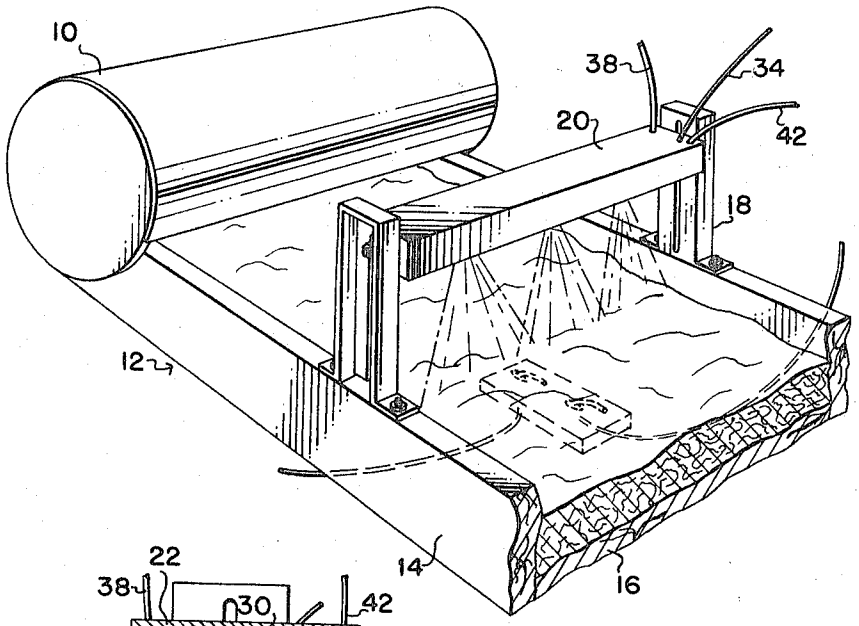
June 13, 1967 D. B. HURDT 3,324,513

PROCESS AND APPARATUS FOR MOISTENING COTTON FIBERS IN A GIN PLANT

Filed June 9, 1966 2 Sheets-Sheet 1

FIG. 1



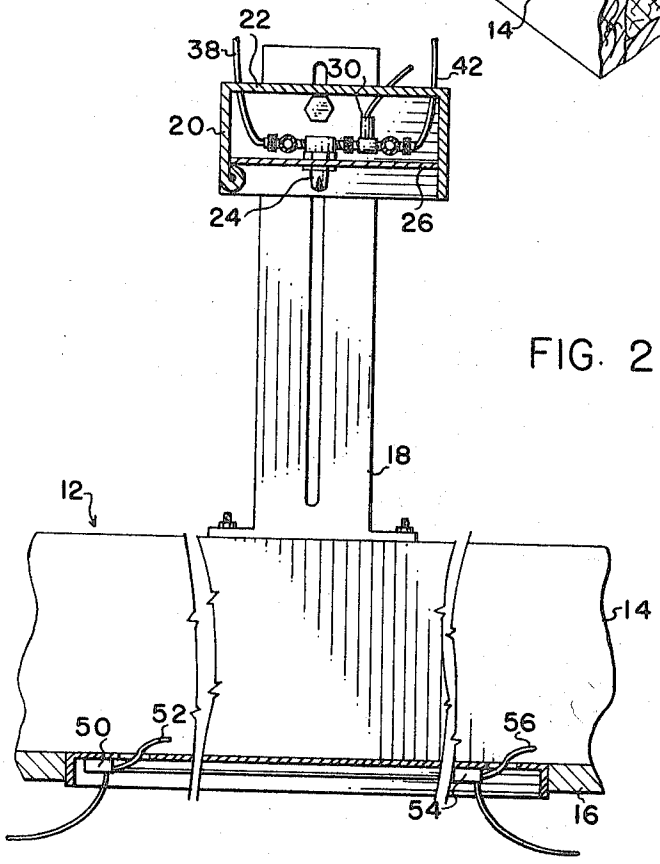


FIG. 2

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PROCESS AND APPARATUS FOR MOISTENING COTTON FIBERS IN A GIN PLANT

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FIG. 3

