

May 5, 1964

C. L. SNAYBERGER, SR., ETAL
FOLDING DEVICE FOR POLO SHIRTS

3,131,838

Filed Nov. 20, 1963

2 Sheets-Sheet 1

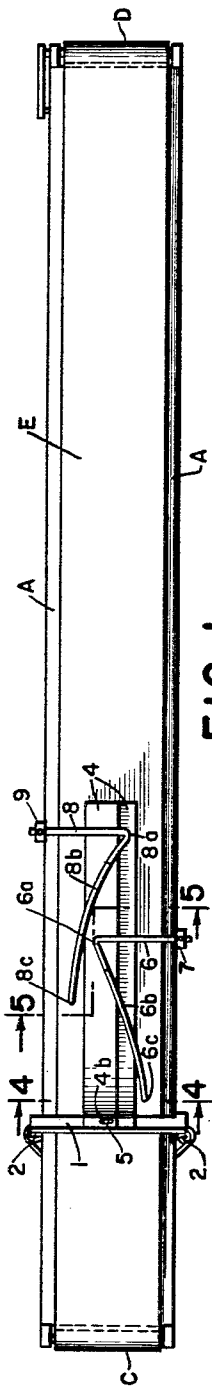


FIG. 1.

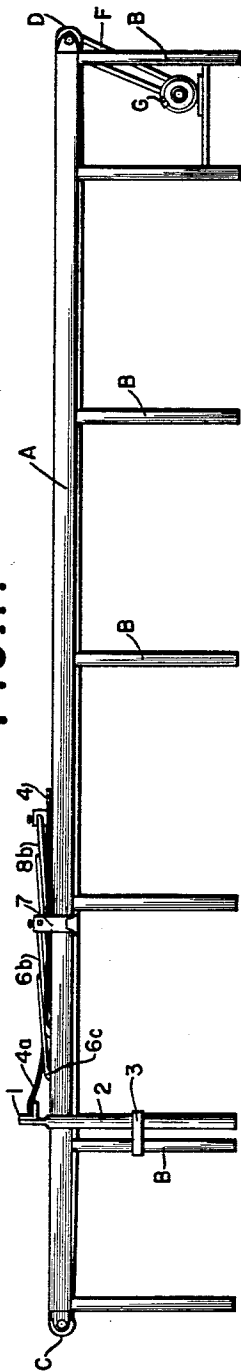


FIG. 2.

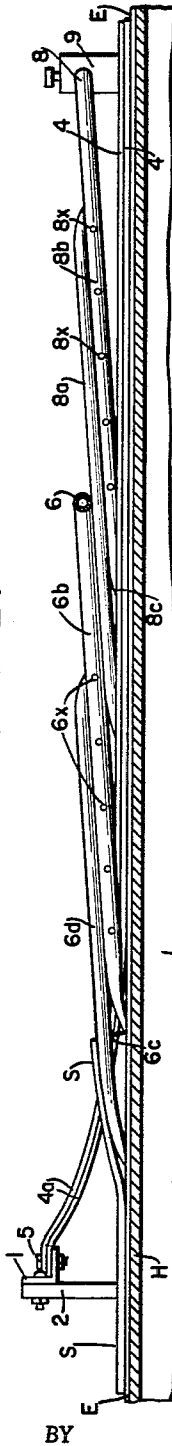


FIG. 3.

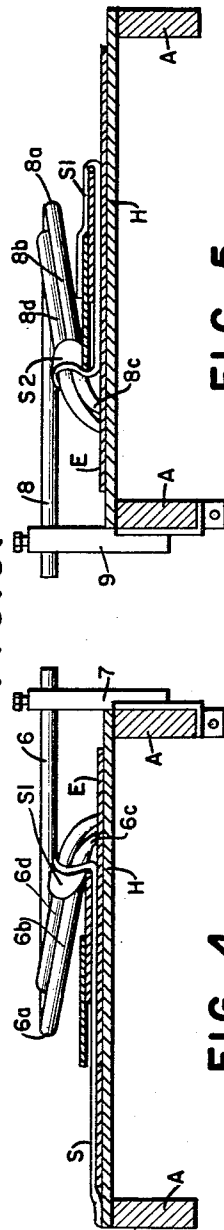


FIG. 4.

