(19) DANMARK

(10) DK/EP 3006352 T3

(12) Oversættelse af europæisk patentskrift

Patent- og Varemærkestyrelsen

(51) Int.Cl.: *B 65 B 21/06 (2006.01)* *B 65 B 17/02 (2006.01)* *B 65 B 35/46 (2006.01)* *B 65 B 35/58 (2006.01)* *B 65 G 29/00 (2006.01)* *B 65 G 47/08 (2006.01)* *B 65 G 47/84 (2006.01)*

(45) Oversættelsen bekendtgjort den: **2017-03-06**

(80) Dato for Den Europæiske Patentmyndigheds bekendtgørelse om meddelelse af patentet: **2016-11-23**

(86) Europæisk ansøgning nr.: **15191455.3**

(86) Europæisk indleveringsdag: **2012-11-30**

(87) Den europæiske ansøgnings publiceringsdag: **2016-04-13**

(30) Prioritet: **2011-12-02 DE 102011119970** **2012-02-01 DE 102012100810**

(62) Stamansøgningsnr: **12805583.7**

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

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(54) Benævnelse: **Indretning til dannelse af emballageenheder (pakninger).**

(56) Fremdragne publikationer:
EP-A1- 1 495 973
EP-A2- 2 258 625
WO-A2-00/68087
US-A- 4 078 357

Device for forming packaging units

[0001] The invention relates to a device for producing cluster packs.

[0002] Containers in the meaning of the invention are, for example, bottles, cans, tubes, or pouches, in each case made of metal, glass, and/or plastic, such as, for example, PET bottles, or other packaging means, in particular such as are suitable for the filling of fluid or viscous products, but also containers which are already grouped together to form groups (multipacks). Such containers, e.g. PET bottles, comprise a contact region which is shaped as spherically cambered, such that the containers can roll around on a circumferential path, i.e. a "rolling ring", essentially next to one another. In the case of glass bottles, after multiple use of the bottle this can be identified, for example, by means of the wear ring which is recognisable by its emphatically lighter appearance. Such "roll rings" can, with PET bottles, be arranged not only in the head region but also in the foot region.

[0003] In detail, the production of a cluster pack takes place, for example, in such a way that the containers are conveyed on a transport plane of a transporter standing upright and with their container axis oriented in a vertical direction or essentially vertical axis, in a mass transport or a wide container stream, in which the containers exhibit a random orientation with regard to containers with particular features and/or equipment features. This wide container stream is turned into a plurality of single-track container flows by channel division. In further process steps, the dividing of the containers takes place, which form the later clusters or their container groups, out of the single-track container streams, the assembling of the necessary number of containers in each case to form a compact container group, in which the containers are in contact against one another with a plurality of casing or circumferential surfaces, i.e. with contact or touch surfaces, and the connecting of the containers of each container group to form the compact and firm and stable cluster.

[0004] The principle is known of assembling or forming a plurality of articles to produce an article group, and, from the article groups, making use of shrink films (e.g. US 7 726 464 A1) to produce firm and transportable storage and transport units or clusters. A disadvantage in this situation, among others, is that the films used, and in particular the shrinking on of the films by the application of heat or energy, incurs not inconsiderable costs.

[0005] It has already been proposed that transportable clusters be produced by way of the containers, formed in each case into a container group, being packed by a surrounding band engaging in loop fashion around the container group (DE 10 2009 025 824 A1, DE 10 2009 044 271 A1, DE 41 26 212 A1), i.e. being connected so as to form a cluster, which represents a particularly economical and simple possibility for producing clusters or transport and storage units. The banding can also be adhesively bonded to the containers. A disadvantage with banding, however, is that the first time a container is taken out of such a cluster the containers still remaining in the cluster are no longer held together by the banding. This applies not only when the banding is separated or cut, but also if it is possible for a container to be taken out of the cluster without severing the banding.

[0006] Furthermore, with the transport of such clusters on a belt conveyor means, the risk always exists that cylindrical or largely cylindrical articles, such as cans, bottles, or containers may adopt a nesting position due to vibration, impacts, etc., i.e. slip into the gap of the adjacent row. In order to prevent this, with known clusters a very great tension must be applied onto the banding.

[0007] By contrast, DE 10 2006 037 105 A1 is concerned with a method for assembling bottle packages with which a rotary star is provided on both sides of a track, which presses the bottle necks held in clamps into flat carriers. The bottle package is also surrounded by a band or encasing (film).

[0008] According to DE 23 31 193, an adhesive agent is applied to containers on narrow surface areas or rows, wherein, in each case, adjacent surface areas which are not provided with adhesive are intended to allow for the gripping of the packaging for the purpose of carrying. EP 2 096 039 A1 likewise discloses the provision of containers with an adhesive agent, wherein, however, a shrink film is additionally arranged around the bottle package. Disclosed in DE 10 2008 038 146 A1 is a shaft drive system which comprises a coaxial direct drive containing the motor, in which the rotor of the motor is secured directly on the shaft, and the stator is fixed such as to surround the shaft and the rotor on the outside. EP 1 647 518 B1, which reverts to the present Applicants, discloses a closure machine which comprises a fixed-position central column which is configured to be free of elements for mechanical force transfer, and in consequence contains only lines or leads.

[0009] The object of the invention is to provide a device and a method for producing clusters of the type referred to in the preamble, with which, despite doing without a surrounding film and/or despite doing without a banding, the possibility is always avoided, in a simple manner, of the articles moving into a nesting position during transport, wherein, even after the removal of one or more articles from a cluster, the cohesion of the remaining articles in the cluster is maintained or can be re-established.

[0010] To solve this object, a device for producing clusters in accordance with claim 1 is provided, wherein a transport system is provided for each of the container streams, wherein a linear drive of the respective transport system comprises a plurality of foot-side guide elements and/or head elements for containers, and wherein, immediately downstream of the linear drive or an outlet device, a separating and/or compacting unit or a separating or compacting segment is provided for the grouping and compacting and temporary pressing together of a predetermined number of containers, by means of which the containers are assembled downstream of the star transporter to form a cluster and are transported further. It is purposeful if the respective main star of the respective star transporter comprises both a plurality of foot-side guide elements as well as a plurality of head guide elements for the containers.

[0011] Containers in the meaning of the invention are, for example, PET bottles, i.e. among others bottles, cans, tubes, pouches, in each case of metal, glass, and/or plastic, but also other packaging means, in particular such as are suitable for the filling of fluid or viscous products, but also containers which have already been assembled to form groups (multipacks). The containers of the cluster are arranged in non-nesting positions.

[0012] "Adherent or adhesive agents" in the meaning of the invention are, among others, all materials or compounds with which an adhesive connection is possible between containers, in particular connections, materials, or compounds which, when applied in a fluid or viscous state, form a self-adhering layer, and/or under the application of pressure and/or by the application of energy and/or after hardening or cross-linking (also by the application of energy), create an adhesive connection. "Adhering or adhesive agents" in the meaning of the invention are, among others, also multilayer materials, e.g. such as are of at least one carrier material, which is coated with a material with which an adhesive connection be-

tween containers is possible, i.e. which are adhesion and/or adhesively active on at least two sides. Such adhering or adhesive agents can be designated as pads. An "adhering" container in the meaning of the invention comprises adhering or adhesive agents, or is provided with an adhering or adhesive agent application. The adhering or adhesive agent is preferably selected in such a way that the containers can be detached by hand and in a non-destructive manner from the cluster, or can be separated from one another. It is conceivable that fluid adhesive agent is applied from the application elements. It is possible for a low viscosity UV-hardening adhesive to be applied. Also suitable would be a hot glue, although this cools very rapidly, and therefore could surrender its adhesive properties before the containers of the cluster are adequately adhesively bonded to one another. A UV-hardening adhesive is also advantageous in respect of the particularly easy adjustment of its desired properties. A corresponding hardening station or hardening segment is provided in a suitable manner downstream of the application elements, stationary or along the linear transporter, above it or, as appropriate, also beneath it. The hardening station is preferably arranged downstream of the star transporter, preferably at the linear transporter.

