Jan. 2, 1968 R. L. BLACK, JR., ET AL 3,360,914

TRAVELLING TENDING SYSTEM FOR TEXTILE MACHINES

Filed Dec. 16, 1965 5 Sheets-Sheet 1

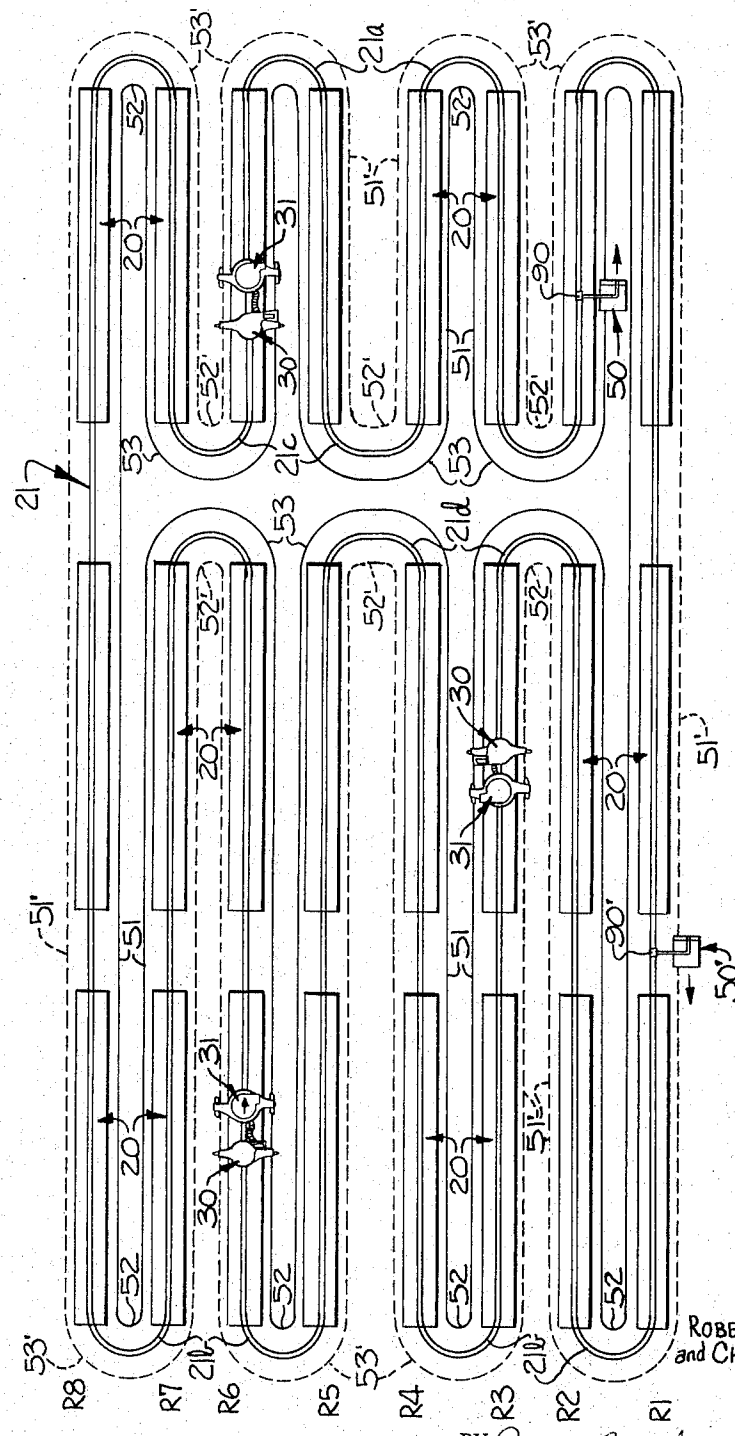



FIG 1

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# TRAVELLING TENDING SYSTEM FOR TEXTILE MACHINES

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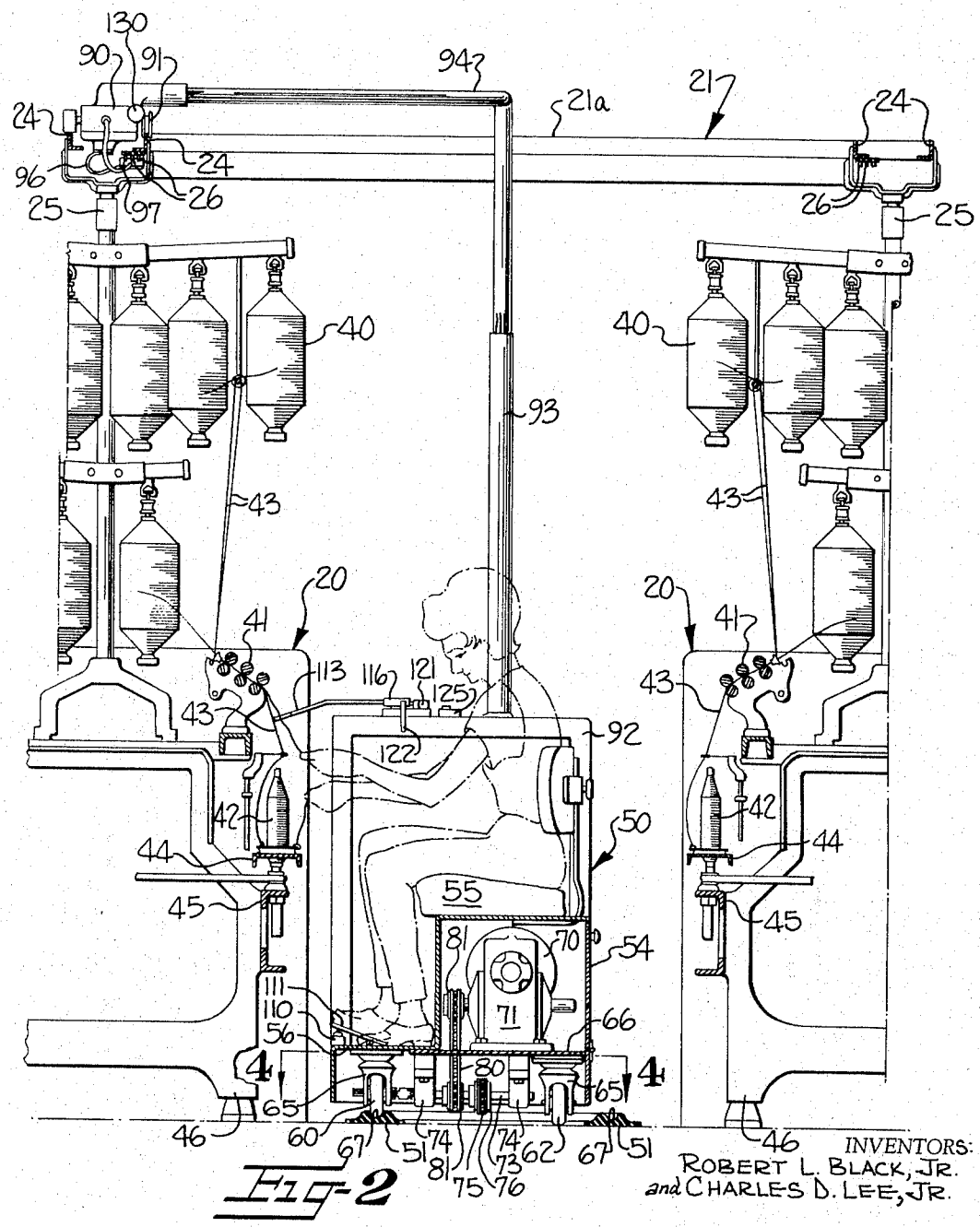



