

[54] CUTTING DEVICE FOR LOOMS

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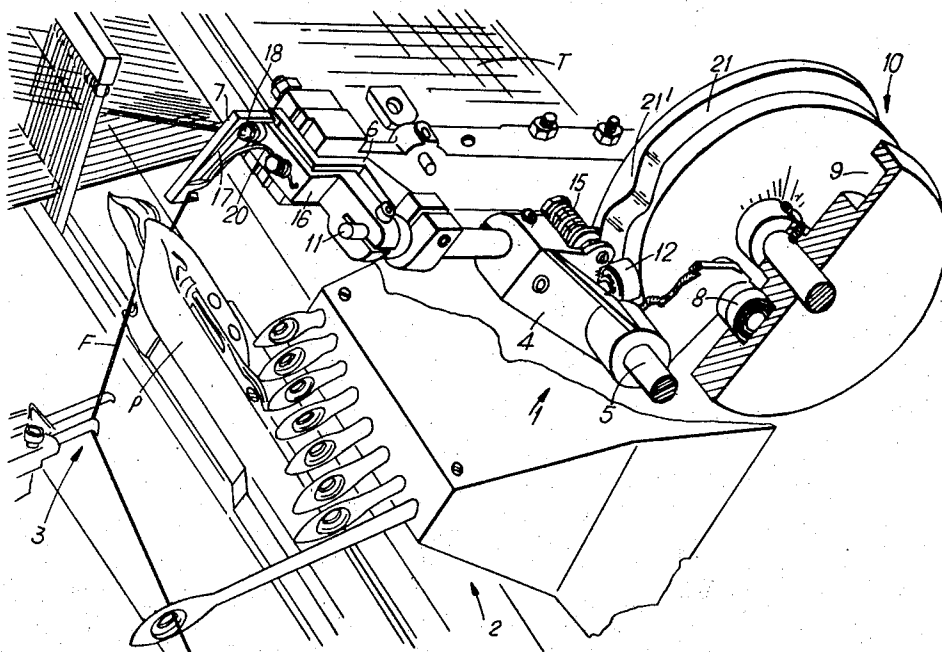
Attorney, Agent, or Firm—Young & Thompson

