Aug. 7, 1956 W. F. DENNING 2,758,041

METHOD OF CLEANING FLOORS IN TEXTILE MILLS

Filed March 24, 1952 2 Sheets-Sheet 1

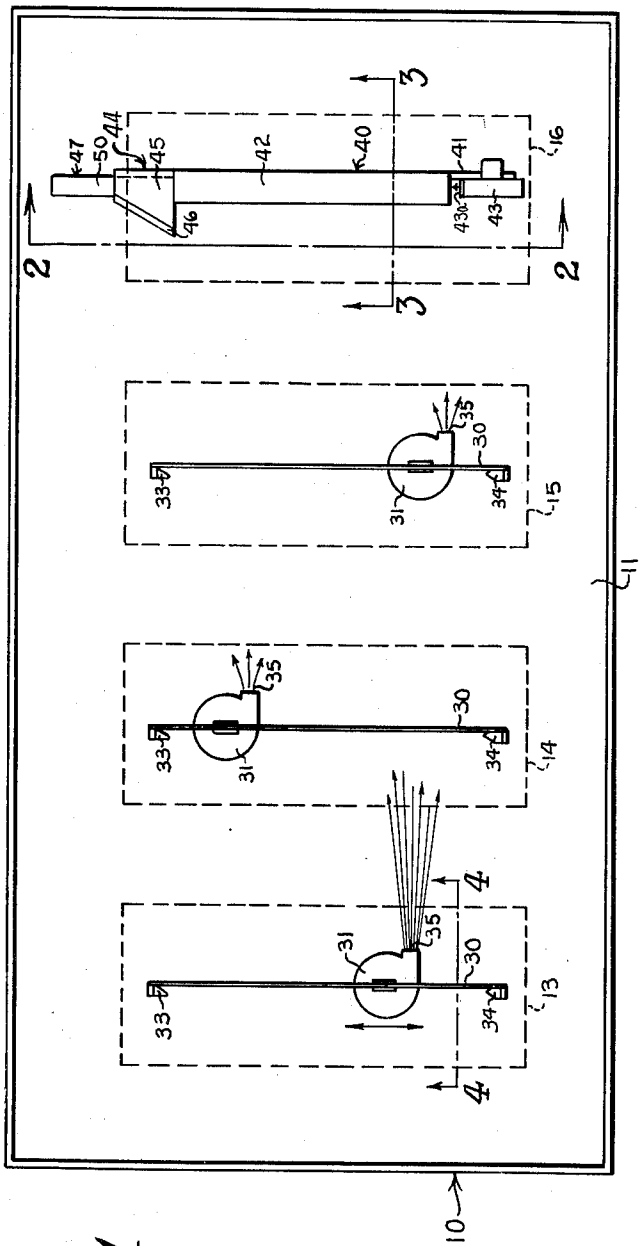


FIG-1

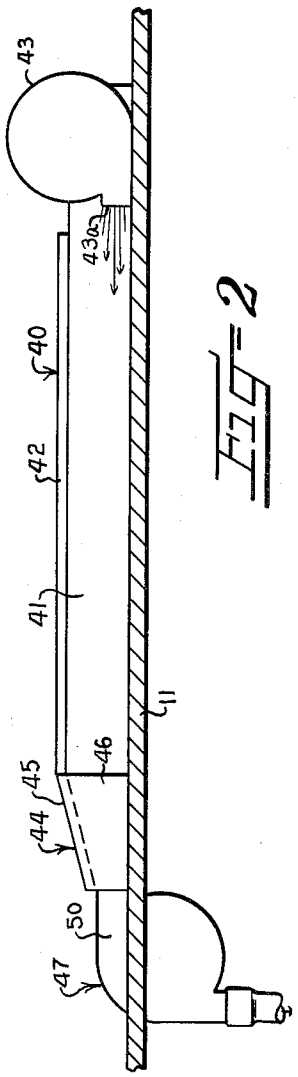


FIG-2

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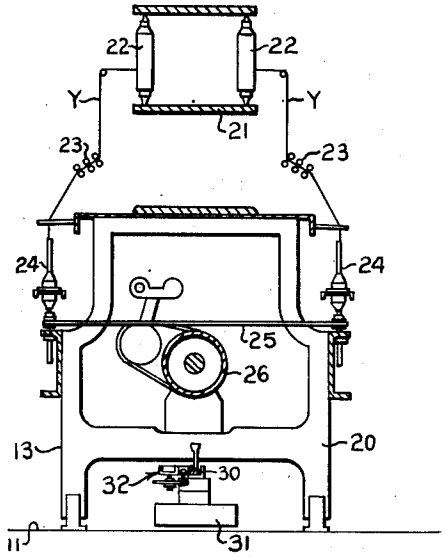


