

Jan. 21, 1936.

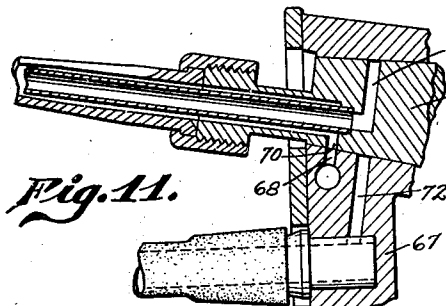
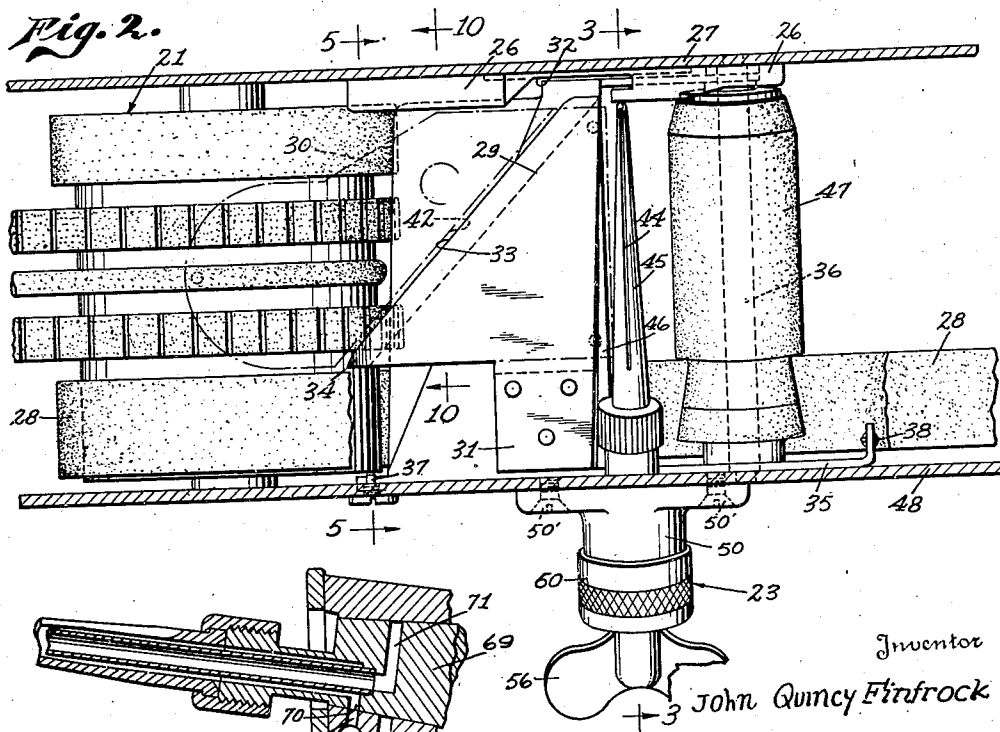
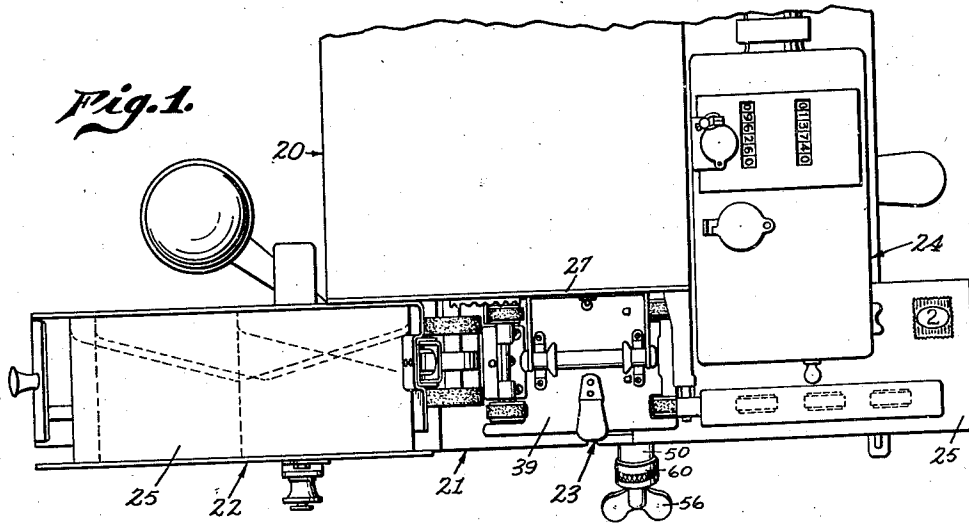
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2,028,277

