Dec. 5, 1961 G. B. HOLTZCLAW 3,011,925

METHOD OF CLEANING FLOORS IN TEXTILE MILLS

Filed Aug. 28, 1958 3 Sheets-Sheet 1

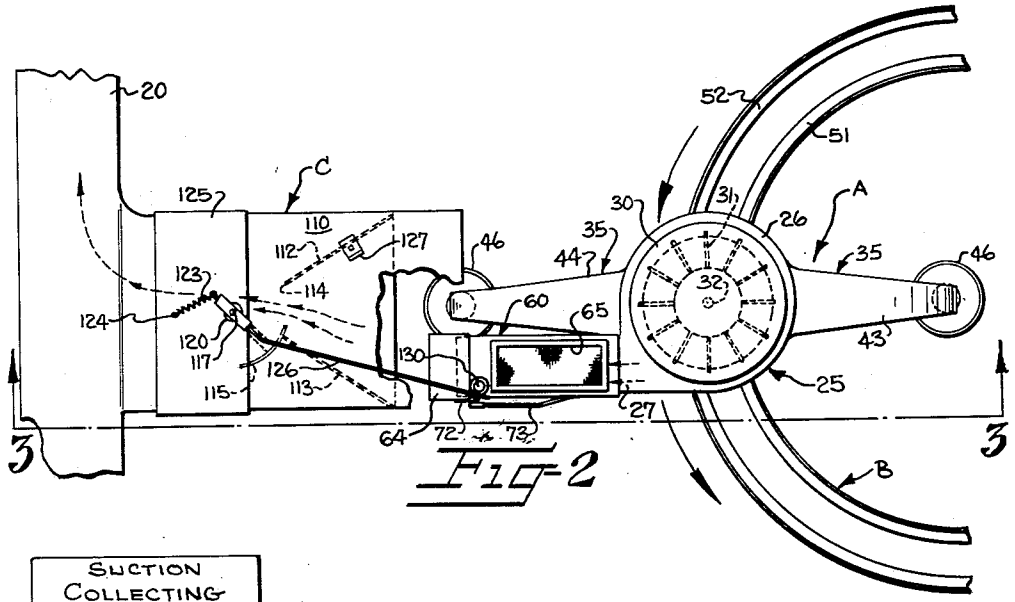

Fig-2

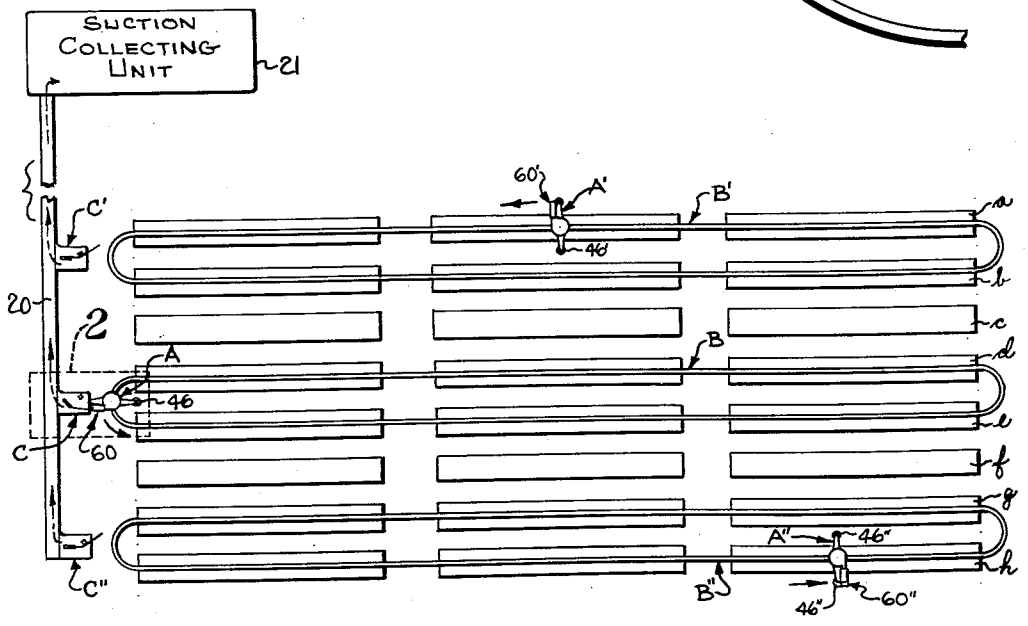

Fig-1

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METHOD OF CLEANING FLOORS IN TEXTILE MILLS

Filed Aug. 28, 1958 3 Sheets-Sheet 2

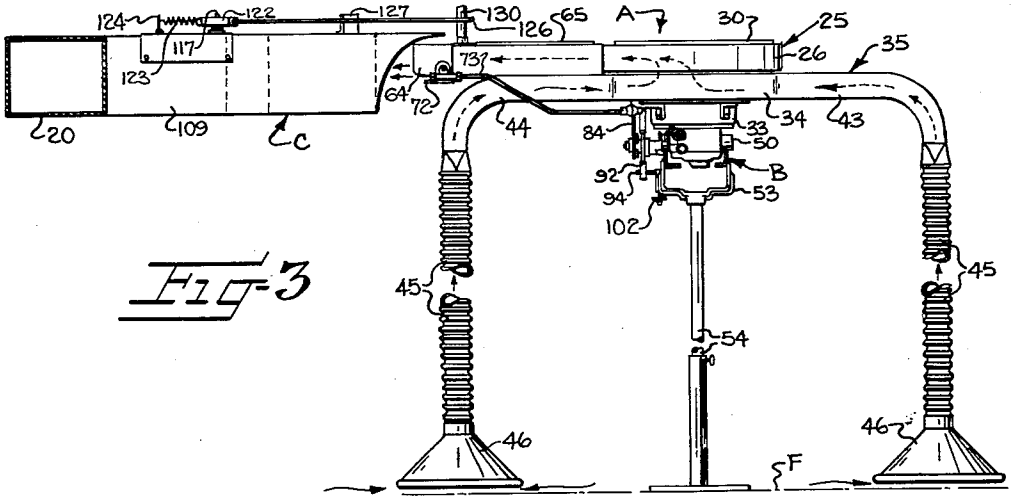

Fig-3

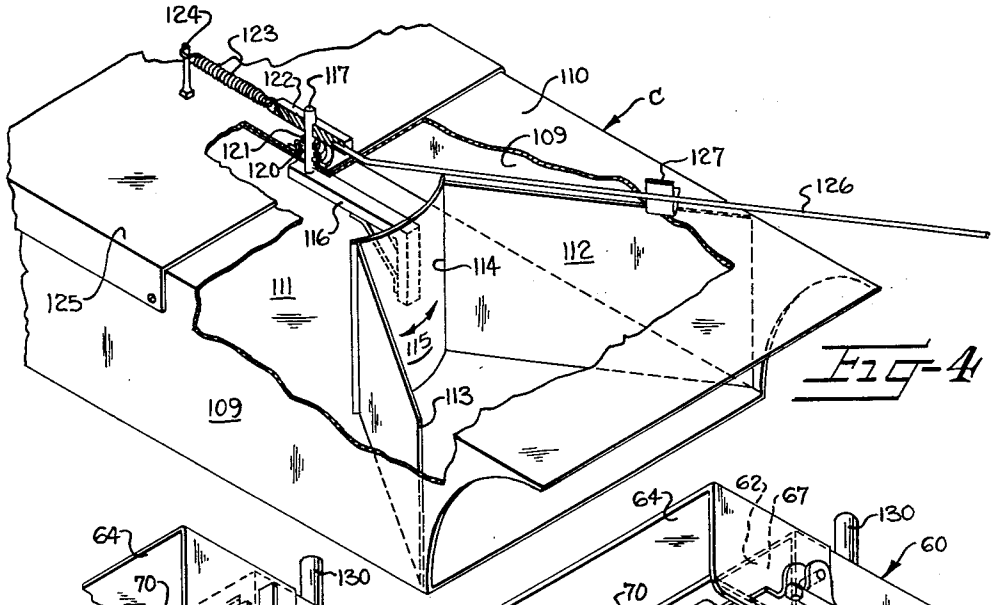

Fig-4

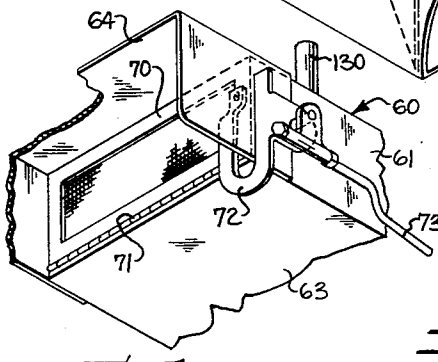

Fig-5

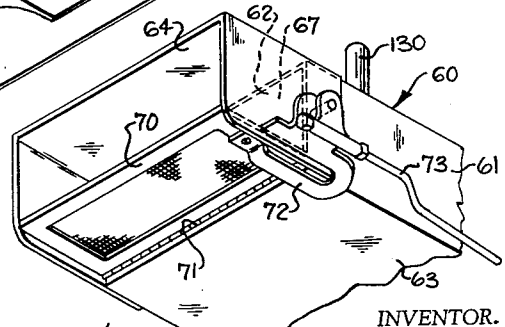

Fig-6

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METHOD OF CLEANING FLOORS IN TEXTILE MILLS

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Fig-7

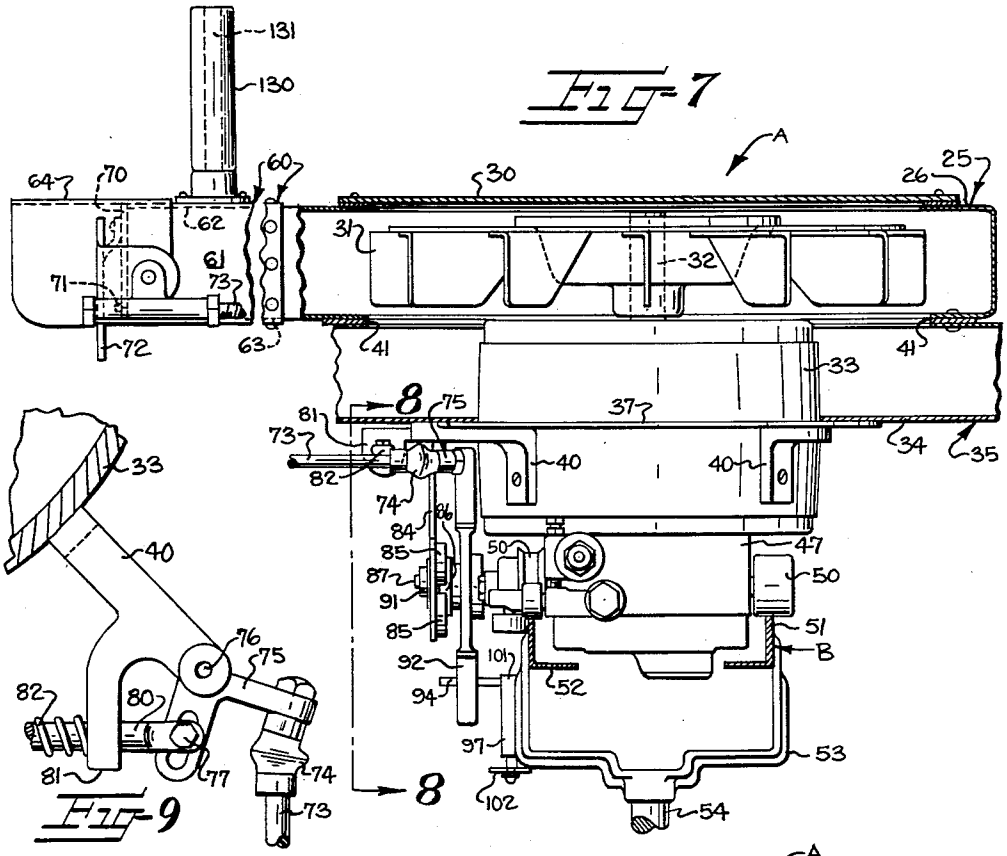

Fig-9

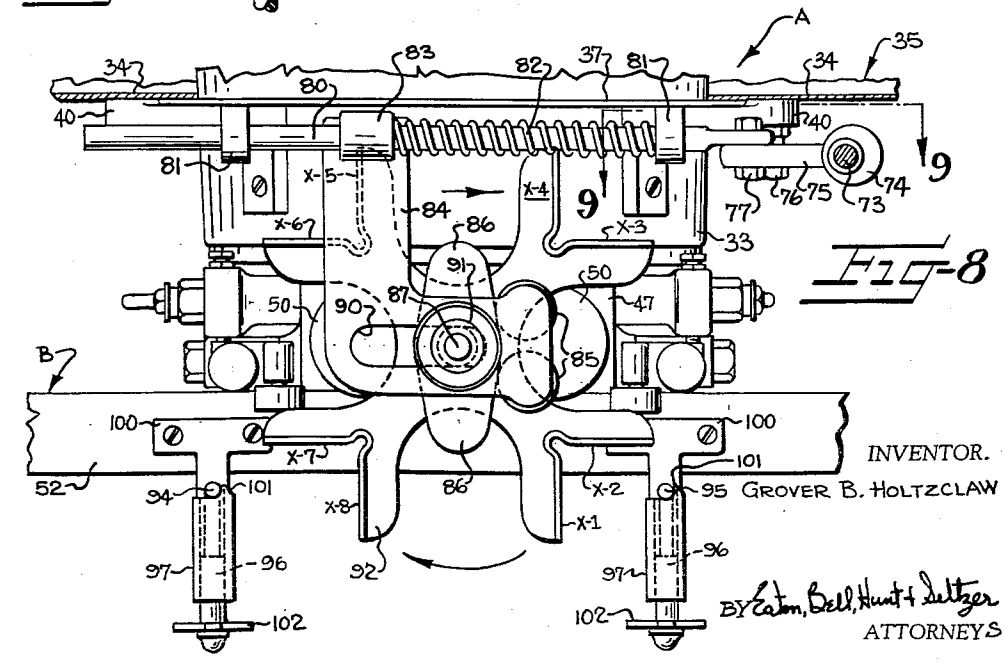

Fig-8

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United States Patent Office 3,011,925 Patented Dec. 5, 1961

3,011,925
METHOD OF CLEANING FLOORS IN TEXTILE MILLS

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Filed Aug. 28, 1958, Ser. No. 757,809
18 Claims. (Cl. 134—21)

This invention relates to a novel method for removing lint, dust and other light foreign matter from the floors of textile mills.

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. Such machines include pickers, carding machines, drawing frames, roving frames, spinning frames, twister frames, winders, knitting machines and looms. As the textile fibers are processed on these and other types of machines, short broken fibers or any insecurely retained longer fibers tend to be thrown out to float in the air as "fly" and settle, as "lint," on various parts of the related machines, on the floor, under the machines, in the aisles between adjacent machines, and on other objects or surfaces in the room.

