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(54) Device for positioning the weft on weaving machines which utilise tucking-in selvedgers.

(57) A device for positioning the weft on weaving machines which utilise tucking-in selvedgers, includes means for holding the thread of the weft (5) and means for the suction of the cut thread. In a preferred arrangement, a suction tube (1) connected to a vacuum pump is installed perpendicularly to the direction of the weft thread (5) and provided with a V-shaped slot (4), the apex of the slot (4) being in line with the trajectory of the weft thread. The means which holds the weft thread is preferably a nipper (9).

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Description

DEVICE FOR POSITIONING THE WEFT ON WEAVING MACHINES WHICH UTILISE TUCKING-IN SELVEDGERS

The present invention relates to a device for positioning the weft on weaving machines which utilise tucking-in selvedgers, also known as re-entering end selvedgers.

Fabrics manufactured on weaving machines are generally provided with selvedges which have the function of locking the warp threads of the fabric to prevent them from unravelling. This result is easily obtained if the weft if fed continuously as is the case with traditional shuttle looms, since a loop of the warp thread is created around the last thread of the weft each time the shuttle inverts direction.

However this does not happen on other types of weaving machines in which the weft is fed discontinuously and here the selvedges not only ensure that the warp threads do not unravel, but they also ensure that the single warp threads which are inserted are held in place. Among all the various solutions and types of selvedges which exist, the tucking-in devices are used from choice especially in the case of industrial fabrics such as, for example, the cord fabrics used to reinforce tyres.

It is known that tucking-in devices or selvedgers are formed by a reinsertion of the protruding ends of the weft threads cut to a height slightly higher than the reed width. For this purpose, each side of the weaving machine is provided with a nipper for tucking-in the weft thread into the warp and a device which positions the weft. It is a well-known fact that if the machine is to function correctly, the weft must be in a very precise position during weaving so that it can be gripped by the nipper, cut by scissors and re-inserted by a needle. The device normally used for positioning the weft is a false tucking-in selvedger which is constituted by an English looper and a narrow strip of canvas material (0.5-1.5cm) which is produced simultaneously on both sides of the weaving machine and is then discarded once it has served its purpose. This inevitably produces scrapping of material and also the need for auxiliary equipment for the formation of the English loop in the false selvedge, boards for selvedger holders, creel positioners and tensioners and mechanisms for the forward and return movements and collection of false selvedges.

The Applicants have now discovered that all the aforementioned difficulties can be eliminated by using a device for positioning the weft which includes a thread holding means and a means which sucks up the cut thread.

Accordingly, the present invention provides a device for positioning the weft on weaving machines which utilise tucking-in selvedgers capable of holding a weft thread fixed in position during the phase of cutting and re-insertion in the warp, characterized by means for holding the weft thread in place and means for the suction of the cut thread.

The suction means can be arranged along the line of trajectory of the weft or can be perpendicular to it, the latter position being preferable.

The suction means can be a suction nozzle or inlet or a tube connected to a vacuum pump.

The holding means can be a nipper, a thread guide, an open ring or a V-shaped hook, around which the warp thread is bent, preferably at an angle of 90°.

In a preferred embodiment of this invention, the weft positioning device is constituted by a suction tube connected to a vacuum pump installed perpendicularly to the direction of the weft thread and provided with a V-shaped slot or cut at the end nearest to the warp thread which has the function of holding the weft thread firmly in position while the selvedger carries out its task. The apex of the V-shaped slot is positioned so that it is exactly in line with the trajectory of the weft thread.

The suction inlet is preferably fixed and positioned adjacent to the external side of the scissors of the selvedger. When the warp thread is cut by the scissors of the selvedger, the thread is sucked up by the suction means and can be discharged into a container or a waste collection sack.

Thread suction occurs after the phase of insertion of the thread and during shed closing.

The positioning device of the invention provides a large number of advantages regarding technological, functional and economic aspects of the equipment. These advantages include:

a) a reduction in losses and waste which amount to a maximum of 0.1% of the finished product, compared to losses of 0.6-2% when false selvedges are used;

b) the machinery is simplified because of the elimination of all the parts relating to the formation, feeding, moving, collection and tensioning of the false selvedge;

c) a reduction in maintenance costs;

d) a nipper of the selvedger can be automatically cleaned because the suction means is positioned in the immediate vicinity;

e) weaving operations are simplified because of the elimination of the false selvedge and the related production devices such as the English loop threader, the warp thread feeder etc.

