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C. W. YOUNG ET AL

AUTOMATIC DOFF LATCH

Filed Jan. 25, 1926

Fig. 1.

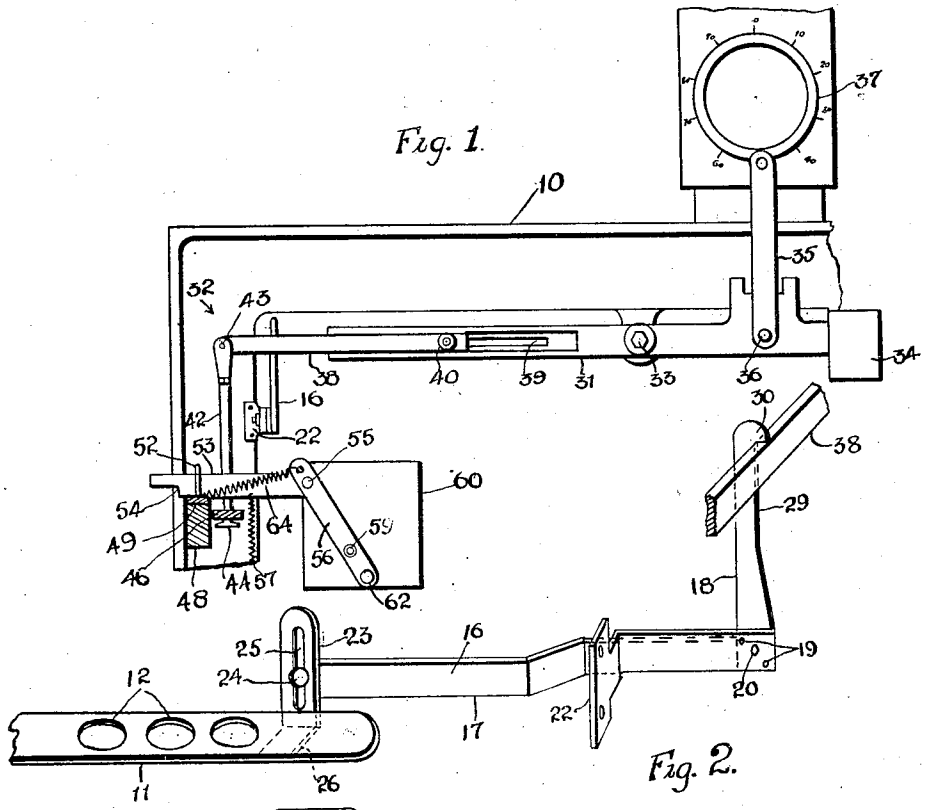


Fig. 2.

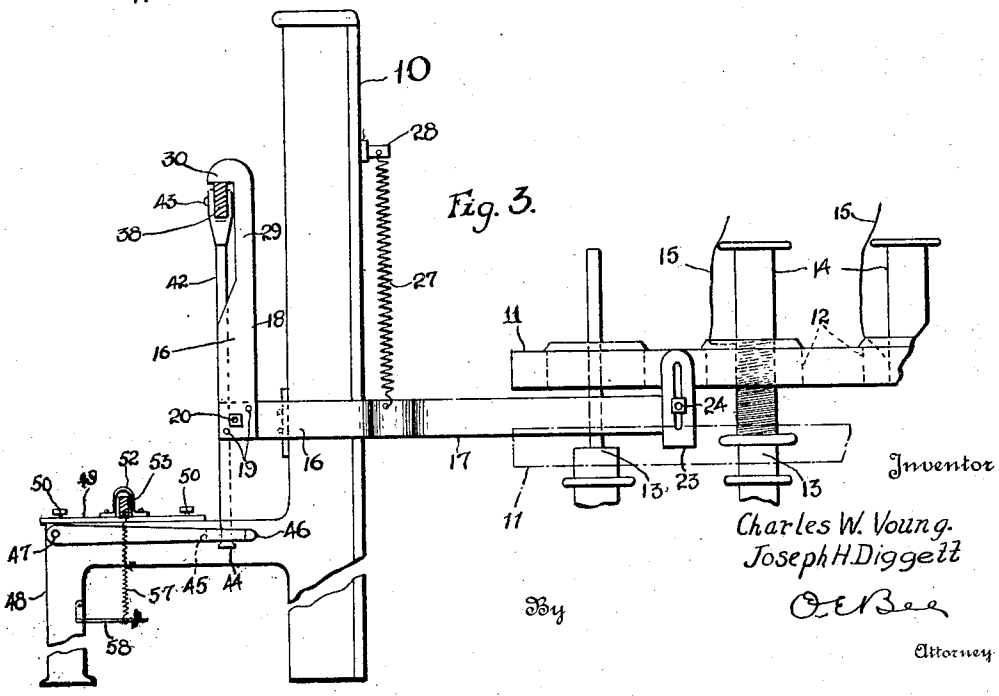


Fig. 3.

