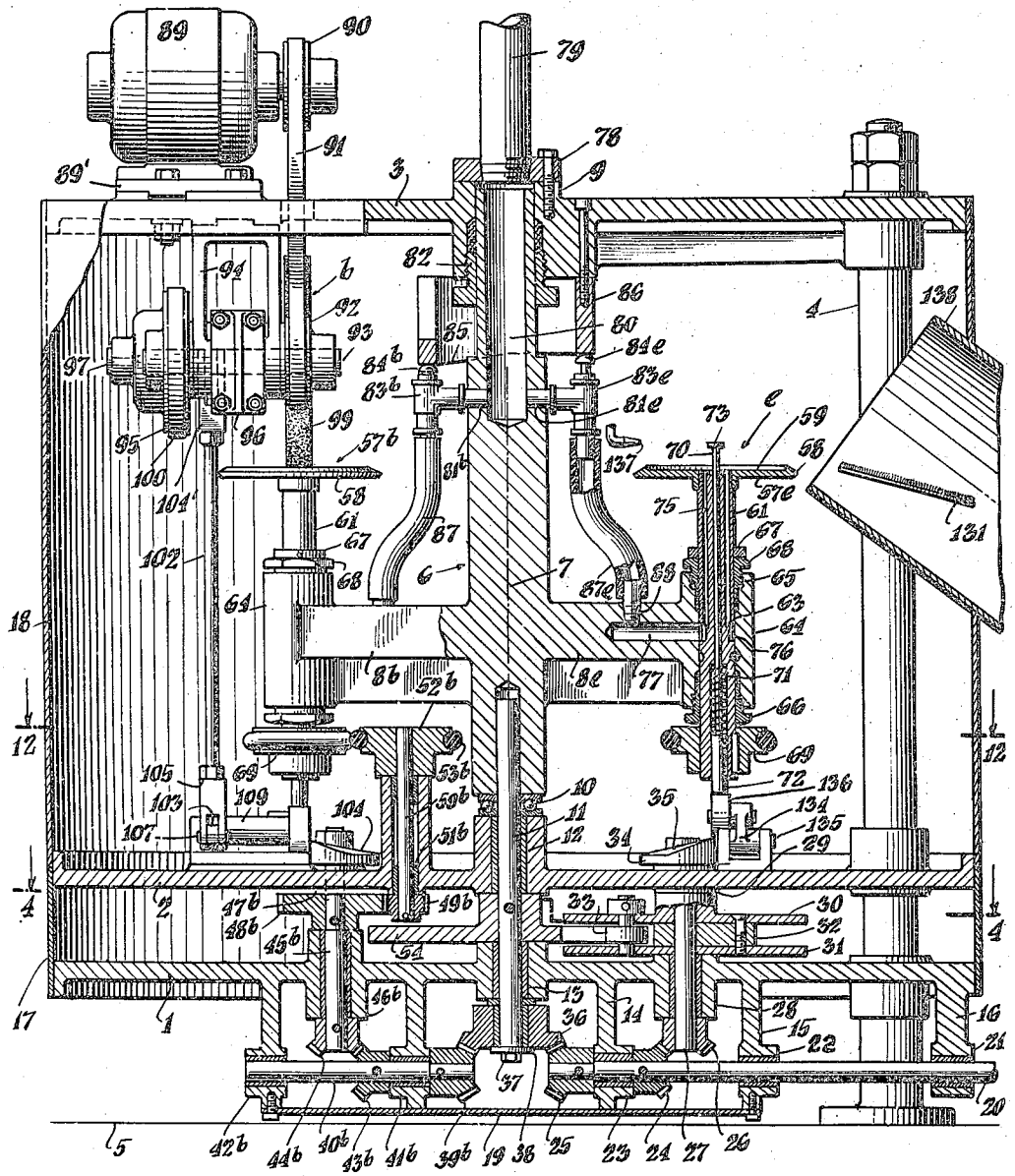
July 26, 1949. J. E. VALENTINE 2,477,154

