Dec. 26, 1933. H. W. NICHOLS 1,941,412

PROCESS OF MAKING ENVELOPES

Filed July 30, 1931 2 Sheets-Sheet 1

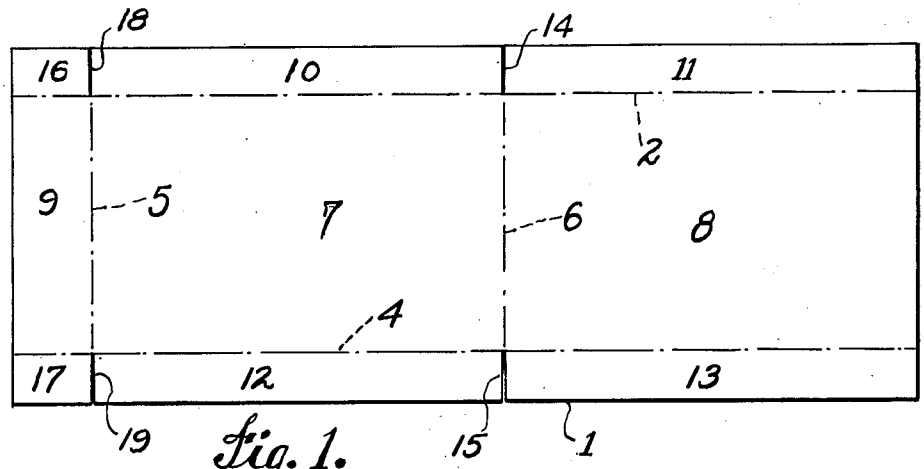



Fig. 1.

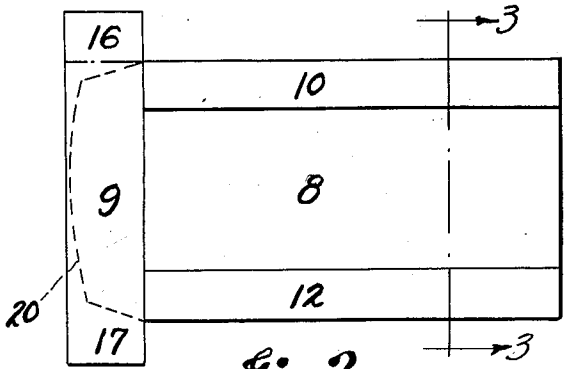



Fig. 2.

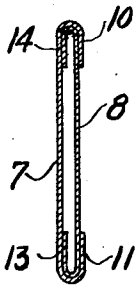



Fig. 3.

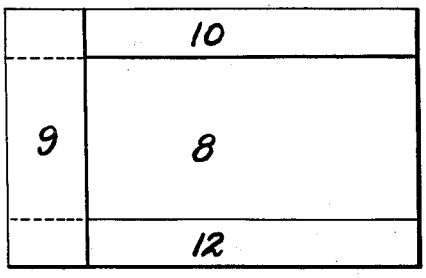



Fig. 4.

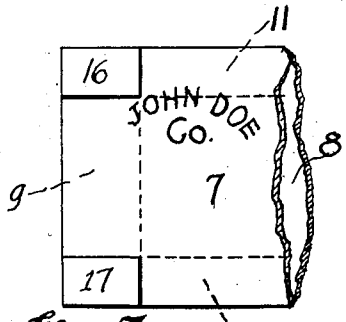



Fig. 5.

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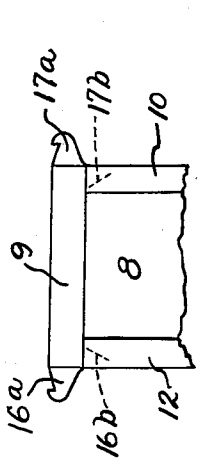



Fig. 7.

