July 20, 1937. V. E. HEYWOOD 2,087,345

MANUFACTURE OF WINDOW ENVELOPES

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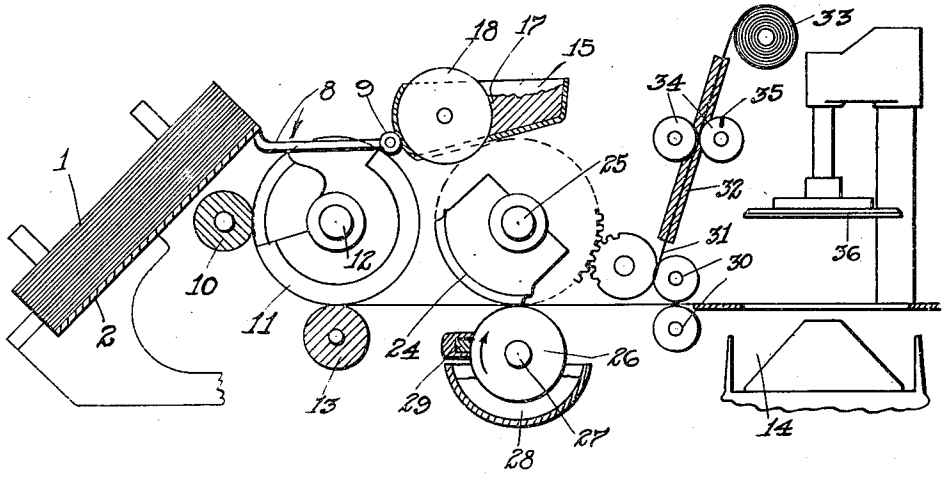


Fig. 1.

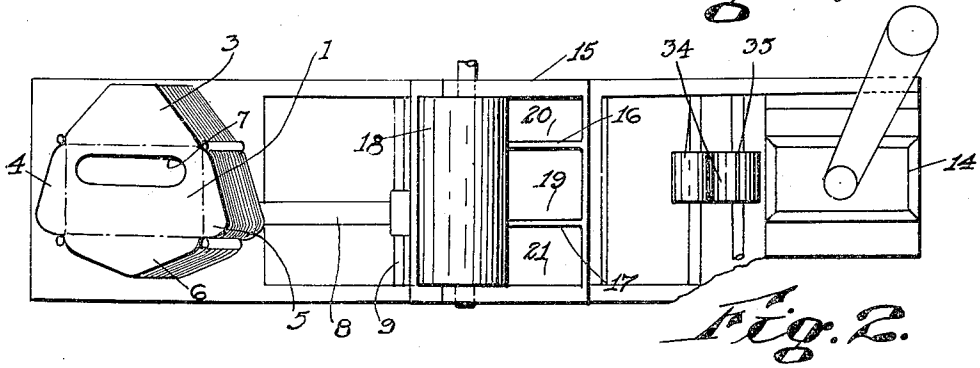


Fig. 2.

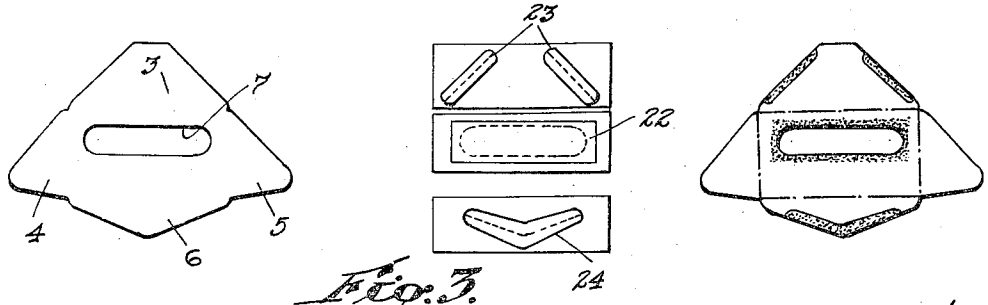


Fig. 3.

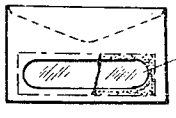


Fig. 4.

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MANUFACTURE OF WINDOW ENVELOPES

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4 Claims. (Cl. 93—61)

The present invention relates to the manufacture of window envelopes of the two-piece type, namely those characterized by a substantially transparent panel, or patch, secured within the inside of the envelope and covering an opening formed in the front wall of the same.

Window envelopes of this type, as heretofore manufactured, have been open to the objection that pieces of mail sometimes catch in the window openings, due to the fact that the patches are not completely secured around the edges of the window openings, and the present invention contemplates, among other things, the manufacture of envelopes in such a manner that each patch is adhered to the envelope over the entire area by which the patch overlaps the window aperture.

