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(54) APPARATUS FOR CONTROLLING BALLOON DIAMETER

(57) The invention relates to balloon control apparatuses used in yarn drawing machines. The invention particularly relates to an apparatus for controlling balloon diameter for use especially in ring machines during slub yarn manufacturing, wherein it comprises limiting elements (5) with an annular shape which are arranged one on the top of the other.

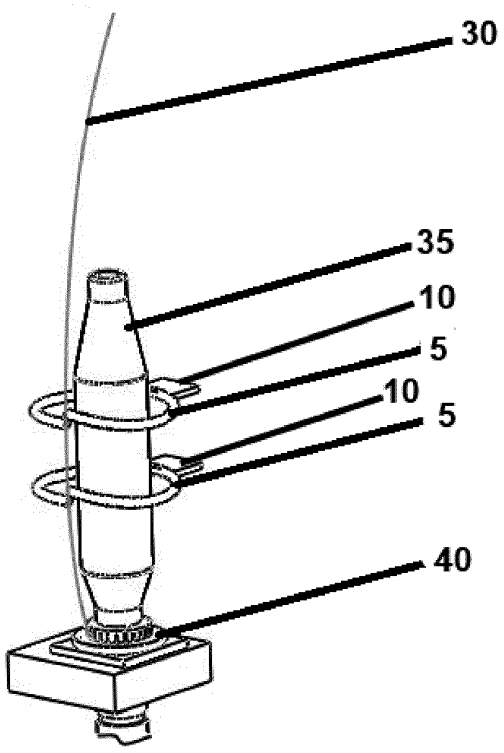

FIG. 1

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Description

Technical Field

[0001] The invention relates to balloon control apparatuses used in yarn drawing machines. The invention particularly relates to an apparatus for controlling balloon diameter for use especially in ring machines during slub yarn manufacturing, wherein it comprises limiting elements with an annular shape which are arranged one on the top of the other.

State of The Art

[0002] Today, various apparatuses are used, or various assemblies are formed for controlling the balloon which occurs during spinning operation in yarn drawing machines. It is difficult to control balloon diameter with the existing apparatuses and assemblies. Failing to control the formed balloon causes yarn breakage at a high level. Yarn breakage experienced during manufacture has a negative impact both on the working performance and on the quality values of the yarn.

[0003] The most commonly known balloon control in the state of the art consists of an annular-shaped metal ring. However, said single ring do not permit controlling the balloon formed by the spun yarn during spinning. Single balloon control configurations are not sufficient, in terms of position and limiting area, for controlling the balloon formed during spinning.

[0004] It is thus required to provide an easy control of the ballooning formed in the spun yarn during spinning, and hence to improve the working performance of the yarn.

[0005] Apart from the single metal ring, more complicated and costly assemblies are also used as balloon control in the state of the art. However, it is not always possible to use these assemblies in every machine already being used.

[0006] It is also possible within the state of the art to employ configurations which entirely surround the cops, around which the yarn is wound, with a view to avoid the formation of balloon during spinning operation.

[0007] Nowadays, in ring machines, especially during slub yarn manufacturing, the thinner areas formed at the start and end of the slub (particularly in thick effects) increase the balloon diameter during yarn manufacturing process. The increasing balloon diameter causes high level of breakage during yarn manufacture. In slub yarn production, the traveller is generally determined as per number. Nevertheless, due to the effect given to the yarn, thicker and thinner areas with respect to the yarn number are present on the yarn. The part of the yarn with slub is thicker while the part without slub is thinner. The overall number is the number of the part comprising both thick and thin areas. While the thin part is being spun during spinning, the balloon expands and when the balloon diameter cannot be controlled, yarn breakage occurs.

[0008] The known developments in the state of the art regarding the subject matter are referred below.

[0009] The Patent Publication No. TR 1998 01159 discloses a "Multiple cable twisting shaft with a rotary balloon limiter". The abstract of said application is as follows: "A multiple cable twisting shaft having a rotary disk (8), wherein said shaft has a yarn conveyance channel radially connected to the shaft groove axis (7). An axially arranged rotation channel (11) is connected to this channel and the yarn outlet holes of said channel are oriented towards the interval between the balloon limiter (12) rotating with the rotary disk (8) and the bobbin carrier protecting cover (25), which is arranged in the balloon limiter (12) and operated in reverse direction to the balloon limiter (12). Said interval presents a part of the bobbin carrier having a bobbin carrying base (22), the shaft is characterized in that a yarn grasping ring (10) is arranged under the outer periphery of the bobbin carrying base (22) or the bobbin carrier protective cover (25) and at an axial distance therefrom".

