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2,584,891

NARROW WEB WITH LOCKED SELVAGE AND METHOD OF MAKING SAME

Filed Aug. 6, 1946

3 Sheets-Sheet 1

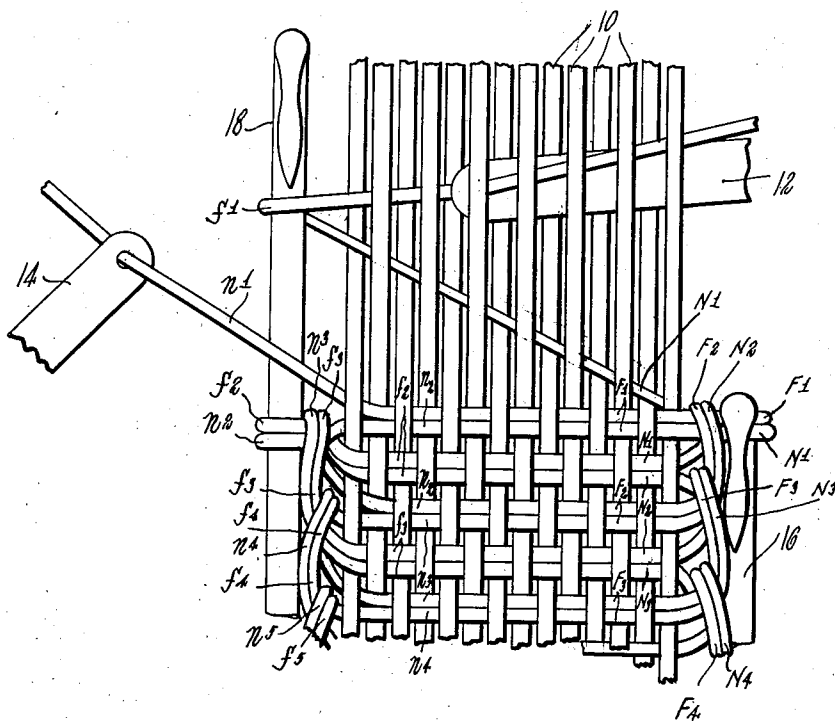


Fig. 1.

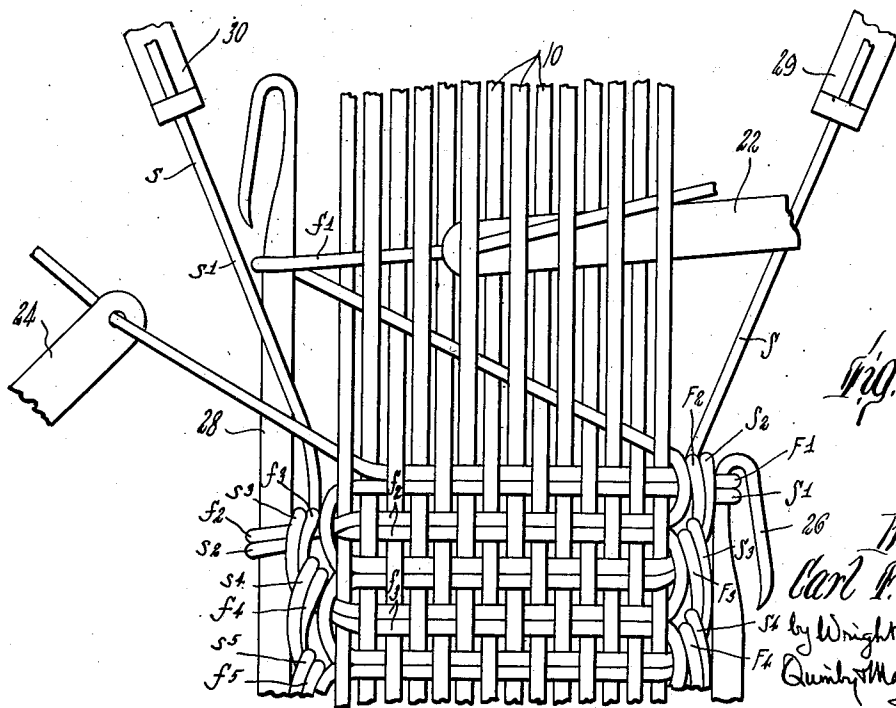


Fig. 2.

