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SELVAGE FORMING MECHANISM

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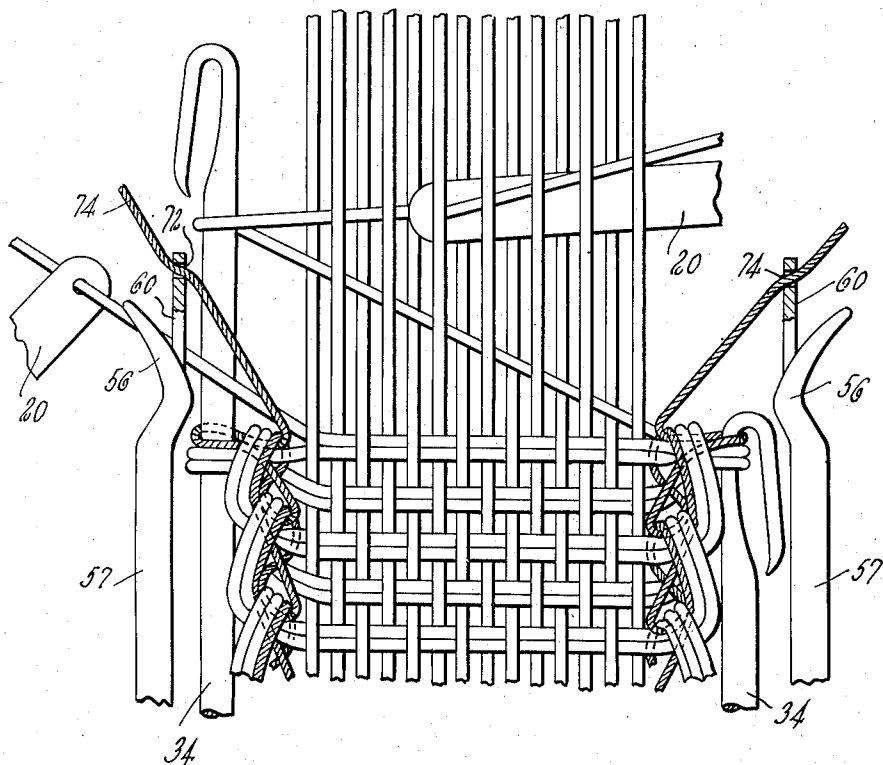


Fig. 8.

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SELVAGE FORMING MECHANISM

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This invention relates to improvements in mechanism for forming selvages on woven webs and more particularly on narrow webs woven by inserting through the shed formed by the warp yarns loops of weft yarns alternately from the two sides of the shed. Looms for this type of weaving are described and illustrated in Letters Patent Nos. 2,180,831 and 2,180,832, granted to me November 21, 1939. As described in these patents, fingers on opposite sides of the shed pass through the shed in alternation with a sweeping movement, each finger having an eye in the end thereof through which a weft yarn is threaded so as to project a loop of the yarn through the shed with each swing of the finger. At the opposite side of the shed a knitting needle is arranged to catch the loop and to knit it through the loop caught from that finger on its previous swing through the shed. Thus the loops along each edge of the fabric are knitted together in succession to make the selvages.

According to the present invention, an improved presser for the needle spring is combined with a guide for the weft yarn which is supplied from the near side of the shed, the action of the guide being to push this weft yarn down at the proper moment in each cycle of the weaving operation so as to cause it to be caught by the needle immediately after the needle has picked up a loop projected through the shed from the far side thereof. These two yarns are then knitted through the double loop of the same yarns already on the shank of the needle and ready to be cast off.

The yarn guide which is associated with the needle spring presser can also be employed to guide a separate selvage yarn to be knitted into the selvage with one or both of the weft yarns.

For a more complete understanding of the invention, reference may be had to the following description thereof and to the drawing, of which:

Figure 1 is a fragmentary plan view of a narrow web loom having an embodiment of the invention included therein;

Figure 2 is a fragmentary side elevation of the same;

Figure 3 is a sectional view on a vertical plane showing the presser and guide member and operating means therefor;

Figure 4 is a fragmentary plan view of a portion of Figure 1 on a larger scale;

Figure 5 is a section on the line 5—5 of Figure 3;

Figure 6 is a fragmentary view of a portion of the woven fabric together with one of the selvage

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knitting needles and the needle spring presser;

Figure 7 is a fragmentary plan view of a narrow web loom having a weft-inserting finger on each side of the shed;

Figure 8 is a fragmentary plan view of a fabric being woven with separate selvage threads knitted into the selvages with both of the two weft yarns.

