

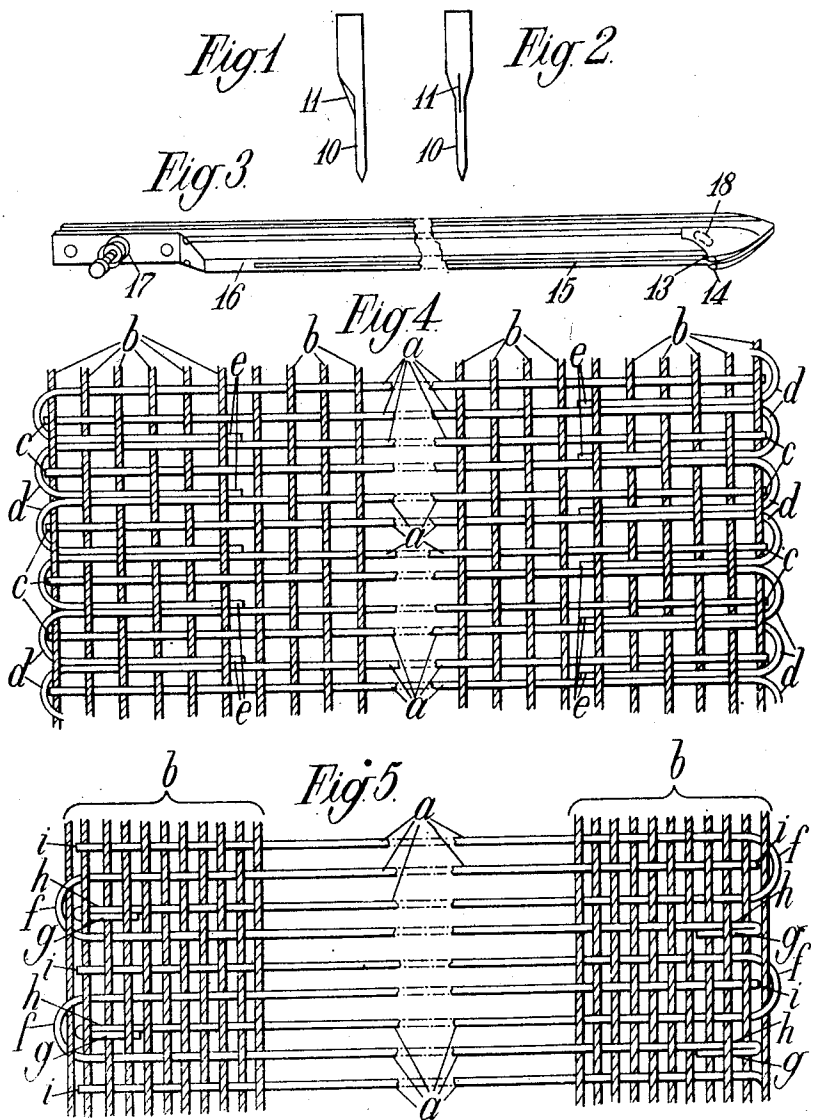
Dec. 17, 1957

D. W. SHIMWELL
LOOMS FOR WEAVING

2,816,577

Filed Jan. 25, 1955

3 Sheets-Sheet 1



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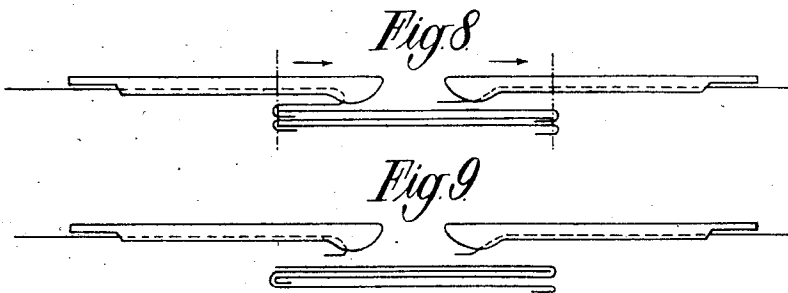
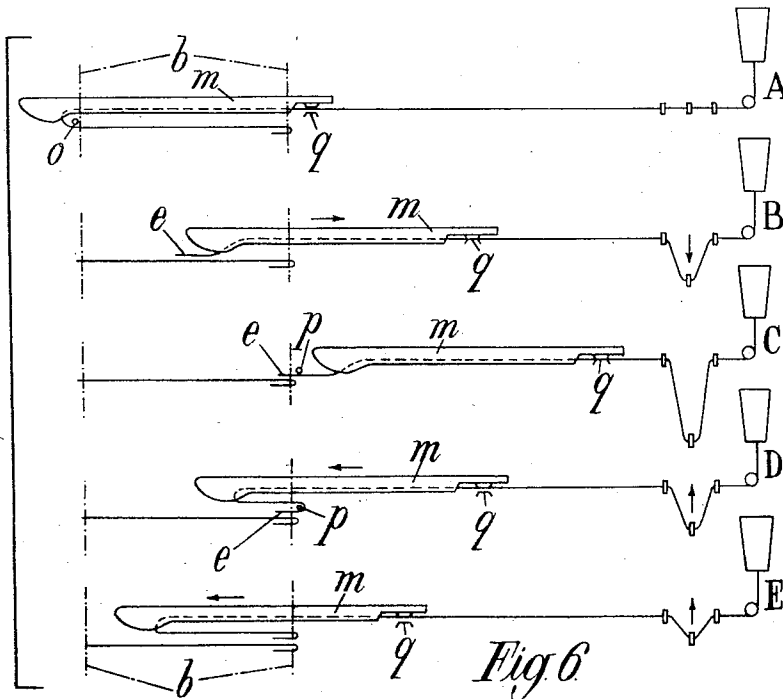
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3 Sheets-Sheet 3

