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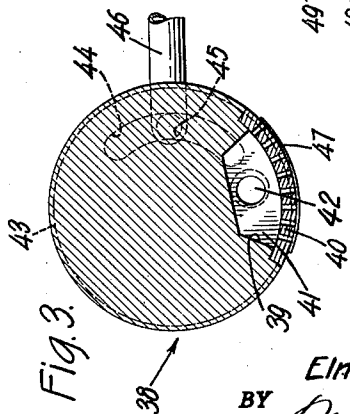
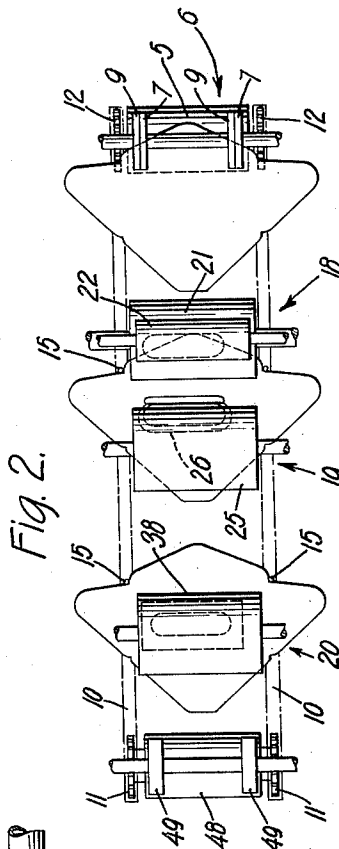
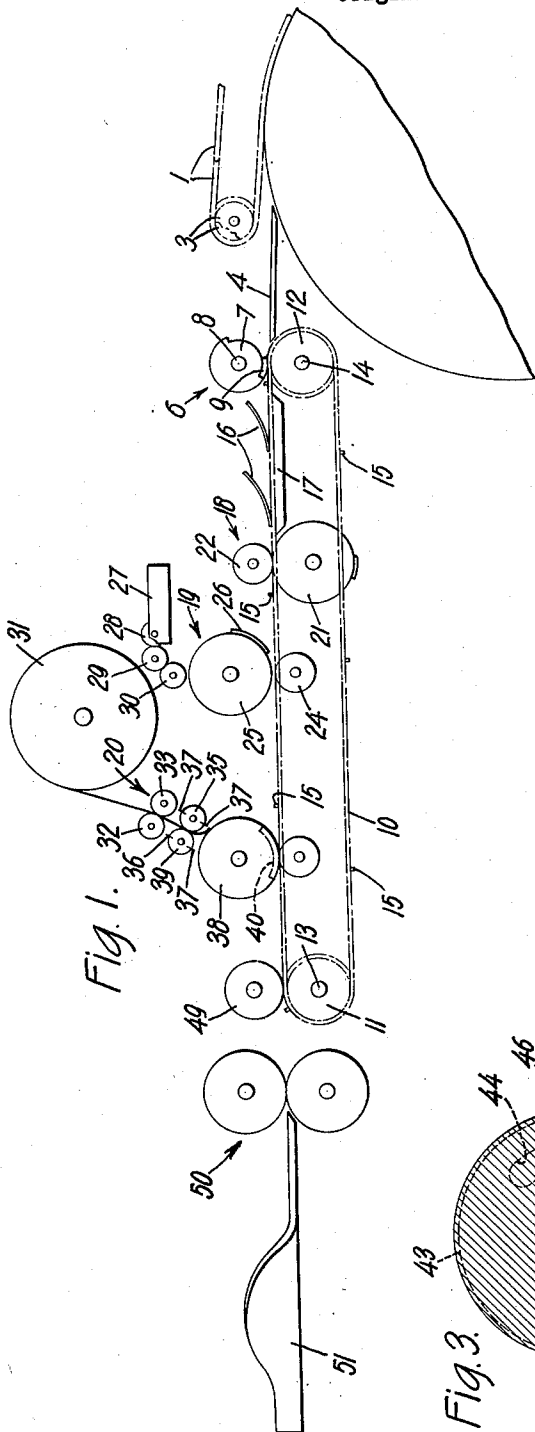
E. G. OVERLY

