

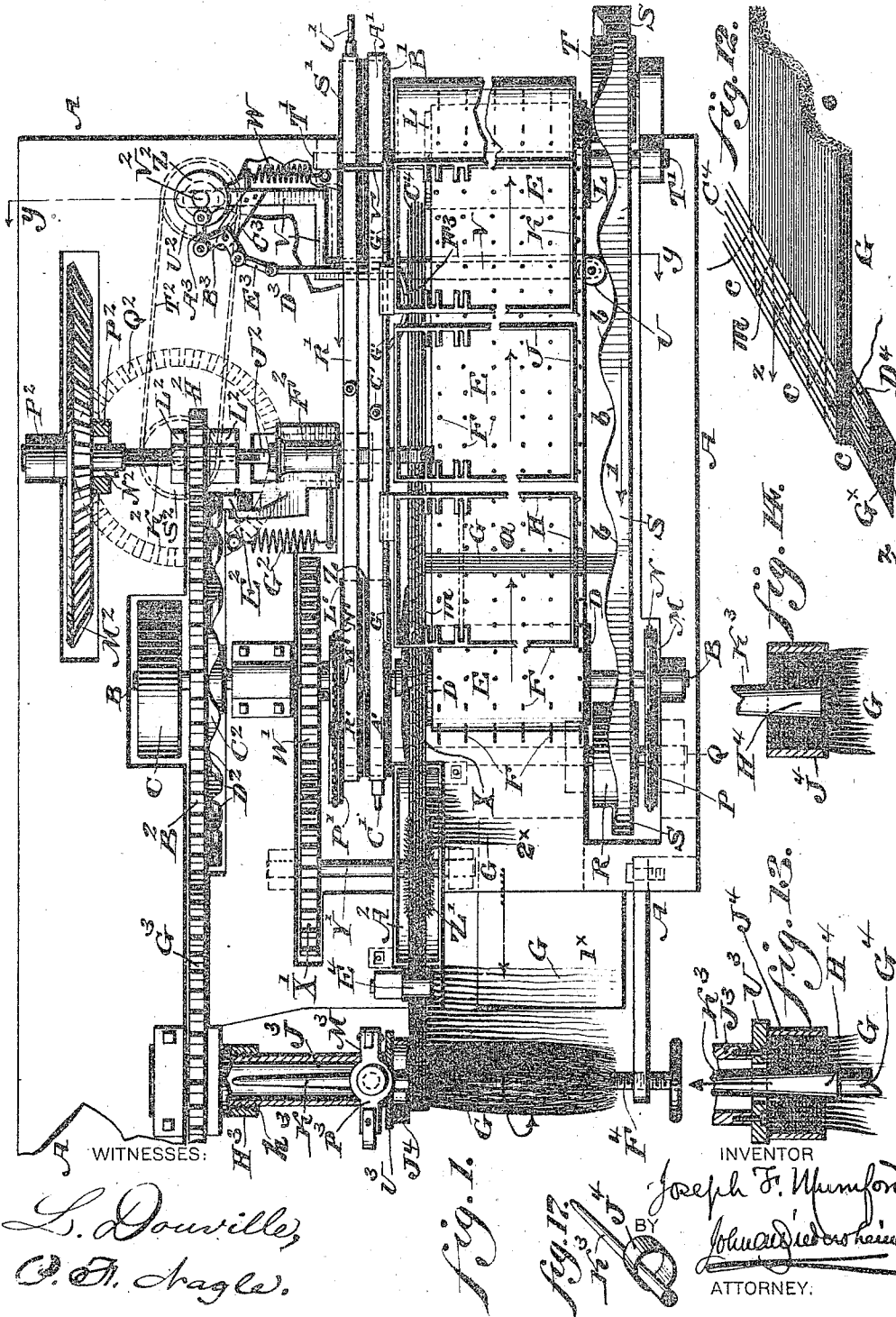
(No Model.)

3 Sheets—Sheet 1.

J. F. MUMFORD.
BRUSH MACHINE.

No. 570,261.

Patented Oct. 27, 1896.



