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FLIER FOR ROVING FRAMES AND OTHER LIKE TEXTILE APPARATUS.

APPLICATION FILED DEC. 21, 1920.

1,399,332.

Patented Dec. 6, 1921.

2 SHEETS—SHEET 1.

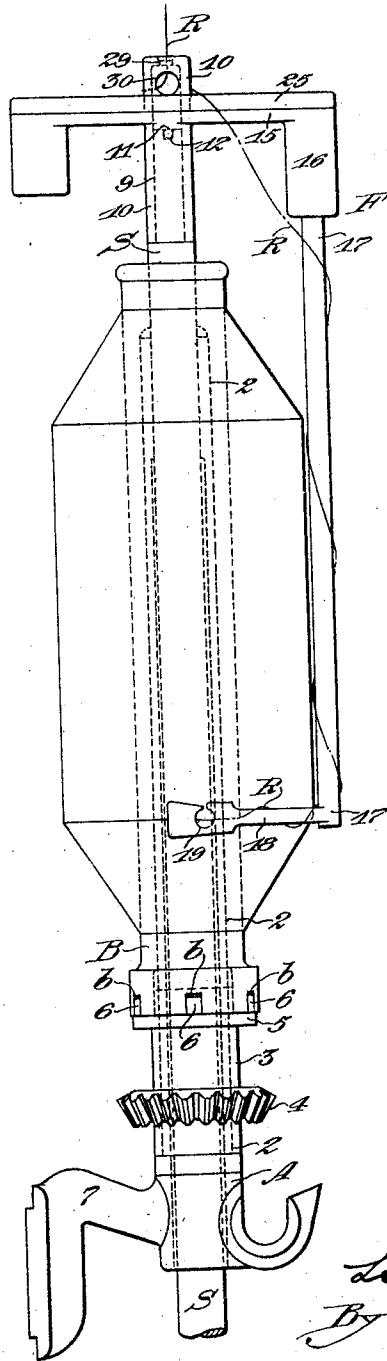


Fig. 1.

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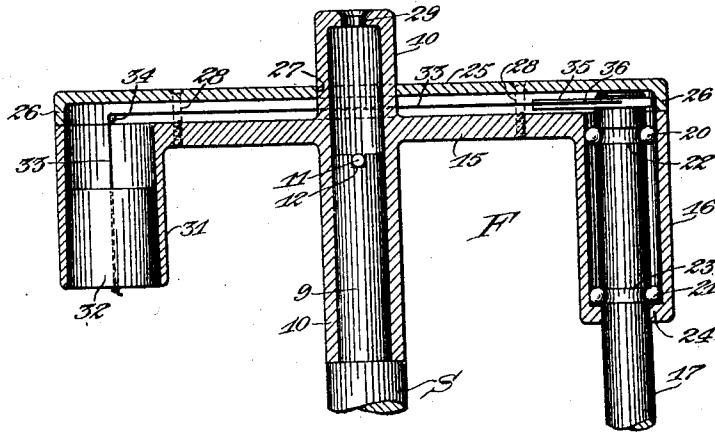


Fig. 2.

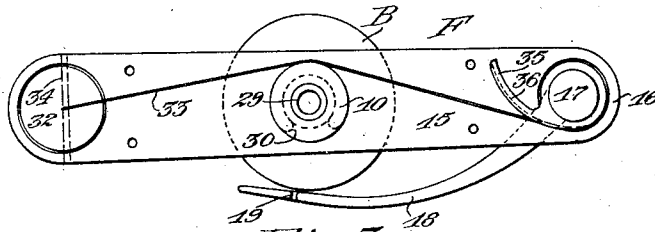


Fig. 3.

