United States Patent [19]

Long

[11] **3,881,426**

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[54] **DOFFER MECHANISM CARRIAGE**

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[73] Assignee: **Whitin Machine Works, Inc.**, Charlotte, N.C.

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[52] **U.S. Cl.** **105/28**; 104/45; 105/177; 254/87

[51] **Int. Cl.** **B61c 13/00**

[58] **Field of Search** ..... 105/177, 157 R, 28; 254/87; 104/35, 45; 248/349

[56] **References Cited**

UNITED STATES PATENTS

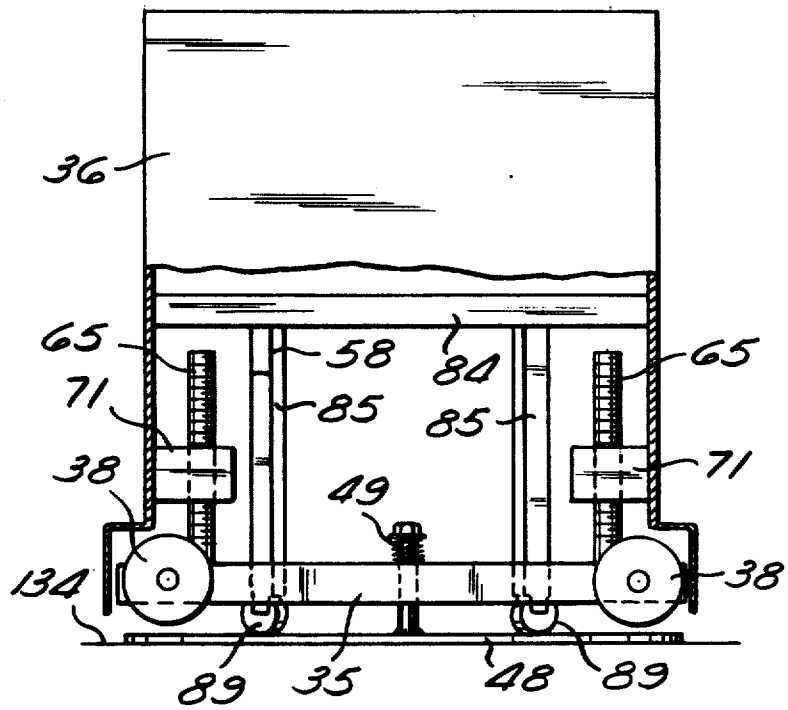
1,486,784	3/1924	Mingo	254/87 X
1,997,327	4/1935	Warshaw	254/87 X
2,156,582	5/1939	Carlini	254/87

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Assistant Examiner—Randolph A. Reese
Attorney, Agent, or Firm—McNenny, Farrington, Pearne & Gordon

[57] **ABSTRACT**

A doffing machine for textile spindles includes doffing units arranged to move along the textile machines and a transporter unit arranged to carry the doffing units from one machine to another. The transporting unit moves along rails set in the floor and is provided with a jacking and turntable arrangement carried entirely by the transporter unit which allows the transporter unit to be lifted off one set of rails, rotated about the turntable and transferred to another set of rails which angularly intersect the first set.

