Aug. 7, 1945. C. M. ASBILL, JR 2,381,482

BOBBIN LIFTING APPARATUS

Filed Jan. 6, 1945 2 Sheets-Sheet 1

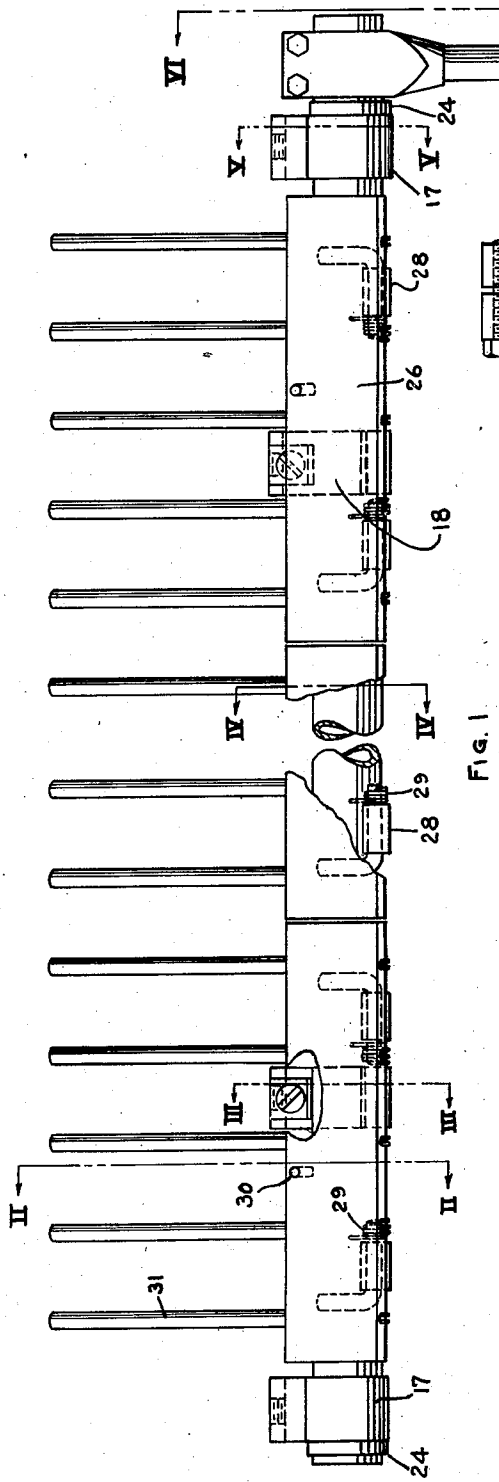


FIG. 1

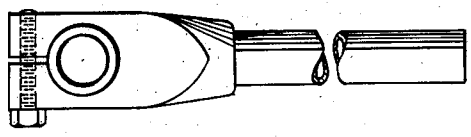


FIG. 6

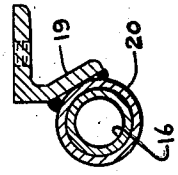


FIG. 5

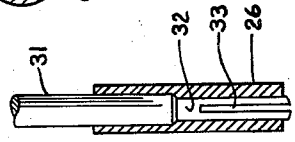


FIG. 4

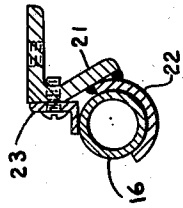


FIG. 3

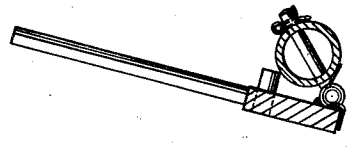


FIG. 2

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BOBBIN LIFTING APPARATUS

Filed Jan. 6, 1945 2 Sheets-Sheet 2

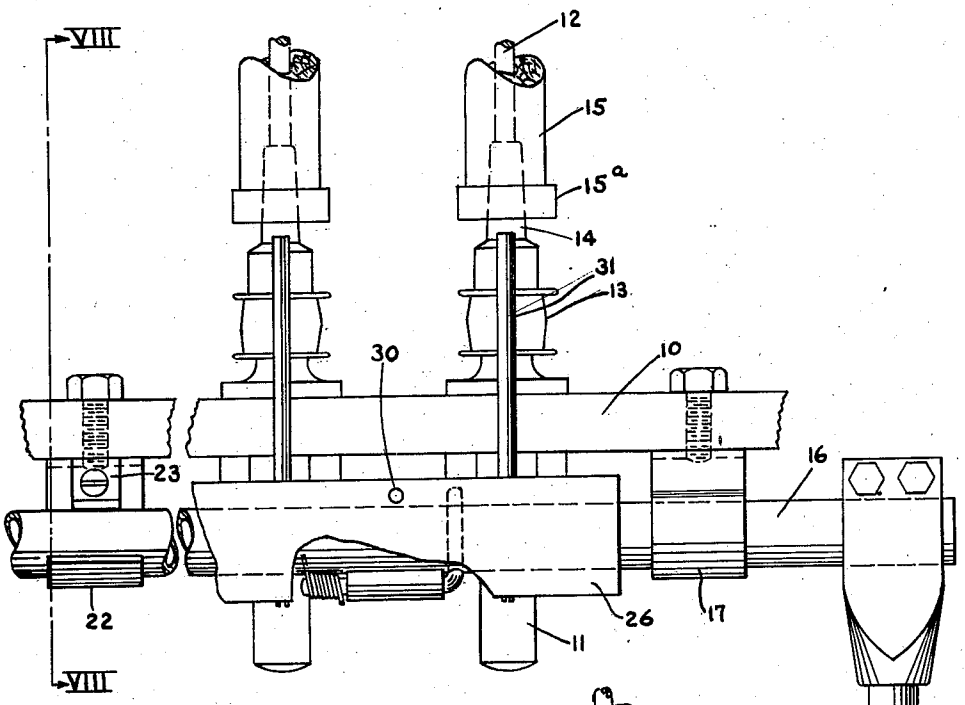


FIG. 7

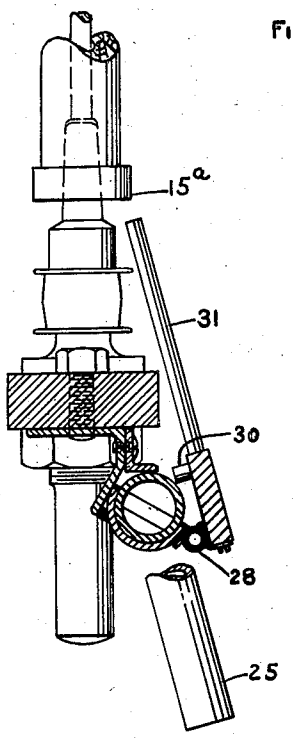


FIG. 8

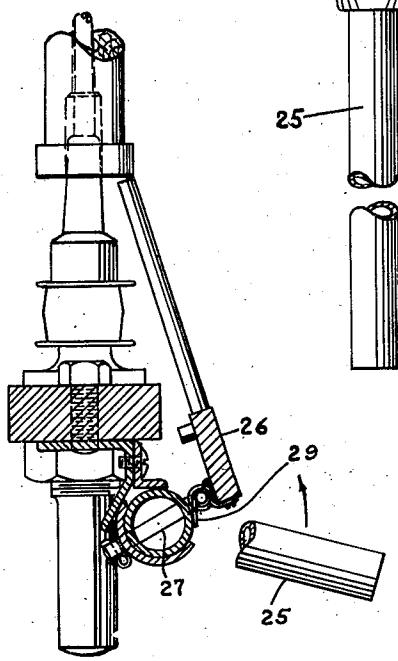


FIG. 9

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UNITED STATES PATENT OFFICE

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BOBBIN LIFTING APPARATUS

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Application January 6, 1945, Serial No. 571,608

13 Claims. (Cl. 57—52)

This invention relates to textile machines in which a strand is wound into a package on a bobbin or the like mounted frictionally on a rotating spindle, a common example of such a machine being a ring spinning frame. More particularly, the invention is concerned with a novel attachment for use on textile machines of the type referred to, which is operable to release the frictional grip of the full packages on their spindles and thus facilitate the work of the machine operator.

In various textile machines, the bobbins, quills, cops, etc., are rotated by frictional engagement with the spindles on which they are mounted, and when full packages have been produced, these packages must be removed from the spindles in an operation known as doffing, and replaced by empty bobbins. Such doffing is ordinarily performed manually, and, since a machine contains a large number of spindles, the doffing operation is very tiring, particularly because considerable effort on the part of the operator is required to release the frictional engagement of the bobbins from the spindles.

