

# United States Patent

[11] 3,587,662

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 [33] **France**  
 [31] **49539**

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[54] **WEFT DISTRIBUTOR FOR SHUTTLELESS LOOM**  
 4 Claims, 20 Drawing Figs.

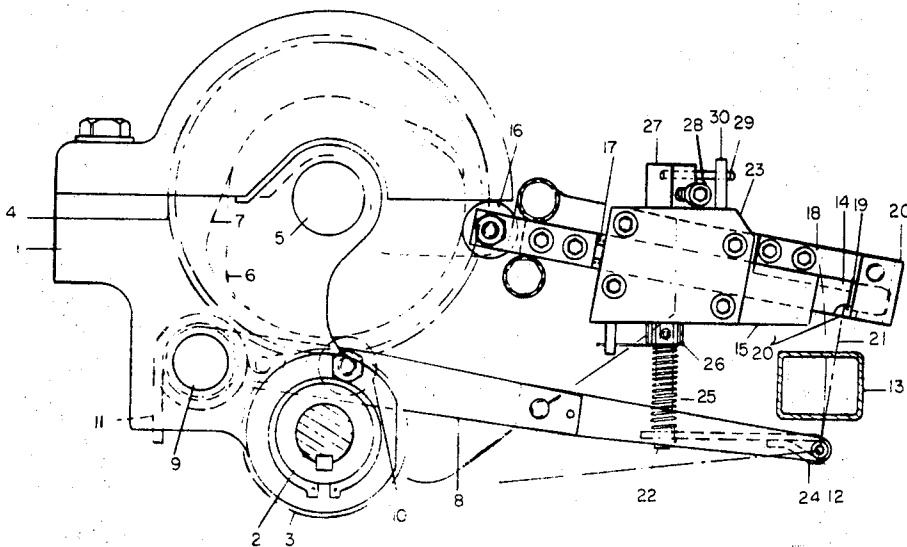
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**139/127**  
 [51] Int. Cl. .... **D03d 47/12,**  
**D03d 47/34**  
 [50] Field of Search ..... **139/122-**  
**—127**

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**ABSTRACT:** A weft distributor for a shuttleless loom comprises a clasp associated with a thread cutter, in combination, on one hand, with a weft feed actuated for a rising and falling movement and, on the other hand, with a pivoting tip for holding the weft. The clasp includes a blade moving longitudinally in a slide so that a flat end of the blade can grip the weft yarn against a small elastic plate. One edge of the blade constitutes a shears cooperating with a fixed back blade constituting the thread cutter. The movement of the pivoting tip is controlled by an axially movable shaft bearing a coaxial return spring and stops. These elements are coordinated by cam and lever actuators so that when the clasp is open and hence no longer holding the free end of the weft, the feed rises to place the weft in the path of the needle. The weft held in the tip is only released when the tip has pivoted under the action of the tension due to the displacement of the picking needle.



