

UNITED STATES PATENT OFFICE.

ADOLPH BRAUCH AND FRANK WELLEN, OF PATERSON, NEW JERSEY,
ASSIGNORS TO THE ENTERPRISE SILK COMPANY, OF SAME PLACE.

LOOM FOR WEAVING GAUZE FABRICS.

SPECIFICATION forming part of Letters Patent No. 670,981, dated April 2, 1901.

Application filed April 11, 1900. Serial No. 12,431. (No model.)

To all whom it may concern:

Be it known that we, ADOLPH BRAUCH and FRANK WELLEN, citizens of the United States, residing at Paterson, in the county of Passaic and State of New Jersey, have invented certain new and useful Improvements in Looms for Weaving Doup or Gauze Fabrics, of which the following is a specification, reference being had therein to the accompanying drawings.

The objects of our invention are, first, to simplify the operation and cheapen the cost of weaving doup or gauze fabrics; secondly, to construct a loom which will obviate the necessity of employing a number of harness-frames by making the reed perform some of the functions hitherto performed by the harness-frames, and, finally, to produce a loom for weaving doup or gauze fabrics with plain harness and a movable reed.

The invention consists of a reed of novel and peculiar construction, which will be hereinafter fully described and which is illustrated in the drawings forming a part of this specification, and also of connections between the reed and the loom-shaft to impart a traverse motion to the reed when the heddle is raised, or vice versa, as desired, by means of which the doup or knot is made and the shed for the filling is formed.

The principle of our invention may be utilized in the manufacture of all fabrics where it is desired to obtain a cloth combining openness of texture, lightness, and strength.

Plain or fancy gauze may be made with slight changes without departing from the essential principles of our invention.

In the drawings, in which similar characters refer to like parts, Figure 1 is a side view of portion of a loom, showing the reed in the lay of the loom and a means of imparting a traverse motion to the same. Fig. 2 illustrates the reed broken in four parts or sections, showing the different positions of the warp-threads in the operation. Fig. 3 is a side and an edge view of one of the short dents provided with an eye. Fig. 4 illustrates the way in which the warp-threads are twisted around the weft-threads U; and Figs. 5 and 6 are illustrations of the operation of the crossing of the warp-threads, inclosing the weft-threads at every

pick, and the traverse motion of the reed before the forming of the shed.

Our reed, as shown in the drawings, consists of a series of long dents of the usual form and secured in the reed-frame in the usual manner and a series of short dents, one end of which is secured in the reed-frame and the free ends thereof having an eye for the purpose of carrying and adapted to control and guide certain warp-threads to the right or to the left of certain other warp-threads when said series of warp-threads have been separated and for the purpose of crossing said series of warp-threads and forming the shed for the reception and free passage of the weft-thread at every pick.

As shown, *b* represents the long dents and *b'* the short ones, having an eye *C* at or near the end *c* of the short dents. In practice we intend to secure the dents in the reed-frame *B* in any suitable manner, permanently or transposably, leaving spaces *D* between the dents, and while we show long and short dents alternating throughout the length of the reed by transposing the dents we intend to make different arrangements and groupings of long and short dents and to reverse the position of the reed shown in the drawings when desired, which we claim can be done without departing from the essential principle and scope of our invention. It is obvious that the short dents may depend from the top of the reed-frame or rise vertically from the bottom thereof, or, in other words, the reed shown in the drawings may be inverted.

In the drawings, *A* is a portion of a loom-frame; *F*, the driving-shaft of a loom; *K*, the lay, and *a* the breast-board.

The lay *K* has a raceway in which the reed is adapted to travel in either direction when traverse motion is imparted to it to control, guide, and regulate the crossing of the lower and upper planes of warp-thread, which are indicated by the numerals 1 and 2 in this case, embracing the weft-thread between every pick, as well as to help form the shed for the weft. It is obvious that other weaves may be obtained by our invention; but to weave the fabric a portion of which is shown in Fig. 4 only one heddle is required to raise

and lower the warp-thread 1, which is always under the weft. The warp-thread 2 is passed through the eye C of the short dent *b'* and the warp-thread 1 is passed through the space D in the reed between the long and the short dents, in which space it is free to be raised and lowered to permit the short dent carrying thread 2 to pass to the right or to the left of thread 1, which, as shown in Figs. 5 and 6, crosses thread 2 and occupies alternately a position on either side of the short dent *b'* below thread 2, as is also shown in Fig. 2.