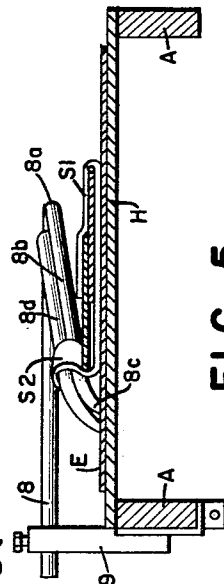


FIG. 5.

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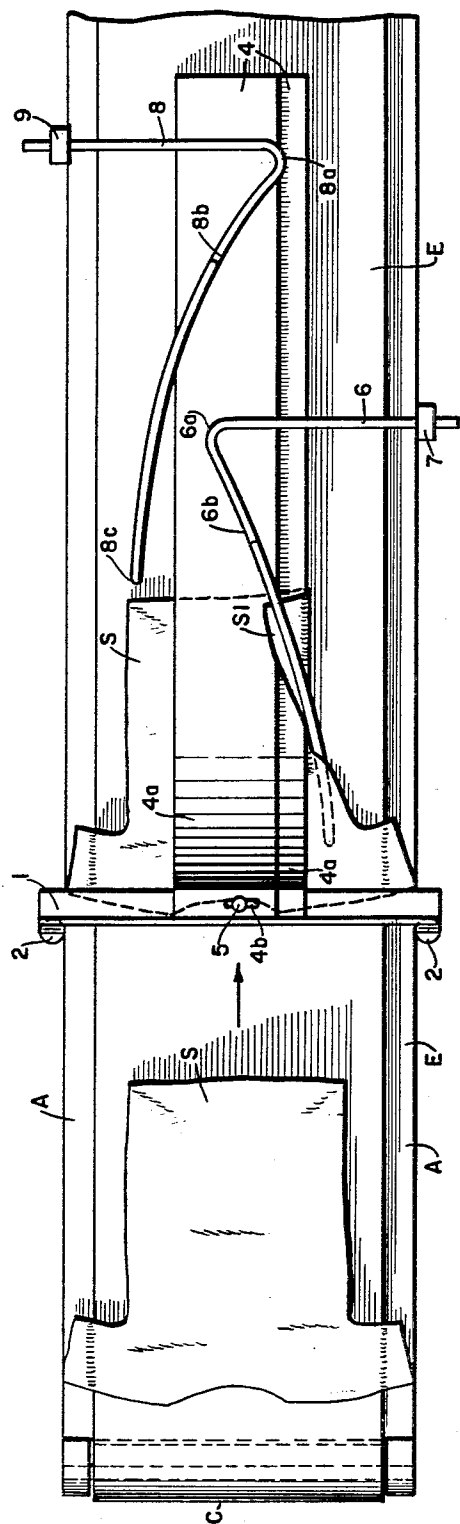


FIG. 6.

