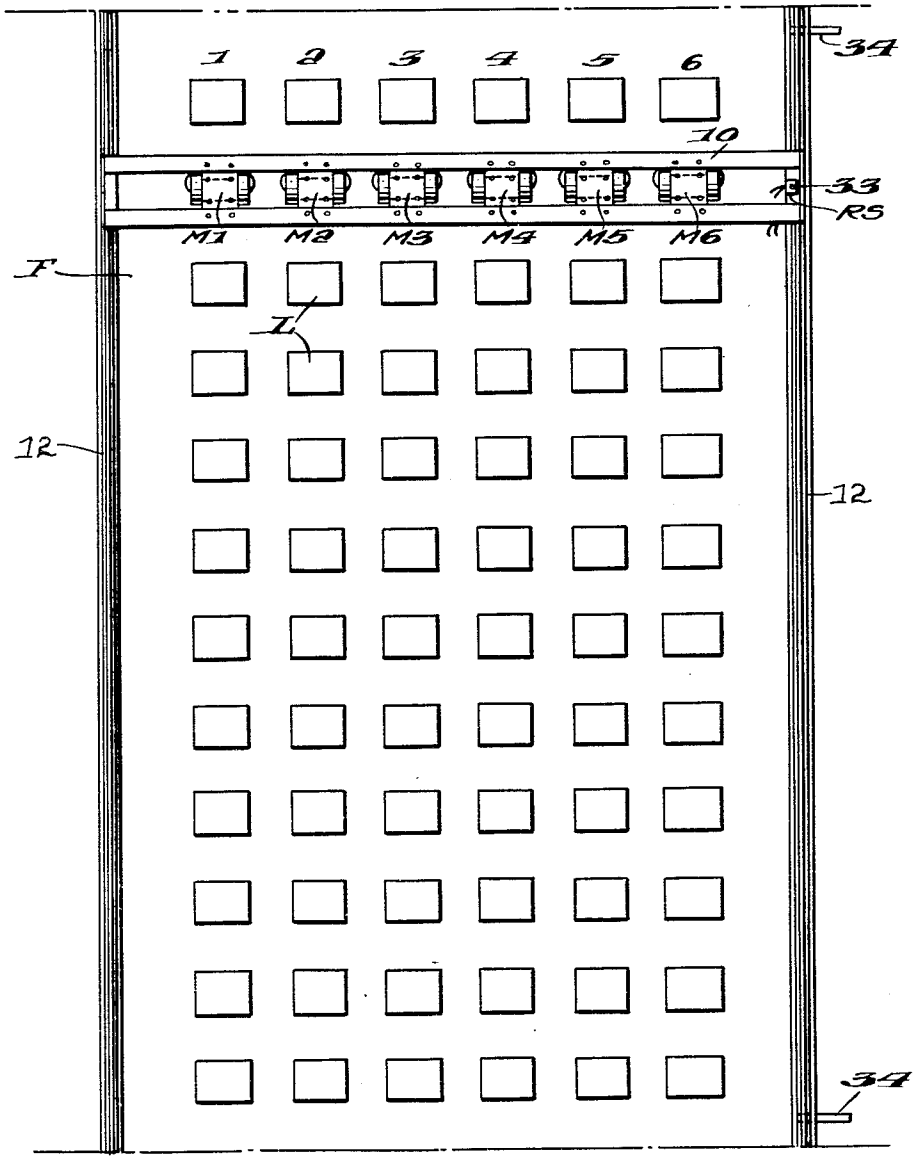
Oct. 27, 1964 A. H. BAHNSON, JR 3,153,803

TRAVELLING TEXTILE MACHINE CLEANING APPARATUS

Filed Oct. 11, 1962 4 Sheets-Sheet 1

Fig. 1.



