T. J. & T. H. GIFFORD.

BOOT AND SHOE SOLE PRESSING-MACHINES.

No. 194,866. Patented Sept. 4, 1877.

Fig. 1.

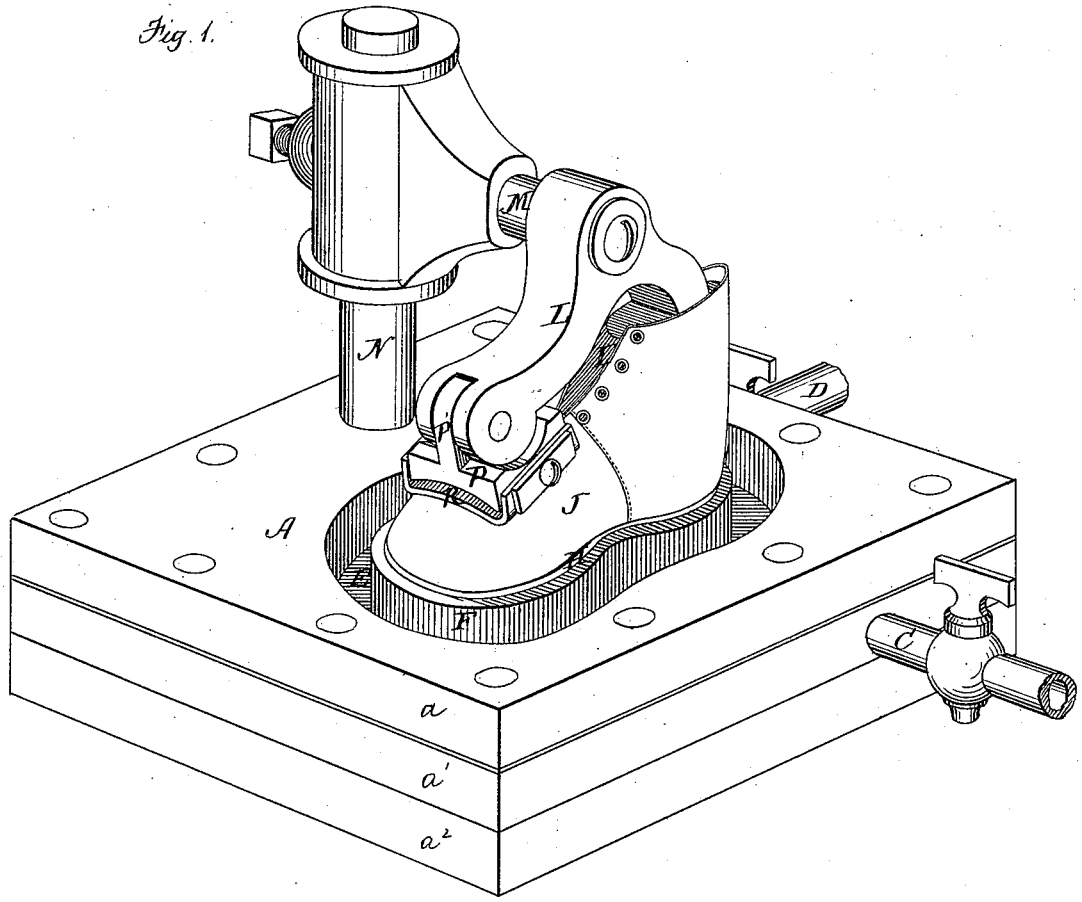


Fig. 2.

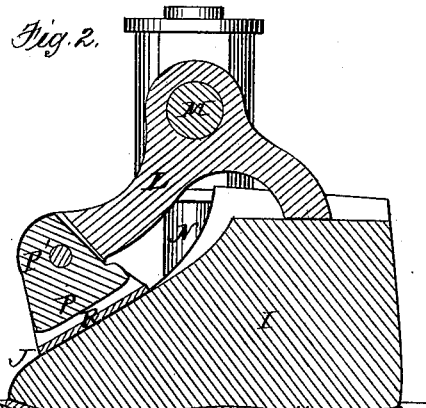
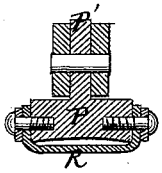


Fig. 3.



