

April 4, 1950

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2,502,735

LOOM WITH STATIONARY WEFT SUPPLY

Filed Oct. 6, 1947

3 Sheets-Sheet 1

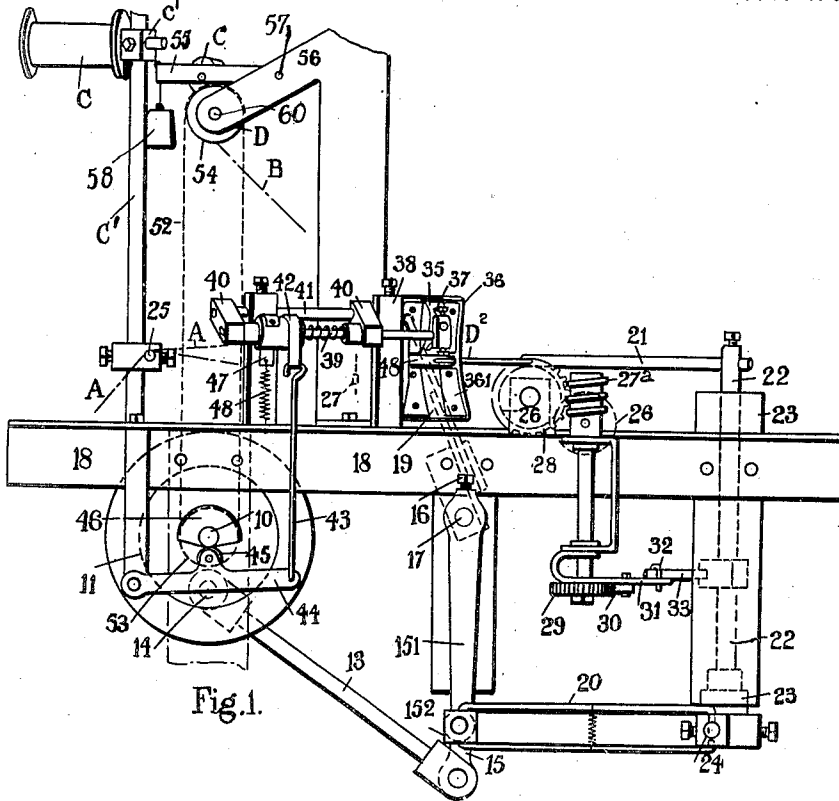


Fig. 1.

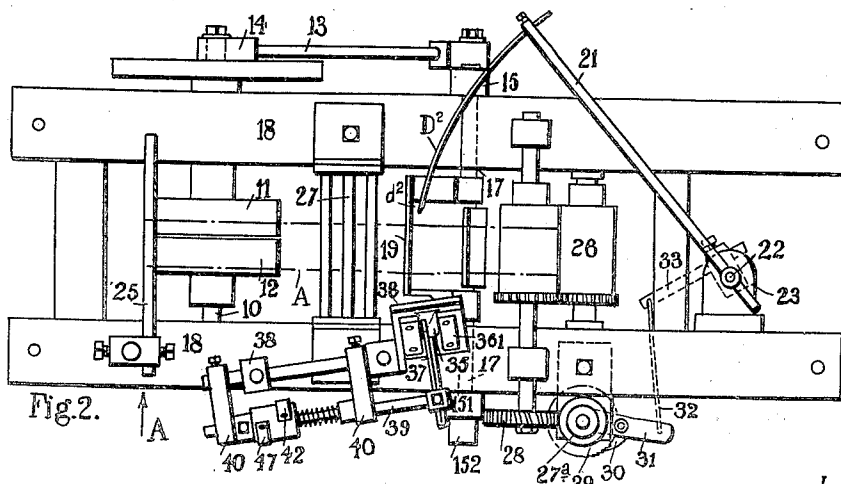


Fig. 2.