6 Claims, 8 Drawing Figures



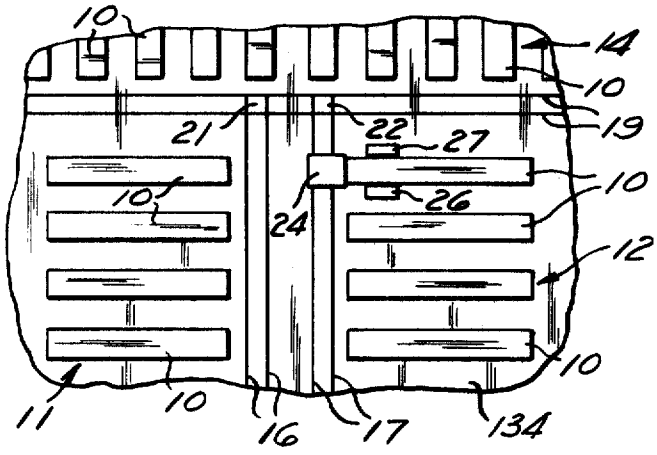


Fig. 1

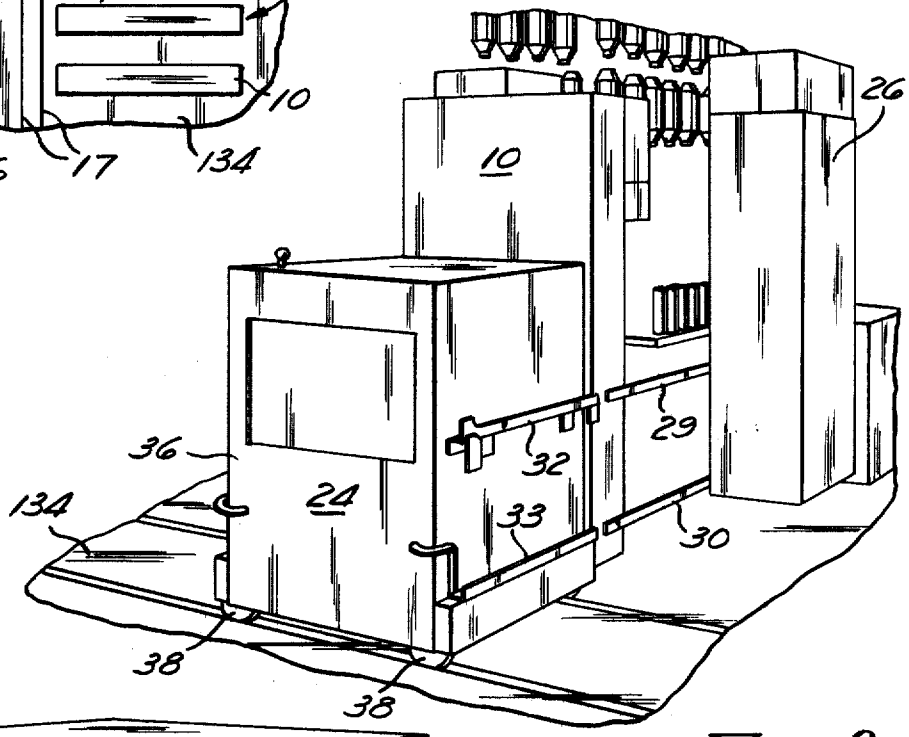


Fig. 2

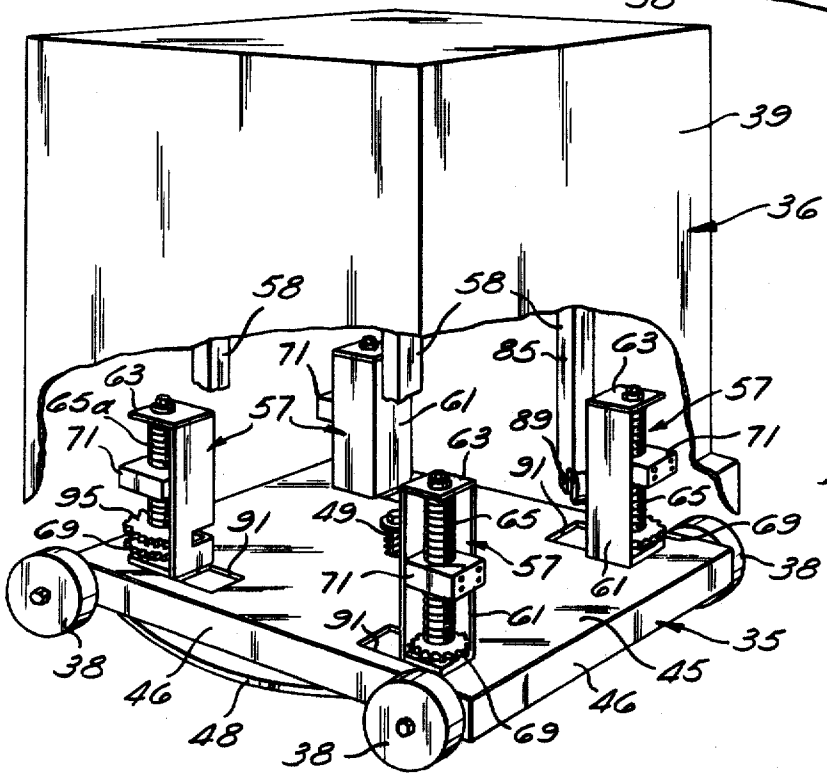


Fig. 3

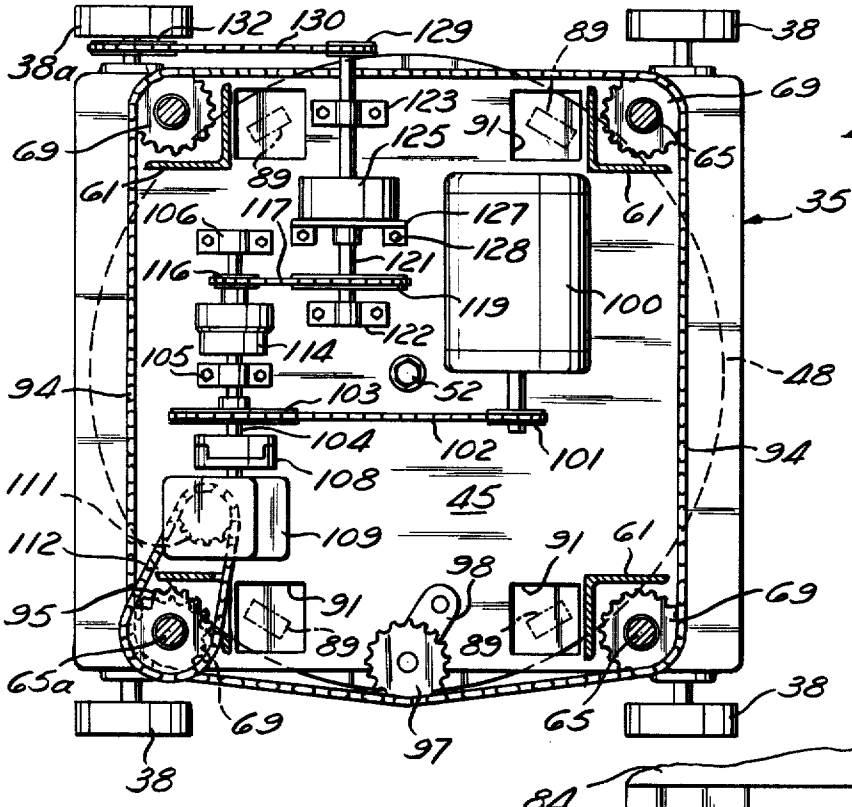

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Fig. 4

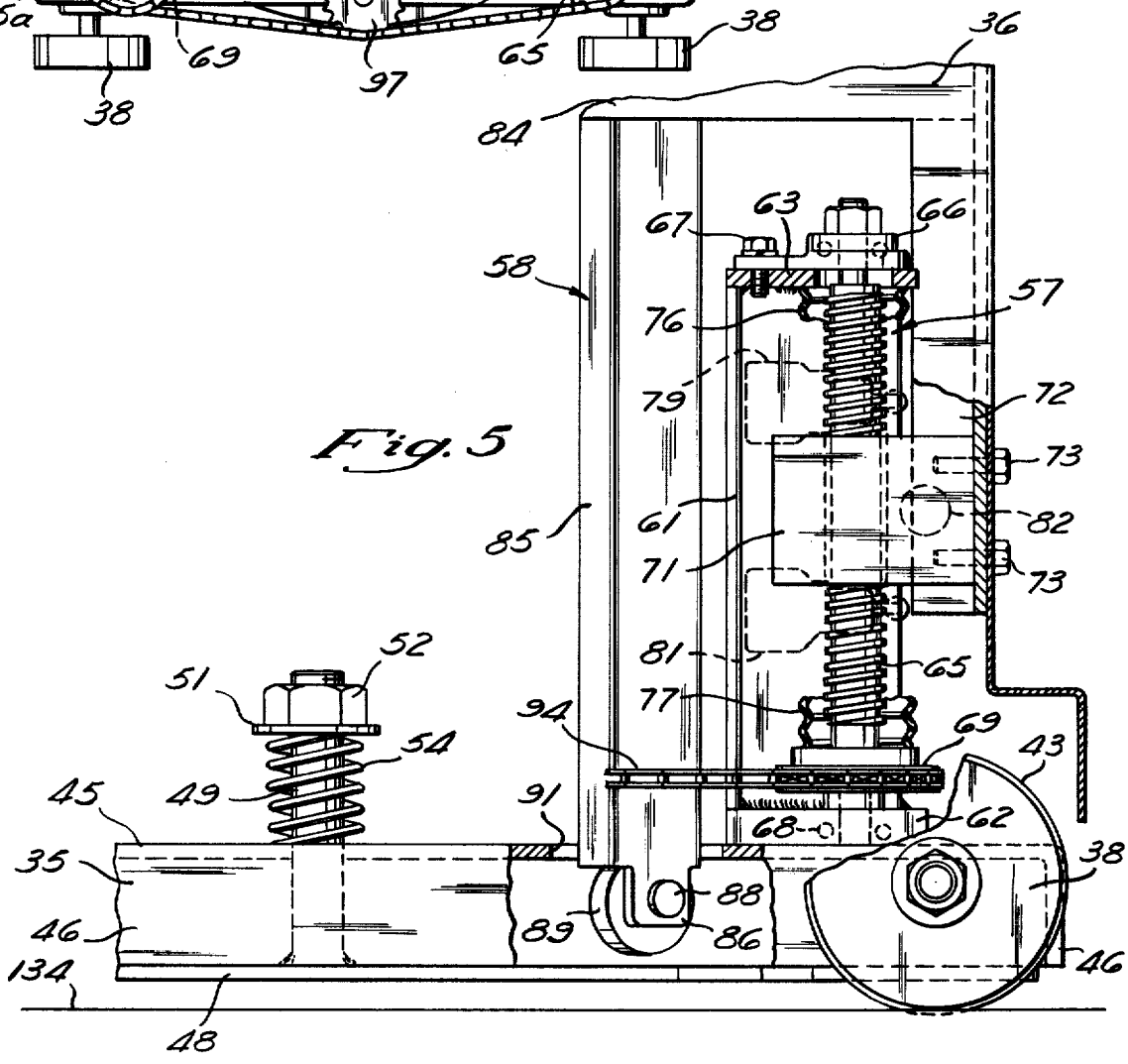

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Fig. 5

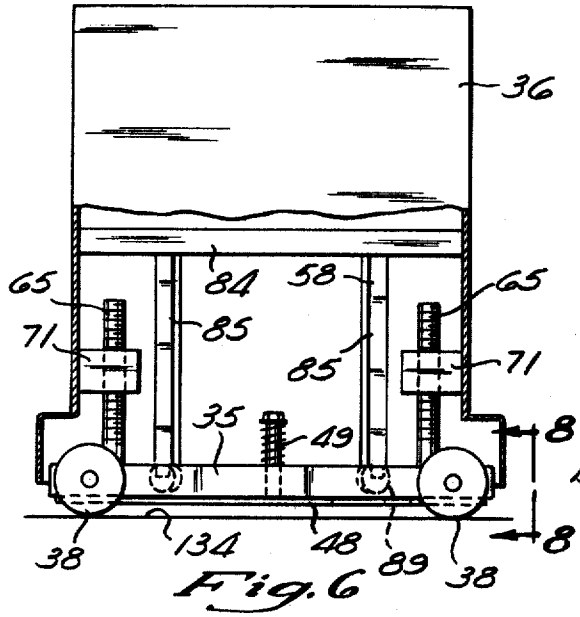


Fig. 6

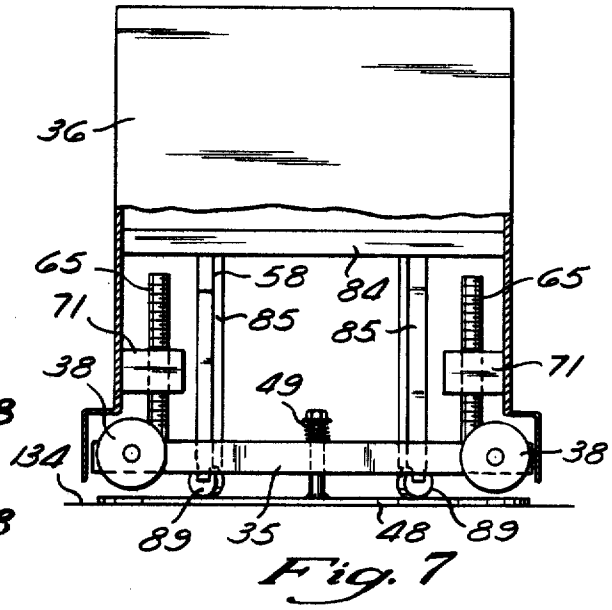


Fig. 7

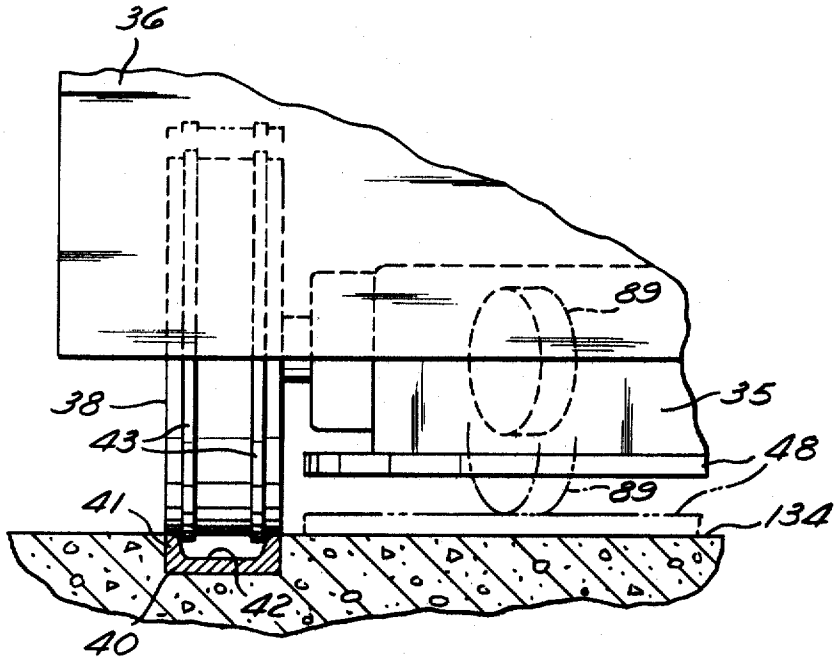


Fig. 8

DOFFER MECHANISM CARRIAGE

BACKGROUND OF THE INVENTION

This invention relates generally to textile machinery and more particularly to machines for automatically doffing full bobbins from spinning frames or the like and replacing them with empty bobbins so that the machine may be restarted for continued operation.

Textile machines of the type such as spinning frames and twisting frames which have large numbers of spindles arranged along both sides of the elongated frame, have been particularly suited for utilizing automatic doffing machines which move progressively along one or both sides of the machine frame, remove the full bobbins and transfer them to a suitable collecting means such as a cart or doff box while placing empty bobbins