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(54) Device for merging two shingled groups of postal items

Vorrichtung zum Zusammenführen von zwei aus geschuppten Postelementen zusammengestellten Gruppen

Dispositif de fusion de deux groupes d'articles postaux imbriqués

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Description

[0001] The present invention relates to a device for merging two shingled groups of postal items.

[0002] It is known to make shingled groups of items, i.e. formed by items aligned along a preferably rectilinear direction, partially overlapping one another and provided with corresponding edges spaced apart from one another at a distance which can be kept either constant or variable.

[0003] These shingled groups are moved using belt carrying systems of either the simple type (i.e. provided with a single lower belt on which the shingled groups rest) or of the double type, i.e. provided with a pair of belts facing each other and adapted to press on the opposite sides of the shingled groups.

[0004] In order to merge two shingled groups, these groups normally pass along two different belt systems (typically of the double type) converging the shingled groups towards a common area where the merging operations occur. Patent EP-2.213.602 discloses a device of the aforesaid type.

[0005] It is the object of the present invention to provide a device for merging shingled groups which pass spaced apart from one another along a single carrying system, typically a simple belt type carrying system.

[0006] The aforesaid object is achieved by the present invention as it relates to a device for merging shingled groups of postal items as described in claim 1.

[0007] The invention will now be disclosed with particular reference to the accompanying drawings which show a preferred embodiment, in which:

- figures 1a-1d diagrammatically show a device made according to the dictates of the present invention and arranged according to different operating conditions;
- figures 1e, 1f show two phenomena that the present device intends to avoid;
- figure 2 shows the control method of the device in figure 1;
- figure 3 shows in detail a first embodiment of the control method;
- figure 4 shows in detail a second embodiment of the control method; and
- figure 5 shows a variation of the device in figure 1.

[0008] In figure 1, reference numeral 1 indicates as a whole a device for merging shingled groups of postal items.

[0009] Device 1 comprises a first motorized belt carrying system 3 which receives at the inlet 3a thereof shingled groups of postal items 7 generated by means of known technologies, and has an outlet 3b which communicates with the inlet 8a of a second motorized belt carrying system 8, which moves the postal items towards an outlet 8b communicating with a final user 10, e.g. a separator

[0010] (of known type and diagrammatically shown).

[0011] The first belt carrying system 3 is configured to carry the shingled groups linearly spaced from one another, i.e. achieving a spacing SP between the last item 7t of a group and the first item 71 of the preceding group.

5 The first carrying system 3 typically consists of a plurality of adjacent, synchronous belts 12 extending between end pulleys 13 arranged side by side to define a common resting surface 14 on which the shingled groups move from inlet 3a towards outlet 3b.

10 **[0012]** The second carrying system 8 typically consists of a plurality of adjacent, synchronous belts 15 extending between end pulleys 16 arranged side by side to define a common resting surface 17 on which the shingled groups move from inlet 8a towards outlet 3b once the merging operations have occurred.

15 **[0013]** The inlet 8a of the second carrying system is at a lower height with respect to the outlet 3b of the first carrying system so as to obtain a falling area having a predetermined height h (typically, the values of h may be in the range from 5 to 10 cm) which connects the first carrying system 3 to the second carrying system 8. For description simplicity, the electric motors (of known type) which actuate the belts 12 and 15 by means of transmissions (not shown and of known type) are not shown.

20 **[0014]** An electronic unit 22 is further provided, which controls the movement of the belts 12, 15 forming the first/second carrying system 3, 8 close to the falling area 20 to allow the first item 7t of a shingled group to fall on the last item of the next shingled group, thus approaching and merging two shingled groups at the interconnection area 20 between the first carrying system 3 with the second carrying system 8.

25 **[0015]** Figure 2 shows the operations carried out by the electronic control unit 22 for controlling the first/second carrying system 3 and 8 according to the present invention.

30 **[0016]** First, a block 90 is reached, which verifies whether a shingled group of postal items having a back side arranged close to the inlet 8a, i.e. close to the falling area 20, is present. Such a presence is verified by means of known technologies, e.g. using an optoelectronic sensor 25 defining an optical path 26 which is interrupted by the postal items 7, if any.

35 **[0017]** If the outcome of the presence verification is positive, block 90 is followed by a block 100 which verifies whether a shingled group of postal items having a front portion arranged at the outlet 3b, i.e. close to the falling area 20, is present. Such a presence is verified by means of known technologies, e.g. using an optoelectronic sensor 27 defining an optical path 28 which is interrupted by the postal items 7, if any.

40 **[0018]** If not, the arrival of a shingled group of items is waited for, otherwise (block 110 after block 100) the first carrying system 3 is stopped (or its speed is set very low, e.g. 1/10 of the previous speed), so that the front items of a shingled group ("head" of the shingled group) are on the end edge of the carrying system 3 flushed with the falling area 20 (see figure 1b) and cannot however fall in

the short.

[0019] Once a still state has been reached, i.e. after a predetermined time T1 has elapsed from the stop command of block 110 (120 after block 110), the first carrying system 3 is advanced at a maximum working speed Vmax (block 130 after block 120) for a determined interval of time Tmax (of the order of 100-500 milliseconds). Typically, the maximum working speed Vmax may be of the order of 200-1000 millimeters/second.

[0020] The rapid acceleration applied to the shingled group of items which quickly passes from a speed equal to (or slightly higher than) zero to the speed Vmax allows to fling (figure 1c) the front portion of the shingled group of items carried by the first carrying system 3 onto the back portion of the shingled group of postal items carried by the second carrying system 8 (which is stationary), thus merging the two groups of items (figure 1d).

[0021] The presence of the falling area 20 prevents the postal items flung by the first carrying system 3 from being inserted under an edge of the objects on which they overlap if the back portion of the shingled group of items of the second carrying system 8 consists of items not in contact with the resting surface 17 (figure 1e).

[0022] Using high speed allows to adequately support the front side of the shingled group flung onto the back side of the stationary shingled group, and prevents the back side of the shingled group arranged on the second carrying system 8 from being fragmented (figure 1f).