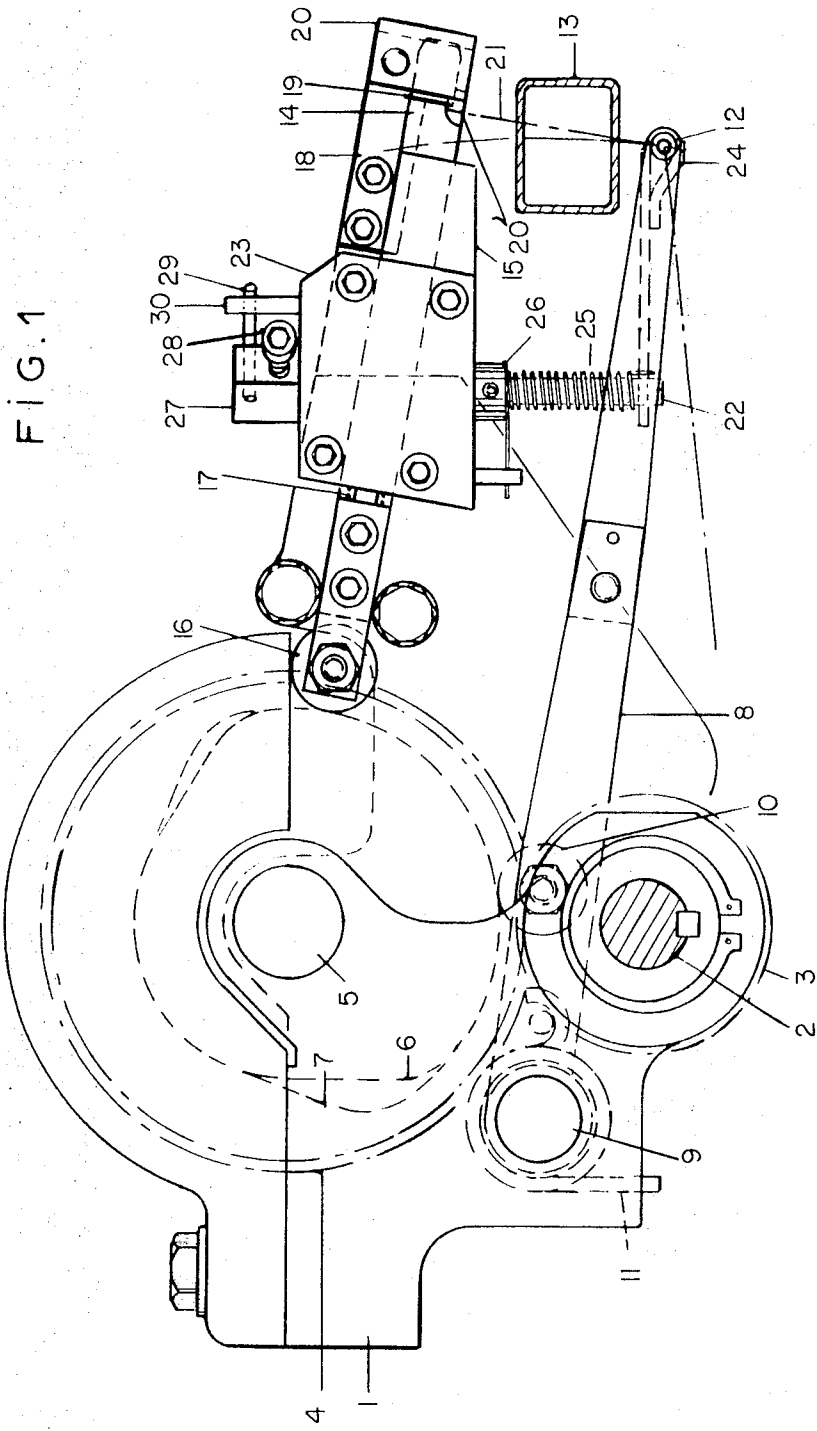
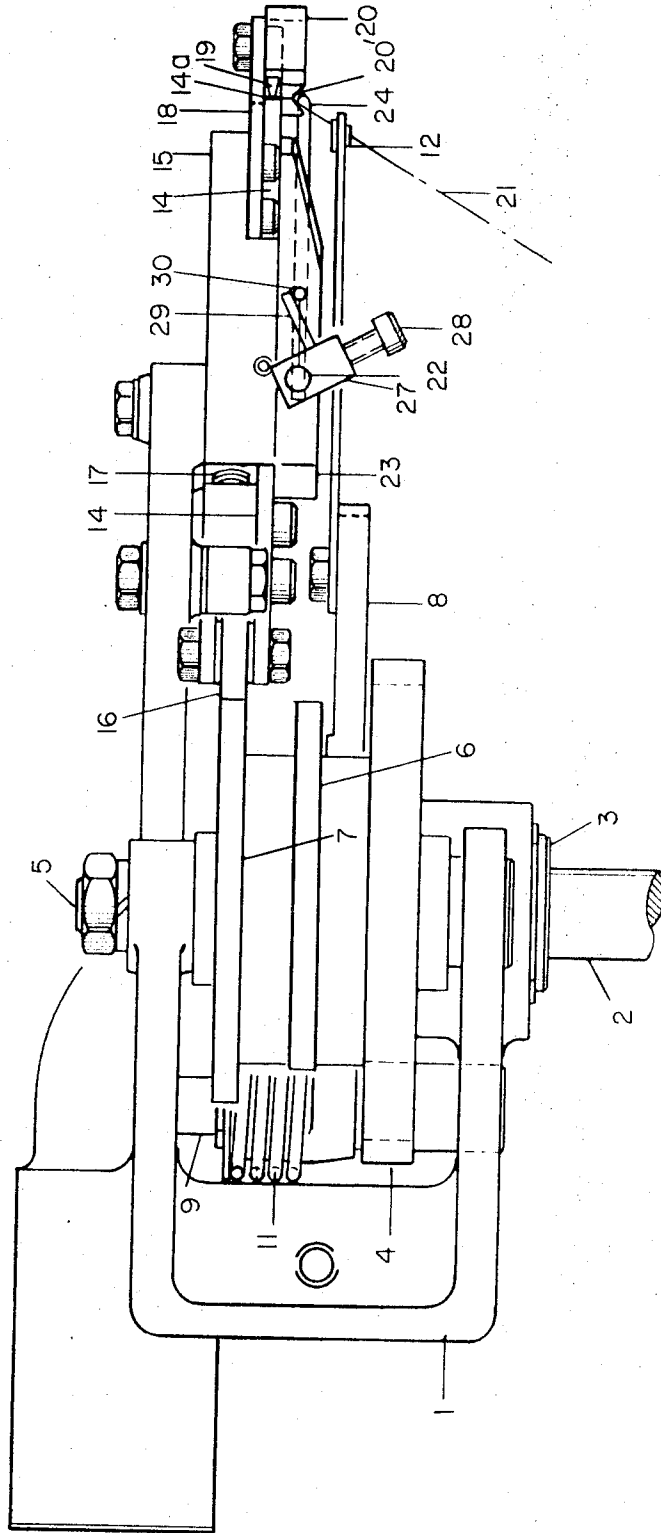
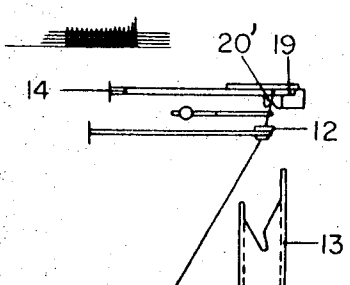
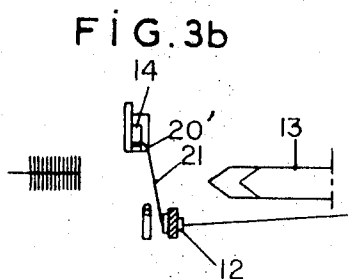
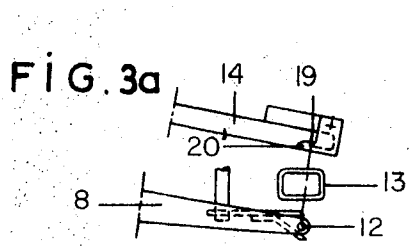
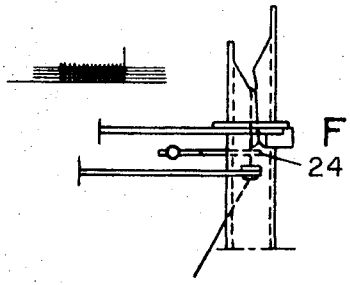
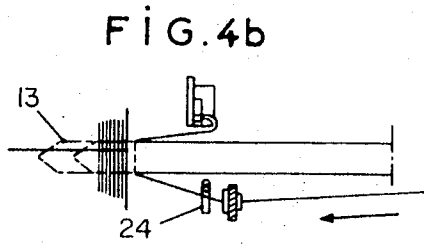
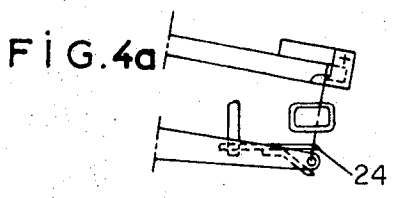


