Dec. 15, 1942. J. W. STEELE 2,305,359

GARMENT FINISHING AND FOLDING APPARATUS

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Fig. 1.

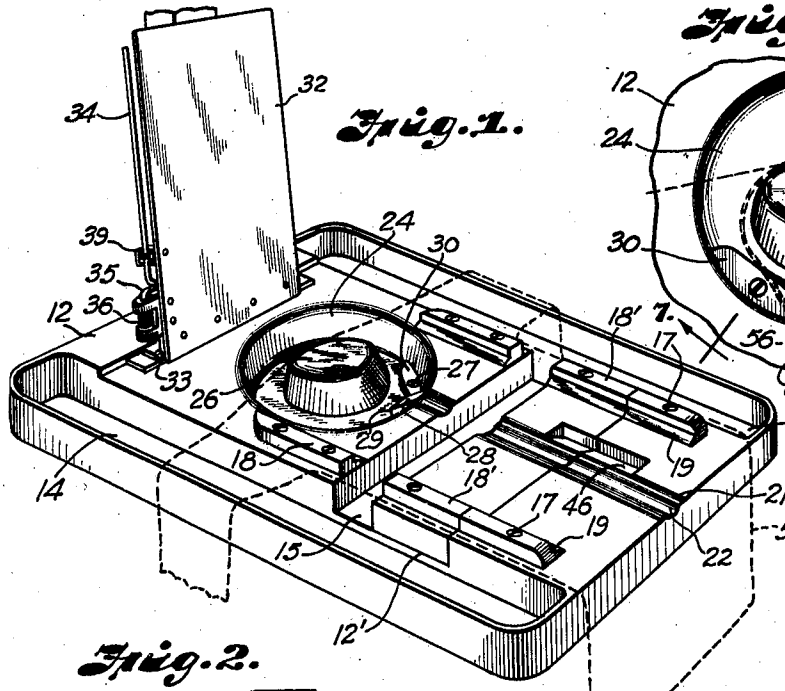


Fig. 6.

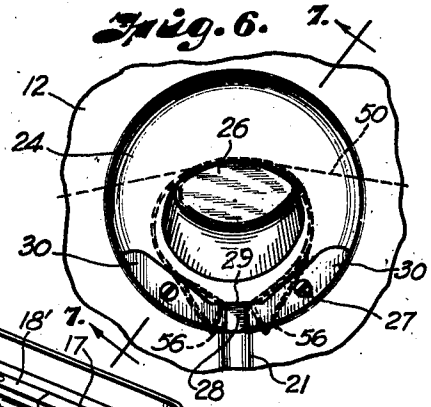


Fig. 2.

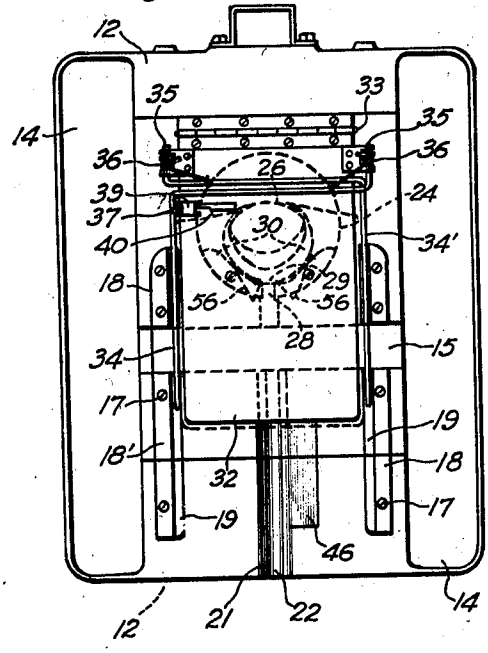


Fig. 7.

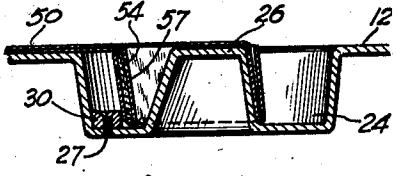


Fig. 9.

