LOOM TENSION-FRAME HOLDING THE WOVEN FABRIC OVER ITS ENTIRE WIDTH

ABSTRACT: Tension plate for holding woven fabric over all its width, comprising a fixed plate the front edge of which is turned down to form a lip, the edge being surrounded, after interpositioning of the fabric by a mobile floating-oscillating section composed of a face substantially parallel to said plate for applying on said plate and a face substantially following the contour of said lip and extending backwards of said lip.
LOOM TENSION-FRAME HOLDING THE WOVEN FABRIC OVER ITS ENTIRE WIDTH

At the output of looms, for the manufacture of woven textile products, the woven fabric must be maintained in tension across its width.

To achieve this, there were firstly used so-called "lateral" tension-frames each constituted by a substantially cylindrical part swiveling freely and in which are cut spiral grooves where a large number of spikes protrude; the edge of the woven fabric passes on this cylinder, under a casing; the loss of these tension-frames is very high, taking into consideration the careful operation that is necessary failing which they damage the thread, the present invention, will cause weaving problems; additionally, the maintenance of the woven fabric essentially by the edges deforms the weft line, alters the number of warp threads per centimeter etc.; on the other hand, the sharp spikes used noticeably mark the fabric.

To remedy this, there appeared on the market a tension-frame holding the fabric over all its width constituted by two plates forming a gripper confining a threaded rod with opposite pitch about which passes the fabric which possibly causes it to rotate. Unfortunately, with this device and principally because of the clamping obtained at the edges of the gripper and also this possible rotation of the rod, fragments of threads or fragments of weft trailing cause clamping and cause collapses, streaks, and even ripping of the fabric.

The present invention, which has for aim to avoid all of these disadvantages, has for object a new tension-frame holding the fabric over all its width.

It is characterized in that it comprises a fixed plate, the front edge of which is bent over towards the bottom to form a lip, this edge being surrounded, after interposing of the fabric, by a mobile section (floating-oscillating), composed, to support itself on the upper surface of the plate, of a plate parallel to that joined to a descending surface until a fold situated slightly below the said lip, before being brought above and behind that.

The invention will be well understood with the help of the following description made by way of nonlimiting examples with reference to the accompanying drawing which shows:

FIG. 1, a schematic cross section of a device according to the invention;
FIG. 2, the device of FIG. 1 with its weft cut;
FIG. 3, an assembly device of two sections end to end.

The entirely new principle of this tension-frame resides in an autoclamping lever-positioning device maintaining the fabric 1 over all its length, upon the operations of weaving.

It is so parts, firstly a fixed part or support plate 2 serving as base and which is an angle bar with a having a leading edge or lip 3 of special shape;
then a mobile part or movable clamping member 4 (floating-oscillating) which is a bent over section. This can have on the lower lip 5, a smooth edge or a notched or threaded edge 6 comprising a clamping means for clamping the fabric 1 against the leading edge 3.
This edge 6 can be separately provided from this mobile part, then fitted thereon; an example is given in the drawing.

The oscillating section 4 constrains the fabric 1 to turn about the fixed nose 3.

This oscillating section 4 thus forms a lock.

The tension of the fabric 1 applies this section 4 against the nose 3 which prevents it from escaping, thus giving autoclamping. The contact of the fabric 1 is thus provided between the surface portion of the edge 6, itself covered by the fabric 1, and the interior surface of the lip or nose 3.

The edge 6 has ribs inclined in opposite directions displaced from the longitudinal axis and moving and separating from each other in the direction of movement of the fabric to keep the fabric 1 over all its width.

The advance is caused upon each insertion of a weft thread. The oscillation enables sliding, but upon withdrawal of the comb the autoclamping prevents any backward movement.

The principle remaining the same, the two parts 2 and 4 can be modified from those illustrated, notably in relation to the cross sections of the section 4 and of the angle bar 2.

In this tension-frame, and this is the principle advantage thereof, all of the turning elements, rollers, spikes, roller systems and clamping at the edges, are thus eliminated. The cramping caused by trailing fragments of thread or fragments of weft and causing collapses, streaks and even ripping of the fabric are thus eliminated.

Additionally, experience has shown that the tension of the chain was because of this reduced by 15 to 20 percent, which considerably reduces breaks of the chain threads and the sliding of knots.

The advantages of this tension-frame are the following:

- it is universal and autoadjustable, equally for heavy and more overtextured fabrics (delicate sheets, poplins, canvas...,) than for the finer, and notably those provided with synthetic fibers.
- it can be adapted to all types of conventional looms with shuttles and to all types of looms without shuttles, notably those with lances, needles or projectiles.
- considerable reduction of thread breakages in the chain on looms or weaving machines.
- perfect regularity of the insertion of the weft.
- elimination of deformations, notably at the edge of the fabric, contrary to conventional tension-frames, comprising needles and covers and possibly causing traces of rubbing.
- ability to weave very textured articles, by removal of the slight to-and-fro movement of the fabric at the moment of striking of the batten. The fabric practically moves back only the value of compression of each weft thread. It is free, in effect, only along the slight distance existing between the forward position of the comb of the weaving loom and the edge 6.
- elimination of angular displacements, which is frequently encountered in square or Scottish fabrics.
- easier passage of the shuttle or of the device for inserting the weft, the sheet having only one straight line from one edge to the other.