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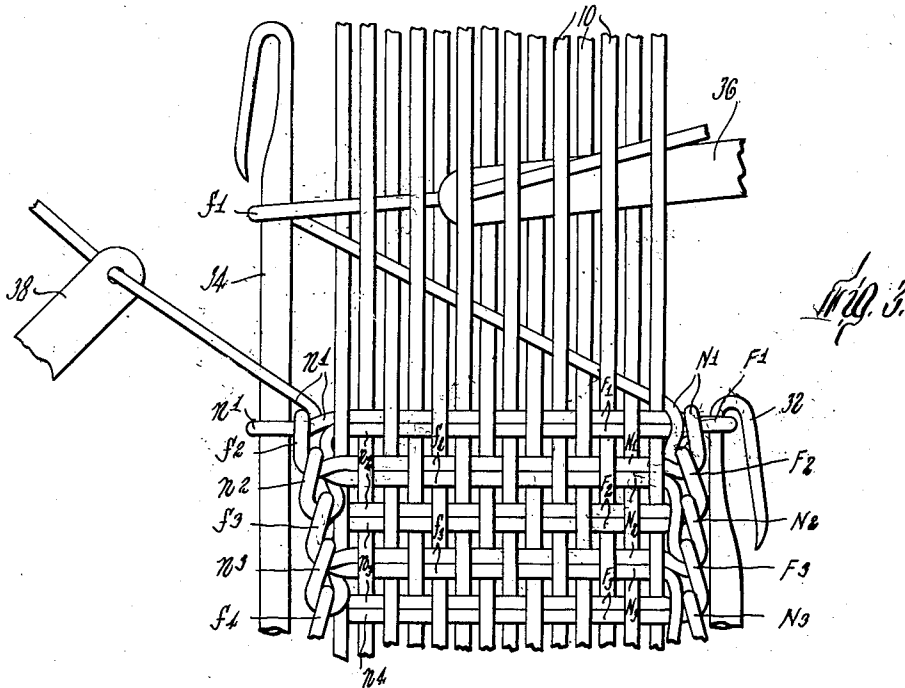
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3 Sheets-Sheet 2



