

No. 609,110.

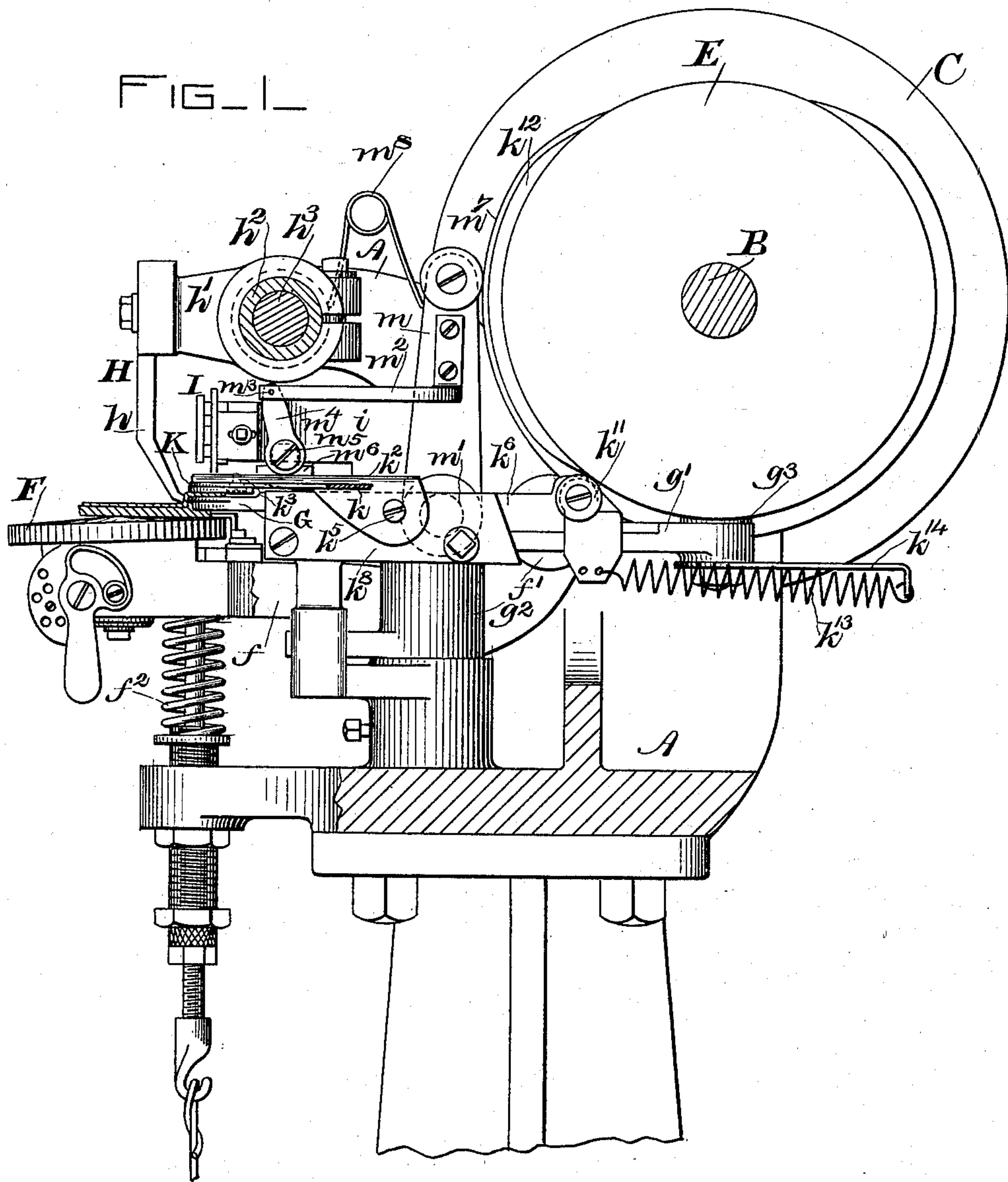
Patented Aug. 16, 1898.

