J. L. HATCH.

MACHINERY FOR MANUFACTURING HEEL-STIFFENERS FOR BOOTS AND SHOES.

No. 173,624. Patented Feb. 15, 1876.

Fig. 4.

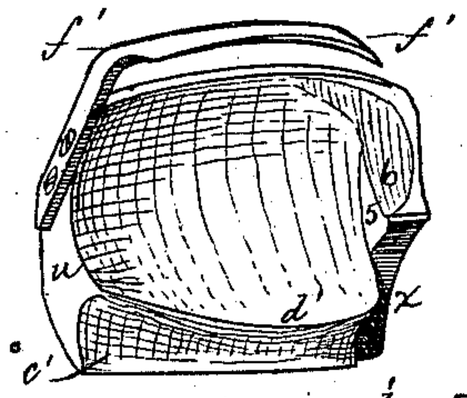


Fig. 1.

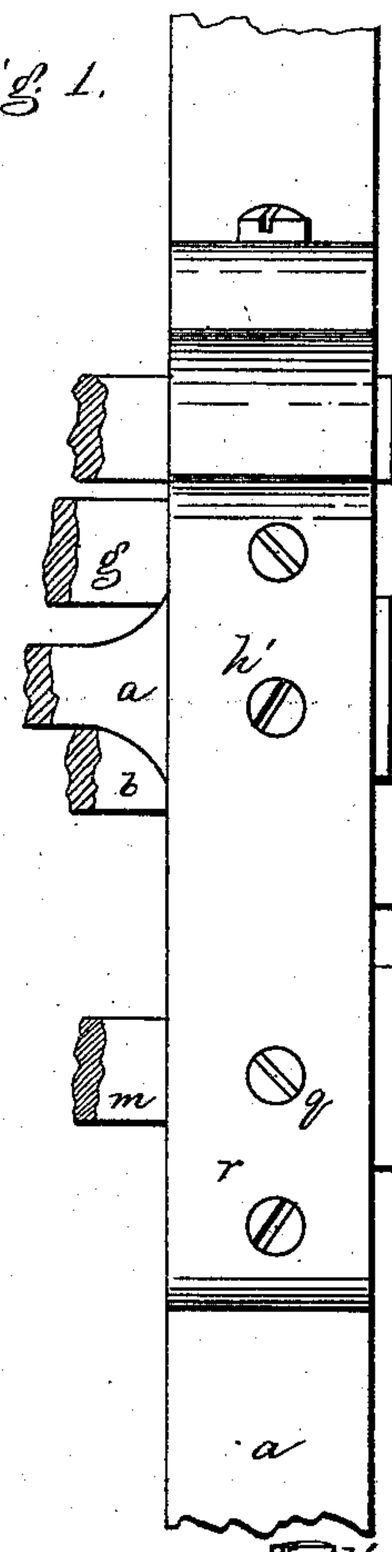
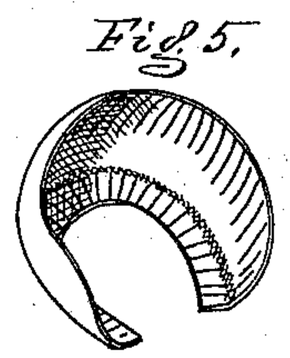


Fig. 5.



