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(54) Method for forming individual letters provided with envelopes

Verfahren zum Herstellen individueller Briefe mit Umschlägen

Procédé pour fabriquer des lettres individuelles dotées d'enveloppes

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Description

FIELD OF THE INVENTION

[0001] The invention relates to a method for forming individual letters provided with envelopes.

BACKGROUND OF THE INVENTION

[0002] The known technology in the field of the invention has been disclosed in publications EP 0297843, EP 0447183, US 6266944, US 2004/0016210, US 2003/0222127 and EP 1693185.

[0003] The first three publications describe methods and apparatuses for producing sealed envelopes, wherein the envelope and the inserted letters are produced separately and from different source webs and then folded in a suitable manner and sealed mechanically inside the envelopes.

[0004] The fourth publication describes a method for cutting, folding and gluing identical envelopes from a paper web.

[0005] The fifth publication describes a method wherein an envelope form and the letters, coupons and the like to be inserted in the envelope are printed on the same paper web.

[0006] In the fifth publication, a specific field has been assigned for the printouts in the paper web in such manner that the envelope form and the letter forms should cover at least half of that field. Consequently, in printing individual mail pieces which vary in size, the size of the field must be adapted to the space required by the largest possible mail piece. Therefore, in almost each mail piece, a considerable portion of the paper web must be cut off to be recycled, or if one wishes to avoid wasting paper, one can only produce one-size mail pieces which must also be so designed that the field assigned for a single printout becomes completely filled. However, such economy measures restrict the efficient use of the method to a considerable degree, so the average paper waste of 20-30% must only be accepted.

[0007] The sixth publication describes a method in which mail pieces of different sizes are made from the same paper web by cutting different-size envelopes of the web according to need. The greatest problems with this application are the complexity of the method, many oblique cuts in different directions and turns of the envelopes and the letters, many flaps and their gluing and folding, etc. This makes the entire method slow and susceptible to malfunctions and not suitable for efficient processing of large mass deliveries.

[0008] Also US 490039/A describes a recirculation folder for direct mail application in which a sheet recirculation, folding and gluing system folds documents, hold them at a wait station and then inserts them into another sheet which is folded and glued online to form an envelope.

[0009] The document US 4 189 895 A discloses a

method and an apparatus for making envelope assemblies from a preprinted web.

OBJECTIVE OF THE INVENTION

[0010] The objective of the invention is to eliminate the drawbacks referred to above. One specific objective of the invention is to provide a new kind of method which allows completely individual letters which may vary freely in their number in a single envelope, allowing at the same time printing of the envelopes and the inserted letters on the same continuous paper web from which they are cut and sorted in a suitable manner. A further objective of the invention is to provide a method in which the paper web is cut as little as possible, the cuts being as quick and straight as possible, so that the entire process becomes as quick and reliable as possible. Similarly, one objective of the invention is to provide a method in which the paper is utilized as efficiently as possible, so that the waste percentage of the paper is reduced to less than 10% and preferably less than 5%.

SUMMARY OF THE INVENTION

[0011] The method in accordance with the invention for producing individual letters provided with envelopes is characterized by claim 1.

[0012] The method in accordance with the invention relates to forming individual letters provided with envelopes from a printed web comprising pre-printed envelope forms and letter forms. In the method, the envelopes are made from the envelope forms and the letter or letters which are inserted in the corresponding envelope are made from one or more letter forms positioned in the immediate vicinity of each envelope form. In accordance with the invention, the envelope forms are led as such to envelope formation. The letter forms, on the other hand, are cut at least on one side into letters which are smaller than the letter forms and which are brought to contact with the envelope form corresponding to the letter. When all letters intended for the envelope are brought to contact with the envelope form, it is folded in two around the letters and glued on the side edges so that an open envelope including the appropriate letters is formed. Finally, the open flap of the envelope is glued and folded, so that a sealed mail piece provided with an envelope is formed.

