

(19)



(11)

**EP 2 200 843 B1**

(12)

**EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention  
of the grant of the patent:  
**08.01.2014 Bulletin 2014/02**

(51) Int Cl.:  
**B43M 3/04** <sup>(2006.01)</sup> **B65H 5/08** <sup>(2006.01)</sup>  
**B65H 9/10** <sup>(2006.01)</sup>

(21) Application number: **07803569.8**

(86) International application number:  
**PCT/EP2007/060004**

(22) Date of filing: **20.09.2007**

(87) International publication number:  
**WO 2009/036807 (26.03.2009 Gazette 2009/13)**

**(54) APPARATUS, AND A METHOD FOR PLACING A PRODUCT IN AN ENVELOPE**

VORRICHTUNG UND VERFAHREN ZUM ANORDNEN EINES PRODUKTS IN EINEN UMSCHLAG  
APPAREIL ET MÉTHODE POUR LA MISE EN PLACE D'UN PRODUIT DANS UNE ENVELOPPE

(84) Designated Contracting States:  
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR  
HU IE IS IT LI LT LU LV MC MT NL PL PT RO SE  
SI SK TR**

(43) Date of publication of application:  
**30.06.2010 Bulletin 2010/26**

(73) Proprietor: **W + D Direct Marketing Solutions  
GmbH  
32584 Löhne (DE)**

(72) Inventors:  
• **WIENEKE, Wilfried  
32602 Vlotho (DE)**

• **DÖRRIE, Arne  
32584 Löhne (DE)**

(74) Representative: **Walkenhorst, Andreas  
Tergau & Walkenhorst  
Patentanwälte - Rechtsanwälte  
Eschersheimer Landstrasse 105-107  
60322 Frankfurt (DE)**

(56) References cited:  
**EP-A- 1 719 724 WO-A-03/061988  
US-A1- 2006 033 260**

**EP 2 200 843 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

**[0001]** The invention relates to an apparatus comprising:

- an envelope feeder configured to feed envelopes to a product receiving position;
- a positioning structure configured to position the envelopes in said receiving position;
- an inserter configured to insert products into envelopes, positioned in the receiving position, in a product inserting direction; and
- an envelope conveyor to remove filled envelopes from the receiving position, in an envelope removal direction.

**[0002]** Such an apparatus is known from practice and has been marketed by applicant. The known apparatus is of modular structure and is provided with a product assembly path which comprises a number of feeders which are arranged along or above a pusher conveyor. Each feeder feeds a product to be placed in an envelope to a position on the pusher conveyor, so that thus composite products can be obtained. Such a product can comprise, for instance, a main document with a number of annexes. Next, the product, which may or may not be composite, is supplied to an inserting module.

**[0003]** The international patent application W003061988, of the applicant, describes an advantageous embodiment of the apparatus, an example of which is shown in Figures 1-2. This apparatus comprises a product assembly path 1 having a pusher conveyor 2 and at least one feeder 4 for feeding a, possibly composite, product which is to be placed in an envelope. Herein, an inserting module is provided with an endless conveyor 12' with grippers 13' (see Fig. 2), such as, for instance, a toothed belt or chain with grippers, the endless conveyor 12' following a path such that the grippers 13' thereof can engage an envelope contained in the magazine and, as a result of the travel of the conveyor, can pull the envelope from the magazine. The grippers 13' can position a respective envelope in another part of the path in the receiving position.

**[0004]** In this known apparatus, the conveying direction of the mentioned discharge path is perpendicular to the conveying direction of the inserting module. Three endless conveyor belts 22, 23, 24 are provided (see Fig. 2), wherein one conveying part of a first conveyor belt 22 is disposed at least partly against a conveying part of a second conveyor belt 23. The envelope with product advanced by the intermediate conveyor is moved into the nip defined by the two conveyor belts, so that the envelope with product is clamped between the two conveying parts. Thereafter, the envelope can be conveyed further (in a inclined upward direction) and ejected onto the discharge path. The discharge path is provided with a stop 30' against which products supplied by the discharge conveyor belts come to abut, so that they are aligned.

The known discharge path is provided with a vacuum conveyor belt and with sealing means not represented in the drawing, for sealing the envelope. These sealing means comprise, for instance, an apparatus for wetting the sealing flap of the envelope and a guideway for gradually folding over the sealing flap during advancement of the envelope along the discharge path. Instead of a wetting device, a hot-melt glue dispensing unit may be provided. During use, the known apparatus can move an envelope with product further between the conveying parts of the conveyor belts until it comes to lie against the stop to be subsequently discharged in the discharge path in transverse direction.

**[0005]** Until the present day, the known apparatus has been successfully used in filling landscape orientated (i.e. wallet type) envelopes, having a relatively wide mouth with respect to lateral envelope edges.

**[0006]** The present invention aims to provide an improved apparatus. Particularly, the invention aims to provide an inserting apparatus that can handle a large range of products into envelopes of a large range of sizes, weights and thicknesses, reliably and rapidly. More particularly, the invention aims to provide an apparatus that can handle portrait orientated (i.e. pocket type) envelopes.

**[0007]** According to an embodiment of the invention, the apparatus is characterized in that the positioning structure comprises envelope guides configured to abut two lateral envelope edges of each envelope that is in said receiving position to actively position, and a drive to laterally adjust a position of at least one of the envelope guides.

**[0008]** In this way, a very accurate, active positioning (alignment) of the envelope can be obtained, automatically, and directly after the envelope has been conveyed into the product receiving position, so that a reliable inserting of product into the envelope can be achieved. It has been found that this improved (drive induced) positioning of the envelope is particularly advantageous in the case the envelope is of a pocket type, wherein the product has to be slid into the envelope over a relatively long distance compared to the filling of a wallet type envelope. However, the present apparatus can also be used to fill wallet type envelopes. Besides, high throughput and even less envelope filling obstructions (due to a misalignment between envelope and product) can be achieved by the present invention, with respect to known apparatus.

**[0009]** An embodiment of the invention provides a method for placing a product in an envelope using an apparatus according to any one of claims 1-9, wherein the envelope is fed to the product receiving position, by the envelope feeder, wherein the position of the envelope guides is adjusted laterally to align the envelope with respect to a product receiving path and the guides hold the envelope without any (zero) tolerance there-between to align the envelope, wherein the inserter inserts a product into the aligned envelope, in the product inserting direc-

tion.

**[0010]** Thus, above-mentioned advantages can be achieved. Preferably, wherein the envelope guides can hold the envelope between respective envelope guiding surfaces.

**[0011]** It is noted that EP 1.719.724 discloses an apparatus, such as paper handling equipment, having a materials feed tray for feeding materials such as envelopes. The material feed tray comprises adjustable side guides. The side guides can be controlled to move toward and away from each other by means of a knob. When rotating the knob, the side guides move in either direction dependent on the direction of rotation of the knob. The feed tray comprises a tensioner mechanism that causes the side guides to automatically back off a controlled amount when the knob is released from movement in the direction to close the side guides. The back off of the two side guides is a controlled movement of the side guides away from each other. The distance is such that the envelopes to be fed from the feed tray will not bind on the sides or be jammed resulting in a failure to feed.

**[0012]** Also, for example, after the filling of the envelope, the envelope guides can be repositioned to release the envelope, wherein an envelope conveyor removes the filled envelope from the receiving position, preferably in an envelope removal direction that is parallel to the product receiving direction.

**[0013]** According to a further embodiment, during a first mode of operation, the position of the envelope guides is preferably adjusted to align envelopes having a first envelope width, wherein, during a second mode of operation, the position of the envelope guides is adjusted to align envelopes having a second envelope width that differs from said first envelope width. In this way, the apparatus and method can include different operating modes for different envelope formats and/or dimensions. As an example, positions of the guides may be manually adjustable, in view of the envelope format that is to be actively aligned by the guides.

**[0014]** Further elaborations of the inserting apparatus according to the invention are described in the dependent claims and will hereinafter, together with the method according to the invention, be further elucidated with reference to the drawing.

