

(No Model.)

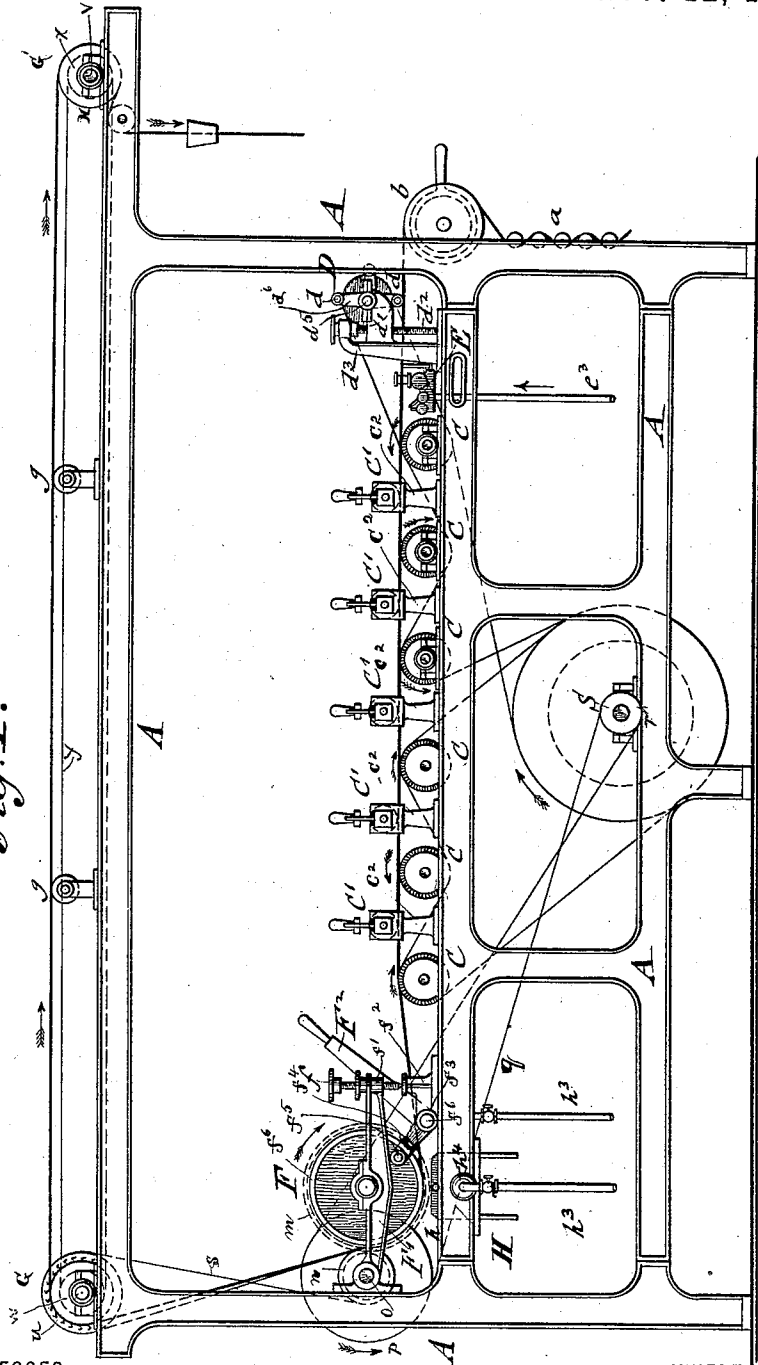
3 Sheets—Sheet 1.

P. VAN DEN ESCH.
MACHINE FOR FINISHING PLUSH.

No. 415,009.

Patented Nov. 12, 1889.

Fig. 1.



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(No Model.)

