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Patented Nov. 12, 1901.

W. B. WHITE & S. HARGREAVES.
WINDING MECHANISM FOR WARPS OR THREADS.

(Application filed July 1, 1901.)

(No Model.)

Fig 1

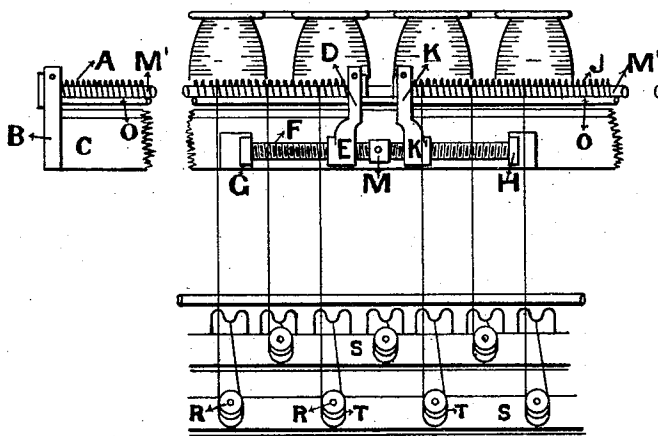


Fig 2

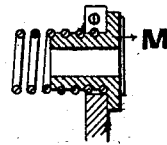


Fig. 3.



Fig 4

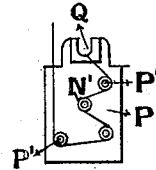


Fig. 5.

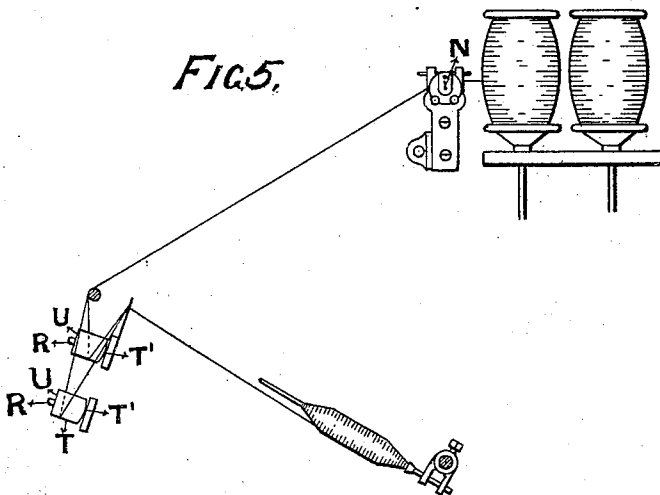


Fig. 9.

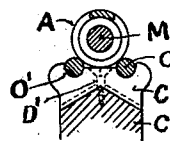


Fig. 6.

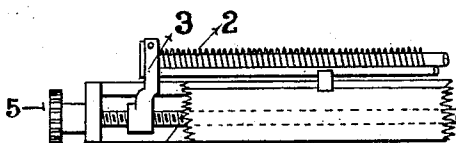


Fig. 7.

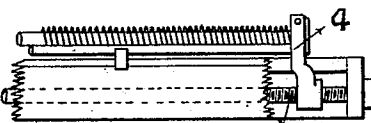


Fig. 8.



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UNITED STATES PATENT OFFICE.

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WINDING MECHANISM FOR WARPS OR THREADS.

SPECIFICATION forming part of Letters Patent No. 686,565, dated November 12, 1901.

Application filed July 1, 1901. Serial No. 66,811. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM BELL WHITE, residing at 206 Skipton road, Colne, and STEPHENSON HARGREAVES, residing at 26 May street, Burnley, in the county of Lancaster, England, subjects of the King of Great Britain, have invented certain new and useful Improvements in and Relating to the Winding of Warps or Threads, of which the following is a specification.

This invention relates to certain improvements in guides for winding-frames and guides for expanding spring-combs for beaming and tape-sizing machines and also to means for applying additional tension or drag to the yarn prior to passing through our improved guide.

