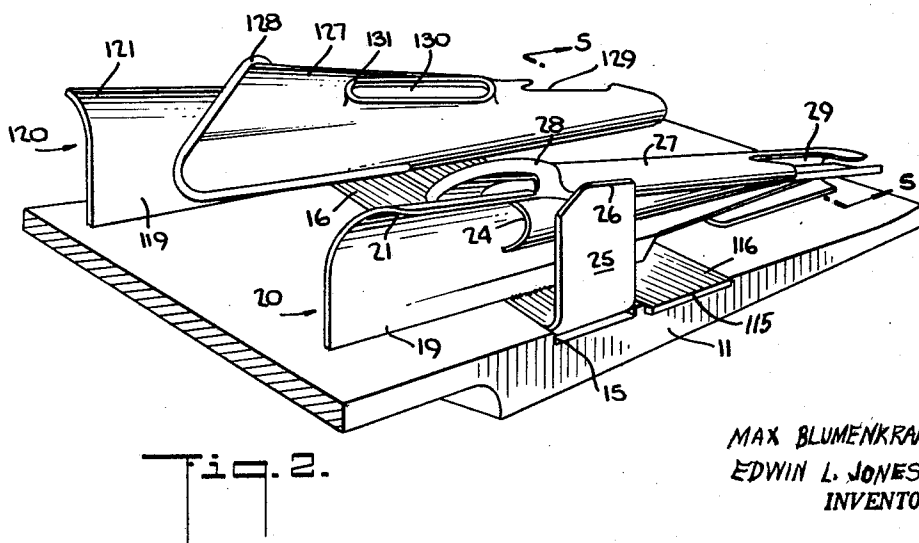


3,125,972

4 Sheets-Sheet 1



MAX BLUMENKRANTZ
EDWIN L. JONES
INVENTORS

BY *Aaron Tushnet*

ATTORNEY

March 24, 1964

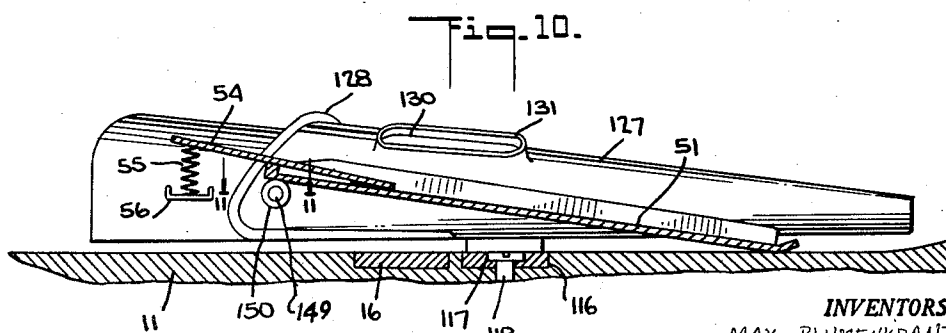
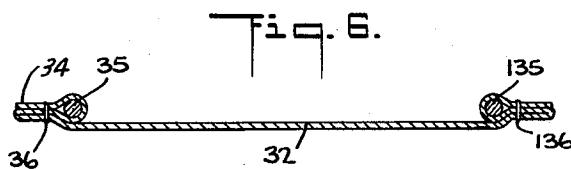
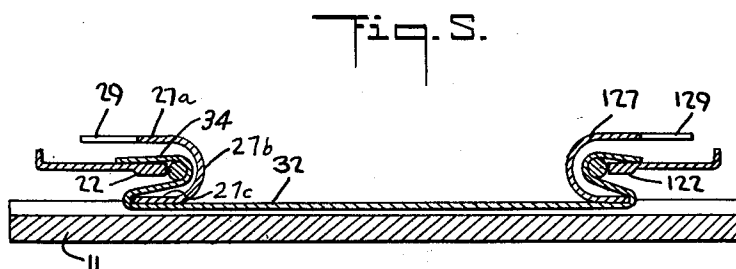
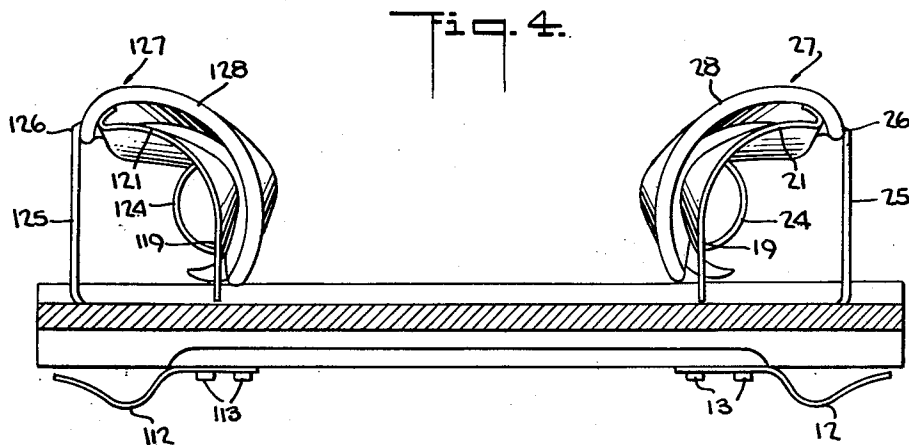
M. BLUMENKRANTZ ETAL

