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PNEUMATIC MOTE CONTROL

Filed June 20, 1941

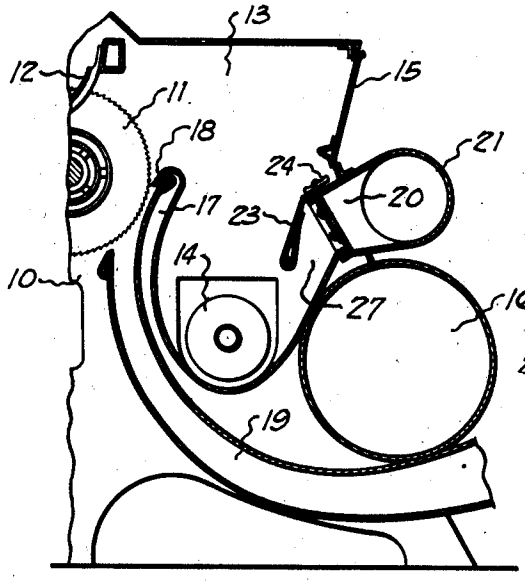

Fig. 1.

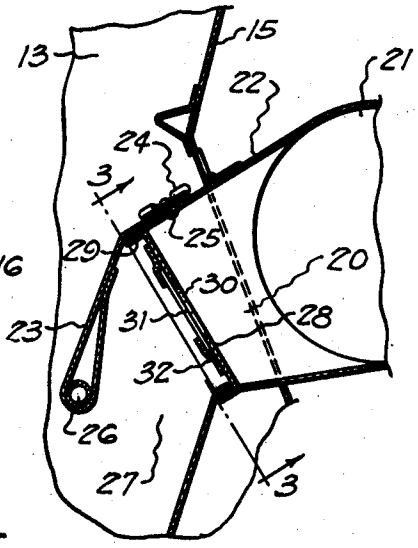

Fig. 2.

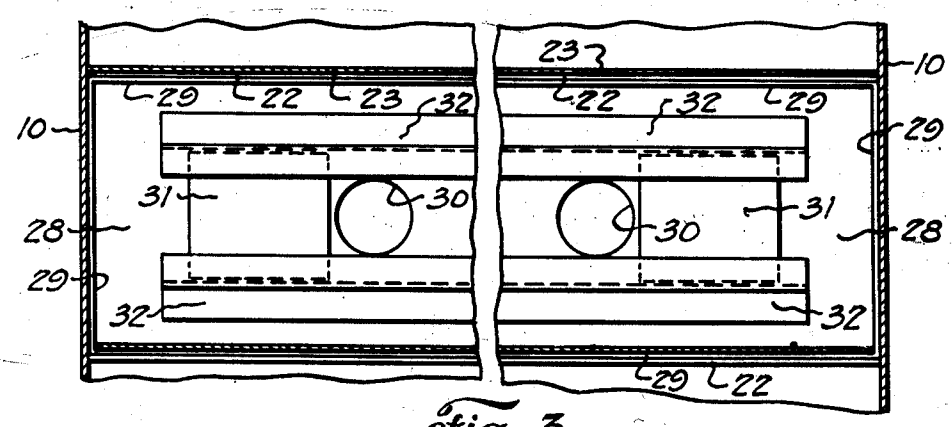

Fig. 3.

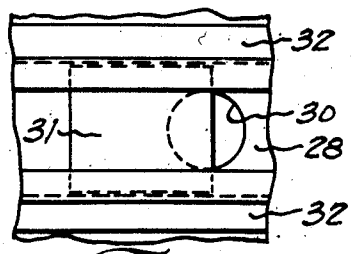

Fig. 4.

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PNEUMATIC MOTE CONTROL

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9 Claims. (Cl. 19—58)

This invention relates to new and useful improvements in pneumatic mote controls.

One object of the invention is to provide improved means for economically and efficiently removing the fine or light-weight motes, dirt, trash, and other fine extraneous matter, from the mote chamber of a cotton gin without disturbing the normal separation and discharge of the heavier motes and other extraneous matter.