PUFF-BRUSHING MACHINE

Filed Jan. 17, 1948 6 Sheets-Sheet 1

Fig. 1



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PUFF-BRUSHING MACHINE

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Fig. 2

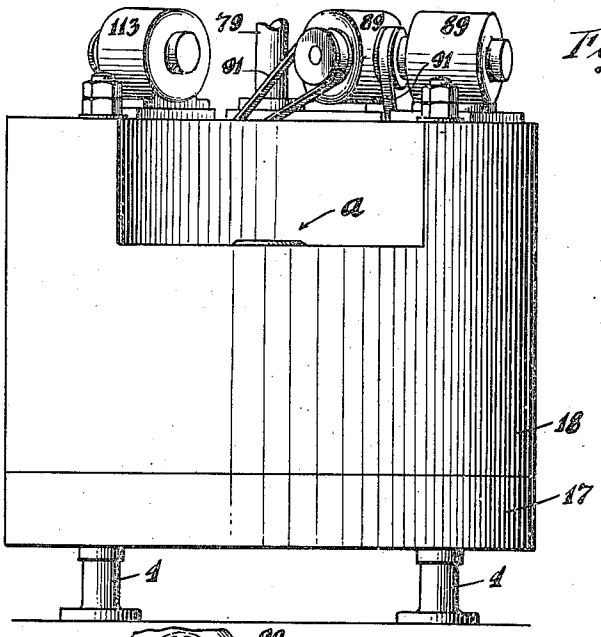


Fig. 5

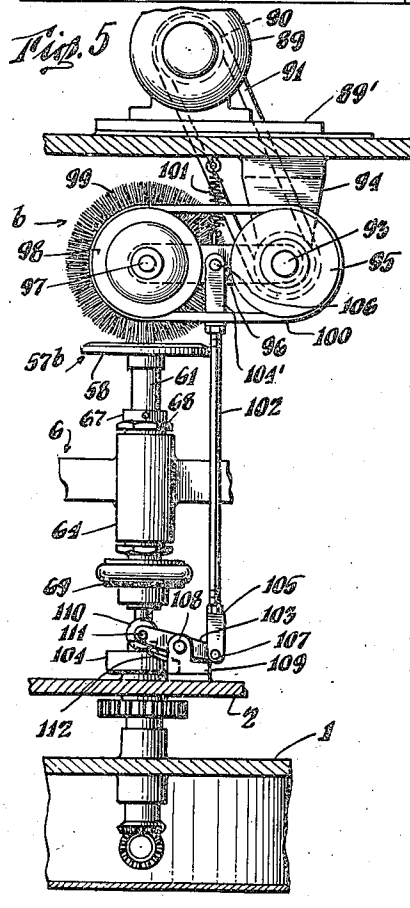
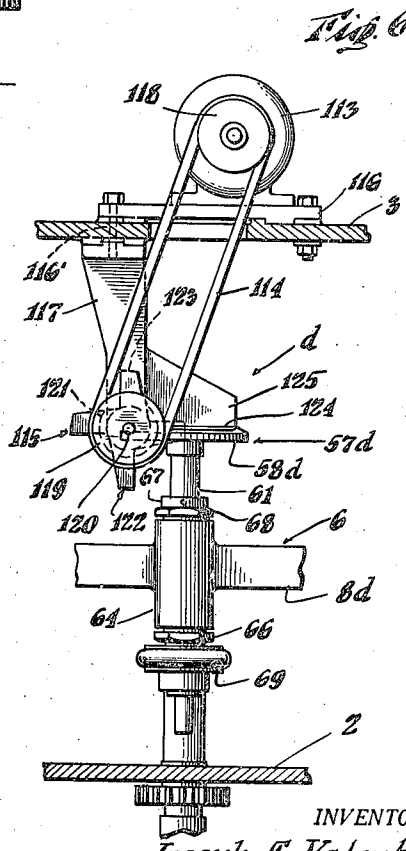


Fig. 6



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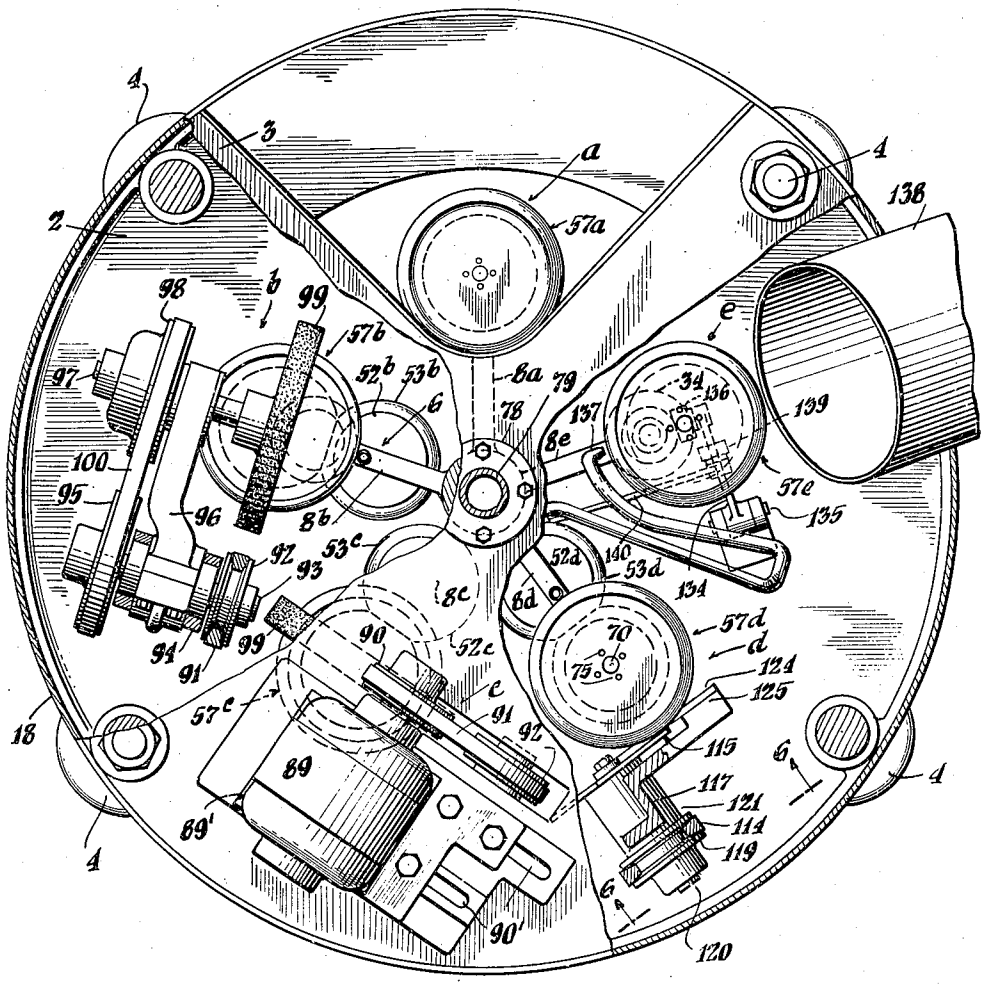
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PUFF-BRUSHING MACHINE

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Fig. 3



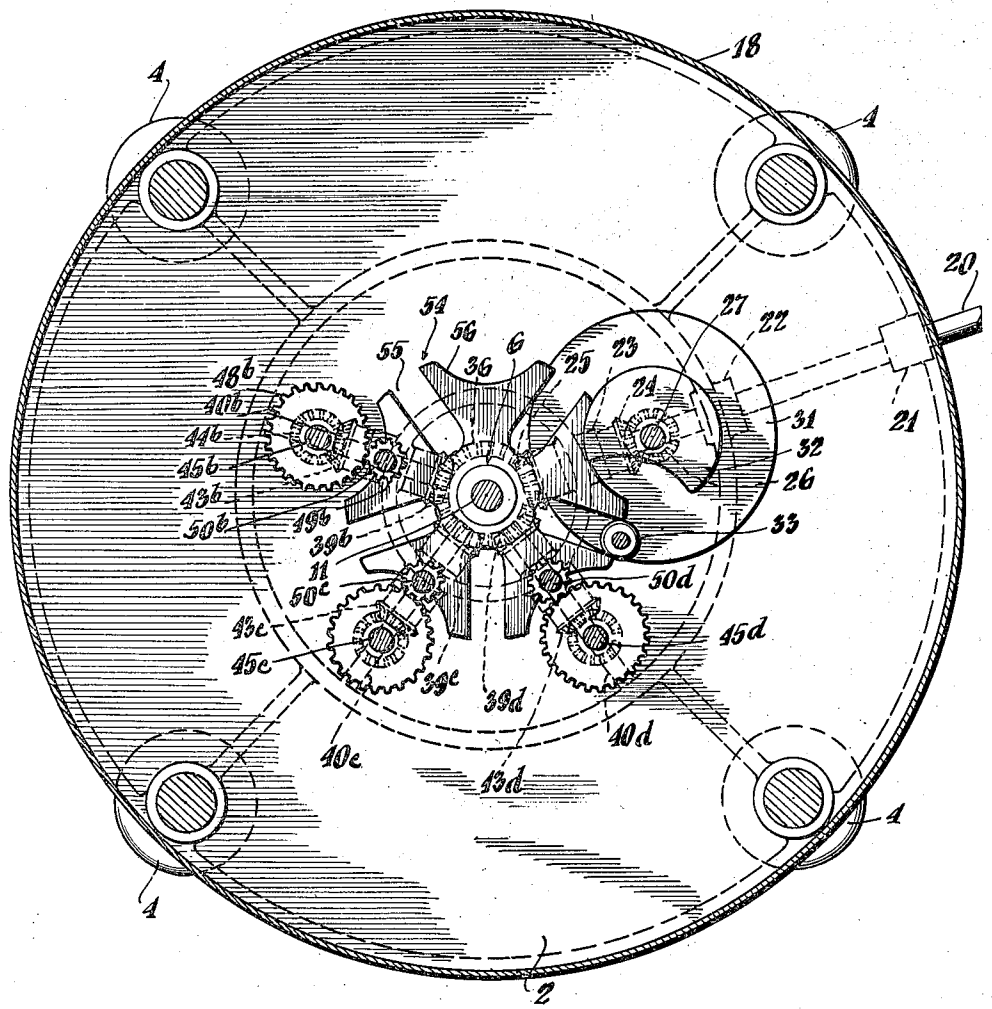
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PUFF-BRUSHING MACHINE

