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O'Neill

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[54] **METHOD OF MAKING WINDOW ENVELOPES**

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Related U.S. Application Data

[62] Division of Ser. No. 864,675, Oct. 8, 1969.

[52] **U.S. Cl.** .....**93/61 A,** 83/54, 156/108, 156/514

[51] **Int. Cl.** **B31b 1/24**

[58] **Field of Search** .....93/61 A, 61 R, 35 MW; 83/911, 912, 54, 55, 178, 188, 191, 195, 627, 633; 156/514, 584, 108, 256

[56] **References Cited**

UNITED STATES PATENTS

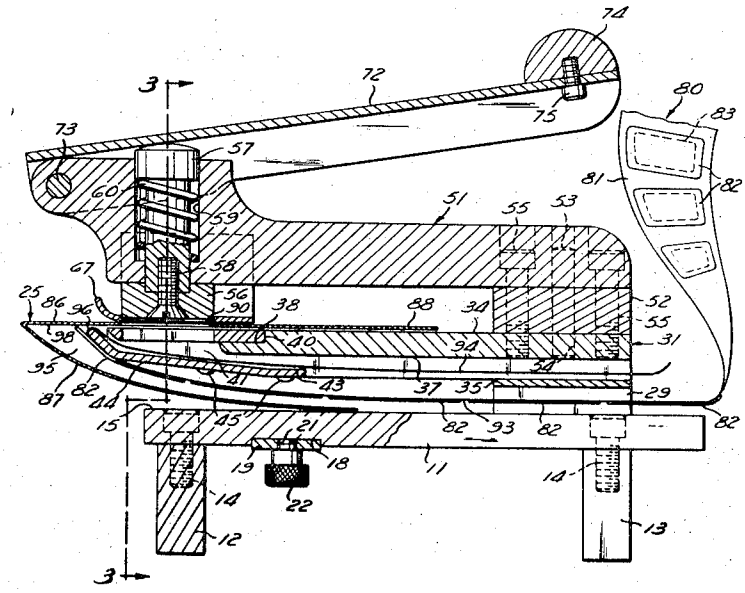
3,259,003	7/1966	Griffin	83/54
666,523	1/1901	Hodshon	83/633 X
3,329,052	7/1967	Simjian	83/191 X
2,389,105	11/1945	Kern	83/627 X
3,163,569	12/1964	Brundage	156/514 X
3,450,009	6/1969	Dohnalik	93/61 A X

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[57] **ABSTRACT**

A method is disclosed for producing window envelopes from preformed windowless envelopes. Front and rear wall portions of a preformed envelope are separated, and a window opening is punched in one of the wall portions. A transparent window pane is located in the interior of the preformed envelope between the separated wall portions by a flexible carrier web and is removed from the carrier web within the interior of the envelope by passing the carrier web over a guide plate which abruptly changes the direction of travel of the carrier web. The window pane is removed from the carrier web and affixed to the interior surface of the one wall portion as the envelope is removed from the punching dies. The window panes are adhesively secured to the carrier web in longitudinally spaced apart relation, and the carrier web is fed into and out of the envelopes in a direction substantially parallel to the wall of the envelope to which the window pane is to be affixed.

