WEFT SHOOT CHANGING DEVICE FOR GRIPPER LOOMS

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[Diagram of the weft shoot changing device for gripper looms]
This invention relates to a device, by means of which in gripper looms wefts in different numbers and of different kinds, for example of different colors, can be shot into the shed in a certain succession.

It has been proposed to attain the above mentioned object by conducting the wefts in a common thread guide in openings arranged in a row, the thread guide, controlled by a pattern card device or the like, being moved so that the individual wefts are brought within the range of a feeder to the gripper. This construction is however open to the objection that the wefts were of unequal lengths, became entangled and caused troubles, because they are all moved simultaneously and over different distances.

These objections are overcome by the device according to the invention of which the following are the main features.

As each weft or each group of wefts has a separate thread guide, which is controlled by a pattern card apparatus or the like, and which feeds the weft directly or indirectly to the gripper, the great advantage is obtained that the threads, when the machine is running, remain stretched in an ordered position. The result is that when the threads are being fed to the grippers no undesired threads are carried, and that the manner of operation of all machine elements connected with the change is effected without hindrance.

A very practical form of construction for feeding the different wefts or groups of wefts is obtained by using a separate feeding device, which transfers the wefts or groups of wefts from the thread guide to the gripper. The feeder of this device moves permanently in the same path, which may be straight or curved, so that it is possible, to move each of the thread guides coming into use into the path of the feeder. In this manner each thread or each group of threads reaches the gripper with the aid of the same feeding device.

The most simple and clear arrangement of this type of changing device for the weft shooting or gripper looms is making the movement of the thread guides approximately perpendicular to the plane through the wefts. It is obvious, that, by the described movement of the thread guides substantially perpendicular to the general plane of the threads, the threads can be most easily brought uniformly into the path of the feeder or gripper.

Moreover the simultaneous employment of the thread guides for feeding the wefts or groups of wefts and for regulating the lengths presents considerable advantages, owing to the simplification of the construction by making two absolutely necessary operations to be carried out by the same machine part.

It is however necessary that the amplitude of the movement of the thread guides be adjustable because the stretching capability of each weft or group of wefts may be different and therefore the length regulation must take place independently in every instance.

This is most easily effected in that the thread feeding movement of the thread guides is effected positively from the driving lever controlled by a pattern card apparatus or the like, whereas the return movement is resilient. It is possible to then set the initial position of the thread guides as desired by means of displaceable stops and consequently to pull back each weft or group of wefts to any desired length by means of the corresponding thread guides, whereas the thread is held by thread holding outside the shed and outside the weft changing device.

This thread holding is preferably effected by a common accordingly controlled thread holder, all wefts or groups of wefts being clamped between common clamping jaws. For saving the wefts the holding device is preferably controlled so that the thread holding occurs on one side of the machine only when wefts are shot from this side.

As the thread guides may be made extremely light, owing to the little forces required for thread feeding, it is possible to make the means for moving the thread guides very simple and practical. A catch, provided with a stop and arranged movable in the driving element for the thread guides, is controlled by a suitable pattern card apparatus in such a manner, that only the actually required thread guide is actuated.

Moreover it is extremely important for saving the wefts and preventing thread fractures, to allow the thread guides to remain at rest during the time the wefts or groups of wefts are passing in the shooting direction through the thread guides. This is easily obtained by suitably constructing the driving elements for the thread guides. The subject matter of the invention is particularly suitable for the equipment of gripper looms, in which the shooting takes place alternately from both sides. One weft shoot changing device is arranged on each side of the machine, the thread guides being, however, only moved on the side of the machine from which the shooting has to be effected, whereas the thread guides on the other side remain at rest. In this arrangement it is possible for example with one changing device to shoot eight colours with four thread guides on each side, different colours being provided on each side.

In as far as the movement of the thread guides is derived directly from the feeler for feeling off the cards, without the aid of an additional driving power, it is possible with gripper looms with alternating shooting from both sides, to stop by engaging a clutch or the like the thread guides
on that side on which no shooting has to be effected.

The actuation of the thread guides may also be effected in such a manner, that each thread guide is pushed by a separate lever, the movement of which is effected directly by the card, so that the interpositioning of a separate driving mechanism for the thread guides is not necessary. In this instance it is possible, to shoot groups of wefts, in that several levers act simultaneously on the corresponding thread guides.

Evidently it is also possible, to control the thread guiding for changing by means of a changing device, as has already been employed in various constructions on shuttle change looms.