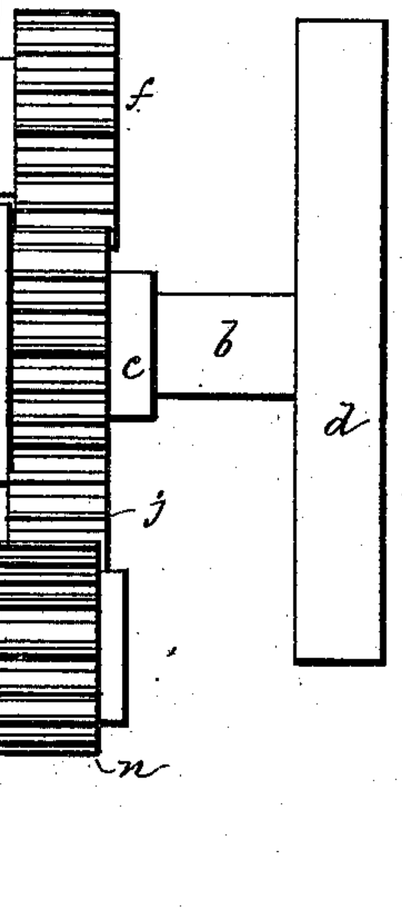


Fig. 3

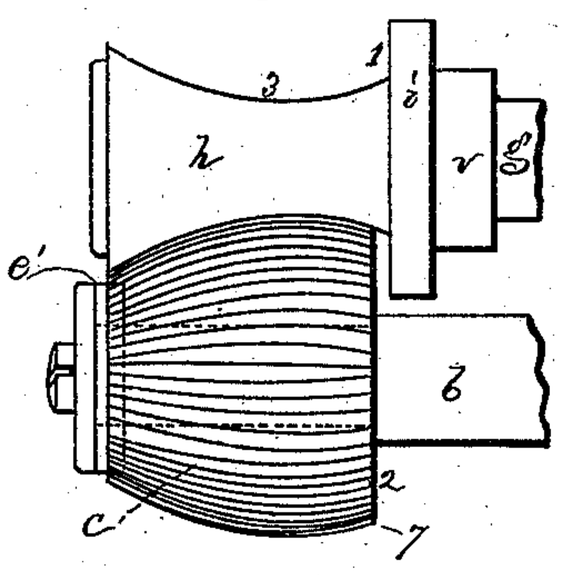
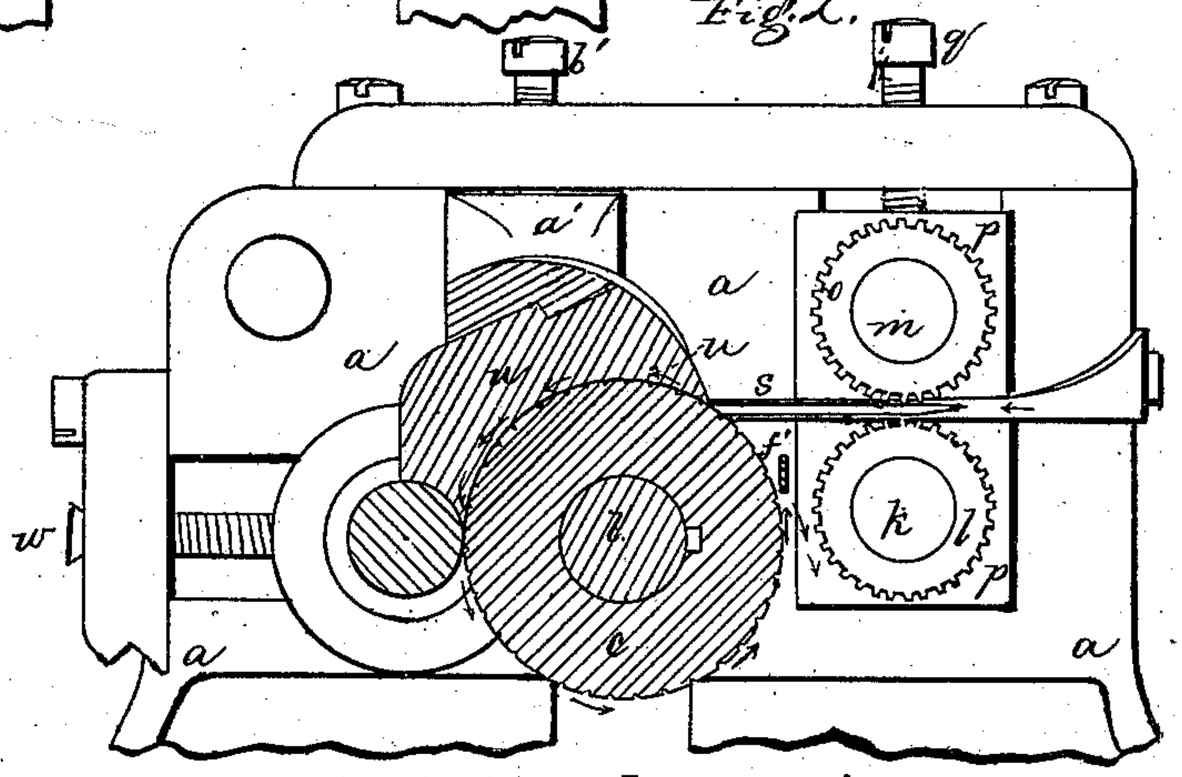


