Aug. 8, 1967 J. A. CUGINI 3,334,480

DOFFING MECHANISM

Filed June 14, 1965 3 Sheets-Sheet 1

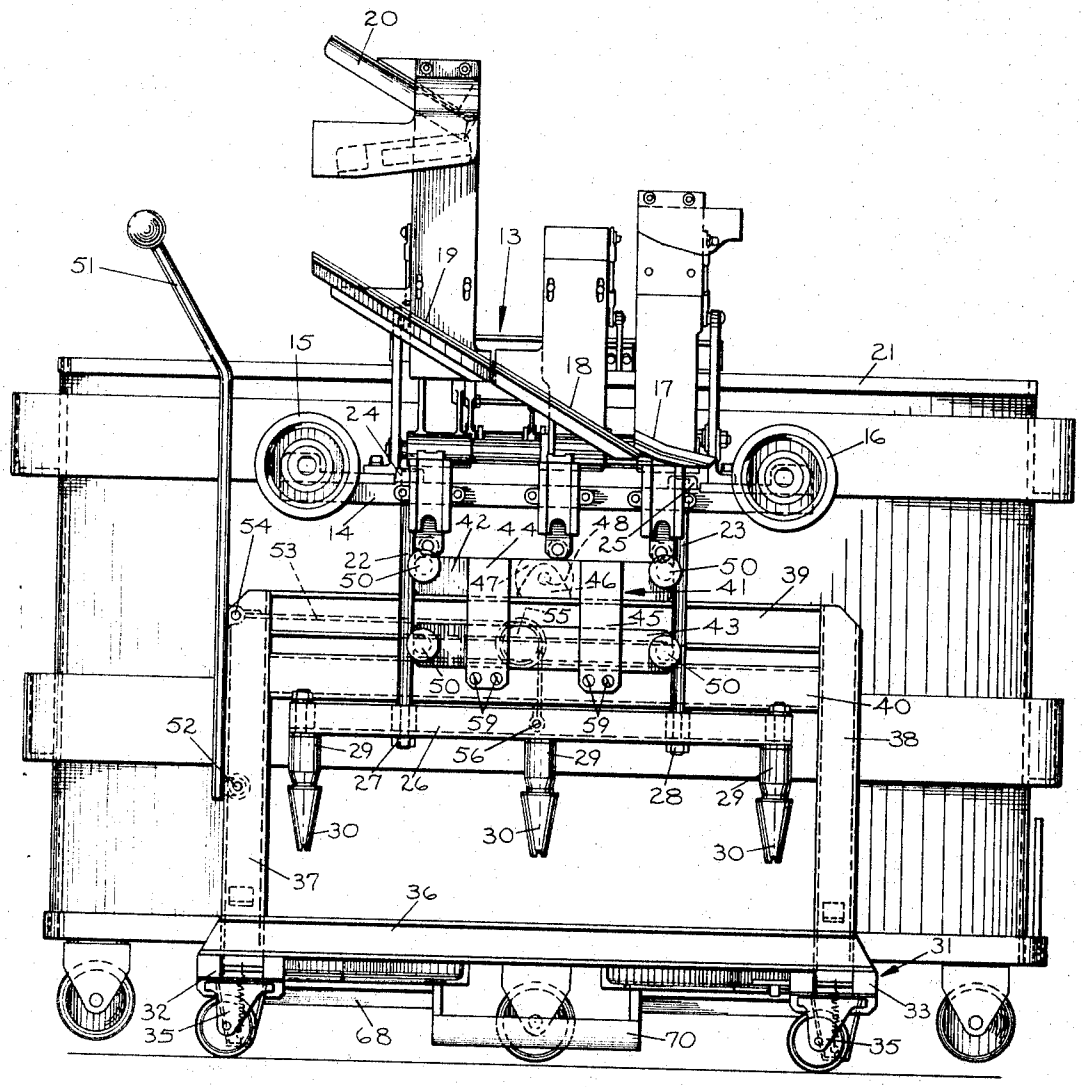


Fig. 1

