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TEXTILE ROOM TRAVERSING ARRANGEMENT INCLUDING BOBBIN
DOFFING AND ROOM CLEANING DEVICES

3,112,601

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2 Sheets-Sheet 1

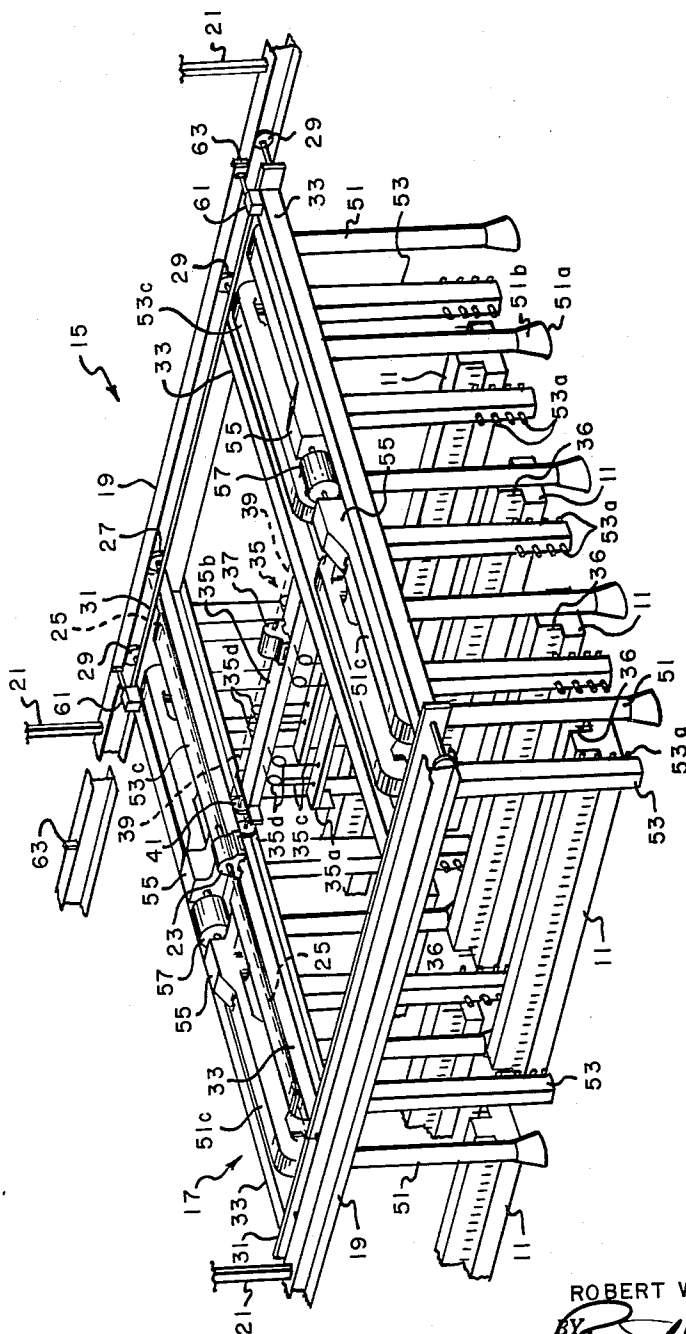


FIG. -1-

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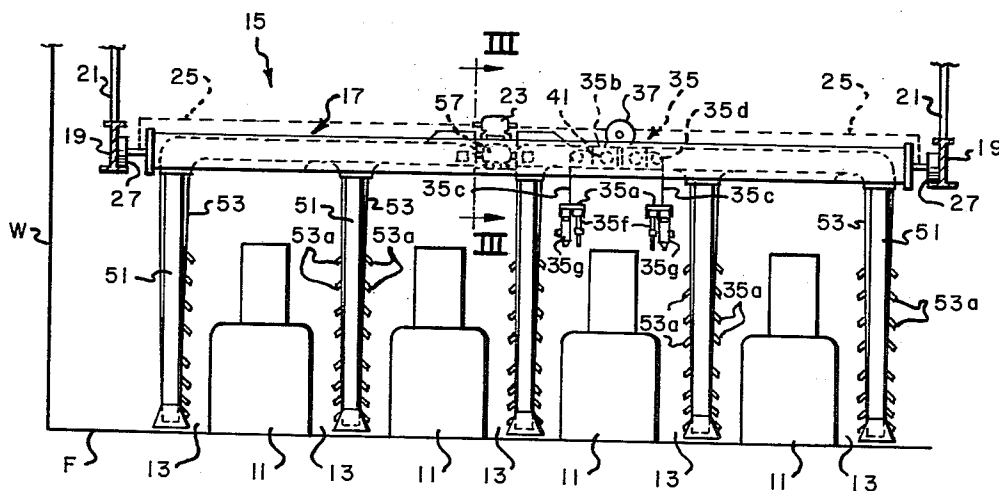