on the spindles. In the case of spinning and twisting frames where the spindles and bobbin are open and accessible at the upper end, the operation of such doffing units allows a relatively short doffing cycle by providing a unit which moves along a side of the frame progressively from one end to the other, usually mounted on rails carried by the frame itself, and progressively and simultaneously removes full bobbins, transfers them to a doff box, and replaces them with an empty bobbin. The doffing machine thus makes one pass along the spinning frame to complete the doffing and replenishing cycle, after which it returns to its original position at the end of the frame.

Because such doffing machines may be able to complete a cycle in as short a time as a few minutes, whereas the actual doffing operation on a given frame may be required only over a relatively long period, such as between 2 and 8 hours, it has been recognized as an obvious economy that in a factory having a large number of spinning frames, a single doffing unit may effectively and efficiently service a large number of spinning frames since the doffing operation may be controlled so that, for example, spinning frames in a linear sequence arranged along an aisle may be serviced in a sequential order without requiring any downtime which might occur where a machine is stopped because the bobbins are full and must await a doffing cycle before productive operation is resumed.

Accordingly, in the prior art it has been recognized as being highly efficient to provide a complete doffing machine comprising three essential units. One of these units is a transporter mechanism which is moveable between the various spinning or twisting frames, and the other are a pair of doffing units, one for each side of the spinning or twisting frame, which may be carried between machines by the transporter unit and after proper connection with the desired frame move downward to doff the frame and replace the full bobbins with empty bobbins and thereafter return to the transporter so that the entire unit may be moved to the next frame for another doffing cycle.

In such machines the doffing units have been carried on stub rails mounted on the transporter units which are moved into alignment with similar rails on the twisting frame so that the doffing units may move on these rails off the transporter to the frame and back to the transporter after the doffing cycle has been completed. The doffing units then remain mounted on these rails as the transporter carries the entire machine from frame to frame.