As is well known, the usual guide for winding-frames takes the shape of a flat steel plate with slits cut in it at intervals for the twist to pass through. In its passage through these slits the twist is constantly rubbing against the sharp edges of the plate for the purpose of cleaning it, it is said; but the twist or yarn thus treated is impaired in its strength, often breaks near the guide-plate, and causes an undue accumulation of fluff, which sometimes escapes or passes through the slits of the guide and when sized in the taping-machine is formed into hard lumps. These pass on to the weaver's beam and appear again in the process of weaving, causing breakage of ends and a waste of time. Different counts of twist are wound on the same winding-frame—fine counts and coarse counts. In winding fine counts the winder-guide often allows the lumps or snarls or fluff which come up or accumulate to pass through the machine, which, as before stated, occasions a lot of trouble to the weaver in the shape of ends breaking down. As a substitute for these guide-plates and also for the brushes "cards or fillets" or snarl-catchers have been secured to the lifting-rail of the winding-frame, consisting of rows of teeth disposed one behind another, the said teeth being pushed through a leather strip secured to the lifting-rail and the rows of teeth being so disposed as to serve the purpose of cleaning the yarn passing through them and intercepting the passage of snarls, fluff, or dirt, as previously described. This

arrangement, however, is defective from the point of view that the friction put upon the yarn by the rows of teeth is very considerable, causing breakages and accumulation of fluff between the teeth of the cards.

In the present invention we employ a spiral spring or springs to take the place of the ordinary guide. These springs may always present a smooth round surface to the twist, and by a mechanical means the coils of the springs may be opened or closed, as desired, according to the counts of yarn it is intended to clean. The yarn is passed through the coils of the springs, which, being smooth, will not injure, while at the same time efficiently cleaning the yarn or twist of snarls, fluff, or dirt. Again, we place glass rods inside the spiral spring for the twist to ride upon, and so reduce the friction.

By our invention it will be seen that the twist retains its strength or body after being submitted to the cleaning process, the friction put upon it being much reduced and the formation of lumps gotten rid of.

Our spiral-spring guide may be adjustable—i. e., capable of expansion or contraction by any suitable means—or it may be unadjustable. In the latter case the spiral springs may be mounted in a trough at a suitable distance apart, the ends of the springs being secured to the trough by screws or like means, while the edges of the trough may be formed smooth to allow the yarn to pass over them without injury, or the edges of the trough may be provided with steel or glass rods, suitably secured to the trough, for insuring the safe traverse of the yarn.

Our spiral-spring guides may be expanded or contracted by mounting them in the trough, as before described, and securing their respective ends to tapped blocks or slides, through which a right and left hand screwed rod or shaft is passed, its right-hand thread engaging with the tapped hole in the other block. The screw is mounted in fixed supports or bearings on the trough and provided with a handle or crank when supplied for a beaming or tape-sizing machine, by which the springs may be expanded or contracted to any degree required.

In conjunction with our invention glass or

steel tension-hooks may be fixed to the knee-board or to the said trough to give additional tension to the yarn in cases where it may be required. These glass or steel tension-hooks may be fixed to the knee-board in different forms, so as to dispense with the well-known flannel that covers the knee-board. Such flannel is used to get drag or tension on the twist or threads passing over the same. The flannel makes fluff, which reduces the strength of the twist and passes onto the bobbins and when the twist at a later period is sized in the sizing-machine comes up again in the shape of a number of ends fast together. When our glass or steel hooks are used to get tension, the half-moon-shaped knee-board and flannel may be dispensed with, if desired, and we employ instead a flat rectangular board, to which the tension-hooks may be fixed direct, or they may be mounted on suitably-formed plates secured to the said board. The tension-hooks may be formed with flanges like a bobbin to guide the twist. The tension-hooks may be fixed to the said board in different forms. They may be in wood; glass, porcelain, or steel or other metal. They may be fixtures or they may revolve. If made to revolve, the glass or porcelain guides may be bushed with wood or wooden pegs employed for them to revolve upon. We may only employ one large revolving bobbin for the tension, made with a flat end and a round end, respectively. The flat end when placed on the peg next the board would give more friction or tension. Thus by reversing the bobbin we alter the tension by frictional contact of the bobbin with the board, and the board may have flannel washers for the bobbins to work against. Such tension-bobbins may also be made from different weights of wood, light and heavy timber—light bobbins for light counts and heavy bobbins for coarse counts.

