

(No Model.)

E. BELKNAP.

ROLLER FOR SIZING OR FELTING HAT BODIES.

No. 304,254.

Patented Aug. 26, 1884.

Fig. 1

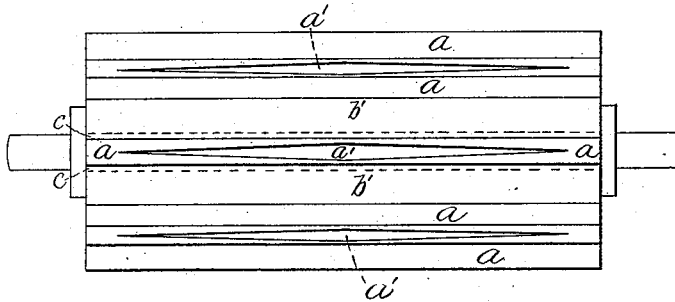


Fig. 2

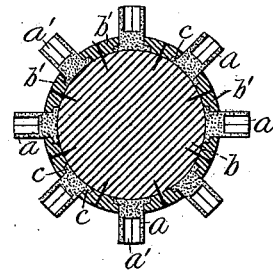


Fig. 3

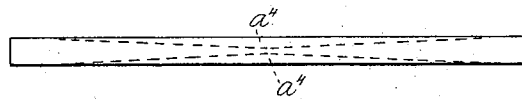


Fig. 4

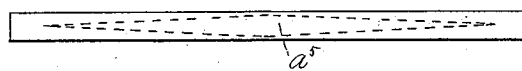


Fig. 5

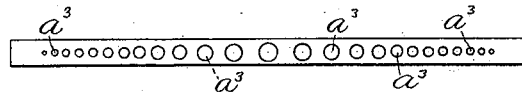


Fig. 6

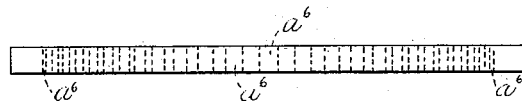


Fig. 7



Witnesses

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Att'y.

# UNITED STATES PATENT OFFICE.

ETHELBERT BELKNAP, OF YONKERS, NEW YORK, ASSIGNOR TO THE  
YONKERS HAT MANUFACTURING COMPANY, OF SAME PLACE.

## ROLLER FOR SIZING AND FELTING HAT-BODIES.

SPECIFICATION forming part of Letters Patent No. 304,254, dated August 26, 1884.

Application filed May 8, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, ETHELBERT BELKNAP, a citizen of the United States, residing at Yonkers, county of Westchester, State of New York, have invented certain new and useful Improvements in Rollers for Sizing or Felting Hat-Bodies, of which the following is a specification.

In another application for Letters Patent filed even date herewith I have described and claimed an improvement in rollers for sizing or felting hat-bodies, which consists in providing said rollers with longitudinal elastic ribs of uniform thickness throughout their length, and having greater flexibility at their central parts than at their ends, so that they will more easily compress at their parts where they act on the thicker parts of the hat-rolls, composed of a number of bats rolled together, thus knitting the felt in a better and more regular manner than can be done by the rollers heretofore used for this purpose.

The invention embraced in this application aims to accomplish a like result by making the elastic ribs of the rollers straight on their outer or active edges, and having a decreasing amount of material in their cross-sections from the ends toward the centers, by reducing in thickness the centers of the ribs, or by making the ribs hollow, or perforating them with vertical or transverse holes, so sized and arranged as to remove more material from the center than at the ends.

To describe my invention more particularly, I will now refer to the accompanying drawings, forming part of this specification, in which—

Figure 1 represents the side view of a roller for sizing or felting hat-bodies provided with elastic ribs of less sectional area at the central parts than at the ends. Fig. 2 is a transverse section of the same. Figs. 3 to 7 are top views and central transverse sections of elastic ribs, showing various ways in which their flexibility may be increased at their central parts according to my present invention.

The elastic ribs *a a*, made of suitable material—as vulcanized india-rubber—of even text-

ure throughout their length, are secured to the periphery of the roller *b* by means of the slats *b' b'*, constructed to overlap the longitudinal ribs *c c*, formed on the bottom edges of the ribs, said slats *b' b'* being fastened to the roller *b* by means of screws or nails. The ribs *a a* are made more flexible at their central parts by having formed in their upper surfaces the chambers *a' a'*, gradually decreasing in width, and depth, if necessary, from the centers to points at or near the ends of the ribs. By this construction of the ribs it will be seen that their action on hat-rolls which are thickest in the middle is to subject them to a pressure uniform or in proportion to the mass of the material in the different parts of the hat-rolls, it being understood that rollers provided with such ribs are used in groups of three, as described in my other application.

In the modification shown at Fig. 3 the rib is cut away at the sides, so as to form taper depressions *a<sup>2</sup> a<sup>2</sup>*, to gradually reduce the amount of the uniformly elastic material of which it is made from the ends to the center of the ribs, and Fig. 6 illustrates how the flexibility may be increased toward the center of the rib by the vertical holes *a<sup>3</sup> a<sup>3</sup>*, which gradually decrease in size toward the ends.

Where it is desired to retain the top or active surface of the ribs intact and of full width throughout, I propose to make the side depressions, *a<sup>4</sup> a<sup>4</sup>*, (see Fig. 4,) similar to the depressions *a<sup>2</sup> a<sup>2</sup>* of Fig. 3, but form them on the under surface instead of the top surface, and, as shown at Fig. 5, the chamber *a<sup>5</sup>* is formed in the under side instead of the top side, as at *a'*, Figs. 1 and 2; or the holes *a<sup>6</sup> a<sup>6</sup>*, Fig. 7, gradually decreasing in size from the center to the ends of the rib, may be formed laterally through it instead of being arranged vertically, as shown at Fig. 6. The upper or active surfaces of the ribs in all these modifications are indicated by the letter *d*, and the ribs may be provided with longitudinal flanges, as shown in Figs. 1 and 2, as a means for securing them to the roller, or may be simply secured in grooves formed longitudinally or spirally in the periphery of the roller.

Having now described my invention, what I claim, and desire to secure by Letters Patent, is—

- 5 1. A rib for rollers for sizing or felting hat-bodies, made of elastic material of a uniform degree of flexibility throughout its length, and decreasing in sectional area from the ends to the center, substantially as and for the purpose set forth.
- 10 2. In a roller for sizing or felting hat-bodies, the combination of the roller *b* with the ribs *a*, of elastic material, secured thereto, substan-

tially as described, and having chambers *a' a'* formed therein, gradually increasing in size from the ends to the centers of the ribs, as and 15 for the purpose set forth.

In witness whereof I have hereunto set my hand, at New York, county and State of New York, this 29th day of April, A. D. 1884.

ETHELBERT BELKNAP.

Witnesses:

ALFRED SHEDLOCK,  
H. D. WILLIAMS.