Fig. 1 shows a front view of the product assembly path of an embodiment of an inserting apparatus; Figure 2 schematically shows a front view of an inserting module of the apparatus of Fig. 1; Figure 3 schematically shows a front view of part of an apparatus according to a further embodiment of the inserting apparatus; Figure 4 schematically shows a top view of an embodiment of the inserting apparatus, having envelope guides; Figure 5 shows a cross-section over line V-V of Fig. 4; Figure 6 depicts a top view of part of the embodiment

of Figures 5-6, in more detail;

Figure 7 is a side view of the part shown in Fig. 6; Figure 8 shows a side view of a transmission wheel; and

Figure 9 shows a front view of an envelope guide of the embodiment of Figures 5-6.

**[0015]** In the present application, similar or corresponding features are denoted by similar or corresponding reference signs.

**[0016]** Figures 1-2 show an embodiment of an inserting apparatus, having a product assembly path 1 and inserting module 7 (see above). The product assembly path 1 can be configured to convey assembled products to the inserting apparatus, particularly utilizing a product conveyor 2.

**[0017]** Figures 3 shows part of a further embodiment of an inserting apparatus. The apparatus can be provided with:

- an envelope feeder 12 configured to feed envelopes E to a product receiving position;
- a positioning structure, comprising a stop device 14, configured to position the envelopes in said receiving position;
- an inserter 7 configured to insert products into envelopes, positioned in the receiving position, in a product inserting direction; and
- an envelope conveyor 29 to remove filled envelopes from the receiving position, in an envelope removal direction (indicted by arrow X).

**[0018]** For example, the apparatus can include an afore-mentioned product assembly path 1 comprising a product conveyor 2 and at least one feeder 4 for feeding a, possibly composite, product P which is to be placed in the envelope E.

**[0019]** The inserter (or inserting module) 7 can be provided with a magazine 8 for envelopes. The inserter 7 can also include a transport device 12 for transporting the envelopes to the mentioned product receiving position (in which receiving position, in use, the product P coming from the product assembly path can be placed in the envelope E).

**[0020]** Also, there can be provided a discharge path in which the envelope with the product placed therein is discharged from the inserting module 7 for further processing. According to a non-limiting embodiment, the discharge path has a discharge conveying direction which is substantially perpendicular (or transverse) to a conveying direction X of the inserting apparatus (such a transverse direction is indicated by arrows Y).

**[0021]** According to an embodiment, the envelope conveyor 12' can include grippers 13', that can engage an envelope contained in the magazine and, as a result of the travel of the conveyor, can pull the envelope from the magazine, and the grippers can position a respective envelope in another part of the path in the receiving position

(see Fig. 2).

**[0022]** Alternatively, means can be provided to push envelopes from the magazine into the grippers, when the grippers pass the magazine. This is depicted in Figure 3. In this case, the envelope magazine 8 comprises conveyors that can take envelopes from a stack, and can push the envelopes into passing grippers 13 of an endless conveyor 12. For example, the grippers 13 can automatically grip envelopes pushed therein, to transfer the envelopes to a mentioned product receiving position at a first stop 14. Also, the grippers 13 can automatically release a gripped envelope in case the envelope has been positioned in that receiving position.

**[0023]** The envelope feeder 12 can also be configured differently.

**[0024]** According to a preferred embodiment, the inserting module (see Fig. 2 and 3) can be provided with intermediate conveyor means which are arranged for taking over the conveyance of the product P from the pusher conveyor 2 of the product assembly path 1 (see also Fig. 1). In the present exemplary embodiment, the intermediate conveyor means are designed as an endless conveyor 20 with pushers 21. The endless intermediate conveyor 20 is driven with a controllable drive, so that the speed with which the product can be slid into the envelope by the intermediate conveyor 20 can be varied. The intermediate conveyor 20 takes over the conveyance of the product, which is initially effected by the pusher 3 of the pusher conveyor 2 of the product assembly path 1, and slides the product into an envelope which is disposed in the receiving position. During or directly after sliding the product into the envelope, the stop 14 is brought into the release position, for example such that the product, together with the envelope, can be conveyed to a second, elongated, stop 30 (or discharge stop), located along the discharge path. For example, a first vacuum belt 29 can be provided to carry out the transfer of the envelopes from the inserting module, in a envelope removal direction X.

**[0025]** Further, in Fig. 3 it is visible that the inserting module can be provided with a suction cup 25 for pulling up an opening edge (i.e. the product receiving mouth) of the envelope E disposed in the receiving position. Further, a movably arranged downholder 26 can be provided, for holding down the product to be inserted, under the pulled-up opening edge. The displacement of the movable downholder 26 involves a reciprocating movement for sliding the downholder into the opening of the envelope after the suction cup has pulled up the opening edge.

**[0026]** In the embodiment of Fig. 3, the discharge path preferably extends at the same vertical level as the receiving position in which, in use, the product coming from the product assembly path is placed in the envelope. Thus, the stop 30 of the discharge path extends substantially at the same height as the product receiving position. For example, a first vacuum conveyor 29, comprising a pair of suction belts in the present embodiment, can be

provided to transfer an envelope E (for example filled with product) with high speed from the product receiving position towards the discharge path. For example, the first vacuum conveyor 29 can move envelopes at a speed higher than 1 m/s, for example 1.5 m/s or more, during use, in a conveying direction X of the inserting module. In the present embodiment, as an example, this conveying direction is equal to a conveying direction of the product assembly path 2. The suction belts of the first vacuum conveyor can be arranged symmetrically with respect to a centre line of a path to be taken by the envelopes.

**[0027]** Advantageously, the inserting module can be provided with the endless conveyor 12 with grippers 13, such as, for instance, a toothed belt or chain with grippers, the endless conveyor 12 following a path such that the grippers thereof can receive an envelope contained in the magazine 8, wherein the endless conveyor 12 is provided with a first upper part 12A for transferring the envelopes to the product receiving position, and a second part 12B extending below the level of the product receiving position (and reaching below a skewed roller conveyor 31, which is described in the following). This is shown in Fig 3, wherein the second upper part 12B of the endless (gripper) conveyor 12 extends at an angle downwards with respect to the first upper part 12A, which extends in a substantially horizontal plane. An intermediate conveyor or guide 17, for example comprising suitable guiding wheels, is provided, from which the second conveyor part extends towards a lower conveyor end part 12C, away from the level of the first vacuum conveyor 29. An opening or slit can be provided in the plane of the vacuum conveyor 29, where-through upwardly protruding parts of the grippers 13 of the endless conveyor 12 (at its upper section) can be led downwardly. During use, the conveying speed of the endless conveyor 12 and the first vacuum conveyor 29 can be set such, that envelopes (filled at the product receiving position) do not run into upwardly protruding gripper parts of the endless conveyor 12 when the envelopes are moved towards the discharge path by the vacuum conveyor 29.

**[0028]** Figures 4-9 show a further embodiment of the apparatus, which differs from the embodiments described above (regarding figures 1-3) in that the positioning structure comprises envelope guides 33, 34 configured to abut the two lateral envelope edges t1, t2 of each envelope that is in said receiving position, and a drive (or drive mechanism) M, 63, 64 to laterally adjust a position of at least one of the envelope guides 33, 34. In the present embodiment, two opposite guides 33, 34 are provided, and lateral (i.e. transverse) positions of both the guides 33, 34 can be actively adjusted during operation of the (inserting) apparatus. Particularly, said lateral envelope edges are the edges t1, t2 that extend in transverse direction with respect to a product receiving mouth (opening edge) of the respective envelope E (see Fig. 4). Also, for example, part of an envelope transport path runs through an area that is laterally enclosed by the guides 33, 34, the guides 33, 34 extending in parallel with

that transport path part (as in the present embodiment, see the drawings).

**[0029]** In the present embodiment, each of the guides 33, 34 includes an elongated envelope guiding element (which can also be called a guide bar, or support member) 33, 34, preferably having a length that is at least half the length of a lateral envelope edge (said length being measured in the direction indicated by arrows X in the drawing). For example, the length of each guiding element 33, 34 can be 75% or more, preferably 90% or more, of the length of the lateral envelope edge.