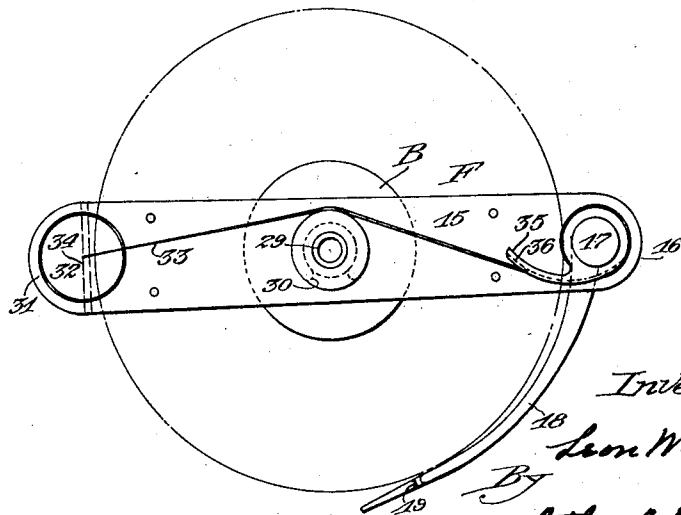


Fig. 4.

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UNITED STATES PATENT OFFICE.

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FLIER FOR ROVING-FRAMES AND OTHER LIKE TEXTILE APPARATUS.

1,399,332.

Specification of Letters Patent.

Patented Dec. 6, 1921.

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To all whom it may concern:

Be it known that I, LEON W. CAMPBELL, a citizen of the United States, residing at Barre Plains, in the county of Worcester, State of Massachusetts, have invented certain new and useful Improvements in Fliers for Roving-Frames and other like Textile Apparatus, of which the following is a specification.

My invention relates to improvements in fliers for roving-frames and other like textile apparatus.

One object of the invention is to provide means for controlling the operation of the presser, which acts to wind the roving or other material onto the bobbin, whereby to obtain a more constant and uniform tension on the strand to insure a more even and level yarn in the finished product.

Another object of the invention is to provide a simpler and less cumbersome controlling-mechanism for the presser which will be proof against derangement or getting out of order.

Further objects of the improvement will appear from the description of a preferred embodiment of the invention as set forth in the following specification which is illustrated by the accompanying drawings.

In the drawings:

Figure 1 is a side elevation of a preferred form of the invention embodied in a flier and showing it as applied to use with a roving-bobbin of conventional type;

Fig. 2, an enlarged vertical sectional elevation of the upper portion of the flier showing the arrangement of the controlling-means for the presser;

Fig. 3, an enlarged plan view of the flier showing it with its top or cover removed; and

Fig. 4, a similar plan view illustrating the presser in a different position.

Referring first to Fig. 1, S designates the vertical, rotating spindle which carries the flier F on its upper end, and A is the bolster carrying the bobbin B on which the roving is wound. The bolster A is provided with a tubular sleeve 2 surrounding the spindle S and adapted to fit the bore of the wooden bobbin B which rotates therewith in coaxial relation with the spindle S. At the lower end of the sleeve 2 is a rotatable bushing 3 provided with a bevel-gear 4 through which it is connected to be driven from the operating mechanism of the machine. At the

upper end of the bushing 3 is a flange or collar 5 having a lug or spur 6 adapted to engage notches 7 in the base of the bobbin B to connect the latter rotatively therewith. The bolster A is connected to the rail of the roving-frame by an arm 7 and through this connection is reciprocated up and down to impart the rising and falling motion to the bobbin in relation to the flier. The arrangement of this part of the mechanism is not herein illustrated or described in detail, however, as it forms no part of the present invention but is of usual construction as well known to those versed in the art.

Referring now particularly to Figs. 2 and 3, the upper end of the spindle S is reduced in diameter at 9 and fitted thereto is a tubular sleeve 10 which serves as the mounting or support for the flier F. Extending across the interior of the sleeve 10 is a pin 11 adapted to engage a cross-slot 12 in the top of the spindle S to key the flier F rotatively therewith while allowing for its removal therefrom for placing the bobbin B on, or doffing it from, the bolster A. Extending diametrically across the sleeve 10 near its top is a horizontal arm 15 provided with a tubular bearing 16 depending at one end. Fitted to turn in the bearing 16 is a rod or shaft 17 carrying the presser 18 at its lower end. The rod 17 extends downwardly in parallel relation with the spindle S and the presser 18 may consist of a curved finger or arm, see Fig. 3, having a flattened end with a thread-eye 19 in its side as shown in Fig. 1. The flattened end of the presser arm 18 is adapted to bear against the side of the bobbin B with the roving R leading through the eye 19 to guide the strand into place thereon; and as the roving builds up on the bobbin the arm 18 swings outwardly from its axis as illustrated in Fig. 4.

