

Aug. 4, 1942.

J. P. LAWRENCE

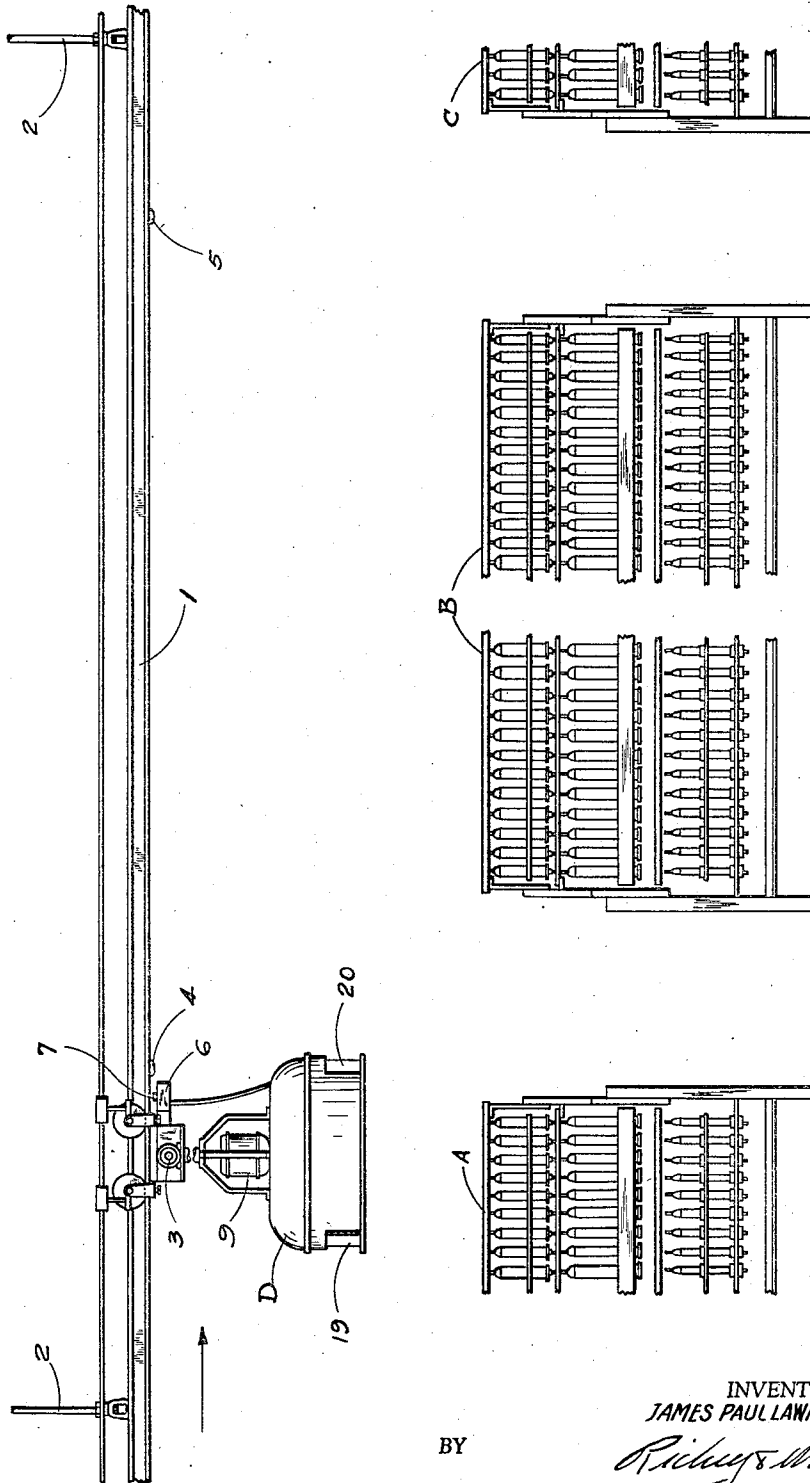
2,291,598

TEXTILE MACHINE CLEANER

Filed May 18, 1940

2 Sheets-Sheet 1

Fig. 1
D



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Fig. 2

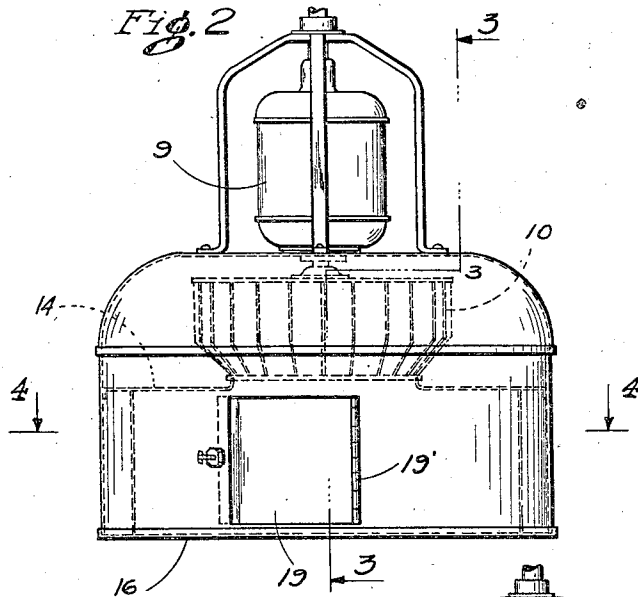


Fig. 3

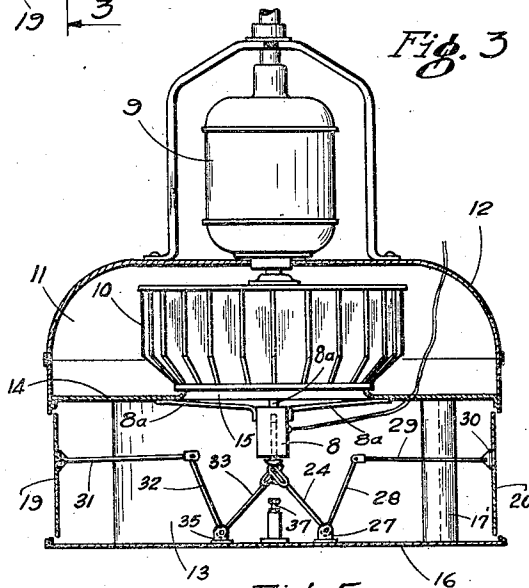


Fig. 4

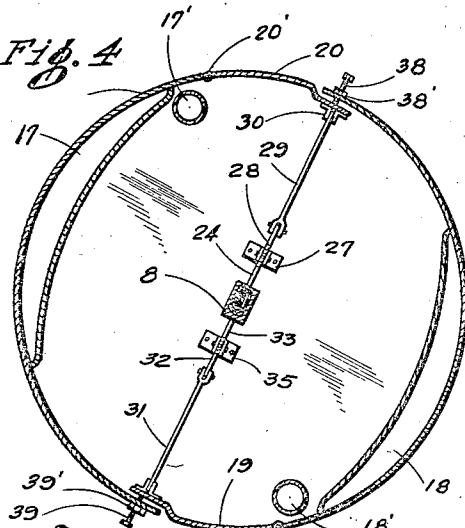
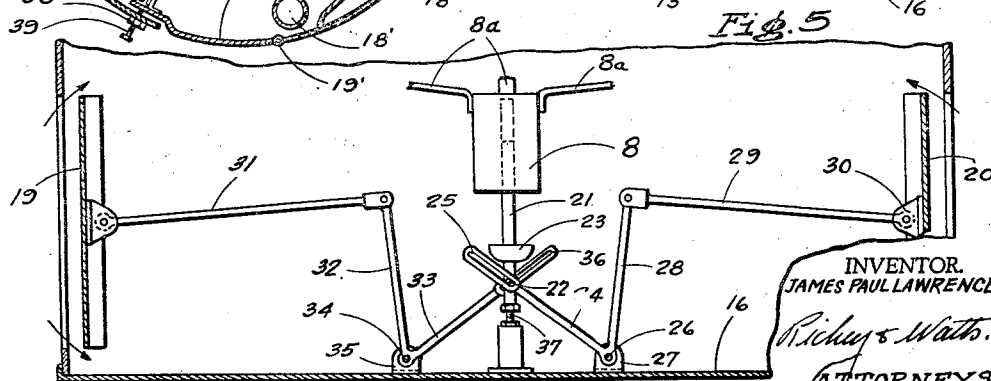


Fig. 5



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UNITED STATES PATENT OFFICE

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TEXTILE MACHINE CLEANER

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7 Claims. (Cl. 15—20)

This invention relates to apparatus for cleaning textile machinery or the like and more particularly to an improved blower system for removing lint, dust and fly from textile machines.