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Fig. 4



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PUFF-BRUSHING MACHINE

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Fig. 8

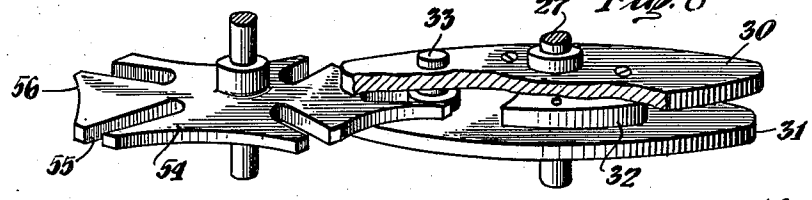


Fig. 9

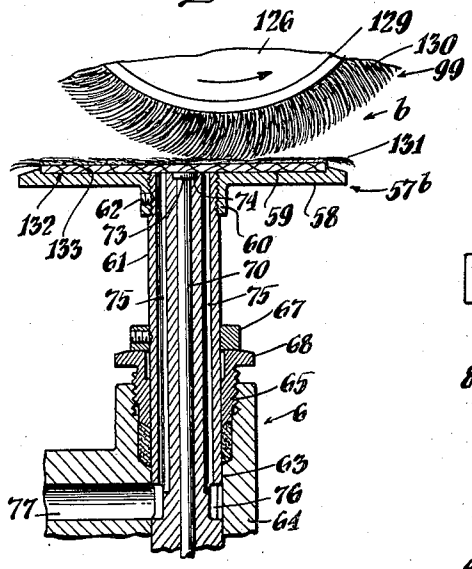


Fig. 10

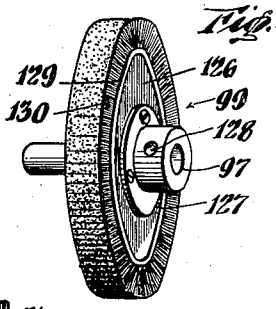


Fig. 11

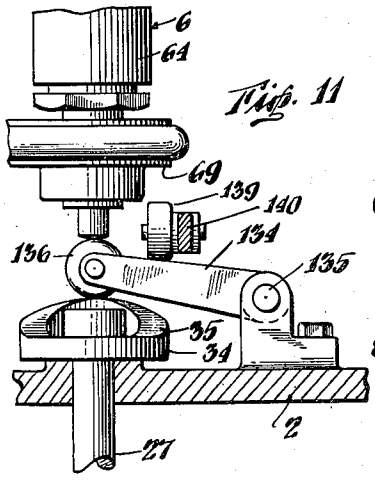
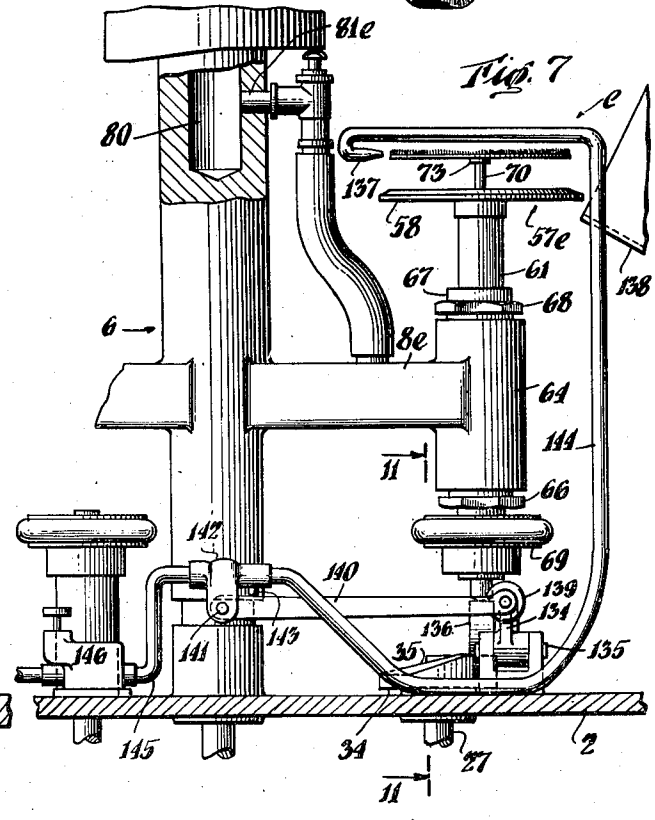