Fig. 4

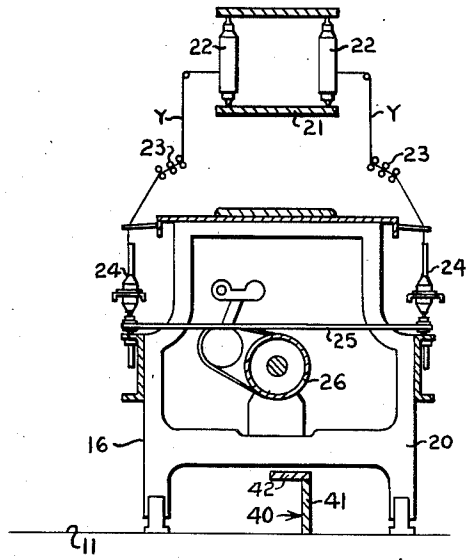


Fig. 3

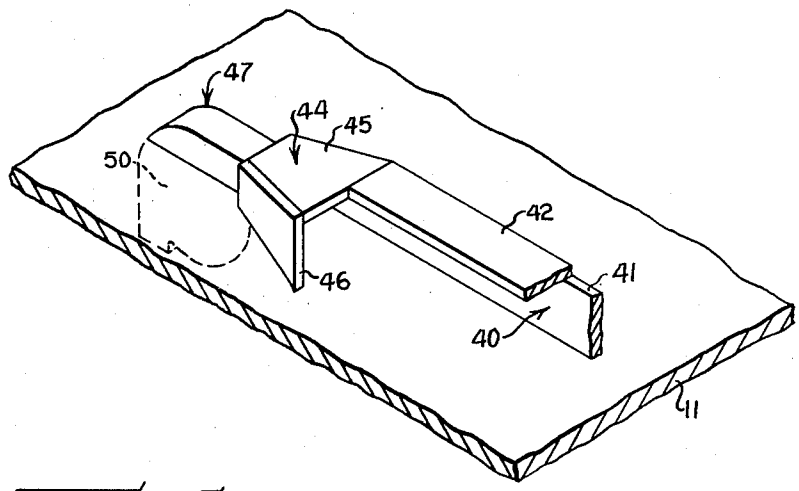


Fig. 5

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METHOD OF CLEANING FLOORS IN TEXTILE MILLS

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Application March 24, 1952, Serial No. 278,205

9 Claims. (Cl. 134—37)

This invention relates to the art of making threads or yarns from textile fibers of various types and more especially to an improved method for cleaning the floors of textile mills and the like to prevent the accumulation of short fibers, lint and any loose foreign matter from beneath rows of textile machines such as spinning frames, twister frames, winders, and other machines wherein the bottom portions thereof are not enclosed.

It is well known that the making of threads and yarns from textile fibers includes the cleaning and blending of the fibers and then drawing them out through various operations so that individual fibers tend to become parallel and to form endless, slightly twisted rope-like strands generally known as roving. This roving is formed on various types of machines including roving frames or fly frames and individual strands of yarn are also formed on spinning frames and, in many instances, several strands of the spun yarn are twisted together by the use of twisting frames.

During the forming of the roving and yarn and during the twisting and spinning operations, the short broken fibers or any insecurely retained longer fibers, known as "fly" or "lint," tend to be thrown out to float in the air and settle on various parts of the corresponding machines. However, most of the fly or lint settles on the floor beneath the machine. In some instances, means are provided to remove the accumulations of fly or lint from the various parts of the machine, but means have not been provided heretofore to remove such accumulations from beneath the machines and from the aisles between the machines with the result that it has been necessary to collect and remove the accumulated lint manually as by sweeping which requires a large expenditure for labor.

It is evident that by manually removing textile fibers and the like from beneath the textile machines, the lint and other patricles would be scattered and would then contaminate the air in the room in which the machinery was located. Moreover, the dust, lint and other particles which were removed from the machinery would ultimately settle upon the yarn and these lint particles would often result in a substantial amount of fly, lint or the like winding up in the yarn as gouts and slubs which cause weakness, breakage and loss of yarn product. Another most objectionable condition resulting from lint and the like being allowed to accumulate beneath the machines is the hazard of destructive flash fires.

It is, therefore, the primary object of this invention to provide a method of cleaning such floors embodying a simple, economically constructed and maintained means which may operate continuously to prevent accumulations of lint and other loose matter upon the floor of the room in which machines of the type described are located and, further, to dispose of the accumulations of lint and the like automatically as they are collected.

