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[54] **THREAD TENSIONING AND BALLOON CONTROL MEANS FOR THE UNWINDING OF YARN FROM SUPPLY PACKAGES ON WEAVING AND OTHER TEXTILE MACHINES**
 4 Claims, 6 Drawing Figs.

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[51] Int. Cl. **B65h 59/02**

[50] Field of Search 242/147,
 156.1, 128, 129.8, 130, 131, 131.1; 139/122

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ABSTRACT: The invention relates to a thread-tensioning and balloon control or breaking motion for unwinding yarn from crosswound or other supply packages on textile machines, particularly on weaving machines. A circular, supporting, rimlike means is provided to be positioned coaxially to and adjacent the package unwinding end, and stands approximately normal to the package axis. It is provided internally with a plurality of pivoted, spring loaded tensioning members. These are spaced circumferentially of the supporting rimlike means and lie tangentially on the outer surface of the package to restrain and inhibit the ballooning tendencies of the yarn being drawn from the package.

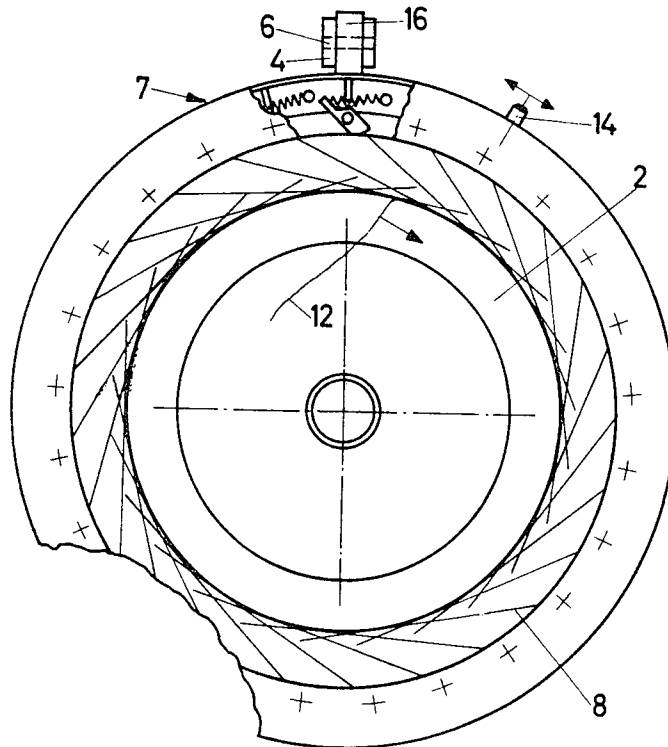


Fig. 2

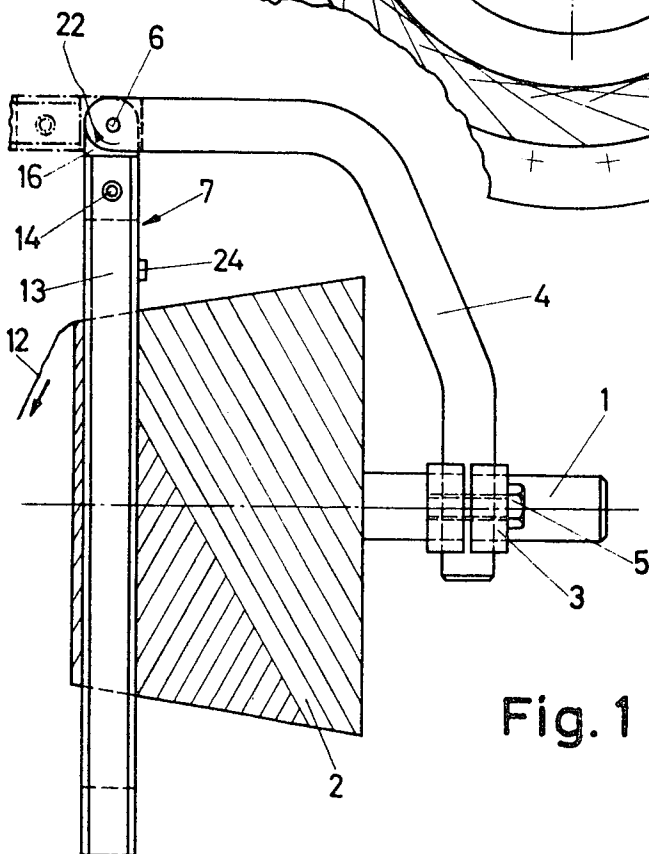
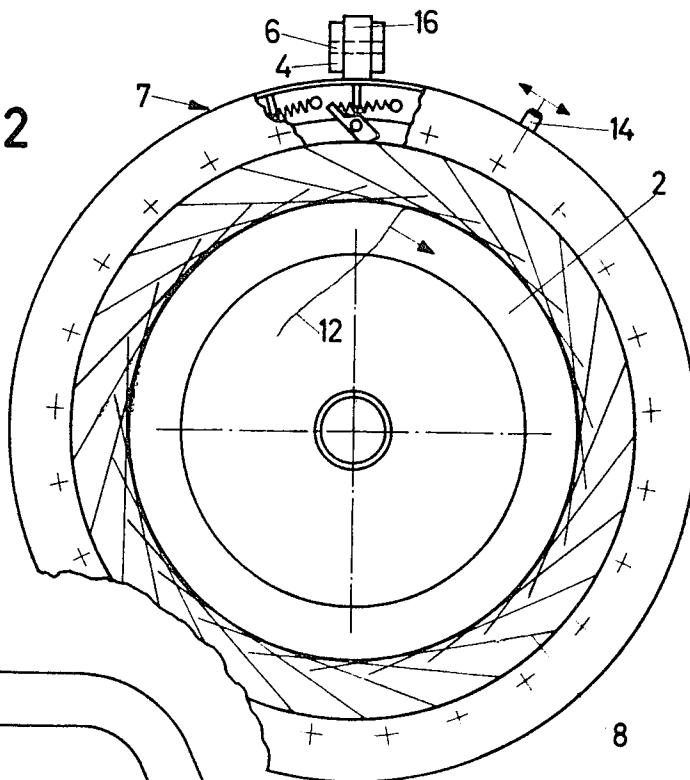


