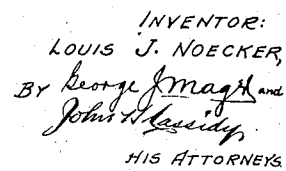


2,280,346

3 Sheets-Sheet 1



April 21, 1942.

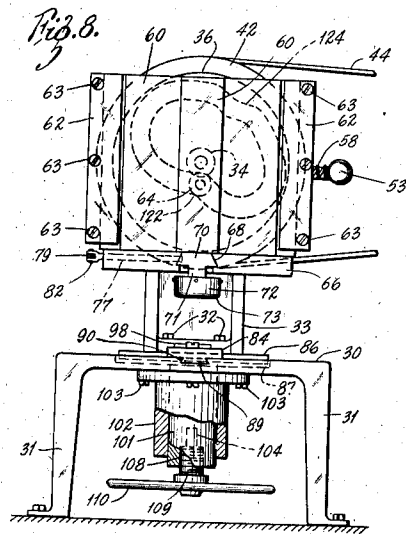
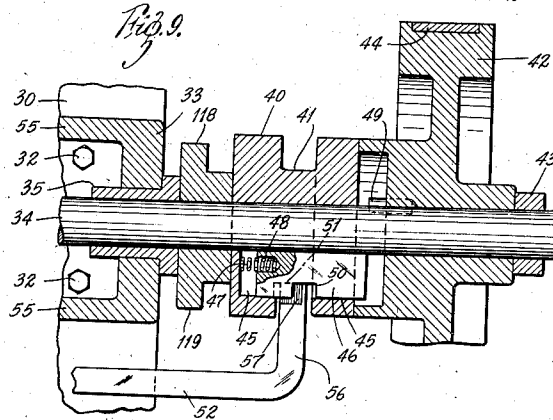
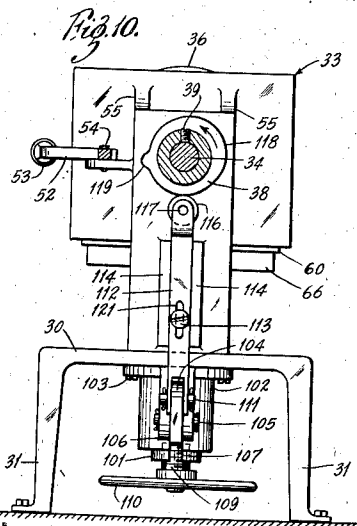
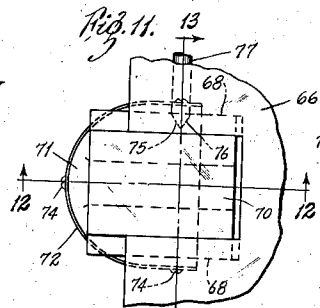
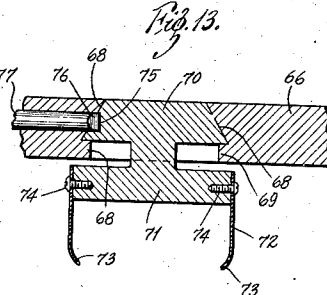
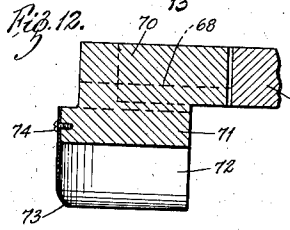
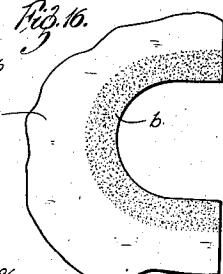
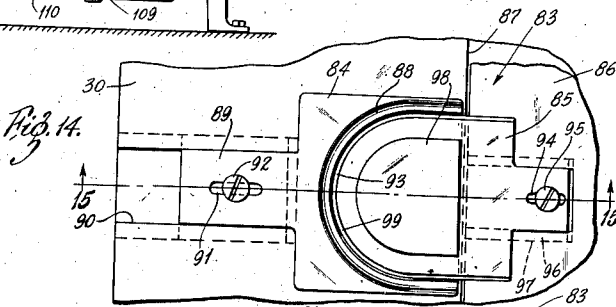
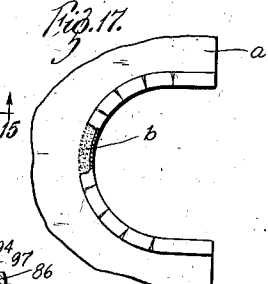
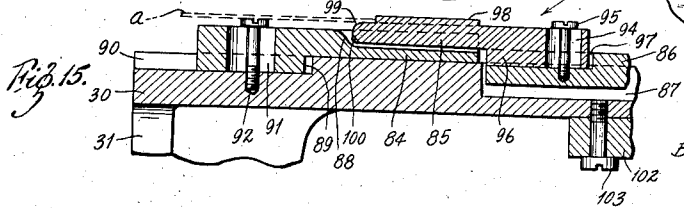
L. J. NOECKER