In sizing or beaming frames the before-named spring-guide is well adapted to be used in substitution of the ordinary expanding-comb, and to open or separate the warp before it gets to the split rods we use an additional spiral spring with open or closed coils, the latter preferred. This additional spiral-spring opener assists or eases the split rods in the work of opening or dividing the warp-threads which pass between the coils, and are thereby caused to separate. One or more of these spiral-spring openers may be used in addition to the expanding spiral-spring guide.

The number of split rods hitherto employed in sizing-machines is reduced by the above arrangement. Besides, the warp being eased and the warp-threads being more readily loosened breakages of same are prevented.

The invention further consists of the novel combination and arrangement of parts hereinafter more specifically described, illustrated in the accompanying drawings, and particu-

larly pointed out in the claims hereunto appended.

In describing the invention in detail reference is had to the accompanying drawings, forming a part of this specification, wherein like characters of reference indicate corresponding parts throughout the several views, and in which—

Figure 1 is a front elevation of our improved spring-guide, partly broken away, with the tensioning device arranged in suitable relation thereto. Fig. 2 is a sectional elevation of the means for securing one end of the spring-guide to a fixed support. Fig. 3 is a detail view of one of the tensioning-hooks. Fig. 4 is a detail view of a modified form of tensioning device. Fig. 5 is an end elevation of the spring-guide connected to a tensioning device. Figs. 6 and 7 are sectional detached elevations of modified forms of spring-guide. Figs. 8 and 9 are cross-sectional views thereof.

In the accompanying drawings, Fig. 1 represents our arrangement of spiral-spring guide in substitution of the usual guide-plates and the like of winding-frames. The spiral spring A is attached at one end to a support or bearing B, fixed at the end of the lifter-rail C of the winding-frame. Spiral spring A is attached at its other end to the adjustable slide-bearing D, which is tapped at E to engage with the right-hand screw-thread of shaft F, whose ends are carried by brackets G and H, respectively. The spiral spring J is similarly secured to the fixed support J' on the lifter-rail, and at its other end is also attached to adjustable slide-bearing K, whose tapped extremity K' engages with the left-hand screw-thread of shaft F. This shaft is made with a central boss M, formed with a number of holes in it, by which means it may be turned by a tommy-bar to tighten the coils of the spring in one direction and turned in the opposite direction to slacken the said coils. In this way the coils of the spring are opened or closed to suit varying counts of yarn. The yarn on its way to the bobbins passes between the coils of the springs, which, being smooth, do not injure it, while at the same time thoroughly cleaning it of snarls, fluff, and dirt. Any other suitable means may be employed for adjusting the coils in place of the method shown. The method of securing the ends of the coil-springs to their bearings or supports will be understood by reference to Fig. 2. For this purpose we make use of the flanged bush M, formed with a screw-thread, upon which a few coils of the spring-guide at the end are screwed to secure the said spring thereto, when the bush M is then placed in the forked bearings B D or K and J', respectively, and the forked portion above the bush crossed by a split pin to hold the bush in place. (See Figs. 5 and 8.)

A spiral spring or springs may be employed for the purpose described without being provided with any means of adjustment, in which

case the spring or springs are constructed to fixed stationary supports, such as B and J'.