Fig. 1

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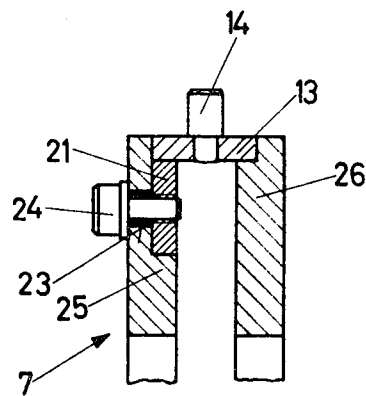
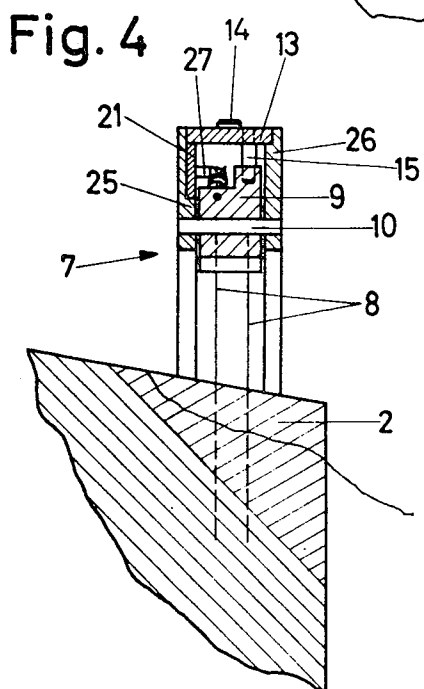
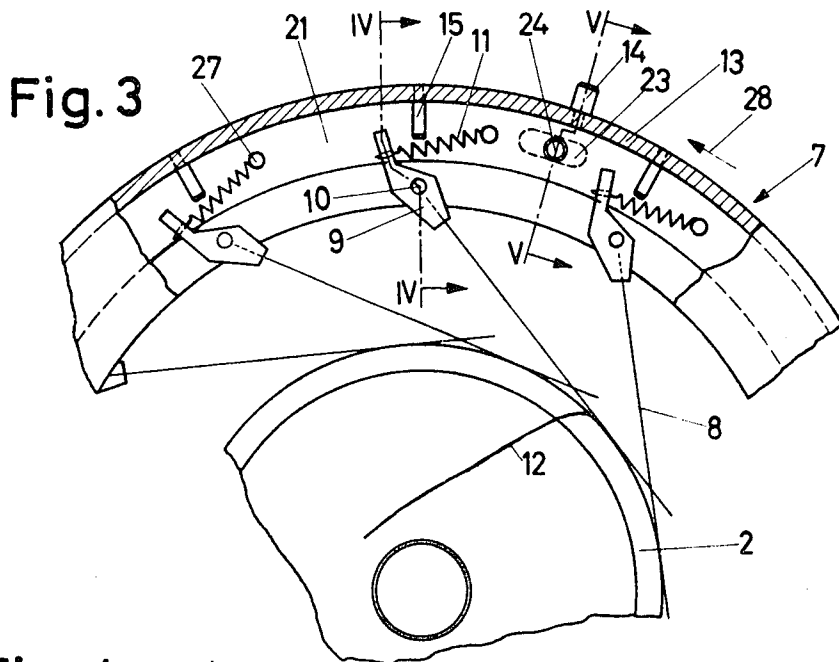


