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(12) # EUROPEAN PATENT SPECIFICATION

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(54) **Compensator device for the bobbin-winding carriage in textile machines.**

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Description

This invention concerns a compensator device for the carriage that winds bobbins in textile machines with one or more bobbins, said device being suitable for enabling the sliver leaving a drawing frame or derived machine to be taken up.

The main object of the invention is to provide a compensator device able to convey, and maintain a constant length of the sliver between the exit of the drawing frame or derived machine and the intake of the sliver itself by the revolving funnel of the traversing carriage that winds bobbins.

It is known that the movement of the sliver from the calender of the drawing frame to the bobbin has to take place with the fibres kept as condensed as possible so that self-regulation between the fibres does not permit false drafting to occur in the tract of sliver which runs in the compensator, for said tract of sliver has of necessity to undergo the take-up tension necessary for the formation of a compact yarn package.

It is also known that as the position of the delivery of the sliver from the drawing group stays unmoved and corresponds to about the centre line of the spindle, the path of the sliver between said delivery position and the spindle will vary continuously in length, unless suitable devices are present, and the sliver will therefore undergo repeated stretching when it coincides with the ends of the bobbin, and repeated slackening when it coincides with the middle of the bobbin.

Such repeated actions are enhanced by the fact that due to the constructional requirements of the machine the length of the path followed by the sliver between the delivery calenders and the take-up spindle tends to be kept as short as possible.

The repeated slackening and stretching are very harmful for the sliver owing to its low strength and consistency.

Devices have been made to eliminate said unwanted stretching and slackening and to guide the sliver along an obligatory path of an always constant length.

Said known devices obtain this result with articulated joint elements, pulley elements or other like elements.

Our invention fulfils its purpose of guiding the sliver along an obligatory path of an always constant length with a compensator device of flexible nature which is of simpler and more solid construction than the known devices and which also enables the length of the path between the delivery point and the take-up spindle to be kept as short as possible.

The present invention relates to a compensator device known from BE—A—659089 and consisting of a sliver flexible support arranged in a bow-shape and flexibly anchored at one end to the exit of the drawing frame delivery calender and at its other end to the bobbin-winding carriage transversing along the yarn bobbin being formed, along which flexible support the sliver is constrained to run at a constant arc length.

According to the invention, the compensator device consists essentially of a spring wire wound in coils with a spiral having its diameter and coil pitch differentiated in at least three different tracts, whereby the compensator is anchored at one end to the exit of the drawing frame calender and at its other end to the bobbin-winding carriage transversing along the yarn package being formed and whereby the sliver runs inside said coils.

According to one aspect of this embodiment the spirals of the first and last tracts have greater coil pitch and smaller diameter as compared to the middle tract and have the task of guiding the sliver and the additional task of imparting a false twist to it at the same time.

According to yet another aspect of this embodiment, one of the spirals or both the spirals of the first and last tracts impart to the sliver a false twist which runs in the reverse direction in respect of the feed of the sliver itself.

As it may consist of steel wire, the compensator device of this embodiment has the low inertia needed to resist the fatigue stress generated by its alternating movement in winding the yarn package.

An advantage provided by the compensator device of this embodiment lies in the fact that its low inertia facilitates the rapid alternating movement of the bobbin-winding carriage.

According to this embodiment the inlet of the compensator device is secured to the drawing frame or like machine with appendages which are clamped downstream from the calender and the outlet of the compensator device is secured to the bobbin-winding carriage with an appendage of the sliver exit guide.

To be more exact, the inlet consists of two closed coils which have the task of giving necessary elasticity for the alternating movement of the compensator device, which swings and pivots on said coils in the vertical and horizontal planes.

The actual length of the compensator device does not vary with the variation of the position of the bobbin-winding carriage and therefore the length of the sliver running within the compensator device remains strictly constant, thus leading to perfect compensation.

