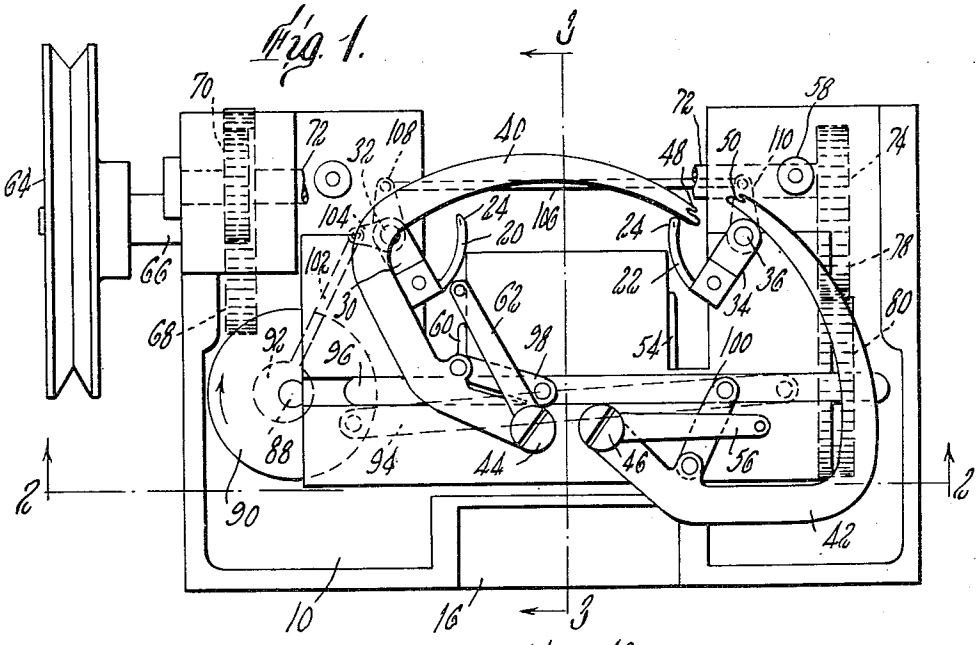
Nov. 6, 1956 C. F. LIBBY 2,769,462

NARROW WEB LOOM

Filed July 27, 1955 2 Sheets-Sheet 1

Fig. 1.



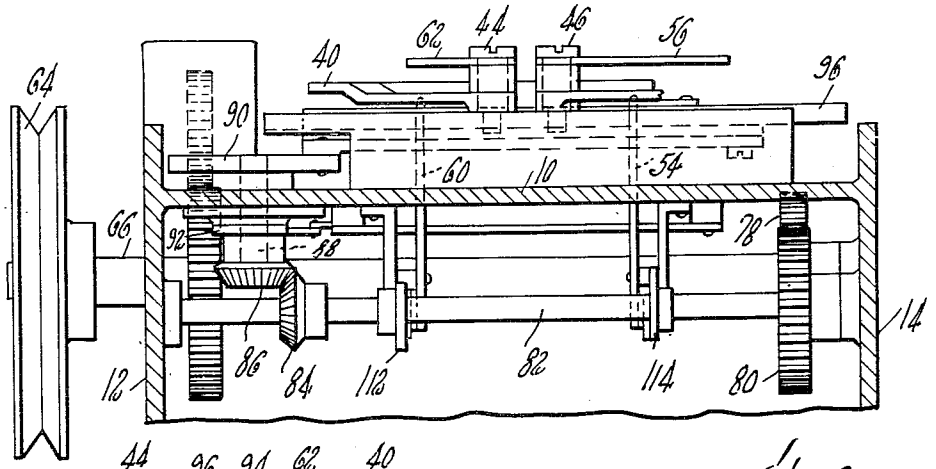


Fig. 2.