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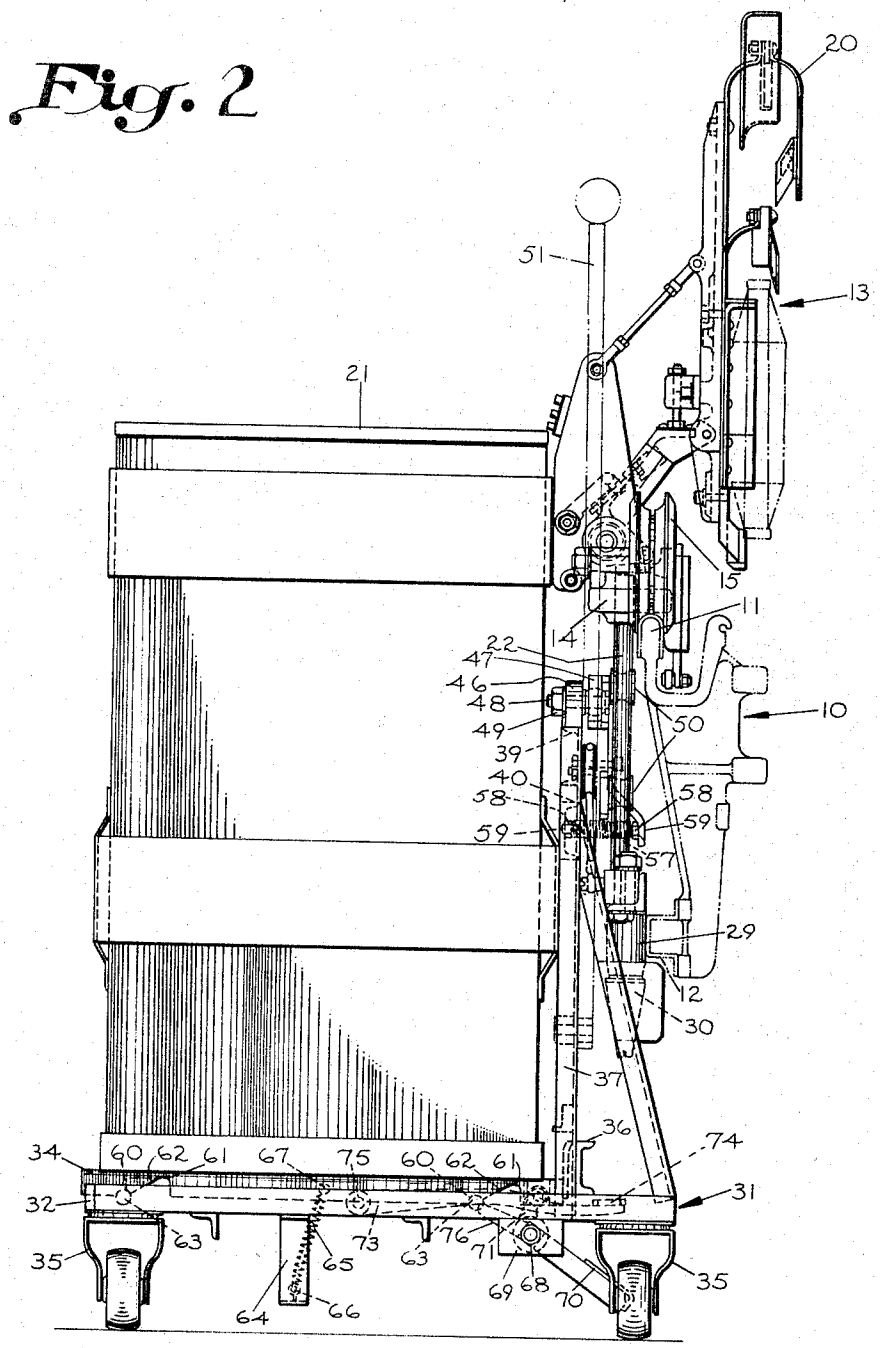
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Fig. 2



