

April 25, 1939.

L. O. HAYES

2,155,656

MANUFACTURE OF ENVELOPES

Filed Aug. 1, 1936

2 Sheets-Sheet 1

Fig. 1.

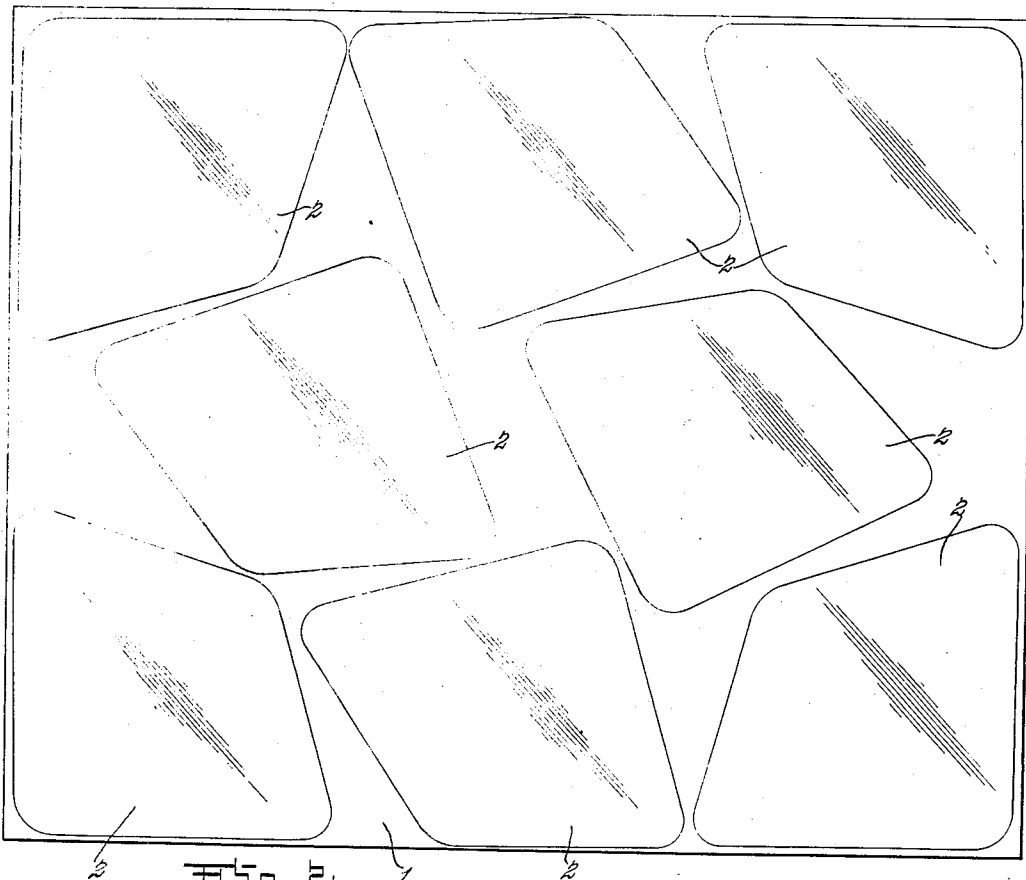


Fig. 2.

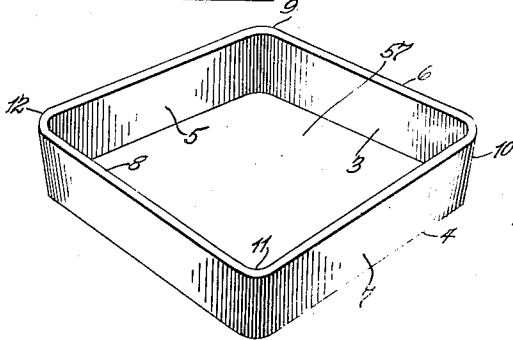
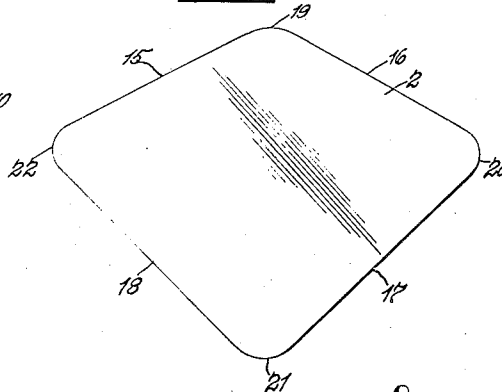


Fig. 3.



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2 Sheets-Sheet 2

Fig. 4.