[0013] It is purposeful if the star transporter comprises the main star, an inlet device, and the outlet device. The inlet device can be configured as an inlet star, wherein the outlet device can be configured as an outlet star. The inlet device causes an adjustment of the incoming container stream to the dividing effect of the main star, such that the respective containers can be transferred with no problem to the main star. With the outlet device, the containers can be transported further at a predetermined interval spacing.

[0014] It is purposeful if the foot-side elements are configured as rotary plates, wherein the head guide elements comprise, on the holding side, packing or centring tulips, or are configured as these. The respective container is in this way held essentially tensioned between the rotary plate and the packing or centring tulip, in a secure position. With the rotary plate and the head guide element, an additional rotation of the individual container can be effected, in addition to the rotation about the axis of the main star. This is advantageous in order to rotate the container, on its transport path about the axis of rotation of the main star, relative to the main star, such that, in the circumferential direction of the container, a plurality of contact and touch surfaces of the container can be provided with adherence or adhesive agent. In this situation it is also purposeful if a plurality of application elements are provided, which follow one another seen in the direction

of rotation of the main star. By means of the rotary plate the upright containers, in a still more favourable manner, can be aligned in accordance with specific container features and/or equipment features, for example in accordance with what are referred to as embossings, and can therefore be provided in a container-specific manner with adherence or adhesive agent in such a way that the containers of a cluster are taken up inside the cluster aligned precisely identically to one another.

[0015] In a preferred embodiment, provision can be made for two application elements to be arranged in each case above one another, wherein the following application element are likewise arranged above one another. Accordingly, in each case an application element can always provide a container region, i.e. a section of the contact or touch area, precisely with adherence or adhesive agent. Naturally, the application elements can be controlled, with a spray or injection application of adherence or adhesive agent, i.e. can be adjusted in its inclination relative to each spatial axis. The application elements can of course also be carried with the containers concerned over at least a part segment, although this is not absolutely necessary.

[0016] Connected directly downstream of the star transporter or the outlet device is a linear transporter, which functions, for example, as a separating or compacting segment, wherein the containers are assembled to form clusters and are transported onwards, and wherein static and/or movable guide elements can be provided in each case on the side of the linear transporter, and wherein driving elements can be provided, which in each case are allocated to a cluster.

[0017] The guide elements can also be designated as rails, which guide and support the clusters, or the containers of the cluster respectively, between them. It is conceivable for the guide elements to be configured as rigid. It is also possible, however, for the guide elements to be configured so as to move with the containers, such that the containers or clusters respectively do not exhibit any relative speed in relation to the laterally arranged guide elements. With the laterally arranged guide elements, a lateral pressure can be exerted, which is purposeful with regard to an adhesive connection of the containers of the cluster. In other words, the guide elements not only have the function of guiding and supporting, but also the function of creating a force which takes effect on the containers, which compacts the containers of the cluster transversely seen in the transport direction, or brings them into close proximity with one another, and presses or

compacts them against one another, in order thereby to be able to achieve an adequate adhesive connection.

[0018] In a preferred embodiment, the driver elements are arranged transverse to the transport direction, and engage completely over the linear transporter, wherein the driver elements, seen in the transport direction, are arranged behind the cluster, such that the carrier elements essentially push the clusters in front of them. As a result of this, a force is advantageously created which supports a connection of the containers to one another, seen in or against the transport direction, or supports a compaction. In order to improve the composite arrangement of the containers of the bundle towards one other, not only transverse to the transport direction but also seen in the transport direction, the driver elements, seen in the transport direction, can apply a relative speed to the containers or to the cluster, taking effect in relation to the transporter. If the conveying speed of the driver element(s) is greater than the conveying speed of the linear transporter, this has the effect of pushing or sliding the containers or the cluster from the intake side in the direction towards the outlet side. It can be seen that the pushing force can perceptibly increase the adherence of the composite. In a preferred embodiment, the driver elements can be configured as a bar, i.e. a driver bar. Furthermore, the driver elements can be self-driven, and/or be in connection with the guide elements. In this respect, the guide elements can, in addition to the functions already referred to, essentially also take on the guide function for the driver elements. If the guide elements are driven, i.e. provided such as to be circulating, then it is entirely within the sense of the invention for the driver elements to be secured rigidly to the guide elements, wherein the relative speed referred to heretofore could be produced by the guide element drive. The guide elements can also be adjustable, seen in the transverse direction, such that the device can also be adjusted to different container dimensions. The conveying speed of the linear transporter, the guide elements, and/or the driving elements can be individually adjusted, for which purpose recourse can be made to suitable control centres or central control units of an overall system.

[0019] It is further possible for the cluster to be provided with a carrying element, for example a handle, for which suitable devices can be provided, and which is arranged downstream on the outlet side or at a suitable location at the linear transporter. The carrying element can of course be secured to the cluster with the adherence or adhesion agent referred to heretofore.

[0020] With the invention, therefore, a device is provided for producing a cluster, which, despite doing without an encasing film and/or despite doing without a banding, nevertheless avoids, in a simple manner, the containers moving during transport into a nesting position, wherein, even after the removal of one or more containers from a cluster, the cohesion of the remaining containers in the cluster is maintained or can be restored. Due to the absence of a film or a circulating band (filmless bottle pack), the environmental burden is eased by the avoidance of waste, and resources are also saved for otherwise manufacturing the films or bands, which are mostly made of plastic. During transport, i.e. in continuous operation of the device for producing clusters or of the packing machine, the containers of a cluster are adhesively bonded directly to one another. In addition to this, a filmless bottle pack can be achieved with minimal adhesive application, which exhibits adequate connection of the individual containers to one another.

[0021] As already indicated heretofore, the containers can be aligned, for example in accordance with design features. It is possible for the alignment function to be transferred onto a separate alignment star, which is arranged upstream of the main star. The container streams can be conveyed to the alignment star via an inlet star, wherein the inlet star corresponds to that referred to heretofore. Preferably arranged between the outlet star and the main star is a transfer star, which in a preferred embodiment can exhibit the dimensions of the inlet star and/or the outlet star referred to heretofore. Arranged at the outlet star are recognition systems, such as camera systems, which detect the actual current position of, for examples, labels and/or embossings and/or other features. The actual data is conveyed to an evaluation unit, in which a comparison with stored reference data is carried out, such that head-side or foot-side guide elements, such as packing tulips or rotary plates, can cause a corresponding movement of the container concerned into the desired reference position. Such a device is known, for example, with labelling machines, with which bottles, for example, are aligned in such a way that labels are applied to the bottles with the same orientation. Purposefully, the situation can be achieved with the alignment and the alignment star respectively that the containers with labels and/or other design features are taken up with the same orientation in the future cluster, since the containers are moved in the alignment star into the respective reference position, wherein the container aligned into the individual reference position are subsequently treated in the main star as described. The container aligned into the reference position remains in this position along its transport path.

[0022] Naturally, containers with different dimensions or formats can be treated. If a change of format is imminent, the operational parameters and operational components must be adjusted to the new container format. For example, inlet stars, transfer stars, and/or outlet stars may be exchanged, wherein, with the invention, provision is purposefully made for the outlet star and/or the main star to be configured with adjustable main axes, such that the alignment star and/or the main star can remain with their components in the treatment system despite the format change. The main axes of the main star and/or of the alignment star are preferably capable of being superimposed along the transport direction and transverse to it, adjustable to the new container format. The head-side and/or foot-side guide elements are preferably configured so as to be universally usable.

[0023] It is also purposeful in the meaning of the invention if the star transporter and its components respectively, preferably the main star and/or the alignment star, are configured with an upright column, integrated into which is a drive element. The drive element is preferably configured as a controllable electric motor. The upright column can of course, as already mentioned, be movable along the adjustment axes, in order, for example, to be adjusted to match a format change. Instead of a linear conveyance, the containers can also be conveyed by means of a transport star for every conveyor stream.

[0024] Further embodiments, advantages, and possible applications of the invention are derived from the following description of exemplary embodiments and from the figures. In this context, all the features described and/or graphically represented are in principle the object of the invention, alone or in any desired combination, regardless of their combination in the claims or reference to them. The contents of the claims are also constituent parts of the description.