Fig-2

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TRAVELLING TENDING SYSTEM FOR TEXTILE MACHINES

Filed Dec. 16, 1965 5 Sheets-Sheet 3

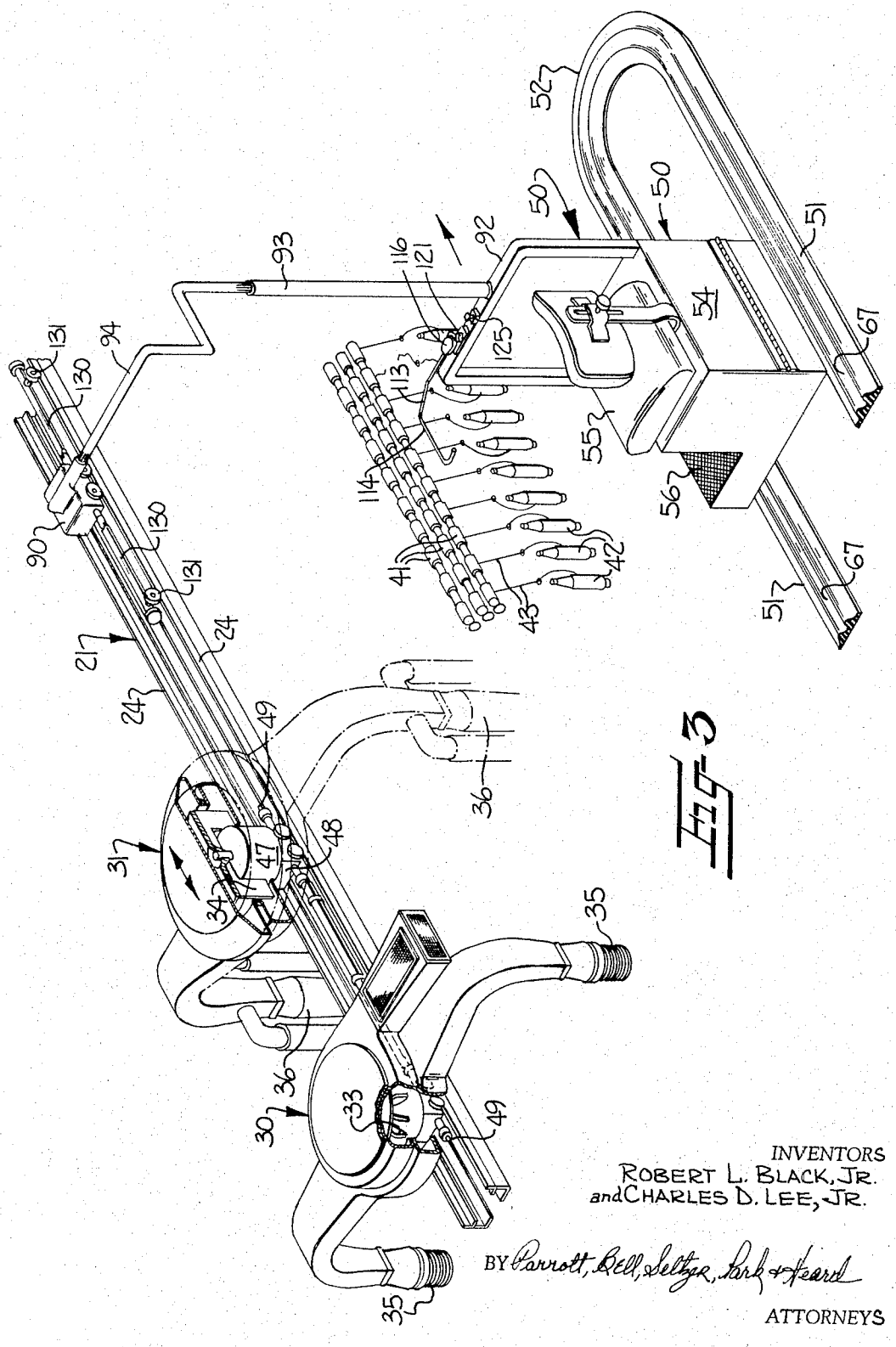



Fig. 3

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TRAVELLING TENDING SYSTEM FOR TEXTILE MACHINES

Filed Dec. 16, 1965 5 Sheets-Sheet 4

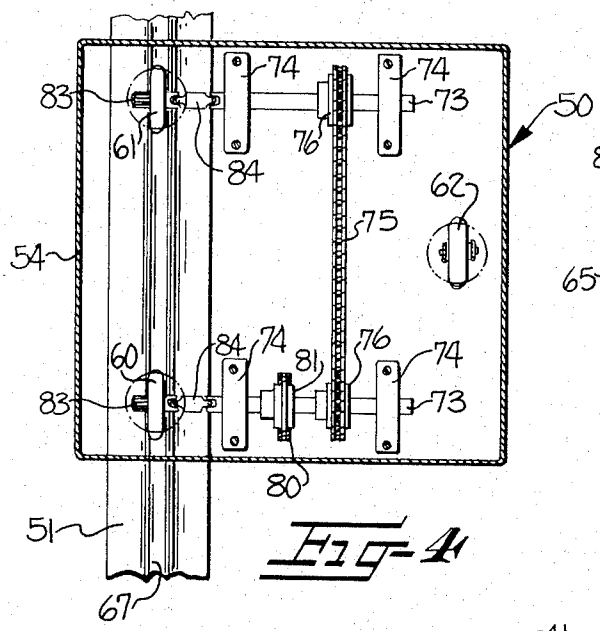



Fig-4

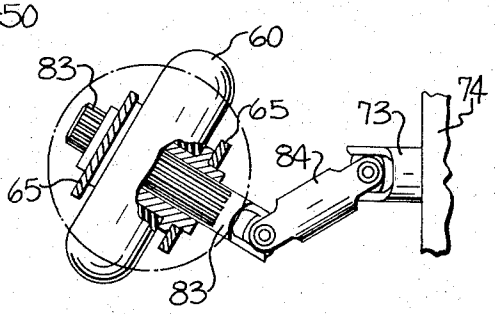
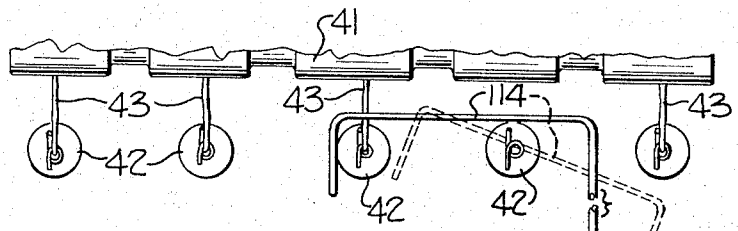