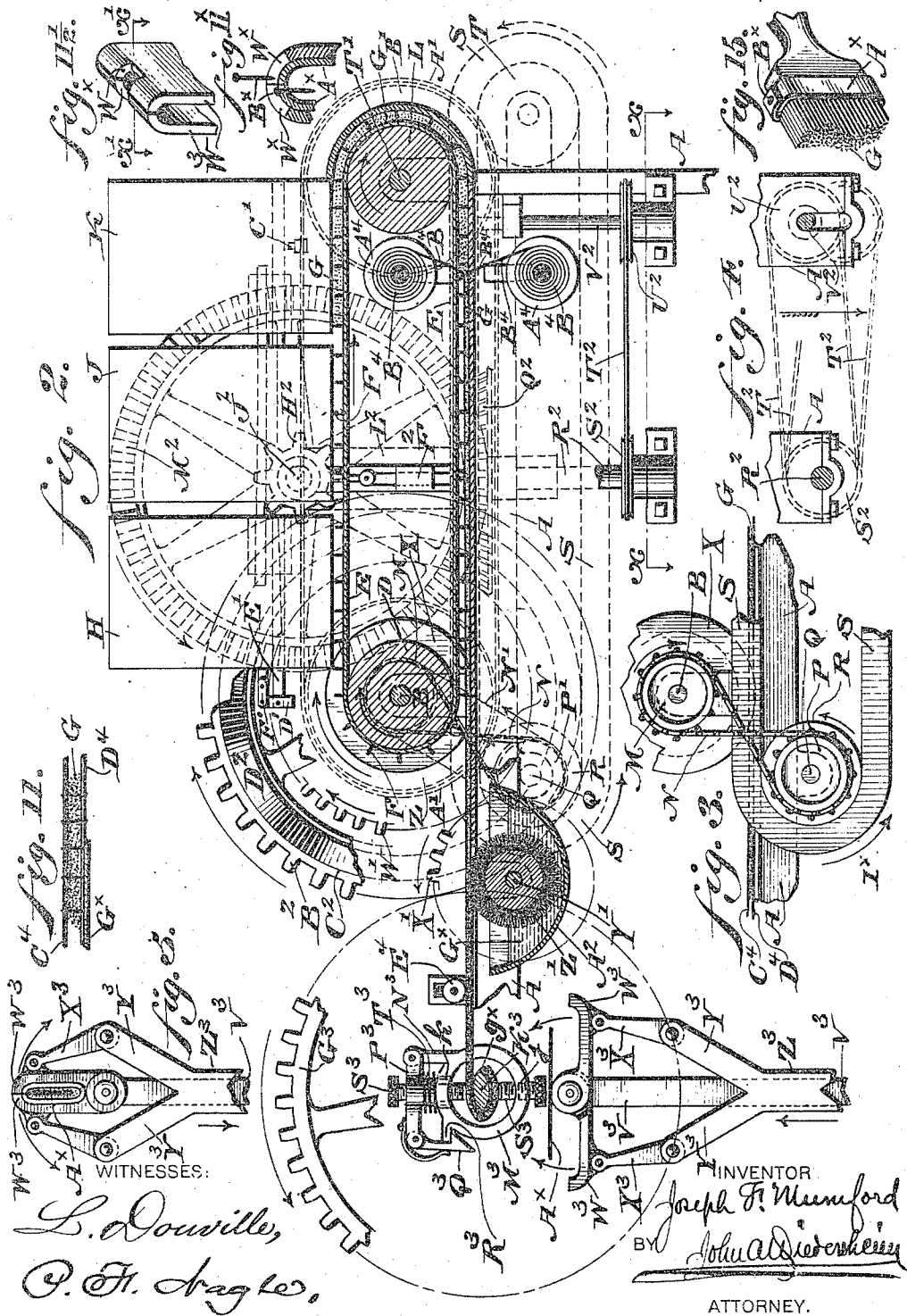
(No Model.)

3 Sheets—Sheet 2.

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3 Sheets—Sheet 3.

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fig. 6.

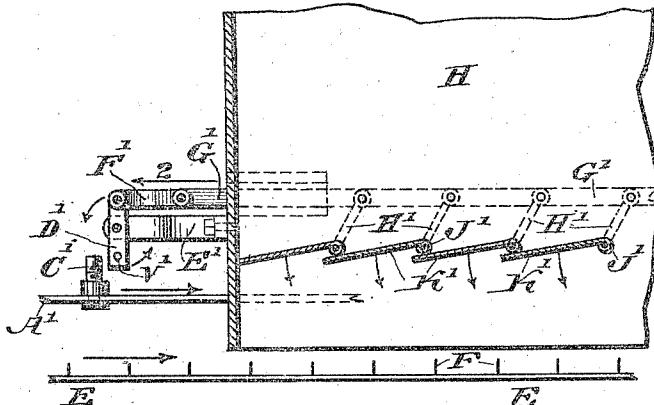


fig. 7.

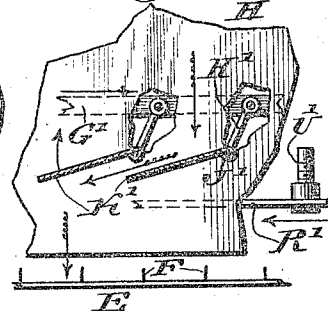


fig. 8.