ENVELOPE FLAP OPENING AND MOISTENING DEVICE

Filed July 17, 1934

3 Sheets-Sheet 1



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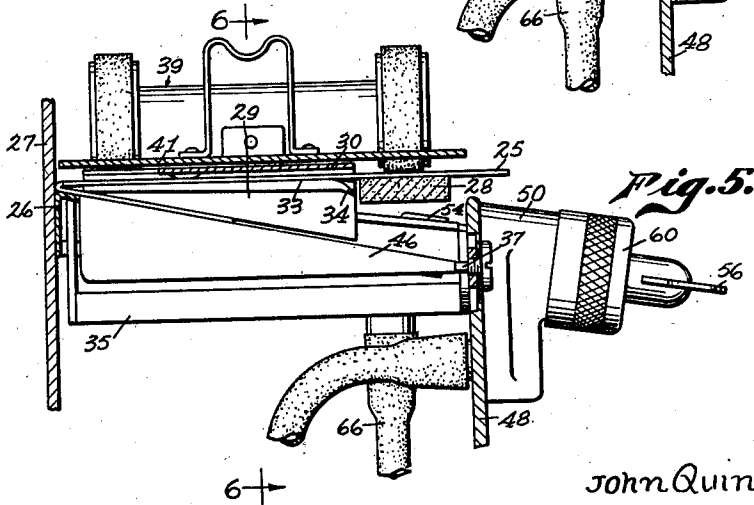
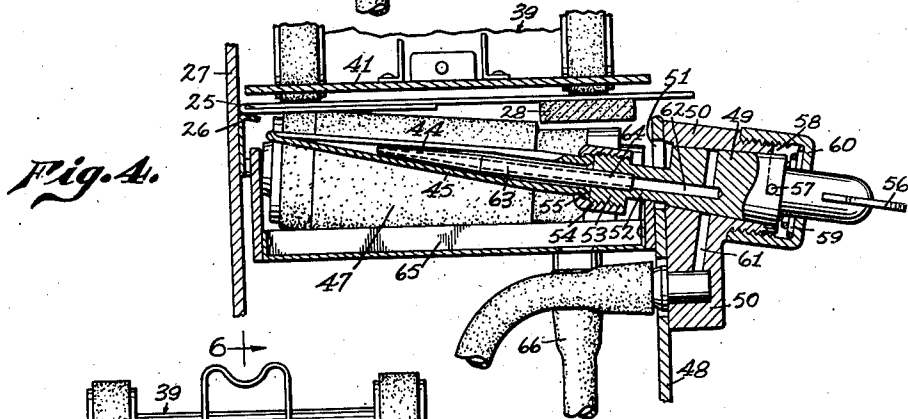
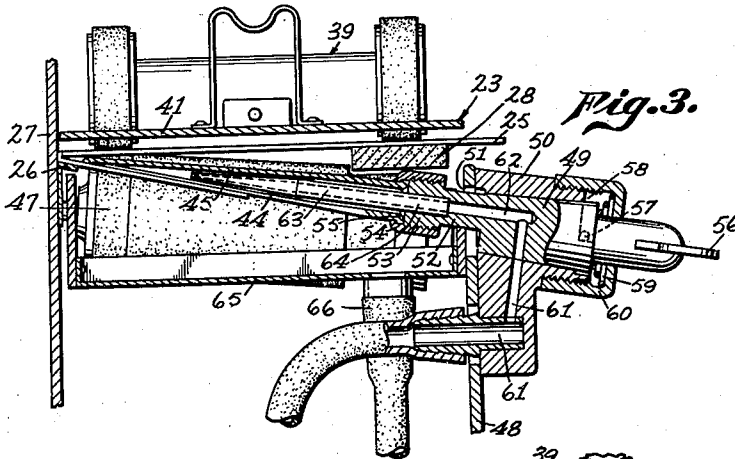
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ENVELOPE FLAP OPENING AND MOISTENING DEVICE