It is another object of this invention to provide an improved method of cleaning floors beneath textile machines and the aisles therebetween, wherein a plurality of machines are arranged in parallel spaced relation to each other to form a row or rows of machines, whereby particles of lint and the like which become detached from the threads or yarns passing through each of the machines and which float to the floor beneath the machines will fall into a continuously moving stream of air which moves longitudinally beneath each of the machines. Thus, the stream of air will blow the particles of lint and the like from beneath one machine across the intervening alley to the next adjacent machine and the moving stream of air beneath said next adjacent machine will blow the particles of lint to the next succeeding machines and so on. The particles of lint or the like are successively blown or moved from one machine to the other in a row of machines and the last machine in said row has means associated therewith for entrapping the accumulations of lint from all of the machines in a row and said entrapping means associated with said last machine has means for directing a stream of air longitudinally thereof to move the lint and the like to a common point from which the lint may be collected manually or directed to a suitable duct system for carrying the lint and the like to other points in the textile mill where the fibers may be reprocessed.

It is another object of this invention to provide a method of cleaning beneath textile machinery and the like which comprises the steps of producing a continuous stream of air immediately adjacent the floor beneath each of the machines, directing the streams of air in a common direction and collecting the matter carried by said streams of air.

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 plan view of a room showing an embodiment of the invention somewhat schematically and wherein the outlines of the textile machines, such as spinning frames and the like, are merely shown in broken lines;

Figure 2 is an enlarged elevation of the lint collecting means associated with the last machine in a row of machines for directing the lint and the like lengthwise of the machine along the floor to a hopper, of means for directing the accumulations of lint to other parts of the textile mill and being taken substantially along the line 2—2 in Figure 1;

Figure 3 is a schematic transverse vertical sectional view through a textile machine, such as spinning frame, with parts shown schematically, showing the improved lint entrapping means disposed therebeneath and being taken substantially along the line 3—3 in Figure 1;

Figure 4 is a schematic view similar to Figure 3 but being taken substantially along the line 4—4 in Figure 1 and which may be taken through any one of the textile machines other than the last machine in said row, and illustrating the blower supported beneath said machine;

Figure 5 is a fragmentary isometric view, with parts in section, showing the collecting means for the fibers disposed at the end of the entrapping means disposed beneath the last machine in said row of machines.

Referring to Figure 1, the numeral 10 generally designates a room of a textile mill or plant having a floor 11 on which a row of textile machines is supported, these textile machines all being substantially identical and being in the category of spinning frames, twister frames, winders and the like, that is, the machines being of the type which are often at their lower portions.

Only a single row of machines is shown in Figure 1 although it is to be understood that a number of rows of machines are usually arranged in parallel rows in the manner in which the row of machines shown in Figure

1 is arranged. The machines shown in Figure 1 are indicated at **13**, **14**, **15** and **16**, these machines being indicated by separate reference characters merely for purposes of clarity since it is evident that all of the machines **13**, **14**, **15** and **16** may be identical and a substantially greater number of machines or a lesser number of machines may be provided in each row or series of machines than that shown in Figure 1.

As is well known, each of the machines **13**, **14**, **15** and **16** includes a framework **20** having a creel **21** on the upper portion thereof which supports a plurality of spools or bobbins **22** or other means for directing yarns Y through respective series of drawing rolls **23** from whence the yarn passes downwardly and is wound about bobbins or spools **24** disposed at opposite sides of the machine. The bobbins or spools **24** are usually driven by tapes or cords **25** which pass about cylinders **26** which are driven in the usual manner.

Now, as heretofore stated, as the yarn Y passes from the source **22** to the bobbins or spools **24**, particles of lint, fly and foreign matter become detached from the yarns or threads and accumulate beneath the machine.

In order to prevent such accumulations of lint and the lie beneath the machines, I have provided a unique method of continuously moving the accumulations of lint from beneath one machine to the next adjacent machine and so on along a row of machines with entrapping means being provided beneath the last machine in said row for entrapping said accumulations of lint and the like and having means associated therewith for moving the entrapped accumulations of lint and the like longitudinally beneath the last machine in said row to a suitable hopper or other means for directing the lint to other parts of the mill.