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3 Sheets-Sheet 3

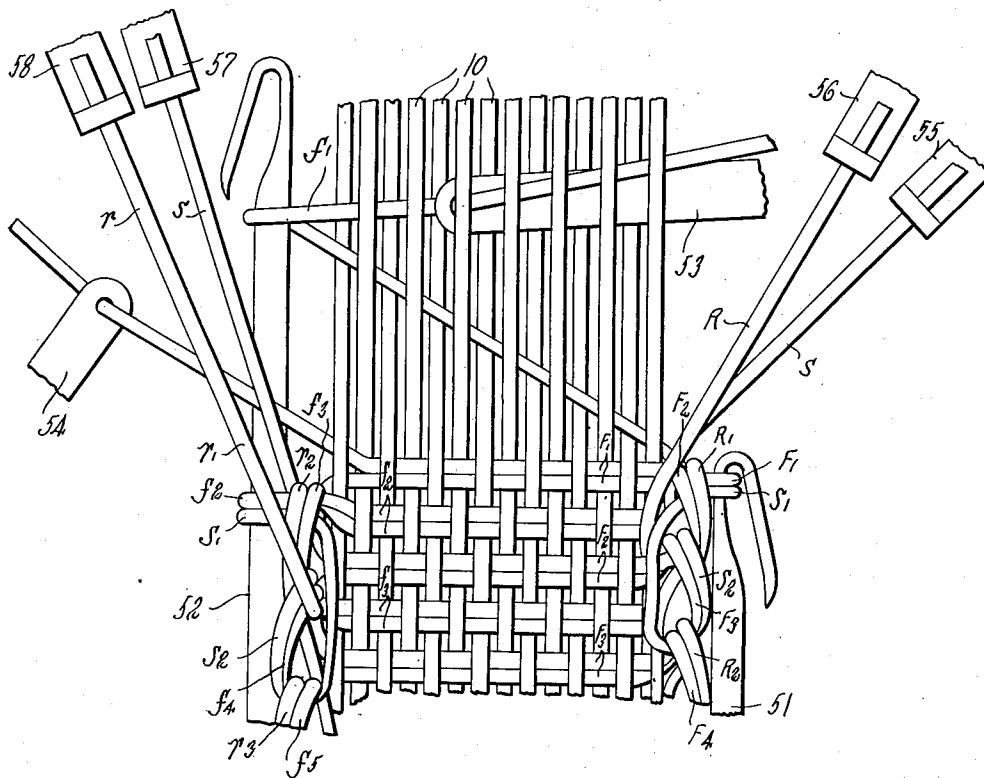


Fig. 4.

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UNITED STATES PATENT OFFICE

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NARROW WEB WITH LOCKED SELVAGE
AND METHOD OF MAKING SAME

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9 Claims. (Cl. 139—383)

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This invention relates to narrow webs such as are woven on needle looms wherein loops of two weft yarns are projected through the shed of warp threads from opposite sides in alternation, the shed being changed after each insertion of a loop. A loom for weaving fabrics of this kind is shown and described in my Patent No. 2,180,831, granted November 21, 1939. In the loom therein shown, a knitting needle is mounted at each side of the shed to catch the loop projected through from the far side and to knit the end of the loop through the previously caught loop from the far side. Thus the loops of each weft yarn are successively knitted together along the edge of the web opposite to the side from which that yarn was introduced. It is evident that if a weft yarn breaks in such a fabric, it can be pulled out of the fabric progressively from the break since each time a loop is pulled out of the fabric, the next loop is released.

It is an object of the present invention to knit the selvages so that the loops of weft yarn are locked not only by the next loop of the same yarn but also by another yarn so that a break in one of the weft yarns does not release that yarn for progressive removal from the fabric. This can be done in a number of ways, some of them being hereinafter described, and illustrated on the drawings, of which:

Figure 1 is a diagrammatic view of a narrow web in the process of being woven, showing one method of locking the selvages;

Figures 2, 3, and 4 are similar views showing other methods of locking the selvages.

In the form of the invention illustrated in Figure 1, when a loop of weft yarn is knitted through the previously formed loop of the same yarn, the other weft yarn is knitted with it, so that if one yarn breaks, the other yarn will prevent ravelling.

A series of warp threads 10 is shown in Figure 1. Through the shed formed by these threads two filling or weft yarns are alternately projected from opposite sides by weft fingers 12 and 14 respectively. A pair of knitting needles 16 and 18 are provided on opposite sides of the shed to catch and knit loops of weft yarn projected through the shed from the opposite side. The knitting needles may be of the latch type or the spring type illustrated. Each knitting needle when it knits a loop of yarn received from the other or far side of the shed, also knits with such yarn the yarn on the same or near side of the shed.

In describing the selvages shown in Figure 1,

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the various loops will be mentioned in the reverse order to that in which they were formed. Thus on the needle 16 is a loop F_1 of yarn which has been projected by the finger 14 from the far side of the shed, and a loop N_1 of yarn from the near side of the shed. These two loops have just been pulled through a double loop consisting of the previous loop F_2 projected by the finger 14 and a loop N_2 of yarn on the near side, and the latter has been cast off. In like manner, the double loop F_2, N_2 extends through a double loop F_3, N_3 previously formed and caught by the knitting needle 16. The double loop F_3, N_3 extends through a double loop F_4, N_4 , and so on.

On the left hand side of the shed, the knitting needle 18 has just caught a loop f_1 brought over by the finger 12 from the far side and in descending will catch a loop n_1 of yarn on the near side. This double loop will be knitted through a double loop f_2, n_2 which has previously been caught by the needle 18 in like manner and has been knitted through an earlier double loop f_3, n_3 , and so on, corresponding previously formed loops being indicated at f_4, n_4 and f_5, n_5 .

