Dec. 26, 1939. W. B. HODGE 2,184,880

TRAVELING CLEANER

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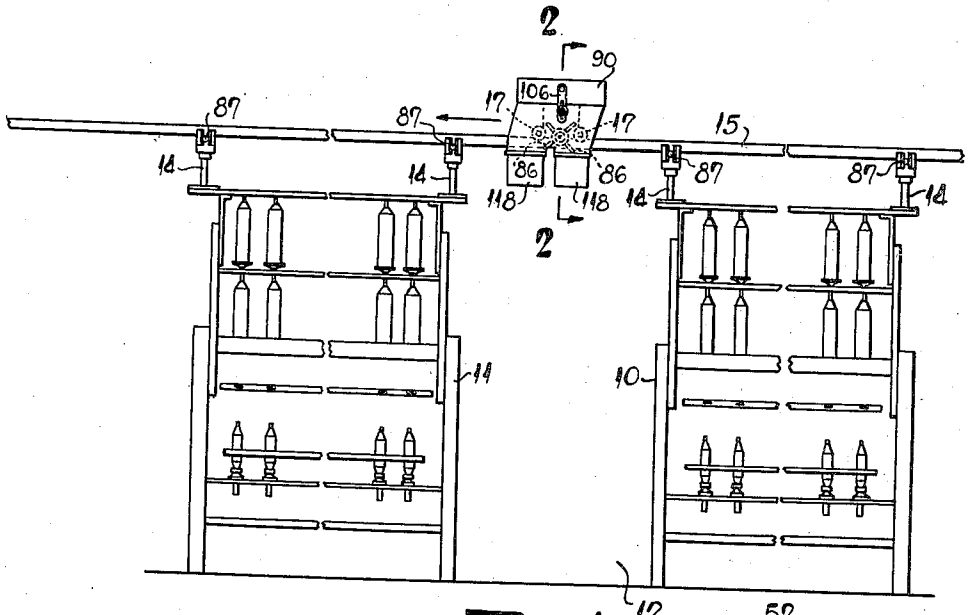