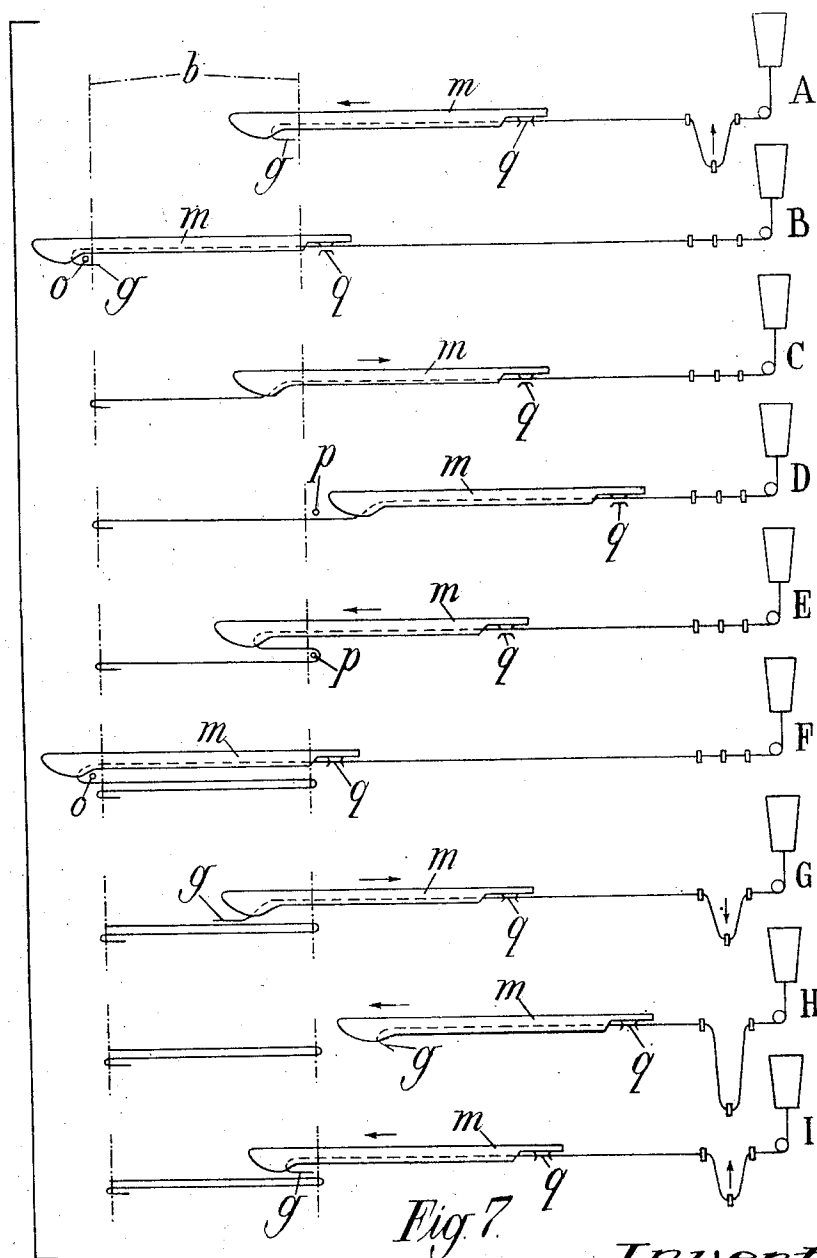


Fig. 7

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LOOMS FOR WEAVING

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5 Claims. (Cl. 139—195)

This invention relates to looms for weaving and has for its object to provide an improved construction of loom which enables fabric patterns to be produced having looped and cut ends in a selvedge.