7 Claims, 4 Drawing Figures



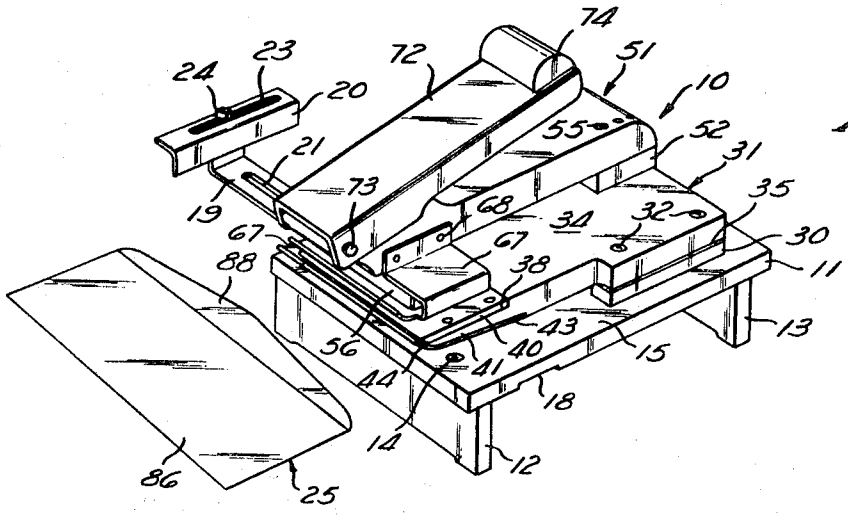

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Fig. 1

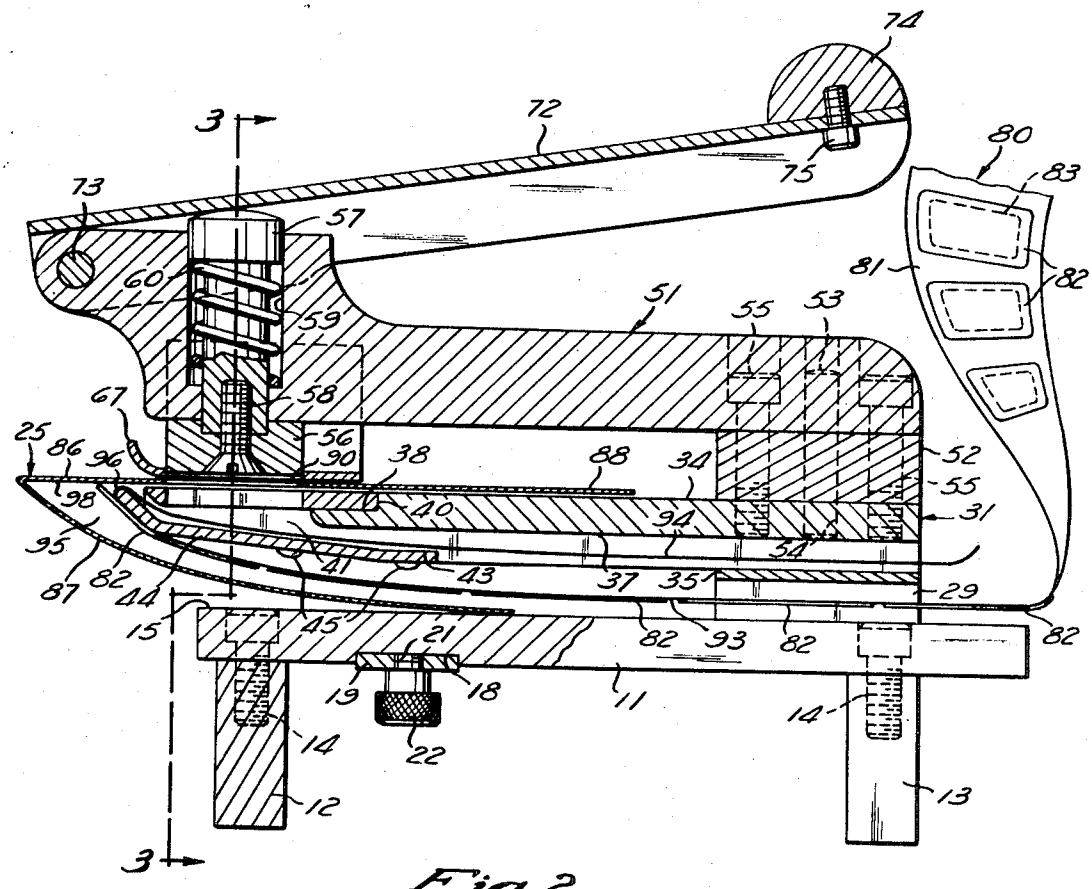
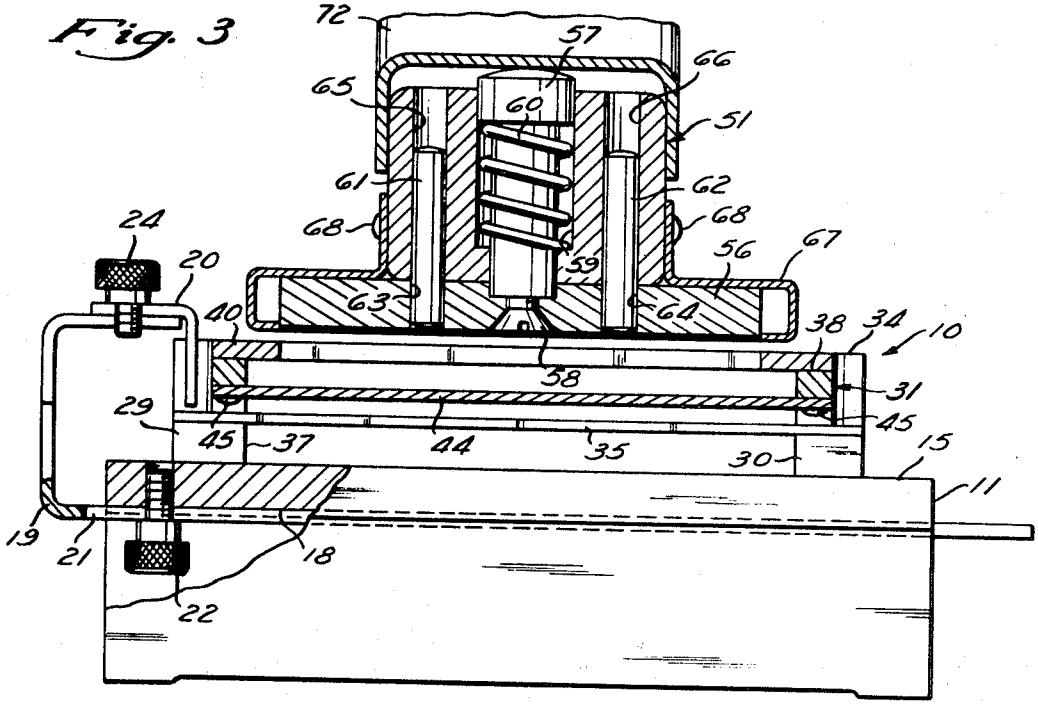

