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ROLLER MACHINE FOR THE MANUFACTURE OF ENVELOPES

Filed March 17, 1931

Fig. 1

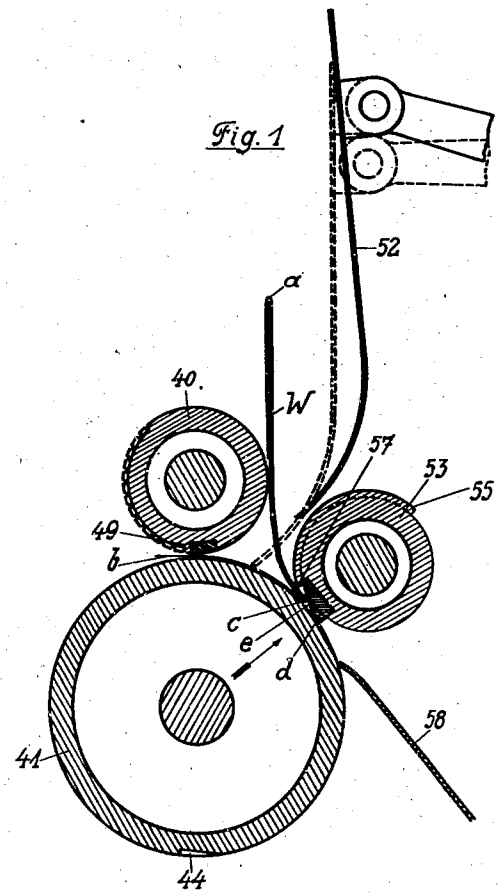
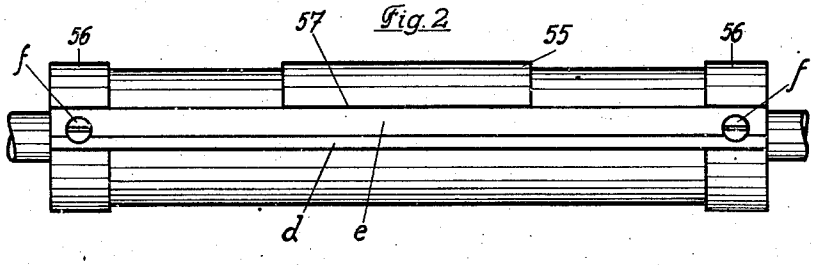


Fig. 2



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ROLLER MACHINE FOR THE MANUFACTURE OF ENVELOPES

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This invention relates to improvements in roller machines for the manufacture either of loosely folded or sharply folded envelopes, and relates more specifically to rollers for producing the closing flap fold.

One object of the present invention is to provide a roller which is adjustable to produce any desired degree of looseness in a fold of an envelope, or to produce a sharp fold therein, thus eliminating the changing and use of special rollers every time a change is desired in the degree of looseness of the fold.

A further object of this invention is to provide a group of rollers for the folding of the bottom and closure flaps of envelopes, comprising means whereby the roller for the folding of the said closure flap is adapted for adjustment to produce either sharp or loose folds and to vary the degree of bulge or looseness when loose folds are produced.

With these and other objects in view, the invention consists in the novel construction and arrangement of parts hereinafter described, illustrated in the accompanying drawings and particularly pointed out in the appended claims, it being understood that various changes in the construction and arrangement and in minor details may be made without departing from the spirit of the invention or sacrificing any of the advantages thereof.

In the drawings, Fig. 1 shows a vertical cross-section through the center of the rollers which coact to fold the bottom and closure flaps of the envelopes made in the machine; and Fig. 2 is a view, looking in the direction of the arrow in Fig. 1, of the roller for folding the closing flap according to our invention.

Referring to Fig. 1 of the drawings, in order to avoid a sharp pressing of the bottom flap fold *a* formed between the rollers 40, 41 a groove 44 running in the longitudinal direction of the lower roller 41 is provided in the known manner in the surface of said roller, one side of such groove 44 having a radially disposed plane as shown, and the loose fold of the bottom flap enters into the space formed by said groove 44 between the two rollers, so that tight or sharp folding is avoided when the rollers continue to turn.

The turning over and folding of the closure flap of the envelope takes place in the manner customary with roller-folding machines of the kind in question, in such a way that the bottom flap folded edge *a* which is the first to leave the rollers 40, 41 is received by a guide plate 52 which, as indicated by dotted lines in Fig. 1, moves up and down intermittently at the speed at which the work is handled. The blank is thereby led upwardly by the guide plate 52 until its closure flap fold *c* has left the rollers 40, 41. As the guide plate 52 then moves upwardly it is at the same time swung out in such manner that it assumes the position shown by full lines in Fig. 1 and thereby releases the envelope with its closure flap fold *c* now lying in position for introduction between the roller 53 and the said roller 41. As the closure flap is already creased the upwardly projecting portion of the envelope tends to move downwards by gravity to introduce the creased edge between the rollers 53, 41. The direction of movement of the envelope thus changes and preferably a swinging folding knife of usual construction (not shown) ensures the proper introduction of the envelope between the rollers 53, 41. In order to avoid, during the passage of the work W between these rollers, a sharp pressing of the closure flap fold and of the loose side and bottom flap folds already formed in the desired manner by other rollers and devices, the roller 53 is of the special form shown in Fig. 2. With the exception of a segment or portion 55 and the end supports or guides 56 and a part of the web or bridge *d*, whose height or diameter corresponds to the roller diameter proper, the entire circumference of the roller

is made deeper by an amount which corresponds to or slightly surpasses the maximum degree of looseness of folds in the work. While the said end parts 56 ensure the proper distance of the elastically supported roller 53 from the roller 41, the segment 55 serves to convey the blank. This segment 55 is smaller in length and width than the smallest size of blank to be handled in the machine.

