Feb. 21, 1950 J. K. COCHRAN 2,497,865

LATCH MECHANISM FOR TEXTILE SPINDLES

Filed Jan. 13, 1948 2 Sheets-Sheet 1

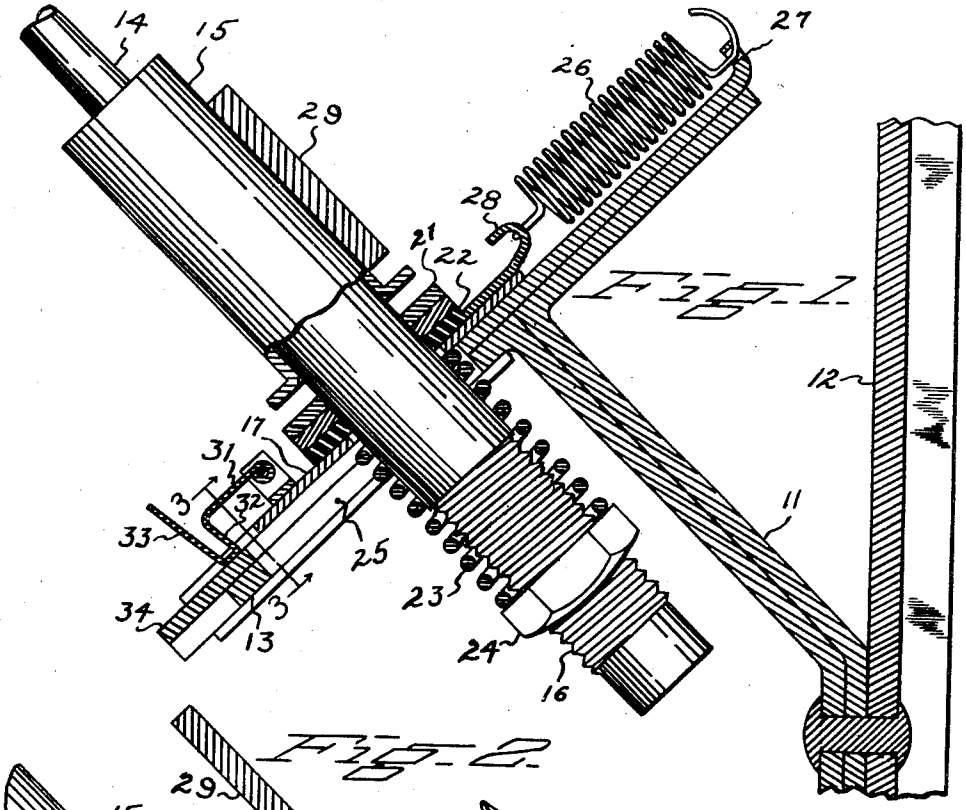



FIG. 1

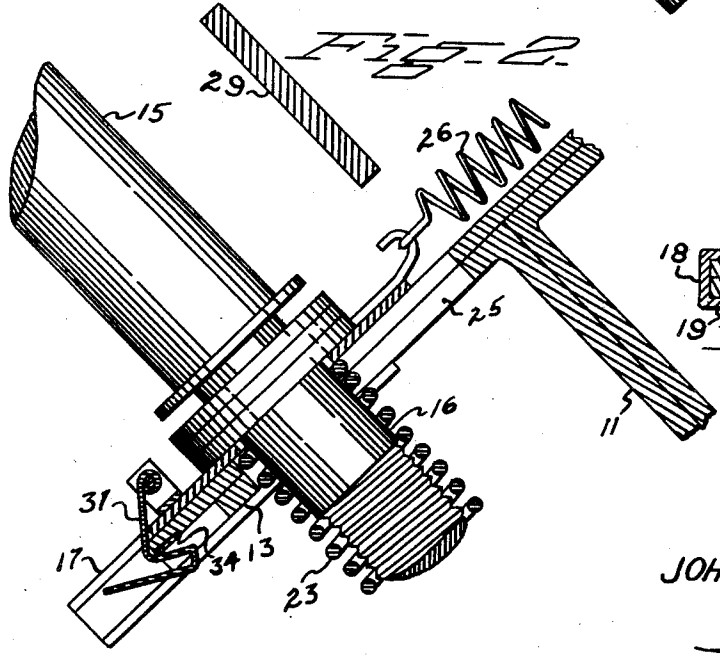



FIG. 2

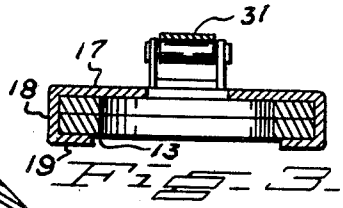



FIG. 3

JOHN K. COCHRAN
INVENTOR.

