



(11) **EP 2 895 413 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention
of the grant of the patent:
27.07.2016 Bulletin 2016/30

(51) Int Cl.:
B65H 39/02 (2006.01) **B65H 43/04** (2006.01)
B65H 29/62 (2006.01)

(21) Application number: **13792463.5**

(86) International application number:
PCT/IB2013/058424

(22) Date of filing: **10.09.2013**

(87) International publication number:
WO 2014/041479 (20.03.2014 Gazette 2014/12)

(54) **METHOD FOR AUTOMATIC STUFFING OF PRINTED DOCUMENTS AND AUTOMATIC STUFFING
SYSTEM OF PRINTED DOCUMENTS**

VERFAHREN UND SYSTEM ZUM AUTOMATISCHEN STOPFEN VON GEDRUCKTEN
DOKUMENTEN

PROCÉDÉ ET SYSTÈME DE BOURRAGE AUTOMATIQUE DE DOCUMENTS IMPRIMÉS

(84) Designated Contracting States:
**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO
PL PT RO RS SE SI SK SM TR**

(30) Priority: **11.09.2012 IT BO20120477**

(43) Date of publication of application:
22.07.2015 Bulletin 2015/30

(73) Proprietor: **C.M.C. S.r.l.
06012 Cerbara-Citta' Di Castello (PG) (IT)**

(72) Inventor: **PONTI, Francesco
I-06012 Cerbara-citta' Di Castello (Perugia) (IT)**

(74) Representative: **Dall'Olio, Christian et al
INVENTION S.r.l.
Via delle Armi, 1
40137 Bologna (IT)**

(56) References cited:
US-A- 5 745 590

EP 2 895 413 B1

Note: Within nine months of the publication of the mention of the grant of the European patent in the European Patent Bulletin, any person may give notice to the European Patent Office of opposition to that patent, in accordance with the Implementing Regulations. Notice of opposition shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

Description

FIELD OF INVENTION

[0001] The present invention relates to a method and a system for automatically stuffing of printed documents.

DESCRIPTION OF THE PRIOR ART

[0002] Various types of companies, in particular banks, post offices, telephone companies and public corporations, have the need to send, to a large number of different destinations, a considerable number of printed paper documents such as, for example, bills, invoices, bank statements, advertising letters and the like see e.g. US 5 745 590 A. These documents can include a series of specific information for each addressee and often contain reserved information that must be treated according to existing standards relating to privacy.

[0003] Many of the above-mentioned businesses use external companies, known in the sector as "mailing services", which can act on the part of third parties to perform services including printing, folding, stuffing and dispatch of the paper documents. For this purpose, the mailing service companies use special web (wound continuous paper sheet) printing systems for printing on web typographic reels of large dimensions, and automatic stuffing systems. The printing systems are able to process a file, generally in a graphic format, supplied by their customer company and comprising a series of encoded data codifying the data to be reproduced in a plurality of printed documents. The printing systems include: a device for unreeling the web from a fresh typographical reel starting from a first external end of the sheet; printing means, typically digital, for printing a portion of the sheet while it is being unreeled; and a winding device for winding, starting from the first end, the printed portion of the web. In this way a first printed typographical reel is obtained on which the documents of the plurality of documents are sequentially printed, generally organizing them on the basis of a dispatch parameter (for example a code relating to a postal address of the receiving party). Each document of the plurality of documents is paginated at least on a page and at least the first page of each document includes an identifying code of the relative document.

[0004] The printed typographical reel is then processed by the automatic stuffing system. For this purpose it has to be manually loaded in an unreeling device included in the system which partially unwinds the relative web.

[0005] Thereafter, every page relative to each single printed document on an unwinding portion of web is automatically separated by a separating device, included in the system and arranged downstream of the unwinding device, so as to obtain at least a relative single printed sheet for each single printed document. Each single sheet bears, printed on a relative side thereof, a page of the respective document. The single sheets are automat-

ically fed to a storing device, which is a part of the system and is arranged downstream of the sub-dividing device. The storing device, by reading the identifying code printed on the first page of each document, is able to determine the number of sheets which make up the document and consequently automatically forms a document unit for each document, stacking the relative single sheets in such a way that the relative identifying code printed on the relative first page of each document is visible.

[0006] The above-mentioned stuffing system can comprise one or more devices, known as sheet-placing devices, for inserting in each document unit one or more insertions that can be constituted by single sheets and/or planar articles. The stuffing system further comprises: a stuffing device, arranged downstream of the storing device, for automatically stuffing the formed document units (flat or folded) and obtain corresponding envelopes in which the relative identifying code is visible from outside.

[0007] Typically the document units are folded so as to be stuffed in envelopes of a smaller format than that of the single sheets that make it up. In this case, the system includes a special folding device, also known as the sheet-folder, arranged upstream of the storing device or (if present) the sheet-placing devices and in any case downstream of the stuffing device. Given the speed at which the stuffing system operates, many non-conformities can occur, for example the web might tear, the single sheets might get jammed. In such cases a document unit is not obtained for each document of the plurality of documents, and it can even happen that non-conforming units are formed, for example where an identifying code is not visible.

[0008] These systems comprise: a verifying device, arranged in such a way as to verify the conformity of each unit obtained by the stuffing device and automatically read the identifying code relative to each conforming unit; a reject device, connected to the verifying device and arranged in such a way as to be activated so as to automatically reject the units judged non-conforming by the verifying device; and processing means connected to the verifying device for automatically and together processing the file and the identifying codes read by the verifying device.

[0009] Once all the single sheets obtained from the first typographic reel have been processed, the processing means generate a further file, a printing file, which encodes only the data connected to the documents of the plurality of documents relative to the identifying codes not read by the verifying device. The printing file is loaded into the printing system on the web so as to obtain a second printed reel, known as the printing reel, in which only the documents of the plurality of documents relative to the identifying codes not read by the verifying device.

[0010] The second printed reel must be loaded in the unwinding device and processed by the automatic stuffing system in the same way as the first printed reel. It follows the further process non-conformities can be verified which will give rise to a further printing file and a

further typographic printing reel to be processed in turn using the automatic stuffing system, and so on up to when a conforming envelope is obtained for each document of the plurality of documents, initially printed on the first reel. Therefore, in order to stuff the whole plurality of documents numerous reiterations of the production cycle can be necessary, involving a respective number of reels to be printed.