It has become common practice to provide some type of blower means in association with certain of such machines, or a traveling blower means which would traverse rows of such machines for directing blasts of air against various parts of the machines for removing accumulations of lint, dust and the like from such various parts of the machines so that such material would settle to the floor. There has always been a problem in sweeping mill floors or otherwise collecting fibers which have settled thereon.

Various methods have been employed heretofore involving devices to move accumulations of lint and the like along the floor and between the machines, such devices having included means for directing blasts of air against the floor or beneath the machines and toward a central location. While many of the prior devices have performed well in some respects, blasts of air directed against or along the floor in the aisles between the machines have, in many cases, resulted in scattering lint and other fine particles so that many such particles would again settle upon the machines or textile material being processed to detrimentally affect the quality of the yarns or other products in process of manufacture. Even when moved to a central location, the problem of removing the collected lint still remained.

Methods employing portable suction means for removing lint and the like from floors have been proposed heretofore. An example of such portable suction means is disclosed in U.S. Patent No. 2,586,145, granted to G. W. Breuer et al. on February 19, 1952. This and other prior suction means for sweeping floors have proved largely impractical for use in textile mills. They are not fully automatic and considerable hand labor is required in connection with their use. To my knowledge, there has never, heretofore, been a satisfactory method of cleaning the floors of a textile mill automatically.