In order to carry out the steps of this improved method, I have provided, adjacent the floor beneath the first machine **13** in each row and beneath each of the intermediate machines **14** and **15** a means for directing a continuous and moving stream of compressed air toward the last machine in said row of machines and, in this embodiment of this invention, a track **30** is suitably supported beneath each of the intermediate machines and the first machine, which track extends from one end of each machine to the other and on which a centrifugal blower **31** is mounted for longitudinal movement. Any suitable means may be provided to reciprocate the blower **31**, associated with each of the machines **13**, **14** and **15**, longitudinally along the corresponding track **30**.

The track **30** is shown in Figure 4 as depending from the framework **20** although it is to be understood that the track may be supported on the floor or in any other desired manner. Since there are various means which may be employed and supported for movement in a reciprocatory manner along each of the tracks **30** for directing a continuous stream of compressed air from one machine to and beyond the next adjacent machine, no attempt will be made to specifically describe the structure of the blower **31** which is used in this instance. However, this blower **31** and the means for effecting reciprocatory movement thereto may be of the type disclosed in my co-pending application Serial No. 278,206 filed of even date herewith and entitled Reciprocating Blower for Cleaning Mill Floors and the like, now abandoned.

Each blower **31** is of the type having a reversing mechanism thereon generally designated at **32** (Figure 4) and which is actuated by suitable cam members **33** and **34** at each end of each stroke to thus cause the blower **31** to reciprocate longitudinally on said tracks **30**. The cam members **33** and **34** may be supported in any desired manner and are preferably carried by the tracks **30**. Each of the blowers **31** has a vent or discharge opening **35** which faces towards the last machine **16** in said row of textile machines and it is preferable that the stream of compressed air emitted through each of

the vents **35** is of such force as to move the accumulations of lint or the like from beneath one machine across the alley between the machines to a point beyond the vent **35** of the fan **31** associated with the next adjacent machine.

It is also preferable, but not necessary, that the blowers **31** on adjacent machines are disposed in staggered relation to each other, that is, the blower **31** on the machine **13**, for example, should be disposed at one end of the corresponding track **30** and the blower **31** associated with the machine **14** should be disposed at the other end of the corresponding track **30** as these blowers move in opposite directions, since these blowers **31** are disposed closely adjacent the floor **11** and it is desirable that the blower **31** associated with the machine **14**, for example, is disposed out of the path of the stream of compressed air from the blower **31** associated with the textile machine **13** to thereby permit the lint and the like to be moved forwardly beyond the blowers associated with the successive machines. The tracks for the blowers **31** are preferably located substantially in alinement with the longitudinal centers of the machines **13**, **14** and **15** and will normally cause a slight negative pressure rearwardly of the blower **31** associated with the textile machine **13** to cause the fibers in back of the same to also be advanced to the next adjacent machine **14** as the blower **31** of the machine **13** reciprocates on the corresponding track **30**.

Now, the last machine **16** in said row has extending longitudinally therebeneath a lint entrapping member, element or trough **40** which is shown as being substantially inverted L-shaped in cross-section and is formed from a wall member **41** and a top horizontal member **42**, the lower edge of the wall member **41** being suitably secured to the floor **11** (Figures 1, 2 and 3). The vertical wall member **41** extends substantially beyond opposite ends of the horizontal or top wall member and one end thereof supports a suitable compressed air discharge device **43** which is shown in the form of a centrifugal blower having a vent or discharge opening **43***a* in the lower portion thereof immediately adjacent the upper surface of the floor **11** for directing the lint and the like along the floor **11** longitudinally of the machine **16**.

This lint entrapping member **40** is associated only with the last machine **16** in said row in order that the accumulations of lint and the like, which are successively advanced from one machine to the other, will ultimately be advanced against the vertical wall **41** and beneath the top wall **42** of the entrapping member **40**. Thus, all of the lint and other matter beneath the entire row of machines will ultimately be directed to the entrapping member **40** and the blower **43** will then cause the accumulations of lint and the like directed against the entrapping member **40** to be blown therealong through a substantially funnel-shaped duct **44** which includes a top wall **45** and a side wall **46**, the side wall opposite from the side wall **46** being formed by the corresponding portion of the wall member **41** extending beyond the top member **42**.

If so desired, the substantially funnel-shaped duct **44** may be closed at its outer end and the top wall **46** may be removable to facilitate removing the accumulations of lint and the like from the funnel-shaped duct **44** periodically. In the latter instance, the duct **44** would be utilized as a hopper or a common container for the accumulations of lint and the like from all of the machines in each row. However, it is preferable that the outer end of the funnel-shaped duct **44** is open and communicating with this open outer end of the funnel **44** is a suitable ductwork generally designated at **47** which may have suitable suction means **50** associated therewith for withdrawing the fibers from the funnel-shaped duct **44** and to direct the same to other parts of the mill for further processing or as otherwise desired.