Figures 1, 2 and 7 illustrate a fragmentary portion of a narrow web loom such as is described and illustrated in said Patents Nos. 2,180,831 and 2,180,832. As therein described, the loom comprises a frame 10 on which is journaled a shaft 12 carrying a series of beat-up blades or plates 14 which revolve with the shaft 12 to beat up the loops of weft yarn projected through the shed from opposite sides thereof in alternation. The means for projecting loops of weft thread through the shed is shown in Figure 1 and comprises a finger 20 having an eye 22 in the end thereof for a weft yarn. The finger 20 is axially slidable through a guide post 24 which is pivotally mounted on the frame so as to turn about a vertical axis. The end of the finger 20 remote from the eye 22 is secured in the pin 26 of a crank 28 on a vertical shaft 30. As the shaft 30 rotates, the crank pin 26 swings around a circular path and causes the eye 22 of the finger 20 to describe a curved path of irregular shape into and out of the shed so that a loop of the yarn which passes through the eye 22 is projected through the shed and is caught at the further side by a knitting needle which is reciprocally mounted with its loop near the fell of the fabric. Figure 1 illustrates a similar knitting needle 34 which is arranged to catch loops from the finger mounted on the other side of the shed. The mechanism illustrated in Figure 1 is duplicated on the opposite side of the shed as illustrated in Figure 7.

The needle 34 is actuated by a lever 36 which is pivoted at 38 and is rocked by an eccentric strap 40 which is on an eccentric 42 mounted on the shaft 30. The shaft 30 and a similar shaft on the other side of the shed are operatively connected to a horizontal drive shaft 44 by suitable bevel gears such as the gears 46 and 48 so that the fingers for projecting the weft yarn and the knitting needles for catching loops of these yarns are all driven through the shaft 44 in timed relation.

The shed (not shown) is formed by warp yarns 49 (Figure 6) which pass between the blades 14 and over the breast beam 50.

According to the present invention improved supports are provided for the two knitting needles

34. These supports are in the form of a pair of vertical guide plates 51. These plates are secured to the ends of the beam 50 and extend vertically therefrom. A description of one plate 51 will serve for both of these plates since they are preferably identical except for being right hand and left hand respectively. Each plate 51 has a transverse groove in its outer side face adapted to contain the shank of the knitting needle 34 with a free sliding fit. The needle 34 is held in its groove by a cover plate 52 which is yieldingly pressed against the side face of the guide plate 51 by a suitable spring 53 confined by a screw 54 set into the side of the plate 51 as illustrated in Figure 5. The cover plate 52 is provided with an upstanding end 55 (Figure 3) which can be pressed by a finger of the operator to move the cover plate 52 away from the guide plate so as to permit the removal or replacement of a knitting needle 34. Thus a broken or bent needle can very quickly and easily be replaced without the use of any tool. The butt of the needle 34 is attached to the end of the lever 36, the hook end of the needle extending beyond the edge of the breast beam 50 so as to be in position to catch loops projected through the shed from the opposite side thereof. As indicated in Figure 4, the needle 34 is of the spring or beard type. This spring must be pressed against the shank of the needle when the needle is to cast off a loop or loops on the shank thereof. For the purpose of pressing the spring at the right time a presser element 56 is provided, this element, as shown, being the end portion of a presser arm 57 which is pivotally mounted as at 58 on the outer side of the guide plate 51. The presser element 56 is movable by rocking movement of the arm 57 into and out of an operative position in which it is in the path of movement of the spring of the needle 34 so that when the needle 34 is retracted to the position shown in Figure 4, the spring rides an inclined surface of the presser 56 and its end is pressed against the needle shank so as to close the loop of the needle and thus to permit a loop or loops of yarn on the shank to be cast off. The arm 57 also has a yarn guide 60 at its end, this yarn guide being immediately below the presser element 56 and having a lower edge with a notch 62 adapted to engage the standing part 64 of the weft yarn supplied from the near side of the shed, as indicated in Figure 6, so that this yarn is depressed to engage the shank of the needle 34 when the presser arm 57 is swung down to move the presser element 56 into operative position. Thus the needle 34, when it is retracted to pick up a loop 66 which has been projected through the shed from the opposite side thereof, also picks up a loop of the weft yarn 64 so that the two yarns are knitted together through a double loop 68 and 70 of the same two weft yarns, which double loop is thereupon cast off.

As shown in Figures 3 and 8, the guide element 60 may have an eye 72 in the end thereof through which a separate selvage yarn 74 can be threaded so as to be caught by the needle 34 when it is retracted and to be knitted into the selvage together with one or both of the weft yarns. The eye 72 is substantially on a level with the notch 62, as shown in Figure 3, so that when the guide member 60 is swung down, the weft thread in the notch 60 and the selvage thread in the eye 72 are carried down across the shank of the needle 34, as indicated in Figure 8, so as to be caught in the loop of the needle when it is retracted. The press-

er arm 57 is actuated by any suitable means such as a head 76 which is mounted on the upper end of a vertical rod 78 and is provided with a lateral slot or notch which receives a pin 80 on the arm 57. Vertical reciprocation of the rod 78 with the head 76 results in rocking movement of the arm 57 to move the presser element 56 into and out of operative position in the path of the needle spring. The rod 78 is pivotally connected at its lower end to a rocking lever 82 which is pivoted at 84 and which carries a cam follower 86 riding on a suitable cam 88 mounted on the shaft 44. Since this shaft drives the weaving mechanism, the movements of the presser arms 57 can readily be adjusted to be in proper timed relation with the movements of the other parts of the mechanism.

