

R. EICKEMEYER.
Hat-Stretching Machines.

No. 140,903.

Patented July 15, 1873.

Fig. 7.

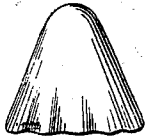


Fig. 8.

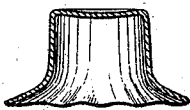


Fig. 9.

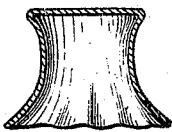


Fig. 1.

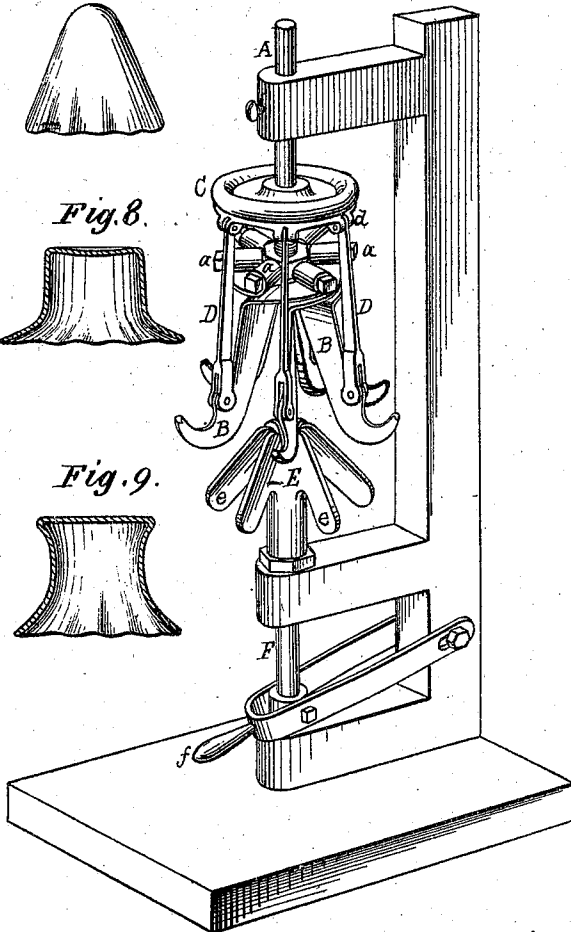


Fig. 2.

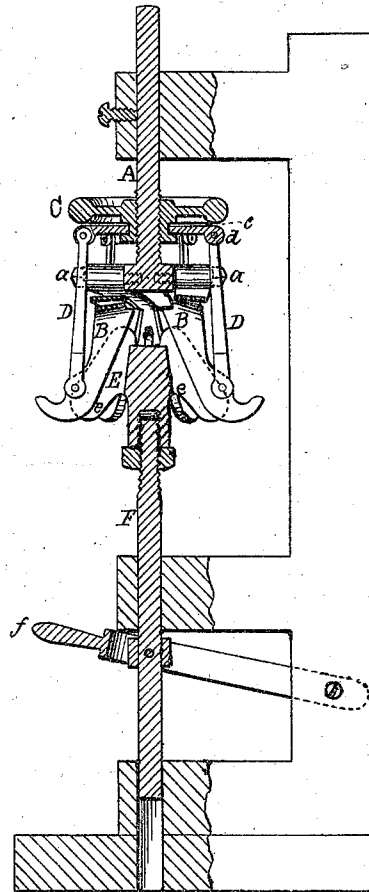


Fig. 3.

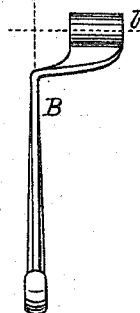


Fig. 4.

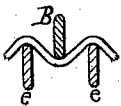


Fig. 5.

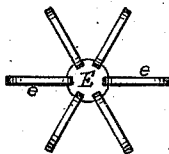
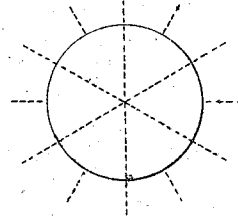


Fig. 6.



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Fig. 10.

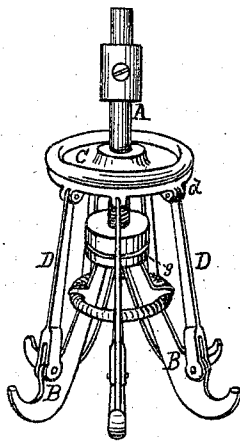


Fig. 11.

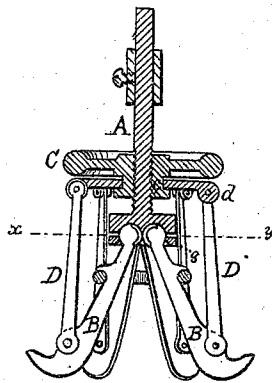


Fig. 12.