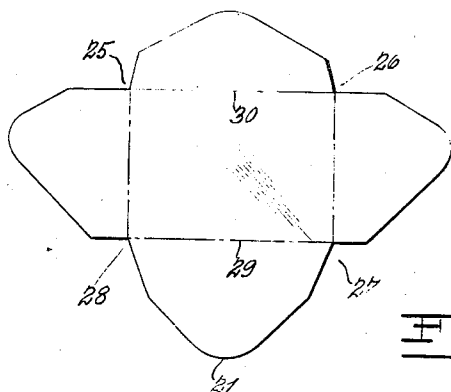


Fig. 5.

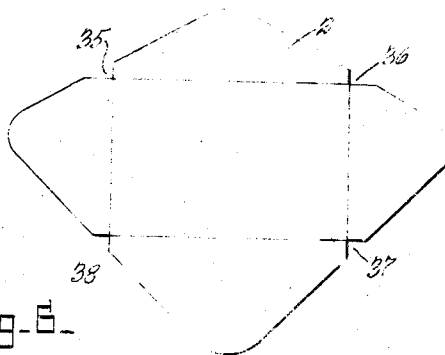


Fig. 6.

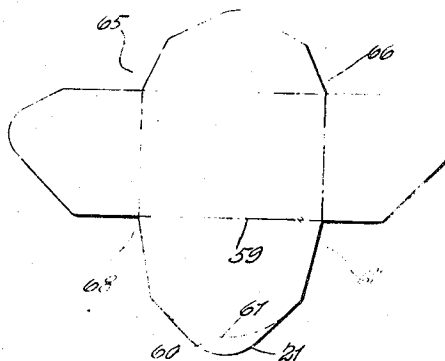
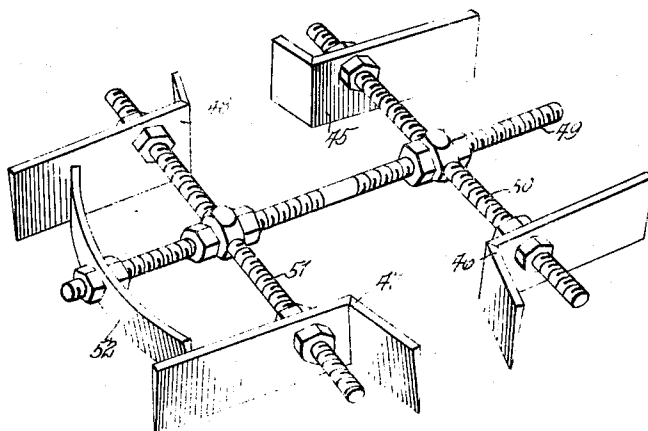


Fig. 7.



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UNITED STATES PATENT OFFICE

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MANUFACTURE OF ENVELOPES

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Application August 1, 1936, Serial No. 93,749

3 Claims. (Cl. 93—61)

This invention relates generally to the manufacture of envelopes and particularly to a process of making odd sized envelopes and the dies employed in such process.

5 In the manufacture of envelopes of conventional sizes, or even in the case of envelopes of odd sizes wherein the quantity to be manufactured renders it economical, a die having a circuitous cutting edge is provided for cutting blanks of the desired shape and size from a stack of paper sheets. With such blanks the only operations necessary to produce the completed envelope are folding and gumming which may be carried out in conventional machinery. In the manufacture of odd sized envelopes in relatively small quantities, however, the conventional practice is to cut preliminary blanks, usually rectangular in shape, from sheets of paper and then, by a series of straight cuts performed upon such rectangular blanks, the blank is reduced to a shape approximating the outline of the completed blank. In a typical case twenty-three such straight cutting operations are necessary upon a given blank in order to prepare it for a final multiple cut with a conventional adjustable die in order to nick the blank at points and to an extent such as to produce a face of the desired dimensions between the vertices of the nicks.

10 In accordance with another practice in manufacturing odd sized envelopes, the procedure set forth in United States Patent No. 863,588 to Cather has been followed to but a limited extent. In that case a rectangular blank is nicked to an extent such as to produce a face of the desired dimensions between the vertices of the nicks. According to the procedure of the Cather patent, envelopes of different sizes may be produced from blanks of a given size by the use of differently dimensioned nicking dies. Envelopes produced according to that method, however, have the disadvantage that the corners of the flaps are angular and, hence, difficult to handle in the machines as well as insecure after being gummed, not to mention the fact that such angular corners result in an envelope of less attractive appearance than one produced according to the now conventional process wherein, as stated above, as many as twenty-three cuts are frequently necessary before the nicking operation is accomplished.

15 The object of the present invention, generally stated, is to provide a process of making odd sized envelopes from blanks of a given size and in which the resultant envelopes will be provided with rounded corners and may be conveniently handled in the conventional envelope machinery.