[0011] The stuffing process and automatic stuffing systems of known type exhibit numerous disadvantages. In particular, when the documents to be dispatched contain sensitive data, the printing on the web requires an appropriate management of the treated data which enables keeping a trace on all the prints launched and the print reels obtained and which takes account of the type of sensitive data and the existing norms and standards on the subject of privacy.

[0012] Further, in order to contain the costs and maximise the production capacity, mailing service companies have to avoid downtimes on the automatic stuffing system. Consequently, once a first printed reel relating to a first client has been processed by the stuffing system, a second printed reel is not waited for, but a printed reel relative to a second client is processed. This can involve a format change or a change of type of the inserts of the document unit and the type of envelope with consequent set-up times of the stuffing system. Each time a successive printed reel is to be processed, relating to the first client, it is newly necessary to reset the stuffing system with the same relative setting as the first printed reel of the first client. This involves a considerable increase in times and costs of working. Further, the envelopes obtained by the second and following print reels are in any case produced in different times with respect to the envelopes obtained by the first printed reel. Consequently a delay can ensue in the delivery of the relative documents which can cause payment of a penalty should the mailing service not respect the dispatch times set down in customer contracts.

[0013] In addition to the above, when the number of documents to be printed is small, as happens after various iterations of the production cycle, it becomes particularly uneconomical to print a small number of pages on a web reel.

[0014] Further, the envelopes obtained following insertion of the print reel can be relative to different destinations; for example they can be relative to different postcodes, or can be relative to the same province or region. In particular the conforming envelopes obtained from several print reels are not ordered according to the same postcode sequence as the first print reel. In this case, the dispatch costs of the envelopes are greater, with respect to those applicable to the envelopes having the same postcode sequence of the first reel, as the subject carrying out the dispatching will have to proceed to a preliminary sorting on the basis of destination or postcode.

SUMMARY OF THE INVENTION

[0015] The main aim of the present invention consists in reducing and/or eliminating the above-cited drawbacks relating to the systems and methods of automatic stuffing of printed documents of known type.

[0016] A further aim of the invention is to provide a method and a system for automatic stuffing of printed documents with a high production capacity and having a low production cost for the envelopes.

[0017] These aims are obtained with a method and a system for automatic stuffing according to the content of the independent claims.

[0018] The method and the automatic stuffing system of the invention enable printing a single reel for a determined client and preventing printing of the print files on corresponding fresh typographic reels, preventing the relative manual loading of fresh reels in the web printing system and the manual loading in the automatic stuffing system of the printing reels. Further, the printing on the single sheets of the documents of the plurality of documents, relating to non-read identifying codes by the verifying device, can occur while the first printed reel is processed by the stuffing system.

[0019] The method and the system of the invention enable processing the single printed sheets with the printing means immediately after having processed the single printed reel relative to the determined client and, in the case of a plurality of iterations, immediately after the preceding iteration. Therefore one single set-up of the stuffing system is sufficient for each client.

[0020] Further, all the envelopes relating to the entire plurality of documents can be delivered contemporaneously to the subject who will carry out the dispatching. This enables reducing the time and production costs of the envelopes of the whole plurality of documents. In particular the time and production costs connected to the last iterations of the production cycle, when the number of pages to be printed is small, are much lower with respect to the prior art.

[0021] In addition, the management of sensitive data contained in the printed documents is simplified, as the printing on the single sheets is carried out in the same period in which the single printed reel is processed.

BRIEF DESCRIPTION THE DRAWINGS

[0022] Embodiments of the method and the realisation of the automatic stuffing system specific to the invention will be described in the following, in accordance with what is set out in the claims and with the aid of the accompanying table of drawings, in which figure 1 illustrates both a diagram (not in scale), of the stuffing system and the various steps of the stuffing method.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0023] With reference to figure 1, reference number 9

denotes the automatic stuffing system of the invention, which enables actuating the method of the invention. The method comprises steps of:

A) providing a typographic reel 1 on a web 101 on which a plurality of documents has been sequentially printed, with each document of the plurality of documents paged on at least a page and with at least a first page of each document reporting an identifying code 22 of the relative document;

B) making available a series of encoded data codifying the information printed in the plurality of documents, the series of data being processable electronically in order to print at least a document of the plurality of documents;

C) automatically separating from the printed web 101 the at least a page of each document of the plurality of documents, such as to obtain at least a relative single printed sheet 2 for each document of the plurality of documents, the printed single sheet 2 having, printed on a side thereof, the at least a page of the relative document;

D) automatically forming a document unit 4 for each document of the plurality of documents, piling the relative at least a single printed sheet 2) in such a way that the relative code (22) reported on the first page of the relative document of the plurality of documents is visible from outside each document unit 4;

E) automatically stuffing each formed document unit 4 for obtaining corresponding stuffed envelopes 5, 5' each containing a document unit 4 wherein the relative code 22 is visible from outside each envelope 5, 5';

F) automatically verifying the conformity of each envelope 5, 5' obtained, automatically discarding each non-conforming stuffed envelope 5' and automatically reading the code 22 relating to each conforming stuffed envelope 5;

G) automatically processing the series of encoded data and the codes 22 read during the verification step such as to detect at least a code 22 that has not been read, if present, and in order to generate a further series of encoded data codifying the printed information in at least a document of the plurality of documents relating to the at least a non-read code 22, the further series of data being usable to print the document; characterised by:

H) automatically printing on at least a single sheet 20 the at least a document of the plurality of documents relating to the at least a non-read code 22 in

order to obtain a relative single printed sheet 2 on a side thereof the at least a page of the document is printed; and

I) reiterating steps D-H until a conforming stuffed envelope 5 has been obtained for each single document of the plurality of documents.

[0024] The identifying code 22 can be an alphanumeric code, a bar code, either single- or bidimensional.