[0023] Furthermore, in order to prevent items of the back side from sliding backwards towards the gap between belts 12 and 15, one or more of various contrivances may be used, such as for example using appropriate guides or guards at the sides or between the belts (not shown), elongating belt 15 to be under belt 12, inclining belt 12 and/or 15 by placing it/them slightly downwards so as to reduce the slope and the gravity sliding displacement, appropriately choosing the shape (e.g. saw tooth) or materials (with high friction) of belt 15.

[0024] The second carrying system 8 is then activated and moved at a working speed Vnorm slower than the maximum working speed Vmax; the advancing speed of the first carrying system 3 is also equalized to the working speed Vnorm so that the two groups of postal items now merged can continuously pass from the first carrying system 3 to the next carrying system 8 (block 140 after block 130). Usual values of the speed Vnorm are 100-700 millimeters/second.

[0025] Once the displacement of the shingled group of postal items from the first carrying system 3 to the second carrying system 8 has been completed (this control operation is diagrammatically shown by block 145 after block 140), the method goes back to block 100.

[0026] Figure 3 shows the operations carried out by the electronic control unit 22 for controlling the first/second carrying system 3/8 according to a first constructional variation of the embodiment shown in figure 2. Such a constructional variation includes checking the thickness of the shingled group carried by the second carrying sys-

tem; the merging operations are only carried out when such a thickness is thinner than a threshold value in order to prevent the area in which the objects of the two different groups are merged to be excessively thick thus complicating the following carrying operations.

[0027] A block 190 is first reached, which verifies whether a shingled group of postal items having a back side arranged close to the inlet 8a, i.e. close to the falling area 20, is present. Such a presence is verified by means of known technologies, e.g. using an optoelectronic sensor 25 defining an optical path 26 which is interrupted by the postal items, if any.

[0028] If the outcome of such a verification is positive, block 190 is followed by a block 200 which verifies whether a shingled group of postal items having a front portion arranged close to the outlet 3b, i.e. close to the falling area 20, is present. Such a presence is verified by means of known technologies, e.g. using an optoelectronic sensor 27 defining an optical path 28 which is interrupted by the postal items, if any.

[0029] If not, the arrival of a shingled group of items is waited for, otherwise (block 210 after block 200) the first carrying system 3 is stopped (or its speed is set very low, e.g. 1/10 of the previous speed), so that the front items of a shingled group ("head" of the shingled group) are on the end edge of the carrying system 3 flushed with the falling area 20.

[0030] Block 210 is followed by a block 215 which verifies (known technologies are used and therefore not described in detail) whether the thickness of the postal items of the back side of the shingled group arranged close to the inlet 8a is thinner than a threshold value Slim; if not, the second carrying system 8 is advanced over a certain length until the thickness value goes under the threshold value. Once such a threshold value has been reached, the second carrying system 8 is stopped. If the outcome of the verification is positive (thickness thinner than the threshold), the second carrying system 8 is kept still.

[0031] After a time T1 elapses from the detection of a thickness thinner than the threshold (block 220 after block 215), the first carrying system 3 is advanced at the maximum working speed Vmax (block 230 after block 220) for a predetermined interval of time Tmax. The rapid acceleration applied to the group of items which rapidly passes from a speed equal to (or slightly higher than) zero to the speed Vmax allows to fling the front portion of the shingled group of items carried by the first carrying system 3 onto the back portion of the shingled group of postal items carried by the second carrying system 8 (which now is stationary - see operations at block 215), thus merging the two groups of items.

[0032] The second carrying system is then activated and moved at a working speed Vnorm slower than the maximum working speed Vmax; the advancing speed of the first carrying system 3 is also equalized to the working speed Vnorm so that the two groups of postal items now merged continuously pass from the first carrying system 3 to the next carrying system 8 (block 240 after block 230).

[0033] Finally, when the back side of the shingled postal items carried by the first carrying system 3 is at a certain distance from the end edge 3b (typically such a distance is of the order of 100-300 millimeters - such a verification is carried out using known technologies indicated by block 250), the first carrying system 3 goes back to the maximum speed V_{max} to prevent the back side of the shingled group of postal items, which is leaving the carrying system 3, from sliding when it passes between the first and second carrying systems (block 260 after block 250).

[0034] Once the displacement of the shingled group of postal items from the first carrying system 3 to the second carrying system 8 has been completed (this control operation is diagrammatically shown at block 265 after block 260), the method goes back to block 200.

[0035] Figure 4 shows the operations carried out by the electronic control unit 22 for controlling the first/second carrying system 3/8 according to a second constructional variation of the embodiment shown in figure 2. Such a constructional variation includes repositioning the shingled group carried by the second carrying system 8; the merging operations are carried out only when such a repositioning has occurred in order to ensure a good overlapping of the shingled group of postal items, thus occupying the minimum overall longitudinal space for the resulting shingled group.

[0036] A block 290 is first reached, which verifies whether a shingled group of postal items having a back side arranged close to the inlet 8a, i.e. close to the falling area 20, is present. Such a presence is verified by means of known technologies, as previously explained. If the outcome of the verification of block 290 is positive, block 290 is followed by a block 300 which verifies whether a shingled group of postal items having a front portion arranged close to the outlet 3b, i.e. close to the falling area 20, is present. Such a presence is verified by means of known technologies, as previously said.

[0037] If not, the arrival of a shingled group of items is waited for, otherwise (block 310 after block 300) the first carrying system 3 is stopped (or its speed is set very low, e.g. 1/10 of the previous speed), so that the front items of a shingled group ("head" of the shingled group) are on the end edge of the carrying system 3 flushed with the falling area 20 (figure 1b).

[0038] The second carrying system (block 315 after block 310) then moves with backward motion, i.e. in the direction opposite to the advancement direction, to take the back side of the shingled group of postal items arranged on the second carrying system 8 exactly at the inlet 8a; such a backward motion (block 320) is carried out by using optoelectronic sensors of known type similar to those described above (and therefore not shown) or by means of a time control based on an estimated retroprocession time T_3 (e.g. 100-500 milliseconds) of the shingled group of postal items carried by the carrying system 8. At the end of these operations, the backward motion ends and the second carrying system is blocked.