As seen in Fig. 1, we pass through the coil spring or springs a glass rod M' for the yarn to bear upon and to present a smooth surface to it. This glass rod is prevented from slipping out at the end by a small swivel piece or spring N, fixed to the flanges of the bush M. (See Fig. 5.) We also provide steel or glass rods O on each side of the rail C below the spiral springs to ease the yarn in its passage. These steel rods are mounted at the ends in brackets B D and K and J'. As seen in Fig. 9, these steel rods rest in the recesses O' of the bridge-pieces C', which are placed at intervals along the lifting-rail C. The latter is formed $\wedge$ -shaped in cross-section, and the bridge-pieces are correspondingly formed to fit upon the same, as shown, and secured by the screw D'. The timber of the lifting-rail is also slightly notched to allow the bridge-pieces C' to bed into it. By this means we obtain a straight secure support for the adjustable spring-guide to rest upon, which is very important, while the ridge shape of the top edge of the lifting-rail facilitates the clearance of the fluff and dirt.

Our invention has also reference to a tensional appliance or appliances to be fixed to the knee-board or a board or plate used in substitution thereof, the said tensional appliance or appliances serving the same purpose as the knee-board, but far more efficiently and with less injury to the yarn or twist. The said tensional appliances may take divers forms and may be made of glass, wood, porcelain, or any other suitable material or metal. They may be fixtures or they may revolve. When they are fixtures, they may consist of a number of glass or steel hooks or pegs, as shown in Fig. 3, and the yarn passed around each of them on its passage from the cops to the bobbins. The knee-board or the like may be dispensed with altogether and metal plates P fixed at intervals in front of the winding-frame. (See Fig. 4.) We fix or screw into the said plate pegs or pins P', on which we mount loose bowls of suitable material N'. The yarn from the cop after passing through the notch Q may traverse over and around a number of these loose bowls or bobbins, by which additional tension is obtained and by which the degree of tension can be varied by altering the number of bowls around which the yarn is passed or changing the position of the yarn on them.

In another method (seen in Figs. 1 and 5) pegs R may be fixed in an inclined board S, and on such pegs are mounted bobbins T, around which the yarn is carried. When fine counts are being wound, the round end T' of the bobbin may be placed next the board, (see Fig. 5;) but for coarse counts the bobbins may be reversed and the flat end U put next the board to increase the friction or drag

as the bobbin revolves by bearing against the board. Bobbins of different weights may also be used for the purpose of varying the tension put upon the yarn. Flannel washers may be placed on the peg next the bobbin, for the bobbins to work against, and increase the friction if need be.

A slightly-modified form of our spiral-spring guide to be used in substitution of the ordinary expanding-comb for beaming-frames, sizing-machines, and the like is shown in Figs. 6, 7, and 8.

The ends of the spiral spring 2 are connected to the movable bearings or supports 3 and 4 and may be secured thereto by the same means as previously described and shown in Fig. 2. The coils of the spring 2 are opened or closed by turning the hand-wheel or handle 5, fixed to the right and left hand screw-threaded shaft 6, upon which the bearings or supports 3 and 4 are respectively mounted. The said bearings or supports 3 and 4 thus move inwardly or outwardly, according to which direction the handle is turned, and by this means open and close the coils of the spring.

In addition to our spiral-spring guide arranged as described to take the place of the usual expanding-comb we may make an additional spiral-spring guide to aid the split rods in separating or dividing the warp-threads in a tape-sizing machine, which we cause to pass through the coils of the said additional spring-guide prior to passing under and over the split rods. By this means the number of split rods in comparison to what was formerly employed in sizing-machines is reduced, while the warp is eased to some extent in its traverse through the machine, as the warp-threads are sooner loosened by the coils of the spring and are not injured as much thereby, and consequently breakages are prevented.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is—

1. In a winding, tape-sizing or beaming frame, the combination of a spiral-spring guide employed for the purpose of cleaning yarn passing through its coils, a core of smooth material, rods on each side of the said spiral-spring guide for the yarn to rest upon, and bridges for supporting the rods and carrying the springs substantially as described and shown.

