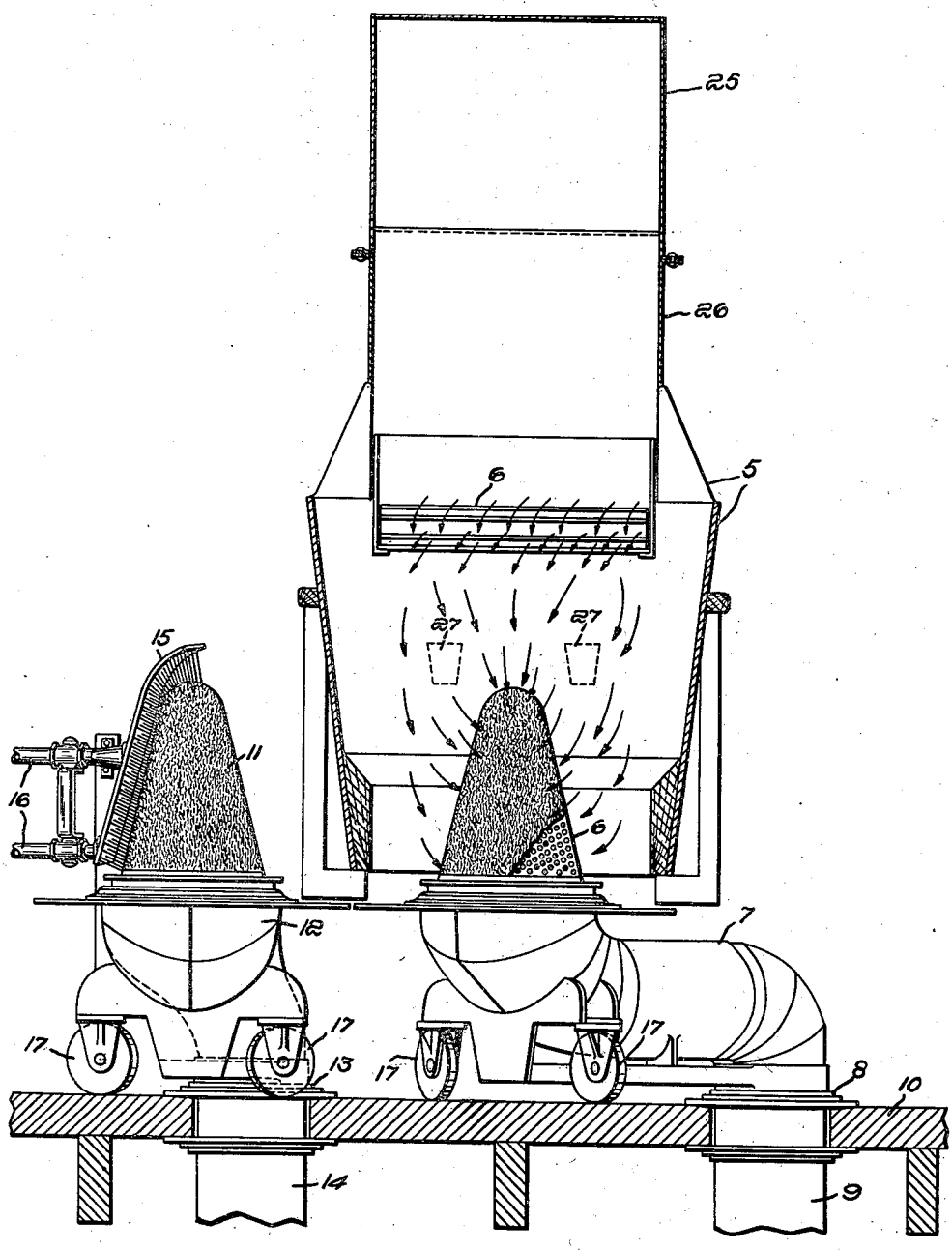
March 24, 1942. L. O. R. CLARK 2,277,042

HAT FORMING SYSTEM

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Fig. 1.