[0039] Next (block 330 after block 320), the first carrying system 3 is advanced at the maximum working speed V_{max} for a predetermined interval of time T_{max} . The rapid acceleration applied to the shingled group of items which quickly passes from a speed equal to (or slightly higher than) zero to the speed V_{max} allows to fling the front portion of the shingled group of items carried by the first carrying system 3 onto the back portion of the shingled group of postal items carried by the second carrying system 8 (which is stationary - block 320), which are arranged with the back edge thereof exactly at the inlet 8a. The two groups of items are thus merged.

[0040] Next, the second carrying system 8 is activated and moved at a working speed V_{norm} slower than the maximum working speed V_{max} ; the advancing speed of the first carrying system 3 is also equalized to the working speed V_{norm} , so that the two groups of postal items now merged can continuously pass from the first carrying system 3 to the next carrying system 8 (block 340 after block 330).

[0041] Once the displacement of the shingled group of postal items from the first carrying system 3 to the second carrying system 8 has been completed (this control operation is diagrammatically shown at block 345 after block 340), the method goes back to block 300.

[0042] In the above description, the first carrying system 3 has a fixed position as compared to the second carrying system 8; in other words, the shingled groups are merged between consecutive belts 12 and 15, the respective positions of which are fixed and determined.

[0043] This concept can be applied to more complex systems in which one of the two carrying systems (e.g. the first carrying system 3) has a fixed position with respect to one (or multiple) carrying system(s) (e.g. the second carrying system), which may be positioned with respect to the other carrying system. Thereby, the height h of the falling area may be modified or different outlet carrying systems 8 may be selected by virtue of a single inlet movable carrying system 3, or vice versa various inlet carrying systems 3 may be served by a single movable outlet carrying system 8.

Claims

1. A device for merging shingled groups of postal items, wherein a first carrying system (3) receives at its inlet (3a) shingled groups of postal items (7) and has an outlet (3b) which communicates with the inlet (8a) of a second carrying system (8), which moves the postal items towards an outlet (8b) communicating with a final user (10); the first carrying system (3) is configured to carry the shingled groups linearly spaced from one another, thus achieving a spacing SP between the last item (7t) of a group and the first item (71) of the preceding group, wherein the inlet (8a) of the second carrying system is at a lower height with respect to the outlet (3b) of

the first carrying system so as to obtain a falling area having a predetermined height h which connects the first carrying system (3) to the second carrying system (8); an electronic unit (22) is provided, which controls the movement of at least the adjacent end portions of the first and second carrying systems (3, 8) close to the falling area (20) to allow a front side (71) of a shingled group carried by the first carrying system to at least partially overlap a back side of the shingled group carried by the second carrying system by approaching and merging two shingled groups into a single shingled group at the interconnection area;

characterized by

said electronic unit (22) being configured to perform the following control operations of the first and second carrying systems (3/8):

- detecting (90) the presence of a shingled group of postal items having a back side arranged close to the inlet (8a) of the second carrying system (8);
- verifying (100) the presence of a shingled group of postal items having a front portion arranged close to the outlet (3b) of the first carrying system;
- after a successful verifying step and after the first carrying system (3) has come to a substantial stop, advancing the first carrying system (3) at a maximum working speed V_{max} (120) by applying an acceleration to the group of items carried by the first carrying system (3), which acceleration allows to fling the front portion of the shingled group of items carried by the first carrying system (3) onto the back portion of the shingled group of postal items carried by the second carrying system (8), thus merging the two shingled groups of items;
- activating the second carrying system (8) at a working speed V_{norm} slower than the maximum working speed V_{max} ; the advancing speed of the first carrying system (3) is equalized to the working speed V_{norm} so that the two groups of postal items now merged in a single shingled group continuously move from the first carrying system (3) to the next carrying system (8).

2. A device according to claim 1, wherein the first carrying system (3) consists of at least one motorized belt (12) defining a common resting surface (14) on which the shingled groups move from the inlet (3a) to the outlet (3b) of the first carrying system (3).
3. A device according to claim 1 or 2, wherein the second carrying system (8) consists of at least one motorized belt (15) defining a common resting surface (17) on which the shingled groups move from the inlet (8a) to the outlet (8b) of the second carrying

system (8).

4. A device according to claim 1, wherein said electronic unit (22) is further configured to verify (215) whether the thickness of the postal items of the back side of the shingled group arranged at the inlet (8a) of the second carrying system (8) is thinner than a threshold value S_{lim} ; if the outcome of the verification is negative, the second carrying system (8) is advanced until the thickness value is below the threshold value at which the second carrying system (8) is stopped; if the thickness is thinner than the threshold, the second carrying system (8) is held still.
5. A device according to claim 1 or 4, wherein said electronic unit (22) is further configured to detect that the position of the back side of the shingled group of postal items is at a certain distance from an end edge (3b) of the first carrying system and to then return the first carrying system to the maximum speed V_{max} to ensure that the back side of the shingled group of postal items which is leaving the first carrying system (3) does not slide when passing between the first and second carrying systems.
6. A device according to claim 1, wherein said electronic unit (22) is configured to control said second carrying system (315) so that the latter moves with a backward motion to take the back side of the shingled group of postal items arranged on the second carrying system (8) exactly at the inlet (8a) of said second carrying system (8); once a predetermined position has been reached, said backward motion ends and the second carrying system is stopped.
7. A device according to any one of the preceding claims, wherein the reciprocal position of a first carrying system with respect to the other carrying system may be modified in order to adjust the value of said height h .
8. A device according to any one of the preceding claims, wherein a first carrying system and a plurality of second carrying systems are included, and wherein the position of the first carrying system may be varied for selecting a second carrying system.
9. A device according to any one of claims 1 to 7, wherein a plurality of first carrying systems and a second carrying system are included, the position of which may be varied for selecting a first carrying system.