3,125,972

SEWING MACHINE ATTACHMENTS

Filed Aug. 1, 1960

4 Sheets-Sheet 2



INVENTORS
MAX BLUMENKRANTZ
EDWIN L. JONES
BY
Aaron Tushin
ATTORNEY

March 24, 1964

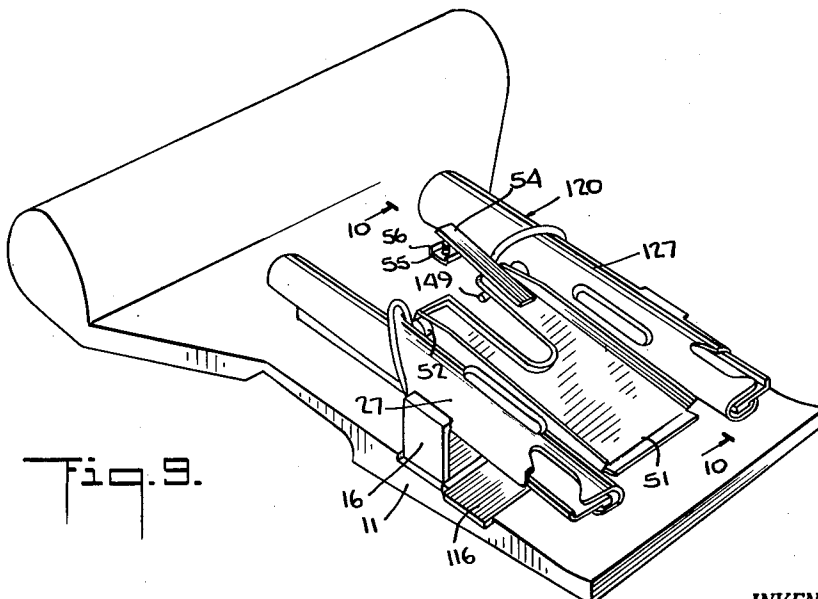
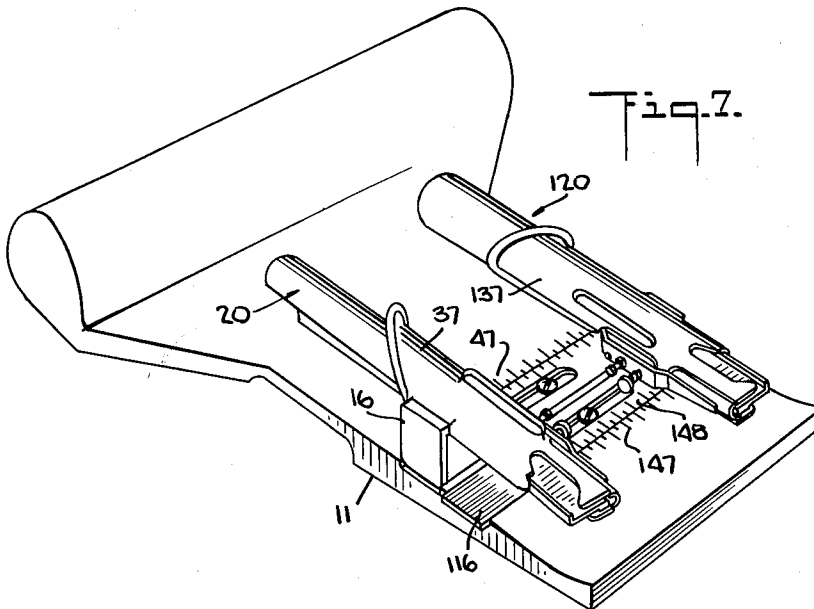
M. BLUMENKRANTZ ETAL

