Sept. 12, 1939. G. T. BIRDSALL 2,172,342

MACHINE AND METHOD FOR MAKING HAT BODIES

Filed March 24, 1937 5 Sheets-Sheet 1

Fig. 2

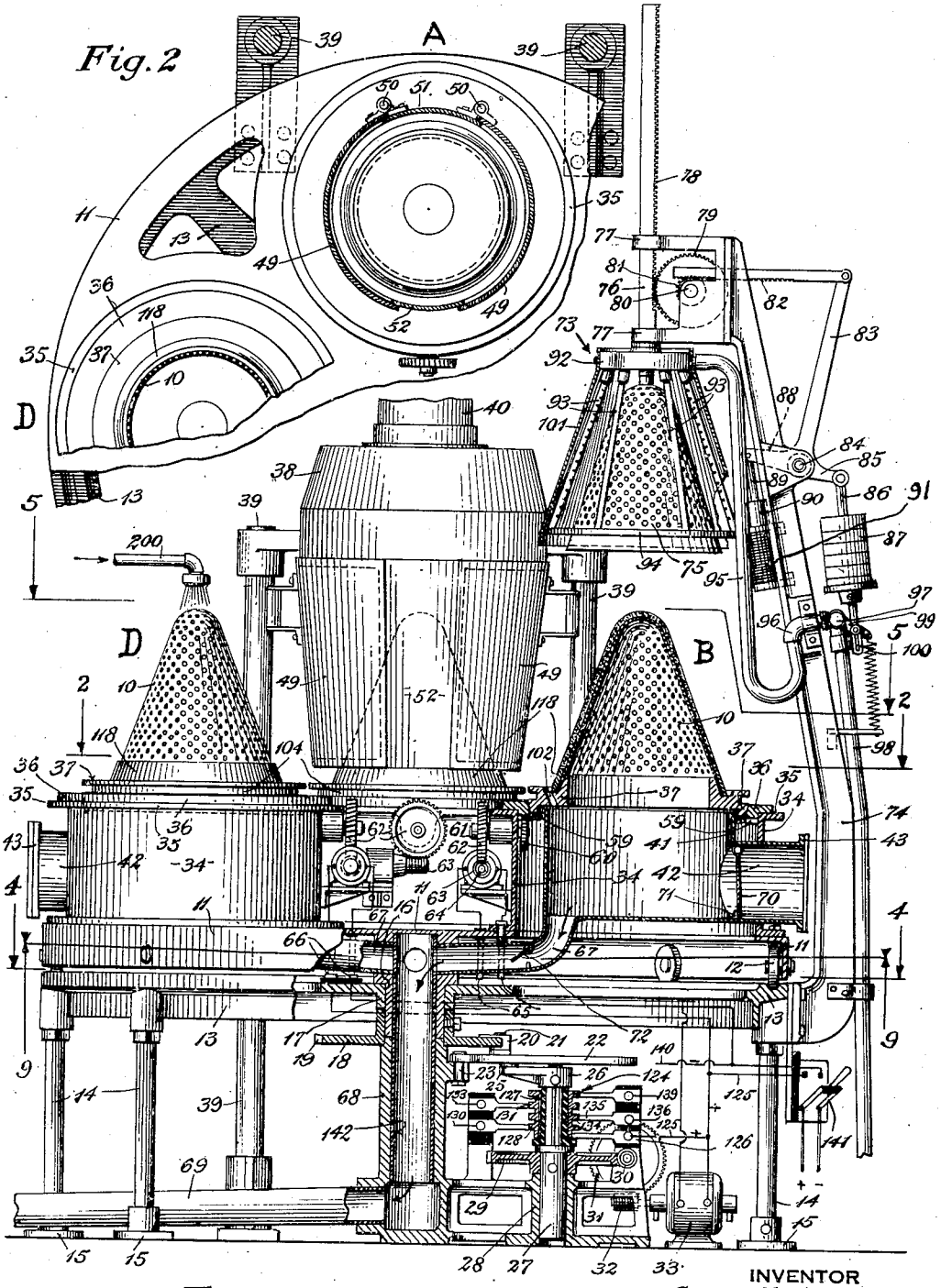


Fig. 1

INVENTOR
George T. Birdsall,
BY
ATTORNEY

Sept. 12, 1939. G. T. BIRDSALL 2,172,342