A further object of the invention is to provide a process of making odd sized envelopes wherein a greater number of envelope blanks may be obtained from a sheet of paper of given size than has been possible in accordance with the practice heretofore followed.

A more specific object of the present invention is to provide a process of making envelopes and dies for use in such process whereby a quadrangular envelope blank having rounded corners may in a single operation be modified so as to produce envelopes of the desired size. Other objects will become apparent to those skilled in the art when the following description is read with the accompanying drawings in which

Figure 1 is a plan view of a sheet of paper stock showing the manner of cutting blanks shaped according to the present invention therefrom.

Figure 2 is a perspective view of a blanking die constructed in accordance with the present invention.

Figure 3 is a plan view of the envelope blank formed by the die of Figure 2.

Figure 4 is a plan view of the blank shown in Figure 3 after being nicked to produce an envelope of small size.

Figure 5 is a plan view of the blank shown in Figure 3 after having been nicked to produce an envelope of larger size than that shown in Figure 4.

Figure 6 is a plan view of the envelope blank shown in Figure 3 after being nicked and trimmed to produce a still smaller envelope.

Figure 7 is a perspective view of an adjustable die suitable for employment in accordance with the process of the present invention.

In accordance with the present invention, envelopes of odd sizes are produced from blanks of a given size, it being understood that a range of sizes is possible from a blank of one given size. In accordance with the present invention, moreover, the blanks employed may be cut from sheets of paper stock by a die having a circuitous cutting edge and having rounded corners, since by this means the ends of the flaps in the resultant envelope are rounded rather than angular and a greater yield of blanks from a sheet of given size is made possible. Ordinarily such envelope blanks will be of quadrilateral shape with rounded corners, the edges between the rounded corners being of regular contour, that is to say, devoid of angles and most usually rectilinear. Having provided a blank of the type just described, the conventional adjustable die as employed in envelope manufacture may be used upon the blanks in

order to nick the regular edges thereof between the rounded corners at points such and to an extent such as to produce an envelope face of the desired dimensions between the vertices of the nicks. By adjustment of the cutting elements of the adjustable die the extent of nicking may be varied and consequently, the distance between the vertices of the respective nicks is varied so as to make possible the production of a range of sizes and shapes of envelopes from given blanks.

Referring now particularly to the drawings, a sheet of paper stock 1 is shown, and arranged thereon is the outline of eight envelope blanks 2 shaped according to the present invention. By the employment of blanks of substantially the shape shown in the drawings a high yield or blanks from a given sheet of paper stock is obtainable as, for instance, in a sheet of paper stock of conventional size from which eight blanks, according to the present invention, may be cut it has, according to the previous practice, been usual to obtain only six blanks.

In cutting blanks 2 from sheet of paper 1 a die such as that shown in Figure 2 may be employed. Such a die may consist of a band 3 of any suitable die stock having a circuitous cutting edge 4 shaped according to the outline of blank 2 and, as shown, the die is of generally quadrilateral shape having four rectilinear sides 5, 6, 7 and 8 with rounded corners 9, 10, 11 and 12 therebetween. According to the present invention, the cutting edges of the die intermediate the rounded corners are of regular contour, that is to say devoid of angles, and ordinarily rectilinear.

By the use of a die such as shown in Figure 2 blanks 2 having a generally quadrangular shape with edges 15, 16, 17 and 18 of regular contour and in the embodiment illustrated rectilinear; such rectilinear edges being joined by rounded corners 19, 20, 21 and 22 corresponding to the shape of die 3.

It will be understood that in the finished envelope rounded corner 19 represents the top flap, rounded corner 21 represents the bottom flap, and rounded corners 20 and 22 the side flaps of the envelope.

From blanks of the same shape and dimensions as blank 2 there may be produced a range of sizes of envelopes according to the present invention. This is accomplished by nicking the blank as shown in Figure 4 as, for instance, at points 25, 26, 27 and 28 in edges 15, 16, 17 and 18 respectively. The position and extent of nicks 25, 26, 27 and 28 determine the size of the face of the resultant envelope, it being understood that the distances between the vertices of the respective nicks determine the size of the face of the envelope, the outline of the face being shown in broken lines in Figure 4.

Similarly, if an envelope of larger size is desired from the given blanks, the nicking may be carried out to a lesser extent than in the case with the blank shown in Figure 4. The blank nicked for the production of such a larger size envelope is shown in Figure 5 where it will be observed that nicks 35, 36, 37 and 38 have been formed with less of a bite from the blank than was the case in the previous embodiment and, consequently, the face of the envelope shown in dotted lines is of larger size than in the embodiment of Figure 4.

