



(19)

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(11)

EP 0 712 950 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
22.05.1996 Bulletin 1996/21

(51) Int. Cl.⁶: **D03C 9/00**, D03C 1/14

(21) Application number: **95117429.1**

(22) Date of filing: **06.11.1995**

(84) Designated Contracting States:
BE CH DE FR IT LI

(30) Priority: **17.11.1994 IT MI942331**

(71) Applicant: **FIMTEXTILE S.p.A.**
I-24020 Torre Boldone, Bergamo (IT)

(72) Inventor: **Cremonesi, Gian Luigi**
I-24028 Ponte Nossa, Bergamo (IT)

(74) Representative: **Vatti, Paolo, Dr. Ing. et al**
Fumero Studio Consulenza Brevetti
Franz-Josef-Strasse 38
D-80801 München (DE)

(54) **Joint, with fast engagement and release, for coupling the control linkage to the heald frames of looms**

(57) A joint with fast engagement and release, for coupling to the heald frames (2) of looms the end connecting rods (6) of the control linkage (3) for said frames, comprises: tailpieces (8) with a C-shaped seat (11) projecting from the bottom of the frames (2); levers (9) with a hook end (12) apt to engage into said seat (11) and the other end of which is pivoted onto the big end of said connecting rods (6); and guide elements (10) of plastic material apt to perform only vertical movements and to contain said levers (9), said guide elements (10) comprising an upper end pocket (13) to house said tailpieces (8) and allow them to move horizontalwise in respect of the hook ends (12) of said levers (9).

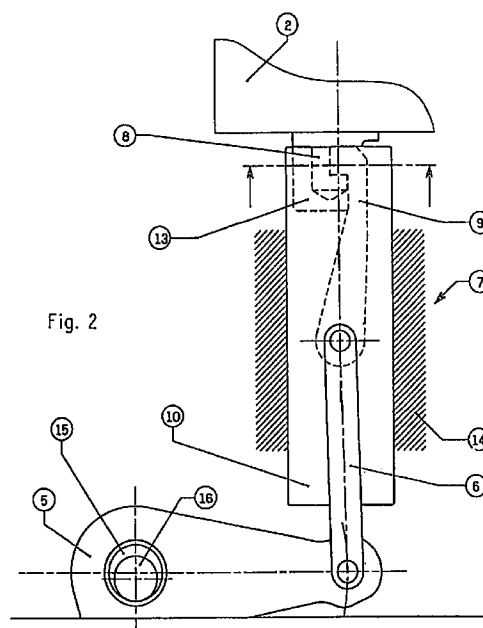


Fig. 2

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Description

The present invention concerns the weaving loom field and, in particular a joint, with fast engagement and release, for coupling to the heald frames the linkage controlling the lifting and lowering movements thereof.

It is known that, according to conventional technique, the control linkage is connected to the heald frames of looms by means of end rods thereof, the big ends of which are pivoted on said frames by way of bushes. This makes very long and complicated the operations of replacing the heald frames, which - as known - are quite frequent in looms.

The present invention proposes to simplify and greatly speed up this operation by supplying a fully original joint, with fast engagement and release, for coupling to the heald frames of looms the end connecting rods of the control linkage for said frames, said joint being characterized in that it comprises: tailpieces with a C-shaped seat projecting from the bottom of the frames; levers with a hook end apt to engage into said seat and the other end of which is pivoted onto the big end of the end connecting rods of the linkage; and guide elements of plastic material apt to perform only vertical movements and to contain said levers, said guide elements comprising an upper end pocket to house said tailpieces and allow them to move horizontalwise in respect of the hook ends of said levers.

Said pocket of the guide elements is suitably filled with lubricant, while said connecting rods are formed as forks containing the guide elements and are partially housed into the same. The various guide elements are in direct mutual contact and they are free to perform movements one in respect of the other.