FIG. -2-

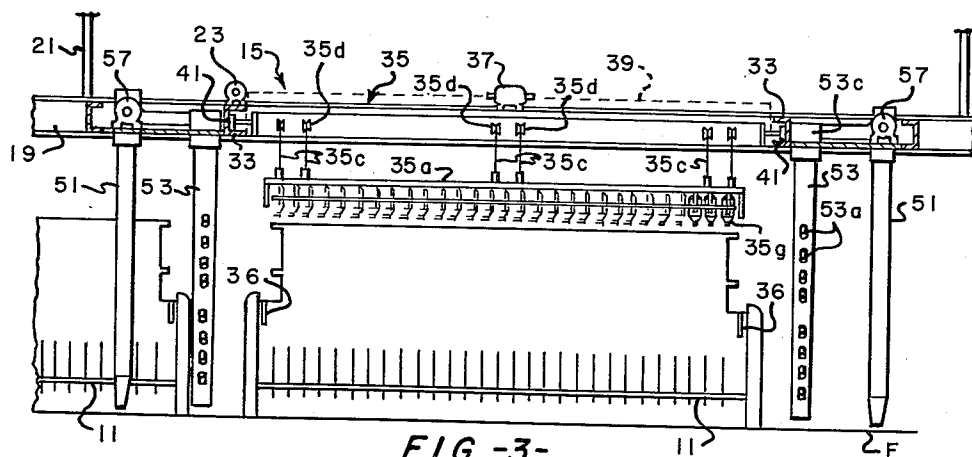


FIG. -3-

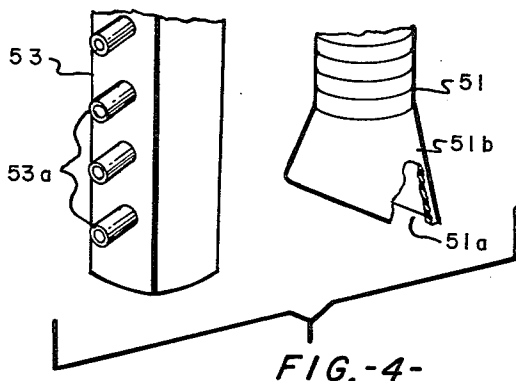


FIG. -4-

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TEXTILE ROOM TRAVERSING ARRANGEMENT INCLUDING BOBBIN DOFFING AND ROOM CLEANING DEVICES

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10 Claims. (Cl. 57—52)

This invention relates to an improved textile room traversing arrangement and more particularly to a unique traveling crane arrangement which serves the dual purpose of doffing and donning bobbins from and onto selected textile frames and also cleans the frames and the alleys between the frames.

In the conventional textile processing room, particularly in rooms handling roving frames and/or spinning frames, it is conventional practice to employ overhead blowers which travel on monorails suspended from the room ceiling. It has recently been proposed in copending patent applications of Robert M. Ingham, Jr., Serial Numbers 703,353, filed December 17, 1957 now U.S. Patent No. 3,059,406, and 50,920, filed August 22, 1960, to doff and don spinning frames by means of an overhead suspended traveling bobbin carrier. Due to various reasons, including the limited amount of overhead space in conventional textile spinning rooms and the like, a difficult problem is encountered in attempting to use such a traveling overhead mounted doffer arrangement where the conventional overhead traveling blower and monorail equipment is utilized, since the doffer and the blower interfere with one another in the individual travel paths. The present invention is directed to the overcoming of this difficulty and the provision of an improved combination bobbin doffing and donning and room cleaning arrangement.

Still other objects, features, and attendant advantages will become apparent to those skilled in the art from a reading of the following detailed description of one physical embodiment constructed in accordance with the invention, taken in conjunction with the accompanying drawings wherein:

FIGURE 1 is a schematic line drawing illustrating an embodiment of the invention as applied to a spinning room.