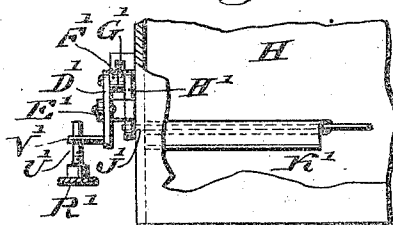


fig. 9.

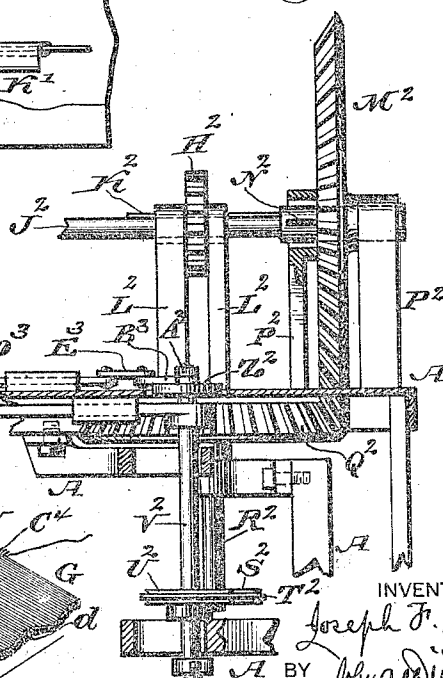
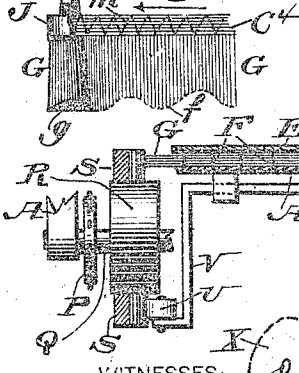


fig. 10.



L. Douville,
P. F. Ingle

fig. 10.

INVENTOR

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UNITED STATES PATENT OFFICE.

JOSEPH F. MUMFORD, OF CAMDEN, NEW JERSEY.

BRUSH-MACHINE.

SPECIFICATION forming part of Letters Patent No. 570,261, dated October 27, 1896.

Application filed August 10, 1895. Serial No. 558,875. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH F. MUMFORD, a citizen of the United States, residing in the city and county of Camden, State of New Jersey, have invented a new and useful Improvement in Machines for Manufacturing Brushes, which improvement is fully set forth in the following specification and accompanying drawings.

My invention consists of a novel construction of machine for manufacturing brushes, in which the bristles or brush-stock employed are caused to be inserted between warps or a series of threads, which are afterward stitched transversely and treated with a suitable adhesive material, the resultant web being wrapped upon a brush-handle, to which a ferrule or binding-strip is suitably applied, the above operations being performed mechanically and automatically, without necessitating additional attention on the part of the operator or attendant.

It also consists of a novel construction of the hopper employed and means for actuating certain portions of the same.

It also consists of novel means for supporting a brush-handle and inserting the same in place and causing it to be there retained.

It also consists of novel means for giving to the ends of a brush a beveled contour.

It also consists of a novel clamping device for applying a binding-strip to flat brushes.

It further consists of novel details of construction, all as will be hereinafter set forth.

Figure 1 represents a plan view of a machine for manufacturing paint and other brushes embodying my invention. Fig. 2 represents a side elevation of the same, certain of the parts which would show in full lines in this figure being shown dotted for the sake of clearness of illustration. Fig. 3 represents a side elevation of a detached portion of the machine, showing the mechanism for actuating the endless apron. Fig. 4 represents a horizontal section taken on line $x x$, Fig. 2, showing the mechanism for actuating that portion of the mechanism which manipulates the bristles. Fig. 5 represents a front elevation of a detached portion of the machine, showing the mechanism for imparting the finishing steps to the brush in closed position. Figs. 6 and 7 represent partial side

elevations and partial vertical sections of the hopper-actuating mechanism. Fig. 8 represents an end view of a portion of said hopper-actuating mechanism. Fig. 9 represents a vertical section on line $y y$, Fig. 1. Fig. 10 represents a perspective view of a layer of bristles secured by warp-threads and stitching. Fig. 11 represents a vertical section on line $z z$, Fig. 12. Fig. 11 $\frac{1}{2}$ represents a perspective view of a detached portion of the machine, showing a recess therein for inserting brads into the finished brush. Fig. 11 $\times$ represents a vertical section on line $x' x'$, Fig. 11 $\frac{1}{2}$. Fig. 12 represents a perspective view of a layer of bristles secured by warp-threads and stitching and coated with an adhesive material. Fig. 13 represents a sectional view of a portion of a partly-finished brush. Fig. 14 represents a sectional view of a portion of a finished brush. Fig. 15 represents a perspective view of a portion of a flat brush. Fig. 16 represents an elevation of a partly-finished brush. Fig. 17 represents a perspective view of a ferrule and a paint or other brush handle carrying the same.

