(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 256 644 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
13.11.2002 Bulletin 2002/46

(51) Int Cl.[7]: **D03D 47/23**

(21) Application number: **01830296.8**

(22) Date of filing: **08.05.2001**

(84) Designated Contracting States:
AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE TR
Designated Extension States:
AL LT LV MK RO SI

(71) Applicant: **Promatech S.p.A.**
24020 Colzate (Bergamo) (IT)

(72) Inventors:
- **Lebbolo, Roberto**
24021 Albino (IT)
- **Testa, Silvana**
24025 Gazzaniga, Bergamo (IT)

(74) Representative: **Faggioni, Marco, Dr. Ing. et al**
Fumero Studio Consulenza Brevetti Snc
Pettenkoferstrasse 20-22
80336 München (DE)

(54) Weft carrying gripper for weaving looms adjustable in respect of the thickness of the weft yarn

(57) A weft yarn carrying gripper for weaving looms comprises a gripper body (1) having a wide bearing surface (4) for the warp yarns and a narrower tip portion (2) separated from the gripper body (1) by a slit (5) for weft yarn insertion. At least the portion of said warp yarns bearing surface (4) delimiting said slit (5) is formed by an upper movable element (6), fixed to the gripper body (1) by adjustable fixing means (7, 8, 9) and bearing onto a sliding plane provided on the gripper body (1), so as to allow adjusting the width of said slit (5).

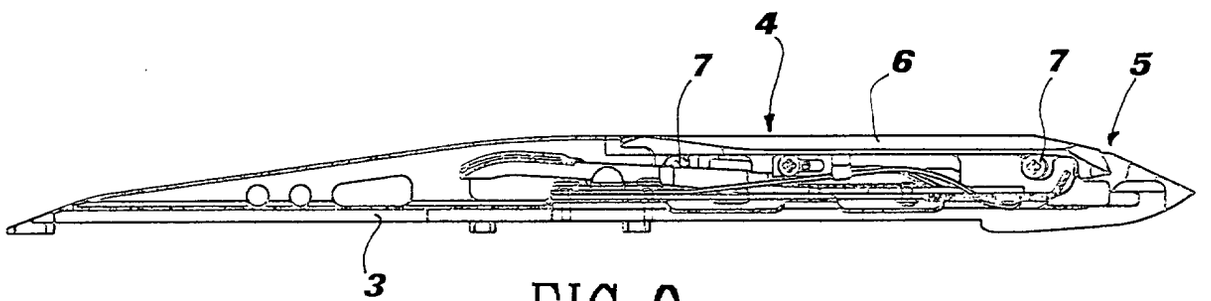

FIG.2

EP 1 256 644 A1

Description

[0001] The present invention concerns a weft yarn carrying gripper for weaving looms and, in particular, a carrying gripper wherein the weft yarn gripping members can be adjusted according to the thickness of the weft yarn used for each weaving operation.

[0002] As well known to the skilled in the art, a conventional weft yarn carrying gripper for looms comprises a fairly wide body, extending frontwise into a narrower portion ending with a tip. The tip is in fact meant to penetrate under the weft yarn being fed each time in front of the gripper by a weft presenting device, so as to cause said yarn to slide along the top surface of the gripper with a suitable tension until it is gripped by its gripping members. To obtain this result, the gripper body is separated from the tip portion thereof by a slit, which is oblique in respect of the motion direction of the gripper and into which the weft yarn inserts itself due to its tension and to the gripper motion; into said slit there are arranged the gripping members, apt to temporarily stop the weft yarn, at least until the exchange of the same with the weft yarn drawing gripper.

[0003] To allow the weft yarn to be inserted into the slit in a regular and repeatable manner, it is however necessary for the width of said slit to be proportional to the thickness of the weft yarn; in fact, an exceedingly narrow slit would obviously hamper the insertion of the weft yarn, but even an excessively wide slit could create problems in that it would allow a certain degree of freedom to the weft yarn, causing its unsteadiness and thereby determining an unreliable and unrepeatable insertion thereof into the gripper slit.

