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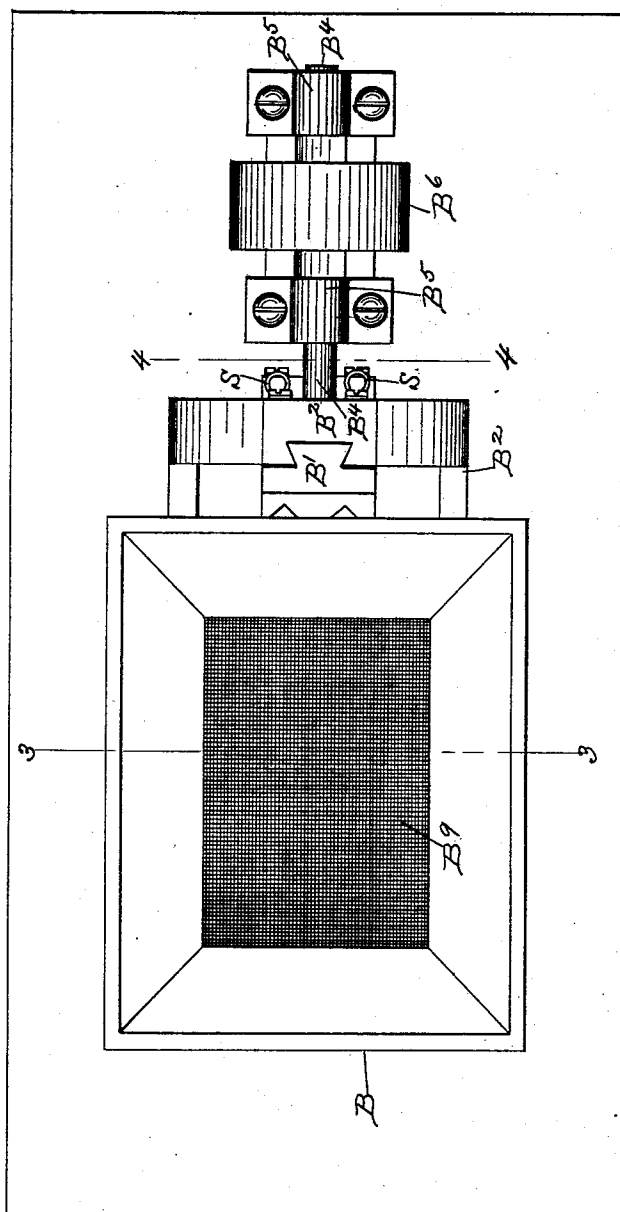
4 Sheets—Sheet 1.

W. MORRISON.
BRUSH MACHINE.

No. 570,604.

Patented Nov. 3, 1896.

Fig. 1.



Witnesses:
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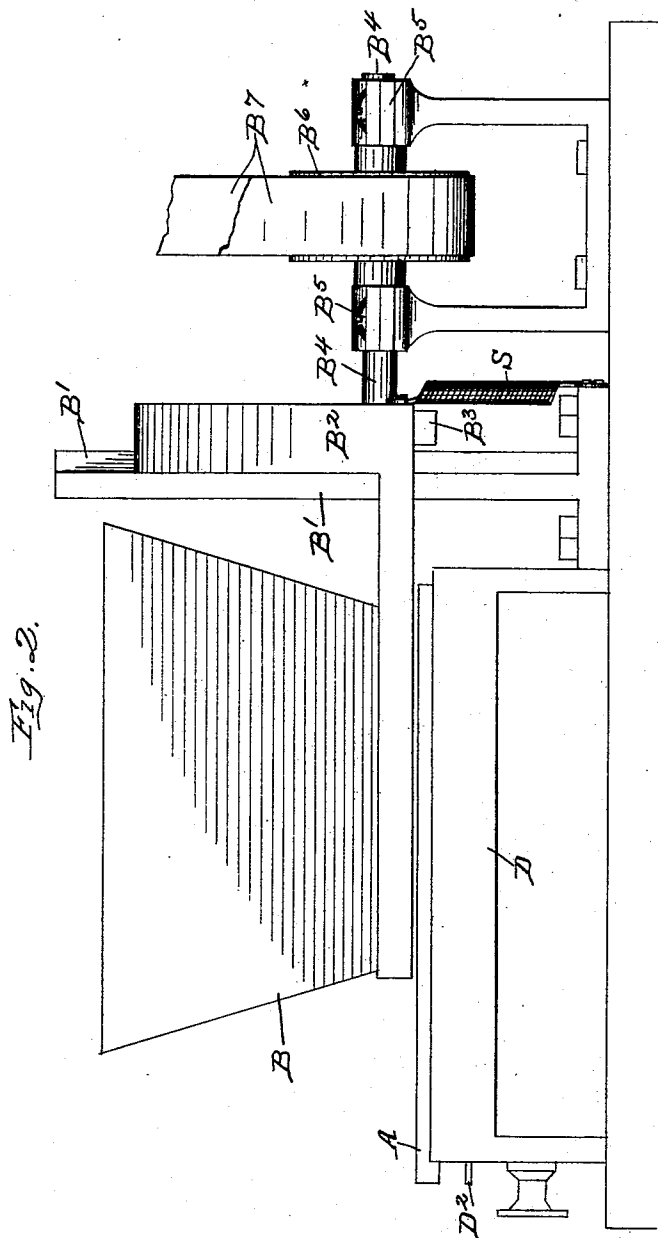
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W. MORRISON.
BRUSH MACHINE.