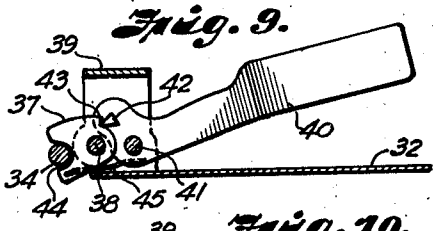
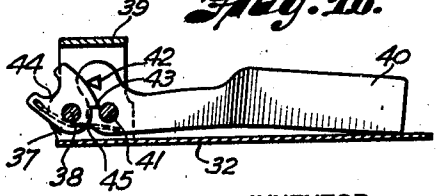


Fig. 10.



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GARMENT FINISHING AND FOLDING APPARATUS

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Fig. 3.

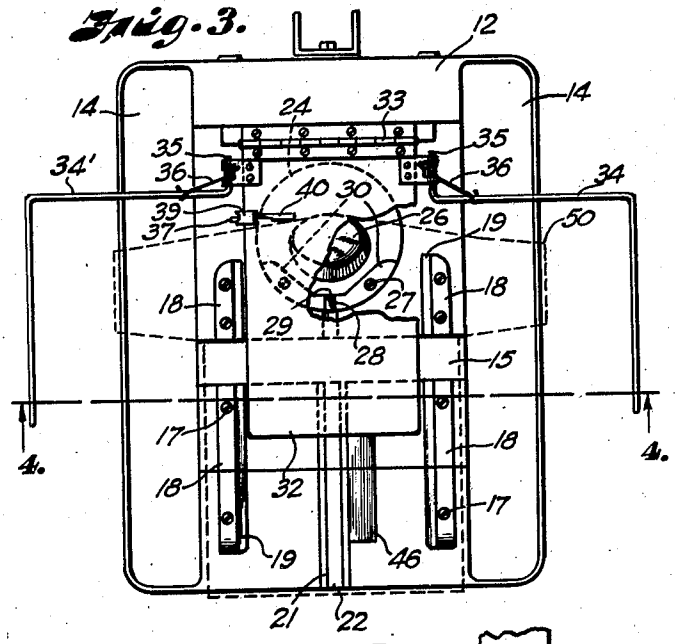


Fig. 8.

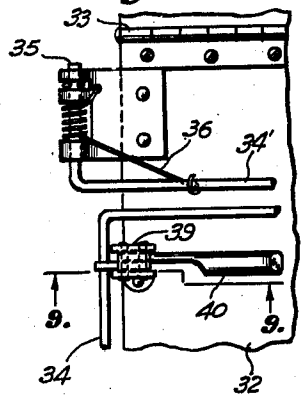


Fig. 11.

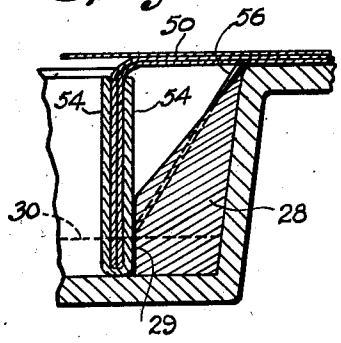
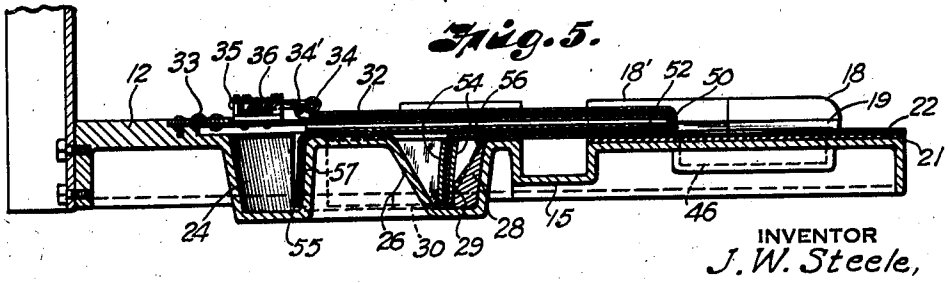


Fig. 4.