[0025] The invention is described in greater detail hereinafter on the basis of the figures in relation to an exemplary embodiment. The figures show:

Fig. 1 a part section of a device for producing a cluster with six articles or containers, in a perspective view,

Fig. 2 the part section from Figure 1 in a view from above,

Fig. 3 the part section from Figure 1 in a side view,

Fig. 4 an exemplary embodiment of a separating or compacting segment in the exemplary embodiment as a linear transporter,

Fig. 5 the part section from Figure 1 in a view from above, with an upstream alignment star and a connecting separating or compacting segment,

Fig. 6 the part section from Figure 5 in a side view,

Fig. 7 the part section from Figure 5 in a frontal view from the inlet side,

Fig. 8 schematic representation of a device for cluster production as an electromagnetic linear endless transporter, and in

Fig. 9 this device in a perspective representation.

The devices from Figures 1-3 and 5-7 are not parts of the invention.

[0026] In the different figures, the same parts are always provided with the same reference numbers, as a result of which these are, as a rule, only described once.

[0027] Figure 1 shows a part section of a device 1 for producing clusters 2 from the containers 3, or of a packing machine 1, wherein primarily, from a wide container stream, the containers 3 are turned into a plurality of container flows, as represented, by way of example, into two single-track container flows 4.1 and 4.2, in which the containers 3 exhibit, for example, their container features and/or equipment features exhibit a random orientation.

[0028] In each case, a star transporter 5 or 5.1 and 5.2 respectively is provided for each of the container flows 4.1 and 4.2, wherein the respective star transporter 5 comprises a plurality of foot-side guide elements 6 and head guide elements 7 for the containers 3, wherein the application elements 8 are arranged at the star transporter or, respectively, at its main star 12 or 12.1 and 12.2 respectively, wherein the containers 3 are assembled downstream of the star transporter 5 to form the cluster 2.

[0029] The containers 3 are transported from an inlet side 9 in the direction towards an outlet side 10 (axial transport direction 14), wherein the application elements 8 are provided at the star transporter 5 for the application of adhesion or adhesive agents, and wherein the containers 3 are assembled downstream of the star transporter 5 to form the cluster pack 2 and then transported in the direction to the outlet side 10.

[0030] Figure 1 shows that each star transporter 5 or 5.1 and 5.2 respectively comprises an inlet device 11 or 11.1 and 11.2 respectively, the main star 12 or 12.1 and 12.2 respectively, and an outlet device 13 or 13.1 and 13.2 respectively for the respective container track 4.1 and 4.2. The inlet device 11 is configured as an inlet star, wherein the outlet device 13 is configured as an outlet star. Since for each container track 4.1 and 4.2 a star transporter 5 is provided in each case, these, or their components, are provided in the figures with the supplementary number .1 and 2 respectively, in order to illustrate clearly the allocation to the respective container track 4.1 and 4.2. The respective components are naturally identical in each case.

[0031] By way of example, the foot-side guide elements 6 at the main star 12 are configured as rotary plates, wherein their head guide elements 7 comprise on the holding side packing or centring tulips, or are configured as such. The respective container 3 is therefore essentially held in a secure position between the rotary plate 6 and the packing tulip 7. Rotary plates and packing or centring tulips are known, for example, from labelling machines.

[0032] As can be seen in Figures 1 and 2, a plurality of application elements 8 are provided at the main star 12, which, seen in the direction of rotation (arrow 18) of the main star 12, follow one another. By means of the rotary plate 6, the upright containers can, in an even more favourable manner, be aligned in accordance with specific container features and/or equipment features, for example in accordance with what are referred to as embossings, and can therefore be provided in a container-specific manner with adherence or adhesive agent in such a way that the containers 3 of a cluster 2 are taken up inside the cluster 2 aligned precisely identically to one another. A rotation of the containers can, however, only be carried out in order for the container(s) 3, seen in the circumferential direction, to be provided at a plurality of contact and touch surface areas with adherence or adhesive agent. An alignment or rotation, for example in front of application elements 8 and/or between application elements 8 following in the direction of rotation 19, is indicated by the reference number 20 in Figure 2.

[0033] In a preferred embodiment, provision can be made for two application elements 8 to be arranged above one another in each case, wherein the following application elements 8 are likewise arranged above one another. In this way, in each case an application element 8 can always provide a container region, i.e. a section of the contact and touch surface area, with adherence and adhesive

agent. Naturally, the application elements 8 can, for example, be controlled with a spray or injection application of adherence and adhesive agent, i.e. can be adjusted in their inclination in respect of every spatial axis. The application elements 8 can of course also be carried with the containers 3 concerned over at least a part segment, although this is not absolutely necessary.

[0034] Arranged immediately downstream of the outlet device 13 or the two outlet stars 13.1 and 13.2 respectively is a linear transporter 15, which functions as a separating or compacting segment 22. The outlet device 13 or the two outlet stars 13.1 and 13.2 respectively assemble the adhering containers 3 and transfer the adhering containers 3 in pairs to the linear transporter 15, which in Figure 2 is represented by the reference number 19. In this situation, initially in each case two adhering containers 3 are pressed against each other by way of the contact and touching surface areas, wherein the linear transporter 15 can be configured in such a way that an assembling is effected of a plurality, for example of three, container pairs to form the cluster 2, which comprises six containers 3. For this purpose the linear transporter 15 can comprise driving elements 21, wherein, in addition, lateral guide elements 16 can be provided for, as can be seen in Figure 4.

[0035] The star transporter 5 or the outlet device 13 respectively is therefore located downstream of the linear transporter 15, wherein static and/or movable guide elements 16 can be provided in each case on the side of the linear transporter 15, and wherein driving elements 21 can be provided, which in each case are allocated to a cluster 2. The driving elements 21 can cause an assembling effect along the axial transport direction 14, i.e. cause the containers 3 to be pushed together to form a cluster 2. The guide elements 16 can exert a pressing force on the containers transverse to the transport direction 14, such that the adhering composite can also be favourably influenced in the transverse direction.

[0036] If a hardening station 17 is required, for example in the embodiment as a UV-hardening station for UV-hardening adhesive, then this is purposefully arranged at the linear transporter 15.

[0037] As already indicated, the alignment of the containers 3 in a reference position can take place along the transport path of the main star 12.1 and 12.2 respectively. With the exemplary embodiment shown in Figures 5 to 7, the alignment is carried out at an alignment star 23.1 and 23.2, which is located upstream

of the respective main star 12.1 and 12.2. The containers 3 of the container streams 4.1 and 4.2 are conveyed to the alignment star 23.1 or 23.2 respectively via the respective inlet star 11.1 and 11.2 respectively. Arranged at the respective alignment star 23.1 or 23.2 are in each case recognition systems 24.1 and 24.2 respectively, in the exemplary embodiment as a camera system. Arranged between the respective alignment star 23.1 and 23.2 respectively and the respective main star 12.1 and 12.2 respectively is in each case a transfer star 25.1 and 25.2 respectively, which in a further preferred embodiment can exhibit the dimensions of the inlet star 11.1 and 11.2 respectively and/or of the outlet star 13.1 and 13.2 respectively referred to heretofore. The exemplary camera systems 24.1 and 24.2 respectively detect the current actual position of, for example, labels and/or embossings and/or other features. The actual data is transferred to an evaluation unit, in which a comparison is made with stored reference data, such stored reference data is carried out, such that head-side or foot-side guide elements, such as packing tulips 7 or rotary plates 6, can cause a corresponding movement of the container 3 concerned into the desired reference position. The containers 3 aligned into the reference position remains in this position along its transport path. The cluster stream, in the further course of the separating and/or compacting segment, is divided into two parallel cluster streams, as can be seen by way of example in Figure 5.

[0038] With an improved embodiment of the device (Figs. 8, 9), the star transporters are replaced by endlessly circulating transport systems, which are configured as linear drives, with which circulating and electrically driveable slides are provided. In this situation, the container guide elements per container 3, such as the foot-side guide element 6 and/or the head guide elements 7, are arranged on such a carrier slide 27. In addition, the drives are advantageously provided on the carrier slides 27, for the rotation of the containers 3 about their vertical axis.

[0039] For particular preference, the linear drives 26 operate on the principle of an electromagnetic linear drive, such that each transport slide 27 can be driven, at least section by section, in the circumferential region of the linear drive 26, independently of other carrier slides 26.

