

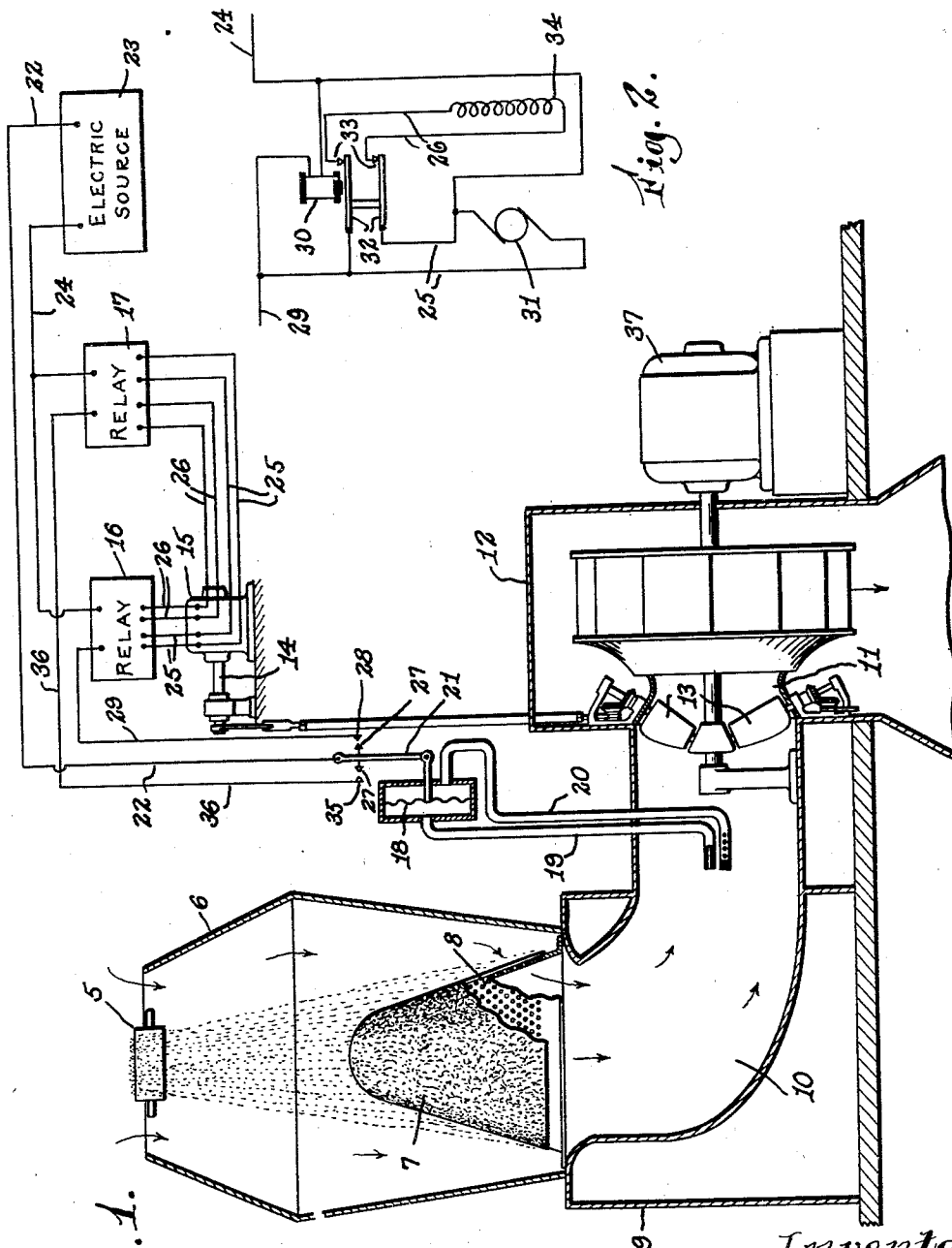
Oct. 10, 1939.

J. CASSIE

2,175,454

HAT FORMING SYSTEM

Filed Dec. 8, 1938



Inventor
JOHN CASSIE
by Robert V. Palmer
Attorney

UNITED STATES PATENT OFFICE

2,175,454

HAT FORMING SYSTEM

John Cassie, Boston, Mass., assignor to B. F. Sturtevant Company, Hyde Park, Boston, Mass.

Application December 8, 1938, Serial No. 244,635

4 Claims. (Cl. 19—148)

This invention relates to hat forming systems and apparatus and has as its general object the maintaining a constant air volume through the hat former.

In hat forming systems of the type to which this invention relates, fur or other forming material is fed into the top of a former in which is included a perforated cone. A fan has its suction side connected to the underside of the cone and acts to draw the fur onto the surface of the cone to build up a layer having the desired thickness. As the fur deposits upon the cone and fills up the perforations, it acts to close up the air inlet to the fan and to decrease the volume of air moved by the fan. To compensate for this action in the past, the fans have been designed to have a capacity for providing and have been operated to provide sufficient air volumes for forming the hat in the final forming stages with the result that in the earlier forming stages, much greater air volumes are provided.

This invention provides a hat former in which the air volume through the former is constant throughout the hat forming process. In one embodiment of the invention, spin inducing vanes in a vane controlled fan are adjusted by a velocity control in the air passage between the former and the fan, to cause the fan to draw a constant volume of air through the former. In the earlier forming stages, the tendency of the fan to move too much air, causes an increased air velocity past the control causing the control to adjust the vanes towards closed position. As the forming progresses, the tendency of the air volume to be reduced due to the deposit of the fur over the perforations in the forming cone, causes the control to act to adjust the vanes towards open position for maintaining a constant air volume.

