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(54) Weft cutting device on looms.

(57) The invention relates to looms and more specifically to a device for cutting the weft thread (3) outside one or both edges of a weave (10). A pointed edge (13) on a stop (12) faces the front part of the loom and is fixed relative to the reed (2) of the loom and accompanies it in its beating-in motion. A counterhold (11) occupies a primarily fixed position relative to the frame of the loom and is disposed with a region (17) with a softer material than in the edge (13). The stop and the counterhold are movable relative to one another and assume in one of their end locations positions in which the edge (13) interacts with the region (17) with the softer material. The edge thus preferably abuts this softer material and thereby cuts the weft thread (3). The softer material normally comprises an elastic polymeric material e.g. rubber, plastic, etc. and thereby forms a block which is replaceably fastened in a holder (16).

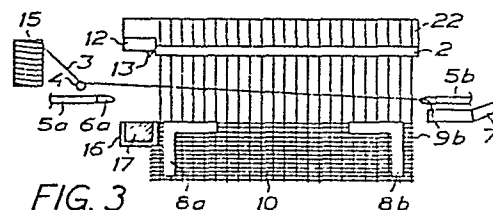


FIG. 3

Device on looms

NOT RECORDED
see front page

The present invention relates to a device on looms, where the weft threads are inserted in the shed from a stationary thread magazine by means of one or more reciprocating devices which move transversally in relation to the batten of the loom, and more specifically to a device for cutting off the ends of the weft threads that extend beyond one or both edges of a weave.

In looms of this type it is generally necessary that the weft threads are trimmed prior to a subsequent beating-in action being initiated. It is thus desirable that the ends of the weft threads which protrude from the weave are as short as possible.

Devices for trimming the ends of the weft have been previously known. Particularly well-known are shears with reciprocating movements. These known solutions possess the disadvantage that the shears in the trimming location occupy positions which mean that they must be moved aside in order not to come into contact with the reed when the weft is beaten in by the latter. This leads to complicated mechanical designs that make the equipment more expensive and impair its operational reliability. In addition, the shears wear relatively rapidly and must be frequently sharpened or replaced. Grinding and/or replacement of the shears leads in itself to major costs, to which can be added the cost of down-time during the repair operation.

Trimming devices have also been previously known where one of the shanks of the shears is permanently attached to the batten at at least one end of the reed outside the outermost leaf of the reed and parallel thereto. The other shank is affixed to a shaft which in the embodiment with shears placed on either side of the reed is continuous, in addition to which the shaft is located below the lower threads of the warp. The shaft is furthermore

affixed to a lever which is in turn articulatedly connected to a connection rod whose other end is movable around a fixed joint. During the beating-in action of the reed the shaft is displaced from the fixed joint, causing the connection rod to rotate the shaft due to the action of the lever, and thus the second shank of the shears is rotated towards the first. The required trimming motion is thus achieved.

Even if the technique described in the preceding paragraph constitutes a simplification in relation to technique described previously, the trimming devices include a transfer mechanism as well as a shaft which is rotated in order to achieve the trimming motion of the shanks. This means that the aforementioned rapid wear of the shears is still present and the major expense caused thereby still persists.

The present invention indicates a device where all moving parts of the trimming device have been eliminated and where the shearing motion of the trimming device has been replaced by a cutting motion, by which means the operational reliability of the loom has been considerably improved. By means of the invention the rapid wear of the cutting tools caused by the shearing motion is also eliminated.

In accordance with the invention a stop and a counterhold are disposed outside one or both edges of a weave, whereby the stop or the counterhold is affixed relative to the reed and accompanies it in its motion. The stop is disposed with a pointed edge which faces the weft of the weave at an angle. The device which is not affixed to the reed and ^{not} accompanies it in its motion has a fixed position in the loom outside the weave in a region adjacent to the position of the weft threads after beating-in has commenced.

In a preferred embodiment of the invention the counterhold in the region where it interacts with the pointed edge of the stop comprises a softer material than that of the pointed edge. This

softer material normally comprises an elastic material, e.g. a polymeric material such as rubber or plastic. The softer material preferably forms a replaceable block which is inserted in a holder in the counterhold.