2,126,804

MACHINE FOR MAKING WINDOW ENVELOPES

Original Filed Dec. 8, 1931

2 Sheets-Sheet 1



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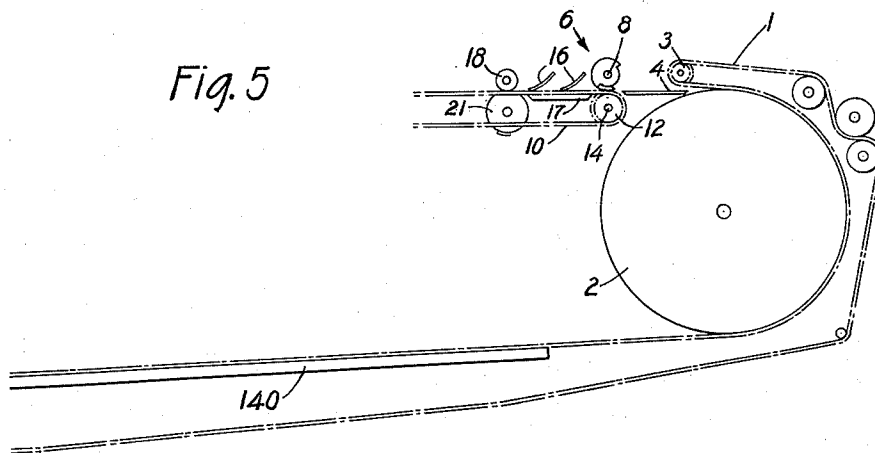
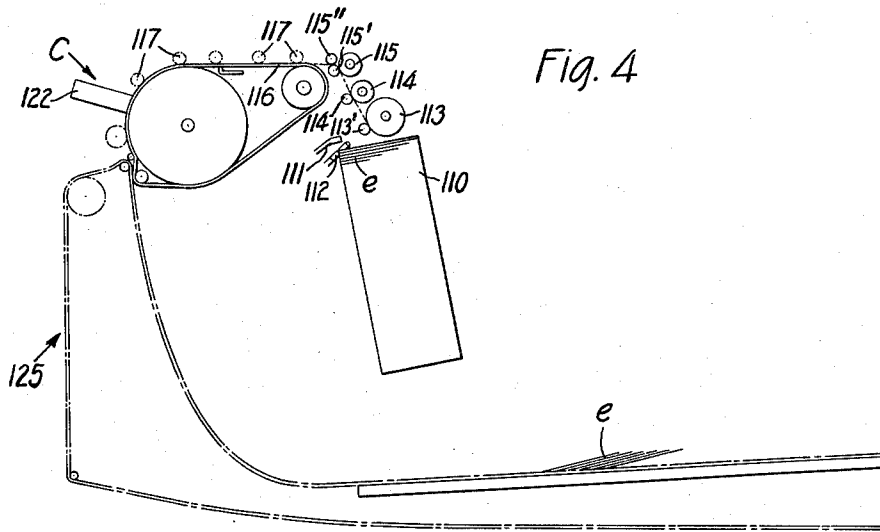
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UNITED STATES PATENT OFFICE

2,126,804

MACHINE FOR MAKING WINDOW
ENVELOPES

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10 Claims. (Cl. 93—61)

This invention relates to a method and to an improved machine for making window envelopes.

In making window envelopes it has heretofore been the practice to punch the window openings from the blanks before presenting them to the envelope making machine. This has the advantage that the window openings can be cut by the same mechanism and at the same operation at which the envelope blanks are cut from a web. It has the serious disadvantage, however, that the window openings give rise to a substantial difficulty in the treatment of the blanks in envelope making machinery of usual construction. Whether or not such machine comprises a fan-out gummer, it is obviously advantageous to conduct the blanks in fanned-out relation during drying of the sealing flaps, since this greatly reduces the necessary length of the drying conveyor. The presence of windows in the blanks necessitates, however, a modification of the separator means for taking the blanks from a stack and interferes with the arrangement of the blanks in fanned-out relation because of the tendency of each following blank to catch in the window opening of the next blank in advance when overtaking it.

In accordance with the present invention it is a feature that the blanks are presented to the envelope machine with no window openings cut therein, that the blanks are gummed and then dried in fanned-out relation, and that after the drying, when there is no further occasion to maintain or arrange the blanks in fanned-out relation, window openings are cut, window patches are applied, and the side flaps, bottom flap, and sealing flap are folded.

