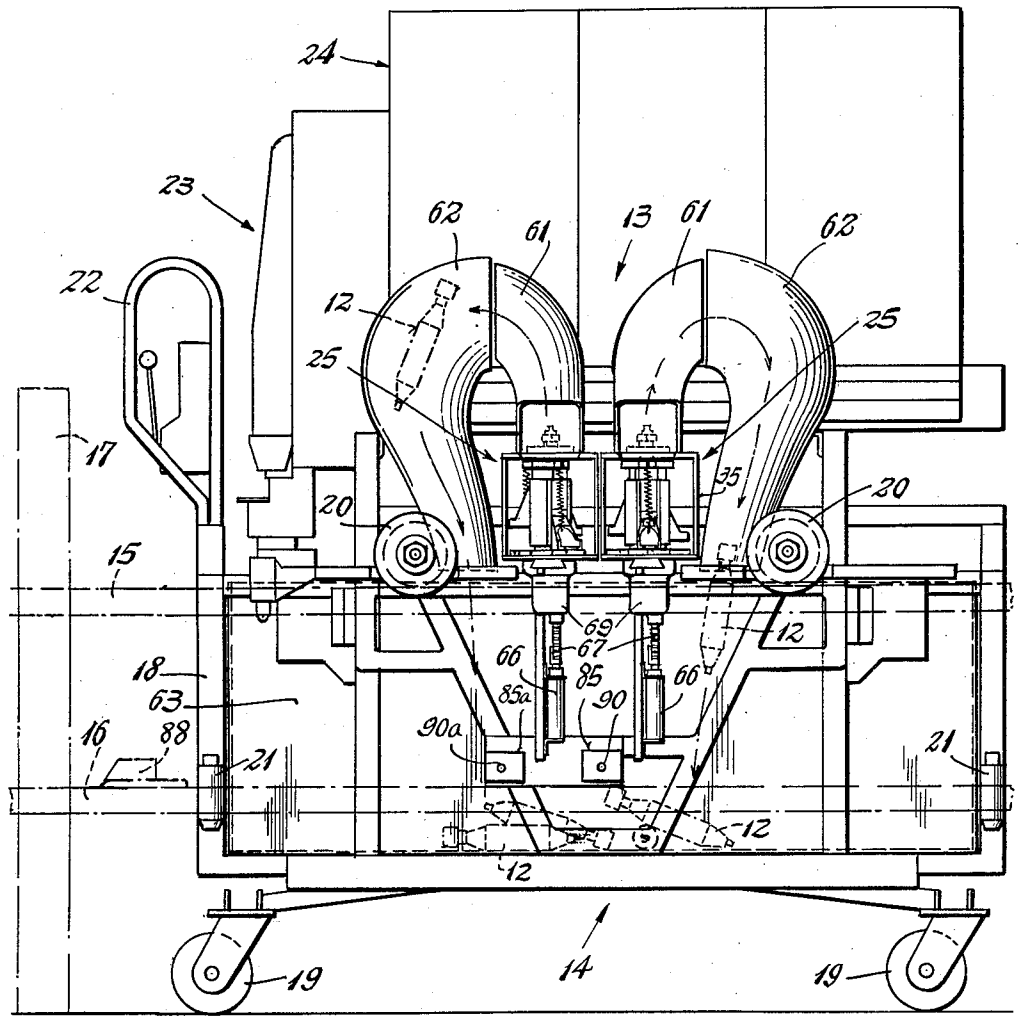
Jan. 1, 1963 E. O. DU BUIS ET AL 3,070,949

DOFFING DEVICE

Filed Feb. 23, 1962 5 Sheets-Sheet 1

Fig. 1



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Jan. 1, 1963 E. O. DU BUIS ET AL 3,070,949

