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(54) **A DEVICE AND CORRESPONDING METHOD FOR GROUPING BLANKS OF WRAPPERS OF SMOKING ARTICLES**

VORRICHTUNG UND ENTSPRECHENDES VERFAHREN ZUM GRUPPIEREN VON SCHACHTELZUSCHNITTEN VON RAUCHARTIKELN

DISPOSITIF ET PROCÉDÉ CORRESPONDANT DE REGROUPEMENT D'ÉBAUCHES D'ENVELOPPES D'ARTICLES À FUMER

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Description

[0001] The present invention relates to a device for grouping blanks of smoking-article wrappers, coming one after another from a unit for treating said blanks, according to claim 1.

[0002] It is known in the art to subject ordered groups of blanks, for example, bundles or stacks of blanks, to a treatment process in which the group of blanks is broken up, the individual blanks are fed to a treatment unit which performs a given operation on them (for example, a printing or labeling operation), and finally the single blanks are grouped again in an ordered group.

[0003] The patent IT 1340565, or US2004/255800 A1, by the same Applicant describes a treatment process of this type to generate, outside the packaging line for smoking articles, a reserve of treated blanks to be used for supplying the same packaging line.

[0004] This patent describes a device for grouping blanks in an ordered group, after they have undergone treatment. This known device comprises a rotatable drum provided with a plurality of radial hoppers which are movable, by rotating the drum, between a position for receiving the single blanks and a delivery position for the reconstituted group of blanks.

[0005] Upstream of the aforesaid drum, the known device in question also comprises an inclined plane arranged to overturn the individual blanks directed towards one of the hoppers of the drum so that they are arranged parallel to the bottom of the hopper and are deposited one on top of the other to form a pile of blanks.

[0006] US 6,206,815 B1, US 2011/0315510 A1, GB 430,393 A, CN 205471912 U and US 5,727,674 A disclose each a device for grouping blanks.

[0007] US 2013/0004285 A1 and US 5,447,262 A disclose each a device for zig-zag folding of a web.

[0008] US 5,233,814 A discloses a device being movable between a position of loading letters and a position of delivery of a group of letters.

[0009] The present invention has the object of providing an improved grouping device with respect to the known device indicated, in particular from the point of view of the operating mode and the speed of forming the pile of blanks.

[0010] This object is achieved by a device having the characteristics referred to in claim 1. The solution described herein also relates to a method according to claim 11 and a machine according to claim 13.

[0011] The claims form an integral part of the technical disclosure provided here in relation to the invention.

[0012] Further characteristics and advantages of the invention will become evident from the description that follows with reference to the attached drawings, provided purely by way of non-limiting example, wherein:

- Figure 1 represents a treatment machine for blanks wherein a grouping device according to an embodiment of the solution described here is used;
- Figure 2 represents the machine of Figure 1 wherein the grouping device is in a different operating step;
- Figure 3 represents a side view of the grouping device of Figure 1;
- Figure 4 represents a front view of the grouping device illustrated in Figure 1;
- Figures 5A and 5B represent, in a simplified manner, the grouping device of Figure 1 in two different operating conditions, respectively;
- Figures 6A to 6F represent successive steps of the operation of the grouping device of Figure 1;
- Figure 7 illustrates an example of a blank for wrapping smoking articles.

[0013] In the following description, various specific details are illustrated aimed at a thorough understanding of the embodiments. In other cases, known structures, materials or operations are not shown or described in detail to avoid obscuring various aspects of the embodiments.

[0014] The references used here are only for convenience and do not therefore define the field of protection or the scope of the embodiments.

[0015] As mentioned above, the device described herein performs the function of grouping blanks of smoking-article wrappers which come out in succession from a unit for treating these blanks.

[0016] To better illustrate the type of application for which the device described here is intended, Figure 1 illustrates an example of a treatment machine for blanks W, which, in particular, carries out a labeling process.

[0017] The illustrated machine, indicated as a whole by reference 100, comprises a unit 102 for feeding the blanks W, a labeling unit 104 and a device 10 made according to the disclosures provided here.

[0018] The machine 100 also includes drums 101, 103 and 105 for transporting the blanks from the feeding unit 102 to the labeling unit 104, and from this to the grouping device 10.

[0019] The feeding unit 102 is designed to receive an ordered group of blanks and feed them in succession to the drum 101.

[0020] Each blank W is constituted by a sheet, usually made of paper or cardboard, which is in a completely extended condition, so as to present a planar conformation.

[0021] The blanks that are received by the unit 102 are arranged in an orderly manner so as to form a bundle or pile of blanks. In other words, they are in mutual contact at their respective opposite faces, and have the same orientation with respect to an axis perpendicular to their lying plane.

[0022] Figure 7 illustrates, by way of example, a blank W of a cigarette packet, which must be subjected to the labeling process carried out by the machine 100 of Figure 1.

[0023] This blank has a given contour and predefined folding lines, so that it can be formed into the final wrapper simply by folding its various portions and their mutual

connection (usually by means of glue). This figure illustrates an adhesive label T, which is applied on the blank by the labeling unit 104, to constitute a sealing label for the packet of cigarettes.

[0024] The drum 101 is arranged to pick up one blank at a time from the feeding unit 102 and transfer it to the drum 103. In turn, the drum 103 receives the blank from the drum 101 and carries it, first, to the unit 104 for applying the label T and, subsequently, to the drum 105. Finally, the drum 105 picks up the blank from the drum 103 and delivers it to the device 10.

[0025] To carry out the dual function indicated, for picking up and transferring the blanks, the two drums 101 and 105 are each provided with gripping members (not illustrated), which are operated by a cam system and are also connected to an air intake system.

[0026] The sequence of steps described above is carried out on all blanks that have been loaded on the unit 102.

[0027] The device 10 operates to group the blanks provided with a label coming from the labeling unit 104, reconstituting an ordered group of blanks.

[0028] As will be seen below, this group of blanks can be directly used for supplying a packaging machine (not illustrated) arranged in line with the machine 100.

[0029] With reference now to Figures 3 and 4, in various preferred embodiments, as well as in the one illustrated, the device 10 comprises a structure 12, which defines an inlet 12A for the blanks, a space S for receiving and accumulating the blanks, and an outlet 12B for extracting from the device the group of blanks formed thereby.

[0030] The collecting space S extends along a reference axis J of the structure 12, and the inlet 12A and the outlet 12B are positioned on opposite sides of the space S, along the reference axis J.

[0031] This space constitutes the position of the device 10, where the single blanks W coming from the labeling unit 104 are received, and where the group of blanks under formation is housed.

[0032] According to an important characteristic of the device described here, the structure 12 is arranged with at least one support - see supports 151, 1511, 15III and 151V of the preferred embodiment represented - which is configured for keeping the blank or blanks received in the collecting space S, near the inlet 12A and according to an orientation whereby the lying plane of the blanks is transversal to the reference axis J.

[0033] This at least one support - 151, 1511, 15III and 151V - is movable along the reference axis J for moving away the already-received blank or blanks from said inlet 12A, and enabling housing of a new blank w2 in said collecting space S.

[0034] The new blank is maintained in the aforesaid orientation transverse to the axis J, by the same blank or same blanks already received in the space S.

[0035] Preferably, this at least one support - 151, 1511, 15III and 151V - is moved continuously and at a constant speed along the reference axis J.

[0036] Thanks to the indicated characteristics, the device described here is able to control the formation of the group of blanks within the space S, ensuring, on the one hand, the correct positioning of the blanks at the inlet, and on the other hand, that the blanks keep in contact with each other and are mutually aligned.

[0037] In various preferred embodiments, as well as in the one illustrated, the structure 12 comprises two frame planar modules 14, 16, which are oriented vertically and are arranged opposite each other, at a given distance, to define the collecting space S indicated above between them.

[0038] The two frame modules 14, 16 extend parallel to each other, along the reference direction J.

[0039] An assembly of belt-like supports 151, 1511, 15III and 151V is mounted on the two modules 14 and 16, each of which constitutes a movable support as discussed above. In particular, the two supports 151 and 1511 are mounted on the frame module 14, and the two supports 15111 and 151V on the frame module 16.

[0040] These belt-like supports are mounted on respective pulleys, so that each one extends along a closed-loop path having at least one section oriented along the reference axis J and of a length such as to connect the inlet 12A and the outlet 12B.

[0041] The respective portions 15'1, 15'11, 15'111 and 15'IV of these supports which extend along this section cooperate together to support the blanks W received in the space S in the aforesaid orientation transverse to the axis J (Figure 4).

[0042] The two portions 15'11 and 15'IV are aligned and spaced apart horizontally to engage opposite end regions of the lower edge of each blank W received in the space S.

[0043] On the other hand, the portions 15'1, 15'111 are arranged correspondingly near the upper edge of each blank W received in the space S

[0044] The belt-like supports 151, 1511, 15III and 151V have respective abutment portions 15IB, 1511B, 15IIIB, 15IVB, which protrude in a plane transverse to the longitudinal direction of the support, and are arranged to be positioned at the portions 15'1, 15'11, 15'111 and 15'IV to each engage the front face - with reference to the feed direction - of the blank which, in a given operating cycle, is first received within the space S.

[0045] With reference to Figure 6A, when a new cycle is started, the abutment portions 15IB, 1511B, 15IIIB, 15IVB are all arranged at the inlet 12A, and aligned with each other in the same plane Q transverse to the reference axis J.

[0046] The first blank W1 that is received in the space S places its lower edge on the two supports 1511 and 151V, and its front face against the abutment portions 151B, 1511B, 15IIIB and 15IVB (Figure 6B).

[0047] The blank W1 is, therefore, oriented parallel to the plane Q identified by the abutment portions 151B, 1511B, 15IIIB and 15IVB.

[0048] To receive a new blank W2, the supports 151, 1511, 15III and 151V are moved in such a way as to move away the respective abutment portions from the inlet 12A, and with them the previously received blank W1.

[0049] The extent of this movement is such as to make room for the new blank W2 (Figure 6C), and, at the same time, keep the blank W1 close enough to the inlet 12A so that the new blank W2 is carried directly against the blank W1, as soon as it passes the 12A inlet.

[0050] The new blank W2, therefore, places its lower edge resting on the two belt-like supports 1511 and 151V and carries its front face against the previously received blank W1 (Figures 6D and 6E).

[0051] Thanks to the positioning of the blank W1, the new blank W2 is also positioned substantially parallel to the plane Q.

[0052] This sequence is repeated for all blanks that are received in the space S.

[0053] Preferably, the movement of the supports 151, 1511, 15III and 151V is continuous and at a constant speed, and is regulated so as to keep the already-received blanks, grouped against each other and close to the inlet 12A.

[0054] This movement is coordinated, in general, with the device located upstream of the device 10 which is suitable for delivering the various blanks.

[0055] With reference to the application example illustrated in Figures 1 and 2, this movement is coordinated with the drum 102 and is carried out until a given group of blanks has formed within the space S (for example, this group could have the same number of blanks in the group that had been loaded on the feed unit 102 or not) (Figure 6F).

[0056] Incidentally, it will be understood that at the end of the operating cycle, the abutment portions 151B, 1511B, 15IIIB, 15IVB will find themselves at a distance from the inlet 12A corresponding, substantially, to the length of the reconstituted group of blanks.

[0057] Preferably, the supports 151, 1511, 15III and 151V are equipped with additional abutment portions - see the portions 15IIIC and 15IVC illustrated in Figure 3 - arranged to position themselves at the inlet 12A - in the same configuration shown in Figure 6A for the abutment portions 15IIIB and 15IVB - when the abutment portions 151B, 1511B, 15111B, 151VB are now out of the active sections 15'1, 15'11, 15'111 and 15'IV of the supports, to allow immediate start of a new loading cycle of blanks.

