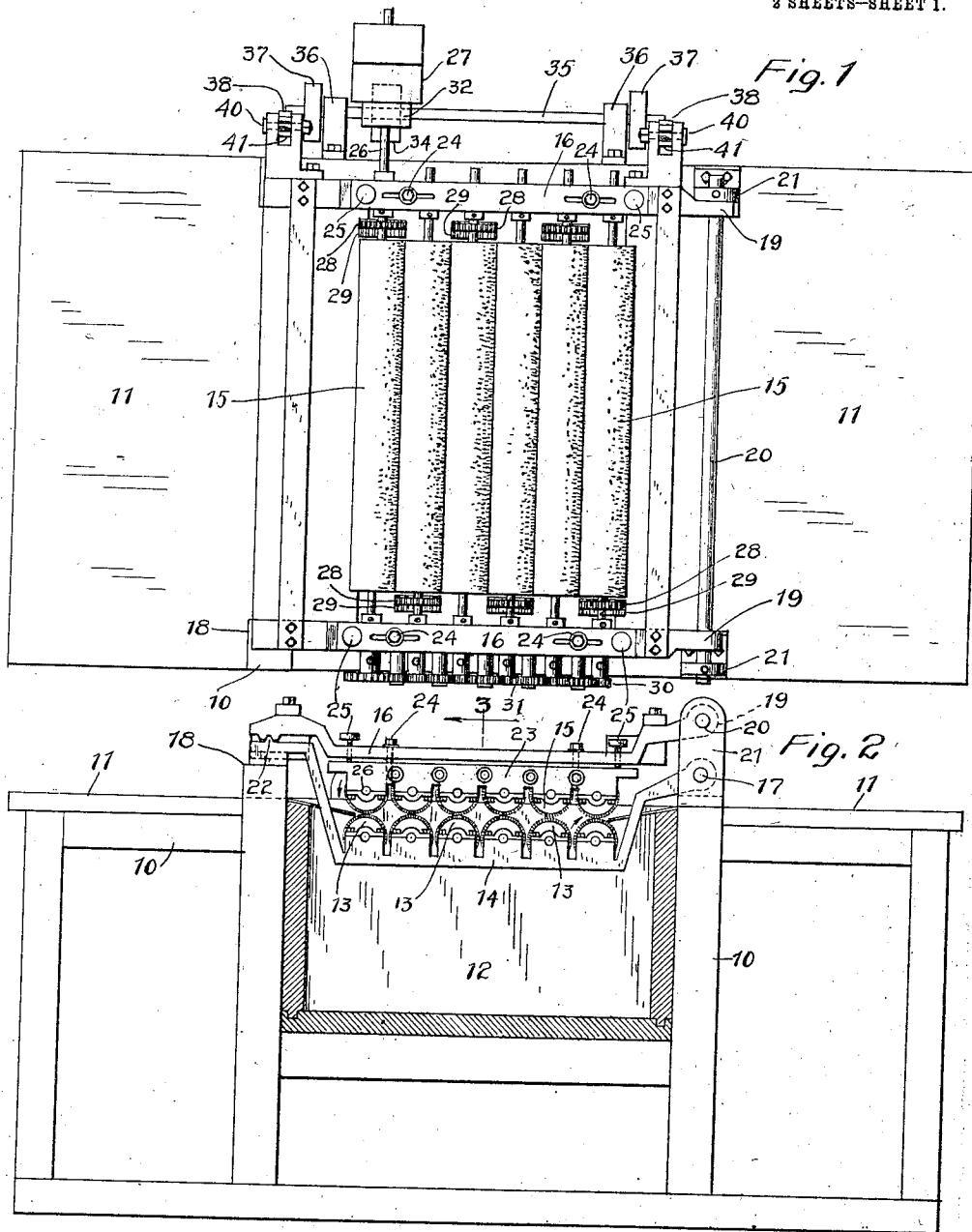


J. H. STARR.
MACHINE FOR WET BRUSHING HAT BODIES.
APPLICATION FILED MAR. 20, 1912.

1,052,857.