DOFFING DEVICE

Filed Feb. 23, 1962 5 Sheets-Sheet 2

Fig. 4

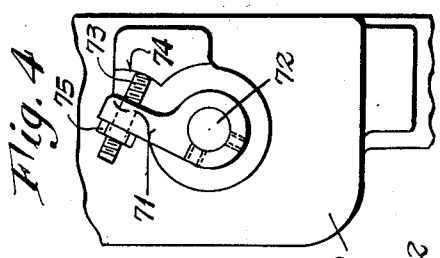


Fig. 2

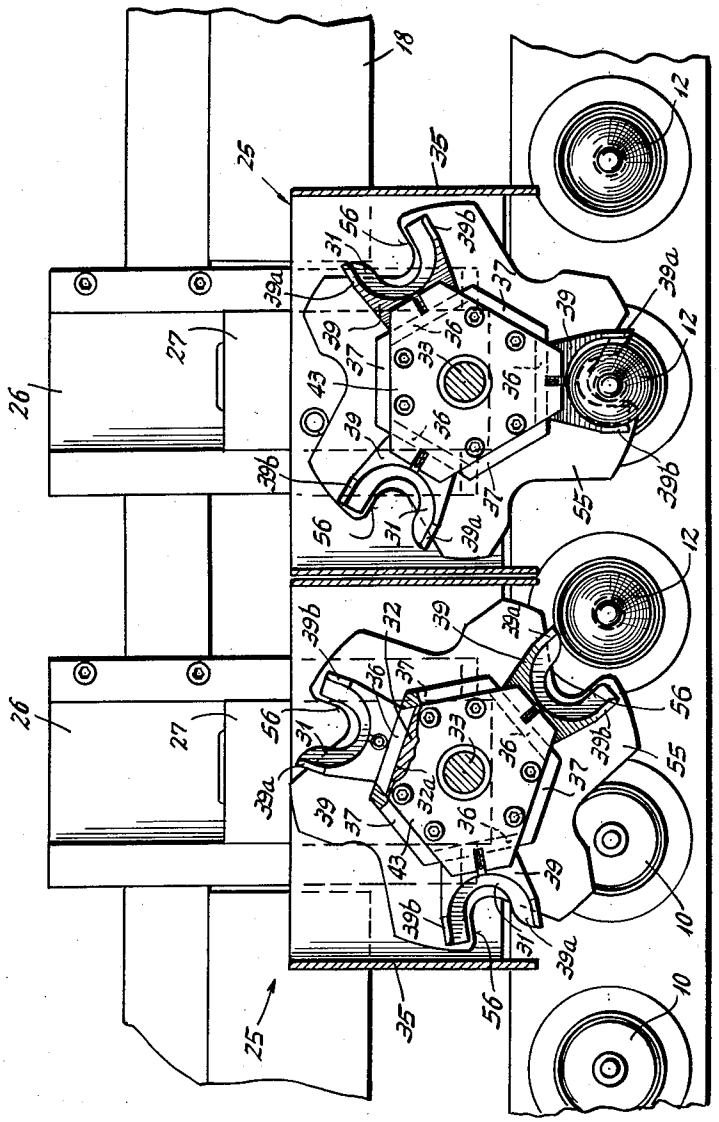
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DOFFING DEVICE

Filed Feb. 23, 1962 5 Sheets-Sheet 3

Fig. 3



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Jan. 1, 1963 E. O. DU BUIS ET AL 3,070,949