The present invention is directed to the provision of an attachment for use on textile machines of the type referred to which enables the operator in a single operation to release the frictional grip of all the yarn packages on the spindles on one side of the machine so that an important part of the labor involved in doffing is eliminated. The new attachment is of simple, inexpensive construction and it is easily operated. Also, it does not interfere in any way with the normal use of the machine to which it is applied.

The new attachment consists essentially of a member which extends lengthwise of the row of spindles in the textile machine and carries a plurality of lifter elements, one for each spindle. These elements are mounted on the member for movement relative thereto, and on movement of the member about its axis in one direction, the elements engage their respective yarn packages from beneath and release their frictional grip on the spindles. As the releasing operation progresses, the elements move relative to the member, so that the forces applied to the packages through the elements may be properly directed to achieve the desired purpose.

For a better understanding of the invention, reference may be made to the accompanying drawings, in which

Fig. 1 is a view of the new attachment in front elevation with parts broken away;

Figs. 2, 3, 4, and 5 are sectional views on the lines II—II, III—III, IV—IV, and V—V, respectively, of Fig. 1;

Fig. 6 is an end view of a portion of the attachment seen from the line VI—VI of Fig. 1;

Fig. 7 is a partial front elevation showing the attachment mounted on a spinning frame and with parts broken away;

Fig. 8 is a sectional view on line VIII—VIII of Fig. 7; and

Fig. 9 is a view similar to Fig. 8 showing the parts in different positions.

The attachment shown in the drawings is of a construction suitable for use on a spinning frame having a bolster rail 10, in which are mounted the bearings 11 for the spindles 12. Each spindle is provided with a whirl 13 by which it can be rotated, and just above the whirl, the spindle has a conical section 14, which frictionally engages the inner surface of the lower end 15a of the bobbin 15 mounted on a spindle.

The new attachment comprises a member 16, preferably in the form of a pipe, which extends the entire length of the row of spindles and is supported for rotational movement in end supports 17 and intermediate supports 18. Each end support consists of a bracket 19 to which a tubular section 20 is attached in any suitable manner, as by weldling, and each intermediate support comprises a bracket 21, similar to bracket 19 and having a semi-cylindrical section 22 attached thereto, as by welding. An angle piece 23 attached to bracket 21 serves to hold the pipe 16 in place in section 22. Collars 24 are mounted at the ends of the pipe to prevent endwise movement of the latter and, at one or both ends, a handle 25 is attached to the pipe. In the inoperative position of the parts, the handle extends downwardly substantially vertically, so as not to interfere with the movement of the operator along the front of the frame.

A plurality of bars 26 are mounted in alignment on the pipe for rotational movement relative thereto and, for this purpose, each bar is attached to the pipe by hinges near its ends. Each hinge comprises a pin 27 extending through the pipe and having a portion outside the pipe lying parallel thereto and received within a tube 28 welded or otherwise secured to the bar. A coil spring 29 is mounted on the end of the pin projecting beyond tube 28, and the ends of the spring bear against the tube and the bottom of the bar. The springs on the hinges supporting each bar tend to move that bar relative to the pipe in a direction such that the top of the bar approaches the vertical plane through the spindles. Each bar is

provided with a stud 30 which may engage the surface of the tube and limit the movement of the bar by its springs.

Each of the bars 26 has mounted in it a plurality of lifter elements 31 in the form of pins, which lie in alignment with respective spindles, and in the inactive position of the device (Fig. 8), the top of each pin lies below the bottom end 15a of the bobbin on the spindle adjacent the pin. The pins 31 may be mounted in the bars 26 in any desired manner, as, for example, each pin may have an end 32 of reduced diameter formed with a slot 33. A stepped opening is then drilled through bar 26, the end portions of the pin defining the slot are spread slightly, and the pin is forced into the opening, where it will be held in place by friction. With this arrangement, the pins can be readily removed for cleaning.

