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W. C. BAXTER

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CRIMPING MACHINE

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Fig. 1.

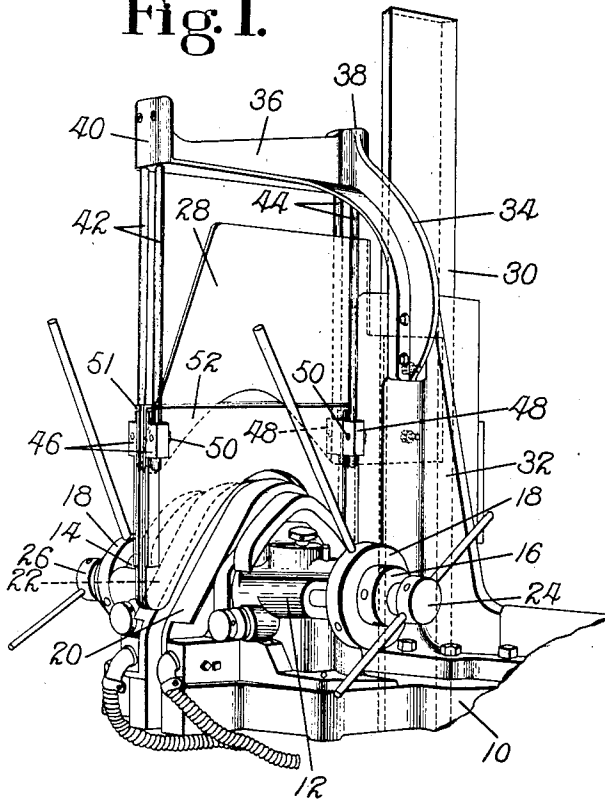


Fig. 2.

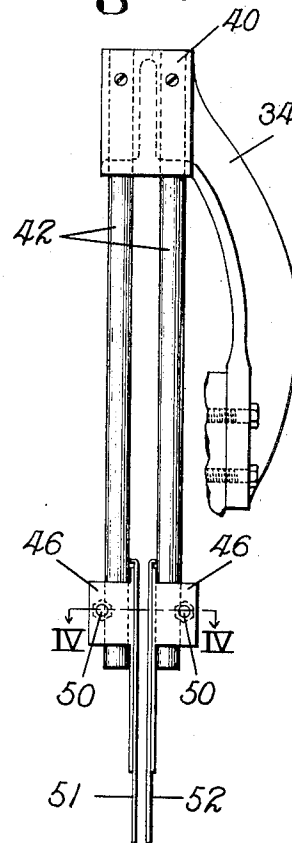


Fig. 3.

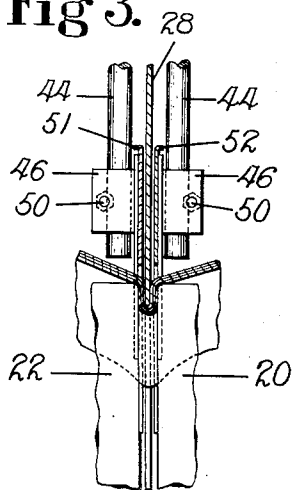
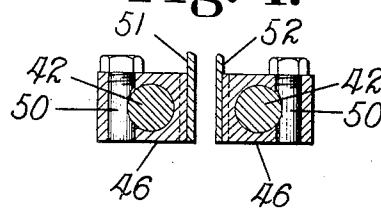


Fig. 4.



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UNITED STATES PATENT OFFICE

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CRIMPING MACHINE

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12 Claims. (Cl. 12—99)

This invention relates to machines for use in the manufacture of boots and shoes for crimping and stretching upper materials and is herein illustrated in its application to a type of machine, the general organization of which is shown and described in United States Letters Patent No. 804,482, granted November 14, 1905, upon the application of A. G. Legge.

In making certain types of shoes, for example riding boots, army shoes and the like, it is sometimes desirable, because of the rough usage to which these types of shoes are put, to use an upper which is formed entirely from one piece of leather. These uppers are usually taken from thick, tough hides and it is often extremely difficult to shape such material smoothly about the last upon which the shoe is to be made. Crimping machines of the type referred to are used to stretch and soften the tops of such uppers and also partially to mold or shape them to conform more readily to the curved portions of the last. The stretching or crimping means consists of a vertically reciprocating blade and a pair of cooperating crimping jaws which act yieldingly to grip the leather and apply increasing pressure to certain portions thereof until it is stretched and crimped in the manner desired.

The upper surfaces of the jaws of the crimping machine are convexly curved and shaped in accordance with the different styles of uppers and the acting edge of the reciprocating blade is concave and made to agree substantially with the contour of the jaws.

