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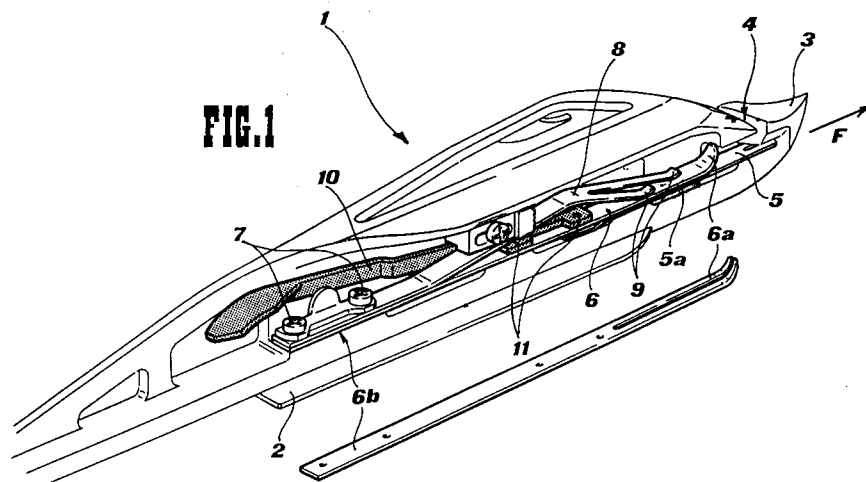
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W-8000 München 40(DE)**(54) **Weft yarn carrying gripper for shuttleless looms.**

(57) Weft yarn carrying gripper for shuttleless looms, comprising no hinged or sliding joints to connect its reciprocally movable parts, which would determine the presence of slacks. This makes the gripper highly wearproof.

The movable clamping member of the gripper consists of a flexible lamina (6), connected with an end (6b) to the gripper body (1) and kept pressed against a fixed clamping member (5) by a leaf spring

(8) acting onto the other free end (6a). Adjusting means (12-14) are provided to regulate the pressure force of the leaf spring (8) acting on the movable clamping member (6).

A stiff lever (10) is fixedly connected to the movable clamping member (6) and is operated by a loom cam, so as to open the clamping zone of the gripper by elastically lifting said member (6) and allow cleaning thereof.

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The object of the present invention is a weft yarn carrying gripper for shuttleless looms. As known, grippers are those members in shuttleless looms by means of which the single weft yarns are gripped at one end of the loom and conveyed to the opposite end thereof through the warp shed. The carrying gripper grips the weft yarn from a weft feeding device and carries it to the centre of the shed, while the drawing gripper receives the weft yarn from the carrying gripper, at the centre of the shed, and conveys it to the opposite end of the loom.

There are known to be many types of grippers apt to perform this function, which have undergone successive improvements, all differing as far as even slight constructive details, but all meant to improve, on one hand, the weft yarn clamping and releasing action and, on the other hand, the life of the gripper. One of the drawbacks most frequently present in such grippers is in fact the short life thereof. In grippers of known technique, the different parts are actually connected by hinged or sliding joints and are hence subjected to high wear while the gripper is working. In particular, the slacks forcedly present in all these types of joints increase quite rapidly with time, up to making the gripper unserviceable when its general structure could still last quite long.

The object of the present invention is to actually supply a carrying gripper having no joints with reciprocally movable component parts, and thus no slacks between said parts, so as to ensure a long life to the gripper.

A further object of the present invention is to supply a gripper of the aforementioned type, wherein it is possible to regulate the clamping pressure of the weft yarn clamping members, so as to adapt said gripper to different types of yarns.

According to the present invention, these objects are reached by means of a carrying gripper for shuttleless looms - of the type in which the weft yarn is clamped between a pair of clamping members, at least one of which is movable under the action of control means, external to the gripper, so as to open the clamping zone and allow cleaning thereof - characterized in that the movable clamping member consists of a flexible lamina connected with an end to the gripper body and kept pressed against the fixed clamping member by spring means acting onto its free end, and in that a stiff lever is fixedly connected to said lamina and is operated by said external control means so as to move the flexible lamina away from the fixed clamping member.

Further characteristics and advantages of the carrying gripper according to the present invention will anyhow be more evident from the following detailed description of some preferred embodi-

ments thereof, given by way of example and illustrated on the accompanying drawings, in which:

Fig. 1 is a perspective view of a carrying gripper according to the present invention;

Fig. 2 is a perspective view of another embodiment of the carrying gripper, showing only the movable weft yarn clamping member;

Fig. 3 is a perspective view similar to that of fig. 1, with some parts removed, showing more clearly the bending movement of the movable clamping member; and

Fig. 4 is a perspective view similar to that of fig. 3, showing also the means to regulate the pressure force imparted by the movable clamping member.

