

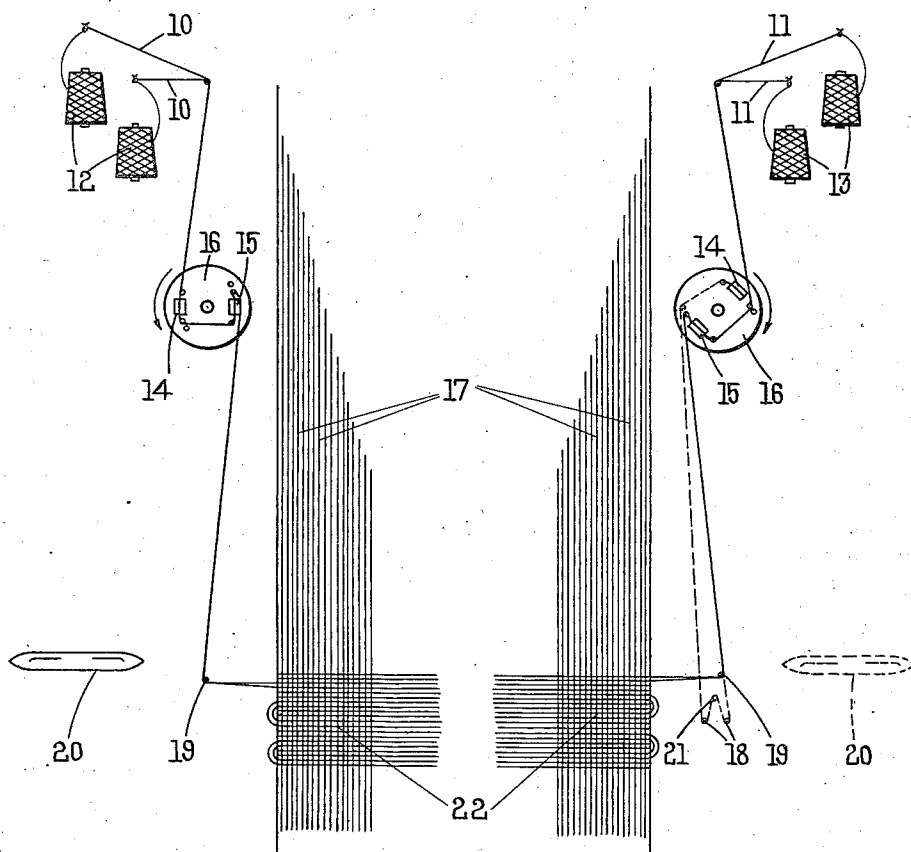
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TEXTILE OPERATION

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TEXTILE OPERATION

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6 Claims. (Cl. 139—126)

This invention relates to textile operations and is especially concerned with the weaving of fabrics, particularly by means of shuttleless looms wherein a weft thread is drawn into a loop of the requisite length outside the warp shed, and is then carried through and inserted in the shed in the course of weaving.

In looms of the type referred to, e. g. in the looms described in U. S. Patents Nos. 2,012,121 filed 27th September, 1930, and 1,883,354 filed 15th October, 1930, the weft is drawn into a measured loop of sufficient length either for one or for two picks. One end of the loop is then released, and the weft is engaged by weft inserting means which carry the free end through the shed. A pick may be inserted from the other side of the loom, and then, if a loop sufficient for two picks has been drawn, the other end of the loop is released, and is carried in to the shed by the inserting means to form a second pick. In any case, the weft inserting means engages, not so as to grip the end of the weft loop, but to pick up an intermediate portion of one of its limbs, so that the free end is floated through the shed. It has now been found that if two such loops are formed simultaneously, the two weft threads can be carried together into the same shed without twisting or entanglement between the two free ends, so that the two picks are laid quite straight and parallel in the same shed.

According to the present invention a fabric is woven in a shuttleless loom wherein the weft is formed into measured loops and is then carried through the shed with the aid of inserting means, by causing the inserting means to carry two or more of such weft threads simultaneously through the shed. The weft threads are laid in the shed, and when the shed is closed, and beat-up has occurred, the two or more weft threads remain parallel in the fabric. While the invention is applicable to the insertion of two, three, or more picks of weft simultaneously in a single shed, reference will be made hereafter to the insertion of two such picks, it being understood that a greater number may be similarly inserted if desired.

The two weft loops which are to be inserted simultaneously may be formed simultaneously as parallel loops, and may even be drawn into loops on a single weft loop forming apparatus. The threads may then be carried into the shed as if they were a single loop, by means of a single inserting means. The threads, being drawn parallel into loops, and remaining under tension through-

out the operation of loop forming and picking will be laid parallel in the shed.