The transporter unit must perform a number of functions other than merely moving between the various frames. For efficient operation, the transporter unit must be self powered and for purposes of alignment and efficiency it is most commonly mounted on wheels to move along rails located in the factory floor and when each transporter unit arrives at a frame, it must be capable of precise positioning both laterally and vertically so that the stub rails on the transporter unit precisely align with the rails on the frame. Furthermore, precise alignment between the frame and the transporter unit must also be provided to allow the transporter unit to make electrical connection with a central power supply so that the external power source can power the doffing unit during the doffing operation and recharge the electric batteries carried by the transporter unit which provide the energy to move the entire doffing machine between the various frames. Although the prior art has provided doffing machines and transporter units which carry out all of the above functions, such prior art units have required a separate transporter and doffing unit assembly for each linear arrangement of machine frames because the movement of the transporter unit has been limited to a single dimension along a line of tracks.

SUMMARY OF THE INVENTION

The present invention provides an improvement over doffing machines of the type described above by allowing a single doffing machine comprising a transporter and doffing units to service a larger number of frames located in various floor layout arrangements at different angles by allowing the transporter to be rotated about an axis so that it may move along rails having intersecting axes.

Another feature of the present invention is that is allows a single doffing machine to service many textile frames located at angles to each other or along opposite sides of an aisle so that the entire doffing unit may be rotated 180° about its axis to allow service of machines facing away in opposite directions from a central aisle.

Another feature of the present invention is that it provides rotary positioning of a transporter unit and doffing machine which is centrally contained, operates between fixed tracks and requires no external turn table or other equipment to allow transfer between angularly disposed tracks.

Still further advantages of the present invention allow the accomplishment of the foregoing features using a minimum of additional parts and applying additional functions to existing components while allowing relatively simple construction and low cost, dependable operation.

The foregoing features and advantages of this invention are accomplished by providing a transporter unit, arranged to carry the individual doffer units, which by its own internal controls and power supply is able to raise itself off one set of rails, rotate about its own axis, and again lower itself onto another set of rails extending at an angle to the first set so that the entire doffer unit may be moved along another pair of rails to service textile frames located at an angular relationship to each other.

In the preferred embodiment of this invention, the transporter unit includes a main frame carrying most of the upper structure of the transporter and the doffer

units arranged to move along the textile frames, in combination with a carriage frame and a vertically moveable turntable carried by the carriage frame. The carriage frame is provided with wheels and driving mechanism to drive it along a set of parallel rails on tracks. The carriage frame and main frame are interconnected by a plurality of screw jack units that allow the main frame to be raised and lowered with respect to the carriage frame. The carriage frame carries a turntable which is rotatably and vertically moveable with respect to the carriage frame and the main frame which carries a plurality of depending legs having rollers on the lower end thereof vertically moveable into and out of contact with the turntable.

In normal operation of the machine along a set of parallel tracks, the screw jack units raise and lower the main frame with respect to the carriage frame to provide proper alignment with respect to the textile frame. When it is desired to provide angular rotation of the transporter unit, the screw jack units are operated to move the main frame down to a lower position wherein the legs and rollers contact the turntable, which is normally biased to a raised position on the carriage frame and drive it downward into abutting contact with the floor. Thereafter, continued actuation of the screw jack units causes the carriage frame to be elevated with respect to the turntable, the floor and the main frame, after which the main frame may be rotated, rolling on the roller units on the ends of the legs engaging the upper side of the turntable, so that the main frame and the carriage frame may be rotated together about a central axis.

After the entire doffing machine has been rotated into the desired position, the operation of the screw jack units is reversed, whereupon the carriage frame is lowered back into a position where its wheels are in rolling engagement with the floor rails, after which, further movement raises the main frame to a normal position and allows the spring loaded biasing means in the turntable to retract it upwardly out of contact with the floor. With this arrangement, the cycle of lowering the turntable and raising the carriage frame may be accomplished quite rapidly with a minimum movement of the screw jacks, the entire doffing machine rotated about its axis, and relocated into engagement with a new set of rails in a relatively short time. Furthermore, the foregoing arrangement requires a minimum of additional parts since the screw legs have already been required in prior art devices to provide the proper vertical alignment between the transporter unit and the spinning frame and the main frame, and the carriage frame in otherwise substantially the same manner.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a fragmentary layout of a textile factory showing an array of textile frames, rails and the doffing machine of the invention;

FIG. 2 is a perspective view of the transporting unit and one doffing unit of the doffing machine of this invention positioned before a textile spinning frame after the doffing cycle has begun;

FIG. 3 is an enlarged perspective with portions broken away of the transporter unit shown in FIG. 2;

FIG. 4 is a plan view of the carriage unit of the transporter unit of FIGS. 2 and 3;

FIG. 5 is an enlarged elevational cross-sectional view of one of the screw jack units as shown in FIG. 4;

FIG. 6 is a fragmentary schematic section of the transporter unit showing the carriage unit in the lower position for movement along the rails;

FIG. 7 is a schematic elevational view similar to FIG. 6 showing the carriage unit in the raised position to allow rotation of the transporter unit; and

FIG. 8 is an enlarged fragmentary cross sectional view taken along lines 8—8 of FIG. 6.