When the spinning frame is operating, the handle 25 is in lowered position and the lifter pins 31 lie below the level of the lower ends of the bobbins on the spindles. When the bobbins have been filled and must be doffed, the operator lowers the ring rail on the machine and then raises the handle 25 of the attachment. This causes the pipe 16 to be rotated and the upper ends of the lifter pins 31 are moved inwardly toward the spindles and upwardly. When the ends of the lifter pins engage the lower ends of the bobbins, continued rotation of the pipe 16 causes the lifter pins to release the bobbins from the spindles. During such releasing action, there is a relative movement of bars 26 and pipe 16 at the hinges. As soon as the vertical grip of the bobbins on the spindles has been broken, the handle 25 is released and the weight of the bars 26 and their pins causes reverse rotation of pipe 16 to restore the parts to their original condition. The operator then completes the doffing and proceeds with the usual operations necessary to place the machine in condition for further operation.

While the new attachment has been illustrated in the form suitable for use on a ring spinning frame, it will be apparent that it may be applied without difficulty and with only minor modifications to other textile machines, in which the bobbins are driven by frictional engagement with spindles. Accordingly, in the accompanying claims in which reference is made to "yarn packages," it is to be understood that the use of that term is not intended to limit the scope of those claims to an attachment for use in spinning frames only.

I claim:

1. A device for use in a textile machine, which contains a plurality of spindles arranged in a row, for releasing the frictional grip of yarn packages on their respective spindles, which comprises a member extending lengthwise of the row of spindles and mounted on the machine for rotational movement, a second member extending lengthwise of the row of spindles and mounted on the first member for rotational movement relative thereto, lifter means on the second member engageable with individual packages on the spindles on movement of the first member in one direction, and means for moving the first member about its axis, such movement in one direction causing said lifter means to engage and release the yarn packages from their spindles, the second member moving relatively to the first as the releasing operation progresses.

2. A device for use in a textile machine, which contains a plurality of spindles arranged in a row, for releasing the frictional grip of yarn packages on their respective spindles, which comprises a member extending lengthwise of the row of spindles and mounted on the machine for rotational movement, a second member extendin lengthwise of the row of spindles and mounte on the first member for rotational movemen relative thereto, means for urging the secon member toward one position, lifter means on th second member, engageable with individual pack ages on the spindles on movement of the firs member in one direction, and means for movin the first member about its axis, such movemen in one direction causing said lifter means to en gage and release the yarn packages from thei spindles, the second member moving relatively t the first as the releasing operation progresses.

3. A device for use in a textile machine, whic contains a plurality of spindles arranged in a rov for releasing the frictional grip of yarn package on their respective spindles, which comprises member extending lengthwise of the row of spin dles and mounted on the machine for rotationa movement, a second member extending length wise of the row of spindles and mounted on th first member for rotational movement relativ thereto, means for urging the second member to ward one position, means for stopping said sec ond member at said position, lifter means on th second member engageable with individual pack ages on the spindles on movement of the firs member in one direction, and means for movin the first member about its axis, such movemen in one direction causing said lifter means to en gage and release the yarn packages from thei spindles, the second member moving relatively t the first as the releasing operation progresse

4. A device for use in a textile machine, whic contains a plurality of spindles arranged in a rov for releasing the frictional grip of yarn pack ages on their respective spindles, which com prises a member extending lengthwise of the ro of spindles and mounted on the machine for ro tational movement, a second member extendin lengthwise of the row of spindles and mounte on the first member for rotational movement rel ative thereto, pins mounted on the second mem ber and engageable with individual packages o the spindles on movement of the first member i one direction, and means for moving the firs member about its axis, said movement in one di rection causing the pins to engage and releas the yarn packages from their spindles, the sec ond member moving relatively to the first as th releasing operation progresses.

5. A device for use in a textile machine, whic contains a plurality of spindles arranged in row, for releasing the frictional grip of yar packages on their respective spindles, which com prises a member extending lengthwise of th row of spindles and mounted on the machin for rotational movement, a plurality of membe extending in a series lengthwise of the row c spindles and mounted on the first member fo rotational movement relative thereto, lifte means on the members of the series engageabl with individual packages on the spindles o movement of the first member in one directio and means for moving the first member abou its axis, such movement in one direction causin said lifter means to engage and release the yar packages from their spindles, the members c the series moving relatively to the first membe as the releasing operation progresses.