5 Practical applications of the invention have shown that the cutting tools retain their sharpness during a very lengthy period of time and that the latter require grinding after a time interval which is up to ten times as long compared with those intervals which are applied in accordance with known techniques.

10 The invention is described in greater detail in conjunction with a number of figures where

figs. 1-4 show plane views of a loom at subsequent stages of its operation, where the loom is disposed with a cutting device in accordance with the invention, whereby the figures only include such devices as are of significance for the comprehension of the invention.

In the figures the number 1 designates warp threads which pass through a reed 2 in order to form the warp in a weave 10. The reed is supported by a batten 22. A weft thread 3 passes from a thread magazine 15 through a thread guide 4 and is displaced in the embodiment of the invention shown in the figures by means of weft inserters 5 a,b through the warp. The weft inserters are disposed with gripping devices 6 a,b in accordance with known technique for retention of the weft threads. A suction nozzle 7 is disposed at least on the side of the weave that faces away from the feed side of the weft thread. The figures also contain temple devices 8 a,b. Ends of the weft thread protruding from the warp and the weave, respectively, have the reference designation 9.

In the embodiment of the invention shown in the figures a stop 12 is affixed in the vicinity of the reed 2, preferably on the batten 22. The stop is disposed with a pointed edge 13 that faces the front part of the loom (downwards in the figures) and at an angle to the weft thread 3. In a region outside the edge of the weave and next to the position to which the weft thread is beaten in there is disposed a counterhold 11 with a holder 16 for a block 17 of a material softer than the material of the edge 13.

The figures describe the sequence of insertion, beating in and clipping of a weft thread in the weave. In fig. 1 the reed 2 is located in its rear position and the weft inserter 5a retains the end of the weft thread 3 by means of the gripping device 6a as the inserter moves simultaneously towards the other edge of the weave. In fig.2 the weft inserter 5a is met by the weft inserter 5b which picks up the weft thread 3 and retains it by means of the gripping device 6b as the inserter returns to its original position outside the other edge of the weave. The weft thread 3 is thus drawn inwards between the wrap threads 1 by means of the motion of the weft inserters. Fig. 3 shows the position of the weft inserters and the weft thread once the drawing-in of the weft thread has been terminated.

As can be seen from fig. 3 both weft inserters are now located outside the edges of the weave, thus exposing the space between the reed 2 and the weave that has already been formed in order to enable the beating-in motion of the reed. During this the gripping device 6b of the weft inserter releases its grip on the weft thread simultaneously with the reed 2 displacing the thread towards the weave and also drawing out a small piece of thread from the thread magazine 15. During the concluding part of the beating-in motion of the reed, cf. fig. 4, the weft thread is cut off between the pointed edge 13 of the stop 12 and the block 17 of the counterhold. This takes place preferably in that the pointed edge is displaced so far that it deforms the block 17 somewhat, thus

cutting the weft thread. The elasticity in the material of the block ensures that this deformation is eliminated when the reed has commenced its return to its rear position.

Fig. 4 also shows how in conjunction with cutting the weft thread 3 is tensioned between the thread guide 4 and the stop 12, by which means the thread possesses an exact position which allows the gripping device 6a on the weft inserter 5a to fix the weft thread once more. When the reed 2 has returned to its rear position the weft inserter 5a can thus commence its displacement towards the other edge of the weave in order to insert the next weft thread in the warp.

In the figures the counterhold 11 and the stop 12 are shown adjacent to only one edge of the weave, but in accordance with the invention corresponding devices (counterhold and stop) are disposed in certain embodiments of the same also in the vicinity of the other edge of the weave. The suction nozzle 7 thereby ensures that the free end of the weft thread extends beyond the warp, by which means the free end of the weft thread is cut off between the pointed edge 13 of the stop and the block 17 of the counterhold during the motion of the reed towards its forward position.

It will be clear from the above description that the invention allows great freedom in the location of counterhold and stop. Even if these are disposed in the embodiment shown in the figures in order to achieve the cutting of the weft thread when the reed is located in its forward position, and thus the weft thread is in its beaten-in position, the counterhold and the stop are disposed in certain embodiments in order to perform the cutting function during an earlier part of the motion of the reed towards its forward position. This embodiment is particularly suitable for use in those applications where the fabric is being woven with selvage.

