R. EICKEMEYER.

Hat-Stretching Machine.

No. 206,168. **Patented July 23, 1878.**

Fig. 1.

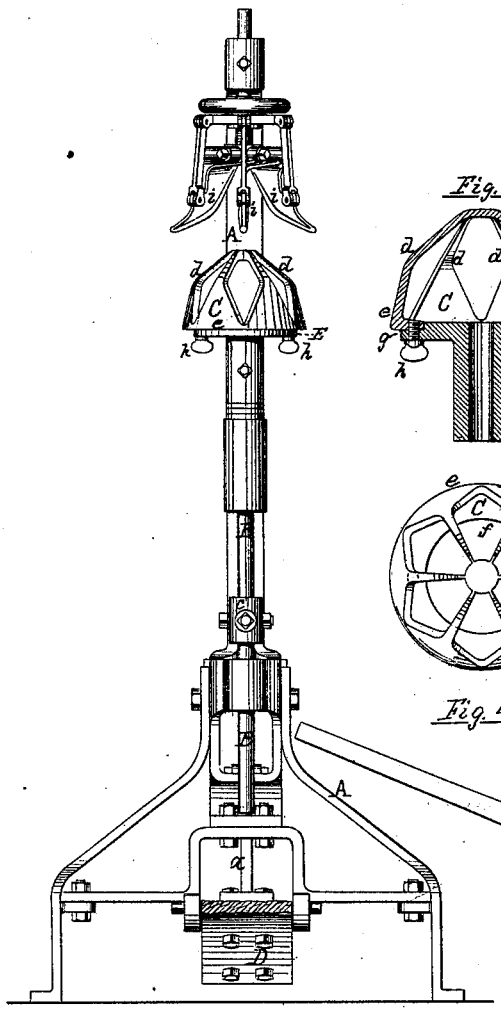


Fig. 3.

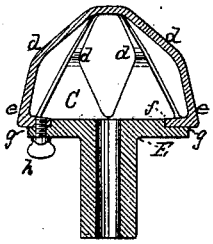


Fig. 4.

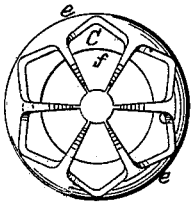
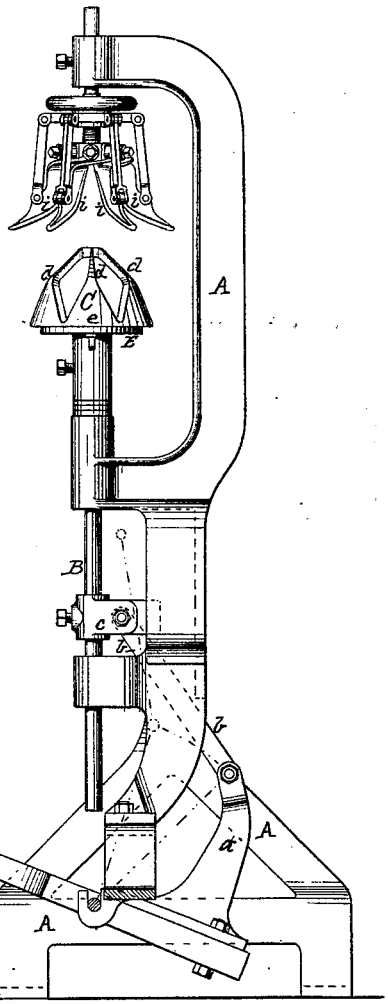


Fig. 2.



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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. **206,168**, dated July 23, 1878; application filed June 28, 1878.

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 drawings furnished and forming a part of the same, is a clear, true, and complete description of my invention.

Certain features of my invention relate exclusively to machines which operate on the corrugation principle; but one feature is applicable to any stretching-machine which embodies a vertically-operating spindle, on which a portion of the stretching devices is mounted, and is of particular value in treadle-machines, although useful in machines operated with power.

An important operation in connection with the stretching of hats by corrugation on machines embodying a ribbed "former" and radial fingers is the frequent rotation of the hat-body, for presenting different portions thereof to the action of the stretching devices.

