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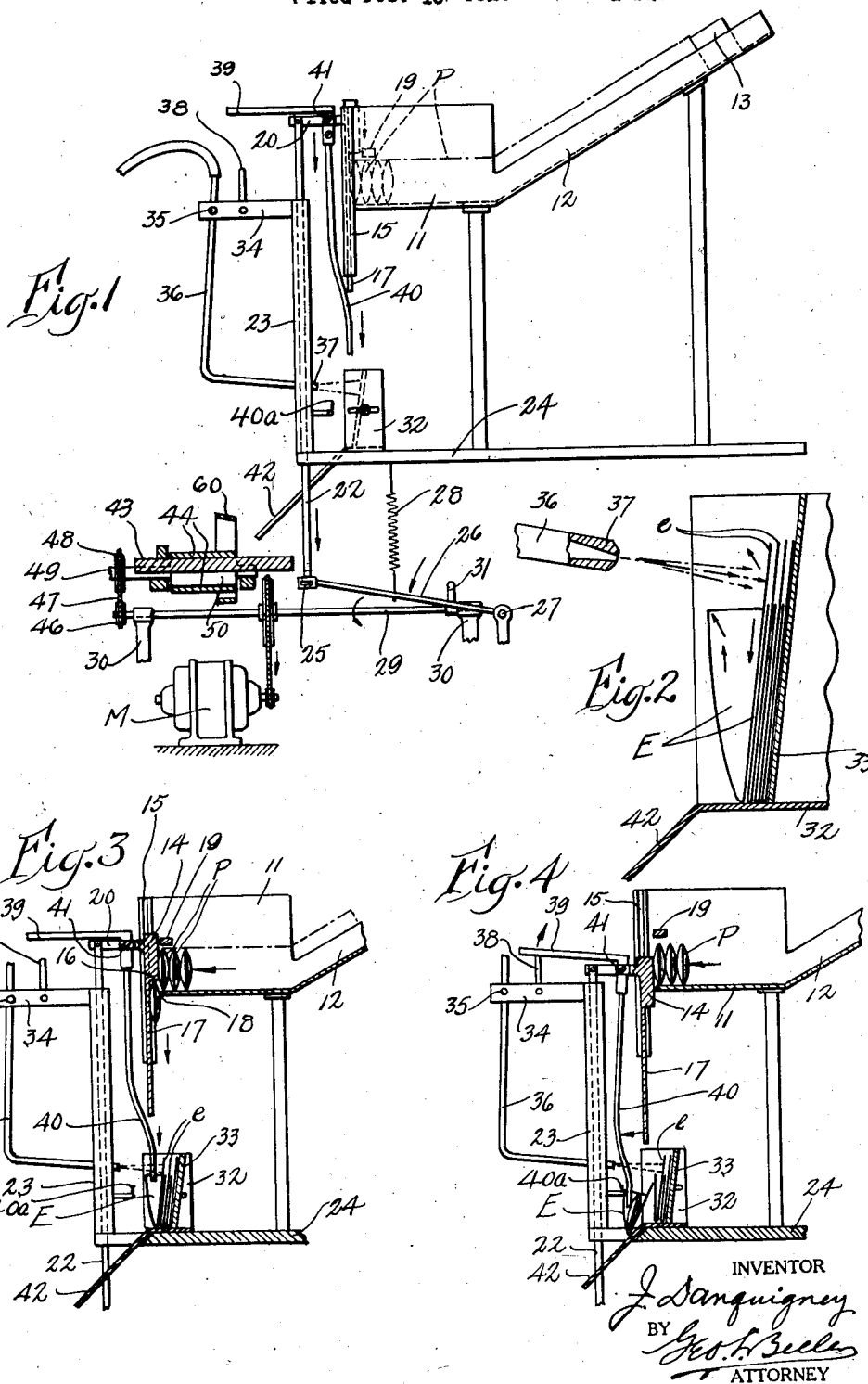
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J. DANQUIGNEY

