

(No Model.)

J. T. WARING.

Apparatus for Felting Hat Bodies.

No. 227,329.

Patented May 4, 1880.

Fig. 1.

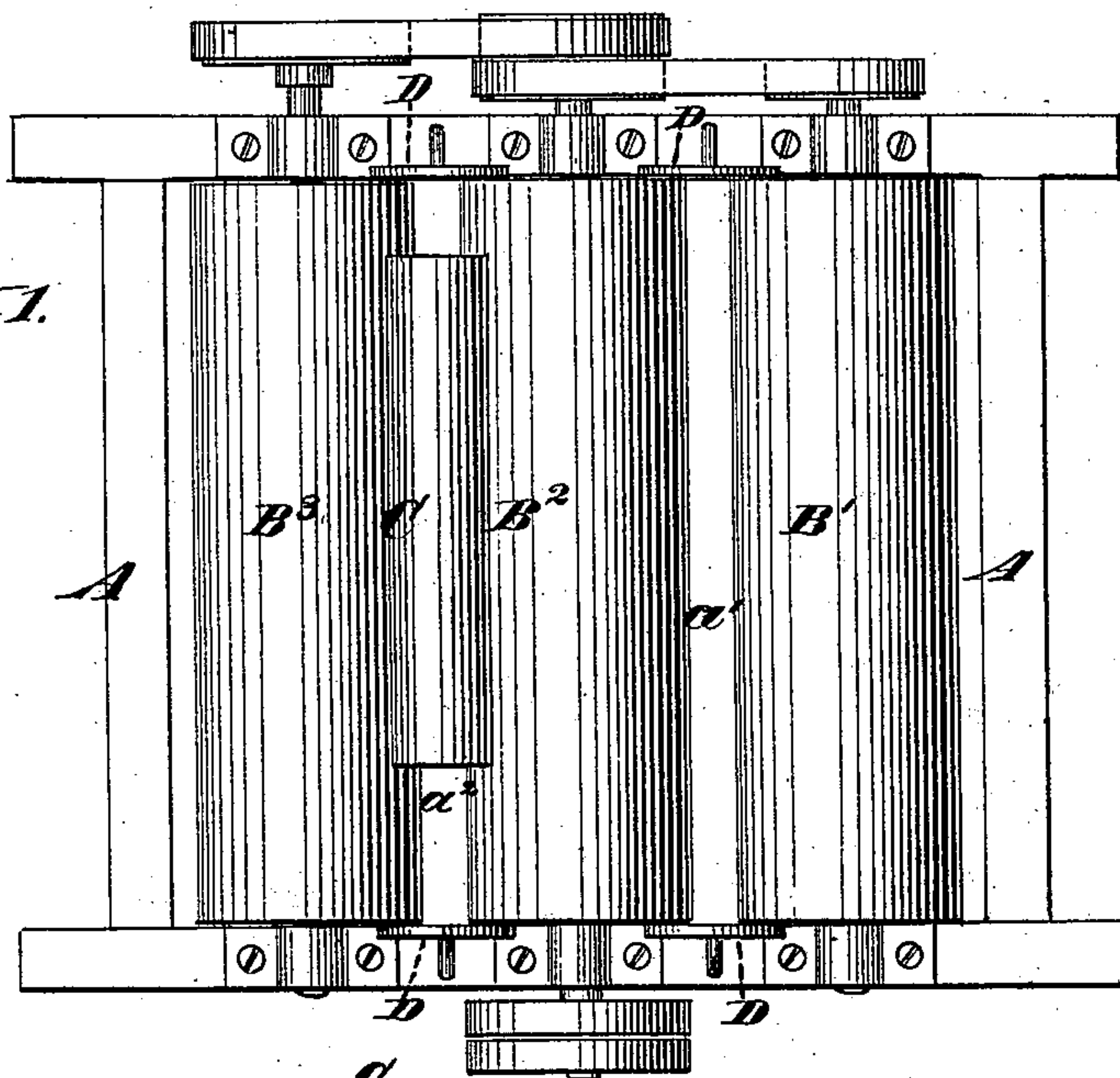


Fig. 2.

