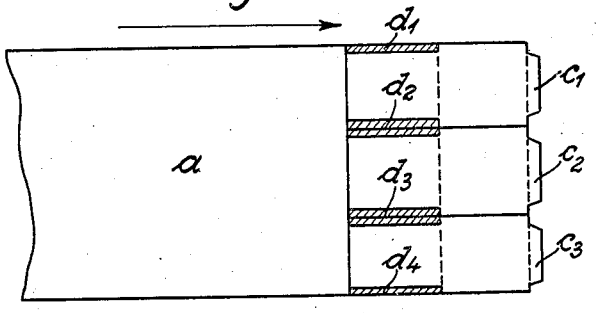
Jan. 23, 1934. F. KLINGER 1,944,794

METHOD FOR THE CONTINUOUS PRODUCTION OF ENVELOPES, ETC

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Fig. 1.



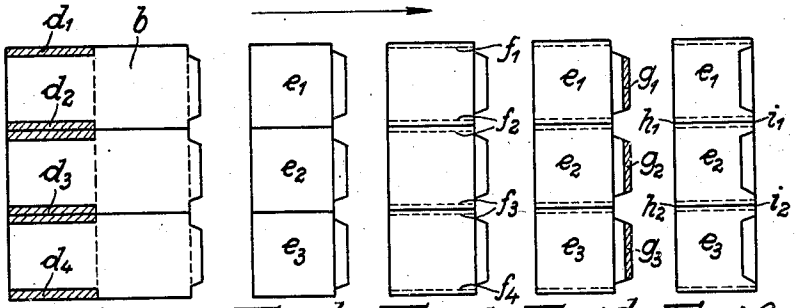


Fig. 1a. Fig. 1b. Fig. 1c. Fig 1d Fig. 1e

Fig. 2.

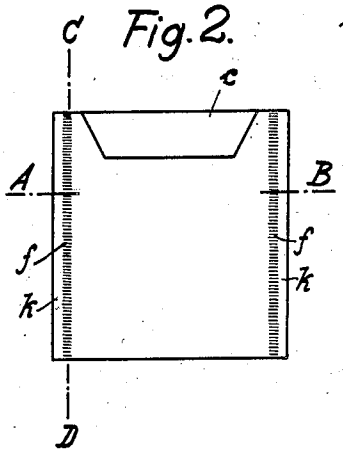




Fig. 3.

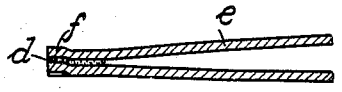


Fig. 4.

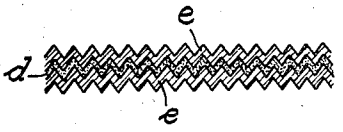


Fig. 5.

Inventor
FRIEDRICH KLINGER
by
Attorney

Jan. 23, 1934. F. KLINGER 1,944,794

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Fig. 6.

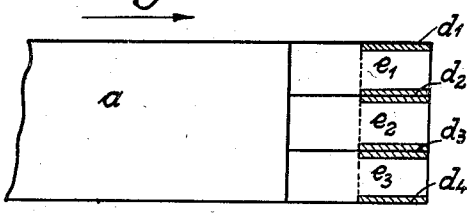


Fig. 6.a

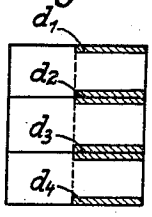


Fig. 6.b Fig. 6.c

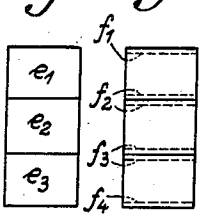


Fig. 7.

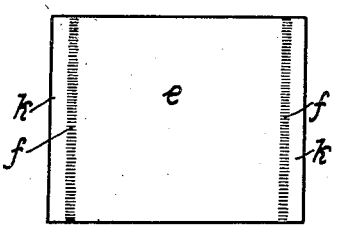


Fig. 8.