G. E. MILNER.  
INSOLE REINFORCING MACHINE.

(Application filed June 25, 1897.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES

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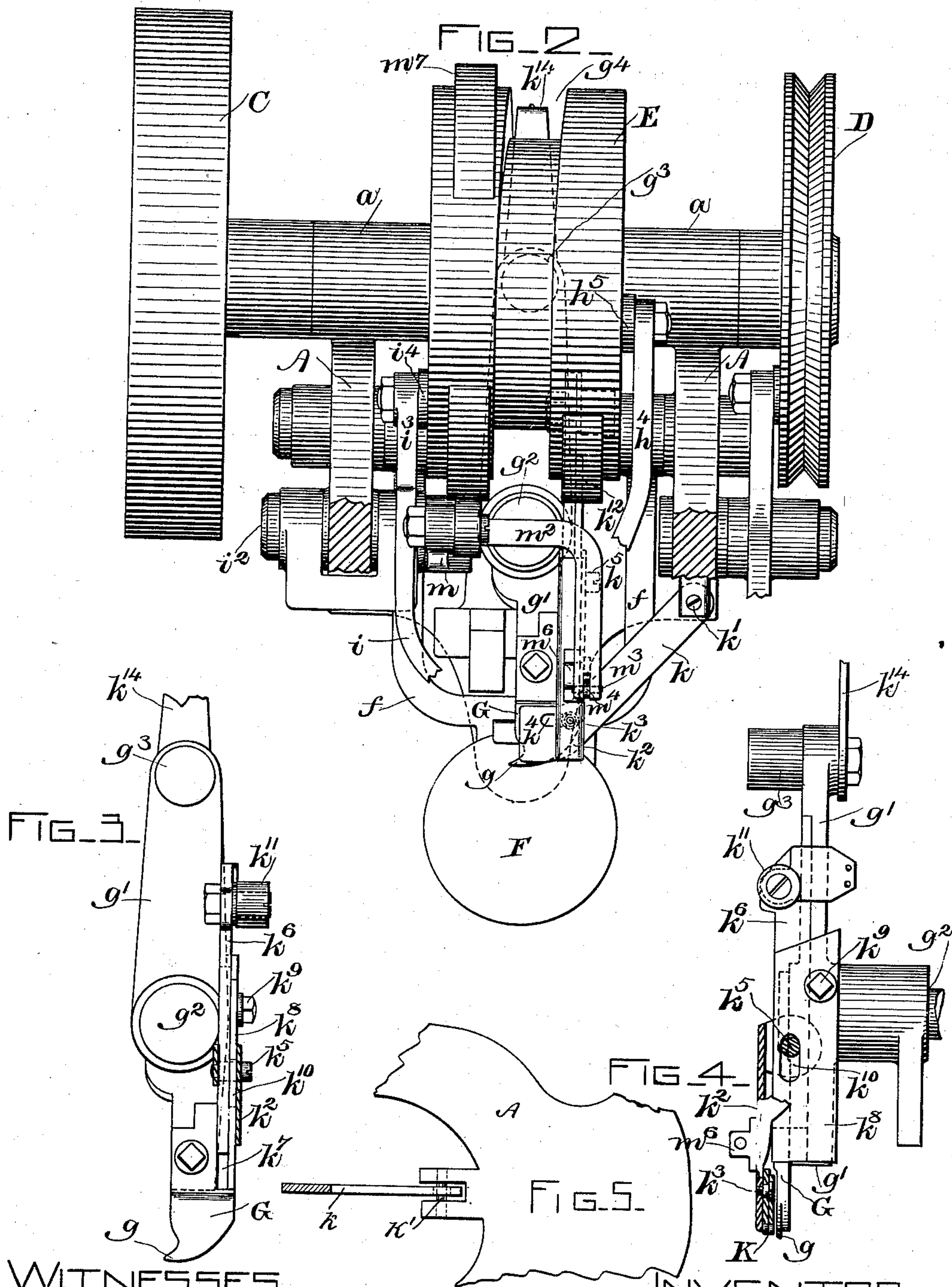
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# UNITED STATES PATENT OFFICE.

GEORGE E. MILNER, OF CHICAGO, ILLINOIS.

## INSOLE-REINFORCING MACHINE.

SPECIFICATION forming part of Letters Patent No. 609,110, dated August 16, 1898.