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MACHINE FOR TURNING AND BINDING THE EDGES OF LEATHER

Filed Feb. 25, 1941

3 Sheets-Sheet 2



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April 21, 1942.

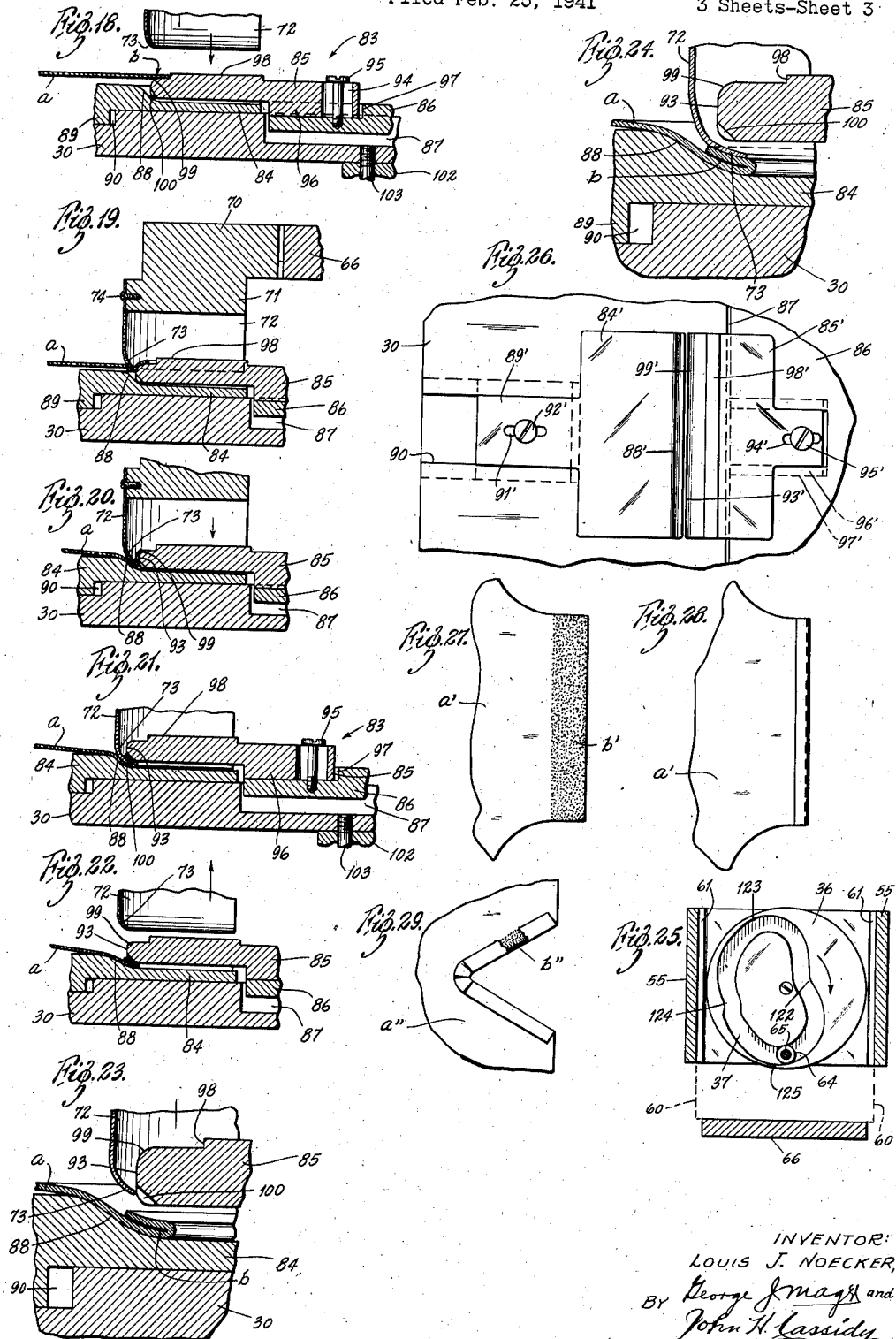
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MACHINE FOR TURNING AND BINDING THE EDGES OF LEATHER