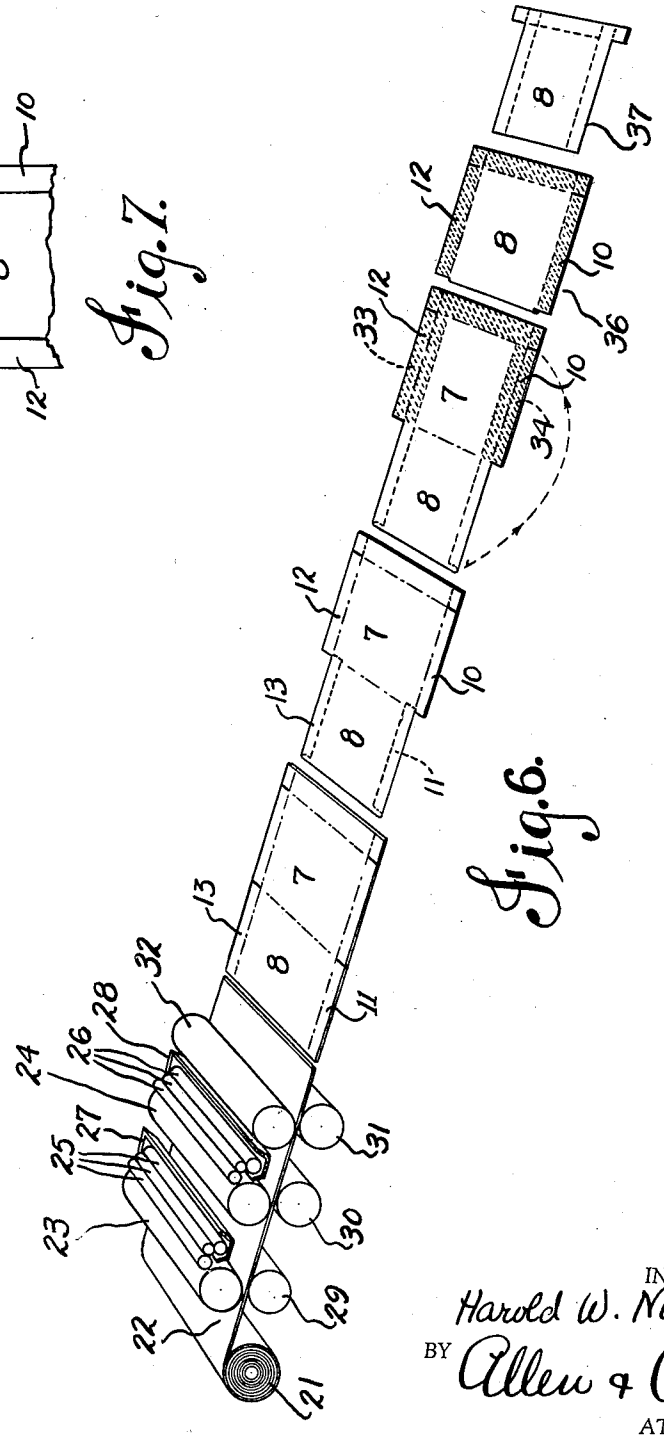



Fig. 6.

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# UNITED STATES PATENT OFFICE

1,941,412

## PROCESS OF MAKING ENVELOPES

Harold W. Nichols, Cincinnati, Ohio

Application July 30, 1931. Serial No. 553,915

6 Claims. (Cl. 93—63)

The primary objects of my invention are the provision of a method of making an improved envelope structure by a continuous process from roll stock. Another object is to provide for the inclusion of a printing step in a continuous manufacturing process, and particularly a printing step which is effected upon the stock when it is in the form of a continuous web. In this way I obviate the difficulties experienced with the printing of preformed envelopes, or separate sheets for the making of envelopes. Still another object is the provision of a continuous process of printing, cutting out, and setting up a succession of completed envelopes without interruption, by steps preferably carried out by machinery.