Fig. 1

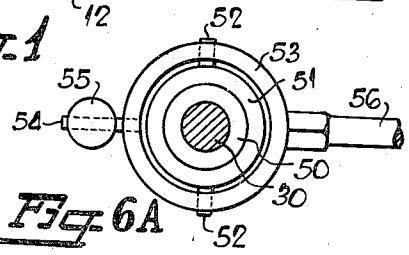


Fig. 6A

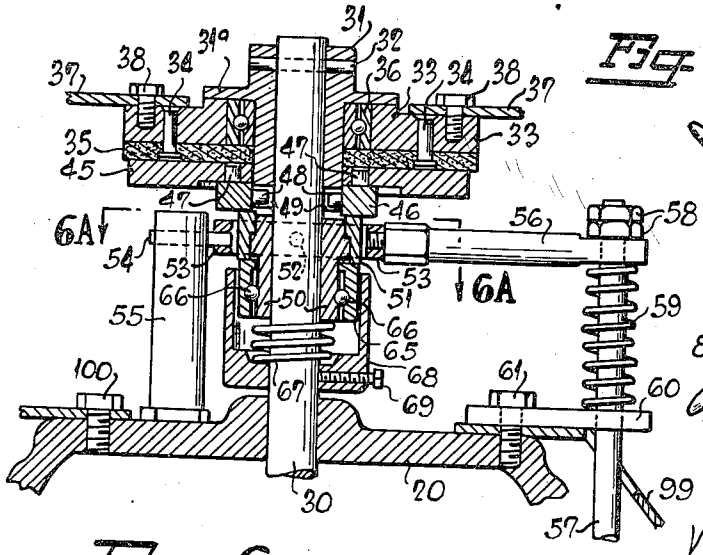


Fig. 6

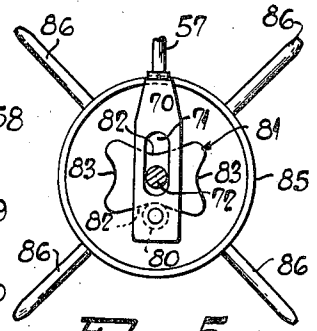


Fig. 5

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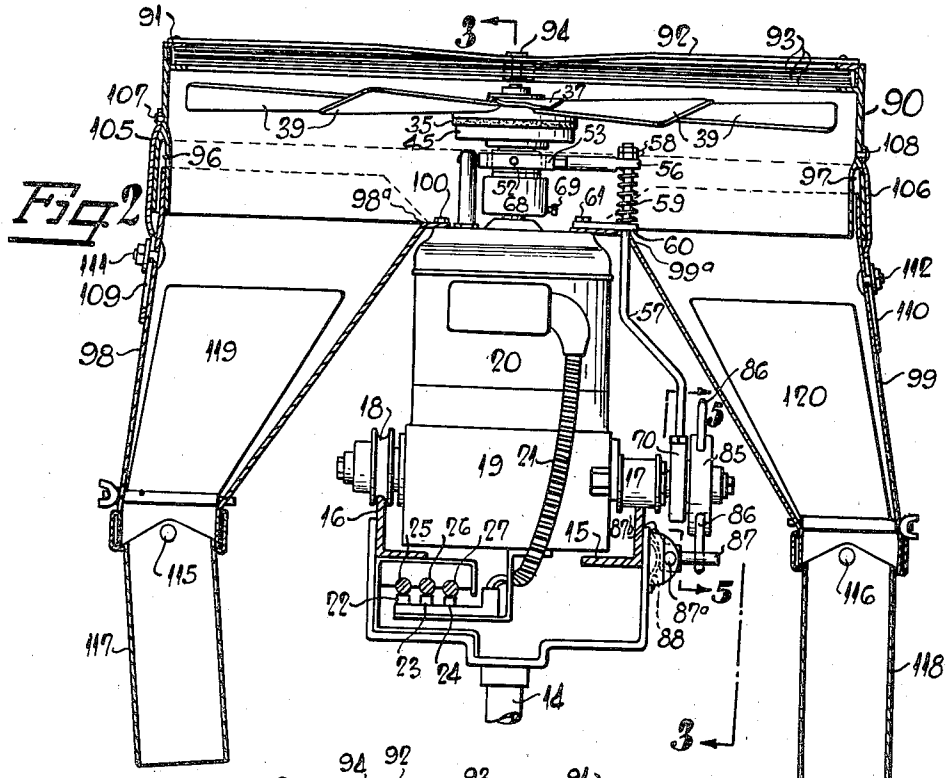