[0040] In this situation the fixed-position part of the linear drive 26 forms a guide element for the moving carrier slides, wherein, in the movement direction or transport direction of the slides, a plurality of magnetic poles follow one another, with individually actuatable windings belonging to them, as well as permanent

magnets, which are provided at or in the transport slides 27. Such a linear drive is available on the market under the trade name "PackTrak" from Siemens AG, by way of example.

[0041] Figure 8 shows in sketch form such an arrangement of two electromagnetic linear drives, 26.1 and 26.2 for the one container row (upper in Figure 8) and linear drive 26.3 and 26.4 for the lower container row in Figure 8. The two container rows, by analogy with the examples described heretofore, enter in two rows and are taken up by the circulating linear drives 26.1 and 26.3 and their carrier slides 27 respectively. An inlet element or transfer element 29 which may also be provided is indicated as a circle. Naturally, the container conveying elements can also be arranged in the transport direction A in such a way that they run in flush to the straight length or tangentially to the inversion of the linear drive 26.

[0042] The carrier slides 27, shown only schematically, carry the containers 3. The detection of the position and angle of rotation, and the alignment and treatment of the containers 3 takes place by analogy with the foregoing examples and embodiments, in particular in accordance with Figures 1 to 7.

[0043] Identified by the reference numbers 27a and 28a are carrier slides which are located on the return segment in order to take up a container 3 again, or to take effect on it. The drives for the rotational movement of the containers 3, as well as for the treatment stations and other devices described heretofore are for this reason not represented or described, since an analogous arrangement and positioning is to be selected.

[0044] The special feature of the solution shown here comprises of the fact that the rear linear drives 26.2 and 26.4 and their carrier slides 28 (only three are schematically represented) can be put into effect in such a way that the containers 3 in the region of the inlet (transition from, for example 26.1 to 26.2) are still held at a distance interval from one another, in order to avoid them coming close to one another prematurely, and unwanted adhesion. The desired container groups (in this case, for example, six containers of two rows of three containers each) are formed in the region of the straight section, which represents a separating and/or compacting segment 2, in that the containers 3 or part groups of containers are speeded up or slowed down relative to one another in a more suitable manner.

[0045] For example, two adjacent containers can first of all be brought in contact at the adhesion points, transverse to the transport direction (if appropriate, after prior detection and alignment of the adhesion and adhesive points), and these connected container part groups are then speeded up or slowed down in a suitable manner, so as to achieve the desired compaction and compressing with adjacent container groups in the transport direction. In this situation the containers are ideally held secure against rotation for as long as required until adequate hardening and/or drying is assured.

[0046] The clusters or container groups formed in this way can finally be discharged on a linear transporter 15.

[0047] In the example shown in Figures 8 and 9, the container is transported only in the region of the linear drive 26.1 and 26.3 respectively by the carrier slides 27, mounted such as to be capable of rotation. After the handover or transfer into the engagement range of the rear linear drives 26.2 and 26.4, the containers are ideally only still held secure against rotation, since, with a knowledge of the angular position of the adhesion and adhesive points, no rotation of the containers 3 about the vertical axis is necessary any longer, nor is it desirable. In this situation, a carrying gripper conveyance of the containers 3 is advantageous, or a sliding transport on a base surface suitable for this purpose, ideally a metallic substrate.

[0048] An improved embodiment of the linear drive 26 and its transport slide 28 respectively including the gripping and holding means, with which the containers 3 are fixed, being displaceable transverse to main transport direction A and being driveable. This improves the adherence of adjacent containers 3, since any rotation movement is thereby avoided.

[0049] The unit can naturally also be assembled in such a way that only the main star according to the examples from Figures 1 to 5, or only the outlet star, in the manner referred to heretofore as a linear transporter, in particular an electromagnetically driven linear transporter, are configured with independently controllable and driveable slides.

Reference number list

1	Device for producing clusters/packing machine
2	Cluster
3	Containers
4	Container track (4.1 and 4.2)
5	Star transporter
6	Foot-side guide element
7	Head guide element
8	Outlet element
9	Inlet element
10	Outlet side
11	Inlet device
12	Main star
13	Outlet device
14	Axial transport direction
15	Linear transporter
16	Guide elements
17	Hardening station
18	Direction of direction of 12
19	Assembly of 3 from 13 on 15
20	Rotation of 3
21	Driver elements
22	Separating and/or compacting unit/segment
23	Alignment star
24	Detection system
25	Transfer star
26	Linear drive (electrical)
27	Carrier slide
28	Carrier slide
29	Inlet element

PATENTKRAV

1. Indretning til fremstilling af pakninger (2), omfattende en én- eller flere-banet beholdertilførsel eller en én- eller flere-banet beholderstrøm, i det mindste et endeløst omløbende transportsystem med i det mindste et tilførselselement i transportsystemets område, ved hjælp af hvilket i det mindste et hæfte- eller klæbemiddel og/eller i det mindste en hæfte- eller klæbemiddelbelægning kan påføres på eller til beholderen (3), hvorved der er tilvejebragt et endeløst omløbende transportsystem for hver af beholderstrømmene, hvorved der i transportsystemet er tilvejebragt lineardrev (26.1, 26.3) med elektrisk drevne bæreslæder, navnlig elektromagnetiske lineardrev (26.1, 26.3), ved hvilke bæreslæderne (27, 27a) drives uafhængigt af hinanden og med hensyn til hastighed kan styres, hvorved det respektive lineardrev (26.1, 26.3) i det respektive transportsystem omfatter et antal fod-side-føringer og/eller hoved-føringer for beholdere (3), og hvorved der umiddelbart nedstrøms for lineardrevet (26.1, 26.3) eller en udføringsanordning er tilvejebragt en adskillelses- og/eller sammentrængningsstrækning (22) til gruppering og sammentrængning, såvel som midlertidig sammenpresning af et forudbestemt antal beholdere (3), ved hjælp af hvilken beholderne (3) nedstrøms i transportsystemet sammenfattes til pakninger og videretransporteres.

2. Indretning ifølge krav 1,
k e n d e t e g n e t v e d , at fod-side-føringerne og hoved-side-føringerne er tilvejebragt på de elektrisk drevne bæreslæder (27, 27a).

3. Indretning ifølge krav 1 eller krav 2,
k e n d e t e g n e t v e d , at der på bæreslæderne (27, 28) er tilvejebragt midler til at gribe om beholderne (3).

4. Indretning ifølge et hvilket som helst af de foregående krav,
k e n d e t e g n e t v e d , at der på bæreslæderne (27, 27a) på det i transportretningen første lineardrev (26.1, 26.2) er tilvejebragt midler til at gribe om beholderne (3) såvel som motordrev til at rotere grebne beholdere.

5. Indretning ifølge et hvilket som helst af de foregående krav,
k e n d e t e g n e t v e d , at der nedstrøms i transportsystemet er placeret en lineartransportør (15), der fungerer som en adskillelses- og/eller

sammentrængningsstrækning (22), og på hvilken beholderne (3) sammentrænges til pakninger (2) og videretransporteres.

6. Indretning ifølge et hvilket som helst af de foregående krav, **kendetegnet ved**, at fod-side-føringerne er udført som drejetallerkener, hvorved hoved-side-føringerne omfatter en emballerings- og centreringstulipan eller er udformet som sådanne.

7. Indretning ifølge et hvilket som helst af de foregående krav, **kendetegnet ved**, at respektive, i det mindste to, påføringselementer er placeret oven over hinanden.

8. Indretning ifølge et hvilket som helst af de foregående krav, **kendetegnet ved**, at der nedstrøms for det respektive lineardrev (26.1, 26.3) er koblet respektive lineardrev (26.2, 26.4), hvorved de nedstrøms koblede lineardrev (26.2, 26.4) er forsynet med elektrisk drevne bæreslæder (28, 28a), navnlig elektromagnetiske lineardrev (26.2, 26.4), ved hjælp af hvilke bæreslæderne (28, 28a) uafhængigt af hinanden kan drives og hastighedsstyres.