FIG. 2





**FIG. 3c**



**FIG. 4c**

FIG. 5a

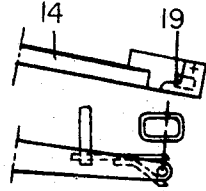


FIG. 5b

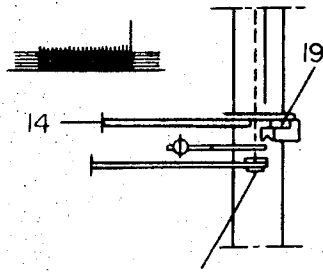
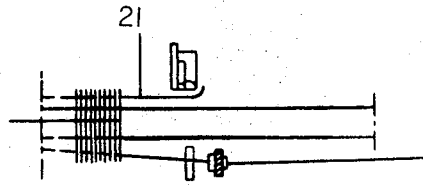


FIG. 5c

FIG. 6a

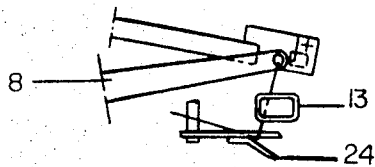


FIG. 6b

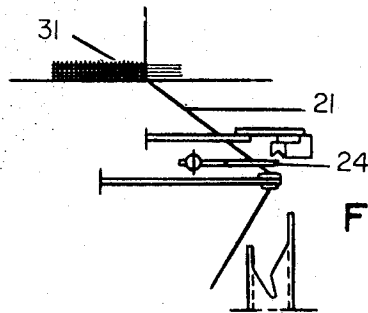
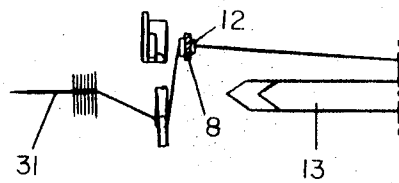


