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(54) **Device for actuating the gripper supporting tape for inserting weft thread in fabric-making machines**

Vorrichtung für das Antreiben eines Greiferbandes zum Eintragen eines Schussfadens in Webmaschinen

Dispositif d'actionnement de la bande de support de pince pour l'insertion de fil de trame dans des machines à tisser

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Description

[0001] The present invention relates to a device for actuating the gripper supporting tape for inserting weft thread in fabric-making machines. More particularly, the invention relates to a device for actuating the gripper supporting tape for inserting weft thread in shuttle-less looms, for making fabrics of any kind for various uses.

[0002] As is known, in looms for making fabrics, for example metallic fabrics, there is a gripper which has a hook for engaging the weft thread. The gripper is moved with a reciprocating rectilinear motion synchronously with the beater of the loom and inserts the weft thread between the warp threads arranged on mutually parallel planes, so as to weave the fabric.

[0003] During the outgoing stroke, the gripper passes through the warp pitch up to its left end, where it engages the weft thread with its hook, and then, during the return stroke, it passes through the warp pitch, inserting the weft thread between the warp threads, thus weaving a portion of fabric.

[0004] Italian patent no. 1274294 by the same Applicant discloses an apparatus for actuating and controlling automatically the gripper supporting tape for inserting the weft thread in fabric-making machines.

[0005] In this patent, the tape winds around a guide, which is constituted by a first straight portion, an arc-like portion, and a second straight portion arranged opposite the first straight portion. The movement of the tape is a back-and-forth movement along the guide. A servomotor is supported at the straight upper portion of the guide, at the end of the curved portion.

[0006] A sprocket is keyed to the servomotor and transmits the motion of the servomotor to the flexible tape along the guide, such tape supporting the gripper for inserting the weft thread between the warp threads.

[0007] Programming and control means allow to set and control the stroke of the flexible tape.

[0008] Although the solution described above is effective, it suffers some drawbacks.

[0009] First of all, the flexible tape generates considerable friction along the guide and in particular at the curved portion thereof.

[0010] Therefore, the tape must be extremely flexible so that it can slide along the guide without particular difficulty by way of the actuation of the sole servomotor.

[0011] Since the tape used to support the gripper is of the flexible type, it is necessary to provide guiding hooks, which are fixed on the frame, are arranged between the warp threads, and allow to create a sort of guiding path for the flexible tape in order to allow a perfectly rectilinear movement thereof.

[0012] The presence of the guiding hooks, however, can cause damage to the fabric, since such hooks are arranged, as mentioned, between the warp threads.

[0013] The aim of the present invention is to provide a device for actuating the gripper supporting tape for fabric-making machines which allows to minimize the friction

between the tape and the guide along which the tape slides.

[0014] Within this aim, an object of the present invention is to provide a device for actuating the gripper supporting tape which allows to use an extremely rigid tape with increased dimensions, which is accordingly much more stable than conventional types of tapes.

[0015] Another object of the present invention is to provide a device for actuating the gripper supporting tape which allows to process very delicate fabrics at twice the current speeds.

[0016] Another object of the present invention is to provide a device for actuating the gripper supporting tape which allows to eliminate the presence of tape guiding hooks arranged on the weaving loom.

[0017] Another object of the present invention is to provide a device for actuating the gripper supporting tape which is highly reliable, relatively simple to manufacture, and at competitive costs.

[0018] This aim and these and other objects, which will become better apparent hereinafter, are achieved by a device as defined in claim 1.

[0019] Further characteristics and advantages of the invention will become better apparent from the description of a preferred but not exclusive embodiment of the actuation device according to the present invention, illustrated by way of non-limiting example in the accompanying drawings, wherein the only figure is a perspective view of the device for actuating the gripper supporting tape according to the present invention, with the weaving loom not shown since it is of a known type.