Fig. 7



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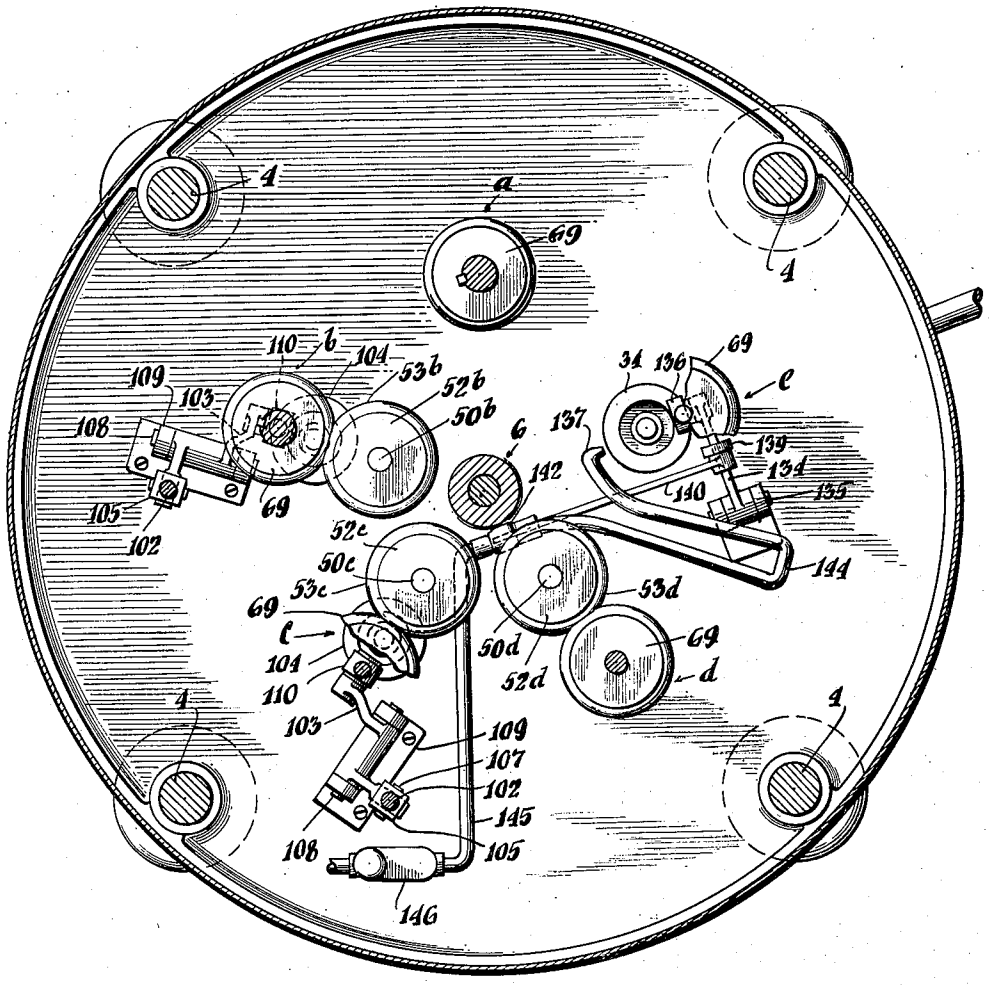
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PUFF-BRUSHING MACHINE

Filed Jan. 17, 1948 6 Sheets-Sheet 6

Fig. 12



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Patented July 26, 1949 2,477,154

UNITED STATES PATENT OFFICE

2,477,154

PUFF-BRUSHING MACHINE

Joseph E. Valentine, West Caldwell, N. J., assignor, by mesne assignments, to Valcourt, Inc., Boonton, N. J., a corporation of New Jersey

Application January 17, 1948, Serial No. 2,864

9 Claims. (Cl. 26—29)

1

This invention relates to a puff-brushing machine, that is, a machine designed to brush out the surface nap of cosmetic puffs as part of the finishing operations in their manufacture; optionally the machine may be equipped to trim the peripheries of the puffs after the surface nap has been brushed out.

Cosmetic puffs, used for applying powder to the skin, are manufactured in enormous quantities and of a variety of materials. They have in general a surface of long fibers in the form of a wool or nap which temporarily retains powder but readily gives it up when patted on the skin. This surface may, for example, be a natural wool surface, or may be the napped surface of a wool, cotton or other fabric. While such puffs may be of any shape, by far the great majority manufactured are circular, and my machine is particularly adapted to finishing circular puffs.

Powder puffs are generally of multi-layer construction and have some form of backing applied to the face layer to facilitate use and improve appearance. The complete puff may consist of face and backing and a plurality of intermediate layers, or may consist simply of a face layer and a backing, such as cardboard, applied directly to the back of the napped face material. Puffs are made in various sizes, customarily from about 1⅜ inches to about 3 inches in diameter. My machine is adapted to brush or brush and trim puffs of varying size and construction.

In manufacture, the component parts of the puff are cut out, assembled and cemented or otherwise fastened together. The fibers of the nap forming the face of the puff are then brushed out radially from the center and are preferably trimmed at the periphery to provide an edge of even contour. These steps may all be performed by hand, by machine or by various combinations of hand and machine work.

It is one object of my invention to provide a machine capable of rapidly and economically brushing out the nap fibers of a powder puff radially from the center to ensure a pleasing and useful finish.

It is another object of my invention to provide a machine of this type that will operate automatically.

It is a further object of my invention to provide a machine of this type in which may conveniently be included means for trimming the puffs peripherally.

Other objects and advantages will be apparent, from the following disclosure, to those skilled in the art.

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My machine comprises essentially a turret rotated intermittently around a vertical axis, a number of rotatable vacuum chucks carried by the turret, a plurality of circular brushes rotated at a relatively high speed the peripheries of which are adapted to be engaged with and disengaged from the surfaces of powder puffs carried by the rotating chucks, unloading means for removing finished puffs from the machine, and suitable automatic devices for controlling the action of the machine together with power means for operating it, as illustrated below. In the embodiment described, rotating shears are also provided to trim the peripheries of the puffs.

The following description of one embodiment of my invention is intended to be illustrative only and not to limit its scope, which is defined in the appended claims.

In the drawings:

Fig. 1 is a rear view of my machine, mostly in section;

Fig. 2 is a front view;

Fig. 3 is a top view, partly cut away;

Fig. 4 is a section on line 4—4 of Fig. 1;

Fig. 5 is a side view of one of the brushing units;

Fig. 6 is a side view of the trimming unit;

Fig. 7 is a side view of the unloading unit;

Fig. 8 is a view of the Geneva turret drive;

Fig. 9 is a view, partly in section, of a puff held in a vacuum chuck while being brushed;

Fig. 10 is a view of one of the circular brushes;

Fig. 11 is a view of the puff-release cam mechanism; and

Fig. 12 is a section on line 12—12 of Fig. 1.

The machine as described below has five operating stations: loading station *a*, first brushing station *b*, second brushing station *c*, trimming station *d*, and discharge station *e*. Structurally or functionally identical elements associated with these stations will be severally identified by the same numerical index followed respectively, where necessary for clarity, by the letters *a*, *b*, *c*, *d* and *e*, referring respectively to the five stations, and will be referred to generically by the appropriate numerical index alone.