ENVELOPE FILLING MACHINE

Filed Feb. 10, 1926

2 Sheets-Sheet 1



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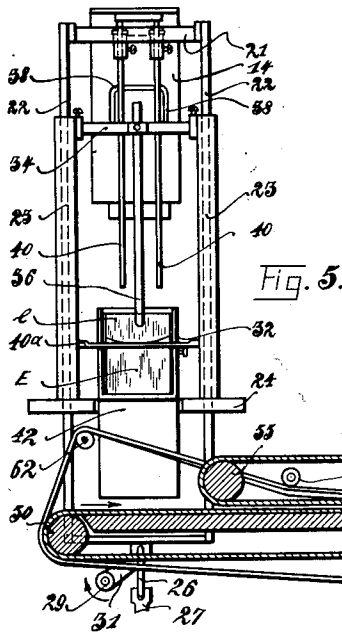
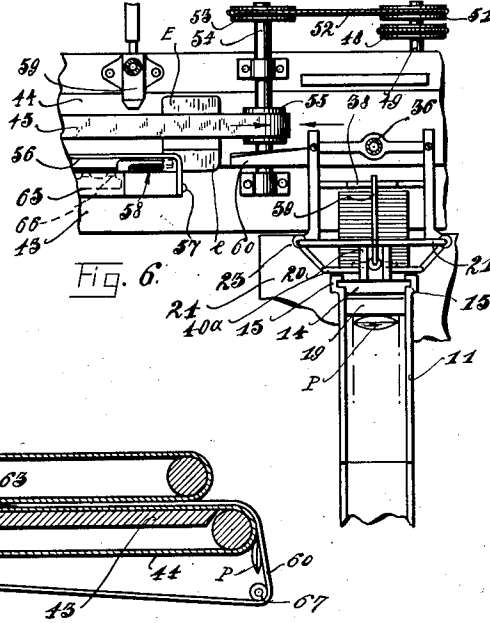
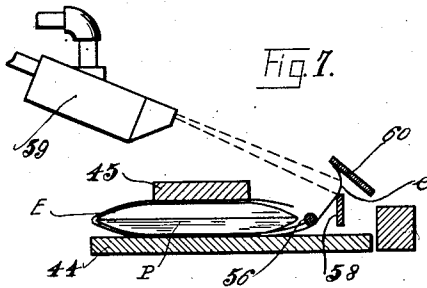
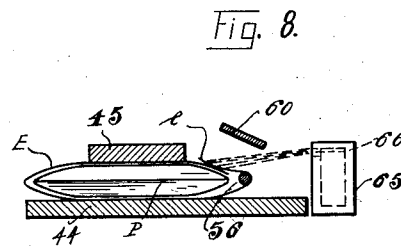
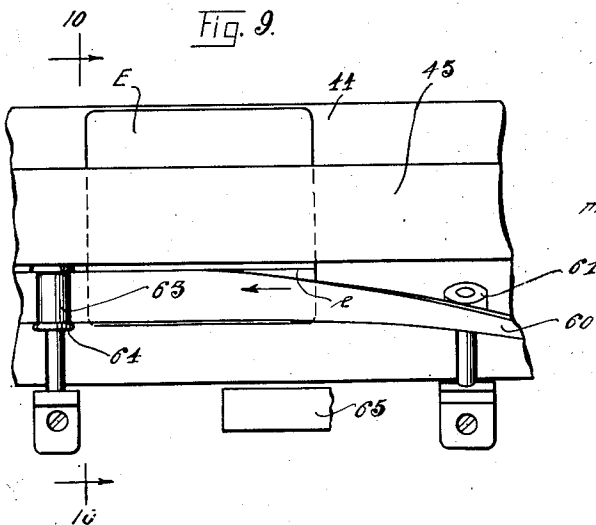
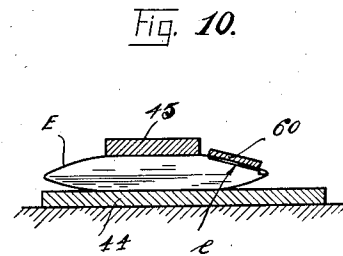
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE.

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ENVELOPE-FILLING MACHINE.

Application filed February 10, 1926. Serial No. 87,212.