Filed Feb. 25, 1941

3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

2,280,346

MACHINE FOR TURNING AND BINDING THE
EDGES OF LEATHER

Louis J. Noecker, St. Clair, Mo.

Application February 25, 1941, Serial No. 389,506

7 Claims. (Cl. 12—55)

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

The general objects of this invention are therefore similar to those set forth in my said patent, but the mechanism employed is of much simpler and more compact construction, and is capable of turning and binding edges of leather more efficiently and more certainly.

In the shoe and kindred leather goods industries, pieces of leather having a raw or unfinished edge or edges, ordinarily are provided with a line of stitching adjacent such edges to impart a finished appearance thereto, the marginal portion of the edge having first been creased and folded back upon itself.

The machine of the present invention enables an operator to turn and bind the raw edges of vamps, quarters, or other parts of the uppers of shoes, slippers, etc., in a single cycle, obviating the necessity of stitching. Obviously, of course, for ornamental purposes, the leather may be subsequently stitched around the edge if desired.

The binding of the turned-in portion is effected by applying a quick-drying paste thereto, before submitting the leather to the action of the machine. In operation, a narrow marginal portion to which such paste has been applied, is turned in and bound by pressure, all in one continuous cycle, so that when the leather is removed from the machine, the otherwise raw edge appears a smooth, finished edge.

The moving parts of the machine are so coordinated as to operate in cycles at the will of the operator. Clutch mechanism is provided, operable by the attendant, which causes the moving mechanism to function and then to be automatically arrested in movement at the close of each cycle.

An important feature of the invention resides in novel means adapted to accommodate pieces of leather varying in thickness.

Another feature is that various sizes and shapes of forming dies and cooperating forming block assemblies, relatively adjustable, may be easily mounted on and removed from the machine.

Other advantages will be apparent or pointed out in the following description and in the accompanying drawings, forming part of this specification. Similar reference characters designate similar parts throughout the drawings, in which—

Fig. 1 is a side elevational view of the machine, with the forming die in elevated position;

Fig. 2 is a plan view thereof;

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

Fig. 4 is a similar view taken on line 4—4 of Fig. 1;

Fig. 5 is a vertical sectional view taken on line 5—5 of Fig. 2;

Fig. 6 is a similar view taken on line 6—6 of Fig. 3;

Fig. 7 is a perspective view of a clutch component;

Fig. 8 is a front elevational view of the machine;

Fig. 9 is a horizontal sectional view taken on line 9—9 of Fig. 3;

Fig. 10 is a rear view of the machine, taken on line 10—10 of Fig. 1;

Fig. 11 is a plan view on an enlarged scale, of a die assembly mounted in operative position;

Figs. 12 and 13 are vertical sectional views taken respectively on lines 12—12 and 13—13 of Fig. 11;

Fig. 14 is a plan view on a similar scale, of a forming block assembly mounted in position to cooperate with said die assembly;

Fig. 15 is a vertical sectional view taken on line 15—15 of Fig. 14;

Fig. 16 is a fragmentary view of a piece of leather having adhesive applied to a marginal portion thereof, as indicated by the stippling;

Fig. 17 is a view of the same piece of material after it has been subjected to the action of my machine;

Figs. 18, 19, 20, 21, 22, 23, and 24 are fragmentary sectional views illustrating successive steps in the turning and binding operation, Figs. 23 and 24 being enlarged for the purpose of clarity;

Fig. 25 is a view similar to Fig. 6, illustrating the position of a roller and cam arrangement immediately following a completed cycle;

Fig. 26 is a view similar to Fig. 14, showing another of various forming block assemblies which may be employed, obviously of course, with corresponding die assemblies;

Figs. 27 and 28 are views similar to Figs. 16 and 17 obtaining when the Fig. 26 arrangement is employed;

Fig. 29 is a view similar to Fig. 17, illustrating another configuration.