Inventor

Charles W. Young.

Joseph H. Diggett

By O. E. Bee

Attorney

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UNITED STATES PATENT OFFICE.

CHARLES W. YOUNG AND JOSEPH H. DIGGETT, OF GOODYEAR, CONNECTICUT, ASSIGNORS TO THE GOODYEAR TIRE & RUBBER COMPANY, OF AKRON, OHIO, A CORPORATION OF OHIO.

AUTOMATIC DOFF LATCH.

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Our invention relates to yarn twisting machines, commonly known as twisters, and it has particular relation to an attachment for controlling the operation of a so-called rail forming a part of such twisters.

One object of our invention is to provide a device so associated with the movable yarn guiding or traverse rail of a twister that the latter will be stopped only when it has reached a pre-determined position.

Another object of our invention is to provide a device which operates in conjunction with a traverse rail of a twister, and which serves to stop movement of the rail in such position that yarn spools may be doffed with a minimum of inconvenience and a minimum loss of time.

A common type of twister employed in the textile industry includes a vertically movable horizontally disposed rail known as a traverse or ring rail, which is provided with a number of openings provided with rings secured therein through which rotatable spool supports extend, the rail being caused to move upwardly and downwardly to guide the yarn on the rotating spools as the twister operates. In order to obtain certain yardage for each spool, the twister is provided with an automatic so-called yardage mechanism, which measures the length of yarn. When a pre-determined number of yards have been wound on the spools, the yardage mechanism automatically operates a knock-off device which is adapted to engage a switch to de-energize the motors employed for driving the twister, whereby operation thereof is stopped. The doffing operation is then accomplished manually.

It will be observed that the twister, if controlled by a yardage mechanism, likely to be stopped when the rail is disposed medially between the ends of the spools or at the tops thereof. Consequently, the rail interferes with the doffing operation because the operator must manually move the rail to its lowermost position, at the lower extremities of the spools, or the driving motor must be again started and stopped to place the rail in that position in order that the spools may be properly doffed.

These additional manual and mechanical operations involve loss of time and the yarn is likely to be broken, tangled or loosely wound and is likely to be soiled. Considerable expense is thus incurred incidentally to this loss of time and in waste of tangled or soiled yarn.

By the employment of an apparatus embodying our invention those aforementioned disadvantages are obviated. The embodiment of our invention disclosed in this application consists of an angular lever, which is pivoted to the frame of the twister, one end of which lever is provided with a portion adapted to engage the lower side of the twister rail. The other end of the lever is provided with a hook or latch member, which is disposed directly above an element of a knock-off device, which is actuated by an automatic yardage mechanism. When the rail moves to its lowermost position, the latch member permits the release of the knock-off device, but in the upper position of the rail, the latch prevents the knock-off device from operating. Thus, after the yardage mechanism is set, and a pre-determined number of yards of yarn is wound upon the spools of the twister, our controlling mechanism will stop the latter when the rail is at its lowermost position. However, if the rail is at any other position at the time the pre-determined number of yards has been wound on the spools, the latch will prevent the knock-off device from stopping the twister, and it will continue to operate until the rail reaches its lower position, at which time the latch will automatically release the element of the knock-off device, and the twister will stop. The filled spools may then be removed from the twister and replaced by empty spools without further movement of the rail.

For a better understanding of our invention, reference may now be had to the accompanying drawings forming a part of this specification, of which:

Fig. 1 is a fragmentary view of a twister, partly in elevation and partly in cross-section, illustrating one application of our invention;

Fig. 2 is a fragmentary perspective view of the automatic doffing latch embodying our invention; and

Fig. 3 is a view partly in elevation and partly in section illustrating an application of our invention, the view being taken substantially at right angles to the view shown in Fig. 1.