The invention will now be described with reference to the drawing of which Fig. 1 is a side elevation in section of a hat forming system embodying this invention, with the controls illustrated diagrammatically, and

Fig. 2 is a schematic view showing the circuit connections of the elements of the fan adjusting motor and of one of the relays of Fig. 1.

The conveyer 5 feeds fur or other hat material into the former 6. The cone 7 containing the perforations 8 is mounted in the base 9 of the former 6, over the air passage 10 connecting with the inlet 11 of the fan 12. The fan 12 except for its being a single inlet fan is similar to the fan illustrated and described in the United States Letters Patent No. 1, 989,413 which issued January 29, 1935, to H. F. Hagen. It contains in

its inlet 11, the spin inducing vanes 13 which correspond to the vanes 16 of said patent. The vanes 13 are adapted to be adjusted towards closed position to decrease the volume of air handled by the fan and towards open position to increase the volume of air handled by the fan. They are adjusted by mechanism similar to that of said patent, the rotary shaft 14 corresponding to the shaft 44 of the patent.

The motor 15 is adapted to rotate the shaft 14 in one or the other direction to open or close the vanes 13 and its direction of rotation is controlled by relays 16 and 17 which are in turn controlled by the diaphragm 18 connected by the pitot tubes 19 and 20 to the air passage 10.

Due to the passage 10 having a constant area, air velocity changes in the passage conform to air volume changes, so that the diaphragm 18 will move to the right (facing the drawing) when the air volume increases above that desired, and will move to the left when the air volume decreases below that desired. When the volume is that desired, the diaphragm is in balance in mid-position.

The diaphragm 18 carries the contact arm 21 which is connected by the wire 22 to one terminal of the electric source 23. The relays 16 and 17 are connected to the other terminal of the electric source 23 by the wire 24.

When the diaphragm 18 moves to the right indicating too great an air volume, the contact 27 on the arm 21, moves against the contact 28 which is connected to the relay 16 by the wire 29. This causes the relay 16 to be energized through the closing of the circuit including the electric source 23, the wire 22, the winding of the solenoid 30 (Fig. 2) within the relay 16, the wire 29, the contacts 28 and 27 and the wire 22. As shown by Fig. 2, the armature lead wires 25 are connected to the wires 29 and 24 so that the armature 31 of the motor 15 is connected to the source 23 at the same time as the solenoid 30. The solenoid 30 upon energization draws up its armatures 32 which are connected to the wires 25, causing the armatures to strike the contacts 33, connected to the lead wires 26 of the field winding 34 of the motor. Thus, the field winding and the armature of the motor are connected to the electric source and together in a direction to cause the motor to adjust the vanes 13 towards closed position when the air volume increases above that desired in the passage 10 to cause the diaphragm to move to the right to close the control contacts. When the volume has been sufficiently reduced by adjustment of the vanes 13,

the diaphragm 18 returns to mid-position and the circuit of the relay 16 is opened.

5 The elements of the relay 17 are connected to the armature and field of the motor 15 in the same way as shown by Fig. 2 except that the field leads 26 are reversely connected to the armatures 33 so as to cause the motor 15 to rotate in the opposite direction, when the relay 17 is energized, to that caused by the energiza-

10 When the air volume in the passage 10 decreases below that desired, the diaphragm 18 moves to the left causing the contacts 27 and 35 to meet causing the circuit including the contacts 27 and 35, the wire 36, the relay 17, the wire 24, 15 the electric source 23 and the wire 22 to be closed causing the motor 15 to rotate in a direction to adjust the vanes 13 towards open position until the volume has been restored to normal at which time the diaphragm will again move to mid- 20 position to deenergize the relays and through them the vane adjusting motor 15.

The motor 37 driving the fans 12 is preferably a constant speed motor requiring no adjustment.

25 The portion of the air passage just below the cone 7, is preferably in the form of a hyperbolic elbow for providing least resistance to the turning of the air from the cone to the fan.

30 While one embodiment of the invention has been described for the purpose of illustration, it should be understood that other apparatus and arrangements of apparatus might be suggested by those skilled in the art without departure from the essence of the invention.

35 What is claimed is:

1. In a hat forming system having a perforated hat forming cone and means for supplying hat forming material upon said cone, a centrifugal

fan, means forming an air passage connecting the base of said cone and the inlet of said fan, means for varying the volume of air moved by said fan, and means responsive to changes in the volume of air passing through said passage for adjusting said control means to maintain a constant volume through said passage. 5

2. In a hat forming system having a perforated hat forming cone and means for supplying hat forming material upon said cone, a centrifugal 10 fan, means forming an air passage connecting the base of said cone and the inlet of said fan, volume control means in the inlet to said fan, and means responsive to changes in the volume of air passing through said passage for adjusting 15 said control means to maintain a constant volume through said passage.

3. In a hat forming system having a perforated hat forming cone and means for supplying hat forming material upon said cone, a centrifugal 20 fan, means forming an air passage connecting the base of said cone and the inlet of said fan, spin inducing vanes in the inlet to said fan, and means responsive to changes in the volume of air passing through said passage for adjusting said 25 vanes to maintain a constant volume through said passage.

4. In a hat forming system having a perforated hat forming cone and means for supplying hat forming material upon said cone, a centrifugal 30 fan, means including a hyperbolic elbow forming an air passage connecting the base of said cone and the inlet of said fan, spin inducing vanes in the inlet to said fan, and means responsive to changes in the volume of air passing through said 35 passage for adjusting said vanes to maintain a constant volume through said passage.

JOHN CASSIE.