The aforementioned fixing of the stop 12 relative to the reed 2 comprises likewise solely one example of an embodiment of the

invention. The stop 12 is in other embodiments fixed relative to the frame of the loom while the counterhold 11 is fixed relative to the reed. In a further embodiment of the invention the pointed edge 13 is disposed on the counterhold while the stop includes the
5 region of softer material that interacts with the edge 13.

In addition to the foregoing description the invention is also revealed in the claims hereinafter.

CLAIMS

1. Device for trimming the thread portions (9 a,b) of the weft (3) that protrude beyond one or both edges of a weave (10) in looms with fixed thread magazines (15) for the weft thread, where the device includes cutting devices movable relative to one another, whereby one of the cutting devices is primarily
5 immobile relative to the reed (2), characterised in that the cutting devices include a stop (12) and a counterhold (11) disposed for motion towards and away from one another, that one of said devices (12,11) is disposed with a pointed edge
10 (13) facing towards the other device and towards a weft thread located between the devices but not yet inserted, that said second device in a region (17) for interaction with the pointed edge (13) comprises a material that is softer than the material in the pointed edge and that in the end position for the relative motion of the devices (11,12) towards
15 one another the edge (13) abuts the material of said region (17) or is relative to the region located at a minimum distance that is inferior to the diameter of the weft thread, by which means in the final stage of motion towards the aforementioned end position a weft thread located between the devices
20 (11,12) is cut off or weakened until it breaks.
2. Device as claimed in claim 1, characterised in that the pointed edge (13) is disposed on the stop (12).
3. Device as claimed in claim 1, characterised in that the pointed edge (13) is disposed on the counterhold (11).
- 25 4. Device as claimed in any of claims 1-3, characterised in that the device disposed with the pointed edge (13) is fixed relative to the reed (2).
5. Device as claimed in any of claims 1-3, characterised in

that the device disposed with softer material for interaction with the edge (13) is fixed relative to the reed (2).

- 5 6. Device as claimed in any of claims 1-5, characterised in that the softer material for interaction with the edge (13) comprises an elastic polymeric material, e.g. rubber, plastic, etc.