Many attempts have been made to overcome the problem created by the accumulations of lint upon surfaces of textile machines and upon room surfaces, in which automatic air suction devices have been used to remove lint as it is shed or to remove it from machine surfaces where it may alight shortly after being shed. To my knowledge, the nearest approach to a practical means for automatically removing lint from the atmosphere adjacent the machines by a traveling unit is disclosed in U.S. Patent No. 1,892,751, granted to W. J. Smith on January 3, 1933. As far as I know, this device was never used

commercially. For well known reasons, the use of suction for cleaning surfaces may be satisfactory only when the nozzle or nozzles reach close to the surfaces to be cleaned.

As far as I know, no previous attempt has been made to lessen the lint problem in textile mills by the use of one or more traveling units, each of which draws lint from the air into a container as the unit travels and delivers its collected lint periodically into a common preferably stationary receptacle. It is therefore an object of this invention to provide a novel method of cleaning the floors adjacent and between textile and analogous machines which comprises creating a suction current closely adjacent the floor in the aisle between adjacent machines, or along beside a row of machines, and in a direction away from the floor while moving the suction current along such aisle for sucking lint and other light particles of foreign matter off of the floor, directing the suction current and the lint and other particles picked up thereby into a collecting chamber movable with the suction current, and intermittently exhausting the lint and other particles from the chamber into a common receptacle.