Witnesses
A. E. Druison
Horace Brown

Inventor
T. J. Gifford
T. H. Gifford.
By Wright Brown
attys

UNITED STATES PATENT OFFICE.

THOMAS J. GIFFORD AND THOMAS H. GIFFORD, OF SALEM, MASS.

IMPROVEMENT IN BOOT AND SHOE SOLE PRESSING MACHINES.

Specification forming part of Letters Patent No. **194,866**, dated September 4, 1877; application filed July 26, 1877.

To all whom it may concern:

Be it known that we, THOMAS J. GIFFORD and THOMAS H. GIFFORD, both of Salem, in the county of Essex and State of Massachusetts, have invented certain Improvements in Apparatus for Pressing the Soles of "Compo" Shoes against the Uppers, of which the following is a specification:

In the accompanying drawing, forming a part of this specification, Figure 1 represents a perspective view of our invention. Fig. 2 represents a sectional view of the same. Fig. 3 represents a section of the pivoted block on the clamp or holder.

This invention relates to the manufacture of goods known as "compo" shoes, or those in which the sole is united to the upper by cement or other adhesive material—a method which is practiced largely in the manufacture of infants' or small children's shoes. In manufacturing this class of goods it is necessary to hold the sole against the lasted upper with a considerable degree of pressure while the glue or other adhesive material is hardening.

Heretofore a machine has been employed consisting of a series of elastic beds for the soles, resting on a rigid support, and a corresponding series of pressure bars or devices adapted to be forced downwardly on the lasts by means of a lever or treadle worked by the operator. In order to obtain a sufficient degree of pressure the operator has to exert his utmost strength on the lever or treadle; hence the machine is hard to operate, and requires a strong operator to attend it.

Our invention has for its object, first, to provide an apparatus for the purpose above mentioned, in which the pressure shall be exerted entirely by water, compressed air, or other equivalent medium, without the expenditure of muscular force, such pressure being exerted by preference upwardly against the bottom of the sole.

The invention also has for its object to provide an improved device for bearing upon the top of the last and the upper held thereon, either as a support or bearing against the upward pressure exerted on the sole against the last and upper, or as a means for applying downward pressure to the last.

To these ends our invention consists, as a whole, in an apparatus composed of a bed or support for the sole and the lasted upper; an elastic or yielding diaphragm supporting said bed; space under said diaphragm adapted to receive a fluid, such as water or air under pressure, which raises the diaphragm, and thus presses the sole upwardly; and a device for supporting the last and upper against the upward pressure exerted on the sole.

Our invention consists, in detail, in the construction and in certain combinations of parts, all of which we will now proceed to describe.

In the drawings, A represents the base of the apparatus, which contains a space, B, for the reception of water, compressed air, or other equivalent medium. The space B is provided with an inlet and an outlet pipe, C D, and is covered by an elastic diaphragm, E, which is composed of a sheet of rubber or other suitable elastic or yielding material. The diaphragm is preferably confined at its edges between frames or sections a a^1, which are securely bolted together and to a bottom section, a^2, the section a^1 forming the sides of the space B, and the section a^2 the bottom. F represents the bed or support for the sole and lasted upper, of a "compo" shoe. This bed is preferably made of rubber, and its upper surface is in form the reverse of the form of the bottom of the sole, the latter resting snugly at all points against the block, as shown in Fig. 2. The bed F is attached to the diaphragm, which constitutes the only support of the bed.

We prefer to provide the bed with a downwardly-projecting marginal rim, f, which rests on the diaphragm and incloses a dead-air space, s, which separates the central portion of the bed from the diaphragm, as shown in Fig. 2.

H represents the shoe-sole; I, the last, and J the upper held thereon.

