F. C. LOWETH.

BOX PLAITING MACHINE.

APPLICATION FILED OCT. 15, 1909.

1,004,799.

Patented Oct. 3, 1911.

3 SHEETS—SHEET 1.

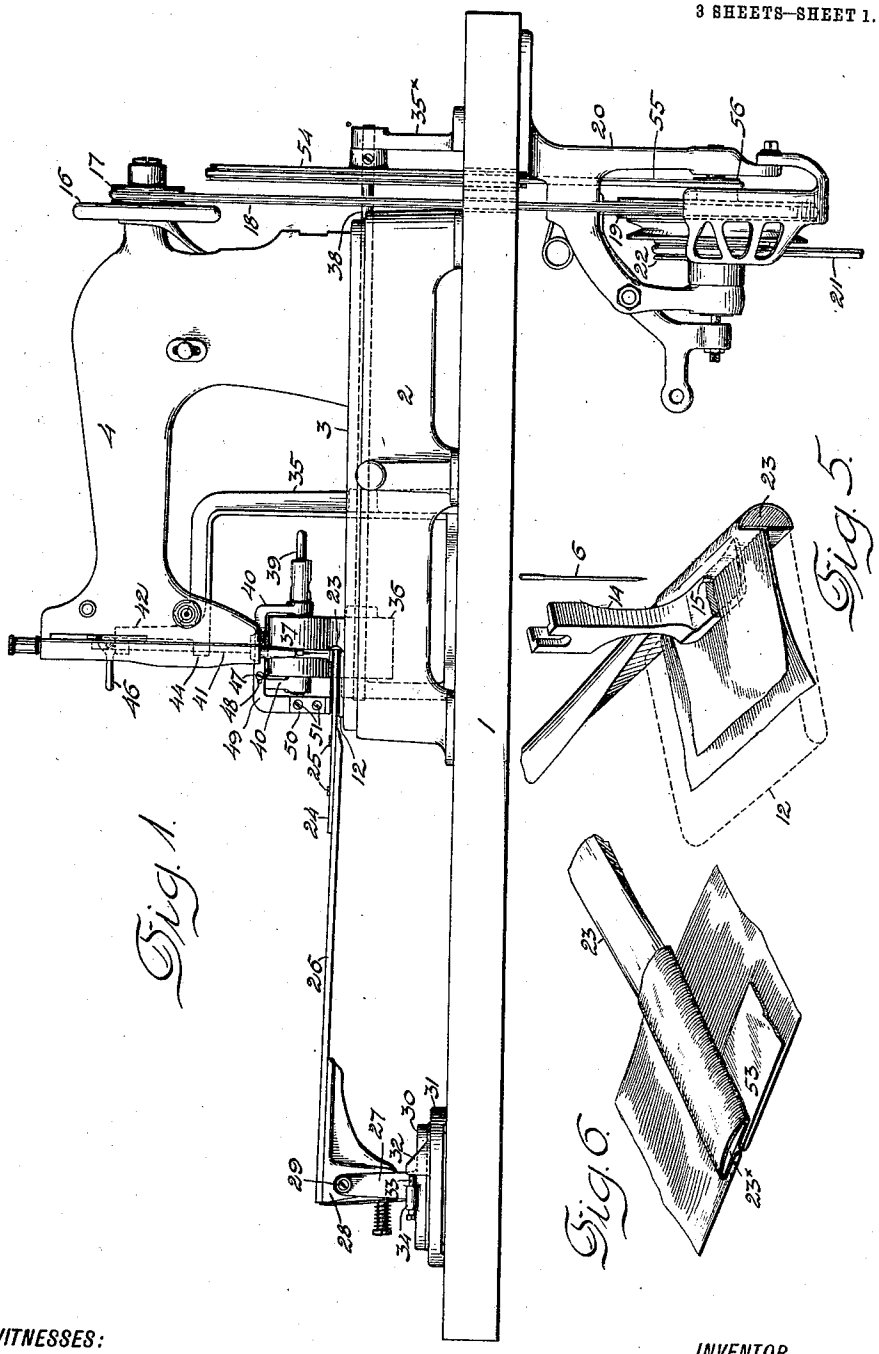

Fig. 1.