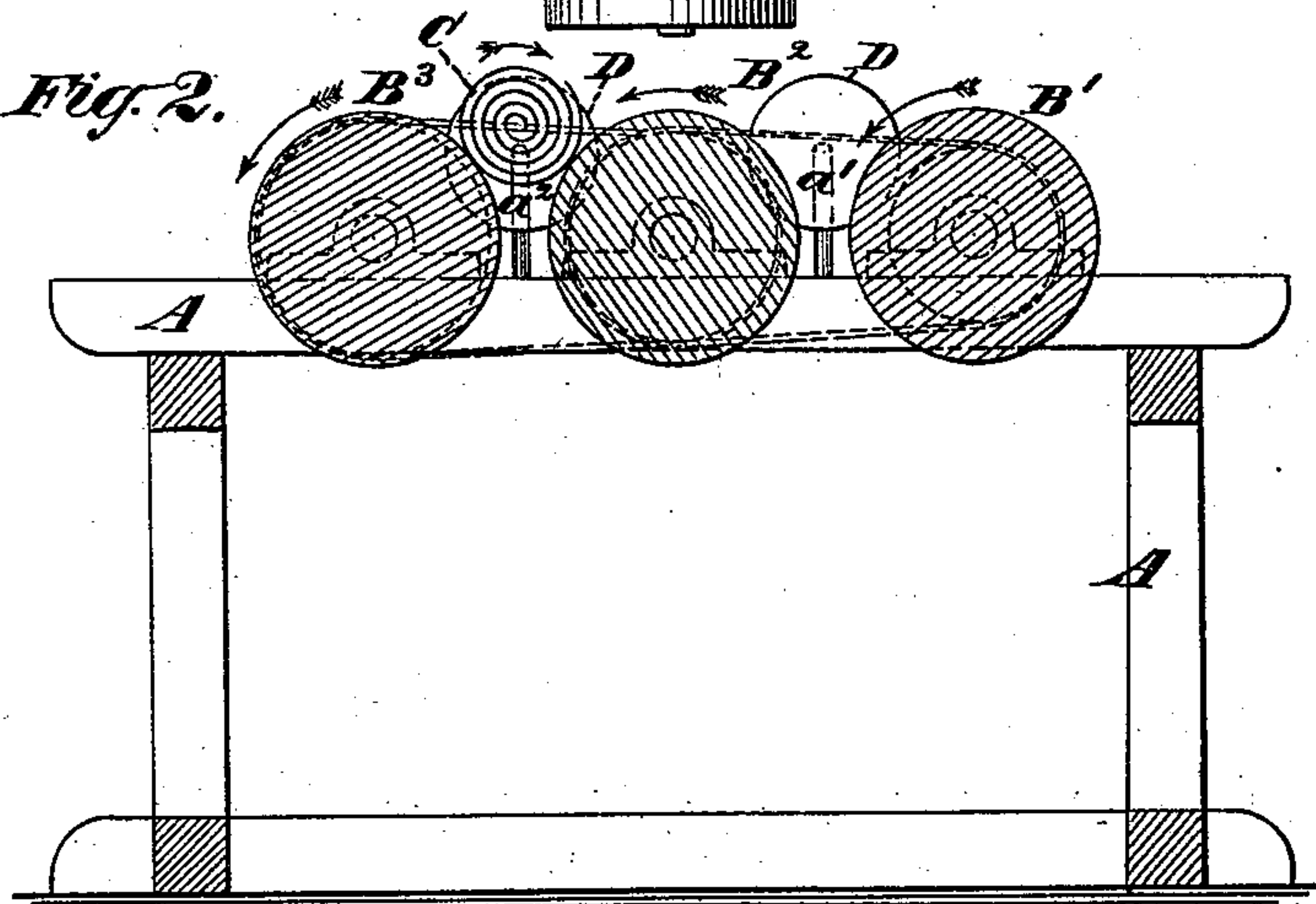