For the purposes of the invention, a loom may be used of the type described in U. S. Patent No. 2,012,121, in which the weft inserting means take the form of a dummy shuttle, i. e. a shuttle shaped member having horns mounted thereon adapted to engage the weft loop at the side of the loom. The dummy shuttle may be adapted to engage the preformed weft loops by means of a single projecting horn, and to carry them through the shed, the tension imparted to the weft during picking being utilized to cause the weft threads to be laid straight in the shed and parallel to each other.

The weft thread is taken from one or more stationary packages at either or both sides of the loom. The two loops may be taken from separate packages or from the same package and may consist of the same kind of thread or of different kinds of thread as desired. Whether the threads are taken from the same package or from different packages they may be formed into a double loop in one weft loop forming apparatus, to be picked together by the dummy shuttle. Where two threads are wound on one package, they should, of course, be wound parallel to each other thereon and unwound from the package in such a way that they do not become doubled together. If desired, the two threads may be sized together with any desired sizing material, prior to being wound parallel on the single package, so that they adhere together by reason of the size applied to them.

The length of the loops depends upon the nature of the loom on which weaving is effected. Thus, each loop may be of such a length as to suffice for one pick only, or it may be sufficient for two picks, the second pick being laid in a different shed from the first, preferably after the insertion of a pick from the other side of the loom.

It will be seen that by laying two picks of weft simultaneously in the shed the fabric will be produced at a faster rate than if one pick were laid. At the same time the thickness of the fabric is not increased as would be if the two weft threads were doubled together and laid as a single weft of double weight. Thus while the same weight of weft thread may be laid in each pick, the weft thread is spread out over a greater length of the fabric with the result that a greater length of finer fabric is produced.

The weft threads may be of the same kind of yarn in every respect or they may differ in any

desired characteristic or characteristics. Thus, they may be of different colours, having been dyed before weaving, or they may be of different materials so that, after weaving, the fabric may be dyed to give a cross-dyed, or multicolour effect. For example, artificial yarns of cellulose acetate may be used in conjunction with yarns of natural fibres such as silk, wool, or cotton, or with artificial yarns of viscose or cuprammonium silk. Again, the weft yarns may be twisted in different manners or to a different degree in order to produce fabrics having pebbled, cockled, or crêpe effects. Further, yarns of different counts or deniers may be used, to give rise to a fancy appearance in the fabric. It is not necessary that every pick should be a double pick as described above. For example, double picks may be laid in the passage of the shuttle from one side of the shed to the other, while in its return a single pick only is laid to produce an effect similar to that obtained with yarns of different deniers or counts. In this manner, and particularly in co-operation with patterning mechanism such as jacquard or dobby mechanism, the present invention enables the scope of this method of weaving to be considerably enhanced.

The invention will now be described in greater detail with reference to a shuttleless loom having weft preparing and inserting apparatus of the type described in detail in U. S. Patent No. 2,012,121, filed September 27, 1930, sufficient of the apparatus being shown to illustrate the present invention.

In the accompanying drawing the figure illustrates diagrammatically the application of the present invention.

Weft threads 10, 10 and 11, 11 from pairs of packages 12, 12 and 13, 13 proceed to trapping devices 14, 15 mounted on rotatable platforms 16, disposed at each side of the warp threads 17. Each platform 16 moves so as to cause the threads to pass between the trapping devices 14, 15 so that the threads extend across the face of the platform 16. One trapping device grips the extremities of the threads firmly while the other trapping device remains open.

The length of the threads 10, 10 and 11, 11 extending between the trapping devices is then engaged at an intermediate point by pegs 18 mounted on a constantly moving chain or other flexible member (not shown), as described in U. S. Patent No. 2,012,121, and as one trapping device is open, thus allowing the threads connected to the supply to pass through it, the threads are drawn in loop form towards the fell of the fabric until each limb of the loop so drawn is of sufficient length to form a pick of weft across the warp threads 17.

Conveniently the loop length is arranged to terminate at a point in a line with the fell of the fabric, and on reaching this position, the loop-drawing pegs 18 are released from the bight of the loop, which is engaged in turn by a retaining finger 19.

A dummy shuttle 20 (shown on the left hand side of the drawing) is then picked across the warp threads 17 to the position indicated in dotted lines on the right hand side of the drawing, carrying with it the two threads comprising the innermost limb of the loop. The upper extremities of these threads are released from their trapper simultaneously with the picking of the shuttle, while the opposite trapper, hitherto maintained open to allow free passage for the

threads proceeding from the supply, closes to grip the outer limb of the loop.

On the return of the shuttle a further pick of weft comprising the innermost limb of the loop formed on the opposite side of the warp is caught and inserted within the warp threads.