[0025] The automatic stuffing system of printed documents comprises:

an unreeling device 10 for unreeling a typographic reel 1 having a relative web 101;

a separating device 11 arranged downstream of the unreeling device 10 for, when on each web 101 a plurality of documents has been continuously printed with each document of the plurality of documents, having been paginated at least on a page thereof, automatically separating from a portion of the web 101 unreel by the unreeling device 10 the at least a relative page such as to obtain at least a relative single printed sheet 2 for each single document of the plurality of documents. This is one for example by cutting or tearing the web along a dotted line 102 delimiting the page. The at least a single printed sheet 2 exhibits, printed on a relative side thereof, the at least a page of the relative document;

a storing device 12 arranged downstream of the separating device 11, activatable such as automatically to form a document unit 4 for each single document, piling the relative at least a single printed sheet 2, obtainable from the separating device 11, such that an identifying code 22 of each document, reported on a relative first page of the single document, is visible;

a stuffing device 13, arranged downstream of the storing device 12, for automatically stuffing each document unit 4 formable by the storing device 12 and obtaining corresponding stuffed envelopes 5, 5' in which the code 22 is visible from outside each stuffed envelopes 5, 5';

at least a verifying device 14, arranged such as to verify the conformity of each stuffed envelope 5, 5' obtainable from the stuffing device 13 and such as to automatically read the code 22 relating to each conforming stuffed envelope 5;

at least a reject device 15, connectable to the verifying device 14 and activatable such as automatically to reject stuffed envelopes 5' judged to be non-conforming by the verifying device 14;

processing means 16 connectable to the verifying device 14 and activatable to automatically and conjointly process a series of encoded data encoding the printed information in the plurality of documents and the codes 22 read by the verifying device 14 such as to detect at least a code 22 not read by the verifying device 14 and such that when at least a non-read code 22 is detected, to generate at least a further series of encoded data codifying the printed information in a document of the plurality of documents relating to the at least a non-read code 22;

printing means 17 designed for printing on single sheets 20, the printing means 17 such as to print the encoded information in the further series of encoded data on at least a single sheet 2 obtaining at least a single printed sheet 2 having, printed on a side thereof, the at least a page of the document of the plurality of documents relating to the non-read code 22; and

feeding means 18 of single sheets 2, with said single sheets 2 printable by the printing means 17, the feeding means 18 being arranged upstream of the storing device 12 and activatable to feed the storing device 12 with said single sheets 2, when they are loaded in the feeding means.

[0026] The feeding means 18, when connected to the processing means, can be automatically activated by the processing means so as to feed the storing means exclusively with single sheet loaded in the feeding means 18. The printing means can advantageously be constituted by common printers for PCs usable for printing on single sheets 20.

[0027] Typically the series of data codifying the printed information in the plurality of documents is supplied by the client of the mailing service company in an electronic format and is comprised in a file (the "printing file") which, as indicated in figure 1, can be registered on any memory support 30 such as a CD, a DVD or a USB memory stick. Alternatively the file can be sent to via e-mail.

[0028] The printing means 17 are preferably connectable to processing means 16 and, when connected, are automatically activatable by the processing means 16.

[0029] The formation of the document unit 4 can be done by reading and decoding the code 22 indicating the number of pages which constitute the relative document and thus the number of single printed sheets 2 to be stacked. The document unit 4 can therefore comprise a single printed sheet 2, when the number of pages to be stacked is 1, or a stack of single printed sheets 2, when the number is greater than 1. Therefore the storing device 12 can comprise reading means (not shown) of the code 22 and possibly further processing means (not shown) for decoding the code with the aim of defining the number of single printed sheets 2 to be stacked. Alternatively, when the processing means 16 are connected to the storing device 12, the further processing means are no longer

necessary.

[0030] The reading means can comprise an optic sensor or more preferably a television camera. The system of the invention can include at least a sheet-placing device (not shown) for inserting, in the document unit 4, one or more insertions, typically paper sheets of the dimension of the single printed sheets 2. As shown in figure 1, the system 9 can further comprise a sheet-folding device 19, arranged between the storing device 12, of the sheet-placing device (when included) and the stuffing device 13, for folding the document unit 4, should the envelopes to be obtained require a smaller format to that of the single sheets which make up the documents. In this case, in outlet from the sheet-folding device 19 a folded document unit 4' is obtained having smaller dimensions than those of the corresponding document unit 4 formed by the storing device 12 or obtained in outlet from the sheet-placing device when present.

[0031] The envelope 5 can be one with at least a transparent window 25, arranged in such a way that the code 22, reported in the relative document unit, is visible from outside the envelope 5. Alternatively the envelope can be constituted by a transparent wrapping. The stuffing device 13 can therefore be predisposed so as to insert each document unit 4, 4' into a corresponding preformed envelope 25, fed into the stuffing device 13 in known ways, for be configured so as to insert the document unit 4, 4' into a continuous tube of paper or transparent wrapping material, which is then transversally cut to form, after gluing, an envelope containing the document unit 4, 4'.

[0032] The step of printing can be advantageously begun automatically following detection during the processing step of a single non-read code 22 during the step of verification, in order to singly print a document of the plurality of documents relating to the single non-read code 22. This further accelerates the production of the conforming staffed envelopes 5. In this case the processing means 16 are activatable to detect a single non-read identifying code 22 at a time, and so as to generate immediately following the detection a single further series of codifying data at a time so as to enable singly printing each document of the plurality of documents relating to a non-read identifying code 22 by the verifying means.

[0033] The step of reiteration begins before the step of separating the web 101 into single printed sheets 2 is terminated.

[0034] This means that the conforming envelopes 5 can be obtained without interrupting the sequence of postcodes in the printed reel 1. For this reason systems 9 are preferred which comprise selecting means (not illustrated) functionally interposed between the supply means 18 and the storing device 12 and activatable so as to supply the storing device 12 only with single sheets 2 loadable on the feeding means of single sheets 2. When connected to the processing means 16, the selection means are advantageously automatically activatable thereby. Also preferred are methods according to the invention in which the series of encoded data comprises a

parameter for each document of the plurality of documents; wherein the plurality of documents has been printed on the web 101 by ordering the documents of the plurality of documents on the basis of a value of the parameter, where the processing step comprises an automatic control such as to establish whether a conforming stuffed envelope 5 has been obtained for each document of the plurality of documents to which a determined parameter value is associated.

[0035] In this case, the processing means 16 are configured so as to establish whether a conforming stuffed envelope 5 has been obtained for each document of the plurality of documents to which the determined parameter value is associated. The parameter can indicate for example the postcode or a datum relating to the address the envelope is to be sent to.

[0036] The step of separating the web 01 into single printed sheets 2 is advantageously halted up to when the automatic control establishes that a conforming envelope 5 has been found for each document of the plurality of documents to which the determined value of the parameter is associated. This enables obtaining conforming envelopes 5 with the same sequence as the parameter (for example the postcode) of the plurality of printed documents on the reel 1.