Hereinafter we shall describe a preferential embodiment of the invention as a non-restrictive example, with the help of the drawings wherein:

Fig. 1 shows a front view of a textile machine comprising a compensator device according to a preferred embodiment;

Fig. 2 shows a side view of the machine shown in Fig. 1;

Fig. 3 shows the compensator device according to the preferred embodiment;

Fig. 3a shows the inlet head of the compensator device of Fig. 3 and the relative anchorage means;

Fig. 3b shows the outlet end of the compensator device of Fig. 3 and the relative anchorage means;

Fig. 4 gives a three-dimensional view of the application of the device of the invention to a bobbin-winding carriage feeding two bobbins.

Figs. 1 to 4 show a compensator device 110 consisting of a sliver flexible support 120 which

has an inlet head 11 secured with a support 122 to the machine or drawing frame 12 substantially at the exit of the calender 14, and an outlet end 13 secured to the inlet of a revolving funnel 17 borne by the bobbin-winding carriage 18 moving with an alternating movement on the guide 19 located along the bobbin 15 supported by the spindle 16 of the take-up group and fed with the sliver 112 coming from the drawing frame or machine 12.

The sliver flexible support 120 of this embodiment consists of spring wire wound in coils with a plurality of tracts of spirals having differentiated diameters and coil pitches.

In this specific example the flexible support 120 consists essentially of spring steel wire wound in coils and stretching from the drawing frame 12 to the bobbin-winding carriage 18; said wire has a first tract 210 with coils spaced widely apart, a middle tract 310 acting as an elbow and having coils close together and with a larger diameter than the first tract 210, and a last tract 410 with coils spaced widely apart and a smaller diameter than the middle tract 310.

Anchorage means 30 and 31 respectively are envisaged at each end of the coiled wire and have the task of securing the inlet head 11 to the support 122 of the drawing frame 12 and the outlet end 13 to the bobbin-winding carriage 18.

Said anchorage means 30, 31 are solidly fixed to the relative end portions 11, 13 of the coiled wire, and said end portions 11, 13 respectively consist advantageously of a number of coils acting as an articulated joint and as a sliver guide at the inlet and outlet of the wire.

To be exact, the end portion at the inlet 11 consists of two closed coils side by side 201 which have the task of providing the necessary elasticity for the alternating movement of the compensator device 110, which swings and pivots on the end coils 201 in the vertical and horizontal planes, whereby said two closed coils 201 are provided with appendages 130 that constitute the anchorage means 30 of Fig. 3a clamped to the support 122 of the drawing frame 12.

The outlet end portion 13 consists likewise of a closed coil 211 having an appendage 131 which constitutes the anchorage means and cooperates with a joint 132 mounted on ball bearings located on the bobbin-winding carriage 18.

According to this embodiment the coils of the first tract 210 and/or last tract 410 can advantageously but not necessarily be wound in opposite directions such as to impart to the sliver 112 in the first tract a false twist that runs in the reverse direction in respect of the feed of the sliver 122 itself and to take away same in the last tract 410.

Fig. 4 shows a machine to which are fitted two compensator devices 110, according to the preferred embodiment, each of which serves a winding station located at the side of the machine.

We have described here a preferential embodiment of the invention but other variants of this embodiment are possible; the wire may consist of another suitable metal; it is possible to conform and fit the anchorage elements 30 and 31 differently without departing thereby from the scope of the invention.

Claims

1. A compensator device (110) consisting of a sliver flexible support (120) arranged in a bow-shape and flexibly anchored at one end (11) to the exit of the drawing frame (12) delivery calender (14) and at its other end (13) to the bobbin-winding carriage (18) transversing along the yarn bobbin (15) being formed, along which flexible support (120) the sliver (122) is constrained to run at a constant arc length, and which has a curvature varying with the variation in the linear distance between its two ends (11, 13) and able to compensate for the variation in distance between the delivery point of the sliver from the calender (14) and the point where said sliver is caused to be deposited on the bobbin (15) owing to the movement of the carriage (18), said flexible support (120) consisting of a spring wire wound in coils, characterized by the fact that said coiled wire has a spiral having a diameter and coil pitch differentiated in a plurality of distinct tracts (210, 310, 410).

2. A compensator device (110) as claimed in claim 1, characterized by the fact that coiled wire is wound in at least three distinct tracts (210, 310, 410), whereby the spiral of at least one tract has a diameter and pitch different from the other tracts.