It is a further object of the invention to provide the window cutting and patch applying mechanism in a standard envelope making machine with the least possible alteration of the machine.

It is a further feature that the window cutting and patch applying mechanism is arranged to act upon the blanks while they are accurately timed and aligned and under the influence of positive conveyor mechanism interposed between the drier and the folding mechanism. Such conveyor mechanism is present in the standard machine for re-timing and re-aligning the blanks preparatory to folding, and in addition to re-timing and re-aligning the blanks it acts positively to advance the blanks. By arranging the window cutting and patch applying means at the point referred to, the presence of this conveyor is taken advantage of to secure absolute precision in the

relationship of the blanks to the window cutting and patch applying means.

It is a further feature of the invention that the window cutting, paste applying, and patch applying means all cooperate with a single blank timing and feeding conveyor at predetermined points therealong, the arrangement being such that all of such mechanisms may be caused to operate a little nearer to, or farther from, the bottom edge of the body portion of the blank simply by setting the conveyor mechanism a little forward or back with relation to the other operating parts.

Other objects and advantages will hereinafter appear.

In the drawings forming part of this specification:

Figure 1 is a fragmentary, diagrammatic, side elevation of a portion of an envelope making machine embodying features of the present invention;

Figure 2 is a diagrammatic, plan view of a conveyor disclosed in Figure 1, and of instrumentalities for operating on the blanks while under the influence of such conveyor;

Figure 3 is a fragmentary, sectional view illustrating a suction patch transferrer and applier;

Figure 4 is a view in side elevation largely diagrammatic showing the mechanism for arranging the blanks in fanned-out relation and for gumming and drying the fanned-out blanks; and

Figure 5 is a view showing the delivery end of the drying conveyor and a portion of the subsequent mechanism associated therewith.

The present invention is illustrated as applied to a wide range open side envelope making machine of the kind illustrated in Letters Patent of the United States No. 1,807,867, issued to Abraham Novick on June 2, 1931.

The machine comprises a mechanism like that disclosed in Novick Patent No. 1,807,867, for taking blanks singly from a stack, arranging them in fanned-out relation, and gumming the sealing flaps and drying the same while the blanks are in fanned-out relation. Such mechanism is shown in Figs. 4 and 5. Referring to Fig. 4, 110 denotes a pile of blanks from which the blanks are fed singly by means of mechanism comprising a sucker 111 and a member 112 which serves to transfer the separated blank into the grip of conveying rolls 113, 113'. The feeding device creates a band of fanned-out envelopes. To this end the roll 113' is arranged to move back and forth a slight amount along the periphery of the larger roll 113, and to be held against this roll by

spring pressure. In this manner rolls 113, 113' are caused to grip the blanks. Following rolls 113, 113', rolls 114, 114', 115, 115', and 115'' are provided, which convey the envelope blanks to an endless conveyor belt 116 and cooperating rollers 117. The belt 116 and rollers 117 convey the envelope band past a gumming device C. After gumming the envelopes are delivered to a drier 125 which comprises conveyor chains 1 to which the blanks are clipped individually. The conveyor chains 1 are passed around a cylinder 2 and are doubled back at their delivery ends around small end rollers 3. The blanks, in fanned-out relation, are carried over a blower 140 and are delivered by the drier onto a table 4. They pass thence between a roller 5 and feeding segments 6. Each feeding segment comprises a segmental disc 7 fixed on a shaft 8 and a segmental disc 9 adjustable on the shaft 8. The roller 5 and the segments 6 operate at a much higher peripheral speed than the linear speed of belt 1, and act to seize the leading blank by its protruding margin and to advance it quickly to a position clear of the fanned-out blanks on the table 4. A conveyor comprising two chains 10 is provided, these chains being mounted upon end sprockets 11 and 12 which are fast, respectively, upon shafts 13 and 14. The chains 10 are provided with pins 15 adapted to engage the blanks at the vertices of the angles formed by the junctions of the side flaps with the sealing flaps of the blanks. Since the blanks may have been disarranged a little in traveling through the gummer and drier, this mechanism is provided for re-aligning and re-timing the blanks preparatory to the flap folding operations. The blanks are delivered onto the chains 10 a little early with reference to the pins 15, and are retarded by friction members 16 which bear upon the blanks as they travel over a table 17. The table 17 is substantially flush with the upper surfaces of the chains 10. It will be apparent that the blanks are accurately timed and aligned by the pins 15 in conjunction with the friction members 16, and that the blanks are advanced positively by the pins 15.