The supporting framework of my machine consists essentially of a base plate 1, a middle plate 2 and an upper plate 3, mounted on four legs 4, all of cast iron. This framework is supported on any suitable stable foundation 5, such as a concrete block.

Centrally supported in this framework is cast aluminum turret 6, intermittently rotatable around a vertical axis 7. The turret is formed with five radial arms 8*a*, *b*, *c*, *d*, *e* of equal length

and spaced equiangularly. The upper cylindrical end of the turret is journaled in bearing 9 formed in a boss in upper plate 3; the lower end rests on ball thrust bearing 10 and is pinned to center shaft 11, which passes downward through the thrust bearing, through middle plate 2 and through bottom plate 1, being journaled in bushed bearings 12 and 13 in these plates. Thrust bearing 10 is supported on a boss formed in middle plate 2.

Two annular webs 14 and 15 and a bracket 16 are formed integrally on the bottom of base plate 1; these serve to carry fixed bearings as described below.

The framework is enclosed by lower guard 17 and upper guard 18 and the bottom protected by gear cover 19.

The general framework of the machine having been described, its further detailed construction can most clearly be explained in connection with its operation. This may be made clear by tracing the power input into the machine from the several electric motors used to operate it.

The main drive shaft 20, journaled in bearings 21, 22 and 23, positioned respectively in bracket 16 and webs 15 and 14, is driven at a regulated speed of about 30–40 R. P. M. This is advantageously accomplished by coupling the shaft to an electric motor through a stepless change-speed device and speed reducer of conventional form (not shown).

Drive shaft 20 carries fixedly pinned to it two small bevel gears 24 and 25. Gear 24 meshes with gear 26 of like pitch diameter fixedly pinned to vertical shaft 27. The latter is journaled in two bearings 28 and 29 mounted respectively in base plate 1 and middle plate 2. Mounted fixedly on shaft 27 between plates 1 and 2 is a Geneva drive pinion consisting of an upper plate 30, a lower plate 31, a Geneva segment 32, and a roller pin 33. Also fixedly mounted on shaft 27, but above plate 2, is cam 34, having an upward-facing operating surface 35.

Bevel gear 25 on the inboard end of shaft 20 meshes with bevel idler gear 36 rotatably mounted on the lower reduced end of shaft 11 and retained thereon by screw 37 and washer 38. Idler gear 36 in turn meshes with three bevel gears 39*b*, *c* and *d*, each of identical pitch diameter with gear 25. Each of the three gears 39 is pinned respectively to one of three short rotatable radial shafts 40*b* *c*, and *d*, journaled in bearings 41 and 42*b*, *c*, and *d*, positioned in webs 14 and 15. Pinned to the middle portion of each shaft 40*b*, *c* and *d* is a bevel gear respectively 43*b*, *c* and *d* of like pitch diameter. Each of the bevel gears 43 engages a bevel gear of like pitch diameter, such as 44*b*, pinned respectively to the bottom ends of three short vertical shafts 45*b*, *c* and *d* journaled in bearings such as 46*b* and 47*b*, positioned respectively in base plate 1 and middle plate 2.

From the above it will be seen that when the main drive shaft is rotated at 30–40 R. P. M., vertical shafts 27 and 45*b*, *c* and *d* will be simultaneously rotated at the same angular speed.

On the upper end of each of the three vertical shafts 45*b*, *c* and *d* is pinned a spur gear, such as 48*b*; each of such spur gears engages a pinion such as 49*b*, of one-third its pitch diameter, pinned to the lower end of each of the short vertical shafts 50*b*, *c* and *d*, journaled in bearings such as 51*b* positioned in upstanding bosses integral with middle plate 2. At the upper end of each of the three vertical shafts 50 is pinned a grooved sheave 52*b*, *c* and *d* provided with a rubber tire 53*b*, *c* and *d*. The vertical shafts 50 will thus rotate simultaneously with shafts 45 but at three times their angular speed.

The system of shafts and gearing so far described, being journaled in bearings positioned in the framework of the machine, all rotate in fixed positions.

The turret 6 is rotated intermittently by means of a five-point Geneva star gear 54 fixedly pinned to turret shaft 11 between plates 1 and 2. The position of the Geneva gear is such that it extends between plates 30 and 31 of the Geneva pinion, its slots 55 mesh with the pinion roller pin 33 and its arrest arcs 56 mesh with Geneva segment 32. The Geneva gear 54 is so positioned angularly with respect to turret 6 that, during the intermittent positions of rest of the latter, the turret arms 8*a*, *b*, *c*, *d*, *e* will all be at operating stations.

Each of the five turret arms 8 carries an identical rotatable vacuum chuck 57*a*, *b*, *c*, *d*, *e*, illustrated in detail at unloading station *e*. Each chuck has an interchangeable face plate 58 having a central flat and shallow recessed portion 59 of a size adapted to receive and center the backing layer of a powder puff; face plates of various sizes and designs may be used to suit the particular puffs being processed. Each face plate has a threaded central hole 60 by which it is screwed to the threaded upper end of a rotatable spindle 61. A set screw 62 holds it fast on the spindle.

Each spindle 61 is journaled in a bearing 63 formed in a boss 64 integrally cast at the outboard end of each turret arm 8. At the upper and lower ends of each boss 64, spindle 61 passes through stuffing boxes 65 and 66 to ensure effective action of the vacuum as described below. Each spindle 61 is retained in vertical position by means of a collar 67 affixed to spindle 61 by set screws and bearing on gland nut 68 of stuffing box 65. On the lower end of each spindle 61 is keyed a rubber-tired sheave 69 in a position adapted, as turret 6 is rotated, to engage and be driven successively by sheaves 52*b*, *c* and *d* at stations *b*, *c* and *d*, illustrated for station *b* in Fig. 1.

Spindles 61 perform two additional functions besides rotatively supporting face plates 58; they serve as guides for discharge pins 70 and as ducts for the regulated application of suction to puffs on the face plates.

For the first purpose they are drilled axially to receive pins 70 with a sliding fit in the upper portion, the bore being enlarged in its lower portion to accommodate compression spring 71, which bears against the upper end of sleeve 72 pinned to the lower end of pin 70. Pin 70 is provided at its upper end with a flat head 73, and the effect of spring 71 is to depress pin 70 and seat its head in recess 74 in the spindle.

For the second purpose spindles 61 are drilled lengthwise to form a ring of four longitudinal ducts 75 open at their upper ends and communicating at their lower ends with circumferential recesses 76; these recesses register with ducts 77 drilled radially in each arm 8 of the turret.

