A. A. & R. B. HAWLEY.

Mechanism for Forming Bats for Boots, Shoes, Hats, &c.

No. 204,668. Patented June 11, 1878.

Fig. 1.

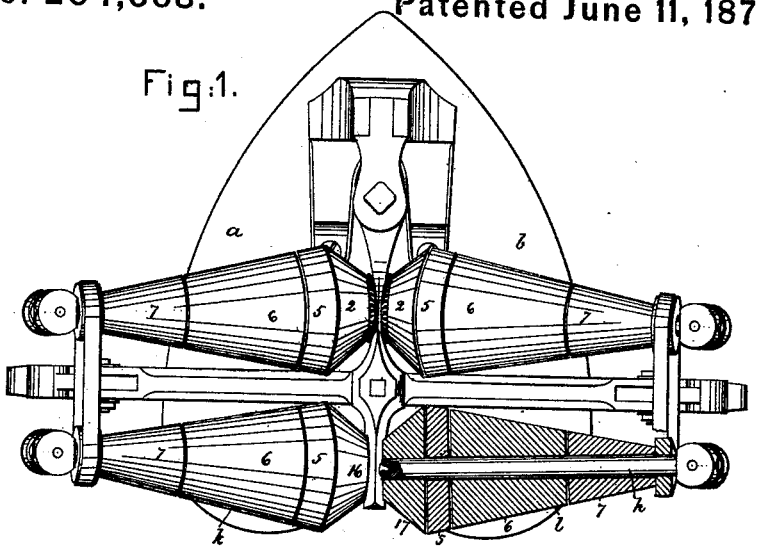


Fig. 8.

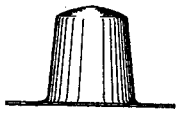


Fig. 2.

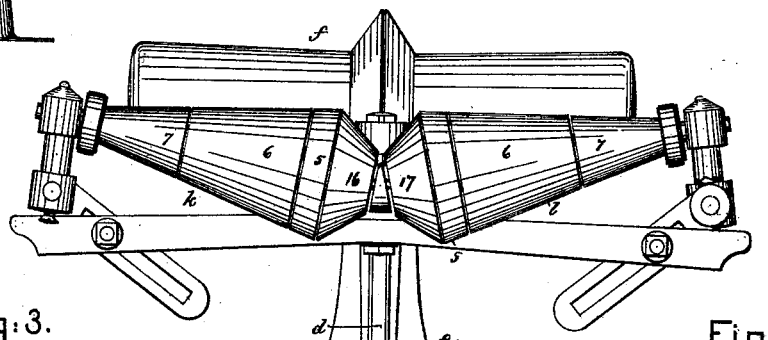
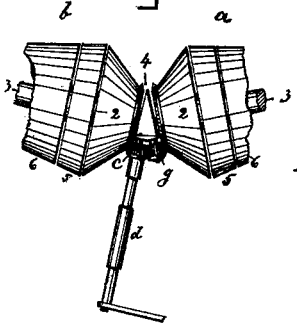


Fig. 3.



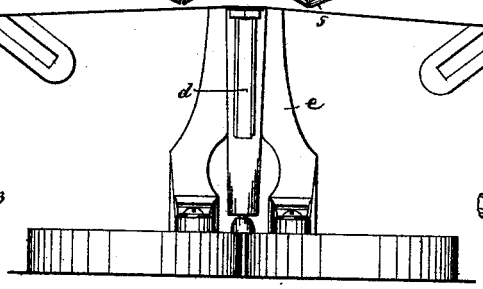


Fig. 4.

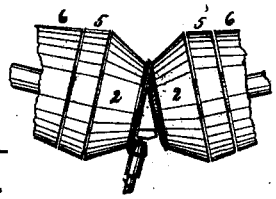


Fig. 5.

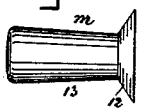


Fig. 6.

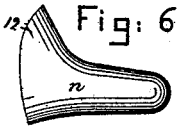
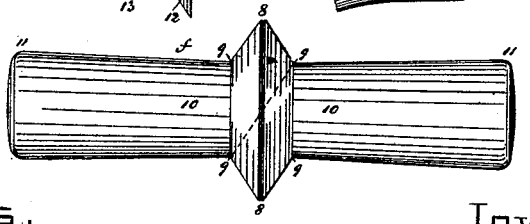


Fig. 7.



