TWISTING MACHINE PROVIDED WITH AN AUTOMATIC TENSIONING MACHINE

The present invention relates to a twisting machine, wherein an outer surface of a drum, on which a belt for rotating a plurality of bobbins is wound, is coated with silicon to reduce the frictional force between the belt and the drum, and in which an automatic tensioning machine is installed to apply a predetermined amount of tension force to the belt. For this purpose, the present invention relates to a twisting machine provided with an automatic tensioning machine, comprising: a plurality of bobbins on which thread is wound; a driving pulley connected to a driving apparatus through a driving shaft such that the driving pulley rotates by the driving shaft; a belt which is wound along the circumference of a drum of the driving pulley, and which moves by the rotation of the driving pulley to rotate the plurality of bobbins; and said automatic tensioning machine connected to the driving apparatus to apply a predetermined tension to the belt, wherein the drum of the driving pulley has an outer surface coated with silicon up to a predetermined thickness to reduce the frictional force between the drum and the belt.
Description

TECHNICAL FIELD

[0001] The present invention relates to a twisting machine provided with an automatic tensioning machine, more particularly, a twisting machine in which an outer surface of a drum, on which a belt for rotating a plurality of bobbins wound with thread is wound, is coated with silicone to reduce the frictional force between the belt and the drum, and in which an automatic tensioning machine is installed to apply a predetermined amount of tension force to the belt.

BACKGROUND ART

[0002] In general, a twisting machine refers to a machine that combines and twists two or more strands of thread withdrawn from a spinning frame. Fig. 1 shows a twisting machine according to a prior art (Application No. 90-17706), wherein bobbins (7) wound with the thread is rotated as a belt (6) is rotated by rotational movement of a driving pulley (5), as illustrated in Fig. 1.

[0003] However, in the prior art as described above, there is a problem that, since a drum of the driving pulley (5) wound with the belt (6) is made of metal material, the belt (6) is easily damaged due to frictional heat between the belt and the drum.

[0004] Also, there is further problem that, since a disadvantage is present that tension force applied to the belt (6) is not constant and thus the change of the tension force applied to the belt (6) is not constant according to the change of temperature in day and night and summer and winter, the life of the belt (6) is shortened and rotational number per unit time of the bobbins (7) is not constant.

[0005] Furthermore, since in the course of combining two threads of different denier wound on the bobbins (7) the two threads of different denier are fed out through one thread guide hole (9), there is another problem that the threads are twisted with each other in mid course and the length by which each of the two threads is fed out per unit time is different from each other.

DISCLOSURE OF THE INVENTION

[0006] To solve the above-mentioned problems, the present invention aims to provide a twisting machine in which the life of the belt is significantly extended by coating the outer surface of the drum wound with the belt with silicone to reduce the frictional force between the belt and the drum and by installing an automatic tensioning machine to apply a predetermined amount of tension force to the belt.

[0007] Furthermore, the present invention also aims to provide a twisting machine in which, when combining two threads with different denier, by providing two feeding-out holes, the threads are not twisted with each other in mid course and the two different threads can be fed out by constant length per unit time.

[0008] To achieve the object, the present invention provides a twisting machine provided with an automatic tensioning machine, characterized in that it comprises: a plurality of bobbins (400) on which thread is wound; a driving pulley (100) connected to a driving apparatus (700) through a driving shaft (710) such that the driving pulley is rotated by the driving shaft (710); a belt (300) which is wound along the circumference of a drum (200) of the driving pulley (100), and which moves by the rotation of the driving pulley (100) to rotate the plurality of bobbins (400); and an automatic tensioning machine (500) connected to the driving apparatus (700) to apply a predetermined tension force to the belt (300), wherein the drum (200) of the driving pulley (100) has an outer surface coated with silicon up to a predetermined thickness to reduce the frictional force between the drum and the belt (300).

[0009] The twisting machine provided with the automatic tensioning machine is also characterized in that it further comprises a plurality of feeding-out rollers (500); and feeding-out holes (510) for delivering the thread wound on the plurality of bobbins (400) to the plurality of feeding-out rollers (500), wherein two feeding-out holes (510) are provided for each feeding-out roller (500), and thus the thread wound on the plurality of feeding-out rollers (500) is delivered to respective feeding-out rollers (500) through the two feeding-out holes.

BRIEF DESCRIPTION OF THE DRAWING

[0010] Fig. 1 is an exemplary view illustrating of a conventional twisting machine.

Fig. 2 is a plane view of a twisting machine provided with an automatic tensioning machine according to an example of the present invention.

Fig. 3 is a front view of a twisting machine provided with an automatic tensioning machine according to the example of the present invention.

Fig. 4 is a detailed view of the automatic tensioning machine according to the example of the present invention.

MODES FOR CARRYING OUT THE INVENTION

[0011] Terms used in the present invention are selected as general terms used currently as widely as possible, but in specific case, terms arbitrarily selected by the applicant are also used, and in this case its meanings are mentioned in corresponding detailed description section, so the present invention should be understood not by lexical meanings of the terms but by given meanings of the terms.

[0012] In the following, preferred examples of the present invention for concretely realizing the above-men-
tioned object will be described with reference to the attached drawings, but the present invention is not restricted by the examples.

[0013] Fig. 2 is a plane view of a twisting machine provided with an automatic tensioning machine according to an example of the present invention.

[0014] Referring to Fig. 2, the twisting machine according to the present invention comprises a driving pulley (100), a drum (200), a belt (300), a plurality of bobbins (400) and an automatic tensioning machine (500), like a conventional twisting machine.

[0015] The dotted part in Fig. 2 shows the part of the belt (300) hidden by the driving pulley (100) and the plurality of bobbins (400). The belt (300) is moved by the rotation of the driving pulley (100), and the plurality of bobbins (400) wound with the thread is rotated by friction generated with the belt (300).