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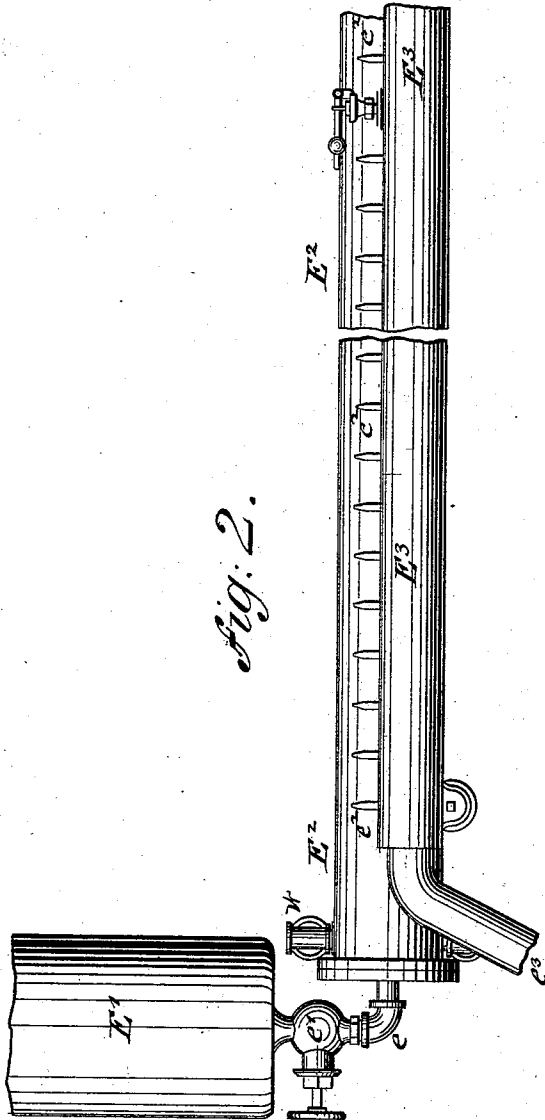


Fig. 2.

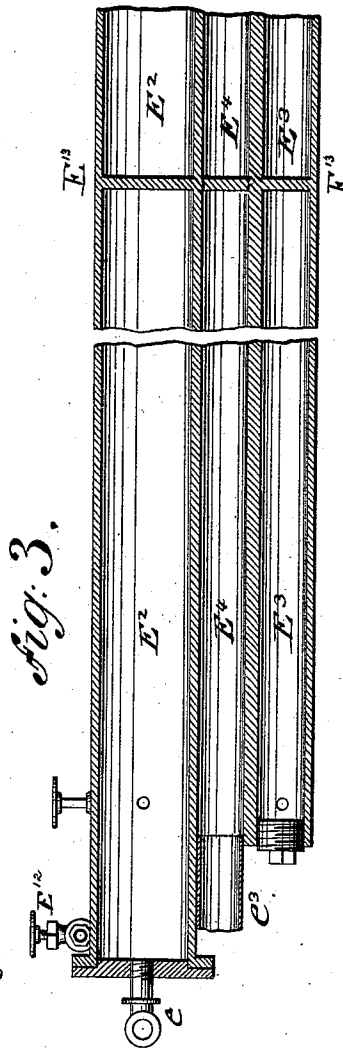


Fig. 3.

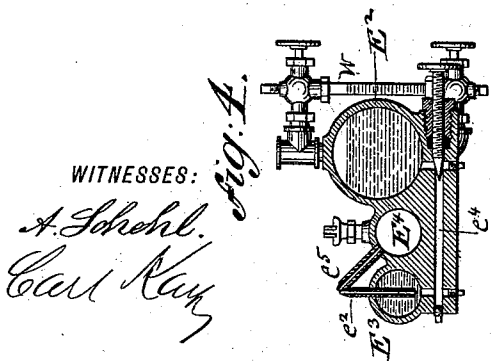


Fig. 4.

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3 Sheets—Sheet 3.