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Fig. 2.

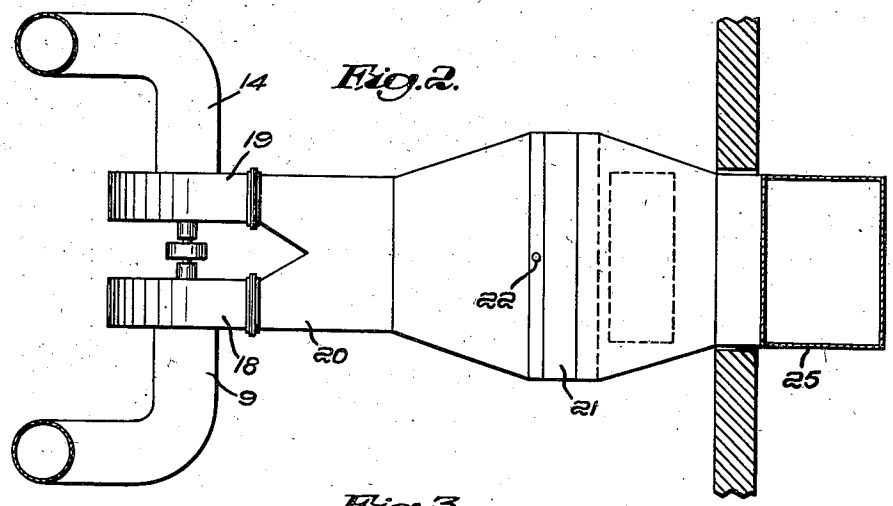
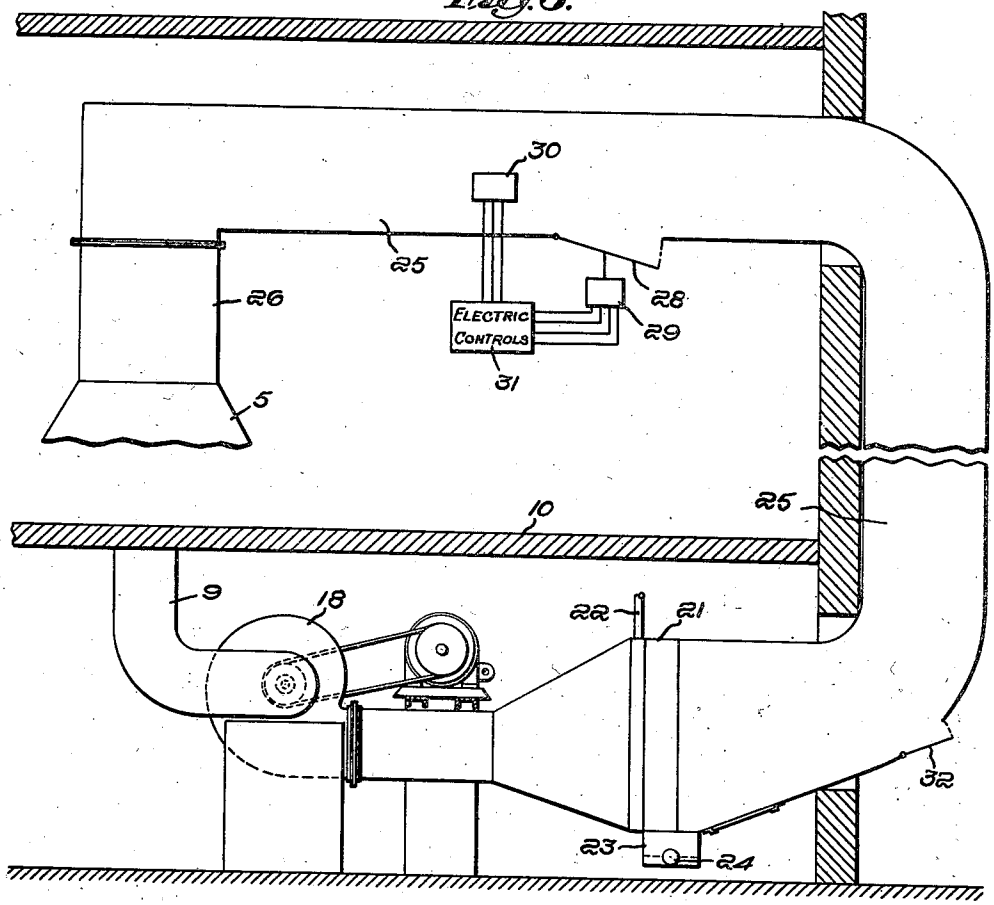