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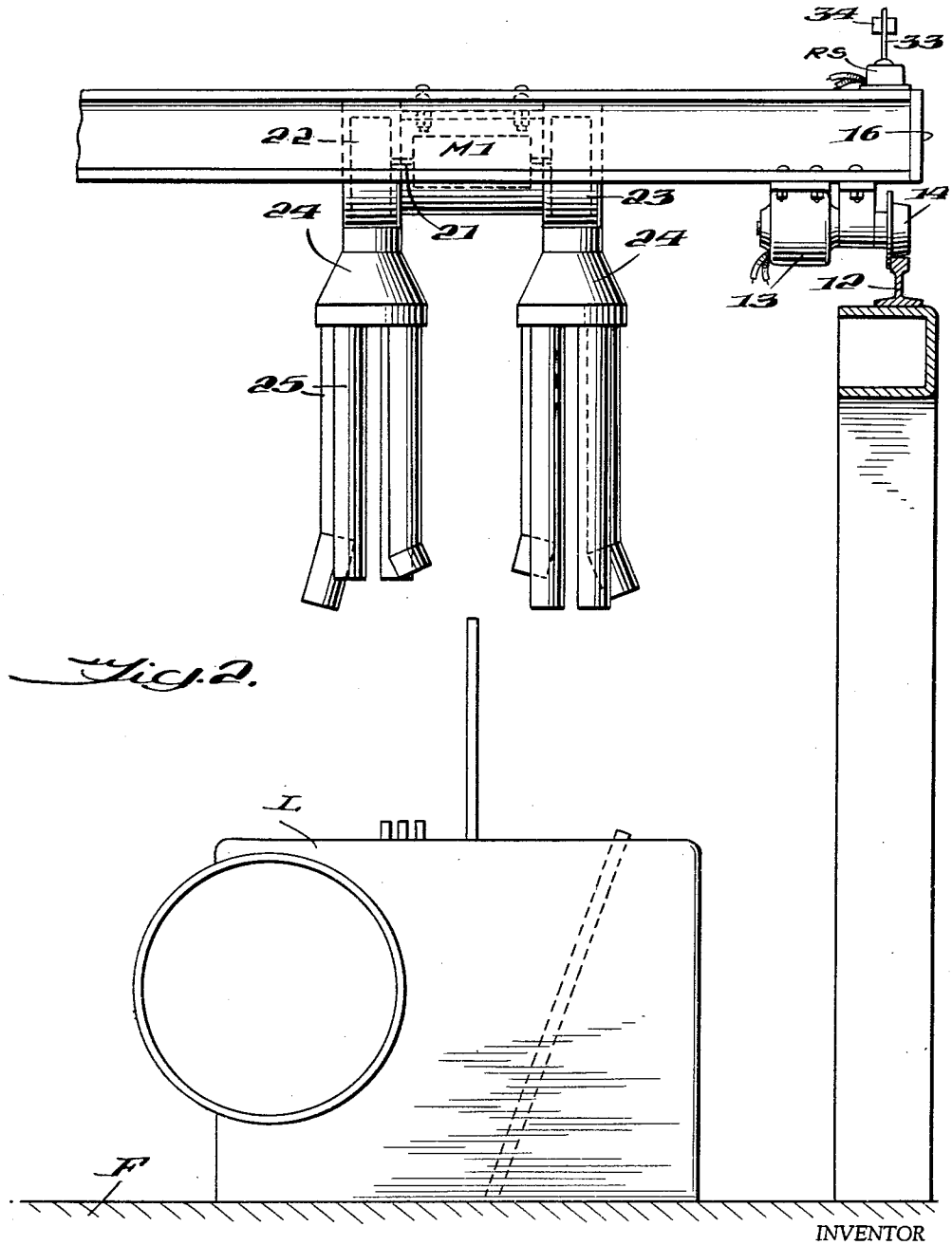

Fig. 2.

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Fig. 3.