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3 Sheets-Sheet 2

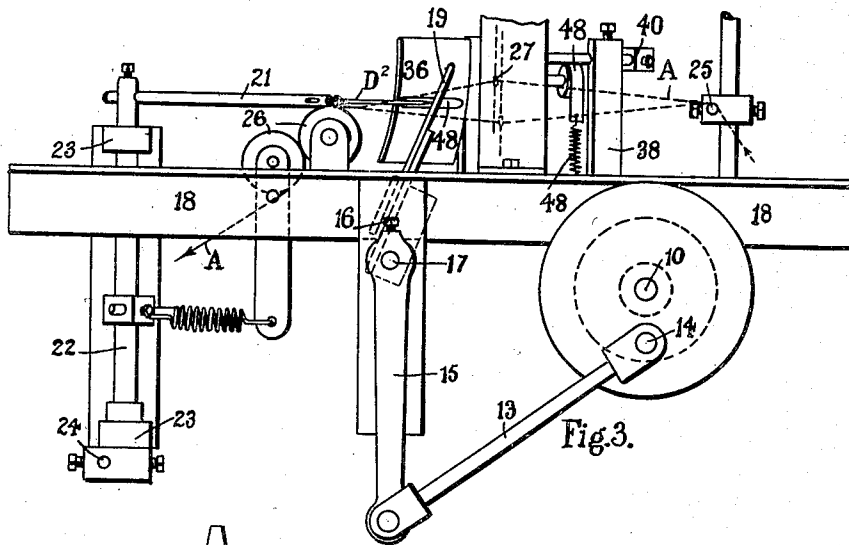


Fig. 3.

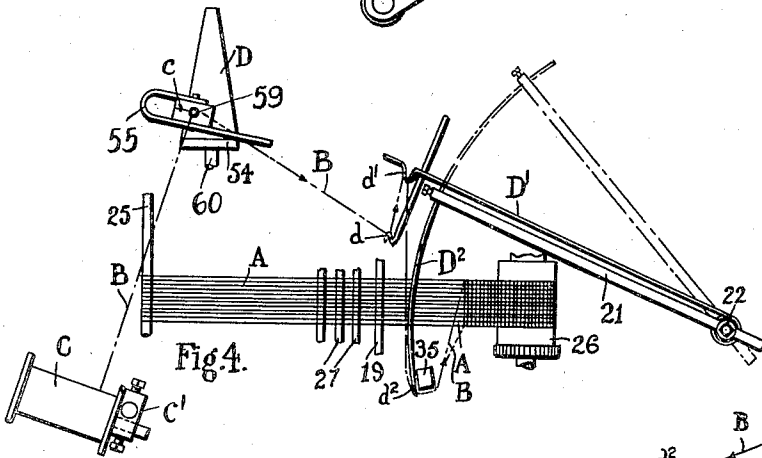


Fig. 4.

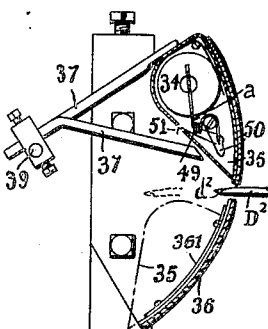


Fig. 5.

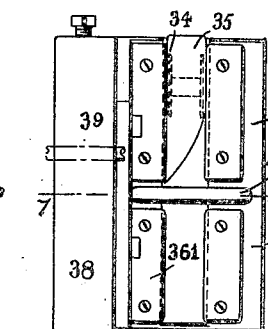


Fig. 6.

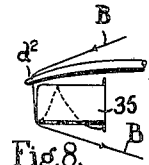


Fig. 8.

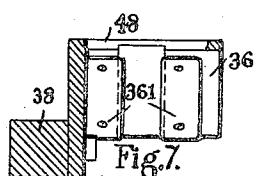


Fig. 7.

