R. EICKEMEYER.

Machine for Stretching Hat Bodies.

No. 168,731. Patented Oct. 11, 1875.

Fig. 1

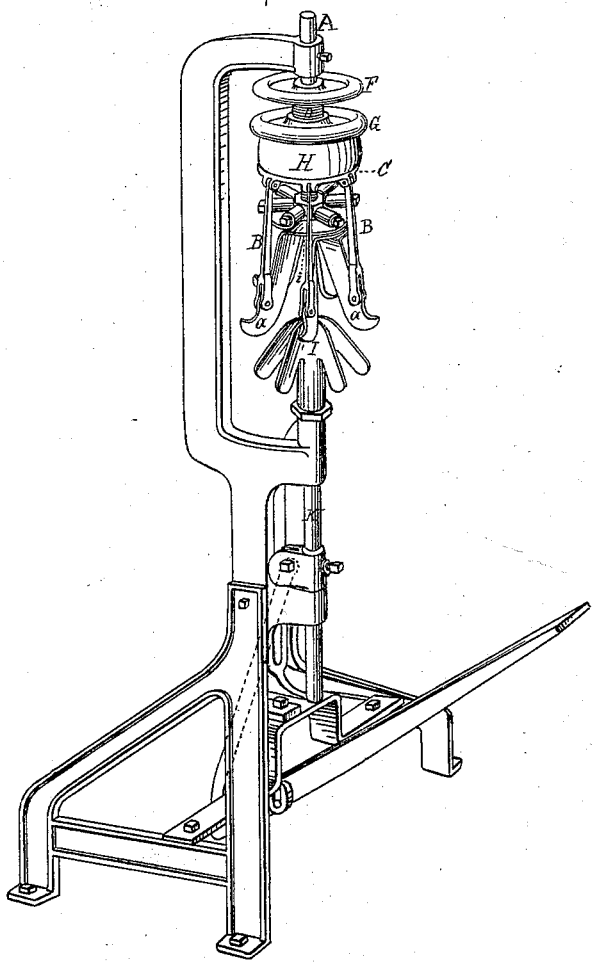


Fig. 2.

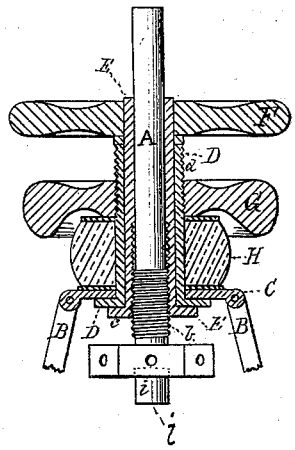
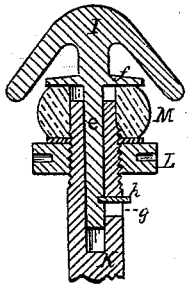


Fig. 3.



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RUDOLF EICKEMEYER, OF YONKERS, NEW YORK.

IMPROVEMENT IN MACHINES FOR STRETCHING HAT-BODIES.

Specification forming part of Letters Patent No. **168,731**, dated October 11, 1875; application filed October 30, 1874.

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.

My said improvements relate to that class of machines invented by me, and shown and described in Letters Patent issued to me July 5, 1873, No. 140,903. Said machines embody a series of radial stretching-fingers, which have longitudinal stretching-surfaces, and a skeleton-former. These machines are efficient and of great practical value. In practice, however, like most machines, they require accurate adjustment, skill, and care on the part of the operative, in order to obviate injury resulting from the rupturing of hat-bodies, by reason of submitting them too abruptly to the full stretching capacity of the operative devices.

The object of my present invention is to insure a practically perfect degree of safety even in operating upon the finest fur hats, regardless of carelessness on the part of the operative; and my invention consists in cushioning those devices on the surfaces of which the hat-body is stretched, and also in the combination, with the stretching-fingers, of an elastic pad, which serves as a central stretching device for operating directly upon the hat-tip at its center; 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 accurate description of my invention, and of different modes of applying the same to machines for practical use.

Referring to the drawings, Figure 1 represents a hat-stretching machine embodying my improvements. Fig. 2 represents, in an enlarged scale, the supporting-spindle thereof, with the adjacent devices and an elastic spring or cushion in vertical section. Fig. 3 represents in vertical section a skeleton-former, and illustrates a modification in the application of the elastic spring or cushion.

