SUCTION CLEANING SYSTEM FOR TEXTILE MACHINERY

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SUCTION CLEANING SYSTEM FOR TEXTILE MACHINERY

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This invention relates to a novel suction cleaning system for drawing dust, waste and other light material away from textile machines.

As is well known, many different types of textile machines are used for processing textile fibers to produce yarns therefrom and to produce the finished fabrics from the yarns. As textile fibers are processed on such machines, short broken fibers or any inaccurately retained longer fibers tend to be blown out to float in the air as "fly" and settle as "lint" on various parts of related machines, on the floor, under the machines and on the textile material being processed.

In recent years, traveling blower-type cleaners, moving on tracks above the machines, have been provided with nozzles for directing blasts of air against various parts of the machines and against the material being processed for removing accumulations of lint, dust and the like from said parts of the machines and the material being processed. Also, some textile machines, such as spinning frames and the like, have been equipped with suction heads disposed adjacent the drafting rolls and which were connected to a suction housing or duct extending longitudinally of the machine and connected to a source of suction or to a suction and collecting apparatus.

The latter type of suction cleaning apparatus has required excessive, and therefore expensive, motive power in order to maintain sufficient suction in the elongated duct or housing which necessarily extends throughout substantially the entire length of a textile machine, to maintain sufficient suction in the inlet ports of the suction heads adjacent various operating elements of the machines, such as the drafting rolls. As a result, the power for the suction source has been necessity, been inadequate for most installations, so that the suction heads would suck only a small percentage of lint thereinto, along with any broken ends. In any event, the quantity and/or size of air inlet openings had to be limited to the extent that the same suction-generating motive power could not be used for creating suction currents at many different parts of textile machines, such as ring and spindle rails, spindles, drafting rolls, stop motions and the like.

It is therefore an object of this invention to provide an improved suction cleaning system for textile machines in which intermittent suction is produced at each of a plurality of air inlets, or groups of inlets, of the system so as to minimize the motive power required in order to generate powerful and effective suction at every inlet of the system.

It is another object of this invention to provide a suction cleaning system of the character described which comprises a series of chambers arranged longitudinally of a textile machine, which chambers are communicatively connected to a common enclosure connected to means for generating suction currents therein. The chambers are provided with inlets communicating with the atmosphere adjacent various operating elements of the machine. A valve is provided at the point at which each of said chambers is communicatively connected to said common enclosure and the valves are opened or closed individually or in groups thus producing intermittent "fractional" suction in each of the chambers whereby a relatively small motive power generates a relatively powerful and effective suction current in each of the chambers and at the inlets thereof for drawing away dust and other waste material produced by the operation of the machine.

It is still another object of this invention to provide a suction cleaning system of the character described in combination with a traveling cleaner or blower which traverses rows of textile machines for directing blasts of air against such machines and the textile material being processed thereon, and wherein the traveling cleaner is coupled with the control mechanism for the valves of the suction cleaning system so as to operate said valves simultaneously with, or in synchronism with, the traveling cleaner as it moves past respective inlets.

This is a continuation-in-part of my copending application, Serial No. 565,771, filed February 6, 1956 and entitled Heavy-Duty Exhaust System, now abandoned.

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 a side elevation of substantially portions of a textile machine, such as a spinning frame, equipped with our improved suction cleaning system, with various parts broken away and other parts being in section for purposes of clarity;

Figure 2 is a vertical sectional view taken substantially along line 2—2 in Figure 1 and also showing a creel above the machine;

Figure 2—A is a view similar to the central right-hand portion of Figure 2 showing the modified arrangement for producing continuous suction in the suction heads adjacent the drafting rolls for continuous cleaning in that area and collection of occasional broken ends;

Figure 3 is a view similar to Figure 1 showing a second form of the invention in which a traveling blower or cleaner is mounted upon a track above the textile machines and also showing means for operating successive valves as the traveling cleaner moves thereby;

Figure 4 is an enlarged vertical sectional view taken substantially along line 4—4 in Figure 3;

Figure 5 is an enlarged somewhat schematic fragmentary vertical sectional view taken substantially along line 5—5 in Figure 4 but omitting the spinning machine, and parts being broken away;

Figure 6 is a fragmentary transverse vertical sectional view taken substantially along line 6—6 in Figure 5.

