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3,086,891

METHOD OF HANDLING LINT

Original Filed Aug. 6, 1959

2 Sheets-Sheet 1

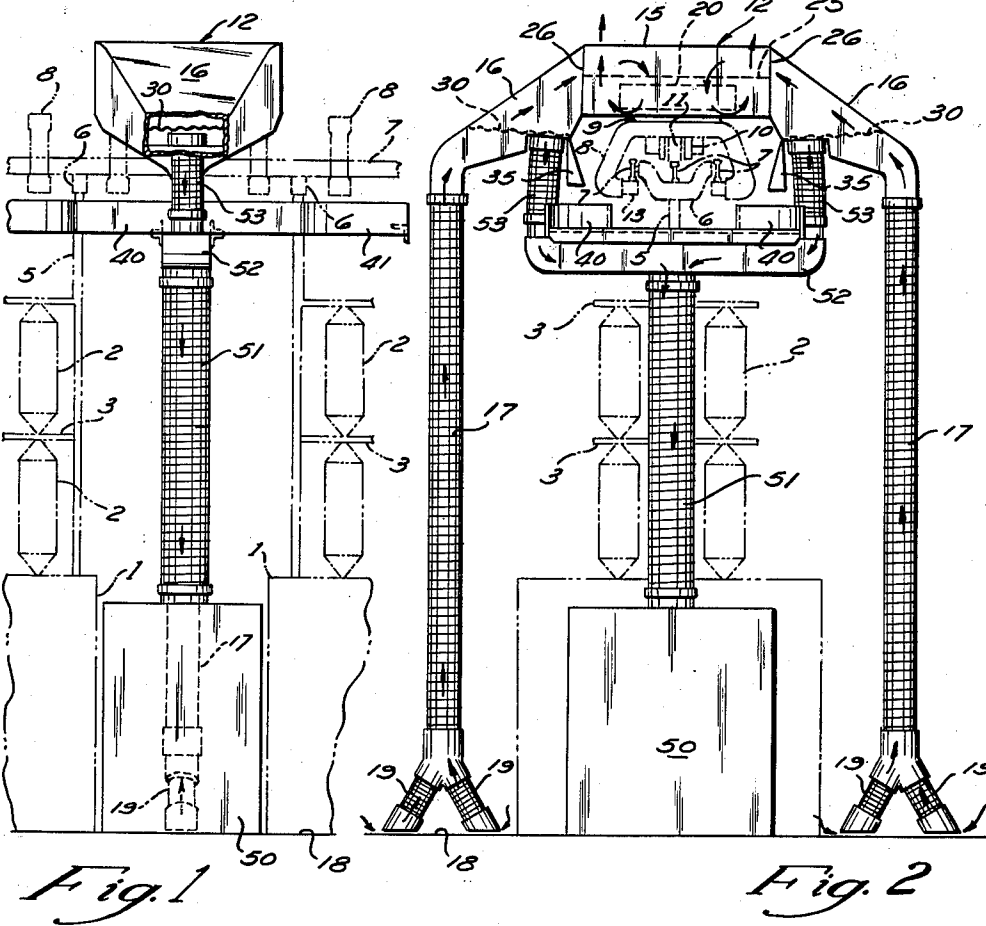


Fig. 1

Fig. 2

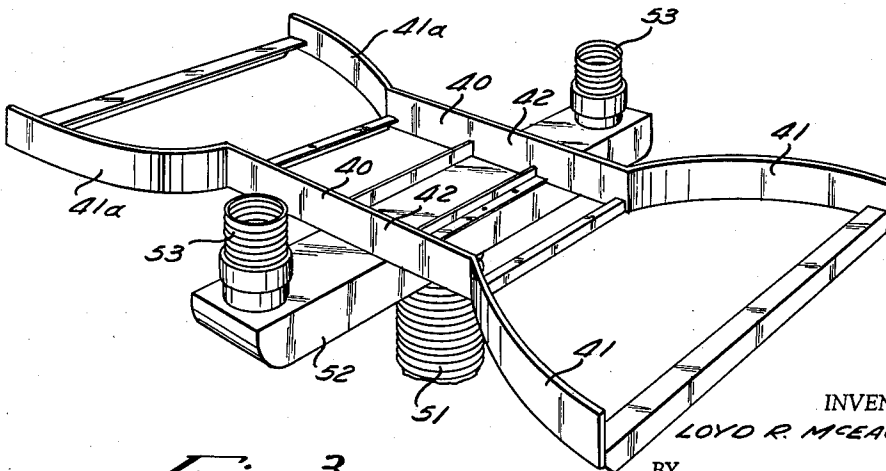


Fig. 3