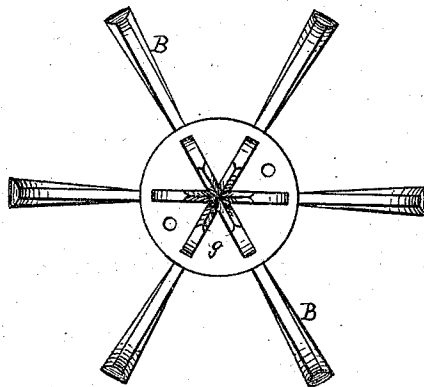
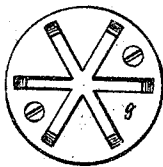


Fig. 13.



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UNITED STATES PATENT OFFICE.

RUDOLF EICKEMEYER, OF YONKERS, NEW YORK.

IMPROVEMENT IN HAT-STRETCHING MACHINES.

Specification forming part of Letters Patent No. **140,903**, dated July 15, 1873; application filed June 11, 1873.

To all whom it may concern:

Be it known that I, RUDOLF EICKEMEYER, of Yonkers, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Machines for Stretching Hat-Bodies; and I do hereby declare that the following specification, taken in connection with the drawings furnished and forming a part of the same, is a full and correct description of my invention.

My improvements relate, particularly, to mechanism for stretching the "tips" and "squares" of hats on the corrugation principle; and they may be embodied in machines solely intended for that purpose; or in more complex machines, which are, in addition thereto, also adapted to stretch other parts of a hat-body at the same time. My invention consists, mainly, in hinging the stretching-fingers to a support which is common to them all in such a manner that they will extend angularly and radially from their support, be simultaneously adjustable, and present longitudinal stretching-surfaces for engaging with the surface of a hat-tip. My invention also consists in mounting the several stretching-fingers on axes which occupy one plane, and radiate from a common center; and also in combining these stretching-fingers with a suitable "former," whereby hat-bodies of various kinds and sizes may be stretched to any desirable degree at the tip or square in an expeditious and effective manner.

In order to more particularly describe my invention I will refer to the two sheets of accompanying drawings, of which—

Figure 1 represents a machine which is adapted solely to operate on the tip and square of a hat-body, and in which the stretching-fingers are mounted on axes, which occupy the same plane, and radiate from a common center. Fig. 2 represents the same in vertical section. Fig. 3 represents one of the stretching-fingers detached from the machine. Fig. 4 represents, in vertical section, one of the stretching-fingers and two ribs of the former, with a portion of the hat-body interposed at a point adjacent to the square of the hat. Fig. 5 represents, in top view, a conical former. Fig. 6 represents, in top view, the tip of a stretched hat-body. Fig. 7 represents a hat-body prior to the

stretching operation. Fig. 8 represents a hat in section after it has been moderately stretched at the tip and square. Fig. 9 represents the same after having been over-stretched. Fig. 10 represents, in perspective, a set of stretching-fingers, which are attached to their support by a method of connection somewhat unlike that represented in the preceding figures. Fig. 11 represents the same as in Fig. 10 in vertical section. Fig. 12 represents, in lateral section, an enlarged view of the stretching-finger support on the line *xy*. Fig. 13 represents a plate for holding the fingers to the spindle, as if viewed from below.

In each of the figures, A denotes a supporting-spindle. As arranged in the machine shown in the drawings, it is vertical in position, and is suspended from a bracket which projects laterally from an upright portion of the frame. To render it vertically adjustable it is fitted to slide-bearings in the bracket, and a set-screw is arranged to engage with the spindle. The lower end is provided, as shown in Sheet 1, with six radial arms, *a*, equidistant from each other, and at true right angles to the vertical axis of the spindle. As represented on Sheet 2, the lower end of the spindle is provided with six slots or recesses. B in each instance denotes a stretching-finger. As represented in the drawings, six of these fingers are embodied in one machine, and are suspended angularly and radially from the spindle A. The number of fingers which can be thus profitably employed in one machine is not arbitrary; but I find that six, as shown, do operate with great practical value. These fingers are mainly straight on the line of their lower or stretching surfaces, but at their lower ends are curved outward in the same vertical plane.

A very desirable method of mounting them is clearly shown in Fig. 3, in which it will be seen that the upper end of the finger is bent laterally and curved just ninety degrees, and provided at the end with an eye, *b*, or cylindrical opening, the longitudinal center of which is on a line at right angles to the central longitudinal line of the finger. These several fingers are mounted on the radial arms *a* at the lower end of the supporting-spindle, and said arms constitute axes, on which said fingers

can vibrate radially. The spindle A, above the radial arms, is encircled by an exterior screw, and fitted thereto is a hand-wheel, C, which is provided with a recessed hub, as at *c*, to which in turn is fitted a circular adjusting-plate, *d*, in such a manner that the turning of the hand-wheel on the screw of the spindle will effect a vertical movement of the plate *d* without any corresponding rotation thereof. Each of the stretching-fingers B is connected by a link, D, by means of hinge-joints at each end to the periphery of the adjusting-plate *c* in such a manner that the turning of the hand-wheel will advance or withdraw the lower ends of said fingers to or from a central line coincident with the vertical axis of the supporting-spindle.

Another method of mounting these fingers is illustrated on Sheet 2. The lower end of the spindle A, as indicated, may be slotted and provided with milled chambers for receiving the ends of the stretching-fingers, which are in turn fitted thereto.