An important object of the invention is to provide an improved pneumatic mote control which is associated with the mote chamber of an air blast gin and which is adapted to assist in the removal of light-weight motes and other extraneous matter from said chamber, the mote control being adjustable to compensate for varying operating conditions and also for the condition and nature of the motes, said control being so positioned that the adjustment of the same has no material effect upon the air currents within the mote chamber, or upon the passage of heavier motes and other extraneous matter therethrough.

A particular object of the invention is to provide an improved adjustable control member for the inlet of a suction duct which communicates with the lower portion of the mote chamber for withdrawing light-weight motes therefrom, the control member being spaced inwardly of the duct inlet and away from said mote chamber, whereby the internal contour and area of the chamber remains unaltered upon adjustment of said member and the normal separation and discharge of the heavier motes is performed in the usual manner.

Another object of the invention is to provide an improved adjustable control member, of the character described, which is so constructed and positioned with relation to the inlet of the suction duct and mote chamber that the same may be adjusted without materially increasing the velocity of the motes being drawn into said duct, whereby clogging of the inlet is eliminated and whereby substantially motes of the same type or weight are withdrawn from the same portion of said mote chamber, irrespective of the adjustment of the control member.

A further object of the invention is to provide an improved pneumatic mote control, of the character described, wherein a stationary deflecting member overhangs the inlet of the suction duct so as to direct the motes to the bottom of the mote chamber and wherein the control means for varying the volume of the air stream set up within said chamber by said suction duct is disposed within said inlet, whereby the volume of said air stream may be varied without affecting the contour or area of the chamber.

The construction designed to carry out the invention will be hereinafter described together with other features of the invention.

The invention will be more readily understood from a reading of the following specification and by reference to the accompanying drawing, as an example of the invention is shown, and wherein:

Figure 1 is a partial, transverse, vertical, sectional view of an air blast cotton gin having a pneumatic mote control, constructed in accordance with the invention, mounted thereon,

Figure 2 is an enlarged, transverse, vertical, sectional view of the mote control,

Figure 3 is a cross-sectional view, taken on the line 3—3 of Figure 2, showing the control in its fully opened position, and

Figure 4 is an elevation of a portion of the control, showing the same in a partially-opened position.

This application is a continuation-in-part of our co-pending application, Serial No. 351,458, filed August 5, 1940, issued July 21, 1942, as Patent No. 2,290,405.

In the drawing, the numeral 10 designates the rear portion of a conventional air blast gin having the usual ginning saws 11 which revolve between the ribs 12. A mote chamber 13 is disposed behind the saws 11 and a screw conveyor 14, for discharging the separated motes and other extraneous matter, is located at the bottom of this chamber. The upper portion of the rear wall of the gin or mote chamber 13 is formed by a transversely-extending, hinged door 15 which may be opened to permit access to the interior of said chamber. An ordinary air conduit 16 is positioned at the rear of the gin, in the conventional manner, while an air blast duct 17 leads upwardly from the air conduit to the saws and the air stream within the duct is directed into contact with the saws by a transverse nozzle 18 which is mounted on the upper end of said duct. A downwardly-curved lint duct 19 extends from the saws contiguous to the duct 17 and conducts the lint from said saws.

The gin operates in the customary manner with the cotton being pulled through the ribs 12 by the saws 11 so as to separate said cotton from the seed. Although the ribs are sufficiently close to the saws to prevent the passage of the seed, said saws do not prevent motes, trash, and other extraneous matter present in the cotton, from being carried through said ribs by the saws.

Centrifugal force is depended upon to throw this extraneous matter from the saws into the mote chamber 13, while the heavier motes or particles fall into the discharge conveyor 14 so as to be conveyed from the gin. Due to their light weight, the finer motes or particles tend to float to the upper portion of the mote chamber when thrown from the saws, with the result that those motes adjacent the nozzle 18 may be drawn downwardly into the lint duct 19 by the air suction therein. In actual practice, it has been found that a large portion of the light-weight extraneous matter becomes admixed with the ginned cotton which is being drawn from the saws 11 by the air suction within the lint duct.