In the Lawrence and Szekely United States Patent No. 2,175,608 of October 10, 1939, a blower and track system is described whereby a draft creating blower is caused to travel over rows of textile machines and discharge an air blast downwardly upon the machines in such a manner that they are kept free from harmful accumulations of dust, lint, etc.

Textile machines, such as spinning frames, are commonly arranged in long rows over which the blower track extends and at times one or more textile machine may be temporarily shut down to suit the production schedule of the mill or for setting up the machine, or for other reasons. With the type of apparatus shown in the above noted Lawrence et al. patent the blower fan operates continuously and the downward draft is discharged against idle as well as operating machines. The repeated strong blasts of air blowing against the stationary roving on an idle machine may cause injury or tangling thereof and also may disturb the roving on the roving bobbins lying on the creel board. The blasts of air are also objectionable to workmen who may be working on the machine. It is among the objects of my present invention to provide means for reducing the discharge of air from the traveling blower unit as it passes over an idle spinning frame or the like to such a value that it will not be objectionable in any way but will still be of sufficient force to prevent undesirable accumulation of dust and lint on the machine while it is out of operation.

Other objects of my invention include: the provision of means for throttling the quantity of air handled by a textile cleaning blower while the blower is passing over an idle machine; the provision of adjustable means for regulating the degree of reduction in the air blast from a traveling blower as it passes over an idle machine; the provision of means for reducing the output of a traveling blower type cleaner as it approaches an idle machine and returning the output of the blower to normal as it leaves the idle machine; and the provision of simple and effective control means for effecting a reduction in the output of a traveling textile cleaner during certain portions of its travel.

The above and other objects of my invention will appear from the following description of one

embodiment thereof, reference being had to the accompanying drawings, in which—

Figure 1 is a more or less diagrammatic elevational view showing a part of a row of spinning frames and a track thereabove for a traveling cleaner, together with my control apparatus for reducing the air output of the cleaner to a predetermined low value when the blower passes over an idle frame.

Figure 2 is an end elevation of the blower housing incorporating my improved output control mechanism.

Figure 3 is a vertical cross-sectional view taken generally on line 3—3 of Figure 2 and illustrating my air inlet door operating mechanism.

Figure 4 is a horizontal cross-sectional view on line 4—4 of Figure 2.

Figure 5 is an enlarged fragmentary vertical cross-sectional view of the operating linkage for the air inlet control doors and the solenoid for operating the same.

In Figure 1 portions of three spinning frames are shown at A, B and C. It will be understood that any number of frames may be arranged in a row and that the track 1 is suitably supported above the row of frames by hangers 2 depending from the ceiling of the room. The spinning frames A and C may be considered to be operating while the spinning frame B may be considered to be shut down. The traveling blower is generally indicated at D and in the embodiment shown it is driven along the track by suitable driving connections from the driving motor 3. As will appear more fully later, as the blower D travels along the track 1 in the direction of the arrow in Figure 1 it normally discharges a relatively strong draft of air downwardly upon the spinning machines to remove and prevent the accumulation of lint, fly, etc.

My invention contemplates the provision of means for reducing the discharge output of the blower D as it passes over an idle frame and then causing the blower to resume its normal output as it leaves the idle frame. This is accomplished by means of switch operating dogs 4 and 5 which are detachably secured to the track 1 and adapted to be easily installed and removed whenever and wherever it is desired to cut down the draft discharged on a particular machine. Any suitable means (not shown) may be employed for removably securing the dogs 4 and 5 to any suitable part of the track structure. The draft control switch 6 is supported on the carriage of the blower D and is provided with an operating button 7 disposed in alignment with the switch op-

erating dogs 4 and 5. This switch may be of any suitable and well known type whereby, when the button 7 is caused to be depressed by engagement with the dog 4, connections will be established to energize the solenoid 8, and when the button is again depressed by the dog 5 the solenoid 8 will be de-energized.