Patentansprüche

1. Vorrichtung zum Zusammenführen geschindelter Gruppen von Poststücken, wobei ein erstes Transportsystem (3) an seinem Einlass (3a) geschindelte

Gruppen von Poststücken (7) aufnimmt und einen Auslass (3b) aufweist, der in Verbindung mit dem Einlass (8a) eines zweiten Transportsystems (8) steht, welches die Poststücke zu einem Auslass (8b) bewegt, der mit einem Endbenutzer (10) in Verbindung steht; wobei das erste Transportsystem (3) derart ausgebildet ist, dass es die geschindelten Gruppen linear voneinander beabstandet transportiert, wodurch ein Abstand SP zwischen dem letzten Stück (7t) einer Gruppe und dem ersten Stück (71) der vorhergehenden Gruppe gebildet ist, wobei der Einlass (8a) des zweiten Transportsystems in Bezug auf den Auslass (3b) des ersten Transportsystems auf einer niedrigeren Höhe angeordnet ist, um so einen Fallbereich mit einer vorbestimmten Höhe h zu erhalten, welcher das erste Transportsystem (3) mit dem zweiten Transportsystem (8) verbindet; wobei eine elektronische Einheit (22) vorgesehen ist, welche die Bewegung zumindest der benachbarten Endbereiche des ersten und des zweiten Transportsystems (3, 8) nahe dem Fallbereich (20) steuert, um es der Vorderseite (71) einer von dem ersten Transportsystem transportierten geschindelten Gruppe zu ermöglichen, die Rückseite der von dem zweiten Transportsystem transportierten geschindelten Gruppe zumindest teilweise zu überlappen, indem zwei geschindelte Gruppen in dem Verbindungsbereich aneinander angenähert und zu einer einzelnen geschindelten Gruppe zusammengeführt werden;

dadurch gekennzeichnet, dass die elektronische Einheit (22) derart ausgebildet ist, dass sie die folgenden Vorgänge zum Steuern des ersten und des zweiten Transportsystems (3/8) durchführt:

- Erkennen (90) des Vorhandenseins einer geschindelten Gruppe von Poststücken mit einer nahe dem Einlass (8a) des zweiten Transportsystems (8) angeordneten Rückseite;
- Prüfen (100) des Vorhandenseins einer geschindelten Gruppe von Poststücken mit einer nahe dem Auslass (3b) des ersten Transportsystems angeordneten Vorderseite;
- nach einem erfolgreichen Prüfschritt und nachdem das erste Transportsystem (3) im Wesentlichen angehalten hat, Vorbewegen des ersten Transportsystems (3) mit einer maximalen Arbeitsgeschwindigkeit V_{max} (120) durch Aufbringen einer Beschleunigung auf die von dem ersten Transportsystem (3) transportierte Gruppe von Stücken, wobei die Beschleunigung ermöglicht, den vorderen Bereich der von dem ersten Transportsystem (3) transportierten geschindelten Gruppe von Stücken auf den hinteren Bereich der von dem zweiten Transportsystem (8) transportierten geschindelten Gruppe von Poststücken zu schleudern, wodurch die geschindelten Gruppen von Stücken zusammengeführt

werden;

- Aktivieren des zweiten Transportsystems (8) mit einer Arbeitsgeschwindigkeit V_{norm} , die geringer als die maximale Arbeitsgeschwindigkeit V_{max} ist; wobei die Vorbewegungsgeschwindigkeit des ersten Transportsystems (3) der Arbeitsgeschwindigkeit V_{norm} angeglichen wird, so dass die beiden Gruppen von Poststücken die nunmehr zu einer einzigen geschindelten Gruppe zusammengeführt sind, sich kontinuierlich von dem ersten Transportsystem (3) zu dem nachfolgenden Transportsystem (8) bewegen.

2. Vorrichtung nach Anspruch 1, bei welcher das erste Transportsystem (3) aus mindestens einem motorgetriebenen Band (12) besteht, das eine gemeinsame Auflagefläche (14) definiert, auf welcher die geschindelten Gruppen sich von dem Einlass (3a) zum Auslass (3b) des ersten Transportsystems (3) bewegen.
3. Vorrichtung nach Anspruch 1 oder 2, bei welcher das zweite Transportsystem (8) aus mindestens einem motorgetriebenen Band (15) besteht, das eine gemeinsame Auflagefläche (17) definiert, auf welcher die geschindelten Gruppen sich von dem Einlass (8a) zum Auslass (8b) des zweiten Transportsystems (8) bewegen.
4. Vorrichtung nach Anspruch 1, bei welcher die elektronische Einheit (22) ferner derart ausgebildet ist, dass sie prüft (215), ob die Dicke der Poststücke der Rückseite der am Einlass (8a) des zweiten Transportsystems (8) angeordneten geschindelten Gruppe dünner als in Schwellenwert Slim ist; wobei, wenn das Ergebnis der Prüfung negativ ist, das zweite Transportsystem (8) vorbewegt wird, bis der Dickenwert unter dem Schwellenwert liegt, bei welchem das zweite Transportsystem (8) angehalten wird; wobei, wenn die Dicke geringer als der Schwellenwert ist, das zweite Transportsystem (8) angehalten wird.
5. Vorrichtung nach Anspruch 1 oder 4, bei welcher die elektronische Einheit (22) ferner derart ausgebildet ist, dass sie erkennt, dass die Position der Rückseite der geschindelten Gruppe von Poststücken eine bestimmte Entfernung zu einer Stirnkante (3b) des ersten Transportsystems (3) aufweist, und dass sie das erste Transportsystem wieder auf die Maximalgeschwindigkeit V_{max} einstellt, um zu gewährleisten, dass die Rückseite der geschindelten Gruppe von Poststücken, welche das erste Transportsystem (3) verlässt, beim Übergang von dem ersten zu dem zweiten Transportsystem nicht rutscht.
6. Vorrichtung nach Anspruch 1, bei welcher die elektronische Einheit (22) derart ausgebildet ist, dass sie das zweite Transportsystem (315) derart steuert,

dass sich das Letztere in einer Rückwärtsbewegung bewegt, um die Rückseite der geschindelten Gruppe von Poststücken, die auf dem zweiten Transportsystem (8) angeordnet sind, genau zum Einlass (8a) des zweiten Transportsystems (8) zu bringen; wobei, sobald eine vorbestimmte Position erreicht ist, die Rückwärtsbewegung endet und das zweite Transportsystem angehalten wird.

7. Vorrichtung nach einem der vorhergehenden Ansprüche, bei welcher die gegenseitige Position eines ersten Transportsystems in Bezug auf das andere Transportsystem verändert werden kann, um den Betrag der Höhe einzustellen.
8. Vorrichtung nach einem der vorhergehenden Ansprüche, bei welcher ein erstes Transportsystem und mehrere zweite Transportsysteme vorgesehen sind, und wobei die Position des ersten Transportsystems zur Wahl eines zweiten Transportsystems variierbar ist.
9. Vorrichtung nach einem der Ansprüche 1 bis 7, bei welcher mehrere erste Transportsysteme und ein zweites Transportsystem vorgesehen sind, dessen Position zur Wahl eines ersten Transportsystems variierbar ist.