MACHINE AND METHOD FOR MAKING HAT BODIES

Filed March 24, 1937 5 Sheets-Sheet 2

Fig. 3

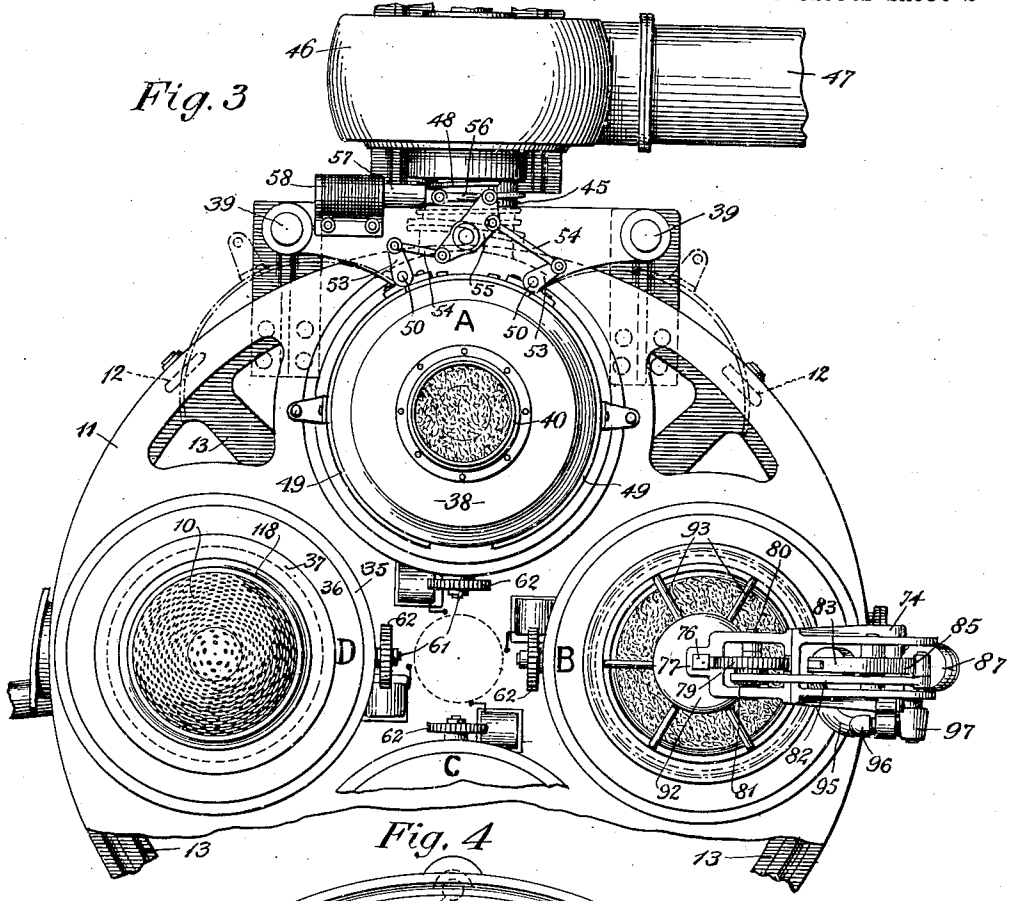
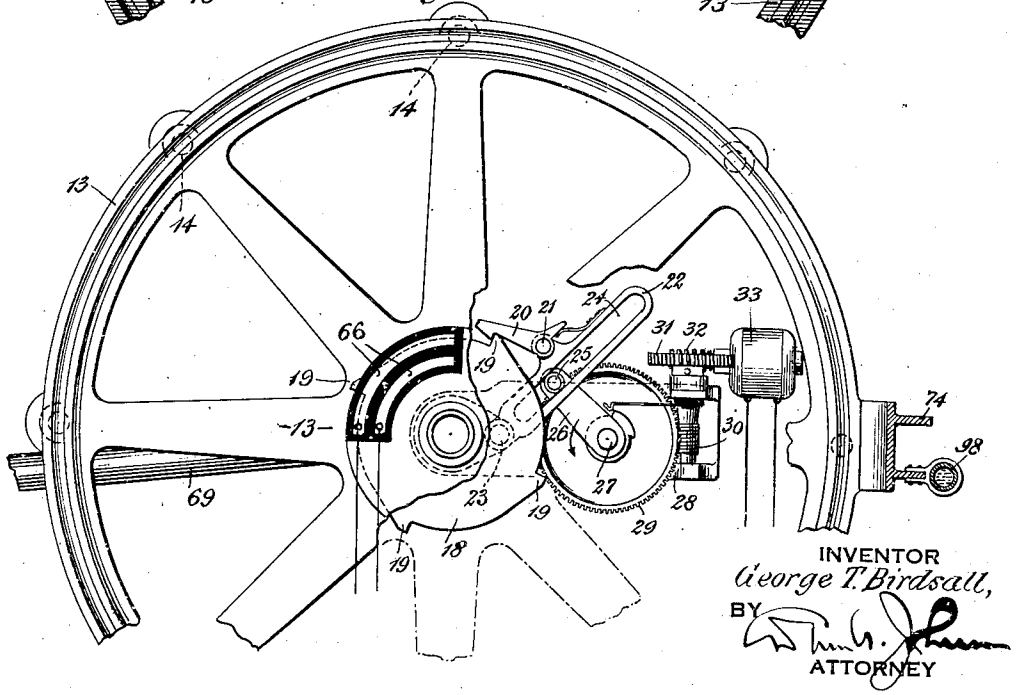


Fig. 4



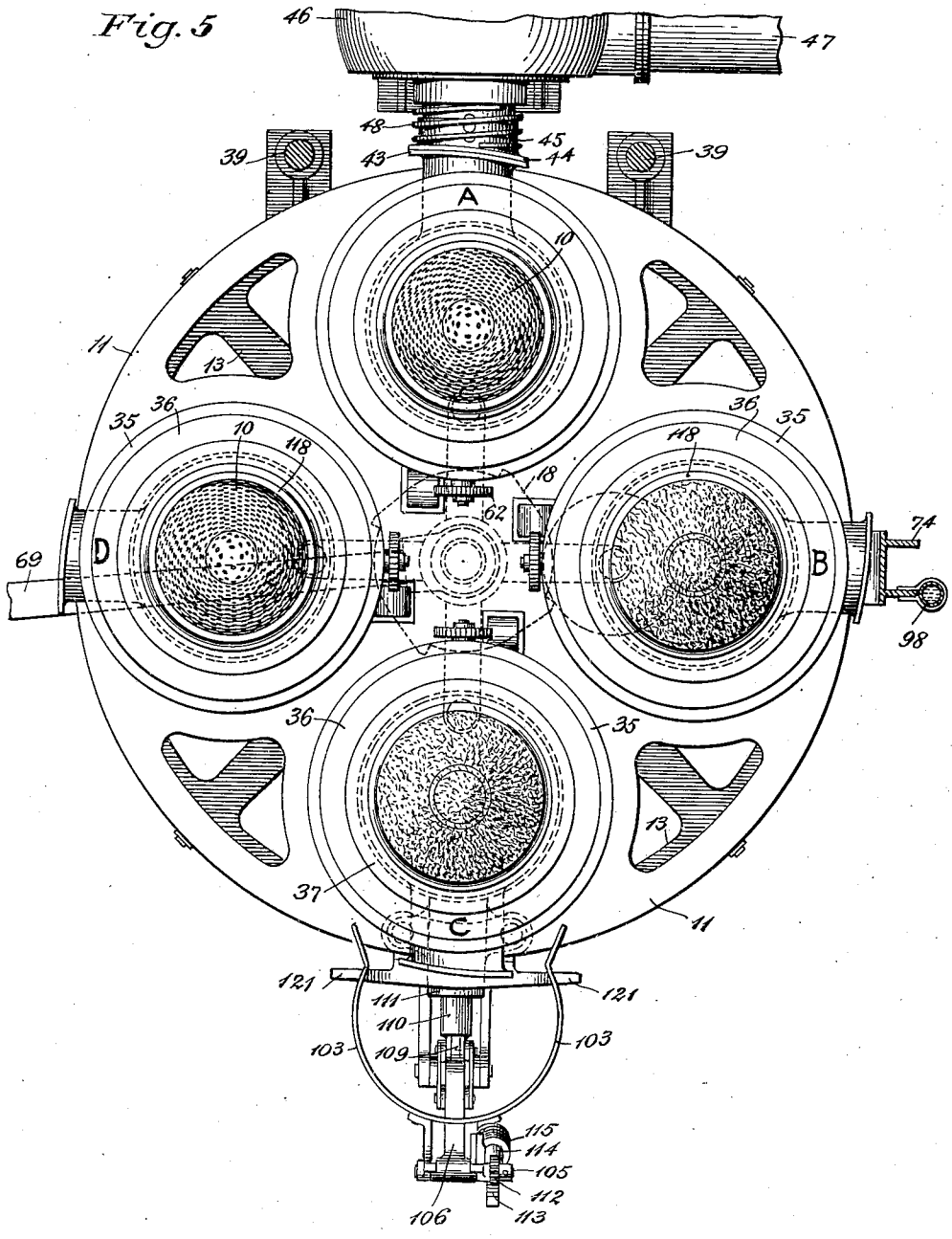
INVENTOR
George T. Birdsall,
BY
ATTORNEY