[0058] Referring to Figure 4, the structure 12 can also be arranged with fixed guides 13, opposite to each other, carried by the two frame modules 14 and 16, to retain the blanks laterally.

[0059] The movable supports 151, 1511, 15III and 151V must, in turn, be synchronized with each other.

[0060] In various preferred embodiments, as well as in the one illustrated, these supports are controlled by a single actuator 18, which is connected to the various supports 151, 1511, 15III and 151V through a motion transmission system, with belt members or equivalent members (e.g. chains). In alternative embodiments, however, two or more actuators could be provided, for example, an actuator for each belt-like support.

[0061] With reference to the preferred embodiment illustrated in Figure 4, the motion transmission system comprises shafts 221, 2211, 22III and 22IV, rotatably mounted on the frame modules 14 and 16, which carry, on the inner side of the two modules, pulleys 231, 2311, 23III and 23IV, and on the outer side, pulleys 211, 2111, 21111 and 211V. The shaft 2211 has a connecting portion through which it connects to the actuator 18.

[0062] An additional shaft 23 extends between the two frame modules 14, 16, and is rotatably mounted on both modules. The shaft 23 has opposite ends which are positioned on the two outer sides of the frame modules 14 and 16, and on which two additional pulleys 24 and 25 are carried.

[0063] The belt-like supports 151, 1511, 15III and 151V are mounted, respectively, on the pulleys 231, 2311, 23III and 231V.

[0064] A first belt member 26 is coupled, connecting them in rotation to each other, to the pulleys 211, 2111 and 24, which are all on the same outer side - the left side, with reference to the Figure - of the two frame modules 14 and 16.

[0065] In the same way, a second belt member 27 is coupled to the pulleys 21111, 211V and 25, which are, however, all on the opposite outer side of the two frame modules 14 and 16 - the right side, with reference to the Figure.

[0066] In various preferred embodiments, as well as in the one illustrated, each of the pulleys 231, 2311, 24 and 25 is associated with a pressure roller 29, which is configured to press the relative belt member against it, to ensure correct coupling between member and pulley.

[0067] It will be noted that the two members 26 and 27 are - in turn - connected in rotation through the shaft 23.

[0068] The actuator 18 is designed to control the rotation of the shaft 2211.

[0069] This rotation, on the one hand, controls the movement of the support 1511. On the other hand, it sets the first member 26 in motion, which, in turn, moves the support 151.

[0070] The movement of the first member 26 is transmitted to the second member 27, on the opposite side of the structure 12, through the shaft 23.

[0071] The second member 27 drives the other two supports 15111 and 151V.

[0072] The above described motion transfer system is only one of the possible embodiments.

[0073] Returning to Figures 1 and 2, the structure 12 is carried by a positioning unit 30, which is configured to move the structure 12 between a position P1, preferably raised, for loading the blanks (illustrated in Figure 1), and a position P2 , preferably lowered, of delivery of the blanks (illustrated in Figure 2).

[0074] With reference to Figure 1, in the loading position P1, the structure 12 has the inlet 12A directly facing,

and in immediate adjacency, to the drum 105.

[0075] At the same time, the structure 12 is oriented so as to arrange the reference axis J slightly inclined upwards, so as to facilitate the passage of the blanks from the drum 105 to the collecting space S.

[0076] In various preferred embodiments, as well as in the one illustrated, the structure 12 also comprises two holding elements 17, which are positioned at the entrance 12A and are opposite each other (Figure 3).

[0077] These elements are equipped with respective teeth 171 between which the inlet passage of the blanks W into the collecting space S is defined.

[0078] These teeth are sized so that the passage defined by them is slightly smaller than the corresponding size of the blanks, so as to allow the insertion of the blanks, through a small deformation of the blanks along the respective upper and lower edges, and to be able instead to retain the already-received blanks, preventing the risk of spillage.

[0079] Alternatively, the teeth 171 could define a passage slightly larger than the size of the blanks; in this case the release of the blank takes place by first inserting the blank behind the upper tooth and then behind the lower tooth.

[0080] As a further alternative, these teeth could be tilting and engage the inlet 12A of the structure only after the positioning of a blank in the collecting space S.

[0081] With reference to Figure 2, in the delivery position P2, the structure 12 is positioned at an underlying conveying line, on which the group of blanks is released.

[0082] In the illustrated example, this conveying line comprises a carriage 111, which is inserted between the two frame modules 14 and 16 and the relative supports 1511 and 151V when the structure 12 lowers into the delivery position P2, engaging the group of blanks contained within the collecting space S with a support plane 111A.

[0083] Preferably, the delivery position P2 is selected so that the blanks resting on the support plane 111A are slightly raised with respect to the supports 1511 and 151V.

[0084] After the group of blanks has been placed on the carriage 111, the supports 151, 1511, 15III and 151V are moved so that the respective abutment portions 151B, 1511B, 15IIIB and 15IVB are removed from the respective sections 15'1, 15'11, 15'111 and 15'IV for engaging the blanks, thus freeing, frontally, the group of blanks.

[0085] The carriage 111 can, at this point, extract the group of blanks through the outlet 12B.

[0086] With reference now to Figures 5A and 5B, these illustrate the positioning unit 30, indicated above, according to a preferred embodiment of the device 10 described here.

[0087] According to this embodiment, the unit 30 comprises two pivoting supports 32, 34, which are hinged around two fixed horizontal rotation axes, 11, 12, respectively. The two axes 11 and 12 are mutually parallel, and transverse to the reference axis J of the structure 12.

[0088] The distal ends of these supports 32, 34 are, in turn, hinged to the two frame modules 14 and 16, around two movable rotation axes 13, 14, parallel to the axes I1 and 12, and mutually spaced apart along the reference axis J.

[0089] The two pivoting supports 32 and 34 are both controlled by an actuator 35, which is connected thereto by means of a motion transmission system (not illustrated), for example, belt driven.

[0090] With reference to Figures 5A and 5B, the two supports 32 and 34 are movable between a lying position, in which they place the structure 12 in the aforesaid delivery position P2, and a vertical or slightly inclined position with respect to the vertical position, in which the structure 12 is held in the aforesaid loading position P1.

[0091] Clearly, the device 10 will also comprise a control unit U (schematically illustrated in Figure 1) for governing the operations of the described means.

[0092] The above described positioning unit 30 (corresponding to the illustrated embodiment) causes a rototranslation of the structure 12 in order to move it between the loading position P1 and the delivery position P2. Alternatively, the device 10 could comprise a positioning unit 30 such as to determine only a translation of the structure 12 in order to move it between the loading position P1 and the delivery position P2.

[0093] As another alternative, the structure 12 may not be movable between the two positions of loading and delivery; in this case, an element for extracting the pile of blanks from the collecting space S could fit into said collecting space S.

[0094] Returning to the application example illustrated in Figures 1 and 2, a complete cycle of operation of the illustrated machine 100 develops as follows.

[0095] An ordered group of unlabeled blanks W is loaded onto the feeding unit 102.

[0096] The single blanks of this group are, in succession, taken from the drum 101, carried to the labeling unit 104 by the drum 103, and finally released to the device 10 by the drum 105.

[0097] During this step, the structure 12 is in the loading position P1 illustrated in Figure 1 to accommodate the single blanks through the inlet 12A.

[0098] The belt-like supports 151, 1511, 15III, 151V are operated according to a continuous movement and at a constant speed, to keep the already-received blanks grouped against each other and close to the inlet 12A.

[0099] Once the collecting space S is filled with labeled blanks W, the structure 12 is carried to the delivery position P2 illustrated in Figure 2, where the group of blanks is placed on the carriage 111.

[0100] The belt-like supports 151, 1511, 15III, 151V are operated once again to free the group of blanks from the engagement of the abutment portions 15IB, 15IIB, 15IIIB, 15IVB.

[0101] At this point, the carriage 111 extracts the group of blanks from the structure 12, through the outlet 12B,

and transports them directly to the packaging machine mentioned above.

[0102] It will be noted that the treatment process carried out by the machine 100 can be performed in line with the packaging process without the speed of the first machine affecting the speed of the second, and vice versa, thanks to the device 10, which operates to generate a reserve of blanks directly upstream of the packaging machine.

[0103] Of course, the details of construction and the embodiments may vary, even significantly, with respect to those illustrated here, purely by way of non-limiting example, without departing from the scope of the invention as defined by the attached claims. For example, alternative embodiments to that illustrated may provide only the lower belt-like supports 1511 and 151V or the two lower belt-like supports 1511 and 151V and a single upper belt-like support.

[0104] Outside the subject-matter of the claims, the belt-like supports described can be replaced by rigid, movable support members of reciprocating motion along the reference axis J.

Claims

1. A device (10) for grouping blanks (w1, w2) of smoking-article wrappers, coming one after another from a machine (104) for treating said blanks,

   said device (10) comprising a structure (12) for receiving said blanks (w1, w2) having an inlet (12A) for said blanks coming from said treatment machine (104), and a collecting space (S), in communication with said inlet (12A), for receiving said blanks and housing a group of said blanks (w1, w2) under formation,
   wherein said collecting space (S) extends along a reference axis (J) of said structure (12),
   said device also comprising at least one support (151, 1511, 15III, 15IV), which is movably mounted on said structure (12), for keeping the already-received blank or blanks in said collecting space close to said inlet (12A) and according to such an orientation that the lying plane of said blanks is transversal to said reference axis (J),
   wherein said at least one support (151, 1511, 15III, 151V) is movable along said reference axis (J) for moving away the already-received blank or blanks (w1) from said inlet (12A), and enabling reception of a new blank (w2) in said collecting space (S),
   wherein said at least one movable support (1511, 151V) comprises at least one belt-like support (1511, 15IV), which is movable along a ring-like closed path having a portion oriented along said reference axis (J), and wherein the portion (15'11, 15'IV) of said at least one belt-like support (1511, 151V) extending along said portion is configured to engage a lower side of the group of said blanks under formation, received within said collecting space (S),
   said device being **characterized in that** said belt-like support (1511, 151V) comprises one or more abutment portions (15IIB, 15IVB) configured to engage the front side of the blank that, in a given cycle of operation of said device, is first received in said collecting chamber (S), and for keeping said blank or the blanks that are received afterwards, in said orientation transversal to said reference axis (J).

2. A device according to claim 1, wherein said at least one support (151, 1511, 15III, 151V) is movable according to a continuous movement, preferably, at constant velocity.

3. A device according to claims 1 or 2, comprising an actuator (18) for driving said at least one movable support (151, 1511, 15III, 151V) and a control unit (U) configured to control said actuator (18) so that the movement of said at least one movable support (151, 1511, 15III, 151V) frees the space that is necessary to receive the new blank, and - at the same time - keeps the already-received blank or the blank sufficiently close to said inlet (12A) so that they can support said new blank in said orientation transversal to said reference axis (J).

4. A device according to any one of the preceding claims, comprising an actuator (18) for driving said at least one belt-like support (1511, 151V) and a control unit (U) configured to control said actuator (18), wherein, in an operation cycle of said device, said control unit (U) is configured to control the movement of said at least one belt-like support (1511, 151V) for carrying said one or more abutment portions (15IIB, 15IVB) from a first position close to said inlet (12A), to a second position where said one or more abutment portions (1511b, 15IVB) find themselves at a distance from said inlet (12A) that is substantially equal to the dimension, along said reference axis (J), of said group of blanks formed in said collecting space (S).