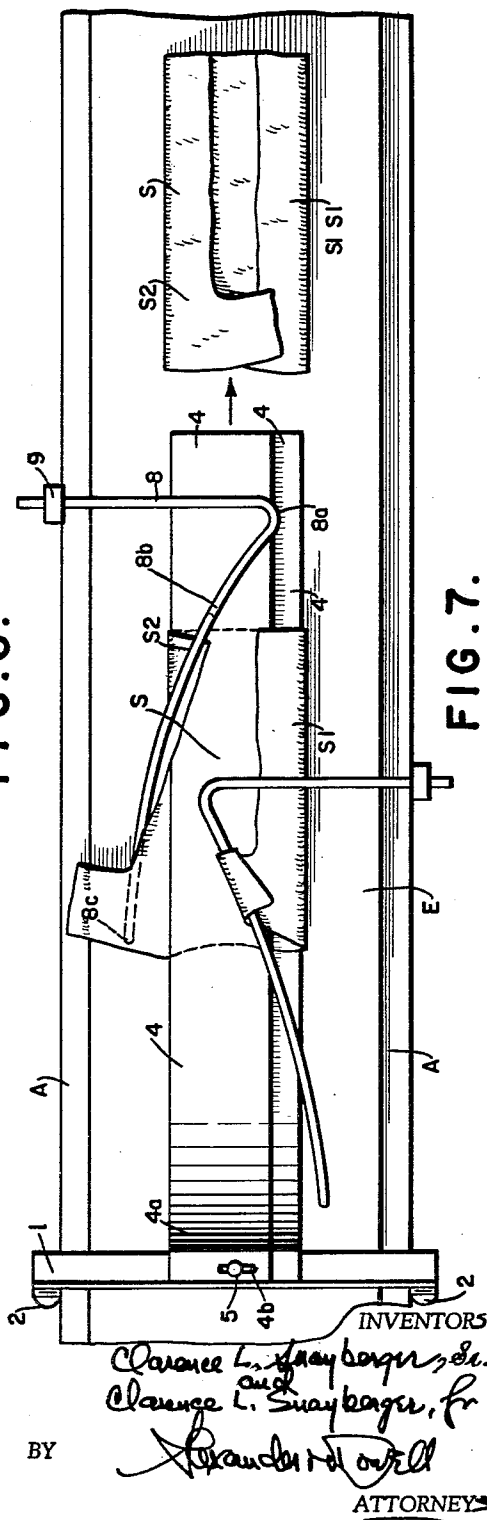


FIG. 7.

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3,131,838

FOLDING DEVICE FOR POLO SHIRTS

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5 Claims. (Cl. 223—37)

Our invention is a novel folding device for garments, such as polo shirts and the like, and the principal object of the invention is to provide a folding device adapted to be mounted upon and associated with an endless conveyor belt, the same being adapted to automatically fold over the two sides of said polo shirts, and other similar garments on the upper run of the conveyor belt as they are fed through and under the device.

Other objects of our invention are to provide a folding device of the above type including a pair of superimposed and laterally offset stainless steel or other folding boards adapted to be adjustably secured to the conveyor frame and to rest in fixed position upon the upper run of the conveyor belt, which boards are laterally adjustable as to combined or overall width so as to conform with the width of the fold which is to be formed at the opposite sides of the shirt or other garment, which garments may obviously be of different sizes; also includes two chrome plated folding bars cooperating with and disposed above the folding boards, one bar being disposed in advance of the other bar and mounted in brackets secured to the conveyor frame, the bars being so shaped that they will form the folds in the shirt by turning in the sides of the shirt as it is moved by the conveyor belt under the folding boards, the bars being disposed one behind the other so as to fold in one side only of the shirt at a time whereby the folding operation at one side of the shirt will not interfere with the folding operation at the other side of the shirt.

A further object of the invention is to provide a folding device of the above type so arranged that the operator may place an unfolded shirt on the leading end of the upper run of the conveyor belt, and as the belt progresses the shirt will be carried under the folding boards, one side of the shirt being first engaged by the first folding bar to fold the said side over and upon the adjacent edge of the folding boards, further progress of the conveyor belt causing the other side of the shirt to be folded up and over the adjacent side of the folding boards, whereby upon further progress of the conveyor belt the shirt will emerge from under the folding boards, the final fold being performed manually by the operator who then lifts the bottom hem of the folded shirt upwardly and folds it back towards the collar of the shirt, the shirt being then ready for packaging.

A further object of the invention is to provide a folding device of the above type in which the folding bars may comprise hollow tubes into which air under pressure or dry steam may be introduced, the outer portions of the bars being perforated to permit escape of air or steam jets therefrom to prevent the material of the garments from clinging to the folding bars during the folding operation.

A further object of the invention is to provide a folding device of the above type in which one, two, three or more shirts may be placed one upon the other, and the plurality of superimposed shirts simultaneously folded for packaging according to the number of shirts desired by a customer.

A still further object of the invention is to provide a folding device which will fold infant's gowns, shirts, kimonos, or any other similar type of garment, the folds being formed automatically in accordance with the number of superimposed garments fed onto the conveyor belt.

We will explain the invention with reference to the ac-

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companying drawings which illustrate one practical embodiment thereof to enable others familiar with the art to adopt and use the same, and will summarize in the claims the novel features of construction, and novel combination of parts, for which protection is desired.

In said drawings:

FIG. 1 is a top plan view of an endless conveyor showing our novel folding boards positioned thereon; also the folding bars mounted at opposite sides of the conveyor frame within the length of the folding board.

FIG. 2 is a side elevation of the parts shown in FIG. 1.

