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(54) **Berendezés csomagolási egységek előállítására**

**Device for forming packaging units**

[0001] The invention relates to a device for forming packaging units, in accordance with the preamble of claim 1, comprising a one-track or multi-track container delivery system or one-track or multi-track container streams, at least one main star of a star transporter, rotating about a central axis, with at least one application element in the region of the star transporter, by means of which at least one adhesive or glue agent and/or at least one glue or adhesive agent application can be applied onto or at the containers. The invention further comprises a method making use of the said device.

[0002] Containers in the meaning of the invention are, for example, bottles, cans, tubes, pouches, in each case made of metal, glass, and/or plastic, therefore, for example, also PET bottles, 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). Such containers, e.g. PET bottles, exhibit a contact region which is configured as spherically cambered, such that the containers can roll essentially one after another about a circumferential track, i.e. on a "roll ring". With glass bottles, with the repeated use of the bottle, this can be identified, for example, by the wear ring, which in most cases is distinctive by its lighter appearance. Such "roll rings" can be arranged, with PET bottles, not only in the head region but also in the foot region.

[0003] In detail, the production of the bundles 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 direction, in a mass transport or in a wide container stream, in which the containers exhibit a random orientation in respect of distinctive containers and/or equipment features. This wide container stream is then converted into a plurality of one-track or single-track container flows by channel division. In one method step, the compartmenting i.e. the grouping of the necessary number of containers in each case to form a compacted container group, of the containers, which will later form the bundles or the container groups thereof, takes place out of the single-track container streams, in which the containers lie against each other with several casing or circumferential surfaces (i.e. with the contact or touch surfaces) of the containers of each container group connecting to form the compact and secure or stable bundle.

[0004] It is known in the art to group or form a plurality of articles together in each case to produce an article group, and from the article groups, making use of shrink films (e.g. US 7 726 464 A1), forming secure and transportable storage and transport units or bundles. Disadvantageous in this situation, among other considerations, is the fact that the films used, and in particular the shrinking on of the films by the application of heat or energy, involves not inconsiderable costs.

[0005] It has already been proposed that transportable bundles be produced by the containers formed in each case to create a container group that is packed by means of a strapping 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. connected to one another to form a bundle, which represents a particularly economical and simple possibility for producing bundles or transport and storage units. The strapping can also be adhesively bonded to the containers. A problem with the strapping arrangement, however, is the fact that the first time a container is removed from such a bundle, the containers remaining in the bundle are no longer held together by the strapping. This applies not only if the strapping is separated or cut, but also if is possible for a container to be removed from the bundle without the separation of the strapping.

[0006] Moreover, during the transport of such bundles on conveyor means there is always the risk that cylindrical or essentially cylindrical articles such as cans, bottles, or containers adopt a nesting position due to vibration, impacts, etc., i.e. slide into the gap in the neighbouring row. In order to avoid this, with known bundles a high degree of tension must be applied to the strapping.

[0007] From EP 1 495 973 B1 a device and a method are known for the formation of container groups, with which, by means of two main transport and alignment stars, containers are held on the mouth and base sides and aligned. They are then fixed and compacted in the target angle position during further transport. Following this, a net-type carrier element is spread from above over the containers, and they are thereby finally grouped together.

[0008] Conversely, DE 10 2006 037 105 A1 relates to a method for the assembling of bottle packages, with which, on both sides of a track, a rotating star is provided, which presses bottle necks in clamps onto flat carriers. The bottle package is then surrounded by a band or envelope (film).

[0009] According to DE 23 31 193, an adhesive is applied to containers on narrow surfaces or rows, wherein, in each case, adjacent surfaces which are not provided with adhesive so as to allow for the gripping of the package for the purpose of carrying. At the adhesive points, the containers adhere to one another. EP 2 096 039 A1 likewise discloses the application of an adhesive onto containers, wherein, however, a shrink film is additionally arranged around the bottle package. In DE 10 2008 038 146 A1, a shaft drive system is disclosed, 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, belongs to the Applicant, disclosed a closing machine, which comprises a fixed-location central column, which is configured as being free of elements for mechanical force transfer, and consequently only contains lines.

[0010] The object of the invention is to provide a device and a method for producing bundles of the type referred to in the preamble, with which, despite the absence of a surrounding film and/or surrounding strapping, the situation of the articles moving into a nesting position during transport can be avoided and, wherein, even after the removal of one or more articles from a bundle, the assemblage of the remaining articles in the bundle is retained, or can be restored.