5. A device according to any one of the preceding claims, wherein said at least one belt-like support (1511, 151V) comprises a first and a second belt-like support (1511, 151V), which are configured to engage the lower side of said group of blanks under formation received in said collecting space (S), and are spaced apart from one another, along a direction orthogonal to said reference axis (J), by a predetermined distance for allowing insertion between said first and second belt-like support (1511, 151V) of a device (111) for picking up the group of blanks

formed in said collecting space (S).

6. A device according to any one of the preceding claims, wherein said at least one movable support (151, 15111) comprises at least one additional belt-like support (151, 15111), which is positioned on the upper side of said group of blanks under formation, and is mounted to be movable along a closed-loop path having a portion oriented along said reference axis (J), wherein said additional belt-like support (151, 15111) comprises one or more abutment portions (15IB, 15IIIB) configured to engage the front side of the blank (w1) which, in a given operation cycle of said device (10), is first received in said collecting space (S), and for keeping said blank (w1) and the blanks (w2, W) that are received afterwards, in said orientation transversal to said reference axis (J).

7. A device according to claims 3, 5 and 6, comprising a motion-transmission system (26, 27, 23) configured to operatively connect said actuator (18) to said first and second belt-like supports (1511, 151V) and to said additional belt-like support (151, 15111).

8. A device according to any one of the preceding claims, wherein said structure (12) has an outlet (12B), for said group of blanks formed in said collecting space (S), which communicates with said collecting space (S) and is positioned at the side opposite to said inlet, along said reference axis (J).

9. A device (10) according to any one of the preceding claims, wherein said structure (12) is movable between a position (P1) for loading said blanks (w1, w2, W) wherein said blanks are received in said collecting space (S) of said structure (12), and a delivery position (P2) wherein the group of blanks (w1, w2, W) formed inside said collecting space (S) is released.

10. A device according to any one of the preceding claims, wherein said structure (12) is provided, at said inlet (12A), with a pair of holding elements (17) that are opposite to one another for holding the blanks already received in said collecting space (S).

11. A method for grouping blanks (w1, w2) of smoking-article wrappers coming - in succession - from a machine (104) for treating said blanks, said method being implemented by means of a device (10) for grouping blanks (w1, w2) of smoking-article wrappers according to any one of the preceding claims, and comprising the step of feeding in succession, one after another, said blanks to said device (10) for grouping blanks,
said method, furthermore, comprising the steps of:

- receiving, through said inlet (12A), a blank (w1) within said collecting space (S), said at least one support (151, 1511, 15III, 151V) keeping said blank (w1) close to said inlet (12A) and according to said orientation transversal to said reference axis (J);
- moving said at least one support (151, 1511, 15III, 151V) along said reference axis (J) for moving said blank (w1) received in said collecting space (S) away from said inlet (12A);
- receiving, through said inlet (12A), a new blank (w2) in said collecting space (S), said new blank (w2) positioning itself against the previously received blank (w1), according to said orientation transversal to said reference axis (J);
- repeating the previous steps until an ordered group of blanks is formed in said collecting space (S).

12. A method according to claim 11, wherein said movement of said at least one support (151, 1511, 15III, 151V) is a continuous movement, preferably at constant velocity, which is executed without interruptions while the single blanks (w1, w2) are received in said collecting space (S) for forming said given ordered group of blanks (w1, w2, W).

13. A machine (100) for treating blanks of smoking-articles wrappers, comprising:

- a unit (104) for treating blanks (w1, w2) of smoking-articles wrappers;
- at least one drum (101, 103) for feeding, in succession, one blank at a time, to said treating unit (104),
- a device (10) according to any one of claims 1 to 10, which is positioned downstream of said treating unit (104), for grouping - in an ordered group - the blanks (w1, w2, W) that have been treated by said treating unit (104);
- a carriage (111) for picking up the ordered group of treated blanks from said device (10) and transporting said group of treated blanks towards a packaging machine.

14. A machine (100) according to claim 13, wherein said structure (12) of said device (10) is movable between a position (P1) of loading of said blanks and a position (P2) of delivery of said group of blanks formed in said collecting space (S), and wherein said carriage (111) is configured to pick up said group of blanks when the structure (12) of said device (10) is in said delivery position (P2).

Patentansprüche

1. Vorrichtung (10) zum Gruppieren von Zuschnitten

(w1, w2) von Rauchartikelschachteln, die einzeln nacheinander von einer Maschine (104) zur Behandlung der Zuschnitte kommen,

wobei die Vorrichtung (10) eine Struktur (12) zum Aufnehmen der Zuschnitte (w1, w2) umfasst, die einen Einlass (12A) für die von der Behandlungsmaschine (104) kommenden Zuschnitte und einen Sammelraum (S) in Kommunikation mit dem Einlass (12A) zum Aufnehmen der Zuschnitte und Unterbringen einer in der Bildung befindlichen Gruppe der Zuschnitte (w1, w2) aufweist,
wobei sich der Sammelraum (S) entlang einer Referenzachse (J) der Struktur (12) erstreckt,
wobei die Vorrichtung außerdem mindestens eine Abstützung (15I, 15II, 15III, 15IV) umfasst, die beweglich an der Struktur (12) montiert ist, zum Halten des/der bereits aufgenommenen Zuschnitt(e) in dem Sammelraum nahe dem Einlass (12A) und entsprechend einer derartigen Ausrichtung, dass die Liegeebene der Zuschnitte quer zu der Referenzachse (J) ist,
wobei die mindestens eine Abstützung (15I, 15II, 15III, 15IV) entlang der Referenzachse (J) beweglich ist, um den/die bereits aufgenommenen Zuschnitt(e) (w1) von dem Einlass (12A) weg zu bewegen und die Aufnahme eines neuen Zuschnitts (w2) in den Sammelraum (S) zu ermöglichen,
wobei die mindestens eine bewegliche Abstützung (15II, 15IV) mindestens eine gurtartige Abstützung (15II, 15IV) umfasst, die entlang eines ringartigen geschlossenen Weges mit einem entlang der Referenzachse (J) ausgerichteten Abschnitt beweglich ist, und wobei sich der Abschnitt (15'II, 15'IV) der mindestens einen gurtartigen Abstützung (15II, 15IV), der sich entlang des Abschnitts erstreckt, dafür gestaltet ist, in Eingriff mit einer Unterseite der in der Bildung befindlichen Gruppe der Zuschnitte, die in dem Sammelraum (S) aufgenommen sind, zu stehen,
wobei die Vorrichtung **dadurch gekennzeichnet ist, dass** die gurtartige Abstützung (15II, 15IV) einen oder mehrere Auflageabschnitte (15IIB, 15IVB) umfasst, die dafür gestaltet sind, mit der Vorderseite des Zuschnitts, der in einem gegebenen Betriebszyklus der Vorrichtung zuerst in die Sammelkammer (S) aufgenommen wird, in Eingriff zu stehen und zum Halten des/der Zuschnitt(e), der/die danach aufgenommen werden, in der Ausrichtung quer zu der Referenzachse (J).

2. Vorrichtung nach Anspruch 1, wobei die mindestens eine Abstützung (15I, 15II, 15III, 15IV) entsprechend einer kontinuierlichen Bewegung, vorzugsweise mit konstanter Geschwindigkeit, beweglich ist.

3. Vorrichtung nach Anspruch 1 oder 2, umfassend einen Aktor (18) zum Antreiben der mindestens einen beweglichen Abstützung (15I, 15II, 15III, 15IV) und eine Steuerungseinheit (U), die dafür gestaltet ist, den Aktor (18) derart zu steuern, dass die Bewegung der mindestens einen beweglichen Abstützung (15I, 15II, 15III, 15IV) den Raum freimacht, der zum Aufnehmen des neuen Zuschnitts erforderlich ist, und gleichzeitig den bereits aufgenommenen Zuschnitt oder den Zuschnitt ausreichend nahe an dem Einlass (12A) zu halten, so dass sie den neuen Zuschnitt in der Ausrichtung quer zu der Referenzachse (J) abstützen können.

4. Vorrichtung nach einem der vorhergehenden Ansprüche, umfassend einen Aktor (18) zum Antreiben der mindestens einen gurtartigen Abstützung (15II, 15IV) und eine Steuerungseinheit (U), die dafür gestaltet ist, den Aktor (18) zu steuern,
wobei die Steuerungseinheit (U) dafür gestaltet ist, in einem Betriebszyklus der Vorrichtung die Bewegung der mindestens einen gurtartigen Abstützung (15II, 15IV) zum Tragen des einen oder der mehreren Auflageabschnitte (15IIB, 15IVB) von einer ersten Position nahe dem Einlass (12A) zu einer zweiten Position, wo sich der eine oder die mehreren Auflageabschnitte (15IIb, 15IVB) in einem Abstand von dem Einlass (12A) befinden, der im Wesentlichen gleich der Abmessung der in dem Sammelraum (S) gebildeten Gruppe von Zuschnitten entlang der Referenzachse (J) ist, zu steuern.

5. Vorrichtung nach einem der vorhergehenden Ansprüche, wobei die mindestens eine gurtartige Abstützung (15II, 15IV) eine erste und eine zweite gurtartige Abstützung (15II, 15IV) umfasst, die dafür gestaltet sind, mit der Unterseite der in der Bildung befindlichen Gruppe von Zuschnitten, die in dem Sammelraum (S) aufgenommen sind, in Eingriff zu stehen, und die entlang einer Richtung orthogonal zu der Referenzachse (J) um einen festgelegten Abstand voneinander beabstandet sind, um das Einfügen einer Vorrichtung (111) zum Abnehmen der in dem Sammelraum (S) gebildeten Gruppe von Zuschnitten zwischen der ersten und der zweiten gurtartigen Abstützung (15II, 15IV) zu ermöglichen.

6. Vorrichtung nach einem der vorhergehenden Ansprüche, wobei die mindestens eine bewegliche Abstützung (15I, 15III) mindestens eine zusätzliche gurtartige Abstützung (15I, 15III) umfasst, die an der Oberseite der in der Bildung befindlichen Gruppe von Zuschnitten positioniert ist und die derart montiert ist, dass sie entlang eines geschlossenen Schleifenweges mit einem entlang der Referenzachse (J) ausgerichteten Abschnitt beweglich ist,

wobei die zusätzliche gurtartige Abstützung (15I, 15III) einen oder mehrere Auflageabschnitte (15IB, 15IIIB) umfasst, die dafür gestaltet sind, mit der Vorderseite des Zuschnitts (w1), der in einem gegebenen Betriebszyklus der Vorrichtung (10) zuerst in den Sammelraum (S) aufgenommen wird, in Eingriff zu stehen und zum Halten des Zuschnitts (w1) und der Zuschnitte (w2, W), die danach aufgenommen werden, in der Ausrichtung quer zu der Referenzachse (J).

7. Vorrichtung nach Anspruch 3, 5 und 6, ein Bewegungsübertragungssystem (26, 27, 23) umfassend, das dafür gestaltet ist, den Aktor (18) betriebsmäßig mit der ersten und der zweiten gurtartigen Abstützung (15II, 15IV) und mit der zusätzlichen gurtartigen Abstützung (15I, 15III) zu verbinden.

8. Vorrichtung nach einem der vorhergehenden Ansprüche, wobei die Struktur (12) einen Auslass (12B) für die in dem Sammelraum (S) gebildete Gruppe von Zuschnitten aufweist, der mit dem Sammelraum (S) in Kommunikation steht und entlang der Referenzachse (J) an der Seite gegenüber vom Einlass angeordnet ist.