[0010] The Patent Publication No. TR 2013 08986 discloses a "Balloon diameter control unit". The abstract of said application is as follows: "The present invention relates to a balloon diameter control unit (1) which allows direct control of the balloon diameter, and thus reducing the energy consumption, thanks to the position sensors (3) in twisting machines which perform direct cabling. The object of the invention is to provide a balloon diameter control unit (1) which allows controlling the diameter of the balloon formed during twisting in a feedback manner, and hence minimizing the energy consumption".

[0011] Consequently, due to the aforementioned drawbacks and insufficiency of the current solutions regarding the subject matter, a development has deemed necessary in the related technical field.

Brief Description of the Invention

[0012] The present invention relates to an apparatus for controlling balloon diameter which meets the aforementioned requirements, eliminates all the drawbacks, and at the same time provides additional advantages.

[0013] The primary object of the invention is to control the balloon diameter in ring machines, especially during slub yarn manufacturing.

[0014] The invention aims to prevent yarn breakage resulting from the balloon formation during spinning operation.

[0015] An object of the invention is to improve the working performance of the yarn in spinning machines.

[0016] The invention also aims to obtain high-quality slub yarn in ring machines.

[0017] Another object of the invention is to reduce the number of interruptions, i.e. halts, in the machine due to yarn breakage.

[0018] Yet another object of the invention is to ensure that the diameters of the balloons formed during spinning operation are controlled with a simple, easy, and cost-

effective method, and that said diameters are prevented from reaching a size that will cause yarn breakage.

[0019] In order to achieve the aforementioned objects, the invention is an apparatus which allows controlling the diameter of the balloons formed during spinning operation in ring machines and which is engaged on ring machines, wherein it comprises two limiting elements which are arranged in parallel and one on the top of the other such that they will not contact with one another.

[0020] In order to achieve the objects of the invention, said two limiting elements have an annular shape.

[0021] In order to achieve the objects of the invention, said limiting element comprises a connection rod enabling it to be engaged on the ring machine.

[0022] In order to achieve the objects of the invention, said limiting elements are either independent of one another or interconnected.

[0023] The structural and characteristic features and all advantages of the invention will be understood more clearly by referring to the following figures and the detailed description written with reference to these figure. Therefore, while making an evaluation, these figures and the detailed description should be taken into account.

Figures for a Better Understanding of the Invention

[0024] Fig. 1: A schematic view of an alternative embodiment of the apparatus according to the invention showing the utilization thereof on a ring machine.

[0025] The drawings do not necessarily need to be scaled and the details that are not required for understanding the invention may have been omitted. Apart from that, the elements that are at least substantially identical or have at least substantially identical functions are referred with the same reference numeral.

Description of Part References

[0026]

5. Limiting element
10. Connection rod
30. Yarn
35. Cop
40. Traveller

Detailed Description of the Invention

[0027] In this detailed description, the apparatus for controlling balloon diameter according to the invention and the preferred embodiments thereof are described only for a better understanding of the subject matter, without any limitations.

[0028] The invention relates to an apparatus which is used for controlling the balloon diameter formed during spinning operation in ring machines and which comprises two limiting elements (5) arranged one on the top of the other such that they will not contact with one another. Fig. 1 is a schematic view of an alternative embodiment of the apparatus according to the invention showing the utilization thereof on a ring machine.

[0029] As seen in Fig. 1, the limiting elements (5) forming the apparatus according to the invention are preferably made of metal and have an annular shape. Said limiting elements (5) comprise connection rods (10) enabling them to be engaged on the ring machines. Said limiting elements (5) may be fixed on the ring machine either independent of one another or in connection with one another. Preferably, the limiting elements (5) are fixed by being screwed on a configuration in profile form which is mounted on the ring machine by means of the connection rods (10).

[0030] As seen in Fig. 1, the limiting elements (5) presenting the apparatus according to the invention are arranged in parallel and one on the top of the other. The limiting elements (5) are positioned on the ring machine such that they will surround the cop (35) around which the yarn (30) is wound during spinning operation. The diameter of the limiting elements (5) having an annular shape, i.e. a hollow ring form, vary according to the used yarn number and the machine's spindle dimension.

[0031] In ring machines, the fiber having passed between the drawing rollers advances rotating around the ring by means of the traveller (40). The traveller (40) serves for winding the spun yarn (30) around the cop (35). In ring machines, the yarn which is spun by way of the traveller (40) is wound around the cop (35). The balloon which is formed while the yarn (30) rotates around the traveller (40) remains within the limiting elements (5). The two limiting elements (5) presenting the apparatus according to the invention controls the diameter of the balloon formed while the yarn (30) oscillates during the spinning operation. It prevents the balloon diameter from reaching a size that will cause yarn (30) breakage. It ensures said prevention by forming a limiting area around the cop (35) with its annular shape.