The machine represented is adapted to be operated by a treadle; but the novel features involved herein are equally applicable to power-machines, and have been so applied by me.

In the drawings, A denotes the supporting-spindle. As in the patented machines referred to, it is rigidly suspended from a portion of the frame of the machine, substantially as shown. On the lower end of said spindle are radial axes, on which the stretching-fingers *a* are mounted. Each finger is connected by means of a hinged, jointed link, B, with a circular plate, C, which is loosely mounted on a flanged sleeve, D. These fingers have longitudinal stretching-surfaces at their lower or inner edges, which are rounded so as to avoid cutting or breaking the hat-body. The spindle A, near its lower end, is provided with an exterior screw-thread, as at *b*, and is embraced within a sleeve, E, which is provided with a hand-wheel, F, keyed thereto, an interior screw-thread, which engages with the thread *b* on the spindle A, and is also provided with a flange at *c*, for supporting the surrounding sleeve D and the circular plate C. On the upper end of the sleeve D is an exterior screw-thread at *d*, to which the threaded hand-wheel or wheel-nut G is fitted. Between the wheel-nut G and the plate C an elastic rubber spring, H, is loosely mounted on the sleeve D, with washers interposed between said plate and wheel, and the spring at top and bottom. I prefer that the spring be composed of elastic rubber; but it is obvious that it may be of metal, and in any well-known form adapted to the position which it occupies.

These several parts, combined substantially as stated, constitute the best embodiment of my invention which is now known to me.

It will be seen that when a hat is placed on a former, and raised until the fingers of the former partially occupy the spaces between the fingers *a*, the hat will be stretched in radial lines, as fully described in my Letters Patent No. 140,903 aforesaid. It is obvious that all the resisting power of the fingers is derived from the abutting of the hinged fingers against the links B, which in turn abut against the plate C, to which said links are hinged, as described in said patent; also, that by revolving the hand-wheel F the plate

C will be raised or lowered on the spindle, and thereby cause the several fingers to be moved outward or inward, and by that means adapt them for properly operating upon hats of different sizes and qualities.

The operation, as thus far explained, is precisely the same as with the machine described in my Letters Patent before referred to. With that machine a careful operator would never abruptly hasten the stretching operation by applying full force to the former at the outset, but would raise and lower the hat several times, turning it a little on the former at each time. A careless operative is liable, however, to neglect the practice of this routine, and, by an abrupt and undue lifting of the former, rupture or otherwise injure the hat-body. However a machine may be constructed, the best results will be attained by the described gradual manipulation of the hat in the machine.

The end I gain by my invention is the practical incapacitation of a careless or inexperienced workman to injure a hat in the manner described. This is accomplished by the presence and operation of the yielding spring or cushion, which receives all the force exercised by the former on the hat interposed between it and the fingers. It being known to a master workman what degree of strain a hat-body can be safely subjected to, he adjusts the force of the spring by means of the hand-wheel or nut G, and, having so adjusted it, may prevent its unauthorized movement; or a lock and key may readily be applied to the hand-wheel and absolutely prevent any change of adjustment. This latter measure may prove desirable in shops where this class of work is performed at so much per hat, as a prompting tendency will then exist, for the workmen too often take risks of injuring the hats in their attempts to stretch a large number in a given time. When properly adjusted, however, a certain amount of successive necessary manipulation cannot be evaded, and it is impossible for the operative to injure the hat-body.