Sept. 12, 1939. G. T. BIRDSALL 2,172,342

MACHINE AND METHOD FOR MAKING HAT BODIES

Filed March 24, 1937 5 Sheets-Sheet 3

Fig. 5



INVENTOR
George T. Birdsall,
BY
ATTORNEY

Sept. 12, 1939. G. T. BIRDSALL 2,172,342

MACHINE AND METHOD FOR MAKING HAT BODIES

Filed March 24, 1937 5 Sheets-Sheet 4

Fig. 6

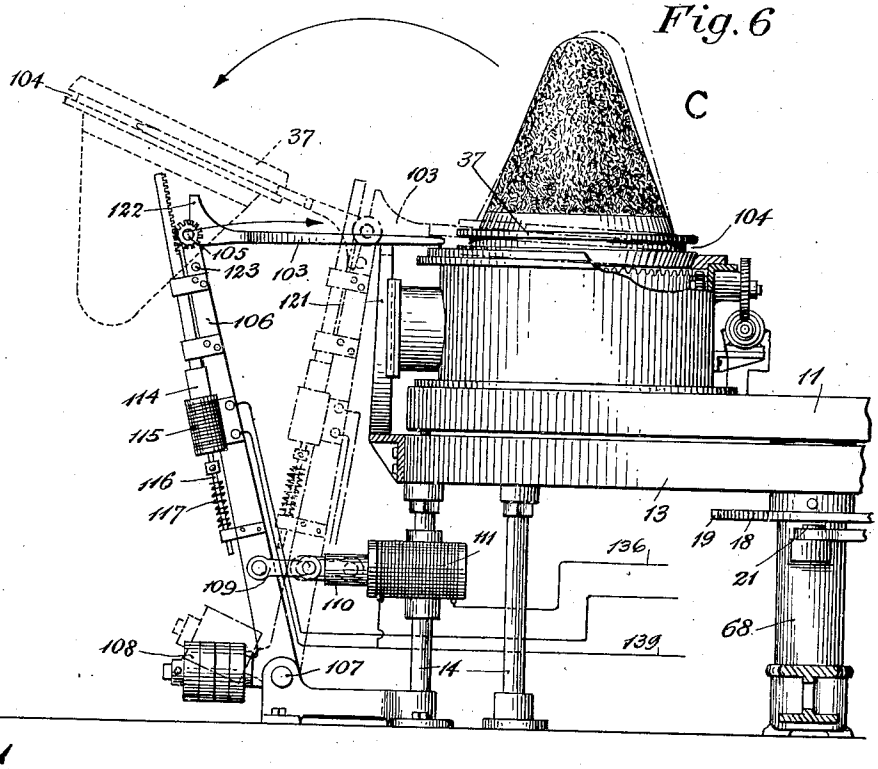
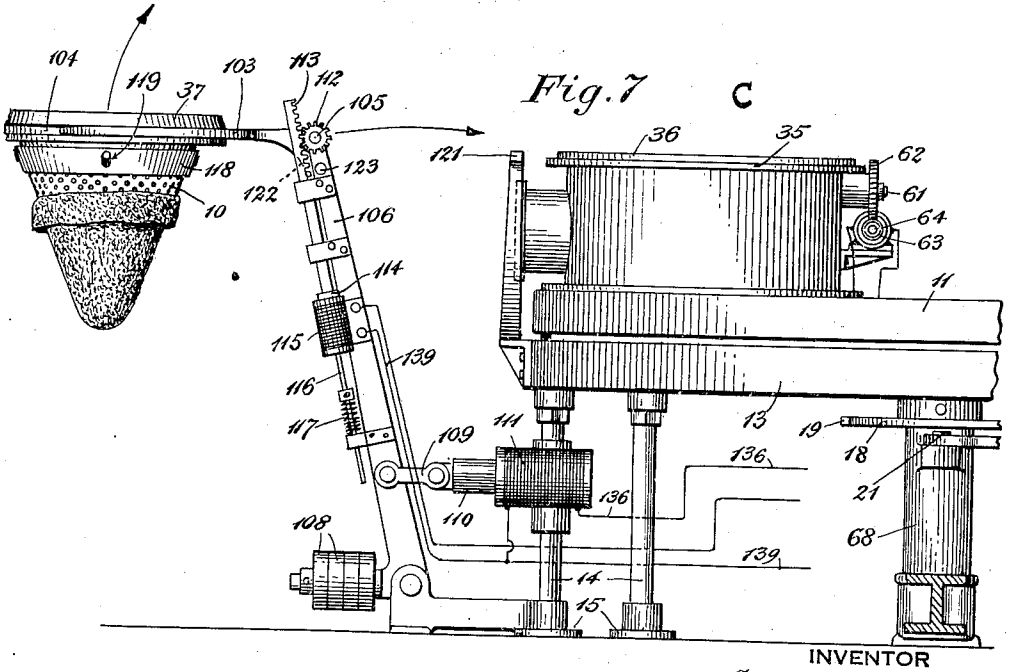