Similar letters and numerals of reference indicate corresponding parts in the several figures.

Referring to the drawings, A designates the frame of the machine, in which is journaled a main driving-shaft B, the latter being provided with a driving-pulley C. Secured to the shaft B is a drum D, around which passes an endless apron E, provided with pins F, which rise therefrom, so that the bristles G, to be formed into a brush and which are fed to said apron from hoppers H, J, and K, lie between each transverse row of pins F, as shown at a in Fig. 1. (See also Fig. 9.)

The pins F serve to insure the proper feeding of the bristles G, supported on the apron E, to certain parts which will be hereinafter referred to. The endless apron E passes also around a drum L, secured to a shaft T', which is journaled in the frame A.

Secured to the shaft B is a sprocket-wheel M, around which passes a crossed chain N, the latter passing also around a sprocket-wheel P, secured to a shaft Q, which is journaled in the frame A of the machine, so that motion from the shaft B may be transmitted to said shaft Q in order that a pulley R.

cured thereon, may be rotated and thereby cause an endless belt S, which passes around it, and a pulley T, journaled in the frame A, to travel in the direction indicated by the arrow 1 in Fig. 1 and the arrow 1^x in Fig. 3.

The inner face of the belt S is corrugated, as at *b b b* in Fig. 1, said corrugations forming substantially a cam in the form of an endless belt against which abuts a roller U, mounted on a sliding bar V, which is guided in the frame A, the roller U being kept at all times in contact with the corrugated face of the belt S by a spring W, secured to said bar and the frame A. (See Fig. 1.)

It is evident that when the belt S is in motion it imparts a reciprocating motion to the bar V, the object of which will be hereinafter explained.

Secured to the shaft B is a rotary cutter X, adapted to trim the projecting butt-ends Y of the bristles G, as shown in Fig. 10, so that said ends will coincide with a continuous straight line, as shown at *c c c* in Figs. 12 and 16, for a purpose to be hereinafter described.

Secured to the shaft B and rotating therewith is a pulley Z, having a belt A, which passes around the same and also around the pulley B' on the shaft T'. The belt A' is provided with adjustable pins or fingers C', the object of which will be hereinafter referred to, (see more particularly Fig. 6,) it being evident that there must be as many pins C' on the belt A' as there are hoppers for the reception of bristles G to be formed into a brush, which in the present instance are three in number—viz., H, J, and K. Consequently the belt A' must be provided with three pins or fingers C'.

Referring now to Figs. 6, 7, and 8, the finger C' is adapted to strike the lower portion of a lever D', fulcrumed on a bracket E', which latter is secured to the hopper H. The upper portion of the lever D' is pivoted to one end of a link F', whose opposite end is pivoted to a sliding bar G', which moves in guides on the outside of said hopper H. The function of the pin C' is to strike the lever D' and thereby cause the bar G' to move in the direction indicated by the arrow 2 in Fig. 6. The bar G' has pivoted thereto the upper ends of a series of levers H', and the lower end of each of said levers is firmly secured to the journal J' of a rocking gate or valve K', so that said gate or valve may be closed and opened by the reciprocation of the bar G'.

It will be noticed that each lever H' has its individual gate or valve K', and consequently the number of levers H' and gates K' in a series must be equal.

The hoppers J and K are each provided with a sliding bar, a link, and levers and gates similar in every respect to the bar G', link F', levers H' and gates K' described in connection with Fig. 6.

The above corresponding parts referred to for the hoppers J and K are not shown in

the drawings for the sake of clearness in illustration.

Loosely mounted on the shaft B is a pulley T', which has secured thereto a sprocket-wheel M', around which passes a chain N', which also, passes around a sprocket-wheel P', secured to the shaft Q, so that motion from said shaft may be transmitted to said pulley T', and consequently to an endless belt R', which passes around the same and also around a pulley S', loosely mounted on the shaft T', so that the motion imparted to said belt R' will cause the same to travel in a direction opposite to that of the belt A', and thereby cause a finger U' on said belt to strike a projection V' on the lever D', (see Figs. 6, 7, and 8,) and thereby restore said bar G' to the position it occupied previous to being struck by the finger C'. This will cause the gates or valves K' to close and thereby shut off the supply of bristles fed from the hopper H to the apron E.