Briefly stated, the invention is characterized by the application of gumming to the envelope blanks so that the gum extends up to the very edge of each window opening, the gummed area being of such an extent that each patch or panel is completely and uniformly adhered to the envelope wall entirely around the opening. The invention further contemplates the application of seam gumming and seal flap gumming to the blank, simultaneously with the application of the patch gumming, so that the seam and seal gumming extends to the very edges of the envelope flaps; the net result being that two-piece window envelopes produced by the practice of my invention possess many advantages from the standpoint of patch and flap gumming over such envelopes as previously manufactured.

The above and other advantageous features of the invention will hereinafter more fully appear from the following description with reference to the accompanying drawing, in which:—

Fig. 1 is a view partially in vertical section and partially in side elevation of apparatus for carrying out the invention.

Fig. 2 is a plan view of the parts shown in Fig. 1, certain non-essential parts being broken away.

Fig. 3 is a diagrammatic view illustrating the edge gumming of envelope blanks in accordance with the practice of the invention.

Fig. 4 shows a completed window envelope.

Like reference characters refer to like parts in the different figures.

Referring first to Figs. 1 and 2 of the drawing, which are merely illustrative of one arrangement of instrumentalities for carrying out the invention, a stack of envelope blanks 1 is supported by a table 2, each blank providing extending flaps 3, 4, 5, and 6, with a window opening 7 extending longitudinally of the body of the blank adjacent the flap 3.

The stack of blanks is operated upon by suitable means for withdrawing the blanks one by one therefrom, the withdrawing means being shown as a sucker 8 pivotally mounted at 9, suction being applied thereto, coincidentally with its downward movement in the direction of the arrow to cause it to deliver a blank 1 into the bite between a roll 10 and a segmental feeder 11 rotatable on a shaft 12. The feeder 11 also cooperates with a second roll 13 to project a blank 1 horizontally in the direction of a folding box 14 of usual construction. In operation, the movement of the sucker 8 and feeder 11 are so timed that blanks 1 are withdrawn at intervals from the stack for delivery to the folding box, each blank 1 being operated upon in transit to the folding box by gumming and patch applying means which will next be described.

A gum box 15 is mounted above the plane of blank travel, and as best shown in Fig. 2, provides transverse partitions 16 and 17. A gumming roll 18 is rotatably supported between the walls of the box 15, with its axis at right angles to the partitions 16 and 17, the ends of which are curved as shown in Fig. 1, to closely fit the periphery of the roll 18. Therefore, the partitions 16 and 17, in conjunction with the roll 18 and bottom of the box, divide the gum box 15 into three separate compartments 19, 20 and 21. These separate compartments contain different kinds of gum, the compartment 19 containing patch gum, the compartment 20 containing seam flap gum, and the compartment 21 containing seal flap gum, all of which gums have different characteristics.

The roll 18 is rotatably driven, and as it turns in the box 15, is adapted to receive a covering of the different kinds of gum from the several compartments 19, 20, and 21, the curved ends of the partitions 16 and 17 in cooperation with the periphery of the roll serving to distribute the several kinds of gum around the periphery of the roll 18 in distinct zones. The gummed periphery of the roll 18 extends below the bottom of the gum box 15, as shown in Fig. 1, and cooperating therewith are three separate gumming elements 22, 23 and 24 rotatably mounted on a shaft 25, the axis of which is parallel to the gumming roll 18. The gumming elements 22, 23 and 24 are in the form of segments mounted on the shaft 25, and as best shown in Fig. 3, are so proportioned and spaced with reference to a blank 1 as to apply gum to definite areas around the window opening 7 and to the flaps 3 and 6, as the blank passes

flatwise beneath the shaft 25 and its moving surface is engaged by the gumming elements.

Cooperating with the gumming elements 22, 23 and 24 is a wet roll 26 mounted on a shaft 27, the axis of which is parallel to the axis of shaft 25 and lies in the same vertical plane. The lower portion of the wet roll 26 runs in a reservoir 28, preferably containing water, and as the roll 26 rotates in the direction of the arrow in Fig. 1, its surface is substantially dried by a wiper 29 loosely maintained against the surface of the roll 26. The segments carrying the gumming elements 22, 23, and 24 are so arranged on the shaft 25 that as a blank is delivered by the feeder 11 and roll 13 between the shafts 25 and 27, the advancing flap 5 is not engaged by the middle gumming element 22. However, as the body of the envelope blank enters the bite between the several segmental elements and the wet roll 26, the adhesively coated elements simultaneously engage a portion of the blank body around the window opening 7, as well as the flaps 3 and 6, thereby applying adhesive to the blank, as indicated by the stippled areas on the blank at the right of Fig. 3.