Witnesses.

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UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN MECHANISMS FOR FORMING BATS FOR BOOTS, SHOES, HATS, &c.

Specification forming part of Letters Patent No. **204,668**, dated June 11, 1878; application filed March 29, 1878.

To all whom it may concern:

Be it known that we, ALFRED A. HAWLEY, of Merrimack, and ROBERT B. HAWLEY, of Amesbury, both in Essex county, State of Massachusetts, have invented an Improvement in Mechanism for Forming Bats for Boots, Shoes, Hats, or Head-Coverings, of which the following is a specification:

This invention relates to mechanism to form bats for boots and shoes and hats or head-coverings, whereby much of the shape to be given to the completed article is given to the bat, whereby the article made from such bat better retains its shape, and the now commonly-practiced method of shaping to exact form by stretching the fulled or shrunk bat is almost, if not quite, obviated.

In hat-making, the former is usually made to resemble two cones joined base to base, and each separate bat formed thereon is, after hardening and shrinking, stretched to cause its open end to assume the proper angular or radial position with reference to the body of the hat to serve as the brim. A brim produced by stretching the material after shrinking it is liable, when wet, to assume its original position; or, in other words, a wool hat formed on the usual cone is liable, when wet, to assume the conical shape that it possessed before it was stretched to produce the brim.

In this invention the "former" is shaped to produce a wool bat with a radial base projecting outwardly from the main or body part of the bat. This peculiar former is specially applicable for the production of bats for boots and shoes and leggings, the radial base of the bat, according to the direction in which the wool upon the former is cut, serving as the foot and toe part of a boot or high shoe, or the brim of a hat, or the lower part of a gaiter-top or legging.

The invention consists, primarily, in a former provided with an annulus projecting from its body in such direction, substantially as described, that a line extended from the highest part of the annulus to the body of the former, where the annulus meets the body of the former, will form an obtuse angle with the body of the former, substantially as hereinafter set forth; also, in a former provided at its center with an enlarged annulus, as just above described, and with its ends of greater diameter than the body of the former at or near the annulus; also, in the combination, with a former, of sectional sustaining-rollers, a portion of their surfaces being free to adapt their speed to the speed of movement of the former; also, in the bat herein described, as an article of manufacture, it being provided at its large end with a radial base extended outwardly from the body part of the bat, to form the toe and foot of a boot and shoe, or the brim of a hat, substantially as described.

Figure 1 represents, in top view, a sufficient portion of a bat-forming mechanism to show one embodiment of this invention; Fig. 2, a rear elevation thereof; Fig. 3, a detail of one plan for driving the main pair of rolls; Fig. 4, a different plan; Fig. 5, a view of a hat-forming bat; Fig. 6, a view of a boot-forming bat; Fig. 7, a side elevation of the novel former, and Fig. 8 a section taken through a shrunk hat-blank made by this our method.

The main rollers *a b* have their bases 2 connected positively with their shafts 3, suitably supported in adjustable bearings of frame *e*, and each base has a bevel-gear, 4, by which the main rollers are operated in unison in the same direction. One of the bevel-gears on the end of one base—say the base of roller *b*—may be driven by means of a bevel-pinion, *c*, on a rotating shaft, *d*, carried by the swinging frame *e*, which also carries the bearings for all the rollers, such shaft being rotated in any usual way, the frame being oscillated as commonly done before the doffer of a carding-engine, so as to change the axial presentation of the former *f*, supported and rotated by the rolls of the frame *e*, so as to wind the wool web removed from the doffer from end to end of the former, each layer crossing the other.