3,125,972

SEWING MACHINE ATTACHMENTS

Filed Aug. 1, 1960

4 Sheets-Sheet 3



INVENTORS
MAX BLUMENKRANTZ
EDWIN L. JONES
BY *Arson Tushin*
ATTORNEY

March 24, 1964

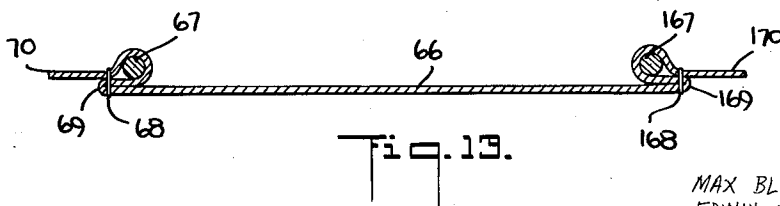
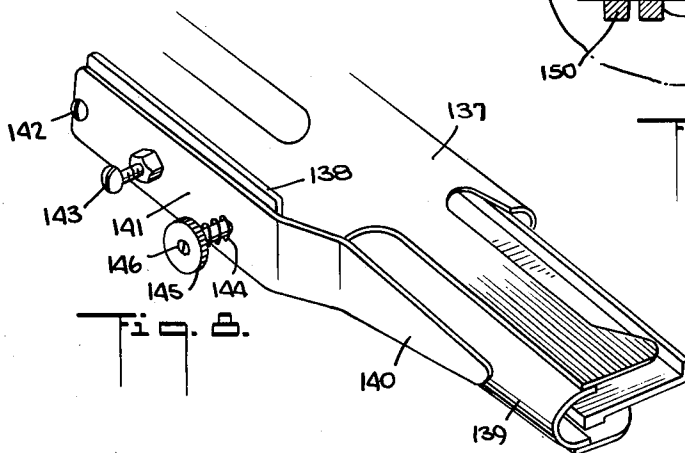
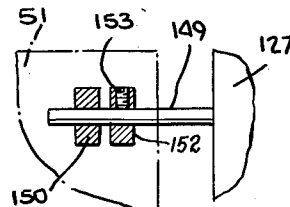
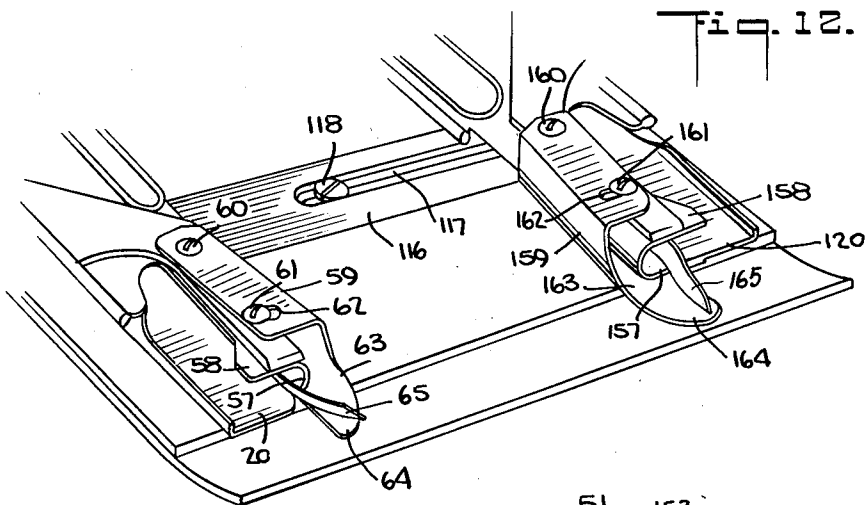
M. BLUMENKRANTZ ETAL