It is well-known that air-looms are provided with a weft stop motion installed on the comb channel. When the weft thread is extremely fine, the machine is often stopped unnecessarily because the presence of the thread is not perceived.

The positioning device of the present invention can also eliminate this inconvenience since an electronic optical sensor can be positioned in correspondence to the suction inlet in the area in which there is turbulence which moves the weft thread and there are no moving mechanical parts which could disturb the optical sensor.

The invention will be further described, by way of example only, with reference to the accompanying drawing, which is a frontal schematic view, from the warp feed side, of an embodiment of a weft positioning device according to the present invention.

Referring to a drawing, a weft positioning device for weaving machines which utilise tucking-in selvedgers comprises a suction tube 1 connected to a vacuum pump in the direction of the arrow 2 and provided, in correspondence to a suction inlet 3, with a V-shaped slot 4. The apex of the slot 4 is arranged so that it is exactly in line with the trajectory of a weft thread 5 to be cut and re-entered. Scissors 6 are installed between the suction inlet 1 and the fabric 7.

The weft thread 5 is passed through warp threads 8 using well-known methods such as, for example, a jet of liquid either air or water pressurised. When the weft thread 5 exits it passes through a nipper 9 and between the open blades of the scissors 6 and is sucked into the suction tube 1. Under this suction force, the weft thread 5 locates itself at the apex of the V-shaped slot 4 and is held firmly in position in the phase in which the selvedger comes into operation.

The thread 5 is then cut by the scissors 6 and taken by a needle 10 which proceeds to re-insert it through the warp using known techniques. The cut thread is sucked up by the suction inlet 3 and collected into sacks or other waste containers.

The positioning device of this present invention can be installed on one side or on both sides of the weaving machine, replacing the false selvedge and providing the advantages mentioned above.

In one particular embodiment of the present invention, an electronic optical sensor 11 is positioned on the wall of the suction inlet 3 which has been provided with an aperture for the passage of the sensor ray.

Claims

1. A device for positioning the weft on weaving machines which utilise tucking-in selvedgers capable of holding a weft thread (5) fixed in position during the phase of cutting and re-insertion in the warp (7), characterized by means for holding the weft thread in place and means (1, 3) for the suction of the cut thread.

2. A device as claimed in Claim 1, characterized in that the suction means is installed along the trajectory of the forward movement of the weft.

3. A device as claimed in Claim 1, characterized in that the suction means is installed perpendicularly to the trajectory of the forward movement of the weft.

4. A device as claimed in any of Claims 1 to 3, characterized in that the means which holds the weft thread is a nipper (9).