It should be noted that each of the two weft yarns is looped alternately on one side and the other of the shed. Thus one yarn includes the loops f_1, N_1, f_2, N_2, f_3 , et cetera. The other weft yarn includes the loops n_1, F_1, n_2, F_2, n_3 , et cetera.

The arrangement and relation of the several loops can be more readily seen by coloring the two weft yarns with contrasting colors.

In the arrangement shown in Figure 2, two selvage yarns S and s are alternately knitted in with loops from the far side when the latter are knitted together. In this case the weft yarns are not knitted on their own side but only on the opposite side of the shed. The loops of weft yarn are projected through the shed alternately by fingers 22 and 24, the loops being caught and knitted by the knitting needles 26 and 28. The selvage yarns are supplied through guides 29 and 30 which move the yarns into position to be caught by the knitting needles at the proper times.

The right hand selvage shown in Figure 2 includes a double loop F_1, S_1 composed of the weft yarn from the far side and the selvage yarn on the near side. This double loop is on the needle 26 which has knitted it through a double loop F_2, S_2 . The latter has been cast off. The loop F_2 is the previously formed loop of weft yarn from the far side, the loop S_2 being the previously formed loop of selvage yarn on the near side. The double loop F_2, S_2 , extends through a pre-

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viously formed double loop F_3, S_3 , and so on, the corresponding previously formed double loop being indicated at F_4, S_4 .

On the left hand side, the knitting needle 28 has caught a loop f_1 of weft yarn from the far side and will catch a loop s_1 from the standing part of the selvage yarn s on the near side. These two loops will be knitted together through a double loop f_2, s_2 , which has been previously formed in like manner and which extends through a double loop f_3, s_3 , and so on, corresponding previously formed double loops being indicated at f_4, s_4 and f_5, s_5 .

In making the web shown in Figure 3, the knitting needles 32 and 34 make twice as many stitches as those shown in the other figures. Thus, both knitting needles knit each time a loop is projected through the shed. As a result, on each side of the shed single loops of the near weft yarn and the far weft yarn are knitted through each other in alternation. In the selvage on the right hand side, the knitting needle 32 has caught a loop F_1 of weft yarn from the finger 38 from the far side of the shed and has pulled it through a previously carried loop N_1 which has been cast off. The loop N_1 , formed in the weft yarn on the near side, was previously pulled through a loop F_2 received from the finger 38. The loop F_2 from the far side passes through the loop N_2 on the near side, which passes through the cross-warp loop F_3 , the latter passing through the loop N_3 .

On the left hand side of Figure 3, the knitting needle 34 has received a loop f_1 brought over from the far side by the finger 36. This loop will be knitted through a loop n_1 now on the shank of the knitting needle 34, after which the loop n_1 will be cast off. The loop n_1 has already been knitted through the previous loop f_2 from the far side of the shed, the loop f_2 has been knitted through a loop n_2 in the yarn on the near side, and so on. In this figure, the weft yarn supplied from the right is represented by the characters $f_1, N_1, f_2, N_2, f_3, N_3$ and f_4 . The other weft yarn is represented by the characters $n_1, F_2, n_2, F_3, n_3, F_4$ and n_4 .

Figure 4 illustrates a web having locked selvages in which two yarns are employed on each side of the warp, the selvage yarns at each side of the warp being alternately knitted with successive loops of weft yarn projected from the far side of the warp. As shown, knitting needles 51 and 52 are mounted to the right and left of the warp threads 10. Weft yarn fingers 53 and 54 are employed to project yarn loops through the shed alternately from the right and left. Two yarn guides 55 and 56 are employed near the needle 51 of selvage yarns S and R . At the other side of the warp, two yarn guides 57 and 58 are employed for selvage yarns s and r .