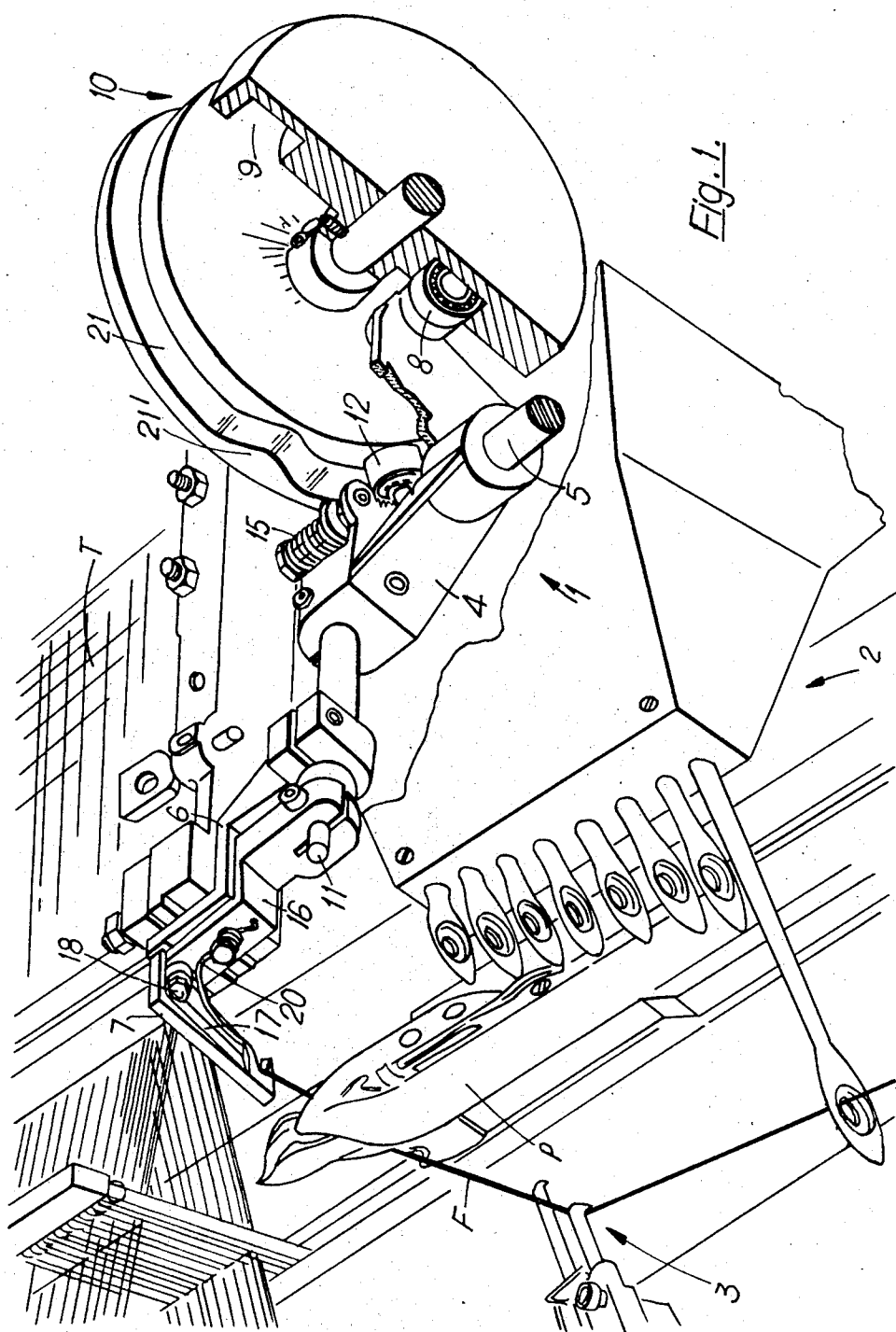
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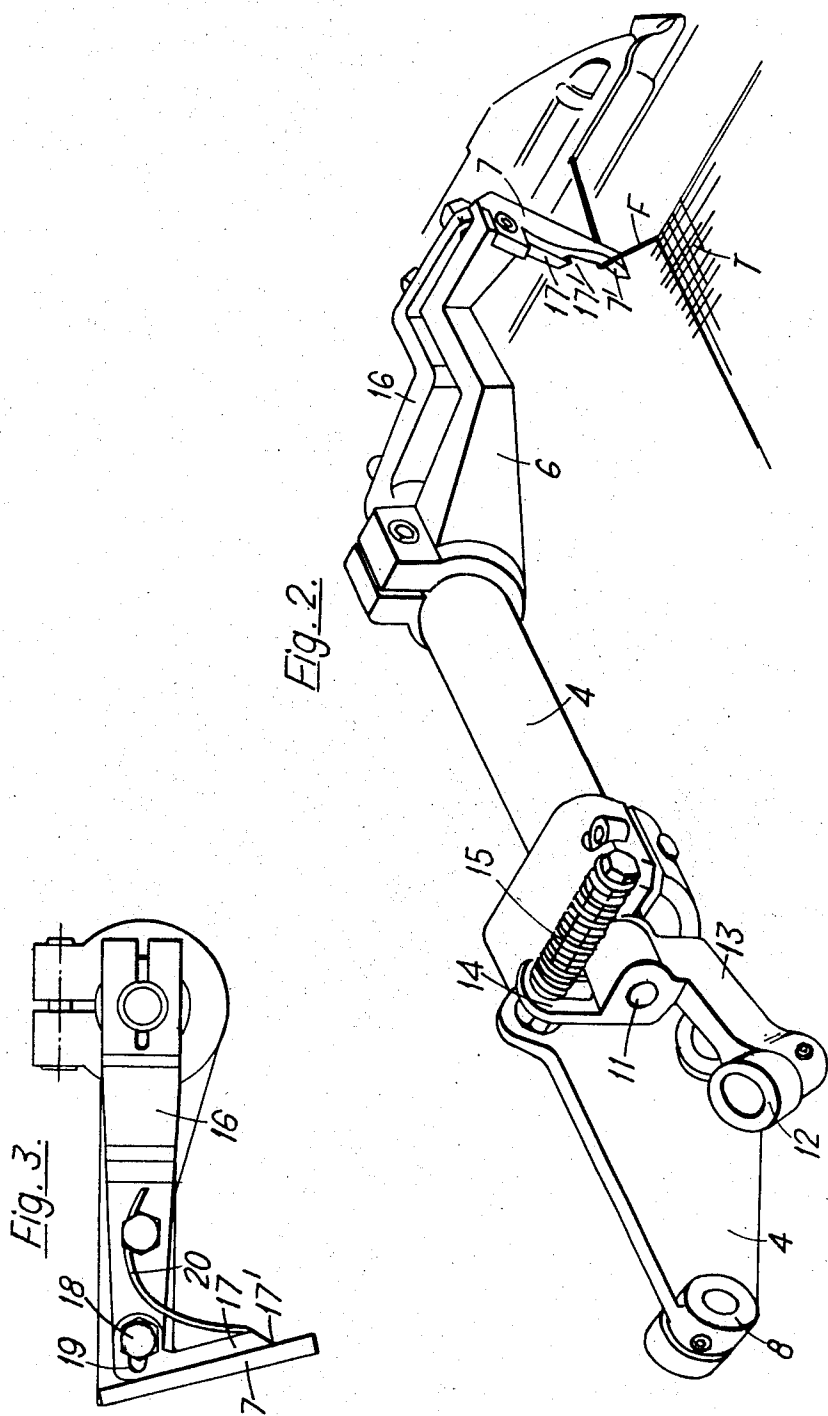
ABSTRACT