DOFFING DEVICE

Filed Feb. 23, 1962 5 Sheets-Sheet 4

Fig. 5

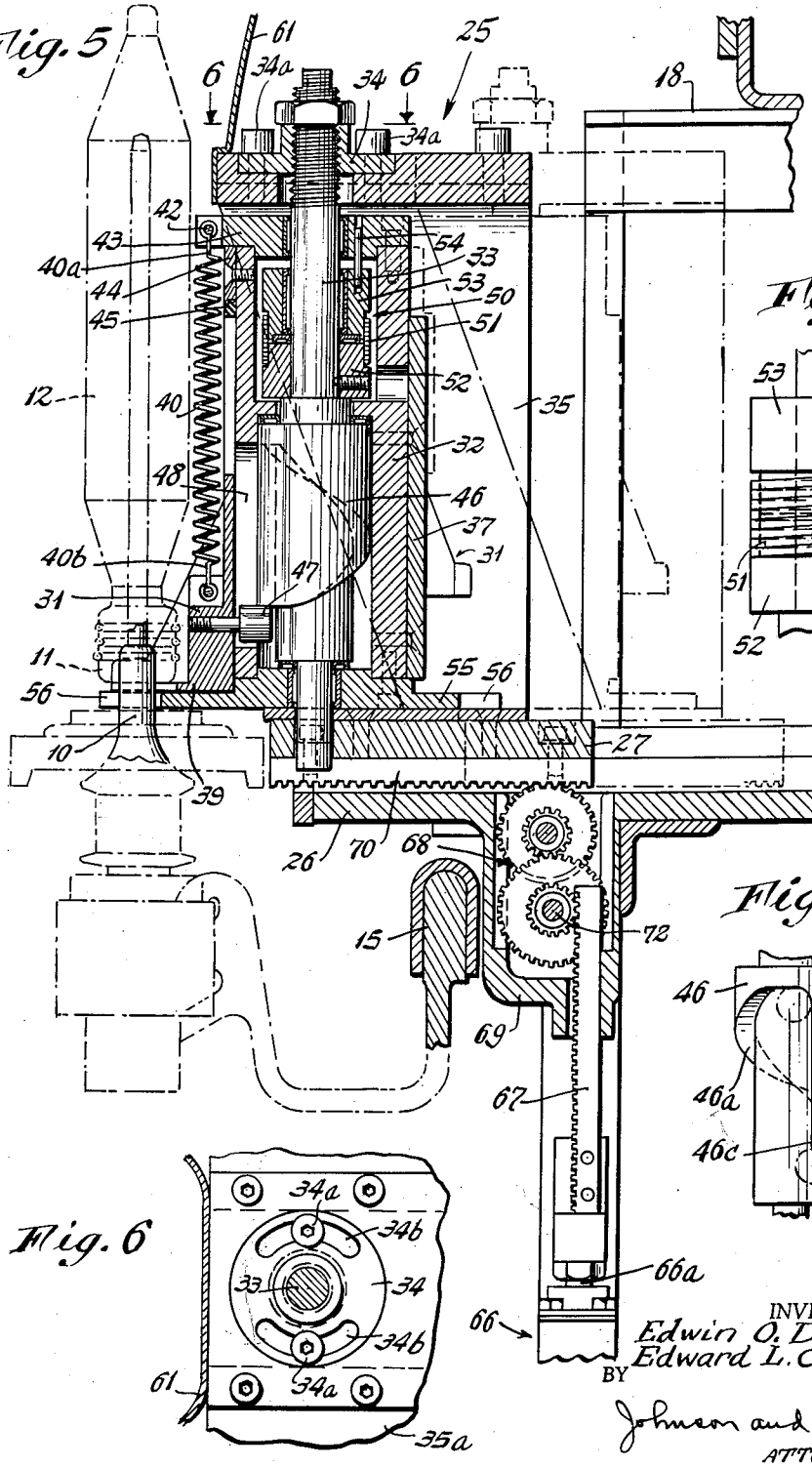


Fig. 8

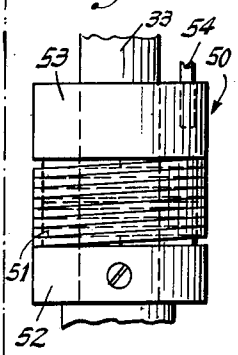


Fig. 7

Fig. 6

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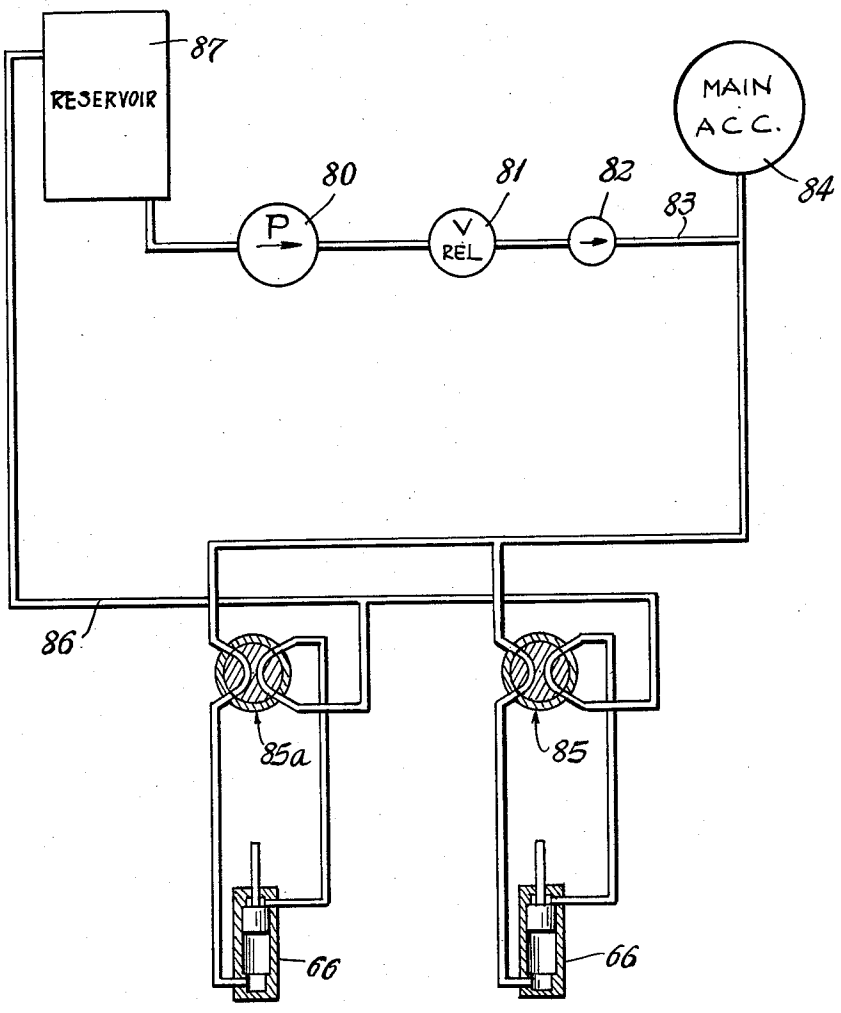
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DOFFING DEVICE

Filed Feb. 23, 1962 5 Sheets-Sheet 5

Fig. 9



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United States Patent Office

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DOFFING DEVICE

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Filed Feb. 23, 1962, Ser. No. 175,136
17 Claims. (Cl. 57—53)

The present invention relates to doffing means and more particularly to a high-speed, pop-up doffing means carried by a carriage movable along the side of a textile machine having a row of parallel spindles thereon for quickly breaking the bobbin drive to a spindle and ejecting the wound bobbin from said spindle.

It is an object of the present invention to provide a simple yet effective means for readily breaking the drive between the bobbin and spindle and rapidly ejecting wound bobbins from spindles on a textile machine.

It is a further object of the invention to provide a doffing means whose operation is controlled by the location of the spindle so that variation in spindle spacing can be readily accommodated.

These and other objects of the invention are accomplished by a unique structure in which the bobbin doffing means is provided with an ejector element. This element is adapted to be moved into cooperative relation with the wound bobbin and, when released from said position, rapidly moves the bobbin along the spindle to eject it from the spindle. Preferably, the means for raising the ejector element comprises a spring which normally urges the bobbin ejector element to an upper position. The doffing means is provided with means for moving the bobbin ejector element to a lower bobbin cooperating position in which the moving means is charged and to hold it in said position until the ejector element is released under control of the location of the spindle to quickly move the bobbin upwardly along the spindle and eject it from the spindle. Suitable deflecting means or guide means are provided for guiding the ejected bobbin to a bobbin receptacle carried by the carriage.

In the preferred form of the invention the doffing means comprises a sleeve having three spaced ejector members thereon, which sleeve is rotated by a star wheel driven by the spindles as an incident to the movement of the carriage along the machine. Spring means normally urge the ejector members to a raised position and cam means within the sleeve moves the ejector elements, in response to rotation of the sleeve, downwardly against the urging of the spring to charge the spring and also locate the ejector members in a position to be moved under the bobbin. Continued rotation of the sleeve with respect to the cam means releases the ejector member whereupon the spring moves the ejector member rapidly along the spindle to eject the wound bobbin from the spindle.