Patented Feb. 11, 1913

2 SHEETS—SHEET 1.



WITNESSES:

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Fig. 3

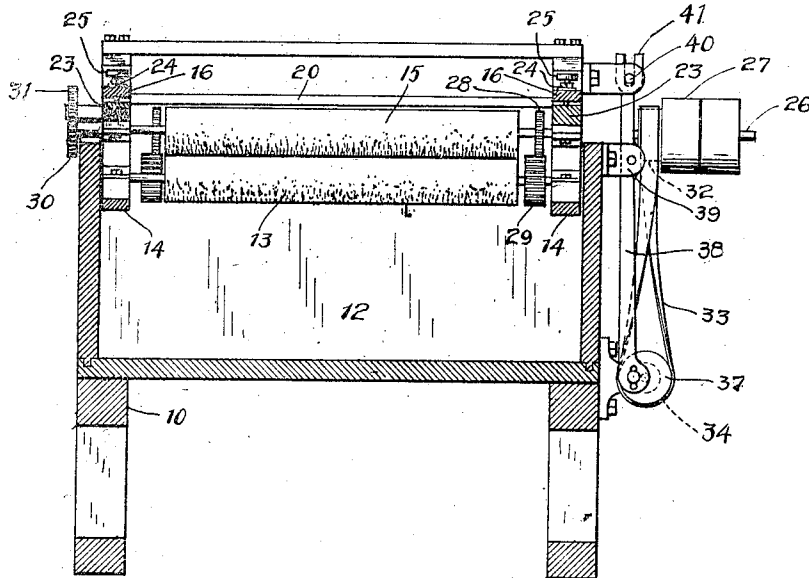
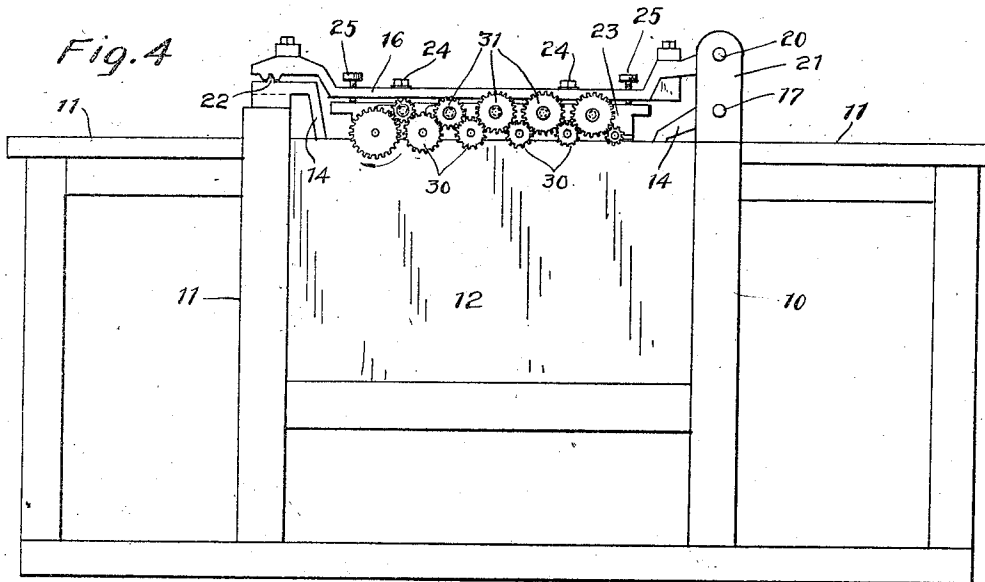


Fig. 4



WITNESSES:

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JOHN H. STARR, OF DANBURY, CONNECTICUT, ASSIGNOR TO E. A. MALLORY AND SONS, INCORPORATED, OF DANBURY, CONNECTICUT; A CORPORATION OF CONNECTICUT.

MACHINE FOR WET-BRUSHING HAT-BODIES.

1,052,857.

Specification of Letters Patent. Patented Feb. 11, 1913.

Application filed March 20, 1912. Serial No. 685,138.

To all whom it may concern:

Be it known that I, JOHN H. STARR, a citizen of the United States, residing at Danbury, county of Fairfield, State of Connecticut, have invented an Improvement in Machines for Wet-Brushing Hat-Bodies, of which the following is a specification.

This invention has for its object to provide an easily operated and thoroughly effective machine for wet brushing hat bodies.

It is of course well understood by those familiar with the art that the operation of wet brushing is performed to improve the character and appearance of the nap of hat bodies and that the operation is especially important in the manufacture of velour hat bodies, the operation succeeding that of jacking or raising the nap thereon.