Fig. 5.



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UNITED STATES PATENT OFFICE

2,305,359

GARMENT FINISHING AND FOLDING APPARATUS

James W. Steele, North Kansas City, Mo.

Application May 11, 1940, Serial No. 334,539

6 Claims. (Cl. 223—37)

The present invention relates to appliances for use in laundries, shirt factories and like establishments for use in connection with the operation of finishing and folding of garments such as shirts and similar garments.

Accordingly the invention aims to provide an improved appliance of this character whereby the folding of the garment and the application of a band or envelope or other container thereto may be carried out in a more efficient manner and with better results as regards preserving the proper lines and finish of the garment at the end of the operation.

For the accomplishment of this object I have devised apparatus which not only tends to automatically set the collar portion of the garment in proper position for the folding operation but also preserves the natural and unbroken appearance of the front portion of the collar during said folding operation.

The improved apparatus further facilitates the folding operation by means of improvements which provide for automatically flexing the stiffening board used in connection with said operation, and also further speeds up the operation by automatic release of the folding arms of the device, thereby reducing some of the labor or movements necessary on the part of the operator in carrying out the successive steps of the operation.

With these various principal objects, as well as minor objects, as will appear in the course of the detail specification, in view as purposes of my invention, the same will now be described by reference to the accompanying drawings illustrating appropriate apparatus for the embodiment thereof, after which those features and combinations deemed to be novel and patentable will be particularly set forth and defined by the appended claims.

In the drawings—

Figure 1 is a perspective view showing apparatus embodying the present features of improvement—with dotted lines representing the outline of a garment in position for the folding operation;

Figure 2 is a plan view of the same, with the fold board or panel in lowered position;

Figure 3 is a similar view illustrating a succeeding step of the operation;

Figure 4 is an enlarged sectional view, illustrating a section taken on the line 4—4 of Figure 3, with dotted lines indicating the sweep of the folding arms into different operative positions;

Figure 5 is a similar sectional view, representing a section taken on the line 5—5 of Figure 4;

Figure 6 is a fragmentary plan view showing the collar recess portion of the apparatus;

Figure 7 is a detail sectional view, representing a section taken on the line 7—7 of Figure 6;

Figure 8 is a fragmentary plan view, on an enlarged scale, showing the hinged portion of one of the folding arm members and the latching means for the other folding arm member;

Figure 9 is a detail sectional view on a still larger scale, showing the latching and latch-releasing device, and representing a section taken on the line 9—9 of Figure 8;

Figure 10 is a similar sectional view, but showing the parts of the device in latch-released relation; and

Figure 11 is a fragmentary sectional detail view showing portions of the garment collar and its cardboard collar support in relation to the front portion of the collar recess of the table member of the apparatus (being similar to corresponding parts appearing in Figure 5 but on an enlarged scale).

The present application relates to improvements in the type of garment finishing and folding apparatus illustrated in my prior Patent No. 2,010,333 dated August 6, 1935.

Referring now to the drawings in detail, these illustrate the table portion 12 of a shirt folding apparatus, the top or working surface of which is provided with receptacles 14 for bands or other accessories, and also with a transverse recess for the placing of such bands in position ready to be wrapped about the finished shirt as described in the aforesaid patent. Longitudinally upon the top of the table are secured (as by screws 17) pairs of guide strips or cleats 18, spaced apart approximately the width of the folded shirt, and the inner edges of these cleats are offset to form inwardly inclined ledges 19. The strips or cleats are provided in alined sections separated at the cross recess or channel 15 to permit the application of said bands in the band-applying operation referred to; and to provide for some variation in the width of such bands, the table may be constructed with a removable top section 12' having separate cleat sections 18' as represented in Figure 1.