The last, with the upper and sole, are placed on the bed F after the sole has been cemented to the upper. A vertically-adjustable clamp or bearing, L, of any suitable construction, is brought to bear on the top of the last and the upper in such manner as to hold the last and upper against upward pressure. Water or compressed air, or any other suitable medium, is now forced into the chamber B, and

raising the diaphragm E, presses the bed F against the sole, and holds the latter firmly against the bottom of the last and upper, the pressure being allowed to continue until the cement hardens.

It will be seen that a very strong pressure can be brought to bear on the sole in this manner, without any material exertion on the part of the operator, particularly in places where the water-supply affords a pressure of about forty pounds, more or less, to the square inch. Where such facilities are not afforded, a force-pump will accomplish the desired result much better and easier than the means heretofore used.

Any desired number of shoes can be pressed simultaneously by duplicating the parts described, to the desired extent, without requiring an increase of the operating power, the pressure required to operate a series of apparatuses being no greater than that required for a single one.

By means of the marginal rim *f* that supports the bed F we are able to apply a greater degree of pressure to the margin of the bed than to its center, thus insuring the effectual pressure of the edges of the sole against the edges of the upper.

The clamp or bearing L that holds the last and shoe against the upward pressure may be of any suitable construction. We prefer to make it in the form of an elbow pivoted at its angle to a bearing, M, which is supported on a vertical standard, N, and is vertically adjustable thereon, the clamp being adapted to swing in a substantially vertical plane.

The two ends of the clamp L are adapted to bear on the top of the last, and on the front of the upper over the last, as shown in Figs. 1 and 2, and the clamp, being pivoted between the bearing ends, is enabled to bear at both points on lasts of different sizes and shapes.

We prefer to provide the front end of the clamp with a block, P, which is pivoted thereto by an ear or lug, P′, and is concaved on its under side. To this block we attach a facing, R, composed of a strip of rubber or other yielding material attached to the opposite sides of the block, and drawn across the concave surface of the same, as shown in the drawings, the concavity of the block forming a space inside of the facing R. The pivoted block P is adapted to have a slight rocking motion, so as to conform to the inclination of the surface on which it bears, and the concavity of the block prevents it from coming in contact with the rubber at the bearing-point, thus preventing injury or defacement of the upper of the shoe.

The clamp thus constructed may be used as a means for applying downward pressure on the last, if desired.

By the use of water, or its equivalent, as a means for applying pressure, as described, we are enabled to operate on a larger class of shoes than those heretofore made with cemented soles, for the reason that the area of pressure increases with the increase in the size of the shoe, and no increase of power is required, whereas in the old machines an increase in the size of the shoe would necessitate a corresponding increase of power, and involve the use of a complicated system of mechanism to obtain the desired pressure.

We claim as our invention—

1. An apparatus for pressing the soles of shoes against the uppers, consisting essentially of a bed or support for the sole, an elastic or yielding diaphragm supporting said bed, a water or air space under said diaphragm, and a device for supporting the last and upper against pressure directed upwardly against the sole, substantially as set forth.

2. The elastic or yielding diaphragm E, provided with the elastic bed having the rim *f*, substantially as and for the purpose specified.

3. The base A, having the space B, the diaphragm E, the bed F, and the inlet and outlet pipes, substantially as set forth.

4. The base A, constructed as described, and having a vertical standard, N, combined with an adjustable device, L, located on said standard and adapted to bear upon a last supported on the base A, as set forth.

5. The elbow or clamp L, having two bearing-surfaces, and pivoted to a vertically and horizontally adjustable bearing, M, in the manner described, and adapted to swing in a substantially vertical plane, as and for the purpose specified.

6. The pivoted elbow or clamp L, provided at one end with the pivoted block P, having a concave under surface and a yielding or elastic facing, R, substantially as set forth.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

THOMAS J. GIFFORD.
THOMAS H. GIFFORD.

Witnesses:
L. W. FAIRCHILD,
C. F. BROWN.