Referring now to the drawings more particularly by reference characters, numeral 30 indicates the base or worktable portion of the machine, which is provided with supporting legs or standards 31. Rigidly mounted on said base

as by bolts 32, is a frame or housing generally indicated 33 which supports a horizontal shaft 34 in suitable bearings 35. A complete revolution of said shaft constitutes a cycle.

Affixed to the forward end of the shaft 34, as by a key and screw, is a circular 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. A collar 40 with an internal annular groove 41, is keyed as shown, or otherwise secured to said shaft between disc 38 and a continuously rotating pulley 42, a collar and set screw arrangement 43 maintaining the parts in proper relation. The pulley, freely rotatable on the shaft, is driven by a belt 44 from any suitable source of power, and at a predetermined suitable speed.

In order to cause the shaft 34 to make one complete revolution, and then to be automatically arrested, means are provided enabling the attendant to operate a clutch mechanism now to be described.

The collar 40 is provided with a horizontal slot 45 wherein a key 46 (Fig. 7), is positioned. A spring 47, seated in a socket 48 and bearing against the forward wall of said slot, normally maintains the key to the right, as viewed in Fig. 9, in engagement with one of a pair of pins 49, fixed on pulley 42, whereby the shaft is rotated with the latter until said key is shifted to the left by means to be described.

Clutch key 46 has a notch or cutout portion 50, the left hand wall of which is beveled or inclined as indicated at 51. A lever 52, provided with a handle 53, is pivotally mounted at 54 on one side wall 55 of housing 33. The end of the lever remote from the handle, and designated 56, beveled as at 57, is normally maintained in the annular groove 41 by means of a spring 58 interposed between the lever and an integral lug 59 on housing 33, as shown particularly in Fig. 2. The action of this clutch arrangement, although deemed obvious, will be explained in conjunction with the operation of the entire machine.

A vertically reciprocable crosshead 60 operates in guideways 61 formed in housing 33, vertical plates 62, held in place by screws 63, retaining the crosshead in said guideways, as shown. Motion is imparted to the crosshead by means of the cam plate 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.

Fixed to the lower end of the crosshead by screws or otherwise, is a plate 66 provided with means whereby a selected forming die assembly may be removably mounted thereon. As illustrated particularly in Figs. 11, 12, and 13, plate 66 is provided midway along its front edge with a recess 67, each of whose side walls includes an undercut portion 68 and an inwardly extending ledge portion 69.

The forming die supporting block includes an upper portion 70 which dovetails into the recess 67, and a depending portion 71 of a configuration corresponding to that of the die. In other words, the upper portion 70 of any selected block is always identical, whereas the depending portion 71 always corresponds in shape to that of the forming die which it carries. By this arrangement, any one of a plurality of dies may be mounted on said plate 66. In the embodiment primarily illustrated, the forming die is shaped to produce the finished edge of Fig. 17; to pro-

duce the finished edge of Fig. 29, the die would be substantially V-shaped.

As shown particularly in Figs. 12 and 13, the die 72 is made of relatively thin, spring metal material, its lower edge being rounded and in-turned as at 73. The die is secured to the correspondingly shaped depending portion 71 of the supporting block by screws 74 or other fastening means.

It is here noted that the forming die may be made in sections if desired. Also, portion 73 thereof may be provided with serrations, similar to those provided on the die illustrated in my said Patent No. 2,198,456.

Proper positioning of a selected die block is provided for by having a notch 75, preferably V-shaped, formed in said block, adapted to be engaged by the similarly shaped extremity 76 of a bar or rod 77 normally forced inwardly, that is toward the longitudinal center line of the machine, by a spring 78. Said spring is anchored at one end to plate 66, and at its other to a manually operable lever 79, pivoted at 80 to an extension 81 of said plate. A pin and slot connection 82 between bar 77 and lever 79 permits the attendant, at will, to withdraw the bar from engagement with the notch 75, whereupon the die block may be removed.

Mounting of a selected die block is extremely simple, requiring only its insertion in the undercut slideway 68, and inward pressure until the extremity 76 enters the notch 75. The attendant can feel the block snap into place by this arrangement, obviating improper mounting with resultant harm to the die or other parts in operation.

A forming block assembly, generally indicated 83, includes two complementary members (Figs. 14 and 15), one of which designated 84 is adjustably and removably mounted on the base or table 30, the other, 85, on a vertically reciprocable horizontal plate 86, working in a recess 87 provided therefor in said base.