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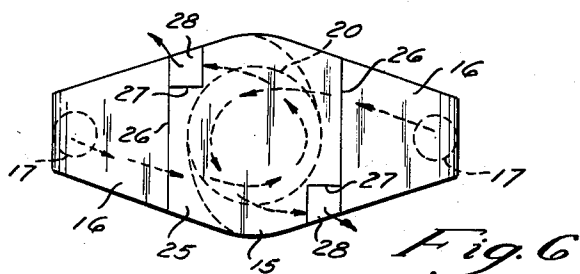
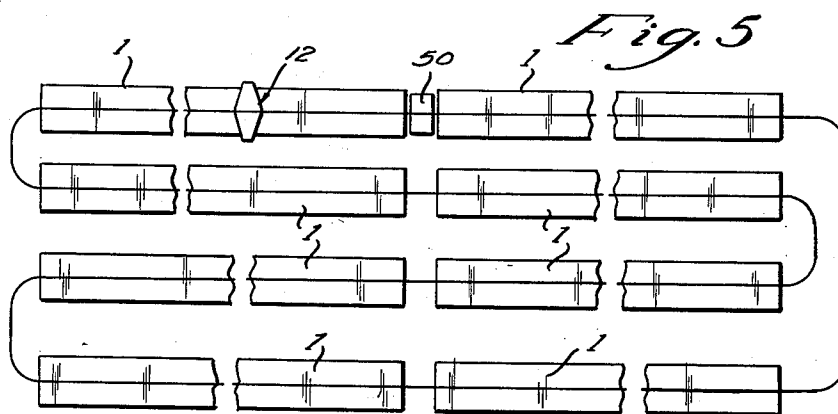
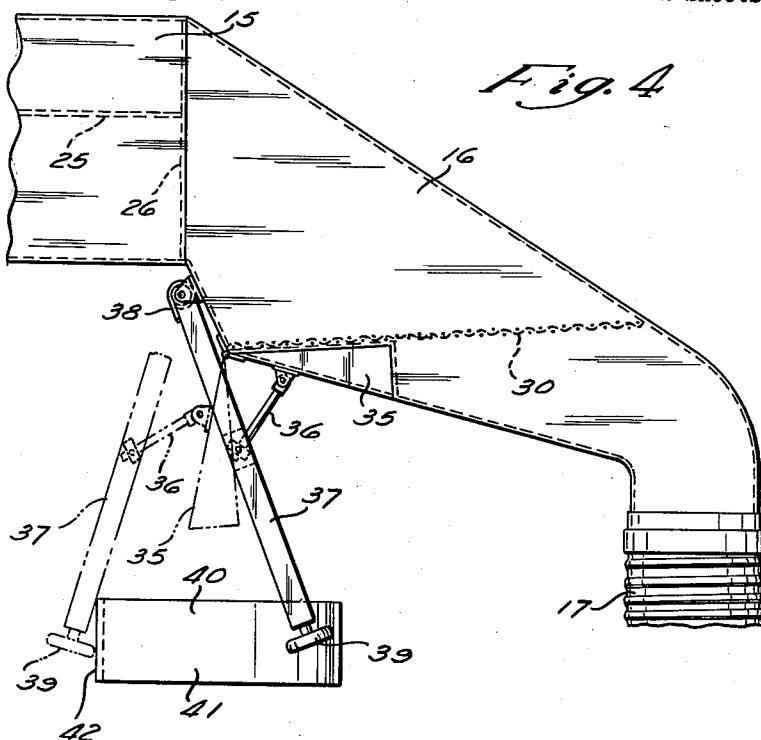
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METHOD OF HANDLING LINT

