Nov. 15, 1960 D. W. SHIMWELL 2,960,117

WEFT INSERTING DEVICE FOR LOOMS

Filed July 20, 1956 2 Sheets-Sheet 1

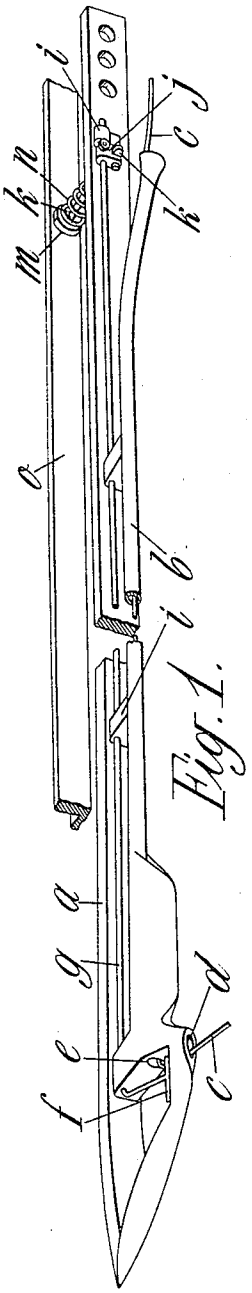


Fig. 1.

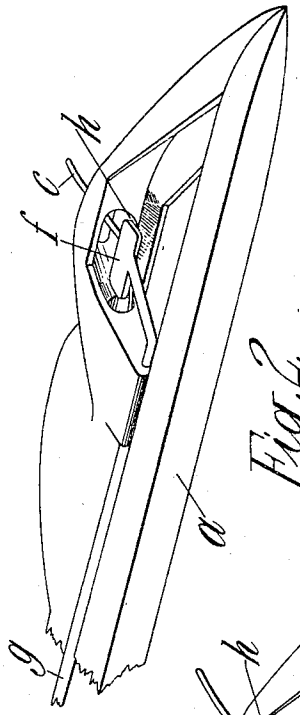


Fig. 2.

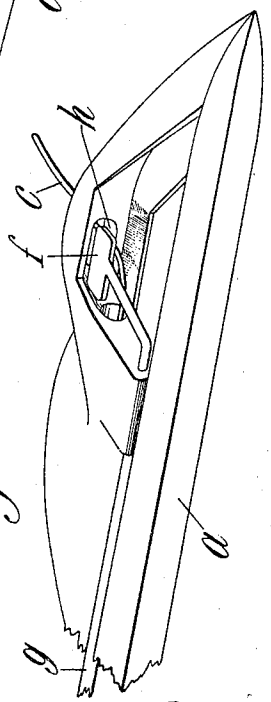


Fig. 3.

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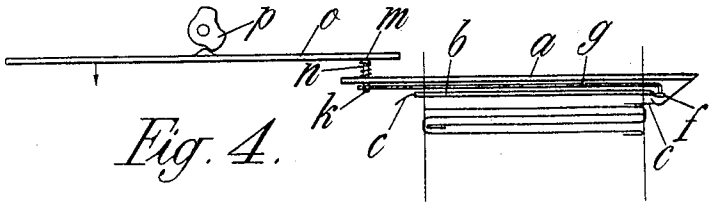


Fig. 4.

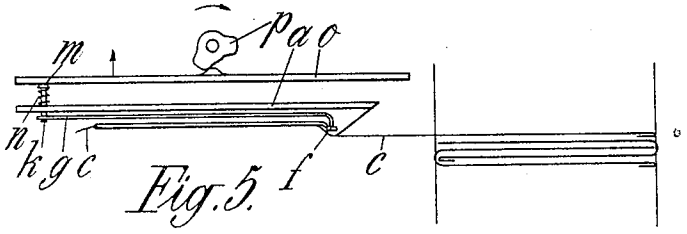


Fig. 5.

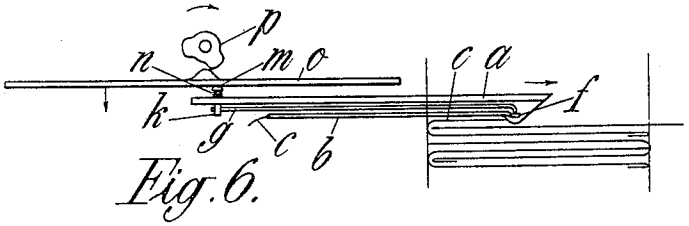


Fig. 6.

