(No Model.)

R. W. HENDERSON.

PLAITING MACHINE.

No. 336,999. Patented Mar. 2, 1886.

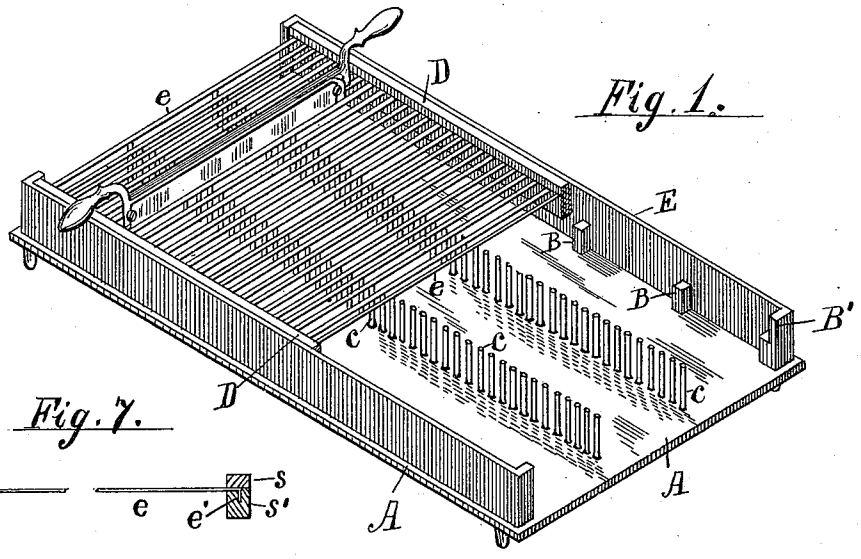


Fig. 1.

Fig. 7.

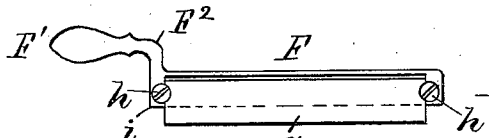


Fig. 4.



Fig. 5.

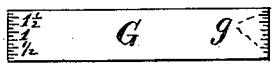


Fig. 6.

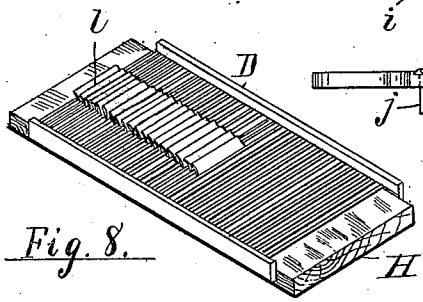


Fig. 8.

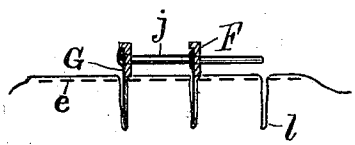


Fig. 2.

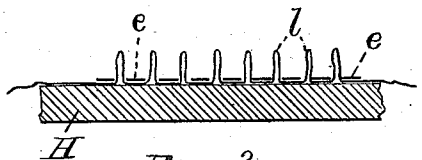


Fig. 3.

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UNITED STATES PATENT OFFICE.

ROBERT W. HENDERSON, OF NEWARK, NEW JERSEY.

PLAITING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 336,999, dated March 2, 1886.

Application filed June 8, 1885. Serial No. 167,993. (No model.)

To all whom it may concern:

Be it known that I, ROBERT W. HENDERSON, a subject of the Queen of Great Britain, residing in Newark, Essex county, New Jersey, have invented certain new and useful Improvements in Plaiting-Machines, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

This invention consists in certain improvements in the construction of the bed, the frame of wires, and the plaiting-knives; and the nature of these improvements will be best understood by reference to the annexed drawings, in which—

Figure 1 is a perspective view of the entire apparatus, excepting a part of the frame of wires. Fig. 2 is a diagram, upon a larger scale, of twelve of the wires, having a piece of cloth laid thereon and having three folds laid in the same at large intervals by two plaiting-knives, the whole being shown in a section transverse to the wires. Fig. 3 is a similar enlarged section of certain of the wires with the plaits projected between them and inverted upon the pressing-board ready for ironing. Fig. 4 is a side elevation of one of the plaiting-knives. Fig. 5 is an edge view of the bottom of the same. Fig. 6 is a view of the knife-blade detached from the handle and showing the side opposite to that exposed to view in Fig. 4. Fig. 7 is a transverse section of the wire frame enlarged, the wires being broken for want of space to show the full length; and Fig. 8 is a perspective view of the pressing-board with the wire frame inverted upon it with a series of plaited folds projecting between them ready for pressing upon the board.