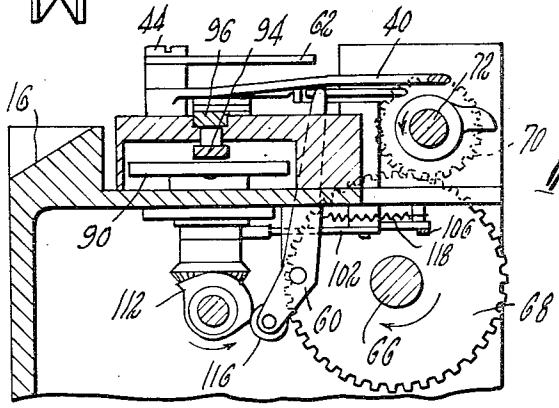


Fig. 3.

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NARROW WEB LOOM

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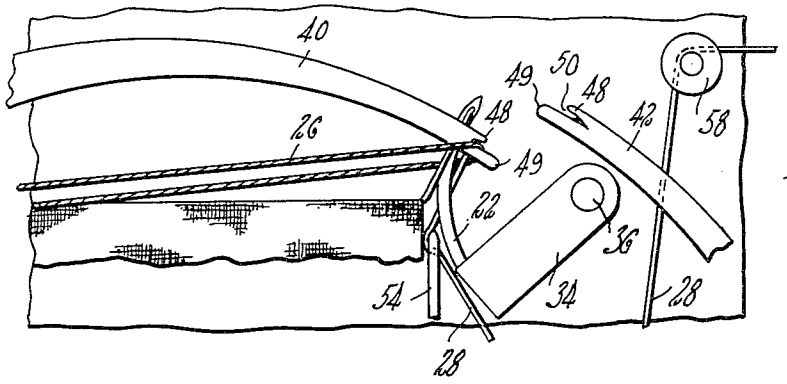


Fig. 4.

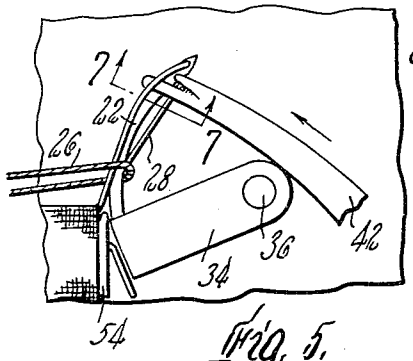


Fig. 5.

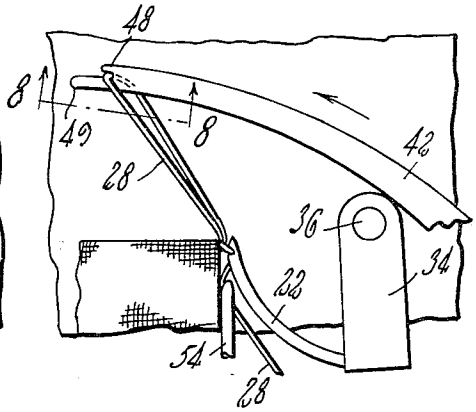


Fig. 6.

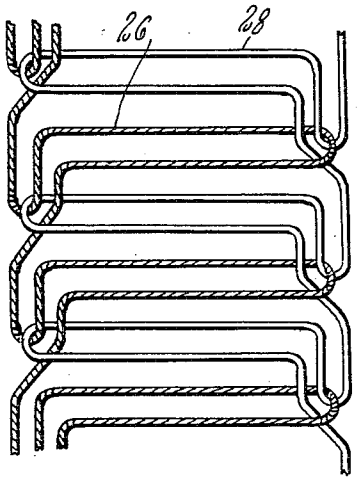


Fig. 9.

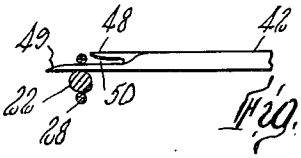


Fig. 7.

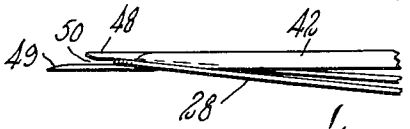


Fig. 8.