**[0030]** The guiding elements 33, 34 can be configured and shaped in different ways, as will be clear to the skilled person. For example, the guiding element 33, 34 can be a guiding blade, or have a knife blade shape (see Fig. 9), or a different shape. For example, the elements can be made of metal, for example aluminum, an alloy, steel, plastic (such as fiber reinforced plastic), or different material(s).

**[0031]** Particularly, the guiding element 33, 34 have parallel vertical guiding surfaces S, which surfaces S are faced towards each other; in the present embodiment, the guiding surfaces S extend parallel with respect to a product inserting direction (particularly, the product inserting direction is a direction in which a product is inserted into the envelope, for example the direction X). These guiding surfaces S also extend parallel with respect to the envelope removing direction X. The drive can adjust the position of the envelope guiding elements 33, 34 directions that are normal (i.e. directions Y) with respect to their guiding surfaces S.

**[0032]** In the present embodiment, the vertical guiding surfaces are flat, uninterrupted surfaces. Alternatively, the guiding surfaces can be perforated, or include apertures in a different way, if desired. Particularly, the guiding surface S of a guiding element 33, 34 is configured such that a major part of a respective lateral edge of an envelope E, to be aligned, can contact that surface S (the major part being for example at least 75% of the lateral envelope edge, and preferably at least 90% of the edge).

**[0033]** The guide drive M, 63, 64 is preferably configured to move the envelope guides 33, 34 to a first position (shown in Figure 4) wherein the opposite guiding surfaces S of the guides 33, 34 are spaced-apart over a first distance, which first distance is larger than a width, measured perpendicularly to said inserting direction, of envelopes E to be positioned.

**[0034]** Also, the drive M, 63, 64 is preferably configured to move the envelope guides 33, 34 to a second position wherein opposite guiding surfaces of the guides are spaced-apart over a second distance, which second distance is the same as or slightly (for example about one millimeter) smaller than the width, measured perpendicularly to said inserting direction, of the envelopes E to be positioned.

**[0035]** Also, in the present embodiment, the two guide elements 33, 34 are preferably translated over the same lateral distance by the drive M, 63, 64, but in opposite

lateral directions.

**[0036]** The guide drive (drive mechanism) can be configured in various ways. For example, the drive can include one or more actuators, motors, servos, configured to reposition the envelope side guides 33, 34. For example, the drive can be an electrical, pneumatic, or hydraulic drive, using electric, pneumatic or hydraulic energy for adjusting the position of the guides 33, 34. Preferably, the drive includes or a controller, or is controlled by a controller (not shown), such that the drive automatically adjust guide positions during operation of the apparatus.

**[0037]** In the present embodiment, both guides 33, 34 are actively adjustable by the drive. According to an embodiment, the apparatus can include two separate guide motors, one per guide 33, 34, to control guide positions. Preferably, as in this embodiment, only a single actuator (for example an electromotor) is included, and arranged to adjust the positions of both the envelope guides 33, 34.

**[0038]** In the present embodiment, for example, the drive M, 63, 64 includes a first and second laterally moveable arm 63, 64, i.e., being linearly movably in the lateral directions Y. Particularly, the arms 63, 64 extend in parallel, for example above an envelope transport path, and for example spaced-apart from each other in the X direction (see Fig. 6). A first 63 of the arms 63, 64 is coupled to a first envelope guide 33, and a second arm 34 is coupled to the second envelope guide 34, respectively, to laterally move the envelope guides. During envelope filling operation, the positions of the guides 33, 34 and their respective drive arms 63, 64 are fixed.

**[0039]** In the embodiment, the arms 63, 64 are movably (for example slidably) mounted onto suitable arm guides 80, 81. In the embodiment, these arms guides 80, 81 are arranged at opposite sides with respect to the envelope path.

**[0040]** In a preferred embodiment, the (lateral) position of each of the envelope guiding elements 33, 34 with respect to the respective arm 63, 64 can be, preferably manually, adjusted. For example, the guiding elements 33, 34 can be connected to the respective arms 63, 64 using releasable locking means 73, 74, for example clamps, bolting means, or other types of connectors or coupling means. In this embodiment, unlocking and locking of a envelope guiding element 33, 34 to and from the respective arm 63, 64 can be achieved manually. Preferably, the arms 63, 64 and guide elements 33, 34 (or at least the respective coupling means) are configured to provide a limited number of guide element locking positions, for example at predetermined arm locations.

**[0041]** In this way, an operator can set different modes of operation depending on the width of envelopes to be filled. For example, there can be provided a first mode of operation, wherein the positions of the envelope guides 33, 34 on the arms 63, 64 is adjusted, in view to a first envelope width, to align envelopes having a first envelope width during a subsequent envelope filling process. During another (second) mode of operation, the position of the envelope guides with respect to their arms

63, 64 can be adjusted in view of a second envelope width, which is different from said first envelope width, to align other envelopes having the second envelope width.

**[0042]** According to a further embodiment, each guiding element 33, 34 can include a stabilizing member 33A, 34A, respectively, which cooperates with the driving arm 64, 63 of the other guiding element 33, 34, to improve the guiding element's 33, 34 stability during operation (see Fig. 6). In this embodiment, the stabilizing members 33A, 33B extend in lateral directions from guide element end sections, along the driving arms 64, 63 to be movably supported by the arms. For example, the stabilizing member 33A of the first guide 33 can be slidably (i.e. slidably) supported by the driving arm 63 of the second guide 34; the stabilizing member 34A of the second guide 34 can be slidably supported by the driving arm 63 of the first guide 33. Therein, the support provided by the driving arms 63, resp. 64 to the stabilizers 34A, resp. 33A is particularly such that pivoting of the guides 34, resp. 33 (particularly along both horizontal and vertical pivot lines) is counteracted.

**[0043]** The drive can also include a mechanism 70, 71 configured to move the arms 63, 64 in opposite directions Y during operation, in order to move the guide elements 33, 34 laterally away from each other (to an envelope holding position) and towards each other (to an envelope release position). The mechanism can be configured in different ways, for example including chain members, transmission belts, toothed rotatable and linearly movable parts interacting with each other, cam means, or in a different manner. The mechanism can be driven by a suitable actuator M, for example electromotor, a stepping motor, or a different actuator type.

**[0044]** In the present embodiment, the mechanism includes a transmission 70, 71 configured to convert a rotation, particularly a rotation over a certain predetermined rotation angle (for example a turn of 360 degrees or smaller), into a first linear movement having a first direction and into a second linear movement having a second direction, opposite to the first direction. This can be achieved in various ways. The present non-limiting embodiment comprises a cam guiding member, particularly a cam guiding wheel 70, that is rotatable about a respective rotation axis. The rotation axis, for example, extends in parallel with the guiding elements 33, 34. The motor M is connected to the cam guiding wheel 70, to turn the wheel over a desired angle of rotation. End sections of the linearly movable (i.e. translating) arms 63, 64 are provided with cams 71 (preferably cam wheels) that cooperate with the cam guiding wheel 70, to convert a rotation of that wheel 70 into the linear movement of the arms 63, 64. Naturally, vice versa, a driven rotating member can also be provided with cams acting on suitable guiding slots of the arms.

**[0045]** For example, the cam guiding wheel 70 can include two eccentric cam guiding slots 70A (one slot 70A being provided in each side of the wheel 70) that receive the cams 71 of the arms 63, 64, as in Fig. 6, 8;

particularly, the guiding slots 70A extend eccentrically with respect to the rotation axis of the wheel 70. The guiding slots 70A may, for example, be ring shaped. Preferably, these eccentric cam guiding slots 70A are shaped identically (having the same dimensions, for example diameter in case of ring shaped slots), and are not concentric with respect to each other. Preferably, virtual centers of the guiding slots 70A are located on opposite sides with respect to a centre of rotation of the guiding wheel 70, at the same distance from that centre.

**[0046]** In a further embodiment, a turning (rotation) of the guiding wheel 70 over a predetermined angle (for example 180 degrees, or a smaller angle) in a first rotation direction leads (via interaction with the cam means 70A, 71) to the envelope guides 33, 34 moving away from each other, and a turning (rotation) of the guiding wheel 70 in a second rotation direction, which is opposite to the first rotation direction, leads to the envelope guides 33, 34 moving towards each other.