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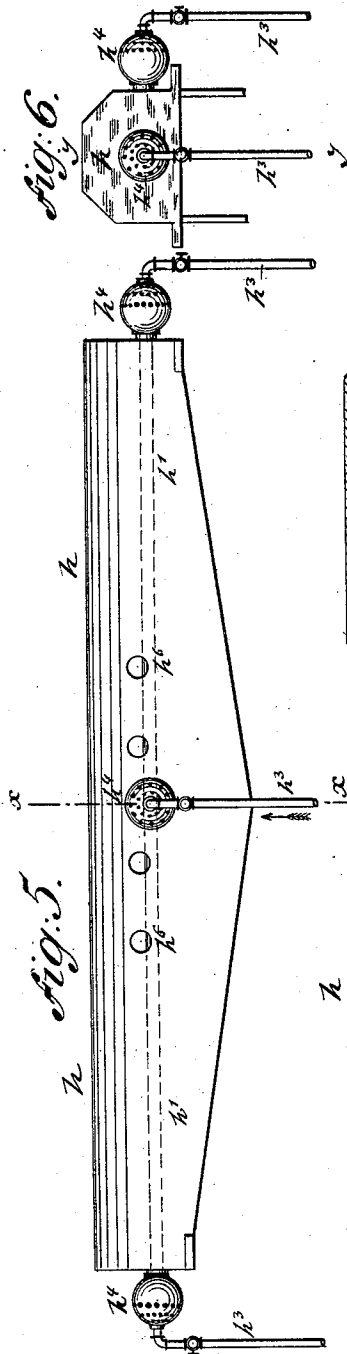


Fig. 5.

Fig. 6.

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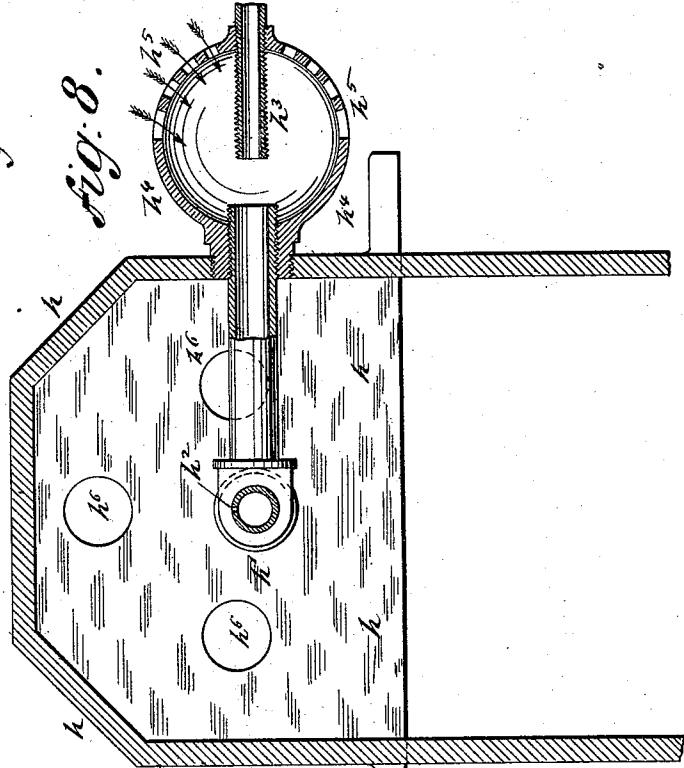


Fig. 8.

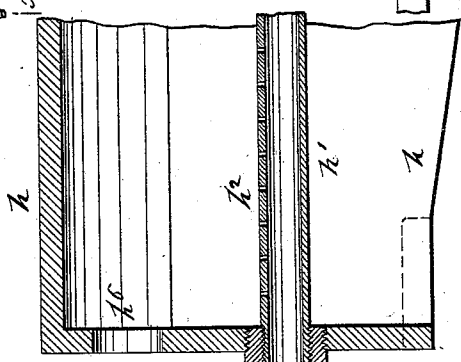
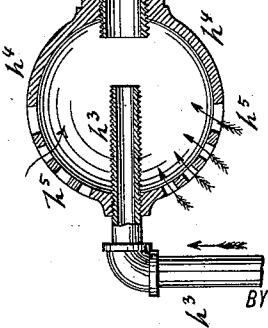


Fig. 7.