[0004] Thus, according to known technique, a series of weft yarn carrying grippers are produced and used for each type of loom, each of them having a slit of different width, so as to be able to mount on the loom grippers corresponding to the weft yarn being used each time for any special weaving lot. This type of solution of course creates several problems in the management of the grippers store, as well as a considerable waste of time when having to replace the grippers on the loom, seen that such an operation should include not only the times strictly required to replace the grippers, but also those required to supply the grippers having to be replaced and to store again those which have been replaced. As an alternative, each loom would have to be provided with a local store containing every possible replacement gripper, with the obvious consequence, not only of an increased bulk, but also of an inefficient optimization in handling the replacement grippers which, forming part of the equipment of each single loom, would have to be supplied in a far higher number than that actually required for the whole weaving compartment.

[0005] The object of the present invention is to thus supply a solution apt to overcome the above drawbacks, namely to allow carrying out the weaving operations with grippers having a slit of width always corresponding to the thickness of the weft yarn being used each time, but with no need to dispose of a plurality of grippers to alternate on the loom.

[0006] According to the present invention said object is reached by supplying an adjustable weft yarn carrying gripper, in which the dimensions of the slit for weft yarn insertion can be modified within a preset range through an easy and fast operation.

[0007] In particular, a weft yarn carrying gripper for weaving looms according to the present invention, of the type comprising a gripper body having a wide bearing surface for the warp yarns and a narrower tip portion separated from the gripper body by a slit for weft yarn insertion, is characterized in that at least the portion of said warp yarns bearing surface delimiting said slit is formed by an upper movable element fixed to the gripper body by adjustable fixing means, so as to allow adjusting the width of said slit.

[0008] The weft yarn carrying gripper according to the present invention will now be described in further detail, with reference to a preferred embodiment thereof, illustrated on the accompanying drawings, in which:

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

Fig. 2 is a side elevation of the gripper shown in fig. 1;

Fig. 3 shows, on an enlarged scale, the front portion of the gripper of fig. 1, clearly illustrating the slit which separates the gripper body from the tip portion thereof;

Fig. 4 is a plan view illustrating only the upper adjustable element of the gripper body; and

Fig. 5 is a side elevation of the upper adjustable element of the gripper body.

[0009] A conventional weft yarn carrying gripper can be functionally subdivided into a body 1 and a tip portion 2, as shown in Fig. 1 and Fig. 3 in relation to the gripper body according to the present invention. The gripper body 1 essentially consists - in known manner - of an elongated bottom element 3, meant to be fixed to the gripper carrying strap, and of a wide flat top surface 4 onto which bear the warp yarns during the initial/final step of inlet/outlet of the gripper into and out of the shed. Between the bottom element 3 and the top surface 4 there are arranged the members to grip the weft yarn T; such members are only diagrammatically illustrated in fig. 2, since they are by no means involved in the present invention.

[0010] As already mentioned above, the tip portion 2 of the gripper is less wide than the gripper body 1 and is separated therefrom by an oblique slit 5 allowing to insert into the gripper the weft yarn T. To facilitate this operation, the tip portion 2 is less high than the body 1 and is radiused to said body in a smoothly inclined manner, so as to form a beveling in correspondence of the slit 5, apt to steadily hold the weft yarn T and facilitate

its correct insertion into the gripper. The working of the carrying gripper during the weft yarn gripping step and the function of the slit 5 have already been widely described in the introductory part of the present description, whereby it is not deemed necessary to dwell any further on this argument.

[0011] According to the innovating aspect of the present invention, in order to be able to dispose of a slit 5 of the desired width required for each single weaving operation, the invention proposes to use a single gripper in which said width can be easily adjusted, instead of adopting different grippers each having a slit of preset fixed width, as done in previous technique.

[0012] According to the present invention said result is obtained by forming at least part of the gripper top surface 4 - namely, at least said portion which delimits the slit 5 - as a movable upper element 6, fixed to the gripper body by adjustable fixing means and slidable on an underlying sliding plane, formed into the gripper body 1 and apt to supply a steady support for the upper element 6 in any position thereof. The upper element 6 lies on the same plane and is perfectly aligned with the remaining fixed part of the surface 4, so that the ensemble formed by the fixed part of the surface 4 and the movable surface of the upper element 6 appears as a single continuous bearing surface for the warp yarns, independently from the position taken up each time by the upper element 6 in order to adjust the width of the slit 5.