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Continuation of application Ser. No. 832,000, Aug. 6, 1959. This application Oct. 5, 1961, Ser. No. 152,701
5 Claims. (Cl. 134-10)

This invention relates to the textile cleaning art and is particularly concerned with a new method for removing lint in textile machine rooms including the removal from the textile machines, and adjacent walls of the room, more especially the floor, collecting such lint and periodically transferring it to a storage chamber, all by means of vacuum-induced streams of air.

Various kinds of textile machines are embodied in the production of yarns and fibers of various kinds and types, and practically every one of these machines has the effect of releasing some of the fibers so that they are free to float around in the air and eventually to collect on the textile machines, on the floor and ceiling and on the side walls of the textile machine room. These fibers are commonly known collectively as "lint."

It has been common heretofore to remove lint from textile machines by directing a stream of high velocity air at accumulations of lint on the machines. While the lint was thereby removed from the machines, it was allowed to float around in the air and eventually collect on the machines, floor and side walls and ceiling of the room. The lint which collects on the floor was customarily swept up by an operator with a large broom or brush, but was generally so contaminated with dirt that it could not be used to make yarn and hence was waste material.

More recently, apparatus has been devised for picking up lint from the floor by a vacuum means, and such apparatus could be used alone or in conjunction with apparatus for blowing the lint off the machines. However, these pick-up devices had no means of disposing of the picked up lint and, as a result, the apparatus had to be stopped periodically for manual removal of the lint with the attendant cost of the manual labor.

The present invention aims to accomplish all that has been accomplished by the lint pick-up devices and additionally to transfer the collected lint to a storage chamber. The present invention operates entirely on the principle of streams of air which are caused to flow by the creation of a vacuum. The present invention is embodied in a new method which, for the first time, combines certain new steps and old steps in a new sequence by which new and valuable results are obtained.

The present invention, briefly described, comprises the steps of progressively picking up lint along a side of a row of textile machines by a vacuum-induced flow of a stream of air, continuously separating the lint from said air stream by screen means, and transferring the thus collected lint from the screen means to a storage chamber at a predetermined fixed place along the line of travel of said screen means by means of a second vacuum-created stream of air flowing through said screen means to said storage chamber.

The present invention will be better understood by those skilled in the art by reference to one form of apparatus which is suitable for carrying out the present method invention.

FIGURE 1 is a side elevational view of one embodiment of the present invention shown in operative position relative to a spinning machine;

FIGURE 2 is an end elevational view of the apparatus of FIGURE 1;

2

FIGURE 3 is a perspective view showing the door-actuating cam mechanism of FIGURES 1 and 2;

FIGURE 4 is a fragmentary, end elevational view of the cam and door-actuating mechanism of FIGURE 3;

FIGURE 5 is a digrammatic plan view showing a plurality of rows of textile machines in combination with apparatus of the present invention; and

FIGURE 6 is a top plan view of the casing of FIGURES 2 and 6, showing the direction of movement of air streams therein.

In FIGURES 1 and 2, the numeral 1 designates, diagrammatically, spinning machines on which packages of roving 2 are carried by the creel boards 3.

A trackway is positioned above the row of spinning machines 1 and comprises a plurality of supports 5, arms 6 and rails 7. A lint collecting unit is positioned on the trackway to run lengthwise thereof. This unit includes a carriage which may be like that shown in FIGURES 1 and 4 of U.S. Patent No. 2,851,716 and a casing carried by said carriage. Briefly described, the said carriage consists of a plurality of trucks 8 which are connected together by a plate 9 which has depending brackets 10 supporting a roller 11 positioned to run on the top of rail 7. Trucks 8 have hold-down devices, such as rollers 13, to engage the undersurface of the side rails 7 to prevent the carriage from tipping.