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UNITED STATES PATENT OFFICE.

PETER VAN DEN ESCH, OF STEINWAY, NEW YORK.

MACHINE FOR FINISHING PLUSH.

SPECIFICATION forming part of Letters Patent No. 415,009, dated November 12, 1889.

Application filed March 6, 1889. Serial No. 302,154. (No model.)

To all whom it may concern:

Be it known that I, PETER VAN DEN ESCH, of Steinway, in the county of Kings and State of New York, a citizen of the Empire of Germany, have invented certain new and useful Improvements in Machines for Finishing Plush, of which the following is a specification.

This invention relates to an improved machine for finishing plush, so that the same receives a glossy and finished appearance over the entire surface of the raised nap; and the invention consists of a machine for finishing plush, composed of a number of driving and guiding rollers supported on a suitable frame, a rotary beating device for the plush at one end of the frame, an atomizer for applying the size by which the gloss is imparted to plush, said atomizer being located adjacent to said beating device, a number of brush-rolls and intermediate supporting-rollers, a guide-drum, and a heating device below said drum for drying the plush and imparting luster to the same, said drum around which the plush passes being readily lifted by means of a hand-lever arrangement whenever a seam passes between the drum and heating device.

The invention consists, further, of certain details in the construction of the machine, which will be fully described, and finally pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation of my improved machine for finishing plush. Figs. 2, 3, and 4 are respectively a partial elevation, a partial horizontal section, and a vertical transverse section of the atomizer, by which the size is applied to the nap of the plush. Fig. 5 is a side elevation of the heating device for drying the plush. Fig. 6 is an end elevation of the same, and Fig. 7 is a vertical longitudinal section of the heating device on line $y y$ of Fig. 6 on a larger scale. Fig. 8 is a transverse section, partly in elevation, on line $x x$ of Fig. 5, on a larger scale.

Similar letters of reference indicate corresponding parts.

Referring to the drawings, A represents the supporting-frame of my improved machine for finishing plush, which frame is provided at one end with a number of tension-rods a

and a guide-roller b , over which the fabric is passed and from which the same is conducted in a longitudinal direction with the nap downward over a number of rotary brush-rolls C and under intermediate supporting-rolls C', which latter are supported in bearings of standards C² on a plane above the brush-rollers.

A rotary beater D is disposed at one end of the machine over the path of the fabric. As shown, this rotary beater consists of spider-frames d^6 , supported on a shaft d^5 , and rods d , supported at their opposite ends in said spider-frames. As the beater revolves, the rods d come in contact successively with the back of the plush and impart a quick succession of blows thereto, serving as whips to beat out the dust therein contained. These rods or whips d are preferably journaled in the spider-frames so that they will rotate axially when in contact with the plush, whereby friction is avoided. The shaft d^5 of the beater-frame D is supported in bearings in horizontal brackets d^7 , which are vertically adjustable by means of screws d^2 on vertical guide-standards d^3 of the main frame A, as shown clearly in Fig. 1. By adjusting the beater-frame lower or higher in its supporting-standards the beaters or whips exert a greater or less effect on the plush fabric, so as to beat the same more or less violently, according to the size of the nap and quantity of dust contained in the same.