The vacuum connections to turret arms 8 are as follows: The top of turrent bearing 9 in plate 3 is provided with a pipe adapter 78 in which is fitted a pipe 79 communicating with any suitable source of suction (not shown). The upper end of turret 6 is provided with an axial duct 80, open at the top to provide communication with pipe 79, and communicating near its bottom with

five radial ducts 81*a*, *b*, *c*, *d* and *e*. Plate 3 is provided on its under side with central stuffing box 82 through which passes the upper cylindrical end of turret 6. Each radial duct 81 connects through a short nipple with one of five standard vacuum valves 83*a*, *b*, *c*, *d* and *e* provided with spring-loaded plungers 84*a*, *b*, *c*, *d* and *e*. These plungers bear continuously against the downward-directed cam face 85 of fixed annular cam 86 mounted on the under surface of plate 9. The valves are so constructed that when the plungers are depressed against their springs, the valves are open; when the plungers rise, the valves are closed. Face 85 of cam 86 is so formed that the plungers are depressed and the valves open when corresponding radial arms 8 are at stations *b*, *c* and *d*, and the plungers raised and valves closed when the corresponding radial arms 8 are at stations *e* and *a*. Each of the valves 83 is connected with radial ducts 77 through short ducts such as 88 by a length of rubber vacuum hose 87, such as 87*e*, and suitable nipples. It will thus be seen that by action of cam 86 on plungers 84 suction is applied to the face plate of each chuck through hose 87, ducts 88 and 77, annular recess 76 and spindle passages 75, when the chuck is at a brushing station *b* or *c*, or trimming station *d*; at discharge station *e* and loading station *a*, suction is shut off.

The brushing units at stations *b* and *c* are identical in construction although they may be adjusted differently as described below. Each unit comprises an electric motor 89 connected through a conventional switch with a source of electric power; this motor is mounted on motor plate 89′ bolted through slots 90′ to top plate 3. The motor shaft carries a sheave 90 connected by a drive belt 91, passing through an opening in plate 3, with sheave 92 pinned to short shaft 93. Shaft 93 is rotatably mounted in bracket 94 bolted through slots in plate 3 to motor plate 89′, and at its opposite end from sheave 92 carries sheave 95, also pinned to it. One end of an arm 96 is pivotally mounted on shaft 93 by means of a bearing which supports the arm, allows it to pivot about the shaft and also allows the shaft to turn freely. At the opposite end of the arm another short shaft 97 is rotatably mounted near its mid point in a bearing carried by the arm. This shaft carries sheave 98 at one end and brush 99 at the other. Sheaves 95 and 98 are connected by drive belt 100. Sheave 92 has the same pitch diameter as sheave 90, and sheave 98 as sheave 95. Accordingly, operation of the motor 89 rotates brush 99 at the same angular velocity as that of the shaft of motor 89, e. g. 1750 R. P. M., while permitting the position of the brush to be altered around the axis of shaft 93 without disturbing the tension of belts 91 and 100. The brushing units are so positioned on plate 3 that, when arms 96 are in an approximately horizontal position and when the chucks are at brushing stations *b* and *c*, brushes 99, to be further described below, will normally be tangent to the surfaces of powder puffs held on the face plates 58 of chucks 57. The slots in top plate 3, through which motor plates 89′ and brackets 94 are bolted, permit adjustment of the brushing units—motor, motor plate, bracket and brush with associated brush-drive elements—radially of the chucks at the brushing stations.

Each of the two arms 96 is further connected to the bottom of plate 3 by a tension spring 101 of sufficient strength to bias the arms upwards. The vertical angular position of arm 96 is determined by a tension rod 102, rocker arm 103 and cam 104 pinned to the upper end of shaft 45 extending above plate 2. Adjustably threaded on rod 102 are upper clevis 104′ and lower clevis 105; the former is pivotally connected to arm 96 by clevis pin 106, the latter to one end of lever 103 by clevis pin 107. Lever 103 is supported and pivoted near its mid point on pin 108 mounted in bracket 109 bolted on the upper side of plate 2. At the end away from clevis pin 107 lever 103 carries a roller 110 on pin 111, the roller bearing on upward-directed cam face 112 of cam 104.

From the previous description of the intermittent turret drive and the chuck-rotating drive, it will be seen that cam 104 rotates once for each three rotations of chuck 57 when rotating means 69 and 52 are engaged; cam 104 also rotates once with each revolution of Geneva pinion 30—33, i. e. with each intermittent one-fifth revolution of turrent 6. Cam face 112 is made with a raised segment and a depressed segment; the former acts through roller 110, arm 103 and rod 102 against spring 101 to draw brush 99 on arm 96 into brushing position; when roller 110 bears on the latter, spring 101 draws brush 99 upwards clear of the chuck and of the puff held by it. The angular extent and position of the raised and depressed segments of the cam are such that the brush is raised during the period when the turret 6 is in motion. A raised cam segment of 216° arc has given good results in the machine described; the remaining 144° of arc are occupied by the depressed segment formed in an easy symmetrical falling and rising curve.

The trimming unit is in some respects similar to the brushing units, having its own motor drive; but no cam-operated engaging and disengaging device is needed in this unit. The unit comprises essentially an electric motor 113 connected by a drive belt 114 to rotating shears 115. Motor 113 is bolted fast to motor plate 116, which in turn is adjustably mounted on top plate 3 by bolts passing through slots 116′ in plate 3; the direction of adjustment is radial with respect to chuck face plate 58*d* at the trimming station. The rotating shears 115 are mounted on a depending bracket 117 bolted fast to motor plate 116 through slots in plate 3. Thus by loosening the motor plate bolts the trimming unit—motor, belt drive and shears—can be adjusted radially of chuck face plate 58*d*.

Belt 114, passing through a suitable opening in plate 3, is driven by sheave 118 on shaft of motor 113 and drive shears sheave 119 pinned to shears shaft 120. The latter is rotatably supported in bearings 121 mounted in the lower end of bracket 117. Fixedly mounted on the end of shaft 120 opposite sheave 119 is star wheel 122 having four radial shear blades 123; these blades are given a slight spring bias out of the plane of the wheel away from bracket 117 so that they engage fixed blade 124 with a slight wiping action similar to that of ordinary hand shears. Blade 124 is fixedly mounted on a side extension 125 of bracket 117. Sheaves 118 and 119 have the same pitch diameter; accordingly shears star wheel 122 is rotated at the same rate as the shaft of motor 113, e. g. 1750 R. P. M.

