

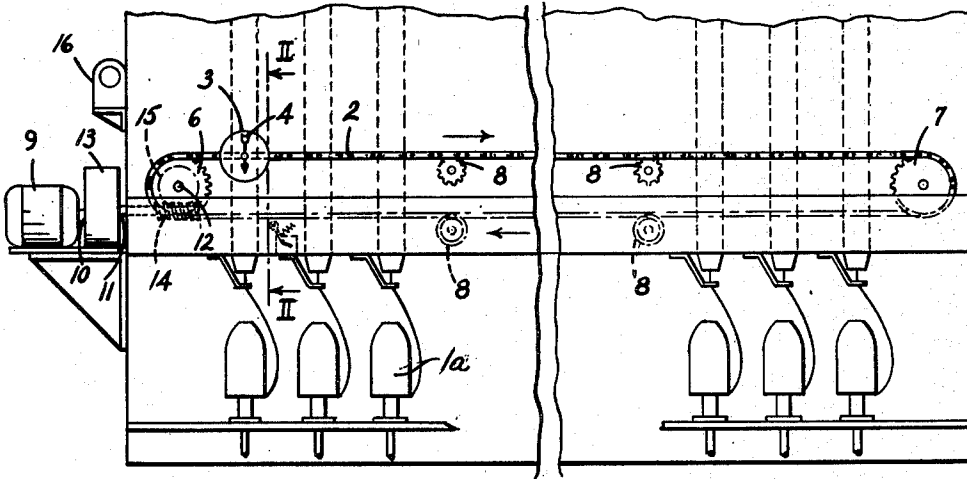
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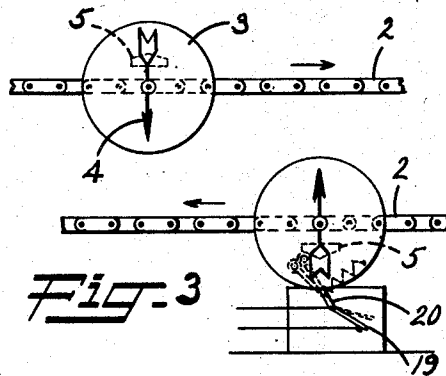
2,463,028

DOFFING INDICATOR SYSTEM

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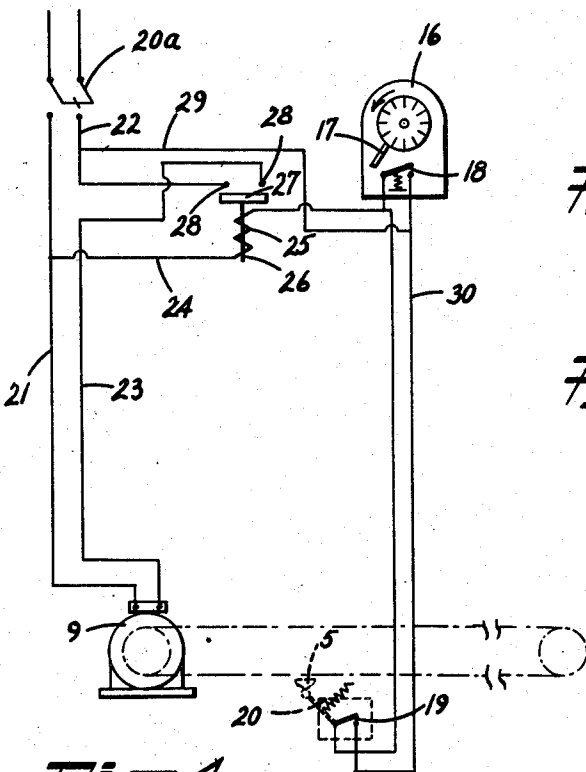
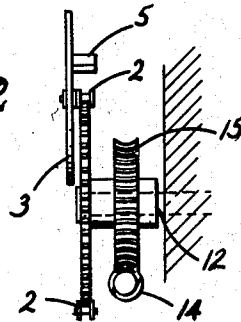


**FIG. 1**



**FIG. 3**

**FIG. 2**



**FIG. 4**

INVENTORS  
*Joseph O. Frist*  
*Ernest K. Bauer*  
by *Carl A. Castellani*  
att'y.

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## DOFFING INDICATOR SYSTEM

Joseph O. Frist and Ernest K. Bauer, Meadville, Pa., assignors to American Viscose Corporation, Wilmington, Del., a corporation of Delaware

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6 Claims. (Cl. 242—39)

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This invention relates to a doffing indicator system for winding apparatus and more particularly to such an indicator system adapted for association with a thread winding apparatus in which continuously fed textile thread, yarn, or the like strand material, hereinafter called thread, is wound simultaneously on a multiplicity of bobbins or other wind-up means.