In order to overcome this highly undesirable situation and for removing the lighter motes from the mote chamber, the pneumatic mote control disclosed in our co-pending application, Serial No. 351,453, has been provided. Although this mote control has been extremely successful, it has been found that the adjustment of its intake nozzle varies the velocity of the air current passing through said nozzle immediately adjacent the inlet thereof and also alters the internal contour and area of the mote chamber. Thus, when the nozzle is moved to its least opened position, the velocity of the air stream will be increased with the result that there is a tendency for said nozzle to become clogged which might necessitate shutting down of the gin and cleaning of the nozzle. Due to this increased velocity of the air stream, there is also a tendency for some of the heavier particles or motes to be drawn into the suction duct, especially those particles immediately adjacent to the suction nozzle and the rear wall of the gin, or arising from the conveyor 14. Therefore, an improved pneumatic mote control 20 has been provided and includes an air suction duct 21 which is disposed behind the mote chamber 13 below the rear door 15 and above the conduit 16.

As is clearly shown in Figure 2, a suitable transition or flue 22 establishes communication between the duct 21 and the lower portion of the mote chamber. This transition or flue extends throughout the transverse width of the gin and has the door 15 hinged to its upper surface. An inclined deflector 23 overhangs the inner open end of the transition and is constructed of a flat member or sheet which extends downwardly at an angle into the mote chamber beyond the lower end of said transition and which has its upper end fastened to the transition by suitable wing nuts 24 and bolts 25. The lower end of the sheet 23 is spaced from the rear wall of the mote chamber and is bent rearwardly and upwardly upon itself so as to surround a transverse supporting rod or shaft 26, whereby said sheet is pivotally supported by the rod, and may be swung about the axis thereof. Thus, access to the interior of the transition 22 may be had by opening the door 15, unfastening the wing nuts 24 and swinging the sheet 23 upwardly and forwardly. By passing the free end of the sheet around the rod and then fastening said free end to the rear surface of said sheet, the rigidity thereof is materially increased. It is pointed out that the elongate, transverse opening formed between the sheet 23 and the rear wall of the gin provides an inlet or intake nozzle 27 for drawing air from the mote chamber 13 into the duct 21.

For controlling the quantity of air passing from the mote chamber, through the inlet 27 and into the duct 21, a partition or plate 28 extends transversely of the transition 22 and has each of its marginal edges bent forwardly upon itself at substantially a right angle to provide a forwardly-directed, continuous flange 29 which is fastened to the walls of said transition by welding, or other suitable means. The partition 28 may be mounted at any point within the transition 22, but it is preferable to locate the same at or adjacent to the inlet end of said transition. As is clearly shown in Figure 3, the partition is provided with a plurality of large circular openings 30 which are preferably spaced equi-distantly apart longitudinally of said partition. For covering and uncovering the openings 30, a plurality of plates or shutters 31 are slidably disposed along the forward or outer surface of the partition and are preferably maintained in close proximity to said opening and in intimate contact with said partition by a pair of longitudinally-extending retaining members or guide bars 32. Each retaining member comprises an elongate, offset bracket or rail which is secured to the outer surface of the partition 28, and said rails are disposed parallel to each other above and below the opening 30. Manifestly, the plates or shutters 31 are slidably confined between the rails 32 and may be moved or slid longitudinally of the partition 28 so as to cover more or less of the openings 30 and thereby vary the volume of air passing through said openings 30.

With the plates in the position shown in Figure 3, a relatively large volume or quantity of air will be drawn from the mote chamber 13 into the duct 21, while only a relatively small volume of air will be drawn into said duct when said openings are partially closed as shown in Figure 4. In both positions of the plates 31, the induced suction or current of air within the mote chamber will be relatively light and will act only upon those motes which are in close proximity to the inlet 27, whereby the extraneous matter in the central portion of said chamber will not be affected by this suction so as to permit normal separation in the remainder of the mote chamber. The position of the plates shown in Figure 4 has been found to be ideal when the extraneous matter is green or damp, due to weather conditions or for other reasons, because such matter has added weight and the centrifugal force of the saws will throw the same farther into the mote chamber. The extraneous matter or motes, which are of insufficient weight to fall into the conveyor 14, are drawn downwardly along the rear wall of the chamber 13 and through the inlet opening into the duct 21.

