2 Sheets--Sheet 1.

A. S. JOYCE.

Hat-Brushing Machine.

No. 162,390. Patented April 20, 1875.

Fig 1.

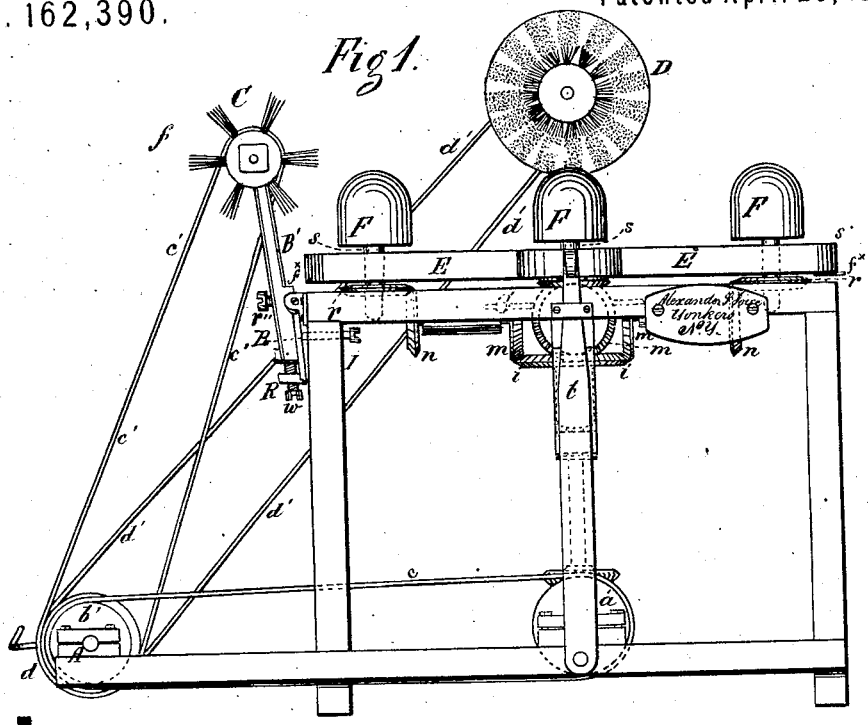
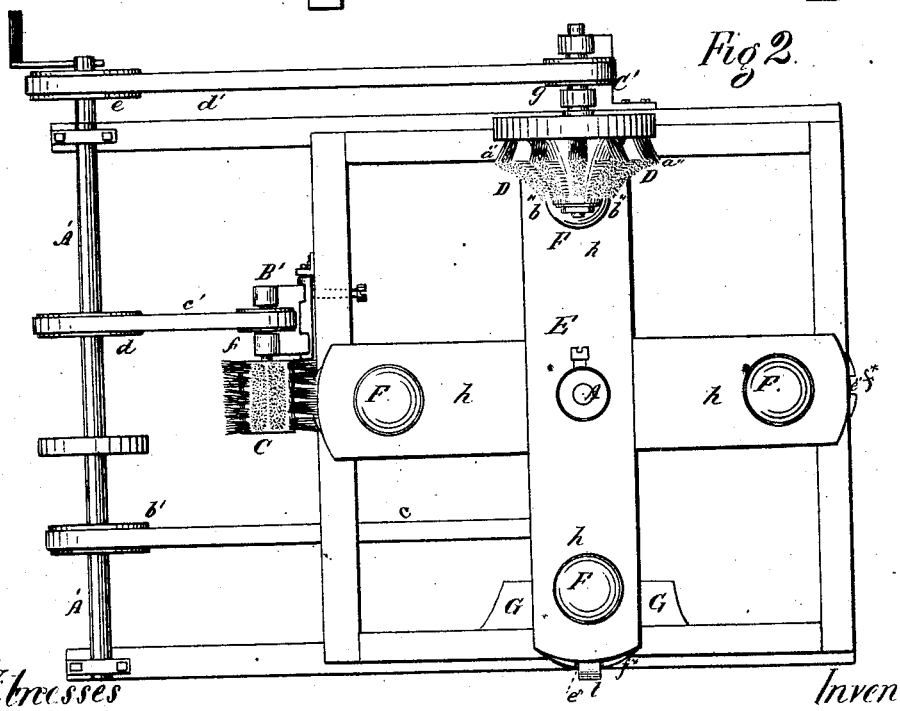


Fig 2.