Because of the fact that the apparatus embodying our invention is peculiarly adapted to function in connection with certain operating parts of a twister, we shall briefly describe these parts and their relation to our invention, in order that a thorough understanding thereof may be had. Such a twister is indicated generally by the numeral 10, and it is provided with a horizontally disposed vertically movable traverse rail 11. A number of regularly spaced openings 12 in the rail register with concentrically disposed rotatable spool supports 13, which are adapted to receive spools 14 upon which strands of yarn 15 are wound in a well known manner by operation of the twister.

Adjacent one end of the rail 11 is disposed a bell crank lever 16, which we shall designate as an automatic doffing latch. This lever is composed of two arms 17 and 18, rigidly secured together, as indicated at 19, the lever being pivotally mounted on a pin 20 mounted upon a bracket 22, which is secured to the twister frame. The arm 17 extends toward the rail, and is provided with a member 23, secured adjacent the end thereof by means of a bolt 24, which is adjustable vertically within a slot 25 formed in the member 23. The member 23 is bent to provide an offset foot portion 26, which is disposed beneath the rail, and which is moved thereby as the rail approaches its lowermost position, as indicated in dot and dash lines of Fig. 3. An intermediate portion of the arm 17 is connected to one end of a coiled tension spring 27, which is connected at its other end to a bracket 28 carried by the twister frame. This spring constantly tends to urge the end of the arm supporting the adjustable step 23 upwardly toward the rail.

The arm 18 of the automatic doff latch is reduced in width adjacent its upper end, as indicated at 29, and is provided at its upper extremity with a hook or latch portion 30, the latter being adapted to engage the top of an arm 31 of a knock-off device 32.

As best shown in Fig. 1, the arm 31 of the knock-off device is pivoted intermediate its ends at 33 to the twister frame, a weight 34 being secured to one end thereof. Adjacent the weight, a bar 35 connected at 36 to the arm 31 extends upwardly and engages an automatic yardage or yarn measuring mechanism 37. This mechanism is adapted to be set in such manner that any desired pre-determined number of yards of yarn may be wound upon the spools 14. When the predetermined length of yarn is wound on the spools, the mechanism automatically actuates the bar 35 and the end of the arm 31 supporting the weight 34 tends to drop downwardly about the pivot 33. Further description of the automatic yardage mechanism is not believed to be necessary, as the structure and operation of such mechanism is well known in the art of twisting.

The end portion of the arm 31 opposite the weight 34, is made adjustable by providing an end bar 38 slidable in a slot 39 in the arm 31, the bar being adapted to be secured in various positions therein, by means of a clamping bolt 40. A downwardly extending rod 42 is pivotally connected to the outer end of the bar 38 by means of a pin 43, and is provided at its lower ends with an elongate enlargement 44. The lower end of the rod, including the enlargement, extends through an elongate opening 45 provided in one end of an arm 46, the other end of the latter being pivoted at 47 to an extension 48 of the twister frame. After the enlargement 44 is inserted through the elongate opening 45 the rod 42 is adjusted rotatably until the enlargement is disposed crosswise of the opening and therefore abuts against the lower side of the arm 46. A plate 49 is rigidly secured horizontally upon the top of the extension 48 by means of bolts 50 and is provided with a U-shaped guide bracket 52, through which the outer end portion of a latch member 53 extends. One end of the latch member 53 is notched adjacent the bracket, as indicated at 54. The latch is pivoted at the other end to a lever 56 by means of a pin 55. In order to maintain the latch member 53 in intimate engagement with the plate 49, one end of a spring 57, which is under tension, is secured thereto, and the other end of the spring is connected to a bracket 58 carried by the extension frame 48.

An intermediate portion of the lever 56 is secured to a switch element 59 mounted in a conventional switch box 60, and a handle 62, secured to the lower end of the lever, is adapted to be manually manipulated in a clockwise direction to pivot the lever until the switch mechanism within the switch box energizes a twister driving motor (not shown). As the operation of switch boxes of this type is well known, further description thereof is not deemed to be essential. A spring 64, under tension, is secured to the end of the lever 56, and to the rigid plate 49. This spring tends to draw the upper end of the lever 56 toward the plate 49. However, when the lever is actuated, against the tension of the spring, until the motor is energized, it will be held in that position by the plate 49, against which the notched portion 54 of the arm 53 is adapted to abut.