The reciprocative stroke of the crimping-blade is of such length that in many instances, when the blade is in its uppermost and inoperative position, an open space of substantial area is left between the lower edge of the blade and the upper surfaces of the jaws. It has been found desirable in machines of this type, in order to insure against accidents to operators who are presenting work to the machine, to guard this open space in such a manner that it will be practically impossible for the operator accidentally to get his hands or fingers in the path of the reciprocating blade.

Accordingly, it is an object of the present invention to provide means whereby the open space between the blade and the jaws will be effectively guarded so that under no circumstances will it be possible for an operator to receive an injury to his hands or fingers when presenting work to the machine.

To the attainment of this object and in accordance with one feature of the invention, the illustrated machine comprises a novel construction including a plurality of members for covering a considerable portion of the unguarded space between the blade and the jaws. After the open space has been thus covered or fenced in, the

operative may present upper materials to the crimping instrumentalities the same as before, but will run no risk of injuring his fingers or hands while doing so. In the illustrated construction the covering means comprises a pair of vertically-disposed guard plates, adjustably mounted above the crimping jaws and having lower edges formed to agree substantially with the shape of the upper surfaces of the jaws. By reason of the adjustable mounting it is possible to move the guard plates as close to the upper surfaces of the crimping jaws as is feasible without hindering the presentation of the upper materials to the crimping instrumentalities, and thereby to cover or guard a considerable portion of the open space separating the blade from the jaws.

It is customary when stretching and crimping upper material of the sort referred to to present two or three uppers to the machine at the same time. The uppers are stacked one on another and are together forced downwardly between the jaws of the machine. It will be clear that when uppers are presented to the machine in this manner, they form a much stiffer and harder mass to stretch and crimp than a single upper would form. It is desirable, therefore, in order to avoid cracking the leather materials thus presented that no mechanism should be in the way to prevent the materials from taking whatever shape is necessary as they are forced downwardly by the blade into the grip of the jaws.

In accordance with another feature of the invention, the illustrated guard plates are so constructed as to provide effective protection against injury to the operator and, at the same time, are mounted in such a manner that no brackets, or other holding means, will be in a position to interfere with the leather materials or prevent them from assuming whatever shape they tend to assume as they are forced downwardly into the jaws. To accomplish this, the illustrated machine comprises a novel mounting for the guards consisting, as illustrated, of vertical supporting rods depending from an overhead bracket so that sufficient space will be allowed for the upper materials to fold up against the guards or to assume any other position which will keep the materials from cracking as they are forced downwardly between the crimping jaws.

The invention further provides novel means for preventing the crimping blade from catching on the upper edges of the guards as it moves downwardly to engage the stock. In the illustrated embodiment, a projection or flange is formed along the upper edges of the guard-plates by bending the portions along these edges in a direction away from the acting surfaces of the guard-plates. The inner edges of these flanges are formed with rounded corners so that if the

reciprocating blade has been bent out of shape, or has not been fastened properly to its carrier slide, it will nevertheless be cammed back into the space between the guard-plates whenever it strikes the rounded corners formed on the flanges. The flanges act also to strengthen the guard-plates and to prevent them from assuming shapes which might interfere with the blade as it moves downwardly between the inner surfaces of the guard-plates.

The above-mentioned and other features of the invention, including various novel details of construction, will now be more particularly described by reference to the accompanying drawing and pointed out in the claims.

In the drawing,

Fig. 1 is a perspective view of a portion of the machine of the type illustrated in the above-mentioned Letters Patent with the present invention embodied therein;

Fig. 2 is a front elevation of the guard-plates and the means for holding the same, being drawn on a somewhat larger scale than Fig. 1;

Fig. 3 is a longitudinal vertical section through the crimping instrumentalities taken through the center of the guard-plates and illustrating the manner in which the crimping blade and jaws operate upon several thicknesses of upper material; and

Fig. 4 is an enlarged sectional view taken on the line IV—IV in Fig. 2, illustrating the means for securing the guard-plates to the supporting rods.