Witnesses

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2 Sheets--Sheet 2.

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Fig 3.

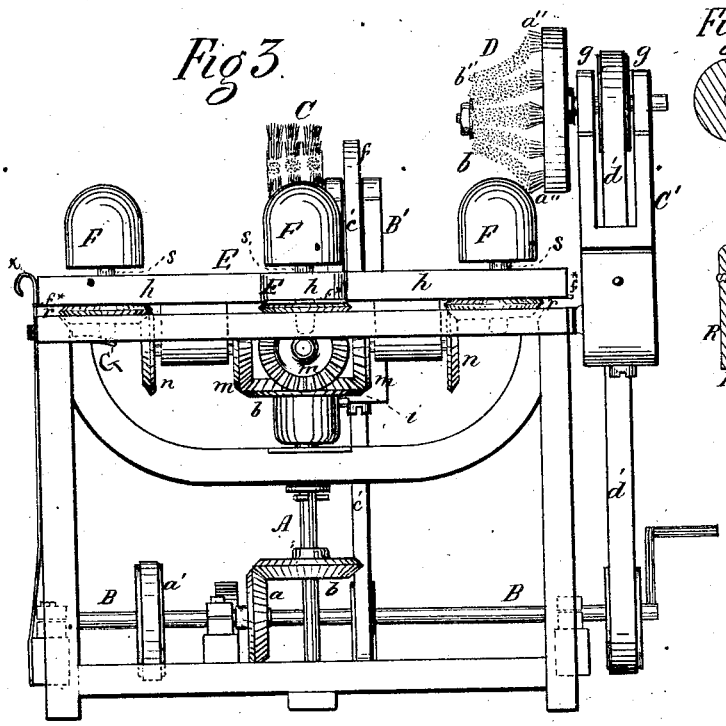


Fig 4.

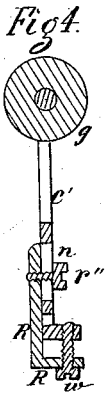


Fig 5.

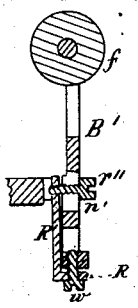
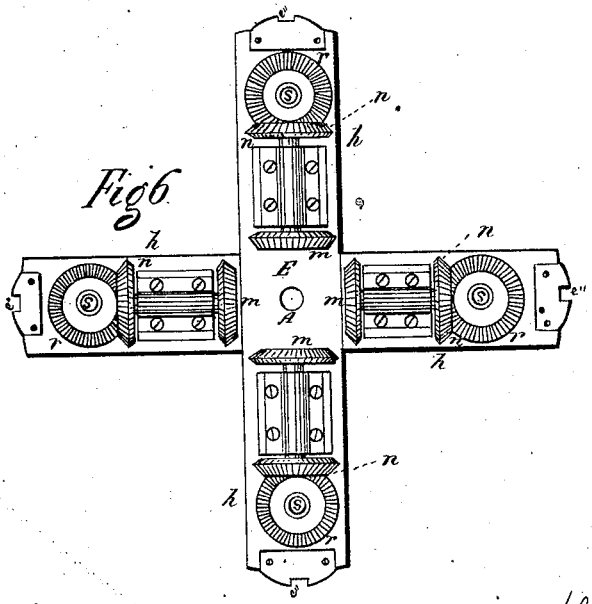


Fig 6.



Witnesses

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UNITED STATES PATENT OFFICE.