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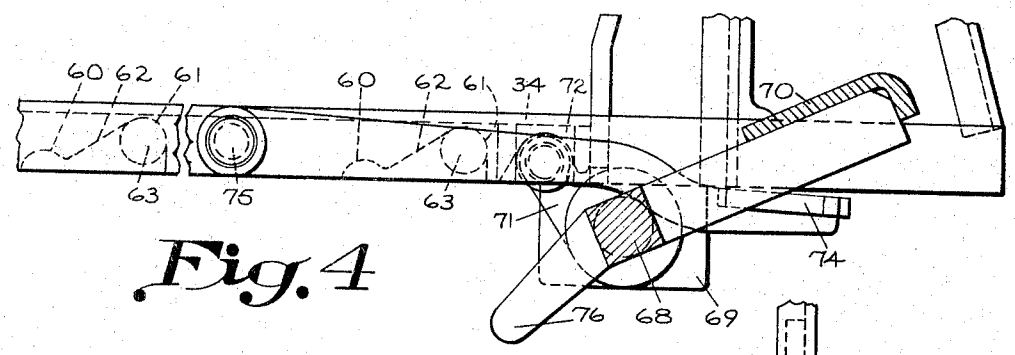


Fig. 4

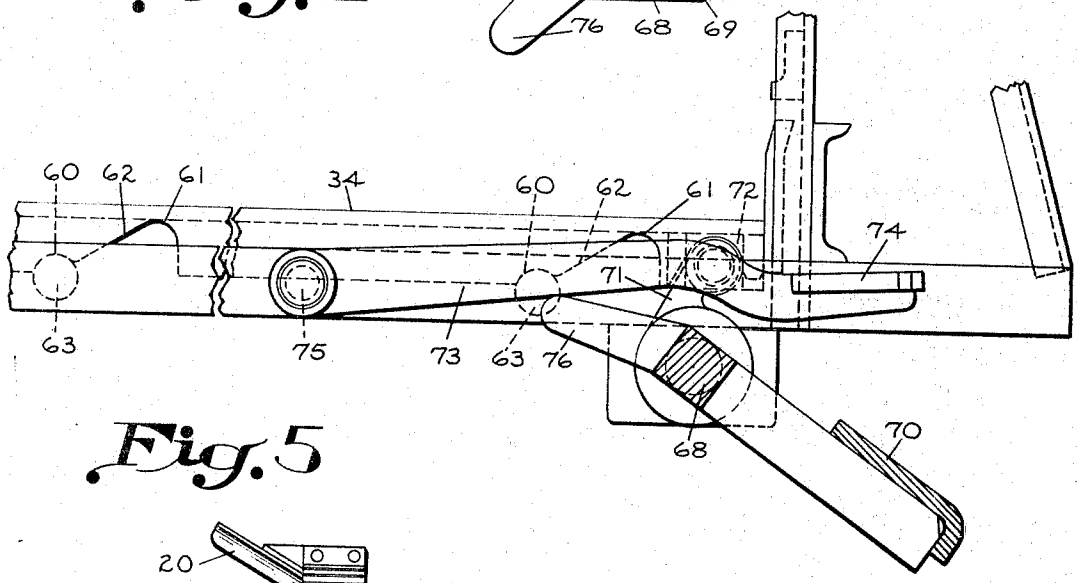


Fig. 5

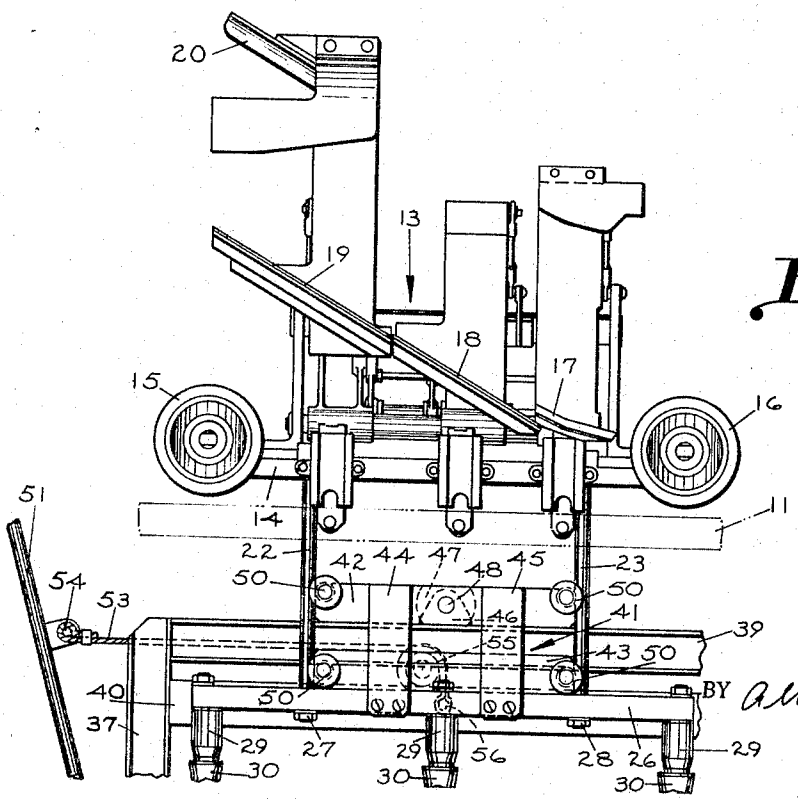


Fig. 3

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3,334,480

DOFFING MECHANISM

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5 Claims. (Cl. 57—53)

The present invention relates to a doffing apparatus for removing wound bobbins from a row of spindles on a spinning frame, and more particularly, to a supporting doffing dolly adapted to cooperate with said apparatus during the intended function thereof.

It is a general object of the invention to provide a doffing mechanism and a cooperating dolly therefor with pivotable and slidable connections therebetween whereby these elements need not remain in alignment during their intended function.

Another object is that of providing a doffing dolly that is adapted to accommodate bobbin receptacles of various sizes to meet the doffing requirements of a particular spinning frame.

A further object in that of alleviating the excessive handling of bobbin receptacles by providing a doffing dolly, which in addition to supporting said receptacle during the doffing function, can be utilized to pick up and transport these receptacles.

A still further object is that of providing a dolly whereby the weight of the receptacle and the bobbins receivable therein are supported by said dolly and not by the rail of the spinning frame as with known mechanisms of the prior art.

Further objects and advantages of the invention will become apparent from the following more detailed disclosure.

Although the doffing dolly which comprises a part of the instant invention is shown as being a cooperating element of a plow-type of doffing mechanism such as disclosed in United States Patent No. 3,176,458, it should be understood that this dolly arrangement would be equally applicable to a pop-up type of doffing mechanism such as that disclosed in United States Patent No. 3,070,949.

