DISCHARGING MECHANISM FOR PAPER FOLDING MACHINES

Filed Sept. 10, 1923

T. N. DELIGIANES ET AL

1,609,161

Nov. 30, 1926

3 Sheets—Sheet 3

T. N. DELIGIANES
VICTOR J. EVERS

ATTORNEY

F. G. BOURDEES
INVENTOR
This invention relates to paper folding machines and more particularly to a discharging mechanism for discharging the folded papers from the machine, and an object of the invention is to provide a discharging mechanism which will discharge the folded papers in up-right flat engagement one with the other, and will effectively prevent folding or rumpling of the papers, and also to provide a novel form of receiver structure for receiving the folded papers which embodies a suitable support movable in a step by step movement upon the receiving of each individual paper.

Another object of this invention is to provide means, in a paper folding machine for positively, accurately and reliably feeding the paper to the final folding rolls.

The present invention embodies a folding and discharging mechanism particularly applicable for use upon napkin folding machines as disclosed in the applications filed April 4, 1922, Serial No. 549,534 and September 22, 1922, Serial No. 589,534 and it also embodies improvements over the discharging mechanism for paper folding machines as disclosed in our companion application filed May 4, 1923, Serial No. 636,613.

Other objects of the invention will appear in the following detailed description taken in connection with the accompanying drawings wherein:

Fig. 1 is a vertical section through a part of a paper folding machine illustrating the present invention.

Fig. 2 is a fragmentary front elevation of a paper folding machine illustrating partly in section and partly in elevation the invention embodied in the present application.

Fig. 3 is a section on the line 3—3 of Fig. 2.

Fig. 4 is a vertical section on the line 4—4 of Fig. 3.

Fig. 5 is a detail vertical section on the line 5—5 of Fig. 2.

Fig. 6 is a detail vertical section on the line 6—6 of Fig. 1.

Referring more particularly to the drawings, the improved discharging mechanism is associated with a napkin or paper folding machine as disclosed in the applications above mentioned which machine includes a pair of cutting members 1 which cuts the paper into proper lengths. As disclosed in the said mentioned patent applications the paper is folded longitudinally, prior to cutting and after it has been cut by the knives 2, on the rollers 1 it is folded transversely or given the final fold by passing it between one of the knife carrying rollers 1 and a final folding roller 3 which is mounted upon the shaft 4. The shaft 4 is driven in any suitable manner, from a suitable power source which, however, forms no part of the present application but is embodied in the entire machine structure. The cut paper is slightly bent intermediate its ends and guided to the proper folding position between the folding rollers 1 and 3 by the bar 5 which is carried by and extends transversely from a suitable carrying or supporting bar 6. The lower end of the supporting bar 6 is attached to the forward end of a rack 7, which rack has transversely extending guiding ribs 8 formed longitudinally along its edges which ride over a suitable supporting guide 9, formed upon the housing structure 10. The teeth on the rack 7 mesh with a gear 11 which is mounted upon a shaft 12. The shaft 12 is rotatably supported by the housing structure 10 and has a pinion 13 mounted thereon, the teeth of which mesh with the teeth 14 on a second rack 15. The rack 15 is slidably supported by suitable guides 16 formed on the housing 10 and it has an upper standing ear 17 formed thereon to which an eccentric rod 18 is pivotally connected as shown at 19. The eccentric rod 18 is connected to an eccentric band 20 which is mounted about the eccentric 21. The eccentric 21 is in turn mounted upon the shaft 4 so that upon rotation of the shaft 4 the rack 7 and consequently the feeding bar 5 are moved towards or from the rollers 1 and 3.