[0016] In general, in the conventional complex twisting machine, frictional heat is generated due to the friction between the drum (200) made of metal material and the belt, and the belt (300) expands due to the frictional heat and thus a constant rotation is not achieved, which makes the twisting number unstable and therefore causes the untwisting and cutting of the thread.

[0017] In the twisting machine provided with the automatic tensioning machine according to the present invention, by coating the outer surface of the drum (200) with silicone up to a predetermined thickness, a factor causing the heat generation is originally eliminated and the frictional force is drastically reduced. Furthermore, in the conventional twisting machine, tension force of the belt (300) is adjusted by the feel, which makes it difficult to maintain an appropriate tension force, and therefore the life of the belt is shortened and the spindle is worn due to motor load and the expansion of the belt (300). With belt-driving apparatus provided with the automatic tensioning machine (500) according to the present invention, the tension force of the belt can be always constantly maintained regardless of temperature, humidity and season.

[0018] Accordingly, 5 KW motor is employed for using of the conventional twisting machine, however, 3.5 KW motor can be employed to achieve the same performance in using of the twisting machine provided with the automatic tensioning machine according to the present invention, thereby reducing the consumption of electrical power by 25%. In addition, wear of several thousands spindles can be reduced and the timing of replacing the belt can be delayed.

[0019] Fig. 3 is a front view of a twisting machine provided with the automatic tensioning machine according to an example of the present invention.

[0020] Referring to Fig. 3, the twisting machine provided with the automatic tensioning machine according to the present invention uses two feeding-out holes (510, 520) in combining two threads.

[0021] Since the conventional twisting machine has only one feeding-out hole, there is a disadvantage that when combining two threads with different physical properties and denier from two bobbins (400), the two threads are twisted or mingled and thus cannot be fed out by the same length per unit time when passing through the one feeding-out hole. Namely, the conventional twisting machine has a problem that, since it has only one feeding-out hole, processing of two threads with different denier and physical properties is impossible and the two threads are overlapped when fed out, whereby the threads are difficult to be constantly fed out and as a result the twisting number is unstable.

[0022] In the twisting machine provided with the automatic tensioning machine according to the present invention, two feeding-out holes (510, 520) are provided above and below feeding-out rollers (500), and therefore two threads with different denier and physical properties are fed out through different feeding-out holes, respectively onto feeding-out rollers (500), whereby the threads can be constantly fed out and accurate twisting number can be obtained. After passing through the feeding-out rollers (500), the two threads are wound on lower bobbins (600).

[0023] Fig. 4 is a detailed view of the automatic tensioning machine according to an example of the present invention. Referring to Fig. 4, in the twisting machine provided with the automatic tensioning machine according to the present invention, a driving apparatus (700) is installed below the drum (200), and the driving apparatus (700) is connected to the drum (200) by a driving shaft (710). Bearings (730, 740) are installed at both ends of the driving shaft (710), and a bearing (750) may be also installed at lower part of the driving apparatus (700). The automatic tensioning machine (500) is connected to the driving apparatus (700) to ensure that constant tension force is applied to the belt (300).

[0024] The present invention has an effect that by coating the outer surface of the drum wound with the belt with silicone the heat generated due to the friction between the drum and the belt is removed and by installing the automatic tensioning machine the constant tension force is applied to the belt and therefore the timing of replacing the belt can be drastically delayed. Furthermore, there is another effect that by separately feeding out two threads with different denier and physical properties through the two feeding-out holes, the two different threads can be fed out by the constant length per unit time without being twisted with each other in mid course.

[0025] Actually, the present invention was applied for production of high quality fabrics by combining and twisting filament rayon yarn of 75 denier and DTY of 75 denier, as a result of which, an excellent effect was shown that faulty twisting did not occur even over one yard only, and it was possible to produce composite twisted thread of or less than 150 denier (S.Z. twisted thread, referred to as modoyori). Test verification was obtained by twisting silk and polyester, and silk and filament rayon yarn, and such a twisting is currently implemented. Furthermore, cut thread rate in the process was drastically decreased.
from 5% to 0.5 % and normal loss rate of 4% was decreased to 2%.

[0026] As above, the present invention has been concretely described with reference to some examples, but the above-described examples were represented only for explanation to understand the present invention, and the scope of the present invention is not intended to be restricted to the examples. It may be understood by persons skilled in the art that various modifications can be made without departing from the scope of technical concepts of the present invention. The scope of the present invention should be interpreted by appended claims.

Claims

1. A twisting machine provided with an automatic tensioning machine comprising:

   a plurality of bobbins (400) on which thread is wound;
   a driving pulley (100) connected to a driving apparatus (700) through a driving shaft (710) such that the driving pulley is rotated by the driving shaft (710);
   a belt (300) which is wound along the circumference of a drum (200) of the driving pulley (100), and which moves by the rotation of the driving pulley (100) to rotate the plurality of bobbins (400); and
   an automatic tensioning machine (500) connected to the driving apparatus (700) to apply a predetermined tension force to the belt (300), wherein the drum (200) of the driving pulley (100) has an outer surface coated with silicone up to a predetermined thickness to reduce the frictional force between the drum and the belt (300).

2. A twisting machine provided with an automatic tensioning machine according to claim 1, further comprising:

   a plurality of feeding-out rollers (500); and
   feeding-out holes (510) for delivering the thread wound on the plurality of bobbins (400) to the plurality of feeding-out rollers (500), wherein two feeding-out holes (510) are provided for each feeding-out roller (500), and thus the thread wound on the plurality of feeding-out rollers (500) is delivered to respective feeding-out roller (500) through the two feeding-out holes.