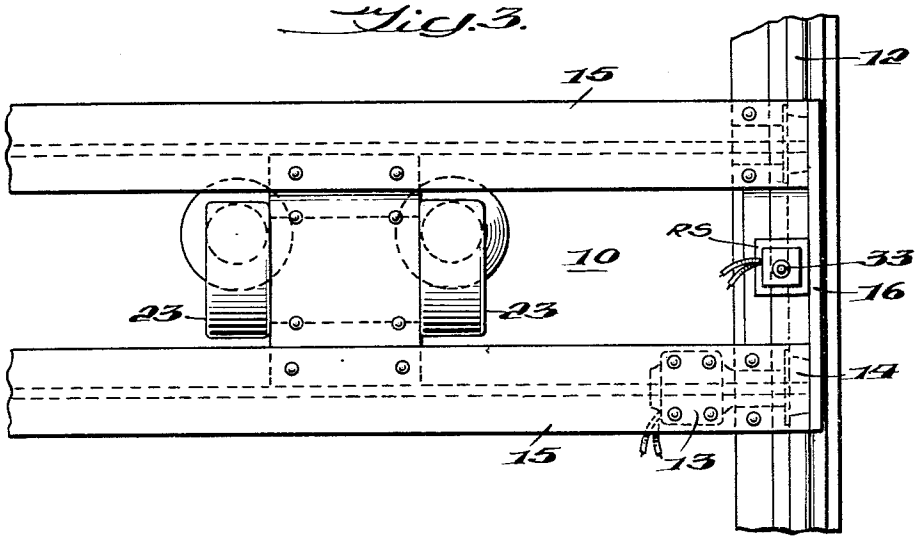


Fig. 4.

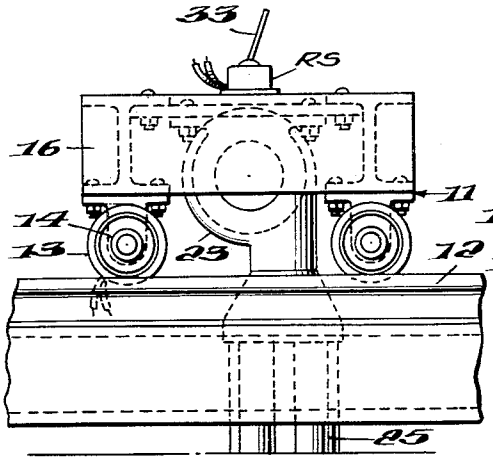
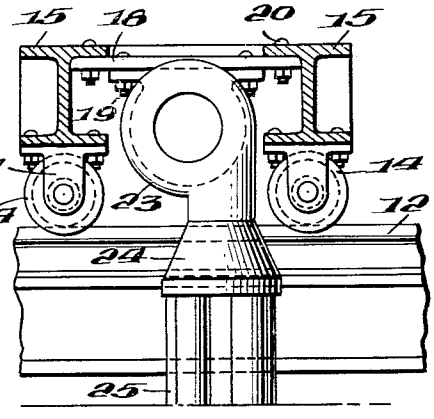


Fig. 5.