These and other objects of my invention, which will be set forth hereinafter or will be apparent to one skilled in the art, I accomplish by that certain construction and arrangement of parts and by that series of process steps of which I shall now describe an exemplary embodiment, reference being had to the accompanying drawings, wherein:

Figure 1 is a plan view of a blank for my preferred envelope.

Figure 2 is a plan view of my formed envelope with the flap open.

Figure 3 is a section through the body of the envelope of Figure 2, taken along the lines 3, 3.

Figure 4 is a plan view of the reverse side of my envelope sealed.

Figure 5 is a partial plan view of the face or front side of my envelope, sealed.

Figure 6 is a diagrammatic view showing the several steps in the process of making my envelope.

Figure 7 shows in plan a form of envelope in which the ears are adapted to be locked instead of sealed.

I shall first describe my preferred envelope structure. As shown in Figure 1, this comprises a blank of paper indicated generally at 1. When making the envelope of heavy papers, such as kraft, or the like, it is preferable not only to cut this blank to shape, but also to score it. I have therefore shown lines of scoring 2 and 4 longitudinally of the blank, paralleling and relatively close to the side edges thereof. I have also shown a line of scoring 5 transversely of the blank and near one end thereof. Another score line 6, also running transversely of the blank, divides the remaining space approximately into two halves. There are thus provided a front portion 7 and a back body portion 8 articulated together, and the flap portion 9 articulated to the end of the front body portion. Articulated to the sides of the body portions are attachment flaps, 10, 11, 12 and 13, respectively. There is a line of cut 14 between the attachment flaps 10 and 11, and a similar line of cut 15 between the attachment flaps 12 and 13. At the end of the flap, I have shown ears 16 and 17 articulated thereto. These ears are separated from the adjacent attachment flaps by lines of cut 18 and 19.

It will be observed that in its preferred form, the blank for my envelope is a rectangular piece of paper, or other suitable fabric, possessing certain cut and score lines, but not requiring the production of any waste, since there are no cut out portions. In its finished form, the back body portion will be folded over upon the front body portion with an interfolding of the attachment flaps, which will be adhesively secured to each other and to the body of the envelope. This structure is very clearly shown in the sectional view in Fig. 3. The manner in which the envelope is set up to form this structure will be hereinafter described. It will be observed in Fig. 2, which shows my envelope ready for filling, that in its preferred form it has the closing flap 9, to which are attached the ears 16 and 17, extending out beyond the sides of the envelope proper. This construction is preferred, but it would also be possible to cut the flap as shown by the dotted line 20 to form a construction in which the ears are absent, and the flap is not wider than the body of the envelope. When, however, the ears are used, after the envelope has been filled, the flap 9 is turned over thereon and cemented down, if desired, after which the ears 16 and 17 may be turned over upon the front body portion of the envelope and there cemented down. In this event the ears 16 and 17 form a reinforcement at the upper ends of the envelope and contribute considerably to its strength. This construction also, however, gives me an additional novel advantage in envelopes designed for other than first class mail shipments. In sealing an envelope filled with such an enclosure, the flap portion 9 may be turned over upon the envelope without being cemented down, whereupon the ears 16 and 17 may be cemented over upon the front body portion of the envelope, thereby holding the envelope closed. The postal authorities may, however, by severing the paper along the score lines 2 and 4 in that portion thereof which articulates the ears 16 and 17 to the flap 9 (this may usually be accomplished merely by raising the flap 9), open the envelope and inspect the contents thereof,

whereupon the envelope may be again sealed, this time by cementing the flap 9 down upon the back bed portion 8 of the envelope. It is also within the scope of my invention to provide means for closing the envelope by an interlock rather than by adhesive means. In this event the ears 16*a* and 17*a* (Figure 7) may be cut to suitable shape to form locking tongues, and corresponding slits 16*b* and 17*b* may be formed in either the front or rear body members of the envelope. The adhesive may be omitted from the ears, and, if desired, also from the flap 9.