The apparatus consists in a bed, A, and in a frame formed of two parallel wooden bars, D, to which are secured a series of tranverse wires, *e*. The bed is provided at its opposite edges with a series of supports, B, for the bars D, and with studs *c*, arranged vertically upon the bottom of the bed in one or more rows parallel with the supports B, and adapted to support each of the wires *e* intermediate to its opposite ends. Two such rows of studs are shown in the drawings; but a single row may be used upon a bed of lesser width. The opposite edge of the frame adjacent to the bars D is provided with a flange, E, to hold the bars upon the supports B, and the flange is bent at the corners B′ to form guides to hold the frame in its place longitudinally.

F is the knife-holder; F′, a handle connected therewith by an offset neck, F², and G is the knife-blade secured upon one side of the holder by screws *h* at its opposite ends. The blade is furnished with graduations *g* at opposite ends, (see Fig. 6,) which indicate the extent of its projection below the edge of the holder, (marked *i* in Fig. 4,) and such graduations would be numbered as shown at the left end of the blade in Fig. 6. One of the screws *h* is shown in Fig. 5 extended through the holder F to form a pin, *j*, which projects from the side of the holder to serve as a gage against which another knife may be placed to guide it into a space some distance removed from the holder, as shown in Fig. 2. Such pin is made smaller than the thread of the screw, so that it may be withdrawn and replaced by another of different length when desired. A similar gage may be formed independent of the screw *h* by a separate pin, shown at *k* in the same figure, secured into the back of the holder and removable independently of the screws.

The bars D are each made in two parts, as shown in the section in Fig. 7, the upper part, *s*, of the bar being made as a separate strip to clamp the wires upon the lower part, *s′*. The ends of the wires are bent at right angles, as at *e′*, and forced into the upper surface of the lower strip, *s′*, where they are securely held by gluing and nailing the upper strip to the lower.

The frame thus constructed is exceedingly rigid and light, and is well adapted to be handled separately, as required in using my machine. The handles upon the knife-holders are provided with offset F², so as to clear the bars D, as shown in Fig. 1, where two knives are represented as placed adjacent to one another between the wires *e*, with the handles F′ projected over the opposite edges of the bed. It will be understood that the frame of wires is intended to cover the whole top of the bed A, although broken off in Fig. 1 to show the construction of the bed and the supporting-pins *c*.

A piece of fabric or knife-plaits formed be-

tween each of the wires is shown in Figs. 3 and 8, and the method of forming and pressing the same is as follows: The strip of fabric is laid across the wires E, and the operator, holding a knife in each hand, commences at one end of the fabric and presses the blades G alternately into the spaces between the successive wires *e*, in each case holding the knife last inserted in its place to keep the fabric from shifting while lifting the previously-inserted knife and placing it in the next space. When this operation is completed, a pressing-board, H, (shown only in Figs. 3 and 8,) of a length and breadth adapted to cover all the wires between the bars G, is laid upon the wires and fabric, and the frame of wires is then lifted from the bed with the board and inverted, as in Fig. 8, which exposes the projecting plaits *l* to the smoothing and pressing iron. When thus inverted, the plaits appear between the wires, as is shown in Fig. 3, where a portion of the wires and the inverted board H are shown upon a larger scale, and the plaits may then be readily pressed with a hot iron to hold them in the required form.

In forming box-plaiting or in making knife-plaits at a greater distance apart than the width of two wires *e*, the knives may be inserted in the spaces between every second or third wire, the latter plan being shown in the enlarged section of a part of the wires in Fig. 2. In this view the function of the pins *j* upon the knife-holder is apparent, as they serve in such case to guide the operator promptly in the insertion of the second knife in the space at the required distance from the first.

Both the knife-holders shown in Fig. 2 are provided with the pins *j*, so that each may be removed in succession from the wires, and inserted at the required distance beside the other knife, which is held in the space during such removal to hold the fabric securely in its place.

By forming the screws *h* with pins of different lengths, where they project through the holder, the gage afforded by the pins *j* for the insertion of an adjacent knife may be varied at pleasure to guide the operator in making the plaits at any desired distance apart.

