United States Patent

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[54] **METHOD OF FORMING ENVELOPES HAVING INSERTS THEREIN FROM A MOVING BLANK WEB**
7 Claims, 2 Drawing Figs.

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[50] Field of Search ..... 53/21 FW, 31, 206; 93/58.2, 61 A, 63 M

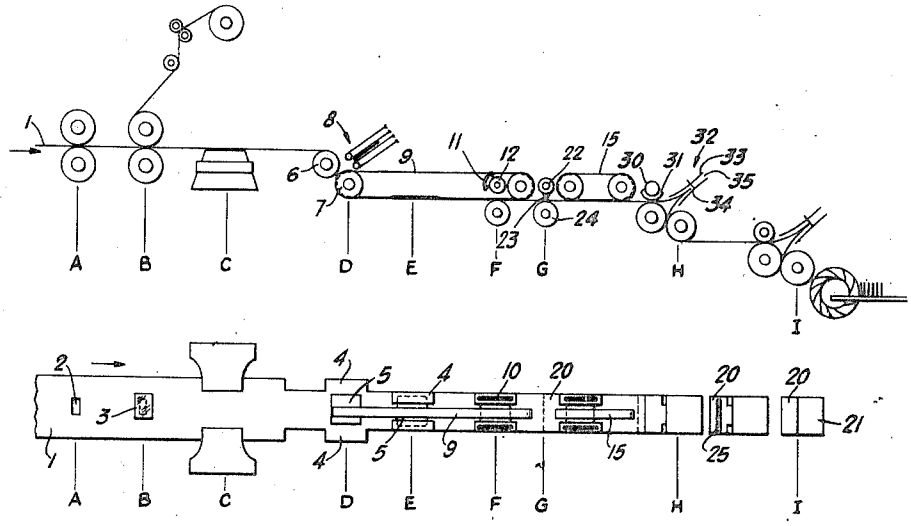
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ABSTRACT: A method of forming envelopes having inserts therein in a continuous manner from a moving blank web of paper or the like. The web is advanced along a line at a selected forward speed and sequentially has side flaps cut therein, inserts placed between those side flaps, the side flaps folded inwardly into overlying contact with the insert materials, bottom and closure flaps cut therein and gummed as required and finally, folded and sealed to form envelopes having inserts sealed therein.



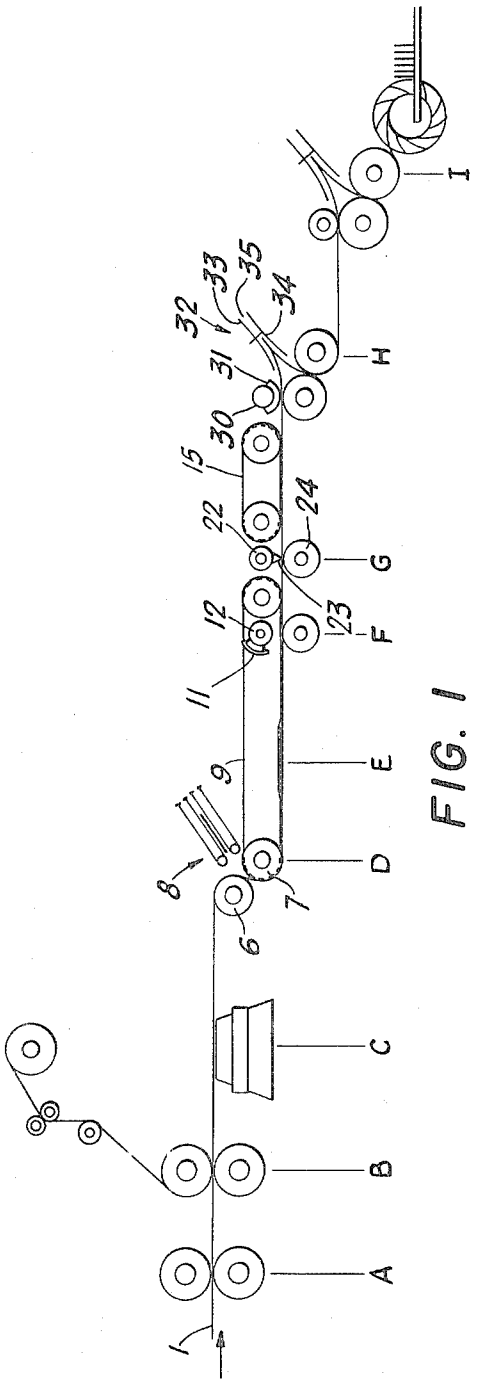


FIG. 1

FIG. 2

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METHOD OF FORMING ENVELOPES HAVING INSERTS THEREIN FROM A MOVING BLANK WEB