[0013] In the method, a pre-printed web is first cut into same-size rectangular envelope forms and letter forms, i.e. the entire web is cut into one-size sheets.

[0014] In one embodiment of the invention, the envelope form is first led to a holding stage, whereupon the letters are led one by one to the holding stage directly onto the envelope form. When all the letters for this mail piece have been placed onto the envelope form, it is folded together with the letters in two to form an envelope including the folded letters.

[0015] Another embodiment of the invention comprises leading the letters to an intermediate stage where the

letters for the same envelope are stacked, whereupon they are folded and led folded onto the envelope form. In this manner the letters, one or more, can be folded in two, three or even more, always according to need.

[0016] In the method in accordance with the invention, a paper web is used which is twice as wide as the envelope form and on which the envelope forms and the letter forms are printed in rows successively, the envelope form first followed by the corresponding letter forms on the same or the following rows. Alternatively, the letter forms can be printed first, followed last by the corresponding envelope form.

[0017] All cuts of the web and the letter forms are realized in the method according to the invention by only cutting in the parallel or perpendicular direction to the movement of the web and the letter forms. In other words, the web is cut using only straight cross-cuts, and the sheets provided from the web, are narrowed or shortened using only straight cuts in parallel to the straight edges. In this manner, the cutting blades do not have to be turned in different angles in the separate cutting steps; instead the cutting blades can either be constantly in the cutting position, or they can be, at the most, raised and lowered relative to the path along which the processed paper passes. In this manner, a further cutting of the web and the cut sheets does not slow down the process in any way or add stages that are susceptible to malfunctions to the process.

[0018] An optical identifier such as a bar code or the like, is printed in conjunction with the printing of the web at least on one of the letter forms and the envelope forms of the same mail piece, so that they can be processed based on the identifier.

[0019] However, the optically scanned identifiers are most preferably printed on all envelope forms and letter forms so that they can be processed based on the identifiers to form a sealed mail piece provided with an envelope. In this manner, each sheet cut of the web comprises the individual information of whether it is an envelope form or a letter form, whether it should be cut on some of the sides, where it shall be led and in what manner it shall be folded.

[0020] The method according to the invention allows printing of envelopes and letters on the same paper web and their mechanical processing into finished and sealed letters. The method according to the invention also provides individual mail pieces in which the number of letters in the envelopes may vary freely. Furthermore, the method according to the invention provides, in the production of the mail pieces, fast and simple processes which enable the quick and efficient realization of large and yet individual mass deliveries.

LIST OF FIGURES

[0021] In the following section, the invention will be described in detail with reference to the accompanying drawings, in which

Fig 1 schematically represents a system which operates by the method in accordance with the invention and

Fig. 2 schematically represents one printed paper web used in the method in accordance with the invention.

DETAILED DESCRIPTION OF THE INVENTION

[0022] Fig. 1 schematically represents one embodiment of the method in accordance with the invention. First, envelope forms E1, E2, E3,... and letter forms L1, L2, L3, ..., which are to be formed into sealed mail pieces, are printed on a paper web 1. .

[0023] The paper web used comprises two printed forms side by side. The cutter 2 preferably cuts the web first in two in the longitudinal direction, and the forms are then cut of the acquired two webs and led forward in the process successively in a suitable manner.

[0024] The system identifies the envelope form from an optically scanned code printed on it. Next, one or more letter forms for the envelope form waiting in the holding stage 3 have been printed on the web, the letter forms being also identified by the system from the codes printed on them. The letter forms are cut of the web by the cutter 2 to be of the same size as the envelope forms. The letter forms are then led through a suitable cross-cutter (not shown in the figure) and a slit 4 which narrows the letter forms into letters 5 which are narrower than the envelope form and which are then led one above the other to the holding stage 3 onto the envelope form 6.