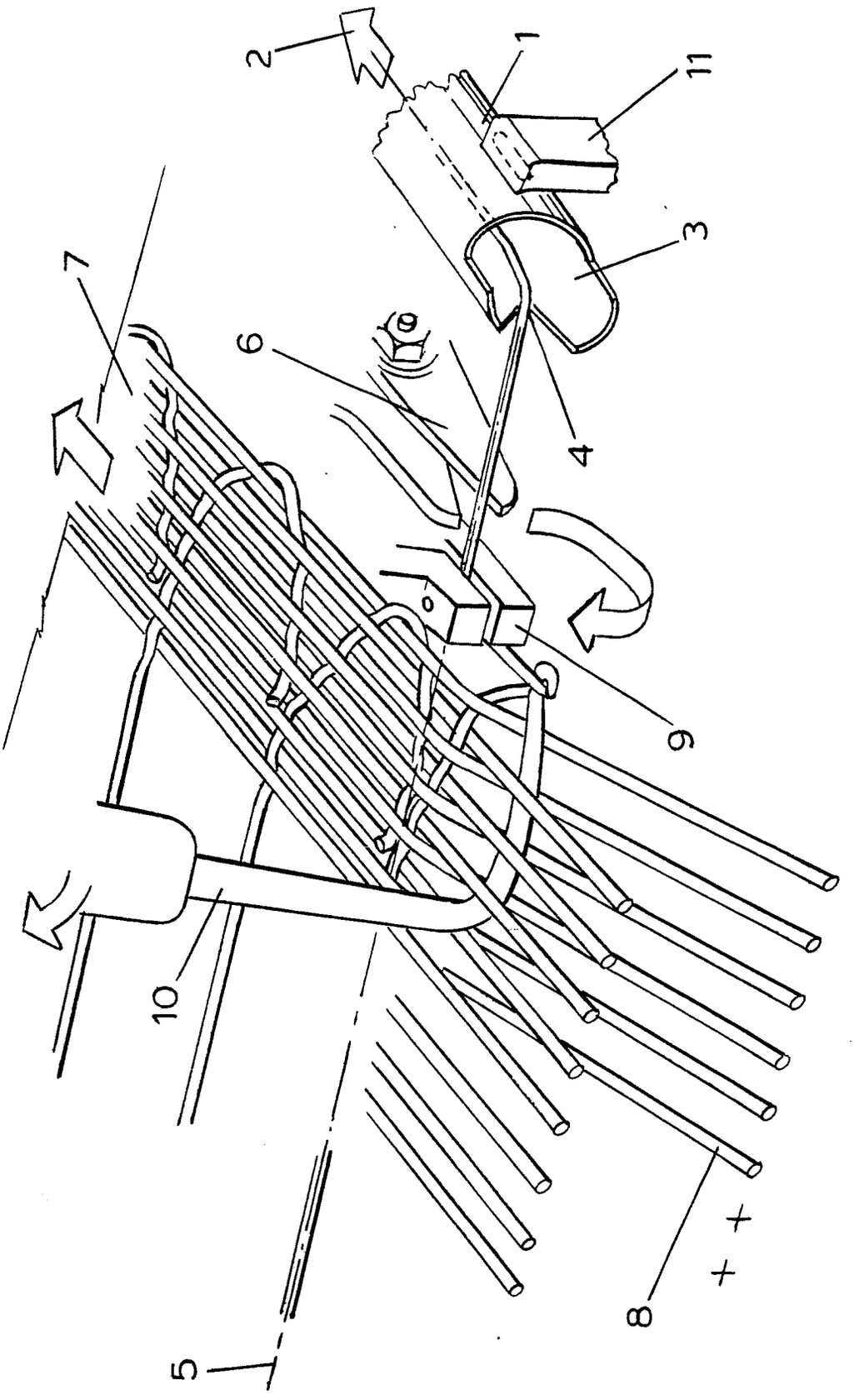
5. A device as claimed in any of Claims 1 to 3, characterized in that the means which holds the weft thread is a thread guide, an open ring or a V-shaped needle into which the thread is bent, preferably at a angle of approximately 90°.

6. A device as claimed in any of Claims 1 to 5, characterized in that the suction means is a nozzle, a suction inlet or a tube connected to a vacuum pump.

7. A device as claimed in Claim 1, characterized by comprising a suction tube (1) connected to a vacuum pump, installed perpendicularly to the direction of the weft thread and provided with a V-shaped slot (4) at the end corresponding to the aforesaid thread on which the thread is bent, preferably at an angle of about 90°, the apex of said slot being in line with the trajectory of the weft thread.

8. A device as claimed in any of Claims 1 to 7, characterized in that it is arranged on both sides of a weaving machine in the vicinity of scissors (6) of the selvedger.

9. A device as claimed in any of Claims 1 to 8, characterized in that an electronic optical weft stop motion is positioned on the wall of the suction means.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EUROPEAN SEARCH REPORT

Application Number

EP 88 30 3190

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.4)
X	US-A-4 078 586 (PORTER) * Column 2, lines 27-68; figures 2,3,4 * ---	1,2,4,6	D 03 D 47/48
A	---	3,5,7	
A	FR-A-2 141 808 (DEWAS) * Whole document * ---	1,2,3,6,7	
A	US-A-3 425 461 (BERRY) ---		
A	FR-A-2 249 984 (NUOVO PIGNONE) -----		

TECHNICAL FIELDS SEARCHED (Int. Cl.4)

D 03 D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	06-07-1988	VON ARX V.U.

CATEGORY OF CITED DOCUMENTS

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