Secured to the shaft B is a gear-wheel W', which meshes with a gear-wheel X', secured to a shaft Y', journaled in the frame A. The shaft Y' has secured thereto a brush Z', placed within a hopper A' and adapted to rotate therein, so as to apply an adhesive material G^x in said hopper to a portion of the bristles G. (See Figs. 2, 11, and 12.)

The hopper A' is secured to the frame A in any suitable manner, and motion from the shaft B is imparted to the brush Z' by the gear-wheels W' and X'.

In Fig. 1 the layers of bristles G are shown in but two places for the sake of clearness in said figure, as at 1^x and 2^x, although in practice said layers extend from the hoppers to the brush-handle K³, as is evident.

Secured to the shaft B is a gear-wheel B², which is provided with a concentric ring C², the same having the cam or corrugated portion D² thereon, and against which bears a roller E², which latter is mounted on a sewing-machine F², adapted to slide in ways on the frame A and travel in substantially a right angle to the line of movement of the apron E. The roller E² is kept at all times against the cam or corrugated portion D² by a spring G², secured to the sewing-machine F² and frame A. It will be seen that when the gear-wheel B² is in motion, the cam or corrugated portion D² thereon, together with the spring G², will impart a reciprocating motion to the sewing-machine F², while the same is stitching a certain portion of the bristles G for a purpose to be hereinafter referred to, the stitching being shown at *m*, Figs. 1, 10, 12, and 16, and the main shaft of the sewing-machine F² being driven in any well-known manner.

The gear-wheel B² meshes with a pinion H², mounted on a shaft J², which is journaled in the frame A.

The pinion H² imparts motion to the shaft J² by means of a feather K², which permits

the shaft J^2 to rotate, and at the same time move to and fro in a line parallel to its axis for a purpose to be hereinafter referred to, the pinion H^2 being placed between the standards L^2 , so that no lateral displacement of said pinion can occur.

Mounted on the shaft J^2 is a bevel gear-wheel M^2 , which receives motion from said shaft by a feather N^2 , which causes said gear-wheel to rotate, and at the same time permits said shaft J^2 to move to and fro in the direction of its length, so that said shaft may impart a reciprocating motion to the sewing-machine F^2 , with which it is connected, and for a purpose to be hereinafter referred to, said bevel gear-wheel M^2 being placed between the standards P^2 , so that no lateral displacement of said wheel can occur.

The bevel gear-wheel M^2 meshes with a bevel gear-wheel Q^2 and imparts motion to the latter, it being noticed that said gear-wheel Q^2 is mounted on the upright shaft R^2 , journaled in the frame A .

Secured to the shaft R^2 is a pulley S^2 , around which passes a belt T^2 , which also passes around a pulley U^2 , mounted on a shaft V^2 , journaled in the frame A , so that a rotary motion may be imparted to said shaft V^2 by the pulley S^2 and belt U^2 . The shaft V^2 has loosely mounted thereon one end of the bar V , hereinbefore described, and, as is evident, the reciprocating motion of said bar V will be transmitted to the shaft V^2 and cause the same to move to and fro with said bar, so that a crank-wheel Z^2 , secured to the shaft V^2 and rotating therewith, will at the same time advance and recede in unison with the bar V for a purpose to be hereinafter referred to.

Pivoted to the crank-wheel Z^2 is a link A^3 , which operates a bell-crank lever B^3 , pivoted to an extension C^3 of the bar V , it being evident that said lever B^3 is thereby caused to travel to and fro with the bar V , so that a beater D^3 , which is connected to said lever B^3 by a link E^3 , will follow the motions of the bar V , and at the same time will have a rapid reciprocating motion imparted thereto by its connection with the crank-wheel Z^2 , so that the bristles G on the table portion of the frame A , against which the forward portion F^3 of the beater D^3 abuts, (see Figs. 1 and 9,) will be caused to assume a wave line, as clearly shown at d in Fig. 10, at e in Fig. 12, and at f in Fig. 16, the object of the wave line referred to being to produce a taper in the brush, as at g in Fig. 16.

The gear-wheel B^2 meshes with a gear-wheel G^3 , journaled in the frame A , said gear-wheel G^3 having secured to it a chuck H^3 , which rotates therewith, and in the present instance is screw-threaded, as at h , to receive a tube J^3 , provided with a clamping device for the handle K^3 of a brush, the said clamping device consisting of a ring M^3 , secured in any suitable manner to the tube J^3 , so as to rotate therewith.

Pivoted to an extension N^3 on the ring M^3

is a lever P^3 , which has pivoted thereto a spring-catch Q^3 , which engages a projection R^3 on said ring M^3 , and thereby retains said lever P^3 in a locked position, so that a handle of a brush placed between screws S^3 , which form a part of the clamping device, may be firmly held in position between said screws, so as to be rotated, for a purpose to be hereinafter referred to.

