

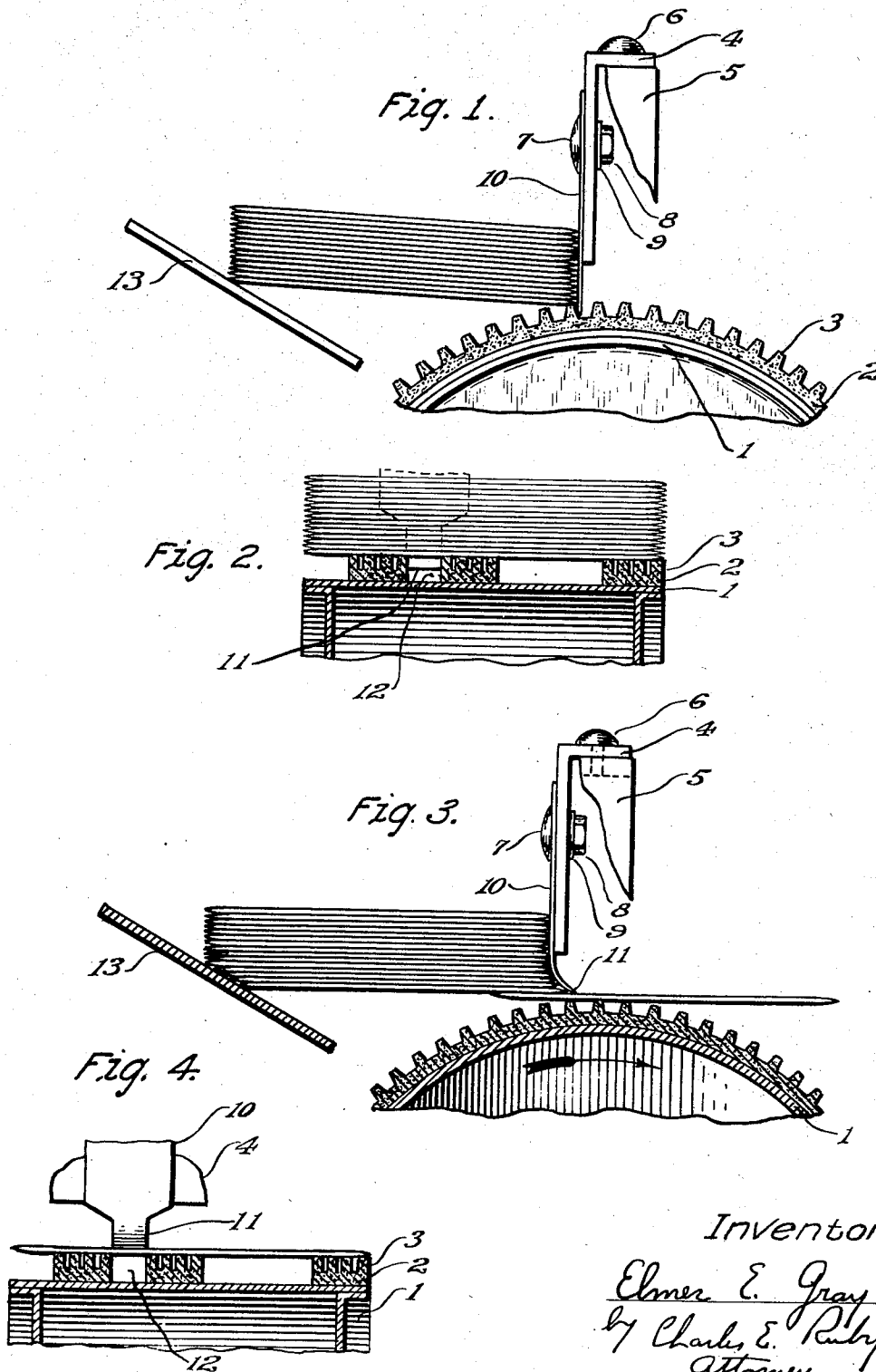
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SEPARATING AND FEEDING MECHANISM FOR ENVELOPES

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SEPARATING AND FEEDING MECHANISM
FOR ENVELOPES

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5 Claims. (Cl. 271-41)

The present invention relates broadly to separating and feeding mechanisms for envelopes, cards and similar objects, and specifically to separating and feeding mechanisms of the type shown and described in my U. S. Patent No. 1,506,423.

