FLIER FOR SPINNING AND TWISTING MACHINES

Michael Kocisuta, Cleveland, and Thomas S. Mayner, Chagrin Harbor, Willoughby Township, Lake County, Ohio, assignors to Industrial Rayon Corporation, Cleveland, Ohio; a corporation of Ohio

Application February 19, 1947, Serial No. 729,476

3 Claims. (Cl. 57—116)

This invention relates to fliers of the type used in twisting and spinning machines.

Where a flier is used in the twisting of yarns of heavier denier it is desirable to restrict its rotation during certain periods to substantially that of a spool if the yarn is to be kept from over-running the spool when the spool is stopped. The over-running of yarn usually causes "corkscrews" in the yarn and a backing up of twist to the point of departure of the yarn from the spool. Should no attention be paid to the elimination of "corkscrews" then such twisted-up yarn is apt to be carried right on to a collecting spool. Such defective yarn will, of course, give rise to further difficulties in later processing steps. Also, should a "cork screw" occur below a flier eye then, on occasion, as it passes through the eye it is apt to be caught therein and break either the flier arm or the yarn. The above difficulties are ordinarily overcome by a personal inspection of each spool position prior to restarching a machine; however, such a procedure consumes a substantial amount of productive time.

Various types of braking means for restricting the rotation of fliers at spool starting and stopping periods have been proposed, such as paddles positioned opposite the flier eye arm to act as air brakes; or centrifugally releasable braking devices which are adapted to hold and release a projection positioned on the lower portion of a flier body; or a resilient brake such as a spring type brake which is responsive to certain speeds and which acts on the top of a spool to frictionally bind the flier to the spool.

The mentioned braking devices have, generally, been found not to be adaptable in the spinning of a heavier denier yarn. This invention, advantageously, provides a flier for use with heavier denier yarns. The flier has a braking device which operates continuously throughout the rotation of the spool and which is integrated in the flier body construction.

Generally, the flier comprises a central, oval shaped body portion adapted to hold a pair of oppositely positioned flier arms. The body portion has an aperture in which there is fixed a core or a sleeve. This core or sleeve is rotatably supported by another sleeve. A compression spring is positioned on the flier, being frictionally restrained in its rotation. The inner sleeve, i.e., the sleeve on which the core is mounted, is adapted to be placed on the flier spindle. Thus the flier is substantially fixed to the spindle with the exception that it is permitted to rotate under certain circumstances relative to the spindle.

During rotation as the yarn is withdrawn from the spool and twisted it tends to lag behind the spool due to air friction and ballooning. When, however, the spool is being slowed down to a stop the yarn has the tendency to continue to rotate and to overrun the spool. Such overrun tends to loosen additional lengths of yarn and cause the twist to back up to form "corkscrews." By frictionally restraining the flier so that it rotates at about the speed of the spool, except at maximum spool speeds, the tension in the yarn will continue to remain substantially constant when the spool is stopped and thus avoid making loose yarn and "corkscrews."

The advantages of the flier will be more thoroughly explained in the following description, and the accompanying drawing where:

Figure 1 represents the flier of this invention mounted in position relative to a spool of yarn;

Figure 2 represents a sectional elevation of the flier body showing the braking means;

Figure 3 is a plan view of the flier; and

Figures 4, 5 and 6 show an adjusting means for adjusting the compression of the flier spring brake.

Referring to the drawings there is shown in Fig. 1 a spool 10 containing yarn 11 which is being withdrawn during a twisting operation. The spool 10 is mounted on a spindle 12 to rotate therewith. On the spindle 12 and above the spool there is positioned a flier 13. The flier 13 is frictionally forced on the spindle 12 to a predetermined depth; and it is adapted to rotate at speeds substantially equivalent to the spindle 12, or the spool 10. Yarn 11, after being taken off the spool 10, is passed through a flier eye 16. In being withdrawn from the rotating spool 10 the yarn 11 tends to balloon out due to centrifugal action. There is created, as a result, a substantial increase in tension and also a lag in the yarn which tends to prevent the flier from rotating with the spool. When the tension in the yarn approaches a certain value the force exerted by the compression spring 24 is overcome to permit the flier to slip and rotate at a rate slower than that of the spool.