A feature of the invention resides in the fact that the ejector member is released in response to the location of the spindle so that the member is always in proper position to engage the bobbin and be released at the proper time. Preferably, the doffing means includes two ejector units so spaced on the carriage that the ejector members of the two units are arranged to cooperate with alternate spindles. This reduces the load on the cam in its operation of charging the springs for the ejector members and prevents damage to the spindles by the star wheels driving the units.

A further advantage of using two ejector units is that the bobbins ejected by the two units can be directed to different parts of the bobbin receiving receptacle, thus

enabling the bobbins to be better distributed in a single receptacle or be deposited in two adjacent receptacles.

Other features and advantages of the invention will be apparent from the specification and claims when considered in connection with the accompanying drawings in which:

FIGURE 1 shows a side view of the carriage having the doffing means of the present invention thereon with the machine frame and rail shown in dot and dash lines.

FIG. 2 is a detailed view partly in section of the doffing means as shown in FIG. 1.

FIG. 3 is a view taken along lines 3—3 of FIG. 2.

FIG. 4 is a detailed view of the stop member.

FIG. 5 is a sectional view taken along lines 5—5 of FIG. 2.

FIG. 6 is a view taken along lines 6—6 of FIG. 5.

FIG. 7 is a detailed enlarged view of the cam and follower.

FIG. 8 is a detailed enlarged view of the clutch and brake mechanism between the sleeve and spindle.

FIG. 9 is a schematic view of the hydraulic circuit for the doffing members.

The pop-up doffing device of the present invention is adapted to be used in conjunction with textile machines having a row of parallel spindles for receiving bobbins, upon which thread or yarn is wound, for the purpose of doffing the wound packages. The invention is herein illustrated in connection with a spinning machine having a plurality of spaced spindles 10 having bobbins 11 impaled thereon to be driven thereby to produce wound bobbins 12.

The doffing device of the present invention comprises doffing means 13 mounted on a carriage 14 adapted to move along the side of the textile machine. Preferably, the carriage is mounted upon upper and lower rails 15, 16 carried by the machine frame 17, as shown in dot and dash lines in FIG. 1, so as to extend along the side of the machine to maintain, during the doffing operation, a predetermined relation to the machine being doffed.

The carriage, as shown in FIG. 1, comprises a main frame 18 having floor-engaging wheels 19 by which the carriage can be manipulated over the floor of the mill and into position adjacent the textile machine. It is then mounted on the textile machine and supported thereon by rail engaging rollers 20 which are adapted to be mounted on the top rail 15 so as to support the carriage thereby. In order to steady the carriage, steadying rollers 21 are also provided for engaging the bottom rail. A handle 22 is provided at the rear of the carriage whereby the carriage can be manipulated over the floors of the mill and alongside of the textile machine.

The carriage as shown in FIG. 1 has the doffing means 13 mounted adjacent the forward end thereof. Usually the carriage also carries donning means 23 at the rear end to don new bobbins on the doffed spindles and supply means 24 for supplying new bobbins to the donning means. However, since these elements form no part of the present invention, they are merely shown diagrammatically.

The doffing means may comprise one or more ejector units 25. In the illustrated form of the invention a pair of ejector units located side by side on the frame are used for reasons noted below. Since each of the ejector units is of the same construction, only one will be described in detail.

The ejector unit 25 comprises a base 26 mounted on the top of the frame 18 of the carriage to extend transversely thereof. A slide 27 carrying the ejector unit is slidably mounted in ways 28 on the top of the base from a retracted position, as shown in dot and dash lines in FIG. 5, to a projected position, shown in full lines, in which it cooperates with the wound bobbins on the spindles. A member 29 projects upwardly from the slide

and carries one or more doffing units 30 having ejector members 31 for cooperating with the wound bobbins to eject them from the spindle. While the upwardly projecting member may take many forms and positions, it is herein illustrated as a sleeve 32 mounted to rotate on a shaft 33 adapted to lie in a plane parallel to the row of parallel spindles. The shaft is locked to a timer plate 34 adjustably mounted on the transverse portion 35*a* of a bridge member 35 secured to the slide 27. While the sleeve may be provided with any number of doffing units, in the herein illustrated form of the invention the sleeve is provided with three doffing units 30 located 120° apart as shown in FIG. 3. The doffing units have a slide member 36 mounted to slide on bearing portions 32*a* on the outer surface of the sleeve. The slide members 36 are held in position on the bearing portions by plates 37 disposed between the bearing portions and secured to the sleeve by bolts 37*a*. The plates have their edges extended to overlap the edges of the slide members 36 to form ways therefor. It will be seen, therefore, that the slide members can be readily assembled on the sleeve for rotation therewith and for sliding movement therealong.

Each slide member has an ejector member projecting therefrom for cooperating with the bobbin to move it off the spindle. While the ejector member may be a gripper or other element cooperating with the wound bobbin depending on the type of bobbin or driving connection thereto, in the herein illustrated form of the invention it comprises a bifurcated member 39 having the forks 39*a*, 39*b* thereof projecting perpendicular to the slide member at the lower end and adapted to be disposed on opposite sides of the spindle below the wound bobbin, when in cooperating relation therewith, as shown in FIGS. 3 and 5.

The slide members are normally urged to a raised position and are movable to a lower bobbin engaging position in which they are held until released, preferably by means controlled by the location of the spindle, to eject the wound bobbin from the spindle. While many mechanisms may be used for operating the slide member to eject the bobbin from the spindle, it is at present preferred to employ a spring 40 having one end 40*a* connected to a pin 42 carried by a cap 43 secured to the top of the sleeve and having the other end 40*b* of the spring connected to the ejector slide. The spring is of such character that it normally urges the slide to an upper position, as shown at the left in FIG. 2, wherein it engages a stop 44. Preferably, the lower edge of the stop is provided with a resilient bumper 45 to absorb the shock of the ejector slide as it ejects bobbins from the spindles.

