

R. EICKEMEYER.
Hat-Stretching Machines.

No. 141,337.

Patented July 29, 1873.

Fig. 1.

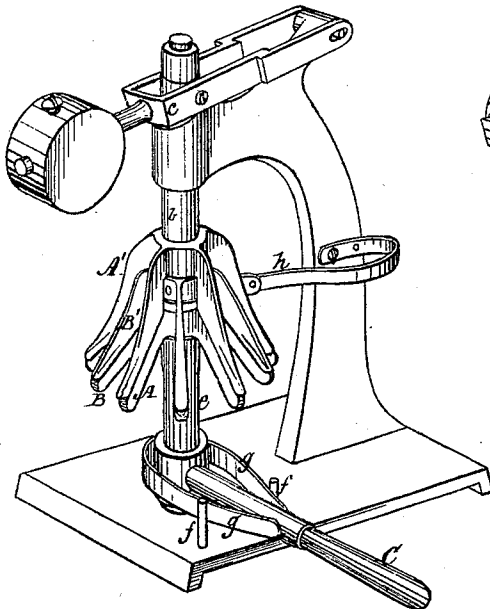


Fig. 2.

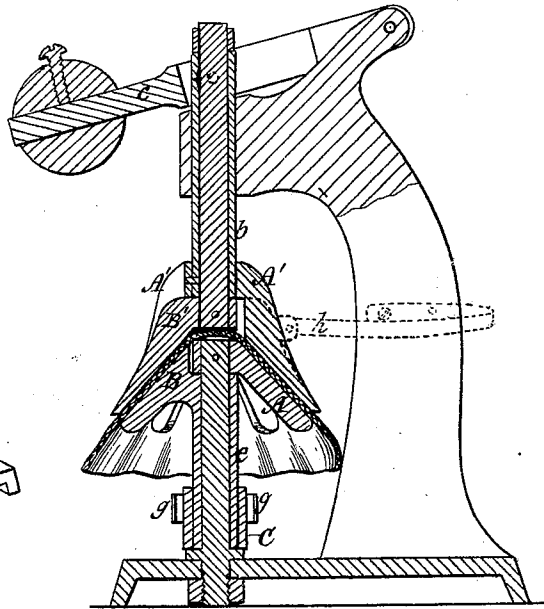


Fig. 3.

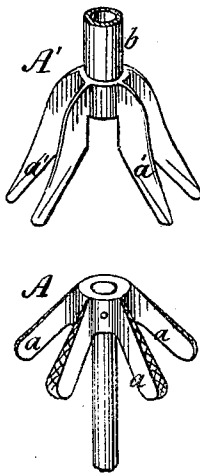
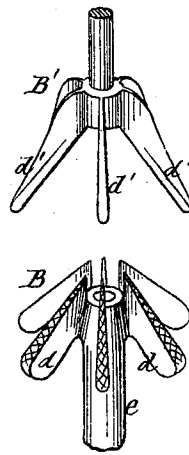


Fig. 4.



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IMPROVEMENT IN HAT-STRETCHING MACHINES.

Specification forming part of Letters Patent No. **141,337**, dated July 29, 1873; application filed July 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 Hat-Stretching Machines; and I do hereby declare that the following specification, taken in connection with the accompanying drawings forming a part of the same, constitutes a true and accurate description thereof.

My invention consists mainly in combining a radially-ribbed sectional clamp for engaging with and firmly holding the portion of the hat-body to be stretched, with a radially-ribbed stretcher, which is arranged to engage with the inner and outer surface of the hat at points thereon between the ribs of the clamp, and which is capable of being partially rotated on an axis, with a movement equal to the limited spaces between the arms or ribs of said clamp; and also in combining with one of the sections of the clamp a controlling spring.

The clamp employed by me may be constructed more or less conical in its general outline, and be adapted to receive a hat-body which is to be stretched at both tip and brim; or it may be adapted for use with stretching devices intended to operate only upon the tips or the brims of hats. Whether adapted to and capable of holding the hat or hat-body at one or two points, the operation of the stretcher therewith will be substantially the same in all cases, and it will stretch the tips or brims of hats by means of the application of force or strain in the line of the periphery of, and simultaneously at, different points in the perimeter of the hat or hat-body.