No. 570,604.

Patented Nov. 3, 1896.



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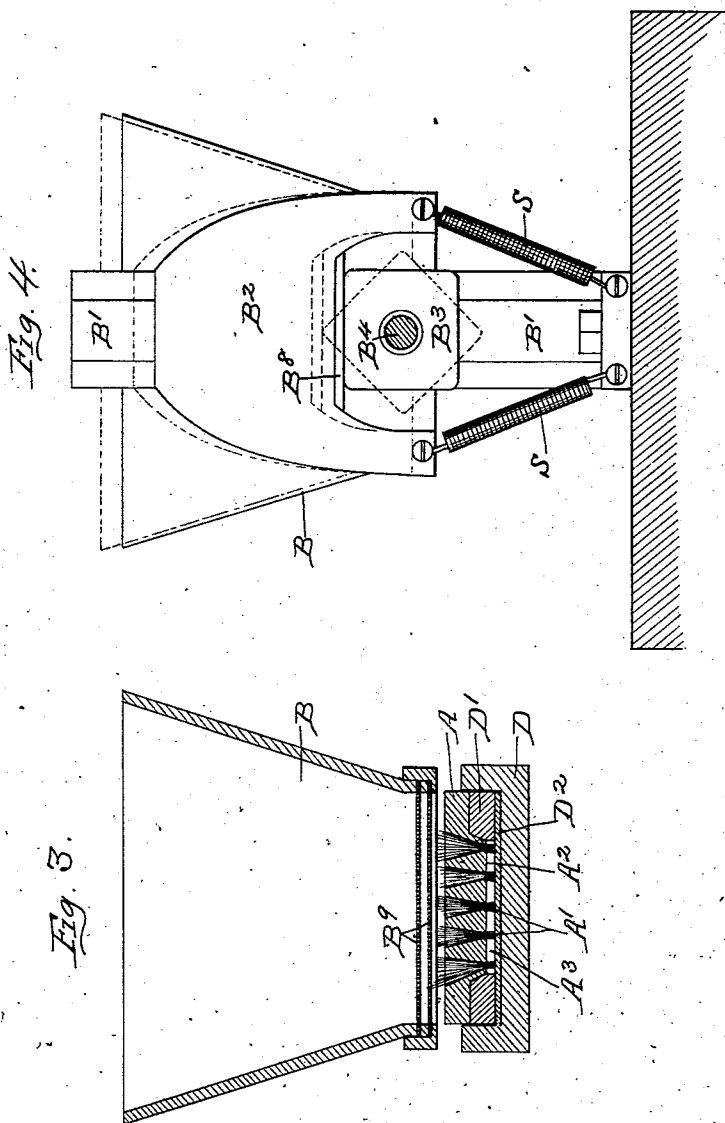
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(No Model.)

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Fig. 5.