As indicated by dotted lines in the diagrammatic showing of Fig. 3, the width and length of the gumming element 22 are such that it completely overlaps the edge of the opening 7, thereby applying adhesive to a considerable area surrounding the opening, as well as up to and beyond the edges of the opening. While this action results in some adhesive being placed on the wet roll 26, due to its direct contact with the gumming element 22 within the opening 7, the surface of the roll 26 is cleared of adhesive by its movement through the water in the reservoir 28. This cleaning of the wet roll 26 effectively prevents any adhesive being applied to the under surface of the next succeeding envelope blank, any excess water on the wet roll being removed by the wiper 29. Simultaneously with the application of adhesive around the opening 7, adhesive is applied to the flaps 3 and 6 by the gumming elements 23 and 24, and as also indicated in dotted lines in Fig. 3, the proportions of the elements 23 and 24 are such that they overlap the outer edges of the flaps 3 and 6. Therefore, adhesive is applied to the very outer edges of the flaps 3 and 6, as shown in the blank at the right of Fig. 3, the wet roll being cleared of adhesive applied thereto by the overlapping of the gummers 23 and 24 in the same manner as described with reference to the gumming element 22.

As a blank is being gummed by its passage between the gumming elements and the wet roll as just described, its advancing flap 5 enters the bite between a pair of rolls 30, which serve to carry the blank over the folding box 14. Simultaneously with the arrival of the gummed area surrounding the window opening 7 at the rolls 30, a patch 31 of suitable transparent window material is delivered to the blank from a chute 32. As shown in Fig. 1, the patch material is drawn into the chute 32 from a supply roll 33 by a pair of rotatably driven feed rolls 34, one of which carries a knife 35 adapted to sever the patch material when a patch 31 of the desired length has been fed into the chute.

As best shown in Fig. 2, the patch feed rolls 34 and the chute 32 are symmetrically disposed in respect to the longitudinal axis of the window opening 7, so that as a blank arrives at the rolls 30, a patch 31 having substantially the same width as the gummed area around the window opening 7 is delivered to the blank. Therefore, as the blank and patch pass between the rolls 30, the patch 31 is pressed onto the blank and uniformly adhered thereto around the entire edge gummed area surrounding the window opening. In order to prevent crinkling of the patch and to insure exact registration with the gummed area around the window opening 7, the rolls 30 are preferably driven at a peripheral speed slightly greater than the peripheral speed of the patch feed rolls 34. This results in the patch material being maintained under an appreciable tension as it is applied to the gummed area surrounding the opening 7, after which the knife 35 operates to sever the patch 31 from the strip.

After application of the patch around the window opening, the blank is suitably positioned over the folding box 14 by gaging instrumentalities which form no part of the present invention, whereupon a plunger 36 carries the blank into the box to complete the folding operations in the usual manner. These folding operations result in completing the envelope with the edged gummed areas on the flap 3 overlapping the edges of the folded over flaps 4 and 5 and adhering thereto. In the completed envelope shown in Fig. 4, it is evident that the patch 31 is uniformly adhered to the inside of the front wall of the envelope over the entire area by which it overlaps the window opening 7. Therefore, there is no possibility of pieces of mail catching in the window opening at the joint between the edge of the opening and the patch.

I claim:

1. The improvement in the manufacture of window envelopes, which consists in advancing a blank having a window opening and extended flaps, then simultaneously applying different kinds of gum to areas surrounding said window opening and along said flaps, all of said gumming extending up to the precise edges of said window opening and said flaps and then applying a patch to said window opening, with the margin of said patch exactly coinciding with the edge gummed area surrounding said opening.

2. The improvement in the manufacture of window envelopes, which consists in advancing a blank having a window opening and extended flaps, simultaneously applying different kinds of adhesive precisely up to the edges of said window opening and flaps, applying a window patch to and exactly coinciding with the edge gummed area surrounding said opening and then folding said blank to cause adhesion between certain of the edge gummed flap areas.

3. In apparatus for the manufacture of window envelopes, the combination with means for advancing flat blanks, each having a window opening and extended flaps, of a container for different kinds of gum, gumming elements cooperating with said container for simultaneously applying the different kinds of gum so as to overlap the edges of the window opening and flaps of each blank, means for applying a patch exactly coinciding with the edge gummed area surrounding each window opening and means cooperating with said gumming elements for disposing of the superfluous gum from said elements.

4. Apparatus for the manufacture of window envelopes, comprising means for feeding flat blanks each having a window opening and extended flaps, means for folding each of said blanks into a completed envelope, a container for different kinds of gum interposed between

said blank feeding and folding means, rotating elements cooperating with said container for simultaneously applying different kinds of gum precisely up to the edges of the window opening and flaps of each blank, and means for applying a patch exactly coinciding with the gummed area surrounding each window opening, in advance of the operation of said folding means on a blank to cause adhesion between certain of the edge gummed flap areas.

VINCENT E. HEYWOOD.