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2,769,462

NARROW WEB LOOM

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Application July 27, 1955, Serial No. 524,667

3 Claims. (Cl. 139—122)

This invention relates to improvements in narrow web looms of the type having fingers or needles which project loops of weft yarn through the shed of warp yarns alternately from opposite sides of the shed. To prevent ravelling of the web and to provide a sightly selvage, the ends of the loops are caught after they have been projected through the shed and are knitted to other loops or to special selvage yarns or to both. Thus a variety of selvages have been devised in some of which the weft loops are more or less securely locked so as to prevent ravelling when a break occurs in one of the weft yarns.

According to the present invention, mechanism is provided for projecting each loop of weft yarn through the end of the preceding loop of the other weft yarn which has just been projected through the shed from the other side thereof as the first-mentioned loop is about to enter the shed to be projected to the other side thereof. To accomplish this result, a needle having a weft yarn threaded through an eye near its end is thrust through the end of the loop of the other weft yarn which has just been projected through the shed from the other side. A finger with a forked end at once picks up the yarn from the needle and projects it through the shed to the other side where the needle on that side at once thrusts its weft yarn through the end of the loop. This operation is described hereinafter in more detail, and mechanism for carrying it out is illustrated on the drawings, of which:

Figure 1 is a plan view of mechanism embodying the invention;

Figure 2 is a front elevation of the same;

Figure 3 is a section on the line 3—3 of Figure 1;

Figures 4, 5 and 6 are fragmentary diagrammatic views showing some of the moving members in their relative positions at successive stages of a cycle of operation;

Figure 7 is a section on the line 7—7 of Figure 5;

Figure 8 is a fragmentary elevation of a weft-laying finger viewed as indicated by the line 8—8 of Figure 6; and

Figure 9 is a diagrammatic view of the disposition of the weft yarns in a web woven by the mechanism illustrated in Figure 1.

The drawing shows a bed 10 which is part of the main frame. Side plates 12 and 14 are also parts of the main frame and may be integral with the bed 10. The loom includes the usual shed changing means (not shown), a part 16 of the bed 10 being shaped to serve as a breast beam.

Two arcuate needles 20 and 22 are mounted to be on opposite sides of the shed and closely adjacent thereto each needle having an eye 24 near the free end thereof. Two weft yarns 26 and 28 are threaded respectively through the eyes of the needles. The end of the needle 20 remote from its free end is secured to a radial arm 30 which extends horizontally from a vertical rock shaft 32. In like manner the needle 22 is secured to a horizontal arm 34 extending from a vertical rock shaft 36. Each arm and its needle are so arranged that the needle lies in

the path of its own movement, that is, the arc of each needle is coaxial with the rock shaft which carries it.

Two weft-laying fingers 40 and 42 are arranged to extend through the shed in alternation from the two sides thereof. These fingers are curved as indicated in Figure 1 and reciprocate about pivots 44 and 46 respectively. The portion of each finger which enters the shed is arcuate and is concentric with the pivot about which the finger rocks. The extremity at the free end of each finger is forked to form two short extensions 48 and 49 with a notch 50 between them. The extension 49 is longer than the extension 48 and is cut away as indicated in Figure 7 to pick up a loop of weft yarn from the adjacent needle.

The fingers and needles cooperate as indicated in Figures 4 and 6 of the drawings to produce a web such as is diagrammatically indicated in Figure 9. For example, when the finger 40 carries a loop of the weft yarn 26 through the shed from the left side thereof, the needle 22 on the right side is projected rearward through the loop carried by the finger 40 and carries with it a loop of the weft yarn 28. The finger 40 is at once retracted from the shed, leaving the loop of the yarn 26 on the needle 22. The finger 42 at once advances toward the left (Figure 5), picks up a loop of the weft yarn 28 at a point between the eye of the needle 22 and the loop of the yarn 26 which is on the needle, and projects the picked-up loop through the shed to the left side thereof while the needle 22 is retracted forward to its initial position (Figure 6). When the finger 42 finishes its stroke through the shed to the left side, the needle 20 thrusts itself with a loop of the yarn 26 through the loop carried by the finger 42 and the sequence of movements at the left of the shed is similar to that hereinbefore described as occurring to the right of the shed. Repetition of these cycles alternately on the right and left sides of the shed produces the web indicated in Figure 9.