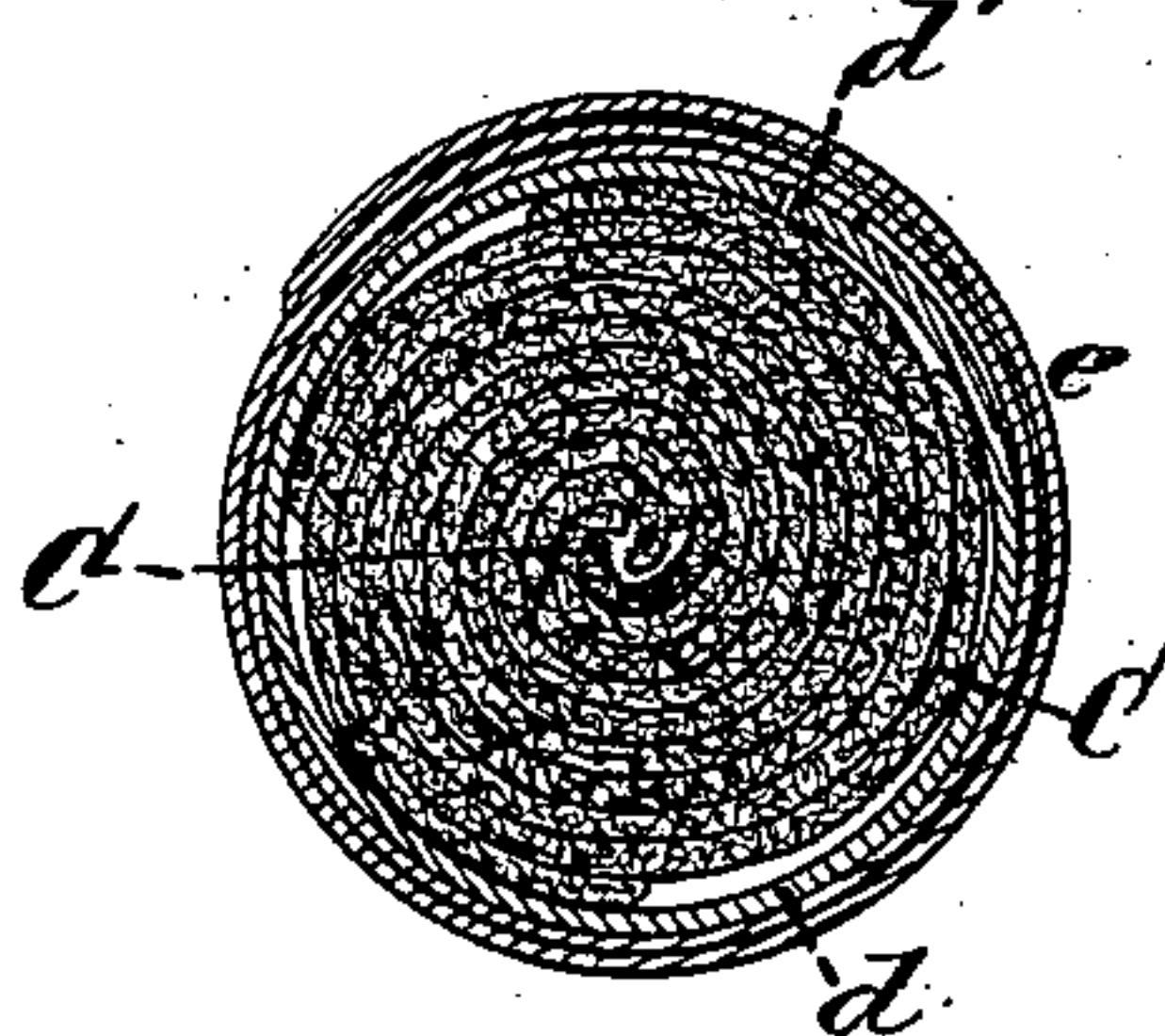