As more fully shown and described in the Letters Patent mentioned, the machine in which the present invention is embodied is provided with a bed plate 10 having duplicate crimping-heads 12 and 14 mounted at opposite sides of a transverse slot formed in the upper surface of the bed plate. Each head contains a chamber in which a plunger (not shown) is adjustably secured, the plungers having shanks which extend loosely through horizontal bores in the rear of the chamber and which are threaded at their outer ends to receive adjusting nuts 16, the nuts bearing against the heads and determining the position of the plungers relatively to the heads. An annular projection on the shank of each of the plungers, substantially equal in diameter to the horizontal bores, provides a bearing surface for the shanks in the bores and, at the same time, permits universal movement of the plungers, this movement, however, being limited and controlled by spring-pressed gibs more fully shown and described in the Letters Patent referred to. Mounted in the plungers are jaw-holding bolts (not shown), the heads of which are shaped to carry crimping jaws 20 and 22, the bolts being threaded at their outer ends to receive lock nuts 24, 26 having operating handles. These jaws may be heated, if desired. By tightening the nuts 24, 26 the jaws are clamped rigidly to the forward vertical surfaces of the plungers in such positions that the adjacent vertical surfaces of the jaws are substantially parallel, as shown in Fig. 3 of the drawing.

To provide for the varying thicknesses of upper leather operated upon, the plungers in the illustrated machine, as stated before, are adjustably mounted so that the acting surfaces of the jaws may be moved slightly to exert equal pressure on all parts of the upper, thereby to avoid leaving wrinkles in relatively thin portions thereof. This adjustment is effected by means which is fully described in Letters Patent No.

804,482, previously referred to and which includes handle-operated cam nuts 18, 18 threaded on bosses on the heads and having cam surfaces adapted to engage studs located at either side of the centers of the heads.

Since the crimping jaws 20, 22, in the illustrated machine, are shaped to operate on shoe uppers, the upper contours of the work-engaging surfaces are designed in the form of mounds or cones, that is, the work-engaging surfaces converge upwardly and merge near the top with a curved surface of comparatively short radius. A vertically reciprocating crimping-blade 28 is located normally some distance above the upper surfaces of the jaws, the blade being rigidly secured to a vertical slide member 30 which is mounted in a bracket 32 bolted to the bed plate 10, and which is reciprocated by suitable mechanism described in the Letters Patent No. 804,482, previously mentioned. The blade 28 is positioned to enter the space which separates the adjacent vertical surfaces of the jaws upon reciprocation of its carrier slide 30 and, as shown in Fig. 3, the upper leather to be crimped, which has been inserted between the blade and the top surfaces of the jaws, is carried by the blade downwardly between the gripping surfaces of the jaws. This action is necessarily rapid to avoid burning the leather which is drawn over the heated surfaces of the jaws. Sufficient pressure is exerted by the jaws during downward movement of the blade to give the desired stretching effect to the leather and to assist the blade in forming a permanent and uniform crimp in the material.

Rigidly mounted on the upper end of a vertical face of the bracket 32 is another bracket 34 having a curved arm which projects upwardly from its mounting to a point well above the top edge of the blade 28 in its uppermost position. Another arm 36 of the bracket 34 extends horizontally in a direction substantially parallel to the plane of the blade 28 and is provided at either end with bosses 38 and 40. The bosses form supports for two pairs of parallel rods 42 and 44 which project downwardly from the arm 36 of the bracket 34 and are provided respectively near their lower extremities with rectangular collars or blocks 46 and 48. The blocks 46, 48 are adjustably secured to the rods by binding bolts 50 and their adjacent inner portions project downwardly, as shown in Fig. 2, to form bearing surfaces and supports for a pair of vertically-disposed protector plates or guards 51 and 52. The guards 51, 52 are formed from thin sheets of metal and extend across the entire acting width of the crimping blade and jaws, and may be permanently secured to the blocks on each side by any suitable means such, for example, as welding. The lower edges of the guards 51, 52 are shaped to agree with the contour of the upper surfaces of the jaw members and the edges may be adjusted sufficiently close to these surfaces to act as fences to prevent an operator from accidentally inserting his fingers under the guards and getting them caught between the reciprocating blade and the jaws, while presenting pieces of work to the leather crimping instrumentalities.

It will be seen from an examination of Figs. 2 and 3 that just enough space is allowed between the inner surfaces of the guards to permit the blade 28 to pass freely therebetween in order to engage work-pieces inserted between the lower edges of the guards and the upper surfaces of the jaws. In order that the blade may not catch on

the upper edges of the guards as it enters this narrow space the top edge of each guard is formed with an intumed projection or flange having a rounded inner edge which will assist in guiding the blade 28 into the space between the guards. As stated, this construction prevents the blade from catching on sharp corners if it should not line up exactly with the space between the guards or if the guards themselves should become slightly bent or otherwise out of shape.