The flier is more specifically shown in Figure 2. As there shown the central body portion 17 supports the oppositely positioned flier arms 18 and 19 which have eyes 16 at their ends for the passage of yarn. The flier body 17 is apertured
and has therein a supporting core or sleeve 21 to which it is fixed. Within sleeve 21 there is an inner and elongated sleeve 22 which is of such diameter as to enable the sleeve 22 to fit snugly over the spindle 12. The sleeve 22, by being frictionally bound to the spindle 12, is adapted to rotate with it while the core 21 is adapted to rotate with sleeve 22.

An expansion spring 24 is positioned about the sleeve 22 to exert pressure through an inter-vening washer 27 on a flanged end 25 of the sleeve 22 and on one end of the core or sleeve 21. The end 25 of the sleeve 22 extending through the flier core is also, desirably flanged. Thus the expanding spring 24 is adapted to frictionally restrain the rotation of the flier supporting core 21 when it is mounted on the spindle 12. The compression of the spring 24 is, further, of such force so as to restrain the flier from rotation only until certain tensions are developed in the yarn 11.

The force exerted by the spring 24 on the flier core 21 can be desirably adjusted by varying the compressibility of the spring. Such an adjusting means is shown in Figures 4, 5 and 6. In Figure 4 there is shown one type of an adjusting means which consists of substantially "U"-shaped, crimping washers 28 which are adapted to be inserted between the lower flange 25 of the sleeve 22 and the compression spring 24. The compression of the spring 24 can thus be varied by the number of washers 28 used.

Another form of adjustment is shown in Figure 5. The sleeve 22 can have threads 31 cut on its surface to enable the use of adjusting nuts 29 and 30. The adjusting nut 29 can be drawn up to give any desirable compression and the second nut can then lock the first in such adjusted position.

There is thus provided a flier which is adapted to rotate at desirable speeds relative to the spool dependant upon the tension developed in the yarn being taken off such a rotating spool. The integrated brake comprising part of the flier construction and is therefore, not adapted to contact any part of the spool.

We claim:

1. A flier for spinning and twisting machines comprising, a centrally apertured body member having oppositely disposed flier arms, a core member in said aperture for supporting said body member, a sleeve having an internal diameter so as to be frictionally positioned about a spindle in said core member, said core member having a diameter greater than said sleeve and being adapted to rotate about said sleeve, an expansible means positioned about said sleeve for exerting pressure against said core member, means at each end of said sleeve for retaining said core member and said expansible means on said sleeve, and means for regulating the pressure of said expansible means on said core member.

2. A flier for spinning and twisting machines comprising, a centrally apertured body member having oppositely disposed flier arms, a core member in said aperture for supporting said body member, a sleeve having an internal diameter so as to be frictionally positioned about a spindle in said core, said core member having a diameter greater than said sleeve and being adapted to rotate about said sleeve, an expansible means positioned about said sleeve abutting said core member and said sleeve, means at each end of said sleeve for retaining said core member and said expansible means on said sleeve, and means for regulating the pressure of said expansible means, said regulating means being substantially U-shaped washers being adapted for insertion between one end of said expansible means and said sleeve.

3. A flier for spinning and twisting machines comprising, a centrally apertured body member having oppositely disposed flier arms, a core member in said aperture for supporting said body member, a sleeve having an internal diameter so as to be frictionally positioned about a spindle in said core, said core member having a diameter greater than said sleeve and being adapted to rotate about said sleeve, an expansible means positioned about said sleeve abutting said core member, means at each end of said sleeve for retaining said core member and said expansible means on said sleeve, and means for regulating the pressure of said expansible means, said regulating means being an adjusting threaded member adapted to be threaded on said sleeve to a predetermined position, and means for locking said threaded member in such position.

MICHAEL KOCSUTA
THOMAS S. MAYNER.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

<table>
<thead>
<tr>
<th>Number</th>
<th>Name</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,132,462</td>
<td>Dickie et al.</td>
<td>Oct. 11, 1938</td>
</tr>
<tr>
<td>2,365,660</td>
<td>Winslow</td>
<td>Dec. 19, 1944</td>
</tr>
<tr>
<td>2,371,939</td>
<td>Winslow</td>
<td>Mar. 29, 1945</td>
</tr>
</tbody>
</table>