Fig. 1 illustrates a carrying gripper comprising the weft yarn clamping members realized according to the present invention. The thin lines show the gripper parts which have not been improved by the invention, so as to make its working more clear as briefly described hereinafter.

The carrying gripper of the present invention thus comprises a gripper body 1 - normally obtained by molding of plastic material or of a light alloy - which consists of: the slide 2, onto which the gripper bears during its movement along the shed formed by the warp yarns; a tip 3, apt to deviate on the right side of the gripper a weft yarn (not shown) interposed across its path by a weft presenting device, as the gripper moves into the shed in the direction indicated by the arrow F; and finally a slit 4, into which moves the weft yarn to be clamped by the clamping members described hereinafter.

As known, the weft yarn clamping members are meant to clamp the weft yarn, to hold it tight while the carrying gripper moves to the centre of the shed, and then release it to the drawing gripper during weft exchange at the centre of the shed. It is evident, therefore, that the clamping action should be positively reliable and, at the same time, reversible; in other words, it should be strong enough to overcome the resistance opposed by the unwinding weft yarn as the carrying gripper moves along the shed, but also soft enough to release the weft yarn when a sufficiently strong pulling action is positively imparted thereon by the drawing gripper. It is also indispensable for the clamping and release of the weft yarn to take place very smoothly, in order to prevent defiberizing or tearing thereof.

These results are usually obtained by properly regulating the mutual contact pressure between the clamping members, and also by making sure that - during weaving - no dust, torn fibres, or other impurities settle between said members, thereby altering the intensity of said contact pressure and hampering the proper working of the gripper. For this purpose, the carrying gripper is equipped with devices to open the clamping members, which are

operated each time the gripper moves out of the shed, so that the clamping members can be kept perfectly clean, for instance by blowing a compressed air jet.

In the carrying gripper of the present invention, the weft yarn clamping members comprise a fixed clamping member 5, consisting of a flat metallic lamina firmly fixed onto the gripper body 1 but freely adjustable onto an elastic support 5a, and a movable clamping member 6, also consisting of a flat metallic lamina, but having a characteristic ski-shaped point, i.e. an arched and raised front end 6a. The movable clamping member 6 bears with its front end 6a onto the fixed clamping member 5, so as to clamp the weft yarn in-between, and it is anchored with its rear end 6b onto the gripper body 1 by a pair of screws 7, or by other suitable fixing means.

Fig. 1 shows - mounted on the gripper body 1 - a first embodiment of the movable clamping member 6, wherein said member has a continuous surface throughout its length. Fig. 2 shows instead - removed from the gripper body - a second embodiment of the movable clamping member 6, wherein its free front end 6a is divided in two parts by a longitudinal slit. Either of the two embodiments of the movable clamping member 6 can be adopted to satisfy the different clamping requirements of the various weft yarns being woven.

The clamping pressure between the members 5 and 6 is determined by a leaf spring 8 acting on the movable clamping member 6. Also said leaf spring consists of a metallic lamina, fixed at one end to the gripper body 1 - by the same means 7 anchoring the member 6 - and bearing with the opposite end 9 onto the movable clamping member 6. Between the anchorage points 7 and the bearing points 9 the spring 8 is usually arc-shaped, preferably as an overturned V, so as to impart the required pressure onto the member 6 and allow its adjustment, as described more in detail hereinafter. The end 9 of the spring 8 bearing onto the movable clamping member 6 can be differently shaped according to the type of yarn being woven and to its thickness, so as to obtain the most efficient clamping action. Thus - as shown in the drawings - the spring 8 may have, for example, a front end 9 split up in two parts of different length, or else it may be formed in one piece, or even be differently shaped.

As clearly shown in fig. 3 - and as can besides be easily gathered from the previous description - the movable clamping member 6 is apt to bend in respect of its anchorage points 7, thus moving its front end 6a from the normal working position (dashed lines in fig. 3) to a lifted position (shown in full lines in the same figure), in which it draws apart from the fixed clamping member 5, against the

action of the spring 8, thereby allowing the clamping members to be cleaned.

The above bending movement of the clamping member 6 is controlled by a lever 10 fixedly connected in 11, in two separate points, to a central zone of said movable clamping member. The lever 10 has a free control end 10a, onto which acts a loom cam (not shown) each time the gripper moves out of the shed. In fact, by applying on said control end 10a a force in the direction of arrow A (fig. 3), the movable clamping member 6 is subjected to a couple G-G applied on the two fixing points 11, which tends to cause its rotation. Said member, which is instead fixed in 7, undergoes an elastic bending in a hingeing zone between points 7 and 11, which causes the aforementioned lifting of its free end 6a.

