ARRANGEMENT FOR A TEXTILE MACHINE, FOR EXAMPLE A WEAVING MACHINE

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ABSTRACT

A regulator (4) works with a thread or yarn supply which is intended to provide a draw-out length of the thread or the yarn which is dependent on the one hand on the size of the supply and on the other hand on an assumed or adjusted thread tension in the draw-out thread or the draw-out yarn. A load cell (7) is arranged so as to sense the actual thread tension in the drawn-out thread and to supply to the regulator (4) information (11) for changing the size of the thread stock when the actual thread tension deviates from the assumed or previously adjusted thread tension (the desired value). The load cell can also function as a pick monitor.
ARRANGEMENT FOR A TEXTILE MACHINE, FOR EXAMPLE A WEAVING MACHINE

TECHNICAL FIELD

[0001] The present invention relates to an arrangement for a regulator which works with a thread or yarn supply which is intended to provide a draw-out length of the thread or the yarn which is dependent on the one hand on the size of the supply and on the other hand on an assumed thread tension in the draw-out thread or the drawn-out yarn.

STATE OF THE ART

[0002] It is already well-known to use regulators in connection with textile machines of various types, for example for weaving machines. The role of the regulator is, before each drawing-out function or pick in the machine, to accumulate a thread or yarn supply from a thread or yarn magazine, which supply represents the draw-out length. The purpose of the regulator is that, during the drawing-out function, it is intended to provide a constant thread tension in the drawn-out thread, which is to result in high quality of the woven product.

[0003] It is also known to arrange regulators so as to be capable of taking up different quantities of thread or yarn so that one and the same regulator can perform weaving functions with different thread lengths, that is to say the regulator can be adjusted so as to be loaded with different quantities of thread or yarn. During weaving in a case in point, the regulator is therefore adjusted so as to be capable of, in its thread or yarn supply, bringing about a draw-out length of the thread/yarn which corresponds to the weaving case concerned. The draw-out length is in this connection related to both the size of the supply and an assumed thread tension (a desired value) with which the system is to work in the weaving or product-manufacturing case in question.

DESCRIPTION OF THE INVENTION

Technical Problem

[0004] Increasingly high standards are, however, set for the products which are manufactured using the textile/weaving machines in question. In this connection, it has also been found that if attempts are made to fix and maintain the assumed thread or yarn tension by means of the function of the regulator and various arrangements associated with the regulator, the problem exists of accurately fixing the actual thread tension in and during each product-manufacturing case. Various factors can change the thread or yarn tension, for example the functions of shuttles, projectiles, warp threads, patterns etc. This can lead to a certain compensation of the draw-out length, that is to say the size of the supply, taking place by virtue of the draw-out thread being stretched differently during the various thread or yarn traverses. This results in the threads or yarns being tensioned to varying degrees in the woven material, which results in the product failing to meet the desired quality requirements. The invention aims to solve this problem and proposes an adjustment function for the size of the thread or yarn supply during an adjustment stage and/or continuously during manufacturing of the product in the machine in question. In this connection, in each adjustment case, the thread or yarn can be sensed during a pick and regulation of the thread or yarn tension can take place for the next pick etc.

[0005] There is also a need to be able to indicate thread or yarn discontinuity in a manner which is technically simple and preferably integrated into the components used. The invention also solves this problem.

[0006] There is also a requirement in this context that previously known components can be used and that machines which are already installed and set up can be provided with the new facility without excessive rebuilding. The invention also solves this problem.

The Solution

[0007] An arrangement according to the invention can be considered to be characterized mainly in that a) a load cell is arranged so as to sense the actual thread tension in the drawn-out thread or the drawn-out yarn and to supply to the regulator information for changing the size of the thread or yarn stock when the actual thread tension deviates from the assumed thread tension, and/or b) the load cell supplies pick-monitoring information by means of which the load cell provides information about thread or yarn discontinuity occurring on the thread or the yarn, about whether the gripping function of the projectile or shuttle is operating etc.