It will be understood that the switch 6 and dogs 4 and 5 are diagrammatically illustrated in Figure 1 and that any suitable switch apparatus and arrangement of adjustable stops or dogs on the supporting structure for the traveling blower could be employed to operate my draft control means. When several machines are idle dogs 4 and 5 will, of course, be positioned adjacent each idle machine.

Referring particularly to Figures 2 to 5, the blower D includes a motor 9 connected to drive a blower type fan shown at 10. This fan is disposed in the upper chamber 11 of the blower housing 12 which chamber is separated from the bottom or inlet portion 13 of the housing 12 by a baffle wall 14 provided with a central opening 15 which directs air into the axial inlet of the blower 10. The bottom of the inlet chamber 13 is closed by a plate 16 through which the draft discharge outlets 17, 17', 18 and 18' extend. The apparatus just described is substantially similar to that shown in the above noted Lawrence et al patent and the air outlet passages 17, 17', 18 and 18' extend upwardly from the plate 16 through the chamber 13 into the chamber 11. Thus, it will be seen that, when the motor 9 drives the fan, air will be drawn in through the axial inlet 15 and discharged radially outwardly and caused to be directed downwardly upon the spinning frames through the outlet openings 17, 17', 18 and 18'. Inlet air is admitted into the chamber 13 through a pair of gates or doors 19 and 20, which, as is seen in Figure 1, are disposed on the advance and trailing portions of the housing 12. The door 19 is hinged at 19' and the door 20 similarly hinged at 20'.

The solenoid 8 may be supported from the stationary baffle wall 14 by arms 8^a and includes a plunger 21, which carries a pin 22 at its lower end, and may be provided with a stop member 23 to limit its maximum movement into the solenoid 8. One arm 24 of a bell crank lever has a slotted connection at 25 with the pin 22. The lever is pivotally mounted at 26 on a bracket 27 carried by the bottom plate 16 and the other arm 28 of this lever is pivotally secured at its upper end to the operating rod 29. On the inner surface of the door 20 is a bracket 30 to which the other end of rod 29 is pivotally attached. When the plunger 21 moves downwardly the above described linkage will open the door 20 and when the plunger is moved upwardly upon energization of the solenoid 8, the door 20 will be moved in closing direction.

In similar manner, the door 19 is operated simultaneously with the door 20 through an operating rod 31 and a bell crank having arms 32 and 33 and being pivotally mounted at 34 on a bracket 35. The end of the arm 33 is slotted at 36 to engage the pin 22 on the plunger 21. Thus, movement of the plunger 21 will operate the doors 19 and 20.

The open position of the doors 19 and 20 shown in Figure 5, may be considered to be the normal or operating position which is maintained whenever the blower D is passing over operating frames. This open position is determined by the adjustable abutment screw 37, carried by the bottom

plate 16, and adapted to engage and adjustably limit the downward or opening movement of the plunger 21.

When, however, the control switch 6 engages and is operated by a dog 4 to energize the solenoid 8 the plunger 21 will be lifted into the position shown in Figure 3 and the doors 19 and 20 will be moved into their air inlet restricting positions, as seen in Figures 3 and 4. When in this position the entry of air into the chamber 13 is not entirely prevented as it will be seen that the doors are not tightly closed, being prevented from complete closure by adjustable stop screws 38 and 39. These screws extend through the vertical cylindrical wall of the housing 12 and are provided with lock nuts 38' and 39' whereby they may be held in any desired position of adjustment. The inner ends of screws 38 and 39 act as stops against which the edges of the doors 19 and 20 strike, thus limiting their closing movement. By varying the adjustment of the screws 38 and 39 the flow of air into the chamber 13 and into the blower 10 is regulated to give the desired reduced discharge of air when the blower passes over an idle machine.

When the solenoid 8 is de-energized upon engagement of the switch operating device 7 with a de-energizing dog 5 the pressure differential between the chamber 13 and the atmosphere will be effective upon the doors 19 and 20 to move them immediately into open position and move the plunger 21 into its lower position in engagement with stop 37.