Fig. 5.

Fig. 6.

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3 SHEETS—SHEET 2.

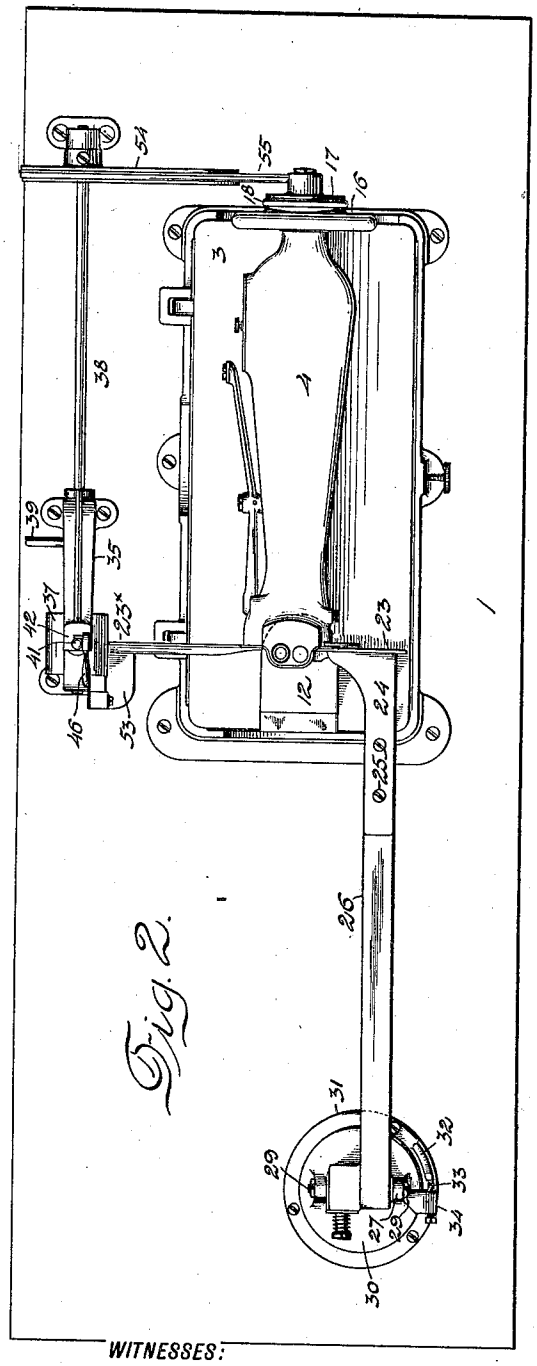

Fig. 2.