9. Vorrichtung (10) nach einem der vorhergehenden Ansprüche, wobei die Struktur (12) zwischen einer Position (P1) zum Laden der Zuschnitte (w1, w2, W), in der die Zuschnitte in den Sammelraum (S) der Struktur (12) aufgenommen werden, und einer Ausgabeposition (P2), in der die in dem Sammelraum (S) gebildete Gruppe von Zuschnitten (w1, w2, W) freigegeben wird, beweglich ist.

10. Vorrichtung nach einem der vorhergehenden Ansprüche, wobei die Struktur (12) an dem Einlass (12A) mit einem Paar von Halteelementen (17), die einander gegenüberliegen, zum Halten der bereits in den Sammelraum (S) aufgenommenen Zuschnitte versehen ist.

11. Verfahren zum Gruppieren von Zuschnitten (w1, w2) von Rauchartikelschachteln, die nacheinander von einer Maschine (104) zur Behandlung der Zuschnitte kommen, wobei das Verfahren mittels einer Vorrichtung (10) zum Gruppieren von Zuschnitten (w1, w2) von Rauchartikelschachteln nach einem der vorhergehenden Ansprüche umgesetzt wird, und umfassend den Schritt des Zuführens der Zuschnitte einzeln nacheinander zu der Vorrichtung (10) zum Gruppieren von Zuschnitten,
wobei das Verfahren ferner die folgenden Schritte umfasst:

- Aufnehmen eines Zuschnitts (w1) über den Einlass (12A) in den Sammelraum (S), wobei die mindestens eine Abstützung (15I, 15II, 15III, 15IV) den Zuschnitt (w1) nahe dem Einlass (12A) und entsprechend der Ausrichtung quer zu der Referenzachse (J) hält,
- Bewegen der mindestens einen Abstützung (15I, 15II, 15III, 15IV) entlang der Referenzachse (J), um den in den Sammelraum (S) aufgenommenen Zuschnitt (w1) von dem Einlass (12A) weg zu bewegen,
- Aufnehmen eines neuen Zuschnitts (w2) über den Einlass (12A) in den Sammelraum (S), wobei sich der neue Zuschnitt (w2) an dem vorher aufgenommenen Zuschnitt (w1) anliegend entsprechend der Ausrichtung quer zu der Referenzachse (J) positioniert,
- Wiederholen der vorherigen Schritte, bis eine geordnete Gruppe von Zuschnitten in dem Sammelraum (S) gebildet ist.

12. Verfahren nach Anspruch 11, wobei die Bewegung der mindestens einen Abstützung (15I, 15II, 15III, 15IV) eine kontinuierliche Bewegung, vorzugsweise mit einer konstanten Geschwindigkeit, ist, die unterbrechungsfrei ausgeführt wird, während die einzelnen Zuschnitte (w1, w2) in den Sammelraum (S) aufgenommen werden, um die gegebene geordnete Gruppe von Zuschnitten (w1, w2, W) zu bilden.

13. Maschine (100) zum Behandeln von Zuschnitten von Rauchartikelschachteln, umfassend:

- eine Einheit (104) zum Behandeln von Zuschnitten (w1, w2) von Rauchartikelschachteln,
- mindestens eine Trommel (101, 103) zum Zuführen von Zuschnitten zu der Behandlungseinheit (104) einzeln nacheinander,
- eine Vorrichtung (10) nach einem der Ansprüche 1 bis 10, die prozessabwärts der Behandlungseinheit (104) angeordnet ist, zum Gruppieren der von der Behandlungseinheit (104) behandelten Zuschnitte (w1, w2, W) zu einer geordneten Gruppe,
- einen Schlitten (111) zum Abnehmen der geordneten Gruppe behandelter Zuschnitte von der Vorrichtung (10) und Transportieren der Gruppe behandelter Zuschnitte zu einer Verpackungsmaschine.

14. Maschine (100) nach Anspruch 13, wobei die Struktur (12) der Vorrichtung (10) zwischen einer Position (P1) des Ladens der Zuschnitte und einer Position (P2) der Ausgabe der in dem Sammelraum (S) gebildeten Gruppe von Zuschnitten beweglich ist und wobei der Schlitten (111) dafür gestaltet ist, die Gruppe von Zuschnitten abzunehmen, wenn die Struktur (12) der Vorrichtung (10) in der Abgabeposition ist.

Revendications

1. Dispositif (10) pour regrouper des ébauches (w1, w2) d'enveloppes d'articles à fumer, provenant l'une après l'autre d'une machine (104) pour le traitement desdites ébauches,

ledit dispositif (10) comprenant une structure (12) pour recevoir lesdites ébauches (w1, w2), présentant une entrée (12A) pour lesdites ébauches en provenance de ladite machine de traitement (104), et un espace de collecte (S), en communication avec ladite entrée (12A), pour recevoir lesdites ébauches et loger un groupe desdites ébauches (w1, w2) en cours de formation,
ledit espace de collecte (S) s'étendant le long d'un axe de référence (J) de ladite structure (12),
ledit dispositif comprenant également au moins un support (151, 1511, 15111, 151V), qui est monté mobile sur ladite structure (12), pour maintenir la ou les ébauches déjà reçues dans ledit espace de collecte à proximité de ladite entrée (12A) et selon une orientation telle que le plan de pose desdites ébauches est transversal audit axe de référence (J),
ledit au moins un support (151, 1511, 15III, 15IV) étant mobile le long dudit axe de référence (J) pour éloigner la ou les ébauches (w1) déjà reçues de ladite entrée (12A) et permettre la réception d'une nouvelle ébauche (w2) dans ledit espace de collecte (S),
ledit au moins un support mobile (1511, 151V) comprenant au moins un support en forme de courroie (1511, 151V), qui est mobile le long d'une trajectoire fermée en forme d'anneau ayant une partie orientée le long dudit axe de référence (J), et la partie (15'II, 15'IV) dudit au moins un support en forme de courroie (1511, 151V) qui s'étend le long de ladite partie étant configurée pour venir en contact avec un côté inférieur du groupe desdites ébauches en cours de formation, reçu dans ledit espace de collecte (S),
ledit dispositif étant **caractérisé en ce que** ledit support en forme de courroie (1511, 151V) comprend une ou plusieurs parties de butée (1511B, 15IVB) configurées pour venir en contact avec le côté avant de l'ébauche qui, dans un cycle donné de fonctionnement dudit dispositif, est reçue en premier dans ladite chambre de collecte (S), et pour maintenir ladite ou les ébauches qui sont reçues ensuite dans ladite orientation transversale audit axe de référence (J).

2. Dispositif selon la revendication 1, dans lequel ledit au moins un support (151, 1511, 15III, 15IV) est mobile selon un mouvement continu, de préférence à vitesse constante.

3. Dispositif selon la revendication 1 ou 2, comprenant un actionneur (18) pour entraîner ledit au moins un support mobile (151, 1511, 15111, 15IV) et une unité de commande (U) configurée pour commander ledit actionneur (18) de telle sorte que le déplacement dudit au moins un support mobile (151, 1511, 15111, 15IV) libère l'espace nécessaire à la réception de la nouvelle ébauche et, en même temps, maintienne l'ébauche déjà reçue ou l'ébauche suffisamment proche de ladite entrée (12A) pour qu'elles puissent supporter ladite nouvelle ébauche dans ladite orientation transversale audit axe de référence (J).

4. Dispositif selon l'une quelconque des revendications précédentes, comprenant un actionneur (18) pour entraîner ledit au moins un support en forme de courroie (1511, 151V) et une unité de commande (U) configurée pour commander ledit actionneur (18),
dans un cycle de fonctionnement dudit dispositif, ladite unité de commande (U) étant configurée pour commander le déplacement dudit au moins un support en forme de courroie (1511, 151V) pour transporter ladite ou lesdites parties de butée (15IIB, 15IVB) d'une première position proche de ladite entrée (12A) à une seconde position où ladite ou lesdites parties de butée (1511B, 15IVB) se trouvent elles-mêmes à une distance de ladite entrée (12A) qui est sensiblement égale à la dimension, selon ledit axe de référence (J), dudit groupe d'ébauches formé dans ledit espace de collecte (S).

5. Dispositif selon l'une quelconque des revendications précédentes, dans lequel ledit au moins un support en forme de courroie (1511, 151V) comprend un premier et un second supports en forme de courroie (1511, 151V) qui sont configurés pour venir en contact avec le côté inférieur dudit groupe d'ébauches en cours de formation reçu dans ledit espace de collecte (S) et qui sont espacés l'un de l'autre, selon une direction orthogonale audit axe de référence (J), d'une distance prédéterminée pour permettre l'insertion entre lesdits premier et second supports en forme de courroie (1511, 151V) d'un dispositif (111) de saisie du groupe d'ébauches formé dans ledit espace de collecte (S).

6. Dispositif selon l'une quelconque des revendications précédentes, dans lequel ledit au moins un support mobile (151, 15III) comprend au moins un support en forme de courroie (151, 15III) supplémentaire, qui est positionné sur le côté supérieur dudit groupe d'ébauches en cours de formation et qui est monté pour être mobile le long d'une trajectoire en boucle fermée ayant une partie orientée le long dudit axe de référence (J),
ledit support en forme de courroie (151, 15III) sup-

plémentaire comprenant une ou plusieurs parties de butée (151B, 15IIIB) configurées pour venir en contact avec le côté avant de l'ébauche (w1) qui, dans un cycle de fonctionnement donné dudit dispositif (10), est reçue en premier dans ledit espace de collecte (S), et pour maintenir ladite ébauche (w1) et les ébauches (w2, W) qui sont reçues ensuite dans ladite orientation transversale audit axe de référence (J).

7. Dispositif selon les revendications 3, 5 et 6, comprenant un système de transmission de mouvement (26, 27, 23) configuré pour relier de manière fonctionnelle ledit actionneur (18) auxdits premier et second supports en forme de courroie (1511, 151V) et audit support supplémentaire en forme de courroie (151, 15111).

8. Dispositif selon l'une quelconque des revendications précédentes, dans lequel ladite structure (12) comporte une sortie (12B), pour ledit groupe d'ébauches formé dans ledit espace de collecte (S), qui communique avec ledit espace de collecte (S) et qui est positionnée du côté opposé à ladite entrée, le long dudit axe de référence (J).

9. Dispositif (10) selon l'une quelconque des revendications précédentes, dans lequel ladite structure (12) est mobile entre une position (P1) de chargement desdites ébauches (w1, w2, W) dans laquelle lesdites ébauches sont reçues dans ledit espace de collecte (S) de ladite structure (12), et une position de distribution (P2) dans laquelle le groupe d'ébauches (w1, w2, W) formé à l'intérieur dudit espace de collecte (S) est libéré.

10. Dispositif selon l'une quelconque des revendications précédentes, dans lequel ladite structure (12) est munie, au niveau de ladite entrée (12A), d'une paire d'éléments de maintien (17) qui sont opposés l'un à l'autre pour maintenir les ébauches déjà reçues dans ledit espace de collecte (S).