A casing 12 is mounted on the top of plate 9, extends transversely thereacross and comprises a central section 15 and outwardly and downwardly extending sections 16, to the lower ends of which are attached flexible tubes 17 which extend to points near the floor 18. Preferably, each tube 17 is provided with a pair of downwardly diverging tubes 19 which extend down close to the floor 18, for example, to within about an inch or less of the floor.

A motor (not shown) is supported between the pair of trucks 8 with its rotor shaft extending up into the central part 15 of the casing, and a centrifugal fan, indicated by the dotted rectangular outline 20 in FIGURE 2, is fixed to the rotor shaft within the casing. A horizontal partition 25 and vertical partitions 26 divide the interior of the central part 15 of the casing into an upper vacuum chamber and a lower fan chamber. Vertical partitions 26 and 27 and side walls of the casing define outlets 28 for air discharged from the fan chamber, as is better illustrated in FIGURE 6. The general direction of the flow of air streams in the casing is indicated by arrows on FIGURE 2 by which it will be seen that the fan draws air from the vacuum chamber into the fan chamber and discharges it through passages 28 to the atmosphere. By reason of the resulting vacuum created in the vacuum chamber by the fan, a low pressure area is created in the chambers in the downwardly extending sections 16 and in the tubes 17 to the vicinity of the floor with resultant flow of air from the floor to the vacuum chamber.

In each of the sections or branches 16 of the casing, a screen 30 extends across the path of travel of the stream of air from tube 17 to the vacuum chamber of casing section 15. The chambers in sections 16 below the screens may be considered as collecting chambers. The lower walls of sections 16 of the casing below the screens are provided with doors 35 which are hinged thereto and when opened afford passages for removal of lint from the screens.

FIGURES 3 and 4 show in some detail these doors and their actuating mechanism. Each door 35 is pivotally connected to the casing and is attached by a short rod 36 to a lever 37 which is also pivotally connected to the casing and which is provided with a spring 38 to urge the lever in a direction to close door 35 and to maintain

it in closed position. At its lower end lever 37 is provided with a roller 39. A cam bar which is in a fixed position is engaged by roller 39 when the unit travels over the cam bar. The parts of bars 40 which engage the rollers 39 and open the doors 35 are indicated at 41, the parts 42 indicate the parts of the bars which are engaged by the rollers 39 when the doors are fully opened and the parts 41a indicating the parts along which the rollers may move under the force of springs 38 to close doors 35.

As stated above, FIGURE 5 shows diagrammatically in plan view, a layout of textile machines, with which trackway and apparatus such as that shown in FIGURES 1 to 4 inclusive may be employed. As these figures show, a storage box 50 is fixed to position between the ends of a pair of textile machines 1. Within this box is disposed means, such as a centrifugal fan (not shown), for creating a condition of vacuum within the box 50. A flexible tube 51 extends upwardly from the top of box 50 to, and communicates with, a transversely extending tubular header 52 from the ends of which flexible tubes 53 extend upwardly in such position that when the doors 35 are opened and screens 30 of casing 15 moved across the upper ends thereof and closed thereto the suction afforded by the vacuum in tubes 53, header 52 and tubes 51 will remove lint which had accumulated on the screens. The header 52 and the door-operating bars 40 may be supported in any convenient and suitable manner but, as shown, are supported from the tops of the creels 3 of spinning machines 1.

The operation of the apparatus of FIGURES 1 through 6 will be readily understood from the foregoing description but succinctly stated is as follows.