[0037] The step of verifying more preferably also comprises an automatic verification of the conformity of each document unit 4, 4' formed; the automatic rejecting of each non-conforming document unit 4, 4' and the automatic reading of the identifying code 22 relative to each conforming document unit 4, 4'. Consequently the verifying device 14 can be advantageously configured so as to further verify the conformity of each document unit 4, 4', once formed by the storing device 12 and/or in outlet from the sheet-placing device and/or the sheet-folding device. Further, the verifying device 14 can automatically read the identifying code 22 relative to each conforming document unit 4, 4'; and the reject device 15 can be configured so as to be activated also so as to automatically reject the document units 4, 4' judged to be non-conforming to the verifying device 14.

[0038] In this case, the processing step advantageously comprises a further automatic control for establishing whether a document unit 4, 4' has been obtained for each document of the plurality of documents, advantageous for each document to which the determined value of the parameter is associated. In this way the printing can immediately be performed on single sheets 20 of a document to which the determined value of the parameter is associated and which is relative to a non-read identifying code 22 during the verification of the conformity of each document unit 4, 4'. In this way the production times of the conforming envelopes 5 are further reduced. It follows that those system 9 are preferable in which the processing means 16 are configured such as to establish whether a conforming document unit 4, 4' has been obtained for each document of the plurality of documents to which a determined value of the parameter is associated. The

verifying means 14 preferably comprise at least a television camera for reading the identifying code 22.

[0039] Systems 9 are preferred in which the processing means 16 are connected to all the devices and/or the means provided in the system 9. In particular, processing means 16 are connectable with the unreeling device 10 and/or the separating device 11 and/or with the storing device 12 and/or the sheet-placing device (when included), the sheet-folding device 13 (when included) and/or the stuffing device 13 and/or the reject device 15 and/or the printing means 17, and/or the sheet-feeding means 18.

[0040] In figure 1, each of the connections relative to the processing means are schematically denoted with broken lines. The above has also been described by way of non-limiting example, so that any variants of a practical-applicational nature are understood to fall within the protective scope of the invention as claimed in the following.

Claims

1. A method for automatic stuffing of printed documents, comprising steps of:

A) providing a typographic reel (1) having a web (101) on which a plurality of documents has been sequentially printed, with each document of the plurality of documents paged on at least a page and with at least a first page of each document reporting an identifying code (22) of the relative document;

B) making available a series of encoded data codifying the information printed in the plurality of documents, the series of data being processable electronically in order to print at least a document of the plurality of documents;

C) automatically separating from the printed web (101) the at least a page of each document of the plurality of documents, such as to obtain at least a relative single printed sheet (2) for each document of the plurality of documents, the printed single sheet (2) having, printed on a side thereof, the at least a page of the relative document;

D) automatically forming a document unit (4) for each document of the plurality of documents, piling the relative at least a single printed sheet (2) in such a way that the relative code (22) reported on the first page of the relative document of the plurality of documents is visible from outside each document unit (4);

E) automatically stuffing each formed document unit (4) for obtaining corresponding stuffed envelopes (5, 5') each containing a document unit (4) wherein the relative code (22) is visible from outside each envelope (5, 5');

- F) automatically verifying the conformity of each envelope (5, 5') obtained, automatically discarding each non-conforming stuffed envelope (5') and automatically reading the code (22) relating to each conforming stuffed envelope (5);
- G) automatically processing the series of encoded data and the codes (22) read during the verification step such as to detect at least a code (22) that has not been read, if present, and in order to generate a further series of encoded data codifying the printed information in at least a document of the plurality of documents relating to the at least a non-read code (22), the further series of data being usable to print the document;
- H) automatically printing on at least a single sheet (20) the at least a document of the plurality of documents relating to the at least a non-read code (22) in order to obtain a relative single printed sheet (2), wherein on a side thereof the at least a page of the document is printed; and
- I) reiterating steps D-H until a conforming stuffed envelope (5) has been obtained for each single document of the plurality of documents.
2. The method of the preceding claim, wherein the step of printing begins automatically following detection during the processing step of a single non-read code (22) during the step of verification, in order to singly print a document of the plurality of documents relating to the single non-read code (22).
 3. The method of any one of the preceding claims, wherein the step of reiteration begins before the step of separating the web (101) into single printed sheets (2) is terminated.
 4. The method of any one of the preceding claims, wherein the series of encoded data comprises a parameter for each document of the plurality of documents; wherein the plurality of documents has been printed on the web (101) by ordering the documents of the plurality of documents on the basis of a value of the parameter, where the processing step comprises an automatic control such as to establish whether a conforming stuffed envelope (5) has been obtained for each document of the plurality of documents to which a determined parameter value is associated.
 5. The method of the preceding claim, wherein the step of separating the web (101) into single printed sheets (2) is suspended until the automatic control establishes that a conforming stuffed envelope (5) has been obtained for each document of the plurality of documents to which the determined parameter value has been associated.

6. An automatic stuffing system of printed documents, comprising:

an unreeling device (10) for unreeling a typographic reel (1) having a relating web (101);
 a separating device (11) arranged downstream of the unreeling device (10) for, when on the web (101) a plurality of documents has continuously been printed, with each document of the plurality of documents having been paginated at least on a page, automatically separating from a portion of the web (101) unreeling by the unreeling device (10) the at least a relative page such as to obtain at least a relative single printed sheet (2) for each single document of the plurality of documents with the at least a single printed sheet (2) heaving, printed on a relative side thereof, the at least a page of the relative document;
 a storing device (12) arranged downstream of the separating device (11), activatable such as automatically to form a document unit (4) for each single document, piling the relative at least a single printed sheet (2), obtainable from the separating device (11), such that an identifying code (22) of each document, reported on a relative first page of the single document, is visible;
 a stuffing device (13), arranged downstream of the storing device (12), for automatically stuffing each document unit (4) formable by the storing device (12) and obtaining corresponding stuffed envelopes (5, 5') in which the code (22) is visible from outside each stuffed envelopes (5, 5');
 at least a verifying device (14), arranged such as to verify the conformity of each stuffed envelope (5, 5') obtainable from the stuffing device (13) and such as to automatically read the code (22) relating to each conforming stuffed envelope (5);
 at least a reject device (15), connectable to the verifying device (14) and activatable such as automatically to reject stuffed envelopes (5') judged to be non-conforming by the verifying device (14);
 processing means (16) connectable to the verifying device (14) and activatable to automatically and conjointly process a series of encoded data codifying the printed information in the plurality of documents and the codes (22) read by the verifying device (14) such as to detect at least a code (22) not read by the verifying device (14) and such that when at least a non-read code (22) is detected, to generate at least a further series of encoded data codifying the printed information in a document of the plurality of documents relating to the at least a non-read code (22);

characterised in that it further comprises:

- printing means (17) designed for printing on single sheets (20), the printing means being (17) such as to print the encoded information in the further series of encoded data on at least a single sheet (2) thereby obtaining at least a single printed sheet (2) having, printed on a side thereof, the at least a page of the document of the plurality of documents relating to the non-read code (22); and
- feeding means (18) of single sheets (2), with said single sheets (2) printable by the printing means (17), the feeding means (18) being arranged upstream of the storing device (12) and activatable to feed the storing device (12) with said single sheets (2).
7. The system of the preceding claim, wherein the printing means (17) are connectable to processing means (16) and, when connected, are automatically activatable by the processing means (16).
8. The system of any one of the preceding claims 6 to 7, wherein the processing means (16) are activatable such as to detect a single non-read code (22) at a time, and to immediately generate, following this detection, a single further series of encoded data at a time to enable singly printing each document of the plurality of documents relating to a non-read code (22) by the verifying device (14).
9. The system of any one of the preceding claims 6 to 8, comprising selecting means activatable to feed into the storing device (12) only single sheets loadable on the single-sheet feeding means (18).
10. The system of any one of the preceding claims 6 to 9, wherein when the series of encoded data comprises a parameter for each document of the plurality of documents and the plurality of documents has been printed on the web (101) and the documents of the plurality of documents being ordered on the basis of a value of the parameter, the processing means (16) are configured such as to establish whether a conforming stuffed envelope (5) has been obtained for each document of the plurality of documents to which a determined value of the parameter has been associated.

Patentansprüche

1. Verfahren zum automatischen Kuvertieren von gedruckten Dokumenten, folgende Schritte beinhaltend:

A) Bereitstellen einer typographischen Rolle (1) mit darauf einer Papierbahn (101), die mit einer Vielzahl von Dokumenten sequenziell bedruckt

wurde, wobei jedes Dokument der Vielzahl von Dokumenten auf zumindest einer Seite paginiert ist und wobei zumindest auf einer ersten Seite jedes Dokuments ein Kennzeichnungscode (22) des entsprechenden Dokuments angegeben ist;

B) Bereitstellen einer Reihe codierter Daten zur Kodifizierung der Informationen, die in der Vielzahl von Dokumenten gedruckt sind, wobei die Reihe von Daten elektronisch verarbeitet werden kann, um zumindest ein Dokument der Reihe von Dokumenten zu drucken;

C) automatisches Trennen der zumindest einen Seite jedes Dokuments der Vielzahl von Dokumenten von der bedruckten Papierbahn (101), um zumindest ein entsprechendes bedrucktes Einzelblatt (2) für jedes Dokument der Vielzahl von Dokumenten zu erhalten, wobei auf einer Seite des bedruckten Einzelblattes (2) die zumindest eine Seite des entsprechenden Dokuments aufgedruckt ist;

D) automatisches Bilden einer Dokumenteinheit (4) für jedes Dokument der Vielzahl von Dokumenten, durch Stapeln des entsprechenden zumindest einen bedruckten Einzelblattes (2) in einer Weise, dass der entsprechende Code (22), der auf der ersten Seite des entsprechenden Dokuments der Vielzahl von Dokumenten angegeben ist, von außen auf jeder Dokumenteinheit (4) sichtbar ist;

E) automatisches Kuvertieren jeder gebildeten Dokumenteinheit (4), um entsprechende gefüllte Umschläge (5, 5') zu erhalten, die jeweils eine Dokumenteinheit (4) enthalten, wobei der entsprechende Code (22) von außen auf jedem Umschlag (5, 5') sichtbar ist;

F) automatisches Überprüfen der Konformität jedes erhaltenen Umschlages (5, 5'), wobei jeder nicht konforme gefüllte Umschlag (5') automatisch ausgesondert und der Code (22) für jeden konformen gefüllten Umschlag (5) automatisch gelesen wird;

G) automatisches Verarbeiten der Reihe codierter Daten und der während des Überprüfungsschrittes gelesenen Codes (22), um zumindest einen Code (22), sofern vorhanden, zu erfassen, der nicht gelesen wurde, und um eine weitere Reihe codierter Daten zur Kodifizierung der gedruckten Informationen in zumindest einem Dokument der Vielzahl von Dokumenten, das auf den zumindest einen nicht gelesenen Code (22) bezogen ist, zu erzeugen, wobei die weitere Reihe von Daten zum Drucken des Dokuments verwendbar ist;

H) automatisches Drucken auf zumindest einem Einzelblatt (20) des zumindest einen Dokuments der Vielzahl von Dokumenten, das auf den zumindest einen nicht gelesenen Code (22)

- bezogen ist, um ein entsprechendes bedrucktes Einzelblatt (2) zu erhalten, auf dessen einer Blattseite die zumindest eine Seite des Dokuments aufgedruckt ist; und
- I) Wiederholen der Schritte D-H, bis ein konformer gefüllter Umschlag (5) für jedes eine Dokument der Vielzahl von Dokumenten erhalten wurde.
2. Verfahren nach dem vorhergehenden Anspruch, wobei der Schritt des Druckens automatisch beginnt, nachdem während des Verarbeitungsschrittes ein einzelner, während des Überprüfungsschrittes nicht gelesener Code (22) erfasst wurde, um ein Dokument der Vielzahl von Dokumenten einzeln zu drucken, das auf den einzelnen, nicht gelesenen Code (22) bezogen ist.
3. Verfahren nach einem der vorhergehenden Ansprüche, wobei der Schritt des Wiederholens beginnt, bevor der Schritt des Trennens der Papierbahn (101) in bedruckte Einzelblätter (2) beendet ist.
4. Verfahren nach einem der vorhergehenden Ansprüche, wobei die Reihe codierter Daten einen Parameter für jedes Dokument der Vielzahl von Dokumenten beinhaltet; wobei die Vielzahl von Dokumenten auf die Papierbahn (101) gedruckt wurde, indem die Dokumente der Vielzahl von Dokumenten auf Grundlage eines Wertes dieses Parameters geordnet wurden, wobei der Verarbeitungsschritt eine automatische Kontrolle beinhaltet, um festzustellen, ob ein konformer gefüllter Umschlag (5) für jedes Dokument der Vielzahl von Dokumenten erhalten wurde, dem ein bestimmter Parameterwert zugeordnet wurde.
5. Verfahren nach dem vorhergehenden Anspruch, wobei der Schritt des Trennens der Papierbahn (101) in bedruckte Einzelblätter (2) ausgesetzt wird, bis durch die automatische Kontrolle festgestellt wurde, dass ein konformer gefüllter Umschlag (5) für jedes Dokument der Vielzahl von Dokumenten erhalten wurde, dem ein bestimmter Parameterwert zugeordnet wurde.
6. System zum automatischen Kuvertieren von gedruckten Dokumenten, Folgendes beinhaltend:
- eine Abwickelvorrichtung (10) zum Abwickeln einer typographischen Rolle (1) mit einer entsprechenden Papierbahn (101);
- eine Trennvorrichtung (11), die stromabwärts nach der Abwickelvorrichtung (10) angeordnet ist und dazu dient, nachdem die Papierbahn (101) kontinuierlich mit einer Vielzahl von Dokumenten bedruckt wurde, wobei jedes Dokument der Vielzahl von Dokumenten auf zumindest ei-