In the right hand selvage of the web, the needle 51 has just pulled a double loop F_1, S_1 through the double loop F_2, R_1 and has cast the latter off. The loop F_1 is of weft yarn projected through the shed from the far side by the finger 54. The loop S_1 was picked up from the guide 55 when the loop F_1 was taken from the finger 54. The loop F_2 is the previous loop of weft yarn from the far side taken by the needle 51, at which time the loop R_1 was caught from the guide 56.

The double loop F_2, R_1 was previously in like manner knitted through the double loop F_3, S_2 consisting of the weft yarn from the far side and the selvage yarn S . Prior to that, the double loop F_3, S_2 was knitted through the double loop

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F_4, R_2 . Thus it is evident that the selvage is made by knitting each weft yarn loop from the far side through the previous loop of the same yarn, but locking each stitch by including a loop of one of the selvage yarns S and R , these being used alternately.

A web can be woven with but one weft yarn, the loops of this yarn being knitted successively together with loops of selvage yarn taken alternately from the guides 55 and 56. Figure 4, however, illustrates a web in which two weft yarns are used, the selvage on the left being made in a manner similar to that in which the right hand selvage is made, as described. The loop f_1 of weft yarn from the far side is on the shank of the needle 52 which will pick up a loop r_1 from the guide 58 when it descends. Lower on the needle shank is the double loop f_1, s_1 through which the double loop f_1, r_1 will be drawn. The double loop f_2, s_1 has previously been drawn through the double loop f_3, r_2 , and the latter through the double loop f_4, s_2 , the loop f_4, s_2 through the double loop f_5, r_3 and so on, the selvage yarns being alternately knitted with successive loops of weft yarn projected from the far side.

I claim:

1. In a web comprising warp threads and two weft yarns extending across the warp in alternate loops from opposite sides of the warp, selvages along both edges of the web in each of which the end portion of each cross-warp loop of weft yarn is knitted through a loop of some other yarn in the web and has the end portion of another cross-warp loop knitted through it.

2. A web as described in claim 1 in which said other yarn in each selvage is an extra selvage yarn.

3. In a web comprising warp threads and two weft yarns extending across the warp in alternate loops from opposite sides of the warp, selvages along both edges of the web in each of which the end portion of each cross-warp loop of weft yarn is knitted through a loop of the other weft yarn.

4. In a web comprising warp threads and two weft yarns extending across the warp in alternate loops from opposite sides of the warp, selvages along both edges of the web in each of which the end portion of each said loop of weft yarn is knitted with a loop of the other weft yarn through a previously formed double loop of said yarns.

5. In a web comprising warp threads and two weft yarns extending across the warp in alternate loops from opposite sides of the warp, selvages along both edges of the web in each of which the end portion of each said loop of weft yarn is knitted through a loop of the other yarn which in turn is knitted through the end portion of the previously formed cross-warp loop of the first mentioned weft yarn.

6. In a web comprising warp threads and two weft yarns extending across the warp in alternate loops from opposite sides of the warp, selvages along both edges of the web in each of which the end portion of each said loop is knitted through a double loop of both said weft yarns.

7. A method of forming selvages on narrow webs wherein two weft yarns are projected across the warp in alternate loops from yarn supplies on opposite sides of the warp, comprising catching each loop of weft yarn projected from the side of its supply, forming therewith a loop of the other weft yarn, and knitting the resulting double loop through a previously formed double loop of the same yarns.

8. A method of forming selvages on narrow

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webs wherein two weft yarns are projected across the warp in alternate loops from yarn supplies on opposite sides of the warp, comprising catching the end portion of each loop of weft yarn projected across the warp from the side of its supply, knitting said end portion through a previously formed loop of the other weft yarn, forming a new loop of said other yarn, and knitting said new loop through said end portion of the first mentioned weft yarn.

9. In a web comprising warp threads and two weft yarns extending across the warp in alternate loops from opposite sides of the warp, knitted selvages along both edges of the web, each stitch of which is formed by knitting the end portion of a cross-warp loop of yarn together with

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a loop of another yarn through a previously formed double loop of yarn.

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