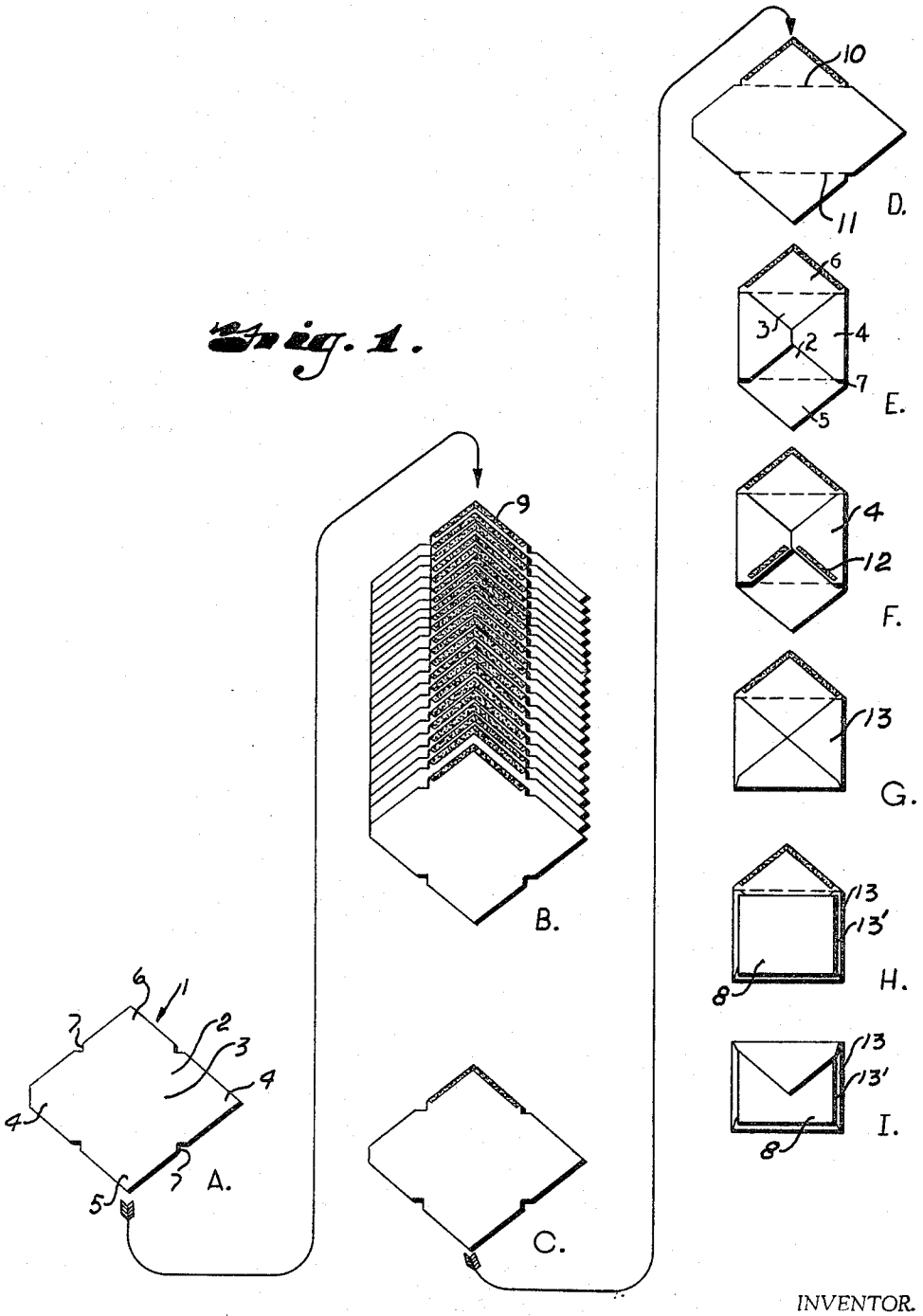
May 14, 1968 E. B. BERKOWITZ 3,382,778

METHOD AND APPARATUS FOR INTERLEAVING INSERTS DURING THE ENVELOPE MAKING PROCESS

Filed Feb. 1, 1966 4 Sheets-Sheet 1

Fig. 1.



