Feb. 26, 1952 F. F. SUTHERLAND 2,587,009

RECIPROCATING REED FOR LOOM LAY

Filed Oct. 17, 1947 2 SHEETS—SHEET 1

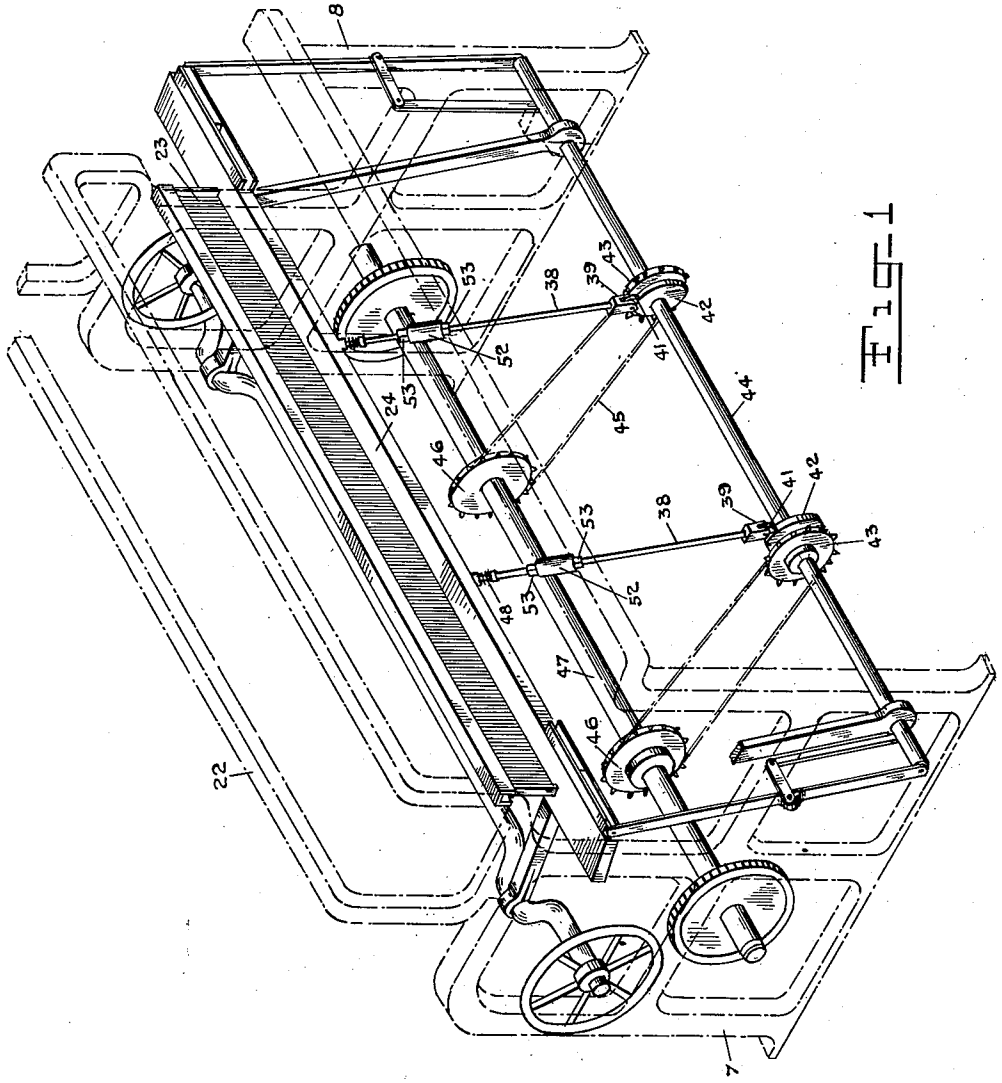


FIG. 1

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2 SHEETS—SHEET 2

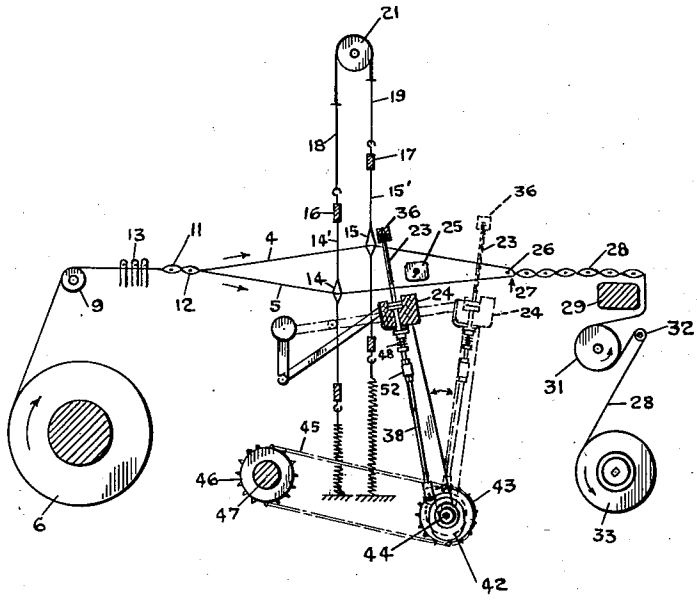


Fig-3

Fig-2

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Patented Feb. 26, 1952

2,587,009

UNITED STATES PATENT OFFICE

2,587,009

RECIPROCATING REED FOR LOOM LAY

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Application October 17, 1947, Serial No. 780,507

10 Claims. (Cl. 139—188)

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This invention relates to looms for weaving textile fabrics, and relates more particularly to a loom having a novel reed operating arrangement for substantially eliminating warp streaks.