11. Procédé de regroupement d'ébauches (w1, w2) d'enveloppes d'articles à fumer provenant, successivement, d'une machine (104) de traitement desdites ébauches, ledit procédé étant mis en œuvre au moyen d'un dispositif (10) de regroupement d'ébauches (w1, w2) d'enveloppes d'articles à fumer selon l'une quelconque des revendications précédentes, et comprenant l'étape consistant à alimenter successivement, l'une après l'autre, ledit dispositif (10) avec lesdites ébauches pour regrouper les ébauches,
ledit procédé, en outre, comprenant les étapes consistant à :

- recevoir, par ladite entrée (12A), une ébauche (w1) dans ledit espace de collecte (S), ledit au moins un support (151, 1511, 15111, 15IV) maintenant ladite ébauche (w1) à proximité de ladite entrée (12A) et selon ladite orientation transversale audit axe de référence (J) ;
- déplacer ledit au moins un support (151, 1511, 15III, 15IV) le long dudit axe de référence (J) pour éloigner ladite ébauche (w1) reçue dans ledit espace de collecte (S) de ladite entrée (12A) ;
- recevoir, par ladite entrée (12A), une nouvelle ébauche (w2) dans ledit espace de collecte (S), ladite nouvelle ébauche (w2) se positionnant elle-même contre l'ébauche (w1) précédemment reçue, selon ladite orientation transversale audit axe de référence (J) ;
- répéter les étapes précédentes jusqu'à ce qu'un groupe ordonné d'ébauches soit formé dans ledit espace de collecte (S).

12. Procédé selon la revendication 11, dans lequel ledit déplacement dudit au moins un support (151, 1511, 15III, 15IV) est un déplacement continu, de préférence à vitesse constante, qui est exécuté sans interruptions pendant que les ébauches (w1, w2) individuelles sont reçues dans ledit espace de collecte (S) pour former ledit groupe ordonné donné d'ébauches (w1, w2, W).

13. Machine (100) pour traiter des ébauches d'enveloppes d'articles à fumer, comprenant :

- une unité (104) pour traiter des ébauches (w1, w2) d'enveloppes d'articles à fumer ;
- au moins un tambour (101, 103) pour alimenter, successivement, une ébauche à la fois, ladite unité de traitement (104) ;
- un dispositif (10) selon l'une quelconque des revendications 1 à 10, qui est positionné en aval de ladite unité de traitement (104), pour regrouper, dans un groupe ordonné, les ébauches (w1, w2, W) qui ont été traitées par ladite unité de traitement (104) ;
- un chariot (111) pour prélever dans ledit dispositif (10) le groupe ordonné d'ébauches traitées et transporter ledit groupe d'ébauches traitées vers une machine d'emballage.

14. Machine (100) selon la revendication 13, dans laquelle ladite structure (12) dudit dispositif (10) est mobile entre une position (P1) de chargement desdites ébauches et une position (P2) de distribution dudit groupe d'ébauches formé dans ledit espace de collecte (S), et dans laquelle ledit chariot (111) est configuré pour prélever ledit groupe d'ébauches lorsque la structure (12) dudit dispositif (10) est dans ladite position de distribution (P2).