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3 Sheets-Sheet 2



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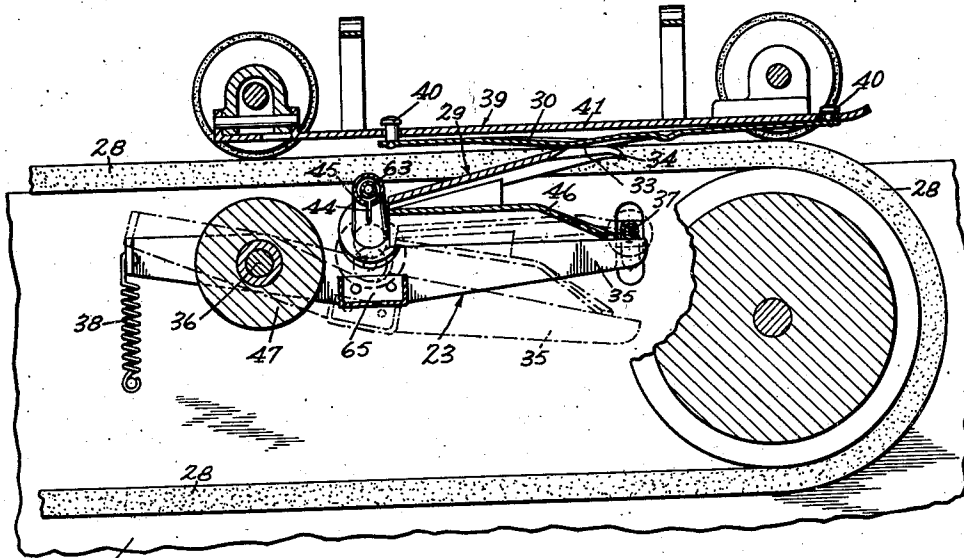
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ENVELOPE FLAP OPENING AND MOISTENING DEVICE

Filed July 17, 1934

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48
Fig. 6.

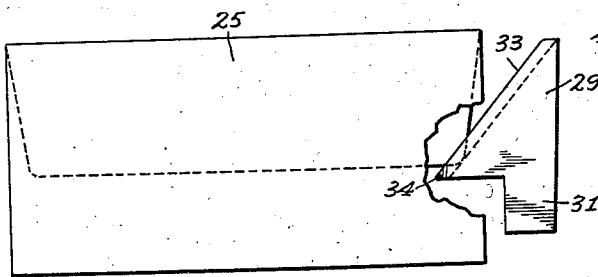


Fig. 7.

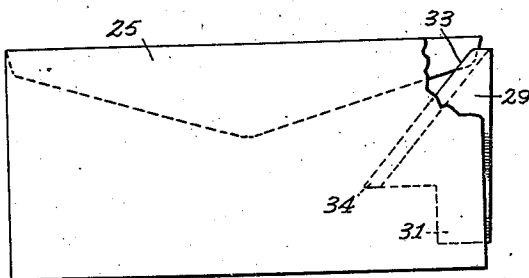


Fig. 8.

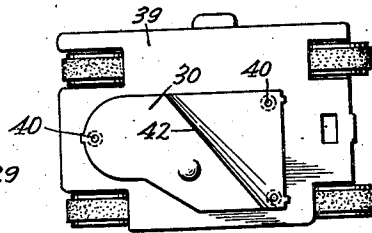


Fig. 9.

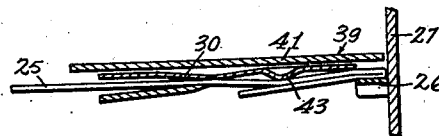


Fig. 10.

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UNITED STATES PATENT OFFICE

2,028,277

ENVELOPE FLAP OPENING AND MOISTENING DEVICE

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Application July 17, 1934, Serial No. 735,578

2 Claims. (Cl. 91—43)

This invention relates to an envelope flap opening and moistening device for use in envelope sealing machines or other envelope treating machines or devices.

