March 11, 1947. A. LANZ 2,417,204

PRODUCTION OF WEAVING EFFECTS BY VARIABLE WARP TENSIONING MEANS

Filed Nov. 10, 1943

FIG.1

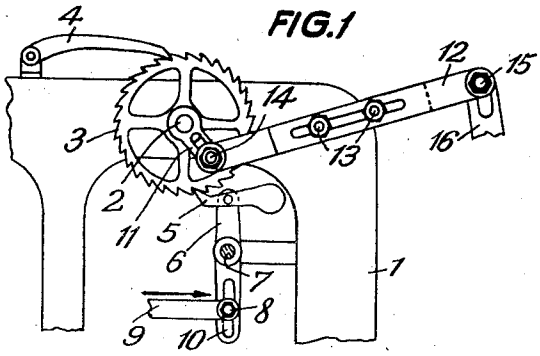


FIG.2

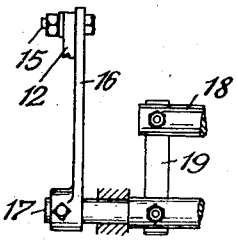


FIG.4

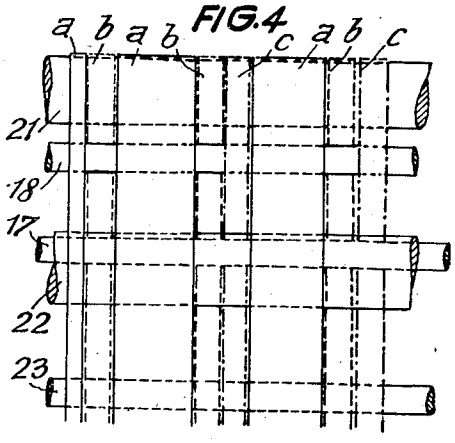
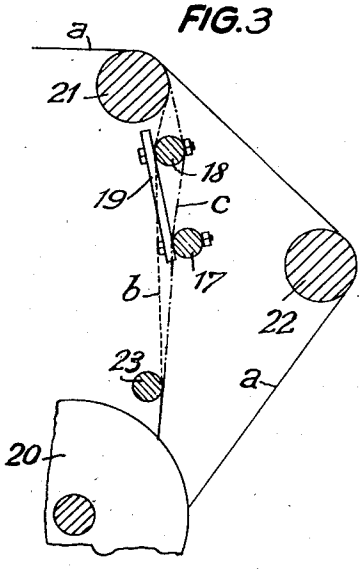


FIG.3



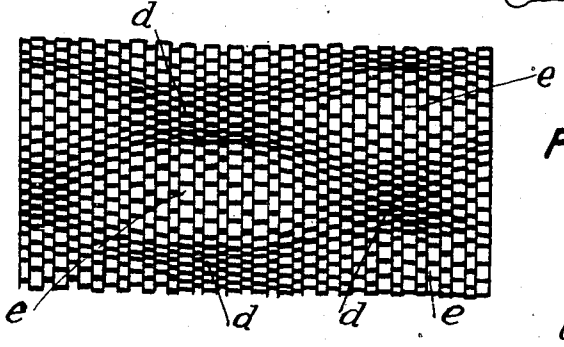


FIG.5

Inventor:
Adolf Lanz
by Sommers & Young
Attorneys

Patented Mar. 11, 1947

2,417,204

UNITED STATES PATENT OFFICE

2,417,204

PRODUCTION OF WEAVING EFFECTS BY VARIABLE WARP TENSIONING MEANS

Adolf Lanz, Wettingen-Damsau, Switzerland, assignor to Baumwoll-Spinnerei & Weberei Wettingen, Wettingen, Switzerland

Application November 10, 1943, Serial No. 509,749
In Switzerland November 11, 1942

3 Claims. (Cl. 139—24)

1

This invention relates to the production of weaving effects.

It is already old in the loom art to deflect groups of threads out of the normal path of the warp by means of a guide member actuated periodically during the weaving and thereby to subject them to alternating tension so as to incorporate them in sinuous form in the weft and thus produce loose and dense places in the woven fabric or so-called woven effects, which may be uniform or non-uniform in configuration. It is old in the art for this purpose to conduct warp threads over spring-loaded tensioning rollers or through dobbies, or, more preferably, over oscillating members, the latter serving to simplify operations.