The invention comprises a weaving loom having selvedge-loop-forming pins, with a cutter associated with each pin which can sever a loop formed around the pin at the selvedge of the cloth being woven.

The invention further comprises a weaving loom as aforesaid having each selvedge loop forming pin with a cutter blade incorporated therein and so positioned on the pin that the cutter blade only comes into action when the pin is moved deeper into a loop which has been formed around it.

The invention further comprises a weaving loom as aforesaid in which each selvedge loop forming pin is moved into position to form a loop at a short distance from the selvedge and is then moved close into the selvedge before it releases the loop.

The invention further comprises the provision adjacent to each selvedge and to the fell of the fabric which is being woven of a pin adapted to be moved to bring it against a weft yarn which extends from the warp shed to beyond the selvedge, so that on the next weft pick a loop is formed around the pin, means which can return the pin to its original position to release the loop at or adjacent to the selvedge, means associated with each pin which can sever the loop formed around the pin, and means which when a loop has been severed at a pin enable the weft inserting means to withdraw the weft from the point of severance wholly or partly from the warp shed.

The invention further comprises the provision of a weft gripper adjacent to the paying out end of each weft inserting means which prevents the severed end of a loop from recoiling or flying back into the said means immediately after severance.

Referring to the accompanying explanatory diagrammatic illustrations:

Figures 1 and 2 are views at right angles to one another of a selvedge-loop forming pin having a loop severing cutter incorporated therein in one convenient form in accordance with this invention.

Figure 3 is a view of one form of weft inserting spear of duplex type as used in my improved loom.

Figures 4 and 5 illustrate two patterns of fabric which can be produced by our improved loom.

Figure 6 gives the cycle of operations of one weft inserting spear in producing the pattern of fabric shown in Figure 4.

Figure 7 gives the cycle of operations of one weft inserting spear in producing the pattern of fabric shown in Figure 5.

Figure 8 shows diagrammatically two spears in process of producing the fabric pattern of Figure 4.

Figure 9 shows diagrammatically two spears in process of producing the fabric pattern of Figure 5.

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In Figures 1 and 2, the selvedge loop forming pin comprises an end 10 which is inserted in the weft so that a loop can be formed therearound and above such end a cutter or blade 11 which is let into a slot in the pin and has its operative edge inclined to the direction or movement of the pin when it is moved deep into the loop which has been formed around the pin, so that the cutter readily severs such loop. On some occasions the loop formed around the pin is released and comes into the selvedge as a loop; on other occasions the loop is severed, leaving a straight end of weft in the selvedge, the weft inserting device carrying away the other part of the loop and leaving it partly in the shed or withdrawing it completely and then re-inserting it on a subsequent pick. These features are dealt with in subsequent figures and the description relating thereto.

In Figure 3 is shown one form of weft inserting device or spear for use in carrying out our invention. Two spears, one at each side of the warp shed are used and they preferably move together, with a space between the forward end of one and the rearward end of the other, through the warp shed. The spear shown comprises two weft delivery points 13 and 14 and there is a slot 15 between the upper and lower portions of the device where it enters the warp shed, so that there are in effect two spears which can enter two warp sheds and cause the weaving of two fabrics, one above the other, simultaneously. At the part 16, which does not pass into the warp shed, the two spears unite to produce an integral end piece which is attached to the spear reciprocating means.

There may be a spring loaded weft gripper at 17 and if desired this may be opened positively when yarn is being drawn from the spears and left in the warp shed. There may also be a blade spring, as at 18, adjacent to each delivery point which also puts slight drag upon the weft in order to hold it and prevent the weft flying back into the spear when a loop is severed.

Figures 4 and 5 show two patterns of fabric which have looped and straight weft threads in each selvedge and we will now describe a cycle of operations of one spear in producing the pattern with the aid of selvedge loop forming pins with loop cutters thereon.

In Figure 4, the weft threads are lettered *a* and the warp threads *b*. The looped portions of weft threads at each selvedge are lettered *d* and the straight ends of weft threads are lettered *c*. Where a loop is shown, this has been formed around a selvedge loop forming pin as shown in Figure 1, which has been lowered to a sufficient extent into the weft to form the loop there around but not sufficiently deep to bring the cutter 11 into action. Where there is a straight end shown of a weft thread, this has resulted from a loop having been formed at the selvedge around a selvedge loop forming pin 10 and then the pin having been lowered into the loop to a sufficient extent to bring the cutter 11 into action which has then severed the loop, leaving a straight end *c* at the selvedge. The other severed end *e* has then been carried away by the weft inserting means and left in the warp shed towards the opposite selvedge to form part of a loop *c* in such selvedge.