[0013] In the embodiment shown, the line of separation between the fixed surface 4 and the upper element 6 is a line parallel to the longitudinal axis of the gripper, and the adjustable fixing means consist of screws 7 of small diameter (for example M2 screws) which screw into corresponding threaded seats, provided in the gripper body 1, by crossing slots 8 (figs. 4 and 5) formed into suitable ears 9 projecting perpendicularly from the upper element 6. The ears 9, and thus the slots 8 and the screws 7, are positioned in the bottom part of the upper element 6 and are hence perfectly "hidden" either by said upper element 6 or by the surface 4, so that the screws 7, though being within easy reach for adjustment from a lateral position, are never apt to interfere with the warp yarns during the gripper motion.

[0014] The width of the slots 8 determines the possible travel of the upper element 6 between an advanced position, in which the slit 5 has the minimum width, and a setback position in which said slit 5 has a maximum width, the upper element 6 always keeping - in any of the possible positions taken up during its travel - perfectly adjacent to the fixed surface 4. To make sure that the union between these two surfaces is perfectly even, the upper element 6 ends, on the side of the surface 4, with a toothed longitudinal rib 10 apt to engage with a conjugate rib provided in the surface 4.

[0015] The adjustment of the width of the slit 5 is very simple, as besides clearly results from the above description. It is in fact sufficient to loosen the two screws 7, to cause the upper element 6 to slide forward or backward up to obtaining the required width of the slit 5 - eventually using graduated shims to insert into said slit - and to then tighten again the screws 7 in the new position taken up by the upper element 6. The entire operation of adjustment can be carried out in a few seconds, namely in positively shorter times than those currently required for the replacement of the whole gripper.

[0016] From the previous description it should be clearly evident how the weft yarn carrying gripper according to the present invention has fully reached the intended objects. In fact, said gripper allows to obtain an easy and fast adjustment of the width of the slit 5 for weft yarn insertion, whereby it fully eliminates the need to store a series of grippers having slits 5 of different width; it moreover drastically reduces the times required to adapt the loom to the weaving operations with weft yarns of different thicknesses, and it allows to optimize - from the economical point of view, as well as for what concerns the supply of spare parts - the management of the grippers in the weaving compartment.

[0017] The present invention has been described with reference to a preferred embodiment thereof, but it is evident that a number of variants can be introduced - for example, by changing the type and arrangement of the fixing means, the sliding direction of the upper element 6 and the system of its engagement with the fixed surface 4 - all within reach of a person skilled in the art, and anyhow falling within the protection scope of the present invention such as defined in the following claims.

Claims

1. Weft yarn carrying gripper for weaving looms - of the type comprising a gripper body (1) having a wide bearing surface (4) for the warp yarns and a narrower tip portion (2) separated from the gripper body (1) by a slit (5) for weft yarn insertion - **characterized in that**, at least the portion of said warp yarns bearing surface (4) delimiting said slit (5) is formed by an upper movable element (6) fixed to the gripper body (1) by adjustable fixing means, so as to allow adjusting the width of said slit (5).

2. Weft yarn carrying gripper as in claim 1), wherein the surface of said upper movable element (6) lies on the same plane and is perfectly aligned, in any position of said plane, with the surface of the remaining fixed part of the warp yarns bearing surface (4).

3. Weft yarn carrying gripper as in claim 1), wherein said upper movable element (6) bears onto a corresponding sliding plane provided on the gripper body (1).

4. Weft yarn carrying gripper as in claim 3), wherein said adjustable fixing means consist of at least one

pair of screws (7), apt to engage into corresponding threaded seats provided in the gripper body (1) and crossing slots (8) formed into ears (9) projecting from the bottom part of said upper movable element (6).

5. Weft yarn carrying gripper as in claim 4), wherein said ears (9) are perpendicular to the surface of the upper movable element (6) and the axis of said screws (7) is parallel to said surface.

6. Weft yarn carrying gripper as in claim 4), wherein said ears (9) are positioned inwardly in respect of the free outer edge of said upper movable element (6).

7. Weft yarn carrying gripper as in claim 3), wherein the edges of contact between said upper movable element (6) and said fixed part of the warp yarns bearing surface (4) are formed as conjugate toothed ribs (10).

8. Weft yarn carrying gripper as in claim 3) wherein, during adjustment of the width of said slit (5), said upper movable element (6) moves in a direction parallel to the longitudinal axis of the gripper.