From what has been described it will be obvious that advantages more or less closely approximating to those described will accrue from the combination, with the hat-stretching fingers, of a yielding cushion, wherever the latter may be located, provided it be placed between the point where the power is applied and the point against which the stretching devices abut or have a bearing. In the machine already described, the cushion is located between the fingers and the point against which they abut or have their point of resistance. It is obvious, however, that approximately similar results would accrue if the fingers were rigidly abutted against the adjusting-wheel, as shown in my aforesaid Letters Patent, provided that the cone or former, which also presents radial stretching-fingers, by reason of its skeletonized structure, be mounted on a cushion interposed at any point between it and the treadle. An illustration thereof is shown in the modification represented in Fig. 3. As there found, the former I is mounted on a spindle, *e*, which enters a main tubular spindle, K, operatively connected to the treadle. The outside of the said main spindle is provided with an exterior screw-thread, to which an adjusting wheel-nut, L, is fitted. The former or cone has a flange, as at *f*, between which and the wheel-nut L is interposed the elastic cushion M. The main spindle has a radial vertical slot at *g*, through which projects a pin, *h*, in the treadle-spindle *e*. It will be seen that by bearing the weight of the former, the spring will cause the pin *h* to bear against the upper end of the slot *g*, and so normally maintain the former at all times in the same altitude with relation to the main spindle; also, that the power of the spring may be increased or lessened by turning the adjusting wheel-nut up or down on the screw-thread on the main spindle. As before stated, I prefer to place the cushion above the fingers, for in that case the said fingers move bodily outward when unduly pressed, and therefore they individually retreat from a possibility of doing injury to the hat-body. With the spring below the former, the adjustable fingers remain immovable, but the action of the treadle on the former is sufficiently modified to greatly lessen the liability of injury to the hats.

In a power machine invented by me, and known as the "Combined Stretcher," manufactured by the firm of Osterheld & Eickemeyer, the adjustable fingers are mounted on a cross-head, which is fitted to two slide-rods, and arranged to reciprocate vertically by means of connecting-links and crank mechanism. In such machines the spring may be located between the stretching-fingers and the cross-head, substantially as shown in Figs. 1 and 2; or, as has been done by me, the spring may be located between the cross-head and crank, and arranged so that the strain of the crank-rod will be first on the spring, and then, through the spring, will be expended upon the connecting-rods which move the cross-head. This latter method of applying the spring does not essentially differ from that illustrated in Fig. 3, the only difference between the two modes being that in one the action of the adjustable fingers is modified in the aggregate by the spring; in the other, the action of the cone is so modified. In both the results are the same. When the spring is applied as shown in Figs. 1 and 2, however, the action of each finger is modified, and the relieving effect extends throughout the length of the fingers, and to every point at which the hat is being stretched. In Fig. 2, I show a small elastic pad, *i*, composed of a solid cylindrical piece of elastic vulcanized rubber. It is located at and fills the central space, which is surrounded by the pivoted ends of the stretching-fingers. The cone-spindle cross-head, to

which the connecting-bar from the treadle-lever is jointed, is provided at its upper surface with a leather washer, which, on striking the under side of the spindle-guiding bracket, as seen in Fig. 1, prevents the cone from being driven above a certain point predetermined as the proper one for perfecting the stretching operation. When the cone is fully elevated, the pad *i* is so compressed between the arms of the cone and the abutting-plate above that those portions of the pad which are not in contact with the cone-arms are projected downward, forcing the central portion of the hat-tip downward between said arms, and thereby, in stretching the center of the tip, it performs the same function as the several stretching-fingers, at a point where said fingers cannot operate with facility.

In hat-stretching machines heretofore constructed, small elastic pads have been combined with the hat-cone, and located on its top at its center; but such a pad on a cone, when operated with the radial stretching-fingers herein shown, could not, as a stretching device, operate in radial lines corresponding with the lines of the stretching-fingers.

In my former Letters Patent No. 91,730, dated June 22, 1869, I show two separate sets of stretching-fingers. One of these sets is for operating upon the tip, and the other upon the brim of a hat-body. In connection with the tip-stretching fingers, I also show a plate backed up by an elastic pad, which affords a yielding resistance to the tip-stretching fingers. The brim-stretching fingers are, however, absolutely unyielding, and therefore, in that combination, the yielding cushion does not render it impossible for an operative to injure a hat, as in the case where the yielding cushion is employed in combination with the radial stretching-fingers, as herein described.

Having thus described my invention, I claim as new—

1. In a hat-stretching machine, the combination, with the radial stretching-fingers, provided with longitudinal stretching-surfaces, of an elastic yielding cushion or spring, substantially as described, whereby the power of the stretching devices is modified, and the possibility of undue strain on a hat-body is practically avoided, as set forth.

2. In combination with radial stretching-fingers, an elastic pad centrally located, and surrounded by the bases of the fingers, substantially as described.

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