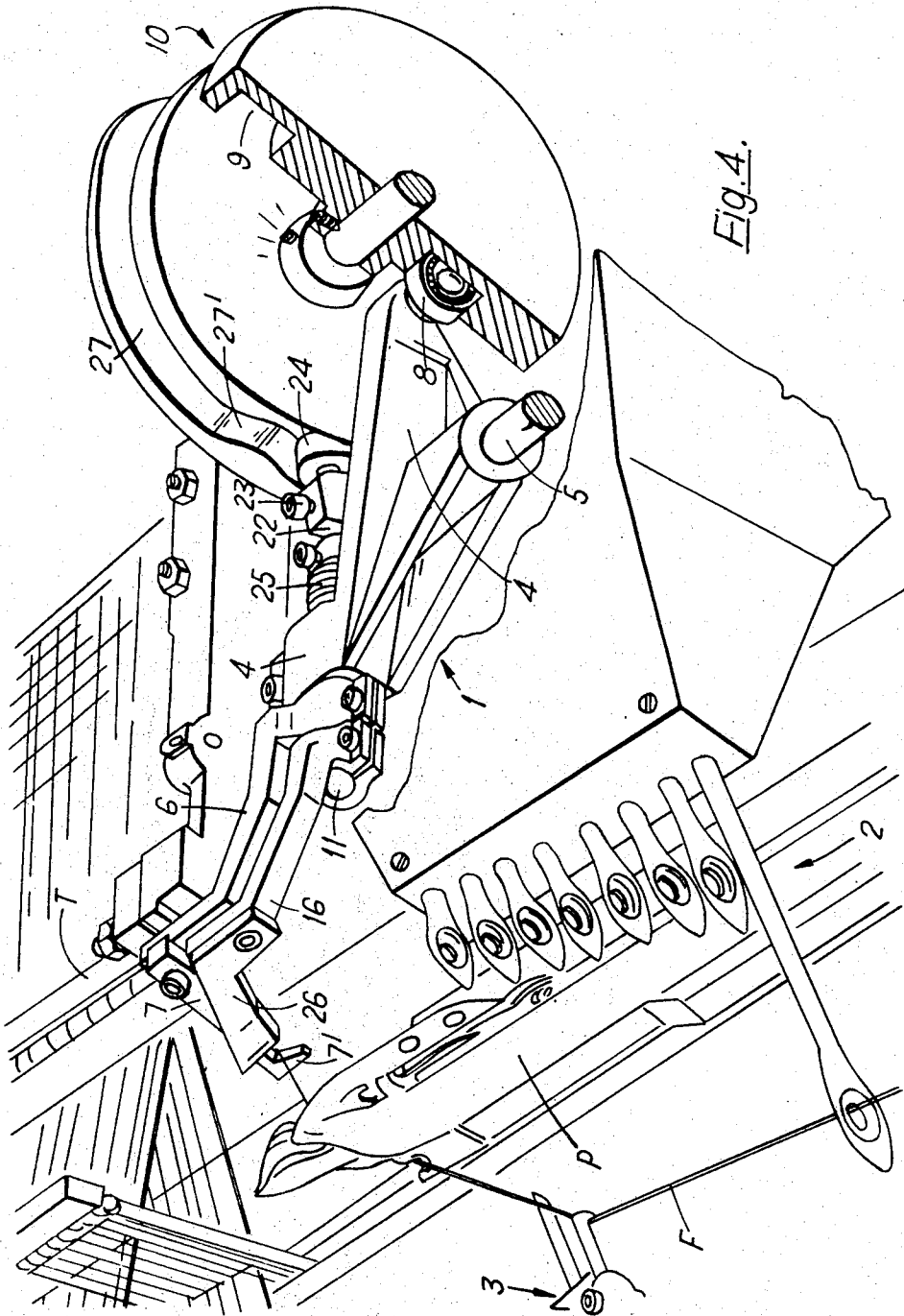
A device to perform the cutting of weft threads in shuttleless looms provided with grippers for carrying the weft threads, in which a cutting blade arranged substantially perpendicular to the weft threads co-operates with a counter blade in respect to which it is operated under the control of cam means. In a first embodiment the blade is perpendicular and in a second embodiment it is parallel to the working path of the grippers.