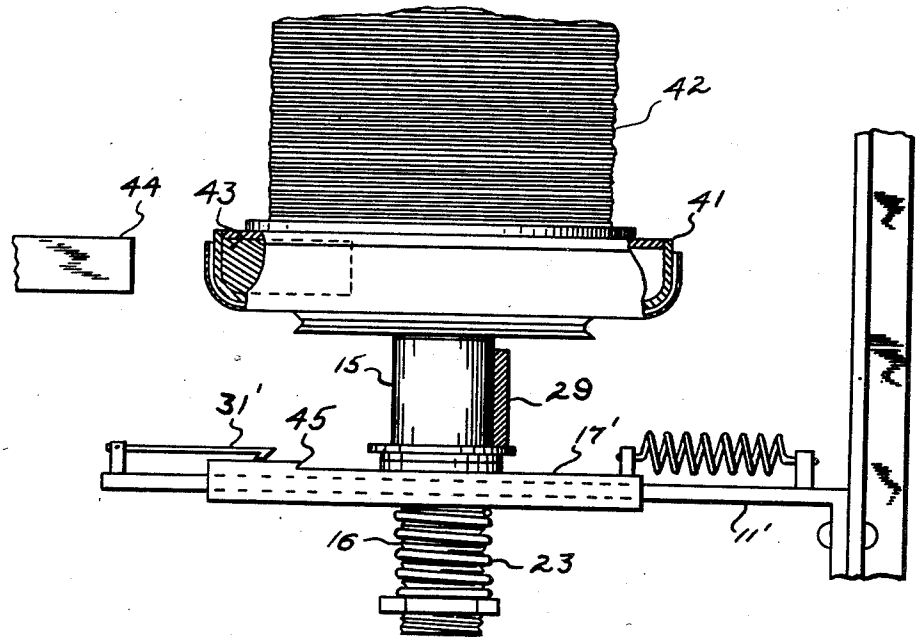
BY Darby & Darby
ATTORNEYS

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LATCH MECHANISM FOR TEXTILE SPINDLES

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FIG. 4.



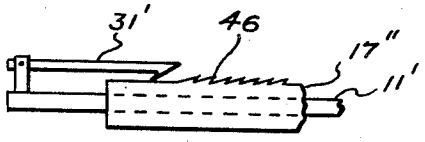




FIG. 5.

JOHN K. COCHRAN
INVENTOR.

BY Darby & Darby
ATTORNEYS

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## LATCH MECHANISM FOR TEXTILE SPINDLES

John Kermit Cochran, Conyngham, Pa., assignor, by mesne assignments, to The Marquette Metal Products Company, Cleveland, Ohio, a corporation of Ohio

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10 Claims. (Cl. 57—89)

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This invention relates to a mounting and latch mechanism for a rotatable spindle for spinning or twisting textile yarns.

In the type machine to which this invention relates, a bobbin or wound package of textile yarns is carried by a rotatable spindle which, in turn, is mounted on a suitable support or rack. The spindle has a whorl portion which contacts a driving belt for rotating the spindle at a high speed while the package of yarn remains comparatively stationary. Such mechanism is used with the so-called double twist spindles, for instance.

There may be various types of mountings for the spindle, and various arrangements for preventing the yarn package from rotating when the spindle is rotating. In one such arrangement, for instance, the spindle may be mounted vertically and magnets are utilized to prevent the package from rotating. In another arrangement the spindle may be mounted at an angle and a weight, such as a lead weight, for instance, inserted on one side of the package carrier so that the package carrier is prevented from rotating by the force of gravity.

In the prior art methods utilizing the rotating spindle and a still package, there has been the problem of preventing injury either to the mechanism or to personnel operating the mechanism when, through accident, the yarn package carrier seizes on the spindle and thus rotates therewith and accelerates to a dangerously high speed. When such accident occurs, and the package and its carrier does begin to rotate at a high speed, some part of the machine is broken due to the unbalance, and parts of the yarn package or spindle mechanism are thrown out by centrifugal force. Thus, not only is there injury to the mechanism itself, but there may be injury to anything or anyone in the trajectory of the broken piece which has been thrown out by the unbalanced rotating package and spindle.