Referring now to the figures in greater detail, Flg. 1 shows a fragmentary schematic plan view of a textile mill having a plurality of spinning frames **10** serviced by a single automatic doffing machine. By way of example, spinning frames are arranged in side by side spaced relationship into a pair of opposed parallel arrays **11** and **12** at the end of which is another array of machines **14** extending transversely to the arrays **11** and **12.** To allow movement of the automatic doffing machine between the various spinning frames and the respective arrays **11, 12** and **14,** the arrays are provided with pairs of rails or tracks **16** and **17,** extending parallel to each other but spaced apart to service the spinning frame arrays **11** and **12,** together with another pair of rails or tracks **19** adapted to serve the other array **14** and making a connection with the tracks **16** and **17** at the intersections noted at **21** and **22.**

The automatic doffing machine includes a transporter unit **24** adapted to move along the rails or tracks **16, 17** and **19,** together with a pair of doffing units **26** and **27** which service the opposite sides of a spinning frame. As shown in FIG. **2,** each of the doffing units is arranged to ride along a pair of upper and lower rails **29** and **30** mounted along the lower side of the spinning frame **10** and as the transporter **24** moves between frames, the doffer units are carried on the upper and lower rails **32** and **33** on the side of the transporter **24.** With this arrangement, once a transporter **24** is lined up with the end of the spinning frame **10,** in the manner shown in FIG. **2,** the doffing units **26** and **27** move off the rails carried by the transporter **24** and onto the rails **29** and **30** carried by the spinning frame which are in alignment with the rails on the transporter. Each of the doffing units moves along its side of the spinning frame **10** doffing the full bobbins and replacing them with empty bobbins until the doffing unit reaches the end of the frame, after which it returns to its position on the transporter **24** which then is moved to the next spinning frame to be doffed.

The transporter unit **24** of the present invention includes two basic frame units as shown in FIG. **3.** The carriage frame **35** is provided with four wheels **38** rotatably journaled thereon to move along the rails **16, 17** and **19** and carries the basic driving mechanism for the transporter. The main frame indicated at **36** is mounted on the carriage frame **35** for vertical movement with respect thereto as will be described in greater detail hereinafter. The main frame **36** includes all of the superstructure above the carriage frame **35,** including the outer housing **39,** the rails **32** and **33,** and other structural details of the transporter unit which are not shown herein. These latter units include the various electrical controls for the transporter unit, the means for locking the unit to the spinning frame **10,** means for making connection to an electrical power supply carried by the spinning frame to operate the doffing units during the doffing operation, as well as to recharge the batteries on the transporter which provide the power for moving the unit from one frame to another.

As previously stated, the carriage frame **35** rotatably journals four wheels **38** which are arranged to roll upon rails preferably recessed in the floor. According to one form of the rails and wheels as shown in FIG. **8**, the rail **40** is in the form of a channel **41** recessed flush in the floor and having a centrally located axially extending recess **42**. The wheel **38** is provided with a pair of raised annular ridges **43** which engage the sides of the channel **41** to prevent lateral movement between the wheel and the rail in either direction.

As shown in FIGS. **3** and **5**, the carriage **35** basically includes a platform portion **45** having depending sides **46** for strengthening and reinforcement purposes, although it is understood that various other reinforcing and structural members are provided as necessary. Directly below the platform **45** and the lower edges of depending sides **46** is located a central turntable **48** in the form of a flat plate having a circular outer periphery. At its center, the turntable **48** has an upwardly extending axle **49** extending upward through a suitable opening in the platform **45**. At its upper end, the axle **49** carries a washer **51** and nut **52** threaded thereon and a helical compression spring **54** is mounted around the axle **49** extending between the washer **51** and the upper surface of platform **45**. It will thus be understood that the turntable **48** and axle **49** are rotatable about a vertical axis in the carriage frame, and the force of the spring **54** acting against the washer **51** biases the turntable **48** toward an upward position against the undersides of the depending platform sides **46**.

The mounting connection between the main frame **36** and the carriage frame **35** includes a screw jack assembly **57** and a leg assembly **58** at each of the four corners of the carriage frame **35** adjacent the respective wheel **38**. Since each of these assemblies is substantially identical in all respects, each assembly will be described in the singular, it being understood that this description applies separately to all four of the mounting units.

Each of the screw jack assemblies **57** includes an upright frame member **61** in the form of an angle having a base plate **62** at the bottom thereof. The upright **61** and base plate **62** are formed as a unit and are secured to the platform **45** in a suitable way such as by welding or by fasteners. At its upper end, the upright member **61** has a top plate **63** in alignment with the base plate **62**. A jack screw **65** is rotatably journaled in a top bearing **66** secured to the top plate **63** by suitable means such as screws **67**, and in a lower bearing **68** carried in the base plate **62**. With this arrangement, the jack screw **65** is freely rotatable in the bearings which hold it against axial movement with respect to the frame member **61**. A driven sprocket **69** is secured to the lower end of jack screw **65** adjacent the lower bearing **68** to provide the driving connection for the jack screw **65** as described hereinafter.

A suitable nut member **71** is threadably journaled on the jack screw **65** and is secured to a pending frame member **72** of the main frame **36** by suitable means such as screws **73**. With this arrangement it will be seen that rotation of the jack screw **65** will cause the nut **71** to move upwardly and downwardly along the jack screw **65** and thereby through its connection with the frame member **72** move the main frame **36** upwardly or downwardly with respect to the carriage frame **35**. For sealing and protective purposes there may be provided upper and lower boots **76** and **77** surrounding the exposed portions of the jack screw **65** above and below the nut **71** to allow proper lubrication and exclude dust and dirt in a manner known to the art. A pair of limit switches **79** and **81** are mounted on the upright frame member **61** and are engagable by a cam **82** mounted on a nut **71** to disconnect the drive and limit movement of the nut **71** along the jack screw **65** to prevent possible jamming of the nut at both of its ends of travel.