In Fig. 2 a reed is divided into four portions to show the position of the threads in the operation. In portion I the thread 1 has been raised by the heddle to the left of and above the short dent *b'*, carrying the thread 2. In portion II is shown the thread lowered to the left of the short dent *b'*. In portion III is shown that the reed has moved to the left when thread 1 was raised to the position shown in portion I, the thread 2 in short dent *b'* being below and to the left of thread 1 now, and in portion IV the thread 1 has been lowered to the right of and near the fixed end of the short dent *b'*. In this fourth position the shed is open, threads 1 and 2 have been crossed, and threads 1 are the lower plane or body of warp-threads and threads 2 are the upper plane or body of warp-threads. The weft is now shot through in the operation, the heddle raises thread 1 to position III, the reed is moved to the right, as in position I, thread 1 is lowered to position II, and the shed is open again for the return of the shuttle, and so the operation continues, any suitable means being employed to impart the traverse motion to the above-described reed for the purposes specified. One means may consist of the cord *I I'*, which connects the reed-frame B with the lever H, passing around pulleys *i i'*, the lever being operated by a cam G, secured to the shaft F. This lever is pivoted to the loom-frame, and at every revolution of the shaft the cam presses the free end of the lever upward, thereby drawing the reed in one direction, the spring L, secured to the reed and to the lay K, drawing the reed back again when the lever is released from engagement with the cam G. The ordinary heddle *m* on single harness M and the usual mechanism for lifting may be used for raising and lowering the warp-thread 1, as shown in Figs. 5 and 6. When the warp-threads are in the second position, (see Fig. 2 and the solid lines in Fig. 5,) the shuttle carries the weft through the open shed, as shown in Fig. 5. When the warp-threads are in the fourth position, (see Fig. 2 and the solid lines in Fig. 6,) the shuttle returns with the weft-thread, as shown in Fig. 6. Thus the warp-threads cross each other between every pick either to the right or to the left, 2 always being above and 1 always below the weft, forming a loop around every weft-thread, as shown in Fig. 4.

It is obvious that numerous combinations may be made in grouping the long and short dents and by changing the harness to vary the weave.

With this description of our invention, what we claim is—

1. In a loom for weaving doup or gauze fabrics, the lay, a raceway formed and extending longitudinally therein, in combination with a movable reed, adapted to travel in either direction in said raceway, a spring connecting the reed and the lay, and connections between the reed and the main shaft of the loom for imparting a traverse motion to said reed, substantially as set forth.

2. In a loom, a heddle and a lay having a raceway extending longitudinally therein, in combination with a reed having long and short dents, the short dents having a loose and free end provided with an eye, said reed being a movable reed, and adapted to slide laterally in said raceway, and connections between the reed and the main shaft of the loom to impart a traverse motion to said reed, substantially as set forth.

3. In a loom for weaving doup or gauze fabrics, the reed having a series of long dents and a series of short dents, one end of each of the short dents being free and loose, and provided with an eye, said reed being laterally movable, in combination with a lay having a raceway extending longitudinally therein, in which said movable reed may be caused to travel back and forth, when motion is imparted to it by any suitable means, the main driving-shaft of the loom, and connections, between said reed and said shaft, adapted to impart a traverse motion to said reed, substantially as set forth.

4. In a loom, a heddle adapted to raise and lower certain threads, and a lay having constructed longitudinally in it a raceway, in combination with a reed, said reed constructed with long dents, secured at the top and bottom in the reed-frame, to control certain threads passing through said reed, and with short dents, secured only at one end in said reed-frame, and provided at the free end with an eye, through which certain other threads are passed, as hereinbefore described and set forth, said reed being movable laterally in said raceway, the main driving-shaft, and connections between the said reed and the main driving-shaft of the loom, whereby a traverse motion is imparted to said reed, which traverse motion of the reed in conjunction with the vertically-moving heddle, cause a transposition and crossing of the threads forming the different sheds, substantially as shown in the drawings, and described in the specification.

5. The combination in a loom, of a vertically-movable heddle, adapted to raise and lower certain warp-threads, with a laterally-moving reed, adapted to carry, control or guide in different ways the series of warp-threads passing therethrough, so that certain

threads may be placed, transposed or crossed from one position to another in relation to certain other threads, as to be either below or above, to the right or to the left of said other threads, said heddle being operated in the ordinary manner, and connections between said reed, and the main loom-shaft for the purpose of imparting a traverse motion to said reed, substantially as set forth.

6. In a loom for weaving doup or gauze fabrics, a device for crossing or transposing different groups of warp-threads from one position to another, or place certain threads above or below, or to the right or left of certain other warp-threads, which consists in the combination of a vertically-movable heddle acting

in conjunction with a laterally-movable reed adapted, not only to carry the warp-threads laterally, but also adapted to beat the weft up to the fell, the lay, having constructed therein longitudinally, a raceway to receive said movable reed, the main driving-shaft of the loom, and connections between said shaft and said reed, substantially as set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

ADOLPH BRAUCH.
FRANK WELLEN.

Witnesses:

JOHN F. KERR,
THOMAS A. ROBINSON.