In order to move the ejector member from its upper position to a lower position in which it is disposed beneath the wound bobbin for cooperating therewith, the shaft has a fixed cam 46 thereon cooperating with a follower 47 on the slide member projecting through a slot 48 in the sleeve. The cam has a helical cam surface 46*a* so arranged that rotation of the unit with the sleeve will cause the follower to ride along the helical surface and be moved downwardly from the raised position. This will charge or tension the spring as it moves the slide and its ejector member to a lower position in which the ejector member is below the level of the bottom of the bobbin. When the slide reaches the lower position, the flat surface 46*b* on the bottom of the cam will hold the ejector member in this position until it has moved into cooperative relation with the wound package as shown in FIGS. 3 and 5. When the ejector element is in this position, continued rotation of the sleeve will cause the follower to leave the end 46*c* of the flat bottom surface of the cam. This releases the ejector element for rapid upward movement by the spring. The initial impact of the ejector element with the wound bobbin will break the drive between the bobbin and the spindle. Thereafter the spring will rapidly move the wound bobbin upwardly along the spindle to eject it from the spindle.

In order to time the release of the ejector member, the timer plate 34 to which the shaft is connected can be adjusted. This is accomplished by loosening the lock bolts 34*a* riding in arcuate slots 34*b* and rotatably adjusting the plate and the screw and cam carried thereby to accurately locate the edge 46*c* of the cam portion 46*b* to release the ejector element at the proper time in the rotation of the sleeve. Thereafter, the bolts 34*a* are tightened to lock the plate in adjusted position.

To prevent the pressure of the springs against the cam surface from causing a counter-rotation of the sleeve, the sleeve is connected to the shaft through a one-way clutch and brake device 50 which, as shown in FIGS. 5 and 8, comprises a coil spring 51 wrapped around a portion of a collar 52 secured to the shaft and a portion wrapped around a collar 53 rotatable on the shaft and secured to the sleeve to rotate therewith through pin 54. The spring is of the type which will permit rotation of the sleeve in an operative direction under the rotating means for the sleeve but will brake the sleeve and prevent backward or retrograde rotation thereof under the urging of the springs.

While the sleeve can be rotated by means cooperating with the rails 15, 16, or by a separate drive, it is at present preferred to rotate the sleeve by means of a star wheel 55 secured to the bottom of the sleeve and having notches 56 in its edge, as shown in FIGS. 2, 3 and 5, which are shaped to cooperate with the row of spindles on the machine, when the ejector units are in projected position, as the carriage is moved along the frame to be rotated thereby. Thus, it will be seen that the rotation of the sleeve and operation of the ejector mechanism will be accurately controlled by the location of the spindles irrespective of variations in the spacing of the spindle.

As noted above, the present invention employs two ejector units 25 since it has been found advantageous to have the units arranged in side-by-side relation so that the ejector elements of each unit operate on alternate spindles to eject bobbins therefrom. The purpose of this is to divide the spring load on the cams so that the effort required to rotate the sleeves by the star wheels is lessened, thereby preventing any chance of damage to the spindles by the load of the doffing device thereon. To accomplish this the star wheels have twice the number of notches as doffing units arranged as shown n FIGS. 2 and 3 wherein the relation of the star wheels of the two ejector units to the spindles and doffing units is illustrated.

The present invention provides means for directing the ejected bobbins to a receiver or receptacle therefor so that they may be readily removed from the machine. While this may be accomplished by deflecting the bobbins onto belts mounted on the machine frame for feeding to a receptacle, it is herein illustrated as being accomplished by means of a deflector member 61 extending above the spindle in position to be engaged by the ejected bobbin so as to deflect the bobbin laterally into a guide chute 62 for guiding the bobbin into a receptacle means carried by the cartridge. As will be seen in FIG. 1, each of the ejector units is provided with the deflector means and guide means which extend in opposite directions so that the ejected bobbins are deposited in spaced relation in the receptacle. While two receptacles may be used—one for each ejector unit—in the herein illustrated form of the invention the receptacle comprises a box member 63 carried by the lower part of the carriage frame 18 in position to be readily removed therefrom without interference with the other mechanism of the carriage.

The slides carrying the ejector units can be moved between retracted and projected positions by various means such as cams, springs and electrical operators. However, in accordance with the preferred form of the

invention each slide is moved by a hydraulic piston and cylinder means 66 having a rack 67 connected to the piston rod 66*a* for operating gear means 68 in a gear housing 69 on the base 26 and driving a rack 70 mounted on the lower surface of the slide as shown in FIGS. 2 and 5.

The gearing and racks are so arranged that as the piston rod moves upwardly the slide will be moved to and held in retracted position and when the piston rod is moved downwardly the slide will be moved to projected position and held in said position. Preferably, stop means is provided for stopping the slide in its projected position wherein it is in cooperative relation with the spindles. In the illustrated form of the invention the stop means comprises an arm 71 secured to a shaft 72 of the gear means 68 and having a stop member 73 threaded in the arm and cooperating with a stop shoulder 74 on the gear housing 69 as shown in FIGS. 2 and 4. By adjusting the stop member and locking it with the stop nut 75, the ejector units can be accurately located in projected position.