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Fig. 2

Fig. 3


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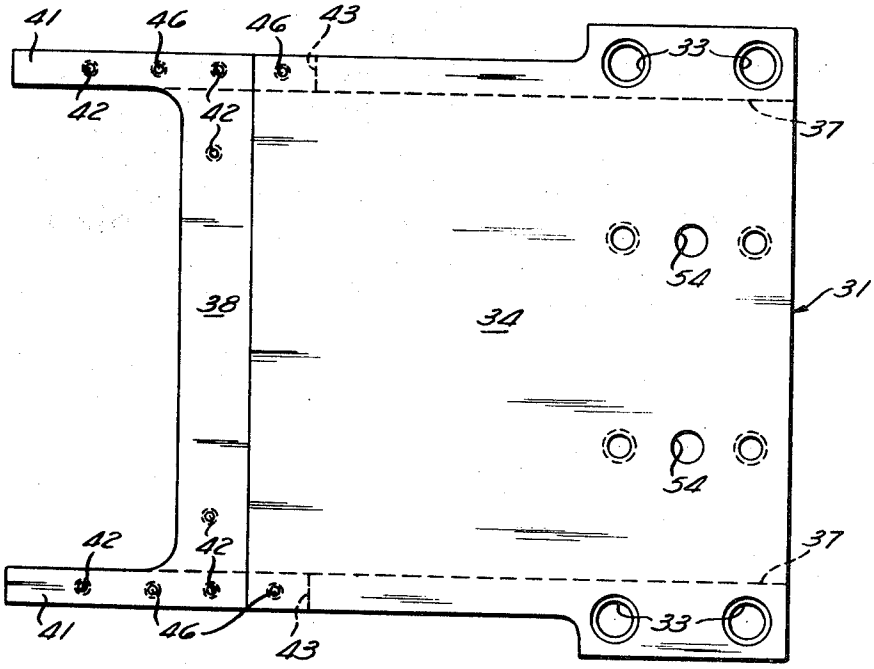

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Fig. 4

METHOD OF MAKING WINDOW ENVELOPES

This application is a division of application Ser. No. 864,675, filed Oct. 8, 1969.