3,125,972

SEWING MACHINE ATTACHMENTS

Filed Aug. 1, 1960

4 Sheets-Sheet 4



INVENTORS
MAX BLUMENKRANTZ
EDWIN L. JONES
BY
Aaron Tushin
ATTORNEY

1

3,125,972

SEWING MACHINE ATTACHMENTS

Max Blumenkrantz, New York, N.Y., and Edwin L. Jones, Englewood, N.J., assignors to Apex Sewing Machine Co., Inc., New York, N.Y., a corporation of New York

Filed Aug. 1, 1960, Ser. No. 46,568

2 Claims. (Cl. 112—139)

This invention relates to improvements in folders sometimes called guides, intended for use in connection with a double needle sewing machine to produce double welt cushion boxing.

In earlier patents, Nos. 2,773,266 and 2,834,308 there are described several folders adapted to produce double welt cushion boxing and especially cushion boxing wherein the stitching of the cords or welts is such that the welts appear to be separated from, but stitched to, the fabric between the welts. The folders to achieve this pattern include a pair of casings one within the other and so bent from inlets to outlets that a fabric will be gradually deformed into the desired folded position embracing two spaced cords.

It is an object of this invention to provide improved folders.

It is a further object of the invention to provide folders wherein one or both of the casings are simplified in structure so as to eliminate such material of construction as is not necessary to functioning of the remaining elements.

Another object of the invention is to provide a folder capable of producing double welt cushion boxings wherein the welts are spaced apart any desired distance.

A further object of the invention is to provide means for producing welting integral with the base fabric with a minimum consumption of fabric, the product being characterized by a smooth flat surface adjacent the welting.

Other objects and advantages of the invention will be apparent to those skilled in the art upon a study of this specification and the accompanying drawings.

Referring to the drawings which are given by way of example to illustrate the invention:

FIGURE 1 is a perspective view of one of my improved double welt forming devices;

FIGURE 2 is a perspective view of the folder from the rear with the rear portion of the plate broken away along the line 2—2 of FIGURE 1;

FIGURE 3 is an enlarged perspective view of a portion of the device of FIGURES 1 and 2;

FIGURE 4 is a cross-sectional elevation taken on the line 2—2 of FIGURE 1;

FIGURE 5 is a section taken along line 5—5 of FIGURE 2, with the inclusion of a fabric web;

FIGURE 6 is a sectional view through the product produced by sewing;

FIGURE 7 is a perspective view of a modified folder;

FIGURE 8 is an enlarged perspective view of a portion of the device of FIGURE 7;

FIGURE 9 is a perspective view of still another folder;

FIGURE 10 is a view taken along line 10—10 of FIGURE 9;

FIGURE 11 is a sectional view along line 11—11 of FIGURE 10;

FIGURE 12 is a perspective view of a portion of another folding guide modification; and

FIGURE 13 is a sectional view through a fabric produced when the guide of FIGURE 12 is in one of its terminal positions.

The folders are preferably constructed of metal although molded or extruded plastic elements can be employed.

With particular reference to FIGURES 1 to 5, the guide comprises a base plate 11 provided on its underside with

2

a pair of spaced spring clips 12, 112 secured thereto as by screws 13, 113 (FIGURE 4). These clips permit the guide to be removably attached in predetermined position relative to a double needle sewing machine (not shown). The face of plate 11 is generally planar, tilting upwardly from its forward edge to its rear. At the rear 14 the plate curves upwardly relatively abruptly to support the material.