Attention is hereby directed to these patents for a detailed description of the mechanisms employed to doff a wound bobbin from its respective spindle and to guide the same into a container carried with and disposed beneath the doffing mechanism.

These doffing units are normally mounted on a carriage having floor-engaging wheels by which the carriage may be moved about a mill and into a position adjacent a spinning frame on which it is adapted to be mounted. The carriage is movable along the rail of the spinning frame in a path parallel to the row of spindles supported thereby. A removable bobbin or quill container is carried in the lower portion of the carriage and is adapted to receive each wound bobbin as it is doffed.

The space limitations in the lower portion of the carriage restricts the size of a bobbin receptacle which can be carried therein and under certain doffing conditions such as longer spinning frames and larger bobbins it has been found feasible to use larger receptacles for the collection of wound bobbins. These bobbin or quill containers require what is considered an excessive amount of handling for they must be placed within the confines of the carriage by hand and when full, removed and transported by another means to their destination.

The doffing dolly forming a part of the instant invention has alleviated the above-mentioned conditions, for collection boxes or bobbin receptacles of various sizes can be carried and supported thereby. The dolly itself includes a lifting means whereby a bobbin receptacle can be picked

up, carried to the doffing frame and when full, delivered to its destination without personal contact therewith.

The base portion of the dolly is provided with casters which are adapted to remain in contact with the floor even while performing its function of moving along a path parallel to the spinning frame.