6 Claims, 5 Drawing Figures









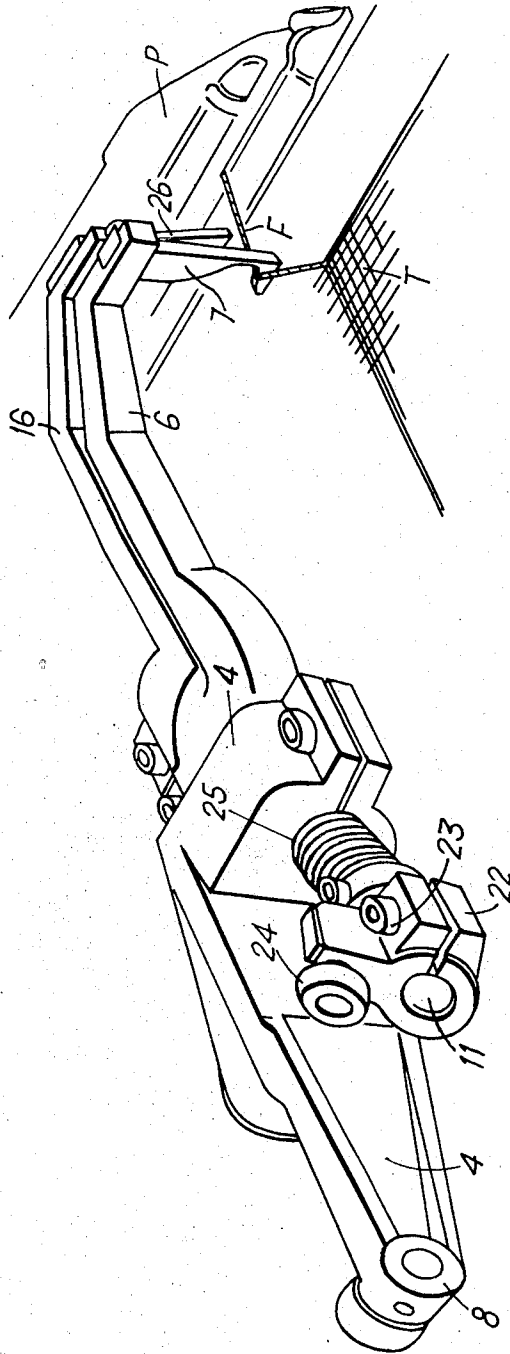


Fig. 5.