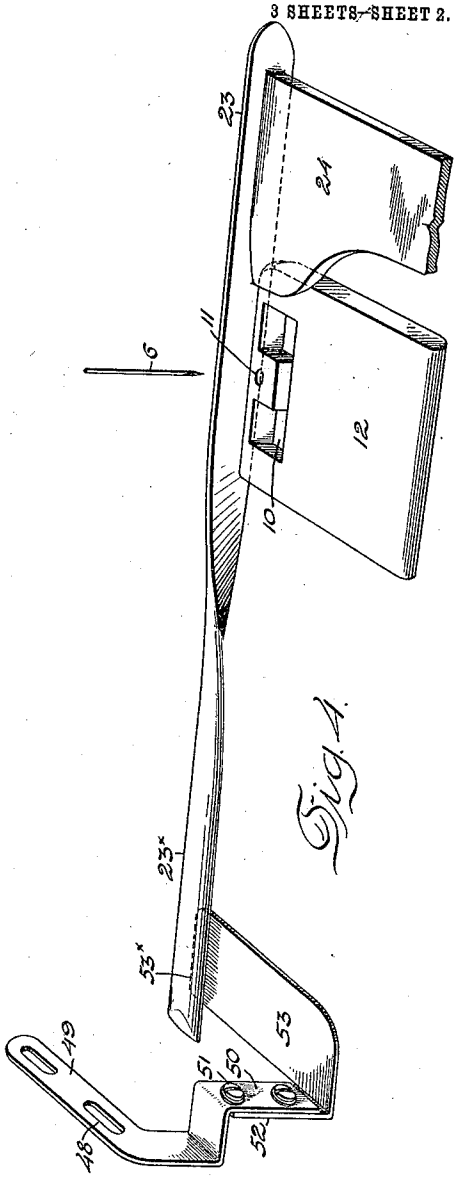

Fig. 1.

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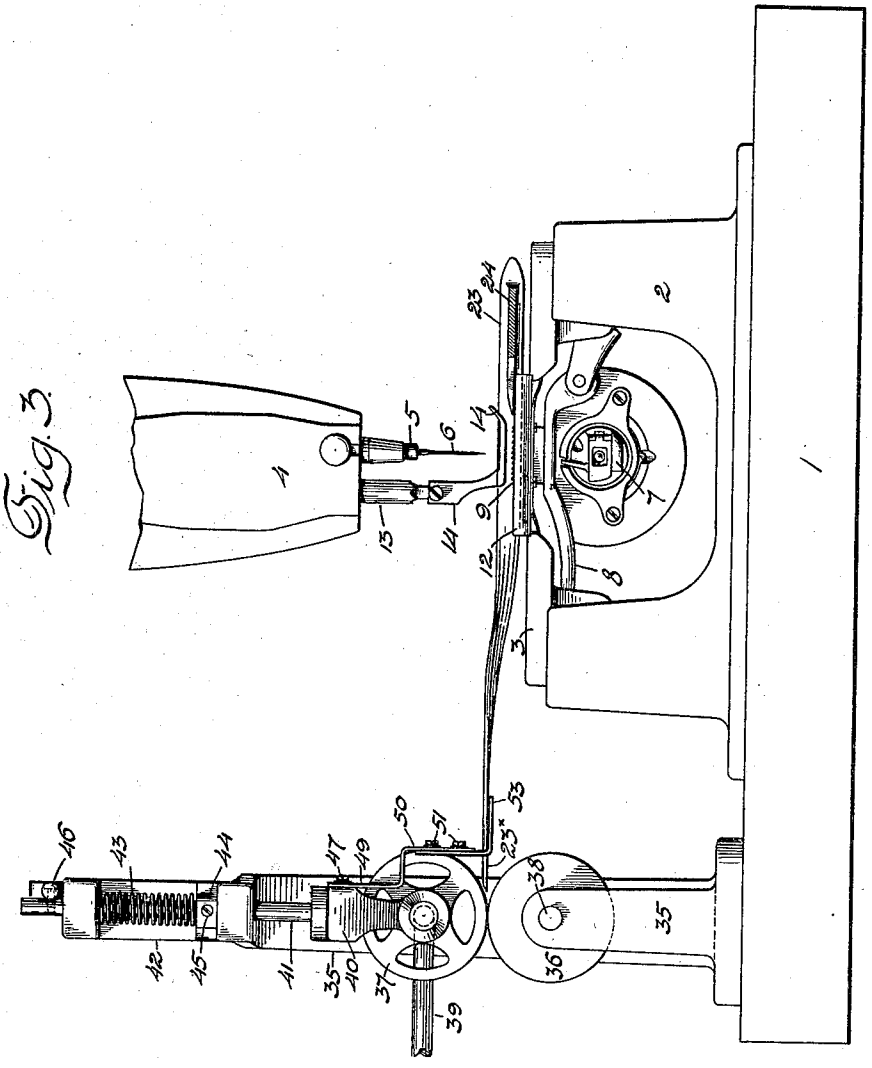
8 SHEETS—SHEET 3.

Fig. 3.



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UNITED STATES PATENT OFFICE.