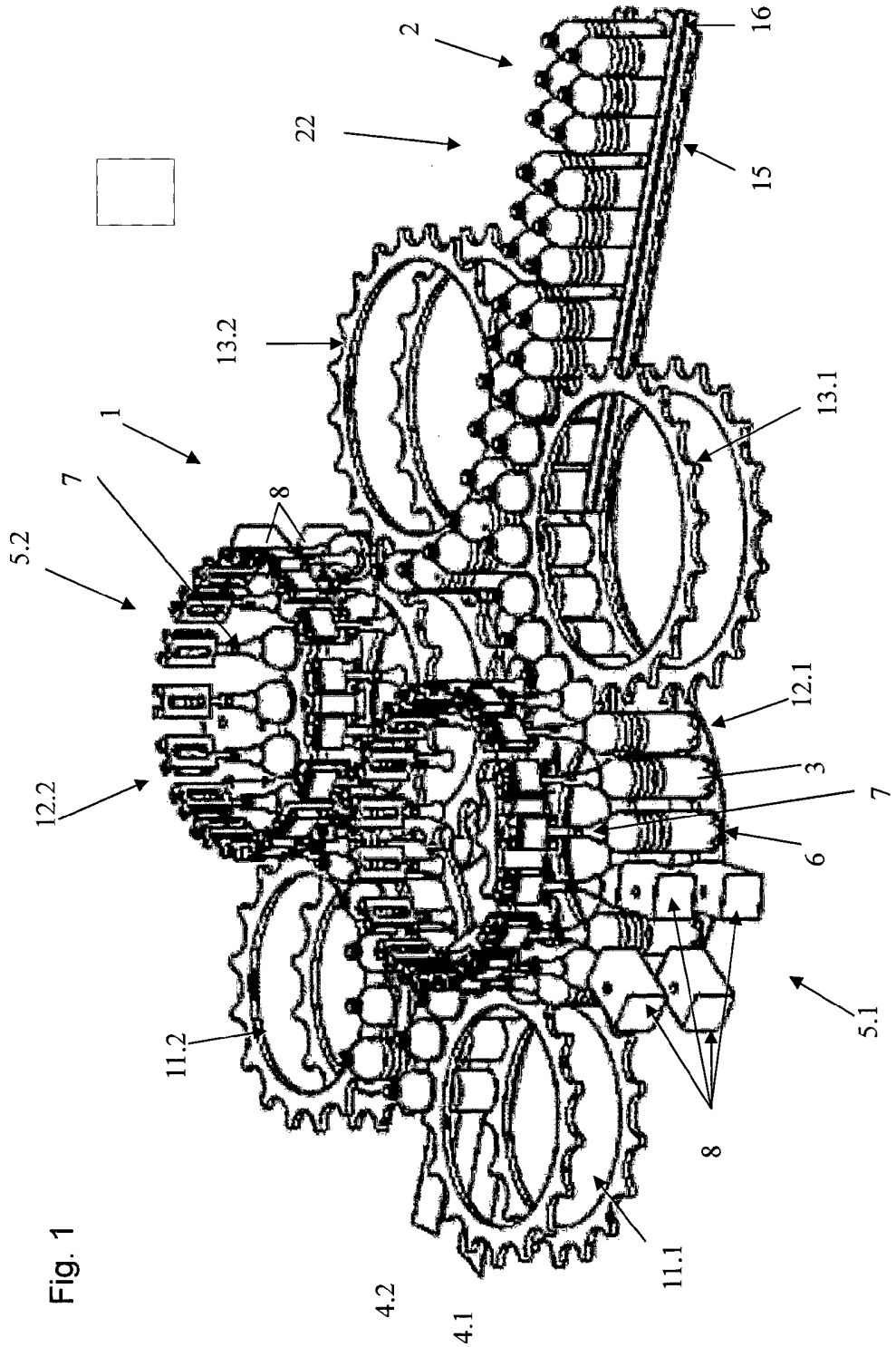

Fig. 1

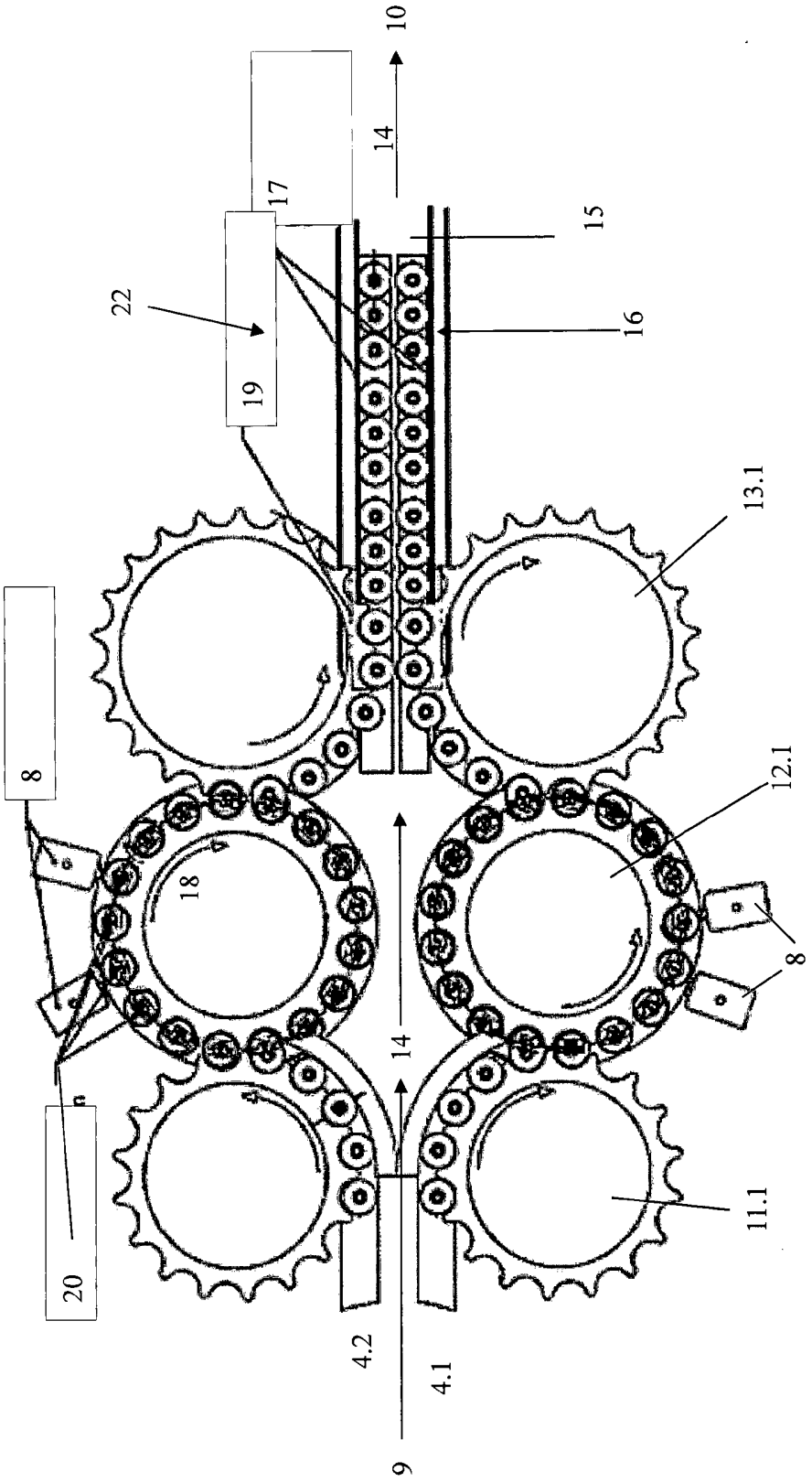

Fig. 2