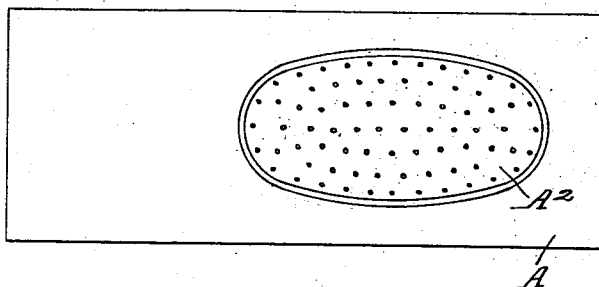


Fig. 6.

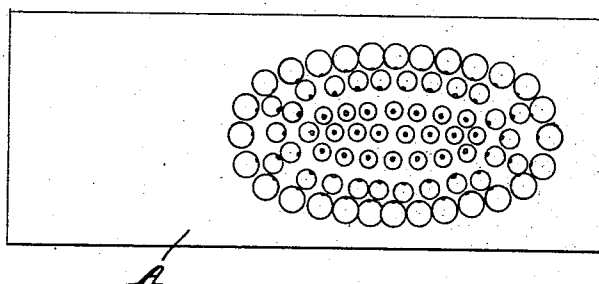
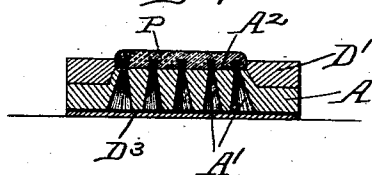


Fig. 7.



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UNITED STATES PATENT OFFICE.

WILLIAM MORRISON, OF LANSINGBURG, NEW YORK, ASSIGNOR TO EMMA MORRISON, OF SAME PLACE.

BRUSH-MACHINE.

SPECIFICATION forming part of Letters Patent No. 570,604, dated November 3, 1896.

Application filed February 3, 1896. Serial No. 577,943. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM MORRISON, a citizen of the United States, residing at Lansingburg, county of Rensselaer, and State of New York, have invented certain new and useful Improvements in Brush-Making Apparatus, of which the following is a specification.

The invention relates to such improvements; and it consists of the novel construction and combination of parts hereinafter described and subsequently claimed.

Reference may be had to the accompanying drawings, and the letters of reference marked thereon, which form a part of this specification.

Similar letters refer to similar parts in the several figures therein.

Figure 1 of the drawings is a top plan view of my improved apparatus. Fig. 2 is a view in side elevation of the same. Fig. 3 is a vertical cross-section of the same, taken on the broken line 3 3 in Fig. 1. Fig. 4 is a vertical cross-section of the same on the line 4 4 in Fig. 1. Fig. 5 is a plan view of one side of the bristle-plate. Fig. 6 is a plan view of the opposite side of the bristle-plate. Fig. 7 is a view in cross-section of the bristle-plate and bristles in the operation of forming the brush-pad.

The principal object of my invention is to provide an efficient means for rapidly inserting short lengths of bristle in a recessed or apertured plate in the operation of making brushes by molding a pad of composition around the ends of the knots or bunches of bristles.

My invention relates particularly to the method of inserting or feeding the bristles into the bristle recesses or apertures in the bristle receiving and supporting plate, as well as to the method of forming the brush-pad around the ends of the bristles so supported.

Referring to the drawings, A is a plate having a plurality of apertures formed there-through, adapted to receive and support the several knots or bunches of bristles A' to be embodied in a molded brush, which apertures are preferably tapered from one side of the plate to the other. The plate is preferably made of metal and provided on one side with

a molding-surface A², in which are the smaller end openings of the bristle-recesses.

B is a hopper adapted to contain a supply of bristles, and B' a vertical slideway-support on which the hopper is mounted by means of the frame B², free to slide longitudinally on the support. Reciprocating movements can be imparted to the hopper by means of the cam B³, mounted upon and rotary with the drive-shaft B⁴, supported in bearings B⁵, and provided with a drive-pulley B⁶, to which power is transmitted through the belt B⁷ to operate the shaft and cam. The cam is engageable with the under side of the frame B², which may be provided with a pad B⁸, of leather or rawhide, to resist the wearing effect of the cam. The hopper is provided with a reticulated bottom comprising one or more meshed diaphragms or sieves B⁹.