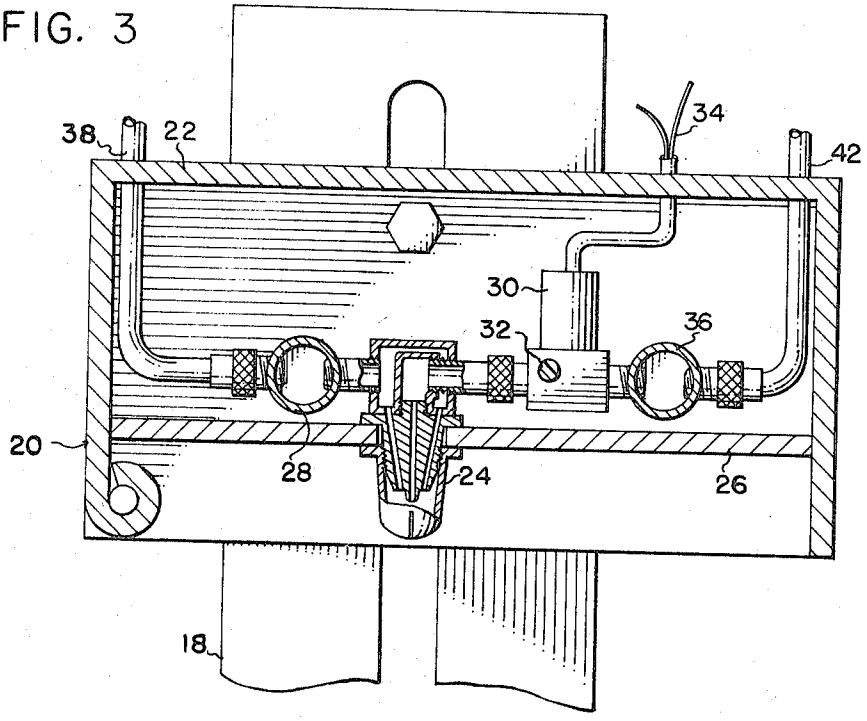
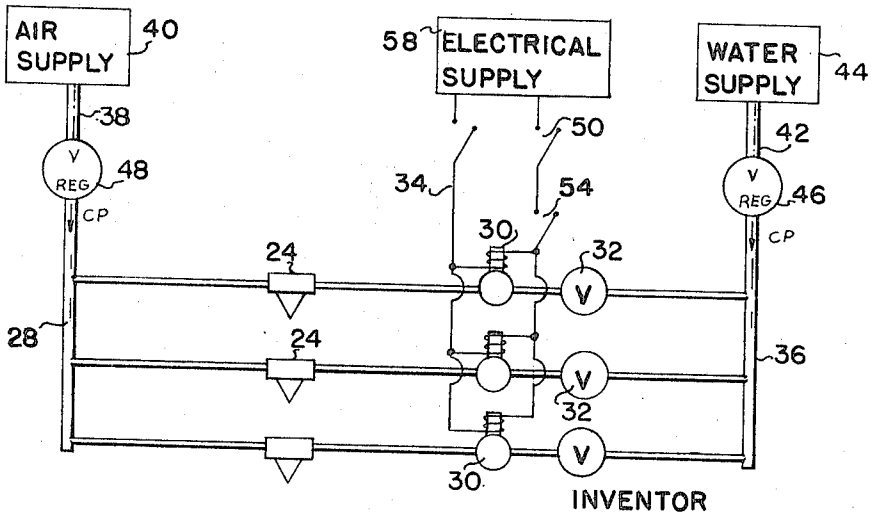


FIG. 4



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3,324,513

PROCESS AND APPARATUS FOR MOISTENING COTTON FIBERS IN A GIN PLANT

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Filed June 9, 1966, Ser. No. 556,500
1 Claim. (Cl. 19—66)

This invention relates to adding moisture to lint cotton at the cotton gin.