FIGURE 2 is an end elevation view of the embodiment of FIGURE 1, looking down the alleys from one end of the frame.

FIGURE 3 is a section view of the bobbin doffing and donning and room cleaning arrangement of FIGURE 1 viewed along line III—III of FIGURE 2.

FIGURE 4 is a more detailed view of one pair of blowing and suction tubes for the room alleys between spinning frames.

Referring now to the figures of the drawings, in FIGURE 1 there is shown one bay of a spinning room in which the spinning frames are laid out in parallel rows of spaced apart end-to-end frames 11. In the illustrated example four rows of frames 11 are shown, and while only two spinning frames are shown in each row for purposes of simplicity it will be understood that any number of rows and any number of frames in a row may be employed depending upon the size of the room and the particular governing necessities. According to the present invention, the spinning frames 11 are doffed and donned and the spinning room, including the alleys 13 between and beside the spinning frames 11 are cleaned by a combination bobbin doffing and room cleaning arrangement generally indicated at 15. This combination bobbin doffing and room cleaning arrangement 15 takes the form of a traveling main conveyor 17 which may be suitably mounted for movement parallel to the rows of spinning

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frames 11 or the like along a pair of spaced apart overhead rails 19 which may be suitably suspended as by rods 21 from the room ceiling or girders therein (not shown). The traveling conveyor arrangement 17 may suitably travel along the rails as by a drive motor 23 and mechanical connection 25 to two drive wheels 27 each of which engages with a respective one of the rails 19. The drive wheels 27 may serve to aid in supporting the main conveyor 17, and suitable idler support wheels 29 may be mounted on the conveyor 17 at spaced intervals and ride in engagement with the rails 19 for support of the central portion and opposite ends of the conveyor 17. Drive motor 23 is preferably of the reversal type in order to effect travel of the conveyor arrangement 17 in opposite directions along and above the rows of spinning frames 11, although it will be apparent that reversing clutches or gearing may suitably be employed for this purpose if desired. The conveyor arrangement 17 includes a pair of longitudinally extending beams 31, and two cross beams or rails 33 on which is supported for cross travel a bobbin doffing-and-donning-crane 35, as disclosed and described in more detail in the aforesaid copending applications of Robert M. Ingham, Jr., Serial Numbers 703,353 and 50,920. The bobbin doffing-and-donning-crane 35 is traversed across the rows of spinning frames 11 for registry with a selected row of spinning frames 11, and by longitudinal traverse of the main conveyor assembly 17 by the drive motor 23 it will be apparent that the doffing-and-donning-crane 35 may be positioned for doffing and donning any selected spinning frame 11 in any one of the rows of frames between the two support rails 19. This cross traverse movement of the bobbin doffing-and-donning-crane 35 may be suitably effected as by a drive motor 37 mounted thereon and connected as through a mechanical connection 39 to drive wheels 41 engaging with the two cross rails 33. Suitable overriding remote controls may be employed for selectively energizing either or both of the two drive motors to position the doffing-and-donning-crane 35 over a selected spinning frame 11.

The doffing-and-donning crane may take any desired or suitable form, a suitable construction being illustrated in the aforesaid copending application Serial Number 50,920, of Robert M. Ingham, Jr. In that construction, as schematically illustrated herein, the doffing-and-donning carrier 35 includes two sets 35a of interested bobbin carrier beams suspended from the doffing-and-donning cross-conveyor crane beam 35b as by cables 35c passing over pulleys 35d carried by the cross conveyor crane beam 35b. The bobbin carrier beams 35a each may have a plurality of supply bobbin holders 35f and/or yarn package holders 35g disposed thereon, and may be moved both vertically and toward and away from the center line of the spinning frames in order to effect doffing of the yarn packages from and donning of the empty supply bobbins onto a selected spinning frame 11. The vertical movement of the bobbin carrier beams 35a may be suitably effected as by take-up and let-off of the support cables onto and from a capstan arrangement (not shown) powered by a suitable drive motor (not shown) carried by the cross conveyor crane main beam 35b, while movement of the bobbin carrier beams 35a toward and away from the longitudinal center line of a spinning frame 11 may be effected by movement of the support pulleys 35d toward and away from the crane beam 35b, also by a suitable mechanical arrangement (not shown). Suitable end guides 36 may be disposed at each of the spinning frames for guiding the respective bobbin holding carriers into doffing and donning positions. The foregoing construction is more fully illustrated and described in the foregoing mentioned application Serial Number 50,920, of Robert M. Ingham, Jr., and is accordingly not shown or described in further detail herein.