It is another object of this invention to provide a method of cleaning floors in a room having a plurality of rows of textile machines therein which includes producing a suction current adjacent the floor while moving the current longitudinally of and between adjacent rows of machines, sucking the lint upwardly and collecting the same in a chamber movable with the suction current and above the corresponding row of machines, converting the suction current into a blowing or positive air pressure current and periodically utilizing the air pressure current for exhausting the contents of the chamber therefrom.

Still another object of this invention is to provide a method of the character described including the further steps of sucking the lint exhausted from the chamber to a common point or container remote from the point or points at which the contents of the chamber are exhausted therefrom.

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 schematic plan view showing a preferred embodiment of means for carrying out the steps of the present method, which embodiment is employed in combination with a plurality of rows of textile machines, and showing the final suction and collecting unit;

FIGURE 2 is an enlarged plan view of the area identified by the numeral 2 in FIGURE 1, showing the apparatus, as embodied in a traveling cleaner, in registration with the inlet of a stationary collection receptacle with the door means of the traveling collection chamber and the receptacle in opened position;

FIGURE 3 is an elevation taken substantially along line 3——3 in FIGURE 2, being partially in section and with portions of the suction tubes and support for the trackway broken away;

FIGURE 4 is an enlarged fragmentary isometric view, with parts broken away, showing one of the stationary collection receptacles with the door thereof occupying closed position;

FIGURES 5 and 6 are fragmentary isometric views of the discharge end of the traveling collection chamber showing the door in closed and opened positions, respectively;

FIGURE 7 is an enlarged fragmentary elevation of the upper portion of the traveling cleaner shown in FIGURE 3, with portions broken away and in section and showing the door of the traveling collection chamber in closed position;

FIGURE 8 is a fragmentary elevation taken substantially along line 8—8 in FIGURE 7 and showing the means for operating the door of the traveling collection chamber in position for holding the door open;

FIGURE 9 is a fragmentary plan view taken substantially along line 9—9 in FIGURE 8.

Referring to FIGURE 1, a layout of several rows of textile machines is shown and several traveling suction cleaners particularly devised for carrying out the present method are shown in association therewith. This layout is typical of an arrangement of textile machinery, such as spinning and twisting machines, in a room of a textile mill. There are eight rows of longitudinally extending spinning frames or other textile machines shown in FIGURE 1 which are respectively designated at *a* through *h*. Although the manner in which the present cleaning system is installed may be varied, in this instance three of the traveling suction cleaners are shown in association with the eight rows of machines, which cleaners are respecitvely broadly designated at A, A′ and A″. These three traveling cleaners are mounted on respective sets of endless trackways B, B′ and B″ which are spaced above the respective pairs of rows of machines *d, e*; *a, b*, and *g, h*, there being no trackways required above the rows *c* and *f*, as will be explained hereinafter.

Hollow or tubular preferably stationary waste receptacles C, C′ and C″ are located adjacent the respective trackways B, B′ and B″. In this instance, the stationary waste receptacles C, C′ and C″ are positioned adjacent corresponding looped end portions of the respective trackways B, B′ and B″, and the corresponding ends of the stationary waste receptacles communicate with a duct **20** suitably supported adjacent the rows of machines *a–h*. The duct **20** extends to a suitable waste collecting station **21** shown schematically as a suction collecting unit in FIGURE 1.

Since the traveling cleaners A, A′ and A″, the respective trackways B, B′ and B″ and the respective stationary waste receptacles C, C′ and C″ may be identical, only the traveling cleaner A, its trackway B and the stationary waste receptacle C will be described in detail and, where applicable, the traveling cleaners A′ and A″ and associated elements will bear the same reference characters.

As best shown in FIGURES 2, 3 and 7, the suction traveling cleaner A comprises air circulating means including a centrifugal blower in the form of a volute upper blower casing **25** having a substantially circular body **26** with which an off-set outlet portion **27** communicates. The upper end of the blower casing **25** is closed, preferably by a removable cover or plate **30**, which may be removed for cleaning the interior of the blower casing **25** and an impeller wheel **31** therein. The impeller wheel **31** is fixed on the shaft **32** of an electric motor **33**. The motor **33** rides upon a carriage **47** of the suction cleaner A.

The blower casing **25** rests upon and is suitably secured to a substantially circular central portion **34** of a suction casing broadly designated at **35**, the lower wall of the central portion **34** being suitably secured to a flange or ring **37** encircling the enlarged upper portion of electric motor **33**. The flange **37** is suitably secured to electric motor **33** by any suitable means, such as brackets **40**. It will be observed in FIGURE 7 that the proximal walls of blower casing **25** and suction casing **35** are cut away to provide an air inlet opening **41** through which air is drawn by impeller wheel **31** to be discharged through outlet portion **27** (FIGURE 2) of blower casing **25**.

As best shown in FIGURE 3, the substantially circular medial portion **34** of the suction casing **35** is provided with a pair of diametrically opposed, radially and outwardly extending spouts or ducts **43, 44** (see also FIGURE 2) which communicates with the central portion **34** of suction housing **35** and each of which curves downwardly at its free end. The free end of each of the ducts **43, 44** has a tube **45**, preferably of pliable or flexible construction, communicatively connected thereto and depending therefrom, to the lower end of which a flared or substantially bell-shaped nozzle **46** is communicatively connected. It will be noted that the lower end of each nozzle **46** is disposed in close proximity to the floor F on which the machines of FIGURE 1 are located.

The carriage **47** (FIGURES 3, 7 and 8) has suitable carriage rollers or wheels **50** journaled thereon which ride upon tracks **51, 52**. The tracks **51, 52** comprise the trackway B and are supported by suitable U-shaped brackets **53** mounted on posts **54**, only one of each of which is shown in FIGURES 3 and 7. The electric motor **33** drives shaft **32** for rotating the impeller wheel **31**, and one or more of the carriage rollers or wheels **50** for imparting traversing movement to the traveling cleaner along the trackway B. The means for effecting energization of the electric motor may be of conventional or other construction, substantially as disclosed in U.S. Patent No. 2,011,763, granted to W. B. Hodge et al. on August 20, 1935.