Fig. 2

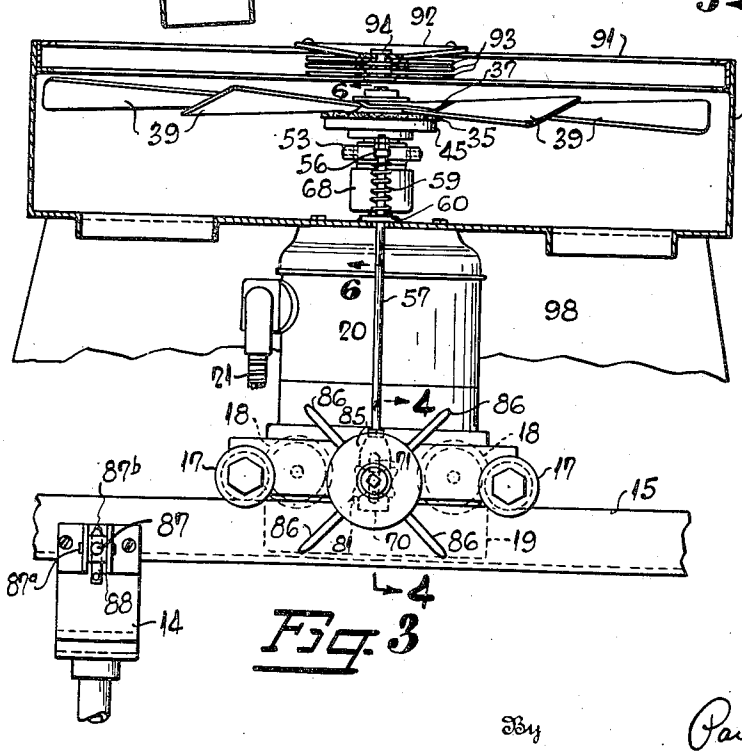


Fig. 3

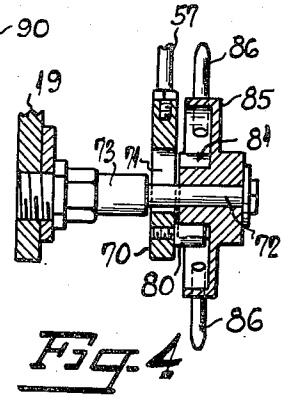


Fig. 4

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TRAVELING CLEANER

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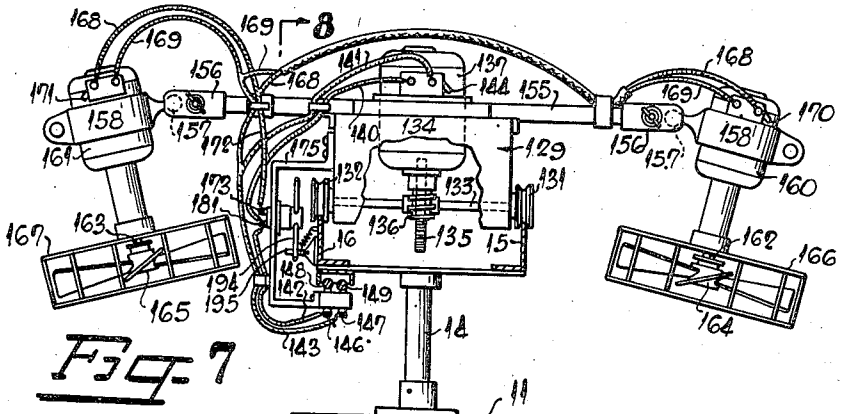


