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(54) **WEFT CUTTING DEVICE FOR LOOMS**

SCHUSSFADENSCHNEIDVORRICHTUNG FÜR WEBMASCHINEN

DISPOSITIF DE COUPE DE TRAME DESTINE A DES METIERS

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Description

[0001] The present invention relates to a weft cutting device for looms, and particularly to a device of this type allowing to cut the weft close to the edge of the fabric.

[0002] In the continuous process to improve the performances and yields of looms, particular importance is given to the elimination or, at least, the reduction of weft wastes due to the forming of split selvages. Said object can be reached by drawing the blades of the cutting device as close as possible to the edge of the fabric being formed, so as to avoid any subsequent operations to trim the weft tails forming the split selvage, and the consequent waste of the unused weft. Since the weft cutting operation is carried out in correspondence of the weft insertion zone, a first problem arises due to the fact that the blades of the device are likely to interfere with the structure of the reed during its beating up motion.

[0003] According to known technique, said problem has been solved by mounting the rotary supports for the two blades of the cutting device in such a way that their rotation axis is inclined in respect of the main axis of the loom; thus, during the rotary motion of the blades from the cutting position to the position of rest, such blades move away from the weft insertion zone both in a vertical direction and in the two horizontal directions, thereby avoiding any interference with the reed during its motion.

[0004] In a cutting device of this type - which satisfactorily solves the problem of cutting the weft close to the edge of the fabric - there is however the technical problem of obtaining the transmission of a rotary reciprocating motion between two mutually inclined axes and, precisely, between a main axis of the loom (or, likewise, an axis derived from the main one and parallel thereto) and the inclined axis according to which the cutting blades are mounted. Said transmission should moreover be realized with great precision and with members of small dimensions.

[0005] According to known technique, this result is reached by using a pair of link rods (one for each blade-support of the cutting device) hinged in correspondence of the two inclined axes by way of ball joints. Said technical solution is not however free from drawbacks. To start with, it involves fairly high costs due to the presence of the ball joints; it requires constant maintenance to lubricate said joints; and, finally, it does not allow in the long run to keep a high and constant degree of precision, seen that, on increasing of the slacks into the ball joints, due to wear, there is no longer a perfect correspondence between the theoretical motion of the blades (reckoned with no slacks into the ball joints) and the real motion thereof.

[0006] The object of the present invention is to overcome these drawbacks by supplying a weft, cutting device of the type described heretofore, in which the motion transmission between the above said two mutually inclined axes is realized with an economic device, which

requires no maintenance and which is apt to perfectly keep through time a high degree of precision of said motion.

[0007] According to the invention, said object is reached with a weft cutting device for looms according to claim 1.

[0008] The invention will now be described in more detail, with reference to preferred embodiments thereof, illustrated on the accompanying drawings, in which:

Fig. 1 is a front view of the weft cutting device according to the invention; and

Fig. 2 is a plan view of the same device.

[0009] The drawings, as well as the device of the present invention, also illustrate some essential parts of the loom cooperating with said device, and precisely: the reed P (in the two positions: of beating up P1, and of weft insertion P2), the warp yarns O, the weft yarns W, and the loom frame U. The weft cutting device of the present invention then comprises, in known manner, a support S onto which is hinged a control shaft A, caused to move by the main transmission of the loom through the gearwheel R keyed thereon. A pair of cams C (only one of them being shown in fig. 1) is keyed onto the opposite end of the shaft A, said cams controlling, during their rotation, two cam-followers D shaped as rocking levers and pivoted, with a central eyelet thereof, onto a working axis B. An end of the cam-followers D carries an idle roller which is kept constantly in contact with the profile of a corresponding cam C, thanks to spring means M acting onto the other end of the rocking lever forming the cam-follower D. The shape of the cams C is such that the motion imparted on the cam-followers D corresponds exactly to the movement one wishes to impart on the rotating supports F1, F2 of the cutting blades T1, T2.

[0010] Due to the reasons explained above, said supports F1, F2 for the cutting blades T1, T2 rotate about an inclined axis, which in the embodiment shown on the drawings is the axis of the inclined shaft G, onto which are coaxially mounted the cylindrical hollow shafts F1 and F2 forming the supports for the cutting blades T1 and T2 respectively. In prior art, the movement of the cam-followers D is imparted onto the shafts F by way of two link rods connected to the rotating parts through ball joints, and giving rise to the drawbacks mentioned heretofore.