FIG. 6c

FIG. 7a

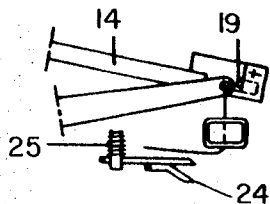


FIG. 7b

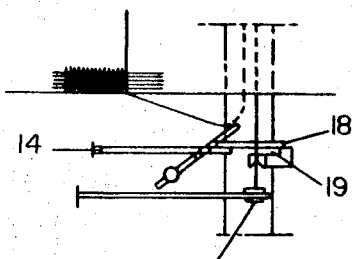
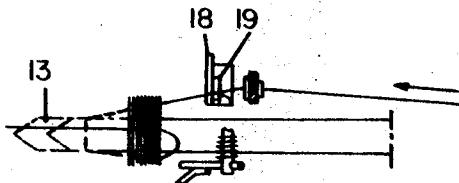


FIG. 7c

FIG. 8a

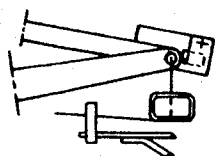


FIG. 8b

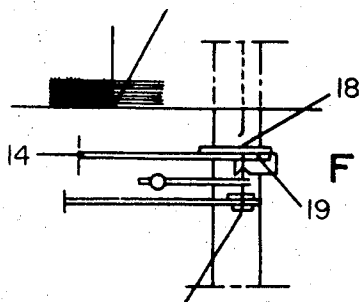
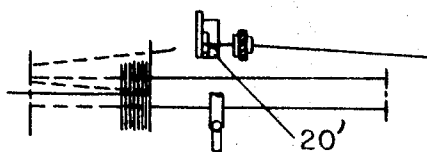


FIG. 8c

## WEFT DISTRIBUTOR FOR SHUTTLELESS LOOM

The present invention relates to a weft distributor for shuttleless loom and more particularly to a mechanical assembly for presenting the weft opposite the head of the needle of a shuttleless loom operating on the "Gabler" principle.

According to the invention a weft distributor for a shuttleless loom comprises a mechanical assembly comprising a clasp associated with a thread cutter, in combination on one hand, with a weft feed actuated for a rising movement and, on the other hand, with a pivoting tip for holding the weft so as to present the weft thread across the path of the picking needle. These elements are arranged so that, when the clasp is opened, and no longer securely holding the free end of the weft, the feed rises to place the weft nevertheless in the path of the needle, the weft being positioned, furthermore, in the aforesaid holding tip and only escaping from the latter when under the tension caused by the displacement of the picking needle and the turning of the tip.

In order that the invention may be more fully understood one embodiment of a weft distributor according to the invention is described below purely by way for illustrative example only, with reference to the accompanying drawings, in which:

FIG. 1 is a view of the mechanism of said embodiment in side elevation;

FIG. 2 is a view of the embodiment of FIG. 1 in plan view from above; and

FIGS. 3a, 3b, 3c to 8a, 8b, 8c show schematically the principal phases of the movement, the index *a* being allocated to the views of side elevation, the index *b* to the front views and the index *c* to the plan views from above.

In the drawings, a frame 1 supports a drive shaft 2 on which is mounted a gear wheel 3 in mesh with a gear 4 turning loosely on an axle 5 and on which are rigidly attached cams 6 and 7, this assembly turning at the rate of one turn for each two turns of the loom.

The cam 6 has the function of actuating a lever or arm 8 constituting the weft feed. The lever 8 is hinged at 9 and comprises a roller 10, a return spring 11 and a thread drawing eyelet 12. The thread drawing eyelet 12 can be moved to occupy two positions, namely a position below the position of passage of the head of the needle 13, or a position above the position of the head of the needle 13.

The cam 7 has the function of controlling a movable blade 14 sliding in a slide 15 and comprising a roller 16 drawn back against the aforesaid cam 7 by a spring 17 housed almost entirely in the mass of the slide 15. The movable blade 14 comprises a cutting edge 14a which constitutes a shearing means against a fixed back blade 18, and the flat end of the blade 14 constitutes a clasp by bearing against a small plate of plastics material 19 located in the housing of a support part 20. Support part 20 comprises, in addition, a small claw 20' for holding the weft 21 correctly in front of the clasp, in spite of the downward pull to which the weft 21 is subjected when the lever 8 descends.