Across the face of plate 11 there are provided a pair of parallel grooves 15, 115. A pair of slides 16, 116 seat in grooves 15, 115 substantially flush with the face of plate 11 and are provided with slots 17, 117 which in profile have a stepped construction. Screws 18, 118 having enlarged heads extend through the slots 17, 117 to engage the face of plate 11 in grooves 15, 115. The stepped profile of the slots ensures that the heads of screws 18, 118 do not project to any appreciable extent above the top of the face of plate 11 and slides 16, 116. By loosening screws 18, 118 slides 16, 116 may be displaced laterally within their respective grooves for a purpose hereinafter to be described. Tightening of the screws will lock the slides in their new positions.

The slide 16 is connected to an upstanding portion 19 of a wall 20 which at its rear flares laterally outwardly at 21 and which at its front is pinched to form a double thickness 22. The wall is provided with a tear-drop shaped opening 23. A member 24, in the shape of a cone longitudinally cut in half, is secured as by welding in the pocket formed by the pinching of wall 20 so as to form with the wall a guide for a cord to be advanced through the opening 23. The slide 116 is connected to a portion 119 of a wall 120 having a flare 121, a double thickness 122, an opening 123 and a member 124 identical with the corresponding elements associated with slide 16.

As a reinforcement, slide 16 projects laterally beyond portion 19 and is bent upwardly to form a leg 25 which is connected to wall 20 at the edge 26 of the latter. A wall 27, comprising portions 27a, 27b, 27c is connected to wall 20 along edge 26 and is shaped so as generally to parallel wall 20. The rear edge 28 of wall 27 is bent up as a reinforcement. Various portions of wall 20 and/or wall 27 may be cut out such as at 29 and 30, the latter being surrounded by bent up reinforcements 31, so as to provide ready manual access to the space between these walls. Corresponding elements leg 125, edge 126, wall 127, cutouts 129 and 130 and reinforcements 128 and 131 are associated with slide 116.

In operation, a fabric web 32 is fed preferably face up into the fold guide. The fabric will lie smoothly across the face of the plate 11 with its edges extending into the spaces between walls 20, 27 and 120, 127. As the fabric 32 advances to the front of the plate 11 a strip along its left edge is folded into a reverse S-shape as shown in FIGURE 5 being guided into shape by the horizontal portion 22 of wall 20 extending toward the joiner between the top and bottom horizontal portions of wall 27; the exact dimensions of the folded fabric edge depend upon the shape of walls 20 and 27. The portion 27b connecting the top portion 27a and bottom portion 27c of wall 27 extends generally vertically, but is advantageously curved approximately to the contour of the cord which will pass therethrough, although the radius of the curvature will be somewhat greater than that of the cord. The cord will fit in the space between portion 27b and the end of horizontal member 22 which parallels portions 27a and 27c. A strip along the right hand edge of fabric 32 will be folded in mirror image, i.e. in S-shape. At the same time a cord 35 is supplied to the guide defined between wall 20 and member 24, passes through opening 23 and is enveloped in the concavity created by edge 34. A cord 135 is similarly enveloped by the fabric edge 134.

3

The assembly of enveloped cords 35, 135 and folded fabric 32 passes to a double needle sewing machine (not shown) and is stitched at 36, 136 as shown in FIGURE 6 to produce a double welted unitary structure capable of further use in known manner.

The modified structures shown in FIGURES 7 to 13 are similar to those shown in FIGURES 1 to 5 except for inclusion of means for placing a predetermined adjustable lateral force on the fabric in FIGURE 7, of means for holding a fabric down against the face of the plate between the walls in FIGURES 9, 10, and 11, and of means for adjusting the nature of the fold.

Referring now more specifically to FIGURES 7 and 8, there are shown a pair of walls 37, 137 generally similar to walls 27, 127 except that the small ends are cut away where the walls face one another. Secured to wall 137 is a reinforcing plate 138. A curved plate 139 is secured to a straight portion 140 at an arm 141. This arm is curved and it has a screw 142 securing it to the plate 138. A screw 143 engages a threaded hole in the arm 141 and forms a settable limit for the minimum distance between the curved plate 139 and the double thickness 122 where wall 120 is pinched, and such setting may be retained by means of the locknut shown. A threaded screw 146 is screwed into the plate 138 and extends through a clearance hole in the arm 141. A spring 144 embraces the body of 146, and a thumb nut 145 is for adjusting the arm 141 so that it exerts a predetermined or wanted urge upon said arm and the curved plate 139 carried thereby. Corresponding elements are carried by wall 37.

