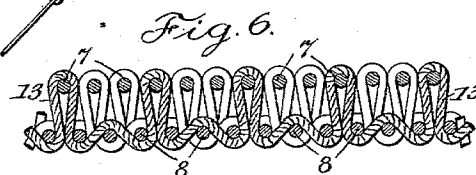
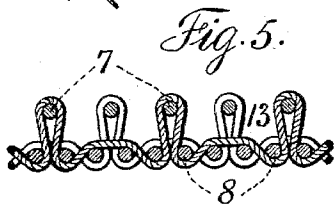
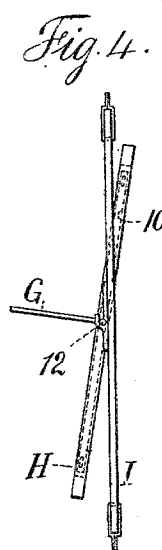
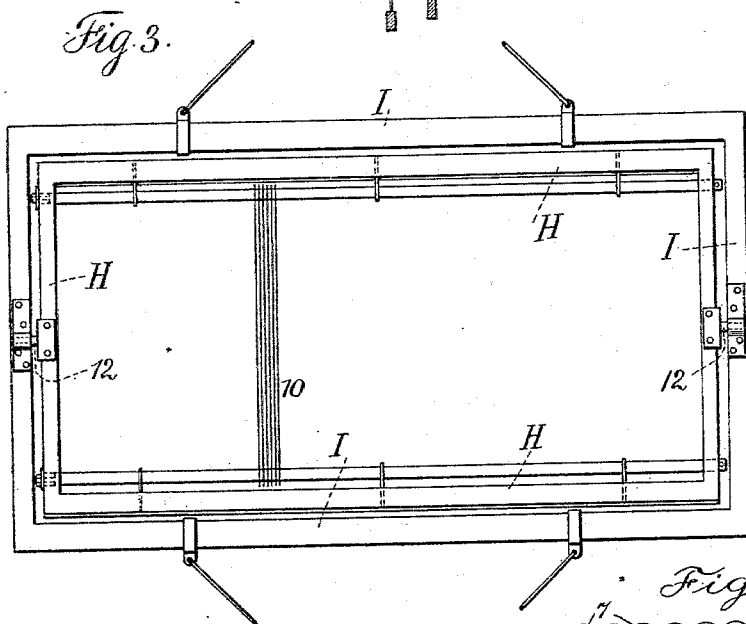
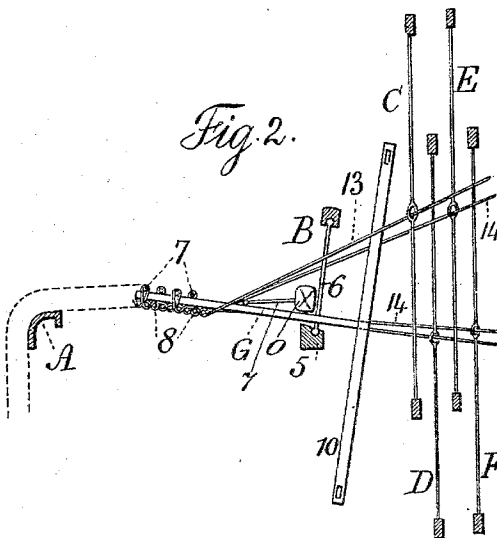
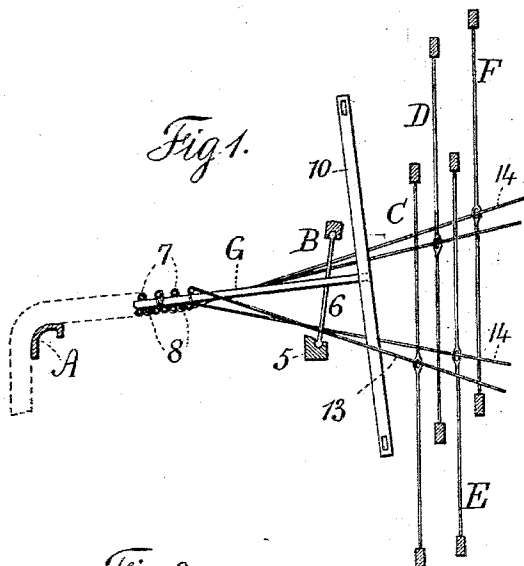


(No Model.)