[0011] According to the present invention, on the peripheral and upper part of the cam-followers D and of the hollow shafts F there are welded screw clamps 1, into which are housed the ends of thin rods 2. By tightening the clamps 1, the rods 2 are blocked in respect of the cam-followers D and of the hollow shafts F, thereby rigidly connecting said cam-followers to said shafts, while allowing however the motion to be conveyed from the first ones to the second ones. In fact, on account of their reduced cross section, the rods 2 do not offer too

much resistance to lateral efforts and are thus apt to undergo a moderate deformation, without losing their axial stiffness, thereby taking up a "twisted" configuration in the planes YZ and XY, i.e. the planes shown respectively in Fig. 1 and Fig. 2, which will necessarily be determined during rotation of the cam-followers D and of the shafts F. At the same time, the rods 2 can easily stand the modest axial load - alternated tensile and compressive loads - to which they are subjected by the cam-followers D, without undergoing any deflections, if their cross section is suitably dimensioned to face the hardest condition, being that of the point load (combined bending and compressive stress) imparted thereon.

[0012] The rods 2 can also be suitably formed by two or more side by side elements, mutually connected in one or more points, so as to reduce their free length of deflection and thereby supply a rigidity against the point loads sufficient to guarantee a correct motion transmission, while maintaining at the same time a flexural and torsional resilience both in the plane XY and in the plane YZ. This last embodiment is advantageous also for what concerns the fatigue strength, which is evidently the higher, the smaller the cross section of the single elements of the rods 2.

[0013] From the above description of the invention, it appears quite evident how the same has fully reached its intended objects. The proposed motion transmission system allows in fact to considerably simplify the construction of the weft cutting device, thereby reducing its costs. Said system allows moreover to eliminate any operations of maintenance, such as the lubrication of the ball joints required in similar devices of known technique. Finally, said system guarantees a perfect and constant identity between the calculated and the real motion of the blades, in that no slacks are present in said transmission, apt to introduce elements which could vary its characteristics with time.

Claims

1. Weft cutting device for looms, of the type comprising a pair of control members (D) rotating about a working axis (B) parallel to the main axis of the loom, a corresponding pair of cutting members (F, T) rotating about an axis (G) inclined in respect of said working axis (B), and motion transmission means between said control members and said cutting members, characterized in that said transmission means consist of a pair of thin rods (2), the ends of which are rigidly connected to said control members (D) and, respectively, to said cutting members (F, T), said rods (2) consisting of metal sections, having a sufficiently small cross section as to allow their lateral and torsional deformation during rotation of said control and cutting members.
2. Device as in claim 1), wherein said rods (2) consist of metal sections, having a sufficiently large cross section as to stand, without undergoing any deflections, the combined bending and compressive stresses imparted by said control members.
3. Device as in claims 1) to 3), wherein said rods (2) comprise two or more side-by-side elements, connected one to the other in one or more points.
4. Device as in claims 1) to 4), wherein said control members (D) and said cutting members (F) have, on their periphery, screw clamps (1) fixed thereto, for fastening said rods (2).

Patentansprüche

1. Schußfadenschneidvorrichtung für Webmaschinen, von der Art mit einem Paar von Steuerelementen (D), die um eine parallel zu der Hauptachse der Webmaschine verlaufende Arbeitsachse (B) drehen, wobei ein entsprechendes Paar von Schneidelementen (F, T) um eine Achse (G) dreht, die zu der Arbeitsachse (B) geneigt ist, und mit Bewegungsübertragungsmittel zwischen den Steuerelementen und den Schneidelementen, dadurch gekennzeichnet, daß das Übertragungsmittel aus einem Paar von dünnen Stangen (2) besteht, deren Enden einerseits fest mit den Steuerelementen (D) und andererseits mit den Schneidelementen (F, T) verbunden sind, wobei die Stangen (2) aus Metallabschnitten bestehen, die einen ausreichend kleinen Querschnitt haben, um während der Drehung der Steuer- und Schneidelemente deren laterale und torsionale Deformation zu erlauben.
2. Vorrichtung nach Anspruch 1, wobei die Stangen (2) aus Metallabschnitten bestehen, die einen ausreichend großen Querschnitt haben, um ohne jedwede Ablenkungen der kombinierten Biege- und Druckbelastungen, die auf die Steuerelemente aufgebracht werden, zu widerstehen.
3. Vorrichtung nach Anspruch 1 bis 3, wobei die Stangen (2) zwei oder mehr Seite an Seite liegende Elemente aufweist, die miteinander in einem oder mehreren Punkten verbunden sind.
4. Vorrichtung nach Anspruch 1 bis 4, wobei die Steuerelemente (D) und die Schneidelemente (F) an ihrem Umfang an ihnen befestigte Schraubenklammern (1) zur Befestigung der Stangen (2) aufweisen.