To facilitate rapid accurate setting of the distance between cords of the sewn product, graduations 47 and 147 are provided on the face of plate 11 to cooperate with opposed graduations 48, 148 on slides 16, 116. The three horizontal portions and the arcuate generally vertically extending portion, described with reference to the embodiment of FIG. 5, are readily apparent in this embodiment at the lower right hand corner of FIG. 8.

In the device of FIGURES 9, 10, 11 a pair of pins 49, 149 project toward one another from walls 27, 127. A ring 150 encircles pin 149 and is interconnected by a tongue 51 with a similar ring on pin 49. A collar 152 (FIGURE 11) also encircles pin 149 between the ring and wall. By means of set screw 153 the collar 152 is locked in position thereby preventing ring 150 from displacement axially along pin 149 while still permitting rotational movement of the ring and tongue about the pin. A lever 54 projects rearwardly from the tongue 51 and carries a coiled spring 55 therebelow.

A channel member 56, U-shaped in cross-section is welded to wall 127 with a free end of spring 55 seated in the channel. The compression of spring 55 between member 56 and lever 54 holds the forward end of tongue 51 down against a fabric (not shown) passing between the walls 27, 127, thereby keeping the fabric flat and in proper position. When the walls 27, 127 are displaced relative to one another the set screw 153 is loosened and collar 152 is moved to a new position holding the tongue against displacement along the pin. If desired, several assemblies of tongue, rings, lever and coiled spring may be provided, each tongue being of a different width so as to accommodate a great range of fabric widths. The three horizontal portions and arcuate generally vertically extending portion, described with reference to the embodiments of FIGS. 5 and 8, are readily apparent in this embodiment near the bottom right of FIG. 9.

In FIGURE 12 there is shown an alternative embodiment including means for effectively changing the distance to which the forward ends of walls 27, 127 project laterally beyond portions 19, 119 of walls 20, 120 of the embodiments of the figures previously described. Specifically, the outermost ends 57, 157 of walls 58, 158 terminate shortly beyond the turning points. An element 59 is adjustably held to wall 58 by two screws 60, 61, 75

4

the top of wall 58 being thickened to permit tapping to receive the screws. Member 59 is provided with a hole (not visible) through which screw 60 projects and with a slot 62 through which screw 61 projects. The member 59 is also provided with an encircling portion 63 bending about wall 58 and terminating in a nose 64. A finger 65 projects forwardly from wall 58 to bring the guiding action of the wall as far forward as possible, the finger extending forwardly about as far as nose 64. By loosening the screws 60, 61 and pivoting member 59 about screw 60 the degree to which nose 64 projects laterally beyond end 57 can be varied. Such variations permit corresponding variations in the lateral distance between the cords and the outermost folded edges of the fabric, i.e. between the free end of the topmost horizontal run of the S and the lower bend of the S. Similar adjustment is possible at the wall 158 by means of corresponding elements 159 through 165. By way of example, FIGURE 13 shows a fabric 66 with spaced cords 67, 167 and lines of stitching 68, 168. The folded edges 69, 169 are positioned far more closely to the cords 67, 167 than in the embodiment of FIGURE 6. The free ends 70, 170 project laterally as far as necessary to permit the welted fabric to be sewn to other fabrics in known manner.

This close positioning is economical of fabric since for most applications the doubled fabric is without function. In addition, with relatively thin fabrics the folded edges, even if on the inside of a cushion, would tend to become visible as a bulge. Occasionally, however, as when operating upon relatively thick or loosely woven fabrics it is desirable to space the folded edges further from the stitch lines to prevent tearing out. In such instances the member 59 would be pivoted to an appropriate position.

This embodiment thus corresponds to that of FIG. 5 in that nose 64 of element 59 of FIG. 12 is the bottom portion and the top of element 59 (which is an extension of the top of wall 58) is the top portion, these portions being interconnected by the vertically extending arcuate portion 63. Finger 65 is the counterpart of the middle horizontal portion of FIG. 5, being spaced from the vertical portion 63 and constituting the lateral abutment for the cord.