The present invention is generally embodied in a pair of elongated substantially parallel ducts which extend longitudinally of each textile machine. These ducts may be independent of each other or they may be embodied in a single elongated housing in which the ducts are separated by a horizontal separating partition therebetween. Further, the ducts are preferably arranged one over the other and the upper duct is subdivided into a plurality of sections or chambers by means of transverse partitions.

The chambers each have communication with the atmosphere adjacent various operating elements of the machine. Each section or chamber communicates with the lower duct, preferably by means of an opening in the partition between the two ducts. Each of the openings is fitted with a valve, and means are provided for automatically opening and closing the valves according to a predetermined cycle. The lower or main duct serves as a common enclosure and is connected to a suitable source of suction, such as a suction and waste-collecting system, and the valves may be operated in succession; that is, one after the other; one valve being opened as the preceding valve is closed, or
the valves may be operated in groups; those of one group being opened simultaneously while the valves of the other groups are closed. By this arrangement, it is possible for a suction apparatus of relatively low capacity to serve a housing of considerable length, since only a portion of the duct-chamber system is effectively connected to the suction source at any time.

The present suction cleaning system may be used in association with many different types of textile machines having working or processing instrumentalities for processing textile strand and/or web material and, in its preferred embodiment, the novel suction cleaning system is illustrated in association with a spinning machine, for example.

The spinning machine comprises a frame broadly designated at 20, which includes head-end and foot-end frame members 21, 22, and intermediate upright frame members or sappone 23 which support beams 24. Beams 24 support spaced roll stands 25 which, in turn, support the usual drafting rolls 26. The rolls between each adjacent pair of stands 25 are generally termed as a roll section. Drafting rolls 26 draw roving or other textile strands 27 from yarn packages 30 carried by a creel, generally designated at 31, supported by frame 20. As strands 27 are drafted by rolls 26, they pass downwardly and are wound about bobbins or yarn carriers 33 supported on spindles 34. The machine is equipped with a vertically traversing ring rail 35 which carries the usual rings and travelers for laying yarn onto bobbins 33.

Spindles 34 are suitably supported by a spindle rail 36 carried by said frame 20. Spindles 34 are driven by tape members 37 which are, in turn, driven by a centrally disposed, driven, drum 38 extending longitudinally of and within the lower portion of frame 20. The parts of the spinning machine heretofore described are conventional and are described only for environmental purposes. Both embodiments of the novel cleaning apparatus disclosed herein are substantially the same with the exception of the particular mechanism for operating the valves thereof.

The novel suction cleaning apparatus of the present invention comprises a main suction duct or enclosure 41 connected permanently with a forced-circulation or suction generating means embodied in a suction and collecting unit or filter box 70. A series of relatively small, substantially aligned chambers 45 is arranged adjacent to a main duct 41. Each chamber 45 is communicatively connected to the main duct 41 with a valve means between each chamber and the duct. The chambers 45 may be spaced from each other and spaced from the main duct 41. In the interests of economy, the chambers 45 collectively form a secondary duct or subchamber 42 above and contiguous to main duct or subchannel 41 and the two ducts 41, 42, form, collectively, an elongated enclosure, channel or housing, broadly designated at 40, extending substantially throughout the length of the textile machine.

Thus, the two ducts 41, 42 are separated by an elongated horizontal partition or separating wall 43. Elongated housing 40 also includes longitudinal side walls 46, 47, which are spanned by horizontal separating wall 43, and top and bottom walls 48, 49. The end of housing 40, or exit from the source of suction 70, is closed by an end wall a (Figure 1). The other end of upper duct 42 is closed by another end wall b. Upper duct 42 is divided, by a plurality of transverse or lateral partitions 44, into a number of said compartments, chambers or sections 45. Depending upon the length of the machine and/or the capacity of the suction generating means, a continuous duct 41 may extend throughout the length of several textile machines, without departing from the spirit of the invention.

The upper portions of side walls 46, 47 forming chambers 45 are each provided with elongated passage-ways or air inlet openings 50 therein (Figures 1 and 2), there being one of said openings 50 in each of said side walls corresponding to each chamber 45. It will be observed that said openings 59 establish communication between the chambers 45 and respective elongated, flared, nozzle members 51 whose outer portions are opposite the extent that they are closed by slotted, foraminated or screened wall members 52. Said screened wall members 52 are disposed closely adjacent bobbins 33 so as to draw lint, dust and other light material, which may tend to collect on the bobbins and associated ring rails, into the nozzle members 51 and, thence, into the respective chambers 45.