For use in producing selectively, closure flap folds with different degrees of looseness or sharply folded closure flaps, the roller 53 is provided with the above-mentioned longitudinal bridge or web *d* in advance, according to the direction of its rotation, of the segment 55, which web *d* is of the same length as the roller 53, or at least longer than the width of the largest envelope to be produced in the machine, and a small strip of the surface of said web is flush with the end parts 56 and the segment 55. The rear edge of the web *d* is bevelled along its entire length, as at *e*, sloping downwards towards the bottom of the edge 57 of segment 55.

As shown in the drawings, the web *d* is constructed in the form of a rail which is let into the roller body and fastened to the roller 53 at each end by means of screws *f* (Fig. 2); this web may however, be formed in any other way, as by suitably cutting out the roller to the form desired. A swinging flap may also be built into the roller to form the bevelled surface *e* in such a way that its inclination towards the interior of the roller is adjustable.

In operation, taking the position of the rollers 40, 41 and 53 shown in Fig. 1, the envelope W is about to pass between the rollers 41 and 53, and it will be evident that the degree of looseness of the closure flap fold *c* depends upon the position which the bevelled surface *e* of the roller 53 occupies at that moment. A slight turn of the roller 53 in a clockwise direction will force the fold *c* at the moment of seizure of the work further into the space formed by the circumference of the roll 41 and the bevelled edge *e* of bridge *d* on the roller 53, as a consequence of which the fold *c* will be sharper. If on the other hand the roller 53 is turned slightly in a counter-clockwise direction from the position shown in Fig. 1, when the work is seized between the rollers 41 and 53, the edge thereof will have entered less deeply into the before-mentioned space and the pressure will therefore be less and the fold looser.

For a sharp fold, finally, it is only necessary to adjust the roller 53 by a suitable turn in a clock-wise direction, so that the closure flap fold will be seized between that surface of the web or bridge *d* which is flush with the segment 55 and parts 56 of the roller 53, and which thus bearing throughout its entire length on the roller 41 produces a sharp closure flap fold. As the envelope emerging from the rollers 41 and 53 slides by gravity over the oblique plate 58 arranged below the roller 53 and thus falls down by itself into further conveying means, the conveyance effected by the segment 55 is sufficient with all sizes of envelopes.

Although the drawings and above specification disclose the best mode in which we have contemplated embodying our invention, we desire to be in no way limited to the details of such disclosure for in the further practical application of our invention, many changes in the form and construction may be made as circumstances require or experience suggests without departing from the spirit of the invention within the scope of the appended claims.

What we claim is:—

1. In a machine for the manufacture of loosely folded or bulging envelopes, roller means for the folding of the closure flap comprising a roller, a raised surface on the roller of less size than the minimum sized envelope to be handled, a longitudinal bridge member having a bevelled outer part adjacent to said surface, and a counter-roller to cooperate with the said raised surface and bevelled part.

2. In a machine for the manufacture of loosely folded or bulging envelopes, roller means for the folding of the closure flap comprising a roller, a raised surface on the roller of less size than the minimum sized envelope to be handled, two raised annular end parts on the roller, a longitudinal bridge member connecting the said end parts, a bevelled surface on the said member adjacent to said raised surface, and a counter roller engaging said raised surface, end parts and bridge member, and cooperating with said bevelled surface to receive the loose fold of a closure flap.

3. In a roller machine for the manufacture of tightly or loosely folded envelopes, roller mechanism for the folding of the bottom and closure flaps of the envelopes, comprising a roller and counter-roller for folding the bottom flap, and a third roller cooperating with the same counter-roller to fold the closure flap of the envelope and comprising end bearing members, a central segment, and a longitudinal bridge member all flush with each other and a bevelled portion between the said bridge member and the central segment to cooperate with said counter-roller in receiving the closure folds of loosely folded envelopes.

4. In a roller machine for the manufacture of tightly or loosely folded envelopes, roller mechanism for the folding of the bottom and closure flaps of the envelopes, comprising a roller and counter-roller for folding the bottom flap, and a third roller cooperating with the same counter-roller to fold the closure

flap of the envelope and comprising end bearing members, and a raised segment flush with each other, and a bridge member extending longitudinally of the said third roller and having an outer surface for engaging the closure flap fold of tightly folded envelopes and an inclined surface for engaging the same fold of loosely folded envelopes.

In testimony whereof we have signed our names to this specification.

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