Adjoining the rotary beater-frame D and between the same and the first brush-roll C is arranged an atomizing apparatus E, which is clearly shown in detail in Figs. 2, 3, and 4. The atomizing apparatus E serves the purpose of supplying a suitable size in finely-divided state into the nap of the plush in such a manner that all the fibers of the nap receive some of the size. For this purpose the size is placed in a reservoir E', from which it is conducted by a pipe e , provided with a stop-cock e' , into a horizontal cylindrical receptacle E², which is provided at one end with an ordinary water-gage W, for indicating the quantity of size in the same. From the cylindrical receptacle E² the size passes through a horizontal channel e^4 below the receptacle E² into a second smaller supply-cylinder E³, from which extend a number of vertical suction-

pipes with tapering nozzles e^2 in upward direction, as shown clearly in Fig. 4. Between the larger and smaller cylindrical receptacles E^2 E^3 is arranged a longitudinal air-tube E^4 , which communicates at both ends by pipes e^3 with a suitable source of supply of compressed air. The air-tube E^4 and the size-receptacle E^3 are divided midway by transverse partitions E^{13} into two halves, and there is a channel e^4 at each end of the atomizer, so that each half can be worked independently of or jointly with the other half.

The atomizing apparatus, as well as the beaters and the brush and supporting rolls, are of such a width that simultaneously two widths of plush can be passed over the finishing-machine. In case one piece only is to be finished the air and size supply pipes of the other half of the atomizer are closed, and only that half of the atomizer over which the fabric is passed is called into action. From the air-supply tube E^4 extend toward the discharge-nozzles of the size-supply pipes inclined air-pipes e^5 , the nozzles of which are located in close proximity to the nozzles of the size-supply pipes, so that the suction exerted by the escaping air lifts the size from the size-supply cylinder E^3 and forces the same in finely-divided spray or vapors against the nap of the plush. The brush-rolls are alternately rotated in opposite directions and serve to work the size thoroughly into the nap, so as to incorporate it with the fibers thereof.

Motion is imparted to the brush-rolls C and beater-frame D from the pulleys of a driving-shaft S, which is supported in bearings at the center of the machine. A cross-belt passes from one of the pulleys on the driving-shaft over pulleys at the ends of one-half of the brush-rolls and over a pulley of the beater-frame, while a second belt passes over the pulleys of the remaining brush-rolls, as shown in Fig. 1. When the plush arrives at the opposite end of the machine, it is passed below a guide-drum F of smoothly-polished steel. A gear-wheel m on the shaft of the guide-drum meshes with a pinion n on the shaft o , said shaft being provided with a pulley p , from which a crossed belt q extends to a pulley r on the driving-shaft S, these parts or their equivalents constituting the means whereby motion is communicated to the guide-drum in the direction as shown by the arrows in Fig. 1. From the guide-drum F the plush passes over a draft-roller G, which is mounted with cards and located at the upper corner of the support-frame A, and which roller receives rotary motion by a cross-belt s from a pulley of the shaft o of the driving-pinion of the guide-drum F. From the driving-roller G the plush passes over a number of intermediate guide-rollers $g g$ to a second card-mounted draft-roller G' at the opposite corner of the machine, and from the same over a smaller guide-roller to a suitable folding device.

The shafts u and v of the card-mounted rollers G G' are provided with pulleys w and x' , connected by a belt y , whereby motion is transmitted to roller G'.

Below the guide-drum F is located the drying apparatus H, which is shown in detail in Figs. 5 to 8. The drying apparatus consists of a gas-heated cast-iron box h , having a horizontal polished top surface, above which the nap of the plush is guided by the drum F at such a distance that the nap does not touch the horizontal top surface of the heating-box. A pipe h' extends longitudinally through the heating-box h , said pipe being provided at its upper part with a number of small jet-holes h^2 . Gas is supplied by gas-supply pipes h^3 , provided with stop-cocks at both ends and at the middle part of the heating-box h , said gas-pipes terminating in hollow spherical casings h^4 , which are provided at that part which surrounds the gas-supply pipes with air-inlet openings h^5 , through which a certain quantity of air is drawn in and mixed with the gas, so that the gas and air mixture when emitted through the jet-openings h^2 of the longitudinal pipe h' burns with a blue heating-flame on the principle of the Bunsen burner. The additional quantity of air required for the combustion of the gas and air mixture is supplied through the open bottom of the heating-box h , while the products of combustion are conveyed to the outside through openings h^6 in the ends and side walls of the heating-box h , which openings are shown, respectively, in Figs. 5 and 8. The heat radiated from the upper surface of the heating-box h dries the finely-distributed size that has been incorporated into the nap of the plush, so that a fine luster is imparted to the nap.