Each brush 99 comprises a wooden wheel 126 about 4½ inches in diameter and ½ inch thick mounted on a steel hub 127, which in turn is fixedly mounted on shaft 97 by means of set screw 128. Around the periphery of wheel 126 is tacked a rubber-and-fabric tape 129 in which are anchored fine flexible upstanding wire bristles 130,

The tape and bristles are thus readily replaceable when worn. In brushing position brush **99** rotates in a vertical plane radial to the chuck at that brushing station, and bristles **130** lightly contact the nap **131** of a puff **132** having a backing **133** and held by vacuum in the chuck at that station as shown in Fig. 9; while the brush is rapidly rotated in its vertical plane on horizontal shaft **97**, chuck and puff are relatively slowly rotated by wheels **52** and **69** around a vertical axis, completing about 2½ revolutions while the brush is in contact with the chuck at this station. This has the effect of brushing the nap fibers of the puff radially outward from the center.

Two successive operations, as at stations *b* and *c*, have been found desirable to produce a satisfactorily finished product. With relatively small puffs it has been found satisfactory to adjust both brushes (as above explained) so that they contact the puffs near their centers. With larger puffs it is desirable that one brush contact the puffs at or near their centers while the other, preferably the second at station *c*, contacts them nearer their peripheries. The length and flexibility of bristles **130** and the depth of nap **131** are sufficient to provide a considerable brushing area at each station. Depth of contact of brush in nap is regulated by appropriately positioning clevises **104'** and **105** on the threaded ends of rod **102**.

At trimming station *d* the motor and rotary shears are adjusted (as above described) so that the cutting edge of fixed blade **124** is tangent to the desired finished periphery of the puffs being treated. While the rotary shear blades **123** revolve at a relatively high speed, each puff as it is brought to the trimming station is rotated relatively slowly, as described above in connection with the brushing steps, completing about 2½ revolutions while being trimmed. This operation gives each puff edge a clean circular contour.

When each puff is finished, i. e. brushed and trimmed, rotation of turret **6** brings it and its supporting chuck to rest momentarily at unloading station *e*. At this station the chuck is itself not rotated since wheel **69** is not engaged. Cam **34** is so fixed on shaft **27**, that, as turret **6** comes to rest, cam face **35** lifts the outboard end of lever **134**, pivoted on plate **2** at **135**, by contact with lever roller **136**. The rising of roller **136** raises push rod **70** against the bias of spring **71** by contact with cap **72**, thus lifting rod head **73** above face plate **58**; the vacuum having been automatically shut off at this point by the action of cam **86** on valve **83***e*, rod head **73** releases and raises the puff seated on the face plate. As the puff is raised a jet of compressed air from nozzle **137** blows the puff from the chuck into chute **138**, through which it falls by gravity into a collecting bin not shown. This ejection of the puff is accomplished as follows: Seated on the upper side of lever **134** is roller **139** mounted on one end of jet valve lever **140**; the latter is pivoted at its other end at **141** on extensions depending from the fixedly mounted body of jet valve **142**. This valve has spring-loaded plunger **143** seated on the upper side of lever **140** and so arranged that, when it is raised against its spring, valve **142** is opened, while in its normal position the valve is closed. The outlet side of valve **142** is connected with jet nozzle **137** by pipe **144**; the inlet side is connected by pipe **145** through air strainer **146** with a source of compressed air, such as a compressed air service line. This automatic action of air valve **142** thus operates to eject the puff from the chuck, as it is released and raised by rod head **73**, and to blow the puff into offtake chute **138**. Each finished puff is removed from the machine in this way and a chuck is cleared to receive another unfinished puff as rotation of turret **6** carries it on to loading station *a*.

From the operative's point of view the operation of my machine is simple. At the start of a run on a given size of puff, the machine is adjusted. This is done first by selecting five face plates **58** of appropriate size to hold the puffs being finished, as shown in Fig. 9, and mounting these plates on the five chuck spindles **61** by means of threads **60** and set screws **62**. The two brushing units and the trimming units are then adjusted in position on plate **3**, as described above, so that the brushes contact the puffs in the desired radial positions and the rotating shears occupy the desired tangential position to the peripheries of the finished puffs.

After connecting suction pipe **79** with a vacuum source and pressure pipe **145** with a compressed air source, as by opening conventional valves in connections to plant supply lines (not shown), power is applied to drive shaft **20** to rotate turret **6** in a counter-clockwise direction as viewed from above, and brushing and trimming motors **89***b* and *c* and **113** are set in operation.

As each chuck appears and is momentarily arrested at loading station *a*, the operator places an unfinished puff, nap side up, on the face plate seating the puff backing **133** in depression **59**, as shown in Fig. 9. In advancing to the first brushing station *b*, vacuum valve **83** is opened by cam **86**, thus sucking down the puff and seating it firmly on the chuck face plate.

At brushing station *b*, rubber-tired sheave **69** engages rubber-tired sheave **52**, whereby the chuck is rotated as described above.

While chuck and puff approach station *b*, cam **104** operates to raise rotating brush **126** above the nap surface of the puff and then to lower it into contact with the nap, as described above, after chuck and puff have been set to rotating. On completion of this brushing step, cam **104** raises brush **126** again, and chuck and puff are advanced to station *c* where the brushing is completed.

At trimming station *d* the chuck and puff are rotated in the same way as at the brushing station while the rapidly rotating shear blades **123**, cooperating with fixed blade **124**, trim the peripheral fiber ends to a smooth contour.

At brushing stations *b* and *c* and trimming station *d*, good results have been obtained with such chuck-rotation speeds as will provide 2 to 3 complete rotations of each puff during each actual brushing or trimming operation.

When chuck and puff reach discharge station *e*, vacuum is released by the closing of valve **83** through the action of cam **86** and natural leakage of air around and through the puff; simultaneously cam **34** raises rod **70**, thereby lifting the puff from face plate **58**, and immediately thereafter the puff is blown into chute **138** by a jet of compressed air from nozzle **137** through action of lever **140** opening valve **142** as described above.

The finished puffs fall through chute **138** into a bin or other suitable container (not shown), whence they are collected for packaging.

From this description it will be seen that I have invented a machine which automatically and

rapidly finishes powder puffs by brushing out the nap surface and, if desired, trimming the peripheries. It will be obvious to those skilled in the art, in the light of this disclosure, that numerous modifications can be made in the embodiment disclosed above without departing from the spirit of my invention, and my invention includes such modifications within the scope of the appended claims and equivalents thereof as limited only by the prior art.