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3 Sheets-Sheet 3

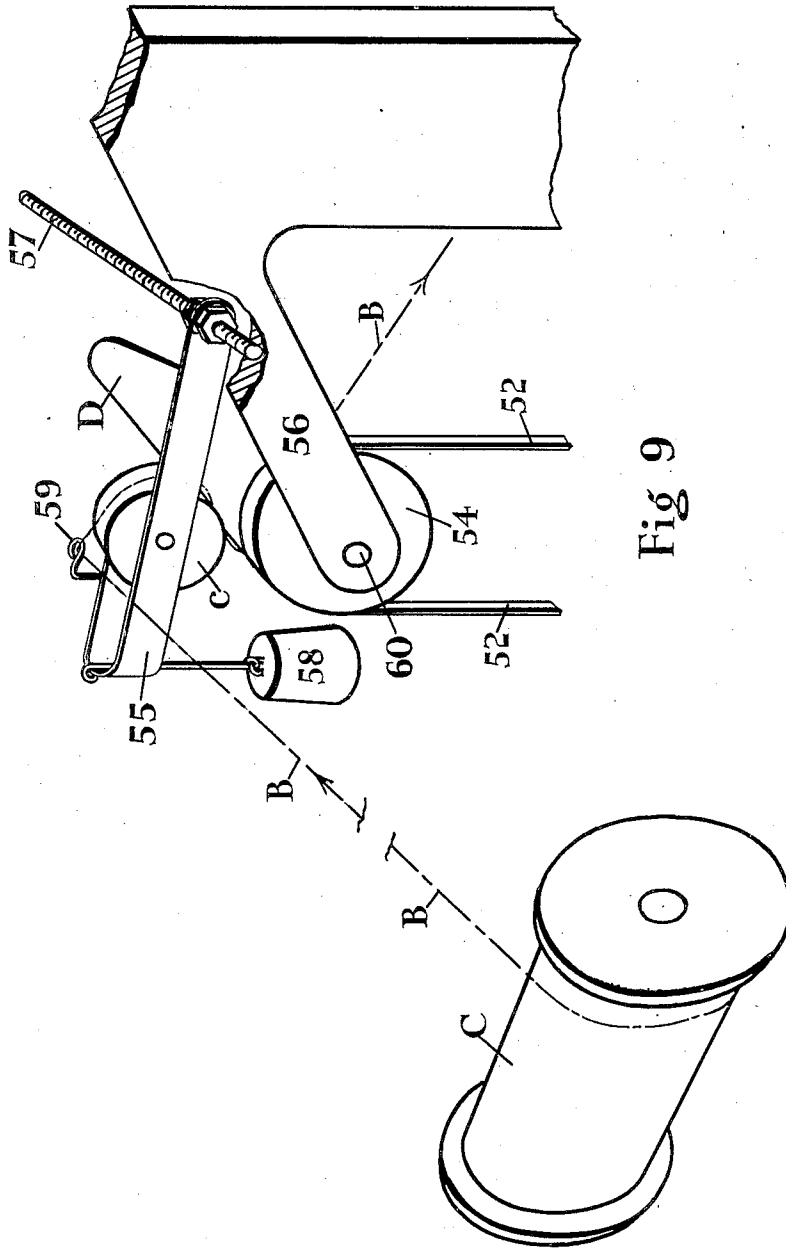


Fig 9

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# UNITED STATES PATENT OFFICE

2,502,735

## LOOM WITH STATIONARY WEFT SUPPLY

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In Great Britain October 7, 1946

3 Claims. (Cl. 139—124)

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This invention relates to improvements in looms for weaving of the type employing a stationary weft supply, the weft being inserted by a member carried by an arm oscillating forwards and backwards through the shed, the shed being changed every two picks, i. e. after each complete forward and backward movement of the arm.

In looms of this type the interweaving of the weft with the warp threads does not form a selvage at one edge of the cloth and it is necessary to provide means for forming a selvage along such edge and the main object of the present invention is the provision of improved means for forming this selvage.

According to the invention the aforesaid selvage is formed by a shuttle which is oscillated or reciprocated at the edge of the warp threads and at right angles thereto to insert a binder thread in the loop of the weft formed between each pick at the opposite side of the warp to that in which the weft inserting member enters the shed.