3. A compensator device (110) as claimed in claim 1 and 2, characterized by the fact that the intermediate tract (310) has a spiral with a larger diameter and a smaller pitch in comparison to the diameter and pitch of the other tracts (210, 410).

4. A compensator device (110) as claimed in any preceding claim, characterized by the fact that the coiled wire end portion (11) at the inlet of the compensator consists of at least two closed coils (201) solidly fixed to anchorage means (30) consisting of two appendages (130) clamped to the support (122) of the drawing frame (12).

5. A compensator device (110) as claimed in any preceding claim, characterized by the fact that the coiled wire end portion (13) at the outlet of the compensator consists of a closed coil (211) solidly fixed to anchorage means (31) consisting of an appendage (131) rotatingly secured to the carriage (18).

Patentansprüche

1. Kompensationsvorrichtung (10—110), die aus einer bogenförmigen Dämpfungshalterung (110) für das Band besteht, das ein Ende (11) am Ausgang der Kalander (14) der Streckmaschine (12) biegsam verankert und das andere Ende (13) am Wickelmaschine-wagen (18) verankert hat, der entlang die sich bildende Spule (15) schwingt, wobei das Band (112) gezwungen wird, auf die genannte Dämpfungshalterung (120) zu laufen, die mit einer konstanten Bogenlänge schwingt und die eine mit der Änderung des linearen

Abstands zwischen seinen beiden Enden (11—13) veränderliche Krümmung aufweist, wobei die genannte Vorrichtung dazu geeignet ist, die Änderung im Abstand zwischen dem Ausgangspunkt des Bandes aus den Kalendern (14) und seinem Ablagerungspunkt auf der Spule (15) für die Bewegung des Wagens (18) auszugleichen, wobei die genannte Dämpfungshalterung (110) aus einem spiralförmig aufgewickelten Federdraht besteht, dadurch gekennzeichnet, daß der genannte aufgewickelte Draht eine Spirale aufweist, die Durchmesser und Schraubenlinie mit in einer Mehrzahl verschiedener Abschnitte (210—310—410) differenzierten Steigungen hat.

2. Kompensationsvorrichtung (110) nach Anspruch 1, dadurch gekennzeichnet, daß der aufgewickelte Draht eine Spirale mit mindestens drei verschiedenen Abschnitten (210, 310, 410) aufweist, wobei die Spirale mindestens eines Abschnitts einen Durchmesser und Schraublinie mit von anderen Abschnitten verschiedenen Steigungen hat.

3. Kompensationsvorrichtung (110) nach Anspruch 1 und 2, dadurch gekennzeichnet, daß der Zwischenabschnitt (310) eine Spirale aufweist, die einen größeren Durchmesser und eine Schraublinie mit kleinerer Steigung als den Durchmesser und der Steigung der Schraublinie der anderen Abschnitte (210, 410) hat.

4. Kompensationsvorrichtung (110) nach den vorangehenden Ansprüchen, dadurch gekennzeichnet, daß am Eingang des Kompensators der Endteil (11) des aufgewickelten Drahtes mindestens zwei geschlossene Windungen (201) aus einem Stück mit Verankerungsmitteln (30) aufweist, die aus zwei Endstücken (130) bestehen, die an der Halterung (122) der Streckmaschine befestigt sind.

5. Kompensationsvorrichtung (110) nach den vorangehenden Ansprüchen, dadurch gekennzeichnet, daß am Ausgang des Kompensators der Endteil (13) des aufgewickelten Drahtes eine geschlossene Windung (211) aufweist, die an Verankerungsmitteln (31) befestigt ist, die aus einem am Wagen (18) drehbar verankerten Endteil (131) bestehen.