[0020] With reference to the figure, the device for actuating the gripper supporting tape according to the invention, generally designated by the reference numeral 1, comprises a tape movement guide, which is composed of a first straight portion 2, which is connected to an arc-like circular portion 4, which in turn is connected to a second lower straight portion 10, which lies opposite the first straight portion. The guide is connected to a weaving loom, which is not shown.

[0021] Supporting posts are further provided, in a known manner, which are adapted to support the first 2, and second 10, straight portions.

[0022] A supporting column 9 is provided at the upper and lower ends of the circular portion 4 of the guide, where the circular portion connects to the upper and lower straight portions.

[0023] In the upper region, at the column 9, there is, at the region that connects one another the first straight portion 2 and the circular portion 4, a first servomotor 5, on which first drive means are keyed; said first drive means are advantageously constituted, for example, by a sprocket 7, which transmits the motion to the gripper supporting tape, which is not shown.

[0024] The peculiarity of the invention consists in that it provides a second servomotor 6, which is arranged diametrically opposite the first servomotor 5 and therefore at the lower region of the column 9, proximate to the

connection between the lower straight portion 10 of the tape guide and the circular portion 4.

[0025] Such second servomotor supports, like the first servomotor 5, second drive means, which are constituted by a sprocket 8 keyed to its driving shaft.

[0026] The two sprockets 7 and 8, therefore, lie diametrically opposite along the column 9.

[0027] Because of the presence of the second servomotor 6, the tape can be extremely rigid, since the friction that occurs along the guide due to the contact of the tape with said guide is reduced considerably thanks to the presence of the second servomotor 6, which acts in step with the first servomotor 5, contributing to the actuation of the tape.

[0028] Therefore, the tape can be made of extremely rigid material, for example carbon, with increased dimensions and accordingly is much more stable during the operation of the weaving loom.

[0029] In view of the inherent stability of the gripper supporting tape, it is no longer necessary to provide tape guiding hooks arranged along the loom, between the warp threads, with the advantage of avoiding damage which can occur to the fabric being woven.

[0030] Moreover, the presence of a double servomotor allows to increase the performance, since the load remains the same and the power is doubled with an equal inertia in the motor.

[0031] The device according to the invention allows to process very delicate fabrics, thanks to the absence of the guiding hooks, at twice the current speed.

[0032] In practice it has been found that the device according to the invention fully achieves the intended aim and objects, since it allows to use an extremely rigid tape, reducing its friction with the guide and at the same time eliminating the guiding hooks that are conventionally present on the weaving loom.

[0033] The device thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the appended claims.

[0034] In practice, the materials used, as well as the contingent shapes and dimensions, may be any according to requirements and to the state of the art.

[0035] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A device for actuating the gripper supporting tape for a weaving machine for inserting the weft thread among the warp threads, comprising a guide for said gripper supporting tape, said guide being composed of a first straight portion (2) which is connected to a

semicircular portion (4) which in turn is connected to a second straight portion (10), a first servomotor (5), which is connected at said first straight portion (2) and is provided with first drive means (7) in order to transmit movement to said gripper supporting tape, **characterized in that** it comprises a second servomotor (6), which is arranged diametrically opposite with respect to said first servomotor (5), at the second straight portion (10), and second drive means (8), which are keyed to said second servomotor (6) which acts in step with said first servomotor (5), contributing to the actuation of said gripper supporting tape, and **in that** said first and second servomotors (5,6) are arranged at opposite ends of a column (9) for supporting said first and second straight portions (2,10) of the guide of the gripper supporting tape.

2. The device according to claim 1, **characterized in that** said first and second drive means (7,8) comprise sprockets which are keyed to said first and second servomotors (5,6) respectively.
3. The device according to one or more of the preceding claims, **characterized in that** it comprises supporting posts, which are adapted to support said first and second straight portions (2,10) of said guide.
4. The device according to one or more of the preceding claims, **characterized in that** said gripper supporting tape is made of rigid material.