Fig. 2.



Witnesses.

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IMPROVEMENT IN MACHINES FOR MANUFACTURING HEEL-STIFFENERS FOR BOOTS AND SHOES.

Specification forming part of Letters Patent No. **173,624**, dated February 15, 1876; application filed January 29, 1876.

To all whom it may concern:

Be it known that I, JAMES L. HATCH, of Rochester, in the county of Monroe and State of New York, have invented an Improved Machine for Manufacturing Heel-Stiffeners, of which the following is a specification:

This invention relates to mechanism for manufacturing heel-stiffeners for the counters of boots and shoes.

This invention is an improvement on that class of machines in which the blank is turned and crimped by the action of a roller that draws the blank between itself and a cap, the pressure between the two being sufficient to draw or stretch the central portion of the blank, whether of leather or leather-board or leather and leather-board united together.

A machine of this class, and now well known, has a former or a rotary conoidal frustum, arranged to rotate within a case adapted to extend about and cover the former, except at the single point where the stiffener-blank is received and discharged; but the cases and formers are not adapted to yield with relation to each other, and in practice the cases are often broken, owing to variations in thickness or hardness of blanks and irregular feeding of the machine, and with such machine the stiffener is usually run through the machine twice to effectually shape and set the flange.

In this my invention the former is connected with its shaft so that it may move longitudinally under pressure and adapt itself to any inequalities in the flange that otherwise might break the machine, and it draws the stiffener-blank against a cap provided with a curved lip to gradually turn the flange, the curved lip being terminated by a guide to define the flange and to guide it to the action of a flanging-roller, having its acting flange-face substantially in the plane of the face of the guide, this flanged roller completing the formation of the flange, and drawing and forming it about the base of the former, and crowding it to the edge of the flange, the fullness of the crimps created in turning the blank from a straight to a curved form. The periphery of this flanging-roller meets the blank on the former at the point where the blank emerges from under the cap, and acts to assist the former to feed or move the blank, the surface of the former and of the flanging-roller moving, preferably, at substantially the same speed, but in opposite directions. The cap is provided with a projection adapted to extend almost to the nipping-point between the flanging-roller and former, to prevent the possibility of the blank passing over the flanging-roller, as it would otherwise do, and the cap and roller are each made to yield, and are easily removable, and the mouth of the cap, or the point at which it first receives the blank, is rounded to obviate puckering and breaking the blank, as is often the case when the cap with a straight front edge or mouth is used with a former shaped substantially as herein described.

Figure 1 represents a top view of my improved machine with the central portion of the shafts and bar broken out; Fig. 2, an end view of the machine, the former, cap, and flanging-roller being in section, the line of section being shown at *x x*, Fig. 1. Fig. 3 is a top view of the former and flanging-roller removed from the machine. Fig. 4 is an underside view of the cap, showing its lip and guide; and Fig. 5 is a view of a formed stiffener.