FREDERICK CHARLES LOWETH, OF NOTTINGHAM, ENGLAND, ASSIGNOR TO THE SINGER MANUFACTURING COMPANY, A CORPORATION OF NEW JERSEY.

BOX-PLAITING MACHINE.

1,004,799. Specification of Letters Patent. Patented Oct. 3, 1911.

Application filed October 15, 1909. Serial No. 522,763.

To all whom it may concern:

Be it known that I, FREDERICK CHARLES LOWETH, a subject of the King of Great Britain, Ireland, and the Isle of Man, residing at Nottingham, in the county of Nottingham, England, have invented certain new and useful Improvements in Box-Plaiting Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to a device for use in making box-plaits with sewing machines, comprising a combined guide and folder cooperating with the throat-plate of the sewing machine, which throat-plate is or may be made of a special form hereinafter described.

The invention has for its primary object the provision of means whereby long lengths of fabric of any suitable breadth may be provided with box-plaits arranged lengthwise thereof and at any desired distance from the margin. Heretofore it has been proposed to perform this class of work by forming initially a flat tuck overlying the sewing machine work-plate and subsequently opening out the same in a plane perpendicular to the throat-plate in which form it was pressed between vertically disposed pressure rolls. While such apparatus was apparently capable of forming box-plaits in comparatively narrow strips of fabric, the construction and arrangement of the several parts were not of a character suitable for handling the wider breadths of fabric required to be operated upon in bulk. According to the present improvement, the tuck is first formed in a position substantially parallel with the needle-path and perpendicular to the work-plate, the former being twisted between the stitching point and the delivery end so as to present the tuck to the pressing means in a plane substantially parallel with the work-plate in such manner that when ironed or pressed upon the body fabric the line of stitching at the base of the tuck or plait extends substantially along its center line.

The improvement will be understood by reference to the accompanying drawings, in which—

Figure 1 is a side elevation of a machine embodying the present improvements, Fig. 2 a plan of the same, Fig. 3 an end view of the work-handling portions of the same upon a larger scale. Fig. 4 is a perspective view, upon a still larger scale, of the needle and throat-plate, the former and the edge-guide. Fig. 5 is a perspective view, partly in section, showing the fabric undergoing the folding and stitching operation adjacent the stitching point, and Fig. 6 a perspective view of a section of the folded and stitched plait as it is presented to the pressure rolls at the delivery end of the former.

The apparatus is shown supported upon a work-table 1, and comprising a sewing machine having a base 2 upon which rests the sewing machine head comprising the bed-plate 3 and overhanging bracket-arm 4 in which is journaled the reciprocating needle-bar 5 carrying the needle 6 coöperating with a shuttle provided with the usual thread-case 7 in the production of stitches. The sewing machine is provided with any usual or suitable feeding mechanism which includes, in the present instance, the feed-bar 8 carrying the feed-dog 9 passing through the usual feed-aperture 10 adjacent the needle-hole 11 in the throat-plate 12, which is shown rising materially above the upper face of the bed-plate 3. The sewing machine is provided with the usual spring-pressed presser-bar 13 to which is secured the presser-foot 14 provided close to one edge with the needle-hole 15. The sewing machine has fixed upon its main-shaft journaled in the bracket-arm 4 the usual balance-wheel 16 with grooved pulley 17 connected by means of the driving belt 18 with one of the pulleys 19 of a well-known form of under-driver 20 driven by means of a belt embracing the grooved pulley 22 from a suitable power-shaft.