Advantage is taken of this accurate timing and aligning and positive feeding to provide a mechanism 18 for punching the window openings in the blanks, a mechanism 19 for gumming the blanks around said window openings, and a mechanism 20 for applying patches to the gummed blanks, all while the blanks are being advanced by the chains 10. The window cutting mechanism comprises coating rollers 21 and 22, the former provided with a die member 23 and the latter with a coating cutting bed. Suitable provision may be made in the usual way for disposing of the chips thus cut from the blanks. The gumming mechanism 19 comprises a bed roll 24, a roll 25 provided with a gum applying member 26, a gum pot 27 and transfer rolls 28, 29 and 30.

The patch applying mechanism comprises a reel 31 of suitable patch material such as cellophane, a pair of cooperating feed rollers 32 and 33, a pair of cooperating cutting rollers 34 and 35 provided with blades 36 and 37, and a patch transferring and applying roller 38. The rolls 21, 25 and 38 are each designed to make one complete revolution for each blank carried past them, and hence are of the same effective circumferential extent as the distance between successive pins 15 on the conveyors 10. The cutter rollers 34 and 35, however, cut a patch for each

half revolution of their travel and are therefore geared to travel at one-half the angular speed of the roller 38.

The patch transferring and applying roller 38 is generally solid but has a longitudinally extending chamber 39 provided in one sector thereof. This chamber 39 is covered by a perforated arcuate plate 40 and is closed at its ends, with the exception that an end wall 41 has an opening 42 through it. The end of the cylinder runs in sealed engagement with a disc 43, which disc has an arcuate channel 44 provided in the face thereof which is contiguous to the cylinder. This channel 44 communicates through a passage 45 and a pipe 46 with a suitable source of suction. The arrangement is such that the opening 42 is carried in the rotation of the cylinder into and out of registration with the channel 44 of the stationary disc 43, the result being that suction is applied within the chamber 39 whenever such opening is in registration with the channel 44. The patch or window web is desirably continuously advanced by the rollers 32 and 33, the leading end of the web being swept or pushed around by the roller 38 in the direction in which said roller rotates. The cutting rolls 34 and 35 are so timed that a patch is severed from the end of the web just when the perforated plate 40 is in position to be covered by the patch so severed and at a time when suction is applied to the chamber 39. The severed patch is thus immediately drawn completely into engagement with the plate 40 and is carried by the plate to the envelope blank and applied to the blank. The channel 44 is so designed that the source of suction is cut off from the chamber 39 simultaneously with the first contact of the patch 47 with the envelope blank.

Provision is made at the delivery end of the conveyor formed by chains 10 of a feed roller 48 and cooperating feed segments 49 for delivering the blanks to a scoring mechanism 50. The blanks pass from the scoring mechanism to side flap folding mechanism of which one element (a folding plate) is indicated at 51, and pass thence to the other instrumentalities for completing the manufacture of the blanks into envelopes.

It will be observed that the pins 15 collate the blanks with reference to a line which is subsequently to be the bottom fold line defining the lower edge of the face of the finished envelope. By properly timing the chains 10 with reference to the rollers 21, 25 and 38 the distance of the windows from the bottom edges of the envelopes may be accurately controlled. When it is desired to change this distance it is not necessary to adjust each of the mechanisms individually, but it is only necessary to adjust the chains 10 and the segments 6 forward or back while leaving the other operating parts stationary.

I have illustrated and described in detail certain preferred embodiments of my invention. I do not wish, however, to be confined to the embodiments shown, but what I desire to cover by Letters Patent is set forth in the appended claims.

I claim:

1. In an envelope machine, in combination, means for fanning out blanks, means for gumming the blanks in fanned-out condition, means for thereafter spacing out the blanks, means for positively advancing them at uniform speed, rotary means for cutting window openings in the traveling blanks, means for applying window

patches to the traveling blanks, and means for thereafter folding the blanks.