**[0047]** According to an embodiment, the transmission 70, 71 can be configured such that each arm 63, 64 (and respective guide element 33, 34) can translate over a maximum distance of several centimeters, for example a maximum distance of 1 cm, more particularly 0.5 cm or less.

**[0048]** Thus, in the present embodiment, the drive M, 63, 64 is configured to laterally adjust the position of each of the envelope guides 33, 34 (preferably over the same distance, but in different direction), particularly such that the guides 33, 34 are always positioned at equal distances with respect to a, predetermined, central envelope positioning line (the central positioning line particularly depends on the longitudinal centre of the product feeding path; during operation, products P that are fed to the envelopes E, located at their product receiving positions, will generally be aligned with respect to their feeding paths).

**[0049]** In the embodiment, of figures 4-9, as follows from the above, the positioning structure comprises a stop device 14 to stop envelopes that are fed to the receiving position, at an envelope edge that is perpendicular to the lateral envelope edges. The overall positioning structure (including the guides 33, 34) is preferably configured such that the stop device 14 acts on an envelope E first, before the envelope guides 33, 34 are activated (i.e. driven by the drive mechanism M, 70, 71, 63, 64) to laterally align that envelope.

**[0050]** The present apparatus can provide swift filling of are pocket type ('portrait') envelopes E, having lateral edges that are longer than the width of a product receiving mouth of the envelopes E. As is mentioned above, the present invention can also be applied to the filling of wallet type ('landscape') envelopes.

**[0051]** Operation of the apparatus (see figures 4-5) can provide a method for placing products P in envelopes. Therein, wherein each envelope E is fed to the product receiving position, by the envelope feeder (for example conveyor) 12.

**[0052]** Preferably, the envelope E is stopped first, by the stop device 14 acting on an envelope edge that is perpendicular to the lateral envelope edges, before the envelope is being aligned by the envelope guides. To this aim, for example, the stop device 14 can move an envelope stop into the envelope conveying path, in a vertical direction Z (as in Fig. 5).

**[0053]** After the envelope E has been stopped by the stop device 14, the position of the envelope guides 33, 34 is adjusted laterally to align the envelope E with respect to a product receiving path. Preferably, as a result, the guides 33, 34 enclose the envelope along its opposite lateral side with zero tolerance. Also, in a further embodiment, the guide elements 33, 34 can apply a small pressure (i.e. a pressing force larger than 0 N) to the envelope E held there-between, for example pressing the envelope E slightly inwardly, however, this is not essential.

**[0054]** Then, the inserter inserts a product P into the thus aligned envelope, in the product inserting direction that is substantially parallel to the lateral envelope edges t1, t2.

**[0055]** Preferably, the envelope guides 33, 34 hold the envelope E between respective envelope guiding surfaces S, without any (zero) tolerance there-between, to align the envelope E.

**[0056]** Also, after the filling of the envelope E, the envelope guides 33, 34 are repositioned, i.e. moved away from each other by the drive mechanism, to release the envelope E. Also, then, the stop device 14 can be controlled to release the envelope E, particularly by removing the respective stop from the envelope conveying path. The downstream envelope conveyor 29 can then remove the filled envelope E from the receiving position, preferably in an envelope removal direction X that is parallel to the product receiving direction, and a subsequent envelope can be transferred to the product receiving position to be aligned by the side guides 33, 34.

**[0057]** Particularly, during operation, the envelope guides 33, 34 are first spaced-apart from each other (in a first lateral direction Y), by the above-described drive mechanism, over a first distance to receive the envelope there-between. As is mentioned above, preferably the first distance is larger than a width, measured perpendicularly to said inserting direction, of the envelope E to be positioned. Subsequently, the envelope guides 33, 34 are moved towards each other (in a second lateral direction Y opposite to said first lateral direction), to a second position, to push the envelope to a desired aligned envelope position. According to a non-limiting embodiment, said first distance can be larger than the envelope width by at most 5 cm, preferably at most 2 cm and more preferably at most 1 cm.

**[0058]** The present apparatus and method can provide a swift, reliable and accurate filling of envelopes E, particularly by using active lateral alignment of the envelopes E. Also, a relatively high throughput can be achieved.

## Claims

### 1. An apparatus comprising:

- an envelope feeder (12) configured to feed envelopes (E) to a product receiving position;
- a positioning structure (14) configured to position the envelopes in said receiving position;
- an inserter (7) configured to insert products into envelopes, positioned in the receiving position, in a product inserting direction; and
- an envelope conveyor (29) to remove filled envelopes from the receiving position, in an envelope removal direction (X);

**characterized in that** the positioning structure comprises envelope guides (33, 34) configured to abut two lateral envelope edges of each envelope that is in said receiving position and a drive (M, 63, 64) to laterally adjust a position of at least one of the envelope guides (33, 34), wherein the drive (M, 63, 64) is configured to move the envelope guides to a first position wherein opposite guiding surfaces of the guides are spaced-apart over a first distance, which first distance is larger than a width, measured perpendicularly to said inserting direction, of envelopes to be positioned and wherein the drive (M, 63, 64) is configured to move the envelope guides to a second position wherein opposite guiding surfaces of the guides are spaced-apart over a second distance, which second distance is the same as or slightly smaller than a width, measured perpendicularly to said inserting direction, of envelopes to be positioned.

2. The apparatus according to claim 1, wherein each of the guides (33, 34) includes an elongated envelope guiding element (33, 34) having a length such that is use at least half the length of a lateral envelope edge of the envelope can contact the guiding element.
3. The apparatus according to any of the preceding claims, wherein the drive (M, 63, 64) includes a first and second laterally moveable arm (63, 64) that are coupled to a first and second envelope guide (33, 34), respectively, to laterally move the envelope guides, as well as an actuator (M) driven mechanism (70, 71) configured to move the arms (63, 64) in opposite directions (Y) during operation.
4. The apparatus according to claim 3, wherein the mechanism includes a transmission (70, 71) configured to convert rotation into a first linear movement having a first direction and a second linear movement having a second direction, opposite to the first direction.

5. The apparatus according to any of the preceding claims, wherein the drive (M, 63, 64) is configured to laterally adjust the position of each of the envelope guides (33, 34), such that the guides are positioned at equal distances with respect to a central envelope positioning line. 5
6. The apparatus according to any of the preceding claims, wherein the positioning structure comprises a stop device (14) to stop envelopes that are fed to the receiving position, at an envelope edge that is perpendicular to the lateral envelope edges, wherein the positioning structure is configured such that the stop device (14) acts on an envelope first, before the envelope guides (33, 34) are activated to align that envelope. 10
7. The apparatus according to any of the preceding claims, wherein the apparatus is configured to handle envelopes (E) that are pocket type envelopes, having lateral edges that are longer than the width of a product receiving mouth of the envelopes. 15
8. A method for placing a product in an envelope using an apparatus according to any one of the preceding claims, wherein the envelope (E) is fed to the product receiving position, by the envelope feeder, wherein the position of the envelope guides (33, 35) is adjusted laterally to align the envelope (E) with respect to a product receiving path and the guides hold the envelope (E) without any (zero) tolerance there-between to align the envelope, wherein the inserter inserts a product (P) into the aligned envelope, in the product inserting direction. 20
9. The method according to claim 8, wherein the envelope guides (33, 34) hold the envelope (E) between respective envelope guiding surfaces. 25
10. The method according to claim 8 or 9, wherein after the filling of the envelope (E), the envelope guides are repositioned to release the envelope, wherein an envelope conveyor removes the filled envelope from the receiving position, preferably in an envelope removal direction that is parallel to the product receiving direction. 30
11. The method according to any of claims 8-10, wherein the envelope guides (33, 34) are first spaced-apart from each other over a first distance to receive the envelope there-between, wherein the first distance is larger than a width, measured perpendicularly to said inserting direction, of the envelope to be positioned, wherein subsequently the envelope guides are moved towards each other, to a second position, to push the envelope to a desired aligned envelope position. 35