It will be observed that the side construction of my envelope gives me double-thickness side edges, which is an important strength factor in envelopes, it being known that the folded edges of an envelope are the weakest portion thereof. Before the formation of the envelope, the entire face of the blank of Fig. 1 may be printed in as many colors as desired. This not only enables me to do my printing in a continuous web prior to the actual formation of the envelope, but also enables me to print both sides of the envelope in a continuous web in one operation. I am thus able to avoid the difficulties connected with printing upon the irregular thickness of the ordinary envelope or the necessity of printing as a separate operation on the blanks. Additionally, by my construction I secure an envelope in which both the front and back portions form substantially uninterrupted panels, which are admirably adapted for the reception and display of printed matter.

The construction of my envelope also facilitates the manufacture thereof by a continuous machine process which has not, so far as I am aware, been previously applied to similar types of envelopes. I prefer, as shown in Fig. 6, to start with my paper in the form of a roll 21 mounted on suitable supports, from which a length of the paper 22 will be continuously drawn. Upon one side of the paper I prefer first to impose whatever printing is desired. This may be done by means of one or more printing rollers 23 and 24, bearing suitable printing plates, or other indicia, and provided with the necessary inking rollers 25 and 26, and ink supply devices 27 and 28. Backing up or platen rolls 29 and 30 will ordinarily be employed. The printed material, preferably still in the form of a continuous band, is next cut and scored to form the envelope. This may be accomplished in any way desired. One way of doing it is by means of a roll 31, bearing suitable cutting and scoring dies, and operating against a back-up or pressure roll 32. Flat bed presses or other equivalent devices may also be used if desired, but continuously operating mechanism is preferred by me, since it is preferable not to interrupt the continuous work of the web. The cutting and scoring mechanism will, of course, be caused, by suitable devices, to operate in synchronism with the printing and with the travel of the web. I have found it possible to form the cut and scored lines in the web and simultaneously to sever the web into individual blanks, which at this stage of my process, will be similar to the blank illustrated in Fig. 1, and will also be printed upon its outer side as shown in Fig. 6.

In the next step of my process and preferably during the continuous travel thereof, I fold over the attachment flaps 11 and 13 onto the inner or upper side of the back body portion 8, as shown at 33. This is preferably accomplished by mechanism. I have not herein described mechanism suitable for accomplishing my process since this forms the subject matter of a separate application. In the next operation, adhesive material is applied at least to areas of the blank indicated at 34 and 35, and which cover the attachment flaps 10 and 12 and adjacent portions of the upper or rear side of the front body portion 7, which adjacent portions will not be wider than the turned over attachment flaps 11 and 13. It is practicable at this point also to apply adhesive material to the envelope flap 9 and its articulated ears 16 and 17, although this may be done as a separate operation either before or after the complete formation of the envelope. If desired adhesive may be omitted on flap 9 and on ears 16 and 17.

The next step, also preferably accomplished by machinery and during the continuous movement of the blank, is to fold the body portion 8 upon the body portion 7, as shown at 36, whereby the folded over attachment flaps 11 and 13 are caused to adhere to the reverse side of the body member 7. The final step is to fold the attachment flaps 10 and 12 bearing the adhesive applied thereto, and before said adhesive has lost its tackiness. This is shown at 37, and the envelope is now finished excepting that in some instances it will be found desirable to hold the envelope by suitable pressure until the adhesive has completely set. Also, if adhesive has not theretofore been applied to the flap 9 and ears 16 and 17, it may be applied and allowed to harden and set. For the selective application of adhesive, rollers having cut out portions in their surfaces and times to rotate synchronously with the passage of the material therebeneath, may be employed. In this way I secure a complete machine formation of an envelope from roll stock, and preferably without the substantial stoppage of the paper in its travel through the machine. By "substantial stoppage" I mean such a cessation of the process as would amount to a division thereof into a plurality of separate processes. If it is desired to perform upon the paper manipulations for which a stoppage of the web is desired, the actual travel of the web may, of course, be made momentarily intermittent. It is possible in my process, however, to accomplish the entire formation of the envelope without interrupting the continuous travel of the paper through the machine.