With this and other objects in view the invention consists in certain constructions and in certain parts, improvements, and combinations which will be hereinafter described and then specifically pointed out in the claims hereunto appended.

In the accompanying drawings forming a part of this specification Figure 1 is a plan view of the machine complete; Fig. 2, a side elevation, the outside gears being removed and the tank in section; Fig. 3, a section on the line 3—3 in Fig. 2, looking in the direction of the arrows; and Fig. 4 is a side elevation.

10 denotes framework which may be of any ordinary or preferred construction, 11 a table at each end of the machine and 12 a tank. It will of course be obvious that it is necessary to brush the nap different ways in order to make it stand out from the body. I accomplish the desired result mechanically and brush the nap four ways by passing the bodies between upper and lower sets of rolls, the corresponding rolls in the two sets comprising pairs and the pairs of rolls having progressively accelerated movement and by imparting to the entire set of upper rolls in a group reciprocatory movement transversely of the machine.

13 denotes the lower brushing rolls which are carried by a frame 14 and 15 the upper brushing rolls which are carried by a frame 16. One end of the lower frame is pivoted to swing vertically on a cross rod 17, the ends of which are secured in a bracket 21, and the other end rests upon the framework at 18. In use the tank is filled with hot wa-

ter or any suitable treating liquid and the central portion of the lower frame is depressed sufficiently so that the lower rolls are wholly submerged and the upper rolls are partly submerged as will be more fully explained. The corresponding end of the upper frame is provided with ears 19 through which a cross rod 20 passes freely, the ends of said rod being secured in brackets 21. The other end of the upper frame is shown as provided with a groove which receives a rib 22 on which, and on cross rod 20, the upper frame has reciprocatory movement transversely of the framework. In order to provide an adjustment of the upper rolls in a group both longitudinally of the framework and vertically, said rolls are journaled on blocks 23 which are secured to the upper frame by screws 24 passing through longitudinal slots in the frame and are adjusted vertically by means of set screws 25 in the frame, the ends of which bear against the blocks.

The rolls are all driven from the shaft 26 of the first upper roll, counting from the left as seen in Figs. 1, 2 and 4, to which power may be applied in any suitable manner as by means of a belt (not shown) passing over a pulley 27. The essential principle of this portion of the invention is the progressive acceleration of movement of the pairs of rolls, an upper and lower roll being considered a pair. In the present instance I have shown the machine as provided with six pairs of rolls. Movement of the first pair, that is the pair toward the left, is slowest, each pair toward the right rotating faster than the preceding pair. The shaft of each upper roll is provided within the framework with a gear 28 and the shaft of each lower roll is provided within the framework with a gear 29. Gears 29 are made wider than gears 28 to permit reciprocation of the upper rolls transversely of the framework. To avoid interference, the pairs of gears 28 and 29 are placed alternately at opposite ends of the rolls, as clearly shown in Fig. 1. The shaft of each upper roll, including driving shaft 26, is provided outside the framework with a gear 30. Each gear 30 meshes with an intermediate gear 31, which in turn meshes with the next succeeding gear 30, as clearly shown in Fig. 4. These gears are not drawn to scale but the principle of progressive acceleration of

each pair of rolls from left to right is clearly indicated.

The transverse reciprocatory movement of the upper frame and upper rolls may be produced in any ordinary or preferred manner. I have shown shaft 26 as provided with a pulley 32 from which a belt 33 passes over a pulley 34 on a shaft 35 journaled in brackets 36 upon the framework. Shaft 35 also carries crank disks 37 which have a pin and slot connection with levers 38 fucrumed in brackets 39 on the framework and provided at their upper ends with slots which receive cross pins 40 in yokes 41 upon the upper frame.