As particularly illustrated in Figure 2, each roll section may be provided with one or more suction heads 55 which may be of conventional or other construction and are shown as being of substantially the type disclosed in U.S. Patent No. 2,837,774 granted to Woodrow W. Hewitt on June 10, 1958. The suction heads 55 have conduits or pipes 56 extending inwardly therefrom and communicating with the upper wall 48 of housing 40, there being one pipe 56 at each side of the machine communicating with each of said chambers 45. It may be desirable, in order to conform to conventional broken end collection devices, to connect pipes 56 to main duct 41 so that continuous suction is present in suction heads 55. This arrangement is shown in Figure 2-A wherein the same reference characters are employed as are employed in Figure 2, with the double-prime (""), notation being applied to those elements which are arranged different from Figure 2.

In order to produce intermittent suction in chambers 45, communicative means with a valve therein is provided between each chamber 45 and the main duct 41. To this end, it will be observed that said chambers 45, communicative with their respective chambers 45 and main duct 41, is provided with a plurality of passageways, openings or ports 56 therein (Figure 2) which are preferably circular and are adapted to be opened and closed by a suitable movable valve 66. Forms of suitable valves will be later described. Continuous suction is produced in lower duct or chamber 42 so that, when any of the valves 66 are opened, suction is also created within the respective compartments or compartment 45, thereby producing suction currents at the respective nozzles 51 and suction heads 55.

Suction may be produced in upper chamber 45 or duct 41, so as to produce suction currents in at least one of the upper chambers 45 whenever respective valves are opened, by means of said collector or filter box 70, which may be of conventional or other construction. In this instance, one end of duct 41 is provided with an elbow or extension 67 which is connected to the inlet side or bottom portion of filter box 70. Filter box 70 contains a filter 71 which may be made from any suitable foraminated or screen material. A fan or blower 72 is positioned adjacent the outlet side of filter box 70 and is driven by a motor 73 which may be in the form of an electric motor suitably mounted within filter box 70.

From the foregoing, it is apparent that fan 72 blows air through the outlet side of filter box or collector 70, as indicated by the arrows in the upper right-hand portion of Figure 1. In so doing, fan 72 creates suction or negative pressure within the bottom or lower duct 41. Upon any of said openings 65 (Figures 1 and 2), suction or negative pressure is produced in the respective upper chambers 45, nozzle members 51 and suction heads 55 to thereby draw lint, dust or other light material into the same and prevent the accumulation of such material upon bobbins 33, spindles 34, ring rails 35, other adjacent elements of the spinning machine, the ring rails, and textile material being processed thereby. The particular positions of, and area covered by, the screened openings 56 are exemplary, since it is apparent that suction devices may be positioned adjacent other elements of the machine and may be connected to housing 40 for
communication with duct 42 and respective chambers 45, without departing from the spirit of the invention. In Figures 1 and 2, each valve 66 which may also be termed as a shutter, comprises a relatively large base 75 which may be of circular or other configuration substantially conforming to but being somewhat larger than the configuration of the respective opening 65. Each base 75 has a reduced hood-like shutter-box, or valve body 76 tending upwardly therefrom and loosely extending through the respective opening 65. A tension spring 77 is fixed, at its lower end, in the bottom of a cavity or well 80 provided in body 76 of valve 66, which cavity may serve as a trap for any lubricant which may be provided on a valve body extension embodied in a shaft or stem 81.

Each stem 81 is connected to the body 76 of valve 66, preferably at the bottom of the respective cavity or well 80. The upper end of each tension spring 77 is suitably secured to the lower surface of the upper wall 48. Stem 81 extends upwardly through wall 48 and is guided in a suitable guide block 82 fixed to said top wall 48. The upper end of stem 81 has a follower 83 thereon, and the follower 83 associated, with each valve 66 is adapted to be engaged by a respective cam 84. Springs 77 yieldably oppose displacement of said valves 66 by cams 84. Cams 84 are fixed on a common substantially horizontal shaft.