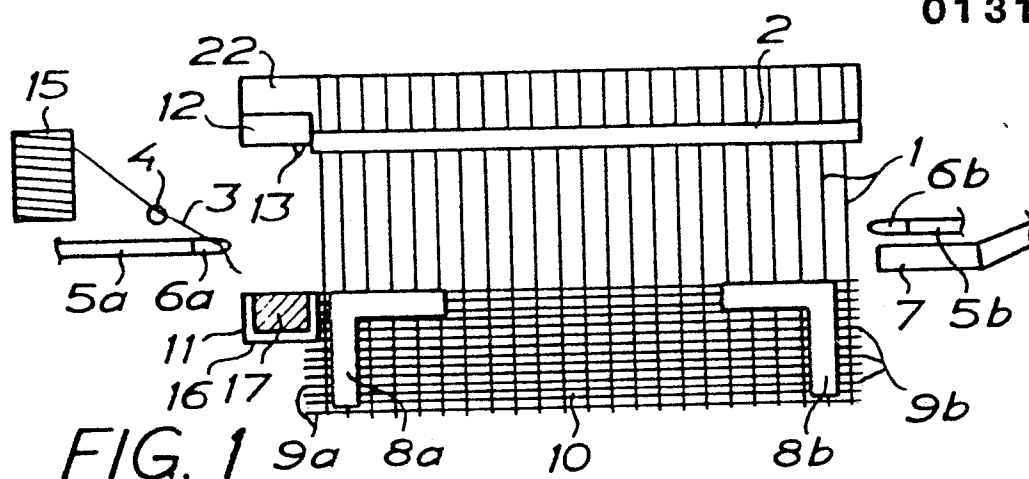


FIG. 1

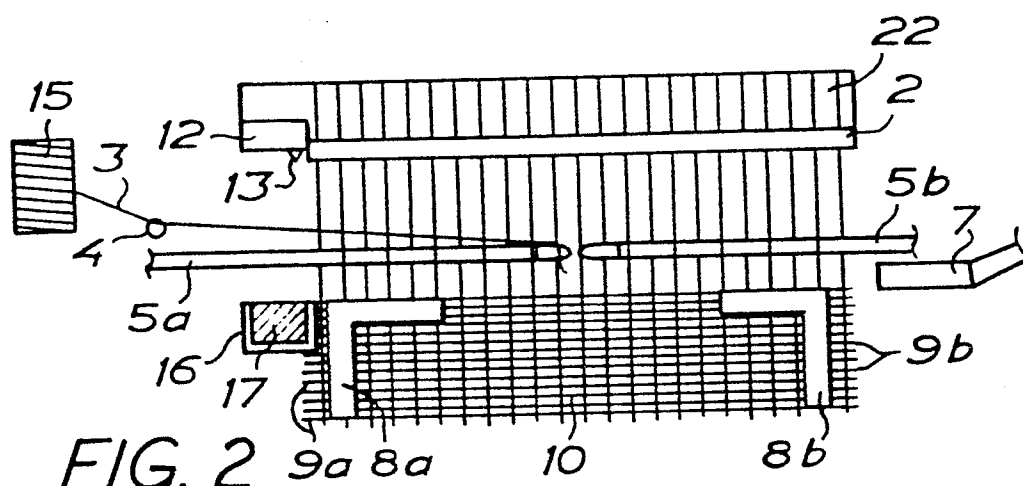


FIG. 2

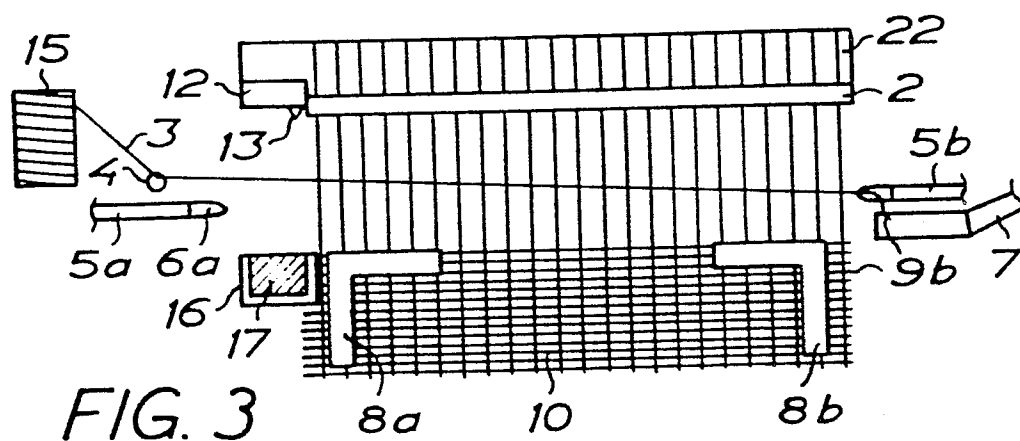


FIG. 3

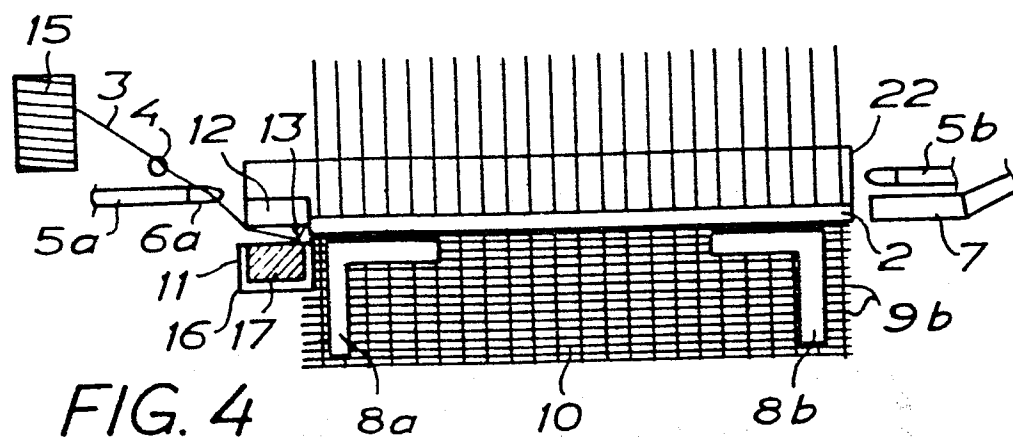


FIG. 4