An embodiment of the invention is illustrated diagrammatically by way of example in the accompanying drawings, in which:

Fig. 1 is a view in elevation showing in full and dotted lines the operation of the thread guide.

Fig. 2 is a top plan view.

Fig. 3 shows the device for holding the wefts.

Fig. 4 is an elevation showing the direct actuation of the thread guide by the card of the loom.

Fig. 5 shows in side elevation the device for holding the wefts.

For a better understanding of the details of the invention, it may be stated that the type of loom for which the invention is more or less particularly adapted is shown in United States Patent #1,620,723.

The thread guides 1, 2, 3 and 4 are shiftably mounted in the frame 5, and each of same is pressed against the set screws 7, 8, 9 and 10 by a spiral spring 6 fixed at one end to the frame 5. A catch 14, controlled by a pattern card device of known construction, is moved in a slot of the operating lever 12 oscillatable on the pin 11 by an appropriate cam 28, said catch, during the movement of the lever 12, striking for example against a stop 15 of the thread guide 2 and positively shifts same, thereby tensioning its spiral spring 6.

The wefts or groups of wefts 16, 17, 18 and 19 coming from the stationary pins each run through two oppositely situated groups of four eyes 26a–26d and 30a–30d of the frame 20 and are at the same time held between these groups of eyes 26a–26d and 30a–30d by means of a thread holder 21 mounted on the corresponding frame 20 and moved by pressing a jaw 22 against a counter jaw 23.

The wefts or groups of wefts are further conducted around a pin 24 through the eyes of the thread guides 1, 2, 3 and 4 and then around a pin 25 to the edge of the fabric.

The weft (or that group of wefts) which is brought by its thread guide within the range of a feeding device 26 (in the illustration this is the weft 18 brought into the position B' by the thread guide 2) is pulled to the side by a feeding device 26 and then gripped in known manner by the gripper 41 and shot into the shed. The gripping per se as indicated is intended to show a conventional form of gripper and the details thereof form no part of the present invention.

The regulating of the length of a shot weft or group of wefts, for instance of the weft 18, which is being shot in known manner, is thereby effected that, after the shooting, the accordingly controlled thread holder 21 holds all the threads, whereupon the actuating lever 12 returns into its initial position. By the action of the spring 6 under tension which is thus liberated the thread guide 2 is returned until it strikes against the set screw 8. The weft 18 is thereby pulled back around the pin 25 a distance corresponding to twice the amplitude of movement of the thread guide 2, its length in the shed being thus regulated.

The actuating lever 12 is moved back such a distance as necessary for the greatest amount of length regulation coming in question, so that the stops 15 of the thread guides lift off the catch 14 of the lever 12 in their extreme positions.

Whilst the weft (or the group of wefts) passes at the shooting into the shed through the eyes of the corresponding thread guide, this thread guide remains at rest.

The weft shooting device can evidently be constructed for any desired number of wefts or groups of wefts.

I claim:

1. A weft shooting device for gripper looms, comprising in combination with stationary weft pins, movable thread guides one for each weft, arranged the one above the other and each one movable independently of the others, means for selectively controlling the actuating of said thread guides, a gripper, a feeding device adapted to convey the wefts from the thread guides to said grippers.

2. A weft shooting device for gripper looms as specified in claim 1, comprising in combination with the thread guides, a spring for each thread guide adapted to hold said thread guide in the operative position, an oscillatable driving lever for said thread guides, an element shiftable on said driving lever to provide selective cooperation of the element with one of the thread guides coupled with that thread guide the weft of which has to be shot, and a cam for positively driving said thread guides.

3. A weft shooting device for gripper looms as specified in claim 1, comprising in combination with the thread guides and the driving lever for said thread guides, a feeder, and a cam disc for driving said thread guides driving lever of such shape that during the shooting of the weft into the shed said thread guides remain at rest until said feeder has stopped and the weft cut through.

4. A weft shooting device for gripper looms as specified in claim 1, comprising in combination with the thread guides and the springs for said thread guides, adjustable stops adapted to limit the return movement of said thread guides so that the length of the wefts is regulated at the feeding.

5. A weft shooting device for gripper looms as specified in claim 1, comprising a weft holding device adapted to securely hold fast at the same time all wefts shot from one side.

6. A weft shooting device for gripper looms as specified in claim 1, comprising in combination with the thread guides and the thread guide driving lever, a cam disc of such shape that the driving lever on the one side remains at rest whilst the wefts are being shot from the opposite side.

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