



Europäisches Patentamt
European Patent Office
Office européen des brevets



Publication number: **0 435 366 A2**

12

EUROPEAN PATENT APPLICATION

21 Application number: **90203275.4**

51 Int. Cl.⁵: **D01H 13/04, D01H 13/06,
D01H 7/92, B65H 54/28**

22 Date of filing: **12.12.90**

30 Priority: **21.12.89 IT 2278989**

43 Date of publication of application:
03.07.91 Bulletin 91/27

64 Designated Contracting States:
BE CH DE ES FR GB GR LI

71 Applicant: **SAVIO S.p.A.**
Via Udine 105
I-33170 Pordenone(IT)

72 Inventor: **Sartoni, Sandro**
Via Pendini, 1/A
I-40026 Imola (Bologna)(IT)
Inventor: **Minguzzi, Eraldo**
Via Golfari, 3
I-48012 Bagnacavallo (RA)(IT)

74 Representative: **Henke, Erwin et al**
Ing.Barzanò & Zanardo Milano S.p.A. Via
Borgonuovo, 10
I-20121 Milano(IT)

54 **Improved twister device for a winding carriage enabling compact bobbins to be formed.**

57 This invention relates to an improved twister device for a winding carriage collecting onto a bobbin the sliver emerging from the gill box or derived machine.

More specifically, the present invention proposes a device which enables compact bobbins of cylindrical form to be obtained, by comprising drive means which rotate the rotary trumpet of the known mobile twister unit independently of the to-and-fro linear movement of said mobile unit of the winding carriage, to transmit single-direction constant uniform rotation to the sliver sliding within the rotary trumpet before it is deposited on the surface of the bobbin under formation.

EP 0 435 366 A2

IMPROVED TWISTER DEVICE FOR A WINDING CARRIAGE ENABLING COMPACT BOBBINS TO BE FORMED

This invention relates to an improved twister device for a winding carriage, which enables compact bobbins to be formed from the sliver leaving the gill box or derived machine.

In the following description and claims the term "sliver" is used to indicate a textile fibre roving, a textile fibre sliver or any other textile fibre aggregate.

In gill boxes with sliver collection onto bobbins the sliver leaving the known calender units of the gill box must be subjected to a so-called "false twist" operation before being wound onto the mandrel of the winding carriage. The "false twist" is imparted to give the sliver the necessary roundness and strength so that its subsequent unwinding can take place without difficulty and without breakage. In this respect, when such a non-twisted or imperfectly wound sliver is subsequently unwound from its collection bobbin it can easily suffer breakage. Rotary funnel twister and condenser devices, conventionally known in the art as trumpets, are normally used in textile machines such as gill boxes to condense or compact a sliver in the form of loose textile fibres before its positioning and collection in helix form on the circumferential surface of the bobbin under formation. The sliver fed into the trumpet is substantially without twist, and when this sliver passes through the trumpet false twist device it is twisted about itself, this twisting as is well known to the expert of the art causing it to assume compactness and a reduction in its transverse dimension, in that the air retained between the fibres is eliminated so that the sliver loses most of its volume. It is apparent that the twist imparted upstream is nullified by the twist imparted downstream, as the trumpet acts as a false twist element. To achieve this, the trumpet is constructed and operated in the manner traditional in the art, it consisting essentially of a funnel rotating about its axis while being simultaneously subjected to axial to-and-fro movement along a path equal in length substantially to the length of the desired bobbin. During said to-and-fro movement the funnel reverses its direction of rotation at the ends of the bobbin under formation, it rotating reciprocatingly in the two directions according to its direction of linear movement. This rotation in the two directions is induced by the rolling of a pulley associated with the rotary funnel along a fixed flat element, as is well known in the art in terms of the methods used up to the present time. It is apparent that the sliver is deposited at the ends without substantial twist and thus poorly compact. This traditional method of application is frequently accompanied by a falling

away of the lateral surfaces of the bobbin, causing a deterioration in the bobbin quality. In fact when such a bobbin is used to feed subsequent machinery difficulties arise in unwinding the sliver, which is subjected to elongation and in the limit to breakage. It is understandable that a breakage of this kind interrupts the production process, requiring the intervention of service personnel. The labour cost of these emergency operations represents a considerable factor in the overall production cost calculation.