Modifications may be made in my invention without departing from the spirit thereof.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. A process of forming envelopes which comprises providing envelope stock in rolled form, printing upon said stock, while in web form, cutting and scoring said stock to provide front and back panel-like body portions having sidewise disposed attachment flaps and a main flap, and setting up said envelope by interfolding said attachment flaps and adhesively securing them respectively to said front and back body portions, all without substantial stoppage of the travel of the stock.

2. A process of producing envelopes which comprises providing envelope stock in rolled form, printing upon one face of said stock, in the web form, cutting and scoring said stock to sever it into rectangular pieces characterized by longitudinally parallel scores, articulating attachment flaps to body portions and transverse scores articulating panel-like body portions to each other and a main flap to one of said body por-

tions, folding over the attachment flaps upon one of said body portions, applying adhesive to the attachment flaps on the other of said body portions, and to adjacent areas of said body portions, folding over said first body portion upon said second body portion, and finally folding over said second attachment flaps upon said first body portion, all without substantial stoppage of the travel of the stock.

3. A process of producing envelopes which comprises providing envelope stock in rolled form, printing upon one face of said stock in the web form, cutting and scoring said stock to sever it into rectangular pieces characterized by longitudinally parallel scores, articulating attachment flaps to body portions and transverse scores articulating panel-like body portions to each other and a main flap to one of said body portions, folding over the attachment flaps upon one of said body portions, applying adhesive to the attachment flaps on the other of said body portions, and to adjacent areas of said body portions, folding over said first body portion upon said second body portion, and finally folding over said second attachment flaps upon said first body portion, said operations being performed during the substantially continuous travel of said stock.

4. A process of forming envelopes which comprises providing envelope stock in rolled form, carrying said stock forward and printing upon the outer face thereof, cutting and scoring said stock to divide it into a plurality of rectangular pieces characterized by longitudinal scores, articulating attachment flaps to body portions and sealing ears to a main flap, and by transverse scores articulating panel-like body portions to each other and said main flap to a body portion, and by means of cuts, freeing said attachment flaps and sealing ears from each other, and during the continuous travel of said rectangular pieces first folding over the attachment flaps upon one body portion, applying adhesive to the attachment flaps of the other body portion and to adjacent areas of said body portion, folding over said first body portion upon said second body portion, folding over said second attachment flaps on said first body portion and holding said envelope until said adhesive has set.

5. A process of forming envelopes which comprises providing envelope stock in rolled form, carrying said stock forward and printing upon the outer face thereof, cutting and scoring said stock to divide it into a plurality of rectangular pieces characterized by longitudinal scores, articulating attachment flaps to body portions and sealing ears to a main flap, and by transverse scores articulating panel-like body portions to each other and said main flap to a body portion, and by means of cuts, freeing said attachment flaps and sealing ears from each other, and during the continuous travel of said rectangular pieces first folding over the attachment flaps upon one body portion, applying adhesive to the attachment flaps of the other body portion and to adjacent areas of said body portion, folding over said first body portion upon said second body portion, folding over said second attachment flaps on said first body portion and holding said envelope until said adhesive has set, and subsequently applying adhesive to said main flap.

6. A process of producing envelopes, which comprises providing envelope stock in roll form, cutting and scoring said stock to sever it into rectangular pieces characterized by longitudinally parallel scores articulating attachment flaps to body portions, transverse scores, articulating panel-like body portions to each other and a main flap to one of said body portions, folding over the attachment flaps upon one of said body portions, applying adhesive to the attachment flaps on the other of said body portions, and to adjacent areas of said body portions, folding over said first body portion upon said second body portion, and finally folding over said second attachment flaps upon said first body portion, all without substantial stoppage of the travel of said stock.

HAROLD W. NICHOLS.