After the insertion of the innermost limb of each loop the rotation of the platforms 16, (the direction of which rotation is shown by arrows on the drawing) brings the outer limb of the loop into the inner position ready for engagement with the shuttle 20 and draws a further length of the weft threads across the face of the platform between the trapping devices 14, 15 ready for further engagement by the loop drawing pegs 18, when the loop drawing cycle is repeated.

On engagement of the shuttle 20 with the second loop limb the retaining finger 19 is withdrawn and the extremity of the limb is severed at its trapping device, thus being freed for insertion within the warp threads, the trapping device retaining the ends of thread connected to the supply. The loop limbs are thus inserted in turn and lie in the fabric 22 in inter-engaging hairpin form as shown in the drawing.

As the drawn loops are retained by the fingers 19 at some distance from the fabric 22 the first picks inserted from the loops must be long enough not only to extend across the fabric but also to extend from the edge of the fabric to the fingers 19. The extra length so required is formed in the loop-drawing operation by a peg 21 which is disposed across the path of the loop drawing pegs 18 and causes a subsidiary loop (shown in dotted lines on the right hand side of the drawing) to be drawn within the main loop. The extra length thus drawn is sufficient to extend between the edge of the fabric 22 and the retaining finger 19.

The separate threads comprising each pick are laid in the fabric 22 in close parallel relation and by reason of their being kept under tension throughout the whole of the loop drawing and inserting period, do not twist or turn about each other.

What I claim and desire to secure by Letters Patent is:—

1. In the method of manufacturing a woven fabric, the steps of drawing at least two separate threads into a succession of loops at the side of a shuttleless loom, maintaining said threads in parallel untwisted and separate relationship during drawing, simultaneously inserting lengths of the plurality of threads so drawn into one shed to form one pick, and similarly inserting a further pick connected to the first pick into a subsequent shed so as to form pairs of connected picks, each pick consisting of a plurality of separate lengths of thread laid in parallel untwisted relationship.

2. In the method of manufacturing a woven fabric, the steps of drawing at least two separate threads into a succession of loops each sufficient for two picks at the side of a shuttleless loom, maintaining said threads in parallel untwisted and separate relationship during drawing, simultaneously inserting into one shed lengths of the looped threads so drawn to form one pick, and similarly inserting into a subsequent shed the remaining lengths of the looped threads to form a further pick so as to form pairs of connected picks, each pick consisting of a plurality of separate lengths of thread laid in parallel untwisted relationship.

3. In the method of manufacturing a woven fabric, the steps of drawing at least two separate threads into a succession of loops each sufficient for one pick at the side of a shuttleless loom, maintaining said threads in parallel untwisted and separate relationship during drawing, simultaneously inserting the plurality of threads so drawn into one shed to form one pick, and similarly inserting a further pick of successively looped threads connected to the first pick into a subsequent shed so as to form pairs of connected picks, each pick consisting of a plurality of separate lengths of thread laid in parallel untwisted relationship.

4. In the method of manufacturing a woven fabric, the steps of drawing at least two separate threads into a succession of loops at each side of a shuttleless loom, maintaining said threads in parallel untwisted and separate relationship during drawing, inserting from each side of the loom in turn lengths of the looped threads so drawn simultaneously into one shed to form one pick and similarly inserting further picks connected to the first picks into subsequent sheds so as to form pairs of connected picks, each pick consisting of a plurality of separate lengths of thread laid in parallel untwisted relationship.

5. In the method of manufacturing a woven fabric, the steps of drawing at least two separate threads into a succession of single loops at the side of a shuttleless loom, maintaining said threads in parallel untwisted and separate relationship during drawing, simultaneously inserting lengths of the plurality of threads so drawn into one shed to form one pick, and similarly inserting a further pick connected to the first pick into a subsequent shed so as to form pairs of connected picks, each pick consisting of a plurality of lengths of thread laid in parallel separate untwisted relationship.

6. In the method of manufacturing a woven fabric, the steps of drawing at least two separate and differently twisted threads into a succession of loops at the side of a shuttleless loom, maintaining said threads in parallel untwisted and separate relationship during drawing, simultaneously inserting lengths of the plurality of threads so drawn into one shed to form one pick, and similarly inserting a further pick connected to the first pick into a subsequent shed so as to form pairs of connected picks, each pick consisting of a plurality of separate lengths of at least two differently twisted threads laid in parallel untwisted relationship.

HENRY DREYFUS.

CERTIFICATE OF CORRECTION.

Patent No. 2,040,925.

May 19, 1936.

HENRY DREYFUS.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 3, second column, line 13, claim 5, strike out the word "separate" and insert the same before "lengths" in line 12, same claim; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 18th day of August, A. D. 1936.

Henry Van Arsdale

Acting Commissioner of Patents.

(Seal)