The paper feeding movement of the feeding bar towards the rollers 1 and 3 is regulated by the action of the eccentric 21 so as to properly feed the paper to the rollers after it has been cut. The paper which is fed to the rollers 1 and 3 is folded or creased transversely and upon issuing from between the folding rollers is guided downwardly by an endless belt 22 which travels over suitable guiding rollers 23 and 24. The roller 23 has a gear 25 thereon which meshes with the gear 26 on the shaft 4. The roller 3 is provided with circumferential grooves 27 into which tongues 28 formed on the guiding plate 29 engage so as to prevent the folded paper from getting beneath the guiding
plate 29 or being moved downwardly below the horizontal axis of the roller 3. The plate 29 cooperates with the endless belt or conveyor 22, in delivering the properly folded paper into the receiving trough 30.

A follower structure such as disclosed in the patent application upon discharging mechanism for paper folding machine, filed May 4, 1923, Serial No. 636,613 may be provided for moving the individual folded and discharged papers into the trough 30 out of the path of succeeding folded papers, such a follower structure being indicated at 31. The trough 30 has an endless conveyor 32 associated therewith the upper run 33 of which travels over the upper surface of the bottom 34 of the trough structure 30.

The operating roller 35 has a ratchet 36 thereon which is engaged by a spring pressed pawl 37. The pawl 37 is pivotally carried by an arm 38. The arm 38 is pivotally connected as shown at 39 to the operating arm 40, which arm is in turn pivotally connected to the slide 41 which supports the follower 32. The slide 41 is operable from the shaft 4 through the medium of a eccentric 42 and an eccentric rod 43, as clearly shown in Fig. 5 of the drawings. Upon each forward movement of the slide 41, such movement being timed to coincide with the delivery of the complete folded paper to the trough, the arm 38 will be rocked to rotate the ratchet 36 one step outwardly through the medium of the pawl 37 which will move the upper run 33 of the conveyor 32 forwardly one step and feed the last delivered paper outwardly out of the path of the succeeding folded paper delivered to the trough thereby preventing confusion in the assembling of the folded papers in the trough and insuring proper and free feeding of the folded papers or napkins through the trough.

In Fig. 4 of the drawings two of the racks are shown, it being understood that such construction is adapted for use in a battery or double folding machine structure and it is also to be understood that the other parts of the machine illustrated and not specifically described in the present application form a part of the machine as disclosed in the above mentioned applications for Letters Patent.

It is, of course, to be understood that the invention may be constructed in other manners and the parts associated in different relations and, therefore, we do not desire to be limited in any manner except as set forth in the claims hereunto appended.

Having thus described our invention what we claim is:

1. In a paper folding and cutting machine, a pair of final folding rollers, a feed bar for feeding the paper between said rollers, a slidable rack, means connecting said slidable rack and feed bar for moving the feed bar into and out of feeding position upon movement of the rack, a second slidable rack having means connected therewith for pressing the front portion of the stack, an eccentric driving connection with said second slidable rack, and means connecting the first and second racks for driving the first rack upon movement of the second named rack.

2. In a paper folding and cutting machine, a pair of final folding rollers, a feed bar for feeding the paper between said rollers, one of said rollers being provided with annular grooves, a guide plate, tongues on said guide plate and engaging in said grooves, an endless belt cooperating with said roller and guide plate in the discharging of folded papers from the folding rollers, a receiving trough for receiving the folded papers from said guiding plate, and a movable conveyor within said trough.

3. In a paper folding and cutting machine, a pair of final folding rollers, a feed bar for feeding the paper between said rollers, one of said rollers being provided with annular grooves, a guide plate, tongues on said guide plate and engaging in said grooves, an endless belt cooperating with said roller and guide plate in the discharging of folded papers from the folding rollers, a receiving trough for receiving the folded papers from said guiding plate, a movable conveyor within said trough, and means for moving said conveyor in a step by step movement one step upon the delivery of each folded paper to said trough.

4. In a paper folding and cutting machine, a pair of final folding rollers, means for feeding the paper between the said roller, a slidable rack, means for connecting said slidable rack to the feeding means for moving the feeding means into and out of feeding position upon movement of the rack, a second movable rack connected to a follower structure member and means connecting the first and second racks for driving the first rack upon movement of the second named rack.

In testimony whereof we affix our signatures.

THOMAS N. DELIGIANES.
ANDREAS A. BOURDES.