The principal object of the present invention is to provide a separating and feeding mechanism of the character described, whereby the envelopes, cards or similar objects to be fed can be separated individually from a pile or stack of the same and can be fed in a substantially continuous manner at a relatively high rate of speed, and yet whereby not more than a single envelope will be fed at one time.

Another object of the present invention is to provide a separating and feeding mechanism for envelopes, cards and similar objects having a construction more simple and having parts fewer in number than has the separating and feeding mechanism of the type shown and described in the patent to which reference has been made.

The attainment of these, and other, objects by the present invention will become apparent when the following detailed description is read in conjunction with an examination of the accompanying drawing wherein like numerals of reference denote like parts in the several views, and wherein

Fig. 1 is a side elevation of a separating and feeding mechanism constructed in accordance with the present invention,

Fig. 2 is a left lateral elevation, partly in section, of the separating and feeding mechanism shown in Fig. 1,

Fig. 3 is a side elevation of the separating and feeding mechanism shown in Fig. 1, exhibiting a single envelope in the process of being fed, and

Fig. 4 is a left lateral elevation of the separating and feeding mechanism shown in Fig. 3.

As shown in the drawing, the present invention comprises a rotatable drum 1, mounted to revolve in a suitable framework and provided at its periphery with friction members in the form of a plurality of rubber bands 2, which, encircling the rotatable drum, are spaced apart and are separated by distances in magnitude less than the widths of the envelopes to be fed, and which are provided, at regularly spaced short intervals, with groups of toothlike projections 3, in lengths substantially equal to the thicknesses of the rubber bands 2 with which they are integral. These toothlike projections 3 are, in character, definitely yielding under compressive stresses, and

their upper surfaces are promotive of non-slip-ping frictional contact with the envelopes which they are designed to feed.

To the cross bar 4, secured by the threaded screw 6 to the upright 5, forming a part of the framework wherein the rotatable drum 1 is mounted to revolve, is affixed, by the bolt 7, the nut 8, and the washer 9, the separating member 10, which extends downwardly toward the rotatable drum 1. This separating member 10 consists of a flexible resilient strip, which, at its lower extremity, is narrowed to form a tongue portion 11, in width approximately one third of the maximum width of the separating member 10, and this tongue portion 11 extends into the space 12 intervening between two of the friction members 2 which are separated by a distance substantially equal to the width of the tongue portion 11. The envelope support 13 is secured to the framework, wherein the rotatable drum 1 is mounted to revolve, by suitable means.

If now a stack of envelopes is positioned, as is shown in Fig. 1, one end of the bottom envelope in the stack rests upon the support 13 and the other and rests upon the toothlike projections 3 of the rubber bands 2. Particular attention is called to the fact that the spaces intervening between adjacent sets of toothlike projections 3 are, in magnitude, sufficiently small, so that the forward end of the bottom envelope will invariably rest upon the top surfaces of one of the groups of toothlike projections 3, and that, during the operation of the separating and feeding mechanism, the stack of envelopes will not be subjected to any perceptible up-and-down pawl-and-ratchet movement by the frictional engaging of successive groups of the toothlike projections 3 with the under surfaces of the envelopes. The manner in which the tongue portion 11 of the separating member 10 fits snugly between two of the friction members, extending into the intervening space 12 to a depth equal to the length of the toothlike projections 3 is shown in Fig. 2.

When the drum is rotated slightly, in a clockwise direction, the envelopes in the stack assume the positions shown in Fig. 3, for the envelopes in the lower portion of the stack are pulled forward by mutual frictional contact and their rear ends slide down upon the support 13. The forward movement of these envelopes in the lower portion of the stack bends the tongue portion 11 of the separating member 10 into an arc, as is shown in Fig. 3. Further rotation of the drum 1 pulls the bottom envelope forward and beneath

the end of the tongue portion 11 of the separating member 10, and the end of the tongue portion 11, resting upon the upper surface of the bottom envelope, as is shown in Fig. 4, exerts a slight downwardly directed force, pressing it into intimate contact with the toothlike projections 3. Particular attention is called to the fact that no buckling of the envelope under the pressure exerted by the tongue portion 11 can occur, since the width of the tongue portion 11 is equal to the distance separating the friction members between which it is normally positioned when the separating and feeding mechanism is not in use. Therefore, as the drum 1 is rotated, the bottom envelope rides flatly upon the toothlike projections 3 of the friction members under the pressure exerted by the tongue portion 11 of the separating member 10.

