Jan. 12, 1943. F. W. CLEGG 2,307,822

LAUNDRY FOLDING MACHINE

Filed March 12, 194[illegible] 2 Sheets-Sheet 1

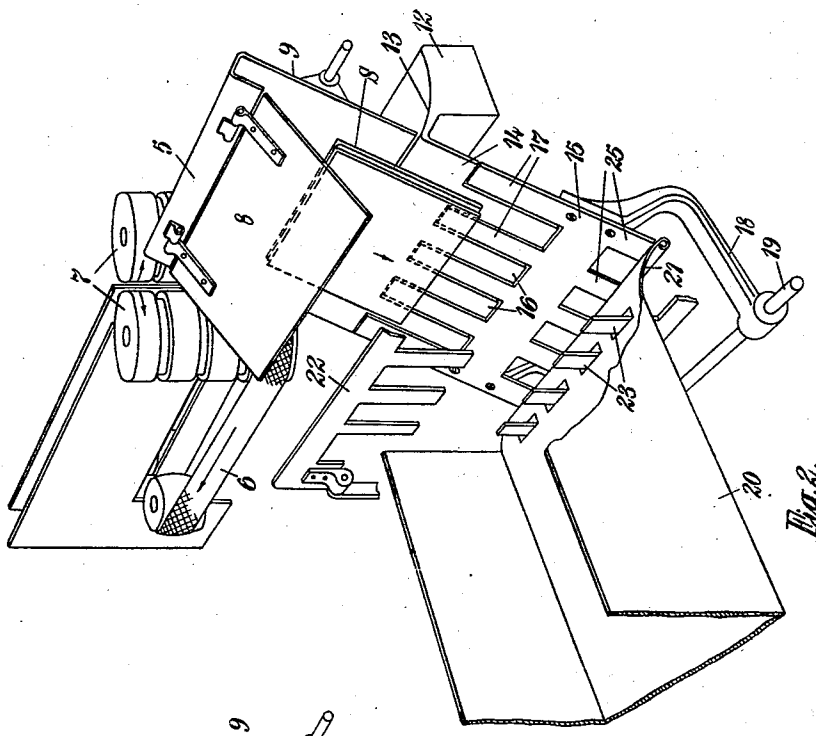


Fig. 2.

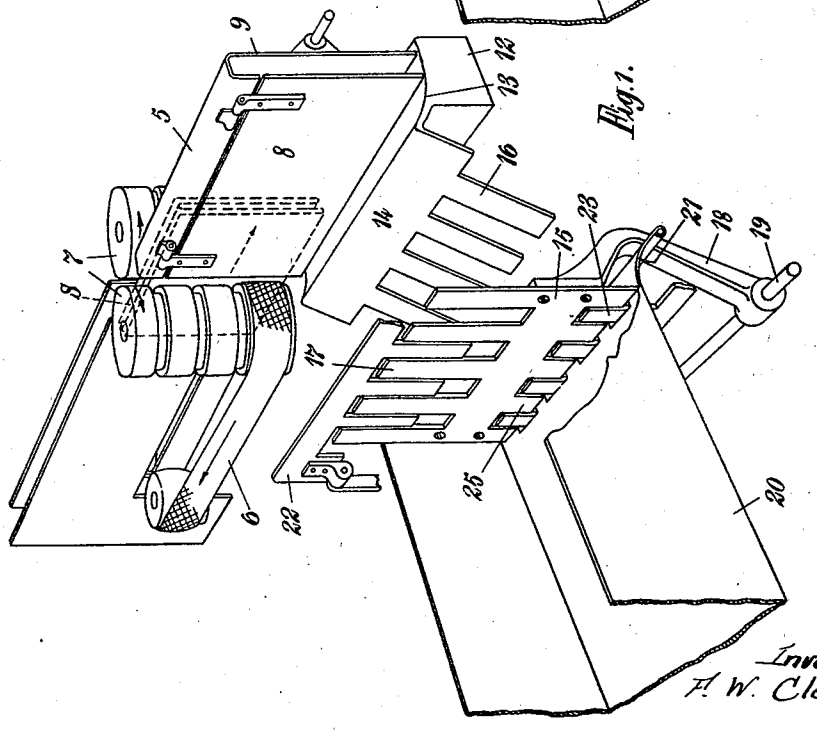


Fig. 1.