The desirability of adjusting moisture of the cotton fibers during the ginning process is well known to the art. It is also known that the quality of the fiber is improved if the moisture is increased after the completion of the processing and before packing the cotton into bales.

Previous apparatus for this purpose had tended to cause difficulty by adding too much water, or adding water at an uneven rate, or dampening the lint slide by applying water when there was not a cotton batt on the lint slide. Furthermore, previous systems have used a moistening agent in the water.

My invention applies the moisture by atomizing the water in a very fine mist by applying both water and air to a nozzle. Such nozzles are known. A solenoid is attached directly to the water supply of the nozzle. Therefore, when the solenoid is closed, the water is shut off but the air is continually supplied to the nozzle. Therefore, the water remaining in the nozzle at the beginning of the cutoff period is atomized by the continued air blast and does not drip. Also, two lint slide switches are used to ensure that there is cotton beneath the nozzles. Furthermore, the water rate may be closely regulated by adjusting the water and air pressures according to a chart.

An object of this invention is to moisten cotton in the advantageous manner outlined above.

Further objects are to achieve the above with a device that is sturdy, compact, durable, simple, safe, versatile, and reliable, yet inexpensive and easy to manufacture, install, operate, and maintain.

Still further objects are to achieve the above with a method that is inexpensive and does not require skilled people to install, adjust, operate, and maintain.

The specific nature of the invention, as well as other objects, uses, and advantages thereof, will clearly appear from the following description and from the accompanying drawing, the different views of which are not necessarily to the same scale, in which:

FIG. 1 is a perspective view of apparatus according to this invention as installed in a cotton gin.

FIG. 2 is a cross sectional view of the apparatus showing a portion of the lint slide.

FIG. 3 is a cross sectional view similar to FIG. 2 on an enlarged scale with the nozzle broken away to show details of construction.

FIG. 4 is a schematic representation of the controls.

Referring more particularly to the drawing, it may be seen represented there a portion of a cotton gin having conventional condenser **10** with lint slide **12** attached thereto to convey cotton from the condenser to the packer (not shown). As known to the art, the lint slide **12** is a wide trough having sides or lips **14** on each side of bottom plate **16**.

Legs **18** are bolted on either side of the lips **14**. Elongated box **20** is supported above the lint slide on top the legs **18**. The bottom **26** of the box is approximately eighteen inches above the lint slide (about fifteen inches above the batt). The box is generally rectangular-shaped in cross section and has a removable cover **22** for access. Three nozzles **24** extend through the bottom **26** of the box.

Air manifold **28** is within the box **20** and extends the length of the box. The air manifold is attached to each of the nozzles **24**. Each of the nozzles **24** has solenoid valve **30** attached thereto between water manifold **36** and the nozzle. Each solenoid valve **30** has an adjustable flow valve incorporated therein on the water side, said valve controlled by screw **32**. Each of the solenoid valves **30** is normally closed. When electrical voltage is supplied to the solenoid valves through conductors or wires **34**, the valves open.

The water manifold **36** in the box **20** extends the length of the box and is connected to each of the solenoids **30** and thus to each of the nozzles **24**. The system is fail safe, i.e., if there is a loss of electrical voltage, the water will be turned off by each of the solenoids **30**. Further, the system is drop-proof in that, by having the solenoid immediately adjacent the nozzle **24**, there is no large supply of water to be disposed of downstream of the solenoid. Furthermore, the air continues to blow after the water has been shut down by the solenoid valve, thus preventing water drippage.

