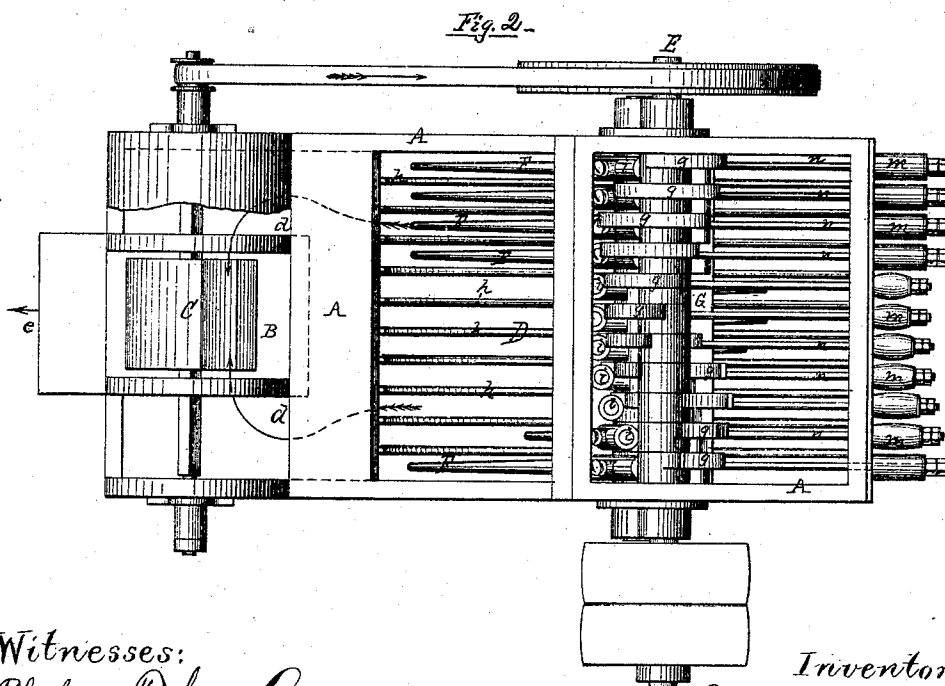
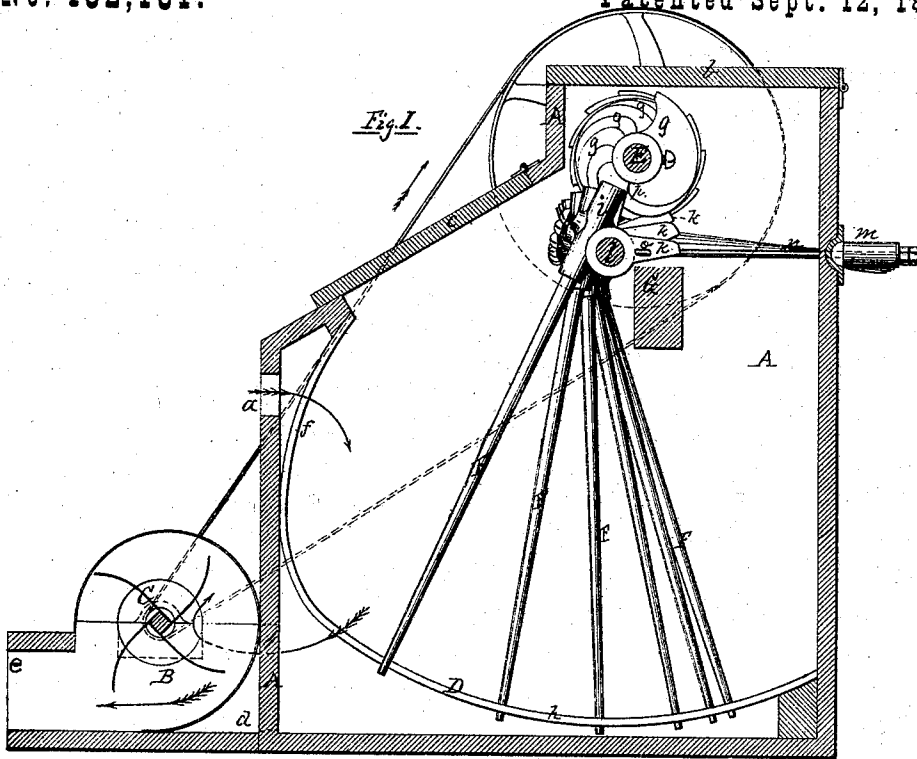


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MACHINES FOR CLEANING HAT BODIES.