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TRAVELLING TEXTILE MACHINE CLEANING APPARATUS

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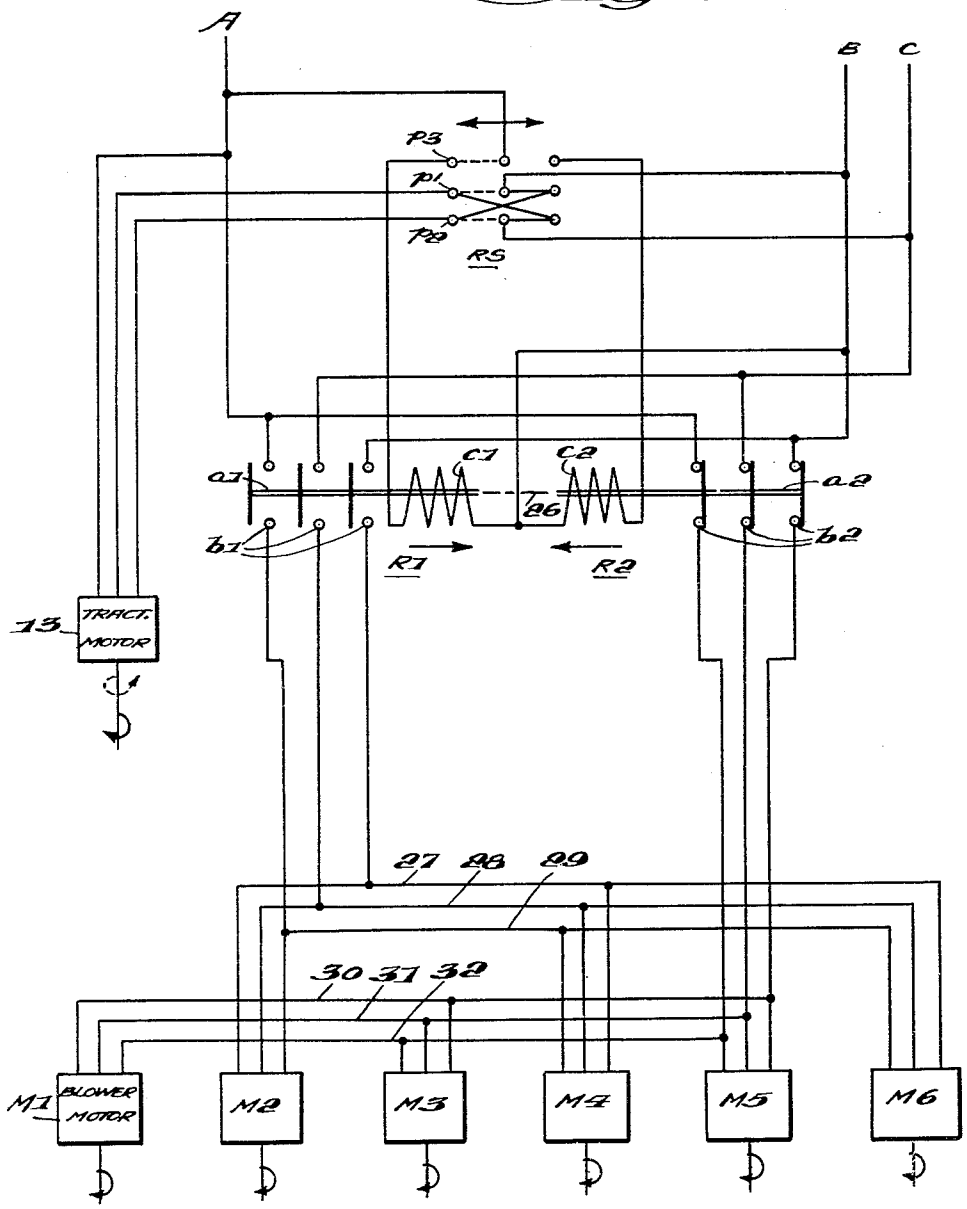
Fig. 6.



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United States Patent Office 3,153,803 Patented Oct. 27, 1964

3,153,803

TRAVELLING TEXTILE MACHINE CLEANING APPARATUS

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Filed Oct. 11, 1962, Ser. No. 229,926
13 Claims. (Cl. 15—312)

The present invention relates to an improved apparatus for automatically removing lint from a plurality of rows of textile machines, more particularly textile looms.

In accordance with the invention, the apparatus includes an overhead traveling beam or bridge which is arranged transversely to a plurality of rows of looms in a textile weave room, the beam being arranged to travel back and forth along the rows of looms. Means are provided on the beam for directing one or more streams of air downwardly in the direction of the loom in each row and these streams of air blow off onto the floor any lint which may tend to collect on the looms proper, thus preventing the lint from getting into the fabric being woven on the looms.

It has been found that if all of the air blower means associated respectively with the several rows of looms located in the room remain in operation continuously a great deal of air turbulence is created in the room which tends to blow the lint back off the floor and on to the loom structure again. One expedient for overcoming this disadvantage would be to use one air blower unit mounted for step-by-step movement along the supporting beam so as to stop at each row of looms in succession for one pass of the beam along the length of the row, thus to clean off each loom row in succession. However, the time cycle required for coverage of all rows of looms in the room is too great for this expedient to be of maximum practical value.

In accordance with the present invention, the time cycle for coverage of all rows of looms is considerably shortened and also the turbulence is reduced to a considerable extent by operating the loom cleaning blowers over alternate rows of looms, such as, for example, the even number of rows during a pass of the suporting beam in one direction along the rows such as, for example, to one end of the room, and then operating the loom cleaning blowers over the odd number rows on the return pass of the beam in the opposite direction. Thus, for example, if the room contains six rows of looms, the loom cleaning blowers for loom rows **1, 3** and **5** will operate while the beam is traveling in one direction and the loom cleaning blowers for loom rows **2, 4** and **6** will operate while the beam is traveling in the opposite direction. In this manner, one half of the total number of rows of looms in the room will be covered during each pass of the beam and yet there will be a minimum of turbulence created tending to blow lint back off the floor onto the looms. If desired, the room may be provided with suction type floor sweeper units adapted to draw off the lint into discharge ducts and these may be carried in a depending manner from the beam itself, or an independent floor-sweeping system may be provided along the floor.