ALEXANDER S. JOYCE, OF YONKERS, NEW YORK.

IMPROVEMENT IN HAT-BRUSHING MACHINES.

Specification forming part of Letters Patent No. **162,390**, dated April 20, 1875; application filed March 26, 1875.

To all whom it may concern:

Be it known that I, ALEXANDER S. JOYCE, of Yonkers, in the county of Westchester and State of New York, have invented certain Improvements in Hat-Brushing Machines, of which the following is a specification:

In the manufacture of felt hats the hats, as they come from the pouncing-machine, are permeated with fine dust and dirt, the removal of which, by hand-brushing, involves much labor and trouble, and is, moreover, only imperfectly accomplished. This invention is designed to provide an apparatus that, actuated by any suitable power, will effectually remove all the dust, dirt, &c., at a fraction of the cost hitherto incurred; and the invention consists in certain novel combinations of parts, hereinafter fully described and particularized, whereby the desired object is fully attained.

Figure 1 is a side elevation of a hat-brushing machine, made according to my invention. Fig. 2 is a plan view of the same. Fig. 3 is a side elevation in a plane at right angles to Fig. 1. Figs. 4, 5, and 6 are detached views hereinafter more fully specified, of certain parts of the machine.

A is a vertical driving-shaft, which receives motion through bevel-gears *a b*, from a counter-shaft, B, itself connected, by pulleys *a′ b′* and belt *c*, with a primary shaft, A′, this latter carrying pulleys *d e*, from which extend belts *c′ d′* to pulleys *f g* of rotary brushes C D, these brushes being mounted upon adjustable standards B′ C′, as hereinafter more fully explained. These two brushes are arranged at two adjacent sides of the rectangular frame-work of the apparatus, so that they work in planes at right angles to each other, as more fully indicated in Fig. 1. The brush C has its radial bristles of equal length, and operates as a plain cylindric brush; the other, D, has its stock so shaped, and its bristles so proportioned and arranged, as to have a concavo-conic form, as shown, from *a″* to *b″*, in Figs. 2 and 3. E is a horizontal frame, the radial arms *h* of which carry the blocks F, as presently herein explained. This frame F has a central or axial bearing upon the upper part of the vertical shaft A, upon which latter, at a suitable distance below the frame E, is a bevel-gear wheel, *i*. Provided upon the under side of each of the arms *h* of the frame E, and parallel therewith, is a short shaft, having at one end a bevel-gear, *m*, gearing into the wheel *i*, and at its opposite or outer end a similar gear, *n*, which meshes with a horizontal gear, *r*, provided on the lower part of the vertical axial stem *s* of the adjacent block F. The axial stem or shaft *s* of each block F is capable of vertical play sufficient to permit the lifting thereof until the gear *r* of such stem is brought out of the plane of rotation of the gears *n*. G is a horizontal cam, or slightly inclined plane, fixed to the side of the frame-work in such manner and position that when the horizontal frame E is rotated around the axis of the shaft A, the lower extremity of each stem *s*, projecting below its gear *r*, will pass upon this cam G, and be lifted up out of gear with the gear *n* previously meshing therewith. Upon the outer end of each arm *h* is a small plate, *f**, the edge of which projects beyond the arm itself, and has formed in it a squared recess or notch, *e″*. A spring-catch, *t*, attached to the frame-work, is so arranged that when one of the arms *h* is brought with its notch *e″* coincident with the aforesaid catch, the latter will pass into the notch, and thereby lock the frame E in a fixed position, the nearest adjacent block F being lifted with its gear *r* out of contact with the gear *n* previously meshing therewith.

It will be seen from the foregoing description that the rotation of the shaft A transmitted through the gears *i m n r*, insures a rotatory movement of the blocks F simultaneous with the rotation of the brushes C D by means of the belts *c′ d′*, that one of the blocks, however, immediately over the cam G, being lifted out of connection with its actuating-gear *n*, and consequently devoid of rotation. The intermittent rotatory movement of the frame E is in the direction of the arrow in Fig. 2.