[0011] To solve this problem, a device is provided for producing bundles in accordance with claim 1, wherein a star transporter is provided for each of the container streams, wherein the respective main star of the respective star transporter comprises a plurality of foot-side and/or head guides for containers, and wherein, immediately downstream of the main star or of a discharge device, a compartmenting and/or compaction unit or a compartmenting or compaction section is provided for the grouping and compacting, as well as temporarily pressing together of a predetermined number of containers, by means of which the containers are brought together downstream of the star transporter to form a bundle and are transported onwards. It is preferable that if the respective main star of the respective star transporter comprises both a plurality of foot-side guides as well as a plurality of head guides for the containers. A corresponding method for solving the object is also provided for.

[0012] Containers in the meaning of the invention are, for example, PET bottles, i.e. among others, bottles, cans, tubes, pouches, in each case made 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 brought together to form groups (multipacks). The containers of the bundle are arranged in a non-nesting position.

[0013] "Adhesive or glue agent" in the meaning of the invention are, among others, all materials or compounds with which an adhesive connection between containers is possible, 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) cause an adhesive bond. "Adhesive or glue agent" in the meaning of the invention are, among others, also multilayer materials, e.g. such from at least one carrier material, which is coated with a material with which an adhesive connection between containers is possible, i.e. which is active as adhesive and/or as glue on at least two sides. Such adhesive or glue agent can be designated as pads. An "adhesive" container comprises, in the meaning of the invention, adhesive or glue agent, or is provided with an application of adhesive or glue. The adhesive or glue agent is preferably selected in such a way that the containers can be detached from the bundle or separated from one another by hand, and without any damage. It is conceivable that fluid glue agent is applied by application elements. It is possible for a low-viscosity UV-curing adhesive to be applied. Also suitable would be a hot glue, although this cools very rapidly, and could therefore cease to provide its adhesive properties before the containers of the bundle have adequately bonded to one another. A UV-curing adhesive is also advantageous in respect of the particularly easy adjustment of its desired properties. A corresponding hardening or curing station or section is analogously provided downstream of the application elements, stationary or along the linear transporter, above it or, if appropriate, also below it. A curing station can, for example, be a tunnel with UV-lighting. The hardening or curing station is preferably arranged downstream of the star transporter, preferably at the linear transporter.

[0013] It is preferable that the star transporter comprises the main star, a feed device, and the discharge device. The feed device can be configured as a feed star, wherein the discharge device can be configured as a discharge star. The feed device has the effect of adjusting the incoming container stream to the division arrangement of the main star, such that the respective containers can be transferred to the main star without any problem. With the discharge device, the containers can be transported further at a predetermined spacing interval.

[0014] It is preferable that the foot-side guides are configured as rotating plates, wherein the head guides comprise, on the holding side, packing or centring tulips, or are configured as these. The respective container is in this way essentially tensioned between the rotating plate and the packing or centring tulip, and held securely in position. With the rotating plate and the head guide, a 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 for the container, on its transport path, to be rotated about the rotation axis of the main star, relative to it, such that, in the circumferential direction of the container, several contact and touch surfaces of the container can be provided with adhesive or glue agent. It is also preferable in this situation if a plurality of application elements are provided, which, seen in the rotation direction of the main star, follow one another. By means of the rotating plates, the upright containers can also, advantageously, be aligned in accordance with specific container and/or equipment features, for example in accordance with what are referred to as embossings, and are then provided in a container-specific manner with adhesive and glue agent in such a way that the containers of a bundle are taken up aligned exactly identically to one another inside the bundle.

[0015] In a preferred embodiment, provision can be made in each case for two application elements to be arranged above one another, wherein the following application elements are likewise arranged above another. Accordingly, in each case an application element can always precisely provide a container region, i.e. a section of the contact and touch surface, with adhesive and glue means. Naturally, the application elements can, for example, be controlled with a spray or jet application of adhesive and glue agent, i.e. can be adjusted in their inclination in relation to any spatial axis. It is of course also possible for the application elements to be carried together with the containers concerned over at least a part section, but this is not absolutely necessary.

[0016] Immediately downstream of the star transporter, preferably of the main star or the feed device, is a linear transporter, which functions, for example, as a compartmenting or compacting section, wherein the containers are brought together to form bundles and transported onwards, and wherein static and/or movable guide elements can be provided in each case laterally of the linear transporter, and wherein driving elements can be provided, which in each case are allocated to a bundle.