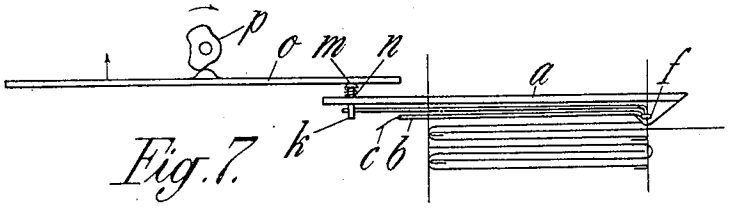


Fig. 7.

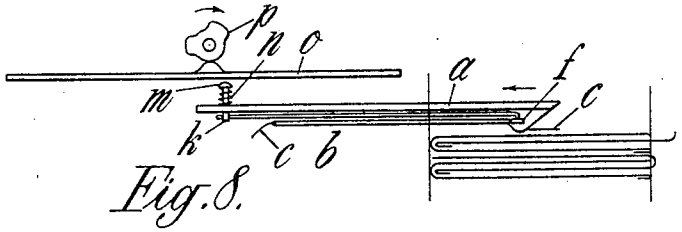


Fig. 8.

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2,960,117

WEFT INSERTING DEVICE FOR LOOMS

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4 Claims. (Cl. 139—123)

This invention relates to looms for weaving of the type in which the weft yarn is inserted into the warp shed by a reciprocating weft inserting device or spear (hereinafter for convenience termed a spear) which may be operated from one or both sides of the loom, the weft being obtained from stationary yarn packages. The invention is particularly applicable to looms in which the weft yarn is cut at the selvedges to produce what is known as a single pick cloth. An example of such a loom is described in specification No. 447,282, now Patent No. 2,816,576, issued on December 17, 1957.

In the operation of a loom of the type in question, when a weft yarn is cut at the selvedge, a short length is left protruding from the mouth of the spear and the latter has within itself a longer length of weft which extends outside the width of the cloth being produced where a gripper is employed to engage and hold the weft. As the weft is held by such gripper whilst the knife is cutting the weft, there is an amount of tension in the length of yarn lying in the spear which may, when the weft is cut, cause the short length protruding from the mouth of the spear to withdraw inside the body of the spear and thus prevent the proper operation of the loom and the production of the desired cloth pattern.

The object of the present invention is to provide simple and efficient means for obviating the disadvantage before indicated.

The invention consists in a loom for weaving of the type in which the weft yarn which is obtained from a stationary weft package, is inserted into the warp shed by a reciprocatory weft inserting spear, having gripping means at or adjacent to its forward end through which the weft issues which can apply pressure to the weft whilst the spear is in motion, with control means for said gripping means located in the loom structure outside of the spear.

The invention further consists in a loom for weaving in which the control means can cause the gripping means to apply an adjustable gripping pressure to the weft and also to move clear of the weft.

The invention further consists in a loom for weaving in which the gripping pressure is applied by a spring acting through a torsion rod.

The invention further consists in a loom for weaving in which a gripper carried by a torsion rod extending along the spear can apply pressure to the weft adjacent to the opening in the spear through which the weft issues into the warp shed, the said rod having a crank thereon connected to a spring loaded plunger which tends to turn the rod and cause the gripper to grip the weft, and means outside the spear but in the loom structure adapted to be operated to depress the plunger and turn the torsion rod when the grip of the gripper on the weft issuing from the spear is to be removed or reduced.

Referring to the accompanying explanatory drawings:

Figure 1 is a diagrammatic view of a weft inserting spear with weft gripping means constructed and arranged in one convenient form in accordance with this invention.

Figures 2 and 3 are similar detail views showing the weft gripping means in action and out of action respectively.

Figures 4–8 are diagrams showing various stages in the insertion of weft into the warp threads of a cloth being woven, with a weft inserting spear having weft gripping means in accordance with this invention.

In Figures 1 to 3, the weft inserting spear *a* which is similar to what is shown in prior specification No. 447,282, now Patent No. 2,816,576, has a tube *b* incorporated therein through which the weft yarn *c* passes from a stationary weft package (not shown) to the mouth or aperture *d* in the nozzle or delivery end of the spear, where the weft is laid into the fell of the cloth which is being woven. Between the delivery end *e* of the tube *b* and the said mouth or aperture *d* is arranged a gripper *f* carried by a torsion rod *g* extending along the spear *a*, the said gripper *f* being adapted to hold the weft *c* between itself and a part *h* of the spear adjacent to the mouth or opening *d*. The torsion rod is carried in suitable brackets *i* in the spear and it has thereon a crank *j* to which is connected the end of a plunger *k*, the outer end of head *m* of which is spring loaded by a spring *n* which is coiled around the plunger and abuts against the back of the spear.