The operation is as follows: The hat bodies are fed to the machine from the left in any position, it being wholly immaterial whether they are fed in tip first or edge first or brim first. After passing through the machine the bodies are folded or closed in a different position and are passed through again. The operation is performed quickly and may be repeated as many times as is desirable. As the lower brushing rolls are wholly submerged and the upper brushing rolls partly submerged, it causes the brushing operation to be all performed while the bodies are immersed in boiling water or a suitable treating liquid. The second pair of rolls pulls the bodies through the first pair and the third pair pulls them through the second pair. As the second and third pairs of rolls are each rotating faster than the preceding pairs, one pair of rollers is in fact brushing the nap forward while the other pair is brushing it backward, this for the reason that while both pairs of rolls are turning forward, as the forward pair is turning relatively fast the slower movement of the first pair gives the effect of brushing the nap backward. Simultaneously with this brushing of the nap forward and backward the nap is brushed in each direction transversely through the reciprocatory movement of the upper frame carrying the upper brushing rolls, so that each time a hat body is passed through the machine the nap thereon is brushed in four directions. The hinging of the two frames enables me to raise the upper frame if necessary at any time without disturbing the lower frame or to raise both frames and swing them over backward out of the way. In brief, access to the tank is convenient at any time, the brushing rolls may be readily cleaned at any time and may be swung out of the tank and kept dry when not in use, which greatly prolongs the life and efficiency of the rolls.

Having thus described my invention, I claim:

1. A machine of the character described comprising a plurality of pairs of brushing rolls, means for progressively accelerating

the movement of the pairs of rolls, and means for imparting reciprocatory movement in a group to one set of rolls transversely of the machine.

2. A machine of the character described consisting of upper and lower sets of rolls comprising a plurality of pairs, means for progressively accelerating the movement of the pairs of rolls, and a tank in which the lower set of rolls may be wholly submerged and the upper set partly submerged.

3. A machine of the character described consisting of upper and lower sets of rolls comprising a plurality of pairs, means for progressively accelerating the movement of the pairs of rolls, means for imparting reciprocatory movement in a group to the upper set of rolls and a tank in which the lower set of rolls may be wholly submerged and the upper set partly submerged.

4. A machine of the character described comprising a tank, a lower frame pivoted at one end thereof and adapted to rest on the other end, lower brushing rolls on said frame adapted to be submerged in the tank, an upper frame pivoted at the same end of the tank, its other end being adapted to rest on the lower frame, upper brushing rolls on said frame which comprise pairs with the corresponding rolls on the lower frame and means for accelerating the movement of the pairs of rolls progressively.

5. A machine of the character described comprising a tank, a lower frame pivoted at one end thereof and adapted to rest on the other end, lower brushing rolls on said frame adapted to be submerged in the tank, an upper frame pivoted at the same end of the tank, its other end being adapted to rest on the lower frame, upper brushing rolls on said frame which comprise pairs with the corresponding rolls on the lower frame, means for accelerating the movement of the pairs of rolls progressively and means for imparting reciprocatory movement in a group to the upper rolls transversely of the machine.

6. A machine of the character described, consisting of upper and lower sets of brushing rolls comprising a plurality of pairs, means for adjusting one set of rolls longitudinally and vertically in a group and means for progressively accelerating the movement of the pairs of rolls.

7. A machine of the character described, consisting of upper and lower sets of brushing rolls comprising a plurality of pairs, means for adjusting one set of rolls longitudinally and vertically in a group and means for imparting reciprocatory movement to one set of rolls in a group transversely of the machine.

8. A machine of the character described, comprising framework, a tank, upper and lower sets of brushing rolls in said tank and

independently swinging frames pivoted to the framework by which the sets of rolls are carried respectively.

9. A machine of the character described, comprising framework, a tank, upper and lower vertically swinging frames, a set of brushing rolls journaled on the lower frame, a set of brushing rolls journaled on a block and means for securing said block to the upper frame and for providing vertical and longitudinal adjustment of said block and the upper brushing rolls.

10. A machine of the character described, comprising framework, a tank, upper and lower sets of brushing rolls in said tank, frames pivoted to the framework by which the sets of rolls are carried respectively and means for reciprocating the upper frame and rolls transversely of the machine.

11. A machine of the character described, consisting of upper and lower sets of brushing rolls comprising a plurality of pairs, upper and lower frames by which the respec-

tive sets of rolls are carried, gears for transmitting movement from each lower roll to the companion roll in a pair, and gears upon the roll shafts and intermediates for transmitting progressively accelerated movement to the successive pairs of rolls.

12. A machine of the character described, consisting of upper and lower sets of brushing rolls comprising a plurality of pairs, upper and lower frames by which the respective sets of rolls are carried, means for transmitting progressively accelerated movement to the pairs of rolls, a lever engaging the upper frame, and means for actuating said lever to impart reciprocation to the upper frame and the rolls carried thereby transversely of the machine.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN H. STARR.

Witnesses:

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FRANK E. WARREN.