The doffing mechanism is pivotably and slidably attached to the upper portion of the doffing dolly and although they are movable in unison along a spinning frame, this universal type of connection between the two will not permit any irregular movement of one element to influence the other. Such irregular movement could be an uneven floor over which the dolly is caused to move and by means of the aforementioned connection any dipping or angular swaying of the dolly will not influence the movement of the doffing mechanism being guided along the rail of the spinning frame.

The invention will be described in further detail in the following disclosure wherein reference is made to the accompanying figures of drawing, in which:

FIG. 1 shows a side view of the doffing mechanism and the cooperating dolly with a receptacle positioned upon the base portion of the latter;

FIG. 2 is an end view of the structure shown in FIG. 1 with the addition of a portion of that part of a spinning frame on which the doffing mechanism is supported and guided;

FIG. 3 shows the doffing mechanism illustrated in FIG. 1 in an elevated position relative to the cooperating dolly;

FIG. 4 is a view in side elevation and partially in section of the base portion of the dolly showing the means for elevating a part of said base portion to support a bobbin receptacle thereon; and

FIG. 5 is a view similar to that of FIG. 4 but showing a part of the base portion in an elevated position.

Now referring to the figures of drawing, FIG. 2 shows a portion of a spinning frame generally indicated by numeral **10** having a supporting rail **11** and a lower guide rail **12**. The doffing mechanism is depicted generally in FIGS. 1, 2 and 3 by numeral **13** and includes a supporting carriage **14** having flanged roller members **15** and **16** disposed adjacent each end thereof which are adapted to be mounted on the supporting rail **11**. When in this position, these roller members are effective in permitting the carriage **14** and the various doffing components supported thereon to be moved along the rail of a spinning frame in a path parallel to the row of spindles supported by said frame.

The doffing mechanism **13** includes a driving breaking cam **17** and in continuation thereof a pair of lifting guide members **18** and **19** (FIGS. 1 and 3).

The drive breaking cam **17** is adapted to move beneath and to contact the butt portion of the bobbins (not shown) and to break the hold between said bobbin and its respective spindle. Continued movement of the doffing mechanism causes the bobbins to move up the inclined surfaces of the lifting guide members **18** and **19** and as the bobbins leave their respective spindle, a guiding element **20** guides the bobbins in a direction which will cause them to drop into a receptacle **21** adapted for that purpose.

The supporting carriage **14** includes an additional guiding element which depends from said carriage by means of spaced shaft members **22** and **23**, respectively. The upper ends of these shaft members are threaded and are fixedly attached to the supporting carriage by means of nuts **24** and **25** (FIG. 1). The opposite ends of these shaft members are also threaded and are adapted to support a horizontally disposed guide bar **26** by means of nuts **27** and **28**. Equally spaced roller members **29** depend from the lower edge of the guide bar **26** and are

adapted to engage the lower guide rail 12 (FIG. 2) when the doffing mechanism is in operating position on the spinning frame.

A guide cone 30 depends from the lower end of each roller member 29 and serves as a means for guiding the doffing mechanism into proper operating position on the spinning frame.

The dolly adapted to cooperate with the doffing mechanism is depicted generally in FIGS. 1 and 2 by numeral 31 and includes a pair of horizontally disposed base members 32 and 33. Each of these base members is bifurcated forming an area therebetween in which lifting elements 34 (one only shown in FIG. 2) are adapted to assemble. By a means to be more fully described hereinafter, these lifting elements can be raised and lowered in unison for the purpose of picking up and removing a bobbin receptacle 21 from the dolly. The base members are supported by casters 35 disposed beneath and at each end of said base members. These members are interconnected by a horizontally disposed channel-like bracket 36 which forms the base for the vertical framework that is adapted to support the doffing mechanism. This framework includes end members 37 and 38 which extend upwardly from the base members 32 and 33, respectively.

The upper portions of the end members are interconnected by a bracket 39 extending therebetween with the ends thereof being fixedly attached to said end members by any suitable means such as by welding. A second bracket 40 is attached in a similar manner to the end members and is positioned a relatively short distance below bracket 39.

The means by which the doffing mechanism is pivotably and slidably attached to the dolly will now be described.