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to a method for the formation of envelopes and more particularly, to a method for the formation of envelopes having an insert enclosed therein during said formation process wherein said envelopes having inserts therein are formed from a continuously advanced moving blank web of paper or the like.

2. Description of the Prior Art

It is often necessary to form several thousand or more substantially identical pieces of mail comprising envelopes having identical insert materials enclosed therein. In the past, it has been the practice to either form the inserts and envelopes at separate locations and thereafter, assemble the completed package of envelope and insert at a place remote from the manufacture of either component. It has also been proposed to first form the insert material and then fold an envelope blank thereover in a continuous process operated, more or less, along a line. For example, U.S. Pat. No. 3,457,696 discloses a method for enclosing material in a mailing piece wherein insert materials are layed upon a preformed, precut envelope blank which is then folded in a predetermined manner and glued along certain lines to form a mailing package comprising an envelope having an insert therein. That method, however, has certain disadvantages in that it requires the use of carefully precut envelope blanks which must be partially gummed and dried before contact with the insert material. Moreover, the blanks employed in that process must be first prepared and stacked in an overlapping stepped position from which they are drawn in a sequential manner to singularly pass to the insert-receiving and folding stages. This step, of course, requires complicated attendant or auxiliary equipment.

U.S. Pat. No. Re. 25,961 teaches a similar process in which an envelope is formed over insert materials by folding the flaps of an envelope blank downwardly, rather than upwardly, over the insert material. While both of the latter processes represent a great improvement over inserting material in a completed envelope, neither represents a truly continuous process for forming an envelope having an insert therein, as each requires the use of a precut and pregummed envelope blank.

I provide a process for forming envelopes having inserts therein from a moving blank web. The process is performed along a line and requires little or no auxiliary or attendant apparatus outside that line.

Moreover, I provide a method of forming envelopes having inserts therein which does not require the formation of precut or pregummed envelope blanks. Nor does my method require the preliminary application and drying of adhesives to a preformed envelope blank.

SUMMARY OF THE INVENTION

Generally, my method for forming envelopes having inserts therein from a continuous moving blank web comprises advancing the web at a preselected forward speed, cutting said moving web along its outer edges at selected, spaced intervals to form side flaps therein, placing on said moving web between said side flaps insert materials in overlying, contacting relationship therewith, maintaining said insert materials in overlying contacting relationship with the moving web, folding the side flaps upwardly and inwardly into overlying relationship on the insert materials, gumming the folded side flaps or a portion of the web adjacent the side flaps and thereafter, cutting the moving web transversely of its direction of travel at selected spaced intervals to form bottom and closure flaps therein, folding the bottom flap into overlying, contacting relationship with the side flaps in a manner that the bottom flap adheres to the folded side flaps, gumming the closure flap and folding it into overlying, contacting relationship with the bottom flap to form an envelope having insert materials sealed therein.

My invention will be further understood and other details and advantages thereof will become apparent by reference to the following detailed description and drawings of certain preferred embodiments thereof.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side elevation schematic of my method.

FIG. 2 is a schematic view illustrating the steps followed in preparing envelopes having inserts therein from a moving blank web according to my invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

It should be understood that the tools and apparatus required for, e.g., cutting and scoring the web, applying adhesive thereto, folding and stacking, etc. do not constitute a part of my invention, which comprises novel methods of forming envelopes having inserts therein. Such tools and apparatus may be conventional and are hence not illustrated or described in detail.

Referring now to the Figures, a continuous web 1 such as a paper web, which is supplied from a supply reel, (not shown) is advanced in the direction indicated by the arrows at a preselected or predetermined speed. Web 1 is advanced to the station designated generally A where panels or windows are cut into the moving web. This may be seen more clearly by reference to FIG. 2 which shows generally the processing of the web per se as it proceeds through the novel methods of my invention. Web 1 having a panel (or window) 2 cut therein is then advanced to the station designated B wherein a transparent patch is placed over the window 2 and glued there in a conventional manner. Any desired number of windows may be cut into web 1 in this manner and, of course, both stations A and B may be eliminated in the case that no windows are required in the finished product.