As the rear end of the bottom envelope approaches the separating member 10, the envelope resting upon the upper surface of the bottom envelope moves forward very slightly, and, at the instant that the bottom envelope is carried out of engagement with the end of the tongue portion 11 of the separating member 10, this second envelope is carried into engagement with the end of the tongue portion 11. By observations made upon the separating and feeding mechanism in action, I have noted that when the bottom envelope is held, near its rear edge, in engagement between the end of the tongue portion 11 and the set of toothlike projections 3 then positioned directly beneath the end of the tongue portion 11, the immediately following set of toothlike projections may make contact with the under side of the next envelope and may carry it forward and beneath the end of the tongue portion 11 before the bottom envelope has passed out of engagement between the end of the tongue portion 11 and the first set of toothlike projections 3, but no simultaneous feeding of the two envelopes ever occurs by reason of any minute overlapping of the ends of the two envelopes beneath the end of the tongue portion 11 of the separating member 10 at the instant of disengagement of the lower envelope.

From the description of the operation of this separating and feeding mechanism, it is obvious that the tongue portion 11 of the separating member 10, when once bent into an arc, does not regain its initial form during the separating and feeding of a stack of envelopes, and hence the end of the tongue portion 11 does not reenter the space 12 intervening between the friction members until the separating and feeding operations are interrupted or concluded.

The qualities of flexibility and resiliency, which must be possessed by the separating member if it is to function efficiently, are satisfactorily attained in a separating member constructed from a thin sheet of spring brass or metal of similar characteristics, while the most suitable spacing of the sets of toothlike projections is realized when the distance between adjacent sets of the toothlike projections is not markedly different from the lengths of the toothlike projections; but I do not wish to limit, in either of these respects, the present invention whose scope is defined in and by the appended claims.

Having thus fully described the present in-

vention and its mode of operation, what I claim is:

1. In a separating and feeding mechanism for envelopes, cards and similar objects, in combination, a drum to support and to feed the envelopes, a plurality of friction members encircling the periphery of the drum to rotate therewith and to increase the frictional engagement of the drum with the envelopes being fed, and a flexible resilient separating member whose end portion is positioned to fit snugly between a pair of the friction members.

2. In a separating and feeding mechanism for envelopes, cards and similar objects, in combination, a rotatable drum to feed the envelopes, a plurality of friction members disposed upon the periphery of the rotatable drum to rotate therewith and provided with series of sets of yielding toothlike projections spaced apart at distances substantially equal to the lengths of the yielding toothlike projections, and a flexible resilient separating member to press an envelope into contact with successive sets of the yielding toothlike projections.

3. In a separating and feeding mechanism for envelopes, cards and similar objects, in combination, a rotatable drum to support and to feed the envelopes, a plurality of rubber bands disposed upon the periphery of the rotatable drum in parallel arrangement and provided with series of groups of yielding toothlike projections spaced apart at distances substantially equal to the lengths of the yielding toothlike projections, and flat spring means, positioned intermediate a pair of the rubber bands and provided with an end portion of width equal to the distance separating the said pair of rubber bands, to press an envelope in non-buckling frictional engagement with successive groups of yielding toothlike projections.

4. In a separating and feeding mechanism for envelopes, cards and similar objects, in combination, a rotatable drum to support and to feed the envelopes, a plurality of friction members encircling the periphery of the drum to rotate therewith and to effect frictional engagement with the envelopes to be fed, and a flexible resilient separating member provided with a tongue portion and positioned intermediate a pair of the friction members, with the tongue portion extending into the space separating the friction members to within a short distance from the surface of the rotatable drum and fitting snugly between the friction members.

5. In a separating and feeding mechanism for envelopes, cards and similar objects, in combination, a rotatable drum to support and to feed the envelopes, a plurality of friction members encircling the periphery of the drum to rotate therewith and to effect frictional engagement with the envelopes to be fed and a flexible resilient separating member provided with a tongue portion of uniform width and positioned intermediate a pair of the friction members spaced apart uniformly by a distance equal to the width of the tongue portion, with the tongue portion extending into the space separating the friction members and fitting snugly between the friction members.

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