2. In combination, a bush, a spring-guide suitably connected thereto, a core extending through the guide and suitably connected to the bush, means for adjusting said guide, and a tensioning device arranged in suitable relation to said guide.

3. In combination, a spring-guide, a glass core therefor, means for fixedly securing one end of said spring, said means being connect-

ed with said core to prevent the slipping out of it, and means for suitably adjusting said guide.

4. In combination, a spring-guide, a core therefor, means for fixedly securing one end of said spring, said means being connected with said core to prevent the slipping out of it, and means for adjusting said guide.

5. In combination, a spring-guide, a core therefor, a rod mounted at each side of and below said guide, and means connected with the guide for suitably adjusting it.

6. In combination, a spring-guide, a core therefor, a rod mounted at each side of said guide, bridge-pieces for supporting said rods, means connected with the guide for suitably adjusting it, and a tensioning device arranged in suitable relation to said guide.

7. In combination, a guide consisting of a coiled spring, means for normally securing one end of said spring in a fixed position, a core for the said guide, means connected to the free end of the said spring for expanding and contracting it, a rod mounted at each side of the said guide, and bridge-pieces for supporting said rods.

8. In combination, a guide consisting of a coiled spring, a glass core therefor, means for expanding and contracting the said spring, and a glass rod mounted at each side of the said guide.

9. In combination, a guide consisting of a coiled spring, a glass core therefor, means for expanding and contracting the said spring, a glass rod mounted at each side of the said guide, and a tensioning device mounted in suitable relation to the said guide.

10. In combination, a lifting-rail, a bearing secured to one end thereof, a spring-guide mounted upon said rail and consisting of a coiled spring, means for connecting one end of said spring to the said bearing, a core for the said spring, a sliding bearing connected to the free end of said spring, and means engaging the said sliding bearing for adjusting the same, causing thereby the expansion and contraction of the said spring.

11. In combination, a lifting-rail, a bearing secured to one end thereof, a spring-guide mounted upon said rail and consisting of a coiled spring, means for connecting one end of said spring to the said bearing, a core for the said spring, a sliding bearing connected to the free end of said spring, means engaging the said sliding bearing for adjusting the

same, causing thereby the expansion and contraction of the said spring, and a rod mounted at each side of the said spring.

12. In combination, a lifting-rail, a bearing secured to one end thereof, a spring-guide mounted upon said rail, and consisting of a coiled spring, means for connecting one end of said spring to the said bearing, a core for the said spring, a sliding bearing connected to the free end of said spring, means engaging the said sliding bearing for adjusting the same, causing thereby the expansion and contraction of the said spring, a rod mounted at each side of the said spring, and a tensioning device arranged in suitable relation to the said guide.

13. In combination, a guide consisting of a spiralspring, a core therefor, means for fixedly securing one end of the said spring, a sliding bearing, a flange-bushing for connecting the free end of said spring to the sliding bearing, and means for adjusting the said bearing, causing thereby the expansion and contraction of the said spring.

14. In combination, a guide consisting of an adjustable coiled spring, a glass core therefor, a bushing for supporting the core, and a spring connected to the bushing to prevent the slipping out of the core.

15. In combination, an adjustable spring-guide, a core therefor, a rod mounted at each side of the guide, and bridge-pieces for supporting said rods.

16. In combination, a spring-guide, a glass core therefor, and a glass rod mounted at each side of the guide.

17. In combination, a guide, a glass core therefor, a glass rod mounted at each side of the guide, and means for suitably adjusting the said guide.

18. In combination, a guide consisting of a coiled spring, a core therefor, a bushing for supporting said core, a rod mounted at each side of said spring, bridge-pieces for supporting said rods, and a spring for preventing the slipping of the core from the said guide.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

WILLIAM BELL WHITE.
STEPHENSON HARGREAVES.

Witnesses:

F. RICHMOND,
W. IDESON.