FIG. 3 is an enlarged longitudinal section through the upper portion of the conveyor frame in way of the folding boards and bars, and showing the conveyor belt, the folding boards and the folding bars.

FIG. 4 is an enlarged transverse section on the line 4—4, FIG. 1.

FIG. 5 is an enlarged transverse section on the line 5—5, FIG. 1.

FIG. 6 is an enlarged plan view of a portion of the conveyor showing a polo shirt placed upon the leading portion of the conveyor belt prior to its passage under the folding board and folding bars, respectively.

FIG. 7 is a view similar to FIG. 6 but showing the shirt disposed under the folding boards and the folding operation at one side substantially completed, and the folding operation at the opposite side in its initial state; also showing beyond the folding boards a folded shirt after having emerged from the folding device while on the conveyor belt.

As shown, the endless conveyor is of conventional type, having side frame A supported upon legs B and having at one end a roller C and at the opposite end of a roller D, a conveyor belt E running around the drums C—D, and the drum D being driven by a belt F by means of a motor G. The particular construction of the endless conveyor forms no part of our invention, assuming that the conveyor is of substantial length to accommodate our folding device. Preferably the frames A carry a flat top board H underlying the upper run of the belt E to avoid sagging of the belt.

At a convenient distance from the leading end of the conveyor belt E and disposed above the belt E is a transversely disposed angle bar 1, the ends of which extend beyond the sides of the frame A of the conveyor, as shown in FIGS. 1, 6 and 7, the ends being supported by uprights 2 which are secured by straps 3 or the like to the legs B of the conveyor frame, as shown in FIG. 2, so as to be fixedly secured to the conveyor frame.

Preferably the angle-iron 1 has its vertical flange facing the end C of the conveyor belt E, and is disposed approximately somewhat above the conveyor belt, and is adapted to adjustably hold the leading end of the pair of folding boards 4, which normally bear upon the upper surface of the belt E disposed axially thereof, the leading end of the boards 4 being upwardly curved as at 4a, FIGS. 6 and 7, each board being provided with a slot 4b at its leading end which rests upon the horizontal leg of angle-iron 1 engaging the vertical leg of the angle-bar 1 so that the boards may be shifted laterally for adjustment to conform with the desired width of the fold in the shirt, and the boards when so adjusted being held against relative movement by tightening the screw 5 which is threaded into the horizontal leg of the angle-iron 1. Thus by 1 loosening the screw 5 both of the folding boards 4 may be adjusted laterally of the belt so as to conform with the width of the fold in the polo or other shirt which is to be folded.

Preferably the boards 4 are formed of stainless steel and are relatively long so as to accommodate the folding bars which are disposed one in advance of the other and which bars cooperate with the folding board to form

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the folds in the polo shirt S, and the major portion of the folding boards directly contacting the upper run of the conveyor belt E.

Associated with the folding plates 4 are a pair of turning bars adapted to fold over the sides of the shirt passing under the folding board 4 in succession, i.e., one side being folded at a time so that the folding operations will not interfere with each other. As shown, the first folding bar 6 is mounted transversely of the belt E at about the center of the folding bars 4, the same being mounted in a bracket 7 which is mounted on one side of the conveyor frame A, as shown in FIGS. 1 and 2. The bar 6 extends inwardly slightly above the folding boards 4 to a point adjacent the far edge of the folding boards 4, the outer portion of the bar 6 being bent as at 6a at an acute angle forming an arcuate portion 6b which extends forwardly as shown in FIG. 1, terminating adjacent the leading end of the folding boards 4, the outer end 6a thereof being disposed substantially parallel with and adjacent but slightly spaced from the adjacent side of the folding board 4 so that as the shirt S on the belt E passes under the leading edge of the folding boards 4 the tip 6c of the folding bar 6 which is in contact with the belt E will initially enter between the belt E and the underside of the shirt S, as shown in FIG. 6, and as the bar 6 is stationary, as the shirt is moved by the conveyor under the folding boards 4, the arm 6b will engage the leading end of the shirt S and turn same upwardly throughout the length of the shirt, forming a fold over the adjacent edge of the folding board 4, as shown at S' in FIG. 7, thus folding one side of the shirt S.