Shaft 85 is suitably journaled on frame 20 of the spinning machine. In this instance, it will be observed that one end of shaft 85 is journaled in head-end frame member 21 (Figure 1) and its other end is journaled in a bearing block 86 suitably secured to foot-end frame member 22. Shaft 85 may be driven by any suitable means, at constant or variable speeds, so as to vary the frequency with which valves 66 are displaced or operated. Cams 84 may also be of varying shapes and may be relatively variably positioned so the valves may operate in succession, groups of the valves may operate in succession, or the valves may be operated in any predetermined sequence.

In this instance, shaft 85 is connected to a variable speed transmission 87 by means of pulleys 90, 91 and an endless belt or chain 92. The input shaft of the variable speed transmission 87 may be driven by an electric motor 93 connected to said input shaft by means of sprocket wheels or pulleys 96, 97 and an endless chain or belt 100. It is thus seen that a relatively small blower motor 73 and corresponding blower or fan 72 may be used for maintaining suction within continuous duct 41 and elbow 67, since only a relatively few valves 66 or a single valve 66 need be driven by one end or other of the shaft, and, in some instances, the suction need only be created in a corresponding chamber or chambers 45 while the remaining chambers of the enclosure or housing 40 remain sealed with respect to the lower duct 41. This insures relatively strong suction at each of the inlets of the sections or chambers 45 of the upper duct 42, as embodied in the nozzles 51 and suction heads 55, even though a relatively low-powered mechanism is used for creating suction in the main or lower housing 41. The arrangement of end collection suction heads 55 in Figure 2-A, wherein they are shown for operating with continuous suction, does not detract from obtaining strong suction at the intermittently effective nozzles 51, because, in all cases, the characteristics of the motor-driven suction impeller are suited to the required vacuum rate of air flow through all nozzles which operate simultaneously.

Second form of the invention

In Figures 3, 4, 5 and 6, a form of the invention is illustrated in which the valves are constructed somewhat differently from each valve 66 of the first form of the invention and, further, the valves are operated in conjunction with a blower-type overhead traveling cleaner which directs blasts of air inwardly toward the elongated enclosure or housing 40' and which also directs blasts of air over the upper surfaces of the top wall 48' of the upper or secondary duct 42. In the traveling cleaner moves past the machine, the blasts of air delivered thereby flow past various operating elements of the machine, such as the bobbins, ring roll, ring travelers, drafting rolls, etc. By this arrangement there is obtained improved air circulation around the various elements of the machine and the ends being processed. Also, connections are provided between the blower or traveling cleaner and the valves for operating the valves in succession and in synchronization with movement of the blower means or traveling cleaner.

The second form of the invention will now be described in detail, wherein those parts in Figures 3 through 6 which are substantially the same as like parts in Figures 1 and 2 will bear the same reference characters, with the prime notation added, in order to avoid repetitive description. There are many different types of blowers which may be for use for directing streams of air toward the elongated enclosures or housings embodying the chambers and valve mechanisms of the present invention. For example, blower-type traveling cleaners which may be used in association with the present invention are disclosed in U.S. Patents Nos. 2,047,558 issued July 14, 1936 and 2,695,039 issued November 23, 1954.

In Figure 3, the traveling cleaner or blower of Figures 3, 4, 5 and 6 is broadly designated at 110 and comprises a volute casing 111 within which a fan or air impeller 112 is positioned. Impeller 112 is driven by an electric motor 113 mounted on a carriage 114 which also serves as a gear box in this instance. Carriage 114 has rollers 115 on opposite sides thereof, one or more of which may be driven by suitable connections with motor 113. Rollers 115 ride upon spaced parallel tracks 116 forming a trackway 117. As is well known, trackways, such as trackway 117, extend over one or more rows of machines such as the spinning machine shown in the drawings.

Casing 111 is open at its upper portion to provide an air inlet 120. Air outlet portions or ducts 122 extend substantially radially outwardly from casing 111 and then curve downwardly and have the upper ends of respective dependent sleeves or tubes 123 connected thereto. Auxiliary tubes or sleeves 124 are also connected to the respective downwardly curved ducts 122. Sleeves 124 have inwardly and downwardly inclined nozzles 125 thereon whose lower ends move adjacent the respective sets of drafting rolls 26. Each of the tubes 123 is usually made from flexible material and has a plurality of nozzles in the form of vertically spaced outlets 126 thereon for directing blasts of air inwardly toward various parts of the machines as the traveling cleaner moves thereby.