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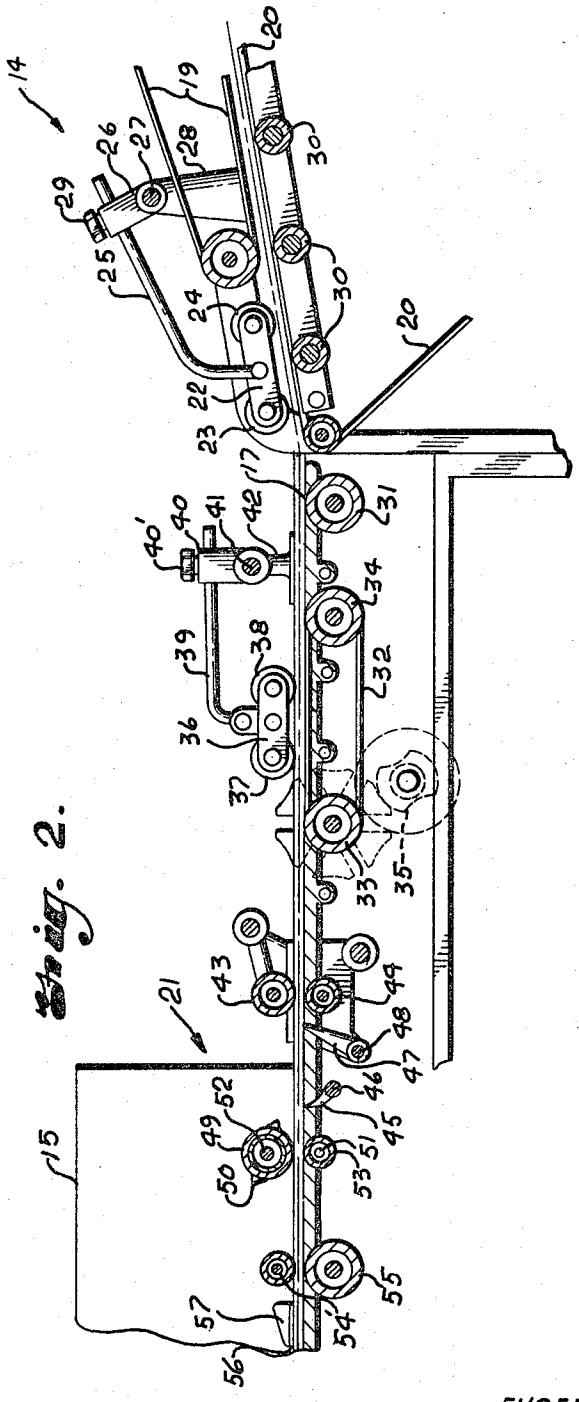


Fig. 2.

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METHOD AND APPARATUS FOR INTERLEAVING INSERTS DURING THE ENVELOPE MAKING PROCESS

Filed Feb. 1, 1966 4 Sheets-Sheet 3

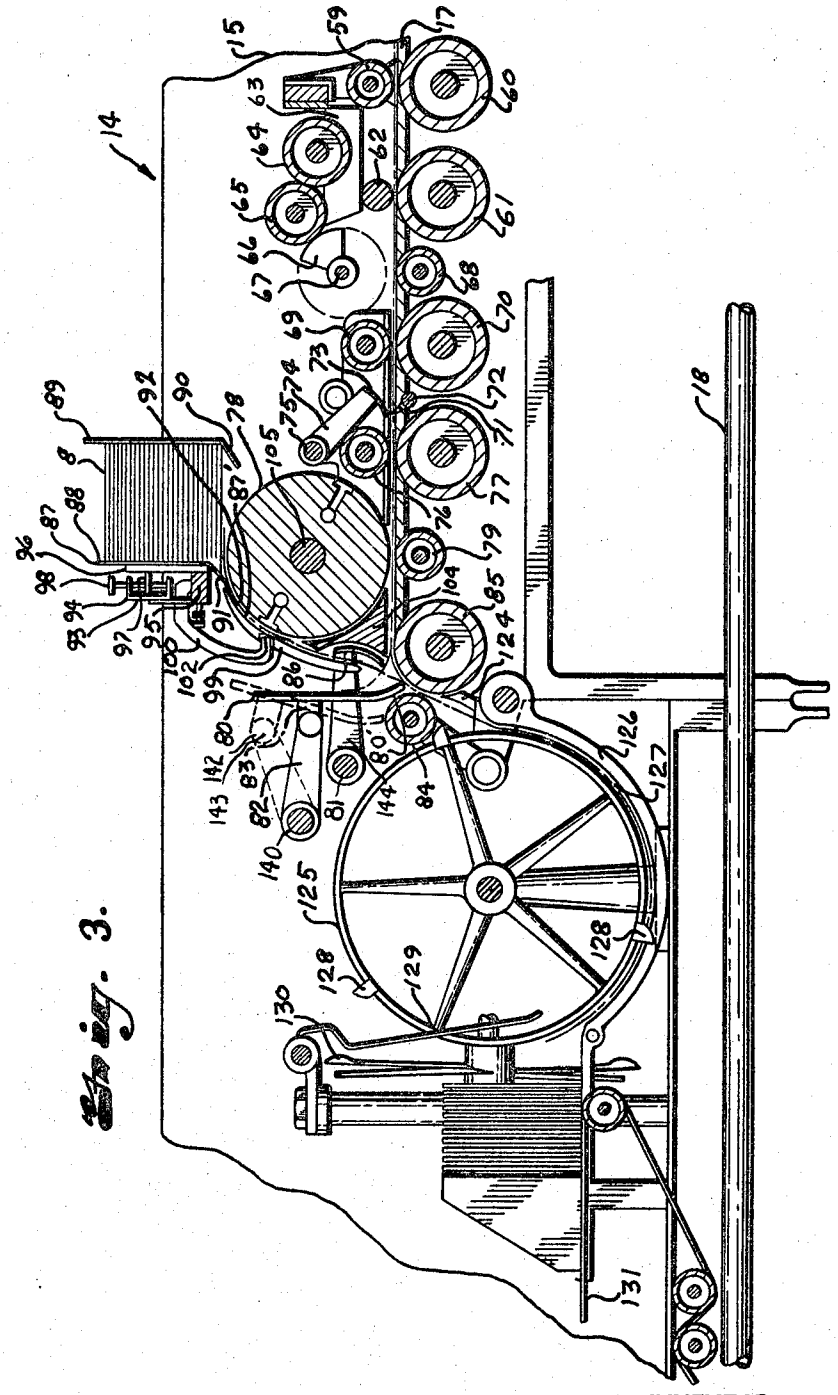


Fig. 3.