This invention relates to machines or methods for introducing articles or commodities into envelopes or analogous containers and sealing the same, and has particular reference to automatic machinery and processes for filling powder puffs into sanitary containers or envelopes and sealing them preparatory to placing the puffs on the market as unitary items.

Among the objects of the invention is to provide automatic machinery and methods of so feeding or delivering a plurality of powder puffs along a chute or runway, and thence singly from the series by means of mechanical ejector mechanism for delivering the powder puffs singly into receptacles such as envelopes for the market.

Another object of the invention is to provide means including the projection of a stream of fluid such as air upon the envelopes so as to accomplish two results,—namely, the opening out of the first envelope, the one to be filled, and, secondly, the holding of the flap of such envelope and the bulk of the succeeding envelopes in flat steady position whereby the article being introduced into the envelope so standing open will have free movement to its place.

A further object of the invention is to provide especially designed ejector mechanism for discharging a filled envelope from the place where it is filled so that it may be delivered to the succeeding mechanism, while the succeeding envelopes and the articles to be filled therein will be retained in proper position until the next actuation of the ejector.

A still further object of the invention is to provide conveyer mechanism for receiving the filled envelopes in succession as they are ejected from the filling machine and causing said filled envelopes to be transported to any suitable place of delivery and having means provided for sealing the envelopes while being so transported.

With the foregoing and other objects in view the invention consists in the arrangement and combination of parts hereinafter described and claimed, and while the invention is not restricted to the exact details of construction disclosed or suggested herein, still for the purpose of illustrating a practical embodiment thereof reference is had to the accompanying drawings in which like reference characters designate the same

parts in the several views, and in which—

Figure 1 is a front elevation of a preferred embodiment of the mechanism, parts of the conveyer being shown in section.

Fig. 2 is an enlarged diagrammatic view of the mechanism for supporting the bulk of envelopes and showing particularly the action of the jet of air incident to the filling operation.

Figs. 3 and 4 are detail views similar to the upper portion of Fig. 1, with parts in section, and indicating successive stages of operation of the filling and ejecting mechanisms.

Fig. 5 is a side elevation of the mechanism as would be seen from the left of Fig. 1, the conveyer being in longitudinal section.

Fig. 6 is a plan view showing particularly the machine at the region of the envelopes and delivery to or toward the sealing mechanism.

Figs. 7 and 8 are diagrammatic cross sectional details showing the progressive stages in the sealing of the envelopes.

Fig. 9 is a plan view showing the relation of the sealing belt to the conveyer.

Fig. 10 is a view showing the sealing belt and its relation to the conveyer in cross section substantially on the line 10—10 of Fig. 9.

Referring now more specifically to the drawings, I show at 11 a hopper or receptacle at the front or lower end of an inclined runway or chute 12 into which a multiplicity of substantially uniform articles such as powder puffs P are introduced and urged forward or downward moderately by any suitable mechanism typified by a plunger or follower 13 which may be a weight slidable along the chute or its equivalent. The puff in the lead will always be held in contact with an ejector device in the nature of a gate 14 mounted to reciprocate in the end of the hopper remote from the follower, the same being guided for vertical reciprocations in guideways 15.

This ejector gate 14 is provided with a shoulder 16 which when the gate is elevated takes over the top of the then advanced puff P, such puff coming against the thinner portion 17 of the gate below the shoulder which serves as a guard to prevent the puffs from passing too far laterally. When the gate is depressed on the next downward reciprocation the puff below the shoulder 16

will be ejected from the series downward through an opening 18 and so set free to drop to its next stage. When the gate is reciprocated upward again the puff in advance and against the shouldered portion 16 is prevented from being elevated by friction by a keeper 19 extending across the interior of the hopper.

Any suitable means may be provided to reciprocate the ejector gate up and down for the purposes just stated. As shown the gate is provided with a pair of laterally projecting arms 20 connected to a cross head 21 having guide rods 22 movable vertically in channels or tubular guides 23 secured rigidly to the main frame or platform 24. Said rods 22 are connected at their lower ends, through pin and slot connections at 25, with a third class lever 26 pivoted at 27 on a fixed fulcrum. A contractile spring 28 extending between the fixed platform 24 and the lever 26 serves to lift the lever and the actuator mechanism, swinging the lever upward as shown in Fig. 1 and bringing the parts into the position shown in Fig. 1. For reciprocating the ejector downward against the force of the spring 28 I provide a shaft 29 journaled for rotation around a horizontal axis in fixed bearings 30, said shaft carrying a finger or cam 31 which strikes upon the lever not far remote from its pivot, causing it to move downward and bring with it the ejector mechanism to the position shown in Fig. 4, completing the discharge or delivery of one powder puff.