The other portion of the mounting unit, the leg assembly **58** includes a depending leg member **85** rigidly secured to a frame cross member **84** on the main frame **36**. At its lower end, the leg **85** is provided with a pair of downwardly projecting ears **86** which serve to journal an axle pin **88** and wheel **89** and as shown more particularly in FIGS. **3** and **4**, the leg **85** extends downward through an opening **91** in platform **45** so that the wheel **89** is in close contact with the upper side of turntable **48**. As shown in FIG. **4**, the legs **85** are so positioned that the axle pins **88** are in radial alignment with the turntable axle **49** at the center of the carriage frame **35**.

In order that all four of the jack screws **65** may be rotated in unison, a single roller drive chain **94** extends around all four of the sprockets **69** and is driven by the driving connection to the one jack screw indicated at **65***a* which has a second sprocket **95** mounted thereon adjacent to sprocket **69**. In order to provide proper tension the chain **94**, an idler sprocket **97** is mounted on a pivot arm **98** and biased in a well known manner to maintain proper tension in chain **94**.

The driving mechanism for the entire transporting unit is shown best in FIG. **4**. The unit is powered both for movement along the tracks and for the raising and lowering of the frame **36** with respect to the carriage frame **35** by a main drive motor **100** which is preferably of the reversing direct current type powered by suitable storage batteries (not shown) carried in the main frame **36**. It will be understood that the main frame **36** also carries suitable controls for the reversible actuation of the motor **100** as well as operation of the electric clutches and brake described hereinafter, and it is understood that such controls are well known in the art and will not be described in greater detail hereinafter except with respect to their function in controlling the drive unit shown in FIG. **4**.

The motor **100** has an output shaft carrying a drive sprocket **101** which is connected by a suitable drive chain **102** to a driven sprocket **103** carried on a shaft **104** which is rotatably mounted on suitable bearing blocks **105** and **106** secured to the upper surface of the platform **45**. At its one end, the shaft **104** is connected through an electric clutch indicated at **108** to a right angle drive gear reducer unit **109**. At its lower end, the gear reducing unit **109** has an output sprocket **111** which is connected through a chain **112** to the sprocket **95** carried on jack screw **65***a*. It will therefore be seen that when the motor **100** is energized and the clutch **108** engaged, the output sprocket **111** will be rotated in one direction or the other, depending upon the direction of rotation of the motor **100** to drive the sprocket **95** and hence through chain **94** all four of the jack screws **65** to thereby cause the main frame **36** to be raised or lowered with respect to the carriage frame **35**.

At the other end of shaft **104**, on the other side of bearing block **105** is located a second electric clutch **114** to which is connected a sprocket **116** which is connected by a drive chain **117** to another sprocket **119**

carried on a second shaft **121** which in turn is rotatably journaled to suitable bearing blocks **122** and **123** mounted on the upper side of the platform **45**. Mounted on the shaft **121** is a suitable electric brake **125** which is of the normally engaged and electrically disengaged type. To provide the reaction forces for braking, the stationary member of the electric brake **125** is carried by a bracket **127** secured to the upper side of platform **45** by suitable means such as screws **128**. At its outward end, shaft **121** carries a sprocket **129** which is drivingly connected to a chain **130** to a sprocket **132** carried on the one carriage wheel indicated at **38a**.

From the foregoing, it will be seen that the motor **100** in one mode of operation may be energized to rotate in either direction to drive the transporter unit in either direction along the rails. When the motor **100** is energized for transport purposes, the electric clutch **114** is energized to drive the sprocket **116** while the electric brake **125** is disengaged. Thus through the sprocket, shaft and chain connections, the motor **100** is then connected directly to the sprocket **132** on wheel **38** and through this driving connection the transporter unit is driven in one direction or the other along the rails. With this arrangment, it will be understood whenever the motor **100** and clutch **114** are disengaged, the electric brake **125** will automatically be applied and therefore brake or lock the wheel **38a** to hold the transporter in its desired position along the rails, and when the doffing unit is in operation, this aids in insuring proper positioning of the transporter unit with respect to the spinning frame.

When the motor **100** is energized in a second mode to raise or lower the main frame **36** with respect to the carriage frame **35**, the electric clutch **108** is energized and hence the motor **100** drives the gear reducer **109** and through chain **112** drives the jack screw **65a** and then through chain **94** all of the other three jack screws to raise or lower the nut **71** and hence the main frame **36**, depending upon the direction of rotation of the motor **100**.

The operation of the above feature for allowing rotation of the transporter unit **24** at the intersections **21** and **22** so that it can be transferred to an angularly extending pair of tracks will now be described in greater detail, particularly in connection with FIGS. **5** through **8**. Referring particularly to FIG. **5**, when the main frame **36** is in normal position for movement along the rails, the nut **71** and leg assembly **58** assume the position shown in solid lines in this figure with the wheels **89** raised a distance above the turntable **48**. It will be understood that normally, when the transporter is to be connected with the spinning frame **10** for doffing purposes, this represents a lowermost limit on the adjustable positions of the main frame **36**, and normally, in order to provide proper alignment between the spinning frame rails **29** and **30** in the transporter rails **32** and **33**, the nut **71** and hence the main frame **36** will be raised upwardly a further distance above the carriage frame **35** and hence above the floor level indicated at **134**.