Fig. 7

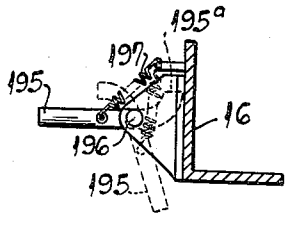


Fig. 9

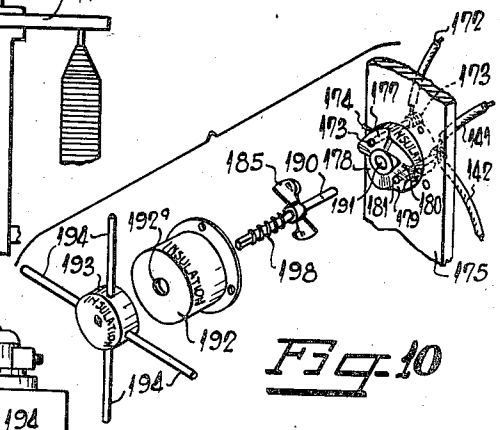


Fig. 10

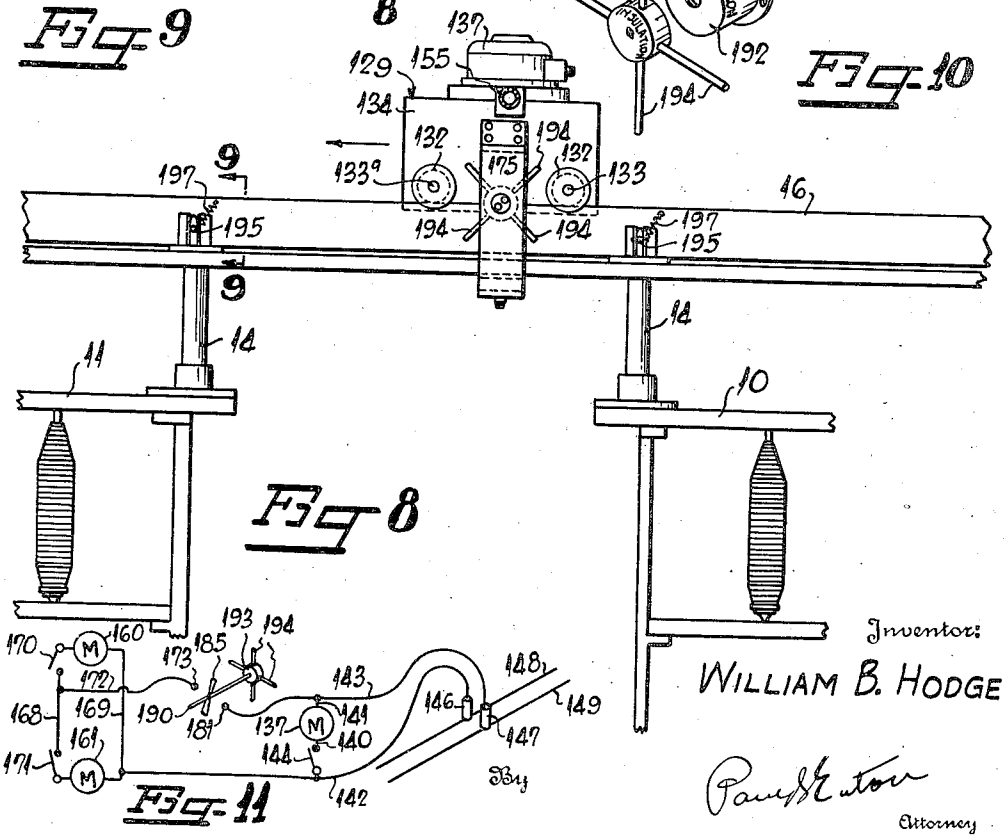


Fig. 8

Fig. 11

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2,184,880

UNITED STATES PATENT OFFICE

2,184,880

TRAVELING CLEANER

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Application May 23, 1938, Serial No. 209,546

11 Claims. (Cl. 15—20)

This invention relates to a cleaning apparatus for textile machinery, and more particularly to a cleaner mounted upon a trackway and adapted to travel successively over a plurality of rows of textile machinery. In my prior patent, No. 2,011,763 of August 20, 1935, a traveling cleaner is disclosed in which downwardly directed blasts of air are projected onto the upper portion of textile machines to clean and to remove lint and other foreign substances therefrom. It quite frequently happens that it is desired to eliminate this blast over one or more machines, especially when doffing takes place, or in case it is desired to work upon any particular machine. The reason for eliminating these blasts of air, over a particular machine while doffing is being effected, is quite obvious, since the yarn is not being processed at this time, and consequently no lint will be falling therefrom. Also the blasts of air are objectionable at this time, because it will interfere with the operation of doffing.

It is, therefore an object of this invention to provide a trackway mounted above a plurality of spaced textile machines over which blast producing means are adapted to travel for delivering blasts of air onto the machines, and means for automatically rendering the blast producing means inoperative while the fan passes over one or more of the machines, and means for automatically rendering the blast producing means operative after it has passed over a particular machine or machines.

It is another object of this invention to provide a fan mounted so as to successively traverse a plurality of spaced textile machines, and a motor for driving the fan, with a clutch between the motor and the fan and means for automatically disengaging the clutch as it passes over the machine and means for engaging the clutch after the fan has passed over a particular machine.

It is a further object of this invention to provide a cleaning apparatus of the class described comprising a pair of fans for directing blasts of air down onto spaced textile machines, with a motor for driving each fan, a third motor for driving a carriage and said fans over successive rows of spaced textile machines as shown in my co-pending application, Serial No. 59,614, filed January 17, 1936, of which this application is a continuation in part. In this present application means are provided for breaking the circuit to the fan motors while the carriage is traveling over a particular textile machine and other means for automatically cutting on the fan motors after the carriage has traveled over the particular machines.

Some of the objects of the invention having been stated, other objects will appear as the description proceeds when taken in connection with the accompanying drawings in which—

Figure 1 is an elevation of a plurality of textile machines, showing my invention applied thereto;

Figure 2 is a vertical sectional view taken along the line 2—2 in Figure 1;

Figure 3 is a vertical sectional view taken along the line 3—3 in Figure 2;

Figure 4 is a sectional detail view taken along the line 4—4 in Figure 3;

Figure 5 is a sectional view taken along the line 5—5 in Figure 2;

Figure 6 is an enlarged vertical sectional detail view taken along the line 6—6 in Figure 3;

Figure 6*a* is a sectional plan view taken along line 6*a*—6*a* in Figure 6;

Figure 7 is a sectional view through a trackway disposed above a textile machine and showing a slightly different form of the invention;

Figure 8 is a vertical sectional view taken along the line 8—8 in Figure 7;

Figure 9 is a sectional view taken along the line 9—9 in Figure 8;

Figure 10 is an exploded isometric view of the switch employed for controlling the current to the fan motors;

Figure 11 is a schematic electrical wiring diagram of the invention.

Referring more particularly to the drawings, the numerals 10 and 11 denote suitable textile machines such as spinning frames, spoolers, drawing frames, and the like, which are spaced apart from each other leaving a passageway 12 therebetween. These textile machines have mounted on the upper side thereof, suitable stands 14, the upper end of which support tracks 15 and 16. Mounted upon these tracks are wheels 17 and 18, respectively, of a wheeled traveler 19. The traveler 19 has a motor 20 carried thereby, which motor receives its electrical energy through cable 21, said cable communicating with contacts 22, 23 and 24. These contacts are adapted to slide along wires 25, 26 and 27, respectively, as the traveler moves longitudinally of the trackway.