Fig. 3.



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2,277,042

HAT FORMING SYSTEM

Lester O. Ray Clark, West Hartford, Conn., assignor to B. F. Sturtevant Company, Boston, Mass.

Application February 20, 1941, Serial No. 379,817

6 Claims. (Cl. 19—148)

This invention relates to hat forming systems and apparatus and has as its objects the improvement in the quality of hats formed in, and the increase of efficiency of, hat forming apparatus.

Prior hat forming equipment has been similar to that disclosed in the J. Cassie Patent No. 2,175,454 of October 10, 1939. In such prior equipment, the air inlet above the hat forming cone was open, to the atmosphere with the result that stray air currents have entered the former to create turbulence therein and to affect the uniformity of fur flow and the quality of the hat. A number of formers are usually placed alongside each other and in the prior constructions, the suctions of the fans of each former affected the uniformity of fur flow to the others. When a hat is stripped off a former cone, the suction applied to that cone is shut-off and this changes the air balance in the plant resulting in the production of stray air currents. Then when suction is again applied to a former, the air balance is again disturbed and one former tends to rob another former of air and fur particles. Observation of the area above such formers has shown fur particles carried by turbulent air currents sometimes to and sometimes from an individual former. Since the quality of a hat depends upon equal fur distribution over all areas of the hat being formed, the stray air currents into and out of the formers, are undesirable. Prior formers also used but a single cone for each former, suction being applied to the cone only during the fur depositing step, the bat being removed from the cone and wetted by dipping into water. The air from the suction fans was blown outdoors.

In a preferred embodiment of this invention, a former has two cones, each connected to the suction side of a fan, the discharge sides of the fans being connected by duct work to the inlet of a scrubber-eliminator, the outlet of the scrubber-eliminator being connected by duct work with the air inlet of the former, air being continuously recirculated through the system. The cones are moved alternately into and out of the former, the bat on the one out of the former being wetted down by spray nozzles while a bat is being formed on the cone in the former. Suction is applied to the cones by their associated fans during the forming and wetting down steps.

The air is cleaned and its entrained moisture eliminated in the scrubber-eliminator and is recirculated in a duct circuit through the system with provision for the venting of sufficient air from the system for preventing too large a volume being supplied into the former. Through enclosing the air inlet into the top of the former, the operation of one former does not interfere with that of other adjacent ones, and the stray air currents are eliminated, resulting in improved quality in the hats. The recirculation of the air also results in a reduction of the air heating load since formerly, in winter, large volumes of heated air were exhausted to the outdoors.

The invention will now be described with reference to the drawings, of which:

Fig. 1 is a front view, with a portion in section of a hat former embodying this invention;

Fig. 2 is a plan view looking downwardly upon the fans, scrubber-eliminator and a portion of the duct work for connection to the former of Fig. 1, and

Fig. 3 is a side elevation of the fans, scrubber-eliminator, and the duct work for connection to the former, together with a diagrammatic view of a spill damper control system.

The dome of the former, indicated generally by 5 receives the fur from the conveyor 6 which is connected to a source of fur (not shown). The perforated cone 6 is connected by the duct 7 through the swivel joint 8 to the duct 9 under the floor 10. The similar cone 11 is connected by the duct 12 through the swivel joint 13 to the duct 14 under the floor 10.