The invention will now be described in further detail with reference to a preferred embodiment thereof, illustrated on the accompanying drawings, in which:

Fig. 1 shows diagrammatically, in a loom, the transmission of the lifting and lowering controls from a shedding machine to a heald frame, by means of a linkage wherein the end rods are connected to said frame by way of joints according to the present invention.

Figs. 2 and 3 show, on an enlarged scale, one of said joints in a position connected to the heald frame and, respectively, in a position disconnected therefrom which either precedes or follows the position of connection to said frame; and

Figs. 4 and 5 are top plan views of the pack of heald frames of a loom showing, respectively, the connected and disconnected positions of the linkage corresponding to figs. 2 and 3.

As diagrammatically illustrated in fig. 1 of the drawings, the transmission - in a loom - of the lifting and lowering controls from a shedding machine 1 to a heald frame 2 is obtained, in known manner, by means of a

linkage 3 with an adjustable articulated head 4, wherein toggle levers 5 operate end connecting rods 6.

According to the invention, the coupling of the end rods 6 of the linkage 3 to the heald frame 2 is obtained through joints 7, of the type with fast engagement and release, illustrated more clearly in figs. 2 and 3.

Each of said joints 7 comprises: a tailpiece 8, projecting from the bottom of the frame 2 to which it is rigidly fixed; a hook lever 9 pivoted to the big end of the connecting rod 6; and a guide element 10 of plastic material cooperating with said tailpiece 8, with said lever 9 and with said rod 6.

The tailpiece 8 is formed with a C-shaped seat 11, apt to house the correspondingly shaped hook end 12 of the lever 9, which can be fitted therein or disengaged therefrom by a simple horizontal sliding movement.

The lever 9 is housed into the guide element 10 which comprises at the top a pocket 13, into which is positioned the hook end 12 of said lever 9 and into which can be housed, to the side of said hook end 12, the frame tailpiece 8. The guide element 10 is apt to perform only vertical movements, being housed between fixed vertical guides 14. The connecting rod 6 - the small end of which is pivoted to the toggle lever 5 - contains the lower part of said guide element 10, being formed as a fork with its big end pivoted to the hook lever 9. At the same time, the rod 6 is partially housed into the element 10 which comprises undercuts suited for the purpose.

As can be seen in fig. 1, each heald frame 2 is provided with two joints 7 for coupling to the respective control linkage 3, the loom being equipped with a pack of adjacent frames 2, each moved by a linkage 3.

The guide elements 10, light and economic, are positioned side-by-side in direct mutual contact - as shown in figs. 4 and 5 - since there are no interferences between the single hook levers 9 and between the single connecting rods 6 associated thereto, which are housed - as seen - into appropriate seats and/or undercuts of said elements 10. Because of the arrangement adopted, the guide elements 10 do not require the use of the conventional rack of known technique. It is hence possible to advantageously obtain a very compact structure. Although the guide elements, thus arranged, slide one against the other during loom operation - according to the lifting and lowering movements imparted on the single heald frames - this involves no problems, since the friction between the contacting surfaces of said elements is very limited due to the nature of the plastic material from which they are made.

It should finally be noted - see figs. 2 and 3 - that the pivoting shaft 15 of the toggle levers 5 is mounted on eccentric pins 16 to allow, when required, the simultaneous lifting or lowering of all the heald frames 2.

The coupling between the linkages 3 and the frames 2 can be easily removed and reset - thanks to the joints with fast engagement and release of the present invention - by operating, not singly on each frame, but simultaneously on the whole pack of frames. In fact, each heald frame can be very rapidly connected to the respec-

tive linkage by a simple vertical movement, causing the insertion of the tailpieces 8 into the pockets 13 of the guide elements 10, followed by a horizontal movement, causing the engagement of the hook ends 12 into the seats 11 of said tailpieces 8: both said movements can be obtained by shifting the whole pack of frames 2 in respect of the sets of guide elements 10 and of the hook levers 9. The disconnection of the heald frames from the respective linkages is obtained - just as simply and rapidly - by two movements imparted in an order and direction opposite to the previous ones.