Fig-5



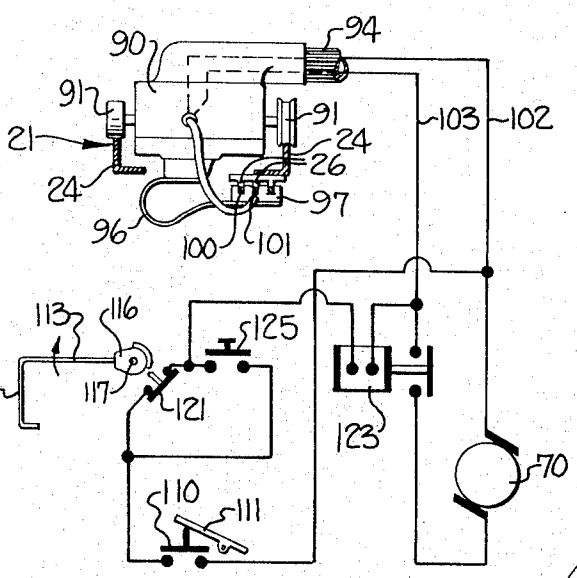




Fig-7

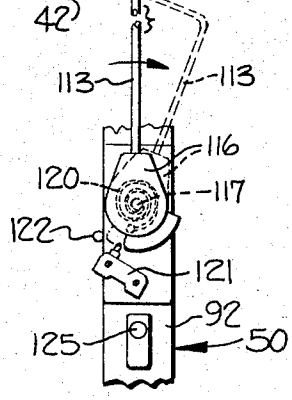



Fig-6

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TRAVELLING TENDING SYSTEM FOR TEXTILE MACHINES

Filed Dec. 16, 1965 5 Sheets-Sheet 5

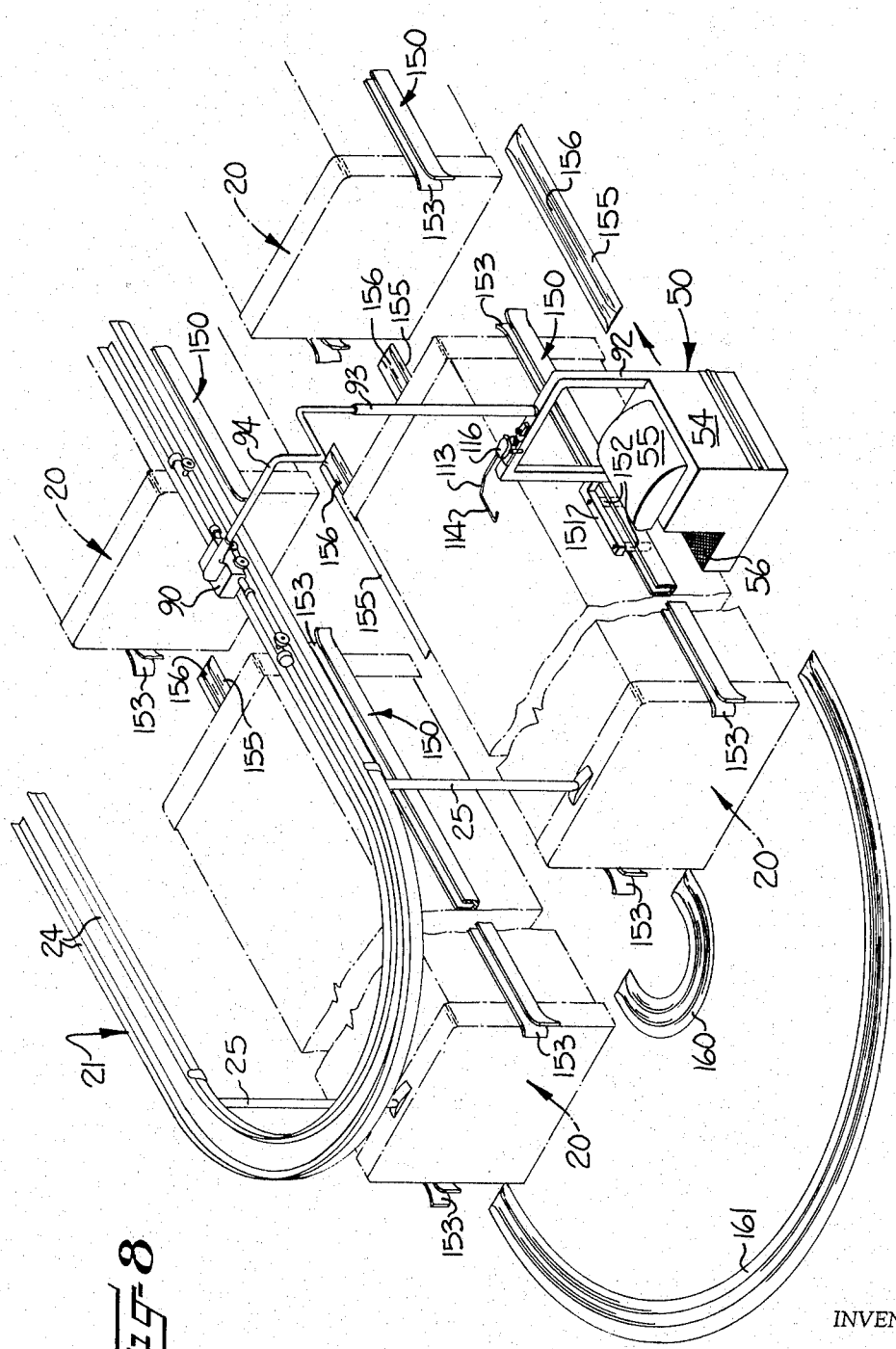



FIG 8

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United States Patent Office 3,360,914
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3,360,914

# TRAVELLING TENDING SYSTEM FOR TEXTILE MACHINES

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12 Claims. (Cl. 57—56)

This invention relates to improvements in a tending system utilizing a car or carrier for transporting an operator past textile machines, such as twisters, spinning frames and the like, and wherein the carrier includes means for detecting broken strand ends and stopping the carrier to permit piecing up or other corrective work by the operator.

Operator-carrying vehicles (cars, carriages, trucks, etc.) have been proposed heretofore for textile mill use, but such known vehicles have had certain deficiencies and drawbacks and have not achieved any appreciable commercial usage. For example, it has been proposed to utilize an operator vehicle and supply truck in combination with a winding machine. It has also been proposed to utilize a vehicle for carrying an operator along a spinning frame for doffing bobbins.

More recently, an operator vehicle of this general type has been employed in connection with certain spinning operations wherein a detector is provided on the vehicle for engaging the strands of yarn being spun so as to sense a broken end and cause the vehicle to stop. Such vehicles are rather bulky due to the provision of storage batteries carried by the vehicle as a power source, and they have required recessed trackways in the textile mill floors for proper positioning relative to the spinning machine. It has been proposed to utilize an electrified floor track as a power source for such vehicles, but this presents problems of safety and possible fire hazards. For these and other reasons, the use of some vehicle for carrying a textile mill operator has been very limited and, insofar as is known, non-existent in cotton textile mills, despite the obvious need for some means of relieving operator fatigue and increasing efficiency.

An inherent problem with the use of such vehicles in modern textile mills, particularly cotton mills, is the relatively narrow aisle space between spinning frames, for example, and the fact that overhead travelling pneumatic cleaner systems must be used for cleaning and removing lint generated by the textile machines. Since substantially the full width of an aisle must be used to accommodate an operator-carrying vehicle, it follows that the depending tubes of a pneumatic cleaner cannot pass by either side of such a vehicle but instead, would have to be dragged over the vehicle in order for the vehicle and the travelling cleaner to pass each other. Thus, the travelling cleaner would be a constant distraction to and interference with an operator riding on such a vehicle.

The object of this invention is to provide a travelling operator vehicle for use in textile mills, particularly cotton type spinning mills, which is operatively associated with a pneumatc travelling cleaning system and is so arranged as to work with the travelling cleaners without interference.

Since the overhead tracks which support such travelling cleaners extend longitudinally of and over rows of textile machines and are provided with conductors substantially throughout their length, it is also an object of this invention to provide an improved tending system comprising an operator-carrying car which is powered electrically by electrical connection with the conductors of the overhead track. Since the car is powered electrically by the overhead track supported conductors, the need for batteries to be carried by the car is eliminated so that the car may be of light-weight construction which reduces its cost and permit use of a smaller car more suitable for use in narrow aisle space.