[0025] Next, the envelope form 6 together with the letters 5 on top of it are led to a folding machine 7 which also accommodates glue spreaders 8 for spreading suitable glue on the longitudinal edges of the envelope form 6. In this manner, the envelope form folded in two is glued at the edges in the folding machine 7 to form an open envelope 9 including the letters folded with it. The glued edges of the letter are then pressed tight with pressure rollers 10.

[0026] Due to the fact that the envelope form 6 is initially longer than the letters 5, a closing flap 11 is formed in the open envelope 9, the flap being then die-cut 12, glued 13 and finally folded 14 such that a sealed envelope 15 including the letters 5 which are folded in two is provided.

[0027] The method described above also allows production of envelopes in which the letters are folded in three inside the envelope. In this case, an intermediate stage 16 followed by another folding machine 17 is positioned between the slit 4 and the holding stage 3. In this manner, the envelope form 6 is led as usual directly from the cutter 2 to the holding stage 3, but the letters 5 for the same mail piece which have been pre-cut in width are first collected one above the other in the intermediate stage 16, whereupon they are folded in three in a stack with the other folding machine 17 and are only then led to the holding stage 3 onto the envelope form 6. In order

to shorten the letter forms, it is possible to use a suitable cutter, not shown in the figure, instead of the intermediate stage 16 and the folding machine 17.

[0028] The ready-printed form presented in Fig. 2 does not show this printed information, which may be any text or image material sent to the customer. However, the crosswise cutting lines of the webs, which are used for cutting the webs into separate envelope forms and letter forms and which are not actually visible, have been added to the figures for illustrative purposes.

[0029] Fig. 2 presents a printed web structure in which the envelope forms E1, E2, E3, E4, ... and the corresponding letter forms L1, L2, L3, L4, ... have been printed on a web which is twice as wide as the envelope form, i.e. two forms positioned side by side. In this embodiment, all forms have been coded, and therefore each form is identified separately based on its code and processed, such as cut in the longitudinal and cross-direction, stacked and folded, according to the instructions of the code. Furthermore, each form, when cut of the web, is equally long in the longitudinal direction of the web. Normally, the web is cut such that it is first divided in the longitudinal direction into two separate webs which are then passed substantially at the same time and one upon the other, and led alternately to common further processing.

[0030] Consequently, the envelope form E1 cut of the web is in this embodiment first led as such to the holding stage, and the following letter forms L1, L2 and L3 are led onto or under it, depending on the embodiment, the letter forms being cut, however, at least at one straight side to be smaller than initially before bringing them to contact with the envelope form. Correspondingly, the letter forms L1 and L2 following the envelope form E2 are brought to contact with it, and further the letter forms L1, L2, L3 and L4 to contact with the envelope form E3, etc. In this manner, the process advances one envelope at a time, using straight cuts only in the longitudinal direction of the paths of the paper or perpendicularly to it as scarcely as possible, without any oblique or curving cuts whatsoever.

Claims

1. A method for forming individual letters provided with envelopes from a pre-printed web (1), comprising pre-printed envelope forms (6) for forming the envelopes (15), and in the immediate vicinity of each envelope form one or more letter forms for forming a letter or letters (5) and inserting them in the envelope, at least one of said letter forms and said envelope form for the same mail piece being provided with an optical identifier in conjunction with printing the web so that the forms are processed based on the identifier,

- the envelope forms (6) and the letter forms are

printed in rows successively on a paper web (1) which is twice as wide as the envelope form, the envelope form first, followed by the corresponding letter forms on the same or the following rows or the letter forms first and the corresponding envelope form last on the same or the following rows,

- at first the letter forms and the envelope forms (6) are cut of the pre-printed web (1) to be equal in size and rectangular in shape only by cutting in the direction which is parallel or perpendicular to the movement of the web,

- the envelope form (6) is led as such to envelope formation;

- the letter forms are cut at least on one side to letters (5) which are smaller than the letter forms only by cutting in the direction which is parallel or perpendicular to the movement of the letter forms;

- the letters (5) are brought to contact with the envelope form (6);

- the envelope form (6) is folded in two around the letters (5) and its side edges are glued together to form an open envelope (9); and

- the open flap (11) of the envelope (9) is glued and folded, so that a sealed letter provided with an envelope (15) is formed.