CUTTING DEVICE FOR LOOMS

BACKGROUND OF THE INVENTION

It is known that in the shuttleless looms for the continuous feeding of the weft of the type provided with weft carrying grippers for exchanging the weft threads at the center of the shed, the wefts, selected at one end of the shed, are caught by the carrier gripper, are cut and then carried into the shed. The cutting may be performed in various manners and by means of devices which operate in many ways, but it is generally carried out by a cutting element which operates along the running direction of the weft and of the grippers, i.e., lengthwise with respect to the loom. That involves some inconveniences concerning both the cutting of the weft, which is not always carried out correctly, and the engagement of the weft itself on the carrier gripper, which may turn out to be faulty or may occur with delay, so that it may happen that the weft is lost while the gripper runs or that double wefts are picked.

The present invention now concerns a device for cutting wefts, which operates under positive control and reliably and with all types or counts of weft threads and assuring in a definitely improved way that the weft thread is engaged on the carrier gripper provided for carrying it into the shed.

SUMMARY OF THE INVENTION

Such device is substantially characterized by the fact that a cutting blade, which is provided substantially perpendicular to the weft thread, cuts said thread in cooperation with a counter-blade, and is operated with respect to the latter under the control of cam means.

In a preferred embodiment the counter-blade is provided at the end of a hooked element guiding and retaining the weft thread, which is supported by a lever swinging around an axis parallel to the working path of the grippers, while the means which support the cutting blade, and which swing around an axis perpendicular to the working path of the grippers, are associated with said lever.

BRIEF DESCRIPTION OF THE DRAWINGS

The device is herein after described further in detail, merely by way of example, with reference to the annexed drawings, which show a preferred embodiment, and in which:

FIG. 1 is a perspective view of the device as a whole, taken from an upper, side position with respect to the loom, showing the device assembled on the loom, and with parts broken away for clarity;

FIG. 2 is a fragmentary perspective view of the device from the side opposite the side of FIG. 1;

FIG. 3 is a detailed view of the cutting element of the device shown in FIGS. 1 and 2 taken frontally with respect to said device; and

FIGS. 4 and 5 are views similar to those shown in FIGS. 1 and 2 which show a different embodiment of the device according to the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

As FIG. 1 shows, the device 1 according to the invention is mounted on the feeding side of a shuttleless loom for the continuous feeding of the weft, in replace-

ment of a hooked lever of an already known type, for guiding and retaining weft threads and for cutting the same in the conventional way. The device 1 is provided in proximity to the inlet of the shed, after the selecting devices 2 and the presenting devices 3.

The device consists of a lever body 4 which is pivotally connected with the fixed structure of the loom, through a shaft 5, and which ends in a double bell-crank arm 6, provided in an essentially horizontal position, from which, in an essentially vertical position and perpendicular to the working path of the grippers as well as to the weft threads, a guiding and threads retaining hooked element 7 projects downwards, ending in a counter-blade 7'. The above described part of the device is mounted, in a known way, for swinging in a vertical plane around shaft 5 under the control of cam means. To this purpose the end of lever 4 bears a cam follower 8 which co-operates with a front cam 9 of the cam group 10 of the device.

According to the invention, a shaft 11 rotates in a seat in the central part of the lever body 4. Said shaft is connected at one end with a roller cam follower 12 by means of a stirrup 13 bearing a seat 14 provided for a return spring 15 acting against the body 4. At the other end of shaft 11 is connected a double bell-crank lever 16, mounted substantially parallel to the arm 6, to the end of said lever being pivotally connected the blade 17. The latter is mounted by means of pin 18 in a hole 19 of the lever 16, it being possible to adjust it, and is operated by a blade spring 20 which pushes the cutting edge 17' of blade 17 into close contact with the hooked counter-blade element 7, 7'.

The roller cam follower 12, mounted on stirrup 13 by means of a swinging bearing, is engaged by a front cam 21 which is one of group 10 and is provided in front of front cam 9, both cams moving independently from one another, since each of them responds in its own way to the general movement of the loom.

The hooked element 7, as it is clearly shown in FIGS. 1 and 2, has a part of it formed into a recess to guide and retain the thread. Said part is rounded, while the cutting edge of counter-blade 7' is provided only at the end of the element, beyond its recess.