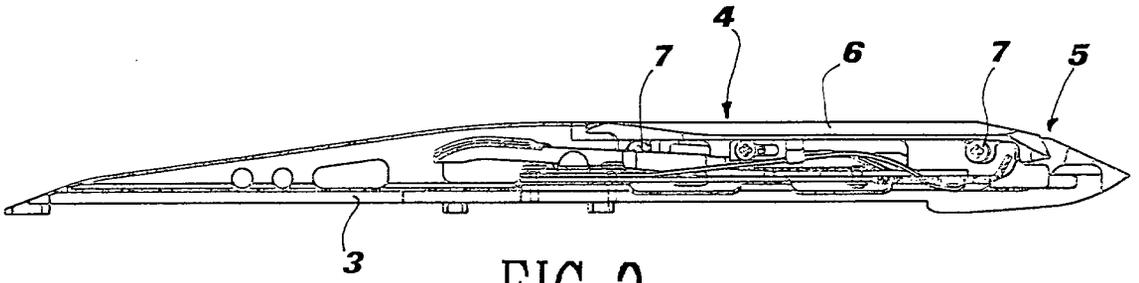

FIG.2

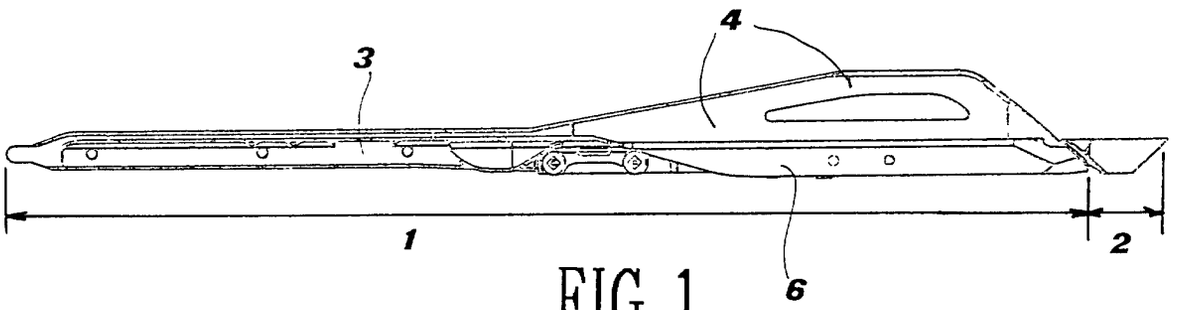

FIG.1

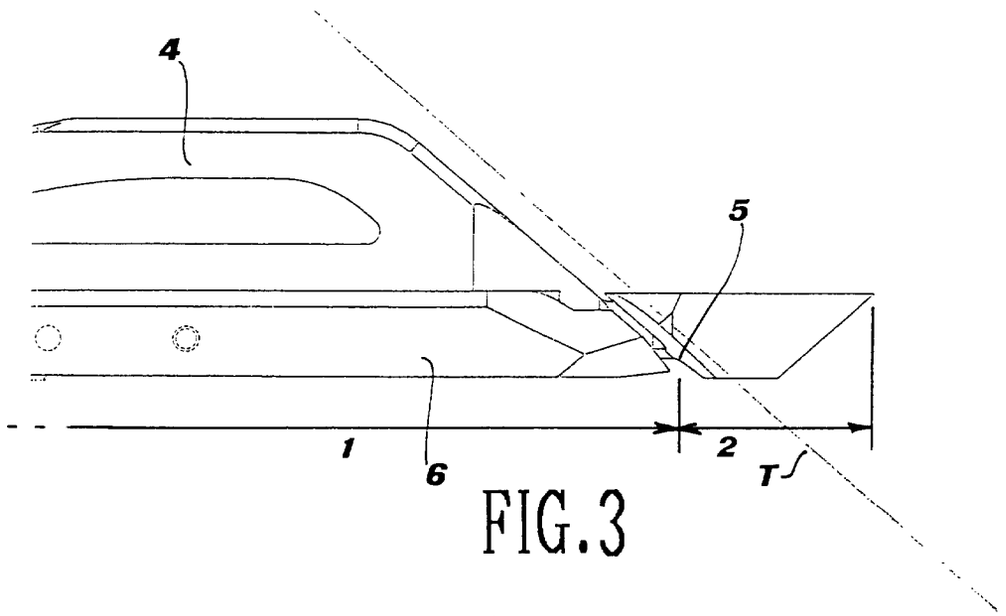

FIG.3

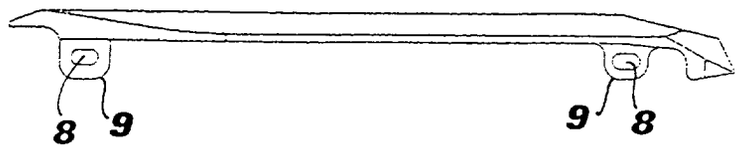

FIG.5

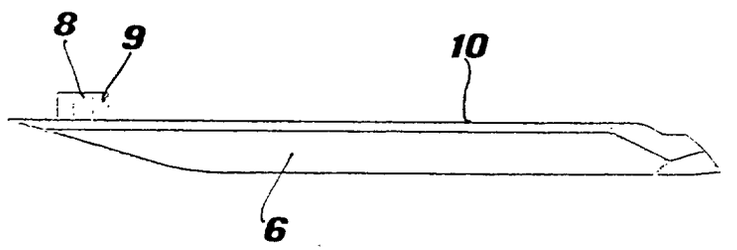

FIG.4

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 01 83 0296

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.7)
A	EP 0 509 255 A (SOMET SOC MEC TESSILE) 21 October 1992 (1992-10-21) * column 2, line 23 - line 33; figure 1 *	1	D03D47/23
A	WO 99 29944 A (ROELSTRAETE KRISTOF ;PICANOL NV (BE)) 17 June 1999 (1999-06-17) * page 7, line 19 - line 24; figure 5 *	1	
A	EP 0 164 034 A (VAMATEX SPA) 11 December 1985 (1985-12-11) * page 2, line 20 - line 28; figure 1 *	1	
A	FR 2 278 815 A (ETCOMA SARL) 13 February 1976 (1976-02-13) * the whole document *	1	
A	EP 0 065 233 A (VAMATEX SPA) 24 November 1982 (1982-11-24) * page 2, line 24 - page 3, line 6; figures *	1	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
A	EP 1 013 806 A (SOMET SOC MEC TESSILE) 28 June 2000 (2000-06-28) * figures 1,2 *	1	D03D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	28 November 2001	Rebiere, J-L

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 01 83 0296

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