2. The method in accordance with claim 1, **characterized in that** the letters (5) are led directly to a holding stage (3) onto the envelope form (6), where they are folded in two together with the envelope form (6).

3. The method in accordance with claim 1, **characterized in that** the letters (5) are led to an intermediate stage where letters for the same envelope are stacked, whereupon they are folded and led folded onto the envelope form (6).

4. The method in accordance with claim 3, **characterized in that** the letters (5) are folded in three before being led onto the envelope form (6).

5. The method in accordance with any one of claims 1 to 4, **characterized in that** optically scannable identifiers are printed on all envelope forms (6) and letter forms so that they are processed into a sealed letter provided with an envelope based on the identifiers.

Patentansprüche

1. Verfahren zum Herstellen von mit Umschlägen versehenen individuellen Briefen aus einer vorbedruckten Bahn (1), umfassend vorbedruckte Umschlagformen (6) zum Herstellen der Umschläge (15), und in der unmittelbaren Nähe jeder Umschlagform einen oder mehrere Briefformen zum Herstellen eines

Briefs oder Briefe (5) und deren Einsetzen in den Umschlag, wobei zumindest eine der Briefformen und der Umschlagformen für das gleiche Versandstück mit einem optischen Identifikator in Verbindung mit dem Bedrucken der Bahn versehen ist, so dass die Formen auf Basis des Identifikators bearbeitet werden, wobei

- die Umschlagformen (6) und die Briefformen in aufeinanderfolgenden Reihen auf einer Papierbahn (1) gedruckt werden, welche zweimal so breit wie die Umschlagsform ist, wobei zuerst die Umschlagform gedruckt wird, gefolgt von den entsprechenden Briefformen auf der gleichen oder den folgenden Reihen, oder wobei zuerst die Briefformen und zuletzt die entsprechende Umschlagsform auf der gleichen oder den folgenden Reihen gedruckt wird,
- die Briefformen und die Umschlagformen (6) zuerst aus der bedruckten Bahn (1) nur durch Schneiden in der Richtung, die parallel oder senkrecht zur Bewegung der Bahn ist, geschnitten werden, um gleich in der Größe und rechteckig in der Forma zu sein,
- die Umschlagsform (6) als solche zur Umschlagsbildung geleitet wird;
- die Briefformen nur durch Schneiden in der Richtung, welche parallel oder senkrecht zur Bewegung der Briefformen ist, zumindest auf einer Seite zu Briefen (5) geschnitten werden, die kleiner sind als die Briefformen;
- die Briefe (5) in Kontakt mit der Umschlagsform (6) gebracht werden;
- die Umschlagsform (6) in zwei Teile um die Briefe (5) gefaltet wird und ihre Seitenkanten zur Bildung eines offenen Umschlags (9) zusammengeklebt werden; und
- die offene Verschlussklappe (11) des Umschlags (9) mit Kleber versehen und gefaltet wird, so dass ein mit einem Umschlag (15) versehener versiegelter Brief gebildet wird.

2. Verfahren nach Anspruch 1, **dadurch gekennzeichnet, dass** die Briefe (5) direkt auf die Umschlagsform (6) zu einer Haltestufe (3) geleitet werden, wo sie zusammen mit der Umschlagsform (6) in zwei Teile gefaltet werden.
3. Verfahren nach Anspruch 1, **dadurch gekennzeichnet, dass** die Briefe (5) zu einer Zwischenstufe geleitet werden, wo Briefe für den gleichen Umschlag gestapelt werden, worauf sie gefaltet und in gefalteter Form auf die Umschlagsform (6) geleitet werden.
4. Verfahren nach Anspruch 3, **dadurch gekennzeichnet, dass** die Briefe (5) in drei Teile gefaltet werden, bevor sie auf die Umschlagsform (6) geleitet

werden.

