

(No Model.)

2 Sheets—Sheet 1.

A. C. MERRIMAN.
PROCESS OF WORKING HORN, &c.

No. 583,067.

Patented May 25, 1897.

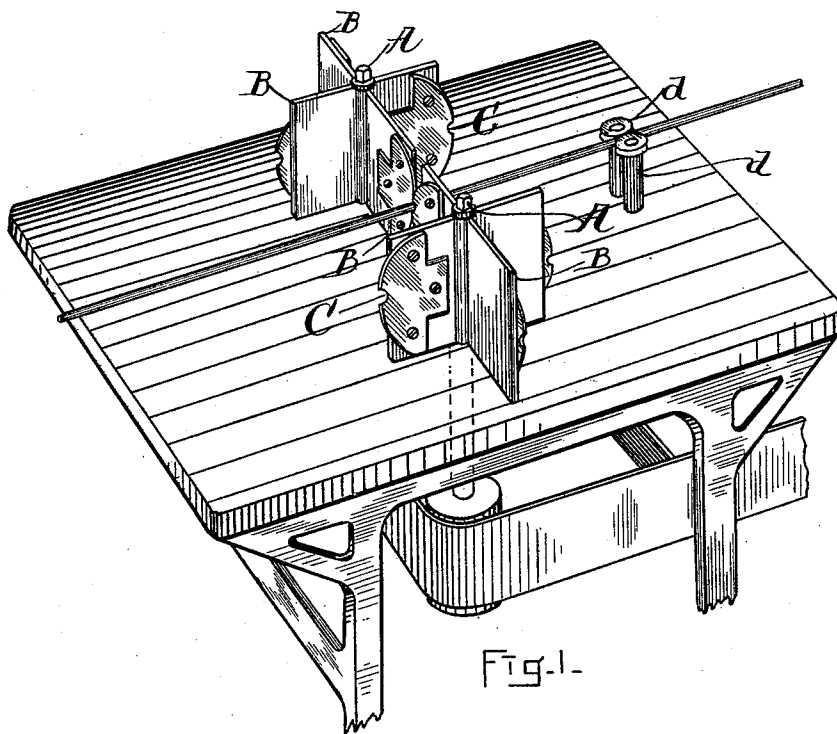


Fig. 1.

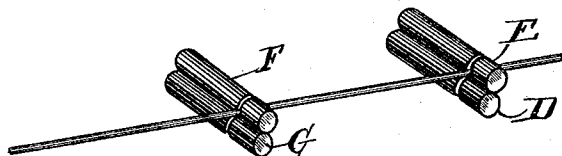


Fig. 2.

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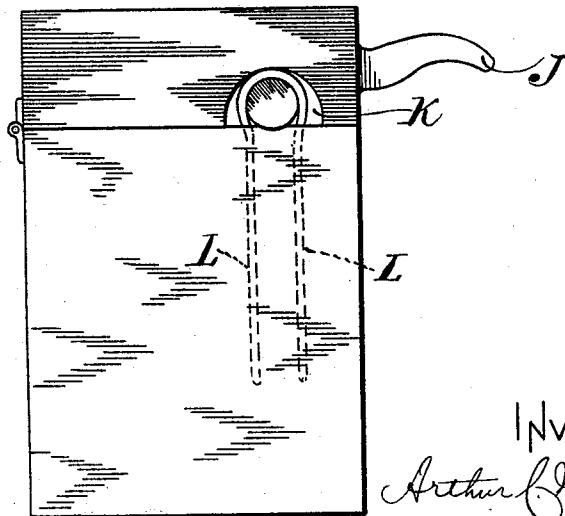
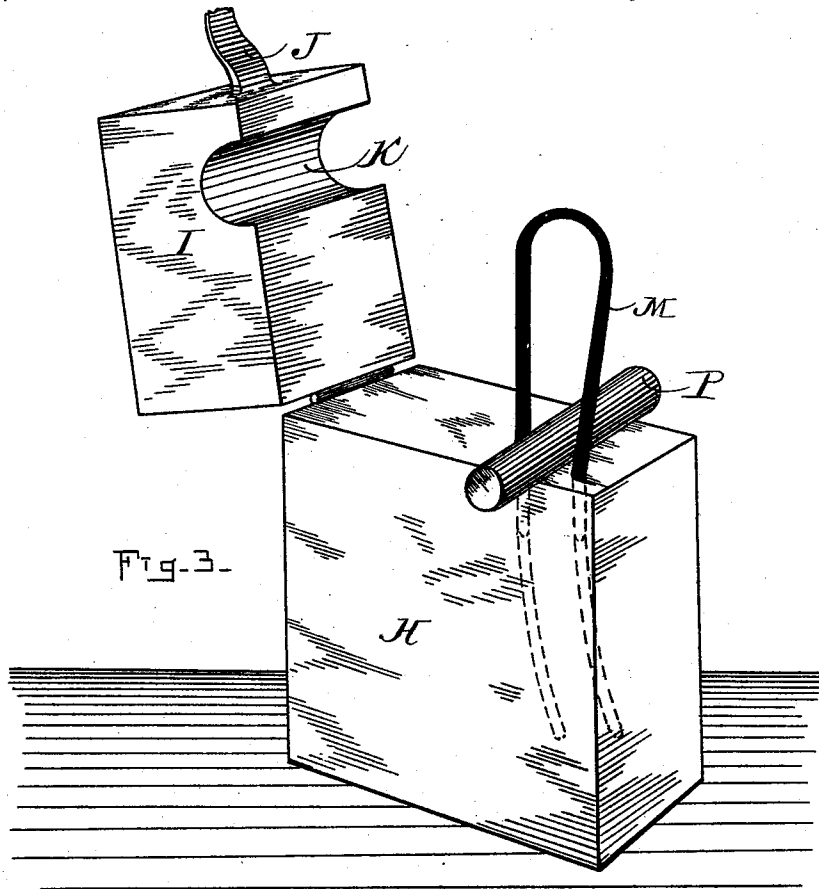
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WITNESSES