The foregoing as well as other objects and advantages inherent in the invention will become more apparent from the following detailed description of one suitable embodiment as applied to a weave room having six rows of looms to be cleaned off, and the accompanying drawings. In these drawings:

FIG. 1 is a top plan view showing a typical loom layout for a weave room having six rows of looms, including the traveling beam and the blower units carried thereon in association respectively with the individual rows of looms;

FIG. 2 is a view in elevation, drawn to a somewhat larger scale showing one portion of the traveling beam, and one overhead blower unit associated with the looms of one row;

FIG. 3 is a top plan view showing one portion of the traveling beam and a blower unit carried by the same;

FIG. 4 is an end view of one end of the traveling beam showing the motorized carriage at that end;

FIG. 5 is a transverse section view of the traveling beam showing the details for supporting one blower unit which depends from the same; and

FIG. 6 is an electrical schematic wiring diagram showing the relay and limit switch arrangement employed for periodically reversing the direction of travel of the beam at each end of the room and for simultaneously switching operation of the blower units from the even to the odd row numbers and vice versa.

With reference now to the drawings, and to FIG. 1 in particular, the floor of the weave room is indicated generally at F. Within this room are a plurality of rows of looms L, the individual looms being indicated generally by a rectangle since the details of their construction are not involved so far as the present inventive concept is concerned. Six rows of looms are shown, as an example only, and these rows are numbered in FIG. 1 by the numerals **1** to **6** respectively. Arranged overhead the rows of looms is a beam or bridge **10** which extends transversely of the row of looms from one side of the room to the other. Bridge **10** is supported at each end on wheeled carriages **11** which are arranged to travel along an overhead trackway **12**. An electric traction motor **13**, shown in FIGS. 2–4 is coupled by a suitable gear transmission to one of the wheels **14** so as to cause the bridge and its supporting carriages to be propelled along the trackway **12**. If desired, a motor **13** may be used in driving relation with the wheels of both carriages at opposite ends of the beam. Motor **13** is of the reversible type and includes a reversing switch mechanism, to be described in more detail later, by which to reverse the direction of travel of the bridge **10** when it reaches each end of the rows of looms.

The cross bridge **10** can be of any suitable construction and, as illustrated is composed of two I beams **15** held in parallel spaced relation by means of end plates **16** which also form components of the wheeled carriages **11**, the wheels **14** being rotationally mounted in bearing brackets **17** secured to the underface of each I beam **15**.

As shown in FIGS. 2–5, the blower unit for each row of looms is seen to include a motor housing which is secured in place along the bridge **10** by means of a horizontal support plate **18** to which it is attached by bolts **19**, which in turn bridges the gap between the I beams **15** and is suitably secured to the latter such as by means of bolts **20**. Each motor housing includes a motor, these being numbered M1 to M6, respectively, and these motors are of the double ended type, being provided with a drive shaft **21** at each end of the rotor on which are secured respectively the impeller elements **22** of centrifugal type blowers. The air delivery scrolls of these blowers are indicated by **23**. Attached to the outlet ends of the scrolls **23** are divergently configured outlet headers **24** and depending from these headers **24** are a plurality of air discharge ducts **25** from which air streams are directed downwardly and selectively to different parts of the looms L. It is to be understood that the structural arrangement of the blowers and the air discharge ducts may be varied from the particular construction depicted without departing from the spirit and scope of the invention which is defined in the appended claims.

Current for the traction motor **13** and the plurality of blower motors M1 to M6 can be supplied in the conven-

tional manner by means of bus bars arranged longitudinally along one of the trackways **12** and collector elements which slidably engage these bus bars and are supported on the traveling beam structure. Being conventional, and forming no part of the inventive concept, these bus bars and the collectors have been omitted in the interest of simplifying the drawings and the description.