Member 84, hereinafter called the guide block, since it has a rounded, internal, beveled edge 88 adapted to properly guide the forming die in operation, includes an integral depending portion 89 which dovetails into an undercut groove 90 formed in the base 30. The configuration of the edge 88 corresponds to that of the forming die. Adjustment is obtained by means of slot 91 and screw 92, the latter maintaining the block in properly adjusted position.

Member 85, hereinafter called the pressure plate, has an external edge portion 93, corresponding in shape to, but slightly spaced from the edge 88 of the guide block. Proper spacing of said members is obtained and maintained also by means of slot 94 and screw 95. The pressure plate 85 has a depending portion 96, which dovetails into an undercut groove 97 in the horizontal plate 86.

It is thus seen that the block assembly may be attached and detached, and adjusted relative to its own components as well as to the die. Obviously adjustments are made with the power shut off until perfect alinement is had.

The guide block 85 includes a raised gauge portion 98 against which the attendant abuts the raw edge of the leather to be turned. Preferably, the peripheral portion 93 of the pressure plate is rounded as at 99, and provided with spaced indentations 100 along its bottom edge. The indentations are not necessary when a straight die and forming block arrangement is

employed, such as that suggested in Fig. 26. In the Fig. 14 embodiment, the indentations or notches 100 are spaced approximately twenty degrees apart.

The plate 86 is formed integrally with or secured permanently to a vertical plunger 101, working in a cylinder 102 secured to the underside of the base 30 by bolts 103. Means for raising and lowering the plunger will now be described.

The lower portion of the plunger 101 is slotted at 103, the slot being of a width to accommodate one end of a lever 104 pivoted at 105 between a pair of ears 106 depending from base 30. A similar slot is formed in the cylinder 102, both slots being in alignment. The plunger also has a threaded bore 108, into which is threaded an adjustment screw 109 having a handwheel 110 within easy reach of the operator.

The other end of the lever 104 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 supporting a cam roller 116 on a pin 117. As shown particularly in Fig. 10, plate 38 is provided with a gradually increasing, then diminishing (in diameter), cam portion 118, and a relatively small cam lobe 119, each of which engage the roller 116 once during each cycle of operation.

A spring 120, bearing against lever arm 104 at its lower end and against the underside of base 30 at its upper end, maintains said arm in abutting relation to screw 109, and at the same time maintains constant engagement between the roller 116 and cam plate 38. A slot 121 in bar 112, through which screw 113 passes, permits vertical movements of the bar.

In Figs. 6, 8, and 25, the cam groove 37 is particularly illustrated. Portions thereof to which attention will be directed in describing the operation of the machine, are indicated by the numerals 122, 123, 124, and 125.

It is not considered necessary to enter into a detailed description of Figs. 26, 27, 28, and 29. Elements of the forming block assembly, and of the leathers acted upon, which correspond to those illustrated in Figs. 14, 16, and 17, are identified by the same reference characters with appended symbols.

The operation of the machine is as follows:

Assuming that a piece of leather, such as that designated *a* in Fig. 16, has an edge corresponding to that of the forming die, the surface adjacent said edge is first supplied with a suitable paste or cement, indicated by the stippling *b*. The leather is then placed on the forming block assembly 83, with its paste treated side up, gauge 98 enabling the operator to properly position same (Figs. 15 and 18). The operator now, by means of handle 53 which he presses inwardly, or to the left as viewed in Fig. 8, withdraws the beveled extremity 57 of the lever 52 from engagement with the similarly beveled portion of clutch element 46. Immediately, spring 47 forces key 46 to the right (Fig. 9), into the path of and engagement with one of the pins 49 of the continuously rotating pulley 42, causing the shaft 34 to rotate, in the direction indicated by arrows.

Cam disc 36 rotates with the shaft, its cam groove 37 controlling the vertical reciprocation of crosshead 60, the initial movement of which is downward. Immediately following such movement of the crosshead, the attendant releases

handle 53, whereupon spring 58 causes said beveled extremity of lever 52 to reenter the groove 41, in position to arrest further rotation of the shaft once an entire revolution thereof has been completed. It is here noted that this precise clutch arrangement is not essential. A treadle-controlled clutch, or other arrangement, operable at the will of the attendant, which would produce a single revolution of shaft 34 for each cycle, could be substituted.