Instead of extending the screws *h* through the holder, removable gage-pins *k* may be inserted in the same, as shown in Fig. 5, by screwing their points into a tapped hole in the holder, and such pins may be made of various lengths, as required, and may be entirely removed when two knives are to be used in succession for pressing the plaits into all the spaces between the wires, as is shown with the two knives applied to adjacent spaces in Fig. 1.

By forming projecting handles upon the knife-holders, as shown herein, the operator may hold the handles at opposite sides of the bed, and may use two knives successively, as described above, without interference from the fingers, as when grasping the back of the holder in the middle.

The knife-blades are held detachably in the holders F by mere clamping-pressure afforded by the heads of the screws *h*, and may be removed at pleasure, and blades of other widths inserted, and such clamping mechanism affords the means for setting the blade G conveniently at different distances below the edge of the holder, in which setting the operator can be guided by the graduations *g*, which indicate the extent to which the blade would press the fabric between the wires.

My entire construction is intended especially for plaiting wide pieces of fabric, and the studs *c* are arranged in such manner beneath the wires as to support each separately and to afford a deep unobstructed space beneath the studs for pressing the fabric through in the formation of wide plaits, and such studs afford the means for using flattened wires, such as are shown most clearly in the enlarged section in Figs. 2 and 3, which have but little rigidity when made of considerable length, as is necessary in a frame of considerable width. Such flattened wires are much to be preferred for pressing the plaits closely into their finished form, and the utility of the studs *c* will therefore be plainly perceived in any construction where such wires are stretched across a wide frame.

The supports B and the corner guides, B′, are convenient means for holding the frame of wires over the bed when the latter is made in one piece of cast-iron; but the frame may be otherwise supported and held upon the bed, provided the latter is formed with the intermediate studs, *c*, to afford the requisite space beneath the wires for wide plaits.

I am aware of the state of the art shown in Patents Nos. 5,923, 207,127, 239,277, and 243,989, and that it is not new to use a gage in connection with a knife, or to furnish a plaiting-machine with a ratchet or pawl or other feeding devices adapted to shift the knife a specific amount, and I therefore disclaim the said patents and any construction different from my own, restricting my claim, so far as the knives are concerned, exclusively to a machine having a flat plaiting grate or frame of wires, and to two knives, constructed as described, with offset handles, so as to be held in the operator's hands and applied successively to the grate in the manner herein shown. I am not aware, however, that any plaiting-knives have ever been constructed with handles and with gages adapted to operate like mine, as, in applying two knives successively to a flat grate the handles are necessarily projected at opposite sides of the frame, and the gage-pins must necessarily be constructed upon the opposite or reverse sides of the knife-holders (in relation to the handles) to make them project in the same direction when the knives are held with their handles at opposite sides of the frame, as shown in Fig. 1. Neither am I aware that any clamping-screws have been used to perform the double function of holding the knife and pro-

jecting from the rear of the holder to serve as a gage, and I have therefore claimed such construction.

Having thus set forth the nature and object of my invention, what I claim is—

1. In a plaiting apparatus, the combination, with a detachable frame of wires, of the bed A, provided with supports B, series of studs *c*, and corner guides, B′, arranged and operated as set forth.

2. In a plaiting apparatus, the combination, with the frame of wires, of the knife constructed with the holder F, provided with the handle F′, connected thereto by an offset neck, F², and with the removable blade G, clamped in the holder by the heads of the screws *h* at its opposite ends, substantially as shown and described.

3. In a plaiting apparatus, the combination, with the flat frame of wires, of two knives constructed with removable blade G, holder F, and offset handle F′, the two holders being provided with gage-pins projected, respectively, at opposite sides of the said holders relative to the handles, so as to project in the same direction when the said handles are held at opposite sides of the frame, the construction being adapted to set the knives successively at a regulated distance from one another in the spaces between the wires when applied thereto, as shown and described.

4. In a plaiting apparatus, the combination, with the flat frame of wires, of the knife constructed with the holder F and handle F′, and with the removable blade G, clamped in the holder by the heads of the screws *h* at its opposite ends, the screws being projected through the holder to serve as gage-pins, and the screw-thread thereon adapting them to be removed and replaced by others of different length, substantially as herein shown and described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

ROBERT W. HENDERSON.

Witnesses:
THOS. S. CRANE,
L. LEE.