No. 182,181.

Patented Sept. 12, 1876.



Witnesses:  
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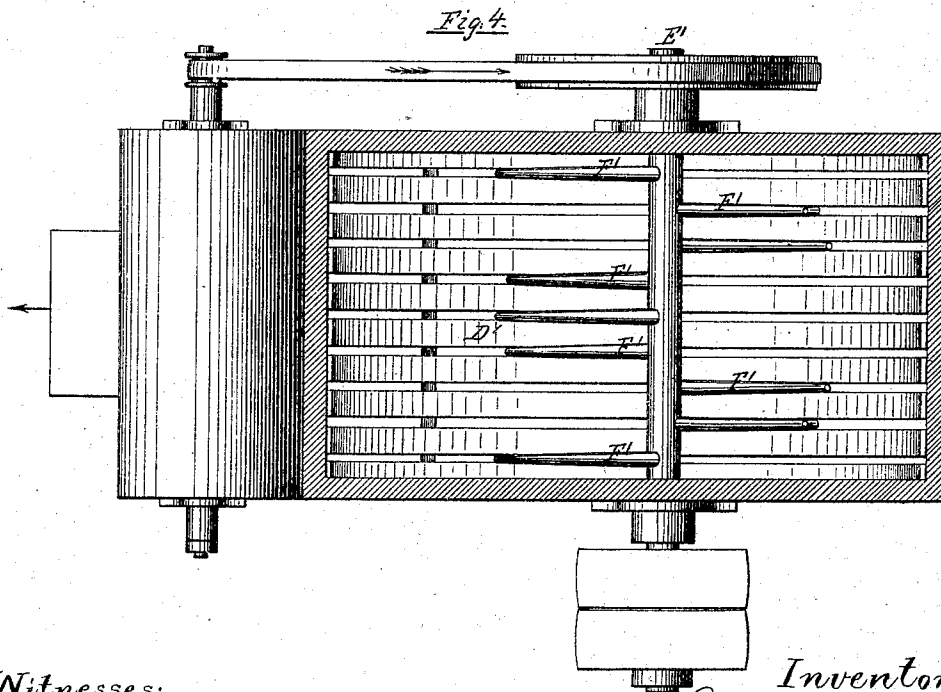
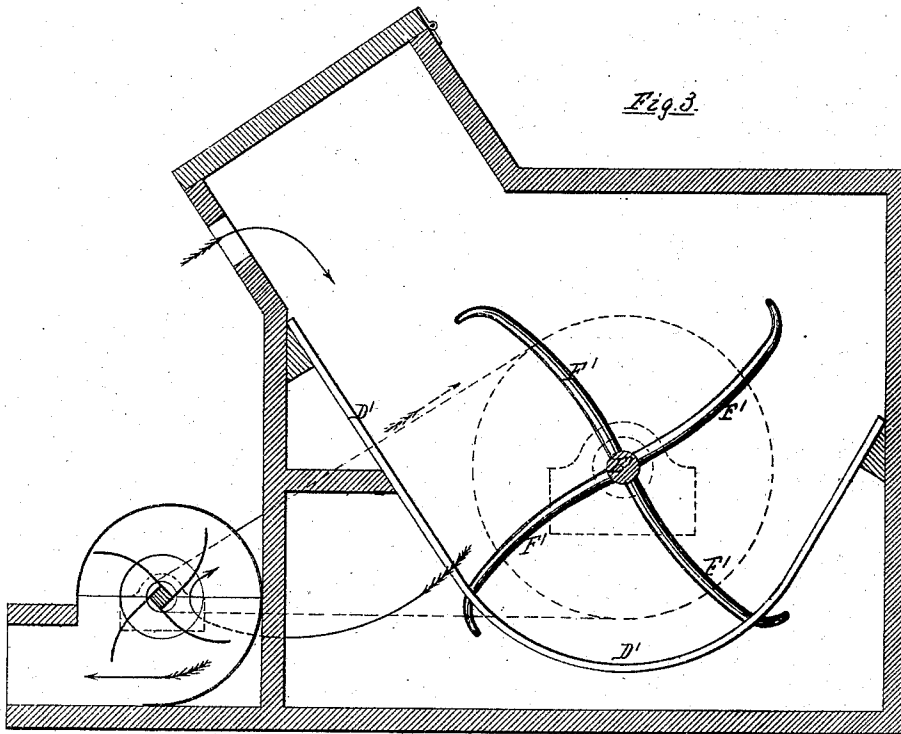
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# UNITED STATES PATENT OFFICE.