Web 1 having patch 3 over panel 2 is next advanced to the station designated generally C where marginal cuts are made therein to form a series of side flaps 4 along the edge portions of the moving web. Side flaps 4 are formed in web 1 by conventional cutting equipment. I prefer that rotary cutting equipment be employed so as to facilitate continuous operation of my process.

At station C preliminary fold lines may be scored on moving web 1 about which lines side flaps 4 may be folded at a point later in my process. The preliminary fold lines may be formed with conventional equipment such as a rotary scoring tool cooperating with an elastic counterroller located beneath that scoring tool. Such preliminary fold lines serve to facilitate the later final folding of the scored web. Likewise, at this stage of the operation, it may be convenient to print any desired matter on the moving web.

Moving web 1 is next advanced and passes to a station designated generally D. Station D is an inserting station wherein one or more inserts 5 is placed in overlying contact with the web between its side flaps 4. Inserting station D may comprise conventional equipment but preferably it is as illustrated in FIG. 1 in simplified form comprising a pair of offset rollers 6 and 7 adapted to engage and advance web 1 through tangential contact therewith. Offset rollers 6 and 7 engaging moving web 1 are operably connected in timed relationship with conveyor means designated generally 8 for conveying and directing inserts 5 to the area of contact between rollers 6 and 7. Inserts 5 are thereby placed in overlying contacting relationship with moving web 1 between flaps 4.

Moving web 1 having inserts 5 in overlying, contacting relationship therewith between side flaps 4 is advanced then to the station designated generally E in the Figures. There, side flaps 4 are folded upwardly and inwardly into overlying contacting relationship with respect to insert 5. A suitable conventional folding tool may be employed in the folding of the side flaps 4.

Web 1 having flaps 4 folded into overlying contacting relationship with insert 5 advances then to station F where gum or adhesive is applied along the upwardly exposed portions of folded side flaps 4 to form adhesive strips 10 thereon. Although the adhesive is described as being applied to the upwardly exposed portions of the folded side flaps 4, it should be understood, as an alternative, adhesive may be applied in spaced strips to a portion of the web in front of the folded side flaps. As later described, this portion of the web is the bottom flap and is folded back on the folded in side flaps. With this latter arrangement, only a single thickness of paper is gummed and the number of inserts may be varied throughout the run as required.

The gum or adhesive may be applied at either location by conventional equipment and in this manner, adhesive strip 10 is formed on each of side flaps 4 on moving web 1. Illustrated at station F in simplified form is an adhesive applicator comprising an adhesive-bearing pad 11 mounted upon a rotating wheel or roller 12 which rotates in a manner whereby adhesive-bearing pad 11 engages and contacts folded side flaps 4 and thereby applies adhesive thereto to form adhesive strips 10.

A first upper endless feeding belt 9 is positioned above stations D, E, F and a portion of G. The belt 9 is preferably a toothed driven belt arranged to move in accurate timed relation with the web 1 with the underside of the belt in abutting relation with both the web 1 and the inserts 5 positioned thereon. The feeding belt 9 is arranged to hold and maintain the position of the inserts 5 on the web 1 during the steps of forming the envelopes from the web and around the insert.

After having either the side flaps 4 or portions of the bottom flap gummed with adhesive strips 10, web 1 advances to station G. It is noted here that no drying of the adhesive strips is required. At station G moving web 1 is cut into desired lengths to form envelope blank portions with closure and bottom flaps 20 and 21 respectively therein. The cutting may be accomplished by conventional cutting equipment but preferably a rotary straight scoring device operating in timed relationship is employed whereby a cut transverse to the direction of travel or advance of the web may be made without interrupting the web movement. A simplified form of a rotary straight cutter is illustrated in the Figure comprising roll 22 having blade or edge 23 mounted thereon cooperating with cooperating member 24 whereby moving web 1 is cut transversely of its direction of travel when edge 23 contacts cooperating member 24. Between stations G and H there is a second feeding belt 15 that maintains the position of the inserts 5 on the web 1 while the web is cut into desired length to form the envelope blank portion that is thereafter folded around the insert.