As heretofore constructed, machines for stretching hats or hat-bodies have either been operated upon what may be termed the corrugation principle, or the peripheral-extension principle. The employment of radial stretching-fingers with radial ribs is common in the corrugation machines, and the stretching of the hat is accomplished by strain or force, which is applied to the hat-body on lines which are generally at right angles to the periphery of the hat, and hence the corrugations. In the extension machines, the stretching operation is effected either by the separation or expansion of the two parts of a sectional block

on which the hat is placed, or by spreading or expanding jaws, which operate on a flat-folded hat-body. In both of these latter cases the strain is applied to the hat-body on peripheral lines, and in both cases the strain is applied simultaneously to two sides of the hat, which is partially flattened in one case, and wholly flattened in the other.

In my new machine the stretching operation is effected by the application of strain on the line of the periphery of the hat or body at several different opposite points thereon, while the hat or body is firmly held at intermediate points in an open or extended condition, whereby the operation of stretching is rapidly, safely, and economically performed; but more particularly to describe my invention I will refer to the accompanying drawings, in which—

Figure 1 represents, in perspective, a machine which embodies my invention. Fig. 2 represents the same in vertical section, with a hat-body in proper position to be stretched. Fig. 3 represents the two sections of the clamp detached from the machine. Fig. 4 represents the two sections of the stretcher detached.

A and A' denote the two sections of the clamp. Both are rigidly mounted on coincident spindles. The section A is composed of six ribs, *a*. Each rib has a rounded or convex lateral surface for engaging with the hat-body. The section A' is provided with six ribs, *a'*, which project radially and downward from a central hub. The ribs are equidistant from each other; their lower surfaces are laterally convex to receive the concave surfaces of ribs *a*, and it is between these coincident surfaces that the hat-body is held. The general form of the surface of the several ribs *a'*, considered as a whole, is that of an inverted cone. The section A' is mounted rigidly on the lower end of a sliding spindle, *b*, to the upper end of which is pivoted a weighted lever, *c*, which is, in turn, pivoted, by a slotted connection at one end, to a portion of the standard of the machine. The sliding spindle moves in a vertical bearing, which is also supported by the standard. As my present invention does not relate to the means for vertically operating the spindle, or raising and lowering the section A', I have not shown such, nor do I think it necessary to describe them, as many of the ap-

pliances now used in hat-stretching machines may be readily adapted thereto in an obvious manner. B and B' denote the two sections of the stretcher. The section B is composed, in this instance, of six radial arms or ribs, *d*, which correspond closely with the arms *a* of the clamp-section A', already described. The section B is mounted on the upper end of a hollow spindle, *e*, which embraces the rod or spindle on which the clamp-section A is mounted, and the arms or ribs of the stretchers occupy the radiation spaces between the ribs of the clamp-section, so that when viewed as a whole it resembles a twelve-ribbed cone. The stretcher-section B' is composed of six radial arms or ribs, *d'*, which so closely correspond with the arms *a'* of the clamp-section A' that the stretching and clamp sections A' and B', viewed as a whole, appear like a twelve-ribbed inverted cone. The lateral coincident surfaces of the ribs *d* and *d'* are, respectively, convex and concave, as is the case with the ribs *a* and *a'* of the clamp. The stretcher-section B' is so mounted on the end of the sliding spindle *b* that it can partially rotate thereon to an extent equal to one of the spaces between the ribs of the clamp. The stretcher-section B, mounted on the upper end of the hollow spindle *e*, is also capable of being partially rotated; but, as the ribs *a* of the clamp are stationary and the ribs *d* are located between them, the latter can only move within the spaces between the said ribs *a*. The hollow spindle *e*, at or near its base, is provided with a lever, C, by means of which the spindle with the stretcher, which it carries, can be semi-rotated. Two stops, *f*, are arranged to bear against side springs *g*, which bear against the sides of the lever C, and thereby cause the stretcher-ribs, when not in action, to be located in every case between the adjacent ribs of the clamp-sections. In order that the arms *d'* of the upper stretching-section may maintain proper relations with the ribs *a'* of the clamp, a curved flat spring, *h*, is arranged to project from the standard and connect with the hub of the section B'. The spring is so set that it will exercise no force upon the section unless the latter is rotated in either direction out of its normal position.