The invention is illustrated in and will be described with reference to the accompanying drawings which show it applied to a smallware or narrow fabric loom. In these drawings:

Fig. 1 is a side elevation looking in the direction of the arrow A, Fig. 2, with spring arm D<sup>1</sup> removed;

Fig. 2 is a plan view of same;

Fig. 3 is a side elevation of same from the opposite side to Fig. 1;

Fig. 4 is a diagrammatic plan;

Fig. 5 is a side elevation of the shuttle for inserting the binder thread and the shuttle race therefor;

Fig. 6 is a front elevation of Fig. 5;

Fig. 7 is a sectional plan on line 7—7, Fig. 6;

Fig. 8 is a plan of the shuttle and weft inserting needle showing the loop formed for the passage of the shuttle;

Fig. 9 is a perspective view showing the arrangement of the tensioning roller and its adjusting means.

The various parts of the loom are driven from a crankshaft 10 which receives its motion through a fast and loose pulley 11 and 12 driven from any suitable source of power.

The weft yarn B is supplied from a bobbin or the like C carried by a bracket c<sup>1</sup> mounted on a vertical pillar C<sup>1</sup> and is inserted into the shed of the warp threads A by a curved needle D<sup>2</sup> carried by an arm 21 pivotally mounted on the frame of the loom and oscillated from the

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crankshaft 10. As is indicated in the diagrammatic plan shown in Fig. 4 and in Fig. 9 the weft B passes from the bobbin C around a conical roller D driven from the shaft 10, the speed of rotation of the roller D being such that it unwinds a length of yarn from the bobbin C for each complete oscillation of the arm 21, i. e. for each double pick equal to twice the width of the cloth. By altering the position of the weft on the roller D the amount of yarn unwound from the bobbin C for each double pick can be varied according to the width of the cloth being woven. The weft is guided to and from the roller D by a tensioning roller c the position of which can be adjusted axially relative to the roller. The conical roller D is rotated by a belt or cord 52 passing over a pulley 53 on the crankshaft 10 and over a pulley 54 on the roller spindle 60 carried in a bracket 56 which carries the shedding mechanism. The tension roller c is mounted on a U-shaped arm 55 carried by a screw threaded spindle 57 supported by the bracket 56 on the frame, the position of the arm 55 on the spindle being adjustable thereon. A weight 58 is suspended from the arm 55 to apply tension to the roller c. The yarn B passes to the roller c over a thread guide 59 mounted on the arm 55.

From the roller D the weft yarn B passes through a stationary guide eye d, then through an eye d<sup>1</sup> at the end of a spring arm D<sup>1</sup> oscillating with the arm 21, to maintain a tension on the yarn and from thence to an eye d<sup>2</sup> in the weft inserting needle D<sup>2</sup>.

The arm 21 carrying the weft inserting needle D<sup>2</sup> is secured to the upper end of a vertical rocking spindle 22 journaled in a bearing 23 and oscillated from a rocking lever 15<sup>1</sup> carried by a horizontal shaft 17 through the member 20 one end of which is pivoted in a rod 24 eccentrically mounted in relation to the spindle 22 and the other end of which similarly engages a block 152 on the end of the lever 15<sup>1</sup>.

The shaft 17 is journaled in the loom frame 18 and is oscillated from the crankshaft 10 by a connecting rod 13 one end of which is mounted on a crank 14 on the shaft 10 the other end is pivoted to the lower end of a rocking lever 15, the upper end of the lever 15 being secured by a screw 16 to the horizontal shaft 17.

The reed 19 for beating up the weft is carried by the rocking shaft 17 so that its movement is synchronised with the movement of the weft inserting needle D<sup>2</sup>.

The warp threads A pass from a beam or

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bobbins over the back rail 25 of the loom and the woven fabric passes over take-up rollers 26 a shed for the passage of the needle D<sup>2</sup> between the warps A being formed in the usual manner by healds 27 operated from the crank-shaft 10 in any known way. The take-up rollers 26 are geared together and driven through a worm 27<sup>a</sup> and worm wheel 28 through a ratchet 29 and pawl 30, mounted on an arm 31 connected by a link 32 to an arm 33 carried by the oscillating spindle 22.