[0032] The yarn (30) is twisted due to the difference in the speeds, i.e. revolutions, of the spindle and drawing rollers, from which the fibers are fed during spinning. Owing to such difference in speed, the rotation of the traveller (40) also helps the yarn (30) to be twisted. Here, the balance between the weight of the traveller (40) and the yarn (30) thickness is of great importance. This balance cannot be achieved in slub yarns because of the presence of thinner and thicker areas different from the overall number. The apparatus according to the invention particularly serves for balancing the ballooning formed during the spinning of the slub yarns.

[0033] Thanks to the apparatus according to the invention, yarn (30) breakage and interruptions in the machine resulting from yarn (30) breakage are reduced by controlling the balloon diameter, thereby increasing the working performance of the yarns (30). The control of the balloon diameter is provided by a more efficient, easy, and simple method.

[0034] The thinner areas formed at the start and end

of the slub (particularly in thick effects) increase the balloon diameter during yarn (30) manufacturing process. The increasing balloon diameter causes high level of breakage during yarn (30) manufacture. The utilization of the apparatus according to the invention with a view to control the increasing balloon diameter is quite advantageous in terms of both productivity and yarn quality.

[0035] It is more advantageous to use the apparatus according to the invention in slub yarn manufacturing due to the fact that thin-thick variations are typically more in slub yarns. However, it may also be advantageously used in normal yarns. Nonetheless, the advantage provided thereby is higher and more significant in case of slub yarn.

[0036] It has become easier to control the ballooning formed in the yarn (30) using the apparatus according to the invention, which consists of two limiting elements (5) having an annular shape and arranged one on the top of the other. Owing to the optimization of the formed balloon diameter, the working performance of the yarn (30) has also been increased.

Claims

1. An apparatus which allows controlling the diameter of the balloons formed during yarn (30) spinning operation in ring machines and which is engaged on ring machines, **characterized in** comprising:

    • two limiting elements (5) which are arranged in parallel and one on the top of the other such that they will not contact with one another.

2. The apparatus according to Claim 1, **characterized in that** said two limiting elements (5) have an annular shape.

3. The apparatus according to Claim 1 or 2, **characterized in that** said limiting element (5) comprises a connection rod (10) enabling it to be engaged on the ring machine.

4. The apparatus according to Claim 1, **characterized in that** said limiting elements (5) are either independent of one another or in connection with one another.

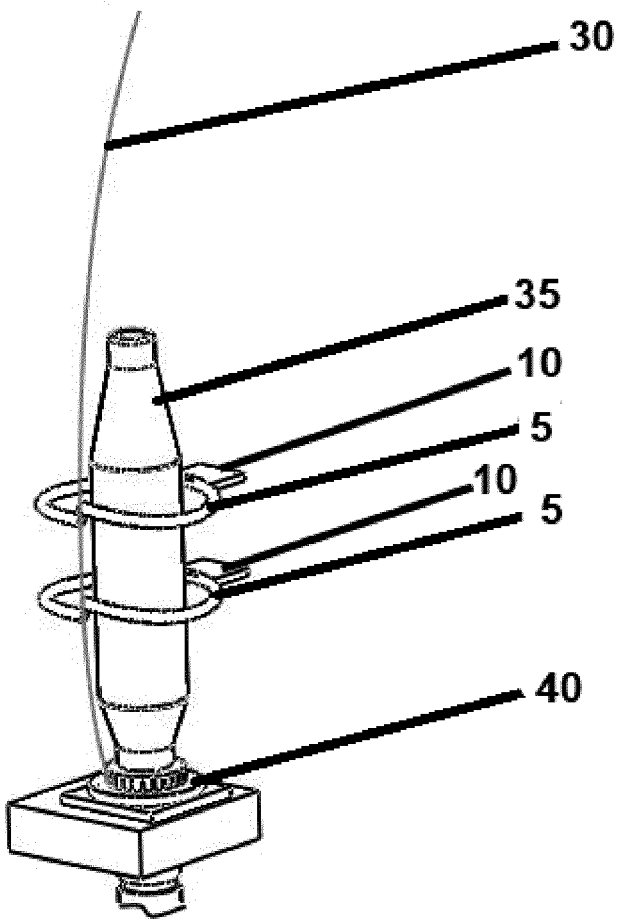

FIG. 1

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EUROPEAN SEARCH REPORT

Application Number
EP 17 16 4769

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	26 September 2017	Humbert, Thomas

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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Application Number
EP 17 16 4769

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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The present search report has been drawn up for all claims

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- TR 201308986 **[0010]**