Warp streaks are present in most loomed fabrics to a greater or less degree. Heretofore, these warp streaks were attributed to variations in yarn. I have now found that warp streaks are also due to minute variations in the spacings between the wires of the reed. The variations in the reed wire spacings have been found to be responsible for tight and loose groups of warp ends, possessing different luster and cover, which absorb dyestuffs to different degree, thus causing complex systems of streaks, bands and other undesirable visual effects.

I have found that irregularity and unevenness of the spacing of the reed wires is greater in the center portion of the reed than at the extreme top and bottom portions of the reed. Since the beat-up action of the reed occurs in the conventional looms substantially at the center portion of the reed where the reed wire spacing is irregular, warp streaks were produced in the fabric being woven. In fact, when the beat-up occurs ¾" from the top or bottom portions of the reed, streaks are formed. Accordingly, it is an important object of my invention to provide a novel method of eliminating warp streaks from fabrics by an improved beat-up technique wherein the fabric beat-up is effected substantially at the extreme top or bottom portions of the reed of the loom, where the wire spacings of the reed are more uniform.

In one aspect of my invention, the warp ends may be raised or depressed with respect to the reed so that the extreme top or bottom portions of the reed are employed for beating up the filling of the fabric.

In another and preferred aspect of my invention, the reed is raised during that part of the lay motion in which beat-up occurs and the reed is lowered during the remaining of the lay motion. In this manner, the reed oscillates up and down during the weaving operation.

Another object of my invention is the provision of novel means for oscillating the reed with respect to the lay during the weaving operation.

Other objects of this invention, together with certain details of construction and combinations of parts, will appear from the following detailed description.

In the drawings wherein a preferred embodiment of my invention is shown.

Fig. 1 is a schematic view, in perspective, of a loom for weaving textile fabrics, showing in detail only such elements as are necessary to describe my invention,

Fig. 2 is a detail view, on an enlarged scale and partly in section, of the arrangement for holding and oscillating the reed, and

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Fig. 3 is a schematic side elevational view of the essential working parts of a loom, modified in accordance with my invention.

Like reference numerals indicate the parts throughout the several views of the drawings.

In looms of the type in connection with which my invention may be employed, the warp ends 4 and 5 are drawn from a warp beam 6 which, like all the working parts of the loom, is supported on or from side frames 7 and 8. The warp ends pass upward over a whip roll 9 and then forward at a horizontal level to the lease rods 11 and 12 which separate the warp ends. Usually, there is provided at a point before the lease rods a stop warp motion comprising drop wires 13 the function and operation of which is well-understood in the art. After passing the lease rods, each warp end passes through an eye 14, 15 of heddles 14' and 15' respectively. The heddles are carried by harnesses 16 and 17, respectively, supported by straps 18, 19 passing around a roller 21 supported on a framework 22 mounted on side frames 7 and 8. As is well-known, the harnesses control the up-and-down motion of the warp ends to form a shed.

After passing through the heddle eyes 14 and 15, the warp ends pass through a reed 23 which spaces the warp ends across the width of the warp. The reed is mounted on a lay 24 which rocks back and forth as shown in Fig. 3. When the reed is in the back position (shown in full lines), the shed is open, permitting the shuttle 25 carrying the filling yarns to pass through and insert a filling yarn 26 between the warp ends. The shed is then closed and the lay carries the reed 23 forward, as shown in dot-dash lines, to force or beat-up the filling yarn 26 against the previous pick to form the fell of the fabric at 27. The woven fabric 28 moves over the breast beam 29, around roller 31, over guide roller 32 and is taken up on roller 33.

In accordance with the preferred form of my invention, the reed 23 is given a vertical reciprocation, or oscillating movement, so that the beat-up takes place at a point ⅛" to ¼" from the bottom of the reed, and preferably about ⅛" from the bottom. To this end, a groove 34 is formed in the lay 24 extending laterally thereof and a lateral groove 35 is formed in reed cap 36. The grooves 34 and 35 may be fitted with brass guides 37, the reed, which is preferably contained in a metal holder, being movable in said guides relative to said lay and reed cap. Extending through suitable openings in the lay and fixed to the reed or reed holder are lifting rods 38. At the lower extremity of each lifting rod is fixed a bifurcated bearing member 39 between the bifurcations of which is journaled a cam-follower 41. The cam followers 41 are adapted to engage the peripheral surfaces of cams 42 which are designed to lift and lower reed

through a predetermined distance during each reciprocating movement of the lay. Cams **42** are fixed to and rotated by sprockets **43**, the cam and sprocket assembly being mounted on rocker shaft **44** in such a manner that it is free to run relative to said rocker shaft.