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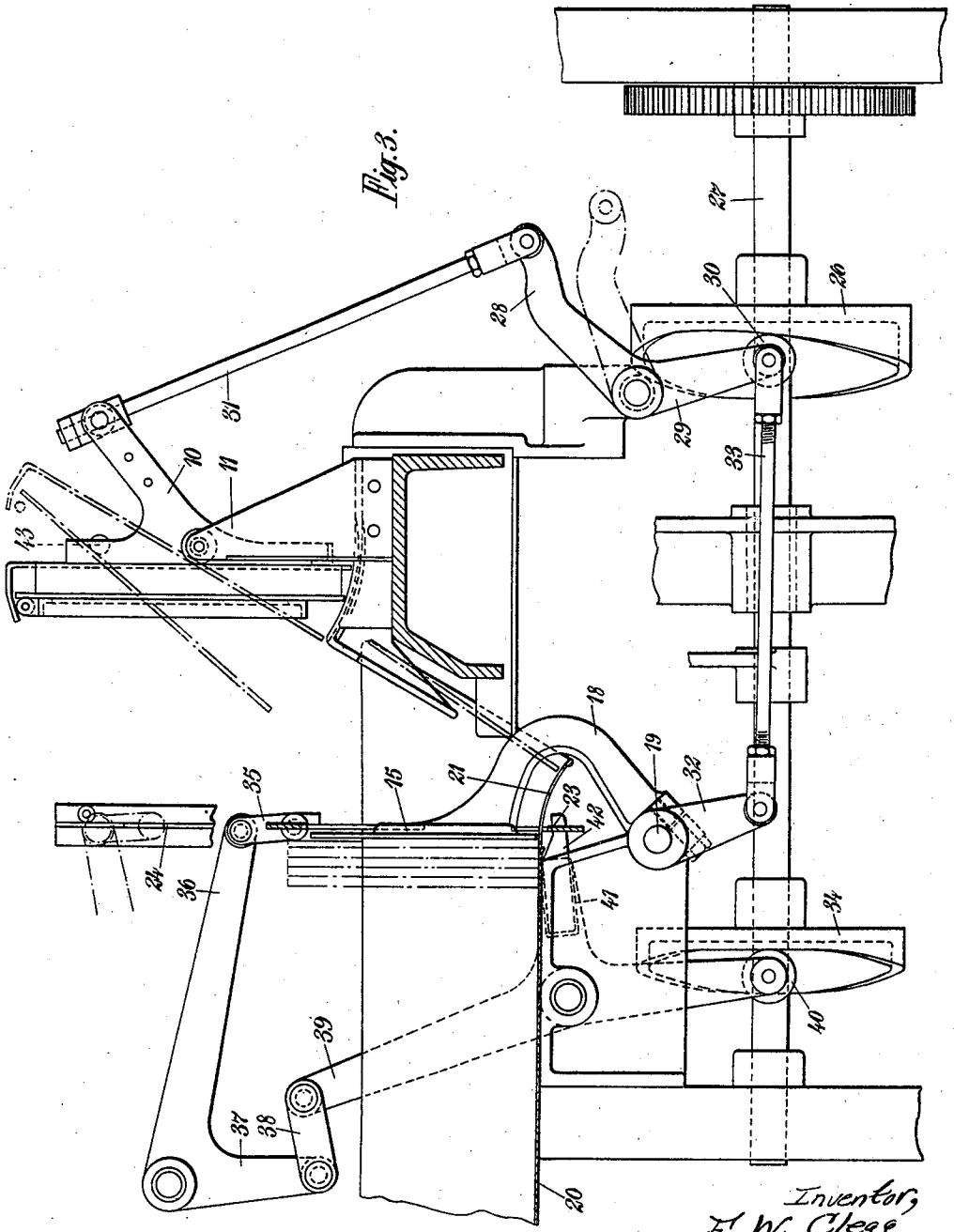
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Fig. 3.



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LAUNDRY FOLDING MACHINE

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9 Claims. (Cl. 271—87)

This invention relates to laundry folding machines suitable for the folding of serviettes and similar flat articles (hereinafter referred to as serviettes) and is particularly concerned with the discharge and stacking of the folded articles as they are delivered from the folding mechanism.

In the stacking of folded articles such as serviettes, it is known to discharge the article from the folding mechanism on edge, i. e., while located in a vertical plane and to deliver it to the end of a horizontal stack so that the articles remain on edge. While this method is more or less satisfactory for relatively small folded articles, it is found that larger articles do not adapt themselves to the "on edge" condition as they are apt to collapse before reaching the stacking position or even in the stack so that the stacking of such articles is not successful.

An object of the invention is to provide improvements in discharge and stacking means adapted to deal with folded articles such as serviettes and to transfer them to a stack while maintaining complete control of the folds of the article throughout the operation so that the possibility of the articles becoming unfolded and collapsing will be avoided, whereby the automatic discharge and stacking of the articles is made possible.