It is still another object of this invention to provide a track system extending above a row of textile machines for carrying one or more travelling pneumatic cleaners and one or more power take off devices for floor mounted operator-carrying cars including means for automatically reversing the direction of travel of a travelling pneumatic cleaner along the overhead track when the cleaner moves into close proximity to the operator-carrying car.

It is another object of this invention to provide a tending system of the type described in combination with a travelling pneumatic cleaner system including means carried by the car for sensing or detecting any broken ends or threads on the textile machines and for stopping movement of the car upon a broken end being detected so the operator may tie the broken end or perform any other required corrective work, with operator-actuated means for effecting resumption of travel of the car upon completion of the corrective work.

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 textile machinery layout showing one illustration of a track arrangement supporting travelling pneumatic cleaners with two tending cars in association therewith;

FIGURE 2 is a transverse vertical sectional view through one of the cars positioned in an aisle between adjacent textile machines;

FIGURE 3 is a perspective view of the car of FIGURE 2 showing portions of travelling pneumatic cleaners in association therewith;

FIGURE 4 is an enlarged sectional plan view taken substantially along line 4—4 in FIGURE 2;

FIGURE 5 is an enlarged detail of the car wheel in the lower left-hand portion of FIGURE 4;

FIGURE 6 is an enlarged fragmentary plan view of the thread sensing device for the car;

FIGURE 7 is a diagram of an electrical circuit for the car; and

FIGURE 8 is a schematic perspective view of a modified embodiment showing how the car may be guided along the textile machines.

While this invention may well be applied to various textile machines such as looms, roving frames and the like, it has particular utility in spinning of the cotton type and will therefore be described in association with this type of system for purposes of illustration. The duties of an operator or spinner in a spinning mill consist primarily in patrolling a number of spinning frames to look for ends down and to piece up or tie together such ends down. The operator may also do some incidental hand cleaning, but generally is not involved with other operations such as doffing, creeling or the like. By providing a suitable vehicle or operator car for the patrolling operator, it is possible to greatly reduce fatigue and provide working conditions more attractive to labor. This system permits greater operator efficiency, since the operator is not required to search for the ends down, and may also result in an operator being able to patrol a larger number of spinning frames while simultaneously achieving increased production by reducing the time in which an end is allowed to remain down, all of this being accomplished with a reduction in operator strain and fatigue. For such a car system to be practical, it must be relatively small, light in weight, easily installed in an exact relationship to the spinning frame, and so arranged as not to interfere with other operations which must be carried out in relatively narrow aisle space. For example, in modern practice, block creeling and/or doffing is frequently used. That is, an entire frame is shunt down and creeled and doffed at one time.