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METHOD AND APPARATUS FOR INTERLEAVING INSERTS DURING THE ENVELOPE MAKING PROCESS

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Fig. 7.

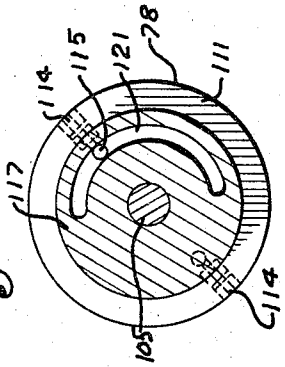


Fig. 6.

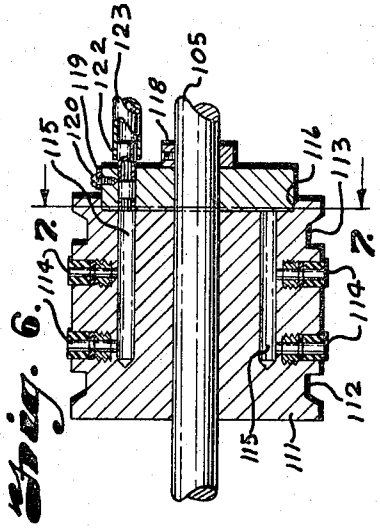


Fig. 4.

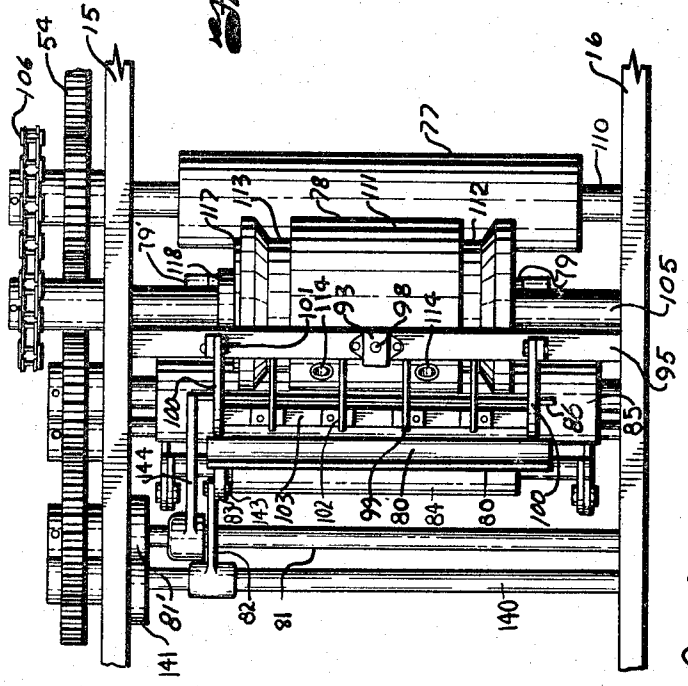
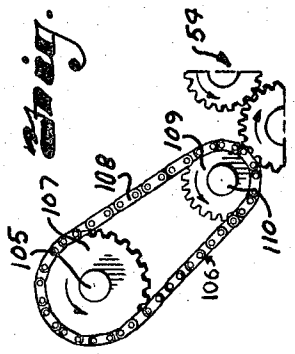


Fig. 5.



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United States Patent Office 3,382,778
Patented May 14, 1968

3,382,778

METHOD AND APPARATUS FOR INTERLEAVING INSERTS DURING THE ENVELOPE MAKING PROCESS

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Filed Feb. 1, 1966, Ser. No. 524,156
10 Claims. (Cl. 93—61)

This invention relates to a method and apparatus for the formation of envelopes and more particularly, for the formation of envelopes having an insert such as a greeting card or the like interleaved between the closure flap and the main body of the envelope during the envelope formation process.

Heretofore, the interleaving of inserts such as cards or the like has been accomplished in a process or operation secondary to the envelope formation process and has utilized an apparatus which feeds a preformed envelope having a main body portion and a closure flap to a certain station where the prefolded closure flap is lifted away from the main body of the envelope and an insert is inserted between the closure flap and the main body of the envelope. The utilization of an interleaving operation of this nature is time consuming in that the envelopes must be delivered from the formation process to the secondary interleaving process. Secondly, the interleaving operations now utilized bring the envelope to a complete stop before inserting the card or like article. Further problems have been experienced due to the necessity of raising the prefolded closure flap to allow for the interleaving of the insert between said closure flap and the main body of the envelope. The closure flap will not always be elevated to the desired position which results in an engagement between the closure flap and the insert preventing the interleaving of the insert and resulting in a stoppage of the interleaving operation.

It is, therefore, the principal objects of this invention to provide a method and apparatus for the interleaving of inserts between the closure flap and main body or enclosure pocket of an envelope during the envelope formation process and thereby eliminating the aforementioned difficulties; to provide such a method and apparatus for the production of a greater quantity of envelopes having an insert interleaved therewith in a unit of time then has heretofore been possible with present methods and equipment; to provide such a method and apparatus wherein the insert is interleaved between the closure flap and pocket portion of the envelope prior to the complete folding of said closure flap to thereby eliminate the difficulties encountered in the art due to the engagement of the insert with said closure flap; to provide a novel method and apparatus in an envelope making process for extracting inserts from a container and placing said insert on a partially formed envelope blank as said blank is being conveyed through an envelope making process whereby a closure flap of said blank will be folded into contacting relation with said insert to thereby interleave said insert with said envelope; and to provide such a novel and efficient method and apparatus wherein the interleaving of inserts and envelope may be accomplished rapidly and in an economical manner during the envelope formation process.