In the operation of the machine, the operator stands at the front of the machine which is toward the left as viewed in Fig. 1, and inserts several thicknesses of upper material between the jaws 20, 22 and the guard plates 51, 52. By gripping the uppers at either side of the guard plates, the operator is able to position them properly with respect to the reciprocating blade 28 and yet, when the machine is tripped, he will run no risk of injuring his hands or fingers even though he retains his grip on the leather after the descending blade 28 has contacted with the uppers and has begun to draw them inwardly toward the jaws of the machine. Since the space between the upper surfaces of the jaws and the lower edges of the guard plates, when properly adjusted, is always less than the width of the operator's fingers, it is impossible for his fingers to slip under or to be drawn under the guard plates during the reciprocating movement of the crimping blade. Consequently, he can retain his grip on the material while the reciprocating blade is in motion without risk of injuring his hands or fingers by catching them between the jaws and the reciprocating crimping blade.

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

1. In a machine of the class described a reciprocating blade, a plurality of jaws cooperating with the blade to stretch and crimp upper materials, and means comprising a plurality of substantially parallel members positioned adjacent to the blade and constructed and arranged to permit only objects of a predetermined thickness to be introduced between the blade and the jaws.

2. In a machine of the class described, a reciprocating blade, a pair of jaws positioned below and coacting with the blade to stretch and crimp upper materials, and a plurality of members arranged substantially to cover a considerable portion of the space separating the blade from the jaws in all positions of the blade until it contacts with a work-piece during its reciprocating movement.

3. In a machine of the class described, a reciprocating crimping blade, a plurality of jaws cooperating therewith to form a crimp in a piece of leather, and provided with top surfaces for supporting the piece of leather, and a plurality of plates adjacent to the jaws, the lower edges of which are shaped to conform to the contour of the top surfaces of the jaws.

4. In a machine of the class described, a vertically reciprocating crimping-blade, jaws positioned a substantial distance below the crimping-blade and having adjacent surfaces between which the blade moves, and a plurality of vertically disposed flat plates arranged to guard the opening between the crimping-blade and the jaws except to objects of, or under, a predetermined thickness.

5. In a machine of the class described, a reciprocating blade, a plurality of jaws cooperating with the blade and having horizontal upper faces

spaced from each other to permit the blade to go between them, and a plurality of guards adjustably mounted above said jaws and having lower edges which agree in outline with the shape of the upper faces of the jaws.

6. In a machine of the class described, a reciprocating blade, a plurality of jaws cooperating with the blade to stretch and crimp work pieces, a plurality of plates mounted above the jaws, and means for adjusting the plates toward and away from the cooperating jaws.

7. In a machine of the class described, a reciprocating crimping-blade, a plurality of crimping jaws spaced from, and between which, the crimping-blade reciprocates, guard members arranged to control the open space above the jaws and thereby to permit only objects under a predetermined thickness to be inserted into the open space.

8. In a machine of the class described, a vertically reciprocating blade, a plurality of jaws spaced from the blade and cooperating therewith, and substantially parallel guard plates the inner faces of which are spaced sufficiently to permit passage of the blade between them whereby said guard plates act to fence in the blade during a substantial part of its downwardly reciprocating movement.

9. In a machine of the class described, a reciprocating crimping-blade, a plurality of crimping jaws located in working relation to said crimping-blade, and a plurality of vertically-disposed guard plates positioned above the crimping jaws and constructed and arranged to extend substantially across the entire width of the acting surfaces of the jaws and having bottom edges which are substantially complementary to said surfaces.

10. In a machine of the class described, a crimping blade mounted for vertical reciprocative movement, a pair of vertically-disposed crimping jaws having inner faces which cooperate with the crimping blade and horizontal upper faces to support a work piece, and a plurality of plate-like guards having rounded inner corners, said guards being constructed and arranged to assist in guiding the blade into the space between the guards and to shield the blade during a substantial part of its downward movement.

11. In a machine of the class described, a reciprocating crimping blade, a pair of vertically-disposed crimping jaws coacting with the crimping blade, a plurality of protector plates, and means including a bracket and a plurality of vertically depending rods for adjustably supporting and maintaining the inner surfaces of the protector plates at a predetermined distance from each other to permit reciprocation of the crimping blade between said surfaces, said plates having lower faces which are shaped similarly to the upper surfaces of the jaws.

12. In a machine of the class described, a reciprocating blade, a pair of crimping jaws spaced from and cooperating with the blade and having vertical pressure-applying surfaces, a plurality of adjustable protector plates to guard the space between the blade and the jaws, and overhead means for supporting the protector plates in vertical planes close to the blade whereby work-pieces may be free to assume whatever positions they tend to assume as they are forced downwardly by the blade between the pressure-applying surfaces of the jaws.

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