BACKGROUND OF THE INVENTION

This invention relates generally to a method for producing window envelopes, and more particularly to a method for producing window envelopes from preformed windowless envelopes.

Window envelopes are commonly produced by automated methods which cut a window opening in an envelope blank prior to folding the envelope blank to form an envelope. A window pane is cut from a sheet of pane material, carried to the envelope blank window opening, and affixed thereabout to provide a substantially transparent closure for the window opening. The blank is then folded to complete the information of the window envelope.

Because such prior art methods require forming the window opening and affixing the window pane prior to complete formation of the envelope, it is presently necessary for consumers to stock both window envelopes and windowless envelopes of various sizes and types, even if the use of window envelopes it rather infrequent. Furthermore, it may be necessary to stock each type and size window envelope with the window located in various positions on the front face of the envelope.

SUMMARY OF THE INVENTION

The present invention overcomes these and other disadvantages of prior art methods for producing window envelopes by providing a method for producing window envelopes from preformed windowless envelopes. In this manner, the invention permits consumers to stock only preformed windowless envelopes, and obviates the necessity of stocking a variety of window envelopes, particularly when such window envelopes are used rather infrequently.

Accordingly to a first feature of the invention, a method is provided for forming a window opening in a performed windowless envelope. According to this feature of the invention, the opposed walls of a performed windowless envelope are separated and a window opening is formed in one of the walls. In a specific embodiment, a punching die is interspaced between the opposed walls to form the opening, and the opening may be formed at any desired location in the wall.

A second feature of the invention provides a method for affixing a window pane to an interior surface of a preformed envelope having a window opening. According to this feature of the invention, the opposed walls of a preformed envelope are separated, a window pane is located within the interior of the preformed envelope between the separated opposed walls, and the pane is affixed to one of the opposed walls. Further according to this aspect of the invention, the window pane is located within the interior of the preformed envelope by a flexible carrier web, and the pane is removed from the carrier web by a guide means which abruptly changes the direction of movement of the carrier web within the interior of the preformed envelope. In a specific embodiment, the carrier web is moved into and out of the interior of the preformed envelope in a direction substantially parallel to the wall of the envelope to which the pane is to be affixed to minimize the separation of the opposed walls of the envelope and

prevent wrinkling or tearing of the envelope. Further according to this aspect of the invention, a flexible web product is provided which includes an elongated carrier web and a plurality of window panes affixed to the carrier web by a pressure sensitive adhesive in longitudinally spaced apart relation. The pressure sensitive adhesive is applied to only the outer peripheral portion of each of the window panes, so that the pressure sensitive adhesive will not be exposed through the window opening in the completed window envelope.

According to a third aspect of the invention, the first and second aspects of the invention are combined to produce a method for producing a window envelope from a preformed windowless envelope in a single and continuous operation. According to this third aspect of the invention, a window pane is located within the interior of a preformed windowless envelope, a window opening is formed in the one wall of the preformed envelope, and the window pane is thereafter affixed to the one wall of the envelope. The window pane is cut outside of the preformed envelope and located in the interior of the preformed envelope by a continuous flexible carrier web, and the window pane is removed from the carrier web by abruptly changing the direction of movement of the carrier web within the interior of the envelope. The window pane is removed from the carrier web and affixed to the preformed envelope while the envelope is being removed from the means for forming the window opening to still further increase the speed of the method.