As the traveling cleaner A moves along the trackway B, the impeller wheel **31** creates a continuous suction current at each nozzle **46** which causes lint and other light particles upon the floor F to be drawn into each nozzle **46**, through the respective tube **45**, into ducts **43** or **44** and into the central portion **34** of suction casing **35**. The suction current then passes upwardly through opening **41** (FIGURE 7), through the volute blower casing **25** and is blown outwardly through outlet portion **27** of volute blower casing **25**.

Since each suction tube **45** (FIGURE 3) is flexible or pliable, it is subject to considerable swaying under influence of chance air currents in the aisles through which it passes, centrifugal effect when going around a track bend, or slight variation in the relative height of the two tracks **51, 52**, which variation may be purposely introduced when the tracks are installed. For one or more of these reasons, movement of the traveling suction cleaner A along trackway B is usually accompanied by a variable side-sway of each tube **45** and nozzle **46**, with the result that, on repeated trips, the nozzle removes lint and other light particles substantially throughout the entire width of the usual aisle and even to some extent from beneath the machines. It is contemplated that mechanical means may be employed to produce oscillatory transverse movement of each suction nozzle **46** as it tranvels longitudinally of a corresponding aisle.

Communicatively connected to the outlet portion **27** of blower casing **25** is a box-like traveling collection chamber or confined collection zone broadly designated at **60** and comprising opposed side walls **61**, a top wall **62** and a bottom wall **63**. An inverted substantially U-shaped hood **64** is suitably secured to and extends outwardly from side walls **61** and top wall **62** of collection chamber **60**.

The top wall **62** is suitably perforated or provided with a foraminated or screened opening **65** through which air escapes from the collection chamber **60** leaving behind the fibers and other particles directed into the collection chamber **60**. Referring to FIGURE 6, the free end of collection chamber **60** is provided with a discharge opening **67** which is normally substantially closed by a screened or foraminated door or cover **70** pivotally or hingedly connected, as at **71**, to bottom wall **63** of collection chamber **60**.

When door **70** occupies closed position, as in FIGURE 5, some air is exhausted through door **70** while lint and other particles are retained within collection chamber **60**. When door **70** occupies open position, as in FIGURE 6,

the lint and other matter is discharged from collection chamber 60 through discharge opening 67 by the force of the air stream.

Means are provided for momentarily opening door 70 of collection chamber 60 so the contents of collection chamber 60 are discharged into the stationary waste receptacle C to be presently described. A preferred means for controlling the operation of door 70 is best shown in FIGURES 3, 5, 6, 7, 8 and 9 wherein it will be observed that one side portion of door 70 has one leg of a bracket 72 suitably secured thereto, this bracket preferably being substantially U-shaped so as to clear the corresponding side portions of hood 64. The other leg of bracket 72 has one end of a link 73 pivotally connected thereto above the level at which door 70 is hingedly connected to the lower wall 63 of traveling collection chamber 60. Link 73 extends inwardly toward the trackway B and has a universal joint or connector 74 thereon for connecting the same to one arm of a bell crank 75 (FIGURE 9).

Bell crank 75 is pivotally mounted, as at 76, on one of the brackets 40 and the other arm thereof is pivotally connected by a slot-and-pin connection, as at 77, to one end of a plunger or shifter rod 80. Shifter rod 80 is guided for horizontal sliding movement, substantially parallel to the trackway B, in guide blocks 81 suitably secured to or formed integral with respective brackets 40.

Shifter rod 80 is encircled by a compression spring 82, one end of which bears against the right-hand or front bearing block 81 and the other end of which bears against a cuff member 83 fixed on the shaft or shifter rod 80. The cuff 83 is attached to or formed integral with the vertical leg of a substantially L-shaped follower arm 84 whose lower horizontal portion has a pair of cam followers or rollers 85 thereon. The cam followers 85 are urged against the periphery of a substantially symmetrical and elliptical cam 86 loosely mounted on a stub shaft 87 projecting outwardly from carriage 47. It will be observed in FIGURE 8 that the lower portion of the follower arm 84 is provided with a substantially horizontal slot 90 therein which is penetrated by shaft 87 for guiding the follower arm 84 to maintain the same in the desired attitude relative to the shifter rod 80. The arm 84 is retained on the shaft 87 by a suitable collar 91 fixed on the reduced free end of the shaft 87.

The cam 86 is formed integral with or suitably secured to a rotatable actuating member or star wheel 92 which is also rotatably mounted on the shaft 87. The star wheel 92 is provided with a plurality of circularly arranged eccentric arms or abutments X–1 through X–8. The arms or abutments X–1, X–3, X–5 and X–7 are adapted to engage adjustable trip fingers 94, 95 carried by the track 52 of trackway B. The arms X–2, X–4, X–6 and X–8 are not necessarily used in this particular instance, but are provided so that the star wheel 92 may be used with either side thereof facing outwardly relative to motor 33 and depending upon the direction of movement of the traveling cleaner unit along trackway B.

In this instance, the trip fingers 94 and 95 are positioned in spaced relationship substantially opposite the corresponding stationary waste receptacle C so as to cause the door 70 (FIGURES 5 and 6) to open and then close as the traveling cleaner A moves past the respective stationary waste receptacle C, in a manner to be later described. Each of the trip fingers 94 and 95 has a downwardly extending stem 96 thereon which is guided within a fixed tubular lower portion 97 of a bracket 100 suitably secured to and depending from the track 52 of the trackway B. The upper end of the tubular portion 97 is provided with a stop 101 thereon against which the corresponding trip finger may be turned by manipulation of a handle or hand wheel 102 provided on the lower end of the stem 96, below the level of the corresponding tubular portion 97.