The drum F, under which the plush is passed, is supported in bearings in horizontal arms F', which are pivoted upon the shaft o of the driving-pinion n , and supported at their opposite ends on vertically-movable screw-rods f , which engage threaded sleeves f' of the arms F and rest loosely at their lower ends on fixed posts f^2 . The drum F is vertically adjusted by the screw-posts f , as shown in Fig. 1, so that the distance at which the fabric passes from the heating apparatus can be readily adjusted, according to the degree of heat to which the fabric is to be exposed in its passage under the drum.

The machine is provided with means for raising the drum bodily on the approach of a seam in the fabric, consisting of an elbow-lever F², pivoted in a bearing f^3 of the frame. The lower short arm of said lever is provided with a recess in its inner face, in which is disposed an inwardly-projecting anti-friction roller f^5 . The trunnion f^6 of the elbow-lever F² may extend across the machine in the form of a rod and be provided at its opposite end with a short arm corresponding with the short arm of said lever F². This short arm may also be provided with an anti-friction roller. The anti-friction rollers of the short arms

rest against the under sides of the supporting-arms F', and when the attendant depresses the elbow-lever F² the arms F' are raised, carrying up the screw-rods f and the drum F, said arms swinging on their pivots and the drum being elevated sufficiently to permit the seam to pass without too close proximity to or contact with the heater. By thus lifting the drum when seams pass under the same the stopping of the machine is rendered unnecessary and the injuring of the plush by contact with the heating-surface is prevented.

Each piece of plush is passed twice through the machine, the second time with its end reversed, so that the nap of the plush receives a splendid luster and finish.

By my improved finishing-machine large quantities of plush can be finished in a uniform, quick, and effective manner at a considerable saving of time and labor, while a superior finish is imparted to the nap, as the operations of beating, sizing, and heating are performed in an automatic and reliable manner.

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

1. The combination of draft and guiding rollers for the fabric, a rotary beater, an atomizing apparatus adjoining said beater, a number of brush-rolls for incorporating the size into the nap of the plush, and a number of supporting-rolls alternating with said brush-rolls, substantially as set forth.

2. The combination of a supporting-frame having draft and guiding rollers for the fabric, a rotary beater at one end of the machine, an atomizing apparatus adjoining said beater, a number of rotary brush-rolls arranged below the fabric, a number of alternating supporting-rolls located above the fabric, a guide-drum at the opposite end of the machine, and

a heating apparatus below the guide-drum, substantially as set forth.

3. The combination of a rotary beater, a number of brush-rolls, a number of supporting-rolls alternating with the brush-rolls, and an atomizing apparatus located between the beater and brush-rolls and composed of a horizontal size-supply cylinder having suction-pipes provided with discharge-nozzles, and an air-supply pipe having inclined air-discharge pipes whose nozzles terminate above the nozzles of the size-supply pipes, substantially as set forth.

4. The combination, with a guide-drum, of a heating apparatus located below said drum, the heating apparatus being composed of a cast-metal heating-box provided with a longitudinal pipe having jet-openings, and gas and air mixers communicating with said pipe for supplying the mixture of gas and air for heating the box, substantially as set forth.

5. The combination of a supporting-frame having draft and guiding rollers for the fabric, a heating apparatus, pivoted arms, a guide-drum supported in said arms above the heating apparatus, and a fulcrumed elbow-lever adapted to engage said arms for lifting the drum.

6. The combination, with a supporting-frame having draft and guiding rollers for the fabric, of a heating apparatus, a guide-drum above the heating apparatus, and means for vertically adjusting said drum, substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

PETER VAN DEN ESCH.

Witnesses:

PAUL GOEPEL,
JOHN A. STRALEY.