The spray nozzle 15 supplied through the pipes 16 with water is shown as spraying water on the bat previously formed on the cone 11.

The cones 6 and 11 are mounted on the rollers 17 and are adapted to be swung alternately one into the former for receiving a fur bat and one out of the former through doors (not shown) under a spray. The cone 6 when it is swung out of the former moves to the right (facing Fig. 1 of the drawings) under a spray nozzle (not shown) similar to the nozzle 15. The cone 11 has its wetted bat removed and moves to the right into the former when the cone 6 is removed therefrom. Thus a bat is being formed on one cone while a previously formed bat on the other cone is being sprayed. As in the prior systems, the cone in the former is rotated by mechanism (not shown) and the same mechanism rotates the cone under the sprays.

During the forming and spraying steps, suction is applied through the ducts 7, 9, 12, and 14 to the cones. In the forming step, the fur is drawn by the suction into the apertures in the cone and in the spraying step, the water is drawn by the

suction to permeate the bat, a large percentage of the water passing through the bat into the duct system.

The centrifugal fan 18 under the floor 10 has its suction side connected through the ducts 9 and 7 to the cone 6, and the similar fan 19 has its suction side connected through the ducts 12 and 14 with the cone 11. The fans 18 and 19 discharge into a common duct 20 which in turn discharges into the scrubber-eliminator 21. This scrubber-eliminator contains zig-zag eliminator plates which may be of the type shown by the Anderson Patent No. 1,896,656 and may contain flooding nozzles of the type shown by Fig. 7 of the Anderson application, Serial No. 309,600 and which may receive water through the pipe 22 for washing down the eliminator plates.

In the scrubber-eliminator 21 any fur which may get into the duct system is washed down into the sump 23 and the entrained moisture in the air is thrown out by the eliminator plates, the fur and water leaving by the drain 24.

The air from which the entrained moisture and fur has been removed in the scrubber-eliminator 21 passes into the duct 25 which connects through the duct 26 with the dome 5 of the former.

The former may be provided with the equally spaced inlet openings 27 in its sides below the conveyor 6 for admitting makeup air which moves inwardly to the cone and aids in the attainment of even fur distribution.

It is estimated that in one installation embodying this invention, it is desirable for the fan connected to the cone in the former to handle 6,000 cubic feet of air per minute. 1,000 cubic feet per minute may be drawn through the inlets 27, leaving 5,000 cubic feet per minute to be supplied into the top of the former through the duct 26. In the normal operation of the system it is not expected that the two fans will overlap to any great extent so that in order to prevent a pressure from being built up in the former, it is only necessary to vent out about 1,000 cubic feet of air per minute, a volume about equal to that drawn in through the inlets 27.

To prevent more than 5,000 cubic feet of air per minute from entering the former, the spill damper 28 may be connected in a wall of the duct 25 and adjusted by the motor 29 through control of the supply of electrical energy from the electric controls 31, and by the pitot tube control 30. The details of the controls 30 and 31 are shown in said Cassie patent. The control responds to air volume changes and when the air volume is over 5,000 cubic feet of air per minute, it opens the damper 28 to spill the excess air back into the former room. Hand operated spill dampers 32 may be provided on all formers for venting to outdoors, an air volume equal to the make-up air volume drawn into the former room.

The damper 28 may, of course, be located in the side walls of the duct or at any other desired point in the system.

The hat forming system described is equipped with other apparatus such as dampers and vane controls in the inlets to the fans, but since such apparatus forms no part of and is not essential to the practice of, the invention claimed herein, it has not been illustrated and described.

While one embodiment of the invention has been described for the purpose of illustration, it should be understood that the invention is not limited to the exact apparatus and arrangement of apparatus illustrated, as modifications thereof may be suggested by those skilled in the art without departure from the essence of the invention.