Application filed June 25, 1897. Serial No. 642,335. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE E. MILNER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Insole - Reinforcing Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The present invention relates to machines for applying reinforcing material to insoles, and more particularly to the type of such machine represented in Letters Patent of the United States issued to the Gem Flexible Insole Company as the assignee of John B. Hadaway May 10, 1898, No. 603,764. The machine of said patent as constructed to reinforce a lipped insole comprises a work-support, upon which the sole to be reinforced is adapted to rest, a beading or crimping tool, a former or anvil which coöperates with the beading or crimping tool to form a bead or crimp in the reinforcing material over the lip of the insole, a presser-tool which presses the reinforcing material against the inner side of the lip, and an auxiliary beading and pressing tool which engages said reinforcing material at the top of the lip and stretches and smooths out the same, at the same time partially conforming the reinforcing material to the lip, whereby said material is caused to lie smoothly against the surface of the insole, and whereby said reinforcing material as finally shaped and pressed by the beading or crimping tool against the feather and outer side of the lip will be free from objectionable folds and plaits. The present invention relates to an improvement on the machine above referred to, and more particularly to improved means for smoothing and stretching the reinforcing material prior to the action thereon of the beading and crimping tool.

The object of the present invention is to produce a smoothing and stretching device which will be independent in its operations of any of the bead or crimp forming devices of such machine and so arranged and operating that it will effectually stretch and smooth the reinforcing material just prior to the ac-

tion thereon of the bead or crimp forming tools and before the edge of the reinforcing material is secured to the feather.

To the above end the present invention consists of the devices and combination of devices which will be hereinafter described and claimed.

The present invention is shown in the accompanying drawings, in which—

Figure 1 shows a vertical sectional view through the machine from front to rear, parts being shown in elevation. Fig. 2 shows a top plan view of the machine, parts being broken away to show underlying parts. Fig. 3 shows a detached plan view of the former or anvil with portions of the smoothing-tool-actuating mechanism, parts being in section; and Fig. 4 shows in side elevation and partial section the former or anvil, a portion of the mechanism for actuating the smoothing-tool, and the forward end of said tool. Fig. 5 represents a detail of the pivotal connection of the lever *k*.

Similar letters of reference designate similar parts throughout the several views.

In the drawings, A represents the supporting-frame of suitable size and shape to support the working parts.

In frame A are suitable bearings *a*, in which is mounted the main driving-shaft B, upon one end of which is fixed the hand-wheel C and on the opposite end the pulley D, and shaft B also carries a cam E, provided with suitable path-cams and peripheral cams to actuate the moving parts of the machine.

F represents a suitable work-support which is revolvably mounted in a yoke or frame *f*, which is fulcrumed at *f'* to the fixed frame and which at its outer end rests upon a spring *f*<sup>2</sup>, which acts to normally elevate the outer end of the yoke or frame *f* and work-support F and maintain the work thereon in position to be acted upon by the bead forming and pressing tools, as will be explained.

G represents the anvil or former, which has a laterally-projecting finger *g*, over which the reinforcing material is pressed by the beading and crimping tools to form a bead or crimp therein over the lip of an insole.

The anvil or former G is mounted upon the outer end of a lever *g'*, which is fulcrumed at



$g^2$  and carries at its inner end a cam-roll  $g^3$ , which engages a path-cam  $g^4$ , cut in the periphery of the cam E, the arrangement being such that the rotation of cam E will vibrate the lever  $g'$  and impart a lateral vibration to the anvil or former G to coöperate with the presser-tool to feed the work.

H represents the presser-tool, which comprises a downwardly and inwardly bent arm  $h$ , which is arranged to engage and force the reinforcing material against the inner face of the lip of the insole, and which also forces the outer face of the lip against the outer end of the former or anvil.

The presser-tool H is arranged to have a vertical movement toward and from the work, and to this end it is fixedly secured to an arm  $h'$  of a lever  $h^2$ , which is fulcrumed upon a shaft  $h^3$ , mounted in suitable bearings, (not shown,) the inner end  $h^4$  of the lever  $h^2$  carrying a cam-roll  $h^5$ , (see Fig. 2,) which engages a path-cam in the face of cam E. The presser-tool H is also arranged to have a lateral movement to feed the work, and for this purpose the lever  $h^2$  is prevented from movement along the shaft  $h^3$ ; but the shaft  $h^3$  is arranged to have a lateral reciprocation in its bearings, it being reciprocated therein by suitable mechanism. (Not shown.)

The above arrangement is such that a rotation of the cam E will by means of the lever  $h^2$  cause the presser-tool to have a reciprocating movement toward and from the work to press the reinforcing material against the inner face of the lip of the shoe-sole and to grip the work against the end of the former or anvil, and while the work is thus gripped the presser-tool and anvil or former will move laterally to feed the work.

