of the spring 120 as is understood.

Thus, by the cooperative movements of the forming block moving downwardly, and the member 79, now functioning as a pressure applying plate, moving upwardly, the permanent adhesion of the marginal portion 73 and the body of leather 74 is effected.

The relative position of the parts at this time is portrayed in Fig. 12. To complete the cycle, the forming block 78, the creasing blade 72, and the combined anvil and presser plate member 79 are caused to return, respectively, to their Fig. 8 position, whereupon the leather is removed, and the machine is ready for the reception of a similar piece to be acted upon.

The advantages inherent in the provision of the resilient component 123 of the member 79 are deemed worthy of note. Thus, on the downstroke of the blade 72, at which time the member 79 functions as an anvil, varying thicknesses of

leather may be accommodated without adjustments of any kind. The extended lip or supporting ledge 125 obviates displacement of the resilient member 123, which, as stated, is bonded to and within the groove of the plate 122.

On the upstroke of the plunger 126, at which time the member 79 functions as a pressure plate, the resiliency inherent in the component 123 insures that a flexible yet firm application of force is exerted against the body portion of the leather to effect the desired result. The resilient feature referred to has been found to be highly efficient in binding edges of arcuate or circular configuration.

With reference to circular configurations, the turning and binding of the peripheral edge of a leather disc, such as that shown at 150 in Fig. 19, obviously requires the use of a circular creasing blade, a similar forming block, and a complementary anvil and pressure applying member.

In an operation of this kind, it is necessary to mash or crinkle said peripheral edge as it is forced through the forming block. In order to accommodate the excess leather, a circular series of spaced indentations or notches 151, shown in Fig. 20, are provided in the upper surface of the here circular lip portion 92 of the forming block.

Said indentations or notches 151 are not deep enough to penetrate the lower edge of the lip however, so that the free crinkled peripheral edge of the disc 150 springs outwardly into engagement with the underside of said lip, and the remaining operations are completed as before.

While the invention has been described as applicable to pieces of leather, it is contemplated that material other than leather could be acted upon by the machine with like results.

Furthermore, it is to be understood that the precise mechanism illustrated and described is subject to modification without departing from the spirit of my invention, which is characterized by suitable mechanism that will operate to first crease the leather adjacent the edge to be finished, and subsequently fold and bind said edge to the body portion of the leather in a single cycle, and with pressure applied from below.

What I claim is:

1. In a machine for turning and binding edge portions of pieces of leather, a forming block including a gauge portion and a projecting lip portion, means for adjustably mounting said block on a vertically reciprocable plunger, a resilient creasing blade, a supporting block therefor, means for adjustably mounting said block on a plate secured to a vertically reciprocable crosshead member, a combined anvil and pressure plate, means for adjustably mounting same on a vertically reciprocable plunger, means for reciprocating said first named plunger, said crosshead member, and said second named plunger during a single cycle of the machine, and clutch mechanism, operable at will, to govern the beginning and end of each such cycle.

2. In a machine for turning and binding edge portions of pieces of leather, a forming block including a gauge portion and a projecting lip portion, means for adjustably mounting said block on a vertically reciprocable plunger, a resilient creasing blade, a supporting block therefor, means for adjustably mounting said block on a plate secured to a vertically reciprocable crosshead member, a combined anvil and pressure plate, means for adjustably mounting same on a vertically reciprocable plunger, a cam and

roller arrangement for reciprocating said first named plunger, a cam and roller arrangement for reciprocating said crosshead member, a similar arrangement for reciprocating said second named plunger, said cam and roller arrangements being such that the reciprocations occur at predetermined intervals during a single operating cycle of the machine, and clutch mechanism operable at will whereby each cycle of operation is begun and automatically ended.

3. In a machine for turning and binding edge portions of pieces of leather, a forming block and a complementary combined anvil and pressure member adapted to have positioned thereon a piece of leather whose marginal portion has been supplied with an adhesive, a gauge included in the forming block for properly positioning the leather, a resilient creasing blade adapted to engage and crease said leather adjacent the adhesively coated margin thereof in cooperation with said anvil member, a projecting lip portion included in the forming block under which the free edge of said marginal portion is adapted to engage, the forming block being adjustably mounted on a horizontal plate formed on the upper end of a plunger whose vertical movements are governed by a cam and roller arrangement, the cam being secured to a horizontal shaft rotatable at will, and the roller being supported in the upper end of a vertically slideable bar whose lower end has a pivotal connection with one end of a pivoted lever, the other end of which is pivotally connected to the lower portion of said plunger.