It is apparent that, when either or both of the trip fingers 94, 95 need not be used, they may be turned, by manipulation of the corresponding hand wheel 102, so as to extend parallel to the track 52 and out of the path of travel of the star wheel 92. On the other hand, when the trip fingers 94 and 95 are turned outwardly as shown in FIGURES 7 and 8, the stops 101 on the upper ends of the tubular portions 97 cause the respective trip fingers 94 and 95 to remain stationary as the corresponding arms of the star wheel 92 engage the same.

In operation, when the carriage 47 of traveling cleaner A has moved from left to right, as in FIGURE 8, it is apparent that arm X–7 is the last to have engaged trip finger 94.

As arm X–7 engages trip finger 94, with movement of traveling cleaner A from left to right, trip finger 94 causes star wheel 92 to rotate one-fourth of a revolution so it occupies the position shown in FIGURE 8. In so doing, the corresponding lobe or high point of cam 86 moves out of engagement with followers or rollers 85 on the follower arm 84, permitting spring 82 to expand to the left.

Thus, bell crank 75 (FIGURE 9) is rotated in a clockwise direction to occupy the position shown and causes link 73 to move outwardly relative to traveling cleaner A and trackway B. As link 73 is thus moved outwardly, door 70 is pivoted about hinge 71 from the closed position shown in FIGURE 5 to the open position shown in FIGURE 6. Thus, while the cleaner A occupies the position shown in FIGURE 8, blower 25 causes the contents of traveling collection chamber 60 to be discharged into the stationary waste receptacle C. At the same time, means may be provided, as hereinafter described, for causing the collected material to be conveyed to a central unit 21.

It is apparent that, with further left-to-right movement of the cleaner in FIGURE 8, the arm X–1 engages the second trip finger 95 which again effects a quarter-revolution to the star wheel 92 and cam 86 in a clockwise direction. This latter movement of the star wheel 92 moves the corresponding high surface or lobe of cam 86 into engagement with and between the rollers or cam followers 85 to cause follower arm 84 and shifter shaft 80 to move from left to right and thereby impart an inward movement to link 73 and move door 70 from the open position of FIGURE 6 to the closed position of FIGURE 5.

As heretofore stated, the stationary waste receptacle C is in the form of a substantially rectangular tube or duct although it need not be limited to this construction. The stationary waste receptacle C comprises opposed side walls 109 (FIGURE 4), a top wall 110 and a bottom wall 111, which are suitably attached to duct 20 (FIGURES 1 and 2) to provide communication between the duct 20 and the stationary receptacle C. Top wall 110 preferably projects beyond the vertical plane of bottom wall 111, as shown in FIGURES 2, 3 and 4, so as to assist in deflecting downwardly any lint or the like which may be blown upwardly during opening and closing movements of the door 70 of traveling collection chamber 60.

It will be observed in FIGURE 4 that, although the free end of the stationary waste receptacle C is open, the outer ends of a pair of inwardly converging panels or baffle plates 112, 113 are connected to side walls 109 adjacent the free edge of the lower or bottom wall 111. The inner ends of panels 112, 113 are spaced apart (FIGURE 2) to provide an ingress or waste-receiving opening 114 within the stationary waste receptacle C. A closure means or door 115, which is preferably made from sheet metal and has an arcuate outer surface thereon, normally closes ingress opening 114, but is moved to open position (FIGURE 2) as the respective traveling collection chamber 60 moves into registration with the outer end of the stationary waste receptacle C.

As best shown in FIGURES 2 and 4, the door or closure member 115 is attached to a substantially L-shaped arm 116 which extends toward duct 20, within the receptacle C, and is pivotally connected to upper wall 110. To this

end, the inner end of arm **116** is fixed on the lower end of a pivot shaft **117** journaled in a bearing **120** carried by the top wall **110** of receptacle C. Pivot shaft **117** extends upwardly through bearing **120** and has a collar **121** fixed thereon and bearing against the upper surface of bearing **120** for supporting pivot shaft **117**, arm **116** and door **115**. The upper portion of pivot shaft **117** has a bar **122** fixed thereon or formed integral therewith, to the inner end of which a tension spring **123** is connected. The other end of tension spring **123** is connected to a suitable spring anchor **124** carried by the top wall **110** of receptacle C. Top wall **110** is preferably reinforced, as at **125**.

The outer end of bar **122** has one end of a control arm or finger **126** attached thereto, which control arm extends outwardly and then extends at an angle and is normally substantially alined with the angularly arranged panel **112**, but overlies and extends outwardly beyond upper wall **110** of stationary waste receptacle C. The tension spring **123** normally tends to maintain bar **122** in alinement between pivot shaft **117** and spring anchor **124** and, in so doing, spring **123** normally maintains control arm **126** against a stop **127**, shown in the form of an angle clip, suitably secured to and projecting upwardly from the top wall **110**. Thus, spring **123** normally urges door **115** to closed position.

It will be observed in FIGURES 2, 3 and 7 that the upper wall **62** of traveling collection chamber **60** is provided with an abutment **130** which, with movement of traveling cleaner A, engages and imparts movement to control arm **126**. In so doing, control arm **126** moves from the position of FIGURE 4 to that of FIGURE 2, somewhat in advance of movement of the traveling collection chamber **60** past the free end of the stationary waste receptacle C, to thus open door **115** so the contents of traveling collection chamber C, discharged into the open outer portion of stationary waste receptacle C, are sucked through opening **114** and pass through receptacle C into the duct **20** and, thence, to the suction collection unit or collection station **21** in FIGURE 1.

With further forward movement of the corresponding traveling cleaner A, abutment **130**, carried by traveling collection chamber **60**, moves out of engagement with and beyond the free end of control arm **126**. Spring **123** then returns door **115** to closed position as shown in FIGURE 4. It will be noted that abutment **130** is shown in the form of a sleeve or roller journaled on a post **131** whose enlarged lower portion is suitably secured to the upper wall **62** of traveling collection chamber **60**.