In accordance with the invention, blower units associated with alternate rows only of looms are operated at the same time for a given direction of travel of the bridge **10** along the rows of looms. This desired control is accomplished by means of switching and relaying equipment which is depicted schematically in FIG. 6. With reference now to FIG. 6, the electrical power supply for the traction motor **13** and the blower motors M1 to M6, and which is supplied by means of bus bars and collectors, is seen to be of the three-phase type, the individual phases of which are designated by A, B and C. The reversing switch RS previously referred to is seen to be of the three pole, double throw type and is operated mechanically. Poles *p*1 and *p*2 of this switch are used to reverse phase connections to the traction motor **13** and therefore reverse its direction of rotation. Pole *p*3 is utilized to effect alternative energization of the coils *c*1 and *c*2 of relays R1 and R2. Each of these relays is seen to be of the three pole type. The armatures *a*1 and *a*2 for these relays are preferably mechanically interlocked by coupling them together as indicated by **26** so that as the three sets of contacts of one relay are closed by the respective contact bridges, the contacts of the other relay must open. Thus, when relay coil *c*1 is energized, the three sets of contacts *b*1, which are open in the de-energized state of relay R1, will be closed and connect the three phases A, B and C to the three phase motors M2, M4 and M6 via conductors **27**, **28**, and **29** to thus start them. Simultaneously with energization of relay coil *c*1, relay coil *c*2 becomes de-energized as previously explained and its three sets of contacts *b*2 which were then closed re-open to thus disconnect the three phases A, B and C from the three phase motors M1, M3 and M5 which had been running, the connections from the latter motors to the three phase supply being by way of conductors **30**, **31** and **32** and, of course, the contacts *b*2 of relay R2.

Similarly, when relay R2 becomes energized again and relay R1 is simultaneously de-energized, motors M1, M3 and M5 will be started again and motors M2, M4 and M6 are stopped.

As now will be apparent from a study of the circuit diagram of FIG. 6, the desired mode of operation is controlled entirely by periodic operations of the reversing switch RS each time the traveling bridge **10** reaches one end of the parallel rows of looms. For actuating the reversing switch RS from one position to another, the two positions being indicated by the full and dashed lines respectively, it will be seen that movement of the three blades of the switch from one position to another is controlled by a switch lever **33** which is adapted to strike a fixed stop **34** located, for example, at each end of the rows of looms in the room. In this manner, switch lever **33** is actuated back and forth to thus actuate the three blades of the reversing switch RS back and forth to thus reverse the direction of the traction motor **13** and simultaneously to switch over from loom cleaning blower motors M1, M3 and M5 to motors M2, M4 and M6 and vice versa. Thus, by operating the blower units associated with alternate rows of looms during each pass of the bridge from one end of the weave room to the other instead of operating all blower units, the amount of turbulence at the floor level is considerably reduced and the lint which is blown off the looms onto the floor by the air streams emanating from the blowers tends to remain on the floor where it can then be removed by other equipment designed especially for this purpose.

In addition to the stops **34** located at the ends of the weave room for actuating the direction reversing switch RS it may well be that other stops will be included therebetween which will also effect a reversal in the direction of travel of the blower carrying bridge or crane **10**. Thus, for example, it is customary to employ another crane, not shown, which is mounted for movement along the trackway **12**, this crane being provided with a hoist for handling the warp beams in connection with placing full beams on the looms and then removing them when empty. This beam handling crane would then likewise be provided with stops similar to the stops **34** so as to effect a reversal of movement of the crane **10** carrying the blower units should the latter come into contact with the beam handling crane. Furthermore, other stationary stops similar to stops **34** could be located along the trackway **12** between the ends of the weave room to control the back-and-forth movement of the crane **10** to take care of special conditions which may arise from time to time.

As an alternative to changing over from cleaning one group of alternate loom rows to another such group as the direction of movement of the bridge or crane **10** reverses, the changeover could also be made to take place while the bridge or crane **10** is traveling in the same direction.