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UNITED STATES PATENT OFFICE.

ARTHUR C. MERRIMAN, OF LEOMINSTER, MASSACHUSETTS.

PROCESS OF WORKING HORN, &c.

SPECIFICATION forming part of Letters Patent No. 583,067, dated May 25, 1897.

Application filed June 25, 1896. Serial No. 596,962. (No specimens.)

To all whom it may concern:

Be it known that I, ARTHUR C. MERRIMAN, a citizen of the United States, residing at Leominster, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in the Process of Working Horn, Hoof, Shell, and Similar Material, of which the following is a specification.

My invention consists of a new process for the treatment of horn, hoof, or shell in the manufacture of hair-pins, enabling the stock to be cut in straight strips and kept in that form almost throughout the process of manufacture, whereby a great saving in material, time, and labor results.

Heretofore it has been found impracticable to manufacture horn hair-pins by bending a straight strip, because the pin would not permanently retain its shape, the heat and moisture of the head spreading and twisting the pin.

The difficulties resulting from the processes previously tried have been entirely overcome by my invention, by which I am able to make a hair-pin from a straight strip of material that will permanently retain its shape.

In the accompanying drawings, Figure 1 is a perspective view of a machine for rounding the strips of horn. Fig. 2 is a perspective view of a machine for burnishing the strips. Fig. 3 is a perspective view of the swage holding a bent strip of horn preparatory to swaging. Fig. 4 is a side view of the swage with the lid shut, inclosing a hair-pin.

Like letters indicate corresponding parts in all the figures of the drawings.

In practicing my invention the material is first softened by steaming in the usual manner of treating horn and is then split or leveled to a uniform thickness, as is customary, before cutting the pins. Instead of cutting or dieing out the pin I then cut the horn into straight strips of the required length for a hair-pin. I can cut the horn to better advantage in this manner and get out more pins. The cutting may be done in any manner, but I prefer a power-knife fixed to a plunger and embodied in a machine of novel construction, for which I shall hereafter make application for Letters Patent. The strip is then passed through a machine for molding or rounding it. I prefer to use the machine shown in Fig.

1, for which I shall hereafter apply for Letters Patent and which consists of two upright spindles A, having horizontal arms B, each provided with a knife-edge C, consisting of a curved notch, which curve, when coinciding with the knife on an arm of the other spindle, forms a round hole with a cutting edge that trims the strip of horn as it is drawn through by the feed-rolls d, which rotate in a direction opposite to that of the rotation of the spindles A, which latter are rotated at a high speed, so as to make a smooth cut. Any method of rounding or molding the strips may be substituted for the work of this machine whereby the corners are taken off or compressed. The strips are then sandpapered or smoothed in any manner, but I recommend for rapid work the employment of a pair of sand-wheels mounted on vertical spindles, the wheels having peripheral grooves which form a round opening through which the strips may be drawn by feed-rolls operating like those in Fig. 1, while the sand-rolls are rotated in opposite directions.