A carriage guide is depicted generally in FIGS. 1 and 3 by numeral 41 and includes a pair of horizontally disposed roller support brackets 42 and 43 positioned in vertical alignment and spaced one from the other by means of tie bars 44 and 45.

A centrally disposed and integrally formed lug member 46 extends upwardly from the upper side of the bracket 39 and serves as a means for mounting the carriage guide 41.

A ball joint bushing 47 is disposed intermediate the side of the lug member 46 and the central portion of the side of the upper roller support bracket 42. A bolt 48 extends through aligned apertures in these three elements and they are firmly held in this position by means of a nut 49 (FIG. 2). This ball joint bushing forms somewhat of a universal type connection between the dolly and the doffing mechanism and permits the latter to pivot longitudinally with respect to the supporting carriage 14 as well as laterally for the curved limitations of the ball within the bushing 47. It can now be easily seen that any irregular movement of the dolly as it moves in unison with the doffing mechanism will not influence the latter as the same moves along the rail of the spinning frame.

Flanged rollers 50 are rotatably attached to the outer ends of the roller support brackets 42 and 43 and are so disposed that the surfaces intermediate the flanged sides of said rollers are engageable with the outer surface of the shaft members 22 and 23. This manner of assembling the doffing mechanism to the carriage guide 41 permits said doffing mechanism to be raised or lowered as illustrated by the two positions of FIGS. 1 and 3 whereby this mechanism is readily attached or removed from the rail of the spinning frame.

To simplify the raising and lowering of the doffing mechanism, a lifting lever 51 is pivotably attached to the end member 37 as at 52 (FIG. 1). A lifting cable 53 attaches to the lifting lever at a point intermediate its ends as at 54 and extending inwardly in a horizontal plane, it is adapted to engage a lifting pulley 55 which is attached to the bracket 39 at a point adjacent the center thereof. This cable is then directed downwardly and attaches to a central point on the guide bar 26 as at 56.

By simply moving the lifting lever 51 from that position shown in FIG. 1 to that position shown in FIG. 2, the doffing mechanism can be raised to a position to be lowered onto the rail of a spinning frame or to be completely removed therefrom.

Roller members 29 when in operating position on a spinning frame are continually urged into contact with the lower guide rail 12 by a biasing force consisting of two or more coil springs 57 (one only shown in FIG. 2). These springs as shown in FIG. 2 extend between the lower ends of the tie bars 44 and 45 and the second bracket 40 with the ends of said springs being suitably attached to these members by such means as threaded plugs 58 and cap screws 59. When the doffing mechanism is in operating position, springs 57 are partially compressed and their natural tendency to return to their free length provides a sufficient biasing force to maintain roller members 29 in contact with the lower guide rail 12.

The means by which a bobbin receptacle is elevated to be supported by the dolly will now be described.

The lifting elements 34 which are positioned in the bifurcated portion of the base members 32 and 33 are in the form of channel irons with the leg portions thereof being directed downwardly. The upper plate-like surface forms the platform on which the bobbin receptacle is caused to rest. The leg portions of the lifting elements are provided adjacent each end thereof with a pair of aligned recesses 60 and 61 which are interconnected by an inclined camming surface 62 (FIGS. 2, 4 and 5). These recesses serve as detents with recess 61 being somewhat deeper than 60. Pin members 63 extend from each of the base members a sufficient distance into the area between the bifurcated base members to enable either of the recesses 60 or 61 in the lifting elements 34 to receive said pin members. When these pins are in recesses 60 the lifting elements are in an elevated position and when caused to be moved to recesses 61 in a manner to be described, these elements are in their lowermost position.

A spring bracket 64 depending from the underside of the base members has one end of a coil type spring 65 attached thereto as at 66 (FIG. 2) and the opposite end is attached to the underside of the lifting element 34 as at 67. This spring arrangement provides a biasing force for maintaining the recesses 60 or 61 of the lifting element 34 in contact with the pin members 63.