Therefore, it is an object of this invention to provide an arrangement for spinning or twisting textile yarns which have improved safety characteristics.

It is another object of this invention to provide a latch mechanism for a spindle which will be an improvement over prior art methods.

It is another object of this invention to provide a latch mechanism for a spindle which will be safer in operation having automatic safety arrangements to prevent the yarn package carrier from rotating at a dangerous speed.

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It is a further object of this invention to provide a latch mechanism for a spindle which will automatically hold the spindle away from the driving belt whenever the yarn package carrier rotates at such a speed that its oscillation will pull it away from the belt.

Further objects of the invention will be apparent to those skilled in the art after a study of the following description, claims and drawing, in which:

Figure 1 is a side view of a spindle mounting and latch mechanism in partial cross section with the driving belt engaging the spindle;

Figure 2 is a cross sectional view of the latch mechanism spindle mounting with the spindle disengaged or spaced from the driving belt;

Figure 3 is a cross sectional view through 3—3 of Figure 1;

Figure 4 is a side elevational view of the spindle assembly including the package carrier and a modified latch; and

Figure 5 shows a portion of the spindle mounting illustrating another modification of the latch.

Referring now in more detail to Figure 1, it will be seen that a bracket 11 is attached by any suitable means, such as riveting, to a frame 12 which may be the standard frame used in spinning or twisting textile yarns; the bracket 11 has a lateral body portion 13 which serves as the base for the mounting of the spindle 14 having a whorl 15.

The bolster 16, having the spindle bearing in the upper portion thereof in the usual way, is mounted to a plate member 17 which is slidably mounted for longitudinal movement on the body portion 13 of the bracket 11. As may be seen by referring to Figure 3, the plate member 17 supporting the bolster has the sides thereof extending downwardly at 18 and then inwardly at 19 to wrap around the edges of the body portion 13 of the bracket. This arrangement locks the plate 17 on to the body 13 of the bracket but permits longitudinal sliding.

The bolster 16 is mounted to the plate 17 in the usual way by means of washers or shoulders 21 seated on a resilient cushion 22. The bolster extends through a hole in the plate and is retained in place by a coil spring 23 having one end thereof pressing against the plate 17 and the other end thereof supported in any suitable way such as an adjustible nut 24. To accommodate the nut 24 the lower end of the bolster is threaded.

This arrangement for mounting the bolster 16

on the plate 17 provides a resilient mounting for the bolster and spindle, the amount of resiliency being readily controlled by adjustment of the nut 24 to increase or decrease, as desired, the tension of the spring 23.

Since the bolster extends below the body portion 13 of the bracket, and since the plate 17 is slidably mounted for longitudinal movement, there is an elongated opening throughout that portion of the body 13 through which the bolster travels as the plate 17 slides longitudinally thereon. This opening is illustrated at 25 and, as may be seen in Figure 1, the bolster is near one end thereof when the spindle is in driving position and is near the other end thereof, as illustrated in Figure 2, when the spindle is disengaged or spaced from the driving belt.

The plate 17 on the body 13 of the bracket is pulled towards the belt by means of a coil spring 26. It is obvious that other means may be used for this purpose but the coil spring is suggested as having operated completely satisfactorily. One end of the spring 26 is attached to a hole in a flange 27 on the body portion 13 of the bracket, while the other end of the spring may be attached in any convenient manner to the plate 17, as, for instance, a hook 28 which may be welded to the plate.

Longitudinal movement of the plate and the bolster and spindle on the bracket is limited by the length of the opening 25 provided in the body portion 13 of the bracket. Thus, in driving position the whorl is held in contact with the belt while in the disengaged position, the whorl is held away from the belt. The spring 26 acts to maintain the spindle in driving position, the tension of the spring causing the plate to be pulled inwardly so that the whorl 15 engages the driving belt 29.