Adjusting means are provided to regulate the pressure force of the spring 8 acting onto the movable clamping member 6, said means essentially consisting of a wedge element 12 - shown more clearly in fig. 4 - the inclined surface of which cooperates with the underlying overturned V portion of the spring 8. Said wedge element 12 is fixed to the gripper body 1 by screw means 13 housed into a longitudinal slot 14 provided in said element. By loosening the screw means 13, the wedge element 12 can thus be shifted lengthwise, thereby compressing - to a smaller or greater extent - with its inclined surface the spring 8, and thus altering the intensity of its pressure force. More specifically, when the wedge element is shifted in the direction of arrow B (fig. 4), the pressure force imparted by the spring 8 in the direction of arrow C increases, and vice-versa in the contrary case.

It is quite evident, from the previous description, how the present invention has fully reached the intended objects. In fact, since the carrying gripper described herein comprises no hinged or sliding joints to connect its reciprocally movable component parts, any problems deriving from slacks between said parts, with the respective wears and tolerances, are thereby eliminated. In particular, the carrying gripper of the present invention requires neither maintenance nor lubrication. Furthermore, it can easily be adjusted, both by regulating the intensity of the pressure force of the spring 8 - by acting on the wedge element 12 - and by regulating the distribution of said pressure force, by suitably modifying the shape of the end part 9 of said spring 8.

It will finally be noted how the shape and positioning of the lever 10 and, in particular, the distance between its two fixing points 11, as well as the distance between said points 11 and the anchorage points 7 of the movable clamping member 6, can be adjusted at will, so as to drastically

reduce the force A required to lift said clamping member 6. This allows to reduce to a minimum extent the stresses on the loom control members acting on said lever 10.

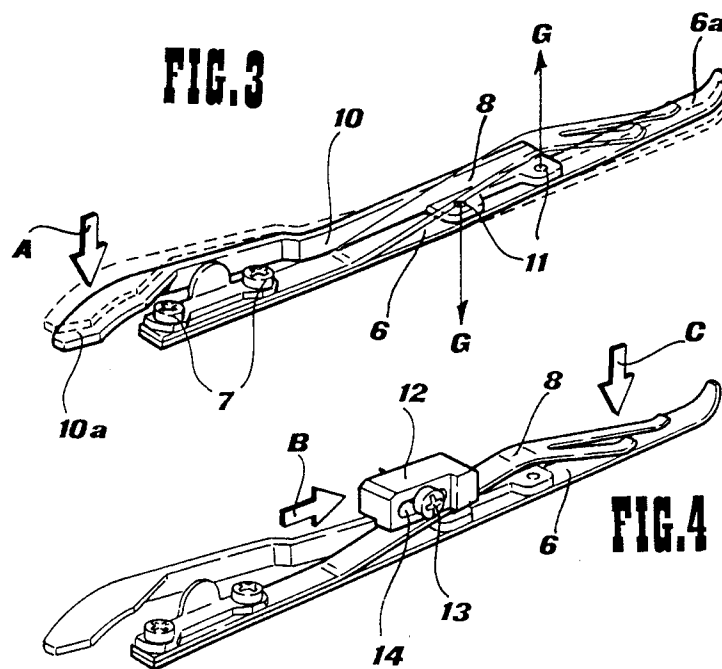
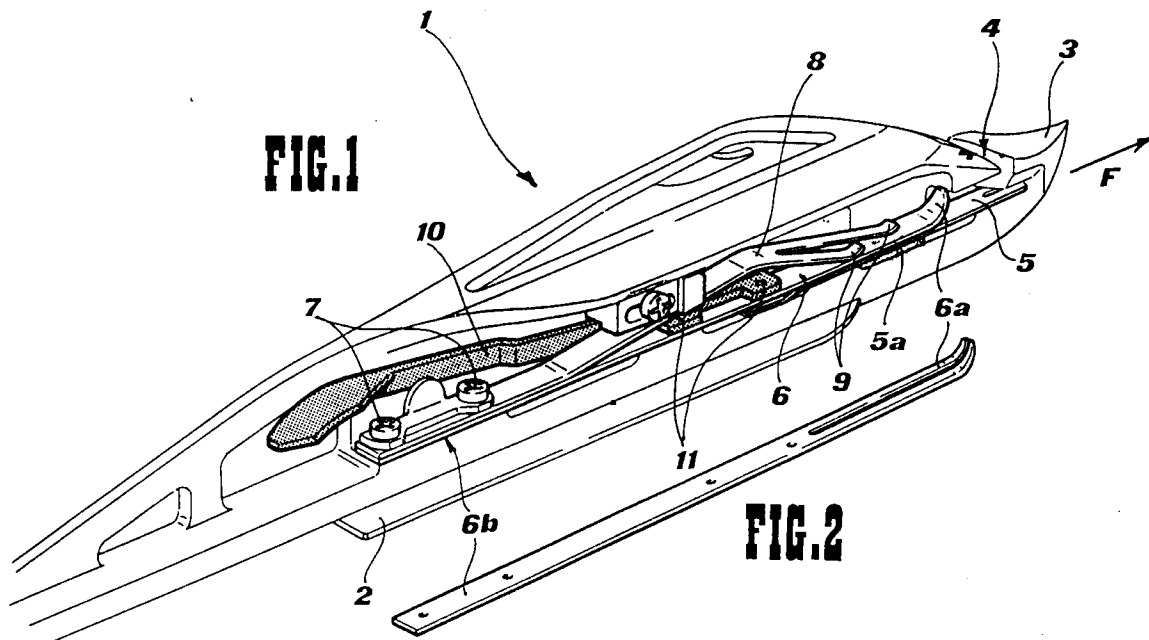
The invention has been described with reference to some preferred embodiments thereof, but it should evidently not be limited to the same. The protection scope of the invention therefore covers any possible modifications and improvements within reach of a technician skilled in the art, falling within the definition of the invention given in the following claims.

