

(No Model.)

J. T. WARING.

MACHINE FOR FELTING HAT BODIES, &c.

No. 320,101.

Patented June 16, 1885.

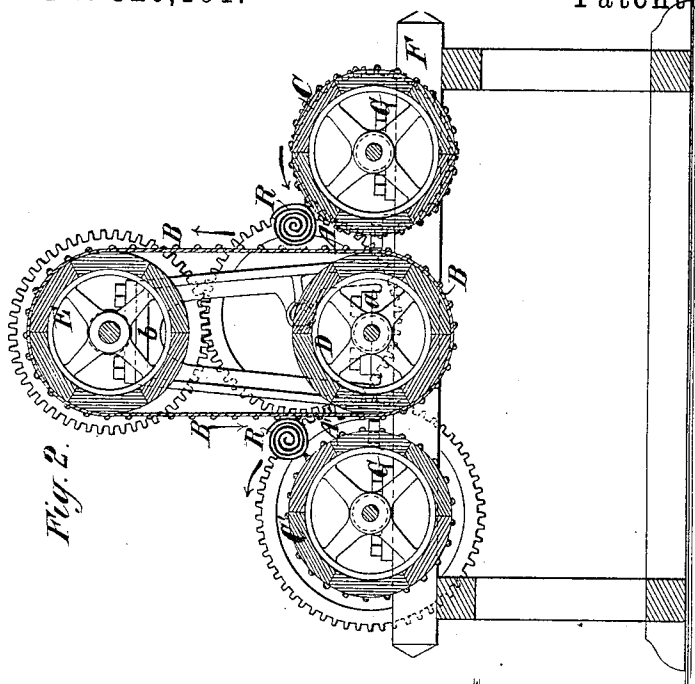


Fig. 2.

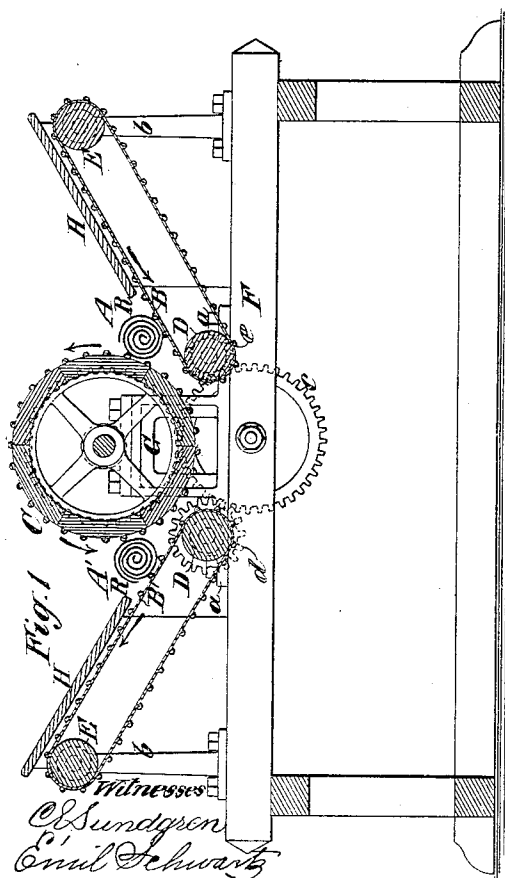


Fig. 1.

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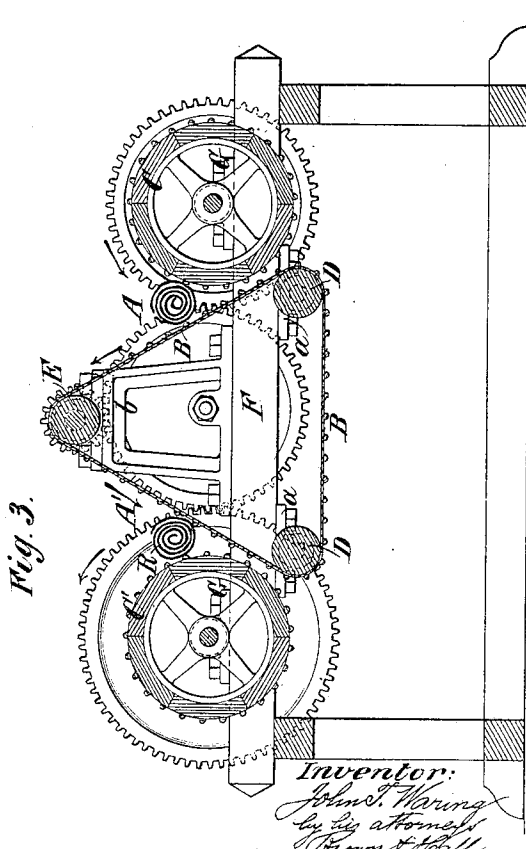


Fig. 3.

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UNITED STATES PATENT OFFICE.

JOHN T. WARING, OF YONKERS, NEW YORK.

MACHINE FOR FELTING HAT-BODIES, &c.

SPECIFICATION forming part of Letters Patent No. 320,101, dated June 16, 1885

Application filed November 13, 1884. (No model.)

To all whom it may concern:

Be it known that I, JOHN T. WARING, of Yonkers, in the county of Westchester and State of New York, have invented a new and useful Improvement in Machines for Felting Hat-Bodies and Other Articles, of which the following is a specification, reference being had to the accompanying drawings.