When so constructed they may be mounted on axes, or merely held in position by encircling them near the spindle with a retractile spiral spring-band or similar device.

A milled head-plate, as at *g*, Figs. 10 and 11, may also be employed successfully for holding the butts of the fingers in proper position with relation to the spindle.

As will be seen in Fig. 12 the axis of each finger may be brought very near to the vertical central line of the spindle A, although it is impracticable when so mounted to have the imaginary or actual axes, on which the fingers hinge, located at the true center of the spindle, as is the case when the radial axes are employed as illustrated in Figs. 1 and 2.

E denotes a skeleton ribbed and recessed former, substantially like the one which is, in part, the subject of Letters Patent issued to me February 28, 1865, No. 46,553, reissued December 1, 1868, No. 3,217. It is conical in its outline, and should have a circumference at its base equal at least to that of the smallest-sized hat to be stretched. It is, when employed with the stretching-fingers, to have a corresponding number of ribs, *e*, like the fingers, also placed equidistant from each other. The upper surfaces are preferably to be rounded and smooth to prevent any undue abrasion of the felt. The upper ends of the ribs *e* are rounded inward, as shown in Figs. 2 and 5, so that the former is, in this instance, in outline, more strictly speaking, the frustum of a cone. The former is mounted on the upper end of a vertically-reciprocating spindle, F, the longitudinal axis of which is coincident with the axis of the supporting-spindle A.

The cone-spindle in a machine adapted to stretch only the tips and squares of hats may be provided with a hand-lever, as at *f*, or connection may be made with a rotating shaft in a manner well known. When employed in more complex machines, like that described in the Letters Patent already referred to, or

in another machine described in patent No. 91,730, June 22, 1869, also issued to me, the brim-stretching mechanism, and any other essential or desirable auxiliary apparatus, can readily be combined with the stretching-fingers herein described.

The mode of operation of my improved machine will be readily comprehended, but I will briefly explain that a hat-body, such as is represented in Fig. 7, is pressed or placed upon the ribbed former, when its spindle is at its lowest point and then elevated therewith, until the several stretching-fingers forcibly press the tip of the hat into the recesses or spaces between the ribs *e*, as illustrated in Fig. 4. The hat is turned on the former and several times set up against the fingers. It will be seen in Fig. 2, that if the former E had a complete conical outline, its apex would occupy a point precisely at the center of the supporting-spindle A, adjacent to its lower end, and that it is from this exact point that the axes *a* of the several stretching-fingers radiate, and therefore when the tip of the body, as in Fig. 7, is subjected to the action of the fingers properly adjusted, it is straightened and flattened by the stretching, as illustrated in Fig. 8, and can also be over-stretched, as in Fig. 9, by advancing the several stretching-fingers toward the center. In performing this operation, the several stretching-fingers and the ribs occupy positions which correspond with the dotted lines shown in Fig. 6, and it will readily be seen that all of these lines radiate from a center which is common to them all.

In working the stretching-fingers, which are not hinged on the radial axes, it will be found that they will operate substantially as already described, but it will be obvious that in advancing and withdrawing them, the portion of the fingers adjacent to the upper portion of the cone-former will not be moved to the same proportionate extent, as will the outer ends of the fingers; while on the other hand when the axes of all the fingers occupy the same plane and radiate from a common center, each finger in adjustment is moved from the central axis throughout its length; and in all positions in which it may be placed, the same comparative relation to the cone-former will be maintained.

It is a fact well known to the craft, that hats of different grades require different degrees of stretching, and it will be seen that by adjusting the fingers the same former will serve not only for accomplishing variable results on any one size, but for properly stretching all sizes of hats. It will also readily be seen that similar results would be attained if the stretching-fingers and the former were arranged to operate horizontally, although for general convenience the vertical arrangement is believed to be the most desirable.

Although I have herein shown and described my novel tip-stretching fingers, in combination with a ribbed and recessed former, it is to be understood that I am well aware

that approximate results may be attained by the employment therewith of a former which is sufficiently flexible to allow it to assume under pressure a form approximating to that of the former herein shown. It is also to be understood that I do not limit myself to the number of my novel stretching-fingers combined in one set, for I am well aware that a lesser or a greater number may be employed with results more or less desirable.

As improvements in hat-stretching machines which embody interior supporters and exterior stretching devices, as substantially described in Letters Patent heretofore issued to me, and specifically referred to herein, I claim—

1. In a hat-stretching machine which operates on the corrugation principle, a set of tip-stretching fingers, each of which has a longitudinal stretching-surface, and is hinged at its inner end to a support which is common to all of the fingers, substantially as and for the purposes specified.

2. The stretching-fingers B, hinged to a suitable support upon axes which radiate in the same plane from a common center, substantially as described.

3. In a corrugation hat-stretching machine, the several angularly-radiating fingers, hinged at their inner ends, and provided with longitudinal radiating tip-stretching surfaces, in combination with a suitable former for sustaining the hat, substantially as and for the purposes specified.

4. The combination of the several angular and radial stretching-fingers with the mechanism for adjusting, substantially as described, whereby the tips and squares of hats of various kinds and sizes may be stretched to any desired degree, as set forth.

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Witnesses:

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