The motor 20 has a motor shaft 30 extending upwardly therefrom, and the upper end of this shaft has secured therearound, a collar 31 by means of pin 32, said collar having a flange 31*a*. Disposed below this flanged collar is a clutch

shoe 33, which has secured to the lower side thereof by means of rivets 34, a clutch lining 35. A roller bearing 36 is disposed between the shoe 33 and the collar 31 so that when the lower face of clutch lining 35 is not contacted, the clutch shoe 33 and its associated parts can have free rotative movement around the collar 31. The upper side of the clutch shoe 33 has suitable plates 37 secured thereto by means of stud bolts 38, and secured to these plates are fan blades 39, which blades extend radially of the shaft 30.

The lower face of the clutch lining 35 is contacted by a clutch disk 45 which is also mounted around the lower portion of collar 31. This disk has secured to the lower side thereof, a small collar 46 by means of upwardly projecting pins 47, said collar 46 also being secured to the lower portion of flanged collar 31 by means of pins 48 which extend into slots 49 disposed in the lower edge of collar 31. The pins 48 prevent relative rotation between the collar 31 and members 45 and 46, but relative vertical movement can take place on account of the slots 49.

An inner race 50 is mounted around the shaft 30 directly below the collars 31 and 46. Disposed around the upper portion of race 50 and supporting collar 46 is a ring 51 which has extending from opposed sides thereof pins 52, said pins being rotatably mounted in opposed sides of an outer ring 53. Disposed at right angles to the pins 52 and projecting from the outer ring 53, is a pin 54. This pin has one end loosely mounted in the ring 53 and has its other end secured in the upper portion of post 55, said post extending downwardly and being supported by the motor 20. Directly in line with the pin 54 and secured in the opposite side of the ring 53 is an arm 56, the outer end of which has the upper end of a vertically disposed rod 57 slidably mounted therein. Suitable nuts 58 are secured upon the upper portion of the rod 57 whereas a compression spring 59 is disposed around rod 57 and on the lower side of the lever 56 to normally press the end of the arm 56 upwardly against the nuts 58. The lower end of spring 59 is confined around the rod 57 by means of plate 60, which plate is secured to the upper portion of the motor 20 by means of a bolt 61.

The rod 57 is adapted to be moved up and down to engage and disengage the brake lining 35 from the face of disk 45. When the rod 57 is moved downwardly then the arm 56 and its associated ring 53 will be rotated in a clockwise manner about the pin 54 (Figure 6). This movement will release the upward pressure of the ring 53 against the collar 46, which, in turn, will relieve frictional pressure between the upper side of disk 45 and brake lining 35 because the upper side of shoe 33 will no longer be pressed against the lower side of flange 31*a*. When the pressure between the faces of disk 45 and brake lining 35 is released, then the shaft 30 and the associated collar 31 will rotate, but the fan blades 39 and associated hub 33 will remain stationary around the shaft because rotation to these members is imparted by virtue of the friction between members 35 and 45.

The lower portion of the race 50 has an outer race 65 mounted therearound and suitable balls 66 are disposed therebetween. A compression spring 67 is disposed directly below the race 50 and has its lower end normally confined around the shaft 30 by means of a cup shaped member 68 which member is secured to the shaft 30 by means of set screw 69. The spring 67 normally presses the members 65, 50, 51, 46 and 45 upwardly against the brake lining 35. Upon the downward movement of arm 56 and the downward movement of rod 57 this spring is compressed to relieve this upward pressure. It is, therefore, seen that it is necessary for the members 35 and 45 to be engaged when the traveler is traveling over machines which are in operation but disengaged when traveling over a machine whenever a doffing operation is being effected.

The lower end of the rod 57 has a block 70 secured thereto which block has a slot 71 therein surrounding the restricted portion 72 of a bolt 73. The bolt 73 is threadably secured in the side of the traveler 19. The lower end of block 70 has a stud 80 extending therefrom which normally contacts cam 81. This cam has depressions 82 and 83, the depressions 82 being disposed nearer the center of shaft 72 than the depressions 83. With the stud 80 in a depression 82 as shown in Figure 5, the upper portion of the rod 57 will be allowed to move upwardly far enough to cause the members 45 and 35 to frictionally engage each other, in which event the rotation of shaft 30 will impart rotation to the fan blades. On the other hand when the cam 81 has been rotated through an angle of 90 degrees from the position shown in Figure 5, the stud 80 will be disposed in depression 83, at which time the rod 57 will be moved downwardly to impart vertical movement to members 56 and 53, and thereby relieve the pressure between the members 35 and 45 (Figure 6).