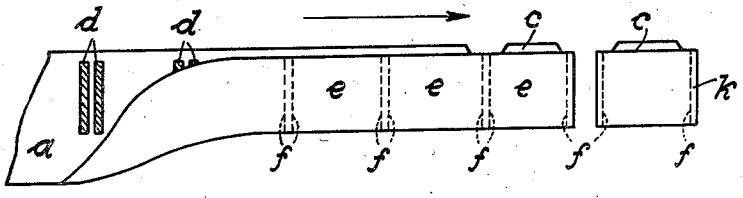


Fig. 8.a.

Inventor
FRIEDRICH KLINGER
by
Attorney

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UNITED STATES PATENT OFFICE

1,944,794

METHOD FOR THE CONTINUOUS PRODUCTION OF ENVELOPES, ETC.

Friedrich Klinger, Hamburg, Germany

Application July 16, 1932, Serial No. 622,961, and in Germany August 25, 1930

4 Claims. (Cl. 93—63)

The invention relates to a method for the continuous production of envelopes etc. without lateral folds from a single continuously moving length of paper, preferably several times wider than the width of an envelope.

A plurality of adjacent envelopes have previously been made simultaneously. Sheets of about four times the width of the flapped envelope, according to the known method of production, are first gummed, turned at an angle of 90°, the lateral edges of the envelope which is being made are provided with gummed strips, the sheet is cut in the middle and the individual halves are folded along the centre line of the envelope, the finished envelopes, finally, being individually separated. When using this method, however, the production is not continuous and an application of gum alone is not sufficient to join together various kinds of materials, the result being that the final product is incapable of holding powdered substances without loss thereof.

Envelopes have also been so made that their edges have been joined together by corrugating them. The paper edges then are either folded over or the corrugated lines intersect each other. This, however, weakens the paper and even causes it to be damaged at the thick portions or at the points where the corrugated lines intersect, thus ruining the envelope to such an extent that it becomes unsuitable for use.

According to the invention, however, envelopes without lateral folds are continuously produced from a moving length of paper preferably several times wider than one of the envelopes, such envelopes being produced by cutting off sheets of about twice the size of the ultimate envelope and folding them along the centre line of said envelope after they have been gummed. The lateral edges are then joined together by means of the gum and corrugated lines, the finished envelopes finally being separated.

A number of embodiments of the invention are shown in the drawings.

Figs. 1 to 1*e* show the various steps of the method according to which a special constructional form of the invention is produced.

Fig. 2 shows an enlarged rear view of an envelope produced according to this method.

Figs. 3 and 4 represent an enlarged section of an envelope on the line A—B of Fig. 2 and made according to this method. In Fig. 3 the envelope is corrugated at a certain distance from the edge and the sheets gummed together. In Fig. 4 the extreme edges of the envelope have been corrugated after a strip of gum has been applied.

Fig. 5 represents a section of the corrugation on the line C—D of Fig. 2.

Figs. 6 to 6*c* illustrate the various steps of the method according to the invention of producing envelopes from a continuously moving length of paper, the envelopes produced in this process being formed without a flap.

Fig. 7 shows an envelope without a flap, its upper edge having been left open.

Figs. 8 and 8*a* represent the steps of a further embodiment of the invention.

Envelopes may, for example, be produced according to the invention in the form illustrated in Figs. 1 to 1*e*. A sheet *b* (Fig. 1*a*) of the length of the unfolded envelope with the flaps *c*1, *c*2, *c*3, is stamped or cut out from the continuous paper supply *a* which is several times wider than the width of a single envelope.