12. The method according to claim 11, wherein said first distance is larger than the envelope width by at most 5 cm, preferably at most 2 cm and more preferably at most 1 cm. 40
13. The method according to any of the claims 8-12, the envelope (E) is stopped first, by a stop device (14) acting on an envelope edge that is perpendicular to the lateral envelope edges, before the envelope is being aligned by the envelope guides. 45
14. The method according to any of the claims 8-13, wherein the envelope that are used in the method are pocket type envelopes. 50
15. The method according to any of claims 8-14, wherein, during a first mode of operation, the position of the envelope guides is adjusted to align envelopes having a first envelope width, wherein, during a second mode of operation, the position of the envelope guides is adjusted to align envelopes having a second envelope width that differs from said first envelope width, 55

#### Patentansprüche

##### 1. Vorrichtung, umfassend:

- eine Umschlagzuführungseinrichtung (12), die dafür ausgelegt ist, Umschläge (E) einer Produktaufnahmeposition zuzuführen;
- einen Positionierungsaufbau (14), der dafür ausgelegt ist, die Umschläge in dieser Aufnahmeposition zu positionieren;
- einen Einleger (7), der dafür ausgelegt ist, Produkte in einer Produkteinlegerichtung in die in der Aufnahmeposition positionierten Umschläge einzulegen; und
- einen Umschlagförderer (29), um die gefüllten Umschläge in einer Umschlagentnahmerichtung (X) aus der Aufnahmeposition zu entnehmen;

**dadurch gekennzeichnet, dass** der Positionierungsaufbau Umschlagführungen (33, 34) umfasst, die dafür ausgelegt sind, sich an zwei seitliche Umschlagkanten eines jeden in der Aufnahmeposition befindlichen Umschlags anzulegen, und einen Antrieb (M, 63, 64), um eine Position mindestens einer der Umschlagführungen (33, 34) seitlich einzustellen, wobei der Antrieb (M, 63, 64) dafür ausgelegt ist, die Umschlagführungen in eine erste Position zu bewegen, in der einander gegenüberliegende Führungsflächen der Führungen um einen ersten Abstand voneinander beabstandet sind, wobei der erste Abstand, senkrecht zur Einlegerichtung gemessen, größer ist als eine Breite der zu positionieren-

- den Umschläge und wobei der Antrieb (M, 63, 64) dafür ausgelegt ist, die Umschlagführungen in eine zweite Position zu bewegen, in der einander gegenüberliegende Führungsflächen der Führungen um einen zweiten Abstand voneinander beabstandet sind, wobei der zweite Abstand, senkrecht zur Einlegerichtung gemessen, genauso groß oder geringfügig kleiner ist als eine Breite der zu positionierenden Umschläge.
2. Vorrichtung gemäß Anspruch 1, bei der jede der Führungen (33, 34) ein längliches Umschlagführungselement (33, 34) aufweist, deren Länge so gewählt ist, dass im Gebrauch mindestens die halbe Länge einer seitlichen Umschlagkante des Umschlags am Führungselement anliegen kann.
  3. Vorrichtung gemäß einem der vorherigen Ansprüche, bei der der Antrieb (M, 63, 64) einen ersten und einen zweiten seitlich beweglichen Arm (63, 64) aufweist, die so mit einer ersten bzw. einer zweiten Umschlagführung (33, 34) gekoppelt sind, dass sie die Umschlagführungen seitlich bewegen, sowie einen von einem Stellglied (M) angetriebenen Mechanismus (70, 71), der dafür ausgelegt ist, während des Betriebs die Arme (63, 64) in entgegengesetzte Richtungen (Y) zu bewegen.
  4. Vorrichtung gemäß Anspruch 3, bei der der Mechanismus ein Getriebe (70, 71) aufweist, das dafür ausgelegt ist, eine Drehbewegung in eine erste lineare Bewegung mit einer ersten Richtung und eine zweite lineare Bewegung mit einer zweiten, der ersten Richtung entgegengesetzten Richtung umzuwandeln.
  5. Vorrichtung gemäß einem der vorherigen Ansprüche, bei der der Antrieb (M, 63, 64) dafür ausgelegt ist, die Position der jeweiligen Umschlagführung (33, 34) seitlich so einzustellen, dass die Führungen in gleichen Abständen zu einer mittleren Umschlagpositionierungslinie positioniert werden.
  6. Vorrichtung gemäß einem der vorherigen Ansprüche, bei der der Positionierungsaufbau eine Anschlageinrichtung (14) umfasst, um die der Aufnahmeposition zugeführten Umschläge an einer Umschlagkante anzuhalten, die zu den seitlichen Umschlagkanten senkrecht steht, wobei der Positionierungsaufbau so gestaltet ist, dass die Anschlageinrichtung (14) zunächst auf einen Umschlag einwirkt, bevor die Umschlagführungen (33, 34) aktiviert werden, um jenen Umschlag auszurichten.
  7. Vorrichtung gemäß einem der vorherigen Ansprüche, bei der die Vorrichtungen dafür ausgelegt ist, Umschläge (E) vom Typ Taschenumschlag zu handhaben, deren seitliche Kanten länger sind als die Breite einer Produktaufnahmeöffnung der Umschlä-
- ge.
8. Verfahren zum Einlegen eines Produkts in einen Umschlag unter Verwendung einer Vorrichtung gemäß einem der vorherigen Ansprüche, bei dem der Umschlag (E) von der Umschlagzuführungseinrichtung der Produktaufnahme-position zugeführt wird, wobei die Position der Umschlagführungen (33, 34) seitlich eingestellt wird, um den Umschlag (E) gemäß einem Produktaufnahmepfad auszurichten, und die Führungen den Umschlag (E) ohne jegliche (null) Toleranz zwischen sich halten, um den Umschlag auszurichten, wobei der Einleger ein Produkt (P) in Produkteinlegerichtung in den ausgerichteten Umschlag einlegt.
  9. Verfahren gemäß Anspruch 8, bei dem die Umschlagführungen (33, 34) den Umschlag (E) zwischen jeweiligen Umschlagführungsflächen halten.
  10. Verfahren gemäß Anspruch 8 oder 9, bei dem die Umschlagführungen nach dem Füllen des Umschlags (E) neu positioniert werden, um den Umschlag freizugeben, wobei ein Umschlagförderer den gefüllten Umschlag aus der Aufnahme-position entnimmt, vorzugsweise in einer zur Produktaufnahme-richtung parallelen Umschlagentnahmerichtung.
  11. Verfahren gemäß einem der Ansprüche 8 bis 10, bei dem die Umschlagführungen (33, 34) zunächst um einen ersten Abstand voneinander beabstandet sind, um den Umschlag zwischen sich aufzunehmen, wobei der erste Abstand, senkrecht zur Einlegerichtung gemessen, größer ist als eine Breite des zu positionierenden Umschlags, und wobei anschließend die Umschlagführungen in eine zweite Position aufeinander zu bewegt werden, um den Umschlag in eine gewünschte ausgerichtete Umschlagposition zu schieben.
  12. Verfahren gemäß Anspruch 11, bei dem der erste Abstand um höchstens 5 cm, vorzugsweise um höchstens 2 cm und besonders vorzugsweise um höchstens 1 cm größer ist als die Umschlagbreite.
  13. Verfahren gemäß einem der Ansprüche 8 bis 12, bei dem der Umschlag (E) zunächst von einer auf eine senkrecht zu den seitlichen Umschlagkanten stehende Umschlagkante einwirkenden Anschlageinrichtung (14) angehalten wird, bevor der Umschlag von den Umschlagführungen ausgerichtet wird.
  14. Verfahren gemäß einem der Ansprüche 8 bis 13, bei dem die in dem Verfahren verwendeten Umschläge Taschenumschläge sind.
  15. Verfahren gemäß einem der Ansprüche 8 bis 14, bei dem während einem ersten Betriebsmodus die Po-

sition der Umschlagführungen eingestellt wird, um Umschläge auszurichten, die eine von der ersten Umschlagbreite abweichende zweite Umschlagbreite haben.