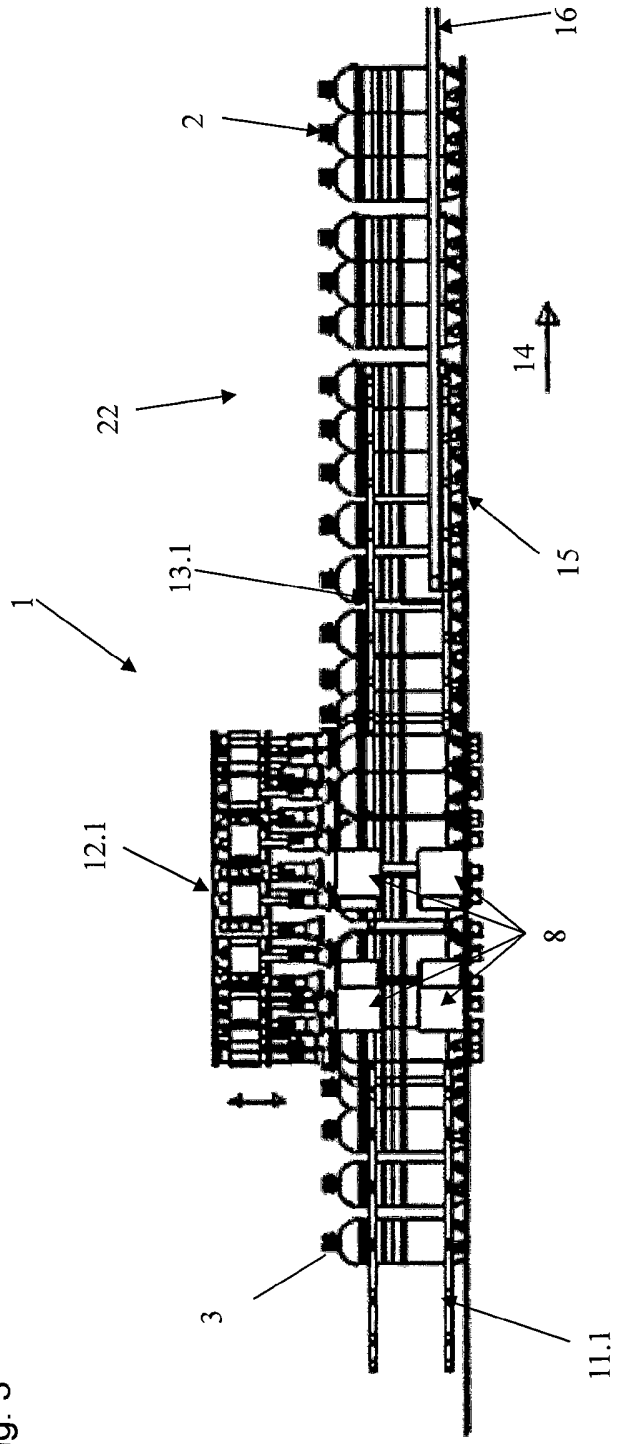

Fig. 3

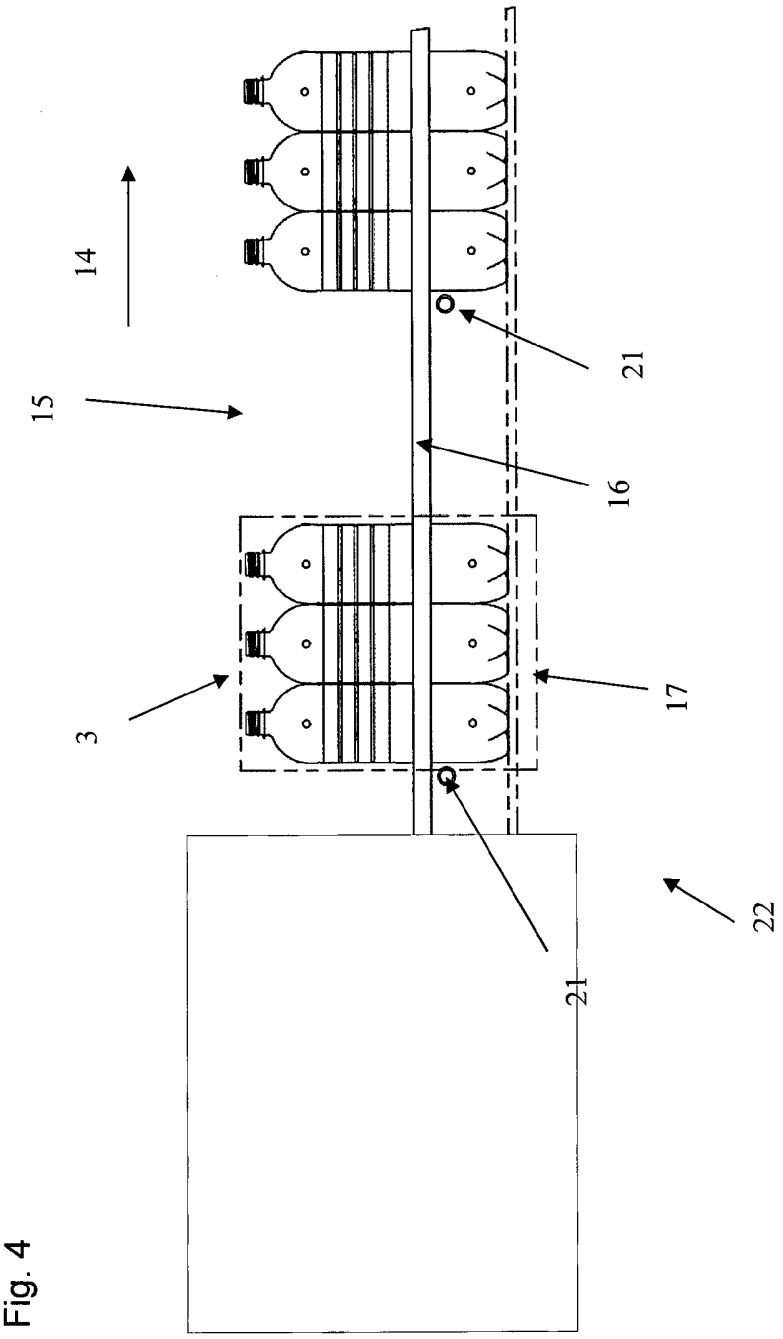

Fig. 4

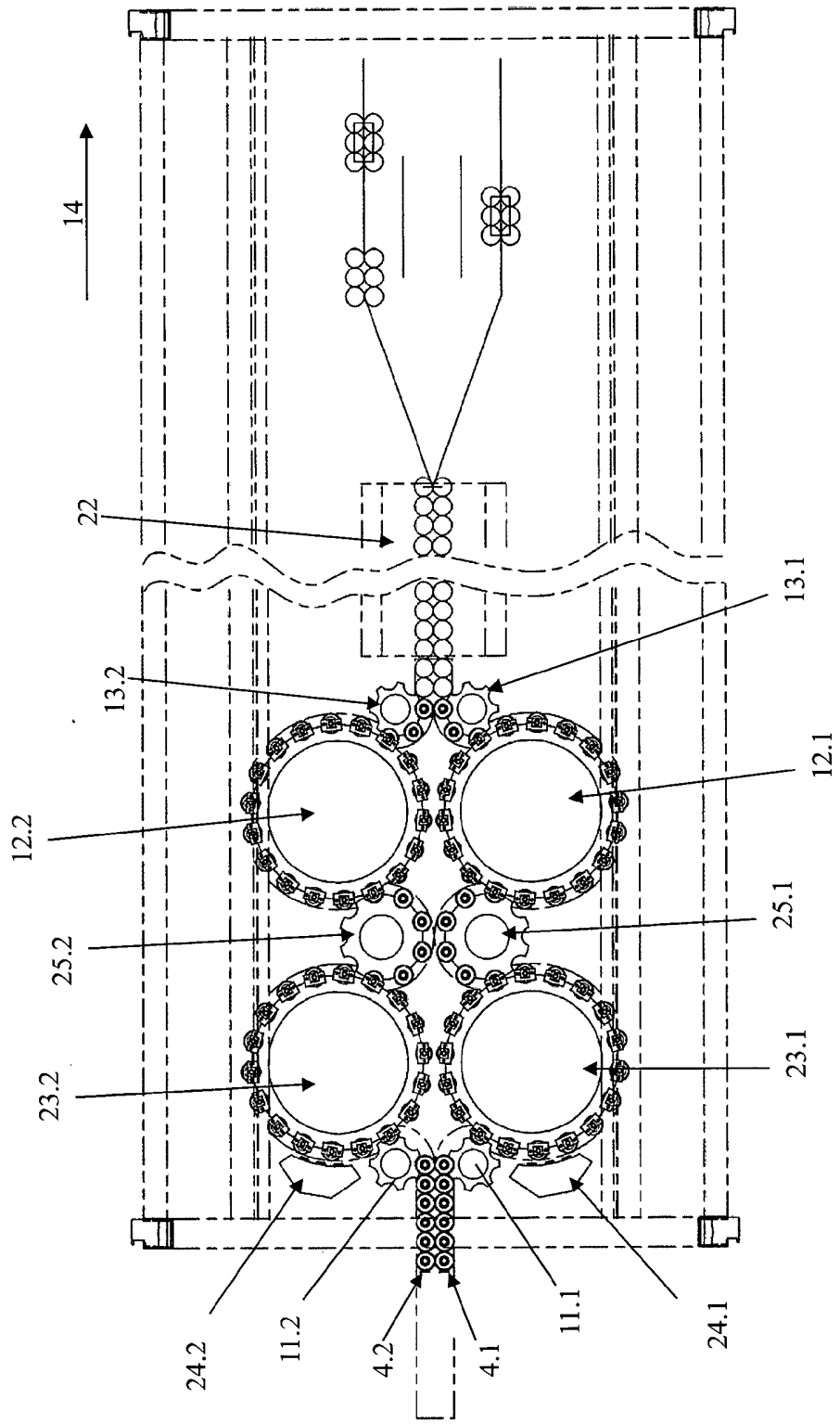