The frame *a* is of suitable shape and material to properly support the working parts. The main shaft *b*, carrying the former *c*, is driven by a band on the pulley *d*, in practice a fast and loose pulley of usual construction being employed. A pinion, *e*, on shaft *b* engages a pinion, *f*, on shaft *g*, carrying the flanging-roll *h*, provided with a flange-turner, *i*, whose inner face 1 is adapted to extend past the base 2 of the former, the curved portion 3 of the flanging-roller being fitted to the periphery of the former. The pinion *e* on the main shaft also engages an idler-pinion, *j*, that meshes with a pinion on the shaft *k*, carrying the lower of the feeding-rollers *l*, the upper shaft *m* being provided with a pinion, *n*, engaging with the pinion on shaft *k* directly under it, but not shown in Fig. 1. The shaft *m* also carries the upper feed-roller *o*, and each shaft rests in plummer-boxes *p*, held down by set-screws *q* in bearing-covers *r*, the plummer-boxes *p* having between them springs or blocks of india-rubber to cause them to separate when permitted so to do by the screws *q*.

A face-grooved directing-gauge, *s*, receives and directs in the proper straight line the edge of the blank placed between the feeding-rollers, that, acting above and below the blank, project it forward into the curved mouth *t* formed between the front of the cap *u*, shaped as shown, (see Figs. 1 and 4,) and the periphery of the former *c*, the shape of the front of the cap, permitting the roller and cap to commence drawing and stretching the blank at or near its base, or at that portion of the blank adapted to fit about the lower portion of the heel, before the former and cap act on the upper portion of the stiffener in the same plane with the portion of the base of the stiffener then being acted on. This is shown in Fig. 1, where it will be seen that that portion of the former and cap directly under the dotted lines will draw on one portion of the stiffener-blank before the upper portion or edge of the stiffener in the same vertical line, or a line drawn transversely through the stiffener, will be acted on by the die and former at the point 4.

The rollers *l o*, besides projecting the blanks forward into the mouth between the former and cap, also serve the very important purpose of corrugating the lower or straight edge of the stiffener to be turned over to form the flange, these corrugations extending across the portion of the blank to form the flange, softening and preparing such portion of the blank to be more easily and evenly turned, and the corrugations so formed predetermine the direction and evenness of the crimps formed gradually by the curved lip, the gage, and the action of the flange *i;* and this is a very important element of my invention, for it insures even and uniform crimps and saves much power in the process of turning and crimping the flange.

The shaft *g* of the flanging-roller *h* rests in plummer-boxes *v*, and set-screws *w* in the frame, working in connection with suitable springs resting in or against the boxes, permit the flanging-roller to yield to adapt itself to the thickness of the material passing between it and the former. The inner face 1, of this flange-turner *i* fits the cavity *x* in cap *u*, and the inner face 1 is substantially in the plane of and forms a continuation of the guide 5 on the inner side of the cap at the end of the curved lip 6. This curved lip acts to curve or bend over the lower or straight edge of the stiffener-blank before the blank meets the guide 5, that acts to define the turn in the blank adapted to form the seat at the junction of the flange and upright portion of the stiffening, (see Fig. 5,) and passing beyond such guide 5, the flange-face 1 wipes the partially-formed flange of the stiffener closely about the edge 7 of the former, crowding the puckers or gathers toward the outer edge of the flange of the stiffener. This rotating flanged roller is less liable to break the blank at the junction of the flange and upright portion of the stiffener than would be the case were a stationary face used instead of the movable face *i*, and the flange-face 1, turning with the former and blank, and substantially at the same speed, and crowding the stiffener-flange over in lines more nearly radial to the former than would be the case with a stationary face in the position of 1, crowds the stiffener at the point 8, (see Fig. 5,) close about the edge 7 of the former, and defines and irons down the bend more perfectly than would be the case were the face *i* stationary.