5. Verfahren nach einem der Ansprüche 1 bis 4, **dadurch gekennzeichnet, dass** optisch abtastbare Identifikatoren auf allen Umschlagsformen (6) und Briefformen gedruckt werden, so dass sie auf Basis des Identifikators zu einen mit einem Umschlag versehenen versiegelten Brief produziert werden.

Revendications

1. Procédé pour fabriquer des lettres individuelles dotées d'enveloppes, à partir d'une bande pré-imprimée (1), comprenant des modèles d'enveloppe pré-imprimés (6), pour former les enveloppes (15) et, à proximité immédiate de chaque modèle d'enveloppe, un ou plusieurs modèles de lettre, pour former une lettre ou des lettres (5) et les insérer ensuite dans l'enveloppe, au moins l'un desdits modèles de lettre et dudit modèle d'enveloppe pour le même élément de courrier, étant muni d'un identificateur optique en liaison avec l'impression de la bande, de manière que les modèles soient traités d'après l'identificateur,

- les modèles d'enveloppe (6) et les modèles de lettre sont imprimés en rangées, successivement, sur une bande de papier (1) d'une largeur double de celle du modèle d'enveloppe, le modèle d'enveloppe en premier, suivi par les modèles de lettre correspondants sur la même rangée ou sur les rangées suivantes, ou les modèles de lettre en premier et le modèle d'enveloppe correspondant en dernier, sur la même rangée ou sur les rangées suivantes,
- tout d'abord, les modèles de lettre et les modèles d'enveloppe (6) sont découpés à partir de la bande pré-imprimée (1), pour être de taille identique et de forme rectangulaire, uniquement par un découpage effectué dans la direction parallèle ou perpendiculaire au déplacement de la bande,
- le modèle d'enveloppe (6) est guidé, en tant que tel, vers la formation d'enveloppes ;
- les modèles d'enveloppe sont découpés au moins sur un côté, de manière à former des lettres (5) plus petites que les modèles d'enveloppe, uniquement par un découpage dans la direction parallèle ou perpendiculaire au déplacement des modèles de lettre ;
- les lettres (5) sont mises en contact avec le modèle d'enveloppe (6) ;
- le modèle d'enveloppe (6) est plié en deux autour des lettres (5) et ses bords latéraux sont collés ensemble, pour former une enveloppe (9) ouverte ; et
- le rabat (11) ouvert de l'enveloppe (9) est collé

et plié, de manière qu'une lettre scellée, munie d'une enveloppe (15), soit formée.

2. Procédé selon la revendication 1, **caractérisé en ce que** les lettres (5) sont guidées directement à un étage de maintien (3) sur le modèle d'enveloppe (6), auquel elles sont pliées en deux, conjointement avec le modèle d'enveloppe (6). 5
3. Procédé selon la revendication 1, **caractérisé en ce que** les lettres (5) sont guidées à un étage intermédiaire, auquel des lettres prévues pour la même enveloppe sont empilées, à la suite de quoi elles sont pliées et menées à l'état plié sur le modèle d'enveloppe (6). 10 15
4. Procédé selon la revendication 3, **caractérisé en ce que** les lettres (5) sont pliées en trois avant d'être menées sur le modèle d'enveloppe (6). 20
5. Dispositif selon l'une quelconque des revendications 1 à 4, **caractérisé en ce que** des identificateurs explorables optiquement sont imprimés sur tous les modèles d'enveloppe (6) et modèles de lettres, de manière qu'ils soient traités pour fabriquer une lettre scellée, munie d'une enveloppe, d'après les identificateurs. 25