Fig. 5

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THREAD TENSIONING AND BALLOON CONTROL MEANS FOR THE UNWINDING OF YARN FROM SUPPLY PACKAGES ON WEAVING AND OTHER TEXTILE MACHINES

BACKGROUND OF THE INVENTION

It is commonly known when unwinding yarn from a cone or bobbin, a balloon is formed which is in proportion to the unwinding velocity and the weight of the thread. If this unwinding is suddenly stopped, the thread has the tendency, owing to its inertia, to continue unwinding from the package, i.e. the balloon formation and action are not interrupted at once. Due to this continued ballooning action a certain length of yarn is still unwound and will hang loose after unwinding has suddenly stopped. Therefore this creates the risk of forming snarls which on contained unwinding of yarn, will not straighten themselves out and will cause trouble. If, for instance, this yarn is being used as weft or filling in a weaving machine, such a snarl (sometimes called a pigtail) can be inserted into the shed and this would result in a weaving fault. On modern high-speed looms this problem is of even greater importance since the filling yarn is subject to high accelerations and decelerations. The object of the invention is to create a motion or device which will overcome these difficulties and allow more perfect unwinding of the yarn from the supply packages at constant yarn tension.

SUMMARY OF THE INVENTION

This desired object is realized by providing a circular supporting rim or supporting means, said rim surrounding the supply package at its unwinding end, standing at least approximately normal and coaxial to the bobbin axis, and being provided at the inside with a plurality of spring-loaded tensioning members such as wires or needles, flat springs or the like, said tensioning members being spaced about the circumference of the rim and lying tangentially on the corresponding outer diameter or surface of the supply package.

An embodiment and adaptation of the invention are shown by way of example in the drawings and described below, wherein:

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side view of the thread-tensioning and balloon-breaking motion, according to the invention.

FIG. 2 is a partially cutaway front view of the motion as per FIG. 1.

FIG. 3 is a partial view of the mechanism of FIG. 2, drawn partially in section and on a bigger scale.

FIG. 4 is a section along the line IV—IV in FIG. 3.

FIG. 5 is a section along the line V—V in FIG. 3.

FIG. 6 shows an arrangement comprising two units according to the invention, in magazined relationship.

DESCRIPTION OF THE PREFERRED EMBODIMENT

As can be seen from FIGS. 1 to 6, the motion or device incorporates a support 1, carrying a crosswound bobbin or other supply package 2, a holding arm 4 mounted by means of a crosshead 3, and clamped at a suitable position by a clamping screw 5. The other end of the arm 4 is fork shaped and carries a swivel pin 6 extending through a bracket 16 of the rim 7. The whole rim is therefore pivotable around the swivel pin 6, in the direction of the arrow 22, between a working position, as shown by full lines in FIG. 1, and a swung-out position as indicated by dash-dotted lines in FIG. 1, to allow, for example, for a new package to be put on. Clamping members (not shown) can be provided to fix the rim in its two end positions, if required.

The rim 7 consists virtually of two parallel rings 25 and 26 connected to each other, FIGS. 4 and 5. In the ring 25 there is a setting ring 21 which can be rotated in a limited way in the direction of the circumference, and the position of which can

be fixed by means of one or more screws 24 leading through slots 23 in the ring 25. The two rings 25 and 26 are held together by a number of pins 10 arranged in regular distances from each other. A needle holder 9 is pivotally borne on each pin 10. In the example shown, FIG. 4, each of the needle holders 9, which are preferably all alike, is provided with two tensioning needles 8, inserted side by side. There could, of course, be more than two needles or only one needle inserted into the needle holder. In FIG. 2, 25 needle holders 9 are provided at equal distances about the rim, but the number of needle holders 9 could also be more or less. Instead of needles 8 it is possible to use other types of tensioning or balloon controlling members, such as flat springs or the like.

One end of a tension spring 11 is connected to each needle holder 9 and the other end is fastened to a pin 27 of the setting ring 21. Due to the tension of the springs 11 the needles 8 are lying tangentially against the surface of the supply package 2. By moving the setting ring 21 in relation to the two rings 25 and 26, the tension of the spring 11 and, therefore, the pressure of the needles 8 on the supply package can be adjusted.