According to the invention in discharging and stacking means for serviette folding machines, spaced wall elements are adapted to receive the folded article on edge and maintain it in the folding condition, such elements being displaceable to a position in which the article is free to move downwardly along an inclined path onto a transfer device which moves the article in a direction transverse to its plane to a stacking position.

The wall elements are mounted above a supporting means for the serviettes and are preferably pivotally mounted, such supporting means extending laterally in an inclined surface which guides the serviettes onto the transfer device.

The pivotally mounted wall elements may comprise an inverted channel member, one wall of which is hinged so that the channel opens during the pivotal discharge displacement.

Further features of the invention will be hereinatfer described and defined in the claims.

In the accompanying drawings—

Figure 1 is a perspective view of the discharging and stacking mechanism in the serviette receiving position,

Figure 2 is a perspective view of the mechanism in the position in which the serviette moves downwardly onto the transfer means, and

Figure 3 is an elevation showing the mechanism for actuating the various parts.

The invention will be described in connection with the discharge and stacking of serviettes in which they are folded in serpentine form in two directions, the first fold being N form, while the second fold which is at right angles to the first fold, is of M or W formation.

In carrying the invention into effect according to one convenient mode by way of example, the discharge and stacking means comprises an inverted channel member 5 which is located to receive the folded serviettes from the delivery mechanism of the folding machine comprising travelling bands 6 and rolls 7. The serviette as fed by the delivery bands and rolls moves in a vertical plane.

The forward wall 8 of the channel member 5 is hinged and the rear wall 9 is attached to a mounting 10 whereby it is pivoted in brackets 11.

The channel member is located above a supporting surface or bar 12 upon which the serviettes are seated while being located within the channel. The upper surface 13 of the supporting bar is curved upwardly in cross section to conform to the path taken by the lower ends of the walls of the channel in their pivotal movement. At the termination of the upward curving of the surface 13 the support 12 is provided with a downward inclined extension to form a comb plate element 14. This plate element co-operates with a transfer element or plate 15 and for this purpose the plate 14 and the transfer plate 15 are provided with co-operating prongs 16 and 17.

The transfer element 15 is carried by arms 18 which are secured upon a rock shaft 19. The transfer plate is adapted to move from an inclined serviette receiving position in co-operation with the plate 14 to a substantially vertical position at the end of a stacking trough or tray 20 in which the serviettes are adapted to be stacked on edge. The transfer plate may lie in the plane of the inclined element 14 when receiving a serviette or rearwardly of it as shown by the dotted lines in Figure 3.

The base of the tray 20 is curved at 21 to conform to the path of the lower end of the transfer plate 15 and thus provide a support for the serviettes when they are located upon the transfer member.

Associated with the feeding end of the stacking tray is a gate device comprising upper and lower displaceable comb elements 22 and 23.

These gate elements are adapted for displacement in a vertical plane being located to move within end guides 24. The gate elements are displaced as a serviette is being fed to the stack and to be returned while the transfer element is holding such serviette in position. For this purpose the gate elements are formed as combs, the prongs of which co-operate respectively with the prongs 17 on the upper part of the transfer plate 15 and the prongs 25 at the lower part thereof.

It will be appreciated that the forward end of the stack will be supported by suitable displaceable means such as a block.

The pivotal movement of the channel member 5 is effected from a rotary face cam 26 mounted upon the shaft 27. Co-operating with this cam is a pivoted bell crank lever 28, 29, the arm 29 of which carries a roll 30 engaging the cam while the arm 28 is connected by an adjustable link 31 to the mounting 10 of the channel element. The cam 26 also imparts a pivotal movement to the transfer plate 15 for which purpose the rock shaft 19 upon which the plate is secured is provided with an arm 32 which is connected by means of an adjustable link 33 with the arm 29 of the bell crank.

The shaft 27 also carries another rotary face cam 34 by which the displacements of the gate elements 22, 23 are obtained. The upper element 22 is connected by a link 35 to one arm 36 of a bell crank lever. The other arm 37 of the bell crank is connected by link 38 to an arm 39 of a pivoted lever which carries a roll 40 engaging the face cam 34. The lever 39 is provided with an arm 41 which carries a finger piece 42 engaging in a slot in the lower gate member 23. A similar finger piece engages in a slot at the other side of the gate member 23. As the cam 34 rotates the lever 39 will be rocked, causing a pivotal movement of the bell crank lever 36, 37 and of the arm 41, whereby the gate members 22 and 23 are reciprocated in their guides.

The opening movement of the front wall 8 of the channel element is effected by the provision of a fixed abutment 43 with which the wall engages as the channel is pivoted. For this purpose the wall may be provided with a part located beyond the wall 9.