Revendications

1. Dispositif de coupe de trame pour métiers, du type comprenant une paire d'organes de commande (D)

tournant autour d'un axe de travail (B) parallèle à l'axe principal du métier, une paire correspondante d'organes de coupe (F, T) tournant autour d'un axe (G) incliné par rapport audit axe de travail (B), et un moyen de transmission de mouvement entre lesdits organes de commande et lesdits organes de coupe, caractérisé en ce que ledit moyen de transmission consiste en une paire de minces tiges (2), dont les extrémités sont reliées rigidement auxdits organes de commande (D) et, respectivement, auxdits organes de coupe (F, T), lesdites tiges (2) consistant en sections de métal, ayant une section transversale suffisamment petite pour permettre leur déformation latérale et en torsion durant une rotation desdits organes de commande et organes de coupe.

2. Dispositif selon la revendication 1, dans lequel lesdites tiges (2) consistent en sections de métal, ayant une section transversale suffisamment grande pour résister, sans subir de fléchissements, aux contraintes de flexion et de compression combinées communiquées par lesdits organes de commande.
3. Dispositif selon les revendications 1 à 3, dans lequel lesdites tiges (2) comprennent deux ou plus de deux éléments côte à côte, mutuellement reliés en un ou plusieurs points.
4. Dispositif selon les revendications 1 à 4, dans lequel lesdits organes de commande (D) et lesdits organes de coupe (F) comportent, sur leur périphérie, des organes de serrage à vis (1) fixés aux organes, pour assujettir lesdites tiges (2).