An angle iron bracket or bar *o*, which is supported in the loom beyond the width of the cloth which is being woven, is adapted to be moved by a cam, as *p* in Figures 4 to 8, to cause it to engage the head *m* of the plunger *k*, the effect of which is to turn the torsion rod *g* in a direction to raise the gripper *f* either out of engagement with the weft *c* or to reduce the amount of pressure exerted on the weft by such gripper due to the spring *n* around the plunger *k* and the torsion of the rod *g*. The extent to which the plunger is moved will depend on the shape and relative positions of the operating cam *p* and the angle iron or bar *o*. The latter may be spring loaded to move it clear of the plunger when the cam *p* so allows.

It will be appreciated that the gripper *f* will, if the cam *p* allows the angle iron *o* to be clear of the plunger head *m*, be loaded by the spring *n* and will apply a predetermined degree of pressure to the weft leaving the spear by the mouth or aperture *d* which will produce tension in the yarn if it is being drawn from the spear or will prevent yarn receding into the tube *b* from its delivery end if the weft has been severed beyond the spear mouth or aperture *d* whilst the weft was under tension. If the angle iron or bar *o* is caused by the cam *p* to move into engagement with the head *m* of the plunger *k*, then the gripper *f* can be moved by the torsion rod *g* clear of the weft passing from the spear so that, for example, the weft can pass freely from the spear when being laid in the warp shed at the fell of the cloth which is being woven.

In Figure 4, the cam *p* is causing the bar or angle iron *o* to engage the head *m* of the plunger *k* and so moving the torsion rod *g* to lift the gripper *f* clear of the weft *c* which is being payed out by the spear as it moves to the left in Figure 4.

In Figure 5, the spear *a* has moved outside the warp threads and the cam *p* allows the bar or angle iron *o* to move away from the spear *a* so that the gripper *f* is allowed to press on the weft at the spear mouth through the pressure of spring *n* around the plunger *k* acting through the torsion rod *g*. When the spear re-enters the warp shed, as shown in Figure 6, and has to deliver weft into the warp shed, the cam *p* removes the pressure of the spring *n* by making the bar *o* press on the plunger head *m* of the gripper *f*. This causes the latter to move clear of the weft leaving the spear.

In Figure 7, the cam *p* is allowing the bar *o* to move away from the spear *a*, so that the spring *n* acting through

the torsion rod *g* tensions and holds the weft during severing and withdrawing operations. The weft is thus held against moving backwards into the spear when it is severed at the selvedge.

Figure 8 shows the weft after severance at the selvedge being carried through the warp shed without paying out any weft, the gripper *f* holding the weft end at the spear delivery mouth. The plunger head *m* is clear of the bar *o*.

What I claim is:

1. In a weaving loom, a reciprocatory spear for traversing a weft yarn through a warp shed of the loom from a stationary weft package, means associated with the spear and extending longitudinally thereof through which the yarn passes to the forward end of the spear where the weft issues into the warp shed, a gripper mounted in the spear adjacent said forward end so that the weft yarn passes through the gripper on its travel into the warp shed, and control means located in the loom outside the spear and engageable with a part in the spear connected to the gripper to regulate the pressure of the gripper on the yarn issuing from the spear by reducing or removing such pressure.

2. A loom as claimed in claim 1 wherein the control means extend in the loom alongside the path of the spear as the spear travels into and through the warp shed, the part in the spear connected to the gripper and operated by the control means extending substantially the entire length of the spear, and the control means serving selectively to cause the gripper to release or grip the yarn.

3. A loom as claimed in claim 2 wherein said longitudinally extending means is a passage formed in the

spear extending substantially from end to end thereof for the passage of the weft yarn through the spear to an opening provided at the forward end of the spear through which the weft yarn issues into the warp shed, the gripper being mounted in the spear adjacent said opening, and spring means being associated with the gripper to load the gripper.

4. In a weaving loom, a reciprocatory spear for traversing a weft yarn through a warp shed of the loom from a stationary weft package, means associated with the spear and extending longitudinally thereof through which the yarn passes to the forward end of the spear where the weft issues into the warp shed, a yarn gripper carried by the spear adjacent the forward end thereof, and control means for said gripper, said control means including means connected to the gripper and extending at least substantially the entire length of the spear and complemental means located in the loom and cooperable with said means in all positions of the spear so that the gripper is operative to selectively release or grip the yarn adjacent either end of its stroke.

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