Means must be provided to permit operation of the operator car without interference with such a creeling, doffing or other operation.

Also, modern mill practice requires thorough cleaning of the textile machines and adjacent areas on a frequent, repeated basis to remove fiber waste generated by the textile machines and prevent lint, fiy and the like from being incorporated in the textile products and creating generally dirty conditions in the mill. Travelling pneumatic cleaners are used for this purpose and are arranged to travel on electrified overhead trackways extending generally over or above one or more rows of textile machines. The pneumatic cleaners include flexible blowing tubes depending into the aisle space for directing blowing air toward the machines for blowing lint and the like off of the machines, and also include flexible suction tubes extending to the floor for picking up and removing lint which settles upon the floor.

The need for efficient cleaning is such that it must not be interfered with by an operator-carrying vehicle. It has previously been proposed to resolve this conflict by incorporating pneumatic cleaning means into the operator-carrying car. While this has had some limited use aboard in worsted mills, it does not provide a satisfactory solution, particularly for cotton, because of the fact that such an arrangement necessitates additional equipment such as fans, motors, ducts, filters and the like being carried by the operator-carrying car, resulting in increased size, weight and cost of the car. Moreover, such proposals have at best resulted in limited cleaning of only the lower portions of the textile machines, requiring that overhead travelling cleaners also be used if the upper portions of the machines are to be properly cleaned. Also, the frequency of travel of the operator car is determined largely by the number of machines assigned to a particular operator and the number of ends down during a given period, while the frequency of travel of the travelling cleaner is determined by the amount of lint being generated which may require speeds of travel substantially different for maximum efficiency of the cleaner and the operator car.

According to the present invention, the tending system or operator car is combined with the overhead track-mounted travelling pneumatic cleaning system in such a way as to permit maximum efficiency of each travelling unit, to utilize the trackway as a power source for both the cleaners and the cars, and with the units being so arranged as to prevent interference with each other.

In FIGURE 1, there is shown one way in which a combined cleaner system and operator car system may be laid out in a typical spinning mill, it being obvious that the particular arrangement of the tracks and the units movable thereon may be varied as desired for a particular operation.

The individual spinning frames are each designated at **20** and the longitudinal rows thereof are designated at R1–R8 in FIGURE 1. An endless overhead track **21** has parallel runs extending over the machine rows with adjacent runs being interconnected by track bends. In order to accommodate spinner tending cars to be later described, track **21** may be arranged so that each of its intermediate runs over machine rows R2–R7 does not cross over the cross-aisle between the proximal ends of any two adjacent machines **20** in the corresponding row, but instead, is connected to an adjacent run parallel thereto by a corresponding track bend. The track bends at the distal ends of the machine rows are indicated at **21***a*, **21***b* and the intermediate track bends overlying a cross-aisle between corresponding ends of adjacent machines are indicated at **21***c*, **21***d*.

Track **21** may be of a type such as is disclosed in U.S. Patent No. 2,011,763; which has been in use in textile mills for many years, and includes a pair of spaced parallel rails **24** (FIGURE 2) suitably supported on posts **25** which may rest upon the floor or the machines **20**. Track **21** supports a plurality of parallel bare conductors or conductor rails **26** suitably insulated therefrom and which are connected to a suitable source of electrical energy, not shown. Conventionally, conductors **26** provide electric power for one or more electric motor driven travelling pneumatic cleaners provided with dependent tubes for blowing lint and other light material off the machines **20** and/or sucking lint and other light material off the mill floor in the longitudinal aisles between the machines. Three sets of two such travelling pneumatic cleaners are shown mounted on track **21** in FIGURE 1, by way of example. Each set of pneumatic cleaners may include a travelling suction floor cleaner **30** and a travelling blowing cleaner **31** which may be interconnected and one or the other or each of which may be self-propelled. The travelling pneumatic cleaners may be of the types disclosed in U.S. Patent No. 3,055,038, for example, to which patent reference is made for a detailed description thereof. As is well known, travelling cleaners of this type have respective electric motor-driven fans **33**, **34** (FIGURE 3) in the housings thereof travelling along the overhead track, and suction tubes **35** depending from the housing of the suction cleaner **30** suck lint and other light material off the floor in the longitudinal aisles between the machine rows while tubes **36** depending from the housing of the blowing cleaner **31** are provided with nozzles which blow lint and other light material off the machines, particularly off the creel **40**, drafting rolls **41**, bobbins **42**, the textile material or strands **43** being processed, the rails **44**, **45** and other surfaces of the frame **46** (FIGURE 2) of each successive machine **20** past which the pneumatic cleaners **30**, **31** travel. Each set of travelling pneumatic cleaners **30**, **31** may be equipped with an electric motor **47** and means **48**, including a shiftable rod **49**, for reversing the direction of travel of the cleaners **30**, **31** along track **21** upon either cleaner of each set engaging an obstruction in its path of travel. Since the reversing means **48** may be of the type disclosed in U.S. Patent No. 3,011,204, a detailed illustration and description thereof is deemed unnecessary.

The tending apparatus of the instant invention is particularly adapted for use in combination with a travelling pneumatic cleaning system of the type generally described and comprises a wheeled car **50** which may travel along a floor-mounted guideway or trackway extending substantially parallel to overhead track **21**. As shown in FIGURE 1, two floor-mounted trackways are provided, there being one trackway **51** represented by a solid line extending substantially parallel to and spaced from one side of the vertical plane of overhead track **21**, and there being another trackway **51′** similar to trackway **51**, spaced from the other side of the vertical plane of overhead track **21** and represented by a dotted line in FIGURE 1. Car **50** is movable along trackway **51**, and another car **50′**, which may be identical to car **50**, is movable along trackway **51′** adjacent the sides of the machines opposite from the sides past which car **50** travels.