The cam 81 is an integral part of hub 85 and this hub has radially disposed prongs 86 extending therefrom. Suitable laterally projecting bolts are disposed in the path of the lowermost of these prongs, and when one of these members contacts a bolt 87, a quarter revolution is imparted to the hub 85 and its associated cam 81 to thereby engage or disengage the members 35 and 45.

The bolts 87 are preferably disposed at each end of the textile machines 10 and 11, and adjacent the aisles 12. Each of the bolts is pivoted as at 87*a* to the upper portion of stand 14. Disposed beneath the bolt 87 is a suitable leaf spring 88 which normally holds the bolt in a laterally extending position. The base of the bolt 87 has a toe portion 87*b* for limiting the counter-clockwise movement (Figures 2 and 3). When it is desired to rotate the bolt 87 out of the path of the prongs 86 so that the clutch arrangement will not be operated, it is only necessary to pull the free end of bolt 87 downwardly for a quarter revolution to a point where this bolt will be in a plane parallel to the motor shaft 30.

In Figure 1 the fan is shown disposed over the aisle 12 at which time the stud 80 in Figure 5 is disposed in a cavity 82 which will allow the members 35 and 45 to be engaged and cause the fan to be in operation. As the fan moves to the left, if machine 11 is being doffed, a laterally extending bolt 87 will be set in horizontal position to be in the path of a prong 86, and impart a quarter revolution to the cam 81. This, of course, will disengage the clutch and cause the fan to cease operation but at the same time the motor 20 will propel the traveler 19 over the textile machine 11. After the carriage has reached the other end of the textile machine, another bolt 87 will be set in horizontal position to engage one of the downstanding prongs 86

and impart another quarter revolution which will place the stud 80 in another depression 82, at which time the clutch members 35 and 45 will again become engaged and the fan will resume its operation.

The fan is encased by a suitable casing 90 which has removably secured in the upper portion thereof, a ring 91. The upper end of the ring 91 has a diametrically disposed member 92 mounted thereon the center of which supports a plurality of adjustable vanes 93 as at 94. These vanes are rotated to different positions in order to vary the size of the opening in the upper side of the casing 90.

The lower side of casing 90 has bifurcated skirts 96 and 97 for the accommodation of the upper edges of spouts 98 and 99, respectively, said spouts being secured as at 100 and 61, respectively, to the upper side of motor 20 (Figure 2). Suitable straps 105 and 106 are secured to opposed sides of the casing 90 by means of rivets 107 and 108 and these straps have suitable slots 109 and 110 therein which are penetrated by bolts 111 and 112, respectively. These bolts also penetrate spouts 98 and 99 and hold them in adjusted position relative to straps 105 and 106. For example, if it is desired to vary the position of the lower ends of the spouts 98 and 99, so as to direct blasts of air in a different direction, then nuts 111 and 112 may be loosened and rotation imparted to the respective spouts. Although these spouts are not provided they are made of material sufficiently flexible to allow bending without damaging the material. The bending or pivoting takes place at points 98*a* and 99*a*. The lower end of spouts 98 and 99 have pivoted thereto, as at 115 and 116, nozzles 117 and 118, respectively. Also disposed in the spouts 98 and 99 are vanes 119 and 120 which are rotated to proportion the amount of air which is delivered by the lower pivoted nozzles 117 and 118.

Figures 7 to 11, inclusive, show another form of the invention which is in many respects similar to the form of the form shown in Figure 6 of my co-pending application, Serial No. 59,614, filed January 17, 1936. In this form of the invention, the trackways 15 and 16 have mounted thereon a traveler 129 provided with wheels 130 and 131, respectively, said wheels, being mounted upon the ends of transverse shafts 133 and 133*a*. This shaft is rotatably mounted in housing 134 and has a gear 135 fixedly secured to the intermediate portion. The gear 135 meshes with a worm 136 which worm is driven by motor 137, said motor being supported by the carriage 134. As the motor 137 is operated, it is evident that rotation will be imparted to the wheels 131 and 132 through the members 136 and 135 and 133.