Fig. 5

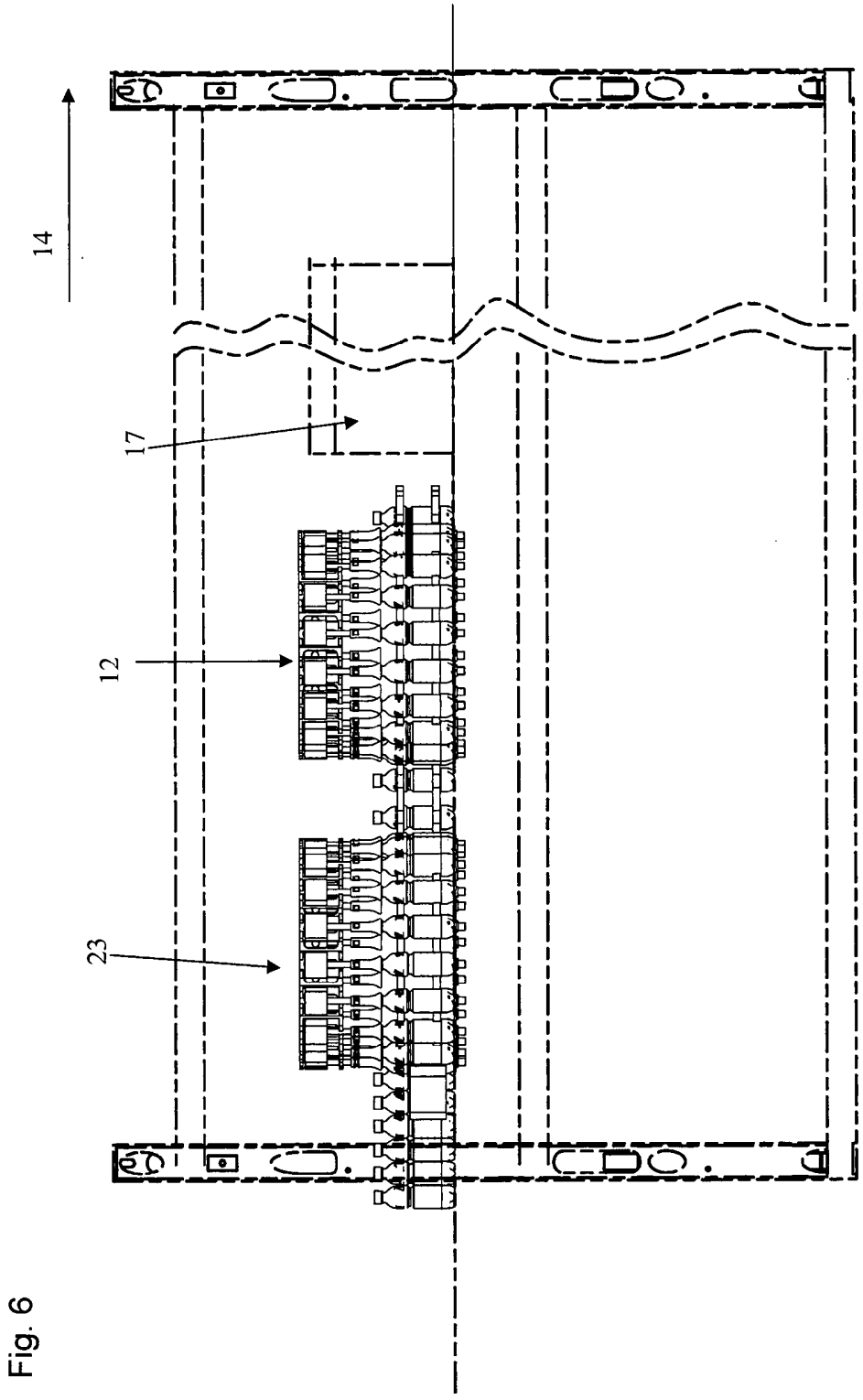

Fig. 6

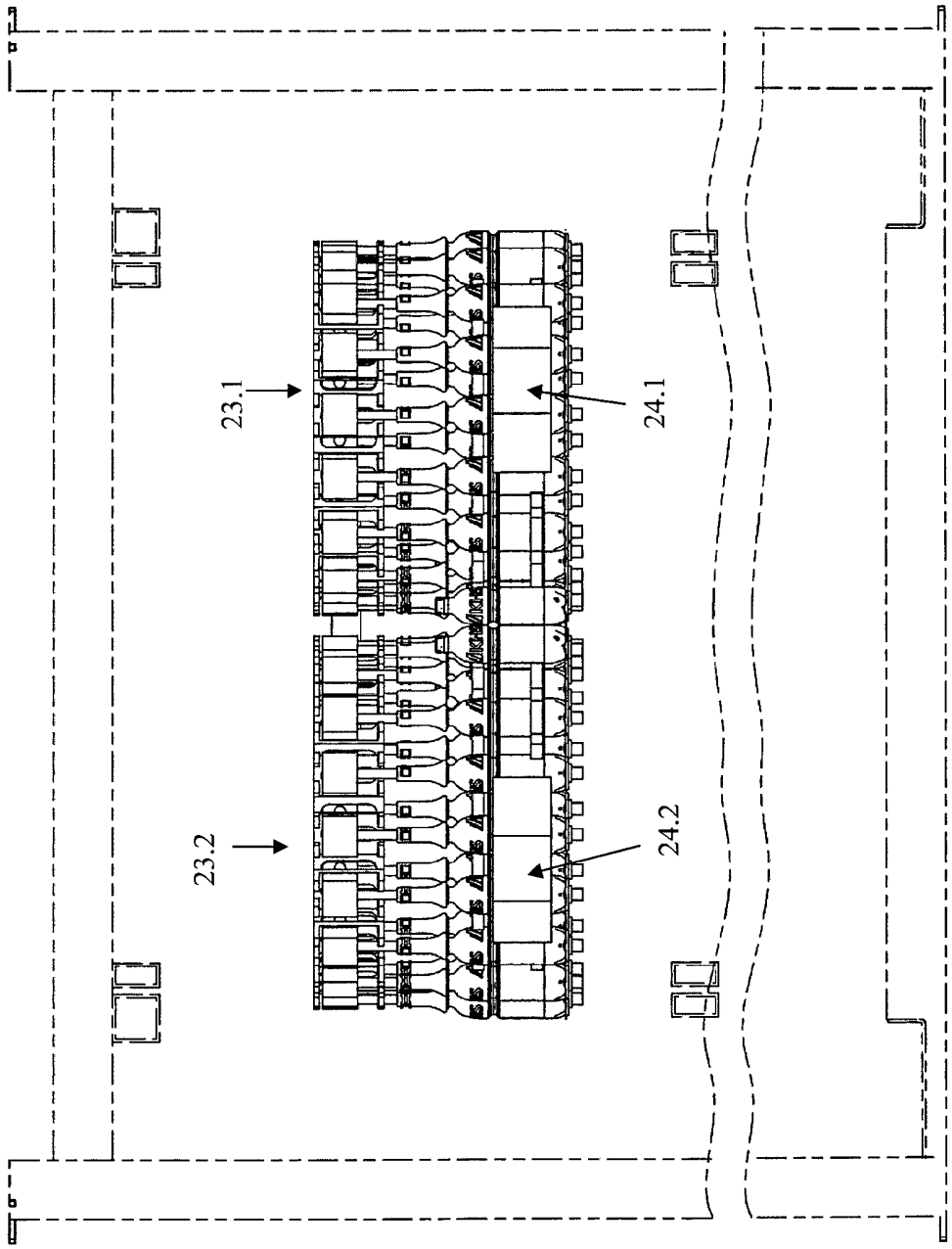