It will be noticed that one of the screws S^3 works in a threaded opening in the ring M^3 , as at j in Fig. 2, and that the other screw S^3 passes freely through an opening in said ring, as at k in Fig. 2, and engages a threaded opening (not shown in the drawings) in the lever P^3 , so that the screw S^3 in the lever P^3 may move with the same when said lever is raised and lowered, for a purpose to be hereinafter referred to.

Interposed between the ring M^3 and the lever P^3 is a spring T^3 , which forces upwardly the lever P^3 , so that the spring-catch Q^3 thereon may positively engage the projection R^3 . This clamping device is employed when round or oval brushes are being made.

Secured to the end of the tube J^3 and adjacent the clamping device is a plate U^3 , the object of which will be hereinafter referred to.

When it is desired to manufacture flat brushes, metal or leather bound, a device (shown in Figs. 1 and 5) is employed for applying the binding A^x (see Figs. 5, 11^x, and 15) to the brush, said device consisting of a stationary bar V^3 , to the upper portion of which are pivoted the jaws W^3 , which latter are connected by links X^3 to the arms Y^3 of a bar Z^3 , which moves up and down on said bar V^3 , so as to open and close said jaws W^3 , for a purpose to be hereinafter referred to. The jaws W^3 have an open space W^x therein, so that when said jaws are closed an opening between them will exist, for a purpose to be hereinafter referred to, said bar V^3 being secured to the frame A in any suitable manner. Mounted on said frame A are spools A^4 , on which are wound threads or warps B^4 . It will be noticed that the butt-ends of the bristles G occupy the space between the upper row C^4 and the lower row D^4 of said warps from the spools A^4 , as best seen in Figs. 9, 10, 11, and 12.

E^4 designates a tension-roller mounted on the frame A , the function of said roller being to keep the web at all times and under all circumstances at the proper tension.

F^4 designates a screw whose end G^4 (see Fig. 13) is adapted to contact with the end H^4 of the brush-handle K^3 and move the same in the direction of the arrow in said Fig. 13.

The operation is as follows: Assuming the gates or valves in the hoppers H , J , and K to be closed, as shown in Fig. 6, it is evident that the bristles which are placed within said hoppers, and which are to be formed into a brush, will remain within the same until the gates or valves therein are opened to permit the escape of said bristles. The first step,

then, is to supply said hoppers with bristles G, it being evident that if desired the hopper H may contain bristles of a certain grade or quality, and that the hopper J may contain
 5 bristles of a different grade or quality from that in the hopper H, and, further, that the hopper K may contain a different grade or quality of bristles from that in either of the hoppers H and J. The ends of the warps B⁴
 10 from the spools A¹ are passed through guides of any well-known form, which are located adjacent to said spools A¹, and are then drawn by hand, so as to reach a point somewhere near the rotary brush Z'. The brush-handle
 15 K³ is then inserted in the clamping device, so as to be firmly held within the same by the screws S³, as shown in Figs. 1 and 2. When it is desired to insert a brush-handle in the clamping device, (shown in Figs. 1 and 2,) said
 20 handle is placed in the space between the ends of the screws S³, so that when the lever P³ is lowered the same will cause the screw S³ therein to come in contact with said handle and force the same against the screw S³
 25 in the ring M³, and firmly hold said handle in position within the clamping device, so that the brush-handle may be rotated by the same and cause the web of bristles to be wound thereon so as to produce a brush. When a
 30 brush-handle is to be removed from the clamping device, (shown in Figs. 1 and 2,) the spring-catch Q³ is swung outwardly, so that the same leaves the projection R³ and thereby permits the lever P³ to be raised, and thus remove the
 35 end of the screw S³ therein from contact with said handle, after which the latter may be easily slipped from between both screws. Previous to placing the brush-handle within the clamp-
 40 ing device hereinbefore described a ferrule J⁴ is slipped on the same, as best seen in Fig. 17, so that when the required quantity of bristles has been wound upon the brush-handle the butt portion of said brush may be brought within the ferrule without
 45 necessitating the removal of said brush-handle from the clamping device. The machine is then started, and, if desired, the ends of the warps B⁴ may be held in the hand, so as to keep the same taut until the work has pro-
 50 gressed sufficiently to permit the web of bristles, &c., to reach the handle K³ of the brush. The warps B⁴, between which are no bristles, are then cut and thrown away, thereby leaving the ends of the warps on a line, or nearly
 55 so, with the forward end of the layer of bristles G, (as at g^x in Fig. 2,) near the left-hand end of said figure. The finger C' at the proper time is brought into contact with the lever D' and rocks the same so as to open the gates or
 60 valves K', as hereinbefore described. This will permit the required quantity of bristles to escape from the hopper H and fall upon the apron E and be carried by the same to the table portion of the frame A, as best seen in Fig. 2.
 65 When the bristles reach the beater D³, the latter will, by reason of its reciprocating motion, cause the bristles on the frame A to as-