For the delivery of the powder puff singly into envelopes such as indicated at E, I provide below the ejector a holder 32 for such envelopes which being very thin will provide for the holding of a large number thereof in a small space preferably against the inclined wall 33 beneath the hopper 11, the top of the inclined wall being tilted rearward with respect to the direction of delivery of the envelopes singly therefrom.

A portion 34 of the rigid frame structure which includes the guides 23 serves two functions: First, to support at 35 an air tube 36 whose nozzle 37 is directed laterally close in front of the holder 32, and, secondly, to support an abutment 38 lying in the path of a finger 39 extending laterally from the upper end of a pair of ejector fingers 40 pivoted at 41 to the gate mechanism. Said fingers project mainly downward but are bent slightly to extend beneath the thin portion 17 of the gate whence the points of the fingers are bent directly downward again as shown best in Figs. 1 and 3. The tube 36 carries a stream of dry fluid such as air from any suitable source not shown and directs the same squarely against the upwardly extending flap portions *e* of the envelopes, especially the one in advance. This stream

of air on striking the flap *e* is deflected, a portion thereof passing downward causing the first envelope to open out wide as shown in Fig. 2, while the other portion of the stream holds firmly the flap in place and the succeeding envelopes in flat position. The stream of air, however, has insufficient force to disturb the fall of the powder puff which drops into the then open envelope as shown in Fig. 4, the envelope being positioned directly beneath the opening 18 in the bottom of the hopper. The powder puff thus falls directly downward into the open envelope close back of the points of the fingers 40. While the ejector gate moves downward to eject a puff from the hopper, the fingers 40 will likewise be brought downward, the points thereof entering the open envelope, and when the ejector mechanism approaches the lower limit of movement, the fingers 39 of the ejector device will strike the abutment 38 and cause the tilting of the ejector fingers as shown in Fig. 4 to cause the filled envelope to be discharged laterally from the holder 32, whence it slides along a guideway 42 to any desired place of delivery. The remaining unfilled envelopes are retained in upright or substantially upright position parallel to the rear wall 33 by the continued stream from the nozzle 37. The ejector fingers swing freely upon their pivot 41, and so when the ejector gate is again lifted by the spring 28, the fingers will assume their normal balanced position as in Figs. 1 and 3. The attendant of the machine has but to keep the runway 12 and hopper 11 supplied with powder puffs and also keep a supply of the envelopes in the holder 32, and the machine acting automatically will fill and deliver the same rapidly. An elastic abutment member 40^a ensures proper tilting of the envelopes as shown in Fig. 4.

43 indicates a platform or table extending preferably slightly beneath the runway 42. Operating over this platform 43 is a carrier belt 44 upon which is received directly the powder puffs in succession from the runway 42, the sealing flap *e* of each envelope being at such time directed rearward or toward the place whence it came. The envelopes are carried by this carrier belt directly forward or to the right in Fig. 5 and are gripped between the carrier belt and the gripper belt 45 driven in any convenient manner to compel the adjacent runs of the two belts to move in unison, holding the filled envelop firmly between them while being transported. These belts may be operated in any convenient manner but as indicated I show the ejector operating shaft 29 driven at relatively low speed from a motor M, and to the end of the shaft 29 is fixed a pulley 46 having a belt 47 running

over another pulley 48 fixed to the shaft 49 of the head drum 50 of the carrier belt. As shown the gripper belt is operated from a pulley 51 on the same shaft 49 through a crossed belt 52 operating over a pulley 53 connected to a shaft 54 upon which the head drum 55 of the gripper belt is mounted.

The gripper belt is materially narrower than the carrier belt 44 insuring that not only the sealing flap *e*, but also the mouth portion of the envelope, will be exposed for free sealing action.