RUDOLF EICKEMEYER, OF YONKERS, NEW YORK.

## IMPROVEMENT IN MACHINES FOR CLEANING HAT-BODIES.

Specification forming part of Letters Patent No. **182,181**, dated September 12, 1876; application filed May 31, 1876.

### *To all whom it may concern:*

Be it known that I, RUDOLF EICKEMEYER, of Yonkers, in the county of Westchester and State of New York, have invented a certain new and useful Machine for Cleaning Hat-Bodies; and I do hereby declare that the following specification, taken in connection with the drawings furnished and forming a part of the same, is a clear, true, and complete description of my invention, and of machines embodying the several features thereof.

In the manufacture of "soft hats," after the bodies have been subjected to the pouncing operation, it is essential that the particles of dust and fur or wool which remain on the hat-bodies, or are partially embedded in the felt, should be thoroughly removed and the surfaces made clean and bright, for otherwise it would be impracticable to subsequently attain a desirable surface-finish. This operation is variously designated, but is usually called "dusting" or "cleaning," and, so far as my knowledge extends, this service has either been performed by the aid of brushes or brushing-machines operating upon one hat-body at a time, or, in extreme cases, by beating the hats singly with a stick by hand. This latter method is preferable, so far as results are concerned, but is obviously laborious and expensive. In some cases it is difficult, even with the use of such sticks, to produce results wholly satisfactory.

The object of my invention is to perform this service rapidly, effectually, and economically. I practically accomplish these ends by means of a novel machine embodying a suitable inclosing structure, a bed on which the hat-bodies are deposited in considerable numbers, a series of whipping-beaters, which strike the bodies and keep them in motion, and an apparatus for inducing currents of air through the machine, so that the dust and detached fiber will be promptly and continuously removed during the beating operation; and my invention consists in various peculiar combinations and arrangement of the mechanism referred to, and in the peculiar construction of portions thereof, as will be hereafter fully described.

To more particularly describe my invention,

I will refer to the accompanying drawings, of which two sheets are presented, and in which—

Figure 1, Sheet 1, represents, in longitudinal central vertical section, a machine embodying my invention. Fig. 2 represents the same in top view with a part of the upper portion of the casing removed. Figs. 3 and 4, Sheet 2, represent, in longitudinal vertical central section and in top view, respectively, a machine differing in construction from that shown in Figs. 1 and 2, but embodying the principles of my invention.

Referring to Figs. 1 and 2, A denotes the casing of my machine. It is box-like in form, having closed sides, ends, and top, with the exception of an aperture at the front end, as at *a*, for the entrance of air. Two hinged covers, as at *b* and *c*, are provided, the former affording access to a portion of the operative mechanism for the purposes of oiling and cleaning, and the latter closes an aperture through which the hat-bodies are put into and taken from the machine.

At each side of the front end, near the bottom, as at *d*, is a passage which communicates with the center of a fan-chamber, B, containing the revolving fan C, whereby air is drawn into the machine through aperture *a*, and from the machine into the fan chamber, and thence discharged into a pipe or flue, as at *e*, as indicated in the drawings by arrows.

D denotes the interior surface of the chamber or receptacle, which serves as a bed, on which the hat-bodies are deposited. It is essential that the bed be skeletonized, to that extent, at least, as will permit the drafts of air induced by the fan to freely pass from the induction-aperture *a* to the fan-chamber through the bed, and to carry off the dust and loose fibers. I prefer to have the bed composed of a series of bent bars or plates of metal, or of wood, as at *h*, arranged after the manner of a grate.