The bevel-gear 4 on roller *b* may directly engage the bevel-gear like it upon the roller *a*, as in Fig. 3; or a separate bevel-pinion, *g*, driven by the bevel-pinion *c*, may engage and drive the bevel-pinion 4 on the roller *a*. The shafts 3 of rollers *a b* are properly belted or geared with the shafts *h* of the back rolls *k l*

so that the surfaces of all the rolls move in the same direction. The surfaces of these rollers are made in sections, as at 5 6 7, each section being loosely held upon their shafts. The former *f* has an enlarged central annulus, 8, which intersects at 9 with the body 10 of the former each side the base of the annulus. The extreme ends 11 of the former may, for boots, be of larger diameter than at the parts 10, so as to give the necessary taper to the leg; but for hats the body of the former may be cylindrical, or be somewhat tapered toward its extreme ends, growing smaller toward such ends.

The greatest diameter of the former is at the annulus, and as that portion moves more rapidly than does the body part 10, we have herein provided to drive positively the part of greatest diameter (the annulus) by the fixed parts or bases of the rollers; and the portions of the rollers bearing upon the body of the former, or the wool being wound thereon, from the base of the annulus to the ends of the former, are loose, and adapt their surface-speed of movement to the surface-speed of the former, or the wool thereon. This lays the bat evenly, avoids strain, which would occur were the roller-surfaces all connected and moved at the same speed from end to end, and enables the wool to be wound firmly and closely into the angle between the annulus 8 and the body 10.

The former, wound with wool to the required thickness, according to the weight of the boot, shoe, or hat to be produced, has such wool removed as follows: For a hat, the wool will be cut on the line of the high part of the annulus, or substantially at right angles to the length of the former, thereby producing a hat-forming bat, *m*, as in Fig. 5. If a boot or shoe, legging or gaiter-top is to be made, the wool is divided diagonally to the axis of the former and across the annulus, substantially as shown by the dotted lines across Fig. 7, one of the bats *n* so formed being shown in Fig. 6.

If the boot or shoe is to have a closed felt bottom, the large open end of the bat *n* will preferably be closed after hardening the main portion of the bat above or beyond such open end, as described in another application for patent filed by us concurrently with this, and the open end will be finally closed upon a horn-like bed, also fully described in another application filed concurrently with this, after which it will be properly shrunk and fulled and dried upon a last and made up. This bat *n*, if hardened and not closed at the open end, may, after shrinking and fulling, be used as a seamless leg and foot for the manufacture of a boot, it being supplied with a sole of leather or other material in any usual way.

The bat *m* to form a hat has the base, or angular or radially-projecting portion 12, extended from the body part 13. Such portion 12, after being subjected to the hardening and shrinking and fulling operations, will remain extended from the body in substantially the position that such brim should occupy in the completed merchantable hat. Such a hat-brim by wear will not fall down out of shape, as is commonly the case with hats made from conical bats stretched at the larger ends, as hereinbefore described and as commonly made. A shrunken hat-body made as described need not be put upon the usual stretching-machine, but, after the fulling and surfacing operation, may be put directly into the finishing-press. The formation of a bat with this radial or angular base 12 is of great importance in the manufacture of boots and shoes, and the bat so produced for subsequent operations may become an article of sale.

The rollers may be divided so as to present one or more loose sections. Figs. 5, 6, and 8 in the drawings are made upon a more reduced scale than on the remaining figures. The base portions 16 17 of the rollers *k l* are fixed to the shafts within them.

We claim—

1. A former provided with an annulus projecting from its body in such direction, substantially as described, that a line extended from the highest part of the annulus to the body of the former, where the annulus meets the body of the former, will form an obtuse angle with the body of the former, substantially as set forth.

2. A former provided with an enlarged central annulus, substantially as described, and with ends of larger diameter than the body of the former near the intersection of the annulus and body, substantially as set forth.

3. The combination, with a former, of sectional rollers to support and rotate it, substantially as described.

4. The combination, with the former provided with the enlarged annulus, of supporting-rollers, certain portions of which next the annulus are driven positively to rotate the former, while other portions are loose thereon, substantially as described.

5. As an article of manufacture, a wool bat provided with a base projecting therefrom at its large end, substantially as described.

6. The herein-described method of manufacturing blanks for hollow felted articles, such as boots, shoes, and hats, consisting in first forming a wool bat with a radial base projecting therefrom, and then hardening, fulling, and shrinking such bat, substantially as described.

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

ALFRED A. HAWLEY.
ROBERT B. HAWLEY.

Witnesses:
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F. G. SEYMOUR.