The cap *u* is attached at the end of a spring-bar *a'*, held down at its forward end by a set-screw, *b'*, which serves as a fulcrum for the bar, and which may adjust itself according to variations in the stock being worked, the reduced portions of the bar *a'* descending and permitting the cap to rise or rock. The lower portion of the cap is cut away at *c'* to fit the periphery of the flanged roller *h*, and is provided with an edge or projecting portion, *d'*, to extend between the roller *h* and former, (as shown in Fig. 2,) to hold the stiffener pressed closely against the former until it is caught between the roller and former. The former is keyed on, and, so as to rotate with the shaft *b*, is held on the shaft by a screw and washer or suitable nut, and a spring, *e'*, of india-rubber or other substance, crowds the base 2 of the former back against the guide 5 and face 1 of the flange, but the former may move forward on its shaft and contract the spring in order to adapt itself to the varying thickness of the flange of the stiffener or the change of position of the cap.

All the parts operating on the stiffener-blank are adapted to yield, and are self-adjusting to any unusual variations in the stock, the force necessary to be overcome before the parts are permitted to yield being controlled by suitable screws and springs, and the machine may, therefore, be run rapidly without fear of being broken or of breaking the stiffener, which is often the case with leather-board stiffeners, which are formed of a material quite stiff and rigid.

It will be noticed that the former and cap and flanging-roller are unobstructed at their outer ends, and I am therefore enabled to easily introduce between and form on the same rolls either shoe-stiffeners, with curved tops, or boot-stiffeners, with much straighter tops, and I can form stiffeners of several sizes on one set of rollers, and, when desired, the former, flanging-roller, and cap may be easily removed, and for them corresponding devices of different sizes may be substituted.

On the cap I employ a discharger, *f'*, that strikes the stiffener carried about by and shaped on the former—the dotted arrows, Fig. 2, indicating the direction of the movement of the stiffener-blank—and stops its further movement with, and carries the end of the stiffener away and disengages it from, the former, and in this way a formed stiffener is discharged automatically when it has passed once through the machine, and a completed

stiffener never impedes the passage to the former of a new blank.

The cap is usually filled in with or formed of Babbitt metal, and in a machine provided with a continuous cap or cover extending about the former the Babbitt metal has often to be renewed, as it wears away quite rapidly, and the cap cannot approach the former, but a cap placed on an arm, as herein described, may be made quite thick, and as the metal is worn away the cap is allowed to approach the former, obviating the frequent renewal of the Babbitt metal, thereby saving much time, and a new cap may be substituted without removing the former.

The former has a serrated surface, to enable it to engage the stiffener-blank.

It will be obvious that I can in this machine form stiffeners of any desired length without liability of one end of the stiffener interfering with the other end in a machine, as with a case completely encircling the roll.

In case the Babbitt metal of the case wears at one end more than at the other, I may cause the cap to tip in either direction required, to equalize this wear, by adjusting either the fulcrum-screw *d'*, at or near the cap, or the one, *h'*, that passes through the opposite end of bar *a*, Fig. 1.

I claim—

1. The combination with the former of the adjustable cap provided with curved lip and guide.

2. The cap curved at its front end, as shown, in combination with the former, and arranged with relation to each other to form a curved mouth, *t*, to receive the blank and operate as set forth.

3. The adjustable cap, its curved lip and guide, in combination with the former and a spring adapted to permit the former to move longitudinally on its shaft, substantially as described.

4. The combination of the former *c* and flanging-roller *h i* with the cap, all constructed and adapted to form a heel-stiffener substantially as deseribed.

5. The combination of the former and cap with a discharging device, substantially as described.

6. The former and cap, in combination with the gage and feeding-rollers, substantially as described.

7. The former, in combination with the cap and yielding bar and its fulcrum.

8. The former and cap, in combination with the rollers *l o*, to corrugate the edge of the stiffener preparatory to turning the flange of the stiffener, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAMES L. HATCH.

Witnesses:

JAMES T. STEWART,

ANDREW J. HATCH.