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Also mounted on the overhead traveling conveyor 17 is a room cleaning arrangement including a plurality of suction and blowing boots or trunks 51, 53 depending into the alleys 13 between and beside the rows of spinning frames 11. Each alley 13 is preferably served by two pairs of blowing and suction boots or trunks 51, 53, one pair being disposed at and depending from one end of the main conveyor and the other pair being disposed and dependent from the other end of the main conveyor. The boots 51, 53 are preferably formed of soft flexible material, such as soft rubber, plastic, or the like, at least in the vicinity of possible contact with an operator, in order to reduce the possibility of discomfort or injury to the operator from contact by the boots. The boots may take any suitable form of construction, and accordingly the details thereof are not specifically shown herein.

It is preferred that the blower or positive air pressure boots 53 disposed between frames 11 have air nozzles or apertures 53a formed on opposite sides thereof to direct the air toward the spinning frames 11 on both sides of the respective alleys 13, whereas the blower boots disposed adjacent a wall W on one side and a spinning frame 11 on the other side thereof may have their air nozzles or apertures 53a formed on only the side extending toward the spinning frame 11 or the like thereadjacent. The suction or negative air pressure boots 51 serve to sweep the lint and trash or the like from the floor F after being blown off the frames 11 or otherwise collecting on the floor F, and to this end each suction boot 51 has a narrow mouth 51a formed at the bottom of a flared end 51b thereof which may ride in contact with or slightly above the surface of the floor F.

The pairs of blowing and suction boots are respectively interconnected through respective conduits 53c, 51c at each of the ends of the conveyor, and one or more blowers 55 driven as by one or more drive motors 57, may be employed for providing the necessary air pressure and suction to the respective blowing and suction boots 53, 51. The blower motors 57 and blowers 55 may be suitably mounted on and carried by the framework of the main longitudinally movable conveyor 17. Suitable filters (not shown) may be employed in the suction conduits 51c.

It will thus be seen that there is provided a set of room cleaning boots 51, 53 which are mounted for movement along the alleys 13 of the spinning frames 11 or the like, together with bobbin doffing and donning means 35 which likewise moves with the cleaning boots 51, 53 along the rows of spinning frames 11 or the like without interference therebetween. It will be noted, however, that while the bobbin doffing and donning means 35 is movable both longitudinally and laterally across the rows of spinning frames 11 for a desired positioning over a selected spinning frame the cleaning boots are substantially fixedly mounted for movement along the alleys 13 only, irrespective of the crosswise position of the bobbin doffing and donning crane 35.

As previously described, the conveyor drive motor 23 may be selectively energized to move the conveyor 17 longitudinally of the spinning frames 11 to position the bobbin doffing-and-donning carrier beams 35a above any desired group of side-by-side spinning frames 11 disposed between and along the length of the main support rails 19. In order to effect cleaning of the spinning frames 11 when this movement of the conveyor assembly 17, 35 to a selected frame is not being carried out, it is desirable to employ means whereby the main conveyor 17 may be substantially continuously run back and forth from one end of the rows of spinning frames to the other. To this end, a limit or reversing switch 61 may be provided on the conveyor 17 with switch actuator lugs 63 or the like disposed on one of the rails 19 adjacent the desired end points of travel of the main conveyor 17 along the rows of spinning frames 11, this switch 61 being suitably connected in the control circuitry with the main conveyor

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longitudinal movement drive motor or motors 23 in order to effect reversal of the movement of the conveyor 17 at the desired opposite ends of travel thereof along the rows of spinning frames 11. Thus, in the periods between doffing and donning of the spinning frames or the like the overriding selection control of the main conveyor 17 and cross conveyor crane 35 may be relinquished and the entire main conveyor assembly 17, including the doffing-and-donning cross conveyor crane 35 and the cleaning boots 51, 53 may be traversed along the rows of spinning frames 11, with reversal of the longitudinal direction of travel thereof being effected by the limit switches 61, or other suitable reversing means as may be desired. Inasmuch as the control circuitry for such reversal does not per se form a part of the present invention, and will be obvious to one skilled in the art, such is not shown or described in detail herein.