A gumming device is provided for applying the adhesive strips *d*1, *d*2, *d*3, *d*4 which extend along the entire length of the sheet or part thereof only as shown in Fig. 1. The sheet then is so folded that its lower edge is flush with the base of the flap, resulting in a folded sheet of the shape *e*1, *e*2, *e*3 (Fig. 1*b*). Laterally to the separating lines of the individual envelopes the corrugations *f*1, *f*2, *f*3, *f*4 are now applied, preferably in the middle of the adhesive strips (Fig. 1*c*). This corrugation is produced by means of so called edging or embossing rollers in such a manner that the paper of the upper sheet is brought into firm mechanical engagement with that of the lower sheet by means of the teeth in said rollers. The flaps are now gummed at *g*1, *g*2, *g*3 (Fig. 1*d*) and folded over after the gum has dried (Fig. 1*e*). The joined envelopes are then separated at *h*1—*i*1 and *h*2—*i*2 (Fig. 1*e*) by means of a cutting mechanism. The form of the envelopes obtained in this manner is shown in Fig. 2. The corrugation *f* as shown in Figs. 2 and 3 may be applied at a certain distance from the edge of the envelope, but can also be set flush with the edge as illustrated in Fig. 4. The edges are gummed prior to being corrugated as shown in Figs. 3, 4 and 5.

Fig. 5 shows an enlarged longitudinal section on the line C—D of Fig. 2. It is readily appreciated that the corrugations or impressions on the two sheets of paper formed by the embossing rollers assist in joining the two sheets together in a firm mechanical engagement. In this case in addition the sheets are stuck together with gum. Applying the corrugated lines before the gum is quite dry causes the gum to penetrate

deeply into the texture of the paper so that a very strong joint is obtained and makes the envelopes so treated most suitable for withstanding any rough handling to which they may be subject in transit.

Even the free edge *k* which is formed when the corrugation *f* is applied a certain distance from the edges causes the strength of the article to be increased enormously.

Figs. 6 to 6c illustrate the production of envelopes without flaps according to the invention. These envelopes are produced in a continuous manner from the paper supply.

Adhesive is applied to the paper *a* at points which correspond to the edges of the ultimate envelopes (Fig. 6). The paper itself is so wide that a plurality of envelopes adjacent to each other can be produced simultaneously. The drawings show an embodiment in which three adjacent envelopes are made. Naturally the number of adjacent envelopes made simultaneously from paper of the same width can be varied.

The sheets which are twice as long as the ultimate envelopes are, in accordance with the adhesive strips applied, cut off (Fig. 6*a*) and folded in the middle transversely to the longitudinal direction of the paper (Fig. 6*b*), whereupon the envelope is stuck together by the adhesive. The envelopes are now corrugated over the adhesive at *f*1, *f*2, *f*3, *f*4 (Fig. 6*c*). After the sheets have been cut apart between the corrugations, envelopes of the form shown in Fig. 7 are obtained. The sides are joined by means of adhesive and the corrugations in the manner shown in Fig. 7 so that a free edge remains adjacent to the corrugated lines.

This type of envelope which has no flaps may be closed by means of a corrugated line.

Finally, the envelopes may, according to the invention, be produced in the constructional form shown in Figs. 8 and 8*a*. The paper length *a* is, at appropriately spaced distances, provided with adhesive strips *d*, the paper is folded in the longitudinal direction and stuck down to the adhesive strips (Fig. 8). It is folded so that one side of the paper length *a* projects to the extent of the width of the flap, thus facilitating the shaping of said flaps. The folded and gummed paper is then corrugated at *f* over the adhesive strips. The flaps may now be shaped and gummed and the operation is completed upon the finished envelopes being severed between the two corrugated lines (Fig. 8*a*).

The scope of the invention is not limited to the above described embodiments only. Thus, for example, a plurality of adjacent envelopes may be simultaneously produced according to the method shown in Fig. 8 and from paper several times wider than a single envelope.

The main feature, however, is that the corrugated lines are so applied that they do not intersect and that they are not run over folded edges of more than double the thickness of the paper since, otherwise, the envelopes etc. are considerably weakened.

The envelopes may be produced by means of suitable devices and need not be limited to the method of production described above.

The method constitutes a considerable advance over other known processes and, consequently, the envelopes will be very much cheaper in production. Considerably less waste is produced when envelopes with flaps and corrugated edges are made than in the production of laterally folded sides according to known methods and from a paper roll. Hardly any waste at all is left when envelopes without flaps are made.