Other objects and advantages of this invention will become apparent from the following description taken in connection with the accompanying drawings wherein are set forth by way of illustration and example certain embodiments of this invention.

FIG. 1 is a diagrammatic view illustrating the successive steps involved in forming an envelope with an insert interleaved therewith.

FIG. 2 is a vertical longitudinal sectional view through an apparatus embodying the features of this invention.

FIG. 3 is a vertical longitudinal sectional view in continuation of FIG. 2 of an apparatus embodying the features of this invention.

FIG. 4 is a plan view of that portion of the apparatus where the interleaving operation is accomplished.

FIG. 5 is a side elevational view of the gear train and chain drive to the vacuum cylinder.

FIG. 6 is a vertical sectional view through the vacuum cylinder.

FIG. 7 is a vertical sectional view taken on lines 7—7 of FIG. 6.

Referring to the drawings in more detail:

The method illustrated in FIG. 1 commences with blanks 1 which are preshaped to provide a main body portion 2 having an inner face 3, side flaps 4, bottom flap 5 and closure flap 6. The envelope blank 1 also has a plurality of notches 7 in the side edges of said blank 1 at the juncture points of the side flaps 4 with the bottom flap 5 and closure flap 6. The notches 7 are utilized for registering the blank 1 within the envelope making machine and also to facilitate the forming of the corners of the envelope.

The novel method illustrated in FIG. 1 constitutes a plurality of steps designated by letters A to I inclusive, all of which are performed while the blanks are in a continuous movement and includes the interleaving of an insert 8 as the steps of the envelope formation process are being continuously executed. The method contemplates the interleaving of the insert 8 prior to the complete folding of the closure flap 6.

In practicing the method, the preshaped flat blanks 1 are incollated at station B in a stepped or staggered formation with the upper portion of the closure flap 6 of each blank 1 exposed for the application of adhesive 9. The envelope blanks 1 are maintained in this formation as they are passed through a drying section of the machine as, for example, like that shown in Patent No. 2,694,351 where the adhesive 9 is dried. After the drying of adhesive 9, the envelope blanks 1 are decollated or successively drawn out from the stepped formation and continuously advanced singularly in spaced relation from one another as shown at station C through the envelope folding section of the apparatus with the inner face 3 of the main body portion 2 of envelope blank 1 facing upwardly. The envelope blank 1 is advanced through station D where the blank is scored along the juncture of the main body portion 2 with the closure flap 6 and bottom flap 5 to form score lines 10 and 11 respectively.

The scored envelope blank 1 is advanced from station D and through station E where the side flaps 4 are folded into overlying contacting relation with the inside face 3 of the main body portion 2 of envelope blank 1. From station E, the envelope blank 1 is conveyed through station F where adhesive 12 is applied to a portion of side flap 4 which will come into contacting relation with the bottom flap 5 when said flap is so folded. The envelope blank 1 is continually advanced through station G where said bottom flap 5 is folded into overlying contacting relation with side flaps 4 and adhesive 12 to seal said bottom flap 5 to side flaps 4 to form an enclosed envelope pocket 13.

The envelope blank 1 is conveyed continuously from station G through station H where the insert 8 is placed in generally contacting relation to the exterior surface 13' of the envelope pocket 13. The envelope blank 1 is advanced through station I where the closure flap 6 is folded itno contacting relation with the insert 8 thereby interleaving said insert 8 between the closure flap 6 and the envelope pocket portion 13.

The initial folding of the closure flap 6 should commence slightly before the delivery of the insert 8 to the envelope blank 1 such that the insert 8 is actually placed between the closure flap 6 and the pocket portion 13. By so folding the closure flap 6, the insert 8 will engage the closure flap 6 when placed on pocket portion 13 thereby ceasing relative movement between said insert 8 and blank 1 to register the blank 1 and insert 8. The folding of the closure flap 6 into contacting relation with insert 8 is then completed. The initial folding of closure flap 6 prior to placement of insert 8 is not essential, however, as the insert 8 could be placed in contacting relation to pocket portion 13 prior to any folding of the closure flap 6 by simply timing the relative movements of the blank 1 and insert 8 or utilizing other means of registering their relative movement.

The insert 8 is placed adjacent the pocket portion 13 of the envelope by first extracting said insert from a retaining means, conveying said insert 8 along a predetermined path in timed sequence to the movement of the blank 1 and then depositing said insert 8 adjacent the pocket portion 13 of the envelope.

It should be noted that pocket portion 13 may be constructed in any manner by any method desired. It is only critical that the insert 8 be interleaved prior to folding of the closure flap 6.

Referring to FIGS. 2 through 7, an apparatus generally indicated by the reference numeral 14 is illustrated for carrying out the aforestated methods and embodies the features of this invention. It should be noted, however, that other apparatus may be utilized for conveying, scoring and folding the envelope blank 1 and also, for delivering the insert 8 to the envelope blank 1.