The length of the arm 21 is such that the eye d<sup>2</sup> of the weft inserting needle D<sup>2</sup> passes completely through the shed at each oscillation of the spindle 22 and, as indicated in Fig. 4, to a sufficient distance beyond the warp threads to form a loop in the weft B.

The shed changes every two picks, i. e. the needle D<sup>2</sup> inserts the weft double through the shed and the shed is only changed when the needle D<sup>2</sup> has returned to its initial position. It will be evident that no selvage would be formed by the interweaving of the weft and warps at the side of the latter remote from that at which the needle D<sup>2</sup> is inserted into the shed and in order to form a selvage at the aforesaid side a binding or selvage forming thread *a* is inserted into the loop of the weft B from a spool 34 carried in a shuttle 35 which is caused to pass through the loop in a similar manner to the action of the shuttle of a sewing machine.

The shuttle 35 is traversed over a vertical arcuate race 36 by a forked arm 37 carried by a rocking shaft 39 carried in brackets 40 mounted on a shaft 41 supported by the loom frame 18. The shaft 39 is rocked in one direction by a strap 42 connected by a link 43 to a lever 44 pivoted on the loom frame and provided with a roller 45 engaging a cam 46 on the crankshaft 10 and in the opposite direction by a second strap 47 connected to a spring 48 anchored to the frame 18 of the loom. The shuttle race 36 is affixed to a pillar 38 on the frame.

The shuttle race 36 is provided with plates 36<sup>1</sup> screwed thereto to form guides for flanges on the sides of the shuttle 35. Transversely of the race 36 a slot 48 is formed for the passage of the needle D<sup>2</sup> as shown in Fig. 7. After the withdrawal of the needle D<sup>2</sup> the shuttle returns to its initial position.

The binding thread *a* from the spool 34 passes through a yarn guide 49 and between two tension plates 50 and out through an aperture 51 in the side of the shuttle so that after each beat up of the weft by the reed 19 it lies parallel to the warp threads A.

Although not limited thereto the invention is particularly applicable for use in the production of narrow width fabrics such as tape, peter-sham, ribbons, webbing or the like.

I claim:

1. In a loom for weaving of the type described, the combination of an oscillating arm and a weft inserting member carried thereby, of a shuttle arranged at the opposite side of the loom

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to that on which the said member enters the shed, a weft supply bobbin mounted on the loom, means for reciprocating the shuttle to insert a binder thread into a loop formed in the weft by the change in direction of the weft inserting member at the end of its forward movement, a pair of rollers between which the weft passes and one of which rollers is conical, and means for varying the position of the weft axially relatively to the rollers for the withdrawal of the required length from the supply bobbin for insertion by the weft inserting member.

2. In a loom for weaving of the type described, the combination of an oscillating arm and a weft inserting member carried thereby, of a shuttle arranged at the opposite side of the loom to that on which the said member enters the shed, a weft supply bobbin mounted on the loom, means for reciprocating the shuttle to insert a binder thread into a loop formed in the weft by the change in direction of travel of the weft inserting member at the end of its forward movement, a crank shaft for operating the weft inserting member, a cam on said crank shaft, a lever oscillated by the cam, a rocking shaft, a strap connecting the cam oscillated lever to the rocking shaft to rotate it in one direction, a second strap controlled by a spring to oscillate it in the opposite direction, and a forked arm mounted on the rocking shaft and connected to the shuttle by which the shuttle is reciprocated.

3. In a loom for weaving of the type described, the combination of an oscillating arm and a weft inserting member carried thereby, a shuttle arranged at the opposite side of the loom to that on which the said member enters the shed, a weft supply bobbin mounted on the loom, means for reciprocating the shuttle to insert a binder thread into a loop formed in the weft by the change in direction of the weft inserting member at the end of its forward movement, a conical roller and a tensioning roller between which the weft passes, and means for adjusting the tensioning roller relative to the conical roller such that the required length of weft is supplied to the weft inserting member to be delivered on a complete forward and backward movement of the member.

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