[0017] The guide elements can also be designated as rails, which between them guide or support the bundles, or the containers of the bundles respectively. It is also possible, however, for the guide elements to be configured to move with the containers, such that the containers or the bundles 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 preferable in respect of an adhesive connection of the containers of the bundle. In other words, the guide elements not only have the function of guiding and supporting but also the function of exerting a force on the containers to compact the containers or the bundle respectively transversely to the transport direction, or brings them close to one another, pushing or pressing them against one another, in order to effect an adequate adhesive connection.

[0018] In a preferred embodiment, the driver elements are arranged transversely to the transport direction, and engage entirely over the linear transporter, wherein the driver elements, seen in the transport direction, are arranged behind the bundle, such that the driver elements essentially push the bundle ahead of them. As a result of this, a force is advantageously exerted which supports a connection of the containers between one another, seen in or against the transport direction, or supports a compaction. In order to improve the compacting of the containers of the bundle to one another not only transverse to the transport direction but also seen in the transport direction, the drivers, seen in the transport direction, can apply a relative speed onto the containers or the bundle in relation to the transporter. If the conveying speed of the driver element or elements is greater than the conveying speed of the linear transporter, this has the effect of pushing or sliding the containers or the bundle from the inlet side in the direction of the outlet side. It can be seen that the pushing force can perceptibly increase the adhesive bond. In a preferred embodiment the carrier elements can be configured as a bar (i.e. a driver bar). In addition, the driver elements can be self-driven, and/or be in connection with the guide elements. To this extent, the guide elements could also, in addition to the functions already referred to, essentially take over the guide function for the driver elements. If the guide elements are driven (i.e. are provided such as to circulate) it is consistent with the invention for the driver elements to be secured rigidly to the guide elements, wherein the relative speed referred to previously could be produced by means of the guide element drive. The guide elements could 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 driver elements can be individually adjusted, for example by suitable control centres or central control units of an overall system.

[0019] It is possible for the bundle to be additionally provided with a carrying element, such as a handle, for which purpose suitable devices can be provided, arranged downstream of the outlet side or at a suitable point on the linear transporter. The carrying element can naturally be secured to the bundle with the adhesive or glue agent referred to heretofore.

[0020] With the invention, a device is therefore provided for producing a bundle, which despite the absence of a covering film and/or despite the absence of a strapping, in a simple manner avoids the containers moving into a nesting position during transport, and wherein, even after the removal of one or more containers from a bundle, the cohesion of the remaining containers in the bundle is retained or can be restored. Due to the absence of a film or strapping band (filmless bottle pack), the burden on the environment is eased by the avoidance of waste, wherein resources are also saved with regard to the production of films or strapping, which are mostly made of plastic. The containers of a bundle are adhesively connected directly to one another during the transport (i.e. in the continuous operation of the device for producing bundles or of the packaging machine respectively). In addition to this, a filmless bottle pack can be achieved with minimal adhesive application, which exhibits an adequate binding of the individual containers to one another.

[0021] As has already been indicated herein previously, 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 located upstream of the main star. The container streams can be fed to the alignment star by way of a feed star, wherein the feed star corresponds to that referred to previously. Preferably arranged between the alignment star and the main star is a transfer star, which in a preferred embodiment can exhibit the dimensions of the feed star and/or of the discharge star referred to heretofore. Arranged at the alignment star are recognition systems, such as, for example, camera systems, which record the actual present position, for example, of labels and/or embossings and/or other features. The actual data is fed to an evaluation unit, in which a comparison with stored target data is carried out, such that head-side or foot-side guides, such as packing tulips or rotating plates can cause a corresponding movement of the container concerned into the desired target position. Such an alignment is known, for example, with labelling machines, with which bottles are aligned in such a way, for example, that labels are applied onto the bottles in the same orientation. With the alignment or with the alignment star respectively the situation can preferably be reached in which the containers, with labels and/or other design features, are taken up in the same orientation in the future bundle, because the containers are moved in the alignment star into the respective target position, wherein the container aligned into the individual target position is treated thereafter in the man star, as described. The container aligned into the target position remains in this position along its transport path.