I claim:

1. In a puff-brushing machine comprising an intermittently movable chuck-carrying element, a chuck rotatably mounted in said element and adapted to hold a puff, means to move said element intermittently to bring said chuck to and arrest it at a plurality of work stations, and means at one of the work stations adapted to rotate the chuck while arrested at said station, the improvement which comprises retractable brushing means at said work station having a rotatable brush the working surface of which makes contact with the surface of a puff held in said chuck while arrested at said work station, power means to rotate said brush, and retraction means operated in synchronism with the movements of the chuck-carrying element to retract the brush from its brushing position and out of the path of the chuck when the chuck is approaching and leaving said work station.

2. A puff-brushing machine comprising in combination an intermittently rotatable chuck-carrying element, a plurality of chucks rotatably mounted on said element, each being adapted to hold a puff, means to rotate said element intermittently to bring each of said chucks in turn to and arrest it at each of a plurality of work stations, one of the stations being a loading station, one a discharge station, and at least one being a brushing station, rotating means adapted to engage and rotate each chuck at the brushing station but to be disengaged from each chuck at the discharge and loading stations, retractable brushing means at the brushing station having a rotatable brush the working surface of which makes contact with the surface of each puff held in each chuck while arrested at said brushing station, retraction means operated in synchronism with the intermittent rotation of the chuck-carrying element to retract the brush from its brushing position and out of the path of each chuck when each chuck is approaching and leaving said brushing station, and power means to rotate the chuck-carrying element, the chucks and the brush and to retract and engage the brush.

3. A machine as defined in claim 2, in which the chucks are vacuum chucks, said machine being associated with a source of suction and further comprising a duct to connect each chuck with the source of suction, a valve in the duct associated with each chuck, and means adapted to close each valve when each chuck is arrested at the discharge station in synchronism with the intermittent rotation of the chuck-carrying element.

4. A machine as defined in claim 2, in which each puff is ejected from the machine at the discharge station by a jet of compressed air, said machine being associated with a source of air pressure and comprising further a puff-discharge opening, an air nozzle at the discharge station so positioned as to direct a jet of air across the face of a chuck arrested at that station towards the puff-discharge opening, a pipe connecting the nozzle with the source of air pressure, a valve in said pipe, and means adapted to open said valve momentarily as each chuck is arrested at the discharge station in synchronism with the intermittent rotation of the chuck-carrying element.

5. A machine as defined in claim 2, in which the work stations comprise two like brushing stations and a trimming station, the trimming station being so positioned as to receive a puff-bearing chuck from a brushing station and being provided with chuck-rotating means and powered rotary shears adapted to engage the periphery of a puff rotated in a chuck at a point tangent to the desired finished periphery of the puff.

6. In a puff-brushing machine in which powder puffs held in rotatable chucks are successively advanced to and arrested at a plurality of work stations, the improvement which comprises: a brushing station, means to move a puff-bearing chuck to, arrest it at and move it away from the brushing station, means to rotate the chuck at a relatively low speed while arrested at the brushing station, a retractable rotary brush adapted to make contact with the face of a puff, means to rotate the brush at a relatively high speed, means synchronized with the chuck moving means to retract the brush from contact with the surface of a puff entering or leaving the brushing station and to engage the brush with the surface of the slowly rotating puff while arrested at the brushing station, and adjusting means adapted to permit positioning the brush radially of the rotating puff.

7. The method of finishing a puff having a napped surface, which comprises: bringing a puff into a brushing zone while free of engagement with a brush, arresting the puff there and rotating it relatively slowly in its own plane, rapidly rotating a wheel-shaped brush in a plane perpendicular the plane of the puff, the brushing surface being on the periphery of the brush, engaging the rotating brush with the surface of the rotating puff to brush out the fibers of the latter radially towards the periphery, and disengaging the brush from the puff before moving the puff from the brushing zone.

8. The method of finishing a puff having a napped surface, which comprises: rotating a puff relatively slowly in a brushing zone, brushing out the fibers of the napped surface radially towards the periphery in an area near the center of the puff by engagement with a rapidly rotating brush, disengaging the brush from the puff, moving the puff to a second brushing zone, rotating the puff relatively slowly in the second zone and brushing out the fibers of the napped surface radially towards the pheriphery in an annular area near the periphery by engagement with a second rapidly rotating brush.

9. A puff-finishing machine comprising in combination: a turret intermittently rotatable about a vertical axis, a plurality of vacuum chucks mounted equiangularly and equiradially on the turret, each chuck being independently rotatable about a vertical axis and adapted to hold a puff in a horizontal plane, a Geneva gear fixedly secured to the turret, a powered drive shaft, a Geneva pinion driven by the drive shaft and meshing with the Geneva gear on the turret, a plurality of work stations including a loading station, a discharge station and two brushing stations, the work stations being so positioned with respect to the Geneva gearing that each

chuck is successively moved to and arrested at each work station, chuck-rotating means driven by geared connection with the drive shaft and adapted to engage and rotate in its own plane a puff held by each chuck while arrested at each brushing station but to be disengaged from each chuck at the loading and discharge stations, a retractable wheel-shaped brush at each brushing station having a brushing surface on its periphery and rotatable at a high speed in a plane perpendicular to the plane of each puff arrested at each brushing station, the brush being so mounted that in unretracted position its brushing surface makes contact with the exposed surface of each puff and the area of contact of brush and puff is adjustable radially of the puff, a source of power to rotate the brushes, brush retracting means operated by geared connection with said powered drive shaft in synchronism with the movements of the turret to retract each brush out of contact with each puff and out of the path of each chuck while it moves to and away from each brushing station and engage each brush with a rotating puff while each chuck is arrested at a brushing station, a source of suction, a duct connecting each chuck with the source of suction, a valve in each duct, valve-operating means adapted to maintain each valve in an open position while its associated chuck is at a brushing station, thereby holding each puff firmly in its chuck by suction while being

brushed, and to close each valve while its associated chuck is at the discharge station, thereby relieving the suction on the puff in the chuck, a puff release member provided for each chuck, puff-release operating means actuated by geared connection with said powered drive shaft to release each puff from a chuck while arrested at the discharge station, a source of air pressure, a puff-discharge opening, an air nozzle at the discharge station so positioned as to direct a jet of air across the face of a chuck arrested at that station towards the puff-discharge opening, a pipe connecting the nozzle with the source of air pressure, a valve in said pipe, and means adapted to open said valve momentarily as each chuck is arrested at the discharge station and after operation of the puff-release means in synchronism with the intermittent rotation of the turret, whereby each puff is ejected from the machine.

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