The motor, 137 has wires 140 and 141 leading from opposed sides thereof, said wires being also connected to wires 142 and 143 respectively. Wire 140 has a hand switch 144 disposed therein which may be operated manually to cut off the motor 137. The wires 142 and 143 are connected to terminals 146 and 147, which terminals contact trolley wires 148 and 149, respectively, which are disposed below the trackway. It is seen that the motor 137 which drives the housing 134 will rotate at all times and is controlled by switch 144.

Mounted upon the housing 134 is a support 155, the ends of which project to an overhanging position relative to the tracks 15 and 16. Each end of the member 155 has a socket 156 secured thereto in which balls 157 or bracket 158 are adapted to fit. Mounted in the brackets 158 are motors 160 and 161, said motors having shafts 162 and 163 with fans 164 and 165, respectively, mounted thereon. These fans have guards 166 and 167, respectively surrounding the same. The motors 160 and 161 are hooked up in parallel by wires 168 and 169, the wire 168 having switches 170 and 171 for controlling the current to motors 160 and 161, respectively. Leading from the wire 168 is another wire 172, the other end of which is secured to terminal 173. This terminal is mounted in insulation block 174, which block is supported by bracket 175, said bracket extending outwardly from the housing 134.

By observing Figure 10, it is seen that the block 174 has notches 177, 178, 179 and 180 cut in the face thereof. The notch 180 has extending thereinto another terminal 181 which is identical to the terminal 173. Leading from this terminal are wires 141 and 142 which have been previously described. By observing the wiring diagram in Figure 11, it is seen that when the terminals 173 and 181 are connected that current will flow to the motors 160 and 161, that is, when the switches 170 and 171 are closed.

It should be stated that when this form of the invention is employed in combination with a plurality of spinning frames and it is desired to cut off the air while the traveler passes over a frame, as in case of a doffing operation being effected, means must be provided for breaking the connection between the terminals 173 and 181, while the fans are passing over the textile machine to eliminate draughts, and also means must be provided for making contact between these two terminals when the fans pass over the machines in operation.

In order to accomplish this result, I have provided a rotary switch bar 185 which has alternate positions in which the terminals 181 and 173 are contacted and which also has alternate positions in which the terminals are not contacted. In other words, the switch bar 185 is so actuated that while the fans are passing over a machine not in operation the switch bar 185 will have its extremities resting in notches 178 and 180 in a non-contacting position whereas while the fans pass over a machine in operation, the switch bar will be resting in notches 177 and 179 and at the same time contacting the terminals 173 and 181.

The switch bar 185 is fixedly secured upon shaft 190 which shaft has one end thereof rotatably mounted in bore 191 in block 174. The other end of shaft 190 is rotatably mounted in housing 192, said housing being secured to the bracket 175. A suitable spring 198 is disposed around the shaft 190 one end of which normally presses against the bar 185 and its other end being confined upon the rod by the housing 192. This spring presses the bar 185 against block 174 at all times. The end of the shaft 190 nearest the observer in Figure 10 is adapted to penetrate a hole 192*a* in housing 192 and upon the projecting end of the shaft, a suitable insulation block 193 is mounted. This block has radially disposed arms 194 extending therefrom. When in assembled position, laterally projecting bolts 195 will extend into the path of these arms, said bolts being pivoted as at 196 to the side of rail 16. This bolt has a curved end 195*a* which presses against the rail 16, when in an extended position and is held in this position by means of tension spring 197. When it is desired to move the bolt 195 out of the path of the radially disposed arms 194 so that the fans 164 and 165 will operate continuously, over all of the frames 10 and 11,

it is only necessary to rotate the bolt 195 to dotted line position (Figure 9), at which time the spring 197 will also hold the bolt 195 out of the path of the arms 194. As the traveler 129 moves to the left along the trackway, it is evident that a prong 194 will engage the laterally extending bolt 195 and cause the shaft 190 to rotate substantially through an angle of 90 degrees. If the switch bar 185 is disposed in cavities 177 and 179, that is in contact position, the rotation of the shaft by the engagement of members 194 and 195 will rotate the same bar into the adjacent cavities 178 and 180, at which time no contact will be made and the circuit to the fan motors 161 and 160 will be broken.

It is therefore seen that I have also provided an electrical means for automatically and periodically controlling the air delivery of a cleaning apparatus for textile machinery.

In the drawings and specification, there has been set forth preferred embodiments of the invention, and although specific terms are employed, they are used in a generic and descriptive sense only, and not for purposes of limitation, the scope of the invention being set forth in the appended claims.