BRIEF DESCRIPTION OF THE DRAWINGS

These and other aspects and advantages of the invention will become more readily apparent to those skilled in the art upon a full understanding of the preferred embodiment of the invention described in detail hereinafter and shown in the accompanying drawings, wherein:

FIG. 1 is a perspective view of a window envelope machine incorporating the principles of the invention, showing a preformed windowless envelope about to be positioned in the machine;

FIG. 2 is a cross-sectional, side elevational view of the machine shown in FIG. 1, with the preformed envelope positioned therein and a window opening formed in the envelope;

FIG. 3 is a cross-sectional view taken along reference view line 3—3 in FIG. 2; and

FIG. 4 is a plan view of the lower die fixture of the machine shown in FIG. 1.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings in greater detail, a manually operated window envelope machine **10** is shown which includes a base plate **11** supported by legs **12** and **13**. The base plate **11** and the legs **12** and **13** are fabricated from suitable cold rolled steel stock in the illustrated embodiment, and the legs **12** and **13** are each secured to the base **11** by two hexagonal socket head cap screws **14** suitably recessed in the base plate **11** to provide the base plate **11** with a smooth uninterrupted top surface **15**. A recess **18** extends laterally across the lower surface of the base plate **11** and slidably receives a support bracket **19** which carries an envelope guide bar **20**. An elongated opening **21** extends substantially the entire length of the support bracket **19**

and receives a knurled locking screw 22 which is received by a threaded hole (not shown) in the base plate 11 to lock the support bracket 19 in the desired lateral position with respect to the base plate 11. In a similar manner, an elongated opening 23 extends substantially the entire length of the envelope guide bar 20 to permit longitudinal movement of the guide bar 20 with respect to the support bracket 19 and the base plate 11. The elongated opening 23 receives a knurled screw 24 which is threadably received by a threaded hole (not shown) in the support bracket 19 to lock the guide bar 20 in the desired longitudinal position with respect to the base plate 11. The envelope guide bar 20 laterally positions an envelope such as the envelope 25 with respect to the machine 10 in a manner more fully described hereinafter.

Two laterally spaced spacer bars 29 and 30 support a lower die fixture 31 on the base plate 11. Two hexagonal socket cap screws 32 extend through holes 33 in the lower die fixture 31 and through suitable holes in each spacer bar 29 and 30, and are threadably received by threaded holes in the base plate 11 for mounting purposes. Each of these holes 33 is counterbored, and the cap screws 32 are recessed in the counterbores to provide the lower die fixture 31 with a smooth substantially uninterrupted upper surface 34. A separator bar 35 is interposed between the spacer bars 29, 30 and the lower die fixture 31 and extends laterally between the spacer bars 29 and 30 for reasons that will become more readily apparent hereinafter.

The lower die fixture 31 is machined from suitable cold rolled steel stock in the illustrated embodiment. The entire central portion of the lower surface of the lower die fixture 31 is machined to form a recess or groove 37 extending substantially the entire length of the lower die fixture 31. As viewed in FIGS. 2 and 4, the left end of the lower die fixture 31 is provided with a machined recess 38 extending laterally thereacross which receives and supports one end of a lower punching die 40. A portion of the lower die fixture 31 immediately beneath the lower punching die 40 is cut out to permit punchings to fall therethrough in a manner that will become more readily apparent hereinafter. The left and right sides of the die 40 are supported by forwardly extending side portions 41 of the fixture 31. The die 40 is secured to the lower die fixture 31 by countersunk flat head machine screws (not shown) which extend through suitable holes in the punching die 40 and are threadably received by threaded holes 42 in the die fixture 31, so that the die 40 may easily be replaced when it becomes worn or when it is desired to punch a different size or shape opening. The lower surface of each forwardly extending side portion 41 is provided with a machined recess 43 (FIG. 2) for receiving a web guide plate 44. The web guide plate 44 is secured to each side portion 41 of the lower die fixture 31 by round machine head screws 45 which extend through the plate 44 and are threadably received by threaded holes 46 in the side portions 41 of the fixture 31.