Since cotton and, consequently, ginning thereof, is affected by weather conditions, it is obvious that the size or area of the openings 30 must be varied in accordance with such conditions. Therefore, the plates 31 are moved to the position shown in Figure 3 when the motes or extraneous matter are extremely dry. With the openings uncovered or fully opened, the air suction exerted upon the motes and other extraneous matter, or the induced air current within the mote chamber, is of much greater intensity than when said openings are partially covered. This relatively increased air current or stream is drawn downwardly within the chamber and upwardly through the inlet 27 and transition 22 into the duct 21, whereby the extraneous matter within said chamber which is of insufficient weight to fall into the conveyor 14 will be carried from the mote chamber. It is pointed out that this air stream or current will be of greater in-

tensity along the rear wall of the chamber, but that the same will be insufficient strength to overcome the effect of the induced suction set up immediately adjacent the air blast nozzle 18 and will not remove minute particles or motes from in front of said nozzle. However, this suction will be of sufficient intensity to affect the fine motes in the central and lower portions of the mote chamber and remove the same from said chamber.

It is pointed out that light-weight motes will be drawn from the trough of the conveyor 14 instead of rising and floating above the heavier motes and that the inlet 27 is disposed below and to the rear of the air blast nozzle 18, whereby the normal separation and discharge of the heavier motes is not interfered with and the suction created by said nozzle is not affected by the induced air current set up by the suction duct 21. Attention is also directed to the fact that the position of the openings 30 is such that the same are not within the moting zone and that only those motes adjacent the inlet 27 are drawn through said openings. Of course, there is a tendency for the light-weight motes rising from the trough of the conveyor 14 and in close proximity to the rear wall of the mote chamber to be drawn into the suction duct 21. It is further noted that due to the positioning of the openings 30 inwardly of the inlet, the size or cross-sectional area of said openings may be varied without materially changing the velocity of the motes passing through the openings into the suction duct. Thus, clogging of the openings is substantially eliminated irrespective of the adjustment of the plates 31. Obviously, the heavier motes are deflected away from the inlet 27 into the conveyor by the deflector or sheet 23 so as to prevent stoppage of the suction duct, since the air current therein is of insufficient intensity to affect the same. Due to the intensity of the air current or stream adjacent the rear wall of the mote chamber, the motes of intermediate weight will be directed downwardly into the conveyor. As has been hereinbefore set forth, access to the plates 31 for adjustment of the same may be accomplished by opening the door 15, which is hinged to the upper surface of the transition 22, unfastening the wing nuts 24 and swinging the deflecting member or sheet 23 upwardly and forwardly.

The foregoing description of the invention is explanatory thereof and various changes in the size, shape and materials, as well as in the details of the illustrated construction may be made, within the scope of the appended claims, without departing from the spirit of the invention.

What we claim and desire to secure by Letters Patent is:

1. The combination with the mote chamber of a cotton gin which chamber is provided with an opening in the lower portion of its rear wall below the moting zone, of a suction duct connected to the opening for setting up an air current within said chamber, whereby the light-weight motes and other extraneous matter may be withdrawn from said chamber, a longitudinal deflecting element within the chamber overlying said opening and spaced from the rear wall of said chamber to form an inlet through which air is drawn from the chamber into the duct, and a partition disposed between the deflecting element and duct having openings for establishing communication between said chamber and said duct.

2. The combination with the mote chamber of a cotton gin which chamber is provided with an opening in the lower portion of its rear wall below the moting zone, of a suction duct connected to the opening for setting up an air current within said chamber, whereby the light-weight motes and other extraneous matter may be withdrawn from said chamber, a longitudinal deflecting element within the chamber overlying said opening and spaced from the rear wall of said chamber to form an inlet through which air is drawn from the chamber into the duct, a partition disposed between the deflecting element and duct having openings for establishing communication between said chamber and said duct, and means for varying the size of the openings for controlling the volume of the air stream.