The hydraulic circuit for controlling the piston and cylinder means is shown schematically in FIG. 9 wherein a pump 80 feeds fluid under pressure through a relief valve 81 and a one-way valve 82 to a pressure line 83 connected to a main accumulator 84, said line 83 also extending to a pair of two-way valves 85, 85*a*, one for each cylinder, to operate the cylinder. The valves 85, 85*a* also connect the cylinders to a return line 86 to return the fluid to a reservoir 87 for the pump.

The two valves are preferably mounted on the frame of the carriage as shown in FIG. 1, and are operated by cams on the lower guide rail 16 to automatically energize the cylinders to move the ejector units between retracted and projected positions. For example, the valves are normally in the position shown in FIG. 9 wherein the ejector units are held in retracted position by the piston being in its upper location. As the machine is moved into operative relation with the side of the textile machine, the operator 90 (FIG. 1) for the valve 85 engages the cam 88 on rail 16 to shift the valve connected to the upper end of the cylinder and automatically project the first slide and the ejector unit thereon into cooperative relation with the spindles. Similarly, operator 90*a* will cause valve 85 to shift the second ejector unit to operative position. After the carriage completes its run along the side of the machine, cam means (not shown) similar to the cam 88 on rail 16 will engage operators 90, 90*a* and return the ejector units to retracted position whereupon the carriage is removed from the textile machine.

Variations and modifications may be made within the scope of the claims and portions of the improvements may be used without others.

We claim:

1. In a doffing device for doffing wound bobbins from a row of parallel spindles on a textile machine comprising a carriage, means mounting the carriage on the side of the machine to move along said row of parallel spindles, and doffing means mounted on the carriage to remove wound bobbins from said spindles in response to movement of said carriage along the machine, the improvement wherein the doffing means comprises a rotatable sleeve having a plurality of doffing units slidably mounted thereon and means operated as an incident to the movement of the carriage for rotating the sleeve on an axis parallel to the spindles to move the units into operative relation with the wound packages, each unit having a wound bobbin engaging element, means normally urgng the unit to a raised position on the sleeve, means moving the unit against said urging means to a lower position in which the engaging element is disposed below the wound package, and means releasing said unit when under the package whereby said urging means moves said engaging element upwardly to engage the wound bobbin and remove the same from the spindle.

2. In a doffing device for doffing wound bobbins from a row of parallel spindles on a textile machine comprising a carriage, rail means mounted on the side of the machine to extend therealong, rollers on the carriage to mount said carriage on the rail means to move along said row of parallel spindles, doffing means mounted on the carriage for movement from a retracted position to a projected position in which it removes wound bobbins from said spindles in response to movement of said carriage along the machine, and means controlled by the machine for moving the doffing means to said positions, the improvement wherein the doffing means comprises a rotatable sleeve having a plurality of doffing units slidably mounted thereon and means operated as an incident to the movement of the carriage for rotating the sleeve on an axis parallel to the spindles to move the units into operative relation with the wound packages, each unit having a wound bobbin engaging element, means normally urging the unit against said urging means to a lower position in which the engaging element is disposed below the wound package and releasing said unit when under the package whereby said urging means moves said engaging element upwardly to engage the wound bobbin and remove the same from the spindle.

3. In a doffing device for doffing wound bobbins from a row of parallel spindles on a textile machine comprising a carriage, rail means mounted on the side of the machine to extend therealong, rollers on the carriage to mount said carriage on the rail means to move along said row of parallel spindles, doffing means mounted on the carriage for movement from a retracted position to a projected position in which it removes wound bobbins from said spindles in response to movement of said carriage along the machine, and means controlled by the machine for moving the doffing means to said positions, the improvement wherein the doffing means comprises a wound-bobbin ejector element, spring means normally urging the ejector element to move the bobbin along the spindle to remove bobbins therefrom, means moving the ejector element into cooperative relation with the bobbin and holding it against the urging of said spring means, and means controlled by the location of the spindle for releasing said ejector element whereby said spring means rapidly moves said ejector element to eject the bobbin from the spindle.

4. In a doffing device for doffing wound bobbins from a row of parallel spindles on a textile machine comprising a carriage, rail means mounted on the side of the machine to extend therealong, rollers on the carriage to mount said carriage on the rail means to move along said row of parallel spindles, doffing means comprising a pair of ejector units having doffing units mounted on the carriage for movement from a retracted position to a projected position, each ejector unit cooperating with alternate spindles to remove wound bobbins from said spindles in said projected position, the improvement wherein the doffing unit comprises a wound-bobbin ejector element, spring means normally urging the ejector element to move the bobbin along the spindle to remove bobbins therefrom, means moving the ejector element into cooperative relation with the bobbin and holding it against the urging of said spring means, and means controlled by the location of the spindle for releasing said ejector element whereby said spring means rapidly moves said ejector element to eject the bobbin from the spindle.

5. In a doffing device for doffing wound bobbins from a row of parallel spindles on a textile machine comprising a carriage, rail means mounted on the side of the machine to extend therealong, rollers on the carriage to mount said carriage on the rail means to move along said row of parallel spindles, doffing means comprising a pair of ejector units slidably mounted on the carriage for movement from a retracted position to a projected position,

each device cooperating with alternate spindles to remove wound bobbins from said spindles in response to movement of said carriage along the machine, and hydraulic means including valve means controlled by the machine for individually moving the ejector units between said positions, the improvement wherein each doffing device comprises a wound-bobbin ejector element, spring means normally urging the ejector element to move the bobbin along the spindle to remove bobbins therefrom, means moving the ejector element into cooperative relation with the bobbin and holding it against the urging of said spring means, and means controlled by the location of the spindle for releasing said ejector element whereby said spring means rapidly moves said ejector element to eject the bobbin from the spindle.