Each trackway **51**, **51′** is preferably of the novel construction shown, i.e., a moulded or extruded non-conductive material such as rubber, plastic or the like devoid of rough edges, and secured to the surface of the floor as by adhesives. This trackway construction presents a distinct advantage in that it eliminates the necessity of cutting the floor to install conventional metal rails or the like. The surfaces of the track are smooth and tapered so as to minimize projections which might be dangerous or interfere with personnel or operations in the aisle. This construction also minimizes the collection of lint on or adjacent the trackway and permits the travelling suction nozzles of the floor cleaners to operate without interference.

In the particular arrangement of FIGURE 1, it will be observed that each trackway **51**, **51′** includes two closely spaced runs in the longitudinal aisle between corresponding adjacent machines **20** so the corresponding car faces toward the machine or machines at one side of the corre-

sponding aisle as the car moves in one direction, and so the car faces toward the machine or machines at the other side of the corresponding aisle as the car moves in the opposite direction along the other run of the trackway in the same aisle. The pairs of such closely adjacent runs of trackways **51**, **51'** are interconnected at one end by respective relatively sharp inside trackway bends **52**, **52'**. Relatively large outside trackway bends **53**, **53'** extend around the ends of adjacent textile machines to interconnect the ends of those adjacent runs of the respective trackways **51**, **51'** which straddle two adjacent rows of machines.

Car **50** may take various forms and a representative embodiment thereof is shown in FIGURES 2 to 6, inclusive, as comprising a housing **54** which may be substantially square in plan and of such size that it may pass freely along the longitudinal aisles between the machines. Housing **54** has a seat **55** (FIGURES 2 and 3) on which an operator or worker may be seated. The seat **55** should be so positioned that the operator, while seated, may easily reach the strands **43** being processed for tying any broken ends. Conveniently, the level of seat **55** should be such that the shoulders of the operator seated thereon are about at the same level as the drafting rolls **41**, since most strand breakage occurs between the drafting rolls **41** and the bobbins **42**. Housing **54** also includes a footrest or platform **56** on which the operator may stand for creeling, passing strands from the creel **40** to rolls **41** of the particular textile machine, or performing any other corrective work which may be required in this area.

Car **50** is supported on wheels **60**, **61**, **62** preferably of a synthetic non-conductive material which may be in the form of casters so the car may turn readily as it moves adjacent each trackway bend **21***a*–**21***d* (FIGURE 1). Accordingly, each wheel **60**–**62** is shown journaled in an inverted U-shaped member **65** (FIGURES 2 and 4) which is, in turn, journaled for movement about a substantially vertical axis on the bottom wall **66** and footrest **56** of housing **54**. Wheels **60**–**62** may be arranged in triangular relationship with wheels **60**, **61** riding in trackway **51** and wheel **62** riding on the floor. Wheels **60**, **61** are guided in a longitudinal groove **67** formed in trackway **51**, and wheel **62** is so positioned that it will not engage the trackway, especially when wheels **60**, **61** are traversing the trackway bends **52**, **52'**.

Wheels **60**, **61** are driven by suitable connections with an electric motor **70** which may be provided with a gear reduction unit **71** and is mounted on the bottom wall **66** of housing **54**. Such connections may take the form of a pair of shafts **73** journaled in bearings **74** depending from bottom wall **66**. Shafts **73** may be interconnected by a chain **75** and sprocket wheels **76**, and one of the shafts **73** may be connected to motor **70** and unit **71** by a chain **80** and sprocket wheels **81**. Since wheels **60**, **61** must turn on their vertical axes when traversing bends in trackway **51**, each wheel **60**, **61** may be splined or keyed on a shaft **83** (FIGURES 4 and 5) connected by a double universal joint **84** to the respective shaft **73**. It is thus seen that shafts **73** drive wheels **60**, **61** and that double universal joints **84** permit wheels **60**, **61** to turn relatively on their vertical axes according to the configuration of trackway **51**.

The electric power for the motor **70** of car **50** is obtained conveniently from the conductors **26** which also provide electric power for driving the travelling pneumatic cleaners **30**, **31**. Accordingly, an overhead track-mounted trolley or carriage **90** (FIGURES 2 and 3), serving as a power take-off means, may be provided with wheels **91** riding upon rails **24** of overhead track **21** and may be moved by and in substantially fixed relation to car by means of an interconnecting framework preferably comprising an inverted U-shaped frame member **92** fixed on housing **54**, a standard or column **93** fixed on member **92**, and a column extension **94** telescopically connected to trolley **90** and standard **93** by splined or keyed connections or any other suitable means which will cause trolley



**90** to move in substantially fixed relation with car **50**. Frame member **92**, standard **93** and extension **94** may be tubular or hollow construction to accommodate electrical conductors therein between car **50** and trolley **90**. An arm or leaf spring **96** (FIGURES 2 and 7), depending from trolley **90** between tracks **24**, carries an insulation block **97** on which contact brushes **100**, **101** are mounted for engaging corresponding conductor rails **26** and to which respective conductors or wires **102**, **103** are connected. Wires **102**, **103** may extend through trolley **90**, column extension **94**, standard **93** and frame member **92** to electric motor **70**.

The electric motor **70** normally may be energized or deenergized manually by means of a foot-operated switch **110** mounted on or adjacent footrest **56** and over which a pivoted treadle **111** may extend. Treadle **111** may be pivotally mounted on or adjacent footrest **56**. Means are provided on the car for detecting or sensing any absent or broken yarn ends **43** on textile machines **20** and for stopping the car in response to the detection of an absent or broken end so it may be knotted or tied by the operator. In this instance, the sensing means is arranged to override switch **110** and interrupt energization of motor **70**. As shown in FIGURES 2, 3, 6 and 7, the sensing means may comprise a sensing arm **113** mounted on and extending outwardly from frame member **92** of car **50**. Arm **113** has a lateral feeler portion **114** thereon adapted to yieldably engage and ride against successive threads **43** extending between rolls **41** and bobbins **42** of each successive textile machine. The effective length of feeler portion **114** should be greater than the distance between adjacent threads and less than the distance between alternate threads so that sensing arm **113** may move away from the operator and inwardly of the plane of threads **43** upon any one or more of the threads being absent or unduly slack.