Fig. 7



INVENTOR
George T. Birdsall
BY
ATTORNEY

Sept. 12, 1939. G. T. BIRDSALL 2,172,342

MACHINE AND METHOD FOR MAKING HAT BODIES

Filed March 24, 1937 5 Sheets-Sheet 5

Fig. 8

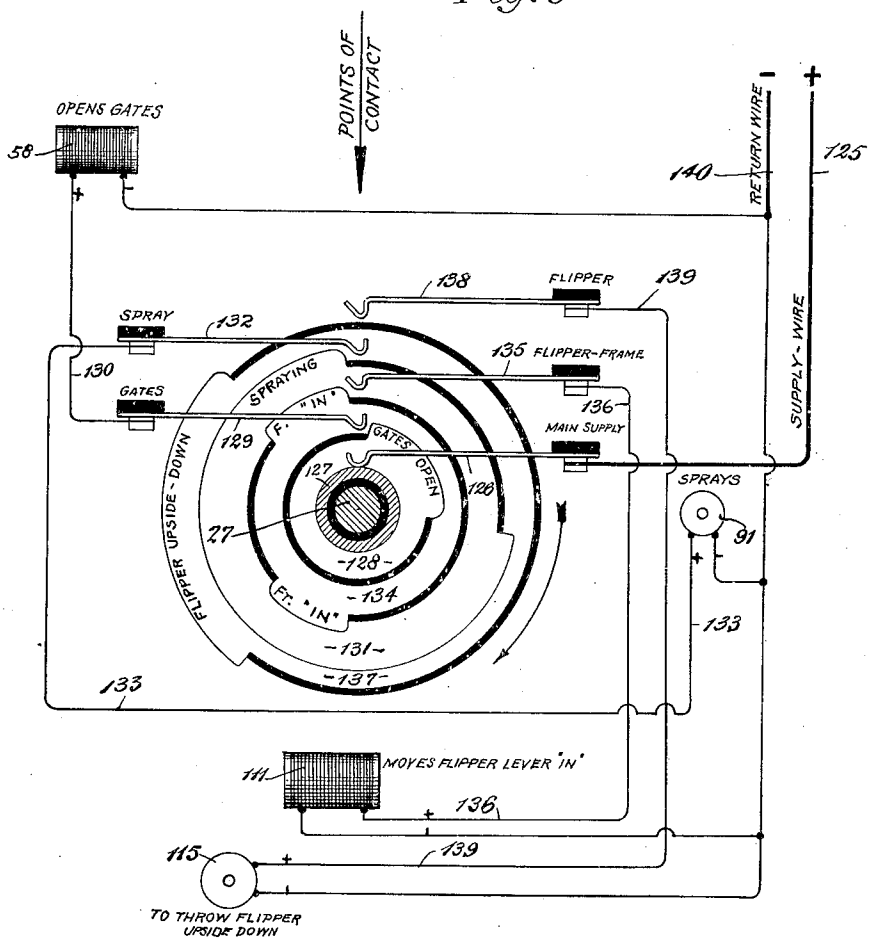
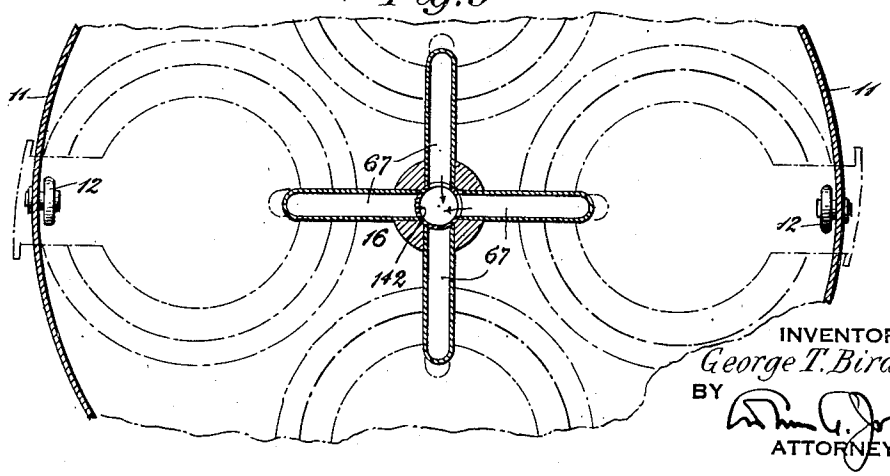


Fig. 9



INVENTOR
George T. Birdsall,
BY
ATTORNEY

Patented Sept. 12, 1939

2,172,342

UNITED STATES PATENT OFFICE

2,172,342

MACHINE AND METHOD FOR MAKING HAT BODIES

George T. Birdsall, Danbury, Conn.

Application March 24, 1937, Serial No. 132,718

34 Claims. (Cl. 19—148)

This invention relates to methods and means for making hat bodies.

An object of this invention is to make felt hat bodies from the initial operation of depositing the fur on a suitable form up to but not including the operation of felting the fur, and to do this without going through the manual operations which were heretofore necessary.

Another object of this invention is to provide a machine in which hat-forming cones are mounted for movement one after another into a plurality of different positions or stations at which the various operations of depositing the fur to form a bat, wetting the bat, and removing the bat from the forming cone may be performed.

A further object of this invention is to provide a machine of the kind referred to wherein the bat-forming, bat-wetting and bat-stripping operations respectively, or any of these, are performed automatically, preferably in timed sequential operation so that the bodies may be formed up to the felting stage without manual operation.

In the broader aspects of the invention, an operator may be placed at each of the stations referred to to control the bat-forming, bat-wetting, and bat-stripping if desired, and even control the seriatim movements of the forming cones into and out of the various stations.

Accordingly, it will be understood that the present invention includes the method of making hat bodies which consists in bringing the cones seriatim to a plurality of working positions and performing the operations at the various stations above referred to, or any group of them.

The practical advantages of having a single unitary machine for performing the various operations in hat-making up to the operation of felting are self-evident, but it may be noted that a great saving is effected in labor expended, and, besides, when the operations are performed automatically, a greater uniformity of product is assured, and this may be maintained at whatever standard of quality is desired. In addition, the bodies may be made more rapidly by the machine provided by the present invention than if made by hand.

Other features and advantages will hereinafter appear.

In the accompanying drawings which illustrate one form of this invention, that at present preferred—

Figure 1 is a side elevation of the improved hat-making machine with certain parts broken away and some parts shown in section to show the details of construction.

Fig. 2 is a horizontal section of the station at which the fur is deposited on the forming cone, taken on the line 2—2 of Fig. 1.

Fig. 3 is a plan view of part of the machine, showing, in dot-and-dash lines, the gates at the fur-depositing station open to receive a cone and to permit the passage of the fur-laden cone to the wetting station.

Fig. 4 is a horizontal section of part of the machine, taken on the line 4—4 of Fig. 1.

Fig. 5 is a plan view of the machine showing the turntable for carrying the forming cones from station to station and omitting the showing of the fur-depositing and wetting mechanism.

Fig. 6 is a side elevation of the part of the machine at the stripping station showing the wetted body in position to be stripped from the cone, and showing, in dot-and-dash lines, one position of the mechanism for removing the cone from the turntable preparatory to stripping the body from the cone.

Fig. 7 is a view similar to Fig. 6, but showing the cone removed from the turntable and the body in the act of peeling or stripping from the cone.

Fig. 8 is a diagrammatic view of the contact mechanism for automatically controlling the various operations on the machine.

Fig. 9 is a horizontal section of the rotating table of the machine taken on line 9—9 of Fig. 1.

According to the present invention, the hat bodies are made on forming cones 10 made of perforated metal and having a rounded apex.

A plurality of cones 10 are employed, and these are moved from station to station, preferably automatically, to receive the fur, to have the bat of fur wetted, and to have the wet bat stripped from the cone. In the broader aspects of the invention, as many cones as desired may be employed, and these may be moved from station to station in any suitable way.

According to the present invention, however, the cones are mounted on a turntable 11 having rollers 12 riding on a track on a main frame member 13 supported on standards 14 having feet 15 which may set on a floor or on the bottom of a pit.

The turntable 11 is preferably circular and at its center has a hub 16 passing through a bearing 17 at the center of the main frame 13.

The fur-depositing, wetting and stripping stations are evenly spaced around the main frame 13, and the turntable 11 is rotatable to bring each

cone 10 to the various stations successively, and to leave the cones at the various stations for a sufficient time to permit the required operations to be performed.