To overcome this winding problem the invention proposes an improved twister device for a winding carriage collecting the sliver emerging from the gill box, which is able to wind compact bobbins of cylindrical form using drive means which rotate the rotary trumpet independently of the to-and-fro linear movement of said mobile unit, for the purpose of providing constant uniform rotation in a single direction to the sliver travelling within the rotary trumpet before being deposited on the surface of the bobbin under formation. Said drive means comprise components which receive rotation from the drive shaft, to transmit single-direction rotary motion, via a linkage comprising pulleys, belts and cables, to the trumpet of the mobile twister unit, said trumpet imparting the false twist to the sliver an instant before this latter is deposited as a crossed winding on the circumferential surface of the bobbin under formation.

The device of the invention enables constant rotation of the rotary trumpet to be achieved, resulting in improved binding of the various layers of sliver and thus enabling its subsequent unwinding to be achieved without abnormal tension and thus without sliver breakage. With reference to the foregoing, the accompanying drawing shows a preferred embodiment, which is non-limiting in terms of the relative positions of the components and the consequent simplifications which can derive therefrom. Said embodiment is described with reference to the single figure of the accompanying drawing. This represents an axonometric perspective schematic view of the device of the present invention showing the entire motion transmission, together with a detailed view of the drive means, which receive rotational motion from the drive shaft to transmit it to the rotary trumpet of the mobile twister unit.

In the single accompanying drawing: 1 is the drive shaft which rotates with constant rotation to transversely drive the mobile twister unit 8 and rotate the twister device of the present invention; 3 is a belt, cord or any flexible element transmitting

rotary motion from the transmission pulley 2 to the pulley 5 via the idle deviation pulleys 4. The pulley 2 is rigid with the shaft 9 and the pulley 5 is rigid and integral with the rotary trumpet 7 of the mobile twister unit 8; 6 is the rocker arm or bar pivoted about the shaft 9, this being mobile to enable the unit 8 to travel with sliding to-and-fro movement along the guide shaft 10, in the direction of the arrows 14.

Said arm 6 rocks angularly by the action of the connecting rod 18 which is connected to it by a connection member 16. Said connecting rod 18 is driven by the crank 21 via the connection pin 19, the crank 21 being rotated by the drive shaft 1 on which it is rigidly fixed; 11 is the drive roller for the bobbin 12 under formation; 15 is a spiral in the form of a helical spring within which the sliver 30 slides before entering the rotary trumpet 7. Said spiral 15, rigidly fixed to the mobile unit 8, helps to compact the sliver 30, as is well known in the art; 22 are flexible belts or similar elements, advantageously toothed, to transmit motion via the toothed wheels 24, without the minimum slippage. The absence of slippage is extremely important in order to maintain the rotation 20 of the rotary trumpet 7 unaltered; 23 are idle toothed wheels for angularly deviating the belt 22; 25 is a box containing gear wheels suitably sized to advantageously obtain a stepping-up of the rotational speed as required for transmitting the correct rotation to the rotary trumpet 7.

Those devices and mechanisms of the gill box or derived machine which operate in mutual cooperation with the device of the invention are not illustrated nor is their operation described, in that they are already known and also because they are not concerned in the operation of the device of the present invention, which is easily understood.

Thus for example the motor driving the drive shaft 1 which rotates constantly in the same direction is not shown. Said shaft 1 simultaneously drives the crank 21 and the toothed belt 22. This latter, via the toothed wheels 24 and toothed belts 22, transmits motion to the belt 3, which by means of the pulley 5 transmits constant uniform rotary motion to the rotary trumpet 7, which rotates in the direction of the arrow 20. Simultaneously with said rotation, the mobile unit 8 slides linearly along the guide shaft 10 with a to-and-fro movement, the rotary trumpet 7 thus rotating about itself while continuously moving linearly.

Said to-and-fro linear movement is generated by said crank 21 which drives the connecting rod 18 and hence the arm 6, which rocks about the shaft 9 to cause the twister unit 8 to move with to-and-fro movement in accordance with the arrows 14. This latter linkage represents a well known application in the case of a gill box winding car-

riage.

Modifications and additions can be made to the details of the device by the expert of the art, but without leaving the general idea of the present invention.

Claims

1. An improved twister device for a winding carriage collecting the sliver emerging from the gill box to wind compact bobbins of cylindrical form, characterised by comprising drive means which rotate the rotary trumpet of the mobile twister unit independently of the to-and-fro linear movement of said mobile unit, for the purpose of providing constant uniform rotation in a single direction to the sliver travelling within the rotary trumpet before being deposited on the surface of the bobbin under formation; said drive means comprising components which receive rotation from the drive shaft, to transmit single-direction rotary motion, via a linkage comprising pulleys, belts and cables, to the trumpet of the mobile twister unit, said trumpet imparting the false twist to the sliver an instant before this latter is deposited as a crossed winding on the circumferential surface of the bobbin under formation.