The present invention is a carrying forward of this idea, and, in accordance with the invention, a lower thread guiding roller is provided for the threads subdivided out of the warp, and between this roller and the usual upper thread guiding roller there is disposed at least one oscillating member, the whole being so constituted that the aforesaid subdivided warp threads can be conducted from the warp beam over the lower thread guiding roller to the oscillating member and thence to the upper thread guiding roller, the latter also serving for guiding the remaining portion of the warp.

Accordingly, the warp threads subdivided out of the warp are thus caused to pass separately from the warp beam to the usual upper thread guiding roller and consequently the remaining portion of the warp also continues travelling separately. In this case, of the various auxiliary means provided for accomplishing the object of the invention, the horizontal operating range of the loom remains as it is, so that the threads are not subjected to wear, in addition to which the arrangement of the invention can also be subsequently applied without difficulty to modern looms, e. g. those having automatic warp thread stop devices. Moreover, since the warp threads subdivided out of the warp and to which an alternating tension is to be imparted, are conducted over the lower thread guide roller separately from the remaining warp threads, the operating conditions necessary for producing the woven effect remain unchanged between the full and the empty warp beam so that the woven effect will be produced exactly in accordance with the pattern provided. Furthermore, the arrangement permits facile supervision and accessibility for control and other purposes. Moreover, it serves to facilitate subdivision of threads from the warp, the normal

2

path of such threads being suitably governed by a supplementary thread guide roller provided between the warp beam and the upper thread guide roller.

For this purpose the oscillating member may be actuated by a step-by-step ratchet device disposed in the upper portion of the loom frame, the said ratchet device being likewise readily accessible for adjusting and other purposes.

The drawing serves to illustrate an embodiment of the invention. In the drawings

Fig. 1 shows an elevtaion of a portion of a loom;

Fig. 2 is a view of parts not shown in Fig. 1 as seen at right angles to the picture plane of the latter;

Fig. 3 is an illustration similar to Fig. 1 showing parts included in Fig. 2;

Fig. 4 is a view as seen at right angles to the picture plane of Fig. 3, and

Fig. 5 shows a piece of woven fabric produced by the method according to the present invention.

As shown in Fig. 1, on the side shield 1 of a mechanical loom is mounted on a pivot 2 a feed wheel 3 to which a locking pawl 4 and a feed pawl are correlated. The feed pawl 5 is mounted on a two-armed carrier lever 6 which is supported by an axle 7 and connected with an oscillating rod 9 by means of a connecting screw 8. The screw 8 is adjustably arranged in a longitudinal slot 10 of the carrier lever 6 in order to permit of varying the throw to be transmitted to the feed pawl 5 by the oscillatory rod 9 via the carrier lever 6 so that said rod feeds the wheel 3 each time by two or three ratchet teeth of this wheel, when the rod 9 is moved in the direction indicated by an arrow. The oscillatory rod 9 is moved to and fro during the operation of the loom to which end it is connected with a part (not shown) of the loom moving in accordance with the working cycle of the latter, advantageously, the rod is, for example, connected with the back rest operating lever or with the automatic feeding device of the warp beam or with the slay.

A radial projection 11 of the hub of the feed wheel 3 is engaged by an extensible connecting link 12, the two parts of which are longitudinally adjustably connected with each other by means of screws 13. The connecting link 12 is adjustably arranged on the feed wheel 3 in a radial slot of the latter by means of a screw bolt 14 functioning as a crank pin. The second end of the connecting link 12 is radially adjustably ar-

ranged by means of a screw 15 in a slot of a swinging lever 16 which is fixed to a shaft 17 which rests at both of its ends in bearings stationarily arranged on the loom frame. Parallel with the shaft 17 extends a round bar 18 the ends of which are firmly secured to the shaft 17 by means of mounting arms 19.

In the operation of the loom the feed wheel 3 is periodically advanced a certain part-turn by means of the pawl 5 through the osillatory rod 9 via the carrier lever 6. Accordingly the connecting link 12 is moved to and fro commensurate with the movement of the crank pin 14, and the shaft 17 is rocked back and forth about its axis by means of the swinging lever 16, whereby the round bar 18 reciprocates accordingly about the axis of the shaft 17 and thus acts in the manner of a reciprocatory bar.