Fig. 3.



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JOHN T. WARING, OF BOSTON, MASSACHUSETTS.

APPARATUS FOR FELTING HAT-BODIES.

SPECIFICATION forming part of Letters Patent No. 227,329, dated May 4, 1880.

Application filed March 13, 1880. (No model.)

To all whom it may concern:

Be it known that I, JOHN T. WARING, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and
5 useful Improvements in Apparatus for Felting Hat-Bodies and other articles, of which the following is a specification, reference being had to the accompanying drawings.

This invention is more especially intended
10 to perform the earlier stage of the felting process, commonly called "hardening," but may be applicable with more or less success in the later stages of the process. The principal object is to supersede the use of skilled hand-
15 labor during those stages of the felting when the hats or other articles are in a tender state and would be liable to be broken or injured by unskillful handling.

One part of the invention consists in the
20 combination, in a machine for felting purposes, of rollers arranged in one or more pairs, side by side, horizontally or nearly so, in such proximity to each other as to form between the upper parts of the peripheries of a pair an
25 open trough or trough-like or hopper-like cavity, in which the hats or other articles, moistened and rolled up in cloth, may lie without any pressure above them and be subjected to a
30 gentle rolling motion by the friction consequent upon the rotation of the two rollers in one direction, one of the rollers of the pair preferably rotating at a greater velocity than the other. The ends of the troughs should preferably be
35 closed by stationary guard-plates arranged in proximity to the ends of the rollers.

The invention also consists in the combination, to be used with this machine or otherwise, of felting-cloths of unequal length, the shorter one, preferably of woolen material, being
40 only just as long as or very little longer than is necessary to completely surround the roll of hats or other articles or goods to be felted, and being placed immediately outside the said roll, and the other, preferably of cotton, linen,
45 hemp, or other vegetable fibrous fabric, being considerably longer and placed outside of the shorter one, the object of such two cloths being to reduce the liability to tear the goods, and to produce a better working of the goods
50 than could be produced with a single cloth, as will be hereinafter fully described.

Figure 1 in the drawing is a plan of a machine illustrating the first-mentioned part of my invention. Fig. 2 is a transverse vertical section of the same. Fig. 3 is a transverse
55 section of a roll of hats contained in two cloths of unequal length.

A, Figs. 1 and 2, is the framing of the machine, on the top of which are bearings for the three parallel rollers B^1 B^2 B^3 , of hard
60 wood, metal, or other material, which are arranged in such proximity to each other, as shown in Fig. 2, as to form open troughs or trough-like or hopper-like cavities a' a^2 between the upper portions of their peripheries,
65 the two rollers B^1 B^2 constituting one pair, between which is formed the trough a' , and the two rollers B^2 B^3 constituting another pair, between which is formed the trough a^2 . The said rollers may have smooth peripheries, or
70 they may be grooved or lagged or corded, but generally, for hardening purposes, I propose to make them smooth. They are so geared together by gearing or belting and so driven that all rotate in the same direction, as indicated by arrows in Fig. 2, so that each of the
75 troughs a' a^2 has an ascending and a descending side, and they are preferably so relatively speeded that the descending side of the roller of each pair moves a little faster than the con-
80 tiguous ascending side of the roller of the same pair, and that consequently there will be a slight tendency produced by the greater velocity of the movement of the descending side of the trough between the rollers to crowd
85 downward into the said trough a roll of hats or other goods, C, that may be placed therein.

Opposite to the troughs a' a^2 , between the rollers and not quite touching the rollers, are arranged stationary disks or plates D D, which
90 are secured firmly to the framing A, and serve as guards to close the ends of the said troughs and prevent the working out of the roll or rolls C.