sume the wave line hereinbefore referred to. The bristles after leaving the beater D³ are brought by the apron E to the sewing-machine
 70 F², which stitches the warps B⁴ and bristles G together, so as to securely bind the two, as hereinbefore stated. The sewing-machine moves to and fro in a transverse direction to that in which the apron E travels. Conse-
 75 quently the stitching m will be caused to assume a zigzag line, as clearly shown in the drawings. After the bristles have been stitched they are brought together by the
 80 apron E to the cutter X, and the projecting butt-ends are cut by the same, so as to trim them close to the warps B⁴, as best seen in Fig. 10. The bristles after leaving the cut-
 85 ter are brought by the apron E to the brush Z', which applies adhesive material to the stitched portion of the layer of bristles, so as to further bind them together. The stitched
 90 and gummed portion of the layer of bristles or web is then passed under the tension-roller E⁴, and from this to the brush-handle K³, to which it is secured in any suitable manner. It is evident that the rotation of the brush-
 95 handle, as hereinbefore described, will cause the gummed and stitched portion of the layer of bristles or web to be wound upon the same and thereby form a brush, as best seen in
 100 Figs. 1 and 16. When a sufficient quantity of bristles has been wound upon the handle K³, the machine is stopped and the stitched and gummed portion of the layer of bristles
 105 or web is cut close to the brush and secured to the portion wrapped upon the handle K³. The screw S³ in the lever P³ is then slightly rotated, so as to loosen its hold upon the
 110 brush-handle K³, to permit the same to be moved in the direction of the arrow in Fig. 13 by operating the screw F⁴. The ferrule J⁴ on the handle K³ is then placed so as to register
 115 with the portion of the bristles secured to the handle K³, and the screw F⁴ is then rotated, so as to cause the handle K³ and bristles secured thereto to move as one in the direction
 120 indicated by the arrow in Fig. 13, until the butt-ends of the bristles wound on the handle K³ come in contact with the plate U³, which prevents further advance of the bristles. The handle K³, however, continues to advance, due to the rotation of the screw F⁴. This will cause the tapering end H⁴ (see Fig. 13) of the handle K³ to force the portion of
 125 the bristles within the ferrule J⁴ outwardly, and thereby cause them to bear against the inner wall of said ferrule, so as to firmly retain the bristles in position on said handle K³.
 130 The tube J³ may, if desired, be of sufficient length to permit the plate U³ to contact with the butt-ends of the bristles while the same are being wound upon the handle K³, in which case the ferrule J⁴ is placed upon the screw
 135 F⁴, instead of the handle K³, before the process of winding the bristles on the handle K³ is begun, and when the winding is completed the body portion of the brush is compressed by hand, which permits the ferrule J⁴ to be

passed over the same and be placed so as to encircle the portion of the bristles or web wound upon the handle K³, (see Fig. 13,) in which case the operation of forcing the bristles against the inner wall of the ferrule J¹ is the same as already described.

When a brush is completed, the same is removed from the clamping device in the manner hereinbefore described, after which another brush-handle may be placed in said clamping device and the same process of manufacture continued as explained.

In the manufacture of flat brushes the binding-strip A^x is employed instead of the ferrule J¹. (See Figs. 14 and 15.)

The process of manufacturing flat brushes is the same as hereinbefore described relatively to round and oval ones, with the exception that in the former the binding-strip A^x takes the place of the ferrule J¹. When the winding of a flat brush has been completed, the binding-strip A^x is placed in the open jaws W³, (see Fig. 2,) after which said jaws are closed, as hereinbefore described, and thereby bend the binding-strip A^x around the bristles, as shown in Fig. 5. The open spaces W^x in the jaws W³ permit brads B^x to be passed therethrough, so as to reach the strips A^x while held by the jaws W³, so that said brads may be driven through the strips A^x and secure the same to the handle of the brush, (see Figs. 11^x and 15,) after which the jaws W³ may be opened, since the binding-strip W^x no longer requires said jaws to retain it on the brush-handle.

If it is desired to use, for example, three kinds of bristles in the manufacture of a brush, the hoppers H, J, and K are each supplied with its respective kind. The gates or valves in said hoppers are then opened and closed, as hereinbefore described. The opening and closing of the valves at the proper time is accomplished by placing the fingers C' and U' in such positions relatively to the parts they operate as to contact therewith at the proper intervals.