The ribbed formers, as heretofore constructed, afford considerable resistance to the rotation of a hat, and devices have heretofore been invented for clearing the hat-body from the former, in order to facilitate its rotation. An instance of such a clearing device is found in Letters Patent No. 162,540, issued to me April 27, 1875.

A certain kind of ribbed former, described in my Letters Patent No. 198,876, dated January 1, 1878, co-operates with fingers adapted to stretch both the tip and side crown of a hat, and the latter may be more readily rotated thereon than on formers as previously constructed for stretching the tip; but in the one case re-entering angles serve to hold the hat, and the other has a six-sided base, the corners of which, with the ribs, also operate to hold the hat against free rotation, and, therefore, both kinds of formers require more or less labor to detach the hat prior to its rotation.

The object of one portion of my invention is to enable the hat to be readily rotated between each two operations of the stretching devices; and to that end said feature of my invention consists in a ribbed former which has a cylindrical base, thereby affording a smooth continuous outline, and no corners or angles with which the hat can unduly engage and prevent its being freely rotated.

As heretofore mounted on their spindles, the adjustment thereon of formers of different sizes involved considerable time and labor, because each requires a careful location of the ribs of the former with relation to the stretching-fingers, both with reference to the spaces between the fingers and to the proper height at which good service may be performed, and hasty or careless adjustment in these respects results in hats which are cut and more or less unevenly strained and injured.

The object of another feature of my invention is to reduce the matter of adjustment of the former to its spindle to a mere mechanical operation, and, therefore, when done at all, it must be well done. Said feature of my invention consists in the combination, with a former having a circular opening in its base, of a spindle and a disk firmly attached thereto, which not only supports the former, but also occupies the circular opening therein.

All the formers, of whatever size, to be used in a machine will be provided with circular openings of the same size, and fitted to receive the disk; and, therefore, every former placed upon the disk will be self-adjusted axially, and also as to height.

The disk is provided with one or more thumb-screws on its under side, and each former is provided with correspondingly-tapped holes to receive them, by which the attachment to the spindle is effected; but these tapped holes having been carefully located in the former, it, if secured at all to the spindle, will thereby be self-adjusted in the proper location of its ribs with reference to its stretching-fingers.

The combination of the stretching-fingers, the spindle, the former, and disk with means for securing the parts together and assuring the proper location of the ribs with relation to the stretching-fingers constitutes another portion of my invention.

In stretching a hat considerable power is required for lifting the spindle, the former,

and the hat into and maintaining them in proper relations to the stretching-fingers, and this power and strain must be borne by the foot of the operative, except so far as I have been enabled to heretofore relieve the strain, as in power-machines such as are shown in my Letters Patent No. 175,953, April 11, 1876, and No. 198,876, January 1, 1878. I therein show spindles which are satisfactorily operated with rock-shafts, which bear the main portion of the strain; but the mechanism is comparatively complex and expensive, and cannot be applied to the simpler foot-machines already existing without their complete reorganization. In said power-machines the stretching-fingers are mechanically vibrated, and they largely relieve the foot from strain; but there is a large class of treadle-machines which have neither the vibrating stretching-fingers nor rock-shaft, and it is the object of one feature of my invention to relieve the strain on the foot of the operative, and at the same time to effect this with such mechanism as may readily be applied to existing machines, and to that extent economically improve them. Said feature of my invention consists in the combination, with the former-spindle and a link pivoted thereto, of a bell-crank treadle-lever, to the short arm of which the link is pivoted.

The short arm of the treadle-lever projects upward and is slightly curved toward the long arm and the treadle-pivot, so that when the long arm is depressed the spindle is elevated, and the pivotal connection of the link and lever is placed nearly in the same vertical line with the treadle-pivot and the pivotal connection of the link with the spindle, thus locating the main strain in stretching upon the treadle-pivot instead of upon the foot of the operative. This treadle-lever may be applied with little difficulty to many machines now in use.

To more particularly describe my invention I will refer to the drawings, in which—

Figures 1 and 2 represent, respectively, in front and side view, a machine embodying all the features of my invention. Fig. 3 represents my improved former in central vertical section. Fig. 4 represents the same in top or plan view.