It will be noted that the uppermost of the outlets 126, in each instance, is disposed in alignment with the bobbins 33' and also directs a stream of air past and against the upper surface of upper wall 48' of the elongated housing 40'. The blasts of air against upper wall 48' disturb any lint thereon so that it may be drawn into respective ports 127 formed in upper wall 48' and communicating with the respective chambers 45'. An upwardly inclined baffle 128 may overlie each port 127. By this arrangement, there is obtained improved air circulation around the yarns 27' and parts of the machine from which dust particles, lint and the like are to be removed at successive portions of the upper duct 42.

The tracks 116 of trackway 117 may be supported by usual means, including longitudinally spaced brackets 130 fixed upon posts 131 which, in some instances, are parts of the creel 31'. In other instances, the posts 131 are suitably secured to the floor between adjacent machines.

As best shown in Figure 3, it is preferable that one of the chambers 45' is provided for each of the roll sections; that is, for each of the sets of rolls 26' between adjacent roll stands 28' and, in this instance, means are
provided for opening the corresponding valves 66 as the traveling cleaner 110 moves above each roll section, as will be presently described.

The valves 66 may be constructed in the same manner as the valves 66 heretofore described. However, in this instance, the valves 66 differ from the valves 66 in that the hollow bodies 76 of valves 66 are guided for vertical movement on cup-like spring housings 140 suitably secured to the lower surface of top wall 48 of housing 40. (Figure 5). Also, instead of a tension spring being connected to the bottoms of cavities within the hollow bodies 76 of valves 66, as is the case with the first form of the invention, each spring housing has a compression spring 141 therein which bears against the bottom wall of the corresponding housing and whose upper end bears against a collar 142 suitably secured to a stem 143.

The stems 143 serve the same purpose as the stems 81 of the first form of valve 66, to the extent that their lower ends loosely penetrate the bottom walls of the spring housings 141 and are suitably secured to the respective valve bodies 76. However, it will be noted that the stems 143 extend outwardly above guides blocks 141 and are guided in suitable guide blocks or brackets 144 suitably attached to and depending from trackway 137. In this instance, each track 116 is provided with a substantially channel-shaped and longitudinally extending shield or housing 146 within which the usual electrodes and other elements for energizing electric motor 113 are disposed. Such electrical elements may be of a type disclosed in U.S. Patent No. 2,011,753, granted to W. B. Hodge et al. on August 20, 1925. Accordingly, an illustration and description thereof are deemed unnecessary.

Now, it will be observed that the upper portions of stems 143 extend outwardly above guide blocks 141, and each has a follower 147 thereon which is urged into engagement with a corresponding follower 148 by means of the respective compression spring 141. As shown in Figures 3 and 5, one of the tracks 116 of trackway 117 has a plurality of said actuating elements 150 thereon, each actuating element being shown in the form of an elongated plate suitably pivotally connected to one side of the corresponding track 116, as by hinges 151.

The actuating plates 150 are preferably of substantially the same length as the respective chambers 45. In the present instance, it will be observed in Figures 3 and 5 that secured ends of each actuating plate 150 are curved downwardly, as at 152, and terminate short of corresponding ends of the next adjacent actuator plate 150. These curved ends 152 are provided on the actuator plates 150 to facilitate movement of a cam 153, carried by or movable with carriage 114, into engagement with the upper surface of the respective plates 150. To this end, it will be observed, in the upper portion of Figure 5, that the cam 153 is suitably secured to carriage 114, as by bolts or screws 155, and opposite sides of cam 153 are inclined or curved downwardly in converging relationship to further enable cam 153 to move into engagement with the upper surfaces of successive actuator plates 150. It is apparent that, as each actuator plate is engaged by cam 153, this actuator plate is swung downwardly to move the corresponding follower 147 and stem 143 downwardly, thus opening the respective valve 66 as shown in Figures 3, 4, 5 and 6.

Cam 153 and actuator plates 150 are shown as being particularly arranged to facilitate movement of the carriage 114 around bends formed in the trackway 117. Of course, in instances in which the blower or traveling cleaner 110 moves in one direction and then in the opposite direction along a straight trackway extending above said chambers, the actuator plate need not be attached to the trackway 117 and, instead, a single actuator plate may be suitably secured to or formed integral with the cam 153 for actuating each successive valve as the plate moves into engagement with the successively followers 147. Any suitable means may be provided for operating the valves in succession to intermittently effect suction currents in successive chambers in accordance with the movement of the traveling cleaner thereby.