To adapt the presser 18 to swing freely on the axis of the rod 17 I preferably mount the latter in ball-bearings. As illustrated in Fig. 2, the bearings may be arranged with two sets of balls 20—21 running in grooved raceways 22—23 spaced at a distance apart on the upper end of the rod 17. The balls 20 and 21 rotate on the interior of the bearing 16 with the lower set 21 bearing against an intumed flange 24 at the bottom of the bearing to take the downward thrust of the rod 17. To take the upward thrust to prevent the rod 17 from rising up out of its bearings I provide a plate or cover 25 adapt-

ed to engage the top of the rod. The cover-plate 25 extends across the length of the arm 15 and is provided with a marginal flange 26 which sets against its upper face to provide a space between the top of the arm and the cover. At its center the cover-plate 25 is provided with a circular opening 27 through which the upper end of the sleeve 10 projects and suitable rivets or screws 28 fasten it down to the arm 15. The projecting portion of the sleeve 10 is closed at the top in the form of a thimble and provided with a central eye 29 through which the strand of roving R is threaded, see Fig. 1, and thence the strand leads out at the side through a second aperture or eye 30.

Depending from the end of the arm 15 opposite the bearing 16 is a cylindrical sleeve 31 adapted to receive a sliding weight 32. A cord or other flexible connection 33 is attached at one end to the weight 32 and draws up over a pin 34 driven through the flange 26 on the sides of the cover 25. From the pin 34 the cord 33 leads across the arm 15 to a curved cam-member or quadrant 35 on the upper end of the presser-rod 17. The quadrant 35 is grooved at 36 to adapt the cord 33 to ride on its curved portion to be taken up by the turning of the quadrant under the swinging action of the presser 18. It will also be noted by reference to Figs. 3 and 4 that the cord 33 draws across the periphery of the sleeve 10 whereby to provide a slight friction or drag to steady the movement of the weight 32 in its sliding action under the swinging movement of the presser 18. If desired the flexible-connection or cord 33 may be attached directly to the head of the rod or shaft 17 to be wound on its periphery; or a straight arm or lever might be used in place of the curved quadrant 35; and any other slight modification in the structure and arrangement of this part of the mechanism would fall within the spirit and scope of the invention.

The method of operation of the invention in its present embodiment is as follows: To prepare the device for operation the flier F is lifted off from the end of the spindle S and a wooden bobbin or shell B placed on the bolster tube 2 with one of the notches b in its base engaged with the driving-lug 6, see Fig. 1. The flier F is then set back in position on the spindle S with its cross-pin 11 engaged with the slot 12 in the end of the spindle S to provide a driving connection therebetween. The strand of roving R, represented by dot-and-dash lines in Fig. 1, is led down from the drawing-rolls through the eye 29 and thence out through the eye 30 in the sleeve 10. The strand R is usually given a partial wrap around the upper end or thimble on the sleeve 10 and then drawn downwardly to the guiding-eye 19 in the presser 18 with one or more wraps around

the rod 17 to provide the required tension or resistance to its draft. In some cases the strand R is also wrapped around the presser-arm 18 before threading it through the guiding-eye 19 and its end is then secured to the wooden bobbin B by giving it a few turns therearound. The roving-frame is now started to operate to rotate the spindle S and bolster-sleeve 2 in the same direction with the sleeve driven at a faster rate than the spindle and with a gradually accelerated speed in the usual manner as well known to those versed in the art. The bolster-sleeve 2 will thus be rotated in advance of the flier F, and as the bolster A rises and falls in relation to the presser 18 the latter is caused to traverse the roving longitudinally of the bobbin B to deposit it in layers thereon. The turning of the bobbin in advance of the flier puts a twist in the roving as it winds onto the bobbin, and as the mass of wound material increases in diameter the speed of the bobbin is increased to maintain a constant ratio between its peripheral speed and the speed of the flier.