C. COUPLAND & F. PEARSON.
LOOM FOR WEAVING PILE FABRICS.

No. 569,814.

Patented Oct. 20, 1896.



Witnesses:
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UNITED STATES PATENT OFFICE.

CHARLES COUPLAND AND FRED PEARSON, OF SEYMOUR, CONNECTICUT.

LOOM FOR WEAVING PILE FABRICS.

SPECIFICATION forming part of Letters Patent No. 569,814, dated October 20, 1896.

Application filed December 6, 1895. Serial No. 571,238. (No model.)

To all whom it may concern:

Be it known that we, CHARLES COUPLAND and FRED PEARSON, citizens of the United States, residing at Seymour, in the county of New Haven and State of Connecticut, have invented an Improvement in Looms for Weaving Pile Fabrics, of which the following is a specification.

Wires have heretofore been introduced in the fabric as woven for spreading or distending the loops of warp-threads composing the pile of the fabric, and such wires have, in some instances, been withdrawn automatically and the pile has sometimes been cut by knives or blades upon such wires.

The present improvements are made with reference to weaving pile fabrics with reliability and with much greater rapidity than heretofore possible, in consequence of the devices which spread or distend the pile-loops being withdrawn progressively as the weaving proceeds, and such devices are much cheaper and more simple and less liable to get out of order than the means heretofore employed for accomplishing the same object.

In the present loom the body or backing of the pile fabric is woven in substantially the ordinary manner and the threads composing the pile-surface are introduced as warps, and we make use of distenders, in the form of thin blades passing through the reed at intervals and supported by a frame and harness similar to the heddles of a loom, and these distenders project beyond the point where the wefts are knocked up to place and the cloth fabric produced, and the parts are so made and the movements so arranged that the distenders are carried downwardly and rest upon the shuttle-rail of the lay at the same time the pile-warps are elevated, so that a distending-thread is laid across the distenders between them and the pile-warps, and when the shed is changed the pile-warps are carried down, leaving loops over the distending-threads, which distending-threads are supported by the distenders, and then a weft-thread is interwoven in forming the body or back of the fabric after the distenders have been raised, and as the weaving progresses the distending-threads slip off the ends of the distenders and the fabric is complete, ready for the distending-threads to be pulled out in

completing the fabric, or the pile-loops may be simultaneously cut as the distending-threads are drawn out.

In the drawings, Figure 1 is a diagrammatic view showing part of the lay, breast-beam, and heddles and with the distenders raised for the shuttle to pass beneath. Fig. 2 is a similar view with the distenders depressed and resting upon the shuttle-rail of the lay for the shuttle to pass over the distenders. Fig. 3 is an elevation, and Fig. 4 an end view, of the frame in which the distenders are sustained; and Fig. 5 represents the fabric by an enlarged diagrammatic section, and Fig. 6 represents a modification in the fabric.

The breast-beam A is of any ordinary character, and around the same the woven piled fabric or plush passes and is wound upon a suitable cloth-beam, and the lay B is made with a shuttle-rail 5 and with a reed 6, and we remark that any ordinary shuttle-controlling devices are to be made use of, as it is usually necessary to employ two shuttles, one for laying in the distending-threads 7 and the other for laying in the weft-threads 8, which form the backing of the fabric. These parts being well known do not require further description, and we have represented heddles and heddle-frames with their supports or harness at C, D, E, and F for manipulating the warps in the operations of weaving. These heddles and their appliances may be of any desired character. We have represented the heddles C and D as adapted to raise and lower the warps that are used in making the pile-loops and the heddles E and F as adapted to manipulate the warps in the weaving of the body or back of the fabric.

The distenders G are in the form of thin wires or springs, of a width to correspond to the length of loops forming the piles of the fabric, and each distender is made with a vertical bar or T-head 10, at the ends of which are slots or eyes for cords or wires by which such distenders are held within the frame H, and the vertical bars of these distenders are of sufficient length for allowing the warps to be raised or lowered by the harness, the warps passing between the vertical bars of the distenders.