The severed envelope blank portion formed from the web 1 having closure flap 20 and backflap 21 cut therein is advanced then to the station designated generally H where backflap 21 is folded over side flaps 4 to thereby form a partially completed envelope enclosing therein insert material 5. Folding of backflap 21 may be accomplished with conventional folding equipment, preferably of the type illustrated in simplified form in FIG. 1. There shown at station H is a cylinder 30 having a speedup segment 31 adapted to thrust web 1 having end and closure flaps 21 and 20 cut therein rapidly into a folding station designated generally 32 having a pair of members 33 and 34 and paper stop 35 adapted to receive and fold the partly formed envelope blank.

The partly formed envelope formed at station H is then advanced to a station I where closure flap 20 is gummed in a conventional manner, and thereafter, folded in a manner preferably similar to that shown in station H to thereby form a sealed envelope having inserts enclosed therein. Preferably, thereafter the formed envelopes are advanced to conventional equipment for delivery, stacking, counting, etc.

It will be appreciated that my novel methods may be employed to produce envelopes having inserts sealed therein of any desired size, e.g. as by merely adjusting the size of flaps 4 and the location of transverse cuts 18 and 19 on moving web 1 and thus provide extremely viable methods adaptable to handle nearly any desired mail packaging order.

According to the provisions of the patent statutes, I have explained the principle, preferred construction and mode of operation of my invention and have illustrated and described what I now consider to represent its best embodiments. However, it should be understood that the invention may be practiced otherwise than as specifically illustrated and claimed.

I claim:

1. A method for forming envelopes having inserts therein from a moving blank web comprising,
- advancing said web at a preselected forward speed,
- cutting said moving web along its outer edges at selected spaced intervals to form side flap portions therein,
- placing insert materials on said moving web between said side flap portions,
- maintaining said insert materials in overlying contacting relationship with said moving web between said side flap portions,
- folding said side flap portions of said moving web upwardly and inwardly into overlying relationship with said insert materials,
- gumming a portion of the upwardly facing surface of said moving web side flap portions,
- cutting said moving web transversely to its direction of travel at selected spaced intervals to form separate envelope blank portions with bottom and closure flap portions,
- maintaining said insert materials in overlying contacting relation with said separate envelope blank portions,
- folding said bottom flap into overlying contacting relationship with said side flap portion with said gummed strips therebetween,
- gumming said closure flap portion, and
- folding said gummed closure flap portion into overlying contacting relationship with said bottom flap whereby envelopes are formed from said envelope blank portions of said web with said insert materials sealed therein.

2. The method for forming envelopes having inserts therein as set forth in claim 1 which includes,
- folding said bottom flap portion into overlying relation with said side flap portions to adhesively secure said bottom flap portion to said folded side flap portion.

3. The method for forming envelopes having inserts therein as set forth in claim 1 which includes,
- forming preliminary score lines in said moving web prior to folding said side flaps into overlying relationship with said insert materials.

4. The method for forming envelopes having inserts therein as set forth in claim 1 which includes,
- cutting a panel in said moving web, and
- patching said cut panel with a transparent material.

5. A method of forming envelopes having inserts sealed therein in a continuous manner from a moving blank web of paper or the like comprising,
- advancing said web along a line at selected forward speeds,
- marginally cutting said moving web to form a series of side flap portions therein,
- placing insert materials on said moving web between said side flap portions,
- maintaining said insert materials in overlying contacting relationship with said moving web between said side flap portions,
- folding said side flap portions into overlying contacting relationship with said insert materials,
- gumming a portion of the upwardly facing surface of said moving web side flap portions,
- cutting said moving web at selected locations transversely to its direction of travel to form envelope blank portions with bottom and closure flap portions,
- folding said bottom flap portion into overlying contacting relationship with said side flap portions with said gummed spaced strip portions therebetween, and

gumming and folding said closure flap portion to form envelopes from said envelope blank portion of said web with inserts sealed therein.

6. The method for forming envelopes having inserts therein as set forth in claim 5 which includes,

forming preliminary fold lines in said web and folding said side flap portions thereon.

7. The method for forming envelopes having inserts therein as set forth in claim 5 which includes,

cutting panels in said moving web, and

patching said panel with a transparent material.

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