To perform the operation of hardening fur-
95 hat bodies in a machine of this kind a number of bodies taken from the cone—say about twelve—are dipped in hot water or liquor and rolled up together loosely, and then surrounded by one or more cloths, which are rolled around
100 them. The roll thus formed is laid in either of the troughs a' a^2 while the rollers B^1 B^2 B^3

are in motion, and is caused by the friction of the surface of the rollers to roll lightly therein, no pressure being applied but what is due to the weight of the bodies and the enveloping cloth or cloths and to the tendency to crowd down into the trough. By the action thus produced a very effective hardening is obtained. During this operation the roll should, from time to time, be taken out from the machine and the bodies be taken from the cloth or cloths, folded in different ways, redipped, and rolled up again in the cloth or cloths and the roll be replaced in the machine.

The machine represented, having the three rollers arranged to form two pairs and two troughs, is a double machine, capable of doing with one attendant as much work as two machines having two rollers each. In working with this machine the attendant would stand at the end shown to the right of Figs. 1 and 2, and can manage the operation in both troughs at the same time. The process may be partly performed in the first trough and finished in the second, the attendant transferring the roll from one to the other at any desired or suitable stage of the process. It may always be proceeding on one roll of bodies in one trough while the attendant is engaged in taking out, refolding, and replacing the bodies of the other roll. While it may be practicable to perform the operation of hardening hat-bodies in this machine with the roll of bodies contained in a single cloth, I find it very advantageous to use two cloths—viz., a short inner one, *d*, Fig. 3, preferably of flannel or woollen material, only just long enough to envelop the roll *C* of bodies, and a long outer one, *e*, preferably of burlap or other vegetable woven fabric, long enough to pass, say, about twice round the roll. If a single cloth be used, it must be, in order to confine the bodies in the roll, much longer than the circumference of the roll to give its outer end a good lap, and when subjected to the rolling operation this cloth will tend to draw tighter, and in so doing move upon the surfaces of the outer body or bodies, which at this stage are very tender, and is thereby liable to tear them; and besides this, the tighter rolling up of the bodies themselves which is thus produced interferes with that working of the fibers of the bodies which is desirable for hardening and felting.

By the use of two such cloths as I have described, the inner one having its edges only meeting, as shown at *d* in Fig. 3, or if having any lap not sufficient for the lap to take hold of the portion within it and gain upon it, does not work injuriously on the hat-bodies. The tightening up of the outer cloth, though of course it will compress the bodies, will do so by creeping along upon the exterior of the in-

ner cloth without rolling it up or rolling up the bodies any tighter, but produces the contraction of the latter cloth and the bodies within it by a gathering-in action which does not so much interfere with the working necessary for perfect hardening and felting.

These improvements are applicable with especial advantage to the felting of fur-hat bodies, but might also be applied in the same manner described to the felting of wool-hat bodies or to the felting of other goods.

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

1. In a machine for hardening or felting hat-bodies or other felt goods, the combination of two parallel rollers arranged to rotate and form between them an open trough or trough-like or hopper-like cavity, which has an ascending surface on one side and a descending surface on the opposite side, and which is adapted to receive within it and contain a roll of hat-bodies or other articles and subject the same to a rolling motion by the friction of said surfaces upon said roll lying loosely between them, substantially as herein described.

2. The combination, in a machine for hardening or felting hat-bodies or other articles, of three parallel rollers arranged side by side, and means of giving rotary motion thereto, whereby the said rollers form two troughs or trough-like or hopper-like cavities, each having an ascending and a descending side, substantially as and for the purpose herein described.

3. The combination, in a machine for hardening or felting hat-bodies or other articles, of two parallel rollers, arranged side by side to form between them a trough or trough-like or hopper-like cavity, and driving mechanism whereby they are driven at unequal velocity, substantially as herein described.

4. The stationary guards *D D*, in combination with parallel rollers arranged to form one or more troughs or trough-like or hopper-like cavities between them, substantially as herein set forth.

5. The combination, for the purpose of hardening or felting hat-bodies or other articles, of a longer outer and a shorter inner cloth in which the hats or other articles are rolled, substantially as herein described.

6. The combination, with two parallel rollers, arranged to form between them a trough or trough-like or hopper-like cavity, substantially as herein described, of two hardening or felting cloths of unequal length, substantially as herein set forth.

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Witnesses:

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