Each time one operates the replacement of a pack of frames in the loom, it will be a good rule to fill with lubricant the pockets 13 of the plastic guide elements 10, so as to favour the engagement and release between the tailpieces 8 and the hook ends 12 of the levers 9.

When wishing to obtain the simultaneous lifting or lowering of all the heald frames 2, it is sufficient to impart a suitable rotation on the eccentric pins 16 of the pivoting shafts 15 of the toggle levers 5.

As can be seen, the coupling between the heald frames and the respective control linkages is obtained - according to the invention - by way of members (the hook levers 9) directly connected to the end rods (6) of said linkages, with very light guide elements (10 in 14) which are not subject to the lifting and lowering loads of said frames. Said coupling is moreover favoured by the presence of a complete and permanent lubrication, while low frictions are produced between the non-lubricated reciprocally slidable parts, with evident advantages as far as loom operation taking into account the high speeds of the mechanical members involved.

It should finally be noted that, besides providing a fast and simple engagement and release of the heald frames from their control linkage, the joint of the present invention is particularly efficient and reliable, long-lasting and of limited cost.

Claims

1. Joint, with fast engagement and release, for coupling to the heald frames (2) of looms the end connecting rods (6) of the control linkage (3) for said frames, characterized in that it comprises: tailpieces (8) with a C-shaped seat (11) projecting from the bottom of the frames (2); levers (9) with a hook end (12) apt to engage into said seat (11) and the other end of which is pivoted onto the big end of said connecting rods (6); and guide elements (10) of plastic material apt to perform only vertical movements and to contain said levers (9), said guide elements (10) comprising an upper end pocket (13) to house said tailpieces (8) and allow them to move horizontalwise in respect of the hook ends (12) of said levers (9).
2. Joint as in claim 1), wherein said pocket (13) is filled with lubricant.
3. Joint as in claims 1) and 2), wherein said connecting rods (6) are formed as forks containing said guide elements (10) and are partially housed into the same.
4. Joint as in claims 1) to 3), wherein said guide elements (10) of plastic material are in direct mutual contact.