An upper die fixture 51 is secured to the lower die fixture 31 and spaced therefrom by a spacer plate 52. Two locating pins 53 extend through alignment holes in the upper die fixture 51, through the spacer plate 52, and into alignment holes 54 in the lower fixture 31 to properly align the upper fixture 51 with respect to the lower fixture 31. Four hexagonal socket head cap screws 55, only two of which may be seen in FIG. 2, secure the upper die fixture 51 to the lower die fixture 31. An upper punching die 56 is secured to an actuating plunger 57 (FIG. 3) by flat head cap screw 58, and the die 56 may also be easily replaced when the actuating plunger 57 is slidably received by a stepped bore 59 in the upper die fixture 51, and a coil spring 60 acts against a head portion of the plunger 57 to bias the plunger 57 and the upper punching die 56 toward an upper or retracted position. Two guide pins 61 and 62 are press fit in bores 63 and 64, respectively, in the punching die 56 and are slidably received in bores 65 and 66, respectively, in the upper die fixture 51. A stamped guard plate 67 is secured to the upper die fixture 51 by machine screws 68 to guide the wall of the envelope that is to be punched and to provide a safety guard for the operator of the machine in a manner that will become readily apparent hereinafter. A stamped actuating lever 72 is pivotally secured to the upper die fixture 51 by the pivot pin 73 so that downward movement of the actuating lever 72 displaces the plunger 57 and the upper punching die 56 from their upper spring biased position. A semicircular handle 74 is secured to the actuating lever 72 by socket head cap screws 75 for the convenience of the operator.

As seen in FIG. 2, the window envelope machine 10 is further provided with a flexible web product 80 which includes a continuous flexible carrier web 81 and a plurality of pre-cut transparent window panes 82 adhesively mounted thereon in longitudinally spaced apart relation. The carrier web 81 is provided with a suitable release coating, and the window panes 82 are preferably of glassine, although other suitable materials such as cellophane could also be used. Each window pane 82 is provided with a suitable pressure sensitive adhesive coating 83 about its outer peripheral portion securing it to the carrier web 81.

The preformed windowless envelope 25 shown in FIG. 1 includes a front wall portion 86, a rear wall portion 87, and a sealing flap portion 88. The envelope 25 is preformed so that the front wall portion 86 is connected to the rear wall portion 87, such as by folding or gluing, along three sides, and the fourth side is arranged to be closed by the flap portion 88. To form a window opening in the front wall portion 86 and to affix a transparent window pane over the window opening, the preformed envelope 25 is inserted in the window envelope machine 10 in the manner illustrated in FIG. 2. The front wall portion 86 of the envelope is separated from the rear wall portion 87 by the lower punching die 40 and is positioned between the lower punching die 40 and the upper punching die 56. The lateral position of the envelope 25 with respect to the punching dies 40 and 56 is determined by the envelope guide bar 20, so that the window opening and pane can be located wherever desired on the front wall portion 86. If desired, an adjustable stop means could also be provided to position the envelope 25 longitudinally with respect to the machine 10.

When the envelope 25 has been properly positioned on the window envelope machine 10 with its front and rear wall portions separated, the handle 74 is manually pressed downwardly so that the actuating lever 72 forces the actuating plunger 57 downwardly against the bias of the coil spring 60. This forces the upper punching die 56 downwardly to cooperate with the lower punching die 40 to punch a window opening 90 in the envelope 25. In this manner, the invention forms a win-

dow opening in any desired location in one wall of a preformed windowless envelope.

A lower reach 93 of the flexible web product 80 is fed into the window envelope machine with the panes 82 facing downwardly, and an upper reach 94 is fed from the machine 10 with the panes removed therefrom. To minimize the separation of the front wall portion 86 from the rear wall portion 87 to preclude wrinkling or tearing of the envelope 25, the forward and rearward reaches 93 and 94 are fed into and out of the envelope 25 in a direction substantially parallel to the front wall portion 86 of the envelope. The reaches 93 and 94 of the carrier web 81 are tensioned slightly in any suitable manner, and the direction of travel of the lower reach 93 within the interior of the envelope between the wall portions 86 and 87 is defined by the web guide plate 44. The guide plate 44 includes an upwardly turned end portion 95 which directs the web product 80 toward the front wall portion 86 to carry a window pane 82 thereto. As the web product 80 with a pane 82 secured thereto approaches the front wall portion 86 of the envelope 25, the direction of travel of the carrier web 81 is abruptly changed by passage over the rounded end portion 96 of the guide plate 44. The carrier web 81 is of a somewhat more flexible material than the window panes 82, so that the abrupt directional change of the carrier web 81 separates the window panes 82 therefrom and the window panes 82 continue in the direction defined by the end portion 95 of the guide plate 44 while the carrier web 81 is fed out of the machine. In this manner, the invention provides a method for locating a window pane within the interior of a preformed envelope by a flexible carrier web, removing the pane from the carrier web within the interior of the envelope, and affixing the pane to the interior portion of one wall of the envelope.