In operation of the structure described in the foregoing paragraphs, a number of spools are placed on the supports 13, and the automatic yardage mechanism 37 is set to measure a predetermined length of yarn to be wound upon each spool. The motors are energized by moving the lever 56 in a clockwise direction, and is held in operating po-

sition by the arm 53. Also, the hook or latch portion 30 of the automatic doff latch is in its proper position adjacent the extension 38 of the knock-off device. When the predetermined length of yarn is measured by the automatic yardage mechanism, the latter actuates or releases the bar 38, and the weight 34 tends to swing downwardly. If the traverse rail 11 at this moment is in the position indicated by dot and dash lines of Fig. 3, it is in proper position for doffing, and the traverse rail will have engaged the adjustable member 23 to swing the latch portion 30 out of engagement with the bar 38. Accordingly, the arm 31 will draw the rod 42 upwardly against the arm 46, which engages the arm 53 and releases the latter from engagement with the plate 49. Also, the spring 64 will swing the lever 56 in a counterclockwise direction, thereby operating the switching element 59 and stopping operation of the twister driving motor.

In the event the traverse rail 11 is in the position indicated in full lines of Fig. 3 when a pre-determined number of yards of yarn has been measured, the latch member 30 of the automatic doff latch will continue to engage the bar 38, and the twister will continue operating until the rail again reaches its lowermost position, at which time the latch portion 30 will release the arm 38. Then the knock-off device, as above set forth, will release the arm 53 to stop operation of the twister motor. Thus, the twister is always stopped at the desired position, or at the proper position for doffing, and the apparatus may be adjusted by moving the adjustable member 23 and securing it rigidly by the bolt 24. Of course it is to be understood that the traverse rail 11 may be stopped at any selected horizontal position intermediate the ends of the spools 14, in the event conditions arise which require such operation. This may be done by adjusting the member 23 which is adapted to be moved independently.

From the foregoing description, it will be apparent that we have devised a simple and effective apparatus, which will materially increase the efficiency of a twister by saving time and labor incident to the operation thereof, as well as saving yarn which would otherwise be tangled or soiled and consequently classed as waste material.

Although we have illustrated but one form which our invention may assume and have described in detail but a single application thereof, it will be apparent to those skilled in the art that it is not so limited but that various minor modifications and changes may be made therein without departing from the spirit of our invention or from the scope of the appended claims.

What we claim is:

1. An attachment for a twister having a traverse rail comprising a latch member adapted to engage a stop mechanism of the twister and an arm adapted to engage the traverse rail of the twister at any predetermined position of the rail to release the latch.

2. The combination with a twister traverse rail and stop mechanism, of a member adapted to engage the rail and the stop mechanism for controlling operation of the stop mechanism.

3. The combination with a twister provided with a traverse rail and stop mechanism, of a device operatively associated with the rail and with the stop mechanism for releasing the latter when the rail is in a predetermined position.

4. The combination with a twister provided with a rail and a knock-off device, of an apparatus provided with a lever adapted to engage both of said members to control operation of the knock-off device.

5. The combination with a twister provided with a traverse member and a stop member, of a device comprising a bell-crank lever adapted to engage both of said members to so control operation of the stop member that the twister is stopped only when the traverse member is at a predetermined position.

6. The combination with a twister provided with a rail and a stop mechanism of a device comprising a bell-crank lever pivoted to the twister and an adjustable member on the lever adapted to cooperate with the rail to cause the stop mechanism to operate only when the rail is in a predetermined position.

7. The combination with a twister provided with a rail and a stop mechanism, of a device comprising a bell-crank lever pivoted to the twister and an adjustable member on the lever adjacent the rail, and latch means formed at one end of the lever adapted to engage the stop mechanism and adapted to be released therefrom only when the rail has reached a predetermined position.

8. The combination with a twister provided with a rail and a stop mechanism, of a device comprising a bell-crank lever pivoted to the twister and adapted to engage the stop mechanism, an adjusting member on the lever adapted to engage the rail, and resilient means connected to the lever and twister machine adapted to release the stop mechanism when the rail is in a predetermined position.

9. The combination with a twister having a movable traverse rail and an automatic stop mechanism, of an attachment comprising a member controlled by the position of the traverse rail for preventing the operation of the stop mechanism.

10. The combination with a twister having a stop mechanism and a traverse rail

continuously movable in opposite directions, of an attachment comprising a member controlled by the movement of the traverse rail for preventing the operation of the stop mechanism at predetermined positions.

11. The combination with a twister having a traverse rail, a stop mechanism, and a measuring clock, of an attachment comprising a member controlled by the position of the traverse rail for preventing the operation of the stop mechanism when released by the measuring clock.

In witness whereof, we have hereunto signed our names.

CHARLES W. YOUNG.
JOSEPH H. DIGGETT.