FIG. 1

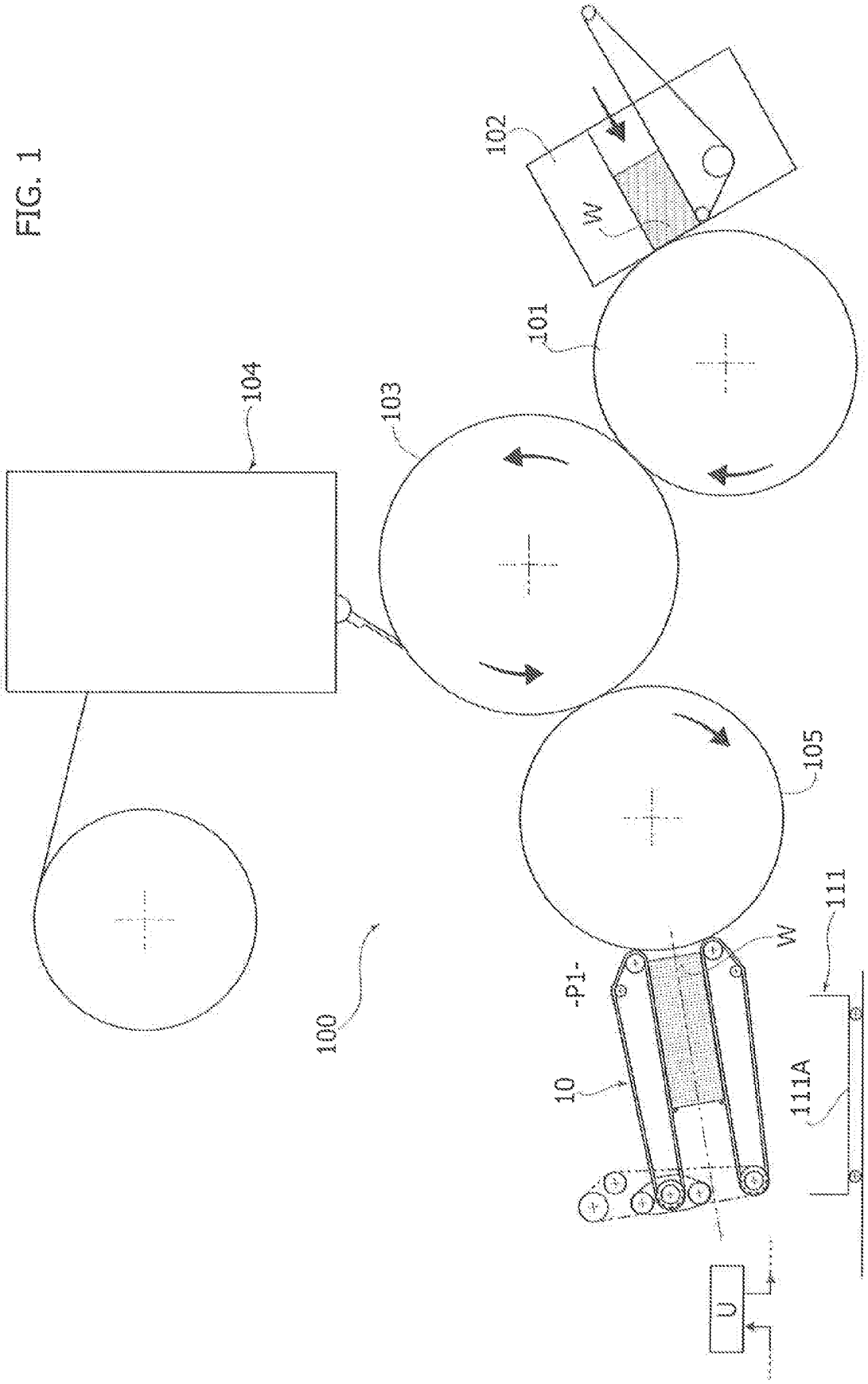


FIG. 2

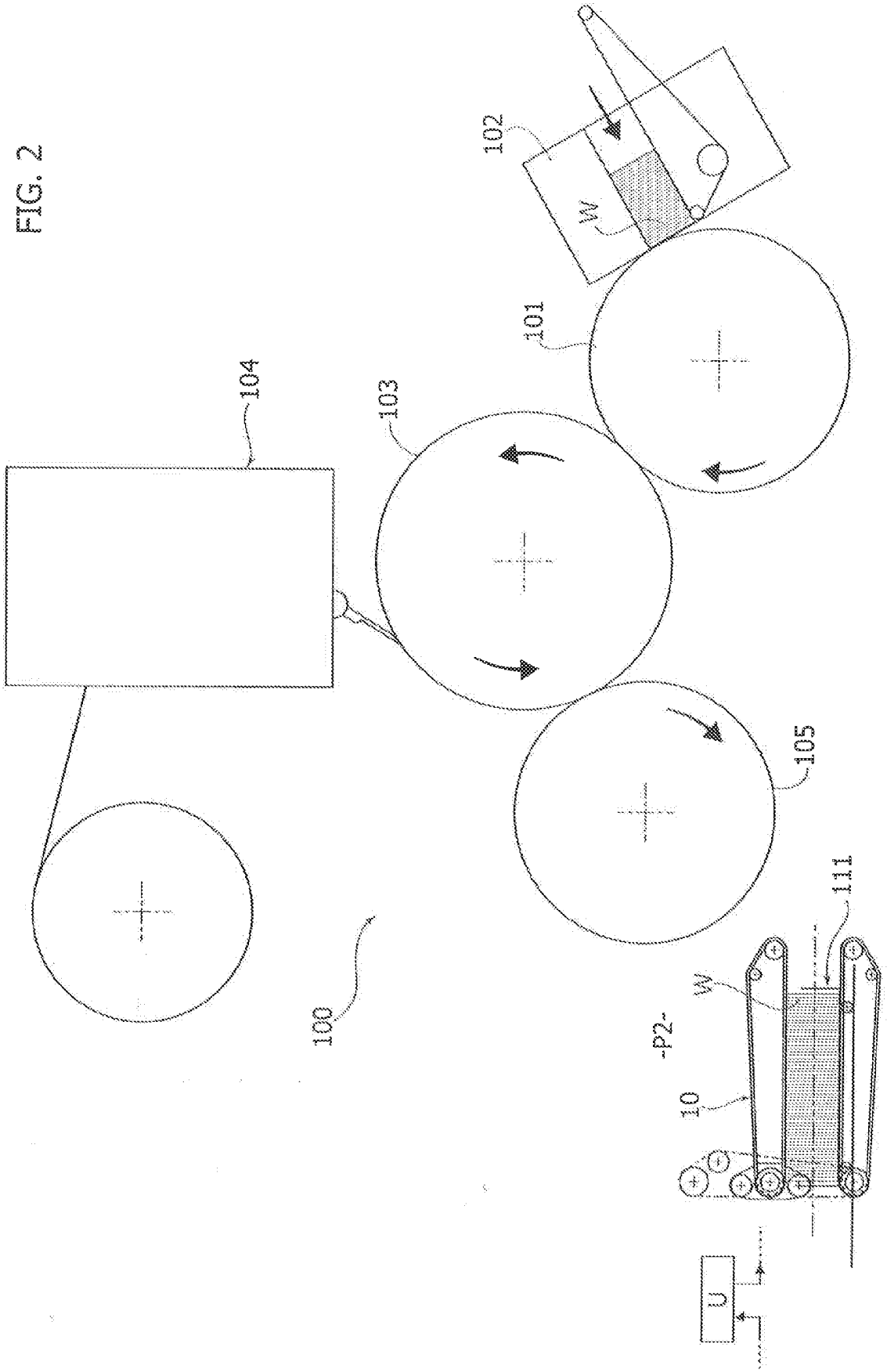


FIG. 3

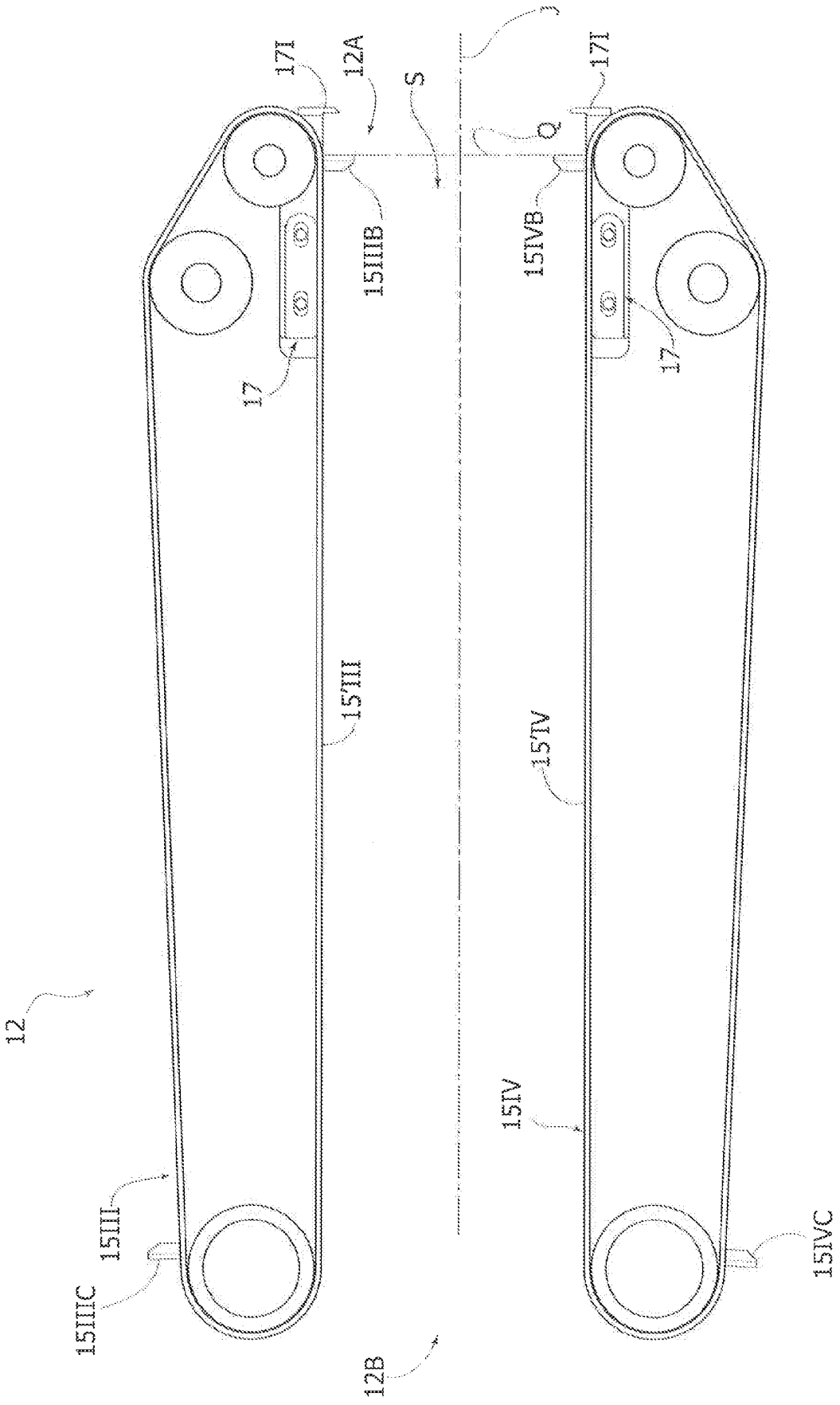

12
12A
12B
17I
17I
S
Q
15IIIB
15IVB
17
17
15'III
15'IV
15III
15IIIC
15IV
15IVC

FIG. 4

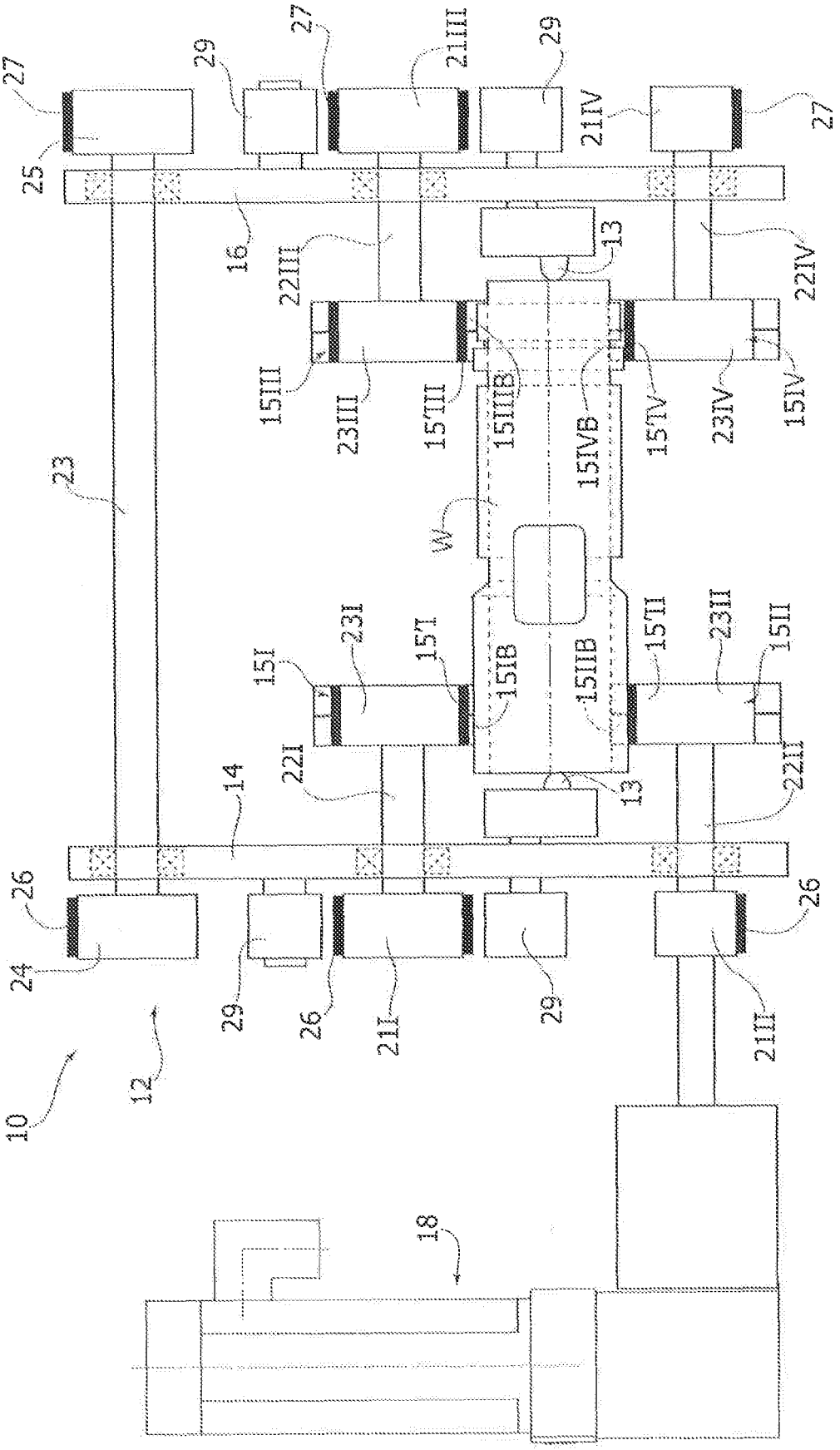

10
12
14
16
18
21I
21II
21III
21IV
22I
22II
22III
22IV
23I
23II
23III
23IV
24
25
26
27
29
13
15I
15II
15III
15IV
15'I
15'II
15'III
15'IV
15IB
15IIB
15IVB
W