This invention is or may be suitable for use in the felting process at different stages of such process, but is designed more especially for the performance of that part of the process called "hardening" when too much pressure on the hat-bodies or other articles to be felted would be injurious.

The invention consists in the combination of a roller or cylinder and an endless apron arranged side by side in such proximity and relation to each other as to present converging surfaces, which form between them an open trough or trough-like cavity, in which the hat-bodies or other articles, moistened and rolled up, may lie without any pressure above them and be subjected to a gentle rolling operation by the friction thereon consequent upon the movement of the said converging surfaces in opposite directions. To facilitate this rolling operation, the roller and the apron may have different surface velocities.

In carrying out my invention a machine may be composed of a single roller and a single apron. This I should call a "single machine;" but in practice I prefer, for the sake of simplicity of construction and economy of space, to so combine one apron with two rollers or two aprons with one roller as to constitute a double machine, which is virtually two machines without duplicating both the roller and the apron.

In the accompanying drawings, Figures 1, 2, and 3 represent vertical sections of three double machines differing in construction, but all illustrating my invention.

I will first describe the machine illustrated in Fig. 1, the working surfaces of which, constituting the sides of the two troughs or trough-like cavities A A', are composed of two endless aprons, B B', arranged at a suitable distance apart, and a single roller or cylinder, C, arranged between the said aprons. The in-

clined aprons B B', which may be made of heavy cloth or india-rubber fabric, are supported and carried each upon a lower drum, D, and an upper drum, E, the lower drums having their journals in bearings *a a* upon the framing F of the machine, and the upper drums having their bearings in standards *b b* erected on the said framing F. The roller or cylinder C is supported between the two aprons in bearings or standards G on the sides of the framing F. The two aprons and the roller or cylinder may have their surfaces either smooth or lagged, as represented in the drawings, or otherwise constructed to present uneven surfaces. They are so geared together, as by spur-gears *c d e*, that the part of the outer surface of each apron nearest the roller or cylinder moves in the opposite direction to that of the part of the surface of the cylinder nearest to it, as indicated by arrows, and each apron and roller or cylinder constitutes an open trough or trough-like cavity, the converging sides of which move in opposite directions.

The gearing of the two aprons and the roller-cylinder may be so proportioned, as shown in the drawings, that descending upper face of one apron, as B, moves faster than the corresponding opposite ascending portion of the surface of the roller or cylinder, and the ascending working face of the other apron, as B', moves slower than the corresponding opposite descending portion of the surface of the roller or cylinder, so that a roll, R, of hat-bodies or other articles to be felted lying loosely in the trough A or A' will be slightly crowded downward into the trough by the greater velocity of the descending working-surface of the roller or of the apron, as the case may be.

In the operation of this machine the roller or cylinder and the aprons having been set in motion, as described, a roll of hat-bodies, which have been dipped in hot water or liquor and rolled up in a cloth, is placed in each or either of the troughs or cavities A A', and by the friction of the opposite surfaces of the apron, and the roller or cylinder constituting the opposite faces of the said trough or cavity, the roll, lying free in said cavity without any pressure above it, is rolled continuously in

the said trough or cavity in such manner as to produce the felting operation.

Above each of the aprons B B' there is represented a fixed board, H, on which the roll of hat-bodies or other articles may from time to time, after being taken from the trough, be unrolled, properly manipulated, and rolled up again at intervals, as is necessary in felting in other machines, as is well understood by persons skilled in the art of felting.

In the machine shown in Fig. 2, instead of two aprons and an interposed cylinder, there are two cylinders, C C', and one interposed apron, B, forming two open troughs, A A', having converging opposite surfaces moving in opposite directions, and being in all respects the equivalents of the troughs A A' illustrated in and described with reference to Fig. 1.

In the machine shown in Fig. 3 there are, as in that shown in Fig. 2, two cylinders, C C', and one interposed apron, and this only differs from that in having its apron mounted upon three rollers, D D E, instead of on only two, D E.

It will be readily understood that the omission of one of the aprons from such a double machine as is shown in Fig. 1, or the omission of one of the rollers or cylinders C C' from such a double machine as either of those shown in Figs. 2 and 3 would make a single machine complete in itself composed of one roller or cylinder and one apron.

The lags on the aprons may either be straight

on their faces or they may have a concave profile, so that those presented opposite each other on two aprons will have between them a space which is wider at the middle of the width of aprons and narrower toward the edges thereof.

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

1. The combination, in a felting-machine, of an endless apron and drums for supporting and carrying it, a roller or cylinder arranged side by side with said apron external thereto, and mechanism for driving the said apron and roller or cylinder with a movement of their convergent opposite surfaces in opposite directions, substantially as and for the purpose herein described.

2. The combination of cylinder and apron, two of one with one of the other interposed, and mechanism for giving motion to the same, whereby are formed two open troughs or trough-like cavities each having an ascending and descending side, substantially as and for the purpose herein described.

3. The combination of a roller or cylinder and endless apron arranged to form an open trough or trough-like cavity, and mechanism for driving the same at unequal surface velocities, substantially as and for the purpose herein described.

JOHN T. WARING.

Witnesses:

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