5 One of the principal objects of this invention is to provide a sealing machine with an envelope flap opening and moistening device which will act efficiently for all types and styles of envelope flaps within the capacity of the machine without the need for adjustment or attention. Envelopes of the same general size having different styles of flaps may be successfully treated in the machine without the need of segregating these envelopes as to types or styles of flaps and without the need of adjusting the flap opening and moistening means for these different styles of envelopes. In fact envelopes of all types and sizes within the capacity of the machine may be successfully treated without the necessity of adjustment or attention to the flap opening and moistening means.

15 A further object is to provide means operable for readily rendering the flap opening and moistening means inoperative and simultaneously therewith shutting off the supply of fluid to the moistening means.

20 A further object is to provide the moistening tube with a capillary slot arranged to be turned to face upwardly when the moistener is in its inoperative position whereby this fine slot may be readily inspected and cleaned if necessary.

25 A further object is to provide means for draining the moistening tube when actuated to its inoperative position.

30 A further object is to provide means for opening and then guiding the flaps of envelopes under treatment across the capillary slot of the moistening tube for wetting the gummed surfaces thereof and for thereafter closing the flaps into sealing engagement with their respective envelopes.

35 A further object is to provide a unitary means operable for actuating the flap opening, moistening and fluid supply means to their operative or inoperative positions at will.

40 Other objects and advantages of the invention will become apparent as the nature of the same is more fully understood from the following description and accompanying drawings, wherein is set forth what is now considered to be a preferred embodiment. It will be understood, however, that this particular embodiment of the invention is chosen principally for the purpose of exemplification and that variations therefrom in details of construction or arrange-

ment of parts may accordingly be effected and yet remain within the spirit and scope of the invention as the same is set forth in the appended claims.

In the drawings:

Figure 1 illustrates a postage printing and sealing machine in which this invention has been incorporated.

Figure 2 illustrates an enlarged fragmental sectional view showing portions of the flap opening and sealing means.

Figure 3 illustrates a sectional view taken substantially in the plane of line 3—3 of Fig. 2 showing an envelope flap in the process of being opened and moistened.

Figure 4 illustrates a view similar to Fig. 3 but showing the moistening tube turned to its inoperative position.

Figure 5 illustrates a sectional view taken substantially in the plane of line 5—5 of Fig. 2.

Figure 6 illustrates a fragmental sectional view taken substantially in the plane of line 6—6 of Fig. 5.

Figure 7 illustrates a more or less diagrammatic representation of the flap opening blade in the act of opening a deep envelope flap.

Figure 8 illustrates a view similar to that of Fig. 7 but showing the flap opening blade in the act of opening a common envelope flap.

Figure 9 illustrates a bottom plan view of the conveyor truck with the envelope guide plate mounted thereon.

Figure 10 illustrates a fragmental sectional view taken substantially in the plane of line 10—10 of Fig. 2; and

Figure 11 illustrates a modified form of the moistener valve incorporating therein a fluid drainage passage.

The flap opening and moistening device of this invention is admirably adapted to be incorporated in the envelope sealing and postage printing machine illustrated in Figure 1. This machine briefly includes a power plant 20 arranged to intermittently drive an envelope feed conveyor 21 for withdrawing envelopes one at a time from an envelope receiving hopper 22 and conveying each envelope withdrawn from the hopper first through the flap opening and moistening device 23 and then to the meter. As each envelope arrives at the meter, it actuates an appropriate control mechanism (not shown) for interrupting the operation of the conveyor and simultaneously therewith placing the meter into operation for printing a postage stamp upon the envelope under treatment. Upon the com-

pletion of the printing operation, the control mechanism automatically functions to again place the conveyor into operation and to stop the meter whereby the treated envelope is ejected from the machine and the next succeeding envelope is moved forwardly to be acted upon in the manner described. The several elements of the machine thus far described, with the exception of the envelope flap sealing mechanism 23, are all well known by those familiar with this art and, therefore, a detailed description thereof need not be included, however, the sealing mechanism which forms the subject matter of this invention will now be described in detail.