The second folding bar 8 is similar in all respects to bar 6, but is mounted on a member 9 disposed at the opposite side of the conveyor frame A, rod 6 extending transversely of the belt E to a point substantially disposed at the opposite side of the folding boards 4, and having a return bend portion 8a, the outer end 8b of which is formed as an arc with the outer tip 8c thereof disposed parallel and adjacent the near side of the folding boards 4 so that as the shirt S shown in FIG. 7 is moved in the direction of the arrow the tip 8c will engage the leading end of the shirt S and fold the same upwardly as at S2, FIG. 7, and inwardly over the near side of the folding boards 4, the shirt eventually emerging from over the folding boards 4 into the folded position shown in FIG. 7. When reaching such position on the conveyor E the folding operation may be completed manually by the operator lifting the hem or leading portion of the folded shirt S to which has been imparted a substantially rectangular shape and folding same upwardly and over to meet the neck portion of the folded shirt, after which the folded shirt is ready for packaging.

If it is desired to lengthen the portions 6b-8b of the folding bars 6 and 8, extension members 6d and 8d may be spot-welded onto the tops of the outer portions of the portions 6b-8b of the bars 6 and 8, as shown more particularly in FIGS. 3, 4 and 5, the outer ends of the extensions 6d-8d being flattened and being adapted to contact the belt E so as to raise the side of the shirt when brought into contact therewith by movement of the conveyor E.

We have found that our folding device will fold more than one shirt at a time when a number of shirts are placed in superimposed relation upon the leading end of the belt E, two, three, four or more shirts being simultaneously folded for packaging, this being a very desirable feature when a customer purchases more than one shirt at a time. The operation of the device with respect to simultaneously folding a plurality of shirts is identically the same as previously described in connection with the folding of a single shirt.

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In order to prevent clinging of the fabric of the shirt to the portion 6b-8b of the folding bars, the bars 6 and 8 may be formed of hollow tubing with their inner ends connected to a suitable source of compressed air, not shown, while the outer portions of the arms 6b-8b are provided with a series of outlet air-jet holes 8x and 6x, as shown more particularly in FIG. 3.

We do not limit our invention to the exact form shown in the drawings, for obviously changes may be made therein within the scope of the claims.

We claim:

1. In combination with an endless conveyor belt supported upon a frame and having an upper run continuously driven in one direction to move articles of clothing placed on said run at the leading end thereof towards the other end, a folding device comprising a pair of superimposed folding plates normally resting upon said run and being of less overall width than that of the run and under which the articles pass during their movement on said run; the leading ends of said plates being upwardly curved to permit entry thereunder of said article; fixed means on said frame for centering and maintaining the plates in fixed relation on said run; means for adjusting the overall width of the plates; a pair of folding bars co-operating with and disposed above the folding plates, one bar being disposed in advance of the other; and said bars being fixedly mounted respectively in brackets secured to opposite sides of the frame; each bar having a rear portion extending from its bracket transversely of said plates and extending to a point adjacent the far side of the plates, the outer portion of the bar having a forward bend terminating in a substantially arcuate portion, the outer tip of which rests on said run adjacent and spaced from the near side of the plates and adapted to pass under and raise the near side of the article along the folding plates, the arcuate portions of the bars being further adapted to fold the raised side of the article inwardly and flat upon the near side of the top of the folding plates as the article is advanced by the run under the folding plates; whereby one side of the article will be folded in advance of the other, both folds being performed when the article emerges from the folding plates.

2. In a combination as set forth in claim 1, said means on the frame comprising a horizontal angle iron disposed at the leading end of the overlapping plates, the ends of said iron being supported in brackets fixed to the frame; and the upwardly curved leading ends of the plates resting upon and being secured to said iron.

3. In a combination as set forth in claim 2, the leading ends of the plates having transverse slots therein; and said adjusting means comprising a screw passing through said slots of the overlapping plates and into the said angle iron.

4. In a combination as set forth in claim 1, extension members fixedly mounted on the arcuate portions having their leading ends flattened and resting upon the belt run adjacent and spaced from the near sides of the plates and disposed in advance of the leading ends of the arcuate portions of the bars.

5. In a combination as set forth in claim 4, said folding bars being hollow tubes adapted to be supplied with air under pressure, and said arcuate portions having perforations therein to provide air jets to prevent clinging of the articles when being folded to the arcuate portions.

References Cited in the file of this patent

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