What is claimed is:

1. Hat forming apparatus comprising in combination, a former housing, a pair of former cones adapted alternately, one to be moved into and the other to be moved simultaneously out of said housing, means for feeding fur into said housing for deposit upon one of said cones for forming a hat thereon, means for spraying a liquid upon the other of said cones for wetting a hat bat previously formed thereon, a pair of fans, ducts connecting the inlets of said fans with the bases of said cones for applying suction thereto, an eliminator for entrained moisture, a duct connecting the outlets of said fans with the inlet of said eliminator, and another duct connecting the outlet of said eliminator with said housing above said fur feeding means.

2. Hat forming apparatus comprising in combination, a former housing, a pair of former cones adapted alternately, one to be moved into and the other to be moved simultaneously out of said housing, means for feeding fur into said housing for deposit upon one of said cones for forming a hat thereon, means for spraying a liquid upon the other of said cones for wetting a hat bat previously formed thereon, a pair of fans, ducts connecting the inlets of said fans with the bases of said cones for applying suction thereto, a scrubber-eliminator for eliminating entrained moisture and for washing down fur particles, a duct connecting the outlets of said fans with the inlet of said scrubber-eliminator, and another duct connecting the outlet of said scrubber-eliminator with said housing above said fur feeding means.

3. Hat forming apparatus comprising in combination, a former housing, a pair of former cones adapted alternately, one to be moved into, and the other to be moved simultaneously out of, said housing, means for feeding fur into said housing for deposit upon one of said cones for forming a hat thereon, means for spraying a liquid upon the other of said cones for wetting a hat bat previously formed thereon, air moving means connected to the bases of said cones for applying suction thereto, an eliminator connected to said air moving means for removing entrained moisture from the air received therefrom, and means for supplying the air from said eliminator into said housing above said fur feeding means.

4. Hat forming apparatus comprising in combination, a former housing, a pair of former cones adapted alternately, one to be moved into, and the other to be moved simultaneously out of, said housing, means for feeding fur into said housing for deposit upon one of said cones for forming a hat thereon, means for spraying a liquid upon the other of said cones for wetting a hat bat previously formed thereon, air moving means connected to the bases of said cones for applying suction thereto, a scrubber-eliminator connected to said air moving means for washing down fur particles, and for removing entrained moisture from the air received therefrom, and means for supplying the air from said scrubber-eliminator into said housing above said fur feeding means.

5. Hat forming apparatus comprising in combination, a former housing, a pair of former cones adapted alternately, one to be moved into and the other to be moved simultaneously out of said housing, means for feeding fur into said housing for deposit upon one of said cones for forming a

hat thereon, means for spraying a liquid upon the other of said cones for wetting a hat bat previously formed thereon, a pair of fans, ducts connecting the inlets of said fans with the bases of said cones for applying suction thereto, an eliminator for entrained moisture, a duct connecting the outlets of said fans with the inlet of said eliminator, another duct connecting the outlet of said eliminator with said housing above said fur feeding means, and a spill damper in said last mentioned duct for venting therefrom an air volume in excess of that it is desired to supply into said former housing.

6. Hat forming apparatus comprising in combination, a former housing, a pair of former cones adapted alternately, one to be moved into and the other to be moved simultaneously out of said housing, means for feeding fur into said housing for deposit upon one of said cones for forming a hat thereon, means for spraying a liquid upon the other of said cones for wetting a hat bat previously formed thereon, a pair of fans, ducts connecting the inlets of said fans with the bases of said cones for applying suction thereto, a scrubber-eliminator for eliminating entrained moisture and for washing down fur particles, a duct connecting the outlets of said fans with the inlet of said scrubber-eliminator, another duct connecting the outlet of said scrubber-eliminator with said housing above said fur feeding means, and a spill damper in said last mentioned duct for venting therefrom an air volume in excess of that it is desired to supply into said former housing.

LESTER O. RAY CLARK.