Envelope flap opening means

The flap opening means is positioned in the machine between the envelope feed hopper 22 and the postage printing meter 24 in position to act upon envelopes carried therepast by the conveyor 21. During this passage of the envelopes 25 past the sealer, the flap edge thereof may be supported by the guide brackets 26 suitably fastened onto the front face of the machine housing wall 27. The forward portion of the guide brackets may be upwardly inclined as well as angled downwardly in the direction of the sealing means for the purpose of assisting envelope flaps in springing open as they are conveyed thereover by the conveyor belt 28 which supports the other edge of the envelope.

Means are provided for opening the envelope flaps as they are conveyed over the guide brackets and these means may include a flap opening blade 29 and an envelope guide plate 30. The flap opening blade 29 is somewhat triangular in form, excepting for its supporting section 31, and extends across the path of travel of the envelope from the conveyor belt 28 to the cut out portion 32 of the guide brackets 26. The front angular edge 33 of blade 29 is sharpened from its under side so as to form a knife edge which will readily enter between the body of the envelope and its flap. This edge is made relatively long in order to enable the blade to open long or short flaps, as illustrated in Figures 7 and 8. The relatively long angular entering edge 33 makes it possible for the machine to be operated successfully for opening all styles of envelope flaps within the range of those shown in Figures 7 and 8 without the need of adjustment or attention and whether the envelopes are all of one style or of an assortment of mixed styles.

In order to insure a smooth passage of the envelope body over blade 29, the most forwardly tip of the entering edge 33 may be formed downwardly slightly as indicated at 34.

It is desirable to be able to shift the flap opening blade 29 to an inoperative position when printing postage stamps upon postcards or upon envelopes which have been previously sealed and for this purpose the blade, by means of its supporting section 31 may be fastened to a suitable swing frame 35. This swing frame may be pivotally mounted upon the sealing roller cross shaft 36 and yieldingly urged against an adjustable stop pin 37 by spring 38. The flap opening blade 29 is preferably mounted to angle upwardly from its proximal to its distal ends and also from its rear edge to its forward or entering edge 33 when maintained in its operative position to most effectively engage the envelope and to swing the flap thereof open. When swung to its inoperative position, the knife edge

33 is moved out of line with the path of travel of the envelopes so that matter carried by the conveyor will not be engaged thereby.

The envelope guide plate 30 may be yieldingly supported upon the under surface of the conveyor truck 39. In this instance, the guide plate 30 is mounted to freely float with relation to the truck by means of three rivets 40 having their shank ends tightly riveted to plate 30 and extending loosely through holes formed in the body 41 of the truck. The shank of each rivet is longer than the truck body is thick and the heads thereof are sufficiently large to prevent their passing through the holes in the truck body. This arrangement permits the plate 30 to weigh the envelope under treatment down sufficiently to insure their proper engagement with the entering edge 33 of the flap opening plate 29.

The proper entry of the flap opening blade 29 between the envelope body and its flap will be more certain if the guide plate 30 is formed with a directing surface or edge 42, which surface is preferably parallel but slightly forwardly of the entering edge 33 of the blade. By this arrangement, the greater portion of the weight of the guide plate 30 is concentrated against the envelope just before it is engaged by the opening blade and thus will act to distort the plane of the envelope and thereby to spring the flap thereof open sufficiently to permit the opening blade to enter between the envelope and its flap. The entry of blade 29 between the envelope and its flap may be further assisted as by the distorting means 43 which is positioned to act against the envelope and to spring the flap thereof open. The distorting means 43 in this instance may be provided by deforming the guide plate 30 as at 43 to form a protuberance thereunder, (Fig. 10).

The conveyor truck 39 may rise and fall as envelopes of varying thicknesses pass thereunder and, due to the floating connection formed between the truck and the guide plate, this plate may act against the envelope under treatment more or less independently of the action of the truck.

The flap opening means just described has been found to work very satisfactorily for various styles of envelopes within its capacity, 50 whether these various envelopes were or were not heavily stuffed with letters or other matter.

Moistening device

After the flap of the envelope under treatment has been opened by blade 29, it is passed over a capillary slot 44 of a moistening tube 45 whereby the gummed surface thereof will be wetted for sealing the flap closed.

Means are provided for properly guiding the open flap across the capillary slot and these means include the opening blade with its associated flap guide plate 46 (Figure 6), and the sealing roller 47 (Figure 2).