In Fig. 1, the bed, in longitudinal section, has a surface-line resembling somewhat that of a fulling-mill bed. It is curved quite regularly on the bottom, but at its front end it is curved upward and inward, as at *f*, so that a mass of hat-bodies, when forced into contact

with the front portion of the bed, will be caused to rise and to fall backward upon the lower portion of the bed again.

E denotes the main shaft of the machine, to which power is applied, and from which the fan is preferably driven, as shown in the drawings. The main shaft has a tight and a loose pulley, and is provided with cams or tappets, as at *g*, all having the same form and having working surfaces on their edges. These cams may be set spirally on the main shaft, or in any other desired order with relation to each other; but, for performing good service, they should be so set that no one cam will occupy a position on the shaft corresponding with the position of the next adjacent cam on either side thereof.

F in each instance denotes one of several whipping-beaters, preferably composed of fine-grained hickory or other tough and springy wood. The beaters are of sufficient length to extend their lower ends between the bars *h*, when the bed is constructed in the form of a grate, as shown, in order to prevent a hat-body from getting between the end of a beater and the bed. Each beater is housed at its butt in a metallic socket, as at *i*. This socket is provided with a lateral hub at its rear, and an arm or lever, as at *k*, which projects rearward from and at right angles to the axial line of the hub. All of the beaters are mounted by means of their hubs side by side on a fulcrum-shaft, *l*, which extends across the machine, and has supports in the sides thereof. The upper rear sides of the sockets *i* are faced off so as to afford a proper surface for the cams to engage with.

Each beater is provided with a spring, as at *m*, which incloses a spring-rod, *n*, attached to the lever *k* of the beater, as at *o*. The spring-rods extend through the rear end of the casing, as shown in Fig. 2, and the springs may abut against the casing, or against plates between them and the casing. Each spring-rod at its outer end has a washer next its spring and two nuts, one of which serves to adjust the force of the spring, and the other serves as a jam-nut for securing the first nut in position. As shown in the drawings, rubber springs may be employed, although spiral or other metal springs may be used.

G denotes a cross-bar, located at the rear of and slightly below the fulcrum-shaft *l*, and so set with relation to the lever *k* that its upper surface serves as a check or stop to the beaters when released by the cams and vibrated by the springs.

It is to be understood that the beaters may be operated in rapid succession, or that one-half of them may be carried backward and released simultaneously, while the other half of the beaters are being in like manner carried backward. Each cam is so formed that its toe at *p* gradually engages with the face of a socket, and, as the shaft revolves, the swell of the cam smoothly carries the beater back-

ward, and the abrupt termination at the heel of the cam permits the beater to promptly respond to the strain of its spring for effecting the striking movement.

It will be seen that between the front inner surface of the chamber and the whipping-beaters there is a space for the reception of the hat-bodies, and that the loose mass of bodies will be supported partially by the surface of the chamber and partially by the beaters, so that the upward blows from the beaters will be felt more or less throughout the mass.

In operation, a desired number of hat-bodies are thrown into the machine, which is then closed and started. The rotation of the main shaft causes the whipping-beaters to strike sharp quick blows upon the hats, and the curved front of the bed causes the bodies to be continuously changing position. The fan draws the air, charged with dust and fiber, from the machine, and discharges it at any convenient point. The air is continuously rushing inward from the aperture in front of the machine through and over the bodies until they have been sufficiently well beaten.

The upper aperture at *a* is so located with reference to the front portion of the chamber and the beaters that the strong inward current of air passing through it will strike the upper hat-bodies of the loose mass and throw them backward and downward upon the beaters, and, therefore, the inward current of air performs a valuable service in securing the desired movement of the hat-bodies while being operated upon in the machine.

In order to get a good effect from the blow of the vibrating beater, there should be a prompt recoil after each blow; and this is effected by connecting the spring-rod *n* with the lever *k*, as at *o*, in such a manner that the spring has no control over the beater when its lower end is thrown fully forward, so that by the force of the spring the beater makes the last portion of its forward movement after the spring has ceased to draw, and, therefore, the beater promptly recoils, being limited therein by contact of its lever or arm with the upper surface of the cross-bar G.

