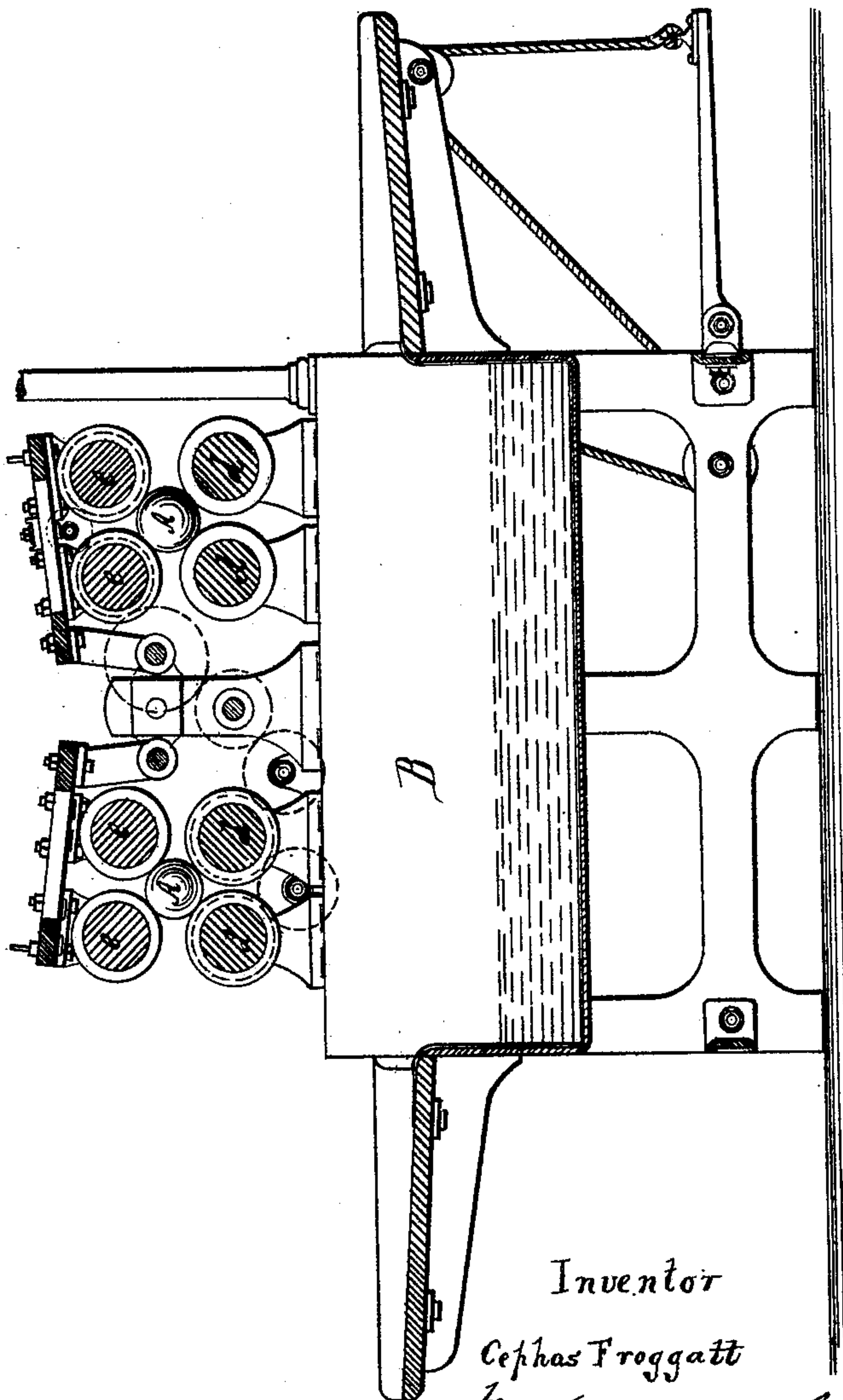


C. FROGGATT.  
Felting Hat-Bodies.

No. 208,806.

Patented Oct. 8, 1878.



Witnesses  
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# UNITED STATES PATENT OFFICE.

CEPHAS FROGGATT, OF STOCKPORT, ENGLAND.