ner Seite paginiert wurde, von einem durch die Abwickelvorrichtung (10) abgewickelten Abschnitt der Papierbahn (101) die zumindest eine entsprechende Seite automatisch abzutrennen, um zumindest ein entsprechendes bedrucktes Einzelblatt (2) für jedes einzelne Dokument der Vielzahl von Dokumenten zu erhalten, wobei auf einer Seite des bedruckten Einzelblattes (2) die zumindest eine Seite des entsprechenden Dokuments aufgedruckt ist;

eine Sammelvorrichtung (12), die stromabwärts nach der Trennvorrichtung (11) angeordnet ist und aktiviert werden kann, um automatisch eine Dokumenteinheit (4) für jedes einzelne Dokument zu bilden, wobei das entsprechende zumindest eine bedruckte Einzelblatt (2), das von der Trennvorrichtung (11) erhalten werden kann, so gestapelt wird, dass ein Kennzeichnungscode (22) jedes Dokuments, der auf einer entsprechenden ersten Seite des einzelnen Dokuments angegeben ist, sichtbar ist;

eine Kuvertiervorrichtung (13), die stromabwärts nach der Sammelvorrichtung (12) angeordnet ist und dazu dient, jede Dokumenteinheit (4), die durch die Sammelvorrichtung (12) gebildet werden kann, automatisch zu kuvertieren und entsprechende gefüllte Umschläge (5, 5') zu erhalten, wobei der Code (22) von außen auf jedem Umschlag (5, 5') sichtbar ist;

zumindest eine Überprüfungsvorrichtung (14), die angeordnet ist, um die Konformität jedes gefüllten Umschlages (5, 5'), der von der Kuvertiervorrichtung (13) erhalten werden kann, zu überprüfen und automatisch den Code (22) für jeden konformen gefüllten Umschlag (5) zu lesen;

zumindest eine Aussonderungsvorrichtung (15), die an die Überprüfungsvorrichtung (14) angeschlossen und aktiviert werden kann, um automatisch diejenigen gefüllten Umschläge (5') auszusondern, die von der Überprüfungsvorrichtung (14) als nicht konform beurteilt wurden;

Verarbeitungsmittel (16), die an die Überprüfungsvorrichtung (14) angeschlossen und aktiviert werden können, um automatisch und gemeinschaftlich eine Reihe codierter Daten zur Kodifizierung der gedruckten Informationen in der Vielzahl von Dokumenten und die von der Überprüfungsvorrichtung (14) gelesenen Codes (22) zu verarbeiten, um zumindest einen Code (22) zu erfassen, der nicht von der Überprüfungsvorrichtung (14) gelesen wurde, und um, falls zumindest ein nicht gelesener Code (22) erfasst wird, zumindest eine weitere Reihe codierter Daten zur Kodifizierung der gedruckten Informationen in einem Dokument der Vielzahl von Dokumenten, das auf den zumindest einen nicht gelesenen Code (22) bezogen ist,

zu erzeugen;

dadurch gekennzeichnet, dass es ferner beinhaltet:

- Druckmittel (17) zum Drucken auf Einzelblättern (20), wobei diese Druckmittel (17) dazu dienen, die in der weiteren Reihe codierter Daten kodifizierten Informationen auf zumindest ein Einzelblatt (2) zu drucken und somit zumindest ein bedrucktes Einzelblatt (2) zu erhalten, auf dessen einer Blattseite die zumindest eine Seite des Dokuments der Vielzahl von Dokumenten aufgedruckt ist, das auf den zumindest einen nicht gelesenen Code (22) bezogen ist; und
- Zuführrmittel (18) für Einzelblätter (2), welche von den Druckmitteln (17) bedruckt werden können, wobei die Zuführrmittel (18) stromaufwärts vor der Sammelvorrichtung (12) angeordnet sind und aktiviert werden können, um die Einzelblätter (2) der Sammelvorrichtung (12) zuzuführen.
7. System nach dem vorhergehenden Anspruch, worin die Druckmittel (17) an die Verarbeitungsmittel (16) anschließbar sind und, sofern angeschlossen, automatisch von den Verarbeitungsmitteln (16) aktiviert werden können.
8. System nach einem der vorhergehenden Ansprüche 6 und 7, worin die Verarbeitungsmittel (16) aktiviert werden können, um jeweils einen einzelnen nicht gelesenen Code (22) nach dem anderen zu erfassen, und sofort nach dieser Erfassung jeweils eine einzelne weitere Reihe codierter Daten nach der anderen zu erzeugen, um das einzelne Drucken jedes Dokuments der Vielzahl von Dokumenten, das auf einen von den Überprüfungsvorrichtung (14) nicht gelesenen Code (22) bezogen ist, zu ermöglichen.
9. System nach einem der vorhergehenden Ansprüche von 6 bis 8, beinhaltend Auswahlmittel, die aktivierbar sind, um der Sammelvorrichtung (12) nur einzelne Blätter zuzuführen, die auf die Zuführrmittel (18) für Einzelblätter geladen werden können.
10. System nach einem der vorhergehenden Ansprüche von 6 bis 9, worin, wenn die Reihe codierter Daten einen Parameter für jedes Dokument der Vielzahl von Dokumenten enthält und die Vielzahl von Dokumenten auf die Papierbahn (101) gedruckt wurde und die Dokumente der Vielzahl von Dokumenten auf Grundlage eines Wertes dieses Parameters geordnet wurden, die Verarbeitungsmittel (16) dafür ausgelegt sind, festzustellen, ob ein konformer gefüllter Umschlag (5) für jedes Dokument der Vielzahl von Dokumenten erhalten wurde, dem ein bestimmter Parameterwert zugeordnet wurde.