Revendications

1. Dispositif pour la fusion de groupes imbriqués d'envois postaux, dans lequel un premier système de transport (3) reçoit, au niveau de son entrée (3a), des groupes imbriqués d'envois postaux (7) et a une sortie (3b) qui communique avec l'entrée (8a) d'un deuxième système de transport (8), qui déplace les envois postaux vers une sortie (8b) communiquant avec un utilisateur final (10) ; le premier système de transport (3) est configuré pour transporter les groupes imbriqués linéairement espacés les uns des autres, réalisant ainsi un espacement SP entre le dernier envoi (7t) d'un groupe et le premier envoi (71) du groupe précédent, dans lequel l'entrée (8a) du deuxième système de transport se trouve à une hauteur inférieure par rapport à la sortie (3b) du premier système de transport de manière à obtenir une zone tombante ayant une hauteur h prédéterminée, qui relie le premier système de transport (3) au deuxième système de transport (8) ; une unité électronique (22) est prévue, qui commande le mouvement d'au moins les parties d'extrémités adjacentes des premier et deuxième systèmes de transport (3, 8) à proximité de la zone tombante (20) pour permettre à un côté avant (71) d'un groupe imbriqué transporté par le premier système de transport de chevaucher au moins partiellement un côté arrière du groupe imbriqué transporté

par le deuxième système de transport en rapprochant et en fusionnant deux groupes imbriqués en un seul groupe imbriqué au niveau de la zone d'interconnexion ;

caractérisé par

ladite unité électronique (22) étant configurée pour exécuter les opérations de commande suivantes des premier et deuxième systèmes de transport (3/8) qui consistent :

à détecter (90) la présence d'un groupe imbriqué d'envois postaux ayant un côté arrière disposé à proximité de l'entrée (8a) du deuxième système de transport (8) ;

à vérifier (100) la présence d'un groupe imbriqué d'envois postaux ayant une partie avant disposée à proximité de la sortie (3b) du premier système de transport ;

à faire avancer, après une étape de vérification réussie et après que le premier système de transport (3) est venu en butée considérable, le premier système de transport (3) à une vitesse de travail maximale V_{max} (120) en appliquant une accélération au groupe d'envois transportés par le premier système de transport (3), laquelle accélération permet de jeter la partie avant du groupe imbriqué d'envois transportés par le premier système de transport (3) sur la partie arrière du groupe imbriqué d'envois postaux transportés par le deuxième système de transport (8), fusionnant ainsi les deux groupes imbriqués d'envois ;

à activer le deuxième système de transport (8) à une vitesse de travail V_{norm} plus lente que la vitesse de travail maximale V_{max} ; la vitesse d'avancement du premier système de transport (3) est égalisée à la vitesse de travail V_{norm} de sorte que les deux groupes d'envois postaux fusionnés maintenant en un seul groupe imbriqué se déplacent en continu à partir du premier système de transport (3) vers le système de transport suivant (8).

2. Dispositif selon la revendication 1, dans lequel le premier système de transport (3) est constitué d'au moins une courroie motorisée (12) définissant une surface de repos commune (14) sur laquelle les groupes imbriqués se déplacent à partir de l'entrée (3a) vers la sortie (3b) du premier système de transport (3).
3. Dispositif selon la revendication 1 ou 2, dans lequel le deuxième système de transport (8) est constitué d'au moins une courroie motorisée (15) définissant une surface de repos commune (17) sur laquelle les groupes imbriqués se déplacent à partir de l'entrée (8a) vers la sortie (8b) du deuxième système de transport (8).

4. Dispositif selon la revendication 1, dans lequel ladite unité électronique (22) est en outre configurée pour vérifier (215) si l'épaisseur des envois postaux du côté arrière du groupe imbriqué disposé au niveau de l'entrée (8a) du deuxième système de transport (8) est plus mince qu'une valeur seuil Slim ; si le résultat de la vérification est négatif, le deuxième système de transport (8) est avancé jusqu'à ce que la valeur d'épaisseur soit inférieure à la valeur seuil à laquelle le deuxième système de transport (8) est arrêté ; si l'épaisseur est plus mince que le seuil, le deuxième système de transport (8) est maintenu immobile. 5
10