Along the middle of the working face of the table is provided a longitudinal recess 21, lined with a suitable plastic filler 22, as also illustrated in the aforesaid patent.

Adjacent to the rear end of the top of the table 12, its working face is formed with a collar recess 24 in which is located a fixed collar block

member 26 of appropriate shape designed for ready entrance into the collar opening of the shirt, i. e., with front and lateral faces sloping toward the front—see Figures 1, 5 and 6. Between this block 26 and the front wall of the recess 24 is secured, as by screws 27 or the like, a collar engaging structure designed for engagement with the front portion of the shirt collar, this structure comprising an inclined middle lug portion 28 located opposite the end of the longitudinal recess or groove 21, and two oppositely extending wing portions conforming to the front wall of the recess 24 and providing ledges 30 somewhat lower than the top edges of said recess 24. Moreover, the middle portion of said structure (between the ledges 30) forms a straight transverse wall 29 at the base of the inclined lug portion 28, for a purpose hereinafter explained.

The appliance also includes a plate or panel member 32 hinged at its rear end, as indicated at 33, and provided with a pair of swinging or folding arms 34 and 34' pivoted to said plate 32 as indicated at 35, in a manner similar to the arrangement illustrated in said Patent No. 2,010,333, the width of the plate 32 being somewhat less than the space between the guide strips or cleats 18, as shown in Figures 2 and 3. In the present improved construction the arms 34 and 34' are actuated by springs 36 normally into outwardly extended relation, as shown in Figure 3. These arms are adapted to fold over each other into operative position as represented in Figure 2, in which relation they are retained or latched by means of an automatically acting latching and releasing device, comprising a detent pawl 37 pivoted at 38 in a keeper 39 mounted on the plate 32, in which keeper is also pivoted, at 41, a counterweighted gravity arm 40 provided with a tooth 42 adapted for engagement with a shoulder 43 on the pawl 37—see Figures 9 and 10. The pawl 37 is also formed with a recess 44 for engagement with the arm 34, and a spring element 45 connects said pawl and the arm 40 below their pivots, or in such a way as to tend to maintain the pawl normally in the position shown in Figure 10 with its shoulder 43 disengaged from the tooth 42. The operation of engaging the arm 34 with this latching means rocks the pawl from the position indicated in Figure 10 to that shown in Figure 9, thereby lifting the free weighted end of the arm 40 and latching its tooth 42 with the shoulder 43 of the pawl. Thereafter, the movement of the plate 32, when thrown down into operative position upon the table, automatically releases the arms 34 and 34', due to the gravity movement of the arm 40 and consequent release of the pawl 37 to the action of its spring 45, as will be readily understood.

In the use of the improved construction, the operation is in general similar to that followed in connection with the apparatus shown in the aforesaid Patent No. 2,010,333, particularly as regards placing the shirt or other garment 50 upon the top of the table, as indicated by the broken lines in Figure 1, and also placing a stiffening board 52 upon the garment over the space between the guide strips 18, and this is followed by lowering of the hinged plate or panel member 32 for the automatic action of the swinging arms 34 and 34' in connection with the remaining steps of the shirt folding operation as indicated in Figures 2 to 5.

In placing the garment in initial position as represented by the broken lines in Figure 1, the same is laid face down upon the table, with the button and buttonhole pleats along the recess or channel 21, and the collar opening of the garment over the collar block 26—prior to which a suitable collar support 54 (such as that shown in Patent No. 2,149,192, dated Feb. 28, 1929) may be inserted inside the folds of the collar 55. Preferably also the pleats of the garment are retained in proper alinement by means of a suitable clasp such as shown in Patent No. 2,041,575, dated May 19, 1936; and to accommodate such clasp or holding device is the purpose of the recess 46 in the top of the table. The proper positioning and alinement of the shirt is facilitated by the improved construction, including the inclined ledges 19 which tend to center and smooth out the front of the shirt beneath the panel 32 and the stiffening board 52 as well as to facilitate flexing the latter as indicated in Figure 4; and also the inclined faces of the collar block 26 and of the lug 28 which cooperate in directing the collar into proper position within the collar recess 24.