It will of course be evident that when it is desired to manufacture square-ended brushes, like whitewash-brushes, &c., the corrugated belt or apron S can be dispensed with, it being then only necessary to employ any suitable means for causing the ends of the bristles or brush-stock to keep in line, as is evident.

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

1. In a machine for manufacturing brushes a suitable frame, an endless apron, means for actuating the same, projections on said apron, a hopper located above the latter, a series of gates in the lower portion of said hopper, and means for automatically opening and closing the same, substantially as described.

2. In a machine for manufacturing brushes a suitable frame, an endless apron, means for actuating the same, pins or projections there-

on, a hopper located above said apron, and adapted to receive bristles or brush-stock, a series of movable plates in the lower portion of said hopper, levers attached to said plates, connections from the levers to an arm or bar pivotally mounted, and means for opening and closing said gates alternately, the same consisting of traveling aprons moving in opposite directions, and having projections thereon adapted to contact at proper intervals with the gate-actuating mechanism, substantially as described.

3. In a machine for manufacturing brushes a suitable frame, an endless apron E, means for actuating the same, projections F thereon, a hopper above said apron, gates K in the lower portion thereof, rods H' attached to said gates, a bar G attached to said rods and suitably guided and supported, and a bar D' having connections to said bar G, in combination with endless aprons R' and A' adapted to actuate said bar D' at proper intervals and means for actuating said aprons, substantially as described.

4. In a machine for manufacturing brushes a suitable frame, an endless apron, means for actuating the same, a series of warp-threads, means for feeding bristles or brush-stock upon said apron, and between said warp-threads, means for stitching the latter transversely to the line of movement thereof, and means for applying adhesive material to the web thus formed, substantially as described.

5. In a machine for manufacturing brushes a suitable frame, an endless apron, a series of warp-threads, means for feeding brush-stock upon said apron between said warp-threads, means for stitching the latter transversely, and means for cutting off the outer ends of said brush-stock adjacent said warp-threads, substantially as described.

6. In a machine for manufacturing brushes a suitable frame, an endless apron, means for feeding bristles or brush-stock thereupon, a beater for causing the ends of the same to assume a wavy or corrugated outline and means for actuating said beater, substantially as described.

7. In a machine of the character described a suitable frame, an endless apron, mechanism for actuating the same, a series of warp-threads between which bristles or brush-stock is adapted to be fed, a beater for causing the extremities of said brush-stock to assume a wavy or corrugated outline, and means for stitching said warp-threads transversely to their line of movement and for actuating said beater, substantially as described.

8. In a machine for manufacturing brushes a frame or housing, an endless apron suitably actuated and supported, a series of warp-threads, mechanism for feeding brush-stock therebetween, means for stitching said warp-threads transversely to their line of movement, and means for supplying adhesive material thereto, substantially as described.

9. In a machine for manufacturing brushes

a suitable frame, an endless apron, and a corrugated endless belt adjacent thereto, in combination with a beater, and actuating mechanism for the above parts, substantially as described.

10. In a machine for manufacturing brushes a suitable frame, a series of warp-threads, means for inserting the bristles or brush-stock therebetween, a sewing-machine mounted adjacent thereto, and means for imparting a reciprocating motion to said sewing-machine, substantially as described.

11. In a machine for manufacturing brushes, means for supporting a brush-handle, a bar mounted adjacent thereto, jaws pivoted to said bar, and means for causing said jaws to approach and recede from each other, the meeting ends of said jaws being recessed, substantially as described.

12. In a machine for manufacturing brushes, the brush-holding device consisting of a ring M^3 , a threaded screw passing through the lower portion thereof, a bar P^3 fulcrumed to a suitable portion of said ring, the threaded screw passing through said bar, but out of engagement with said ring, and a catch-dog common to said ring and bar, and means for holding the same in position, substantially as described.

13. In a machine for manufacturing brushes,

a supporting-frame, a series of threads or warps, means for feeding bristles or brush-stock therebetween, in combination with means for stitching transversely to said warps, means for cutting off the butt of the brush-stock, and means for applying size or adhesive material thereto, substantially as described.

14. In a machine of the character described, a suitable frame or housing, a series of warp-threads, means for actuating the same, means for inserting brush-stock therebetween, a sewing-machine, mechanism for imparting a reciprocating motion thereto, in combination with means for applying size to the web thus formed, and means for wrapping said web around the brush-handle, substantially as described.

15. A machine for manufacturing brushes, a frame having warp-threads suitably supported and actuated, means for inserting brush-stock therebetween, means for causing the same to be retained in position, and means for wrapping the same about the handle of a brush, substantially as described.

JOSEPH F. MUMFORD.

Witnesses:

JOHN A. WIEDERSHEIM,
E. HAYWARD FAIRBANKS.