I claim:

1. In a traveling cleaner apparatus having a motor for propelling the same along a suitable trackway and having a fan clutched to said motor to be driven thereby for producing blasts of air as the apparatus travels along said trackway, and means carried by the apparatus and cooperating with other means disposed at spaced intervals along the trackway for disconnecting the fan from the motor at predetermined times and for predetermined intervals, and again connecting the fan to the motor.

2. A traveling cleaner apparatus comprising a motor and a fan, means driven by the motor for propelling the apparatus successively over a plurality of machines, means for driving the fan, means acting at predetermined points in the travel of the apparatus for rendering the means for driving the fan inactive, and after the apparatus has traveled a predetermined distance for again rendering active the fan driving means.

3. In a traveling cleaner apparatus for travel over a plurality of machines and having a motor for propelling the apparatus and driving a fan for creating blasts of air to strike the machines as the apparatus passes successively over the machines, disconnectible means between the motor and the fan, means settable at will for actuating the disconnectible means for rendering the fan inoperative, and other means settable at will for again actuating the disconnectible means for rendering the fan operative.

4. In a traveling cleaner apparatus adapted to travel along a trackway and having a motor for propelling the apparatus and also having blast producing means carried by the apparatus, means carried by the apparatus for controlling said blast producing means, and means mounted independently of the apparatus and arranged in the path of the travel of the apparatus for cooperation with the means carried by the apparatus for controlling the blast producing means, for rendering the blast producing means inoperative for predetermined periods of travel of the apparatus.

5. In a traveling cleaner apparatus having wheels adapted to travel along a trackway, an electric motor having a driving connection with said wheels, a fan driven by said motor for creating blasts of air while the apparatus is traveling along the trackway, disconnectible means between the fan and the motor, fixed means for disconnecting the fan from the motor, and other fixed means for connecting the fan to the motor.

6. In a traveling cleaner apparatus having a motor for propelling the apparatus along a suitable trackway and also having a blast producing means driven by the same motor, means carried by the apparatus for controlling the blast producing means, and means remotely mounted from the apparatus and independent thereof for actuating the controlling means to render the blast producing means inoperative and operative at will during predetermined periods of travel of the apparatus.

7. In a traveling cleaner apparatus having wheels adapted to travel along a trackway, an electric motor having a driving connection with the wheels of the apparatus for propelling the same along the trackway, said motor having a motor shaft, a fan loosely mounted on said motor shaft, a clutch disposed between the motor shaft and said fan, means settable at desired points on the trackway for opening said clutch to render the fan inoperative, and other means settable at desired points on the trackway for closing said clutch and again rendering the fan operative, after the apparatus has traveled a predetermined distance along the trackway.

8. In a traveler adapted to pass over a plurality of machines successively and having means for propelling the traveler and also having means for creating blasts of air to strike the machines as the traveler passes over the machines, means for rendering the blast producing means inoperative for predetermined length of travel while maintaining in operation the means for propelling the traveler, and means operable after the traveler has moved a predetermined distance for again rendering the blast producing means operative.

9. In a traveling cleaner apparatus adapted to travel on a suitable trackway and having means for imparting travel to the apparatus along the trackway and for creating blasts of air as the apparatus moves along the trackway and means for rendering the blast producing means inoperative for a predetermined length of travel while maintaining in operation the means for imparting travel to the apparatus.

10. Apparatus for removing lint and other foreign particles from machinery and being adapted to travel along a trackway disposed over a plurality of machines, a motor driven traveler mounted on said trackway to pass successively over said machines, said traveler being provided with means for producing downwardly directed blasts of air to strike the machines as the traveler passes over the same, and means for rendering the blast producing means inoperative while passing over a selected machine and for again rendering the blast producing means operative after it has passed over the selected machine.

11. In a traveling cleaner apparatus adapted to travel on a trackway above a plurality of machines and to successively traverse said machines and having an electric motor for propelling the apparatus along the trackway, a member disposed transversely of the line of travel of the apparatus and having an electric motor mounted on each end thereof, a circuit for the motor propelling the apparatus, a second circuit for the two motors mounted on the ends of said transversely disposed member, a fan driven by each

motor disposed on the end of said transversely disposed member, and means engageable by the apparatus for breaking the circuit to the motors having fans thereon at one point in the travel of the apparatus in its movement along the trackway, and other means engageable by the apparatus for again restoring the circuit to the fan motors after the apparatus has traveled a predetermined distance after the breaking of the fan motor circuit.

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