[0022] Naturally, containers with different dimensions and formats can be treated. In the event of a format change being imminent, the operating parameters and components must be adjusted to the new container format. For example, feed, transfer, and/or discharge stars must be exchanged, wherein, with the invention, provision is preferably made for the alignment star and/or the main star to be configured with adjustable main axes, such that, despite the format change, the alignment star and/or the main star can remain with their main components in the treatment system. The main axes of the main star and/or of the alignment star are preferably adjustable

along the transport direction and transversely to it, such as to be capable of being superimposed onto the new container format. The head-side and/or foot-side guides are preferably configured so as to be universally usable.

[0023] It is also preferable in the meaning of the invention if the star transporter and its components, preferably the main star and/or the alignment star, are configured with a standing column, in which a drive element is integrated. The drive element is preferably configured as a controllable electric motor. The standing column, as mentioned heretofore, can of course be capable of being moved along the adjustment axes, in order, for example, to be adjusted so as to match a format change. Instead of a linear feed, the containers can also be fed by means of a transport star for each container stream.

[0024] Further embodiments, advantages, and possible applications of the invention can also be derived from the following description of exemplary embodiments and from the figures. In this respect, all the features described and/or presented in pictorial representation are in principle, individually or in any desired combination, the object of the invention, regardless of their relationship in the claims or reference to them. The contents of the claims are also established as a constituent part of the description.

[0025] The invention is described hereinafter on the basis of the figures by way of an exemplary embodiment. The figures show:

Fig. 1 A part section of a device for producing a bundle 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 compartmenting or compaction stretch section in the exemplary embodiment, as a linear transporter,

Fig. 5 the part section from Figure 1 in a view from above, with an upstream aligning star and downstream compartmenting or compacting stretch section,

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

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

Fig. 8 Schematic representation of a device for bundle preparation, as an electromagnetic linear endless transporter, and

Fig. 9 this device in a perspective representation.

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

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

[0028] In each case, a star transporter 5, or 5.1 and 5.2 respectively, is provided for each of the container streams 4.1 and 4.2, wherein the respective star transporter 5 comprises a plurality of foot-side guides 6 and head guides 7 for the containers 3, wherein the application elements 8 are arranged at the star transporter or at its main star 12, or 12.1 and 12.2 respectively, wherein the containers 3 are brought together downstream of the star transporter 5 to form the bundle 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 adhesive or glue agent, and wherein the containers 3 are grouped together downstream of the star transporter 5 to form the total bundle 2, and are transported in the direction towards the outlet side 10.

[0030] Figure 1 shows that each star transporter 5, or 5.1 and 5.2 respectively, comprises a feed device 11, or 11.1 and 11.2 respectively, the main star 12, or 12.1 and 12.2 respectively, and a discharge device 13, or 13.1 and 13.2 respectively, for the respective container track 4.1 and 4.2. The feed device 11 is configured as a feed star, wherein the discharge device 13 is configured as a discharge star. Since for each container track 4.1 and 4.2 in each case a star transporter 5 is provided, these and their components are provided in the figures with the accompanying Figures 1 and 2 respectively, in order to make clear the allocation to the respective container track 4.1 and 4.2. The respective components are of course in each case identical.

[0031] By way of example, the foot-side guides 6 at the main star 12 are configured as rotating plates, while their head guides 7 comprise, on the holding side, packing tulips or centring tulips, or are configured as such. The respective container 3 is therefore essentially held securely between the rotating plate 6 and the packing tulip 7. Rotating plate and packing tulip or centring tulip are known, for example, from labelling machines.

[0032] As can be seen from 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 rotating plates 6, the upright containers can also, in a still more preferable manner, be aligned in accordance with specific container features and/or equipment features (i.e. for example in accordance with what are referred to as embossings), and are therefore provided in a container-specific manner with adhesive and glue agent, such that the containers 3 of a bundle 2 are taken up inside the bundle 2 aligned precisely identically to one another. A rotation of the containers can, however, also be carried out easily in order to provide the containers 3, seen in the circumferential direction, with adhesive and glue agent at several contact and touch surfaces. An alignment or rotation, for example upstream of the application elements 8 and/or between application elements 8 following in the direction of rotation 18, is indicated by the reference number 20 in Figure 2.

[0033] In a preferred embodiment, provision can be made in each case for two application elements 8 to be arranged above one another, wherein the subsequent application elements 8 are likewise arranged above one another. Accordingly, in each case an application element 8 can always provide precisely one container region (i.e. a section of the contact and touch surface), with adhesive and glue agent. Naturally, the application elements 8 can be controlled, for example with a spray or jet application of adhesive and glue agent, i.e. adjustable in their inclination angle in relation to every spatial axis. The application elements 8 can of course also be moved on a part stretch section together with the container 3 concerned, but this is not absolutely necessary.