The flap guide plate 46 is appropriately fastened to swing frame 35 and is maintained in spaced relation to the flap opening blade 29 whereby flaps opened by blade 29 will travel between it and its associated plate 46 and upon leaving this means will pass under the moistening tube and as the capillary slot is formed along the bottom of the tube the gummed surface of the flap will be drawn across the capillary slot and will be wetted thereby.

The sealing or closing roller 47 is placed adja- 75

cent the rear side of the moistening tube and is driven by the conveyor means whereby as the envelope flap under treatment passes beyond the tube it will engage roller 47 and will be returned thereby into engagement with the body of its related envelope. The portion of the flap which engages the sealing roller will be lifted upwardly, thereby causing the following length of flap to closely hug the under surface of the moistening tube and this action will insure a proper wetting of substantially the entire area of the gummed surface of the flap.

The sealing roller 47 is freely journaled upon the cross shaft 36, which shaft is carried by and between the machine walls 27 and 48.

The moistening tube may be mounted upon one end of a suitable valve member 49, which valve member in turn may be operatively mounted in a valve body 50. The valve body 50 may be fastened upon the front face of the machine wall 48 as by suitable screw means 50', while the valve member may project through a suitable opening 51 formed in this wall.

It is preferable to mount the moistening tube upon the valve member whereby, as the valve member is actuated to turn off the source of water supply to the tube, it will also act to swing the tube from its operative to its inoperative position and vice versa. For this purpose, the valve member may be provided with an eccentric tubular extension 52 having a threaded end portion 53 to which, by means of the nut 54, the flanged end 55 of the moistening tube may be securely fastened. The moistening tube may be cylindrical in cross section but tapered from its proximal end to a well rounded point at its distal end and may be provided with a capillary slot 44 of such size as to prevent the free flow of water therethrough due to surface tension thereof and yet of such size as to permit water to be drawn through the capillary slot onto the gummed surface of the envelope flaps due to the affinity of water to such surfaces. If the slot is correctly proportioned, water will not feed therethrough onto the paper surface of the envelope flap but only onto the gummed surface thereof, thus making a neat, clean sealing operation.

Comparing Figures 3 and 4, it may be observed that the capillary slot will be directed downwardly while the tube is maintained in its operative position and will be directed upwardly for inspection and cleaning while in its inoperative position. Due to the eccentric mounting of the tube upon the valve member, the tube will be moved bodily far below the path of travel of the envelopes when turned to its inoperative position, while by the same turning movement of the valve member the source of fluid supply will be shut off.

The eccentricity of the tubular extension 52 of the valve member may be made use of for rocking the swing frame 35, which carries the flap opening blade 29 and guide plate 46, by passing this frame directly under the extension 52 (Fig. 6). By this arrangement, the flap opening, moistening and fluid supply means may be all simultaneously actuated to their operative and inoperative positions by turning a single means, namely, the valve member. For this purpose, the valve member may be provided with a thumb piece 56 and the extent of rotation governed by the valve member pin 57 engaging either end of an appropriate slot 58 formed in the end of the valve body.

The valve member may be of the tapered plug type and yieldingly retained in seating engagement with its related valve body bore as by the spring means 59, which spring means may act between the outer end of the valve member and a suitable cap 60. The cap 60 may be screw threaded onto the outer end of the valve body.

The valve body 50 is provided with suitable water passages 61 which cooperate with the water passage 62 formed in the valve member 49 when this member is turned to place the moistening tube in its operative position, whereby water may flow from any suitable source of supply into the moistening tube. In some instances it is desirable to feed the inflowing water to the distal end of the moistening tube and for this purpose a tapered tube 63 may be mounted at one end in the counterbored section 64 of the valve member tubular extension 52, (Figs. 3 and 4). With the valve member turned to its position, as illustrated in Figure 3, the water passage 62 thereof will register with the corresponding water passages 61 formed in the valve body and thus water will be carried by means of the tapered tube 63 to the upper end of the moistening tube and in this way insuring an equal distribution of water throughout the length of the moistening tube capillary slot 44. As stated, any suitable form of means may be provided for supplying water to the inlet passage 61 of the valve body. One form of such means is fully illustrated and described in the United States Letters Patent to Commodore D. Ryan, No. 1,894,427, dated January 17, 1933.