## Revendications

### 1. Dispositif comprenant:

- un mécanisme d'alimentation d'enveloppes (12), qui est configuré pour alimenter des enveloppes (E) à une position de réception de produit;
- une structure de positionnement (14), qui est configurée pour positionner les enveloppes dans dite position de réception;
- un dispositif d'insertion (7), qui est configuré pour insérer des produits, dans une direction d'insertion de produit, dans les enveloppes positionnées dans la position de réception; et
- un convoyeur d'enveloppes (29) pour enlever les enveloppes remplies, dans une direction d'enlèvement d'enveloppes (X), de la position de réception;

**caractérisé en ce que** la structure de positionnement comprend des guides-enveloppe (33, 34), qui sont configurés pour abouter à deux bords latéraux d'enveloppe de chaque enveloppe se trouvant dans la position de réception, et un entraînement (M, 63, 64) pour ajuster latéralement une position d'au moins un des guides-enveloppe (33, 34), dans lequel l'entraînement (M, 63, 64) est configuré pour mouvoir les guides-enveloppe vers une première position dans laquelle des surfaces de guidage opposées des guides sont espacées par un premier écartement, ce premier écartement étant plus grand qu'une largeur, mesurée perpendiculairement à dite direction d'insertion, des enveloppes à positionner, et dans lequel l'entraînement (M, 63, 64) est configuré pour mouvoir les guides-enveloppe vers une deuxième position dans laquelle des surfaces de guidage opposées des guides sont espacées par un deuxième écartement, ce deuxième écartement étant aussi grand ou légèrement plus petit qu'une largeur, mesurée perpendiculairement à dite direction d'insertion, des enveloppes à positionner.

2. Dispositif selon la revendication 1, dans lequel chacun des guides (33, 34) comprend un élément allongé de guidage d'enveloppe (33, 34), dont la longueur est choisie de façon que, pendant l'utilisation, au moins la moitié de la longueur d'un bord latéral d'enveloppe de l'enveloppe peut contacter l'élément de guidage.

3. Dispositif selon l'une quelconque des revendications

précédentes, dans lequel l'entraînement (M, 63, 64) comprend un premier et un deuxième bras (63, 64) mobile latéralement, qui sont couplés avec un premier, respectivement deuxième, guide-enveloppe (33, 34) de façon qu'ils meuvent les guides-enveloppe latéralement, ainsi qu'un mécanisme (70, 71) qui est entraîné par un actionneur (M) et qui est configuré pour mouvoir, pendant le fonctionnement, les bras (63, 64) dans des directions (Y) opposées.

4. Dispositif selon la revendication 3, dans lequel le mécanisme comprend une transmission (70, 71) qui est configuré pour convertir un mouvement rotatoire en un premier mouvement linéaire ayant une première direction et un deuxième mouvement linéaire ayant une deuxième direction opposée à la première direction.

5. Dispositif selon l'une quelconque des revendications précédentes, dans lequel l'entraînement (M, 63, 64) est configuré pour ajuster latéralement les positions du guide-enveloppe (33, 34) respectif de façon que les guides sont positionnés à écartement égal à une ligne de positionnement d'enveloppes centrale.

6. Dispositif selon l'une quelconque des revendications précédentes, dans lequel la structure de positionnement comprend un dispositif de butée (14) pour arrêter les enveloppes alimentées à la position de réception, à un bord d'enveloppe qui est perpendiculaire aux bords latéraux d'enveloppe, et dans lequel la structure de positionnement est conçue de façon que le dispositif de butée (14) agit d'abord à une enveloppe avant que les guides-enveloppe (33, 34) soient activés pour aligner cette enveloppe.

7. Dispositif selon l'une quelconque des revendications précédentes, dans lequel le dispositif est configuré pour manier des enveloppes (E) du type enveloppe pochette dont les bords latéraux sont plus longs que la largeur d'une ouverture de réception de produit des enveloppes.

8. Procédé pour insérer un produit dans une enveloppe en utilisant un dispositif selon l'une quelconque des revendications précédentes, dans lequel l'enveloppe (E) est alimentée par le mécanisme d'alimentation d'enveloppes vers la position de réception de produit, dans lequel la position des guides-enveloppe (33, 34) est ajustée latéralement pour aligner l'enveloppe (E) d'après un chemin de réception de produit et les guides tiennent l'enveloppe (E) entre eux sans aucune (zéro) tolérance pour aligner l'enveloppe, et dans lequel le dispositif d'insertion insère un produit (P), dans la direction d'insertion de produit, dans l'enveloppe alignée.

9. Procédé selon la revendication 8, dans lequel les

guides-enveloppe (33, 34) tiennent l'enveloppe (E) entre des surfaces respectives de guidage d'enveloppe.

10. Procédé selon la revendication 8 ou 9, dans lequel les guides-enveloppe sont repositionnés après le remplissage de l'enveloppe (E) pour relâcher l'enveloppe, et dans lequel un convoyeur d'enveloppes enlève l'enveloppe remplie de la position de réception, de préférence dans une direction d'enlèvement d'enveloppes qui est parallèle à la direction de réception de produit. 5  
10
11. Procédé selon l'une quelconque des revendications 8 à 10, dans lequel les guides-enveloppe (33, 34) sont d'abord espacées par un premier écartement pour recevoir l'enveloppe entre eux, le premier écartement étant plus grand qu'une largeur, mesurée perpendiculairement à la direction d'insertion, des enveloppes à positionner, et dans lequel les guides-enveloppe sont ensuite mis l'un vers l'autre vers une deuxième position pour pousser l'enveloppe vers une position alignée d'enveloppe désirée. 15  
20
12. Procédé selon la revendication 11, dans lequel le premier écartement est au plus 5 cm, de préférence au plus 2 cm et tout particulièrement de préférence au plus 1 cm plus grand que la largeur de l'enveloppe. 25  
30
13. Procédé selon l'une quelconque des revendications 8 à 12, dans lequel l'enveloppe (E) est d'abord arrêtée par un dispositif de butée (14) agissant sur un bord d'enveloppe qui est perpendiculaire aux bords latéraux d'enveloppe, avant que l'enveloppe soit alignée par les guides-enveloppe. 35
14. Procédé selon l'une quelconque des revendications 8 à 13, dans lequel les enveloppes utilisées dans le procédé sont du type enveloppe pochette. 40
15. Procédé selon l'une quelconque des revendications 8 à 14, dans lequel la position des guides-enveloppe est ajustée pendant un premier mode de fonctionnement pour aligner des enveloppes ayant une deuxième largeur d'enveloppe différente de la première largeur d'enveloppe. 45