Patentansprüche

1. Vorrichtung zum Betätigen des Greiferunterstützungsbandes für eine Webmaschine zum Einbringen des Schussfadens zwischen die Kettfäden, mit einer Führung für das Greiferunterstützungsband, wobei die Führung gebildet ist aus einem ersten geradlinigen Abschnitt (2), der mit einem halbkreisförmigen Abschnitt (4) verbunden ist, der seinerseits mit einem zweiten geradlinigen Abschnitt (10) verbunden ist, und mit einem ersten Servomotor (5), der mit dem ersten geradlinigen Abschnitt (2) verbunden ist und mit ersten Antriebsmitteln (7) versehen ist, um die Bewegung an das Greiferunterstützungsband zu übertragen, **dadurch gekennzeichnet, dass** sie einen zweiten Servomotor (6), der diametral gegenüber dem ersten Servomotor (5) bei dem zweiten geradlinigen Abschnitt (10) angeordnet ist, und zweite Antriebsmittel (8), die mit dem zweiten Servomotor (6) verkeilt sind und im selben Takt wie der erste Servomotor (5) arbeiten und zu der Betätigung des Greiferunterstützungsbandes beitragen, umfasst und dass der erste und der zweite Servomotor (5, 6) an gegenüberliegenden Enden einer Säule (9) für die Unterstützung des ersten und des zweiten geradlinigen Abschnitts (2, 10) der Führung

des Greiferunterstützungsbandes angeordnet sind.

2. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** die ersten und die zweiten Antriebsmittel (7, 8) Kettenräder umfassen, die mit dem ersten bzw. dem zweiten Servomotor (5, 6) verkeilt sind.

3. Vorrichtung nach einem oder mehreren der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** sie Unterstützungsposten umfasst, die dazu ausgelegt sind, den ersten und den zweiten geradlinigen Abschnitt (2, 10) der Führung zu unterstützen.