Fig. 18 illustrates the forming die descending upon the leather. At this time, cam roller 64 which controls the crosshead, is being advanced by the rotation of cam plate 36 from portion 122 of the cam groove 37 toward portion 123 thereof (Fig. 6).

Fig. 19 shows the die, still in descent, engaging the edge of the leather approximately centrally of the pasted portion *b* thereof. It is noted that the rounded portion 99 of the external edge 93 of pressure plate 85 is so located that it will cause the die to spring outwardly a slight distance, approximately equal to the thickness of the leather. A definite creasing of the leather is thus attained. Upon further descent of the die, as shown in Fig. 20, portion 73 thereof and the creased edge of the leather will contact the beveled guiding portion of block 84. Thereupon, as illustrated in Fig. 21, portion 73 and the now folded marginal edge of leather are guided into the space provided therefor by a slight elevation of the pressure plate 85, secured on member 86 whose movements are regulated by the cam plate 38.

Fig. 21 illustrates the end of the initial descent of die 72. At this time, roller 64 has arrived at region 123 of cam groove 37. At the same time, cam lobe 119 is in contact with roller 116, depressing bar 112 and causing the lever 104 to raise plunger 101 a distance predetermined by the thickness of the leather. Adjustments for various thicknesses are made by means of the handwheel 110 associated with the adjusting screw. At this period of the operation, any bunching of the material at the curve is taken care of by the spaced indentations 100, which permit entry of the excess leather as shown.

Further rotation of the shaft 34 produces the condition illustrated in Fig. 22. Immediately following the Fig. 21 condition, the cam lobe 119 travels beyond roller 116, whereupon the spring 120 exerts a downward pressure on arm 104, and therefor depresses plate 85. Thus the now folded edge of leather is held firmly in place, permitting forming die 72 to be withdrawn upwardly. The die continues its ascent until roller 64 reaches portion 124 of cam groove 37, whereupon the die begins its second descent, as roller 64 approaches portion 125 of said cam groove.

Obviously the pressure exerted by plate 85 during this interval effects the adhesion of the marginal portion and the adjacent body of leather, so that said plate may now be raised, the leather remaining in position, as shown in Fig. 23.

An inspection of cam surface 118 is invited. It extends approximately one-fourth the periphery of cam plate 38, and plate 35 begins its ascent when roller 64 leaves portion 124 of cam groove 37, and is then held in its elevated position for the duration of the final function of the forming die, shown in Fig. 24, which will be described.

Referring again to Fig. 23, die 72 is seen to be descending, with its inturned edge 73 riding along the periphery of the elevated plate 85. As stated above, at this time, roller 64 is approaching por-

tion 125 of the cam groove. Further rotation of shaft 34 causes the resilient returned portion 73 of the die to firmly and positively bind the pasted and folded marginal portions of the leather, producing the result indicated in Fig. 17. Thereafter, the die is returned to its elevated (Fig. 1), position, the roller 64 being forced inwardly (upwardly), toward portion 122 of cam groove 37, where it comes to rest due to the clutch arrangement already described.

While the roller 64 travels from portion 125 to portion 122 of the groove (Fig. 25), the pressure plate 85 is simultaneously and gradually being lowered to its Fig. 1 position. During this interval, the leather may be removed from the machine.

Proper coordination of the cams, and alignment of the die and forming block assemblies are readily obtainable with the adjustments provided. The facilities for mounting and removing such assemblies are simple. When irregular or intricate patterns are contemplated, the die may be made in sections.

Various modifications of the mechanism illustrated are possible within the scope of my invention. I do not therefore desire to be limited to the precise constructions illustrated and described.

I claim:

1. In a machine for turning and binding edge portions of pieces of leather, a forming block assembly 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 assembly for properly positioning the leather, a resilient forming die adapted to engage and crease said marginal portion of the leather, an adjustably mounted guide block having a rounded beveled edge adapted to conduct said creased marginal portion into a space provided therefor between the base of the machine and a pressure plate included in said forming block assembly, the pressure plate being adjustably mounted on a platform supported on the upper end of a plunger whose vertical movements are regulated 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 bar whose lower end is connected to one end of a pivoted lever, the other end of which is adjustably connected with said plunger.