Revendications

1. Dispositif compensateur (110) formé d'un support flexible de ruban (120) disposé en formé d'arc et ancré de façon flexible par une extrémité (11) à la sortie de la calandre fournisseuse (14) du banc d'étirage (12) et par son autre extrémité (13) au chariot d'enroulement de bobine (18) allant et venant le long de la bobine de fil (15) en formation, support flexible (120) le long duquel le ruban (112) est contraint de courir à une longueur d'arc constante et qui a une courbure variant avec la variation de la distance linéaire entre ses deux extrémités (11, 13) et capable de compenser la variation de distance entre le point d'amenée du ruban venant de la calandre (14) et le point où le ruban est amené à se déposer sur la bobine (15) par suite du mouvement du chariot (18), le support flexible (120) étant formé d'un fil de ressort enroulé en spires, caractérisé par le fait que le fil enroulé a une spirale ayant un diamètre et un pas de spires différenciés dans de multiples tronçons distincts (210, 310, 410).

2. Dispositif compensateur (110) selon la revendication 1, caractérisé par le fait que du fil enroulé est enroulé en au moins trois tronçons distincts (210, 310, 410), de sorte que la spirale d'au moins un tronçon a un diamètre et un pas différents des autres tronçons.

3. Dispositif compensateur selon les revendications 1 et 2, caractérisé par le fait que le tronçon intermédiaire (310) a une spirale d'un plus grand diamètre et d'un plus petit pas en comparaison du diamètre et du pas des autres tronçons (210, 410).

4. Dispositif compensateur (110) selon l'une quelconque des revendications précédentes, caractérisé par le fait que la partie terminale (11) du fil enroulé à l'entrée du compensateur, est formé d'au moins deux spires fermées (201) fixées solidement à des moyens d'ancrage (30) formés de deux accessoires (130) bloqués sur le support (122) du banc d'étirage.

5. Dispositif compensateur (110) selon la revendication précédente, caractérisé par le fait que la partie terminale (13) du fil enroulé, à la sortie du compensateur, est formée d'une spire fermée (211) fixée solidement à des moyens d'ancrage (31) formés d'un accessoire (131) fixé de façon rotative au chariot (18).