The invention is designed to insure that bobbins or the like will be doffed in regular order when approximately the same amount of thread or yarn has been wound on each bobbin. At present it is extremely difficult for the operator to gauge when the thread build-up on one of a multiplicity of bobbins is equal to that on the remaining bobbins, and the bobbins are doffed in a more or less haphazard chance manner. The disparity between the amount of thread wound on the various bobbins which results from such chance doffing practices can be a very serious matter especially when the bobbins are to be mounted on a creel and the thread wound on a warp beam. In such cases, the bobbins having the lesser amount of thread wound thereon determine the ultimate weight of the beam, or, if a beam of greater weight is desired, all of the bobbins must be removed from the creel when the thread on those carrying the lesser amount has been unwound, and replaced by full bobbins and, in the latter case, considerable waste of both yarn and labor occurs because the yarn remaining on the bobbins which are not exhausted during the creeling operation must be removed before the bobbins can be again used in a winding machine.

The object of this invention is to provide an indicator system for signalling when a predetermined winding period has been terminated, and for indicating when each successive bobbin of a multiplicity of bobbins is to be doffed upon completion of the winding period, thus insuring that all of the doffed bobbins have approximately the same amount of thread wound thereon.

Essentially, the indicator system of the invention comprises means for signalling the conclusion of a predetermined winding period, an indicating means, and means for moving the indicating means past each of a multiplicity of thread-receiving units in succession, the signalling means being constructed and arranged to initiate operation of the means for moving the indicating means.

In the accompanying drawing,

Figure 1 is a front elevation of a dry spinning machine having an indicator system in accordance with this invention associated therewith;

Figure 2 is an enlarged view of the apparatus taken on line II—II of Figure 1;

Figure 3 is an enlarged view of a portion of the apparatus shown in Figure 1; and

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Figure 4 is a wiring diagram of the circuit employed.

In the drawing, the indicator system is shown associated with a dry spinning machine 1. Artificial filamentary material is directed from the spinning cells of the machine to a multiplicity of winding and twisting units 1a of standard cap type arranged, as usual, on a vertically reciprocating rail. Positioned above the cap twisters and mounted on the spinning machine frame adjacent to the spinning cells is an endless sprocket chain 2 which has affixed thereto an indicating means comprising a disc 3 bearing a suitable indicium, as shown an arrow 4. The disc also carries a projection or cam 5. The chain passes over end sprockets 6 and 7 and is supported at intervals by spaced pairs of idling sprockets 8.

A motor 9, supported by means not shown, drives chain 2 through shafts 10, 11, and 12. Shaft 10, driven by motor 9, drives shaft 11 through reduction gear box 13. Shaft 11 in turn drives worm gear 14 which meshes with worm wheel 15 carried on shaft 12 together with end sprocket 6. An alarm or signalling device, such as clock 16, is set to signal the conclusion of a predetermined winding period, and is provided with a lug 17 which trips a switch 18 to set motor 9 in operation, when the alarm is sounded. Movement of chain 2 over end sprockets 6 and 7 is thus initiated. The indicator system also includes a limit switch 19, having an arm 20, the switch being so positioned that cam 5 on disc 3 trips the switch to stop operation of motor 9 when the disc has passed over end sprocket 7 and has been returned to a starting position adjacent end sprocket 6. At the start of the operation, disc 3 on chain 2 is so positioned with respect to end sprocket 6, that when lug 17 trips switch 18 to set motor 9 in operation, the operator has sufficient time to reach the first doffing station before arrow 4 is aligned with the first thread-receiving unit to be doffed. As chain 2 moves over sprockets 6 and 7, disc 3 is carried past each of the thread receiving units in succession. The operator, keeping abreast of disc 3, removes each bobbin as arrow 4 passes thereover, replaces it with an empty bobbin, and laces up the fresh bobbin. The speed of chain 2 may be adjusted to provide ample time for even the slowest operator to complete these operations. When disc 3 has been carried by chain 2 along the full length of the spinning machine, and all of the full bobbins have been doffed and replaced by fresh bobbins, disc 3 passes over end sprocket 7 and is returned to the starting position as previously described.

Referring more particularly to Figure 4, there are shown two circuits, the motor circuit comprising leads 21, 22, and 23, and the control