Coöperating with the former or anvil and the presser-tool is a beading and crimping tool I, which may be of any suitable construction and which is arranged to have a reciprocating movement toward and from the work to press the reinforcing material over the lip and the edge of the reinforcing material down onto the feather. The beading or crimping tool I is fixed to the outer end of a bell-crank lever  $i$ , which is fulcrumed at  $i^2$  and has upon the end  $i^3$  a cam-roll  $i^4$ , which engages a path-cam formed in the face of the cam E, (see Fig. 2,) whereby upon a rotation of the cam E the beading and crimping tool will be reciprocated toward and from the work. The machine as so far described is substantially the same as the machine of the patent hereinbefore referred to and forms no part of the present invention and has been merely selected for the purposes of illustration only, and the parts thereof may be changed or altered without in any way affecting the present invention.

In the present invention instead of having the tool which stretches and smooths out the reinforcing material carried by and actuated by the presser-tool I have arranged it to be independent in its operation of any of the

bead-forming tools, and it is preferably arranged and operated as follows:

The stretching and smoothing tool is shown at K, it being mounted upon or formed integrally with the lever  $k$ , which is fulcrumed at  $k'$  to some fixed part of the frame to swing laterally over the work, as will be explained, and its pivotal connection is such that the outer end of said lever is permitted to be raised and lowered toward and from the work and moved in and out over the material in a diagonal direction to engage the reinforcing material and exert a pull thereon in a diagonal line to stretch and smooth out the reinforcing material.

The lateral movement of the smoothing-tool in the outward direction is preferably a positive movement imparted by a cam, and its movement in the opposite direction on the inward movement is imparted by a spring, which will insure a quick action of said tool on the edge of the reinforcing material and its return to its inward position.

The outward movement of the tool K or the outward swing of the lever  $k$ , carrying said tool, is imparted by a pivoted link  $k^2$ , which at its forward end is connected by a pin  $k^3$ , passing through a slot  $k^4$ , to the lever  $k$ , said link  $k^2$  being pivotally connected at  $k^5$  to a slide  $k^6$ , which slide  $k^6$  is arranged to reciprocate in a guideway  $k^7$ , formed by a plate  $k^8$ , secured by a bolt  $k^9$  to the side of the lever  $g'$ , carrying the anvil or former G, the plate  $k^8$  being provided with a slot  $k^{10}$ , in which the fulcrum  $k^5$  of the link  $k^2$  is arranged to reciprocate. At its rear end the slide  $k^6$  is provided with a cam-roll  $k^{11}$ , which is arranged to be engaged by a peripheral cam  $k^{12}$  on cam E, and the inner end of the slide  $k^6$  is connected by a spring  $k^{13}$  to an arm or extension  $k^{14}$ , secured to the end of the lever  $g'$ .

The above arrangement is such that a rotation of the cam E will by means of the peripheral cam  $k^{12}$  impart a forward movement to the slide  $k^6$ , which by means of the link  $k^2$  will impart an outward-swinging movement to the end of the lever  $k$  and the smoothing-tool K carried thereby, and when the cam  $k^{12}$  releases the roll  $k^{11}$  the slide  $k^6$  will be drawn quickly back by the spring  $k^{13}$ , thus causing the smoothing-tool K to quickly snap back into its retracted position. The vertical movement of the smoothing-tool K toward and from the work is imparted by a lever  $m$ , which is fulcrumed at  $m'$  to the frame of the machine, said lever being connected by an arm  $m^2$ , which is rigidly connected thereto and which at its outer end is pivotally connected at  $m^3$  to a link  $m^4$ , which in turn is pivotally connected at  $m^5$  to a lug  $m^6$ , carried by the link  $k^2$ . The lever  $m$  is arranged to be positively actuated in the forward direction to press the smoothing-tool K upon the reinforcing material to grip it against the anvil or former G by a peripheral cam  $m^7$  on the cam E, and said lever is returned in the opposite direction to raise the smoothing-tool K by a spring  $m^8$ ,



one end of which bears against said lever and the other end against some fixed portion of the frame of the machine.

The arrangement just described is such that a rotation of the peripheral cam  $m^7$  will by means of the lever  $m$ , arm  $m^2$ , and link  $m^4$  depress the smoothing-tool K upon the reinforcing material, and when said lever  $m$  is released by the cam  $m^7$  the spring  $m^8$  will move it backward, thus raising the smoothing-tool K.