The apparatus or machine 14 is comprised of two horizontally spaced apart side frames 15 and 16 for carrying the operating mechanisms at the different stations and for journaling therein the shafts of the various feed rollers and cylinders in a manner to be described. A support surface 17 is mounted to the side frames 15 and 16 to provide a surface over which the envelope blanks 1 are propelled and through which the lower feed rollers and cylinders extend to cooperate with the upper cylinders and feed rollers to provide the propelling force for the envelope blanks 1 along the support surface 17. No attempt has been made to show the complete drive system of the apparatus 14 so the figures may be more readily understandable. A portion of a gear train has been shown in FIG. 4 connected to the shafts of the various rollers and cylinders. This gear train may be operatively connected to a main drive shaft 18 by suitable means in a conventional manner.

Referring to FIG. 2, the envelope blanks 1 are conveyed from an adhesive application and drying section, for example, like that shown in Patent No. 2,694,351, of machine 14 between belts 19 and 20 and ahead of a blank folding section generally indicated by reference numeral 21 in a collated or stepped fashion as shown at station B in FIG. 1. In the apparatus of the illustrated embodiment, it is necessary to withdraw the blanks 1 from their collated stepped fashion in a sequential manner to singularly pass said blanks 1 through the folding section 21 of the machine 14. It should be noted that other machines for forming envelopes in which the interleaving method previously described could be utilized might pass the envelope blanks 1 through a folding section in a stepped or overlapped formation. In machine 14, the withdrawal of blanks 1 or the decollation of said blanks 1 is accomplished in a conventional manner by passing said blanks 1 through a series of belts and rollers which extract the uppermost blank 1 from the formation of blanks and pass said blank 1 to the blank folding section 21 of machine 14.

The machine 14 is illustrated as having a pair of laterally spaced carriages 22, each having fore and aft pressure rollers 23 and 24 respectively, axially mounted for rotation on carriages 22. The carriages 22 are mounted on an adjustable arm 25 which extends outwardly and downwardly from a frame mounting, here illustrated as a clamp 26, axially mounted on a transverse shaft 27, said shaft 27 being mounted to side frames 15 and 16 by means of brackets 28. The clamp 26 has a screw 29 for clamping engagement with arm 25. By this arrangement, carriages 22 may be adjusted in relation to belt 19 and the pressure exerted by rollers 23 and 24 may also be adjusted by movement of arm 25 in clamp 26. The rollers 23 and 24 on carriages 22 cooperate with belt 20 to move the blanks 1 forwardly toward the blank folding section 21 of machine 14. The belt 20 is mounted on rollers 30, some of which are illustrated, and is driven in a conventional manner.

After the blanks 1 pass between rollers 23 and 24 and belt 20, they are propelled forwardly over a driven cylinder 31 and onto belt 32. The belt 32 is mounted on rollers 33 and 34 which, like the shaft of cylinder 31, are journaled in side frames 15 and 16 of machine 14. The belt 32 is intermittently driven by means of a Geneva drive 35 which is operatively connected to the shaft of roller 33 in a conventional manner.

As the blanks 1 move forwardly on the conveyor belt 32, they encounter a second pair of laterally spaced carriages 36 having fore and aft pressure rollers 37 and 38 respectively, axially mounted thereto with said carriages being mounted on an arm 39 which extends outwardly from clamp 40. The clamp 40 is mounted to a transverse shaft 41 which is retained in bracket 42, said bracket 42 being mounted in a conventional manner to the side frames 15 and 16. The clamp 40 has a screw 40' which clampingly engages arm 39 and allows for adjustment of said arm to thereby adjust carriages 36. As the foremost blank 1 reaches the rollers 38 of carriage 36, it is driven forwardly and pulled out from the overlapping collated formation of blanks but is not completely separated from said formation of blanks. The cooperative action of rollers 37 and 38 with the intermittent movement of belt 32 merely increases the spacing between the blanks 1 and said blanks 1 still remain in an overlapping stepped or collated formation. The blank 1 is not completely withdrawn or decollated from said formation until it is grasped by cylinders 43 and 44 and extracted from the remainder of the blanks to be passed through the blank folding section 21 of machine 14 in spaced relation from adjacent blanks 1.

As the blanks 1 proceed forwardly into the folding section 21 of machine 14 from cylinders 43 and 44, the notches 7 of blank 1 are engaged by a pair of fingers 45 which are axially mounted on shaft 46 in a conventional manner for intermittent movement in and out from the plane of the support surface 17. After engagement by the pair of fingers 45 in the forward notches 7 of blank 1, a pair of straightening fingers 47 engage the rearward notches 7 of blank 1 as the blank is leaving cylinders 43 and 44. The straightening fingers 47 which are axially mounted on shaft 48 in a conventional manner for intermittent movement in and out from the plane of the support surface 17 cooperate with fingers 45 to align blank 1 on the support surface 17 in order to position said blank for accurate scoring by a scoring roller 49.

The scoring cylinder 49 has a pair of longitudinally extending knife edges 50 extending therefrom which engage the blank 1 as it passes beneath cylinder 49 to form score lines 10 and 11 on blank 1. The scoring cylinder 49 has a cooperating conveying cylinder 51 mounted in underlying relation thereto, each having shafts 52 and 53 respectively journaled in side frames 15 and 16 and driven by a gear train 54, a portion of which is shown in FIG. 4.