It will be observed in FIGURE 1 that the traveling cleaners A, A′ and A″ are shown in relatively staggered relationship so that ordinarily only one of them at a time occupies dumping position adjacent its corresponding stationary waste receptacle. This is desirable so that a maximum amount of negative pressure may be present without using an unnecessarily large and expensive motor and blower equipment for creating suction at the station **21**.

It is apparent, by referring to FIGURE 1, that the suction nozzles **46** (FIGURE 2 and 3) pass immediately above the floor F adjacent opposite sides of the machines in the rows *a*, *b*, *d*, *e*, *g* and *h*. Thus, the nozzles **46** associated with each of the traveling cleaners A, A′ and A″ form separate zones of suction currents at the floor F which zones move longitudinally of the aisles between adjacent rows of machines, the separate zones of suction currents drawing the lint and other light particles from the floor and conveying them to collection chambers **60** which move with the respective suction zones for temporarily collecting and retaining the lint and other light particles attracted by the suction zones. Periodically or with each cycle in movement of the suction zones longitudinally of and between adjacent rows of machines, the lint and other particles, which have been collected and moved with the suction zones, are automatically transferred to a second suction apparatus, embodied in the corresponding stationary waste receptacles C, C′ and C″, and thus conveyed to a common collection station.

It will be noted that, although in the arrangement of FIGURE 1, there are no trackways above the rows of machines *c* and *f*, the aisle between the rows *b* and *c* is swept by the traveling cleaner A′ as it moves from left to right in FIGURE 1; the aisle between the rows of machines *c* and *d* is swept by the traveling cleaner A with movement thereof from right to left in FIGURE 1, the aisle between the rows of machines *e* and *f* is swept by the traveling cleaner A as it moves from left to right in FIGURE 1, and the aisle between the rows of machines *f* and *g* is swept by the traveling cleaner A′ as it moves from right to left in FIGURE 1.

Although the trackways B, B′ and B″ each extends above two rows of machines, one or more trackways may be arranged so that each such trackway extends above only one of several rows of machines, depending upon the length of the rows and the capacity of the individual traveling collection chambers **60**. It is also contemplated that the blower **25** of each suction floor cleaner may be positioned beneath the corresponding suction casing **35** so the lint, dust and other particles attracted by the suction nozzles **46** then flow downwardly through the central portion **34** of the suction casing **35**, into the blower casing **25** and, thence, into the collection chamber **60**, all without departing from the spirit of the invention. The traveling suction cleaner A is constructed in the manner illustrated and described in order to minimize the height of that portion of the apparatus disposed above the trackway B and to simplify the construction of the apparatus.

As heretofore stated, it has become common practice in most textile mills to use traveling blowers which direct blasts of air against and beneath machines to prevent accumulations of lint thereon. The present apparatus may be economically installed in such mills, since the trackways already in the mills may be utilized for this purpose.

Although the apparatus for carrying out the present method is illustrated in the annexed drawings as being equipped with a single suction nozzle **46** for traversing each aisle, it is contemplated that several such nozzles may be used which may depend from a common duct extending from the central portion of the suction casing or from independent ducts extending from the central portion of the suction casing. Also, the traveling suction cleaner may be equipped with a nozzle or nozzles which traverse the aisle along only one side of a row of machines, as may be desirable in removing lint from the floor in aisles between rows of looms.

It is also contemplated that, in some cases, the method of cleaning floors as described herein may be combined with other methods in which lint is blown or sucked from machine surfaces and/or from other room surfaces.

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 arranged in rows therein which comprises producing a suction stream of air adjacent the floor and of sufficient force to suck lint and other particles upwardly from the floor and to a level above the machines, moving said suction stream of air in a generally transverse oscillatory manner as well as longitudinally of and between adjacent rows of said machines, simultaneously collecting the material sucked from the floor in an overhead traveling receptacle, and periodically utilizing a moving stream of air for emptying the collected material into a stationary container during said movement of said suction stream.

2. A method of sweeping the floor of a room having a plurality of rows of textile machines therein which com-

prises producing a suction current in the form of a substantially vertical upwardly moving stream closely adjacent the floor between said rows of machines while moving the suction stream longitudinally of the aisles between adjacent rows of machines, conveying the material sucked from the floor by the suction stream to a confined overhead zone moving with the suction stream, removing the material from the confined zone at predetermined intervals while said confined zone is moving with the suction stream, and utilizing a moving current of air for conveying the material so removed to a point remote from the machines.

3. A method of removing and disposing of accumulations of lint and the like from a floor between a row of spaced, parallel textile machines in a room which comprises the steps of causing a stream of air to flow into a nozzle by suction, automatically moving the nozzle in a predetermined repeating path of travel closely adjacent the floor of the room substantially longitudinally of and adjacent at least one side of said row of textile machines, collecting the lint drawn into the nozzle in a chamber having door means and moving with the nozzle, positioning a receptacle at a predetermined location adjacent the path of travel, periodically bringing the chamber into register with the receptacle, automatically opening the door means of the chamber while in register with the receptacle, emptying the lint from the collection chamber into the receptacle, and then closing the door means of the chamber.

4. A method of removing and disposing of accumulations of lint and the like from a floor between rows of spaced, parallel textile machines in a room which comprises the steps of moving suction nozzles producing suction streams of air in a predetermined path of travel closely adjacent the floor longitudinally of and adjacent opposite sides of the textile machines, collecting the lint drawn into the nozzles in at least one chamber moving above the machines with the suction nozzles, and automatically at predetermined intervals opening the chamber and removing collected lint during travel of said suction nozzles.

5. A method of removing accumulations of lint and the like from a floor between a row of spaced, parallel textile machines in a room which comprises the steps of moving at least one suction nozzle producing a suction current in a predetermined path of travel closely adjacent the floor longitudinally of and adjacent at least one side of said textile machines, collecting the lint drawn into the nozzle in a confined zone moving above the level of the machines and with the suction nozzle, and periodically discharging the lint under air pressure from the confined zone.