## IMPROVEMENT IN FELTING HAT-BODIES.

Specification forming part of Letters Patent No. **208,806**, dated October 8, 1878; application filed September 18, 1878.

*To all whom it may concern:*

Be it known that I, CEPHAS FROGGATT, of the borough of Stockport, in the county of Cheshire, in the Kingdom of England, (temporarily residing in the city of New York, in the county and State of New York,) have invented a new and useful Improvement in Process of Felting Hat-Bodies, which improvement is fully set forth in the following specification.

In felting hat-bodies the usual process is to dip such bodies in hot water, then wrap them up in an apron of cotton cloth, and roll the cylindrical bundles thus formed on a flat table or planking-board. Instead of rolling these bundles by hand they have also been rolled by machinery in various ways—either on a planking-board perforated with a number of holes and submerged in hot water, so that the bundles are kept constantly moist, or between a series of rollers.

The bundles, when being rolled by hand or between rollers, are out of contact with the hot water; and when the hat-bodies become cold or dry the bundles have to be unwound, the hat-bodies dipped into the hot water for a second time, and again wrapped up and rolled, and so on until the felting operation is completed. During this rolling operation it is essential that the bundles shall become tighter and tighter as the operation progresses, since the harder the bundles are rolled the quicker the felting operation is completed.

In order to prevent the escape of heat and moisture in the process of felting hat-bodies, and to increase the hardness of the bundles as the same are rolled, I employ an apron of elastic india-rubber cloth, or other material of a similar nature, which when wrapped round the hat-bodies prevents the escape of moisture and of heat, and, furthermore, has a tendency to tighten itself during the rolling process, so that the operation of felting is materially facilitated.

In order to render the following description more easily understood I will refer to the accompanying drawing, which represents a longitudinal section of a machine for felting hat-bodies; patent granted to James Kirk, Samuel Shelmerdine, and myself March 20, 1870, No. 101,276.

In this drawing, the letter A designates a cylindrical bundle formed of one or more hat-bodies wrapped up in a cotton cloth, the hat-bodies being dipped into hot water contained in a tank, B, just before they are wrapped up in the cotton cloth. The cylindrical bundles thus produced are placed between the rollers *e e* and *d d*, and by imparting to these rollers the required motion the bundles are rolled and the hat-bodies felted; but in using this machine I have found that the cotton cloth used for wrapping up the heated and moistened hat-bodies allows the moisture and the heat to escape very rapidly, rendering it necessary to unroll the bundles and to dip the hat-bodies at very short intervals; and, furthermore, as the bundles are rolled very tightly, the fibers of the cotton cloth are liable to become entangled with those of the hat-bodies, so that when the hat-bodies are finished and dyed they present a bad appearance.

I have, therefore, looked for means to retain the heat and moisture, and I have found that by using india-rubber cloth instead of cotton cloth for forming the cylindrical bundles the hat-bodies retain the requisite heat and moisture, and the bundles have to be unrolled much less frequently than by the present process, where cotton cloth is used, thereby saving considerable time. Furthermore, no fibers are liable to become disengaged from the india-rubber cloth, and the hat-bodies when dyed and finished present a good appearance. Besides this, the india-rubber cloth is much more durable than the cotton cloth, and during the rolling operation it has a tendency to tighten itself up, so that the bundles become very tight in a comparatively short time, and the operation of felting is greatly facilitated. I have also found that the apron is liable to wear out quickest in the middle, and I therefore make my india-rubber aprons thick in the middle, with a gradual decrease in thickness toward the ends, the thickness in the middle being about twice that at the ends, so that the wear of the apron is uniform throughout.

What I claim as new, and desire to secure by Letters Patent, is—

1. The process, substantially as herein de-



scribed, of felting hat-bodies, the same consisting in dipping the hat-bodies in hot water and then wrapping the same in an apron of india-rubber or other suitable elastic cloth, substantially as described.

2. As a new manufacture, an apron of india-rubber cloth made thickest in the middle and with gradually-decreasing thickness toward its ends, substantially as and for the purpose specified.

In testimony that I claim the foregoing I hereunto set my hand and seal this 12th day of September, 1878.

CEPHAS FROGGATT. [L. S.]

Witnesses:

W. HAUFF,  
E. F. KASTENHUBER.