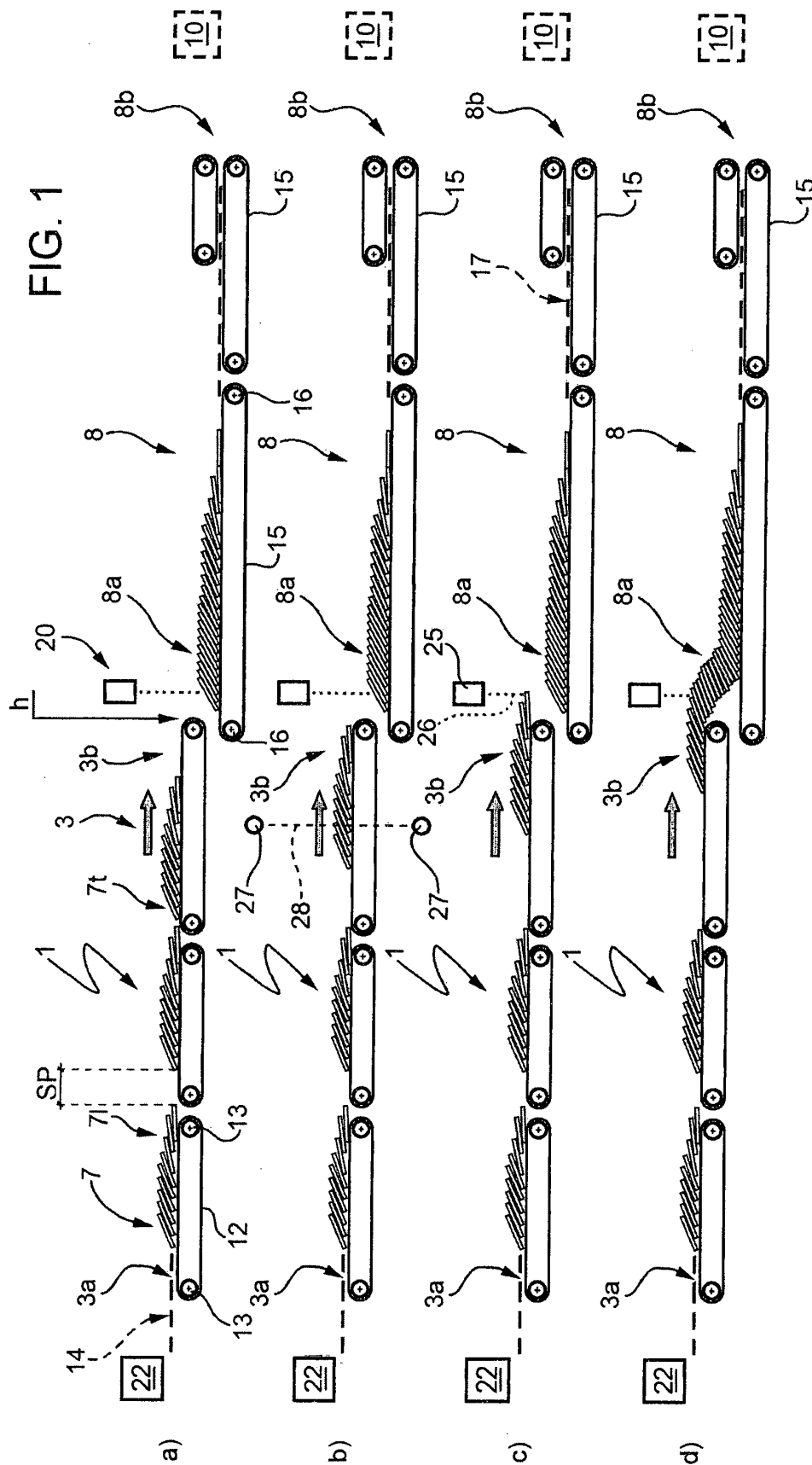
5. Dispositif selon la revendication 1 ou 4, dans lequel ladite unité électronique (22) est en outre configurée pour détecter que la position du côté arrière du groupe imbriqué d'envois postaux se trouve à une certaine distance à partir d'un bord d'extrémité (3b) du premier système de transport et pour remettre ensuite le premier système de transport à la vitesse maximale Vmax pour s'assurer que le côté arrière du groupe imbriqué d'envois postaux qui quitte le premier système de transport (3) ne glisse pas lors du passage entre les premiers et deuxième systèmes de transport. 15
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6. Dispositif selon la revendication 1, dans lequel ladite unité électronique (22) est configurée pour commander ledit deuxième système de transport (315) de sorte que ce dernier se déplace avec un mouvement vers l'arrière pour prendre le côté arrière du groupe imbriqué d'envois postaux disposés sur le deuxième système de transport (8) exactement au niveau de l'entrée (8a) dudit deuxième système de transport (8) ; une fois une position prédéterminée a été atteinte, ledit mouvement vers l'arrière prend fin et le deuxième système de transport est arrêté. 30
35

7. Dispositif selon l'une quelconque des revendications précédentes, dans lequel la position réciproque d'un premier système de transport par rapport à l'autre système de transport peut être modifiée afin d'ajuster la valeur de ladite hauteur h. 40
45

8. Dispositif selon l'une quelconque des revendications précédentes, dans lequel un premier système de transport et une pluralité de deuxième systèmes de transport sont inclus, et dans lequel la position du premier système de transport peut être modifiée pour sélectionner un deuxième système de transport. 50

9. Dispositif selon l'une quelconque des revendications 1 à 7, dans lequel une pluralité de premiers systèmes de transport et un deuxième système de transport sont inclus, la position de celui-ci peut être modifiée pour sélectionner un premier système de transport. 55