A latch 31 is pivotally mounted on the other end of the plate 17. This latch 31 may be an elongated strip of metal having a downwardly extending portion 32 which may be bent slightly inwardly providing a latching finger. In the preferred form, the end 33 of the latch 31 is bent upwardly to provide a U-shaped portion so that the upwardly extending part may serve as a handle for operation of the latch mechanism. As may be seen by referring carefully to Figures 1 and 2, the latch 31 is mounted in such a position that the U-shaped portion of finger 32 slides longitudinally along the end of the body 13 of the bracket. When the plate 17 is at the inner end of its longitudinal travel, that is, when the driving belt 29 engages the whorl 15, the latching finger 32 rests on the body 13 of the bracket near one end of the opening 25 therein. When the spindle and bolster approach the other end of the opening 25, due to the longitudinal movement of the plate 17, the latching finger drops over the end 34 of the body 13 as illustrated in Figure 2. When this occurs, the plate and thus the bolster and spindle are latched in this position, and the spindle whorl 15 is disengaged from the driving belt 29.

It will be obvious that the amount of longitudinal travel of the plate 17 and bolster and spindle mounted thereon is not critical. It is only necessary that the whorl 15 be spaced from the driving belt 29. However, it will be noted that the length of the lateral extension or end 34 of the body 13 over which the latching finger 32 slides is dependent on the amount of longitudinal travel of the plate 17. Thus the bolster 16 must not abut against the outer end of the opening 25 before the latching finger 32 slides down over the end 34 of the body 13.



With this arrangement the spindle is mounted completely resiliently both by means of the bolster spring 23 and additionally by means of the plate spring 26. The handle portion 33 of the latch 31 serves as a convenient hand control for allowing the spindle to be engaged by the driving belt or for disengaging the spindle from the driving belt as desired.

As pointed out previously, if a yarn package carrier rotates at an accelerating rate which would develop a dangerous speed unless checked, the entire mechanism, being unbalanced, will result in breakage or other injury. With the type mechanism described and illustrated, an unbalanced rotating package carrier and spindle will begin to oscillate or gyrate. When this occurs, the entire mechanism will tend to move due to the resilient mounting, and the plate 17 which supports the spindle will move longitudinally, since this is the only direction in which it can move. When the rotating parts gyrate sufficiently due to unbalance there will be a considerable longitudinal movement of the plate 17. When this occurs, the plate or a unit described as herein will move sufficiently to allow the latch 31 to drop down over the edge 34 of the body 13. In this position, the spindle is disengaged from the driving belt and latched in the disengaged position.

If the longitudinal movement of the plate 17 and lateral extension of the end 34 of the body 13 is sufficiently short, the gyrating or oscillating spindle will be disengaged from the driving belt fairly quickly. The disengagement will take place before a high rotating speed has been reached. The driving force is removed automatically before there is any danger of injury due to the unbalanced rotation of the spindle and yarn package carrier.

The particular adjustments for enabling the latch to operate and thus retain the spindle in a non-rotatable position will vary with different conditions in a manner well understood by those skilled in the art. For instance, there are variable factors such as tensions of the springs 23 and 26, the speed of operation or rotation of the spindle and the weight or amount of unbalance of the package carrier. The latch 31 may be readily adjusted to take into account these variable factors. The amount of longitudinal movement of the spindle with its mounting plate in order to be safely removed from the driving belt 29 may vary according to use. Therefore, it will be readily recognized by those skilled in the art that dimensions are not critical.

In Figure 4 there is illustrated a spindle in a vertical position and there is included the unbalanced package carrier 41 together with a yarn package 42. The package carrier 41 may be unbalanced by a weight 43, for instance, in a small radial section thereof. This weight 43 may be a lead weight which is particularly useful if the spindle is mounted at an angle as illustrated in Figures 1 and 2. If a magnetic means is being used to retain the package carrier stationary, then the weight may be a part of the magnetic apparatus. A magnetic pole 44 is shown in Figure 4 to illustrate this principle which is well understood by those skilled in the art.

Also in Figure 4, a modified form of latch is illustrated. In this particular form, the latch 31' is mounted on the stationary plate or support 11' and is adapted to latch over a complementary

point 45 on the movable plate 17'. Thus, it will be noted that the latch may be mounted on either the movable or the stationary plate.