After the blanks 1 have been scored in the manner previously described at station D of the machine, the blank 1 is continuously advanced through station E of machine 14 by means of conveying cylinders 54' and 55 where the side flaps 4 are folded into contacting relation

with the inner face 3 of the main body portion 2 of envelope blank 1. The envelope blank 1 passes beneath a pair of laterally spaced folding rails 56 and the side flaps 4 are folded by means of a pair of pushers 57 which operate reciprocally in a direction transverse to the path of the envelope blank 1 in a conventional manner. The envelope blank 1 then passes between upper and lower feed cylinders 59 and 60 respectively which react to press the folds of the side flaps and bring said side flaps 4 into contact with the main body portion 2 of blank 1.

The envelope blank 1 is then conveyed to station F by means of a driven cylinder 61 and a pressure roller 62 where adhesive 12 is applied to side flaps 4. The adhesive 12 is removed from an adhesive container 63 by means of pick-up cylinder 64 in a conventional manner and is transferred to a transfer cylinder 65 by direct engagement of cylinders 65 and 64. A pair of adhesive applicators 66 which are mounted on shaft 67 rotate in timed sequence with the passage of blanks 1 through the blank folding section 21 and successively remove adhesive 12 from cylinder 65 and apply said adhesive 12 to the side flaps 4 of the envelope blank 1 in a conventional manner. A driven cylinder 68 serves to back up the blank 1 as the adhesive applicators 66 apply the adhesive to said blank 1.

A pair of conveyor cylinders 69 and 70 propel the envelope blank 1 through station G where the bottom flap 5 is folded into contacting relation with adhesive 12 and side flaps 4. After the blanks 1 have passed through conveyor cylinder 69 and 70, a finger 71 mounted on shaft 72 swings into the path of the envelope blank 1 and bends up the bottom flap 5 along score line 11. After finger 71 has bent the bottom flap 5 in an upward direction, a swinging knife 73 mounted on arm 74, said arm being mounted to shaft 75 which is, in turn, journaled in side frames 15 and 16, intermittently swings into contact with the juncture between the bottom flap 5 and main body portion 2 of blank 1 assuring the correct introduction of the score line between the pair of cylinders 76 and 77 which cooperate to press the fold of the bottom flap 5 and effect the sealing of bottom flap 5 to side flaps 4 to form the envelope pocket portion 13.

The envelope blanks 1 are conveyed beneath vacuum cylinder 78 by a driven cylinder 79 and rollers 79' to station H where the insert 8 is placed adjacent the exterior 13' of the pocket portion 13 of the envelope 1. The pocket portion 13 of the envelope travels upwardly along a guide plate 80 which intermittently swings into the path of envelope 1. As shown in FIG. 4, the guide plate 80 which has a curved lower portion 80' is mounted to the shaft 140 which is journaled in a cam mechanism 141, said cam mechanism 141 being driven by gear train 54 to reciprocate the guide plate 80 into and out of the path of the envelope 1 causing the envelope pocket portion 13 to move over the curved lower portion 80' of the plate 80 and upwardly along plate 80. Said lower curved portion 80' of guide plate 80 is positioned in overlying relation to a path of envelope travel between cylinder 85 and roller 84. The cam mechanism 141 then reciprocates the guide plates 80 upwardly and outwardly as shown by dashed lines in FIG. 3 to allow the envelope 1 to be forced downwardly between the cylinder 85 and roller 84 to fold the closure flap 6 by moving the lower curved portion 80' of guide plate 80 outwardly from its position overlying the path between cylinder 85 and roller 84 to a position which allows the envelope 1 to move between cylinder 85 and roller 84.

The guide plate 80 is rigidly mounted to an arm 83 which is, in turn, swingably mounted to a second arm 82 by means of a shaft 142 having an enlarged head portion 143 adjacent each of the arms 82 and 83 to retain said arms 82 and 83 on said shaft 142. The arm 82 is rigidly mounted to shaft 140 and moves to an upwardly directed position when shaft 140 is rotated by the cam mechanism 141 which, in turn, lifts the arm 83 and the guide plate 80 as shown in dashed lines on FIG. 3.

An insertion blade 86 is employed to engage the closure flap 6 as the pocket portion 13 is disposed in a generally vertical position along guide plate 80 to initiate a fold of the envelope blank 1 along score line 10 and force the envelope blank 1 downwardly between the roller 84 and cylinder 85 to press the closure flap 6 against the pocket portion 13 of the envelope 1. The blade 86 has an arm 144 rigidly mounted thereto which is, in turn, rigidly mounted to a shaft 81. As the shaft 81 is rotated by means of a cam mechanism 81' which is driven by the gear train 54, the blade 86 engages the envelope blank 1 along score line 10 thereby introducing the envelope 1 to the folding path between the cylinder 85 and roller 84 to press the fold of the closure flap 6. If the insert 8 is sufficiently stiff, the downward force of the insert 8 against the closure flap 6 would be sufficient to force the blank 1 between cylinder 85 and roller 84, thus eliminating the necessity of blade 86.

In the illustrated embodiment, at the point when the insertion blade forces the envelope downwardly between rollers 84 and cylinder 85, an insert 8 is delivered adjacent the exterior 13' of the pocket portion 13 of the envelope between said pocket portion 13 and the closure flap 6 so that when the envelope passes through or between folding rollers 84 and cylinder 85, the closure flap 6 is actually pressed into contacting relation with the insert 8 which is interleaved between the closure flap 6 and the pocket portion 13 of the envelope.