In conclusion, it is desired to point out that the particular embodiment of the invention which has been described and illustrated is to be regarded as typical rather than limitative and the details of construction can therefore be modified without, however, departing from the spirit and scope of the invention as defined in the appended claims. The blower construction may be altered using, for example, only one blower unit per row of looms instead of the double blower unit described. Also, it would be possible to use a single larger capacity blower unit mounted on the bridge and a distribution ductwork associated with the outlet from this blower including damper-controlled discharge openings at each row of looms, the dampers for the even and odd number loom rows being opened and closed respectively by the relays R1 and R2 to obtain the same general effect as is obtained by the illustrated arrangement of blower motors individual to each row of looms. Another practical alternative would be to use one blower and related air distribution ductwork for the even number loom rows and a second blower and related air distribution ductwork for the odd number loom rows, these two blowers being operated in alternation by means of the relays R1 and R2.

I claim:

1. Apparatus for removing lint from the looms of at least four parallel rows of looms comprising a bridge extending transversely of said rows of looms and above the same, an overhead trackway extending longitudinally of said rows of looms on which said bridge is mounted for movement along the trackway, reversible means for propelling said bridge, means actuating said reversible means each time said bridge reaches an end of said rows of looms whereby said bridge is caused to move back and forth along said trackway, blower means mounted on said bridge, means delivering loom cleaning air streams from said blower means to only one group of alternate rows of looms when said bridge moves in one direction along said trackway and means delivering loom cleaning air streams from said blower means to only another group of alternate rows of looms when said bridge moves in the opposite direction along said trackway.

2. Apparatus for removing lint from the looms of at least four parallel rows of looms comprising a bridge extending transversely of said rows of looms and above the same, an overhead trackway extending longitudinally of said rows of looms on which said bridge is mounted for movement along the trackway, reversible means for propelling said bridge, means actuating said reversible means each time said bridge reaches an end of said rows of looms whereby said bridge is caused to move back and forth along said trackway, blower means mounted

on said bridge, means delivering loom cleaning air streams from said blower means to only the even number loom rows when said bridge moves in one direction along said trackway, and means delivering loom cleaning air streams from said blower means to only the odd number loom rows when said bridge moves in the opposite direction along said trackway.

3. Apparatus for removing lint from the looms of at least four parallel rows of looms comprising a bridge etxending transversely of said rows of looms and above the same, an overhead trackway extending longitudinally of said rows of looms on which said bridge is mounted for movement along the trackway, reversible means for propelling said bridge, means actuating said reversible means each time said bridge reaches an end of said rows of looms whereby said bridge is caused to move back and forth along said trackway, a plurality of motorized blowers mounted in spaced relation along said bridge in alignment respectively with said rows of looms, each of said blowers including means for directing at least one stream of loom cleaning air downwardly towards the looms of its respective row, means for operating only those blowers appertaining to one group of alternate rows of looms when said bridge moves in one direction along said trackway and means for operating only those blowers appertaining to another group of alternate rows of looms when said bridge moves in the opposite direction along said trackway.

4. Apparatus for removing lint from the looms of at least four parallel rows of looms comprising a bridge extending transversely of said rows of looms and above the same, an overhead trackway extending longitudinally of said rows of looms on which said bridge is mounted for movement long the trackway, reversible means for propelling said bridge, means actuating said reversible means each time said bridge reaches an end of said rows of looms whereby said bridge is caused to move back and forth along said trackway, a plurality of motorized blowers mounted in spaced relation along said bridge in alignment respectively with said rows of looms, each of said blowers including means for directing at least one stream of loom cleaning air downwardly towards the looms of its respective row, means for operating only those blowers appertaining to the even number loom rows when said bridge moves in one direction along said trackway and means for operating only those blowers appertaining to the odd number loom rows when said bridge moves in the opposite direction along said trackway.

