Jan. 25, 1938. A. NOVICK 2,106,255

ENVELOPE MACHINE

Filed Nov. 29, 1932

Fig. 2.

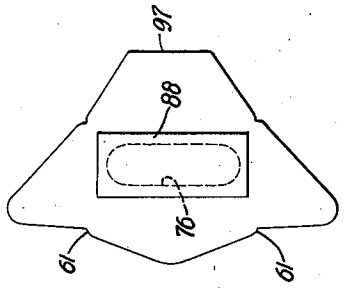


Fig. 1.

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ENVELOPE MACHINE

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5 Claims. (Cl. 93—61)

This invention relates to envelope making and has for an object to provide a machine and method whereby envelopes may be made more efficiently and economically than heretofore. Even though the first operation performed on the blanks in an envelope making machine be to feed them to a fan-out gummer in fanned-out relation, the blanks ordinarily are individually separated when first taken from the blank stack and are thereafter rearranged in fanned-out relation for presentation to the gummer.

It is an object of the present invention to provide, in combination, means for separating envelope blanks from a stack and individualizing them, means for performing a necessary operation upon the individualized blanks, and means for thereafter rearranging them directly in fanned out relation for the continuation of the process of making them into finished envelopes.

In accordance with one embodiment the operation performed on the individualized blanks may be the printing of the lining faces of the blanks. Such printing is employed, for example, to make the envelope opaque, to ornament the lining, or to provide a business form. The printing may in some instances consist of the application of a composition to render window portions of the blanks transparent. The invention may also be practiced by printing upon the outer faces of the envelope blanks.

It has been the practice heretofore to print the lining faces of the blanks on the machine which cuts the blanks from a paper web or upon a separate machine after the blanks have been cut and before they have been delivered to the envelope making machine. The present invention simplifies and reduces the cost of manufacture of envelopes of the kind referred to by combining lining printing mechanism with the other instrumentalities of an envelope making machine.

In accordance with another embodiment of the invention the operation performed on the individualized blanks may be the cutting of window openings and the application of window patches thereto. It is an important feature of this embodiment that provision is made for rearranging the individualized, patched blanks directly in fanned-out relation without liability of catching the free edge of one blank or its patch in the window opening of an adjacent blank.

Other objects and advantages will hereinafter appear.

In the drawing forming part of this specification,

Figure 1 is a fragmentary, sectional, side elevation, largely diagrammatic, of an envelope machine embodying features of the invention; and

Figure 2 is a plan view of the lining side of a blank having a patch applied to it by the mechanism of Figure 1.

In the embodiment of the invention illustrated in Fig. 1, the blanks are initially arranged in the form of a stack **50** in a magazine **51**. The blanks are taken singly from the bottom of the stack by separator mechanism. This separator mechanism is desirably the same as that illustrated in my pending application Serial No. 628,302, filed August 11, 1932, for Envelope machines, and is, therefore, only partially illustrated herein. Briefly, the separator mechanism comprises a pneumatic picker device **52** which starts the lower edge of a blank away from the stack, a wedge or dagger device **53** which presses the separated margin away from the stack and toward a variable speed roller **54**, and auxiliary feed rollers **55** which are oscillated upon the periphery of the speed roller **54** to cause the lower margin of the blank to be gripped and to be fed forward by the feed roller **54** at the appropriate time in the cycle. The feed rollers **54** and **55** and a feed roller **56** that cooperates with the roller **54** act to advance the blank between a feed roller **57** and a feed segment **58** which form a feeding couple. The feeding couple **57, 58** is located at the introductory end of a conveyor **59** and desirably operates at the same peripheral speed as the conveyor **59**. The conveyor **59** comprises a pair of parallel chains which carry pusher pins **60**. The pusher pins **60** engage in notches **61** of the envelope blank formed at the junction of the sealing flap with the end flaps (see Fig. 2), and act to advance the individualized blank in accurately timed and aligned relation. Friction brushes **62** and **63** act upon the blanks to exert a retarding influence and thereby assure proper engagement of the blanks with the pusher pins. Each individualized blank is carried past a cutter **64** and a cooperating bed cylinder **65** which rotate at a peripheral speed equal to the speed of the conveyor **59**. The cutter is effective to cut a window opening in the blank but not to remove the chip formed by such cutting. The blank is next carried by the conveyor **59** past a chip removing mechanism which comprises a tucker blade **66** and a gripper jaw **67**, the jaw being carried by a cylinder **68**.

The blank is next advanced by the conveyor **59** past a gumming mechanism **69**. This mechanism comprises a gum pot **70**, a pickup roller **71**, successive transfer rollers **72** and **73**, a gumming seg-

ment 74 and a bed roller 75 for cooperating with the gumming segment. The gumming segment applies gum to the marginal portions of the blank which border upon the window opening 76.