In order to accomplish the nicking operation mentioned above, the conventional adjustable envelope die may be employed whereby each of the

four nicks may be simultaneously produced. Such a die generally consists of four angular cutters arranged for relative adjustment and adapted to be forced through a stack of sheets of paper stock or envelope blanks in accordance with the present invention.

The minimum size of envelopes obtainable from a blank of given size in accordance with the present invention is limited first, by the size of the bottom flap resulting from nicking the blank at 27 and 28, it being understood that the distance between round corner 21 and line 29 as shown in Figure 4 must always be less than the distance between lines 29 and 30. In accordance with the present invention, however, the tail of the bottom flap portion in the region of rounded corner 21 may be simultaneously trimmed as the nicking operation is accomplished in order to produce envelopes of still smaller size. A blank so trimmed is illustrated in Figure 6 and may be produced by using a modified adjustable die such as is shown in Figure 7.

The adjustable die shown in Figure 7 is provided with four angular cutters 45, 46, 47 and 48 adjustably mounted upon suitable trunnions 49, 50 and 51 in accordance with the usual construction. The present invention, however, contemplates the provision of an additional trimming cutter 52 upon trunnion 49 in order to provide for trimming the tail from the bottom flap as above described. Such an additional trimming cutter may be mounted for adjustment relative to the other cutters and along trunnion 49. The cutter 52 may conveniently be arc shaped in order to round the end of the bottom flap as it is trimmed.

Accordingly, when extremely large sized envelopes are desired from the given blank, the adjustable die 57 including the trimming cutter 52 may be applied, in which case simultaneously with the cutting of nicks 65, 66, 67 and 68 from the blank there is trimmed from the bottom flap part, in the region of rounded corner 21, a crescent shaped piece 60 so as to leave a rounded edge 61 on the bottom flap, the distance between such edge 61 and the line 59 in Figure 6 being, however, less than the depth of the face of the envelope.

By thus providing envelope blanks of substantially the shape shown in the drawings and having four rounded corners with regular edges therebetween, it is apparent that a range of sizes of envelopes may be produced from such blanks by a single multiple cut or nicking operation which may conveniently be accomplished by the conventional adjustable die. It will be apparent, therefore, that the present invention accomplishes its objects and that, in the manufacture of odd sized envelopes only two operations, namely, blanking and multiple nicking, are necessary to place the blanks in condition for operation by conventional envelope machinery whereas in the previous practice, many operations and a vast amount of time were required to reduce the envelope material to such condition.

While in the foregoing description and in the accompanying drawings a disclosure has been made of some specific embodiments of the invention for the purpose of illustration, it is not to be understood that the invention is limited to the details of the described embodiments, but, on the contrary, that various features of the invention are applicable at large in the manufacture of envelopes. It is realized that various

modifications and adaptations will present themselves to those skilled in the art and it is to be distinctly understood, therefore, that such modifications and the use of such individual features and subcombinations of features of the present invention as present themselves to those skilled in the art without departing from the spirit of this invention are, although not specifically mentioned herein, contemplated by and within the scope of the appended claims.

Having thus described the invention what is claimed is:

1. The method of making relatively irregular, differently sized envelopes from blanks of uniform size and shape which consists in forming a plurality of equi-sized quadrilateral envelope blanks, respectively uniform in configuration, nicking the four sides of the respective blanks at points and to respectively various depths, such as to leave between the vertices of the nicks, faces of desired dimensions within the area of the original blanks, which faces differ in size from each other, folding the blanks in line with the vertices of the respective nicks, and completing the envelopes thereby providing from blanks of a given uniform size, envelopes differing relatively in size inversely with the extent or depth of nicking.

2. The method of making relatively irregular, differently sized envelopes from blanks of uniform size and shape which consists in forming a plurality of equi-sized quadrilateral envelope

blanks having uninterrupted rectilinear sides and rounded corners, and respectively uniform in configuration, nicking the four sides of the respective blanks at points and to respectively various depths, such as to leave between the vertices of the nicks, faces of desired dimensions within the area of the original blanks, which faces differ in size from each other, folding the blanks in line with the vertices of the respective nicks, and completing the envelopes, thereby providing from blanks of a given uniform size, envelopes differing relatively in size inversely with the extent or depth of nicking.

3. The method of making relatively irregular, differently sized envelopes from blanks of uniform size and shape which consists in forming a plurality of equi-sized quadrilateral envelope blanks having rounded corners, and respectively uniform in configuration, nicking the four sides of the respective blanks at points and to respectively various depths, such as to leave between the vertices of the nicks, faces of desired dimensions within the area of the original blanks, which faces differ in size from each other, folding the blanks in line with the vertices of the respective nicks, and completing the envelopes, thereby providing from blanks of a given uniform size, envelopes differing relatively in size inversely with the extent or depth of nicking.

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