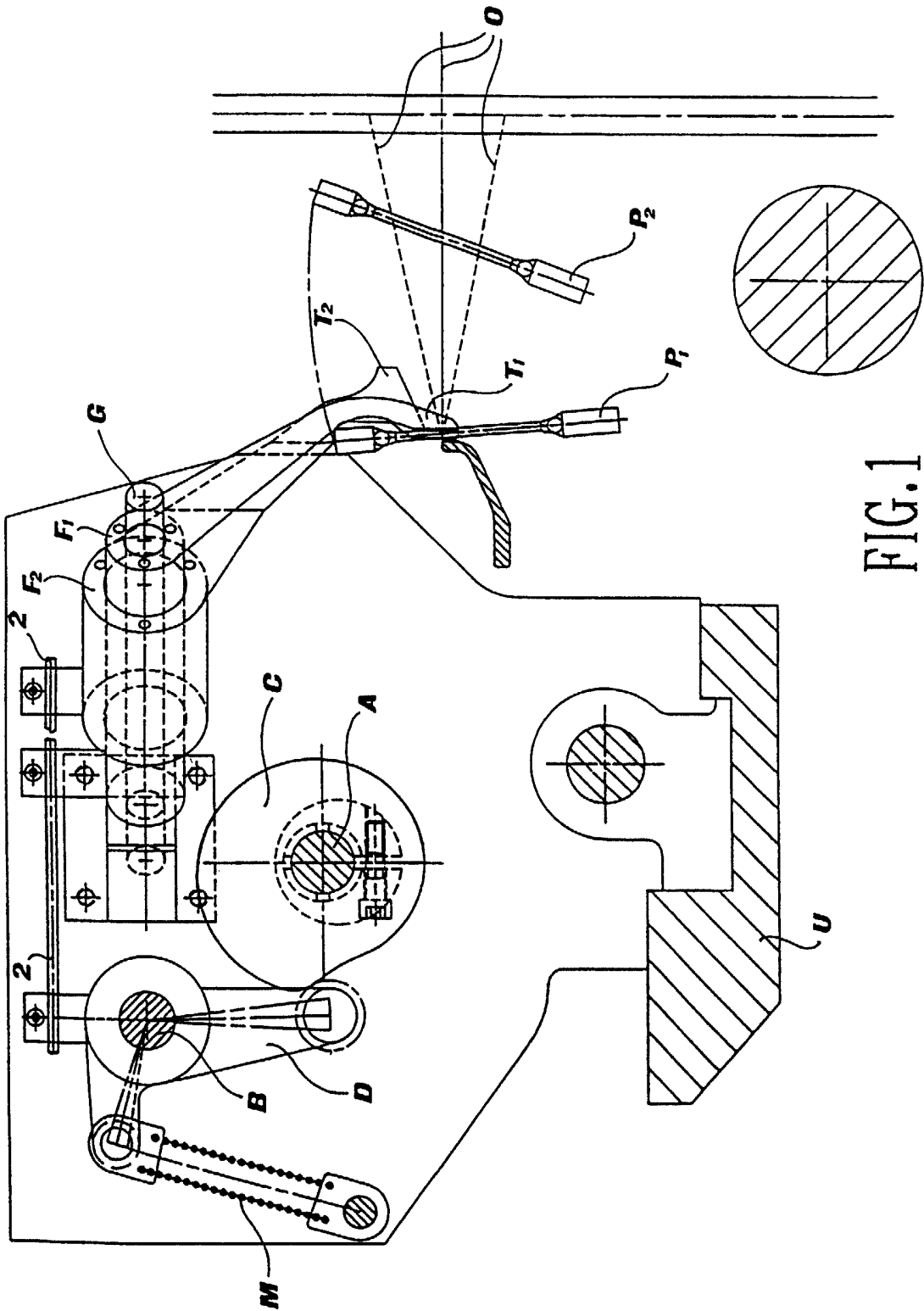


FIG.1

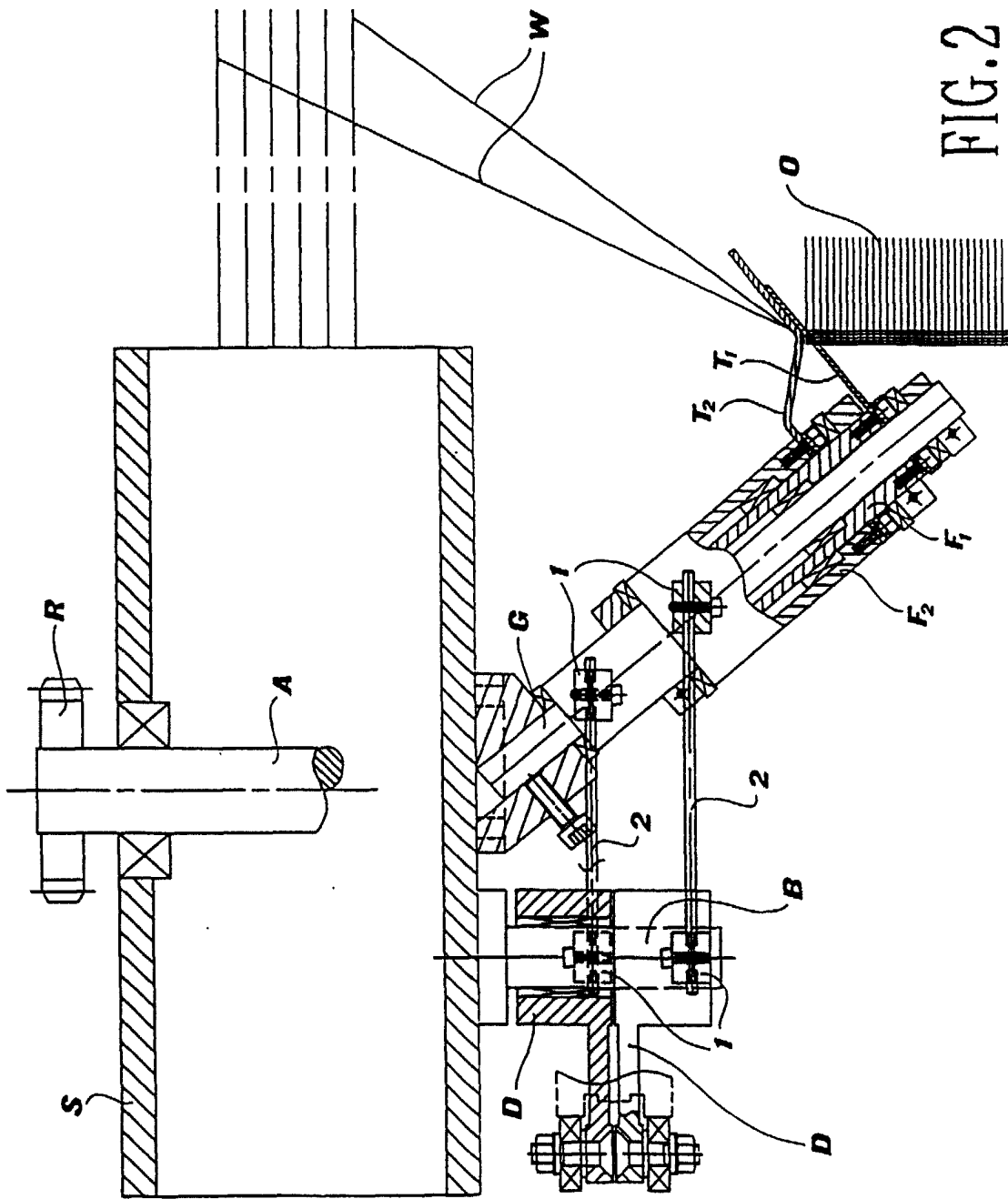


FIG. 2