In Figure 5, all the loops *f* have been formed around selvedge loop forming pins and all the straight ends *i* at the selvedges have resulted from a loop having been formed around a selvedge-loop-forming pin 10 and the pin having been lowered deeply into the loop so that the cutter 11 has come into action and has severed the loop. The straight end *i* is at a selvedge where the loop severance occurred but the other severed end has been carried out of the warp shed by the weft inserting means, then brought back into the shed as a trailing end which has been left in the shed whilst the selvedge loop forming pin has been

brought in operation to produce the loop shown between the parts *g* and *h* of weft.

In producing the fabric pattern shown in Figure 4, each spear performs a cycle of operations and two spears operate in alternation from the sides of the warp shed. In Figure 6 are shown the several movements (indicated by parts A to E of the figure) of one spear in a cycle of operation. In part A, the spear *m* has carried a weft pick through the warp shed, which is between the lines *b*; and drawn the weft around the loop forming pin *o* which as the spear moves to the right is lowered to cause its cutter to sever the loop around the pin. In part B, the spear *m* is withdrawing from the warp shed, and its gripper *q* is closed so that the weft is carried with the spear. In part C the trailing end *e* of the weft is held in the warp shed. In part D, the spear re-enters the warp shed with the weft looped around the pin *p* and the gripper *q* open. Part E shows the spear part way across the warp shed and about to return to the position as in part A of the figure.

With regard to the Figure 5 pattern of fabric, again two spears are employed, each performing the same cycle of operations but the two spears acting in alternation, that is to say whilst one spear is moving forward in one direction, the other spear is moving backward in the same direction. Figure 7 illustrates in parts A to I of the figure, the stages of the complete cycle of operations of a spear. In part A, the spear *m* is carrying a trailing end of weft *g* into the warp shed and the clamp *q* on the spear is closed. In part B, at the opposite selvage a selvage pin *o* has been lowered into position so that when the spear *m* has passed out of the warp shed at the left and reversed its direction of movement, a weft loop is formed at the selvage. The gripper *q* is now opened. The pin *o* is then withdrawn as shown in part C and the spear passes out of the warp shed. In part D it is completely out and the loop forming pin *p* is moved into position. In part E, the spear returns into the warp shed and a loop is formed around the pin *p*. The gripper *q* is now open. In part F, the spear has reached the opposite side of the warp shed with the gripper *q* closed. The pin *o* is moved into position and when the spear has started to return to the right of the warp shed, the pin *o* is lowered sufficiently to sever the loop so that as shown in part G the spear draws a trailing end *g* through the warp shed. In part H, the trailing end is being carried back into the warp shed and the gripper *q* is closed. Part I shows the cycle of operations completed and the parts are as in part A of the figure.

With two spears, each working on the same cycle of operations, but entering the warp shed from opposite sides of the shed, one spear moving forward through the shed whilst the other moves backwards in it, there results the pattern shown in Figure 5 with looped and straight ends in each selvage.

Figure 8 shows diagrammatically two spears in action

producing the Figure 4 pattern of fabric and Figure 9 shows diagrammatically two spears in action producing the Figure 5 pattern of fabric.

In Figures 6-9, the means which feed the weft from the bobbins to the spears and avoid the formation of slack between the bobbins and spears have been omitted.

The loop forming pins may be brought into operative position for the formation of loops therearound at a short distance from the selvage and then moved into the selvage as a loop thereon is tightened by a retreating spear.

The means for operating the loop forming pins, the spears and grippers may be as described in my concurrent application No. 447,282.

What I claim is:

1. A weaving loom having selvage loop forming pins with a cutter associated with each pin which can sever a loop formed around the pin at the selvage of the cloth being woven.

2. A weaving loom as claimed in claim 1 in which each weft loop forming pin has a cutter blade incorporated and positioned at a distance from the end of the pin so that when the latter is lowered to allow weft to pass around the pin, a loop is formed which remains in the selvage if the pin is raised, but which is severed by the cutter blade in the pin if the pin is moved deeper into the loop.

3. A weaving loom as claimed in claim 1 in which each loop forming pin is moved into position to form a loop at a short horizontal distance from the selvage and is then moved close into the selvage before it releases the loop.

4. A weaving loom as claimed in claim 1, having adjacent each selvage of the fabric being woven and also adjacent to the fell of such fabric, a pin adapted to be moved to bring it against a weft yarn which extends from the warp shed to beyond the selvage, so that on the next weft pick a loop is formed around the pin, the latter being withdrawn from the loop to release the loop at the selvage, a cutter associated with each pin which can sever the loop around the pin if the latter is moved deeper into the loop, so leaving a severed straight weft end at the selvage and weft inserting means to withdraw the other severed end into the selvage.

5. A weaving loom as claimed in claim 4, in which there is a blade spring adjacent to the paying out end of each weft inserting means which prevents the severed end of a loop from recoiling or flying back into the said means immediately after severance.

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