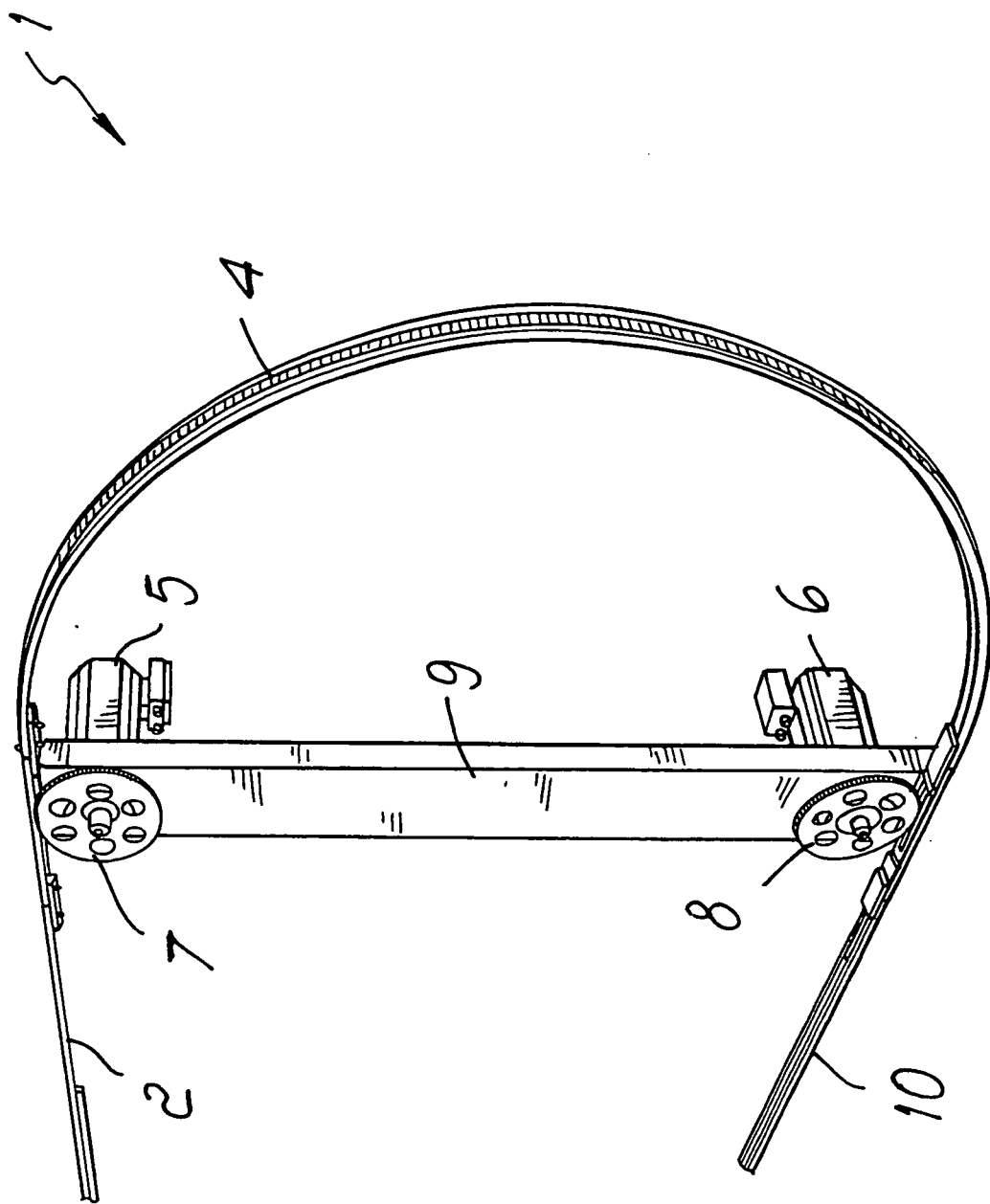
4. Vorrichtung nach einem oder mehreren der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** das Greiferunterstützungsband aus einem starren Material hergestellt ist.

dudit guide.

4. Dispositif selon une ou plusieurs des revendications précédentes, **caractérisé en ce que** ladite bande de support de pince est réalisée en un matériau rigide.

Revendications

1. Dispositif pour actionner la bande de support de pince pour une machine à tisser afin d'insérer le fil de trame parmi les fils de chaîne, comprenant un guide pour ladite bande de support de pince, ledit guide étant composé d'une première partie droite (2) qui est raccordée à une partie semi-circulaire (4) qui est raccordée à son tour à une seconde partie droite (10), un premier servomoteur (5), qui est raccordé à ladite première partie droite (2) et est doté de premiers moyens d'entraînement (7) afin de transmettre le mouvement à ladite bande de support de pince, **caractérisé en ce qu'il** comprend un second servomoteur (6), qui est agencé de manière diamétralement opposée par rapport audit premier servomoteur (5), sur la seconde partie droite (10) et des seconds moyens d'entraînement (8), qui sont clavetés sur ledit second servomoteur (6) qui agit par palier avec ledit premier servomoteur (5), contribuant à l'actionnement de ladite bande de support de pince, et **en ce que** les premier et second servomoteurs (5, 6) sont agencés aux extrémités opposées d'une colonne (9) pour supporter lesdites première et seconde parties droites (2, 10) du guide de la bande de support de pince.
2. Dispositif selon la revendication 1, **caractérisé en ce que** les premier et second moyens d'entraînement (7, 8) comprennent des pignons qui sont clavetés auxdits premier et second servomoteurs (5, 6) respectivement.
3. Dispositif selon une ou plusieurs des revendications précédentes, **caractérisé en ce qu'il** comprend des montants de support qui sont adaptés pour supporter lesdites première et seconde parties droites (2, 10)



REFERENCES CITED IN THE DESCRIPTION

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