Sprockets **43** are driven by chains **45** from sprockets **46** fixed to and rotated by the machine cam shaft **47** extending along the lower back portion of the machine. The tooth ratios of the sprockets are such that cams **42** are caused to make one revolution during one cycle of the lay motion.

By the foregoing arrangement, the cam shaft **47** of the machine drives the sprockets **43** and cams **42** rotatably mounted on the rocker shaft **44** of the machine, the cams give each lifting rod **38** an up-and-down reciprocating motion, against the action of spring **48** held on the lifting rod by collars **49** and **51**, that is transmitted to the reed. This oscillating motion permits the beat-up of the reed to occur in its lowest part, thus eliminating warp streaks which result from beating up with the reed in its normal position.

The lifting rod **38** is provided with a turnbuckle **52** and lock nuts **53** to adjust the length thereof.

It is to be understood that the foregoing detailed description is merely given by way of illustration and that many variations may be made therein without departing from the spirit of my invention.

Having described my invention, what I desire to secure by Letters Patent is:

1. Method of eliminating warp streaks from fabrics woven in a loom wherein the beat-up is effected by a rockable reed, which comprises reciprocating the reed vertically during the weaving operation so that the beating up the fabric with said reed takes place at a point between ⅛ inch and ¼ inch from a vertical extremity of said reed.

2. Method of eliminating warp streaks from fabrics woven in a loom wherein the beat-up is effected by a rockable reed, which comprises reciprocating the reed vertically during the weaving operation so that the beating up the fabric with said reed takes place at about ⅛ inch from a vertical extremity of said reed.

3. Method of eliminating warp streaks from fabrics woven in a loom wherein the beat-up is effected by a rockable reed, which comprises reciprocating the reed vertically during the weaving operation so that the beating up the fabric with said reed takes place at a point between about ⅛ inch and ¼ inch from the bottom of said reed.

4. Method of eliminating warp streaks from fabrics woven in a loom wherein the beat-up is effected by a rockable reed, which comprises reciprocating the reed vertically during the weaving operation so that the beating up the fabric with said reed takes place at about ⅛ inch from the bottom of said reed.

5. In a loom having a rocker shaft and a lay mounted on and operated by said rocker shaft, a reed carried by said lay for movement therewith, and means for reciprocating said reed relative to said lay in such a manner that only the portion thereof adjacent to the bottom of said reed functions to beat-up the fabric being woven, said means including lifter rods fixed to said reed, cams journaled on said rocker shaft for moving said lifter rods and means operatively connected to said cams for rotating the same.

6. In a loom having a rocker shaft and a lay mounted on and operated by said rocker shaft, a reed carried by said lay for movement therewith, and means for reciprocating said reed relative to said lay, said means including lifter rods fixed to said reed, cams journaled on said rocker shaft for moving said lifter rods and sprockets fixed to said cams for rotating the same.

7. In a loom having a rocker shaft and a lay mounted on and operated by said rocker shaft, a reed carried by said lay for movement therewith, and means for reciprocating said reed relative to said lay, said means including lifter rods fixed to said reed, cams journaled on said rocker shaft for moving said lifter rods and sprockets journaled on said rocker shaft and fixed to said cams for rotating said cams.

8. In a loom having a cam shaft and a rocker shaft and a lay mounted on and operated by said rocker shaft, a reed carried by said lay for movement therewith, and means for reciprocating said reed relative to said lay, said means including lifter rods fixed to said reed, cams journaled on said rocker shaft for moving said lifter rods, sprockets journaled on said rocker shaft and fixed to said cams for rotating said cams, said sprockets being operatively connected to said cam shaft for rotation thereby.

9. In a loom having a cam shaft and a rocker shaft and a lay mounted on and operated by said rocker shaft, a reed carried by said lay for movement therewith, and means for reciprocating said reed relative to said lay, said means including vertically adjustable lifter rods fixed to said reed, cams journaled on said rocker shaft for moving said lifter rods, sprockets journaled on said rocker shaft and fixed to said cams for rotating said cams, said sprockets being operatively connected to said cam shaft for rotation thereby.

10. In a loom having a cam shaft and a rocker shaft and a lay mounted on and operated by said rocker shaft, a reed carried by said lay for movement therewith, and means for reciprocating said reed relative to said lay, said means including lifter rods fixed to said reed, cams journaled on said rocker shaft for raising said lifter rods, spring means for lowering said lifter rods, sprockets journaled on said rocker shaft and fixed to said cams for rotating said cams, said sprockets being operatively connected to said cam shaft for rotation thereby.

FREDERICK F. SUTHERLAND.

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