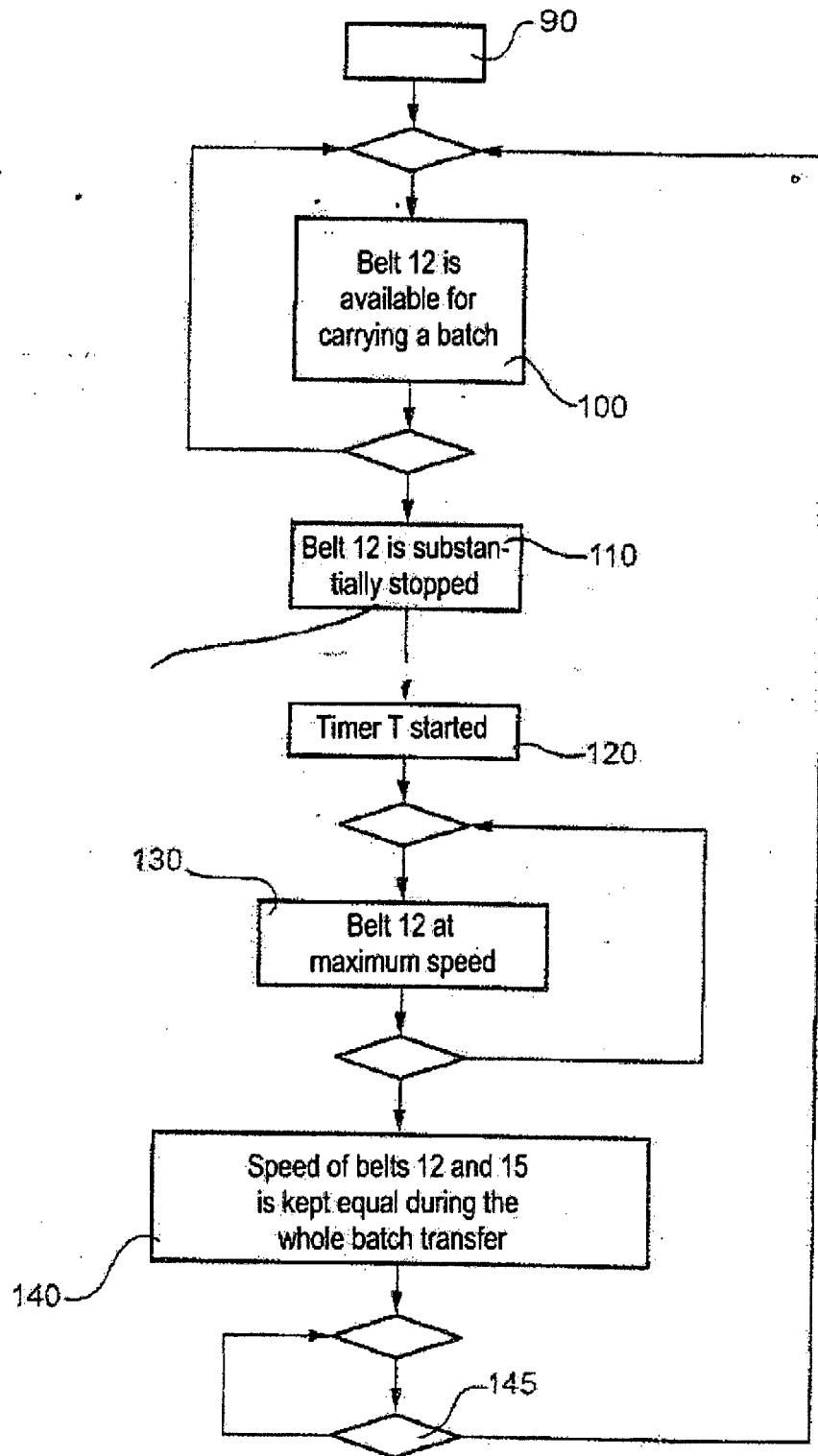


FIG. 2

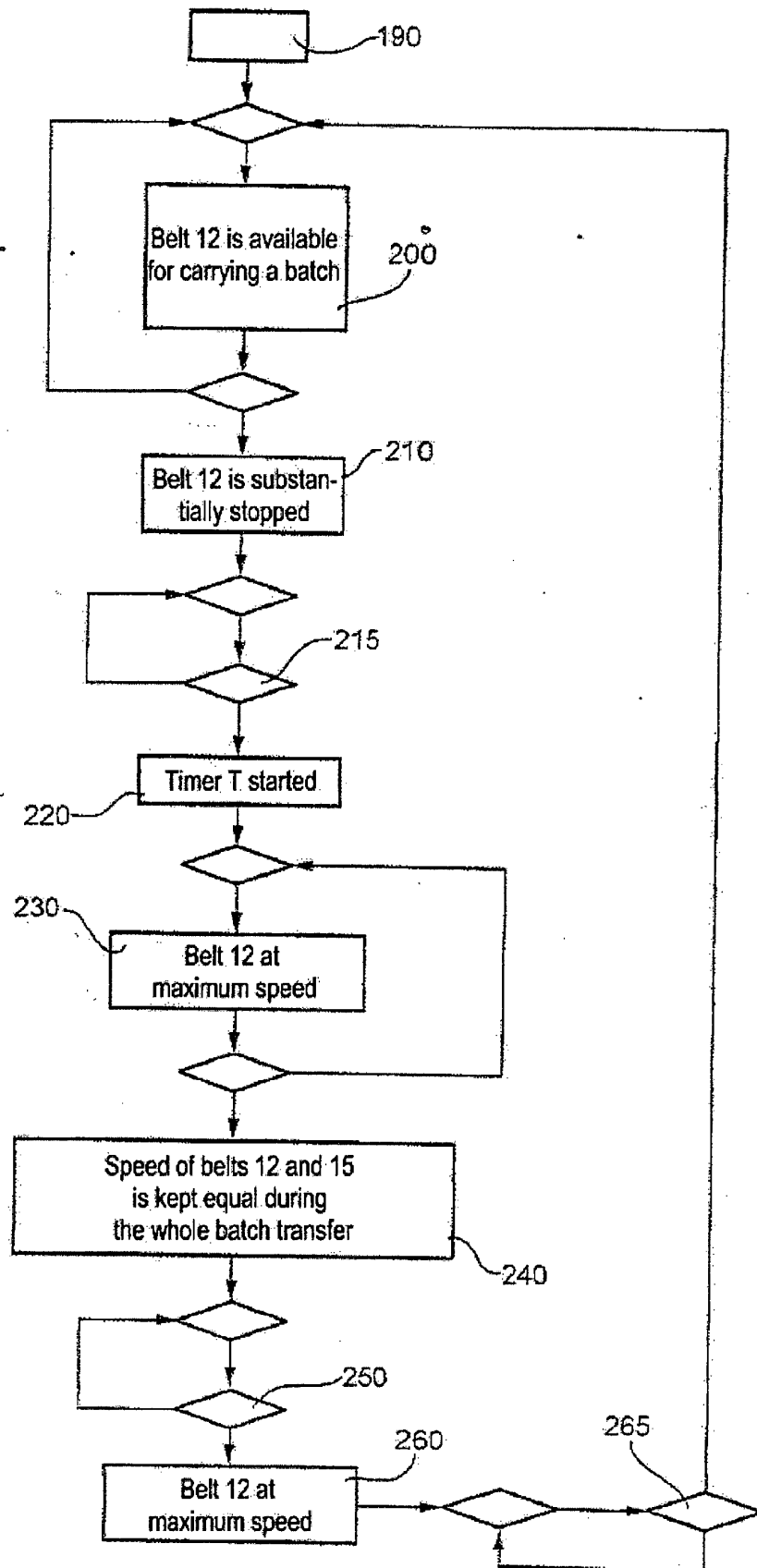


FIG. 3

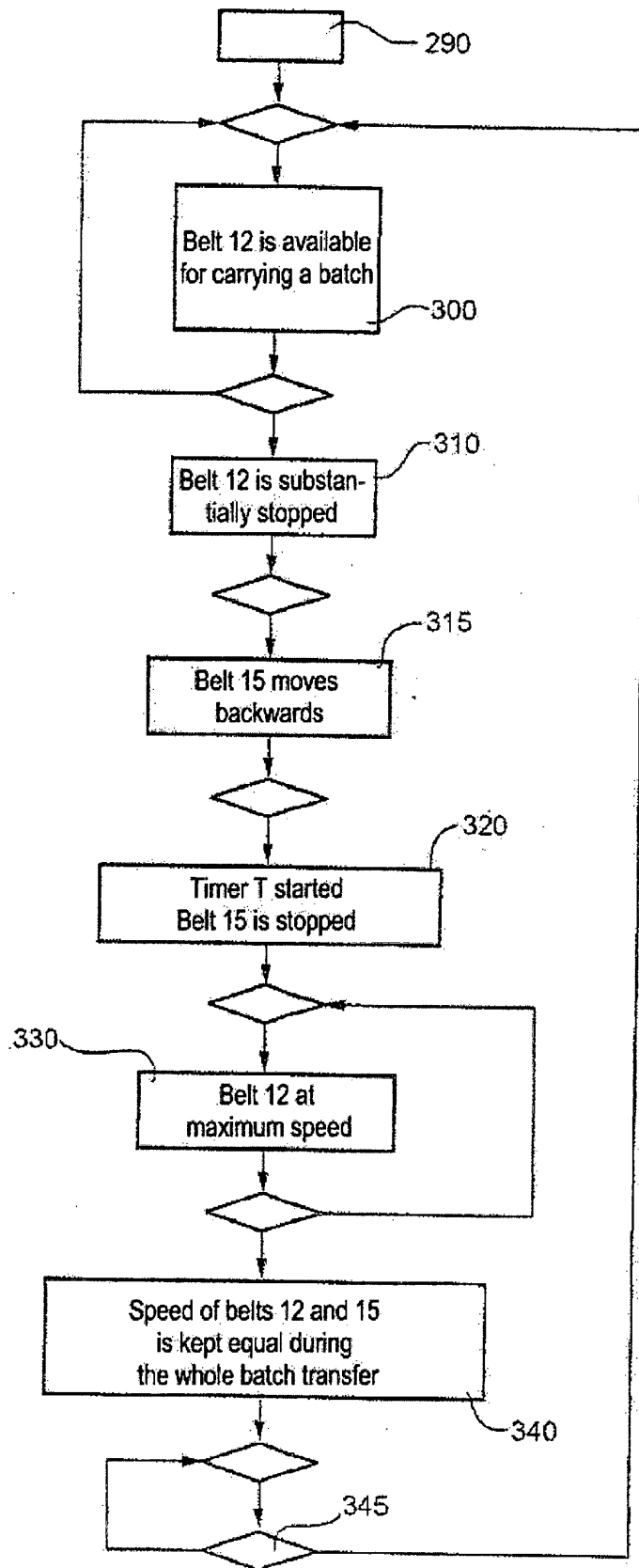