I claim:

1. In a loom having shed-forming means and means for projecting loops of weft yarn through said shed from opposite sides thereof in alternation, a knitting mechanism on each side of the shed for knitting the successive loops from the far side of the shed together with the weft yarn on the near side, each said mechanism comprising a vertical guide plate having a lateral groove therein, a knitting needle having its shank slidably fitted in said groove, a vertical cover plate covering a portion of said groove to maintain the needle therein, spring means pressing said cover plate against said guide plate, and means for reciprocating said needle at predetermined intervals.

2. In a loom having shed-forming means and means for projecting loops of weft yarn through said shed from opposite sides thereof in alternation, a knitting mechanism on each side of the shed for knitting the successive loops from the far side of the shed together with the weft yarn on the near side, each said mechanism comprising a spring knitting needle reciprocally supported on said loom in position to catch loops of weft yarn projected through the shed from the opposite side, means for reciprocating said needle at predetermined intervals, a presser arm rockably mounted on said loom, said arm having a presser element movable into and out of the path of the needle spring, means for rocking said arm in timed relation with the reciprocations of the needle, and a yarn guide on said arm movable therewith to push a portion of the weft yarn on the near side against the needle as the needle is retracted to catch the yarn in the spring of the needle.

3. In a loom having shed-forming means and means for projecting loops of weft yarn through said shed from opposite sides thereof in alternation, a knitting mechanism on each side of the shed for knitting the successive loops from the far side of the shed together with the weft yarn on the near side, each said mechanism comprising a vertical guide plate having a groove in one face thereof, a spring knitting needle having a shank slidably fitted in said groove, a vertical cover plate covering a portion of said groove to maintain the needle therein, spring means pressing said cover plate against said guide plate, a presser arm pivotally mounted on said guide plate, said arm having a presser element movable into and out of the path of the needle spring when the arm is rocked, said arm also having a yarn guide movable to push a portion of the weft yarn on the near side against the shank of said needle when the arm is rocked, and means for

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rocking said arm in timed relation to the movements of said weft projecting means.

4. In a loom having shed-forming means and means for projecting loops of weft yarn through the shed from opposite sides thereof in alternation, a knitting mechanism on each side of the shed, said mechanism comprising a reciprocable spring knitting needle, a support therefor, means for reciprocating said needle at predetermined intervals to and from a position to catch a loop projected through the shed from the far side thereof, a presser arm pivotally supported on said loom near said needle, said presser arm having a presser element thereon movable to and from a position in the path of said needle spring, said arm also having a yarn guide thereon movable to engage the weft yarn on the near side of the shed to push it against the shank of said needle, said yarn guide having a guide eye for a selvage yarn to be knitted with the weft yarns.

5. In a loom having shed-forming means and means for projecting successive loops of weft yarn through the shed from one side thereof, a knitting mechanism on the other side of the shed for knitting together said successive loops, said mechanism comprising a vertical guide plate having a lateral groove therein, a knitting needle having its shank slidably fitted in said groove, a vertical cover plate covering a portion of said groove to maintain the needle therein, spring means passing said cover plate against said guide plate, a needle-pressing arm pivotally mounted at one end on said guide plate, means for rocking the free end of said arm up and down from and to an operative position in which the free end portion of the arm is engageable by said needle to close the needle loop, a yarn guide car-

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ried by said arm adjacent to its free end to guide a selvage yarn into engagement by said needle, whereby to knit loops of the selvage yarn together with loops of the weft yarn, and means for reciprocating said needle.

6. In a loom having shed-forming means and means for projecting successive loops of weft yarn through the shed from one side thereof, a knitting mechanism on the other side of the shed for knitting said successive weft loops together with a selvage yarn, said mechanism comprising a spring knitting needle reciprocably mounted on said loom with its loop near the fell of the fabric and arranged to catch loops of weft yarn when they are projected through the shed from the other side thereof, means for reciprocating said needle in timed relation with the movements of the weft-projecting means, a presser arm rockably mounted on said loom, said arm having a presser element movable into and out of the path of said needle spring, means for rocking said arm in timed relation with the reciprocations of said needle, and a yarn guide carried by said arm to guide a selvage yarn to be caught by said needle and knitted together with said loops of weft yarn.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
2,258,538	Clutsom	Oct. 7, 1941

FOREIGN PATENTS

Number	Country	Date
521,096	Great Britain	May 13, 1940