6. A pop-up doffing device for doffing wound bobbins from a row of parallel spindles on a textile machine comprising doffing means, means mounting the doffing means to move along said row of parallel spindles to remove wound bobbins from said spindles, said doffing means including an ejector element adapted to be located below the wound bobbin and normally urged by spring means to a raised position, means holding said ejector element in said position below the bobbin and against the action of the spring means, and means controlled by the position of the spindle for releasing the last-named means whereby said ejector element moves rapidly upward to engage the wound bobbin and eject the same from the spindle.

7. A pop-up doffing device for doffing wound bobbins from a row of parallel spindles on a textile machine comprising a carriage adapted to move along said row of parallel spindles, and doffing means mounted on the carriage to remove wound bobbins from said spindles as said carriage moves along the machine, said doffing means comprising a member having a doffing unit mounted thereon and means for operating the member to move the doffing unit into operative doffing relation with the wound packages, said doffing unit comprising a wound bobbin ejector element, means moving the ejector element rapidly from a lower bobbin engaging position to a raised position for ejecting the bobbin from the spindle, and means controlled by the location of the spindles for rendering the last-named means operative to eject the wound bobbin from the spindle.

8. A doffing device for doffing wound bobbins from a row of parallel spindles on a textile machine comprising a carriage adapted to be mounted on the side of the machine to move along said row of parallel spindles, and doffing means mounted on the carriage to remove wound bobbins from said spindles as said carriage moves along the machine, said doffing means comprising a rotatable member having a doffing unit mounted thereon and means for rotating the member to move the doffing unit into operative doffing relation with the wound packages, said doffing unit comprising a wound bobbin ejector element, means raising the ejector element from a lower bobbin engaging position to a raised position for ejecting the bobbin from the spindle, means controlled by the position of the spindle for rendering the last-named means operative to eject the wound bobbin from the spindle, and deflector means for directing the ejected bobbins to a receptacle therefor.

9. A doffing device for doffing wound bobbins from a row of parallel spindles on a textile machine comprising a carriage adapted to be mounted on the side of the machine to move along said row of parallel spindles, doffing means mounted on the carriage and means on the carriage moving the doffing means from a retracted position to a projected position in which said doffing means removes wound bobbins from said spindles as said carriage moves along the machine, said doffing means comprising a rotatable member having a doffing unit mounted thereon and means for rotating the member to move the doffing unit into operative doffing relation with the wound packages, said doffing unit comprising a wound bobbin ejector element, means moving the ejector element from a lower bobbin engaging position to a raised position for doffing the bobbin from the spindle, and means controlled in accordance with the location of the spindles for rendering the last-named means operative to doff the wound bobbin from the spindle.

10. A doffing device for doffing wound bobbins from a row of parallel spindles on a textile machine comprising a carriage adapted to be mounted on the side of the machine to move along said row of parallel spindles, and doffing means mounted on the carriage to remove wound bobbins from said spindles as said carriage moves along the machine, said doffing means comprising an ejector element adapted to be moved into position below the wound bobbin and normally urged by operating means to rapidly move to a raised position, means holding said ejector element in said position below the bobbin and against the action of the operating means, and means controlled by the position of the spindle for releasing the last-named means whereby said ejector element moves rapidly upward to engage the wound bobbin and eject the same from the spindle.

11. A doffing device for doffing wound bobbins from a row of parallel spindles on a textile machine comprising a carriage adapted to be mounted on the side of the machine to move along said row of parallel spindles, doffing means mounted on the carriage for movement from a retracted position to a projected position in which it will cooperate with the spindles to remove wound bobbins from said spindles, and power means for moving said doffing means between said positions, said doffing means comprising a rotatable sleeve having a plurality of doffing units slidably mounted thereon and means for rotating the sleeve on an axis parallel to the spindles to move the doffing units into operative doffing relation with said wound bobbins, said doffing units comprising a wound-bobbin ejector element, spring means normally urging the ejector element to move the bobbin along the spindle to remove bobbins therefrom, means moving the ejector element into cooperative relation with the bobbin and holding it against the urging of said spring means, and means controlled by the location of the spindle for releasing said ejector element whereby said spring means rapidly moves said ejector element to eject the bobbin from the spindle.

12. A pop-up doffing device for doffing wound bobbins from a row of parallel spindles on a textile machine comprising a carriage adapted to be mounted on the side of the machine to move along said row of parallel spindles, and doffing means mounted on the carriage to remove wound bobbins from said spindles controlled by the location of said spindles and in response to movement of said carriage along the machine, said doffing means comprising a rotatable sleeve having a plurality of doffing units slidably mounted thereon, each doffing unit comprising a slide member having a wound bobbin ejector element projecting therefrom, spring means normally urging the slide member and ejector element to a raised position on the sleeve, and cam means cooperating with the ejector element and moving the ejector element against said spring means to a lower bobbin engaging position to charge said spring means and to locate the ejector element in cooperative relation with the wound bobbin, said ejector element being released when moved to a predetermined position with respect to the spindle whereby said spring means rapidly moves said ejector element upwardly to eject the wound bobbin from the spindle.