Fig. 7

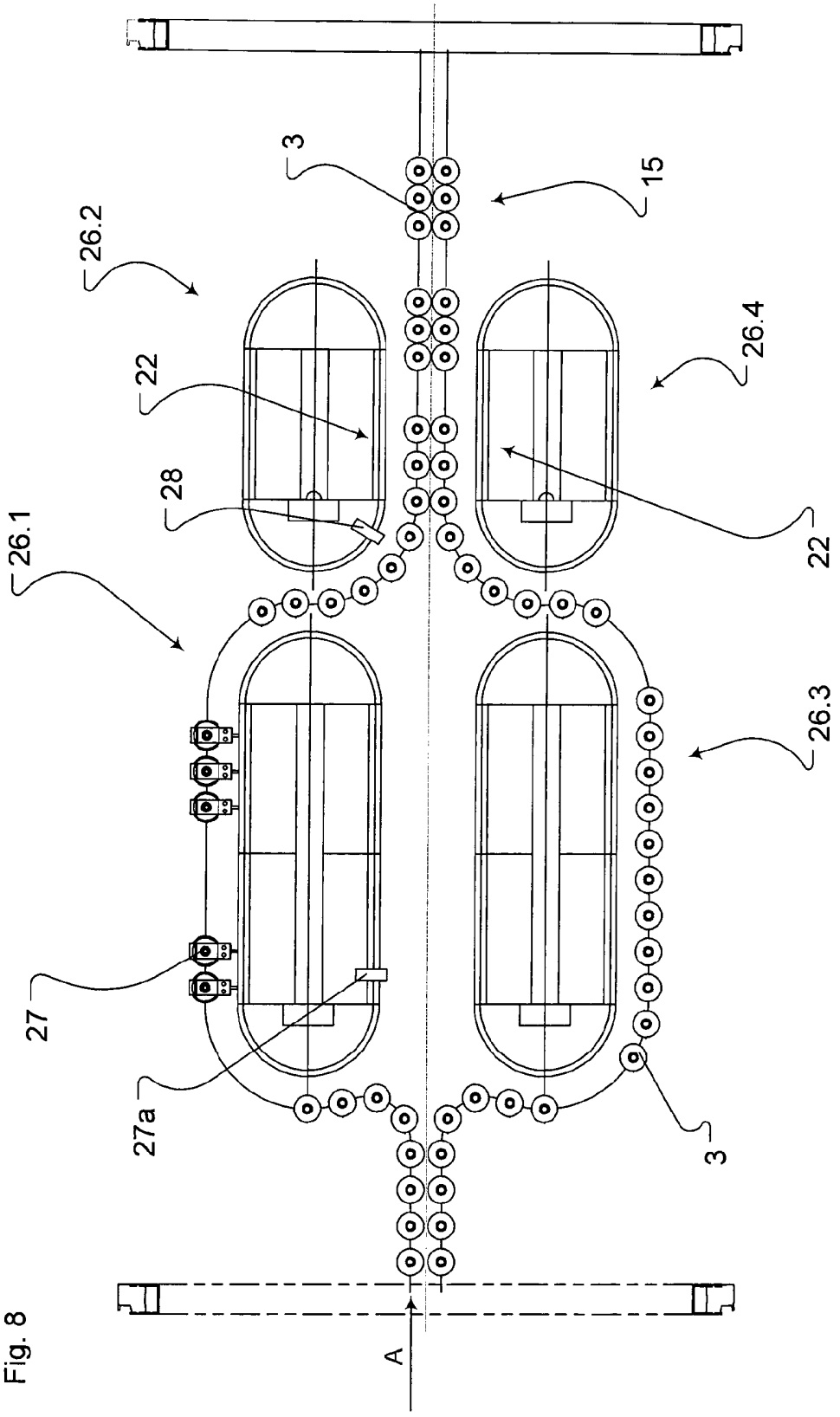

Fig. 8

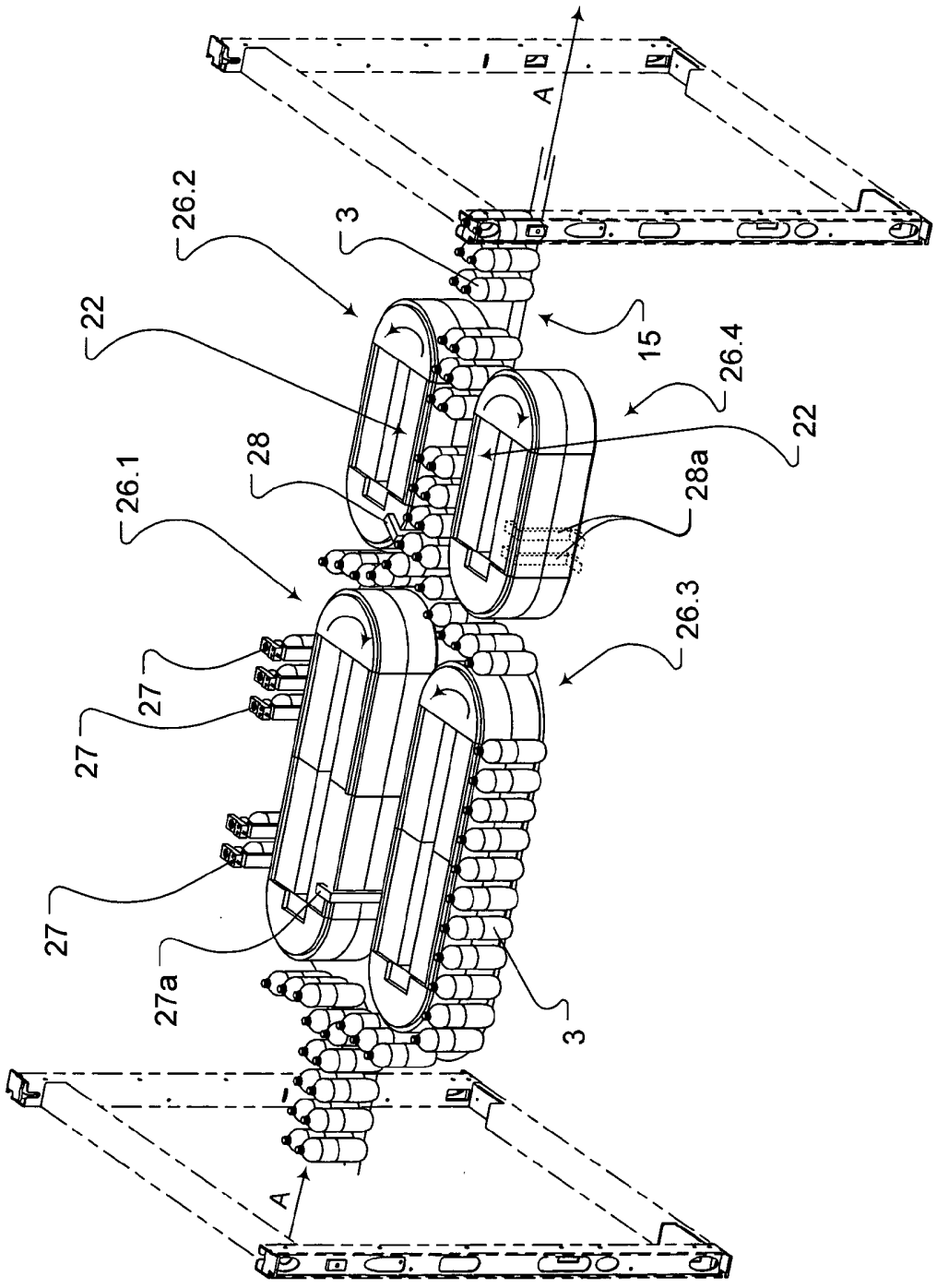

Fig. 9