6. A device for use in a textile machine, whic contains a plurality of spindles arranged in

row, for releasing the frictional grip of yarn packages on their respective spindles, which comprises a member extending lengthwise of the row of spindles and mounted on the machine for rotational movement, lifter means rotatably mounted on the member and operable to engage and release the individual packages from their spindles, and means for rotating the member to operate said lifter means.

7. A device for use in a textile machine, which contains a plurality of spindles arranged in a row, for releasing the frictional grip of yarn packages on their respective spindles, which comprises a member extending lengthwise of the row of spindles and mounted on the machine for rotational movement, a plurality of lifter elements operable to engage and release individual packages from their spindles, a mounting for the elements rotatably mounted on the member, and means for rotating the member to cause the elements to release the packages, said mounting moving relatively to the member as the releasing operation progresses.

8. A device for releasing the frictional grip of yarn packages on their respective spindles arranged in a row in a textile machine, which comprises a member extending lengthwise of the row of spindles and mounted on the machine for rotational movement, a bar hinged on the member, a plurality of lifter elements mounted on the bar and engageable with individual packages on the spindles on movement of the member in one direction, and means for moving the member about its axis, said movement in one direction causing the elements to engage and release the yarn packages from their spindles, the bar moving relative to the member as the releasing operation progresses.

9. A device for releasing the frictional grip of yarn packages on the spindles arranged in a row in a textile machine, which comprises a member extending lengthwise of the row of spindles and mounted on the machine for rotational movement, a series of bars extending end to end in a row lengthwise of the row of spindles and individually hinged on the member for rotational movement relative thereto, a plurality of lifter elements on each bar engageable with individual packages on the spindles on movement of the member in one direction, and means for moving the member about its axis, such movement in one direction causing the lifter elements simultaneously to engage and release the yarn packages from their spindles, the bars moving relatively to the member as the releasing operation progresses.

10. A device for use in a textile machine, which contains a plurality of spindles arranged in a row, for releasing the frictional grip of yarn packages on their respective spindles, which comprises a member extending lengthwise of the row of spindles and mounted on the machine for rotational movement, a plurality of lifter elements, one for each spindle, connected to the member for rotational movement relative thereto, the elements being engageable with respective packages on the spindles on movement of the member in one direction, and means for moving the member about its axis, such movement in one direction causing the lifter elements to engage and release the yarn packages from their spindles, the lifter elements moving relatively to the member as the releasing operation progresses.

11. A device for use in a textile machine, which contains a plurality of spindles arranged in a row, for releasing the frictional grip of yarn packages on their respective spindles, which comprises a member extending lengthwise of the row of spindles and mounted on the machine for rotational movement, a plurality of lifter elements, one for each spindle, connected to the member for rotational movement relative thereto, the lifter elements being engageable with respective packages on the spindles on movement of the member in one direction, means urging the lifter elements to one position relative to the member, and means for moving the member about its axis, such movement in one direction causing the lifter elements to engage and release the yarn packages from their spindles, the lifter elements moving relatively to the member against the action of said urging means as the releasing operation progresses.

12. A device for use in a textile machine, which contains a plurality of spindles arranged in a row, for releasing the frictional grip of yarn packages on their respective spindles, which comprises a member extending lengthwise of the row of spindles and mounted on the machine for rotational movement, a plurality of lifter elements, one for each spindle, connected to the member for rotational movement relative thereto, the lifter elements being engageable with respective packages on the spindles on movement of the member in one direction, means urging the lifter elements to one position relative to the member, means for preventing movement of the lifter elements beyond said position, and means for moving the member about its axis, such movement in one direction causing the lifter elements to engage and release the yarn packages from their spindles, the lifter elements moving relatively to the member against the action of the urging means as the releasing operation progresses.

13. A device for use in a textile machine, which contains a plurality of spindles arranged in a row, for releasing the frictional grip of yarn packages on their respective spindles, which comprises a member extending lengthwise of the row of spindles and mounted in a plurality of supports on the machine for rotational movement, a bar extending lengthwise of the row of spindles and hinged to the member for rotational movement relative thereto, spring means acting on the bar to urge it in one direction relative to the member, a plurality of lifter elements mounted on the bar and engageable with individual packages on the spindles on movement of the member in one direction, and a handle attached to the member for moving the member about its axis, such movement in one direction causing the lifter elements to engage and release the yarn packages from their spindles, the bar moving relatively to the member against the action of the spring means as the releasing operation progresses.

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