50

55

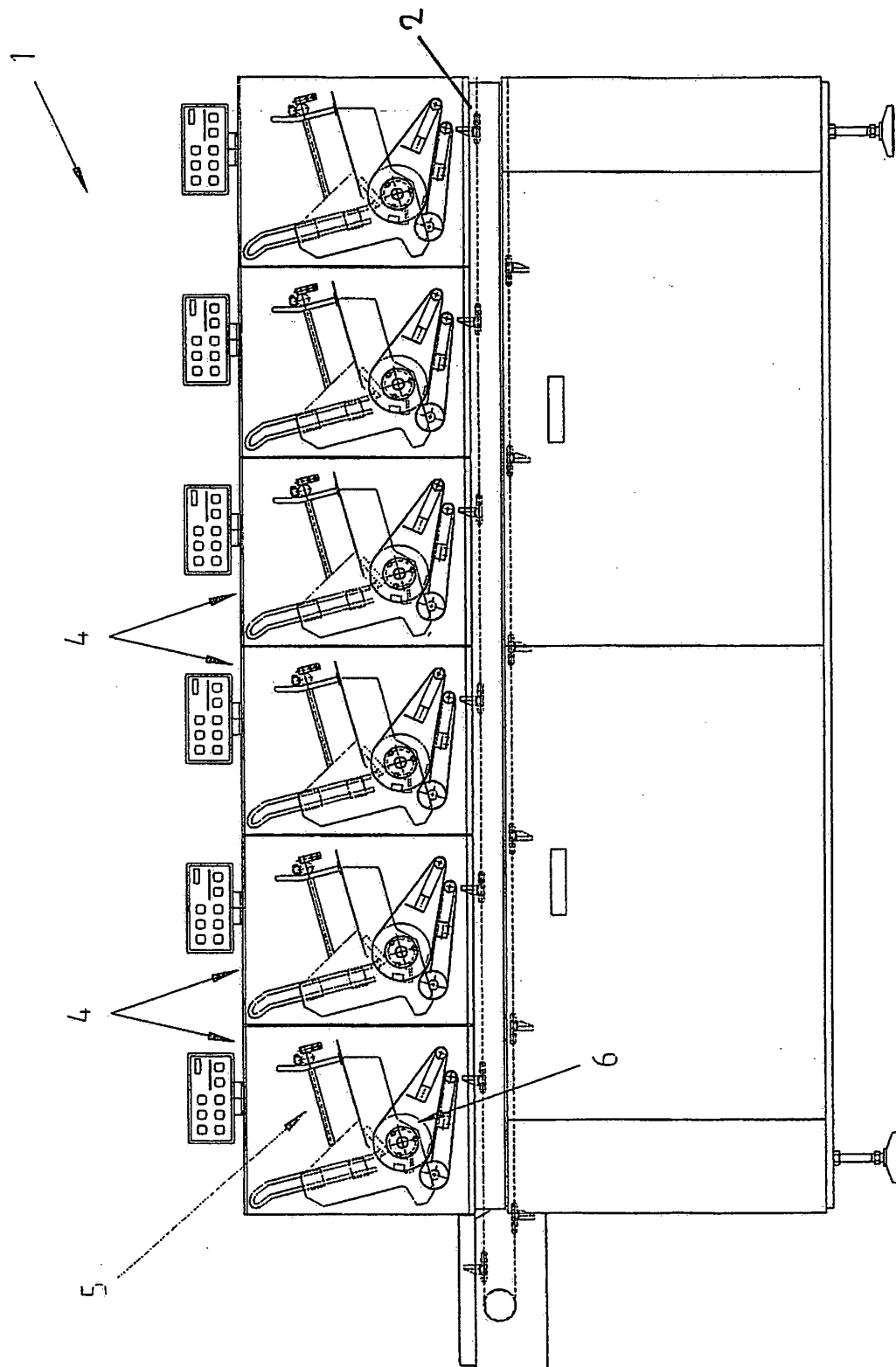


Fig. 1

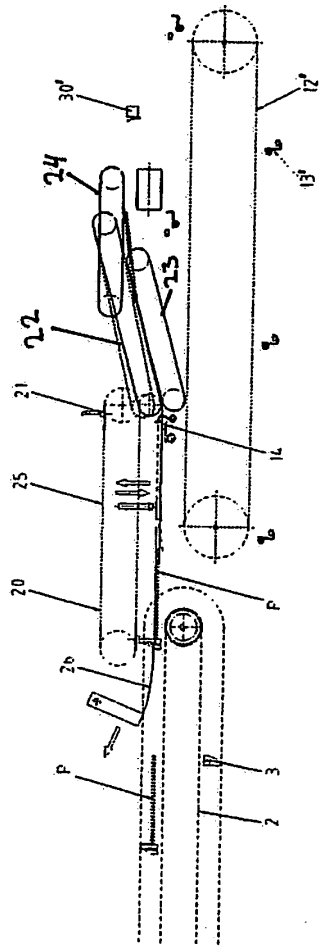


Fig. 2

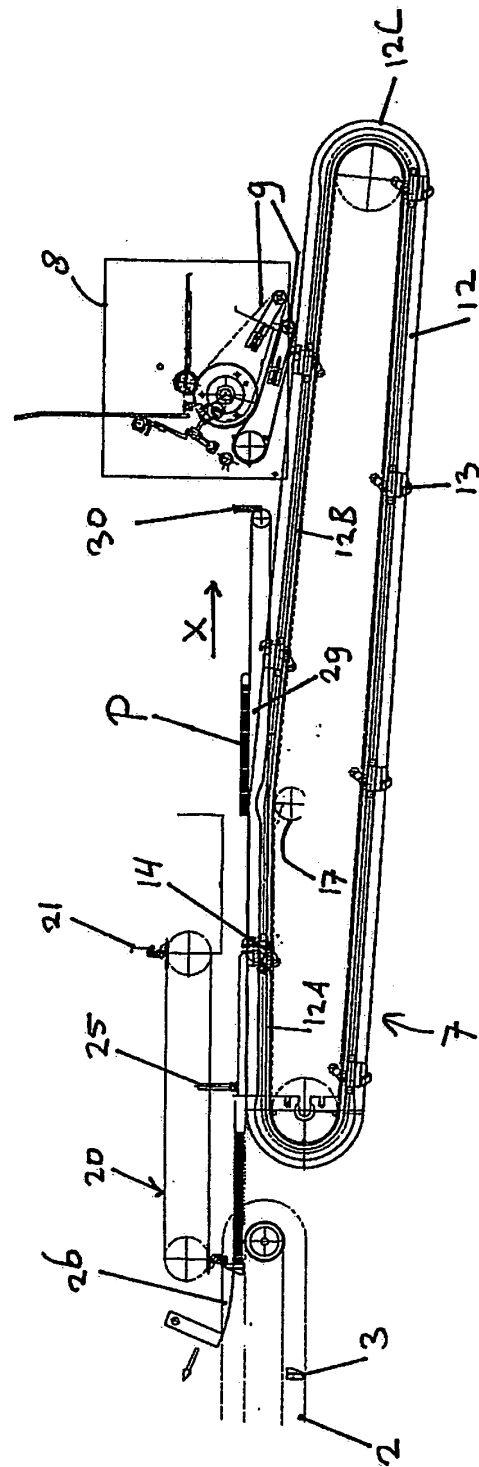


Fig. 3

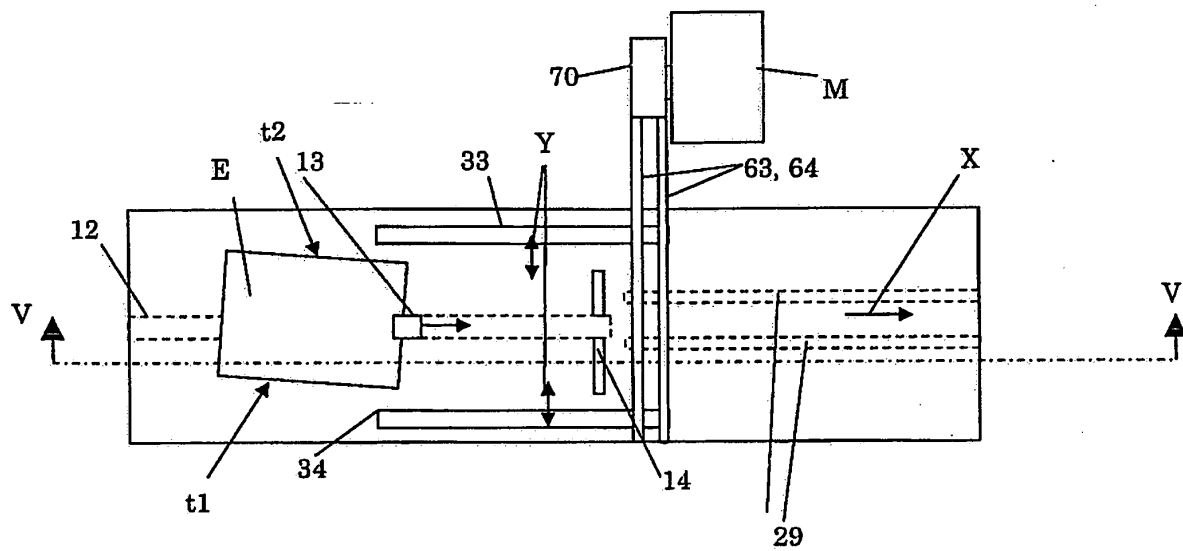


Fig. 4

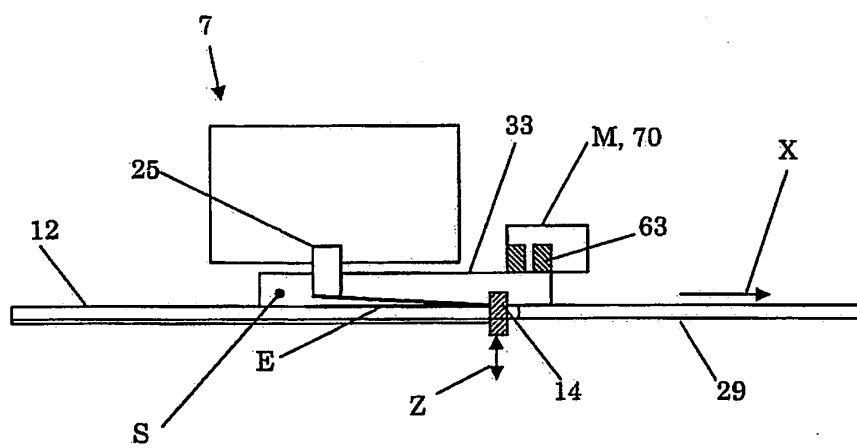