The new method is much more economical and simple in operation than known methods of making folded envelopes due to the fact that the stamping out, folding and gumming of the lateral folds have not to be considered. The method of joining the edges together by gum and corrugation is particularly adaptable for continuous production from a continuous paper supply. The machines adapted for the new method have a capacity many times greater than that of machines of known types.

External as well as internal printing or the fitting of windows can be carried out simultaneously with the production of the envelopes and any desired imprints can readily be applied thereon. The method according to the invention may also be applied to the making of paper bags, pouches, sacks, etc., and any suitable material such as paper, artificial fabrics, sheets or continuous lengths of derivatives of cellulose, metal foils and the like can be used, which materials frequently cannot be joined together strongly by means of adhesives only.

The envelopes produced by this method are exceedingly strong particularly if the edges are gummed before the corrugated lines are applied. They are far stronger than envelopes which have been gummed or corrugated only. This is particularly the case if the corrugated lines are applied a short distance from the edge.

The envelopes according to the invention have the additional advantage that they cannot be steamed open and then re-closed as is the case with the ordinary types of envelopes. Once an envelope, bag or the like with corrugated edges has been opened, the teeth forming the corrugation are ruined and it can be detected at once if it has been tampered with. The new envelopes, consequently, form a safeguard against their unauthorized opening. A highly desirable type of useful and yet cheap safety envelope is supplied to meet the demand for wrapping of valuables to be used as wage envelopes and the like. For this purpose bags or pouches of derivatives of cellulose or transparent paper are particularly suitable.

Another advantage of the envelopes according to the invention is found in the perfectly smooth surfaces free from gummed seams and therefore admirably adapted for advertisements etc. since there are no obstructions for interfering with any kind of writing, typing or printing.

The corrugation provides a closure sufficiently tight to prevent substances in powder form from leaking out, and the subject matter of the invention, consequently, is particularly suitable for mass production of bags to be used for wrapping cigars and the like and for powdered materials. When used for such purposes the closing may also be effected by corrugated lines. Bags with corrugation sealed edges can be so tightly closed that they may even be used for the wrapping of sterilized goods such as medicaments, perishable matter, etc. Metal foil bags with corrugated edges form an excellent packing for articles for despatch to the torpics, for matter sensitive to light such as photographic materials, films, papers and the like.

The envelopes produced according to the invention can be used in all cases where a cheap covering for mass produced articles is required upon which is put great demands for durability

and strength, which is dust-proof in character and safe against unauthorized opening.

What I claim is:—

1. The method of producing envelopes, bags and the like from a continuous band of material such as paper which includes the steps of forming from the supply band a sheet having a width twice that of the envelope, applying adhesive to said sheet, folding said sheet substantially centrally and longitudinally corrugating the portion of said folded sheet which carries the adhesive.

2. The method of producing envelopes, bags and the like from a continuous band of material such as paper which includes the steps of forming from the supply band a sheet having a width twice that of the envelope and a length equal to the added lengths of a plurality of envelopes, applying adhesive to said sheets at distances approximating to the length of the envelopes, folding said sheet, corrugating the portion of said folded sheet which carries the adhesive at a plurality of places, and severing the individual envelopes.

3. The method of producing envelopes, bags and the like from a continuous band of material such as paper which includes the steps of forming from the supply band a sheet having a width twice that of the envelope and a length equal to the added lengths of a plurality of envelopes, forming at an edge of the sheet a number of flaps corresponding to the number of envelopes to be produced, applying adhesive to said sheets at distances aproximating to the length of the envelopes, folding said sheet, corrugating the portion of said folded sheet which carries the adhesive at a plurality of places, and severing the individual envelopes.

4. The method of producing envelopes, bags and the like from a continuous band of material such as paper which includes the steps of forming from the supply band a sheet having a width twice that of the envelope, applying strips of adhesive to said sheet at a spacing substantially corresponding to the length of the envelope, folding said sheet, and corrugating the portion of said folded sheet which carries the adhesive.

FRIEDRICH KLINGER.