Revendications

1. Un procédé de mise sous enveloppe automatique de documents imprimés, comprenant les phases consistant à :

A) prévoir une bobine typographique (1) ayant une bande (101) sur laquelle une pluralité de documents a été imprimée séquentiellement, avec chaque document de la pluralité de documents mis en page sur au moins une page et avec au moins une première page de chaque document reportant un code d'identification (22) du document correspondant ;

B) rendre disponible une série de données codées codifiant les informations imprimées dans la pluralité de documents, la série de données pouvant être traitée électroniquement de manière à imprimer au moins un document de la pluralité de documents ;

C) séparer automatiquement de la bande imprimée (101) ladite au moins une page de chaque document de la pluralité de documents, de manière à obtenir au moins une feuille simple imprimée (2) correspondante pour chaque document de la pluralité de documents, la feuille simple imprimée (2) ayant, imprimée sur un côté de celle-ci, ladite au moins une page du document correspondant ;

D) former automatiquement une unité documentaire (4) pour chaque document de la pluralité de documents, en empilant ladite au moins une feuille simple imprimée (2) correspondante de manière à ce que le code (22) correspondant reporté sur la première page du document correspondant de la pluralité de documents soit visible de l'extérieur de chaque unité documentaire (4) ;

E) mettre automatiquement sous enveloppe chaque unité documentaire (4) formée pour obtenir des enveloppes remplies (5, 5') contenant chacune une unité documentaire (4) dans laquelle le code (22) correspondant est visible de l'extérieure de chaque enveloppe (5, 5') ;

F) vérifier automatiquement la conformité de chaque enveloppe (5, 5') obtenue, en rejetant automatiquement chaque enveloppe remplie non conforme (5') et en lisant automatiquement le code (22) correspondant à chaque enveloppe remplie conforme (5) ;

G) traiter automatiquement la série de données codées et les codes (22) lus pendant la phase de vérification de manière à détecter au moins un code (22) qui n'a pas été lu, si présent, et de manière à générer une autre série de données codées codifiant les informations imprimées dans au moins un document de la pluralité de documents correspondant audit au moins un co-

- de non lu (22), l'autre série de données étant utilisable pour imprimer le document ;
 H) imprimer automatiquement sur au moins une feuille simple (20) ledit au moins un document de la pluralité de documents correspondant audit au moins un code non lu (22) de manière à obtenir une feuille simple imprimée (2) correspondante, où, sur un côté de celle-ci, ladite au moins une page du document est imprimée ; et
 I) réitérer les phases D-H jusqu'à obtenir une enveloppe remplie conforme (5) pour chaque document simple de la pluralité de documents.
2. Le procédé selon la revendication précédente, dans lequel la phase d'impression commence automatiquement suite à la détection pendant la phase de traitement d'un code simple non lu (22) pendant la phase de vérification, de manière à imprimer individuellement un document de la pluralité de documents correspondant audit code simple non lu (22).
 3. Le procédé selon l'une quelconque des revendications précédentes, dans lequel la phase de réitération commence avant que la phase de séparation de la bande (101) en feuilles simples imprimées (2) soit terminée.
 4. Le procédé selon l'une quelconque des revendications précédentes, dans lequel la série de données codées comprend un paramètre pour chaque document de la pluralité de documents ; dans lequel la pluralité de documents a été imprimée sur la bande (101) en ordonnant les documents de la pluralité de documents en fonction d'une valeur du paramètre, où la phase de traitement comprend un contrôle automatique de manière à établir si une enveloppe remplie conforme (5) a été obtenue pour chaque document de la pluralité de documents auquel une valeur de paramètre déterminée est associée.
 5. Le procédé selon la revendication précédente, dans lequel la phase de séparation de la bande (101) en feuilles simples imprimées (2) est suspendue jusqu'à ce que le contrôle automatique établisse qu'une enveloppe remplie conforme (5) a été obtenue pour chaque document de la pluralité de documents auquel la valeur de paramètre déterminée a été associée.
 6. Un système de mise sous enveloppe automatique de documents imprimés, comprenant :
 - un dispositif de déroulement (10) pour dérouler une bobine typographique (1) ayant une bande (101) correspondante ;
 - un dispositif de séparation (11) disposé en aval du dispositif de déroulement (10) pour, quand une pluralité de documents a été imprimée en

continu sur la bande (101), avec chaque document de la pluralité de documents ayant été mis en page au moins sur une page, séparer automatiquement d'une portion de la bande (101) déroulée par le dispositif de déroulement (10) ladite au moins une page correspondante de manière à obtenir au moins une feuille simple imprimée (2) correspondante pour chaque document simple de la pluralité de documents avec ladite au moins une feuille simple imprimée (2) reportant, imprimée sur un côté correspondant de celle-ci, ladite au moins une page du document correspondant ;

un dispositif de stockage (12) disposé en aval du dispositif de séparation (11), pouvant être activé pour former automatiquement une unité documentaire (4) pour chaque document simple, en empilant ladite au moins une feuille simple imprimée (2) correspondante, pouvant être obtenue du dispositif de séparation (11), de manière à ce qu'un code d'identification (22) de chaque document, reporté sur une première page correspondante du document simple, soit visible ;

un dispositif de mise sous enveloppe (13), disposé en aval du dispositif de stockage (12), pour mettre automatiquement sous enveloppe chaque unité documentaire (4) formable par le dispositif de stockage (12) et obtenir des enveloppes remplies (5, 5') correspondantes dans lesquelles le code (22) est visible de l'extérieur de chaque enveloppe remplie (5, 5') ;