The plait-former is shown comprising a substantially half-round rod of which the work-receiving end portion 23 has its flattened side arranged at the right of the needle-path and parallel with the line of feed and with the adjacent edge of the throat-plate, but depending partially below the face of the latter, as represented in the drawings. The former is supported in advance of the stitching mechanism by means of a flat shank 24 whose extremity joins the flat face thereof, and rearwardly of the stitching point the former is twisted a quarter-turn and slightly flattened to form a wider and thinner delivery portion $23^{\times}$, the extremity of which is beveled to a comparatively thin

edge. The shank 24 is secured by means of screws 25 upon the supporting arm 26 of the stand 27 constructed substantially in accordance with the United States patent to A. Laubscher No. 689,100, dated December 17, 1901. The arm 26 is secured upon a bracket-piece 28 mounted upon center screws 29 of the standards 27 rising from the foot-plate 30 journaled for circular movement upon the base 31 which carries the stop-lug 32 adapted to be engaged by the point of the adjusting screw 33 mounted in the lug 34 of the foot-plate 30. By the suitable adjustment of the screw 33 the forward or operative position of the plait-former may be set as required in relation to the throat-plate and the stitching mechanism. For the convenient introduction of the work, the supporting arm 26 may be first swung toward the operator and then upwardly to shift the former entirely clear of the sewing machine.

The throat-plate constitutes a work-supporting member having a work-sustaining face opposed to the presser-foot in transverse relation to the needle-path with one edge parallel with the direction of feed. The work-receiving end portion of the plait-forming bar, arranged adjacent the edge of the work-support and having its upper and lower edges disposed respectively above and below the face of the work-supporting member, produces a tubular fold in the material whose upper and lower edges are respectively above and below the body of the material resting upon the work-support, so that the function of the delivery portion of the plait-forming bar is to turn the fold thus formed and connected with the body fabric at right angles to its position at the stitching point preparatory to the action of the pressure rolls.

Rearward of the machine, upon the stand 35 are supported a pair of pressure rolls 36 and 37 the former being mounted upon the horizontal shaft 38 journaled in the stand 35 and bracket 35×, and the other being journaled by means of the tubular-shaft 39 in the hanger 40 carried by the bar 41 which is journaled in spaced lugs of the bearing bracket 42 rising from the stand 35, a pressure spring 43 being interposed between the upper bearing lug and the collar 44 adjustably secured by means of the screw 45 upon the bar 41. The bar 41 is adapted to be raised for separating the pressure rolls by means of a common form of lifting cam-lever 46 pivotally attached to the upper end of the bar 41 and having its cam-portion adapted to rest upon the top of the adjacent bearing lug.

In practice, the outer extremity of the tubular-shaft 39 constitutes a nozzle to which is attached a gas supply pipe to provide for maintaining the upper roll heated for the work pressing operation.

Adjustably secured to the front side of the hanger 40 by means of screws 47 entering elongated apertures 48 therein is a bracket-piece 49 having an offset depending member 50 to which is secured by means of fastening screws 51 the upturned shank 52 of a horizontal edge-guide 53 extending transversely to the former and having its operative edge 53× extended beneath the adjacent edge of the former to about the middle of the width of the same, but spaced slightly below the flat lower face thereof. This edge-guide is adapted to enter the folds between the lower member of the plait and the top of the body fabric, as represented in Fig. 6, to insure that the base of the plait will be arranged midway of its edges in the pressing operation performed by rolls 36 and 37 between which it is directed by the delivery end of the folder. The lower feed-roll shaft has fixed thereon adjacent its farther end a grooved pulley 54 connected by means of a belt 55 with a small grooved pulley 36 attached to and adapted to rotate with the larger pulley 19 of the under-driver. The pulleys 17, 19, 54 and 56 are so proportioned that the pressure roll 36 will be rotated at a surface speed substantially equal to or somewhat greater than the feed movement imparted to the work by the action of the feed-dog 9, in order that the work intermediate the stitching point and the pressure members may be maintained taut so that the guiding edge 53× will be effective in accurately guiding the work in its delivery to the feed-rolls.

In the operation of the apparatus, the former is withdrawn from the stitching and feeding mechanism and the fabric is doubled over the same, with one side overlying and the other underlying the arm 36, after which the former is extended into operative position and the sewing machine presser-foot lowered, when a half-round plait is formed in the fabric as represented in Fig. 5. As the stitching operation proceeds, the work is advanced by hand until the forward extremity is introduced between the pressure rolls, when the folding and creasing operation proceeds automatically, the proper presentation of the folded fabric being insured by the action of the edge-guide 53, as before explained.