In Figure 5, a further modification of the latch mechanism is illustrated. According to this form one of the plates 17'' may have a ratchet tooth surface illustrated at 46. The latch 31' is mounted on the other of the plates 11' and is adapted to engage the ratchet surface 46. This particular form has the advantage that the oscillation of the spindle will continue so long as there is contact with the driving belt 29 and until a sufficient number of ratchet teeth have been engaged to retain the spindle away from the driving belt and thus in non-rotating position. In this way the mechanism is automatically self-compensating for the variable factors such as spring tensions.

A vertical mounting for the spindle such as illustrated in Figure 4 may be desired in some cases. In other cases an angular mounting such as is illustrated in Figures 1 and 2 may be preferred. The angular mounting may be adapted to any desired angle and has the advantage that the weight of the unbalanced package carrier retains the package carrier in non-rotating position due to the force of gravity.

While the movement of the plate 17 has been referred to as a longitudinal movement it will be apparent that variations in structural detail will permit variation in the movement of the plate to accomplish the desired result.

While particular details of the latch mechanism have been described and illustrated, it will be apparent to those skilled in the art that modifications are possible without departing from the scope of the invention.

What is claimed is:

1. Apparatus for spinning and twisting textile yarns comprising a rotatable spindle, an unbalanced package carrier mounted thereon, said package carrier adapted to be stationary while said spindle rotates, a mounting for said spindle comprising a base member resiliently mounted for slidable movement on a support, said spindle being resiliently mounted on said base member and a latch mechanism to retain said spindle in non-rotating position.

2. The combination according to claim 1 in which the spindle is mounted at an angle with respect to the horizontal.

3. Apparatus for spinning and twisting textile yarns comprising a rotatable spindle, an unbalanced package carrier mounted thereon, said package carrier being adapted to be stationary while said spindle rotates, a mounting for said rotatable spindle comprising a base member resiliently mounted for movement on a support, said spindle being resiliently mounted on said base member and a latch mechanism operable to retain said spindle in non-rotating position.

4. Apparatus for spinning and twisting textile yarns comprising a rotatable spindle, an unbalanced package carrier mounted thereon, said package carrier adapted to be relatively stationary while said spindle rotates, a mounting for said spindle comprising a latch mechanism mounted for longitudinal movement on a support, said spindle being resiliently mounted and movable with said latch mechanism, said latch mechanism being operable to retain said spindle in non-rotating position.



5. The apparatus according to claim 4 in which said spindle is mounted at an angle with respect to the horizontal.

6. Apparatus for spinning and twisting textile yarns comprising a rotatable spindle, an unbalanced package carrier mounted thereon, said package carrier being adapted to be relatively stationary while said spindle rotates, a mounting for said spindle comprising a support, a plate resiliently mounted on said support and slidably movable with respect thereto, said spindle being resiliently mounted on said plate and a latch mounted on said plate and adapted to catch over a portion of said bracket thereby to retain said spindle in non-rotating position.

7. Apparatus for spinning and twisting textile yarns comprising a rotatable spindle, an unbalanced package carrier mounted thereon, said package carrier being adapted to be relatively stationary while said spindle rotates, a mounting for said spindle comprising a stationary supporting plate and a movable plate resiliently mounted thereon, said spindle being resiliently mounted on said movable plate, and a latch mounted on one of said plates and adapted to catch over a portion of the other of said plates, thereby to retain said spindle in non-rotating position.

8. Apparatus for spinning and twisting textile yarns comprising a rotatable spindle, an unbalanced package carrier mounted thereon, said package carrier being adapted to be relatively stationary while said spindle rotates, a mounting for said spindle comprising a stationary supporting plate and a movable plate resiliently mounted thereon, said spindle being resiliently mounted on said movable plate, one of said plates having a ratchet surface and a latch mounted on the other of said plates adapted to engage said ratchet surface, thereby to retain said spindle in non-rotating position.

9. Apparatus for spinning and twisting textile yarns comprising a rotatable spindle, an unbalanced package carrier supported by the spindle but free therefrom to the extent that the carrier normally will not rotate, a mounting for the spindle guided for rectilinear movement along a main support, the mounting normally occupying a position on the main support such as to maintain the spindle in a normal operating position, and a latch device arranged to connect the mounting to the main support consequent upon movement of the mounting and spindle out of their normally occupied position under centrifugal influence of the unbalanced package.

10. The combination according to claim 9 in which the main support is arranged to guide the mounting for rectilinear movement of the spindle in a direction inclined relative to the horizontal.

JOHN KERMIT COCHRAN.


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