It will thus be seen that the present invention provides a combination textile room cleaning and bobbin doffing and donning arrangement which obviates any difficulties which might otherwise be encountered in using individual bobbin doffing and donning equipment and room cleaning equipment, and also providing the full cleaning of an entire bay of spinning frames 11 or the like between doffing and donning operations while doffing and donning is not required and while the assembly is being moved to a selected frame 11 for doffing. If desired, the blowers 55 and blower motors 57 may be shut off during the doffing and donning operation per se in order to obviate possible knocking down of yarn or roving ends by the then stationary concentrated air streams from the boots 53 at one spinning frame 11 or the like.

While one preferred embodiment of the invention has been illustrated and described, it will be apparent that various modifications and improvements may be made without departing from the scope and spirit of the invention. Accordingly, it is to be understood that the invention is not to be limited by the particular illustrative example shown and described herein, but only by the scope of the appended claims.

That which is claimed is:

1. The combination comprising a horizontally movable carriage, a bobbin doffer, and a pneumatic room cleaning device, said bobbin doffer and said room cleaning device being carried by said carriage, two parallel spaced apart main support rails, said carriage being movably supported by said rails for longitudinal movement therealong, said carriage including two parallel carriage rails extending transverse to said main support rails, said bobbin doffer being movably supported for transverse movement therealong, said room cleaning device comprising a positive-air-pressure-blowing trunk having side air orifices formed therein, and a negative-air-pressure-suction trunk having a floor cleaning suction mouth formed at its bottom end, said trunks depending from said carriage and out of the path of transverse movement of said bobbin doffer device, and means for applying positive air pressure to said positive pressure blowing trunk and negative pressure to said suction trunk.

2. The combination according to claim 1 further comprising two pairs of said trunks carried by said carriage, one pair adjacent each end of said carriage.

3. The combination according to claim 2 further comprising a plurality of pairs of said positive and negative pressure trunks carried by each of said ends of said carriage, said pairs at each of said ends being spaced apart at increments across the width of said carriage.

4. In a textile-processing-room having a plurality of rows of textile processing frames with alleys between rows, the improvement comprising combination textile-processing-room-cleaning and textile-product-doffing means movable as a unit along said rows, said textile processing frames including bobbin-using means, said textile-processing-room-cleaning and textile-product-doffing means comprising a carriage movable longitudinally

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along the direction of said alleys, said textile-product-doffing means comprising a bobbin-doffing-and-donning device carried by said carriage, a plurality of air-guiding trunks carried in depending relation from and by said carriage, at least two of said air-guiding trunks being disposed in registry with each of a plurality of side-by-side ones of said alleys, and air-movement means carried by said carriage and operatively connected to said trunks, said two trunks in each alley being disposed at opposite longitudinal ends of said carriage.

5 The improvement according to claim 4 said bobbin-doffing-and-donning device being also movable on said carriage in a direction transverse to the direction of and across said alleys.

6 The improvement according to claim 5 further comprising overhead suspended rails, said carriage being carried by said rails, said bobbin-doffing-and-donning device further comprising bobbin holding means movable in a vertical direction to remove bobbins from and replenish bobbins onto said textile processing frames.

7 In a textile-processing-room having a plurality of rows of textile processing frames with alleys between rows, the combination comprising a horizontally movable horizontally elongated carriage disposed above said frames, a bobbin doffer, and pneumatic room cleaning devices, said bobbin doffer and said room cleaning devices being carried by said carriage, said carriage being movable in a first horizontal direction parallel to said alleys and said bobbin doffer being also movable on said carriage in a horizontal direction extending transverse to

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said first direction, said room cleaning devices being arranged so that one cleaning device is disposed in a fixed position on one end of said movable carriage over each of said alleys and another cleaning device is disposed in a fixed position at the opposite end of said movable carriage over each of said alleys.

8 The combination according to claim 7 wherein each of said cleaning devices comprise at least one air conveying trunk depending from said carriage.

9 In a textile-processing-room having a plurality of rows of textile processing frames with alleys between rows, the combination comprising a horizontally movable horizontally elongated carriage, a bobbin doffer, two pneumatic room cleaning devices, one of said cleaning devices being disposed at each of the opposite ends of said elongated carriage in registry with each of a plurality of said alleys in order to afford full cleaning of substantially the full longitudinal extent over which the carriage moves, said bobbin doffer and said room cleaning devices being carried by said carriage.

10 The combination according to claim 9 wherein each of said pneumatic room cleaning devices comprises at least one air conveying trunk depending from said carriage.

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