The turntable may, according to the present invention, be moved step-by-step for this purpose in any suitable way. The mechanism shown for accomplishing this step-by-step movement includes a ratchet wheel 18 having four teeth 19 and a pawl 20 pivoted at 21 on an arm 22 which is pivoted at 23 on a portion of the main frame. The arm 22 has a long slot 24 in which rides a pin 25 carried by a crank 26 on a shaft 27 having a bearing 28 on a portion of the main frame. The shaft 27 has a worm wheel 29 meshing with a worm 30 driven by a worm wheel 31 which, in turn, is driven by a worm 32 on a shaft of a motor 33. The motor 33 is constantly operating, and through the train of worm wheels and worms above-described slowly rotates the crank 26, with the result that the pawl 20 and its arm 22 are caused to swing about the pivot 23. The crank rotates in the direction of the arrow and, as it rotates from the position shown in Fig. 4, it moves toward the pivot point 23 and thereby causes the movement of the arm 22 to accelerate. During this movement the pawl 20 is moved 90° and, since it engages a tooth 19 on the ratchet 18, advances the turntable 11 for 90°. The continued rotation of the crank 26 causes the direction of operation of the pawl arm 22 to be reversed, and during this time the crank pin is further removed from the pivot point 23, resulting in a slow return movement of the pawl. It is during the return movement of the pawl that the operations of depositing the fur, wetting the bat, and stripping the bat are performed. By the time these operations have been finished, the pawl 20 is again in position to engage a tooth 19 on the ratchet.

The forming cones 10 are not supported directly on the turntable 11, but rather are elevated above it, on cylinders 34. At the top of each cylinder 34 there is a flange 35, see Figs. 1 and 7, on which there is mounted for rotation a ring 36. The inner surface of the ring is tapered downwardly and is adapted to engage a similarly shaped base 37 to which the cone 10 is secured. There is a frictional fit between the cone base 37 and the ring 36, so that each cone, with its base, may be removed from the ring 36 when desired and yet, when it is supported on the ring, will rotate with it.

As stated above, the machine of the present invention has three operating stations. The fur-depositing station is indicated generally by A, the wetting station by B, and the stripping station by C. As shown, these stations are spaced 90° apart around the main frame 13, but it should be understood that any suitable spacing of the stations may be employed. Also, as shown, there are four cones 10 and mounting structures therefor. These likewise are spaced 90° apart in the machine illustrated. At station D no work is performed, except that of moistening the cone so that when it arrives at station A the fur will adhere to it. For this purpose, there is provided at station D a constantly operating spray 200 throwing a very little mist onto the cone.

Fur depositing

At station A there is provided a chute 38, supported on standards 39, carried by the main frame, and this is connected to a stack 40 through which a predetermined quantity of fur is allowed to fall at the proper time so that the fur may settle on the cone.

To insure the fur settling on the perforated cone 10 in an even layer, suction is employed. For this purpose, the cylinder 34 which supports the cone and its base 37, is provided with a sheet metal box 41, the top of which is open and has its edge lying close to the base 37 of the cone. At one side the box 41 has a duct 42 radially extending with relation to the cylinder 34 and the turntable 11. The duct 42 has a flange 43 which engages a flange 44 on a duct 45 when the cone is located at station A. The duct 45 leads to the interior of an impeller-type blower 46 which has an exhaust duct 47. When the flanges 43 and 44 are engaged, the air is drawn down through the fur-depositing stack 40, the chute 38, through the perforated cone 10, through the box 41 and ducts 43 and 44 so that the falling fur is drawn upon and held to the cone in an even layer. A duct 45 is slidably mounted and resiliently urged by a spring 48 so that the flange 44 is engaged with the flange 43. When the turntable moves, however, the duct 45 is cammed back permitting the flange 43 to pass the flange 44.

During the depositing of the fur on the cone 10 at station A, the cone is completely enclosed by the chute, and means are provided by the present invention for permitting the cone to enter and leave the chute. For this purpose, side walls 49 of the chute are made in the form of gates. In the form of the invention herein shown, the gates 49 are each pivoted on a shaft 50 on a solid rear portion 51 of the chute and close against a solid front wall 52 of the chute, see Figs. 2 and 3. Each of the shafts 50 is provided with an arm 53 and the arms 53 have links 54 connecting them to a lever 55 which in turn has a link 56 connecting it to an armature 57 of a solenoid 58. Before the turntable 11 moves, the gates 49 are opened and they stay open while the cone on which fur was deposited travels from station A to station B, while the cone from which the bat has been stripped travels from station D to station A. The manner in which the solenoid 58 is operated will be described below.

While the cone is receiving the fur falling through the chute 38, it is rotated so that the fur will be deposited more evenly on it. For this purpose, the ring 36 on which the base 37 of the cone rests is provided with an annular row of teeth 59 meshing with a gear 60 on a shaft 61 journaled in the cylinder 34 and having a worm wheel 62 meshing with a worm 63 on the shaft of an electric motor 64, see Fig. 1. Each of the motors is connected by wires to brushes 65 in position to engage contacts 66 carried by the base 13, see Fig. 4, so that when any cone is at station A, the brushes engage the contacts and cause the motor associated with that particular cone to operate and rotate the cone.

It is desired to hold the fur in an even layer on the cone 10 while it travels from station to station, and for this purpose each of the boxes 41 is provided with a conduit 67 leading to the hub 16 of the turntable where the various conduits 67 join. The hub 16 is hollow and joins with a hollow standard 68 at the center of the turntable and forming part of the base member, and this is connected at the bottom by a duct 69 connected to a blower not shown. Air is continuously drawn through the hollow standard 68 and conduit 67, and thus provides suction within the hollow cone 10 to hold the fur thereto.

Only a slight amount of suction is necessary

to hold the fur on the cones while moving from station to station, but a large amount is needed during the fur-depositing operation at station A, and this is the reason for the provision of the blower 46.

In order that the air drawn in through the conduits 67 will not enter through the large duct 42 while the cone is being transferred from one station to another, a flap valve 70 is provided in each conduit 42, the reduced atmospheric pressure in the box 41 causes the flap to remain against a stop 71 in closed position. Likewise, to prevent the blower 46 from drawing air back through the conduit 67 when in fur-depositing position, the latter is provided with a flap valve 72.

Fur wetting

After the fur is deposited on the cone at station A, the turntable 11 moves and the cone is brought to station B where the fur which is deposited thereon and held thereon by suction, is wetted. At station B, there is provided a spraying device having a standard or support 74 secured to the main frame 13 and carrying at its upper end a hollow perforated cone 75. The cone 75 is mounted on a non-circular rod 76 slidably mounted in arms 77 at the upper end of the bracket, and the rod 76 is provided with gear teeth 78 meshing with a gear 79 mounted on a shaft 80 and also carrying a gear 81 meshing with a rack 82 connected to an arm 83 on a rock shaft 84. The rock shaft 84 has an arm 85 carrying a rod 86 having a weight 87 thereon to counterbalance the weight of the rod 76. The rock shaft 84 has another arm 88 connected by a link 89 to an armature 90 of a solenoid 91. When the solenoid 91 is operated, the shaft 84 is rocked, causing the hollow cone 75 to be lowered over the bat on the cone 10 so that the fur, of which the bat is composed, will be held against shifting on the cone 10 during the spraying operation.