2. In an envelope machine, in combination, means for gumming and means for drying the sealing flaps of the envelope blanks, means for folding the bottom and side flaps of the blanks, means interposed between said gumming and folding means for timing, aligning and positively feeding the blanks at uniform speed, rotary means acting on the timed and aligned blanks in advance of folding for cutting window openings in the traveling blanks and means for applying window patches to the traveling blanks.

3. In an envelope machine, in combination, a gummer, a fan-out drier, means taking the blanks from the drier and spacing them apart, means for accurately timing and aligning and positively advancing the blanks at uniform speed, rotary means for cutting window openings in the traveling blanks, and means for applying window patches while the timed and aligned blanks are being positively advanced.

4. A machine for making window envelopes comprising means for advancing a series of blanks in overlapping relation, means for detaching the foremost blank of said series, speeding it up so as to space it from the series, means for timing and aligning said blank and then positively advancing it at uniform speed, rotary means for operating on the so-detached blank while in motion to cut a window opening therein, means for applying a patch to the blank over said window opening, and means for folding the timed and aligned blank.

5. A machine for making window envelopes comprising means for advancing a series of blanks in overlapping relation, means for detaching the foremost blank of said series, speeding it up so as to space it from the series, means for timing and aligning said blank and then positively advancing it at uniform speed, rotary means for operating on the so-detached blank while in motion to cut a window opening therein, and means for folding the timed and aligned blank.

6. A machine for making window envelopes from whole blanks, comprising means for advancing a series of the blanks in overlapping relation, means for detaching and speeding up the foremost blank of said series, means for timing and aligning the detached blank and advancing it at uniform speed comprising a pair of uniformly traveling aligned pusher elements engageable with the trailing edge of the blank, means acting on the blank while it is being advanced by the pusher elements, comprising a rotary window cutter, a rotary gummer, and a rotary window applying device, all traveling at the same speed as the blank, and means for thereafter acting upon the timed and aligned blank to fold the same.

7. In an envelope making machine, the combination of means for delivering blanks in fanned-out relation, a table for receiving said fanned-out blanks, means operating at a speed greater than

the speed of said delivery means for removing the blanks individually from said table, a conveyor to which said removal means delivers said individualized blanks, means for frictionally engaging the individualized blanks in order to retard their movement by the conveyor, means carried by the conveyor for positively engaging the blanks edgewise thereof in order to align them and time their movement, and instrumentalities timed with relation to said conveyor for operating on said blanks, said instrumentalities comprising a pair of rolls for engaging the blanks from above and below for cutting window openings therein and means for applying patches over said openings.

8. In an envelope making machine, the combination of means for delivering in fanned-out relation blanks having gummed fold flaps, means operating at a speed greater than that of said delivery means for individually removing said blanks from fanned-out relation, means for positively advancing said blanks when so individualized, means forming part of the blank advancing means for aligning and timing said blanks while advancing, and instrumentalities timed with relation to said advancing means for successively operating on said blanks, said instrumentalities comprising a pair of rolls for engaging the blanks from above and below for cutting window openings therein and means for applying patches over said openings.

9. In a machine for making window envelopes, the combination of means for delivering in fanned-out relation envelope blanks having gummed fold flaps, means for individualizing said blanks respectively, means for advancing said individualized blanks, means frictionally engaging the upper surface of said blanks for retarding their movement, and means forming part of the blank advancing means co-operative with said retarding means for aligning said blanks and bringing them into timed relationship with instrumentalities operating thereon, said instrumentalities comprising a pair of rolls for engaging the blanks from above and below for cutting window openings therein and means for applying patches over said openings.

10. In a machine for making window envelopes from whole blanks, in combination, means for individualizing the blanks, rotary means for cutting window openings in the blanks, rotary means for gumming the margins of the window openings, rotary means for applying patches over the window openings, and continuously operating pusher mechanism for advancing the blanks in timed relation past the window cutting, window gumming, and patch applying mechanisms, said pusher means engaging each blank in line with the lower boundary of the face or body portion, and being adjustable to change the location of the window relative to said boundary without disturbing the feeding of the window cutting, window gumming, and patch applying means.

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