Now in this preliminary operation of placing the shirt upon the table and adjusting it for the rest of the folding operation, it is to be noted that the garment is pulled slightly endwise to set or position the collar 55 properly within the collar recess 24. Previous garment folding methods and appliances have not taken sufficiently into account the fact that in a properly finished shirt having a collar attached there should be an open space beneath the front fold of the collar or wing portion 56 and its neckband portion 57, and the prevailing practice has resulted in breaking or creasing the front of the collar across these wing portions at the angle between the table surface (where the body of the garment rests) and the edge of the collar recess into which the collar projects. The present improvements therefore provide for not only facilitating the proper positioning of the collar within the recess of the table, but also for preventing the pulling or tensioning of the garment upon the table from producing any break in the front of the collar which would tend to distort the natural appearance of the collar in its finished condition. It will of course be apparent that not all collars will be drawn into engagement with the rear face of the collar block 26, since the garment collar openings are of different sizes, and hence that with some sizes the tensioning pull on the shirt will draw the collar against the front wall of the collar recess 24 and thereby produce the objectionable break in the contour of the collar as referred to, at the angle between the top table surface and the front wall of the collar recess 24. Since the pull or tension on the shirt is not made with any violent jerk or pull on the garment, it is only necessary to provide a forward support or abutment—such as the middle portion 28 and 29, to receive the principal thrust at the extreme front of the collar (for engagement between its wing portions at the opposite sides of said points 28 and 29), and the front wing portions of the collar are left free to be engaged by the lower ledges 30 within the recess 24 and with a contact which is insufficient to break or crease the collar; in other words, even though the collar block 26 should not take up all the endwise pull on the shirt, or should not even engage the rear of the shirt collar (as in the larger sizes of shirts), the shoulders 28 and 29 will nevertheless provide all the abutment necessary for this purpose, while leaving the collar wings or points 56 free of any gripping engagement except by the ends of the

front tab portion of the collar support or stiffener **54** (at the top corners of the shoulder **29**) and by the upper edges of the low ledges **30**—so that only the extreme tips of the collar wings **56** may be slightly bent at the top of the table surface, as represented in Figure 5. The result is that no sharp turns are produced in the front collar wings **56** which would break or crease these finished portions of the collar.

Moreover, by the use of the supporting member or stiffener **54**, no buttoning is required of the collar neckband **57**, although it is apparent that such stiffening device may be omitted if desired, and merely a suitable fastener inserted to hold the ends of the collar neckband in position.

One advantage of the vertical wall or abutment **29** lies in the fact that it cooperates with the tab portion of the collar stiffener or support to set and clamp said support in position (in the manner referred to in said Patent No. 2,149,192), while at the same time acting as a part of the shoulder or abutment necessary in connection with the operation of straightening the garment on the top of the table.

This whole operation is of course in marked contrast to the action of the sectional and expanding type of collar block device, which often exerts too much internal pressure inside the collar of the shirt and hence tends to unduly spread the meeting ends of the collar.

While the drawings illustrate the operation in connection with the collar-attached type of shirt, it will be apparent that the construction is adapted also for use in the finishing and folding of shirts of the neckband type, in which case the contour of the parts at the front of the collar recess **24** will impart the proper finished shape to the ends of the neckband portion of the shirt.