When the carriage is moved along the trackway and the vacuum-creating fans in casing 15 is rotated rapidly, streams of air carrying lint will be drawn up through tubes 17 and 19. The lint will be separated from these streams of air by screens 30 in the collecting chambers in portions 16 of the casing and the substantially lint-free air will then pass through the vacuum chamber of casing 15 and into the fan chamber and thence out of the casing through the outlets 28. As the apparatus moves along the trackway, the lint will be progressively removed from the floor along the sides of the rows of machines and collected on the screens. When the apparatus approaches the position occupied by the storage box 50, the rollers 39 of levers 37 will engage the curved portions 41 of the bars 40 and will be moved toward each other with resultant opening of the doors 35. These doors will be opened substantially to the position shown in FIGURE 2 and in dotted lines in FIGURE 4 just prior to the passage of the screens over tubes 43. As the screens, with the accumulations of lint thereon, pass over the tubes 53, that lint will be drawn into the tubes 53 by the vacuum-created air streams flowing thereinto and the lint will then be transported through header 52 and tube 51 and deposited in storage box 50.

Apparatus disclosed, but not claimed herein, is claimed in my copending application Serial No. 791,108, filed February 4, 1955, or in Serial No. 832,113, filed August 6, 1959, now Patent No. 3,003,178.

This application is a continuation of my copending application Serial No. 832,000, filed August 6, 1959, now abandoned.

Having thus described this invention in such full, clear, concise and exact terms as to enable any person skilled in the art to which it pertains to make and use the same, and having set forth the best mode contemplated of carrying out this invention, I state that the subject matter which I regard as being my invention is particularly pointed out and distinctly claimed in what is claimed, it being understood that equivalents or modifications of, or substitutions for, parts of the above specifically described embodiment of the invention may be made without departing from the scope of the invention as set forth in what is claimed.

What is claimed is:

1. The method of collecting and storing lint which comprises the steps of moving a suction chamber over a row of textile machines, drawing a first stream of air from adjacent to said machines, through a confined passage and a lint collecting screen and into said chamber, moving a second stream of air through a fixed open-ended tube and into a storage chamber, opening said passage to expose the screen as it approaches said tube end and moving the screen across the tube end, and employing said second stream of air to transfer lint from said screen through said tube and into said storage chamber.

2. The method of collecting and storing lint which comprises the steps of moving a suction chamber over a row of textile machines, drawing a first stream of air from adjacent to said machines, through a confined passage and a lint collecting screen and into said chamber, causing a suction-induced second stream of air to flow through a fixed open-ended tube and into a storage chamber, opening said passage to expose said screen as it approaches said tube end and moving the screen across the tube end, and employing said second stream of air to transfer lint from said screen through said tube and into said storage chamber.

3. The method of collecting and storing lint which comprises the steps of moving a suction chamber over a row of textile machines along an endless path, drawing a first stream of air from adjacent to said machines, through a confined passage and a lint collecting screen and into said chamber, moving a second stream of air through a fixed open-ended tube and into a storage chamber, opening said passage to expose said screen as it approaches the tube end, moving the screen across the tube end in close proximity to said tube end, and employing said second stream of air to remove lint from said screen and transport the lint through said tube and into said storage chamber.

4. The method of handling lint which comprises the steps of moving a chamber and a lint collecting screen over a row of textile machines, causing a first stream of air to flow from adjacent to a floor beside said machines up through said screen and into said chamber and retaining on the lower side of said screen lint carried by the stream of air, causing a second stream of air to flow through the open end of a tube and into a second chamber on said floor near said machines, moving the screen with lint thereon across, and in close proximity to, said open end of the tube and employing said second stream of air to remove lint downwardly from said moving screen and to transport the lint through said tube and into said second chamber.

5. The method of handling lint which comprises the steps of moving a first suction chamber and lint collecting screen means over a row of textile machines, causing a first stream of air to flow from adjacent to a floor beside the machines through said screen means and into said chamber, retaining on the screen means lint carried by said stream of air, pneumatically removing lint from the screen means by moving the latter with lint thereon across and in close proximity to the open end of a tube while causing a second stream of air to flow into the open end of the tube and collecting the so removed lint by causing the second stream of air and lint carried thereby to travel through said tube and into a second chamber.

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