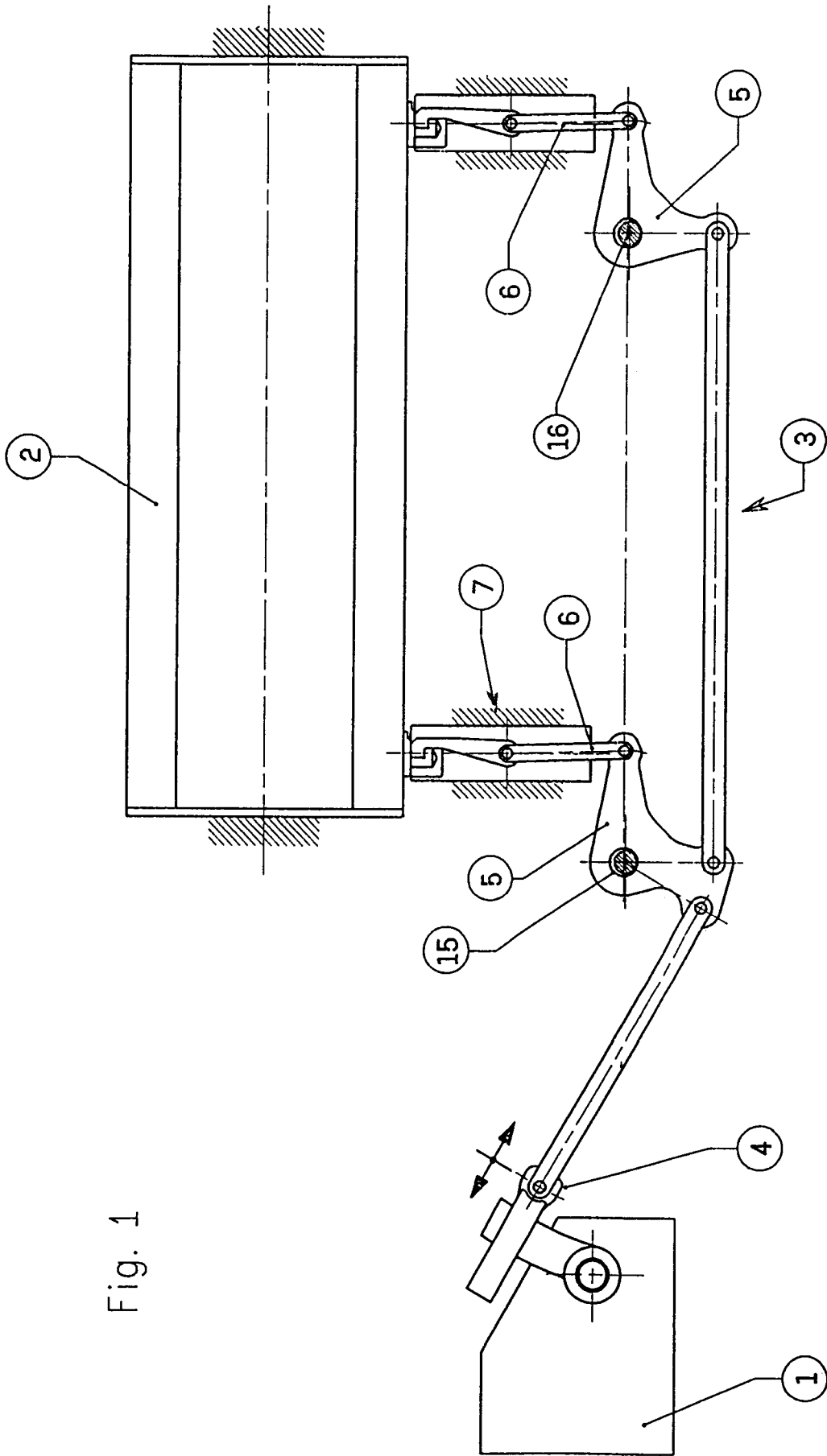


Fig. 1

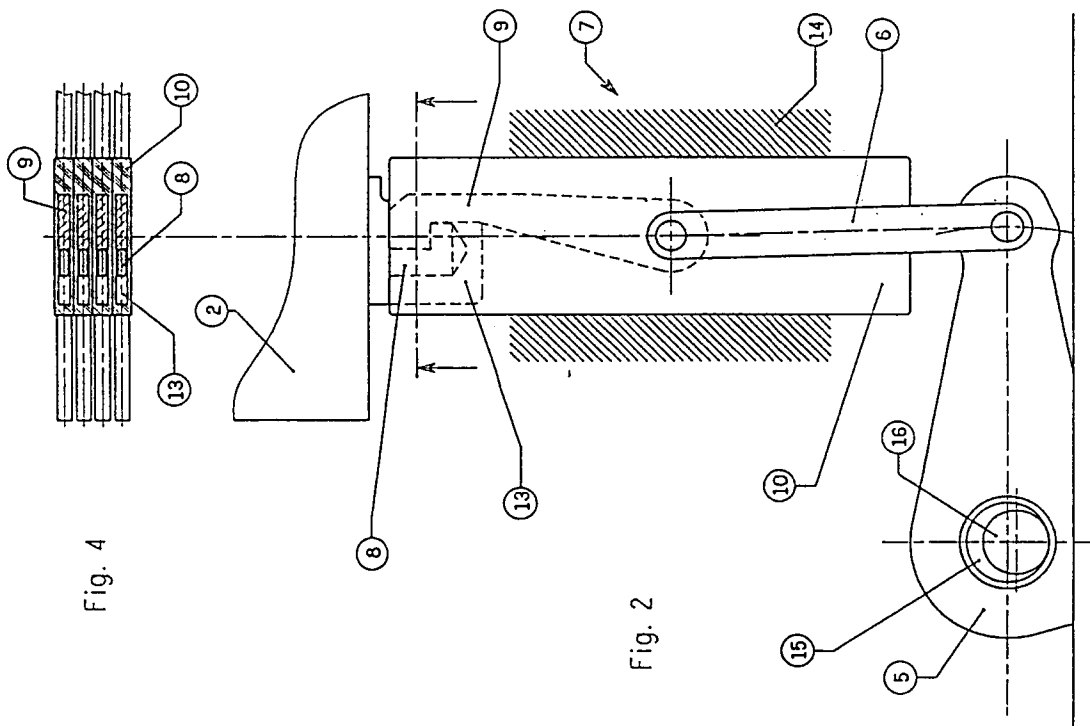
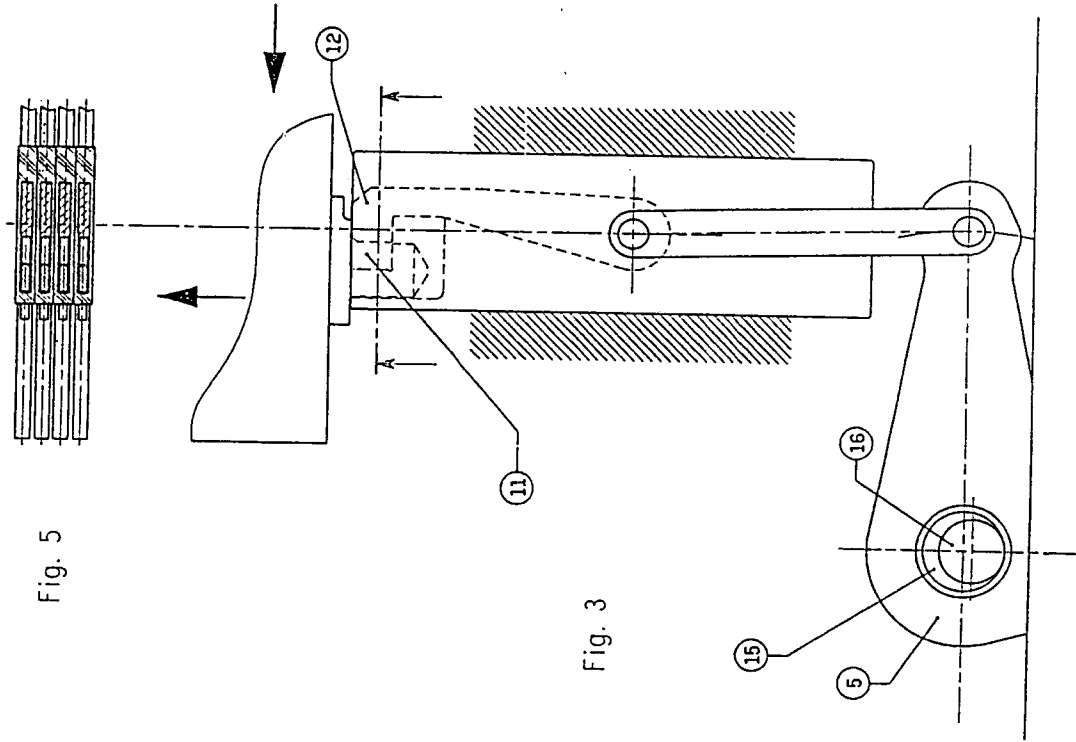


Fig. 5

Fig. 4



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EUROPEAN SEARCH REPORT

Application Number
EP 95 11 7429

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.6)
A	FR-A-2 318 959 (SULZER) * page 4, line 5 - line 36; figure 1 * ---	1	D03C9/00 D03C1/14
A	CH-A-488 830 (SULZER) * figures 1-6 * ---	1	
A	CH-A-451 040 (EGELHAAF) * column 2, line 8 - line 20; figure 1 * -----	1	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			D03C
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 19 January 1996	Examiner Boutelegier, C
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 03.02 (P04C01)