6. A method of removing lint and other light particles from a floor in a room having a plurality of rows of textile machines therein which comprises producing a suction current adjacent the floor while moving the current longitudinally of and along beside a row of said machines, sucking the lint upwardly and collecting the lint in a chamber movable with the suction current and above the row of the machines, converting the suction current to a blowing current of air, and periodically utilizing the blowing current of air for exhausting the contents of the chamber therefrom.

7. A method of cleaning the floor of a room having a plurality of rows of textile machines therein which comprises moving a blower longitudinally of and above at least one row of said machines while utilizing the inlet of the blower to produce suction currents in a nozzle movable with the blower in close proximity to the floor and while utilizing the outlet of the blower for collecting the material picked up by the suction nozzle, periodically opening the outlet during uninterrupted movement of the blower to discharge from the blower and under air pressure from the blower the material thus collected, and utilizing a moving stream of air for conveying the material so discharged to a point remote from the machines.

8. A method of sweeping the floor of a room having a plurality of textile machines therein which comprises producing a suction current closely adjacent the floor between said machines, while moving said suction current generally longitudinally of an aisle adjacent said machines, utilizing said current for simultaneously conveying lint and the like sucked from the floor into an overhead traveling receptacle, and periodically discharging the collected material from said receptacle during uninterrupted movement of the receptacle.

9. A method of removing lint and other light particles from a floor in a room having rows of textile machines therein which comprises producing a suction current of air adjacent the floor while moving said current longitudinally of and along adjacent at least one side of a row of said machines, utilizing said current for sucking the lint upwardly, converting the suction current to a positive-pressure air current, utilizing the positive-pressure current for conveying the lint into a chamber movable with the suction and positive-pressure currents and above said row of machines, and periodically utilizing said positive-pressure current for exhausting from the chamber the contents thereof.

10. A method of cleaning the floor of a room having a plurality of rows of textile machines therein which comprises repeatedly moving a blower longitudinally of and above at least one row of said machines while utilizing the inlet of the blower to produce suction currents in a nozzle movable with the blower in close proximity to the floor and while utilizing the outlet of the blower for conveying the material picked up by the nozzle into a collection chamber moving with the blower, periodically opening the chamber, removing the collected material therefrom, and then closing the chamber without interrupting travel of the blower.

11. A method of cleaning the floor of a room having a plurality of rows of textile machines therein which comprises moving a blower longitudinally of and above at least one row of said machines while utilizing the inlet of the blower to produce suction currents in a nozzle movable with the blower in close proximity to the floor and while utilizing the outlet of the blower for conveying the material picked up by the nozzle into a collection chamber moving with the blower, periodically opening the chamber to discharge the collected material therefrom, and utilizing a suction current for conveying the material so discharged to a point remote from the machines.

12. A method of sweeping the floor of a room having a plurality of textile machines therein which comprises producing a suction current closely adjacent the floor between said machines, while moving said suction current generally longitudinally of an aisle adjacent said machines, simultaneously collecting lint and the like sucked from the floor in an overhead traveling receptacle, and periodically removing the lint from the traveling receptacle by a moving current of air.

13. A method of sweeping the floor of a room having a plurality of textile machines arranged in rows therein which comprises producing a suction stream of air adjacent the floor and of sufficient force to suck lint and other particles upwardly from the floor to a level above the machines, moving said suction stream of air in a generally transverse oscillatory manner as well as longitudinally of and between adjacent rows of said machines, simultaneously blowing the material sucked from the floor into an overhead traveling receptacle, and periodically blowing the material out of the receptacle.

14. A method of sweeping the floor of a room having a plurality of textile machines therein which comprises producing a suction current closely adjacent the floor between said machines, while moving said suction current generally longitudinally of an aisle adjacent said ma-

chines, utilizing said current for conveying lint and the like sucked from the floor into a normally closed overhead traveling collection chamber, moving said collection chamber past a normally closed receptacle, momentarily opening proximal portions of the chamber and the receptacle as said chamber moves adjacent said receptacle, and transferring the lint and the like from the chamber into the receptacle.

15. A method of sweeping the floor of a room having a plurality of textile machines therein which comprises producing a suction current closely adjacent the floor between said machines, while moving said suction current generally longitudinally of an aisle adjacent said machines, utilizing said current for simultaneously conveying lint and the like sucked from the floor into a normally closed overhead traveling collection chamber, moving said collection chamber past a normally closed receptacle, momentarily opening proximal portions of the chamber and the receptacle as said chamber moves adjacent said receptacle, transferring the lint and the like from the chamber into the receptacle, and utilizing a suction current for conveying the material so transferred away from the machines.

16. A method of removing lint and other light particles from a floor in a room having a plurality of rows of textile machines therein which comprises producing a suction current adjacent the floor while moving the current longitudinally of and along beside a row of said machines, sucking the lint upwardly to a location above the row of machines, converting the suction current to a blowing current of air, collecting the lint in a chamber movable with the suction current, and periodically opening the chamber and utilizing the blowing current of air for exhausting the contents of the chamber therefrom.

17. A method of sweeping the floor of a room having a

plurality of textile machines therein which comprises producing a suction current closely adjacent the floor between said machines, while moving said suction current generally longitudinally of an aisle adjacent said machines, utilizing said current for conveying lint and the like sucked from the floor into a traveling collection chamber, periodically moving said collection chamber adjacent a stationary receptacle, producing suction in said stationary receptacle, and utilizing said suction to assist the transfer of lint and the like from the traveling collection chamber into the stationary receptacle.

18. A method of sweeping the floor of a room having a plurality of textile machines therein which comprises producing a suction current closely adjacent the floor between said machines, while moving said suction current generally longitudinally of an aisle adjacent said machines, utilizing said current for conveying lint and the like sucked from the floor into a traveling collection chamber, periodically moving said collection chamber into registration with a stationary receptacle, transferring the lint and the like from the traveling collection chamber into the stationary receptacle, and utilizing a suction current for conveying the material so transferred out of the stationary receptacle to a point remote from the machines.

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