In the operation of filling the plate with bristles the plate is placed upon a support or carriage D, with its molding-surface on the under side and supported a short distance above the floor of the carriage by means of the ring D', which surrounds said molding-surface. The carriage is then placed beneath the hopper, the flaring ends of the bristle-apertures in the plate being uppermost, and a supply of bristles having been inserted in the hopper the same is rapidly reciprocated by means of the cam mechanism above described. The agitation thus imparted to the bristles in the hopper causes them to assume various positions therein, in some of which positions the ends of the bristles enter the meshed openings in the hopper-bottom and guide the bristles therethrough in approximately vertical lines. The bristles thus fed through the hopper-bottom by agitation enter the flaring mouths of the bristle-apertures in the plate A and are guided by the converging walls of such apertures through the contracted end openings to project from the molding-surface A² into the space A³ between such surface and the carriage. As the operation of the hopper is continued the bristle-apertures in the plate A are gradually filled, the impact of the continuously-falling bristles, as well as gravity, causing the bristles to descend through the contracted ends of

the apertures until their progress is arrested by engagement with the floor of the carriage or an interposed plate D². When the bristle-plate is properly filled, the carriage is taken from beneath the hopper and the surplus of bristles removed from the uppermost surface of the plate. The filled plate can then be removed from the carriage by superposing thereupon a plate D³ and inverting together, after which the plate D² can be removed to expose the molding-surface of the bristle-plate and the ends of the bristles projecting uniformly therefrom in proper position for the application of the plastic composition in the process of forming a brush-pad.

The brush-pad may be formed in any known manner. I have ascertained, however, that it is not desirable to subject the plastic composition to any considerable pressure in the operation of forming the brush-pad around the projecting ends of the bristles, for the reason that the bristles are not supported throughout their length, but only near or at the molding-surface of the bristle-plate, and their ends are consequently comparatively free to move in opposite directions. It is therefore apparent that variations in the lateral pressure exerted upon the projecting ends of the bristles would tend to cause them to change their position in the apertures, which would render the product unsymmetrical and unattractive. For this, among other reasons, I prefer to form the brush-pad in the manner hereinafter described.

The bristle-plate having its tapered apertures filled with bristles projecting from the molding-surface A², as above set forth, is provided with a removable flange or ring, which may be the ring D' used in the operation of filling the plate, and which surrounds the molding-surface and the space above the same into which the ends of the bristles project.

I employ for the brush-pad a fusible composition which I reduce by heat to a fluid state, in which condition it is poured upon the molding-surface of the bristle-plate around the ends of the bristles, the inclosing ring D' preventing the escape of the molten material. After a sufficient quantity of the molten material has been applied to the bristle-plate and distributed properly around the ends of the bristles it is permitted to harden by cooling, and forms, when hard, a supporting-pad P for the bristles. The removal of the pad

from the bristle-plate will withdraw the bristles from said plate, and the connected pad and bristles constitute a brush suitable for many purposes.

The brush may be provided with an ornamental back and handle in any known manner.

The composition for making a pad in this manner may be any known material which can be reduced by heat to a fluid state and will harden upon cooling.

The bristle-receiving plate above described, having tapered bristle-apertures, can be used independently of the bristle-feeding hopper and the bristles inserted in the tapered apertures by hand.

The hopper may be provided with any known form of reticulated or apertured bottom adapted to separate the bristles and induce an endwise movement of the same toward the subjacent bristle-plate.

The apparatus above described is adapted to be used for feeding bristles, brush fiber, or other capilliform brush material.

The springs S, as well as gravity, tend to maintain the hopper in its lowermost position, acting in opposition to the cam in producing the reciprocating movements of the hopper.

It is characteristic of my invention that the bristle-receiving plate is supported in a fixed position relatively to the hopper while the hopper is reciprocated toward and from the plate.

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

1. In a brush apparatus, the combination with a bristle-feeding hopper having a reticulated bottom, and mechanism for agitating the hopper, of a bristle-receiving plate having a plurality of bristle-recesses and a stationary support for the plate below the hopper, substantially as described.

2. In a brush apparatus, the combination with a bristle-feeding hopper, having a reticulated bottom, and means for agitating the hopper, of a bristle-receiving plate having a plurality of downwardly-tapering apertures; and a stationary support for the plate below the hopper, substantially as described.

In testimony whereof I have hereunto set my hand this 27th day of January, 1896.

WILLIAM MORRISON.

Witnesses:

GEO. A. MOSHER,
FRANK C. CURTIS.