Supported on the rod 76 is a spray head 92 having depending perforated tubes 93 located at spaced points around the hollow cone 75 and connected at their bottoms by a ring 94. The spray head 92 is connected by a flexible hose 95 to a fitting 96 carried by the bracket 74. This fitting is connected to a valve 97 and a supply hose 98. The valve 97 has an arm 99 connected to the rod 86 by a pin-and-slot connection 100 carrying the counterweights 87. Thus, when the perforated cone 75 and the spray are lowered over the bat of fur on the cone 10 and approach their final position, the valve 97 is opened to cause water from the supply pipe 98 to be sprayed on the cone 75 and through the cone against the fur. The water supplied to the spray is preferably boiling-hot. To prevent the water issuing from the spray pipes 93 from unnecessarily wetting the machinery, the cone and sprays are enclosed within a conical cover 101.

During the spraying operation, air within the cone 10 is continually withdrawn and sucks through the bat the water which is sprayed thereon, thus insuring the complete and thorough wetting of the bat.

Water entering the box 41 passes down through the conduit 67 and hollow standard 68 to the conduit 69, and a suitable water trap not shown is provided between the conduit 69 and the blower which is also not shown. Surplus water flowing off the bat is allowed to flow into the box 41 through one or more drain holes 102.

After the bat is fully wetted, current through the solenoid is interrupted allowing the weights 87 to return the parts to their inactive positions shown in Fig. 1. At the beginning of this return movement, due to the fact that the valve 97 is spring-biased to off position, the valve is shut off before the cone and spray have moved substantially away from the bat. After the spray has moved up to its inactive position, the turntable and cone moves 90°, and this brings the wetted bat to the stripping position C, see Fig. 5.

Stripping

As will be seen from a comparison of Figs. 6 and 7 at station C, the cone 10 with its base 37 is picked up from the cylinder 34 and the turntable and is flipped over so that the wetted bat may be stripped from the cone.

To permit this to be done, the base 37, as stated above, has a frictional fit in the ring 36 so that the cone and its base may be lifted out of the ring. To do this, a fork 103 is provided and is so positioned that its tines may enter an annular groove 104 in the base 37 of the cone. In doing so, the tines expand, and when they are located within the groove 104, they firmly grip the base and hold it against movement relative to the fork. The fork is pivotally mounted on a shaft 105 carried by the upper end of a rocking frame 106 which in turn is pivoted at 107 on the base of the machine. The rocking frame is counterbalanced by weights 108 so as to normally occupy the position shown in Fig. 6. When the wetted cone arrives at station C, the frame 106 is pulled to the right as shown in Fig. 6, by a link 109 connected to the armature 110 of a solenoid 111 so as to occupy the position shown in dot-and-dash lines with the fork 103 gripping the base of the cone.

This rocking movement is such that the base is tilted up on one side so that it occupies the position shown in dot-and-dash lines in Fig. 6. With the cone thus grasped, the rocking frame 106 returns to its full-line position shown in Fig. 6, and, at the same time, the fork 103 is rocked on the axis of the shaft 105 so that when the frame 106 reaches the position shown in Fig. 7, the cone has been flipped over and is upside down. To thus flip over the cone, the shaft 105 is provided with a pinion 112 engaged by a rack 113 connected to an armature 114 of a solenoid 115, and also connected to a rod 116 having a spring 117 tending to return the rod, armature and rack to their normal positions shown in Fig. 6. When the cone is flipped over, a loose ring 118 surrounding the base of the cone and held thereto by pin-and-slot connections 119, is allowed to fall by gravity. This causes the lower edge of the wetted bat to be turned outwardly and the weight of it causes it to turn downwardly as shown in Fig. 7. From this position, the body strips itself by gravity from the cone and in doing so turns inside out and falls into a suitable receptacle.

To guide the fork 103 into proper position in the groove 104, the frame 13 of the machine has a pair of stationary arms 121 on which the lower edge of the tines rest. When the fork swings from the dot-and-dash line position to the dotted line position shown in Fig. 6, an arm 122 on the fork engages a pin 123 on the swinging frame.

After the body has stripped from the cone 10 with the parts shown in the positions they occupy in Fig. 7, the solenoid 115 is deenergized, permitting the cone and the fork to swing back and at the same time the solenoid 111 is ener-

gized to swing the rocking frame 106 back toward the frame of the machine. When the parts reach this position, the base 37 of the cone is deposited on the ring 36 and the fork 103 withdraws from the annular groove 102 leaving the cone in proper position on the turntable. When this operation as well as the fur-depositing and wetting operations have been concluded, the table turns and this brings the cone 10, from which the body had previously been stripped, to station D where it remains out of service until it is moved to station A. While it is at station D, the cone may be moistened by the spray 200, so that it will be sufficiently damp to receive the fur.

In the above description it has been stated that the gates 49 at station A, the sprinkler 73 at station B, and the stripping mechanism at station C are operated by solenoids. It should be understood, however, that in the broader aspects of this invention, these parts may be operated in any suitable manner and by any suitable means, and, in fact, they may be operated by hand having an operator at each station to open and close the gates and to raise and lower the sprinkler, and to remove the cone from the turntable, if desired. However, it is preferable and advantageous to have these operations performed automatically and in coordination with the movement of the turntable and with the operation of each other. For this purpose, electrical means are provided for operating the various mechanisms in coordination with the means for advancing one cone after another through the different stations.

Accordingly, as shown in Fig. 1, and as diagrammatically indicated in Fig. 8, the shaft 27, which controls the step-by-step movement of the turntable, carries a contact drum 124. Current is supplied to the contact drum from a main supply line 125, through a brush 126 to a sleeve 127 carrying a plurality of contact disks adapted to be engaged by contact fingers leading to the various solenoids. As shown in Fig. 8, there is a contact disk 128 having a raised contact portion for engaging a contact finger 129, connected by a wire 130 to the solenoid 58 which opens and closes the gates 49. This raised part of the disk 128 occupies that portion of the disk which is located in position to be engaged by the contact finger 129 while the turntable is moving from one position to another. On the sleeve 127 there is another disk 131 having a raised portion adapted to engage a contact finger 132 connected by a wire 133 to the solenoid 91 controlling the spray. There is another disk 134 carried by the sleeve 127 having a raised portion adapted to engage a contact finger 135 connected by a wire 136 to the solenoid 111 which controls the movement of the swinging frame 106 of the cone-flipping mechanism. There are two raised portions on this disk 134 at spaced intervals, one to cause the rocking frame to be moved in so that the fork 103 may receive the cone, and another raised portion to move the rocking frame in when the fork 103 is to redeposit the cone on the turntable. There is another disk 137 carried by the sleeve 127 and this is adapted to engage a contact finger 138 connected by a wire 139 to the solenoid 115 which controls the rotation of the fork 103 from the position shown in Fig. 6 to that shown in Fig. 7. Each of the solenoids is connected by return wires to the return supply line 140 on the main source of supply.