Another movable assembly mounted on a shaft 22 and oscillating freely in a vertical bore formed in the wall 23 of the slide 15 comprises a tip 24, a return spring 25, a stop ring 26, another ring 27 situated at its top, a fixing screw 28 and a rod 29, the screw 28 and the rod 29 limiting the oscillation of the movable assembly by abutting against a rod 30 supported by the slide 15.

The oscillating movement of this latter assembly is caused only by the hooking and unhooking of the weft in the tip 24.

The operation of this weft distributor discussed with reference to the diagrams of FIGS. 3a, 3b, 3c, 4a, 4b, 4c, 8a, 8b, 8c showing the principal phases of the operation distributing over two turns of the loom, that is to say two to and fro movements of the sley.

FIGS. 3a, 3b, 3c show the position of the various elements at the moment of striking of the sley, that is to say at 0° on the first turn. At this moment, the end of the weft, after having been cut by the cutter 14a remains gripped between the movable blade 14 and the flexible plate 19; it then passes around

the claw 20' and is held in a lowered position by the lever 8 in the eye 12, of which it passes through. The weft is thus presented vertically in front of the head 13 of the needle.

FIGS. 4a, 4b, 4c are located approximately at 90° on the first turn. The weft is drawn in the form of a loop by the head 13 and is then engaged on the upper branch of the tip 24 in which it will remain until the following pick.

FIGS. 5a, 5b, 5c are located approximately 180° on the first turn. This is the moment when, in the well-known "Gabler" system, the weft loop is exchanged from the head of one needle to the other in the middle of the web.

The length of the divided weft is then equal to the width of the web and this the weft is immobilized, during a short dwelling period effective at the dead-point of the stroke of the heads. At this moment the movable blade 14 separates from the flexible plate 19, which frees the end of the weft 21, the unreeling from the external reserve being blocked by an attached conventional device (not shown).

The spreading of the loop is then freely effected and a weft is thus deposited between the warp threads.

FIGS. 6a, 6b, 6c are located at approximately 0° on the second turn. The first pick which was previously deposited is pressed against the web by the comb of the sley (not shown).

The weft 21 is then engaged at the bottom of the tip 24 while the lever 8 then rises to present the weft vertically opposite the head 13.

FIGS. 7a, 7b, 7c are situated at approximately 90° on the second turn. The weft is drawn into the form of a loop by the head 13 and is engaged, on one hand, between the movable blade 14 and, on the other hand, between the fixed blade 18 and the flexible plate 19. At the same moment, the weft has caused the tip 24 to pivot and is freed therefrom, the latter then resuming its waiting position under the action of its return spring 25.

FIGS. 8a, 8b, 8c are situated at approximately 180° on the second turn, which corresponds to the moment when, as previously explained, the pick is unwound to the necessary length. The movable blade 14 then pushes the weft over the small claw 20, grips it against the flexible plate 19 and then cuts it with the aid of the fixed back blade 18. The cut end is then free to be drawn up to the opposite selvage of the web.

It should be noted that the selvage located on the side of the weft distributor is normally constituted as in a fabric executed on a traditional shuttle loom.

Of course, various changes and modifications may be made in the embodiment described without departing from the essential concept of the invention as defined in scope by the appended claims.

I claim:

1. A weft distributor for a shuttleless weaving loom comprising clamp means operable for holding and releasing a weft thread, said clamp means including a thread cutter, a pivotal tip element, a thread feeding means including a pivotal arm provided with an eyelet through which said weft thread passes, drive means including a cam for imparting pivotal movement to said arm of said thread means so as to alternately position said eyelet carrying said weft thread opposite said tip element or said clamp means, said clamp means being positioned to receive said weft thread on a first feed pass, said weft thread remaining held by said clamp means as said feeding means moves to place the thread in the path of a weft inserting needle, said pivotal tip element being provided with an opening into which the weft thread is introduced at a second feed pass when said clamp has released the weft thread, the weft thread remaining held by said tip element as the thread feeding means moves to place the thread in the path of the needle, the thread being held by the tip element until the tip element pivots in response to the tension exerted on the thread at the moment when the needle moves in the shed.

2. A weft distributor according to claim 1, wherein said clamp means comprises a movable blade including a flat end, and a plate of resilient material against which said flat end can be urged.

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3. A weft distributor according to claim 2, wherein said thread cutter is constituted by an edge of said movable blade and by a fixed back blade with which said edge cooperates.

4. A weft distributor according to claim 1, wherein the

movement of said pivotal tip element is controlled by a shaft, a return spring coaxially mounted on said shaft, and adjustable stop means for limiting the oscillation of said shaft against said spring.

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