13. A doffing device for doffing wound bobbins from a row of parallel spindles on a textile machine comprising a carriage adapted to be mounted on the side of the machine to move along said row of parallel spindles, and doffing means mounted on the carriage to remove wound bobbins from said spindles in response to movement of

said carriage along the machine, said doffing means comprising a pair of ejector units located side-by-side and each having a sleeve rotatable on a fixed shaft and having a plurality of doffing units slidably mounted longitudinally of said sleeve, a star wheel connected to each sleeve, said star wheels having twice the number of notches as doffing units mounted on the sleeve and being located to engage the spindles and be rotated thereby as an incident to the movement of the carriage for rotating the sleeve on said fixed shaft to move the doffing units into operative doffing relation with the wound packages on alternate spindles, each doffing unit comprising a bifurcated ejector element, a spring having one end fixed to the sleeve and the other connected to the ejector element and normally urging the ejector element to a raised position on the sleeve, and fixed cam means cooperating with a follower on the ejector element for moving said ejector element against said spring means to a lower position to charge said spring means and locate the ejector element below the wound package, said cam means having a portion for releasing said ejector element when said ejector element is under the package whereby said spring means rapidly moves said ejector element upwardly to engage the wound bobbin and eject the same from the spindle.

14. A doffing device for doffing wound bobbins from a row of parallel spindles on a textile machine comprising a carriage adapted to be mounted on the side of the machine to move along said row of parallel spindles, and doffing means mounted on the carriage to remove wound bobbins from said spindles in response to movement of said carriage along the machine, said doffing means comprising a pair of ejector units located side-by-side and each having a sleeve rotatable on a fixed shaft and having a plurality of doffing units slidably mounted longitudinally of said sleeve, a star wheel connected to each sleeve, said star wheels having twice the number of notches as doffing units mounted on the sleeve and being located to engage the spindles and be rotated thereby as an incident to the movement of the carriage for rotating the sleeve on said fixed shaft to move the doffing units into operative doffing relation with the wound packages on alternate spindles, each doffing unit comprising a bifurcated ejector element, a spring having one end fixed to the sleeve and the other connected to the ejector element and normally urging the ejector element to a raised position on the sleeve, fixed cam means cooperating with a follower on the ejector element for moving said ejector element against said spring means to a lower position to charge said spring means and locate the ejector element below the wound package, said cam means having a portion for releasing said ejector element when said ejector element is under the package whereby said spring means rapidly moves siad ejector element upwardly to engage the wound bobbin and eject the same from the spindle, and deflector means adjacent each ejector unit and extending in opposite directions for deflecting the ejected wound bobbins into receptacle means therefor.

15. A doffing device for doffing wound bobbins from a row of parallel spindles on a textile machine comprising a carriage adapted to be mounted on the side of the machine to move along said row of parallel spindles, and doffing means mounted on the carriage to remove wound bobbins from said spindles controlled by the location of said spindles and in response to movement of said carriage along the machine, said doffing means comprising a sleeve rotatable on a fixed shaft having a plurality of doffing units slidably mounted thereon, and a star wheel connected to the sleeve for cooperating with said spindles for rotating the sleeve on the shaft as an incident to the movement of the carriage to move the doffing units into operative doffing relation with the wound packages, each doffing unit comprising a wound bobbin ejector element, spring means normally urging the ejector element to a raised position on the sleeve, a fixed cam on the shaft cooperating with the ejector element and moving the ejector element against said spring means to a lower position in response to relative movement of said sleeve with respect to said cam to charge said spring means, and a one-way clutch and brake between said sleeve and shaft to permit the star wheel to rotate the sleeve in one direction and prevent retrograde movement of the sleeve by the spring, said cam having means to hold the ejector element below the wound package, said cam releasing said ejector element when said sleeve is moved to a predetermined position by the star wheel cooperating with the spindle whereby said spring means rapidly moves said ejector element upwardly to engage the wound bobbin and eject the same from the spindle.

16. A doffing device for doffing wound bobbins from a row of parallel spindles on a textile machine comprising a carriage adapted to be mounted on the side of the machine to move along said row of parallel spindles, doffing means mounted on the carriage to remove wound bobbins from said spindles in response to movement of said carriage along the machine, and receptacle means for receiving said doffed bobbins, said doffing means comprising a sleeve rotatable on a fixed shaft and having a plurality of doffing units slidably mounted longitudinally of said sleeve, a star wheel connected to said sleeve and located to engage the spindles and be rotated thereby as an incident to the movement of the carriage for rotating the sleeve on said fixed shaft to move the doffing units into operative doffing relation with the wound packages, each doffing unit comprising a bifurcated ejector element, a spring having one end fixed to the sleeve and the other connected to the ejector element and normally urging the ejector element to a raised position on the sleeve, fixed cam means cooperating with a follower on the ejector element for moving said ejector element against said spring means to charge said spring means and locate the bifurcated ejector element around the spindle and below the wound package, said cam means having a portion for releasing said ejector element when said ejector element is under the package whereby said spring means rapidly moves said ejector element upwardly to engage the wound bobbin and ejects the same from the spindle, and deflectors engaging the ejected wound bobbins and guiding said bobbins to said receptacle means.

17. A doffing device for doffing wound bobbins from a row of parallel spindles on a textile machine comprising a carriage adapted to be mounted on the side of the machine to move along said row of parallel spindles, and doffing means mounted on the carriage to remove wound bobbins from said spindles in response to movement of said carriage along the machine, said doffing means comprising a rotatable sleeve having a plurality of doffing units movably mounted thereon and means operated as an incident to the movement of the carriage for rotating the sleeve to move the doffing units into operative doffing relation with the wound packages, each doffing unit comprising a wound bobbin ejector element, spring means normally urging the ejector element in the direction to doff the bobbin from the spindle, holding means holding the ejector element in a ready position against the urging of said spring means, and means responsive to the position of the spindle for releasing said ejector element from ready position whereby said spring means rapidly moves said ejector element into engagement with the wound bobbin and doffs the bobbin from the spindle.

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