The blower **43** and the suction means **50** are merely

shown schematically in Figures 1 and 2 since it is evident that many different types of blowers and suction means may be employed or it may be desirable to merely place a nozzle connected to a source of compressed air in the position occupied by the blower 43 which would serve to blow the accumulations of lint and the like along the lint entrapping member 40 and into the funnel-shaped duct 44.

It is thus seen that I have provided a unique method of cleaning and maintaining clean the floors of textile mills and, particularly, the areas beneath rows of spaced parallel textile machines. This method results in a considerable saving in the cost of maintaining clean floors in textile mills since it is possible to largely eliminate manual sweeping. Also the amount of lint that may be suspended in the air to subsequently settle on the various operating parts of the machines and the yarns or roving processed thereby is greatly minimized.

It should be noted that in large installations, it may be desirable to place a lint entrapping member 40 in association with one or more machines intermediate the ends of each row of machines.

In the drawings and specification, there has been set forth a preferred embodiment 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. A method of sweeping the floor of a room having a plurality of textile machines therein which comprises producing streams of air of sufficient force to sweep the floor between and beneath said machines, directing the streams of air across the floor in one direction to sweep between and beneath said machines while moving said air streams transversely of said one direction in a predetermined path of travel to sweep lint and the like across the floor, and collecting the lint and the like swept by the streams of air.

2. A method of sweeping the floor of a room having a plurality of textile machines therein which comprises producing at least one moving stream of air of sufficient force to sweep the floor between and beneath said machines, moving the stream of air in a predetermined path of travel parallel to said machines while directing the stream of air across the floor laterally of said machine to sweep the floor between and beneath said machines, automatically reversing the path of travel of said air stream at the end of said predetermined path of travel, and collecting the material swept by the stream of air.

3. A method of sweeping the floor of a room having a plurality of textile machines therein which comprises producing streams of air of sufficient force to sweep the floor between and beneath said machines, directing the streams of air across the floor in one direction transverse to said machines to sweep between and beneath said machines while moving said air streams in a predetermined path of travel longitudinally of said machines to sweep lint and the like on the floor to a common point, and collecting the lint and the like carried by said moving streams of air at said common point.

4. A method of removing accumulations of lint and the like from between and beneath a row of spaced, parallel textile machines which comprises producing streams of air having sufficient force to sweep beneath and between said parallel machines, directing all the streams of air in a common direction laterally of the textile machines across the floor while moving said air streams longitudinally of said textile machines in a predetermined path of travel to sweep lint and the like on the floor from beneath and between the textile machines to a common point to one side of said row of machines, and collecting lint and the like at said point.

5. A method of removing accumulations of lint and the like from beneath and between a row of spaced, parallel textile machines in a room which comprises the steps of moving blowers producing streams of air in a predetermined path of travel longitudinally of said textile machines, directing the discharge opening of the blowers laterally of the textile machines while discharging air therefrom along the floor with enough force to sweep beneath and between said machines to sweep lint and the like to a common point, and collecting the lint and the like at said common point.

6. A method of sweeping the floor of a room having a plurality of spaced parallel textile machines therein which comprises producing moving streams of air to operate in a path of travel parallel to said machines, directing all the streams of air laterally of said machines to sweep the floor between and beneath said machines while moving said air streams in said predetermined path of travel to sweep lint and the like across the floor, and collecting the lint and the like carried by the streams of air.

7. A method of sweeping the floor of a room having a plurality of spaced parallel textile machines therein which comprises producing moving streams of air to operate in a predetermined path of travel longitudinally of said machines, directing the streams of air laterally of said machines while moving said air streams longitudinally of said machines in said predetermined path of travel to sweep lint and the like across the floor between and beneath said machines, and collecting the lint and the like at a common point.

8. A method of sweeping the floor of a room having a plurality of spaced textile machines therein which comprises producing at least one moving stream of air to operate in a predetermined path of travel parallel to said machines to sweep the floor between and beneath adjacent machines, directing the stream of air laterally of said machines while moving said air stream parallel to said machines and in said predetermined path of travel to sweep lint and the like across the floor, and collecting the lint and the like carried by the air stream.

9. A method of cleaning the floor of a room having a plurality of textile machines therein which comprises producing a moving stream of air adjacent each of said machines, directing the streams of air across the floor laterally of said machines, producing a moving stream of air at the side of the room toward which the first-named streams of air are directed, directing said last-named stream of air in a direction at an angle to the direction of said first-named streams of air, and collecting the matter carried by all of said streams of air at the end of the last-named stream of air.

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