It is thus seen that we have provided a novel suction cleaning apparatus in which suction is intermittently effected in the different chambers communicating with the atmosphere so that relatively small power means may be used for creating extremely powerful suction currents at the inlets of the various chambers or duct sections.

It is seen further that we have provided a new suction cleaning apparatus wherein suction is created in the various chambers intermittently and blower means directs compressed air toward the inlets of the respective chambers so that, not only does the blast of air from the traveling blower dislodge any lint or the like which may tend to accumulate on the various operating elements of the machine or the material being processed, but adequate suction is provided adjacent such elements for drawing such lint and other light material into the corresponding chambers to subsequently be carried into the main duct and, thence, carried to the collecting device embodied in the suction and collecting unit.

In the drawings and specification there have 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 defined in the claims.

I claim:

1. Apparatus for removing lint and other light material from working instrumentalities of textile machines comprising a channel extending longitudinally of a machine, a suction and collecting unit connected to said channel, said channel having a longitudinally arranged series of air inlets therein adjacent central portion of said working instrumentalities, and means successively and independently establishing communication between said inlets and said suction and collecting unit in predetermined sequence.

2. Apparatus for removing lint and other light material from working instrumentalities of textile machines comprising an elongated duct extending longitudinally of a machine, a suction and collecting unit connected to one end of said duct for creating negative pressure therein, a row of chambers adjacent said duct, each chamber having at least one air inlet therein adjacent central portion of said working instrumentalities, and means successively and independently establishing communication between all of said chambers and said duct in predetermined sequence.

3. Apparatus for removing lint and other light material from working instrumentalities of textile machines comprising a duct extending longitudinally of a machine, a suction and collecting unit connected to said duct for creating negative pressure therein, a row of chambers adjacent said duct, each chamber having at least one air inlet therein adjacent central portion of said working instrumentalities, and means successively and independently establishing communication between all of said chambers and said duct in predetermined sequence.

4. A structure according to claim 3 in which said means for operating said valve means comprises a plurality of cams, there being one of said cams for each of said valve means, means for rotating said cams, each of said valve means comprising a valve body for each of said communicative means, each valve body being provided with an extension engageable by a respective one of said follower means, said extension comprising the displacement of each of said valve bodies by said cams.

5. A structure according to claim 3 in which each of said valve means is provided with an extension thereon, a traveling blower movable above said machine and hav-
a respective one of said cams for periodically opening the respective valve.

11. A structure according to claim 10 including means for varying the speed of said shaft.

12. Apparatus for removing lint and other light material from textile machines comprising a traveling air-propelling cleaner mounted for movement longitudinally of at least one textile machine and having at least one nozzle thereon, a channel having a plurality of air inlets arranged adjacent said machine and adjacent the path of travel of said nozzle, and means for momentarily producing suction at said inlets simultaneously with movement of said nozzle past respective inlets.

13. Apparatus for removing lint and other light material from textile machines comprising a traveling air-propelling cleaner mounted for movement longitudinally of at least one textile machine and having at least one nozzle thereon, a channel having a plurality of air inlets arranged adjacent said machine and adjacent the path of travel of said nozzle, and means for intermittently producing suction currents at said inlets at intervals coinciding with movement of said nozzle past and adjacent respective inlets.

14. Apparatus for removing lint and other light material from working instrumentalities of textile machines, said apparatus comprising a blower mounted for movement longitudinally of at least one machine and means for directing means for directing at least one stream of air toward successive instrumentalities as it moves thereby, a channel having a series of air inlets arranged adjacent said successive instrumentalities and adjacent the path of travel of said air-directing means, and means for successively and independently producing suction at said inlets in synchronism with movement of said air-directing means past said inlets.

15. The combination with a traveling cleaner movable longitudinally above a row of textile machines wherein said traveling cleaner is provided with nozzles moveable adjacent corresponding machines, the combination therewith of a duct system arranged parallel to working instrumentalities of at least one of said machines, said duct system including a plurality of air inlets arranged longitudinally of the respective machine and adjacent said working instrumentalities, and means for successively and independently producing suction at said inlets with movement of said nozzle means past the respective air inlets.