In Fig. 3, the numeral 20 designates the warp beam, 21 the usual back rest and 22 an additional back rest. The numeral 23 refers to a thread guiding roller which is arranged close by the warp beam 20. From the warp *a*, at distances apart, groups of threads *b* are divided off as indicated in dash lines in Fig. 4, and from Fig. 3 it will be seen that these groups extend away from the warp beam 20 past the roller 23 and then across the reciprocatory bar 18 and the back rest 21. From the warp are further divided off groups of threads *c* which also extend away from the warp beam 20 across the roller 23, the reciprocatory bar 18 and the back rest 21. The thread groups *c* two of which are shown in chain-dotted lines in Fig. 4 each adjacent a thread group *b*, bear against the reciprocatory bar 18 on the side of the latter opposite to that against which bear the thread groups *b*. The thread groups *b* and *c* are thus diverted from the normal course of the warp threads *a* in different manner between the warp beam and the place of weaving since said threads *a* pass at this place from the warp beam 20 round the additional back rest 22 and the usual back rest 21.

At each reciprocation of the slay, that is, after each picking of the weft thread the feed wheel 3 is advanced, whereby the reciprocatory bar 18 is moved back and forth in opposite directions each time after a certain number of feed steps have been performed. By this means the tension of the thread groups *b* and *c* passing across the reciprocatory bar 18 on oppostie sides thereof is continually changed in consequence whereof these groups are alternately tautened and released again to a greater or lesser extent, while the warp threads *a* following the normal course are subjected to constant tension.

The varying tensioning of the thread groups *b* and *c* of the warp has such an effect on the weave in progress of formation that in the same within the embrace of the thread groups *b* and *c* tighter portions *d* and looser portions *e* are formed in the manner illustrated in Fig. 5 without any further provisions. In the illustration of Fig. 5 only thread groups *b* and *c* that adjoin each other are included, that is, warp threads *a* are not taken into consideration at all, it being understood that naturally, by way of example, several such pairs of thread groups *b*, *c* may be arranged side by side. Within the embrace of the warp threads *a* the weave is given uniform tightness and thus presents a homogeneous appearance except of the marginal portions, that is, at the portions merging in the thread groups which have been diverted from the normal course of the warp threads *a*, where naturally the weave beginning to be varied is noticeable.

Concerning choosing the weft threads to be diverted from the normal course of the warp, any possibility of variation is left open as will be readily seen. If required, several reciprocatory bars to be moved in accordance with the working cycle of the loom may be provided, each bar for governing a part of the warp threads being diverted from the normal course of the warp. The movement of the reciprocatory bar or other movable part serving as a swing may alternatively, for example, also be carried out in accordance with a Jacquard device or a dobby which, by way of example, would control the cooperation of the feed pawl 5 with the feed wheel 3 commensurate with the number of feed steps to be performed.

Weaves carried out in accordance with the method according to the invention may, for example, be intended for producing articles of washable wear, such as sporting shirts or the like, further fabrics for ladies' garments, curtains, draperies, or the like.

I claim:

1. A loom arrangement for producing woven effects, an upper warp thread guide roller for contacting and guiding all of the threads of the warp, a lower warp thread guide roller for guiding a subdivided group of warp threads, and an oscillating member disposed between said upper and lower guide rollers for applying tension to and releasing the tension of said group of warp threads, the guides being so disposed that the said group of warp threads is guided from the warp beam over the lower thread guiding roller to the oscillating member and thence to the upper thread guide roller, which also serves for guiding the remaining portion of the warp.

2. A loom arrangement according to claim 1, and in which a supplementary thread guiding roller is provided between the warp beam and the upper thread guide, the said supplementary thread guiding roller serving to determine the normal path of the part of the warp not subdivided out of the warp.

3. A loom arrangement according to claim 1, wherein the oscillating member derives its movement from an adjustable stroke step-by-step ratchet device disposed in the upper portion of the loom.

ADOLF LANZ.

REFERENCES CITED

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

UNITED STATES PATENTS

Number	Name	Date
1,065,766	Aumann	June 24, 1913
1,705,324	Brewer	Mar. 12, 1929

FOREIGN PATENTS

Number	Country	Date
6,332	British	1905
350,638	French	Apr. 15, 1905
65,324	Swedish	June 5, 1928