Referring now to Figs. 6 to 10, the loose flap *e* of the envelope as the envelope is being conveyed between the belts will glide under a guide rod 56 whose front end is curved and fixed at 57 to a stationary frame member, while its rear end is free, and said flap will glide over a deflector 58 shortly after passing under the curved front end of the rod 56, whereby the flap will be tilted upward in position to receive a spray of moisture such as water from a nozzle 59 as shown in Fig. 7. This tilting action is aided by a sealing belt 60 which runs about the carrier belt and moves therewith. The sealing belt is arranged to act in the manner of a cam for effecting a uniform positive folding of flap *e*. Thus said belt is inclined by a roller 61 after leaving a roller 62 to act at an angle to the plane of the carrier belt, the elevated position of the sealing belt insuring free movement of the envelope *E* therebeneath by the carrier and gripper belts. Finally a roller 63 having flanges 64 effectively depresses the sealing belt upon the carrier belt to cause the flap *e* to be retained in snug contact with the body of the envelope *E*. At the same time the roller 63 by means of flanges 64 operates to move the sealing belt laterally to move the same over the path of movement of the flap *e*. In this way a sort of continuous action is provided.

Immediately after receiving the spray from the nozzle 59, the up tilted moistened flap will receive on its opposite or outside a jet of air from an air trunk 65, see Fig. 8, the force of which passing through downwardly projected ports 66 will throw the moistened flap over downward upon the main body of the envelope where it will stick and thereby the envelope will be sealed initially. Soon thereafter the sealing belt 60 which is gradually depressed will again contact the flap *e* and bear downward with sufficient firmness while the envelope is being conveyed forward by the belts to insure perfect sealing. While the sealing operation progresses the sealed mouth of the envelope will be stripped directly from the free end of the rod 56. The envelopes will then be carried forward and delivered successively in sealed sanitary condition for delivery from the delivery end of the carrier belt. A roller 67 co-operates with the sealing belt

to insure release of a powder puff *P* from between the carrier belt and the sealing belt. It will be observed that through co-operation of the air jet and the sealing belt, an envelope of particularly weak material such as one that might be formed of an organic compound can be folded neatly and sealed snugly. The operation of the machine is continuous and is rapid as well as being automatic. A single attendant keeping the hopper and envelope holder supplied with material will have complete control of the apparatus.

I claim:

1. The method of opening a flexible envelope having an open but collapsed mouth and an extended flap which consists in directing the flow of a fluid laterally against said flap and into the envelope to expand the same and open said mouth.

2. The method of expanding a flat collapsed envelope having an open end and a flap at said end, which comprises directing a flow of an opening medium into the envelope and against said flap to expand the envelope from flattened collapsed condition and render the same operative to receive an article through said end.

3. The method of sealing an envelope having a flap which comprises directing a jet of gas against the flap to cause the same to fold over toward and upon the body of the envelope.

4. The method of gluing together two flexible members which comprises subjecting the same to the force of a jet of fluid to cause the members to closely contact each other and render the glue effective therebetween.

5. In a machine of the class set forth, the combination of means to support an envelope having a flap, and means to fold the flap upon the envelope comprising a jet of gas which is caused to impinge against the flap.

6. In a packing machine, the combination of means for supporting an envelope, feeding means for supplying an article to be received by said envelope, means for directing a jet of gas transversely to the path of movement of the article toward the envelope, and means for deflecting a part of the jet to flow into the envelope and open the same to receive said article.

7. A machine as set forth in claim 6 wherein said jet is directed initially against the envelope whereby the portion of the jet which is not deflected as aforesaid serves to retain the envelope against the means supporting the same.

8. In an envelope filling machine, the combination of means for receiving a supply of similar articles and for delivering them singly from said receiving means, a holder for a plurality of envelopes located

in the path of movement of the single articles, means to cause the opening of the advanced envelope so as to receive in its open mouth the oncoming article, and means for 5 delivering the filled envelope from the holder. which the means for ejecting the filled envelope is carried by the means for delivering the articles toward the envelopes. 10 In testimony whereof I affix my signature.

9. Mechanism as set forth in claim 8 in

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