16. The combination with a traveling blower movable above a row of textile machines provided with substantially horizontal rows of working instrumentalities and wherein said traveling blower is provided with air outlet means for directing blasts of air toward corresponding machines, the combination therewith of a duct system arranged parallel to working instrumentalities of at least one of said machines, said duct system including a plurality of air inlets arranged longitudinally of the respective machine adjacent said working instrumentalities, and means for successively and independently producing suction at said air inlets with successive movement of said air outlet means past respective air inlets.

17. The combination with a traveling blower movable above a row of textile machines provided with strand processing instrumentalities and wherein said traveling blower is provided with means for directing blasts of air toward corresponding machines, the combination therewith of a row of suction chambers arranged parallel to processing instrumentalities of at least one of said machines, each chamber having at least one air inlet arranged longitudinally and adjacent respective processing instrumentalities, and means for momentarily producing suction in each chamber independently of others of said chambers in synchronism with movement of said blower past respective air inlets.

18. In a cleaning system for textile machines having working instrumentalities and including a traveling clean-
er movable along a track above a row of said machines and wherein said traveling cleaner is equipped with nozzles for directing blasts of air inwardly toward said working instrumentalities; the combination therewith of an elongated main duct adjacent at least one of said machines, a suction and collecting unit connected to said duct, a series of chambers extending substantially parallel to said duct, each chamber having at least one inlet opening therein, communicative means between each chamber and said duct, valve means for each of said communicative means and being individually operable for selectively establishing communication between any of said chambers and said duct, and control mechanism operatively connected with said valve means for successively opening and closing all of said communicative means whereby the blasts of air from said nozzles of the traveling cleaner assist in dislodging lint and other light material from working instrumentalities and intermittent suction produced in the chambers causes lint and other light material so dislodged to be drawn into respective inlet openings, into the chambers, through said communicative means, into said duct and, thus, to said suction and collecting unit.

19. A structure according to claim 18 in which said control mechanism includes means under control of said traveling cleaner for opening said valve means simultaneously with the movement of said nozzles past the respective inlet openings.

20. A structure according to claim 18 in which said valve means each comprises a valve body for each of said communicative means, each valve body being provided with an extension terminating adjacent the path of travel of said traveling cleaner, said control mechanism comprising means carried by said traveling cleaner for imparting movement to said extensions for opening or closing in response to the valve bodies and means yieldably opposing displacement of said bodies by said traveling cleaner.

21. A structure according to claim 18 wherein each chamber includes an upper wall provided with an opening therein so blasts of air from said nozzles move across said upper wall with movement of the traveling cleaner thereby and the lint and other light material dislodged from said upper wall by the blast of air are subsequently drawn into the latter openings as the corresponding valve means are opened.

22. An exhaust system comprising an elongated exhaust channel divided into two substantially coextensive subchannels, partition means dividing one of said subchannels into a plurality of sections, a forced-circulation means connected to apply suction to the other of said subchannels at one point, intake means for a circulating fluid connected to each of said sections, said sections being provided with passages leading to said other subchannel, shutter means for said passages individually operable for selectively establishing communication between any of said sections and said other subchannel, a control mechanism operatively connected with said shutter means for successively opening and closing all of said passages in a predetermined sequence, said mechanism comprising a shaft extending along said exhaust channel, a plurality of cams on said shaft, means for rotating said shaft, said shutter means comprising a shutter body for each of said passages, and said shutter body being provided with an extension engageable by a respective one of said cams and being further provided with spring means opposing displacement of said shutter body by said respective cam.

23. A structure according to claim 22 wherein said shutter body has a cavity at the top, said extension comprising a stem rising within said cavity toward said respective cam, and said spring means surrounding said stem within said cavity.

24. An exhaust system comprising an elongated exhaust channel divided into two substantially coextensive subchannels, partition means dividing one of said subchannels into a plurality of sections, a forced-circulation means connected to apply suction to the other of said subchannels at one point, intake means for a circulating fluid connected to each of said sections, said sections being provided with passages leading to said other subchannel, shutter means for said passages individually operable for selectively establishing communication between any of said sections and said other subchannel, a control mechanism operatively connected with said shutter means for successively opening and closing all of said passages in a predetermined sequence, a blower means, means supporting said blower means for movement along said subchannel having said plurality of sections, and the intake means of each of said sections being adapted to receive a fluid stream from said blower means upon the latter occupying a position adjacent each section.

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