While the spring-beater is deemed by me preferable to any other form, I am aware that approximately-similar results may be attained with revolving arms, set radially in a continuously-revolving shaft. Such a machine is shown in Figs. 3 and 4.

It will be seen that the casing is somewhat different in form from that already described, but is provided with the hinged cover, air-aperture, fan-chamber, and passages, as before described. The bed *D'* is not of the same form as in Fig. 1, but is skeletonized, and composed of bars, as before described. It has no rearward curve at its front, as that construction is not required with the revolving beaters. The whipping-beaters *F'* are radially mounted on the main shaft *E'*, have ends

which are curved in the direction opposite to that in which they move, and project downward through the spaces between the bars of the bed.

In this machine the bodies are beaten or whipped, and continuously thrown upward against the cover and casing adjacent thereto, and the currents of air are employed as before.

In both machines the bodies will be constantly changing their positions with relation to each other and to the whipping-beaters.

I am well aware that in carpet-beating machines, as heretofore constructed, inclosed chambers have been employed, in combination with beaters, both revolving and vibrating, for delivering blows upon a carpet and removing dust and dirt therefrom; also, that in some of such machines fanning apparatus has been employed for removing dust from the chambers; also, that tightly-stretched ropes or bands have been employed in the same connection for affording a flat support for a carpet while being beaten; and that various other devices have been used which perform the functions of beds for flatly maintaining the carpet in proper position to receive blows from the beaters. It will be seen, however, that a machine in which the beaters deliver their blows in lines parallel with the flat surface of a bed, as in all carpet-beating machines, would be practically worthless for cleaning hat-bodies, because the beaters would not cause the bodies to be constantly changing positions, but would simply mat them flatly upon the bed. In my machine, whether the revolving or the vibrating whipping beaters are employed, the blows are not delivered in a line parallel with any bed, but they are delivered upward, moving from the bottom of the receptacle, and the beaters strike against the bottom of the loose mass of hats, and, therefore, cause them to be continuously changing position, so that it is hardly probable, even if the chambers were well filled, that the same hat-body would receive more than two or three consecutive blows from the same beater. Moreover, the force of the blows from the beaters is communicated more or less to all the hats in the loose mass, because the bodies are supported partially by the beaters. When a small number of bodies are being operated upon, a large proportion of them will be either flying upward or falling downward, and the remainder will momentarily be resting either upon the beaters or on the supporting-surface of the chamber. The outgoing

currents in my apparatus remove the dust and loose fiber from the chamber, as in carpet-beating machines; but the ingoing current in those machines has no service to perform, while in my apparatus it performs a special and valuable service. The hat-bodies are piled up against the front inner surface of the chamber through the action of the beaters, and the powerful inward current of air through aperture *a* displaces the upper bodies of the pile, throws them backward and downward upon the beaters, and thus assists materially in securing a proper movement of the bodies during the beating operation.

Having thus described my invention, I claim as new and desire to secure by these Letters Patent—

1. In a hat-cleaning machine, the closed receptacle or chamber, and the series of whipping-beaters, in combination and arranged with relation to each other for affording a space for receiving the hat-bodies in mass, substantially as described, whereby the mass of bodies are supported partially by the beaters and partially by the interior surface of the chamber, are beaten by the upward blows of the beaters, and kept in motion, as set forth.

2. In a hat-cleaning machine, the combination, with an inclosed chamber having a skeletonized bed, an air-induction aperture in the upper front portion of the chamber, above the bed, and air-eduction apertures below the bed, of an apparatus for inducing currents of air, and the whipping-beaters, substantially as described, whereby the incoming current of air throws the upper hat-bodies backward and downward upon the beaters and the outgoing current removes the dust and loose fiber from the chamber, as set forth.

3. In a hat-cleaning machine, the combination, with the inclosing-chamber and the skeletonized curved bed, of the whipping-beaters, substantially as described.

4. The combination, with a curved bed, composed of bars, of a series of whipping-beaters, axially mounted and extended through the spaces between the bars of the bed, substantially as described.

5. In a hat-cleaning machine, the vibrating whipping-beaters, in combination with cams for moving the beaters backward, and springs which are adjustable for imparting a light or a heavy blow, substantially as described.

R. EICKEMEYER.

Witnesses:

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GEORGE NARR.