[0008] In embodiments of the invention, the information for changing the size of the thread or yarn stock brings about a reduction in the diameter of the thread or yarn supply of the regulator so that, in the event of the actual thread tension being lower than an assumed thread tension, the diameter of the thread or yarn supply/the regulator is reduced in order to increase the tension in the thread/the yarn during the next pick. It is also a feature of said embodiments that the information for changing the size of the thread or yarn stock brings about an increase in diameter in the thread supply of the regulator so that, in the event of the actual thread tension being higher than an assumed thread tension, the diameter of the thread or yarn supply/the regulator is increased in order to reduce the tension in the thread/the yarn during the following pick. The regulator receives said size-changing information as soon as the actual thread tension deviates from the assumed thread tension or the latest thread tension read by the load cell. The regulator and the load cell or the load cells can be arranged in a weaving machine for flat-woven wire. A shuttle or projectile is arranged so as to perform the drawing out of the thread from the thread supply of the regulator. The load cell can be arranged at the exit of the regulator for thread or yarn delivery. Each load cell can be connected to the control unit of the machine/weaving machine, which senses the information signal of the load cell and supplies a control signal depending on the sensing to the regulator. The load cell can also provide a thread-monitoring information signal to stop circuits in the machine (and/or, if appropriate, the regulator) in the event of discontinuity occurring in the thread/the yarn.

Advantages

[0009] As a result of the proposals made above, uniform thread or yarn lengths with the same thread tensions are obtained in the various draw-out threads or draw-out yarns in the material manufactured irrespective of the mechanical circumstances or conditions prevailing during manufacture of the material or product, for example the weaving. Load cells well-known per se can be used together with existing regulators, which guarantees reliable and financially advan-
tageous operation. A simple pick-monitoring arrangement can in this connection also be obtained in the machine in question (regulator).

DESCRIPTION OF THE FIGURES

[0010] A for the present proposed arrangement which has the characteristics significant of the invention will be described below with simultaneous reference to the appended drawings, in which

[0011] FIG. 1 shows a diagrammatic side view of the drawing-out of a thread from a regulator performed by a shuttle or projectile,

[0012] FIG. 2 shows a diagrammatic end view of a regulator with a thread or yarn supply obtained from a thread or yarn magazine and a thread or a yarn running out, which is sensed by a load cell which controls the diameter of the regulator and thus the size of the thread or yarn supply, and

[0013] FIG. 3 shows in perspective at an angle from above the regulator according to FIG. 2 arranged in a textile machine which is shown diagrammatically and can consist of a weaving machine.

DETAILED EMBODIMENT

[0014] In FIG. 1, reference number 1 designates a draw-out thread which has been drawn out with an assumed or previously adjusted thread tension, that is to say a desired value. The thread length of the thread 1 is indicated by L. A regulator arrangement is shown by 2. Control equipment 3 is also included. A regulator forming part of the arrangement is shown by 4 and a diagrammatically represented thread magazine by 5. Incoming thread or yarn for the regulator is indicated by 6. The outgoing thread or yarn portion is shown by 6a and a load cell arrangement is shown by 7. The regulator arrangement can comprise a means 8 which is controlled by the equipment 3 and, depending on controls from the equipment 3, changes the size of the yarn supply of the regulator. The regulator is of the type which works with a constant number of coils of thread or yarn. The size of the supply is therefore varied by changing a diameter D. The portion is drawn out by a shuttle or projectile 9. According to the invention, the actual thread tension is sensed and the quantity of thread or yarn supplied is changed depending on the sensing so that the thread or yarn tensions are changed so as to be the same in the various instances of drawing-out.

[0015] FIG. 2 shows that the regulator is of the type which can vary its diameter for the thread or yarn supply in question. In FIG. 2, a first line indicates the contour which gives a first diameter D. Depending on controls, this diameter can be changed to D' which is indicated by a broken circular line. FIG. 2 also shows diagrammatically the thread or yarn magazine from which the regulator obtains thread or yarn for accumulating in its temporary thread or yarn supply which is represented by a number of thread or yarn coils on the regulator. It is clear that if the regulator works with a thread or yarn supply which is to be contained within a predetermined number of coils, the thread or yarn supply is changed in the event of the diameter of the regulator changing, for example from diameter D to diameter D'.

[0016] In one embodiment, the tension in the thread is sensed during a first pick, adjustment of the tension in the thread or the yarn then taking place in one or more following pick(s).