5. Apparatus for removing lint from the looms of at least four parallel rows of looms comprising a bridge extending transversely of said rows of looms and above the same, an overhead trackway extending longitudinally of said rows of looms on which said bridge is mounted for movement along the trackway, reversible means for propelling said bridge, means actuating said reversible means each time said bridge reaches an end of said rows of looms whereby said bridge is caused to move back and forth along said trackway, a plurality of motorized blowers mounted in spaced relation along said bridge in alignment respectively with said rows of looms, each of said blowers including means for directing at least one stream of loom cleaning air downwardly towards the looms of its respective row, means responsible when said bridge reaches one end of said rows of looms for rendering operative those blowers correlated to the even number loom rows and rendering inoperative those blowers correlated to the odd number loom rows, and means responsive when said bridge reaches the opposite end of said rows of looms for rendering operative those blowers correlated to the odd number loom rows and rendering inoperative those blowers correlated to the even number loom rows.

6. Apparatus for removing lint from the looms of at least four parallel rows of looms comprising a bridge extending transversely of said rows of looms and above

the same, an overhead trackway extending longitudinally of said rows of looms on which said bridge is mounted for movement along the trackway, reversible means for propelling said bridge, means actuating said reversible means each time said bridge reaches an end of said rows of looms whereby said bridge is caused to move back and forth along said trackway, a plurality of motorized blowers mounted in spaced relation along said bridge in alignment respectively with said rows of looms, each of said blowers including means for directing at least one stream of loom cleaning air downwardly towards the looms of its respective row, means responsive when said bridge reaches one end of said rows of looms for energizing the motors for those blowers correlated to the even number loom rows and de-energizing the motors for those blowers correlated to the odd number loom rows, and means responsive when said bridge reaches the opposite end of said rows of looms for energizing the motors for those blowers correlated to the odd number loom rows and de-energizing the motors for those blowers correlated to the even number loom rows.

7. Apparatus for removing lint from the looms of at least four parallel rows of looms comprising a bridge extending transversely of said rows of looms and above the same, an overhead trackway extending longitudinally of said rows of looms on which said bridge is mounted for movement along the trackway, means for effecting a back and forth movement of said bridge along said trackway, blower means mounted on said bridge, means delivering loom cleaning air streams from said blower means to only one group of alternate rows of looms when said bridge moves in one direction along said trackway, and means delivering loom cleaning air streams from said blower means to only another group of alternate rows of looms when said bridge moves in the opposite direction along said trackway.

8. Loom cleaning apparatus as defined in claim 7 wherein said blower means delivers loom cleaning air streams to only the even number loom rows when said bridge travels in one direction along said trackway and delivers loom cleaning air streams to only the odd number loom rows when said bridge travels in the opposite direction along said trackway.

9. Loom cleaning apparatus as defiined in claim 7 wherein said blower means comprises a motorized blower unit individual to each row of looms, said blower units being mounted in spaced relation along said bridge, and said blower units being operated in alternation so that one group of alternately positioned blower units are operated when said bridge moves in one direction along said trackway and another group of alternately positioned blower units are operated when said bridge moves in the opposite direction along said trackway.

10. Apparatus for removing lint from the looms of at least four parallel rows of looms comprising a bridge extending transversely of said rows of looms and above the same, an overhead trackway extending longitudinally of said rows of looms on which said bridge is mounted for movement along the trackway, means for effecting movement of said bridge along said trackway, blower means mounted on said bridge, and means delivering loom cleaning air streams from said blower means to different groups of only alternate rows of looms in succession as said bridge moves along said trackway.

11. Loom cleaning apparatus as defined in claim 10 wherein said blower means delivers loom cleaning air streams to one group of even number loom rows succeeded by delivery of loom cleaning air streams to a group of odd number loom rows or vice versa as said bridge moves along said trackway.

12. Apparatus for removing lint from textile machines assembled in at least four parallel rows of such machines, said apparatus comprising a bridge extending transversely of said rows of textile machines and above the same, an overhead trackway extending longitudinally of said

rows of textile machines on which said bridge is mounted for movement along said trackway, means for effecting movement of said bridge along said trackway, blower means mounted on said bridge, and means delivering textile machine cleaning air streams from said blower means to different groups of only alternate rows of textile machines in succession as said bridge moves along said trackway.

13. Textile machine cleaning apparatus as defined in claim 12 wherein said blower means delivers textile machine cleaning air streams to one group of even number machine rows succeeded by delivery of machine cleaning air streams to a group of odd number machine rows or vice versa as said bridge moves along said trackway.

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