It will be noticed that the rounding of the strips is done by one operation and also the smoothing of it by the means referred to, which cannot be the case where the pin has been formed previously. The pin is an awkward shape to operate upon and requires many more handlings than a straight strip of horn. The strips remain slightly moist up to this stage of the process and are now subjected to the usual process of coloring, after which they are partially dried in any of the well-known ways of drying horn. They are kept in a state of agitation during the drying process, so as to dry the surface and leave a little moisture in the center of the strip, so as to make it somewhat pliable. The strips are then burnished or polished, and the means preferred by me is the machine shown in Fig. 2, which consists of two pairs of rolls mounted on horizontal axes. The rolls are grooved so as to admit the strips, and the opening formed by the grooves in the rear rolls is in line with that formed by the grooves in the forward rolls. The lower roll D is rotated so as to feed the strip forward to the left, while the upper roll E is rotated in the opposite direction. The roll E has a highly-polished surface and serves to finish the upper side of

the strip. The upper roll F acts like the lower roll D to feed the strip, while the lower roll G is a highly-polished one and is rotated in the opposite direction to the roll F for the purpose of polishing the under side of the strip. The strips are now immersed in a bath of hot lard-oil for about twenty minutes and then swaged, as hereinafter particularly described. The operation of the lard-oil bath at this stage is very essential. Its action is to displace the water and moisture in the strip, which must be disposed of before it is swaged. The pin will not retain its shape when in use if a particle of moisture remains in the strip during the process of swaging and cooling. The swage is shown in Fig. 3, and consists of a metallic box II, having a lid I, provided with a handle J to force down the lid upon the head of the pin.

K is an opening to admit a rod over which the head of the pin is bent to form it.

L L are deep slender holes to receive the shanks of the pin. The surfaces of the holes are highly polished.

When the strip is taken from the bath of lard-oil, it is bent and its ends inserted into the holes L L. The rod P is then laid in the space K between the points of the strip M, which is then forced down into the holes L L. The lid I is then closed, and by means of the handle J is pressed down upon the head of the pin, so as to compress the head and to force the points down into the swage. The swage is heated before the strip is put into it to a degree much greater than the temperature of the strip itself. The pin is held in the swage under pressure for a brief time. The swage is then dipped into a cooling solution consisting of some mixture of oil. I prefer to use a composition of about two-fifths solar oil, about two-fifths naphtha or benzin, and about one-fifth lard-oil. This composition should have a temperature of from 20° to 30° Fahrenheit, which is accomplished by setting the vessel containing it in a solution of brine, which is kept in a state of agitation.

The pin may be partially withdrawn from the swage before the swage is dipped into the cooling solution, providing a considerable part of the shanks of the pin are still held in the swage and thereby not allowed to change their position, the purpose being to subject the pin itself to the cooling process while it is retained in proper shape by the swage. The swaging and cooling process imparts a permanent shape that is not affected by the heat

or moisture of the head, to which it is subjected in its ordinary use. The swage may be somewhat effective without heating it before the strip is put in, but by chilling it when the pin is being swaged. Better results are obtained, however, by heating the swage hotter than the strip before it is put in and then chilling the swage, as above described.

While I have shown and described one form of swage which is operative, it is evident that a great variety of forms could be employed for this purpose more or less convenient and economical. It is only essential that it be so constructed that the pin in its final shape may be held firmly in its grasp and that while so held a pressure may be exerted sufficient to set the head bend and loop and to kiln the stock so that it will retain its shape. The lid or cap of the swage may be entirely separate and distinct from the body of it for all practical purposes. If the strip is held by one device with the loop exposed for the action of the cap, the cap may be in the form of a pair of jaws or dies of the requisite shape to grasp and compress it into the proper form.

I do not limit myself to the particular construction of the mechanical devices described for operating upon the strip, as a great variety of simple tools and machines can be employed to perform the various operations described.

My invention covers the process consisting of the several operations enumerated upon a straight strip of material preparatory to swaging and then swaging the strip into the required shape, whatever mechanical devices or tools may be employed to perform such operations.

What I claim as my invention, and desire to secure by Letters Patent, is—

The hereinbefore-described process of manufacturing hair-pins from hoof, horn, shell or similar material consisting of molding, smoothing and burnishing successively a straight strip while in a pliable state, then coloring the same in any of the well-known ways of dyeing horn, then subjecting the same to a bath of hot lard-oil and then swaging it into its finished shape and chilling it while being swaged, substantially as described.

In witness whereof I hereunto set my hand this 6th day of March, A. D. 1896.

ARTHUR C. MERRIMAN.

Witnesses:

HARRY C. BASCOM,
NATHAN E. METCALF.