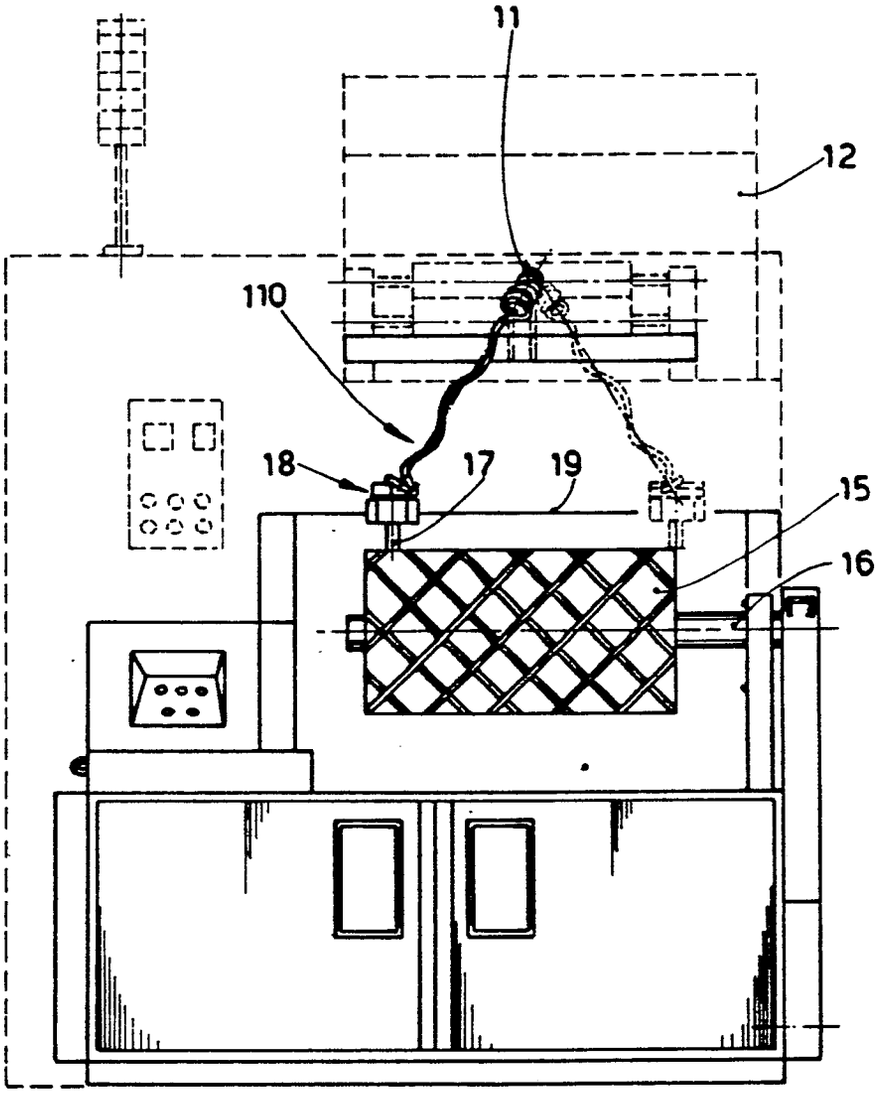

fig. 1

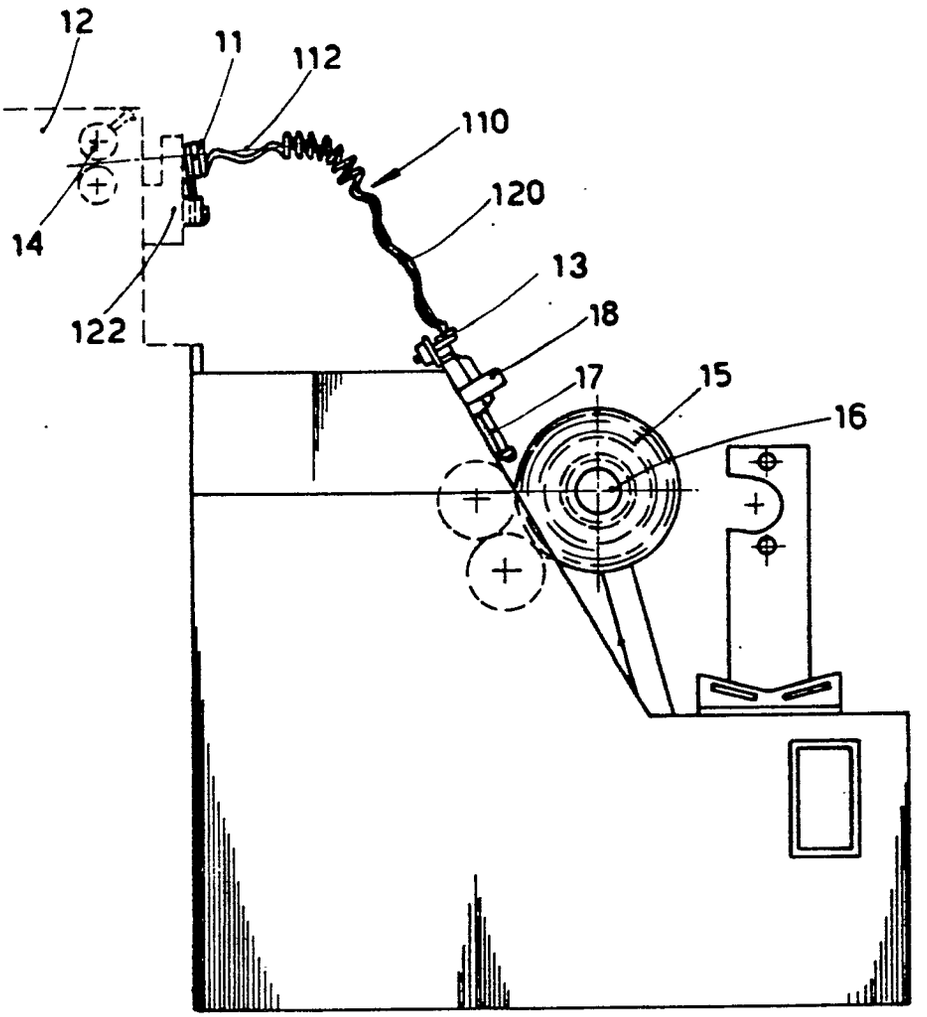