As sometimes there may be a small amount of drippage from the moistening tube, it is desirable to provide means for catching this moisture and conveying it to a suitable receptacle. For this purpose a drip pan 65 may be mounted upon the swing frame 35 directly below the moistening tube, as clearly shown in Figures 3 to 6. The drip pan may be provided with a hose attachment 66 for conveying the water to any suitable form of receptacle, not shown.

Operation

The machine illustrated in Figure 1 may be operated to seal the flaps of envelopes fed thereto and also for printing postage stamps upon the upper faces thereof. It is possible, as is well understood in this art, to disrupt the operation of the postage printing meter 24 and use the machine for the purpose of sealing envelopes only. When the machine is to be adjusted for this purpose, the control means previously referred to, and which is not shown, will be rendered inoperative, in the usual manner, thus permitting a continuous operation of the envelope feeding conveyor 21 whereby envelopes placed in the hopper 22 will be serially withdrawn therefrom and conveyed past the envelope opening, moistening and sealing means. It will be understood that the envelopes are placed in the hopper with their flaps directed downwardly whereby as each envelope is conveyed forwardly, the upper surface thereof will first engage and lift the envelope guide plate 30, which will act to depress or deform the envelope just in front of the entering edge 33 of the flap opening blade 29, thus permitting the entering edge of the flap opening blade 29 to enter between the flap and its related envelope body and to guide the flap so opened beneath the moistening tube 45 whereupon the gummed surface of the flap will become wetted as it passes across

the capillary slot 44. As the envelope continues its travel, the wetted flap will engage the sealing roller 47 which will act to return the flap into sealing engagement with the envelope. The envelope, after passing the sealing roller 47, will be carried by the conveyor through the printing meter and finally discharged from the machine. The operation of the machine is very rapid, accurate and neatly seals the envelopes supplied thereto. In some instances it is desirable to operate the machine for printing postage stamps upon postcards, or mail matter which has previously been sealed, and for this reason it is desirable to be able to render the flap opening and moistening means inoperative. This is accomplished in the manner previously described. When the machine is operated with the flap opening and moistening devices turned to their inoperative positions, the conveyor will carry the envelopes, or other mail matter, past these means without bringing them into operation.

Modified form of valve structure

In some instances it is desirable to arrange the valve means whereby when the valve member is turned to its off position a drainage passage will be opened to the moistening tube whereby the water contained therein may drain out and thus prevent this member from becoming coated with lime or other material carried by the water. In this form of valve structure, as shown in Figure 11, the valve body 67 may be provided with a suitable discharge or drainage passage 68 which may be connected to the drainage system of the machine, and the valve member 69 may be provided with a discharge or drainage passage 70 positioned to register with the passage 68 when the valve member is turned to the off position, as illustrated in this figure, whereby any moisture contained with the moistening tube may be drained out so as to prevent corrosion, or the incrustation of foreign matter upon the inner surface of the tube or in

the capillary slot. When the valve member is turned to place the moistening tube into its operative position, the passage 70 will be moved out of register with the passage 68, thus shutting off the escape of fluid from the moistening tube and simultaneously therewith bringing into registration the valve member inlet passage 71 with the valve body inlet passage 72 to establish a source of water supply to the tube.

It will be appreciated that the means for opening the envelope flaps may be used separately of the moistening device in other forms of envelope treating machines.

Having fully described the invention, it is to be understood that it is not to be limited to the details herein set forth but the invention is of the full scope of the appended claims.

I claim:

1. In a moistening device for an envelope sealing machine, a flap opening blade operatively mounted for movement to or from its active position, a moistening tube mounted independently of said blade and also operable to or from its operative position, a source of fluid supply for the tube, unitary means operable for simultaneously placing said blade, tube and fluid supply into or out of service.

2. In a moistening device for an envelope sealing machine, a flap opening blade having operative and inoperative positions, a moistening tube positioned adjacent the rear edge of said blade and likewise having operative and inoperative positions, said tube having a capillary slot arranged to be directed downwardly when the tube is actuated into its operative position for wetting the gummed surfaces of envelope flaps directed therepast by said blade and said slot arranged to be directed upwardly when the tube is turned into its inoperative position, and means for actuating the blade and tube to either of said positions.

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