3. The combination with the mote chamber of a cotton gin which chamber is provided with an opening in the lower portion of its rear wall below the moting zone, of a suction duct connected to the opening for setting up an air current within said chamber, whereby the light-weight motes and other extraneous matter may be withdrawn from said chamber, a longitudinal deflecting element within the chamber overlying said opening and spaced from the rear wall of said chamber to form an inlet for the suction duct, and a perforate member disposed between the deflecting element and duct for establishing communication between the chamber and said duct.

4. The combination with the mote chamber of a cotton gin which chamber is provided with an opening in the lower portion of its rear wall below the moting zone, of a suction duct connected to the opening for setting up an air current within said chamber, whereby the light-weight motes and other extraneous matter may be withdrawn from said chamber, a longitudinal deflecting element within the chamber overlying said opening and spaced from the rear wall of said chamber to form an inlet through which air is drawn from the chamber into the duct, a partition disposed between the deflecting element and duct having openings for establishing communication between said chamber and said duct, shutters associated with the openings for varying the cross-sectional area of the same so as to accurately control the volume of the air stream, and means mounted on the partition for slidably supporting the shutters in cooperative relationship to said openings.

5. In an air blast gin having saws and a mote chamber provided with a mote discharge conveyor in its bottom, a pneumatic mote control including, a suction duct, means below and to the rear of the moting zone for establishing communication between the duct and the lower portion of the mote chamber, whereby the motes of intermediate weight will be drawn into the lower portion of said mote chamber and directed into the discharge conveyor, and slidably adjustable means within said communicating means and spaced from the mote chamber for varying the amount of suction in accordance with the operating conditions.

6. In an air blast gin having saws and a mote chamber provided with a mote discharge conveyor in its bottom, a pneumatic mote control including, a suction duct, downwardly-directed means for directing an air stream downwardly through the mote chamber and upwardly into the duct, whereby motes thrown from the saws and of insufficient weight to fall to the bottom of said chamber are drawn into the discharge conveyor, and control means spaced from the chamber and adjacent said duct for varying the

volume of the air stream, the control means being disposed longitudinally of said chamber and being movable along its longitudinal axis.

7. In an air blast gin having saws and a mote chamber provided with a mote discharge conveyor in its bottom, a pneumatic mote control including, a suction duct communicating with the lower portion of the mote chamber, downwardly-directed means associated with the duct and disposed below and to the rear of the moting zone for directing an air stream downwardly through said chamber and upwardly into said duct, whereby the motes of intermediate weight thrown from the saws are drawn into the lower portion of the chamber and directed into the discharge conveyor, and means movable transversely of the duct disposed between the downwardly-directed means and said duct and spaced from said chamber for controlling the volume of the air stream.

8. In an air blast gin having saws and a mote chamber provided with a mote discharge conveyor in its bottom, a pneumatic mote control including, a suction duct, means opening downwardly into the lower portion of the mote chamber for establishing communication between the duct and said chamber, whereby a downwardly sweeping air current may be induced within and across the chamber to draw the intermediate motes and other extraneous matter into the lower portion of said chamber and into the discharge conveyor, and slidably adjustable means within the communicating means and spaced from the chamber for controlling the intensity of the air current induced within and across said chamber.

9. The combination with the mote chamber of an air blast gin which chamber has an opening in its rear wall below the moting zone and a mote discharge conveyor in its bottom, of a pneumatic mote control including, a suction duct communicating with the chamber opening for setting up a downwardly-sweeping air current within and across the chamber, whereby the motes and other extraneous matter of intermediate-weight may be drawn from the upper portion of said chamber into the lower portion thereof and into the discharge conveyor, a longitudinal deflecting element depending and spaced from the rear wall of the chamber so as to overlie its opening and form an upwardly-directed inlet to the suction duct, and slidably adjustable means within said opening and disposed between the deflecting element and duct for varying the volume of the air current.

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