A jack bar 68 is disposed beneath the base members 32 and 33 adjacent that side of the dolly which supports the vertical framework. The ends of this jack bar are journaled in bearing members 69 (one only shown in FIGS. 2 and 4) which are attached by any suitable means to the base members 32 and 33. A laterally extending foot pedal 70 is disposed intermediate the ends of the jack bar 68 and is fixedly attached to the latter. Directly beneath the ends of the lifting elements 34 the jack bar is provided with generally upwardly directed fingers 71 the terminus portions of which fit into pockets 72 provided on the underside of the lifting elements 34. When the foot pedal 70 is moved from that position shown in FIG. 4 to that of FIG. 5, fingers 71 are caused to move in a clockwise direction. This motion moves the lifting elements along the inclined camming surface 62 and raises said elements from a position where they were seated in recesses 61 on pins 63 to the elevated position shown in FIG. 5 where said pins are caused to seat in recesses 60.

A release lever 73 having a foot pedal 74 forming a part thereof is pivotably attached to the inner side of the base member 32 as at 75. This lever is so disposed that a second finger 76 which is fixedly attached to the jack bar 68, slightly elevates said release lever and is caused to bear against the underside thereof when foot pedal 70 is moved downwardly to that position shown in FIG. 5.

To lower the lifting elements 34 an operator simply presses on the foot pedal 74. This movement moves the second finger 76 in an anticlockwise direction which turns

the jack bar **68** in a like manner to return the foot pedal **70** to its initial position. The initial pressing of foot pedal **74** elevates the lifting elements slightly and the tendency of the coil springs **65** to contract plus whatever weight may be on said elements causes the latter to be lowered by moving along the inclined camming surface **62** back to the recesses **61**.

In operation, the base members **32** and **31** are pushed beneath an empty bobbin receptacle and the lifting element then raised so as to support the weight of said receptacle. The complete unit is then moved to a position adjacent a spinning frame. The doffing mechanism is raised and then lowered onto the rail of the spinning frame where it is caused to move therealong to perform its intended function all of which is well known to those conversant in the art.

The dolly moves in unison with the doffing mechanism as heretofore described with the dolly remaining in contact with the floor adjacent the spinning frame.

The receptacle being carried on the dolly is of sufficient size to meet the doffing requirements of a spinning frame and on completing a frame, the doffing mechanism is simply raised, moved away from the frame and then lowered to a non-operating position on the dolly.

At this point the operator simply has to move the dolly to the destination of the doffed bobbins, lower the dolly's lifting elements to release the bobbin receptacle, and is then ready to repeat this cycle.

While one embodiment of the invention has been disclosed, it is to be understood that the inventive concept may be carried out in a number of ways. This invention is, therefore, not to be limited to the precise details described, but is intended to embrace all variations and modifications thereof falling within the spirit of the invention and the scope of the claims.

I claim:

1. A doffing mechanism for removing wound bobbins from a row of spindles on a spinning frame and comprising a doffing carriage adapted to be mounted on a side

of said spinning frame to move along said row of spindles, a wheeled supporting frame movable in unison with said doffing carriage, pivoting means secured to said supporting frame, a carriage guide borne by said pivoting means for free pivotal movement longitudinally and laterally thereon, and mounting means on said carriage guide on which said doffing carriage is supported for sliding movement in a generally vertical direction.

2. A mechanism according to claim **1** in which said pivoting means includes a ball and socket type connection for permitting free reciprocal motion to said carriage guide relative to said supporting frame.

3. A mechanism according to claim **2** in which said mounting means includes flanged rollers rotatably fixed at the outer ends of said carriage guide, and a pair of spaced shaft members rigidly secured to said doffing carriage engageably contained by said rollers.

4. A mechanism according to claim **3** in which said wheeled supporting frame includes laterally extending base elements for supporting a bobbin receptacle, and means for elevating and lowering a portion of said base elements.

5. A mechanism according to claim **4** in which said elevating and lowering means includes locking means for retaining said portion in the elevated and lowered positions.

References Cited

UNITED STATES PATENTS

1,714,244	5/1929	Rowley	254—8.2
2,010,490	8/1935	Jones	254—8.2
2,937,850	5/1960	Winkler et al.	254—8.2
3,077,725	2/1963	Du Buis et al.	57—53
3,088,266	5/1963	Bahnson et al.	57—53
3,103,096	9/1963	Prat	57—53

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