Fig. 6, it should be mentioned, is an inverted plan view of the aforesaid frame, showing the arrangement of the system of bevel-gears carried by the said frame.

In the operation of the machine, each hat, in the condition in which it comes from the pouncing-machine, is, during an interval in the rotation of the frame E, placed upon that

one of the blocks next to, but not in contact with, the brush D. In the movement, therefore, of the said frame, each hat is first carried to the brush D, which brushes the top and a portion of the sides, then to the brush C, which brushes the brim or peripherical portion, and finally over the cam G, which, by lifting the block and stopping its rotatery movement, enables the brushed hat to be readily removed, in order that another may be put in its place at the next interval in the movement of the frame E. It will, therefore, be seen, that while one hat is being placed upon the machine others are undergoing the brushing operation, and the one completely brushed is being removed from the apparatus. It will also be seen that inasmuch as the hats themselves receive a rotary motion while undergoing the action of the rotary brushes, all parts of each hat are subjected to a most thorough and searching action by the brushes, which thus remove all dust, dirt, loose and extraneous coloring matter, &c., from the hats, leaving them in condition for finishing by any of the usual, or by any suitable, means.

Inasmuch as it is desirable that the machine should be capable of use in brushing hats of various sizes, each of the brushes is made adjustable with reference to the blocks F, as follows: The axial shaft of the brush and its pulley are arranged in a bearing formed in the upper end of the standard, which rests upon a bracket, R, pivoted upon the frame-work of the machine. In the bottom of this bracket is a screw, *w*, so arranged that by turning in one direction or the other it will raise or lower the standard upon the bracket, the standard being slotted as shown at *n'* in Figs. 4 and 5, with a set-screw, *r''*, passing through said slot in such manner as to form a guide for the vertical movement or adjustment of the standard, and also as a means of fixing the same rigidly thereto, when required. A screw, I, passing through a fixed nut on the frame-work, has its end arranged in such relation to the bracket, below the pivotal point of suspension of said bracket, that by turning the screw in or out the bracket, and consequently the standard, may be tilted to bring the brush nearer to or farther from the blocks F. The latter are attached to their axial stems by any appropriate devices that will permit their removal and replacement by those of a different size, when occasion requires. It should be mentioned that the intermittently rotating movement of the frame E is produced by simply pulling the spring-catch outward from the notch or recess *e''*, whereupon the friction incident to the meshing of the gear *i* with the gears *m* is sufficient to turn the frame E around the shaft A, until the catch, slipping back into the next succeeding recess, stops such movement of the frame A, until the catch is again withdrawn to permit another partial revolution of the said frame.

By the use of this my invention I am enabled to effect a saving of labor in the brushing of hats amounting from sixty to seventy per cent. of that required in hand-brushing. I am enabled to expel the dust and impurities from the felt throughout the structure of the same, instead of driving it from one side to the other as in hand-brushing, and by this more thorough expulsion of the dirt and waste matter, by mechanical means, I am enabled to diminish, in a very great degree, the washing commonly employed to assist the removal of impurities, but which, when carried to the extent ordinarily found necessary, has been found to materially injure the color of the goods.

What I claim as my invention, is—

1. The horizontal frame E, carrying the blocks F, and system of bevel-gears *m n r*, actuated by the gear *i*, in combination with the cylindric brush C, and concavo-conic brush D, the whole arranged for operation, substantially as and for the purpose specified.

2. The fixed cam G, arranged in relation to the axial stems of the blocks F, capable of a vertical movement in the intermittently-rotating frame E, whereby one of the said blocks is automatically lifted out of connection with its actuating-gear, while the rotatory movement of the others is continued, substantially as and for the purpose set forth.

ALEXANDER S. JOYCE.

Witnesses:

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J. A. WHITNEY.