In order to provide sufficient yarn free of tension for the loops which are carried through the shed by the fingers and to tension the weft yarns when the fingers and needles are being retracted, two slack take-up members are provided for each weft yarn. At the right side is a guide element 54 which also serves as one of the take-up members. This element is in the form of an upright arm mounted to swing forward and rearward along the right hand edge of the newly woven web. This element has an eye near the upper end thereof through which the yarn 28 extends. The second take-up member at the right of the shed is an arm 56 mounted with the finger 42 to rock in a horizontal plane about the pivot 46. The yarn 28 passes through an eye near the end of this arm and is drawn from a supply (not shown) and about a guide member 58 (Figure 4) which is well to the rear so as to form a loop of yarn of substantial size with the take-up members 56 and 54. When the finger 42 is projected through the shed with a loop of yarn in its end notch 50, the arm 56 swings with it to provide freely the yarn necessary for the loop which is rapidly elongated as it is projected through the shed by the finger 42. For the weft yarn 26 similar guide and take-up members 60 and 62 are provided.

The moving parts of the loom are driven by means of mechanism which comprises a power-input pulley 64 adapted to be connected by a belt or chain (not shown) to a convenient source of power. The pulley 64 is mounted on a shaft 66 which is journalled in the main frame 10 and carries a gear wheel 68 which meshes with a pinion 70 on a shaft 72. The latter extends across the machine and carries a gear wheel 74 which meshes with a gear wheel 76 which is one of a train of gear wheels 78 and 80. The latter is mounted on a transverse shaft 82 which also carries a bevel gear 84. The gear 84 meshes with a bevel gear 86 on a vertical shaft 88. On the shaft 88 are a

crank wheel **90** and an eccentric **92**. The crank wheel **90** is connected by a link **94** to a transverse bar **96** which slides in a groove in the frame **10** to reciprocate the fingers **40** and **42**. For this purpose the finger **40** is connected to the bar **96** by a link **98**. The finger **42** is connected to the bar **96** by a link **100**.

The eccentric **92** reciprocates a rod **102** an end of which is attached to an arm **104** projecting from the rock shaft **32**. The shaft **36** is connected to the shaft **32** by a link **106** extending from an arm **108** on the shaft **32** to a parallel arm **110** on the shaft **36** so that these two shafts rock in unison.

The shaft **82** carries two cam disks **112** and **114** which rock the guide members **60** and **54** respectively, each of the latter having a cam follower **116** which is held against the corresponding cam by a spring **118**.

I claim:

1. In a narrow web loom having shed-forming means, a needle on each side of the shed reciprocable a short distance forward and rearward, each said needle having an eye near its free end for a weft yarn, a weft-projecting finger at each side of the shed, each said finger having a forked end adapted to pick up a loop of weft yarn from the needle on the same side and to project said loop through the shed to the needle at the other side of the shed, and means for operating said needles and fingers in timed relation so that said needle at the other side of the shed is moved to project its loop through the loop brought through the shed by said finger just before said finger is retracted from the shed.

2. Mechanism as in claim 1, each said needle being longitudinally arcuate, the operating means for each said needle comprising a vertical rock shaft and means rigidly connecting each needle to its shaft so that the arc thereof is coaxial with the shaft.

3. Mechanism as in claim 2, each said finger being rockable about a fixed vertical axis, the portion of each finger which is projected into the shed being arcuate in form and concentric with its rocking axis.

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