After the window opening 90 has been punched in the front wall portion 86 of the envelope 25 in the manner described above, the punching falls on the top surface of the upper reach 94, and the envelope 25 is manually displaced to the left as viewed in FIG. 2 to remove it from the punching dies of the window envelope machine 10. As the envelope 25 is being so moved to the left, the flexible web product 80 is simultaneously manually advanced to move the upper reach 94 to the right to carry the punching out of the machine 10 and to move the lower reach 93 to the left as viewed in FIG. 2. The speed of movement of the carrier web 81 and of the front wall portion 86 relative to the fixture 31 are substantially equal, so that the window pane 82 is smoothly applied to the interior surface 98 of the front wall portion 86 to provide a transparent closure for the window opening 90. The pane 82 is positioned on the interior surface 98 of the front wall portion 86 in such a manner that the adhesive 83 extends around the window opening 90 without being exposed through the window opening. In this manner, the invention provides a method for producing a window envelope from a preformed windowless envelope in which the window opening is formed and the window pane is affixed in a single continuous operation. After the envelope 25 is removed from the machine 10 with a window opening formed therein and a window pane affixed thereon, a subsequent window pane is in position for being affixed to a subsequent envelope.

Although a preferred embodiment of the invention has been shown and described in detail, various modifications, rearrangements and additions may be made without departing from the scope of the invention. For example, although a manually operated window envelope machine has been shown incorporating the invention, the principles of the invention can also be applied to a method in which the feeds of the envelope and of the flexible web product are determined by suitable web conveyors actuated by manual operation of an actuating lever which also controls movement of the punching dies. Furthermore, the principles of the invention can also be applied to a fully automatic window envelope machine for producing window envelopes from preformed window envelopes.

What is claimed is:

1. A method of producing a window envelope comprising separating opposed walls of a preformed envelope, forming a window opening only in one of said walls, locating a window pane within the interior of the said preformed envelope between said separated opposed walls, and affixing said pane over the opening formed in said one of said opposed walls.

2. A method as defined in claim 1, wherein said pane is located in said interior of said preformed envelope between said opposed walls by a flexible carrier web, said pane is removed from said carrier web within the interior of said preformed envelope, and said pane is affixed to the interior surface of said one wall.

3. A method as defined in claim 2, wherein said pane is pre-cut and adhesively secured to said carrier web, said carrier web is an elongated continuous web having other pre-cut window panes adhesively secured thereto in longitudinally spaced apart relation for being affixed to subsequent preformed envelopes, said pane is removed from said carrier web within said interior of said preformed envelope by a guide means abruptly changing the direction of movement of said carrier web within said interior of said preformed envelope, and removal of one window pane from said carrier web positions a subsequent window pane for removal and for being affixed to a subsequent envelope.

4. A method as defined in claim 3 wherein said carrier web is moved into and out of said interior of said preformed envelope in a direction substantially parallel to said one wall.

5. A method as defined in claim 4 wherein said window pane is affixed to said interior surface of said one wall while said one wall is moving at a speed relative to a fixed reference point substantially equal to the speed of movement of said carrier web relative to said fixed reference point.

6. A method as defined in claim 1 wherein said pane is removed from sad carrier web within the interior of said preformed envelope and affixed to the interior surface of said one wall while said one wall is being removed from the means for forming said opening, and the speed of movement of said one wall relative to said means is substantially equal to the speed of movement of said carrier web relative to said means.

7. A method of producing a window envelope comprising separating opposed walls of a preformed windowless envelope, and forming a window opening in one of said walls by simultaneously cutting through the periphery of an area defining said opening.

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