[0017] In FIG. 3, the thread or yarn supply of the regulator 4 is represented by a predetermined number of thread or yarn coils 4a, 4b, 4c and 4d. As above, the size of the thread or yarn supply is changed by changing the diameter of the regulator or the coils, the number of coils always being the same in the various traverses. The draw-out thread 6a is drawn out by the projectile or the shuttle 9 of a type known per se, which projectile or shuttle moves in the direction of the arrows 10. The weaving machine is symbolized by 11. The traverse of the projectile or the shuttle takes place from the first side 11a of the weaving machine to its second side 11b or vice versa. The weaving machine is also represented by a number of warp threads 12, a heald shaft arrangement 13 and a reed arrangement 14. As far as the principle and the construction are concerned, the weaving machine can be of a type known per se, and reference is made to, inter alia, the TM 300 and TM 400 weaving machines sold on the general market by TEXO AB, Sweden. Also shown in FIG. 3 is a control unit 15 of a type known per se, which controls the functions in the machine 11, which control is indicated by arrows 16. The load cell 7 can be connected to the control unit 15 which senses the sensed control information 1 from the load cell and, depending on this sensing, sends a control signal 12 to the means or the unit 8, which latter information is dependent upon the first sensed information.

[0018] By way of alternative or complement, one or more load cells 7 can be used as a pick monitor, each load cell sensing whether a draw-out thread or a draw-out yarn is being produced or is making a traverse at all, that is to say whether there is a fault in the drawing-out or the transfer function in the machine. Such faults may be thread or yarn discontinuity, faults in the gripping function of the shuttle or the projectile etc. The signal 11 may therefore consist of pick-monitoring information which is received in the control unit 15 which, depending on the information received, sends a stop signal information to the machine (cf. number 16 in FIG. 3) and/or information to the alarm panel of the machine and/or information (for example stop information) to the regulator etc.
[0019] The invention is not limited to the embodiments shown above by way of example but can be modified within the scope of the patent claims below.

1. Arrangement for a regulator (4) which works with a thread or yarn supply (4a, 4b, 4c and 4d) which is intended to provide a draw-out length (L) of the thread which is dependent on the one hand on the size of the supply and on the other hand on an assumed thread or yarn tension (that is to say a desired value) in the draw-out thread (6a), characterized by one or both of the following alternatives:

a) a load cell (7) is arranged so as to sense the actual thread tension in the drawn-out thread (6a) and to supply to the regulator (4) information (II) for changing the size of the thread stock when the actual thread tension deviates from the assumed or adjusted thread tension, that is to say the desired tension value,

b) the load cell is arranged so as to supply pick-monitoring information by means of which the load cell indicates that there is a fault or discontinuity on the thread or the yarn and/or that the gripping function is not operating etc.

2. Arrangement according to Patent claim 1, characterized in that the information (II) for changing the size of the thread or yarn stock brings about a reduction in the diameter (D) of the thread or yarn supply of the regulator so that, in the event of the actual thread tension being lower than the assumed or adjusted thread tension (the desired value), the diameter of the thread or yarn supply/the regulator is reduced.

3. Arrangement according to Patent claim 1 or 2, characterized in that the information (II) for changing the size of the thread stock brings about an increase in diameter in the thread or yarn supply (4a, 4b, 4c and 4d) of the regulator so that, in the event of the actual thread tension being higher than the assumed or adjusted thread tension, the diameter of the thread or yarn supply/the regulator is increased.

4. Arrangement according to Patent claim 1, 2 or 3, characterized in that the regulator receives said size-changing information (II) when the actual thread tension deviates from the assumed thread tension or the latest thread tension read by the load cell.

5. Arrangement according to any one of Patent claims 1-4, characterized in that the regulator and the load cell (7) are included in a machine for weaving flat-woven wire.

6. Arrangement according to Patent claim 5, characterized in that a shuttle or projectile (9) is arranged so as to perform the drawing out of the thread (6a) from the thread supply (4a, 4b, 4c and 4d) of the regulator.

7. Arrangement according to any one of the preceding patent claims, characterized in that the load cell (7) is arranged at the exit of the regulator for thread or yarn delivery.

8. Arrangement according to any one of the preceding patent claims, characterized in that each load cell is connected to the control unit (15) of the machine, which senses the information signal (II) of the load cell and supplies a control signal (2) depending on the sensing to the supply-adjusting means of the regulator.

9. Arrangement according to Patent claim 1, characterized in that the pick-monitoring information brings about a signal to the stop circuits of the machine or the regulator and/or to the alarm panel in the machine.

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