Fig. 5

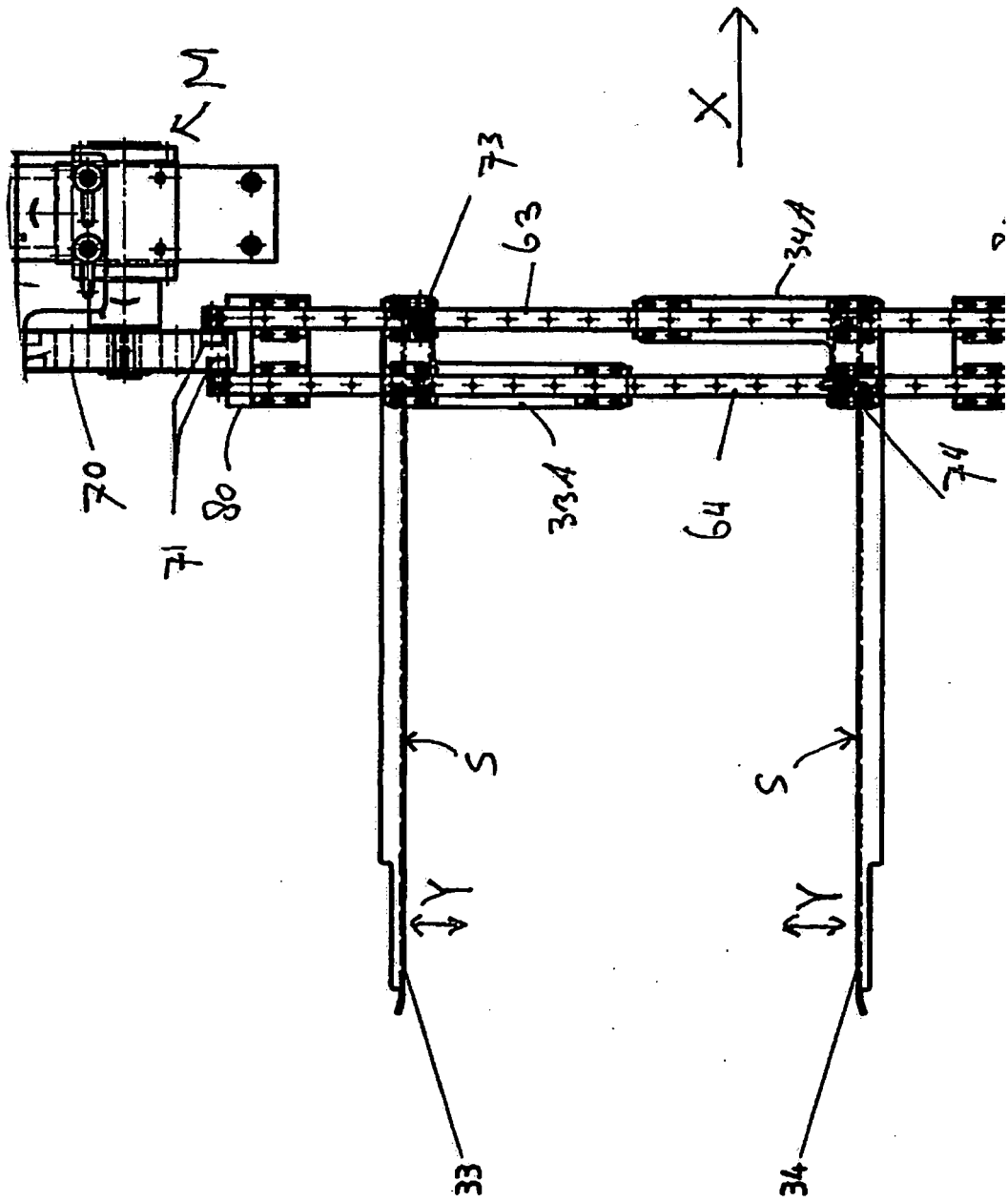
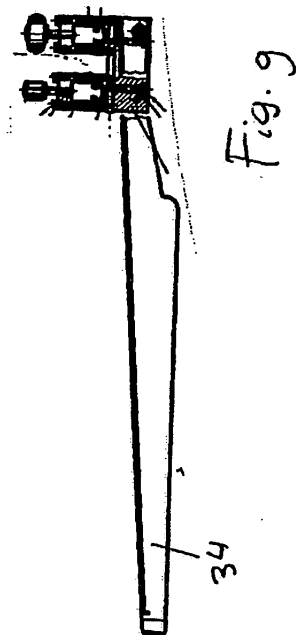
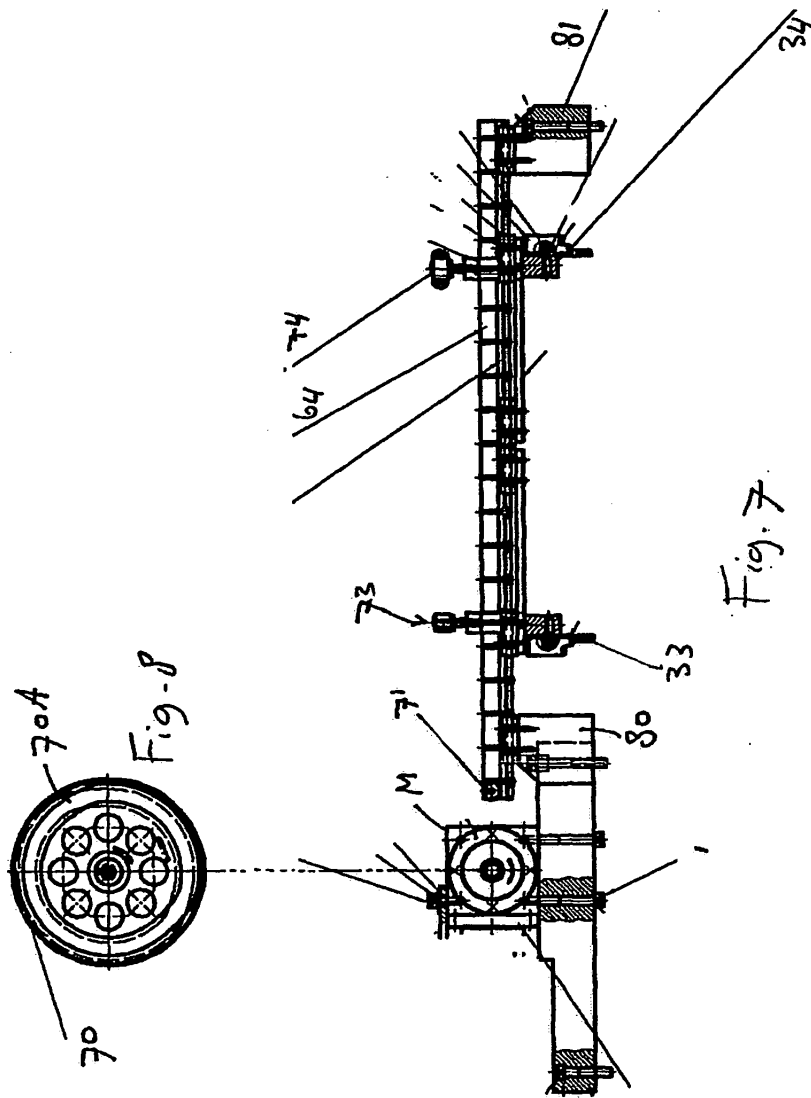


Fig. 6



**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**

- WO 03061988 A [0003]
- EP 1719724 A [0011]