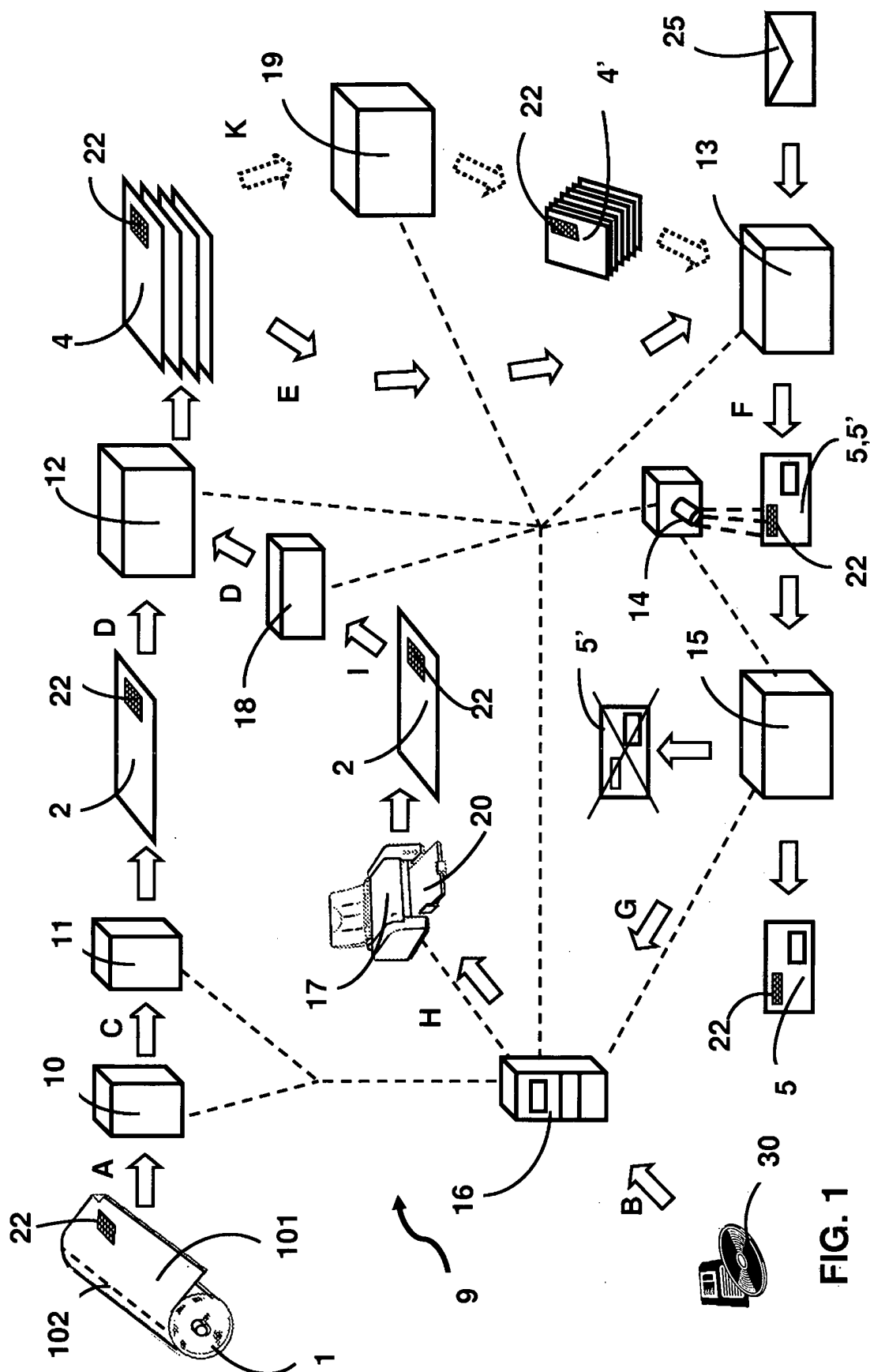
au moins un dispositif de vérification (14), disposé de manière à vérifier la conformité de chaque enveloppe remplie (5, 5') pouvant être obtenue du dispositif de mise sous enveloppe (13) et de manière à lire automatiquement le code (22) correspondant à chaque enveloppe remplie conforme (5) ;

au moins un dispositif de rejet (15), pouvant être relié au dispositif de vérification (14) et pouvant être activé de manière à rejeter automatiquement des enveloppes remplies (5') jugées non conformes par le dispositif de vérification (14) ;

des moyens de traitement (16) pouvant être reliés au dispositif de vérification (14) et pouvant être activés pour traiter automatiquement et conjointement une série de données codées codifiant les informations imprimées dans la pluralité de documents et les codes (22) lus par le dispositif de vérification (14) de manière à détecter au moins un code (22) non lu par le dispositif de vérification (14) et de manière à générer, quand au moins un code non lu (22) est détecté, au moins une autre série de données codées codifiant les informations imprimées dans un document de la pluralité de documents correspondant audit au moins un code non lu (22) ;

caractérisé en ce qu'il comprend en outre :

- des moyens d'impression (17) destinés à imprimer sur des feuilles simples (20), les moyens d'impression (17) étant tels qu'ils impriment les informations codées dans l'autre série de données codées sur au moins un feuille simple (2), obtenant ainsi au moins une feuille simple imprimée (2) ayant, imprimée sur un côté de celle-ci, ladite au moins une page du document de la pluralité de documents correspondant au code non lu (22) ; et
- des moyens (18) d'alimentation de feuilles simples (2), avec lesdites feuilles simples (2) imprimables par les moyens d'impression (17), les moyens d'alimentation (18) étant disposés en amont du dispositif de stockage (12) et pouvant être activés pour alimenter le dispositif de stockage (12) avec lesdites feuilles simples (2).
7. Le système selon la revendication précédente, dans lequel les moyens d'impression (17) peuvent être reliés aux moyens de traitement (16) et, quand reliés, peuvent être activés automatiquement par les moyens de traitement (16).
8. Le système selon l'une quelconque des revendications précédentes 6 et 7, dans lequel les moyens de traitement (16) peuvent être activés de manière à détecter un code non lu unique (22) à la fois, et à générer immédiatement, suite à ladite détection, une autre série unique de données codées à la fois pour permettre l'impression individuelle de chaque document de la pluralité de documents correspondant à un code (22) non lu par le dispositif de vérification (14).
9. Le système selon l'une quelconque des revendications de 6 à 8, comprenant des moyens de sélection pouvant être activés pour alimenter dans le dispositif de stockage (12) uniquement des feuilles simples chargeables sur les moyens d'alimentation (18) de feuilles simples.
10. Le système selon l'une quelconque des revendications de 6 à 9, dans lequel, quand la série de données codées comprend un paramètre pour chaque document de la pluralité de documents et que la pluralité de documents a été imprimée sur la bande (101) et les documents de la pluralité de documents ont été ordonnés en fonction d'une valeur du paramètre, les moyens de traitement (16) sont configurés de manière à établir si une enveloppe remplie conforme (5) a été obtenue pour chaque document de la pluralité de documents auquel une valeur déterminée du paramètre a été associée.



REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- US 5745590 A [0002]