Sensing arm **113** projects radially from a hollow cam **116** journaled at **117** (FIGURE 6) on a substantially vertical axis on frame member **92**. A spring **120** in cam **116** normally biases cam **116** in a clockwise direction in FIGURE 6. A normally closed stop-motion switch **121**, mounted on frame member **92**, is engaged and opened by the high surface portion of cam **116** to deenergize motor **70** whenever the absence of a thread **43** is detected by sensing arm **113**. It is noted that the runs of trackway **51** corresponding to machines **20** should be so located that feeler portion **114** engages threads **43** to prevent switch **121** from being opened by cam **116** unless an absent or broken thread is detected by feeler portion **114**. A stop **122** may be provided on frame member **92** to limit clockwise movement of cam **116** and sensing arm **113**.

Referring to FIGURE 7, a normally inactive relay **123** has its armature interposed in conductor **103**, and the coil of relay **123** is electrically connected between conductors **102**, **103** in series with stop-motion switch **121** and foot-operated switch **110**. A normally open, hand-operated, push-button switch **125** may be arranged in parallel with stop-motion switch **121** so that current will flow from track conductors **26** and brushes **100**, **101** through the coil of relay **123**, and thus energize motor **70** whenever foot switch **110** and either or both switches **121**, **125** are closed. Accordingly, it can be seen that car **50** will not be moved along floor trackway **51** by motor **70** unless switch **121** and/or switch **125** is closed and an operator depresses treadle **111** and closes foot switch **110**.

Thus, in the operation of car **50**, if sensing arm **113** is being held in inoperative position by threads **43** on a corresponding textile machine, an operator sitting on seat **55** depresses treadle **111** and closes switch **110** to energize motor **70** and cause car **50** to move from left to right along trackway **51** in FIGURE 3 until stop-motion switch **121** is actuated to break the circuit to motor **70** due to detection of a broken end by sensing arm portion **114** or due to the sensing arm portion **114** being moved beyond the threads **43** of the particular machine. Assuming a

broken end has been detected by the sensing arm portion, car 50 stops adjacent the broken end and, after the operator pieces up the broken end (during which the operator returns sensing arm 113 to inoperative position and releases treadle 111), movement of car 50 is effected again in the manner described. Whenever car 50 reaches the end of a machine 20, resulting in stop-motion switch 121 being opened, the operator may close the hand-operated switch 125 (which may be conveniently located on frame member 92) while depressing treadle 111 so as to advance car 50 to the next succeeding machine, or around a corresponding bend in trackway 51, until the threads 43 of the next succeeding machine 20 again return sensing arm 113 to the solid line position of FIGURE 6, whereupon the operator may release switch 125 and operation of the sensing means will be resumed in the manner heretofore described.

If desired, a manual switch or a manually operable gear transmission, not shown, may be provided for reversing the motor 70 or the direction of rotation of drive wheels 60, 61 without departing from the spirit of the invention, so the car 50 and its trolley 90 may move in either direction along floor trackway 51 and overhead track 21. In the arrangement of FIGURE 1, it is desirable that the travelling pneumatic cleaners 30, 31 and cars 50, 50' travel in the same direction with respect to overhead track 21. Since there may be occasions in which each car 50, 50' may collide with an adjacent set of travelling pneumatic cleaners or vice versa, each trolley 90 may have the proximal ends of a pair of cleaner reversing arms 130 (FIGURE 3) pivotally connected thereto and each of which may have a wheel 131 thereon riding on one of the track rails 24. Thus, upon relative movement of trolley 90, for example, and a travelling cleaner set 30, 31 into close proximity to each other, one of the reversing arms 130 will engage and actuate the shifting rod 49 of the corresponding cleaner reversing means 48 so the corresponding travelling cleaner set 30, 31 will move in the opposite direction away from trolley 90. Each cleaner set 30, 31 may be provided with means, such as the reversing arms 130 of trolley 90, for engaging and actuating the reversing means 48 of any of the other sets of pneumatic cleaners 30, 31 in the event of adjacent sets moving into close proximity to each other.

It is known, in travelling pneumatic cleaning systems, to provide means for sensing a condition of a textile machine, such as when a spinning frame is not operating for the purpose of block creeling, automatic doffing, etc., and to stop and/or reverse the direction of travel of a travelling cleaner in response to the latter sensing means as it approaches and moves into close proximity to such machine. It is to be understood that the cars 50, 50' also may be arranged to respond to such a sensing means so as to stop and/or reverse their direction of movement along the respective trackways 51, 51' upon movement thereof into close proximity to a textile machine 20 which may not be operating so the corresponding car will not collide with any special equipment, such as an automatic doffer, which then may be in use on the machine.

In the event of the various sets of travelling pneumatic cleaners 30, 31 and/or the cars 50, 50' becoming grouped too close together, it may be occasionally desirable for an operator to interrupt the flow of current to the same temporarily and to manually redistribute the sets of cleaners 30, 31 and cars 50, 50' along trackway 51. However, such redistribution of the cleaner sets and cars may be reduced or obviated by careful determination of the relative speeds of the cleaner sets and the cars. The speed of the travelling pneumatic cleaners 30, 31 should be somewhat greater than that of the cars 50, 50' in order that they perform their desired cleaning functions in an effective manner. For example, cars 50, 50' may each travel about 60 to 80 feet per minute and each set of travelling pneumatic cleaners may travel about 80 to 100 feet per minute.

Although the travelling pneumatic cleaners are disclosed as being in sets of two, one of which is a suction cleaner and the other of which is a blowing cleaner, it is to be understood that all the pneumatic cleaners may be either in the form of a suction cleaner or a blowing cleaner, or a combination suction and blowing travelling cleaner such as is shown in the copending U.S. application of Robert L. Black, Jr., Ser. No. 484,298, filed Sept. 1, 1965, now Patent No. 3,304,571. Also, it is apparent that sensing means other than that shown in FIGURE 6 may be mounted on each car 50, 50' for stopping the same in response to sensing the absence of a thread on the corresponding spinning frame or the like, without departing from the spirit of the invention.

Referring to FIGURE 8, there is shown a modified arrangement of means for guiding each tending car so as to obviate the need for providing floor-mounted trackways extending longitudinally of and in front of the textile machines. The car 50, overhead track 21 and connections therebetween shown in FIGURE 8 may be identical to, and bear the same reference characters as, the corresponding elements previously described with respect to FIGURES 1–7.