The adjustability feature of this embodiment can be combined with the spring loading of FIGURES 7 and 8 or with the tongue action of FIGURES 9, 10, and 11. It can even be employed as part of a folding guide wherein the walls are fixed laterally relative to one another.

It will be noted that in essence walls 20 and 120 of FIGURE 1 form a U-shaped casing with that portion of plate 11 disposed therebetween. In similar manner walls 27 and 127 may be considered to form a second casing with the space therebetween serving as an access passageway or slot to the fabric therebelow.

While in FIGURE 1, for example, both walls 20 and 120 have been shown as mounted for lateral displacement it is possible to retain the desired adjustability in the distance between welts of the end product by mounting only one of the walls for lateral displacement. If such displaceability is not desired then both walls may be fixed to the face of plate 11. However, as illustrated it is possible to remove one of the walls from the base plate so as to produce only single welted bands. In such event, if desired, it is possible to utilize in place of the second folding wall a straight wall which will serve as an abutment for the free edge of the fabric, although this is not necessary.

If desired, wall 20 could be bent in such manner as to produce a bulge equivalent to element 24 and the guide for the cord could be produced by a semi-conical element welded to wall 20 adjacent wall 27. This structure would be substantially identical with that shown. Thus, insofar as this feature is concerned, it is not of consequence whether the element added to produce the guide for the cord is welded to the inside or outside of wall 20.

Although we have herein shown and described by way of example certain improvements in folders for the formation of double welting, we are not limited by the exact structure herein shown and described as many changes may be made in the arrangements shown and described within the scope of the following claims.

What is claimed:

1. In a folder for the formation of welting or the like, a base, a pair of spaced means for guiding a pair of spaced cords, a wall structure operatively connected to each of said guiding means, said base and wall structures together forming a casing-like structure defining a graded passage wherein the borders of a fabric web being passed therethrough are folded around a pair of cords passed through said guiding means and adapted to be delivered to double stitching means which simultaneously forms a row of stitches in each of said borders of said web adjacent to each of said cords, said folder including means connecting at least one of said guiding means and its wall structure to said base in a manner permitting displacement relative to the other of said guiding means and its wall structure, whereby said folder can be adjusted to vary the spacing between said cords, a pin on each of said wall structures, a tongue pivotally supported on said pins between said wall structures, means projecting from at least one of said wall structures, and spring means extending between said tongue and said projecting means and resiliently urging said tongue against a fabric web passed therebelow.

2. In a folder for the formation of welting or the like, a base and a pair of wall structures operatively connected to said base so as to be laterally displaceable relative to one another, each of said wall structures including top, middle, and bottom generally horizontal wall portions,

the top and bottom portions being connected at a location spaced from one end of said middle portion, whereby a fabric web passed therethrough will be folded into an S-shape between said portions and base, means for guiding a cord into the space between the end of said middle portion and the connection of said top and bottom portions so as to be received in the upper bend of the S defined by a bent fabric web passed through said folder, and means for adjusting the effective distance between the end of said middle portion and the connection of said top and bottom portions, whereby the lateral distance between the free end of the topmost horizontal run of the S and the lower bend of the S may be varied, said adjusting means including an essentially vertically extending member connected with said wall structure, and an essentially horizontally extending member provided with a slot and pivotally mounted about said vertically extending member for displacement relative thereto about a vertical axis, a screw extending through said slot into said wall structure for locking said horizontally extending member in any selected position.

References Cited in the file of this patent

UNITED STATES PATENTS

992,942	De Voe	May 23, 1911
1,167,777	Moffatt	Jan. 11, 1916
1,230,906	Krug et al.	June 26, 1917
1,390,195	De Voe	Sept. 6, 1921
1,435,661	Rohn	Nov. 14, 1922
2,278,042	Sailer	Mar. 31, 1942
2,313,261	Podgorny	Mar. 9, 1943
2,539,845	Kohout	Jan. 30, 1951
2,834,308	Blumenkrantz	May 13, 1958