In some instances the concavo-convex surfaces of the ribs or arms of the clamp and stretcher sections will be roughened by angular scores, to induce proper contact with the hat-body. In other cases the ribs will be clothed with wood, India rubber, cloth, felt, or any other suitable material which will properly engage with the hat-body without injury thereto.

The operation of my improved machine will be readily comprehended.

A hat-body, for instance, ready for stretching is placed upon the complex cone, and the inverted cone is let down thereon. The tip of the body will be pinched between the twelve clamp-ribs and the twelve stretcher-ribs with a uniform degree of pressure. The lever C is

moved from left to right, and the several stretching-ribs *d* are also moved in that direction until in contact on that side with the adjacent sides of the ribs of the clamp-sections. The upper stretcher-section moves with the lower by reason of its pressure on it and the interposed portions of the hat. The movement of the lever C, thus described, stretches six triangular-shaped portions of the hat-body; and on moving it again to the left as far as it can go, six other triangular-shaped portions of the hat-body will be stretched; or, in fact, all of the tip, except such portion as is immediately pinched by the ribs, will have been appreciably stretched. By moving the hat-body slightly on the cone another stretching, as before described, will complete the operation.

In most hat-stretching machines, as heretofore constructed, the stretching was necessarily as much effected at one point of the body as another, and therefore if a body had imperfections or thin places the said stretching operation was liable to develop them into positively objectionable defects.

With the machine herein described the stretching operation is not essentially uniform at all points in all cases, for, as the clamp and the stretcher sections are arranged so as to bear with a uniform degree of pressure at all of the concavo-convex surfaces of the ribs or arms, it is obvious that a thin place in a hat-body would not be so firmly grasped as the balance of the body, and therefore such portions would not be liable to be so much stretched as adjacent thicker parts, while with "bunches" the reverse would be the result. Should a practically-uniform and perfect body be placed on the cone it would necessarily be evenly stretched, for the action of the several pairs of ribs would be uniform.

When adapted to brim-stretching the laterally-vibrating stretcher-arms will be alternated with the clamping-ribs, as described; but instead of having all of the stretcher-arms vibrated as by a semi-rotation on an axis common to them all, each arm may be vibrated on an axis of its own, which will occupy a point adjacent to the band-line, so that while the perimeter of the outer edge of the brim can be increased to any desired degree the band-line may remain practically intact. To effect the simultaneous movement of all the stretcher-arms the actuating power may be applied peripherically—as, for instance, by an encircling annular plate or ring, to which the outer ends of all the stretching-arms will be connected by a link or a variable or slotted joint; or said arms may be pivoted by slotted connections at their outer ends to radial arms which extend from a central axis. In either case the spirit of my present invention will be involved, in that the several stretcher-arms will encircle the hat, and operate simultaneously at several opposite points of the perimeter thereof.

When desired, the upper stretching-section may be also provided with an actuating-lever,

and this may be connected with the lower to secure proper co-operation; and said levers may be operated by rotative mechanism, by means of link-connections, in an obvious manner. When thus connected the compressing-surfaces could never get out of coincidence.

The extent of the vibration of the stretcher will be varied to suit different kinds of hats, as those which are tender will not bear a very extended movement thereof.

Although I have shown the weighted lever to press the upper sections downward, it is obvious that the same results can be effected by having the upper section stationary, and the lower movable by means of a foot-lever or similar lifting and depressing device.

To secure a yielding or spring pressure, springs may be interposed between the sections, and the power applied thereto.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a hat-stretching machine, the combination, substantially as described, of a sectional clamp, arranged to hold an interposed hat or hat-body by means of coincident radial compressing-surfaces, with a sectional stretcher composed of radial arms provided with coincident hat-holding surfaces, arranged to engage with the hat-body at points thereon between the radiations of the clamp, and also so arranged that its several stretcher-arms, while engaged with the hat, will be capable of being laterally vibrated, as and for the purposes specified.

2. The combination, with a sectional stretcher, of a spring, which is arranged to engage therewith, substantially as described.

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