It will be noted that all of the raised portions of the disk, except that of the disk 128, are located within substantially three-quarters of the circumference of the sleeve 127, and that only the raised portion on the disk 128 is located on the other one-quarter of the circumference of the sleeve. This is because the gates are the only things which are operated by solenoids during the movement of the turntable from one position to another, and that this movement, because of the accelerated action produced by the crank 26 and slotted arm 22, occupies only one-quarter of the rotation of the shaft 27.

The main feed lines 125 aand 140 are connected to a source of current supply by a switch 141, see Fig. 1.

To avoid a condition where the suction effect produced within the hollow cones would practically be destroyed at the time and by the removal of the body and cone from the turntable at the stripping station, a stationary sleeve 142 is provided within the hollow standards 58 and this extends up into the turntable structure. It has two holes so disposed that one aligns with the conduits 67, leading to the cone which is in fur-receiving position, and the other aligns with the cone which is in bat-wetting position. The solid walls of the sleeve 142 match up with the conduit 67 which lead to the cone at the stripping station and the cone-spraying station and thus prevent air entering the open box 41 or the empty cone at station D from affecting the suction within the other cones.

Variations and modifications may be made within the scope of this invention and portions of the improvements may be used without others.

I claim:

1. A machine for making hat bodies comprising a plurality of forming cones; supporting means therefor for moving the forming cones step-by-step from station to station; means at one station for depositing fur on said cones under heavy suction; means at another station for wetting the bat of fur laid on said cone at the first station; and separate means for maintaining a light suction on the cone from the time it leaves the depositing position until the wetting operation is completed.

2. A machine for making hat bodies comprising a plurality of forming cones; supporting means therefor for moving the forming cones step-by-step from station to station; means at one station for depositing fur on said cones; means at another station for wetting the bat of fur laid on said cone at the first station; and pivoted means at another station independent of the supporting means for removing the bodies from the cones when the latter arrive at said third station.

3. A machine for making hat bodies comprising a plurality of forming cones; supporting means therefor for moving the forming cones step-by-step from station to station; means at one station for deposting fur on said cones; means at another station for wetting the bat of fur laid on said cone at the first station; and means at another station movable into operative relation with the cone for flipping-over said cones to permit stripping of the bodies from the cones when the latter arrive at said third station.

4. A machine for making hat bodies comprising a plurality of cones; means for moving said cones step-by-step from station to station; means at one station for depositing fur on said cones, said means including a chute to guide the fur toward the cone; suction means for drawing toward and holding on the cone the fur passing through said

chute; and separate suction means for holding the fur on the cone during movement of the cone from said station.

5. A machine for making hat bodies comprising a plurality of cones; means for moving said cones step-by-step from station to station; means at one station for depositing fur on said cones, said means including a chute to enclose the cone and to guide the fur toward the cone at said depositing station; suction means for drawing toward and holding on the cone the fur passing through said chute; means on the chute to permit the entry and exit of the cones one by one into and out of said chute; and separate means for holding the fur on said cone as it passes out of said chute.

6. A machine for making hat bodies comprising a plurality of cones; means for moving said cones step-by-step from station to station; means at one station for depositing fur on said cones, said means including a chute to guide the fur toward the cone; suction means for drawing toward and holding on the cone the fur passing through said chute, the cones being movable under said chute; and gates mounted on the chute to move about vertical axes and adapted to open to receive the cone within and close around the cone while the fur is being deposited thereon.

7. A machine for making hat bodies comprising a plurality of cones; means for moving said cones step-by-step from station to station; means at one station for depositing fur on said cones; means at another station for wetting the bat formed on the cone at said first station and including a hollow perforated cone; a sprinkler around the same; and means for automatically causing the hollow cone and bat to engage after the bat has reached the wetting station.

8. A machine for making hat bodies comprising a plurality of cones; means for moving said cones step-by-step from station to station; means at one station for depositing fur on said cones; means at another station for wetting the bat formed on the cone at said first station and including a hollow perforated cone; a sprinkler around the same; means for automatically causing the hollow cone and bat to engage after the bat has reached the weting station; and means automatically causing the sprinkler to operate to wet the bat when the bat and hollow perforated cone are brought into engagement.

9. A machine for making hat bodies comprising a plurality of cones; means for moving said cones step-by-step from station to station; means at one station for depositing fur on said cones; means at another station for wetting the bat formed on the cone at said first station and including a hollow perforated cone; a sprinkler around the same; means for automatically causing the hollow cone and bat to engage after the bat has reached the wetting station; and means for sucking water sprinkled on the bat through the same to wet the bat all through.

10. A machine for making hat bodies comprising a plurality of cones; means for moving said cones step-by-step from station to station; means at one station for depositing fur on said cones; means for wetting the bat which is formed on the cone at said first station; means at another station for starting and causing the wetted body to be stripped from the forming cone; and means moving in timed relation to said movement of the cones for controlling the wetting and stripping operations in accordance with the step-by-step movement of the cones.

11. A machine for making hat bodies comprising a plurality of cones; means for moving said cones step-by-step from station to station; means at one station for depositing fur on said cones; means for wetting the bat which is formed on the cone at said first station; and means at another station for causing the wetted body to be stripped from the forming cone, said last-named means including means movable into cooperative relation with the cone to flip the cone over so that the body may peel off the cone.

12. A machine for making hat bodies comprising a plurality of cones; means for moving said cones step-by-step from station to station; means at one station for depositing fur on said cones; means for wetting the bat which is formed on the cone at said first station; means at another station for causing the wetted body to be stripped from the forming cone, said last-named means including means to flip the cone over so that the body may peel off the cone; and means operative when the cone is flipped over to start said peeling operation.

13. A machine for making hat bodies comprising a plurality of cones; means for moving said cones step-by-step from station to station; means at one station for depositing fur on said cones; means for wetting the bat which is formed on the cone at said first station; and means positioned adjacent another station for causing the wetted body to be stripped from the forming cone, said last-named means including means operable in timed relation to the movement of the cones to automatically flip the cone over so that the body may peel off the cone.

14. In a machine for making hat bodies, a plurality of forming cones; means for mounting the cones for simultaneous movement to bring each cone successively to a plurality of stations; means at one of said stations for wetting a bat carried by the cone when it reaches said station; and means positioned at another station for engaging the cone and causing the wetted body to be stripped from the forming cone.

15. The herein described method of making hat bodies which consists of causing a plurality of forming cones to be brought seriatim to a plurality of working stations, subjecting the cone to a suction and depositing fur on the cone at one station and at the same time stripping the body from the cone at another station, wetting the bat of fur on one cone while the cone is held against rotation intermediate the operation of depositing fur thereon and stripping the body from the cone, and subjecting the cone to a separate and lighter suction during at least a part of its movement.