4. In a machine for turning and binding edge portions of pieces of leather, a forming block and a complementary combined anvil and pressure member adapted to have positioned thereon a piece of leather whose marginal portion has been supplied with an adhesive, a gauge included in the forming block for properly positioning the leather, a resilient creasing blade adapted to engage and crease said leather adjacent the adhesively coated margin thereof, in cooperation with said anvil member, a projecting lip portion included in the forming block under which the free edge of said marginal portion is adapted to engage, the forming block being adjustably mounted on a horizontal plate formed on the upper end of a plunger whose vertical movements are governed by a cam and roller arrangement, said creasing blade being attached to a supporting block adjustably mounted on a horizontally disposed plate secured to a crosshead member whose vertical movements are governed by another cam and roller assembly, the cam of the said assembly being secured to a horizontal shaft rotatable at will, and the cooperative roller being supported on a horizontally disposed stud affixed to said crosshead.

5. In a machine for turning and binding edge portions of pieces of leather, a forming block and a complementary combined anvil and pressure member adapted to have positioned thereon a piece of leather whose marginal portion has been supplied with an adhesive, a gauge included in the forming block for properly positioning the leather, a resilient creasing blade adapted to engage and crease said leather adjacent the adhesively coated margin thereof in cooperation with said anvil member, a projecting lip portion included in the forming block under which the free edge of said marginal portion is adapted to engage, the forming block being adjustably mounted on a horizontal plate formed on the upper end

of a plunger whose vertical movements are governed by a cam and roller assembly, said anvil and pressure applying member being adjustably secured to the upper end of a plunger whose vertical movements are governed by another cam and roller arrangement, the latter cam being secured to a horizontal shaft rotatable at will, and the roller being supported in the upper end of a vertically slideable bar whose lower end has a pivotal connection with one end of a pivoted lever whose other end is pivotally connected to the lower portion of said plunger.

6. In a machine for turning and binding edge portions of pieces of leather, a forming block and a complementary combined anvil and pressure member adapted to have positioned thereon a piece of leather whose marginal portion has been supplied with an adhesive, a gauge included in the forming block for properly positioning the leather, a resilient blade adapted to crease said leather adjacent the adhesively coated margin thereof and to maintain same in firm engagement with a resilient component included in said combined anvil and pressure member, mechanism adapted to cause said creasing blade and said anvil member to descend simultaneously past a projecting lip portion included in the forming block, mechanism adapted to cause said forming block to then descend while the creasing blade ascends, and mechanism adapted to cause said anvil and pressure member to then ascend concurrently with the descent of the forming block whereby the body portion of the leather adjacent the crease is firmly pressed against the adhesively coated marginal portion thereof to produce a smooth finished edge.

7. In a machine for turning and binding the edge portions of pieces of leather, a combined anvil and pressure member adapted to have positioned thereon a piece of leather whose marginal portion has been supplied with paste, a complementary forming block including a gauge against which the edge of said marginal portion of leather is placed, a vertically reciprocable resilient blade member adapted to crimp the leather adjacent the paste coated margin thereof in cooperation with said anvil member, a projecting lip formed on the upper anvil-opposing edge of the forming block under which the free edge of the marginal portion is adapted to engage subsequent to the creasing operation to prevent the fold from being withdrawn with the creasing blade, and means for simultaneously reciprocating said forming block and said pressure member in opposed directions to firmly press the body portion of the leather against the paste coated marginal portions thereof.

8. A machine for turning and binding the edge portions of pieces of sheet material including a base, a first vertically reciprocable plunger working in a cylinder rigid with said base, a forming

block including a gauge and a projecting lip portion adjustably mounted on said plunger, a second vertically reciprocable plunger working in a cylinder rigid with said base, a complementary combined anvil and pressure applying member adjustably mounted on a plate integral with said second plunger, a housing rigidly mounted on the base, a vertically reciprocable crosshead working in guideways formed in said housing, a resilient creasing blade adjustably mounted on a platform rigid with said crosshead, a rotatable shaft, a cam and roller assembly operated from said shaft for reciprocating said first plunger, a cam and roller arrangement operated from said shaft for reciprocating said second plunger, a cam and roller arrangement also operated from said shaft for reciprocating said crosshead, all said reciprocal movements being regulated to occur at predetermined intervals during one cycle of the machine, and clutch mechanism, operable at will, for placing said shaft in rotation and acting automatically to arrest its rotation following the completion of such cycle.

9. A combined anvil and pressure applying member adapted to be adjustably secured to a vertically movable portion of a machine for turning and binding the edge portions of pieces of leather, said member comprising a slotted plate of metal or the like, a groove or recess in at least one side of the plate, and a member of resilient material having a portion thereof seated within said groove and bonded thereto, and the remaining portion thereof unsecured and extending laterally beyond the marginal edge of said plate.

10. A combined anvil and pressure applying member adapted to be adjustably secured to a vertically movable portion of a machine for turning and binding the edge portions of pieces of leather, said member comprising a slotted plate of metal or the like, a groove or recess in at least one side of the plate, a member of resilient material having a portion thereof seated within said groove and bonded thereto and a portion thereof unsecured and extending laterally beyond the groove, an arcuate edge formed on said laterally extending portion, and a laterally extended ledge on said plate defining the bottom of said groove and supporting the unsecured portion of said resilient member.

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The following references are of record in the file of this patent:

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