The operation of my invention is as follows: The insole with a lip struck up thereon having been provided with a covering of reinforcing material which is cemented thereto along the medial line of the sole, with the free edges of the reinforcing material extending over the lip and feather preparatory to being beaded and crimped over the lip and pressed onto the feather, is placed upon the work-support F, with the former or anvil G beneath the edge of the reinforcing material and resting on the feather, its outer end engaging the outer side of the lip and the finger  $g$  resting above the lip. (See Fig. 1.) A rotation of the cam-shaft B will now cause the presser-tool H to descend and press the reinforcing material against the inner surface of the lip and grip the lip and reinforcing material against the former or anvil G preparatory to feeding the work one step to the position where it is acted upon by the beading or crimping tool I. During the downward movement of the presser-tool H the smoothing-tool K has been raised by the spring  $m^8$  forcing back the lever  $m$  and moved outwardly by the cam  $k^{12}$  and its connections, and the cam  $m^7$ , engaging the lever  $m$ , has depressed the smoothing-tool K upon the edge of the reinforcing material, causing it to press said edge against the top of the lip of the insole and against the former or anvil G, the under surface of the stretching and smoothing tool being roughened or serrated or otherwise formed to frictionally engage the reinforcing material. Just prior to the final downward movement of the presser-tool H and before it presses the reinforcing material and lip of the sole against the anvil or former G the cam  $k^{12}$  releases the cam-roll  $k^{11}$  and permits the spring  $k^{13}$  to quickly draw back the slide  $k^6$  and the link  $k^2$ , which causes the smoothing-tool K to quickly snap back, and because said material is clamped by said tool K it exerts a backward pull thereon to stretch and smooth the reinforcing material. The presser-tool H and the anvil or former G now grips the work and feeds it under the beading and crimping tool I, which descends and presses the reinforcing material over the lip and onto the feather, and these operations are repeated until the material has been secured to the insole entirely around the shank and fore part of the sole.

It is to be noted that the smoothing and stretching tool is independent in its movements of the bead-forming tools and that by

giving it the diagonal movement described it effectually stretches and takes up all slack which may be present in the reinforcing material, causing it to lie smoothly against the lip and feather without puckering or plaiting.

It is to be noted that while the slide which imparts to the stretching and smoothing tool its movement toward and from the medial line of the sole is guided to reciprocate in a guide formed on the side of the lever upon which is mounted the anvil or former that the stretching and smoothing tool is entirely independent in its movements of any movement of the lever carrying the anvil or former, the slotted connection between the link upon the reciprocating slide and the stretching and smoothing tool permitting a free action of said tool and also a free action of the anvil or former, the action of the tool and the anvil or former being entirely independent of each other.

Having fully described the construction and mode of operation of my invention, I claim as new and desire to protect by Letters Patent of the United States—

1. In a machine for applying reinforcing material to insoles, the combination with bead-forming tools, for forming a bead or crimp in the reinforcing material and securing it to the insole, of a stretching and smoothing tool operating independently of said bead-forming tools, for stretching and smoothing the reinforcing material, substantially as described.

2. In a machine for applying reinforcing material to insoles, the combination with bead-forming tools for forming a bead or crimp in the reinforcing material and securing it to an insole, of a stretching and smoothing tool arranged to engage the reinforcing material and pull the same from the medial line of the sole toward the edge thereof, substantially as described.

3. In a machine for applying reinforcing material to insoles, the combination with bead-forming tools, for forming a bead or crimp in the reinforcing material and securing it to an insole, of a stretching and smoothing tool and means to impart thereto a pulling movement in a diagonal direction with reference to the front of the machine, substantially as described.

4. In a machine for applying reinforcing material to insoles, the combination with an anvil or former over which the reinforcing material is beaded or crimped, of a stretching and smoothing tool, and means to actuate the same arranged to cause said tool to press the reinforcing material against the anvil or former and exert a pull on said material, substantially as described.

5. In a machine for applying reinforcing material to insoles, the combination with bead-forming tools for forming a bead or crimp in the reinforcing material and securing it to an insole, of a stretching and smoothing tool, and means to positively project said



tool over the reinforcing material and a spring to retract the tool, substantially as described.

6. In a machine for applying reinforcing material to insoles the combination with  
5 bead-forming tools for forming a bead or crimp in the reinforcing material, and securing it to the insole, of a stretching and smoothing tool, a reciprocating slide arranged to move said tool toward and from the medial  
10 line of the sole, and a lever and connections

for raising and lowering said tool toward and from the face of said tool, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE E. MILNER.

Witnesses:

A. E. WHYTE,  
A. O. ORNE.