fig. 2

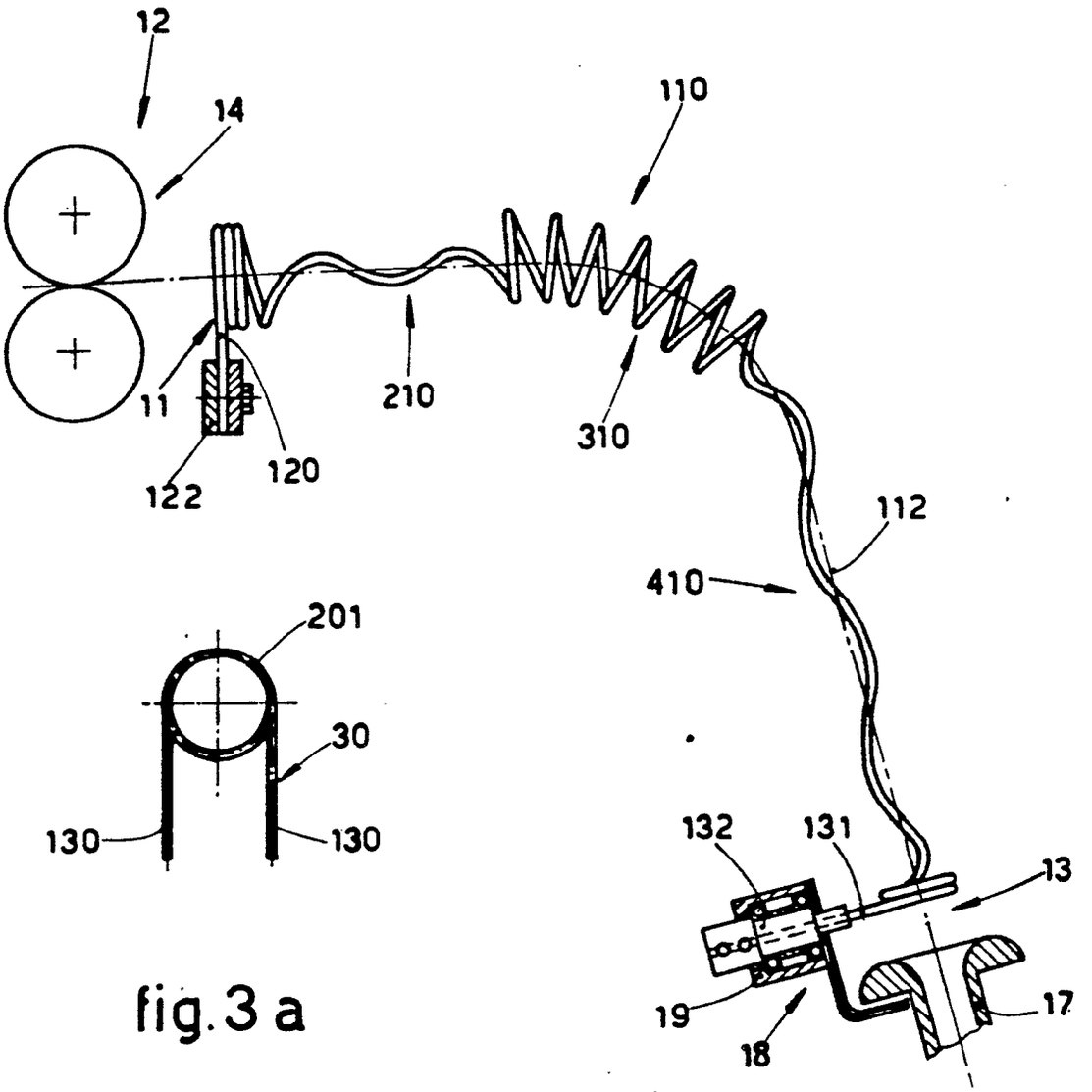

fig. 3

fig. 3 a

