ANTI-BALLOONING SPINDLE FOR RING SPINNING MACHINES

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INVENTORS

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This invention relates to ring spinning machines and more especially to the kind of machines for spinning with a suppressed balloon and for the multiple twisting of a plurality of yarfs without the formation of a balloon.

It quite particularly concerns anti-balloon-devices to be used in connection with the spindle forming part of such machines. As is well known to those skilled in the art, when spinning or twisting yarfs without a balloon or with a suppressed balloon, the yarn is wound helically on the spindle and on a tube seated on said spindle, according to a helix with great pitch.

In spite of the advantages offered by this spinning method, it has made little progress in industry because, if there is a great number of spindles in the machine, it proved very difficult to keep the frictional resistance constant, which the yarn experiences on its helicoidal path around the spindle. A suppressed yarn balloon will always be formed and practically all spindles will operate under the same conditions as before. It often happens that during the winding of the yarn the tension exerted on it is so great that it will break. This is particularly true at the beginning of the winding operation, where the tension acting on the yarn is unduly great, and during spinning it is not sufficiently constant.

These drawbacks are done away with by the present invention.

As is well known to those skilled in the art, spindles of balloonless spinning machines hitherto used are provided with knobs or other protruding parts at their free ends. Below these knobs extends the spindle neck and below this is a part of the spindle carrying a sleeve or tube. The knobs grip the thread to guide it along the spindle neck and the sleeve or tube surrounding the lower part of the spindle, in a helicoidal path having a very steep pitch.

According to the invention, when spinning yarns in the known way without a balloon or with a suppressed balloon, the yarn is so guided on its path to the winding place by one or more protruding parts of the surface of the tube which is mounted on the spindle, such that during spinning the yarn gets into contact with the surface of the tube only in a few places. This means that according to the invention when spinning without a balloon, tubes are used with certain protuberances arranged as flanges or like on their surface. The extent to which the protuberances project from the surface of the tube and the distribution of the protuberances over this surface should be so chosen, that during spinning parts of the tube are filled gradually and the thread is always guided along one or more protuberances. In this manner the tension of the yarn can be practically kept constant.

It should be noted that in certain spinning methods, however, when spinning without balloon, tubes have been used the surface of which was provided with grooves, rings or points which served to make the yarn adhere to the tube surface. However, these tubes cannot be used in the operation of the method according to this invention, because the distribution of the protuberances on the surface of the tube and the extent to which these protuberances project from the surface of these known tubes is not suitable for spinning without balloon.

As a result of the invention the surface of contact between the yarn and the tube on its helicoidal path around the tube is made as small as possible.

In a further development of the invention the yarn is guided also along the spindle part extending from the tube by parts protruding from the spindle surface. Preferably when applying the method according to the invention to ring spinning machines with travellers, these travellers are maintained in a position which is inclined towards the tube.

Thus the yarn can always be held in the middle part of the traveller and in doing so exert a uniform pulling force on both legs of the traveller. This leads to a uniform load on the traveller ring and the traveller and, consequently, to less wear and tear of these parts. The result is that the speed of the spindle can be much increased, e. g., to 1 1/2 times the normal speed of 24 meters allowable per second.

In the drawings:

Fig. 1 is a view of a spindle with a tube designed in accordance with the invention;

Fig. 2 illustrates a spindle neck as diagrammatically indicated at 2 in Fig. 1, in greater detail and as modified according to the invention;

Fig. 3 is a top view of the spindle head shown in Fig. 2.

The spindle according to Fig. 1 has a head formed with star- or knob-shaped bodies 1. Below said head is the so-called spindle neck 2 and therebelow is a spindle part 3 on which a tube 4 can be located. A traveller 6 is arranged to run along a spinning ring 5. The yarn is shown at 7. The surface of the tube 4 and the surface of the spindle neck 2 are provided with protruding ring flanges 8—12. The yarn which is wound on the spindle and tube along a helix with great pitch contacts the spindle and tube surfaces only at a few places. Consequently, the friction exerted on the thread will be a minimum.

The ring 5 has an inclined profile so that the thread engages the traveller 6 right in the middle.

Very good results were obtained with a spindle neck provided with a helical ridge 2b, as shown in Fig. 2.

We claim:

1. In a ring spinning machine for suppressed balloon type spinning of yarn and the like, a high speed spindle including a base portion and a neck portion, a sleeve surrounding said base portion, and a number of narrow, spaced, projecting, continuously curved guide elements distributed over the sleeve and spindle portions, the effective surface, number, spacing distance, and extent of projection of said guide elements being so selected that during spinning, adjoining sections of said sleeve and spindle portions are filled in successive order, and the yarn is guided along a helicoidal path whereby contact of the yarn with the sleeve and spindle portions is limited to the narrow, intermittent guide elements and friction is reduced to a minimum.
2. A spindle according to claim 1, wherein the guide elements on the sleeve are provided in the form of annular flanges.

3. A spindle according to claim 1, wherein the guide elements on the sleeve are provided in the form of annular flanges, and the guide elements on the neck portion are provided in the form of annular flanges of a materially smaller diameter than the sleeve flanges.

4. A spindle according to claim 1, wherein the guide element on the spindle neck portion is provided in the form of a helical ridge extending around and along said neck portion at a steep pitch selected to reduce contact and consequent friction with the yarn, to a minimum.

References Cited in the file of this patent

UNITED STATES PATENTS

<table>
<thead>
<tr>
<th>Patent Number</th>
<th>Inventor(s)</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>465,045</td>
<td>Keene</td>
<td>Dec. 15, 1891</td>
</tr>
<tr>
<td>799,280</td>
<td>Tillman et al.</td>
<td>Sept. 12, 1905</td>
</tr>
<tr>
<td>1,435,475</td>
<td>Joyce</td>
<td>Nov. 14, 1922</td>
</tr>
<tr>
<td>2,198,636</td>
<td>Schaff</td>
<td>Apr. 30, 1940</td>
</tr>
</tbody>
</table>

FOREIGN PATENTS

<table>
<thead>
<tr>
<th>Patent Number</th>
<th>Country</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>3,354</td>
<td>Great Britain</td>
<td>Sept. 4, 1877</td>
</tr>
<tr>
<td>11,491</td>
<td>Great Britain</td>
<td>Mar. 5, 1898</td>
</tr>
</tbody>
</table>