FIG. 5B

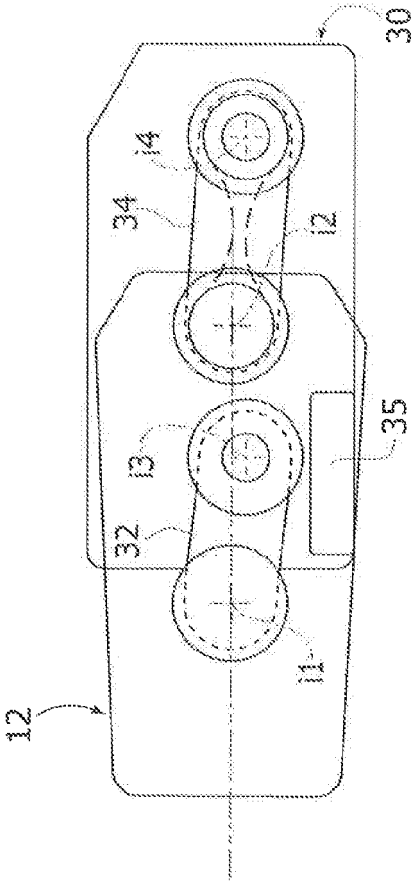


FIG. 5A

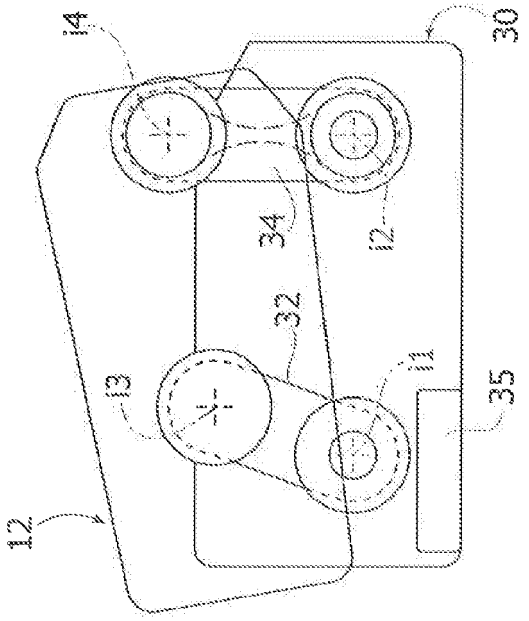


FIG. 6A

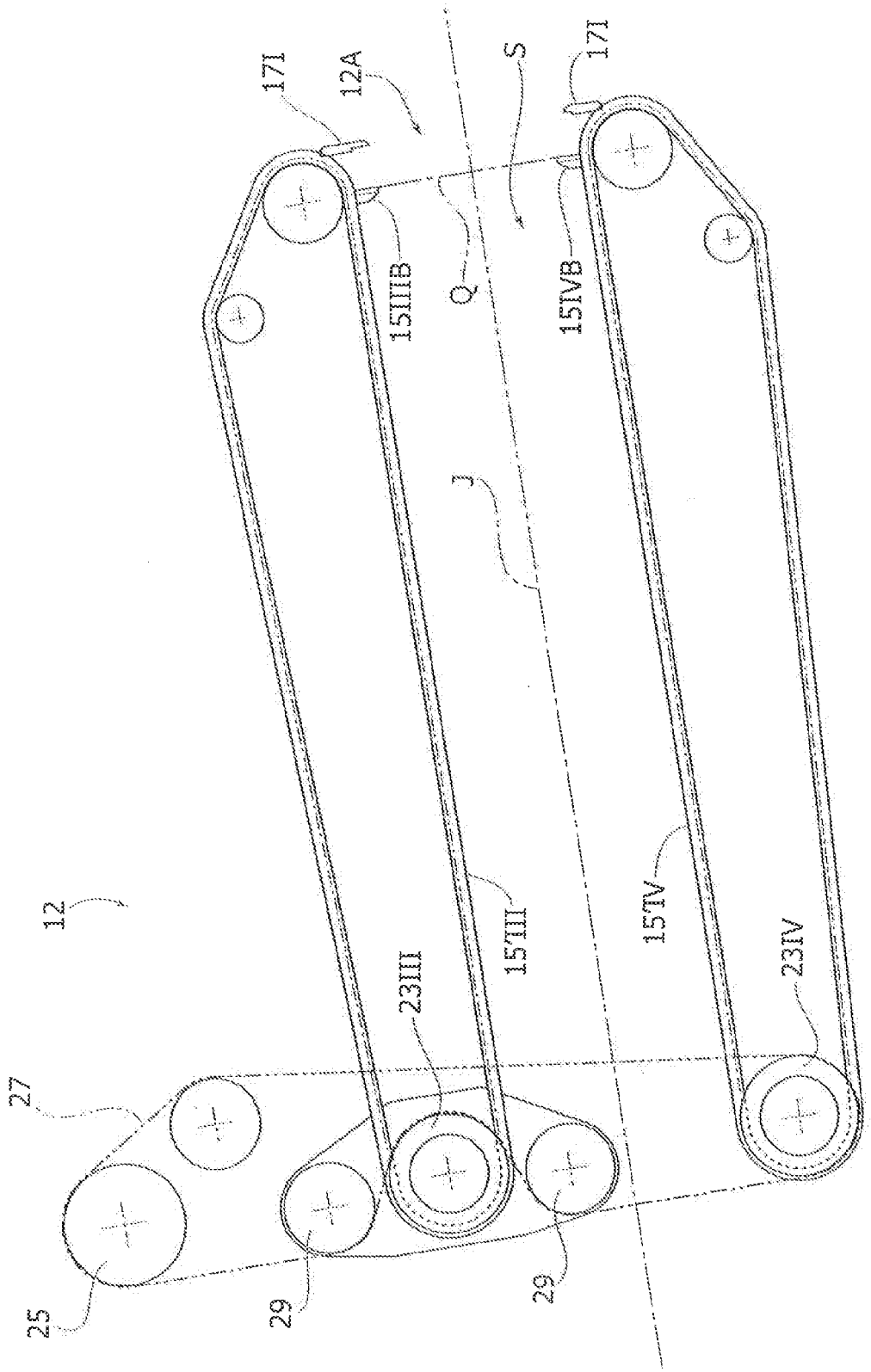

12
17I
12A
S
17I
15IIIB
Q
15IVB
J
15'III
15'IV
23III
23IV
27
25
29
29

FIG. 6B

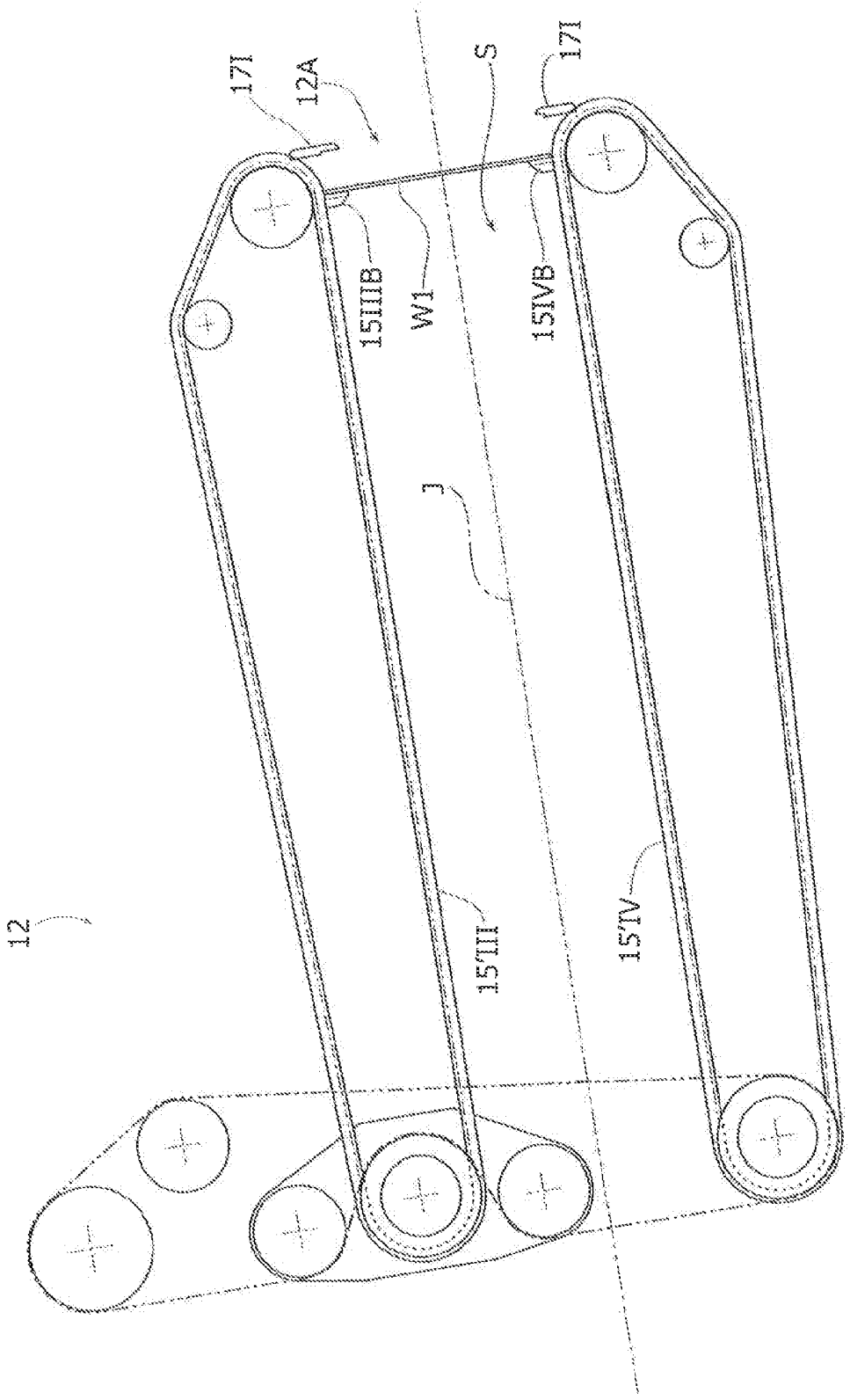


FIG. 6C

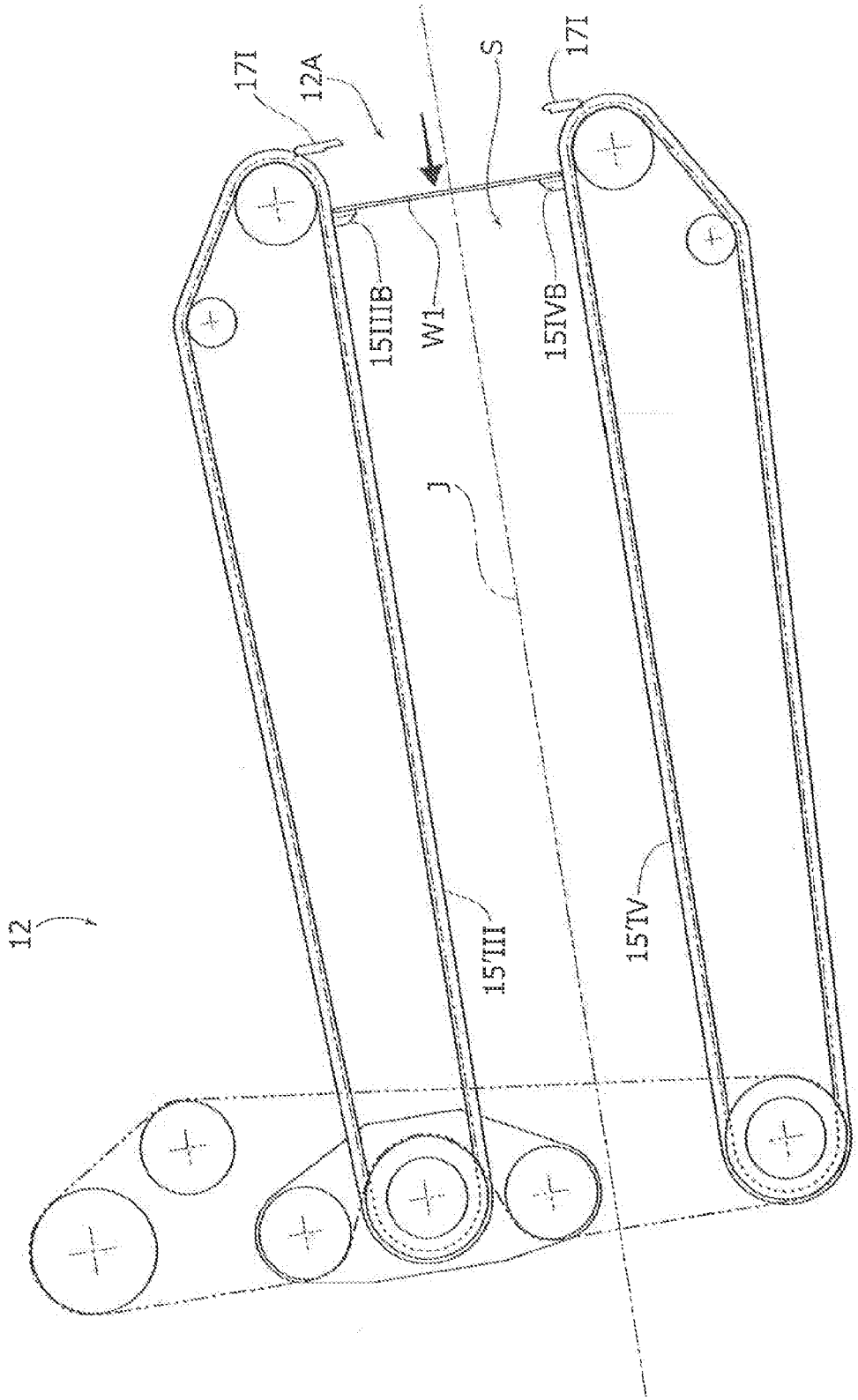