16. A machine for making hat bodies, comprising a plurality of forming cones; supporting means therefor for moving the forming cones step-by-step from station to station, said supporting means also including an individual drive means for each cone for rotating the same; means for controlling the drive means at predetermined intervals and at predetermined stations whereby the rotation of each cone is regulated; means at one station to deposit fur on said bodies; and means at another station for wetting the bat of fur laid on said cone at the first station.

17. A machine for making hat bodies, comprising a plurality of forming cones; supporting means therefor for moving the cones from one station to another station; means for applying a suction to the cone in one station; and means for maintaining a lower and separate suction on the

cone during movement of the cone from said first station to a second station.

18. A machine for making hat bodies, comprising a cone; means for moving said cone step-by-step from station to station; means at one station for subjecting the cone to a high suction; and means for subjecting the cone to a lower suction upon movement of the same from said station and during movement to another station, said suction means including a plurality of valves constructed and arranged to allow only one of said suction means to be effective at a time.

19. A machine for making hat bodies, comprising a cone; means for moving said cone step-by-step from station to station; means at one station for subjecting the cone to a high suction; and means for subjecting the cone to a lower and independent suction upon movement of the same from said station and during movement to another station.

20. A machine for making hat bodies, comprising a plurality of cones; means for moving said cones step-by-step from station to station; means at one station for depositing fur on said cones including suction means for drawing toward and holding on the cone the fur passing thereto; and means responsive to the movement of the support for the cones for reducing the suction on the cone to that necessary to hold the fur thereon.

21. A machine for making hat bodies, comprising a plurality of cones; means for moving said cones step-by-step from station to station; means at one station for depositing fur on said cones including means for imposing a high suction on the cone; means for wetting the bat in another station including means for imposing a lower suction on the cone; and means at another station for causing the wet body to be stripped from the cone, including means for discontinuing the suction as applied to the cone.

22. A device of the class described, comprising a cone adapted to receive a bat for making a hat; and a ring mounted on the base of the cone a pin and slot connection connecting the ring to the cone for limited axial movement whereby the ring falls by gravity to engage the bat when the cone is turned to inverted position to initiate the removal of the bat from the cone.

23. In a hat making machine, a plurality of cones; means for depositing fur on said cones; means located remote from said depositing means for inverting said cones; and means for creating relative movement between each of said cones and said inverting means after fur is deposited thereon, for associating the inverting means with each cone, whereby said cones first have fur deposited thereon and are then inverted.

24. In hat making machines, the combination of a plurality of cones; fur depositing means to form bats on said cones; bat wetting means to wet each bat after it has been formed; cone inverting means to invert each cone for stripping the bat therefrom after a bat has been formed thereon and wetted; and motive means to cause relative movement between the cone and all of said means to operatively associate said cones successively with said fur depositing means and wetting means, and to operate said cone inverting means, whereby each of said cones is associated with said fur depositing means to form a bat thereon and the bat is then wetted and the cone is inverted.

25. In a hat making machine, a plurality of cones; fur depositing means to form bats on said cones; bat wetting means to wet each bat after it has been formed; motive means to cause relative horizontal movement between said cones and said fur depositing means and said wetting means to associate said cones successively with said fur depositing means to form bats thereon and then with said wetting means to wet the bats; and means to invert each cone for stripping the bat therefrom after a bat has been formed thereon and to reinvert the cones after the bat has been stripped.

26. In a hat making machine, supporting means; a cone rotatably mounted on the supporting means; means for depositing fur on said cone; an arm pivotally mounted for movement into an inverted position; means for imparting relative movement between at least a portion of the arm and said cone to effect interengagement of said cone and said arm whereby said arm is brought into supporting relationship with said cone; and means for pivoting said arm to invert said cone.

27. In a hat making machine, a supporting mechanism; a cone rotatably mounted on said mechanism; means for depositing fur on said cone; a U-shaped arm pivotally mounted for movement into an inverted position; motive means adapted to impart relative movement between the open portion of said U-shaped arm and said cone to effect an interengagement of said cone and said arm whereby said arm is brought into supporting relationship with said cone; and additional motive means for pivoting said arm to invert said cone.

28. In a hat making machine, a supporting mechanism; a cone rotatably mounted on said mechanism and having a base with a peripheral groove formed therein; means for depositing fur on said cone; a support; a U-shaped arm pivoted on said support for movement about a horizontal axis; motive means adapted to impart relative movement between the open portion of said U-shaped arm and said cone to move the legs of said U-shaped arm into said groove; and additional motive means for pivoting said arm to invert said cone.

29. In a hat-making machine, fur-depositing means including a hopper having a plurality of normally closed doors; means for interconnecting the doors whereby they are operated in unison; a forming cone; means for causing relative movement between the forming cone and fur-depositing means whereby the cone is moved into said hopper to have fur deposited thereon and removed from the hopper after the depositing operation; electro-responsive means for simultaneously opening the doors of the hopper; and means for energizing the electro-responsive means for opening the doors before movement of the cone into or out of the hopper.

30. In a hat-making machine, fur-depositing means including a hopper having a plurality of openings and doors for closing said openings; means for interconnecting the doors whereby they are operated in unison; a forming cone; means for causing relative movement between the forming cone and fur-depositing means whereby the cone is moved into said hopper to have fur deposited thereon and removed from the hopper after the depositing operation; electro-responsive means for operating the doors of the hopper; and means to operate the electro-responsive means to open the doors and maintain them open throughout the movement of the cone into or out of the hopper.

31. In a hat-making machine, fur-depositing means including a hopper having openings therein and doors for closing said openings; means for interconnecting the doors whereby they are operated in unison; a forming cone; means for causing relative movement between the forming cone and the fur-depositing means whereby the cone is moved into said hopper to have fur-deposited thereon and removed from said hopper after the depositing operation; electro-responsive means for operating the doors of the hopper; and means to operate the electro-responsive means to operate the doors, said means being correlated with the means for causing relative movement between the cone and depositing means whereby the doors are opened and maintained open during movement of the cone into or out of the hopper.

32. A machine for making hat bodies comprising a plurality of cones; means for moving said cones step-by-step from station to station; means at one station for depositing fur on said cones including means for subjecting the cone to a heavy suction; and independent means for holding the fur in place thereon during movement of the cone to another station, said last-named means including a light suction applied to the cone.

33. In a machine for making hat bodies, a plurality of forming cones; means for mounting the cones for simultaneous movement to bring each cone successively to a plurality of stations; means at one of said stations for wetting a bat carried by the cone when it reaches said station; means moving in timed relation to said movement of the cones for operating the wetting means at predetermined intervals; and means for holding the bat on the cone until it is completely wet.

34. In a machine for making hat bodies, a plurality of forming cones; means for mounting the cones for simultaneous movement to bring each cone successively to a plurality of stations; means at one of said stations for wetting a bat carried by the cone when it reaches said station, said means including a sprinkler; and means moving in timed relation to said movement of the cones for automatically causing the sprinkler to operate at predetermined intervals to wet the bat only when the bat and the cone carrying the same reach said station.

GEORGE T. BIRDSALL.