A tensioning ring or needle-retracting ring 13 is provided on the outer circumference of the two rings 25 and 26 which can be moved in the direction of the circumference in relation to the two rings 25 and 26 by means of a handle 14.

On turning the tensioning ring 13 in the direction of the arrow 28, FIG. 3, the pins 15 contact the free end of the needle holders 9 and by overcoming the force of the tension springs 11, cause pivoting of the needle holders 9 with their needles 8. All the needles 8 are then lifted off the circumference of the supply package or bobbin 2 simultaneously. This is required whenever an empty package is to be replaced by a new full one, or for any other reason, the supply packages are to be removed or changed.

The inclination of the needles 8 as shown in FIG. 2 and 3 is in accord with the corresponding outer diameter of the supply package 2. The needle holders 9 are shaped in such a way that when pivoting on their pins 10 they transfer the force of the tension springs 11 to the end of the needles 8 and apply practically constant pressure onto the supply package 2 which is virtually independent of the diameter of the yarn bobbin.

In order to achieve an uninterrupted filling yarn supply on a weaving machine, it is necessary to connect the yarn ends of a first and second supply package nose to tail. FIG. 6 shows how this uninterrupted filling yarn supply can be achieved when using the motion which is the subject of the invention. Two swivel pins 20 and 30 are arranged on a fixed support 29. The support is arranged on a ground plate 33 which is provided with a guiding eyelet 34 for the filling yarn. A clamping bracket 31 with a support 1, the cross head 3 and the holding arm 4 with the rim 7 can be pivoted around the pin 20. In the same manner a clamping bracket 31', a support 1', a cross head 3' carrying a holding arm 4' with a rim 7' can be pivoted around the pin 30.

The tail 32 of the supply package 2 is connected to the nose 17 of a new full supply package 18, whereby the yarn is guided through the rim 7 and lightly held by a holding or clamping device 19. When the yarn supply from the package 2 is exhausted, the thread is pulled out of the holding device 19 and leaves the rim 7. The yarn will then be unwound from the bobbin 18.

After swinging out the empty bobbin 2 around the swivel pin 20, lifting up the rim 7 and opening the needles 8 in the described manner by means of handle 14, the empty bobbin 2 can be replaced by a new full package. The nose of the yarn of the new package is to be connected to the tail of the package 18 just put into operation. This process is repeated whenever a supply package is exhausted to ensure an uninterrupted filling yarn supply.

Additional devices (not shown) can be provided to fix the clamping brackets 31 and 31' respectively, on their pins 20 and 30 in their two end or extreme positions, i.e. in working position and swung-out position.

Advantages of the described device are that the unwinding of yarn from the supply package is effected without formation of a balloon and that the yarn is held under the light pressure of at least one tensioning needle at any moment during unwinding and is thus held under constant tension. The formation of loops and snarls is thereby avoided.

This disclosure of a preferred embodiment of the invention is to be interpreted as illustrative of one form and one application of the same and modifications will readily occur to those skilled in the art. The invention is not to be restricted except by the scope of the appended claims.

The novel features desired to be protected by Letters Patent are:

1. A thread-tensioning and balloon control motion for the unwinding of yarn from supply packages on textile machines, particularly on weaving machines, characterized in that, a rimlike supporting means is provided on a holding arm, said supporting means surrounding the supply package adjacent its unwinding end and standing at least approximately normal and coaxial to the package axis, pivot pins spaced about the supporting means and holders pivoted on said pins, at least one springlike tensioning member fixed in each said holder and so arranged at spaced intervals circumferentially of the rimlike supporting means that they lie tangentially against the outer

surface of the supply package, and resilient means connected to one end of each holder and to an anchor means on a part of the rimlike supporting means for urging the tensioning members against the surface of the package.

2. A thread-tensioning and balloon control motion as defined in claim 1, characterized in that, said resilient means comprises tension springs which act on the tensioning members through their holders and a common adjusting device arranged in the rimlike supporting means for simultaneous adjustment of said springs.

3. A thread-tensioning and balloon control motion according to claim 1, including means in the rimlike supporting means for simultaneously pivoting said tensioning members from their operating position to an ineffective position wherein the tensioning members are withdrawn and lifted off the surface of the supply package.

4. A thread-tensioning and balloon control motion as defined in claim 1, characterized in that, a pivot pin is provided for interconnecting said rimlike support means to the holding arm so that the support means can be swung about the pivot pin out of its operating position into a position in which a supply package can be exchanged.

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