2. In a machine for turning and binding the edge portions of pieces of leather, a forming block assembly including a gauge portion and adapted to have positioned thereon a piece of leather whose marginal portion has been supplied with an adhesive, said forming block assembly also including a guide block having a recessed portion corresponding in shape to that of said marginal portion of leather, and a pressure plate provided with a peripheral portion likewise corresponding in shape to that of said marginal portion of leather, a complementary forming die of resilient material, a cam arrangement for reciprocating said pressure plate at predetermined intervals, mechanism for moving said forming die into engagement with the leather to fold and bind the same, for withdrawing the die from such engagement, for again moving the die into engagement with the folded edge of leather to exert external pressure thereon, and then for returning it to its initial position.

3. In a machine for turning and binding the

edge portion of a piece of leather, a forming block assembly including a gauge portion and adapted to have positioned thereon a piece of leather whose marginal portion has been supplied with paste, said forming block assembly also including a guide block having a bevel edged recess portion of a contour similar to that of said marginal portion of leather, and a cooperating pressure plate having a complementary peripheral edge, the latter rounded along its upper margin and provided with spaced notches along its lower margin, a resilient forming die, means for causing the lower inturned portion thereof to engage the leather and then crease the same along the rounded upper marginal periphery of said pressure plate, and thereafter to force the creased edge against the bevel edged recess portion of the guide block to fold the same, a cam arrangement for then elevating the pressure plate a predetermined distance to provide a space into which the said lower inturned portion of the forming die forces the now folded edge of leather and for thereafter lowering the pressure plate, and a spring arranged and adapted for maintaining the pressure plate in contact with said edge while the die is withdrawn.

4. A machine for turning and binding the edge portions of pieces of sheet material including a bed, having an undercut groove formed therein, a recessed guide block having a depending portion which dovetails into said undercut groove supported on the bed, a pressure plate positioned above the guide block, means whereby the former and the latter may be adjusted relative to one another, a forming die supported above the guide block and the pressure plate having a resilient blade with an inwardly curved lower edge, positioned, proportioned, and adapted when lowered to wipe the edge of the pressure plate and then engage the surface of the recess of said guide block beneath the edge of the pressure plate, and operating mechanism for separately reciprocating the forming die and the pressure plate.

5. A machine for turning and binding the edge portions of pieces of sheet material including a bed, a recessed guide block supported on the bed, a pressure plate positioned above the guide block, a forming die supported above the guide block and the pressure plate having a resilient blade with an inwardly curved lower edge, positioned, proportioned, and adapted when lowered to wipe the edge of the pressure plate and then engage the surface of the recess of said guide block beneath the edge of the pressure plate, and operating mechanism for separately reciprocating the forming die and the pressure plate, said mechanism including a cam formed to cause said pressure plate to be held elevated above the recess in the guide block during a descent of the die, and then to be lowered and held in lowered position during an ascent of the die.

6. A machine for turning and binding the edge portions of pieces of sheet material including a bed, a recessed guide block supported on the bed, a pressure plate positioned above the guide block, a forming die supported above the guide block and the pressure plate having a resilient blade with an inwardly curved lower edge, positioned, proportioned, and adapted when lowered to wipe the edge of the pressure plate and then engage the surface of the recess of said guide block beneath the edge of the pressure plate, and operating mechanism for separately reciprocating the forming die and the pressure plate, said mechanism including a cam formed to cause

said pressure plate to be held elevated above the recess in the guide block during an initial descent of the die, then to be lowered and held in such position during an ascent of the die, and then to be raised and held in raised position during a second descent and subsequent ascent of the die.

7. A machine for turning and binding the edge portion of pieces of leather including a base, a forming block assembly mounted thereon, a gauge for properly positioning the material with its marginal portion supplied with paste on said assembly, a resilient forming die, a rotatable shaft, a cam and roller assembly operated from said shaft for reciprocating said die to fold and

bind said marginal portion of the material, cam mechanism operated by said shaft for causing a pressure plate included in said forming block assembly to cooperate with the die and a guide block also included in said assembly, during the folding and binding operation, manually adjustable means for predetermining the vertical reciprocation of said pressure plate, and clutch mechanism, operable at will, for placing said shaft in rotation and acting automatically to arrest its rotation following the reciprocations of the forming die and the pressure plate required to complete a cycle of operation.

LOUIS J. NOECKER.