In my apparatus the motor 9 and blower 10 operate continuously and by simply throttling the inflow of air into the chamber 13 I am able accurately to control the output of air through the discharge openings 17, 17', 18 and 18'. Thus, a full stream of air is maintained over the active machine A up to the moment when the solenoid 8 is energized upon engagement of the switch button 7 with the dog 4. Immediately upon such engagement the solenoid 8 lifts the plunger 21 moving the doors 19 and 20 into the restricting positions shown in Figures 3 and 4 wherein the inlet air to the blower 10 is so restricted that the discharge from the blower will be only sufficient to prevent the accumulation of dust, etc., on the idle spinning frame B. If the discharge of air from the blower D were completely stopped while passing over an idle frame the idle machine would accumulate undesirable quantities of dust, etc., which might cause trouble when the normal draft was resumed and the machine was again put in operation. By maintaining a restricted discharge over the idle machines, I am able to prevent damage to the roving and uncomfortable operating conditions for men working on the machine and still keep all of the machines in the mill in clean condition at all times.

Although I have illustrated a solenoid and means for energizing and de-energizing same to actuate the control doors or dampers for the blower inlet it will be understood by those skilled in the art that other means might be employed for opening and closing these doors. For example, a motor or mechanically operated linkage could be used. I do not, therefore, wish to be limited to the specific form of my invention herein illustrated and described, but claim all embodiments thereof coming within the scope of the appended claims.

I claim:

1. In apparatus for cleaning textile machines or the like, a track extending over a row of ma-

chines, a blower unit supported by said track, means for moving said blower unit along said track over said machines, means included in said blower unit for discharging air upon said machines as the blower moves thereover, means for reducing but not completely stopping said discharge of air and means for actuating said last named means when said unit reaches a predetermined place on said track.

2. In apparatus for cleaning textile machines and the like, a track extending over a row of machines, a device supported for movement along said track and including a blower for discharging air upon machines therebelow, means for decreasing the normal amount of air discharged by said blower without substantially stopping the discharge of air from said blower when the blower reaches a predetermined place on said track and means for increasing to normal the amount of air discharged by said blower when said blower reaches another predetermined place on said track.

3. In traveling cleaning apparatus of the type described, a track, a housing movable along said track, a fan in said housing, said housing having an outlet opening for air discharged from said fan and an inlet opening for air entering said fan, means for restricting said inlet opening, means operatively associated with said inlet restricting means for varying the amount of restriction of said inlet opening, and means for actuating said restriction varying means when said housing passes predetermined places on said track.

4. In traveling cleaning apparatus, a track structure, a housing movable along said track structure, a fan in said housing, means for driving said fan, said housing having an outlet opening for air discharged from said fan and an inlet opening for air entering said fan, a movable door for one of said openings, a dog member carried by said track structure, means for moving said door in closing direction, means actuated by engagement with said dog member for operating said door closing means, and means for limiting closing movement of said door whereby said one of said openings will not be completely closed.

5. In machine cleaning apparatus of the type described, a supporting structure, a housing movable along said supporting structure, a fan in said housing, means for driving said fan, said housing having an inlet opening for air entering said fan and an outlet opening for air discharged from said fan, closure means for said inlet opening, means for moving said closure means in inlet closing direction, and means on said supporting structure whereby said closure moving means will be automatically actuated at a predetermined point in the travel of said housing.

6. In machine cleaning apparatus of the type described, a supporting structure, a housing movable along said supporting structure, a fan in said housing, means for driving said fan, said housing having an inlet opening for air entering said fan and an outlet opening for air discharged from said fan, closure means for said inlet opening, means for moving said closure means in inlet closing direction, means on said supporting structure whereby said closure moving means will be automatically actuated at a predetermined point in the travel of said housing, and means for limiting the degree of closing of said closure member to prevent complete closing of said inlet opening.

7. In machine cleaning apparatus of the type described, a supporting structure, a housing movable along said supporting structure, a fan in said housing, means for driving said fan, said housing having an inlet opening for air entering said fan and an outlet for air discharged from said fan, closure means for said inlet opening, electrically operated means for moving said closure means, switch means for controlling said electrically operated means, spaced dogs removably secured to said supporting structure in the path of said switch means whereby said closure means will be disposed in inlet restricting position during a portion of the travel of said housing and in open position during another portion of the travel of said housing.

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