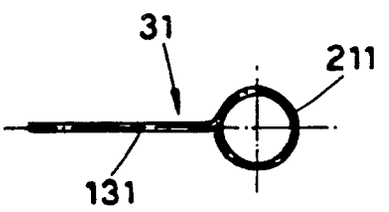

fig. 3 b

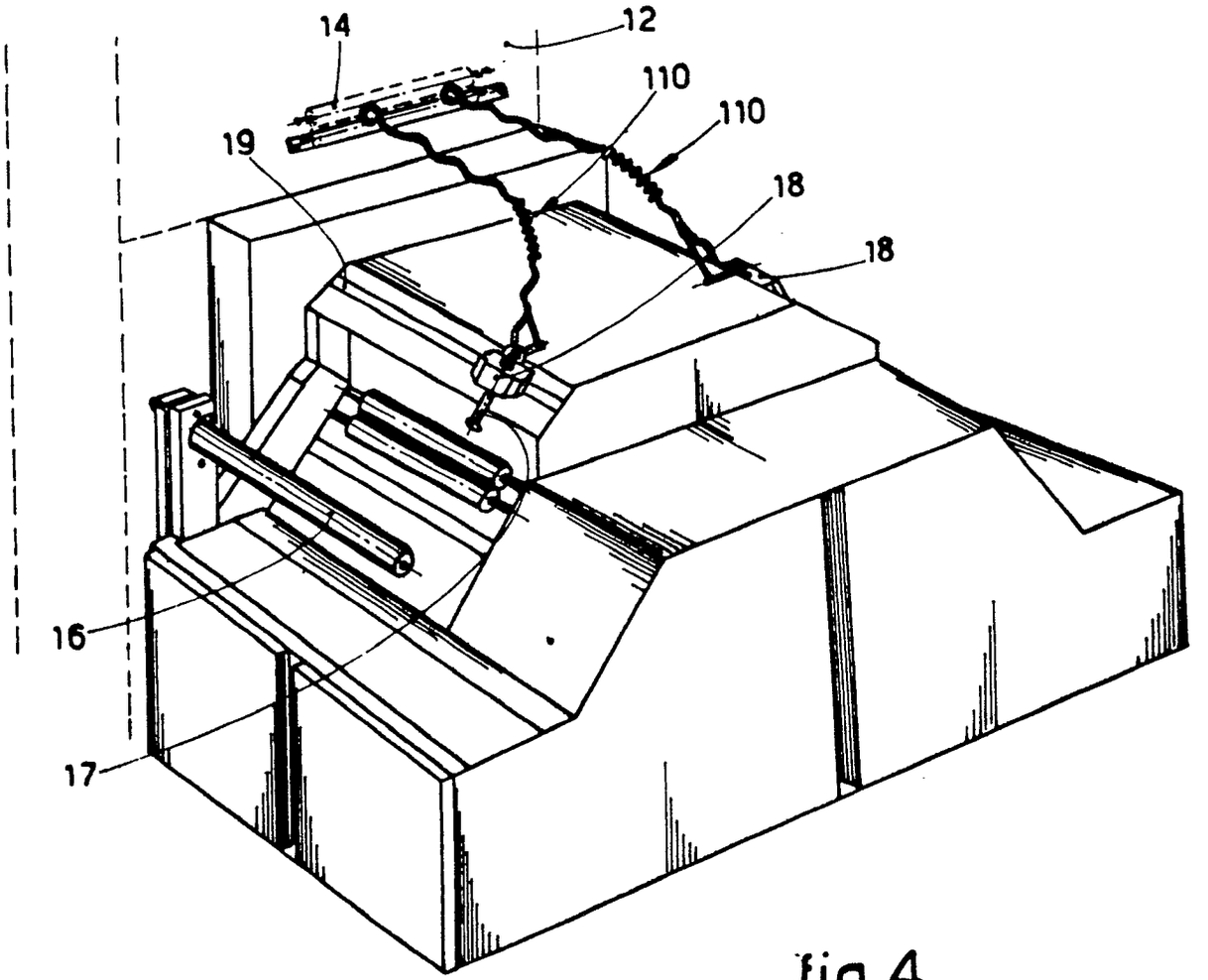

fig.4