However, when it is desired to provide for rotation of the transporter unit **24**, the jack screws **65** are driven in a direction to force the nuts **71** in a downwardly direction. When this is done, the main frame **36** moves downwardly with respect to the carriage frame **35** until the wheels **89** on legs **85** contact the upper surface of turntable **48**. Thereafter, further downward movement of the main frame **36** and legs **85** causes the wheels **89** to force the turntable **48** downward against the biasing force of spring **54** until the bottom surface of turntable **48** rests on the floor level **134**. When this is done, further rotation of the jack screws **65** thereafter causes the carriage frame **35** to be lifted upwardly, as shown in FIG. **7**, until the wheels **38** are out of engagement with the adjacent rail **40**. When this is done, all of the weight of the entire transporter unit **34** is carried by the legs **85** and wheels **89** through the turntable **48** which is now in abutting contact with the floor level **134**.

At this point, both the main frame **36** and carriage frame **35** may be rotated with respect to the turntable **48** by rotating them with rolling movement of the wheels **89** along the upper surface of turntable **48** until the transporter unit is realigned with another pair of rails. After this is done, the jack screws **65** are rotated in the opposite direction to thereby lower the carriage frame **35** until the wheels **38** are in proper engagement with the rail **40**. Thereafter, further rotation of the jack screws **65** will cause the main frame **36** to be moved upwardly and by this retracting motion of the legs **85**, the turntable **48**, under the biasing force of spring **54** will be moved upwardly out of contact with the floor level **134** until it reaches its normal position in contact with the depending sides **46** of platform **45**. Thereafter, the entire transporter unit **24** and the doffing units **26** and **27** may be moved along the new set of rails between spinning frames under the action of motor **100** and its driving connection described above to the wheel **38***a*.

From the foregoing, it will be seen that the screw jack assemblies **57** provide two separate functions with a minimum of additional structure. On the one hand, they provide for normal raising and lowering of the main frame **36** for proper alignment with a spinning frame, and one the other hand, they serve to depress the turntable **48** and raise the carriage frame **35** to allow the transporter unit to be easily rotated about its own axis for switching between angularly disposed pairs of rails. It will therefore be seen, referring again to FIG. **1**, that the entire doffing unit in transporter **24** may be driven along any of the pairs of rails **16**, **17** and **19** between the various arrays of spinning frames **11**, **12** and **14**, and may be transferred between the pairs or rails by moving the transporter unit and doffing units to one of the intersections **21** and **22**, after which the transporter unit is operated as described above to rotate it through an angle of substantially 90° so that the wheels **38** may be disengaged from the one set of rails or tracks and reengaged with the angularly disposed sets of rails or tracks. Also, the doffing machine and transporting unit **24** can be transferred directly between parallel sets of rails **16** and **17** by first moving the unit to the one intersection **21**, transferring the transporter to the transverse pair of rails **19**, moving the unit to the second intersection **22**, and thereafter again rotating the unit and switching it to the other pair of rails **17**. With this arrangement, since the turntable **48** and the other mechanism for rotating the transporter is entirely self contained, no special switching units or actual rail turntables are required to transfer or switch the entire doffing machine and transporter unit **24** from one set of rails to another so that the doffing machine can thereby service a larger number of spinnning frames which may then be laid out in the manner shown in FIG. **1**.

While the preferred embodiment of the present invention has been shown in the drawings and described in detail hereinabove, it is recognized that various modifications and rearrangements of the structure thereof may be resorted to by those skilled in the art without departing from the scope of the invention which is defined in the following claims.

What is claimed is:

1. A transporter unit for a textile spindle doffing machine comprising a carriage frame having wheels adapted to roll along a surface, a main frame carried on said carriage frame and vertically movable with respect thereto, a turntable carried by said carriage frame and vertically movable with respect thereto, and means selectively operable in one mode to elevate said main frame and turntable with respect to said carriage frame and allow said transporter unit to roll on said wheels and operable in another mode to lower said main frame and said turntable with respect to said carriage frame and allow said main frame and said carriage frame to rotate about said turntable.

2. A transporter unit for a textile spindle doffing machine comprising a carriage frame having wheel means to roll along a surface in a unidirectional path, a main frame carried by said carriage frame, elevating means interconnecting said main frame and said carriage frame and operable to produce relative vertical movement therebetween, a turntable carried by said carriage frame for vertical and rotational movement with respect thereto and roller means carried by said main frame and engageable with said turntable when said elevating means is in a lowermost position whereby said main frame is supported by said roller means on said turntable with said turntable in contact with said surface and with said carriage frame raised out of engagement with said surface and said main frame and said carriage frame are rotatable with respect to said turntable and said surface.

3. A transporter unit as set forth in claim 2 wherein said elevating means comprise a plurality of screw jacks interconnecting said main frame and said carriage frame.

4. A transporter unit as set forth in claim 2 wherein said turntable is biased upwardly away from said surface and toward said roller means.

5. A transporter unit as set forth in claim 2 wherein said carriage frame includes motor means selectively engageable in one mode to drive said wheel means to move said transporter unit along said surface, said motor means being selecteively engageable in another mode to operate said elevating means.

6. A transporter unit as set forth in claim 5 including brake means normally engaged to lock said wheel means and prevent movement of said transporter unit along said surface, said brake means being released when said motor means is energized in said one mode.

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