This invention relates to the art of cotton ginning, and is concerned particularly with that phase of ginning which deals with the removal of motes.

In the ordinary overhead moting air blast cotton gin, to which this invention is adapted, motes are thrown from the saws into a mote chamber from which they are removed by a screw conveyor located in its bottom. Just below the moting area an air jet is directed against the saw teeth to remove the lint therefrom and deliver it into a lint duct. Although the centrifugal force of the saws is sufficient to throw the heavier motes well into the mote chamber, the lighter particles and a large percentage of dust and dirt float in the comparatively still air immediately above and behind the saws, and are sucked down into the lint which is being removed, due to the action of the air jet and the brush effect of the saw teeth loaded with lint, thus contaminating the lint and impairing its quality. This contamination of the lint has a detrimental effect on the value of the product, and constitutes a major problem to gin operators.

An object of the invention is to provide, in an overhead moting air blast gin, pneumatic means operative in a manner to insure removal of the entire mote content delivered from the saws and to prevent it from again contacting the lint on the saw teeth or being removed therefrom by action of the air jet.

Another object is to provide, in a cotton gin, pneumatic means operative in a positive manner upon motes, trash, dirt, etc. to remove same from the gin without the intervention or aid of mechanical means.

Other objects will be readily apparent to those skilled in the art. In considering the instant disclosure, it is to be understood that it constitutes a practical embodiment of the invention, and that within its claimed scope the invention may be practiced by any desired variations of the structural details specifically shown and described herein.

In the drawing, the figure is a vertical cross sectional view through the rear portion of a well known type of overhead moting air blast cotton gin, showing the invention applied thereto.

As shown, the construction comprises the rear portion 5 of a well known type of cotton gin provided with the usual roll box 6, ginning ribs 7, and saw 8. Behind the saw is located the mote chamber 9 into which motes are thrown from the blades of the rotary saw under the action of centrifugal force. The gin is an overhead moting air blast gin, and is equipped at its rear with a conventional air pressure chamber 10 from which the air blast duct 11 leads upwardly to the saw. The upper end of the duct is provided with a nozzle 12 which directs an air jet downwardly over and along the saw teeth to strip the lint therefrom and deliver it into the mouth of the air blast lint duct 13 which is connected with the usual lint flue (not shown). The structure thus far described is conventional, and its operation is well understood.

In gins not equipped with my invention, the mote chamber is unobstructed between its rear wall and the nozzle 12, so that motes may drop to the chamber bottom for removal by the usual screw conveyor provided in all such gins.

The present invention comprehends an attachment which may readily be applied to gins already constructed, or which may with equal facility be incorporated in a gin during its fabrication. It comprises an air chamber 14 fitted into the lower portion of the mote chamber 9 between the air blast nozzle 12 and the rear wall. Air is supplied to the chamber 14 under pressure through an air supply inlet 15 opening through one end of the gin casing at the chamber bottom. Preferably the inlet 15 is the opening for the mote discharge screw conveyor previously mentioned; the conveyor being removed and dispensed with in the practice of this invention. The chamber 14 extends horizontally from end to end of the gin casing, and is closed at its ends, top, sides and bottom except for the inlet 15 and an outlet hereinafter described. The front and rear walls 16 and 17, respectively, of the chamber extend upwardly from its rounded concave bottom 18 in divergent relation, and the top 19 is a convex arcuate plate which serves as a catch plate for motes as well as a bottom for a mote discharge duct 20 that extends through the rear of the gin casing as indicated at 21. The top 22 of the discharge duct extends forwardly within the mote chamber in parallel spaced relation above the plate 19 to approximately its middle, and has hinged to its front edge a rearwardly swinging door 23 provided with one or more transparent sight panels 24. The door normally occupies a vertical position as shown with substantially a one inch clearance between its upper edge and the top of the gin casing, and in addition to being a means for obtaining access to the saw and inspecting the moting chamber it constitutes a baffle against which motes thrown from the saw impinge and drop down onto the plate 19 at the mouth of the discharge duct 20.
Immediately above the nozzle 12 and behind the saw the air chamber 14 is provided throughout its length through the jet head 23 having a rounded top 26 and a bottom 27 convexed to conform to the bend of the nozzle which is substantially nested therein. The bottom of the jet head is spaced from the bend of the nozzle to provide a passage 29 therebetween which opens directly adjacent the saw below the jet head and above the point at which air issues from the nozzle 12; and the jet head is so disposed that a clearance space 29 of substantially one fourth inch exists between the front of the head and the periphery of the saw. Air from the chamber 14 is supplied to the hollow interior of the jet head through port means 30 in the plate 19, and issues therefrom through a longitudinal discharge orifice 32 directed rearwardly beneath a lip 31 formed along the entire length of the rear of the head. The lip 31 is spaced above the plate 19 and extends substantially one fourth inch from the head, cooperating with the plate to provide a nozzle aligned with the opening to the mote discharge duct 20, and leaving between the jet head and the door 23 a wide mouth 33 through which motes may pass into the discharge duct.

During operation of the gin, motes, trash, dirt, etc., carried past the ribs 7 are thrown from the saw into the mote chamber 9 where the heavier particles drop onto the catch plate 19 at the wide mouth 33 of the discharge duct and are immediately swept into and through the discharge duct by the propelling force of the air stream issuing from the jet 32 beneath the lip 31. The curvature of plate 19 and the disposition of the lip 31 are such that the jet 32 is directed squarely into the discharge duct 20, whereby the entire forward area of the catch plate is continuously swept clean by air issuing from the jet head.

The air jet issuing from the orifice 32 sets up an induced air current in the upper portion of the mote chamber which acts effectively to suck the lighter particles from the chamber into the mote discharge duct, and the shedding effect of the rounded top 26 of the jet head expedites passage of motes to the mouth 33.

Ordinarily there would exist in the clearance space 29 between the jet head and saw a downward air current induced by the air blast from nozzle 12 acting in conjunction with the pull of the rapidly rotating saw blades, which would, in the absence of preventive means, suck down the lighter motes, dirt, etc. from the upper portion of the mote chamber and immediately adjacent the saw, causing lint contamination as previously stated herein. The presence of the passage 29 between the bottom of the jet head and the bend of the nozzle enables air to be drawn from the interior of the gin casing in sufficient volume to dampen and nullify any such induced downward current, thus eliminating the possibility of matter thrown from the saw again coming into contact with the lint.

The action of the air jet issuing from the jet head 25 is such that the entire content of motes, trash, dirt, etc., is picked up as soon as it leaves the saw and is conveyed away from the lint on the saw teeth by the positive propulsion of a continuously flowing air stream, the velocity and volume of which may be controlled by regulation of the air supply through the inlet 15 to the chamber 14. The material discharged from the duct 20 at the rear of the gin is handled by any suitable disposal means, not shown, associated with the outlet 21.

I claim:

In an overhead moting air blast cotton gin having a saw, a mote chamber above and behind the saw, and a downwardly directed air blast nozzle adjacent the saw for removing lint therefrom, a mote discharge duct leading from the chamber, air jet means above the nozzle adjacent the saw and directed rearwardly from the saw into said discharge duct to convey motes thereinto, there being a clearance space between said jet means and the saw periphery, and air conduit means opening from a part of the gin interior not under pneumatic pressure into said clearance space immediately above the air blast nozzle to nullify down suction in the chamber behind the saw.

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