The frame A of the machine shown is substantially like that of the foot-machine shown in my Letters Patent No. 162,540, April 27, 1875, and also that shown in the foot and power machine described in my Letters Patent No. 167,391, September 7, 1875, to both of which and to many other stretching-machines my present improvements are applicable.

B denotes the sliding spindle on which the former C is mounted, and this is reciprocated by means of the treadle-lever D. This lever D, instead of being a simple straight lever, as heretofore, has at its rear end, on its upper side, a rigid arm, *a*, which may be of cast-iron and bolted to the lever; or lever and arm may be cast solidly in one piece, although I prefer the main lever to be of wood and the arm of cast-iron. The treadle-lever, considered as a whole, is of the rectangular or bell-crank species, but differs therefrom in being pivoted as if a simple lever instead of at the junction of the rectangular arms, as is common with bell-crank levers. The arm *a* is preferably slightly curved, so that its upper end will extend somewhat toward the treadle-lever pivot. The spindle and treadle-lever are connected by a link, *b*, pivoted to a cross-head, *c*, as heretofore, and to the upper end of the arm *a* of the treadle-lever.

It will be seen, as indicated by dotted lines in Fig. 2, that when the treadle-lever is depressed by the foot the pivotal connection of link *b* and arm *a* is located so nearly in line with the pivotal connection of the link and cross-head and the treadle-pivot that the link will be nearly vertical, thus relieving the foot from a great portion of the pressure.

It will also be seen that as the upper end of the arm *a* moves inward the lifting-point moves toward the treadle-pivot, thus increasing the leverage.

The former C has usually six ribs, *d*, and these, instead of being radial wings or webs projecting from a common center, as heretofore, are attained by skeletonizing a hollow conical structure of the required form, so that its base has a cylindrical outline and a continuous surface, as shown at *e*. This smooth, unbroken surface enables a hat to be easily rotated after each operation of the stretching devices.

The former has in its under side a circular aperture, *f*, and all the formers to be used in one machine are, regardless of their size, provided with a circular aperture of the same diameter in all of them.

The spindle B, at its upper end, has secured to it a hub-disk, E, which is provided on its upper surface with an annular recess, *g*, the horizontal portion of which serves as a bed or support for the former, and its vertical portion serves as a gage for axially locating the former on the disk. In other words, the outside diameter of the disk is a little smaller than the outside diameter of the base of the smallest former required, and the raised portion of the disk, forming the inner boundary of the recess *g*, is of an outside diameter which so far corresponds to the inner diameter of the aperture *f* in all the formers as to enable the raised portion of the disk to snugly enter the circular aperture.

It will be seen that when any former is placed upon a disk it is mechanically self-adjusted as to its axial position and its height.

To positively connect the former and spindle, which is necessary, I use thumb-screws *h*, and by properly locating the tapped holes in the former for receiving the screws the ribs *d* will thereby be self-adjusted, so that when moved upward they will occupy positions exactly central between the stretching-fingers *i*. With this method of mounting the former the liability of wrong adjustment is reduced to a

minimum, and such liability only exists in connection with the accurately mounting of the disk on the spindle; but this having been once carefully effected need never be changed.

Any kind of well-known clamping or securing devices may be employed for connecting the former with the disk, and a groove or slot in the former and a projecting pin or stud on the disk may be relied upon to secure the self-adjustment of the ribs to the fingers; and I do not therefore limit myself to thumb-screws by which both self adjustment and attachment are attained.

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

1. A ribbed hat-stretching former provided with a cylindrical base, substantially as described, whereby the hat may be freely rotated thereon between the operations of the stretching devices, as set forth.

2. The combination, with a spindle and a former, of a disk mounted on the spindle, and fitted to support and axially adjust the former, substantially as described.

3. The combination, with stretching-fingers, a spindle, and a former, of a disk which is mounted on the spindle and provided with devices for uniting the former and disk, and attaining a self-adjustment of the ribs of the former with relation to the stretching-fingers, substantially as described.

4. The combination, with the sliding spindle and a link pivoted thereto, of a bell-crank treadle-lever, pivoted at its short arm to the link and thence to the spindle, substantially as described, whereby the strain of the stretching operation is mainly relieved from the foot of the operative, as set forth.

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