Having thus set forth the nature of the invention, what I claim herein is:—

1. A machine for forming box-plaits comprising a stitching mechanism including a reciprocating needle, feeding mechanism, a work-supporting member having a work-sustaining face disposed transversely of the needle and having one edge parallel with the direction of feed and adjacent the needle-path, a plait-former in the form of a bar having a receiving end portion parallel with the line of feed adjacent the needle-path with

its top and bottom arranged respectively above and below the work-sustaining face of said work-supporting member and having its delivery end portion arranged to deliver the plait in parallel relation with the face of said work-supporting member in overlapping relation with the line of stitching, and means for pressing the plait over the line of stitching.

2. A machine for forming box-plaits comprising a stitching mechanism including a reciprocating needle, feeding mechanism, a throat-plate, an opposed presser-foot, a plait-former arranged at one side of the needle-path and parallel with the line of feed and having a receiving end flattened adjacent the needle-path and depending partly below the face of the throat-plate and twisted a quarter-turn to present the plait at the delivery end parallel with the face of the throat-plate, and means adjacent the delivery end of said former for pressing the plait over the line of stitching.

3. A machine for forming box-plaits comprising a stitching mechanism including a reciprocating needle, feeding mechanism, a plait-former arranged at one side of the needle-path and parallel with the line of feed and having a receiving end flattened on the side adjacent the needle-path and twisted a quarter-turn to present the plait at the delivery end transversely of the needle-path, means adjacent the delivery end of said former for pressing the plait over the line of stitching, and an edge-guide independent of but in overlapping relation with one edge of the delivery portion of the former and adapted to engage the base of the plait at the line of stitching for guiding the same to the pressing means.

4. A machine for forming box-plaits comprising a stitching mechanism including a reciprocating needle, feeding mechanism, a plait-former arranged at one side of the needle-path and parallel with the line of feed and having a receiving end flattened on the side adjacent the needle-path and twisted a quarter-turn to present the plait at the delivery end transversely of the needle-path, means adjacent the delivery end of said former for pressing the plait over the line of stitching, and an edge-guide independent of but in overlapping relation with one edge of the delivery portion of the former and adjustable transversely of the same and adapted to engage the base of the plait at the line of stitching for guiding the same to the pressing means.

5. A machine for forming box-plaits comprising a stitching mechanism including a reciprocating needle, feeding mechanism, a throat-plate, an opposed presser-foot, a plait-former arranged at one side of the needle-path and parallel with the line of feed and having a receiving end flattened on the side adjacent the needle-path and depending partly below the face of the throat-plate and twisted a quarter-turn to present the plait at the delivery end transversely of the needle-path, a pair of pressure rolls, of which one is spring-pressed toward the other, and having their axes arranged in planes parallel with the face of the throat-plate, means for driving said pressure rolls, and an edge-guide independent of but in overlapping relation with one edge of the delivery portion of the former and adapted to engage the base of the plait at the line of stitching for guiding the same to the pressure rolls.

6. A machine for forming box-plaits comprising a stitching mechanism including a reciprocating needle, feeding mechanism, a throat-plate, an opposed presser-foot, a plait-former arranged at one side of the needle-path and parallel with the line of feed and having a receiving end flattened on the side adjacent the needle-path and depending partly below the face of the throat-plate and twisted a quarter-turn to present the plait at the delivery end transversely of the needle-path, a pair of pressure rolls, of which one is spring-pressed toward the other, and having their axes arranged in planes parallel with the face of the throat-plate, means independent of the driving means of the stitching and feeding mechanisms for driving said pressure rolls, and an edge-guide independent of but in overlapping relation with one edge of the delivery portion of the former and adapted to engage the base of the plait at the line of stitching for guiding the same to the pressure rolls.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

FREDERICK CHARLES LOWETH.

Witnesses:
JAMES REID,
JOHN HANCOCK.