For tension-frames for weaving without shuttle, the width of the tension-frame is easily adjustable, which is indispensable for this type of tension-frame.

For weaving machines without shuttle the fixed section 2, oscillating sections 4, as well as the edges 6 can be joined up or cut by their middle to change the width of the fabric 1.

To this end, two T-squares 11 (FIG. 3) laterally space the various joined up elements of the oscillating section, a housing being provided for the T-squares at the extremities of this section 4.

It must be also pointed out that these T-squares, in their part in contact with the fabric, rigorously maintain this at the edges, either by fixed or oscillating notches, or if absolutely necessary, by pivoted rollers.

The adjustment of the height of the edge threads easing the reentry of a hook forming the edge, is obtained by these two small T-squares 6 on adjustable supports 12 (FIG. 3).

If it proves necessary to once more improve the exact position of the edges of the fabric it can be previewed to provide a supplementary pressure of this fabric of the edge 6 by any means whatsoever, always at the extreme edges.

The nose 3 can also be reinforced, to increase its pressure at the edges.

For certain delicate or very heavy fabrics the pull of the fabric can be eased and at the same time the insertion of the weft threads, by imposing at the section 4 an oscillation, this oscillation, which pulls the fabric, is a slight levering movement.

In the different types of weaving machines or conventional tension-frames, a special weft cutter 7 can easily be positioned near to the edge. This weft cutter is composed of a needle 8 with hook 9 displaceable backwards; this movement is caused by the batten in the rearward direction and corresponds to the
cutting operation. The needle is pushed forward again by a spring.

The sectioning of the weft is provided by hook 9 returning into its housing 10.

The weft cutting apparatus 7 is easily positioned under the fixed section 2. Its height is preadjustable and the width position is eased by a line of holes provided on the edge of the said fixed section 2.

Normal unwaving is carried out without any difficulty. For considerable unwaving, it is sufficient to detension the chain and the fabric 1 by a simple forward rocking movement, to disengage the oscillating part 4. Starting up once more of the weaving takes place without fault, the insertion of the weft being always rectilinear.

It is clear that the invention is not limited to the above described and illustrated examples from which it is possible to provide other shapes and other embodiments without departing from the scope of the invention as defined in the following claims.

What is claimed is:

1. An apparatus for releasably clamping an intermittently advancing fabric web in its advanced position comprising: a fixedly mounted support plate and a movably mounted clamping member disposed in the path of travel of an intermittently advancing fabric web and cooperative together to releasably clamp the web therebetween; said support plate having an arcuate leading edge disposed transverse to the path of travel of the fabric web dimensioned to slidingly receive therearound the fabric web; said clamping member having an arcuate configuration substantially enclosing said leading edge of said support plate and including at one end thereof clamping means for releasably clamping the fabric web against said leading edge in response to movement of said clamping member; and means mounting said clamping member for movement relative to said support plate to enable said clamping means to releasably clamp the fabric web against said leading edge in dependence upon the degree of tension externally applied to the fabric web.

2. An apparatus according to claim 1; wherein said clamping means comprises an arcuate surface having a profiled portion complementing a surface portion of said leading edge to effectively clamp the fabric web between said arcuate surface and leading edge in response to movement of said clamping member.

3. An apparatus according to claim 2; including a plurality of ribs positioned on said arcuate surface to increase the clamping effect of said clamping means.

4. A tension plate for holding woven fabric at the output of a loom over its full width, comprising: a fixed plate, a lip on a front edge of said plate having a rearwardly facing surface, a movable floating-oscillating member loosely mounted on said front edge and including two arms spaced one on each side of said front edge, a first arm having at least a portion extending towards the second arm, said portion having a surface cooperating with the rearwardly facing surface of said lip to effectively grip the fabric therebetween.

5. A tension plate according to claim 4, wherein said fixed plate has a horizontal surface and said movable member has a substantially horizontal surface above the longitudinal surface of said plate, a substantially vertical surface below said horizontal surface and said first arm being bent back at the bottom of said vertical surface.

6. A tension plate according to claim 4, wherein the rearwardly facing surface of said lip is formed with oppositely inclined ribs extending away from the longitudinal axis of the lip and separated one from the other in the direction of advance of the fabric.

7. A tension plate according to claim 6, wherein the rearwardly facing surface of said lip comprises a threaded element.

8. A tension plate according to claim 4, wherein the surface of said movable member cooperating with the rearwardly facing surface of the lip is provided with oppositely inclined ribs extending away from the longitudinal axis and separated one from the other in the direction of advance of the fabric.

9. A tension plate according to claim 8, wherein the surface of said movable member cooperating with the rearwardly facing surface of said lip comprises a threaded element.

10. A tension plate according to claim 4; wherein said movable floating-oscillating member comprises a plurality of elements positioned by means of two T-squares, which T-squares are effective to hold the fabric at the edges.

* * * * *