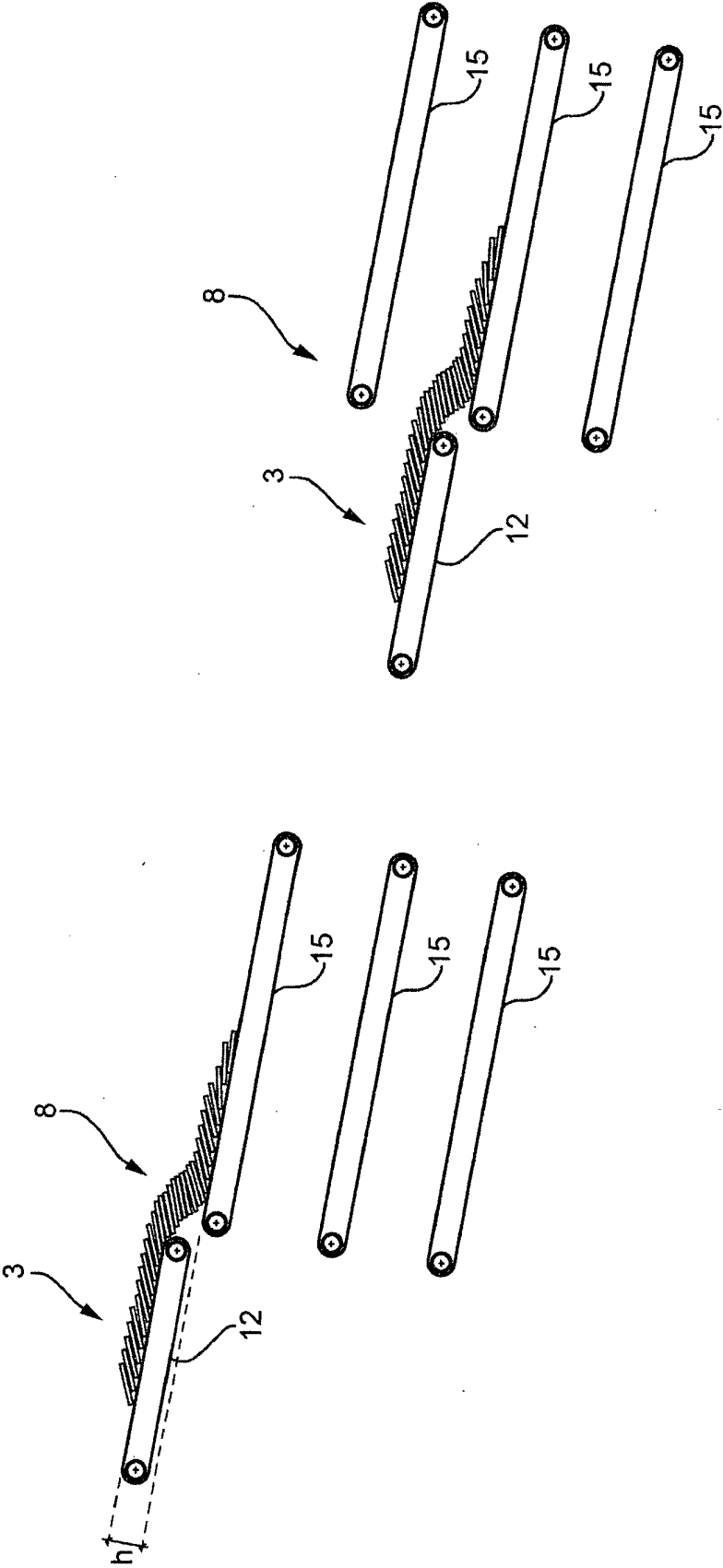


FIG. 4

FIG. 5



REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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