The remaining steps of the operation, for the folding of the garment, are in general similar to that outlined in the prior Patent No. 2,010,333, with the additional advantages due to the improved latching and releasing function with reference to the swinging or folding arms **34** and **34'**—the dropping of the plate or panel member **32** resulting in the automatic release of said arms whereupon, as already explained, the arms fly out automatically into operative position, as represented in Figures 3 and 4. At the end of the folding operation, the said arms are again latched by the engagement of the arm **34** with the detent pawl **37** and pressing said arm down from the position shown in Figure 10 to that indicated in Figure 9. After a wrapping band has been applied to the folded garment (or an envelope slipped over it, according to the practice being followed), the plate or panel member **32**, with the finished garment still thereon, is lifted back into the position illustrated in Figure 1—the operator saving a movement by simply removing the finished garment simultaneously with the lowering of said member **32** for the next folding operation.

It will thus be seen that I have provided an improved and efficient apparatus for carrying out the desired objects of the improvements as herein set forth, including the preservation of the proper finished appearance of the front collar portion of the garment, leaving no creased or broken lines therein and at the same time preserving the desired open space between the folds of the collar.

However, while I have illustrated and described what I now regard as the preferred form of construction for embodying the several improved features, I desire to be understood as reserving the right to all changes or modifications fairly falling within the spirit and scope of the appended claims.

Having thus described the invention, what I claim and desire to secure by Letters Patent, is:

1. Garment folding and finishing apparatus comprising a table formed with a recess for the collar portion of the garment, a block member within said recess for entering the collar opening of the garment, and means providing a shoulder or abutment for the front meeting ends of the collar and confined to the space between the front wing portions thereof for receiving the thrust imparted by the straightening of the remainder of the garment upon the table, said shoulder or abutment being offset inwardly relative to the remainder of the wall of said collar recess and thereby providing clearance at the opposite sides of said shoulder or abutment for freeing the front wing portions of the collar from contacts operative to crease or mar the finish of the collar.

2. Garment folding and finishing apparatus comprising a table formed with a recess for the collar portion of the garment, a block member within said recess for entering the collar opening of the garment, means providing a shoulder offset inwardly relative to the remainder of the wall of said recess to provide an abutment for the front meeting ends of the collar and confined to the space between the front wing portions thereof for receiving the thrust due to straightening of the remainder of the garment upon the top of the table, and collar-engaging means at opposite sides of said shoulder or abutment in position for making relatively light contacting engagement with said front wing portions of the collar.

3. Garment folding and finishing apparatus comprising a table formed with a recess for the collar portion of the garment, a tapering block member within said recess for entering the collar opening of the garment, a partly inclined shoulder offset inwardly relative to the remainder of the wall of said recess to provide an abutment for the front meeting ends of the collar between the front wing portions thereof to counteract the thrust resulting from the straightening of the garment upon the top of the table, and ledges located at opposite sides of said shoulder or abutment and at a lower level than the upper edge of said collar recess for making relatively light contacting engagement with said front wing portions of the collar.

4. Garment folding and finishing apparatus comprising a table providing a garment-supporting surface, a leaf or panel member movable into and out of superposed relation to said supporting surface, garment folding elements carried by the opposite sides of said panel member and operative to engage and fold the opposite sides of the garment over on to said panel member, and means acting automatically as said panel member is swung down upon said supporting surface to throw said folding elements into outward position.

5. Garment folding and finishing apparatus comprising a table providing a garment-supporting surface, a leaf or panel member movable into and out of superposed relation to said supporting surface, garment folding elements carried by the opposite sides of said panel member and operative to engage and fold the opposite sides of the

garment over onto said panel member, automatic means for actuating said folding elements into outwardly spread relation, means for latching said folding elements in their inwardly folded relation, and means for releasing said folding elements from said latching means actuated by the throwing of said panel member downwardly into operative position upon said supporting surface.

6. Garment folding and finishing apparatus comprising a table, a panel member movable into and out of superposed relation to the top of said table, garment folding elements carried by the opposite sides of said panel member and operative to engage and fold the opposite sides of the garment over on to said panel member, means for actuating said folding elements into outwardly spread relation, means for latching said folding elements in their inwardly garment-folding relation, and automatically acting tripping means for releasing said folding elements from said latching means as the panel member is thrown into operative position upon the table.

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