In FIGURE 8, it will be observed that, instead of providing a floor-mounted trackway extending in front of and parallel to each successive textile machine 20, each side of each textile machine 20 may be provided with a longitudinally extending guideway 150 which may be of substantially U-shaped cross-section and may be suitably secured to the corresponding textile machine preferably on a level spaced above the floor, but below the upper portion of the spindle rail (see spindle rail 45 in FIGURE 2). The frame member 92 of car 50 is shown in FIGURE 8 as being provided with an arm or bracket 151 which overlies the horizontal plane of the guideways 150 of the textile machines 20 and has follower means 152 depending therefrom which is adapted to engage and move along each successive guideway 150 so as to maintain the car 50, and especially the sensing arm 113 and its feeler portion 114, in proper relationship to the corresponding textile machine during movement of car 50 longitudinally thereof. Opposed ends of each guideway 150 may be flared as at 153, to insure that follower means 152 are properly led into the groove defined by each guideway 150 as the car 50 passes from one textile machine to the next succeeding machine.

Any suitable intervening guide means may be provided for guiding the car 50 as it passes between the successive machines in each row or as it moves parallel to a corresponding bend in overhead track 21. Such intervening guide means for car 50 may take the form of a short sectional floor-mounted trackway 155 which may be of substantially the same cross-sectional configuration as that of trackway 51 in FIGURE 2 with opposed ends of the groove 156 therein being flared outwardly to lead the corresponding wheels of car 50 into the same for guiding the car 50 past any cross-aisles between adjacent textile machines. Relatively small and relatively large floor-mounted arcuate trackway sections 160, 161 also may be provided inwardly and outwardly, respectively, of the vertical plane of any bends in overhead track 21 for guiding the car 50 as it reverses its direction of movement along a corresponding aisle between adjacent machines or as it passes around the end of adjacent rows of machines, as the case may be. Arcuate trackway sections 160, 161 also may be of the same cross-sectional configuration as trackway 51 in FIGURES 1 and 2 and their opposed ends may be flared in the manner of the short intermediate trackway sections 155.

Although guideways 150 (FIGURE 8) are shown mounted on the lower portions of the textile machines, there may be instances in which it is desirable to mount the guideways overhead, such as by suspending them from the overhead track 21. In this instance, frame member 92 may be extended upwardly to a higher level than that

shown to support follower means 151 at the desired level. Also, if desired, a suitable steering means, not shown, may be provided on car 50 in lieu of the floor-mounted trackway sections 155, 160, 161 to enable the operator to guide car 50 between adjacent textile machines and generally parallel to bends in overhead track 21 and so sections 155, 160, 161 will not obstruct cross-aisle floor space. It is contemplated that, by raising guideways 150 above the head level, these guideways may be extended parallel to the bends in track 21 and between the adjacent machines in each row to guide the car 50 in lieu of trackway sections 155, 160, 161 or the aforementioned steering means.

It is well known in the textile art to provide strand sensing or detecting means on the textile machine for sensing or detecting an end down. Such known devices function to stop the machine or to actuate a mechanical device or electric circuit for signalling, recording, etc. According to this invention, such known devices may be operatively connected to the car 50 or its power source, by means of the guideway 150 or similar connection so as to cause the car 50 to stop in accordance with actuation of such machine-mounted strand sensing or detecting means, in lieu of the car-mounted sensing device 113, 114.

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.

We claim:

1. In a travelling cleaner system including an overhead track extending above a plurality of textile machines arranged in rows, electrical conductors on said track and at least one travelling pneumatic cleaner mounted for travel on said track and powered through said conductors; the combination therewith of a car for transporting an operator and having wheels movable along the floor supporting the machines, electric motor means mounted on the car and coupled to said wheels for driving the same, a brush carrier movable along said track for travel with said car and having contact brushes thereon engaging said conductors, and conductor means connecting said brushes to said motor means on the car.

2. A structure according to claim 1, in which said textile machines process a plurality of parallel textile strands, sensing means carried by said car for sensing the presence or absence of strands being processed on said machines, and means responsive to sensing the absence of a strand by said sensing means for stopping said car.

3. A structure according to claim 2, in which said responsive means includes means for interrupting the flow of current to said motor means.

4. A structure according to claim 3, including manually operable means carried by said car and interposed in said conductor means for effecting flow of current to said motor means independently of said responsive means.

5. A structure according to claim 3, including manually operable switch means interposed in said conductor means, and said interrupting means comprising a stop-motion switch means interposed in said conductor means in series with said manually operable switch means and being opened upon the sensing of the absence of a strand by said sensing means.

6. A structure according to claim 1, in which said brush carrier includes means thereon for reversing the direction of travel of the travelling pneumatic cleaner upon movement of said travelling cleaner into close proximity with said brush carrier.

7. A structure according to claim 1, including guide means extending longitudinally of the machines in each row, and means on the car engageable with said guide means so as to guide the car parallel and in predetermined relationship to each machine.

8. A structure according to claim 7, in which said guide means comprises an elongate substantially horizontal guideway spaced above the floor.

9. A structure according to claim 1, including a trackway positioned adjacent said machines and engaged by at least one of the wheels on said car for guiding said car in a path substantially parallel to said track.

10. Apparatus according to claim 9, in which said trackway comprises an elongate moulded strip of non-metallic material having a substantially flat bottom surface adapted to be secured against the floor and provided with at least one longitudinally extending ridge thereon engageable by at least one of the car wheels for guiding the same.

11. A structure according to claim 1, in which at least one of the textile machines includes means for sensing whenever the same is not operating, and means responsive to the last-named means sensing that the corresponding machine is not operating for reversing the direction of movement of said car upon said car moving into close proximity to the last-named machine.

12. In a travelling pneumatic cleaning system for textile mills including overhead track means positioned above a plurality of rows of textile thread processing machines, a travelling cleaner mounted for movement along said track means and having dependent tube means thereon, and means inducing flow of air through said tube means and past surfaces to be cleaned for removing lint and the like therefrom; the combination therewith of a car movable adjacent said rows of machines, means on the car for supporting an operator thereon, means adjacent said machines for guiding said car in substantially parallel relation thereto, means propelling said car, power means carried by the track means and operatively connected to said propelling means for activating the same, sensing means on said car for sensing the absence of a thread being processed on said machines, and means responsive to the sensing of the absence of a thread by said sensing means for stopping said car.

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