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circuit comprising lead 24, a relay comprising coil 25, core 26, contactor 27 and contacts 28, leads 29 and 30, and switches 18 and 19 which are arranged in parallel. Switches 18 and 19 remain open during the winding operation. Operation is as follows: Master switch 20a is closed. When the alarm of clock 16 is sounded, at the expiration of a predetermined winding period, say six hours, and the thread receiving units are ready for doffing lug 17 trips switch 18, which springs to closed position. The control circuit is thus closed, the relay being energized through a circuit comprising leads 21 and 24, 22, and 29, and switch 18, which causes core 26 to close contacts 28, thereby establishing a through circuit of line 22 to line 23 to energize motor 9 and initiate movement of chain 2. Clock switch 18 remains closed until cam 5 has moved past arm 20 of switch 19, when lug 17 releases switch 18, which springs back to normal open position. Switch 18 remains open until, when a new winding period is concluded, the alarm device of clock 16 again causes lug 17 to trip switch 18. Switch 19 is closed and remains closed until cam 5 makes a complete round, back to switch 19. On its return trip, after disc 3 has moved past all of the thread-receiving units, cam 5, carried by disc 3, strikes against arm 20 of switch 19. Switch 19 is thereby caused to spring open, which opens contact 28, thereby deenergizing the relay and breaking the through circuit of lead 22 to lead 23, and deenergizing motor 9. Disc 3 on chain 2 is now in position awaiting the start of another doffing operation. Cam 5 holds switch 19 open until clock 16 starts a new cycle. Clock 16 is again set to signal the conclusion of a new winding period.

As shown, clock 16 is of the hand wound mechanically operated type, but it may be replaced by an electrically operated clock, if desired. Of course, instead of disc 3 and arrow 4, any other suitable type of indicia may be employed.

By the practice of the present invention, guess work in doffing operations is eliminated, and all of the bobbins, spools, or other thread-receiving units are doffed in regular scheduled, sequential order, and when approximately the same amount of thread is wound on each unit. The indicator system of the invention may be associated with various types of winding or winding and twisting machines, and the thread or the like would upon the bobbins or other take-up devices may be forwarded directly from a setting medium, as in the production of artificial filamentary material, or it may be unwinding from other spools or bobbins in a rewinding operation.

It will be understood that although we have illustrated a specific embodiment of our invention, modifications may be made in the details thereof, and the invention is not to be limited except as necessitated by the appended claims.

We claim:

1. In combination with a thread winding machine comprising a multiplicity of thread-receiving units to which thread is continuously fed, a doffing indicator system comprising means for signalling the time when a predetermined winding operation is scheduled to terminate, an indicator independent of the signalling means, and means for continuously moving the indicator past and out of contact with each of the thread-receiving units in succession.

2. In combination with a thread winding ma-

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chine comprising a multiplicity of thread-receiving units to which thread is continuously fed, a doffing indicator system comprising means for signalling the time when a predetermined winding operation is scheduled to terminate, an indicator independent of the signalling means, means for continuously moving the indicator past and out of contact with each of the thread-receiving units in succession, and means operatively associated with the signalling means and the means for moving the indicator past the thread-receiving units for initiating movement of the indicator moving means in response to operation of the signalling means.

3. In combination with a thread winding machine comprising a multiplicity of thread-receiving units to which thread is continuously fed, a doffing indicator system comprising means for signalling the time when a predetermined winding operation is scheduled to terminate, an endless indicator-conveying means arranged to extend transversely of all of the thread-receiving units, an indicator supported on the conveying means and independent of the signalling means, means for moving the indicator past and out of contact with each of the units in succession, and means operatively associated with the signalling means and the means for moving the indicator past the thread-receiving units for initiating movement of the indicator moving means in response to operation of the signalling means.

4. In combination with a thread winding machine comprising a multiplicity of thread-receiving units to which thread is continuously fed, a doffing indicator system comprising means for signalling the time when a predetermined winding operation is scheduled to terminate, an endless indicator conveying means arranged to extend transversely of all of the thread-receiving units, an indicator carried by the conveying means and independent of the signalling means, a motor for driving the conveying means to move the indicator past and out of contact with each of the units in succession, and means operatively associated with the signalling means and the means for moving the indicator past the thread-receiving units for initiating movement of the indicator moving means in response to operation of the signalling means.

5. In combination with a thread winding machine comprising a multiplicity of thread-receiving units to which thread is continuously fed, a doffing indicator system comprising means for signalling the time when a predetermined winding operation is scheduled to terminate, an endless indicator-conveying means arranged to extend transversely of all of said units, an indicator carried by the conveying means and independent of the signalling means, a motor for driving the indicator-conveying means to move the indicator past and out of contact with each of said units in succession, and an electrical control circuit for said motor including a relay and a control switch operated by said signalling means for energizing said relay and motor.

6. In combination with a thread winding machine comprising a multiplicity of thread-receiving units to which thread is continuously fed, a doffing indicator system comprising means for signalling the time when a predetermined winding operation is scheduled to terminate, an endless indicator-conveying means arranged to extend transversely of all of said units, an indicator carried by the conveying means and independent of the signalling means, a motor for

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driving the indicator-conveying means to move the indicator past and out of contact with each of said units in succession, and an electrical control circuit for said motor including two switches arranged in parallel and a relay, one of said switches being operated by said signalling means to energize said relay and motor, and the other of said switches being operated by the indicator to deenergize said relay and motor after the indicator has moved past all of said thread-receiving units.

JOSEPH O. FRIST.  
ERNEST K. BAUER.

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