It should be noted that in this embodiment of the invention, the closure flap is partially folded along score line 10 as the pocket portion 13 moves upwardly against guide plate 80; therefore, guide plate 80 effects a partial fold of closure flap 6. The insert 8 is therefore delivered into engagement with closure flap 6 or between the partially folded closure flap 6 and the pocket portion 13. The insert 8 could, however, be delivered to the blank 1 prior to this partial folding of closure flap 6.

In the illustrated embodiment, the insert 8 is delivered to its position between the closure flap 6 and the pocket portion 13 of the envelope by means of a vacuum cylinder 78 which extracts the insert 8 from a container 87 mounted in overlying relation to cylinder 78 and conveys said insert 8 through a pass 87' to the envelope blank 1.

The vacuum cylinder 78, as previously mentioned, has a holding apparatus or container 87 mounted in overlying relation to said cylinder 78 which may be manually or mechanically fed. The cylinder 78 and holding apparatus 87 may be similar to that shown in the Skow patents Nos. 2,853,296 and 2,635,538. The holding or retaining apparatus or container 87 is comprised of side frames 88 and 89 which guide the inserts 8 into an overlying contacting position in relation to the vacuum cylinder 78. Side frames 88 and 89 may be mounted to the side frames 16 and 15 of the machine 14 in a manner shown in FIG. 4 or may be mounted on a suitable structure independent of the machine 14. As illustrated, the side frame 89 has a lower lip portion 90 extending inwardly toward side frame 88 to support the rearward portion of inserts 8. The side frame 88 has a lower extension member which comprises an upper guide 91 adjustably mounted thereto and having a pliable end tip 92. The upper guide 91 is adjustable in relation to the vacuum cylinder 78 to insure that only one insert 8 is withdrawn from the container 87 upon each half revolution of the vacuum cylinder 78. The upper guide 91 has an adjusting device, here illustrated as a bracket 93, having spaced ears 94 with said bracket 93 being mounted to a cross frame member 95, and a sliding abutment plate 96. The cross frame member 95 is mounted by suitable means to the side frame members 15 and 16. The abutment plate 96 is mounted to bracket 93 by means of a lug 97 and an adjustment screw 98. The adjustment screw 98

passes through lug 97 and each of said spaced ears 94 to provide vertical adjustment of the abutment plate 96 upon rotation of screw 98. The abutment plate 96 which lies in abutting relation to the upper guide 91 serves to retain guide 91 in desired spaced relation from vacuum cylinder 78 and is thereby utilized to insure the removal of a single insert 8 from container 87 at any one time.

Referring to FIG. 4, the cross frame member 95 has a plurality of lower guides 99 mounted thereto by means of two arms 100 which extend outwardly and downwardly from the pivotal connection 101 on the cross frame member 95 to an adjustable connection 102 on a transverse beam 103. The lower guides 99 being mounted on transverse beam 103 are so shaped as to define the pass 87 between said lower guides 99, vacuum cylinder 78 and a guide block 104, through which the inserts 8 are propelled. The guide block 104 is so positioned relative to the vacuum cylinder 78 to insure the movement of insert 8 outwardly away from vacuum cylinder 78 when said cylinder releases the insert 8 so that said card will move forwardly between the lower guide 99 and the insertion blade 86 to its interleaved position between the closure flap 6 and the pocket portion 13 of the envelope.

Referring to FIG. 5, a portion of gear train 54 is illustrated to show one way in which the vacuum cylinder 78 may be operated or driven in timed sequence with the remainder of the driven cylinders to coordinate the movements of the insert 8 with the envelope blank 1. As illustrated, the vacuum cylinder 78 is mounted on a shaft 105 which is journaled in side frames 15 and 16 and operatively connected to a chain drive 106. The shaft 105 has a sprocket 107 mounted thereon over which chain 108 operates in cooperation with a sprocket 109 mounted to shaft 110 on cylinder 77. The shaft 110 of cylinder 77 is driven by gear train 54 as shown in FIG. 4 with sprocket 109 mounted outwardly from gear train 54.

Referring to FIGS. 6 and 7, the vacuum cylinder 78 is illustrated as having a cylindrical body portion 111 having annular grooves 112 and 113 and two diametrically opposed pairs of suction ports 114, each of said ports 114 of the respective pairs being interconnected by manifold channels 115 which open inwardly from a recess 116 at one end of cylinder 78. A valving disc 117 is retained in recess 116 by a collar 118, said valving disc 117 being retained against rotation when the shaft 105 and cylinder 78 are rotated by arms 119 which are mounted to the valving disc 117 by a screw 120 and secured to the frames 15 or 16 by suitable means. The valving disc 117 has an arcuate channel 121 adapted to register with the manifold channels 115 to successively establish and disestablish a vacuum through ports 114 as the cylinder 78 and shaft 105 rotate. The valving disc carries a nipple 122 to which a flexible hose 123 is secured to connect said cylinder 78 to a vacuum pump (not shown). As the vacuum cylinder 78 is rotated in timed sequence with the remainder of the envelope folding section 21 of machine 14, the arcuate channel 121 of the fixed valving disc 117 moves into and out of communication with the manifold channels 115 to provide a vacuum at ports 114 as said ports 114 contact the lower most insert 8 in the container 87 and serves to shut off said vacuum as the insert 8 is propelled through pass 87' with the shut off point being above the guide block 104. The centrifugal force on the insert 8 will cause insert 8 to move outwardly against the lower guide 99 and over guide block 104 to its interleaved position between the pocket portion 13 and the closure flap 6 of the envelope.