Air line **38** connects the air manifold **28** to a source **40** of air under pressure, e.g., a compressor and storage tank. Water line **42** connects the water manifold **36** to a source **44** of water under pressure, such as a pump. Water regulator valve **46** in water line **42** is adjustable so that the operator may select the water pressure to be supplied to water manifold **36**. Likewise, air regulator valve **48** in the air line **38** provides a means whereby the operator may select the air pressure to be supplied to the air manifold **28**. By regulating the pressures by regulator valves **46** and **48**, precise regulation of the water supplied to the cotton is achieved. I have found best results with supplying the air at pressures varying within the range of 1.2 to 2.2 times the water pressure at the water manifold. Generally, the amount of water supplied is regulated by setting the water pressure to an even increment and adjusting the air pressure for the water rate desired. The following table is exemplary of a system according to my invention:

LIQUID CAPACITY IN GALLONS PER HOUR

10 p.s.i.		Water Pressure				40 p.s.i.	
		20 p.s.i.		30 p.s.i.			
Air Pressure in p.s.i.	G.P.H.	Air Pressure in p.s.i.	G.P.H.	Air Pressure in p.s.i.	G.P.H.	Air Pressure in p.s.i.	G.P.H.
12	21.0	22	34.5	34	27.2	46	40.1
14	16.2	26	24.9	38	29.4	50	32.7
16	12.6	30	18.0	42	23.4	54	26.1
18	9.9	32	15.3	46	17.7	56	23.4
20	8.1	34	12.9	48	15.0	60	19.2
22	6.0	36	10.8	50	12.9	65	13.8
		38	9.0	52	11.1	70	9.9

Upstream switch **50** is attached to the underside of the lint slide bottom plate **16** upstream from the box **20**. Actuator rod **52** extends through a hole in the bottom plate **16**. The switch **50** is normally open and is closed by the weight of the cotton batt upon the rod **52**. The rod **52** extends downstream so as not to impede the flow of the cotton batt thereover.

Downstream switch **54**, with its actuator rod **56**, is mounted to the bottom plate **16** in a similar manner as upstream switch **50**. Inasmuch as the downstream switch is below the box **20** on the lint slide **12**, it may be seen that, if both switches **50** and **54** are closed, there is a reasonable likelihood that there will be cotton batt beneath the nozzles **24** and, therefore, there will not be an undesirable water spray upon the lint slide.

The solenoids **30** are connected with their wires **34** in parallel so that each solenoid has the full voltage from electrical energy source **58** applied to them if both the switches **50** and **54** are closed, inasmuch as the source **58**, the switches **50** and **54**, and the solenoids **30** are connected in series by electrical conductor **34**.

It will be understood that various embellishments, such as additional valves, switches, etc., have not been shown for simplicity of this description.

It will be apparent that the embodiment shown is only exemplary and that various modifications can be made in operation, construction, materials, and arrangement within the scope of the invention as defined in the appended claim.

I claim as my invention:

A system for adding moisture to cotton at the cotton gin comprising:

(a) a lint slide from a condenser to a packer,
(b) an elongated box,
(c) legs from the lint slide to the box supporting the box transversely of the lint slide,
(d) a plurality of nozzles extending through the bottom of the box,
(e) an air manifold in the box extending the length of the box,
(f) said air manifold connected to each nozzle,
(g) each nozzle having a normally closed electrical solenoid valve in the box attached to the nozzle,

(h) a water manifold in the box extending the length of the box,
(j) said water manifold attached to each solenoid,
(k) at least two electrical switches,
  (i) one switch mounted beneath the lint slide upstream the box, and
  (ii) the other switch mounted beneath the lint slide downstream the box,
  (iii) each switch having a rod extending therefrom to above the lint slide so that, when there is cotton on the rod, the switch is closed and, when there is no cotton on the rod, the switch is open,
(m) a source of electrical energy,
(n) an electrical conductor connecting the solenoids in parallel and connecting the two switches and source of electrical energy in series with the solenoids so that, when either switch is open, the solenoid valves are closed and, when both switches are closed, the solenoid valves are open,
(o) an air line attached to the air manifold,
(p) a pressure regulator valve in the air line for maintaining an adjusted air pressure on the air manifold,
(q) a water line attached to the water manifold,
(r) a pressure regulator valve in the water line for maintaining an adjusted water pressure on the water manifold,
(s) a source of air under pressure attached to the air line, and
(t) a source of water under pressure attached to the water line.

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