In the embodiment shown in FIGS. 4 and 5, in which the same numerals refer to the same parts, the hooked element 7 is provided in a different position, it being still substantially vertical, but on one side perpendicular to the path of the weft thread and on the other side parallel to the working path of the grippers. Furthermore, differently from the above described embodiment, shaft 11 carries at its end close to the cam group 10 a small support 22 provided with a locking screw 23 for a cam follower 24 and a return spring 25 operating between the body 4 and the small support 22. At the other end of shaft 11 the double bell-crank lever 16 carries at one end a blade 26 provided in the same position as the hooked element 7 for co-operating in cutting with the cutter side of said hooked element. Cam follower 23 co-operates with cam 27 which belongs to the cam group 10.

The other characteristics are the same as those of the previous embodiment.

In the operation of the device of FIGS. 1 or 4, the weft thread F, selected by the selecting device 2 and caught by the presenting device 3, is only slightly inserted into the carrier gripper P by the gripping means with which it has to be engaged and it is still connected

to the fabric T in the making. The device according to the invention is shown in its already lowered position, owing to the control of cam 9, so that the hooked element 7 guides and retains thread F in its recess. In the operating stage which immediately follows the stage illustrated in FIG. 1, cam 21 or cam 27 engage, by means of their protrusion (21' or 27'), cam followers 12 or 23, thus causing shaft 11 to rotate against the action of springs 15 or 25 in the direction which causes the lowering of blade 17 or of blade 26. Then, the lowered blade with its cutting edge engages the weft thread F and cuts it, in the most safe manner, against the end part of element 7 on which counter-blade 7' is provided, said blade co-operating with the counter-blade.

Immediately before all the above happens, gripper P move into a sufficiently forward position as to obtain the safe insertion of thread F into the holding means of said gripper. Therefore, the cut is carried out only after said insertion is performed.

The insertion is guaranteed by the fact that thread F, before it is cut, is supported by a rounded surface of element 7, so that there is no possibility that the cut is carried out before or at the same time as the insertion.

Of course, using a cam control to swing both the whole device and the cutting blade, allows one to set practically in a perfect way the operating times of the guiding and retaining hook and of the cutting blade, and therefore to obtain the best working of the loom for the feeding of the carrier gripper.

Besides, many other advantages are allowed by the device which is the object of the present invention:

First of all an absolute certainty is reached as to carrying out, at any speed of the loom, the cut of the weft threads, even when high count fabrics are worked.

Further, there is the absolute certainty that the cut is carried out when the weft thread was already inserted into the carrier gripper, as was said above. As a consequence, the possibility is excluded that double wefts are formed.

The possibility is offered to remarkably reduce the size of the cutting element and this fact, together with the particular form it was given, reduces the inconvenience,

which is often present in the known cutting devices, that non-selected weft threads are unexpectedly cut by mistake, they were engaged by the cutting element.

Finally, the heretofore described device, in spite of the complexity and precision of the operation performed, is extremely simple, rational, easy to be manufactured and adjusted and remarkably compact.

I claim:

1. In a continuous weft feeding loom having a shed and grippers carrying weft threads into the shed and transferring said threads at the center of the shed to further grippers entering the shed from the opposite direction, and weft thread cutting means oscillable about an axis parallel to the path of the grippers between a rest position and a cutting position and comprising a blade and a counter blade and means to move said blade and counter blade relative to each other to cut the weft thread; the improvement comprising means for moving said counter blade relative to said blade about an axis perpendicular to said path to the grippers, means to effect said movement of said cutting means to said cutting position and said relative movement of said blade and counter blade to cut said thread when said grippers move toward said center of the shed, and separate first and second rotary cam means to control the movement of said blade and counter blade.

2. Apparatus as claimed in claim 1, said cutting means comprising a lever mounted for oscillation about an axis parallel to said path of the grippers, said lever terminating in a hook element for guiding and retaining the weft threads, said counter blade being disposed close to the free end of said hook element.

3. Apparatus as claimed in claim 2, and spring means interconnecting said blade and counter blade.

4. Apparatus as claimed in claim 2, in which said hook element has a rounded portion for guiding and retaining the weft threads.

5. Apparatus as claimed in claim 1, in which said blade is perpendicular to said path of the grippers.

6. Apparatus as claimed in claim 1, in which said blade is parallel to the path of the grippers.

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