[0034] Arranged immediately downstream of the discharge device 13, or the two discharge devices 13.1 and 13.2 respectively, is a linear transporter 15, which functions as a compartmenting and/or compacting stretch section 22. The discharge device 13, or the two discharge devices 13.1 and 13.2 respectively, bring together the adhesive-applied containers 3, and then transfer the containers 3 in pairs to the linear transporter 15, which is represented in Figure 2 by the reference number 19. In this situation, in each case in the first instance two containers 3 are pressed against each other by way of the contact and touch surfaces, wherein the linear transporter 15 can be configured in such a way that the convergence is effected of several container pairs, for

example three, to form the bundle 2, which comprises six containers 3. For this purpose the linear transporter 15 can comprise driver elements 21, wherein, additionally, lateral guide elements 16 can be provided, as can be seen in Figure 4.

[0035] Accordingly, downstream of the star transporter 5, or the discharge device 13 respectively, is the linear transporter 15, wherein static and/or movable guide elements 16 can be provided in each case laterally to the linear transporter 15, and wherein driver elements 21 can be provided, allocated in each case to a bundle 2. The carrier elements 21 can cause the containers 3 to be brought together along the axial transport direction 14, i.e. the containers 3 of a bundle 2. The guide elements 16 can cause a contact pressing force on the containers 3 transverse to the transport direction 14, such that the adhesive bond is also favourably influenced in the transverse direction.

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

[0037] As already mentioned, the alignment of the containers 3 into a target position can take place along the transport path of the main star 12.1 or 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 are 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 fed to the alignment star 23.1 and 23.2 respectively by way of the respective feed star 11.1 and 11.2 respectively. Arranged at the respective alignment star 23.1 and 23.2 respectively 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 or 23.2 and the respective main star 12.1 or 12.2 is in each case a transfer star 25.1 or 25.2 respectively, which in a further preferred embodiment can exhibit the dimensions of the feed star 11.1 or 11.2, and/or of the discharge star 13.1 or 13.2 referred to heretofore. The exemplary camera systems 24.1 or 24.2 record the actual position, for example, of labels and/or embossings and/or other features. The actual data is delivered to an evaluation unit, in which a comparison is made with stored target data, such that head-side and foot-side guides, such as, for example, packing tulips 7 or rotating plates 6, can carry out a corresponding transfer of the container 3 concerned into the desired target position. The container 3 aligned in the target position remains in this position along its transport path. The container stream is divided in the further course of the compartmenting and/or compacting stretch section 22, for example, into two parallel container flows, 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 formed as linear drives, with which circulating and electrically driveable carriages are provided. In this situation, the container guides are arranged, per container 3, such as, for example, the foot-side guide 6 and/or the head guides 7, on such a carrier carriage 27. In addition, the drives are advantageously provided on the carriages 27, for the rotation of the containers 3 about their height axis.

[0039] Preferably, the linear drives 26 operate in accordance with the principle of an electromagnetic linear drive, such that each transport carriage 27 can be driven at least in sections in the circulation region of the linear drive 26 independently of other carrier carriages 26.

[0040] The fixed-position part of the linear drive 26 in this situation forms a guide for the moving transport carriages, wherein, in the movement or transport direction of the carriages, following one after another, a plurality of magnetic poles with individually controllable windings pertaining to them are provided for, as well

as permanent magnets, which are provided at or in the transport carriages 27. Such a linear drive is available on the market under the trademark name "PackTrak" from Siemens AG.

[0041] Figure 8 shows in sketch fashion such an arrangement, in each case, of two electromagnetic linear drives 26.1 and 26.2, for the one container row (upper row in Figure 8), and linear drives 26.3 and 26.4 for the lower container row in Figure 8. The two container rows run in, by analogy with the examples referred to herein previously, in two rows, and are taken up by the circulating linear drives 26.1 and 26.3 and their carrying carriages 27. An inlet element or transfer element 29, which may still be provided, is indicated by a circle. Naturally, the container feeds in the transport direction A can also be arranged in such a way that they run in flush to the straight line or tangentially to the inverse direction of the linear drive 26.