FIG. 6D

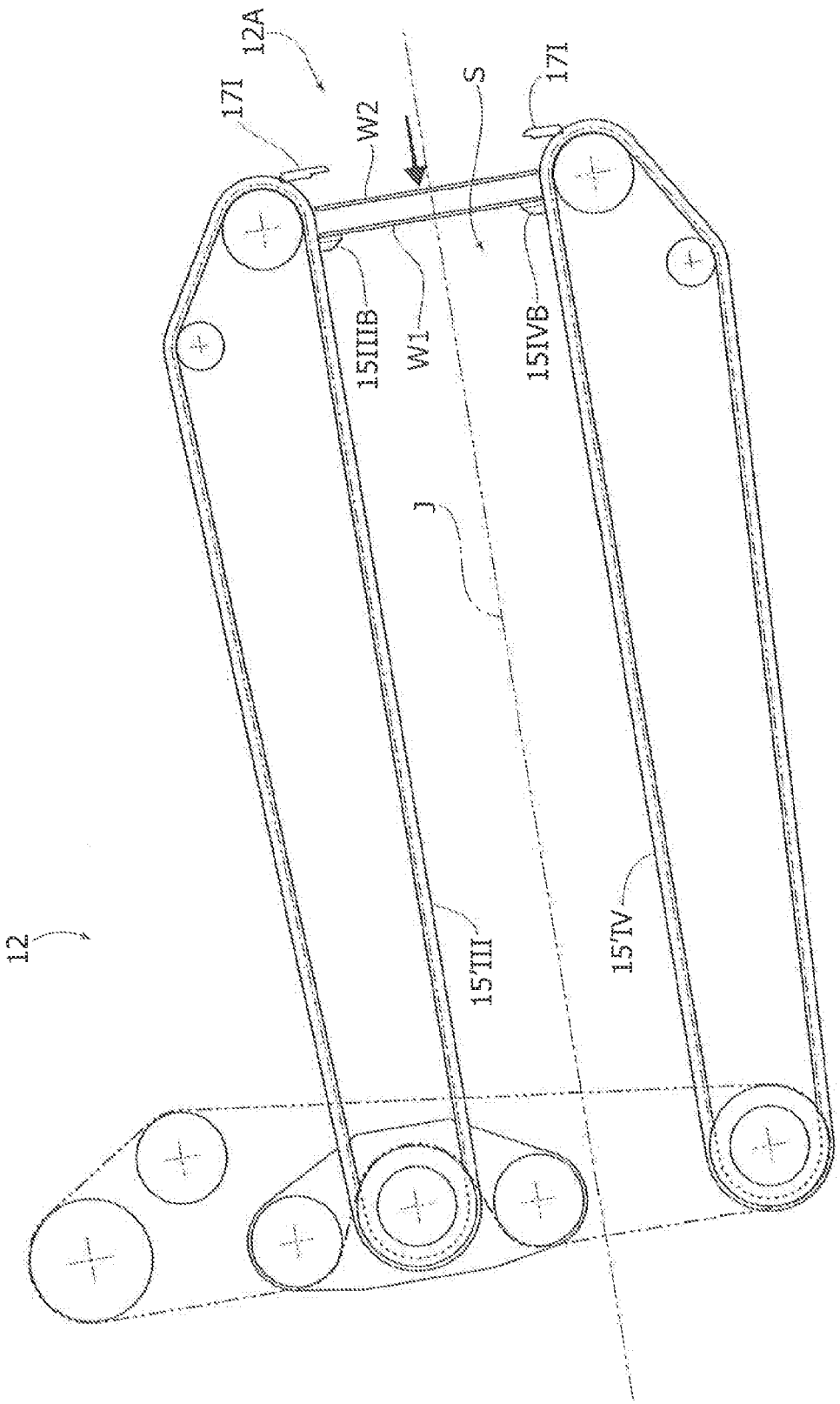
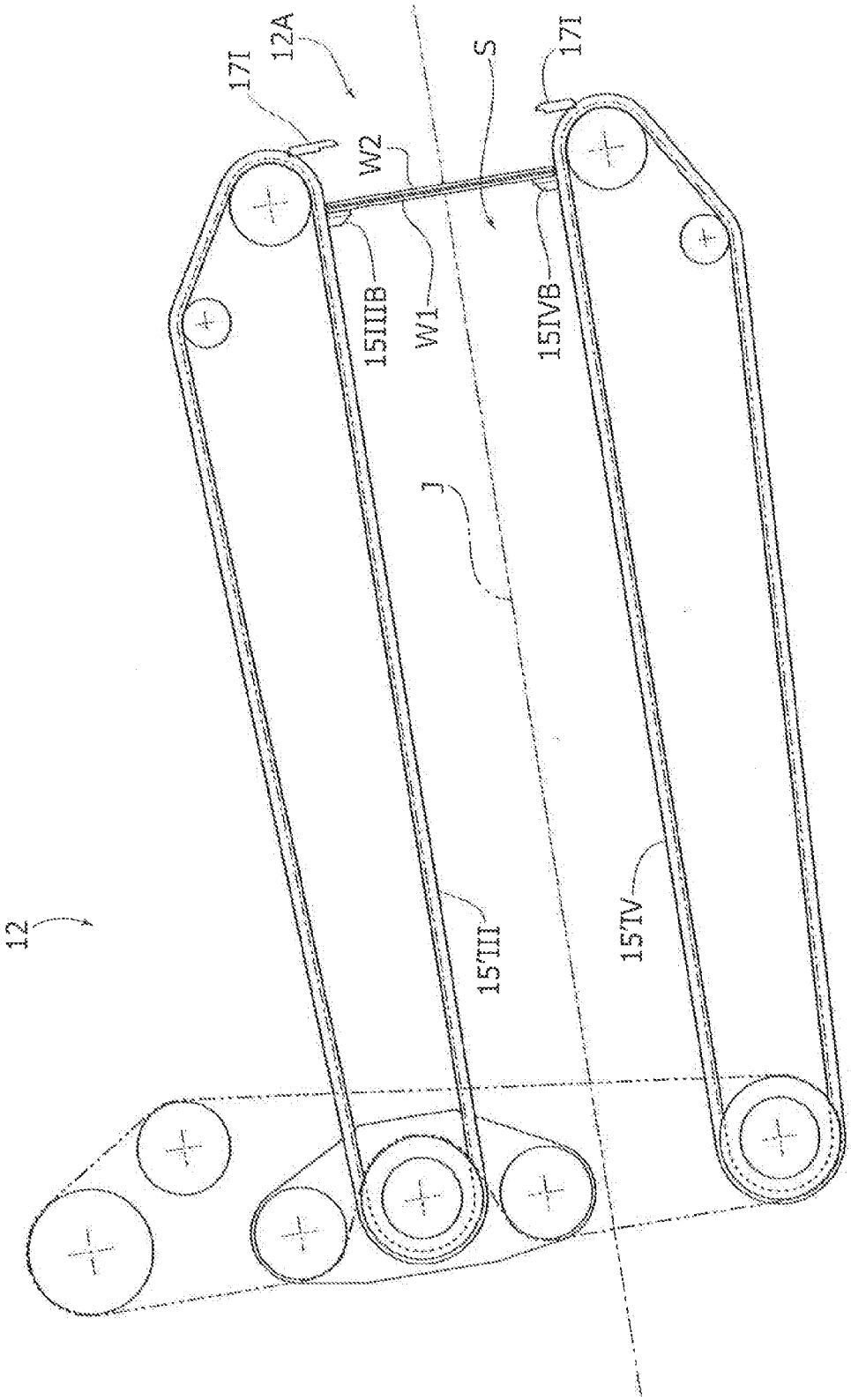


FIG. 6E



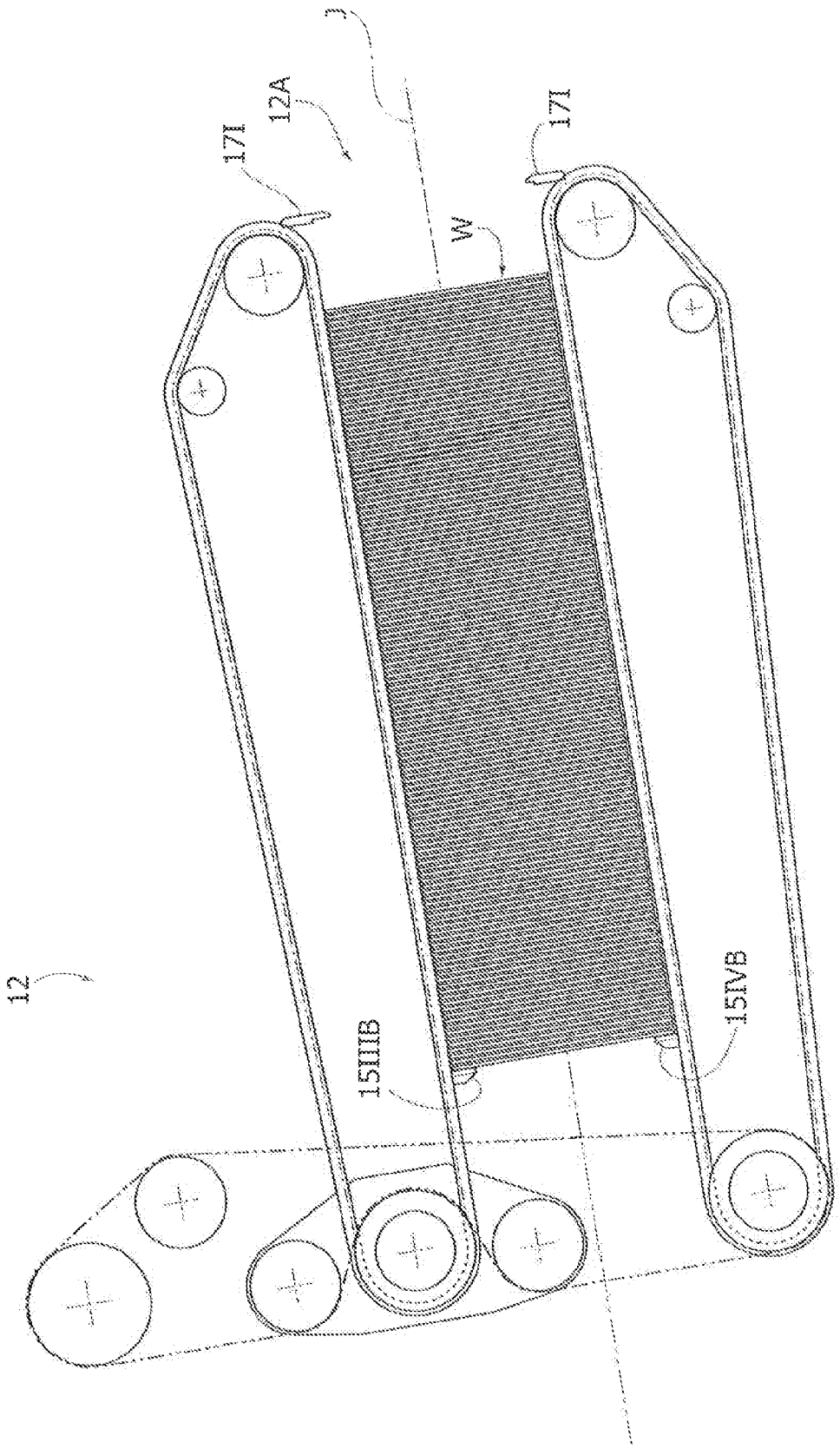
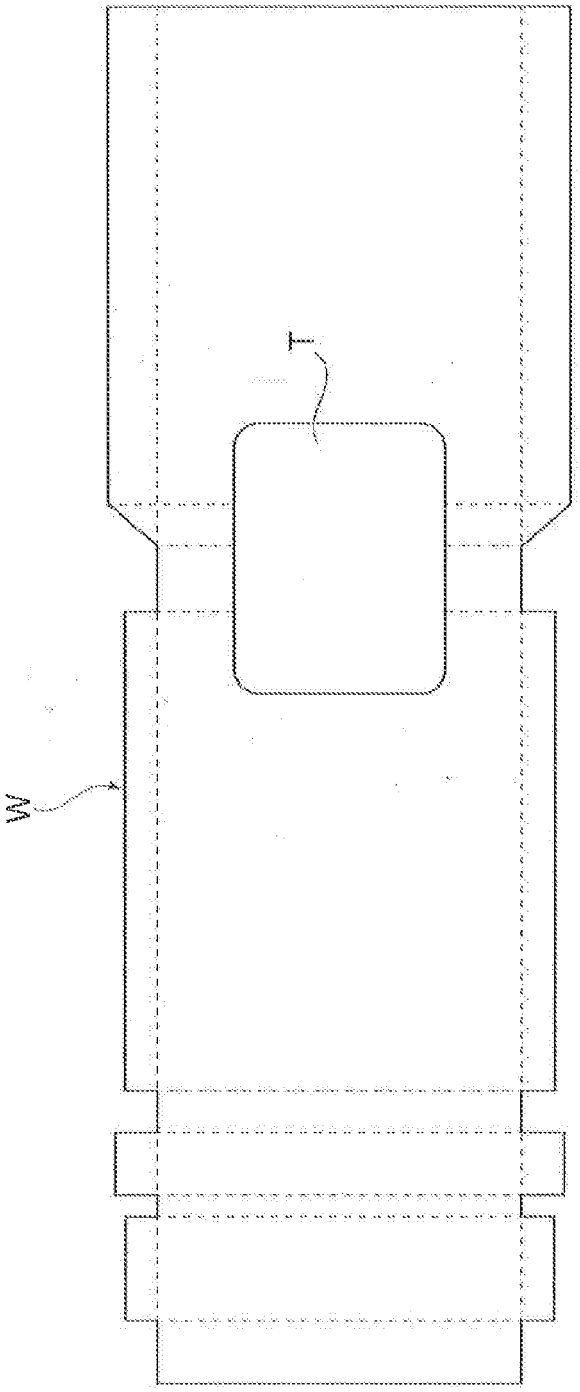


FIG. 6F

FIG. 7



REFERENCES CITED IN THE DESCRIPTION

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