The section of machine 14 containing vacuum cylinder 78 and its related mechanism may be inserted into a standard conventional rotary envelope making machine, thereby eliminating the necessity of special machines to accomplish the interleaving of inserts 8 during the envelope formation process.

After the insert 8 has been placed adjacent the pocket portion 13 of the envelope and forward of the insert blade 86, said insert blade moves downwardly forcing the envelope to bend along score line 10 and between rollers 84 and cylinder 85 to effect the fold and press of the upper closure flap into contacting relation with insert 8. After passing between pressing rollers 84 and cylinder 85, the envelope and insert 8 slide over plate 124 and between a pair of conveying discs 125 and guide rails 126 arranged concentrically thereto to define a pass 127 between said discs 125 and said guide 126. Each of the conveying discs 125 has lugs 128 which engage the envelope at its trailing edge and pushes it through pass 127 in a conventional manner. When the trailer edge of the envelope and insert 8 have reached the horizontal portion 131 of guide 126, a swinging rail 129 presses said envelope and insert 8 against the back of a pair of discs 130. The discs 130 are in the form of a double threaded conveyor worm and cooperate together to, upon every half revolution, convey one envelope from its rear to its frontside where the envelopes and inserts 8 are collected standing on edge in an upright position. The envelopes and inserts 8 then pass on to a conveyor belt 131 which in a conventional manner propel said envelopes and cards 8 to a collecting point.

It is to be understood that while I have illustrated and described one form of my invention, it is not to be limited to the specific form or arrangement of parts herein described and shown except insofar as such limitations are included in the claims.

What I claim and desire to secure by Letters Patent is:

1. A method of forming envelopes and interleaving an insert therewith in the envelope making process, said method comprising:
   (a) conveying an envelope blank having a closure flap and while so conveying,
   (b) forming said blank into an enclosure pocket,
   (c) placing an insert adjacent said enclosure pocket,
   (d) folding said closure flap into contacting relation with said insert.

2. A method of forming envelopes as recited in claim 1 wherein the fold of the closure flap is commenced, the insert is placed between the pocket portion and the closure flap thereby utilizing the closure flap for engagement to register the insert and the envelope, and then completing the fold of the closure flap.

3. A method as recited in claim 1 wherein the insert is placed in overlying contacting relation to the body portion of the envelope before folding of the closure flap into overlying contacting relation to the insert member.

4. A method as recited in claim 3 wherein the closure flap is partially folded in relation to the pocket portion of the envelope, the insert is placed between the closure flap and the pocket portion, and the closure flap is completely folded into contacting relation with the insert.

5. A method as recited in claim 1 wherein the insert is placed adjacent the pocket portion by,
   (a) extracting said insert from a retainer means,
   (b) conveying said inert along a predetermined path in timed sequence with the movement of the blank,
   (c) depositing said insert adjacent the pocket portion of the bank.

6. An apparatus for forming envelopes and interleaving an insert therewith, said envelope being formed from a blank including a closure flap, said apparatus comprising:
   (a) a frame,
   (b) conveying means connected to said frame for conveying the envelope blank along a path through an envelope blank folding section,
   (c) means on said frame and operatively connected to said conveying means for forming an envelope enclosure pocket from said envelope blank,
   (d) means on said frame and operatively connected to said conveying means for placing at least one

insert in contacting relation to said pocket portion of the envelope blank,

(e) means on said frame and operatively connected to said conveying means for folding the closure flap of the envelope blank into contacting relation to said insert member, thereby interleaving the insert member between the pocket portion and the closure flap of the envelope.

7. An apparatus for forming envelopes as recited in claim **6** wherein the means for placing an insert is comprised of:

(a) retaining means associated with said frame for holding a plurality of inserts in spaced relation from said conveying means, and

(b) means operatively connected to said conveying means for extracting an insert from the retaining means and delivering said insert to the envelope blank as said blank moves along the conveying means.

8. An apparatus for forming envelopes as recited in claim **7** wherein the means for extracting the inserts from the retaining means and delivering said inserts to the envelope blanks is comprised of a vacuum cylinder having vacuum ports therein engageable with at least one insert in the retaining means, said ports being operatively connected to a means for drawing a vacuum through said ports and means for alternatively establishing and disestablishing said vacuum to effect a gripping and releasing respectively of said inserts by said ports and means for operatively connecting said cylinder to the conveying means for rotating said cylinder in the desired timed sequence with the conveying means.

9. An apparatus for forming envelopes as recited in claim **7** wherein the extracting and delivery means includes:

(a) means for extracting said inserts from the retaining means,

(b) guides extending from said retaining means to said conveying means defining a pass through which the inserts pass to the envelope blanks, and

(c) means for propelling said inserts through said pass to said blanks.

10. An apparatus for forming envelopes as recited in claim **6** wherein said apparatus includes:

(a) means for partially folding said closure flap,

(b) means for delivering said insert between the partially folded closure flap and the pocket portion, and

(c) means for completing the folding of the closure flap into contacting relation with the insert.

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