Claims

1. Carrying gripper for shuttleless looms - of the type in which the weft yarn is clamped between a pair of clamping members, at least one of which is movable under the action of control means, external to the gripper, so as to open the clamping zone and allow cleaning thereof - characterized in that the movable clamping member consists of a flexible lamina (6), connected with an end (6b) to the gripper body (1) and kept pressed against the fixed clamping member (5) by spring means (8) acting onto its free end (6a), and in that a stiff lever (10) is fixedly connected to said lamina (6) and is operated by said external control means so as to move the flexible lamina (6) away from the fixed clamping member (5). 5 10 15 20 25 30
2. Carrying gripper as in claim 1), comprising also adjusting means (12-14) to modify the pressure force of the spring means (8) acting on the movable clamping member (6). 35
3. Carrying gripper as in claim 1), wherein said flexible lamina (6) is of metallic material and its free end (6a) is arched like a ski point. 40
4. Carrying gripper as in claim 1), wherein the free end (6a) of said lamina (6) is divided in two parts by a longitudinal slit. 45
5. Carrying gripper as in claim 1), wherein said flexible lamina (6) is anchored to the gripper body (1) by screw means (7). 50
6. Carrying gripper as in claim 1), wherein said spring means consist of a leaf spring (8) shaped as an overturned V, fixed at one end to the gripper body (1) and bearing with the other end (9) onto the free end (6a) of the movable clamping member (6). 55
7. Carrying gripper as in claim 6), wherein said leaf spring (8) is fixed to the gripper body (1)

in the same point and with the same means (7) as the movable clamping member (6).

8. Carrying gripper as in claim 6), wherein the free end (9) of said leaf spring (8) is split up in two parts, possibly of different length, by a longitudinal slit.
9. Carrying gripper as in claim 1), wherein said lever (10) is fixed onto a substantially central zone of the lamina (6), between its anchored end (6b) and its free end (6a).
10. Carrying gripper as in claim 9), wherein said lever (10) is fixed onto said lamina (6) in correspondence of at least two separate points (11).
11. Carrying gripper as in claims 2) and 6), wherein said adjusting means consist of a wedge element (12), sliding longitudinally along the gripper body (1) and apt to be fixed thereto in a position at will, the inclined surface of said element (12) cooperating with the inclined surface of the overturned V portion of said leaf spring (8).
12. Carrying gripper as in claim 11), wherein said wedge element (12) is fixed to the gripper body (1) by screw means (13) housed into a longitudinal slot (14) of said element.





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EUROPEAN SEARCH REPORT

Application Number

EP 92 10 4590

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
A	FR-A-1 595 579 (SOMET) * figures 1,2,4,7,8 * ---	1,3-8	D 03 D 47/23
A	FR-A-1 480 561 (NUOVO PIGNONE) * page 2, line 1 - line 51; figures 1-4 *	1-4	
A	FR-A-2 635 538 (NUOVO PIGNONE) * page 5, line 12 - line 28; figures 1,2 * ---	1,3	
A,P	FR-A-2 657 626 (NUOVO PIGNONE) * the whole document * -----	1-3,5,9	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			D 03 D
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 12-06-1992	Examiner BOULEGIER C.H.H.
CATEGORY OF CITED DOCUMENTS			
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