The blank is finally delivered by the conveyor 59 to a patch applying mechanism 77. This mechanism may be the same as that illustrated in Letters Patent of the United States #1,827,539, granted to me October 13, 1931. Briefly, the mechanism comprises a shaft 78 which carries a roll 79 of patch material. The patch web is drawn intermittently from the roll 79 around a guide roller 80 by means of an intermittently operated feeding couple 81, 82. The leading end of the patch web is fed across a stationary cutter member 83 and a patch length is severed from it by a cooperating cutter blade 84 which is carried by a reciprocating arm 85. A patch transferrer 86 carries a gripper 87 which grips the severed patch 88 and delivers it to a suction patch applying roller 89. The patch applying roller 89 cooperates with a roller 90 to continue the advance of the blank at the same speed at which it was advanced by the conveyor 59. The feeding couple formed by the members 89 and 90 delivers the blank onto a table along which a conveyor chain 91 is operated. The conveyor chain 91 runs at a little slower speed than the peripheral speed of the members 89 and 90 and carries a gripper 92 for gripping the blanks by their leading margins. Each blank is delivered in such timed relation to the travel of the conveyor chain 91 that its leading margin overtakes an open gripper. After the leading margin of the blank is properly positioned in the gripper the tail of the gripper rides off of a cam member and the gripper snaps closed on the blank to draw it forward. This conveyor and gripper mechanism, and the mechanism at the delivery end of the conveyor for rearranging the blanks in fanned-out relation may be like that disclosed in Letters Patent of the United States #1,656,289, granted to me on January 17, 1928, for Envelope transfer mechanism. The conveyor chain 91 runs upon sprockets 93 and 94. A pair of retarding wheels 96 are mounted co-axially with the sprocket 94 but are driven at a much slower speed than the conveyor chain 91. The retarding wheels advance a single tooth space for each blank delivered whereas the conveyor chain 91 travels the distance from one gripper to the next between the delivery of successive blanks. The teeth of the retarding wheel 96 are disposed to engage in the leading edge 97 of the blank, near its ends. Each gripper 92 is caused to be released by engagement with a hub 98 which is mounted co-axial with the sprocket 94. Each gripper is so formed that it may cam underneath a blank which is restrained by the retarding wheel, lift such restrained blank and pass under it while holding it clear of the blank on the conveyor 91 which the gripper itself is advancing. After the delivery of a blank the continued rotation of the retarding wheel 96 acts to carry the following tooth into position to lift the leading edge of the blank and press it against conveyor belts 99. Conveyor belts 99 run on pulleys 100, 101 and 102 and are driven at the same speed as the outer extremities of the teeth of the retarding wheels 96. The conveyor belts 99 cooperate with a broad, smooth conveyor belt 103 to carry the fanned-out blanks past a gum applying member 104 for gumming the sealing flaps. From the fan-out gummer the blanks are delivered to a drying conveyor 105. From the drier 105 the blanks pass to other instrumentalities (not shown) for completing the manufacture of the blanks into finished envelopes in the usual manner.

I have described what I believe to be the best embodiment of my invention. I do not wish, however, to be confined to the embodiment shown, but what I desire to cover by Letters Patent is set forth in the appended claims.

I claim:

1. The method of making window envelopes which comprises separating whole blanks successively from a stack, individualizing the separated blanks, cutting window openings in the individualized blanks, applying window patches to the individualized blanks, feeding the blanks directly into fanned-out relation and gumming the sealing flaps of the fanned-out blanks.

2. The method of making window envelopes which comprises individualizing envelope blanks, applying window patches successively to the upper faces of the individualized blanks, feeding each blank beneath its predecessor so that only its upper trailing margin is exposed, and gumming the upper trailing margins of the blanks.

3. In an envelope making machine, in combination, means for taking blanks from a stack and individualizing them, means for applying a window patch to the upper face of each individualized blank, means for directly rearranging the individualized blanks in fanned-out relation, comprising a retarder and means for carrying each blank beneath its predecessor, and means for gumming the upper trailing margins of the fanned-out blanks.

4. In an envelope making machine, the combination of means for removing blanks from a stack, means for delivering them face down to a conveyor, means co-operating with the conveyor to individualize the blanks while face down, instrumentalities for successively operating on each blank while face down, means for re-arranging the blanks in fanned-out relation while maintaining them face down, and means for thereafter operating upon the fanned-out blanks.

5. In an envelope making machine, in combination, means for taking blanks from a stack and individualizing them, means for applying a window patch to each individualized blank, means for advancing the blanks at relatively high speed to and beyond the patch applying means, means for thereafter advancing the blanks at a relatively low speed for gumming, means for facilitating the direct transfer of the blanks from the fast to the slow blank advancing means, whereby the blanks are directly rearranged from individualized relation into fanned-out relation, and means for gumming the sealing flaps of the fanned-out blanks.

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