Referring now to Fig. 3 of the drawings, at the start of the winding operation the presser 18 bears against the barrel of the bobbin B; but as the successive layers of material are laid in place thereon the presser will be forced outwardly from the axis of the bobbin until, when the bobbin reaches its full diameter, it will have been carried into the position illustrated in Fig. 4. This swinging movement of the presser 18 is controlled by the weight 32 which is connected by its cord 33 to the rod 17 whereby to resist the turning movement thereof. As the rod 17 turns in its bearing the cord 33 will be taken up by the cam or quadrant 35 to draw the weights 32 upwardly in its guiding-sleeve 31. The weight 32 thus serves to maintain the presser 18 constantly bearing against the surface on which the strand is being laid with a substantially uniform pressure. By shaping the cam-surface of the quadrant 35 to increase its leverage on the rod 17 the pressure of the presser 18 on the bobbin may be augmented if desired as the bobbin increases in diameter, and any required degree of pressure may be obtained by varying the size of the weight 32.

My improved device provides an extremely simple and efficient apparatus having but few parts, which are proof against derangement or damage under severe conditions of use. The elements of the flier are properly balanced to provide for high speed operation and the novel arrangement of the sliding weight for controlling the action of the presser provides for a more constant and even tension on the strand of roving as it delivers to the bobbin. For this reason a more uniform twist is applied to the strand and the bobbin builds up with a more per-

fect formation, whereby the roving delivers more freely and evenly in unwinding, resulting in a more even and level yarn in the finished product.

5 Without limiting myself to the precise embodiment of the invention herein illustrated, what I claim is:

1. In a flier for roving-frames and like textile apparatus, the combination with 10 means for rotating the bobbin, of a member mounted to rotate on the axis of the bobbin, a presser hinged to said member to adapt it to bear against the roving being wound onto the bobbin and to recede from the axis 15 thereof, a suspended weight, and flexible means connecting the weight to resist the receding movement of the presser.

2. In a flier for roving-frames, the combination of a member adapted to be mounted 20 on the bolster-spindle, a vertical rod journaled in a bearing on said member, a presser carried at the lower end of the rod to adapt it to swing outwardly from the axis of the spindle, a weight, a cord for suspending 25 the weight on the member, and means to connect the cord to the rod to resist the turning movement of the latter by the action of gravity on the weight.

3. In a flier for roving-frames, the combination of a member adapted to be mounted 30 on the bolster-spindle, a presser hinged to said member to adapt it to bear on the bobbin and to swing outwardly from the axis thereof, a gravity-controlled weight, a 35 flexible cord connected to said weight to suspend the latter, and means connected with the presser to be moved therewith, said means being connected with the suspension cord for the weight to raise the latter under 40 the swinging motion of the presser.

4. In a flier for roving-frames, the combination with the bolster-spindle, of a member adapted to be rotatively connected therewith, a presser pivotally mounted on the

member to adapt it to swing outwardly from 45 the axis of the spindle, a cord connected with the presser to adapt it to be taken up by the swinging motion thereof, and a weight suspended from said cord to adapt it to resist the movement of the presser. 50

5. In a flier for roving-frames, the combination with the bolster-spindle, of a member adapted to be rotatively connected therewith, a rod journaled in a bearing on said 55 member, a presser carried by said rod to adapt it to swing outwardly from the axis of the spindle, a cord connected to said rod to be taken up by the turning movement thereof under the swinging action of the presser, and a weight suspended from the 60 cord to resist the turning movement of the rod.

6. In a flier for roving-frames, the combination with the bolster-spindle, of a cross-arm adapted to be rotatively connected with 65 said spindle, a rod journaled in a bearing at one end of the cross-arm, a presser mounted on the rod to adapt it to swing outwardly from the axis of the spindle, a weight slidable in a bearing at the opposite 70 end of the arm, and a cord connecting the rod to raise the weight in its bearing under the swinging action of the presser.

7. In a flier for roving-frames, the combination with the bolster-spindle, of a cross-arm adapted for attachment thereto, said 75 arm formed with a tubular extension depending from one end and a bearing at its opposite end, a rod journaled in said bearing, a presser carried by the rod to adapt 80 it to swing outwardly from the axis of the spindle, a weight slidable in the tubular extension of the arm, a cord for suspending the weight in connection with the presser-rod, and a cover fitted to the top of the arm 85 to inclose the cord and its connections.

In testimony whereof I affix my signature.

LEON W. CAMPBELL.