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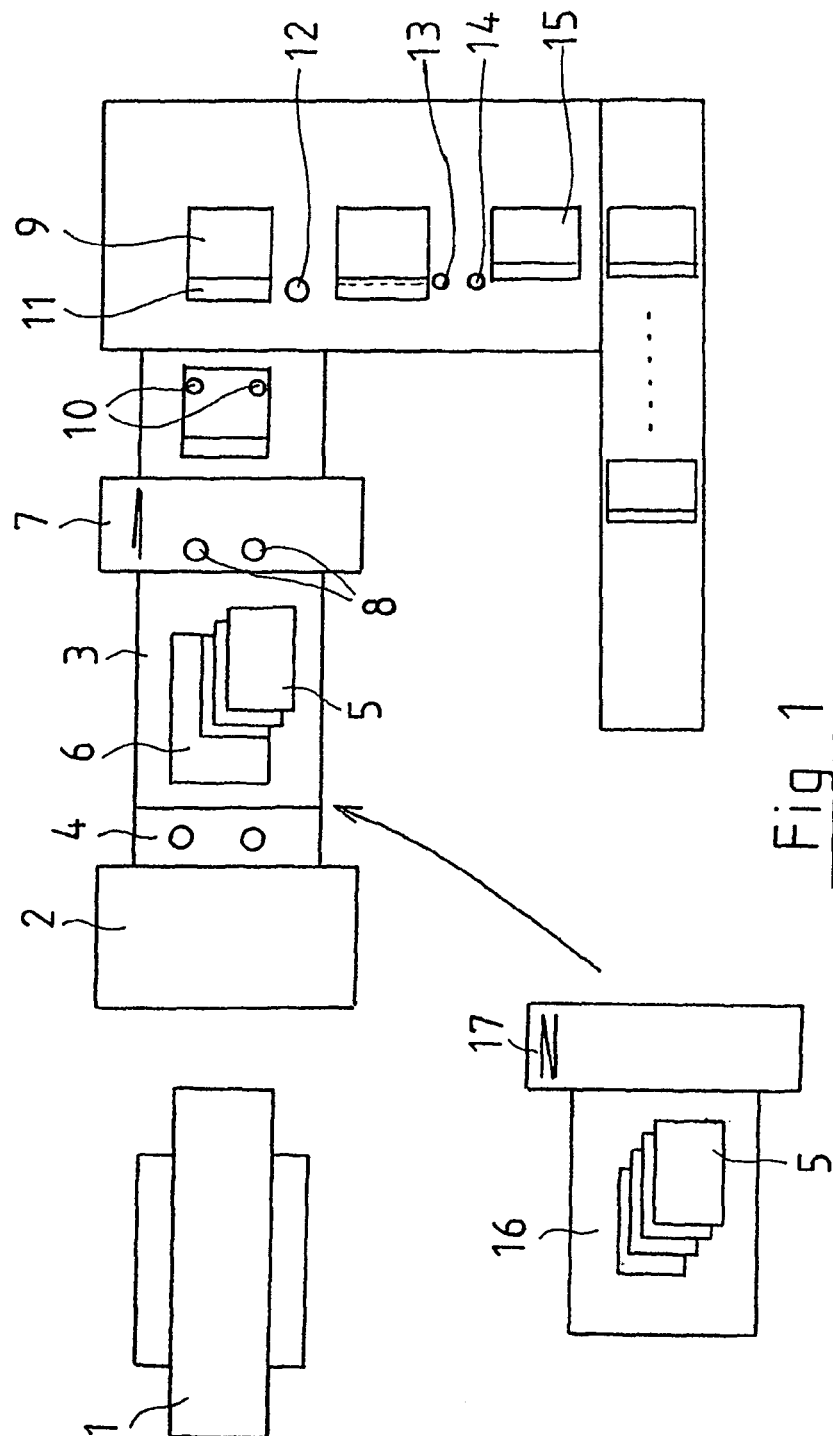
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E1	L1
L2	L3
E2	L1
L2	E3
L1	L2
L3	L4

Fig 2

REFERENCES CITED IN THE DESCRIPTION

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