The supporting bar 12 may have its surfaces 13 located in a horizontal plane or it may be inclined downwardly away from the serviette delivery means, so that the serviette may move within the channel under the action of gravity.

In operation, the parts being in the position shown in Figure 1, the delivery bands 6 and rolls 7 discharge the folded serviette S from the folding machine and feed it into the channel element 5, where the serviette is supported on edge by the bar 12, the walls preventing it from collapsing and unfolding.

As the channel member 5 is pivoted by the action of the cam 26 and moved in a clockwise direction as viewed in Figure 3, the transfer element also moves clockwise into the serviette receiving position so that the upper prongs 17 pass between the prongs 16 of the plate 14 and slightly beyond them. By the time the transfer element has arrived at this position the channel element has moved the serviette to the edge of the supporting bar 12 so that it will slide down the plate 14 and become supported by the transfer plate 15 and the curved wall 21 of the stacking tray. During movement of the transfer element 15, the gate means 22 and 23 will hold the previously stacked serviettes in position in the stacking tray.

Continued movement of the cam shaft causes the channel element to return to its serviette receiving position and at the same time the transfer element 15 moves the serviette lying in front of it to the stacking position. When the serviette arrives at the end of the stack the gate elements 22 and 23 by the rotation of the cam 34 are respectively raised and lowered so that the fresh serviette will be brought into engagement with the end of the stacking and thus push the stack forward. The return movement of the gate elements is effected before the transfer element moves to receive the next serviette.

While it is preferred to stack the serviettes on edge in a horizontal stack it will be appreciated that the movements of the transfer means may be such that the stack may be vertical.

I claim:

1. In discharging and stacking mechanism for serviette folding machines, spaced wall elements adapted to receive the folded article on edge and maintain it in the folded condition, a transfer device, means for displacing said elements to a position in which the article is free to move downwardly between said elements along an inclined path onto said transfer device, means for displacing said transfer device to move the article in a direction transverse to its plane to a stacking position.

2. In discharging and stacking mechanism for serviette folding machines, pivotally mounted spaced wall elements adapted to receive the folded article on edge and maintain it in the folded condition, article supporting means located beneath said wall elements, a transfer device, means for pivoting said wall elements to a position beyond the supporting means to allow the folded article to move downwardly onto said transfer device, and means for displacing said transfer device to move the article in a direction transverse to its plane to a stacking position.

3. Discharging and stacking mechanism as claimed in claim 2, wherein the supporting means terminate in an inclined guide which guides the folded article onto said transfer device.

4. Discharging and stacking mechanism as claimed in claim 2 wherein the supporting means terminate in an inclined forked guide, said transfer device comprising a forked element complementary to the forked guide, the prongs of the transfer device being adapted to pass between the prongs of the guide to an article receiving position.

5. In discharging and stacking mechanism for serviette folding machines, a pivotally mounted inverted channel member adapted to receive the folded article on edge and maintain it in the folded condition, one wall of said channel being hinged, article supporting means located beneath the channel member, a transfer device, means for pivoting the channel member to a position beyond the supporting means, and means for hinging said wall during said pivotal movement to allow the folded article to move downwardly onto the transfer device, and means for displacing the transfer device to move the article in a direction transverse to its plane to a stacking position.

6. In discharging and stacking mechanism for serviette folding machines, pivotally mounted spaced wall elements adapted to receive the folded article on edge and maintain it in the folded condition, article supporting means located be-

neath said wall elements, a pivotally mounted transfer device, means for pivoting said wall elements to a position beyond the supporting means to allow the folded article to move downwardly onto said transfer device, a stacking tray, means for pivoting said transfer device to move the article to said tray, gate means associated with said tray and co-operating with said transfer device.

7. Discharging and stacking mechanism as claimed in claim 6, wherein said gate means comprising displaceable upper and lower comb elements, said transfer device having a comb formation complementary to said comb elements.

8. Discharging and stacking mechanism as claimed in claim 6 wherein said gate means comprising upper and lower comb elements, means for displacing said comb elements in opposite directions in a vertical plane, said transfer device having a comb formation complementary to said comb elements.

9. Discharging and stacking mechanism as claimed in claim 6 wherein said gate means comprising upper and lower comb elements, means for displacing said comb elements in opposite directions in a vertical plane, said transfer device having a comb formation complementary to said comb elements and wherein the means for pivoting the wall elements and transfer device and for displacing the gate comb elements comprises a pair of rotary face cams and operative connections being the gate comb and one cam and between the wall elements and the transfer device and the other cam, said cams being mounted upon a cam shaft.

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