28-11-2001

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0509255 A	21-10-1992	IT 1245579 B	29-09-1994
		AT 140275 T	15-07-1996
		DE 69212040 D1	14-08-1996
		DE 69212040 T2	06-03-1997
		EP 0509255 A1	21-10-1992
		ES 2090389 T3	16-10-1996
WO 9929944 A	17-06-1999	BE 1011604 A3	09-11-1999
		WO 9929944 A1	17-06-1999
EP 0164034 A	11-12-1985	IT 1196138 B	10-11-1988
		AT 46374 T	15-09-1989
		BR 8502724 A	12-02-1986
		DE 3573004 D1	19-10-1989
		EP 0164034 A2	11-12-1985
		ES 543912 D0	01-06-1986
		ES 8607434 A1	01-11-1986
		HK 34790 A	11-05-1990
		JP 1971961 C	27-09-1995
		JP 7000857 B	11-01-1995
		JP 61034249 A	18-02-1986
		KR 9300370 B1	16-01-1993
		TR 23274 A	10-08-1989
FR 2278815 A	13-02-1976	FR 2278815 A1	13-02-1976
EP 0065233 A	24-11-1982	IT 1135814 B	27-08-1986
		AT 40421 T	15-02-1989
		BR 8202811 A	26-04-1983
		CS 8203546 A2	15-08-1985
		DD 202902 A5	05-10-1983
		DE 3279395 D1	02-03-1989
		EP 0065233 A1	24-11-1982
		ES 512115 D0	01-04-1983
		ES 8305438 A1	01-07-1983
		HK 2091 A	11-01-1991
		JP 1630717 C	26-12-1991
		JP 2058375 B	07-12-1990
		JP 58004846 A	12-01-1983
		MX 157476 A	24-11-1988
		US 4505305 A	19-03-1985
EP 1013806 A	28-06-2000	CN 1257947 A	28-06-2000
		EP 1013806 A1	28-06-2000

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82