It is not necessary to have as many dis-

tenders as there are wires in the reed, as the weaving is reliably performed when there is a distender to every three or four wires in the reed, and the distenders G pass through the reed and are of a sufficient length to reach beyond the cloth-making point, so as to support the desired number of pile-loops in the woven fabric before the distended pile-loops pass beyond and separate from the ends of the distenders as the weaving progresses. These distenders are raised when the shuttle or shuttles are to pass beneath them, and they are depressed and lie substantially upon the shuttle-rail when the shuttle is to pass above them. Hence they are sometimes in line with the woven fabric and sometimes at an angle to the same, and to give freedom of movement to the parts the frame H is pivoted at its ends to the frame I, to which the ordinary straps or cords are applied in the harness mechanism for raising or lowering the frame I, and as this movement takes place the frame H and the vertical bars 10 of the distenders G swing upon the pivots 12, so as to allow the parts easily to assume the proper positions as the distenders stand at different angles to the woven fabric.

We have not represented any mechanism for raising or lowering the heddle-frames or the frames H I and the distenders, as the devices employed for this purpose may be of any ordinary or desired character as now employed in actuating the heddles of looms.

When the loom is in operation, the weft-threads 8 are thrown in at the proper time from a shuttle or shuttles passing below the distenders G, so as to weave the body or backing of the fabric, and when the weft-threads 8 are laid in position by the shuttle the distenders G are elevated for the shuttle to pass beneath the same, and when the pile-loops are to be formed the distenders G are lowered, so as to rest upon the shuttle-rail, as seen in Fig. 2, for the shuttle O to pass over the same and lay in a thread 7 between the top edges of the distenders G and the warp-threads 13, from which the pile of the fabric is made, and when such warp-threads 13 are depressed and the distenders G raised a weft-thread 8 is to be laid into the body of the fabric to confine and hold the loops of the plush or pile fabric, and the pile-warps are again raised and the distenders depressed for laying in another thread 7 for distending the loops of the pile. The distenders are substantially in the plane of the upper shed while the backing is being woven and in substantially the plane of the lower shed when the distending-thread for the loops is laid above them.

It is advantageous to employ two or more

heddles for manipulating the warps from which the pile-loops are made, so that such loops may be woven alternately between the weft-threads forming the body of the fabric, as represented in larger size in Fig. 5, the threads of the warp forming the pile-loops passing up between one weft-thread and the next and around the distending-thread 7, and passing beneath two weft-threads and over two other weft-threads in the body or backing before being again carried up to form another loop in the pile fabric.

It will be apparent that as the weaving progresses the distending-threads 7 pass off the ends of the distenders G progressively, and they remain in the loops of the pile fabric and they may be drawn out at any time, as desired, and where the pile-loops are to be cut any suitable blade may be drawn in for cutting such loops as the distending-threads are drawn out, the cutting-blade being connected with a distending-thread, so as to be drawn into each loop in succession as the distending-thread is drawn out.

The warp-threads 14, that are interwoven with the weft-threads 8 to form the backing of the fabric, may be of any desired character and number. They are not represented in Fig. 5, to avoid confusion. Three weft-threads may intervene between the pile-loops, as seen in Fig. 6, instead of the four shown in Fig. 5.

We claim as our invention—

1. The combination in a loom for weaving warp-pile fabrics, with the lay, and devices for manipulating the warp, of distenders formed of smooth thin wire, means for raising and lowering the distenders into the upper and lower plane of the warps, and means for inserting a weft-thread above the distenders while the distenders are in the plane of the lower warps, whereby the pile-warps will be formed as loops around such weft-thread as it is supported by the distenders substantially as specified.

2. The combination with the lay, reed and heddles in a loom for weaving pile fabric, of distenders passing through the reed and bars connected with the distenders and behind the reed, a frame in which the distender-bars are sustained, pivots for such frame and means for raising and lowering the pivots and elevating or depressing the distenders, substantially as set forth.

Signed by us this 28th day of November, 1895.

CHARLES COUPLAND.
FRED PEARSON.

Witnesses:

JOHN A. GRIFFITH,
HENRY HOWARD.