[0042] The carriages 27, shown only schematically, carry the containers 3. The position and rotation angle acquisition, alignment, and treatment of the containers 3 take place by analogy with the examples and embodiments given previously, in particular with respect to Figures 1 to 7.

[0043] The reference numbers 27a and 28a designate carriages which are on the return path, so as to pick up a container 3 again or to exert effect on it. The drives for the rotational movement of the containers 3, as well as for the treatment stations and devices described previously, are for this reason not represented or described again, since an analogous design and positioning are to be selected.

[0044] The special feature of the solution shown here lies in the fact that the rear linear drives 26.2 and 26.4, and their respective carriages 28 (only three are schematically represented) can be arranged in such a fashion that the containers 3 in the region of the inlet (transfer, for example, from 26.1 to 26.2) are still kept at a distance from one another, in order to avoid coming prematurely close and unintentional adhesive bonding. Next, the required container groups are formed (in this case, for example, six containers, of two rows of three containers in each case) in the region of the straight section, which represents a compartmenting and/or compaction stretch section 22, in that the containers 3 or part groups of containers are speeded up or slowed down relative to one another in an appropriate manner.

[0045] For example, first two adjacent containers can be brought into contact at adherence points transverse to the transport direction (if appropriate, after prior detection and alignment of the adherence and gluing points), and these then connected container part groups are speeded up or slowed down in an appropriate manner, in order to achieve the desired compacting and pressing together of container part groups which are adjacent in the transport direction. The containers are in this situation ideally held secure against rotation for sufficiently long for an adequate curing or hardening and/or drying to be ensured.

[0046] The bundles or container groups formed in this way can in the final stage be discharged onto a linear transporter 15.

[0047] In the example shown in Figures 8 and 9, the container is only transported in the region of the linear drive 26.1 or 26.3 respectively by the carriages 27, mounted in a rotatable manner. After transfer or conveying into the engagement region of the rear linear drives 26.2 and 26.4, the containers 3 are ideally only still held such as to be secure against rotation, since, with an awareness of the angular position of the adhesion and gluing positions, no rotation of the containers 3 about the height axis is necessary any longer, and is also no longer desirable. In this situation, a carrying and gripping guidance of the containers 3 is advantageous, or a sliding form of transport on a surface suitable for this, ideally a metallic substrate.

[0048] An improved embodiment of the linear drive 26 and its transport carriages 28 consists of the gripping and holding means, with which the containers 3 are fixed, being capable of displacement and being driven transverse to the main transport direction A. This improves the adherence of adjacent containers 3, since in this way any rotational movement is avoided.

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

Reference number list:

| | |
|---|---|
| 1 | Device for producing bundles/packaging machine |
| 2 | Bundle |
| 3 | Container |
| 4 | Container track (4.1 and 4.2) |
| 5 | Star transporter |
| 6 | Foot-side guide |
| 7 | Head guide |
| 8 | Application elements |
| 9 | Inlet side |
| 10 | Outlet side |
| 11 | Feed device |
| 12 | Main star |
| 13 | Discharge device |
| 14 | Axial transport direction |
| 15 | Linear transporter |
| 16 | Guide elements |
| 17 | Curing or hardening station |
| 18 | Direction of rotation of 12 |
| 19 | Bringing together of 3 from 13 onto 15 |
| 20 | Rotation of 3 |
| 21 | Driver elements |
| 22 | Compartmenting and/or compacting unit/stretch section |
| 23 | Alignment star |
| 24 | Recognition system |
| 25 | Transfer star |
| 26 | Linear drive (electrical) |
| 27 | Carriage |
| 28 | Carriage |
| 29 | Inlet element |

**Berendezés csomagolási egységek előállítására**

SZABADALMI IGÉNYPONTOK

1. Berendezés csomagolási egységek előállítására, amely tartalmaz egypályás vagy többpályás tartály szállító rendszert, vagy egypályás vagy többpályás tartály áramot (4.1 és 4.2), egy csillag transzporter (5) legalább egy központi csillagát (12), ami egy központi tengely körül forog, ahol egy csillag transzporter (5) tartozik mindegyik tartály áramhoz (4.1 és 4.2), és ahol a csillag transzporterek (5) megfelelő központi csillagai (12) tartalmaznak talphoz tartozó vezető elemeket (6) és/vagy fejrészhez tartozó vezető elemeket (7) a tartályok (3) számára, azzal jellemezve, hogy a csillag transzporterek (5) között van egy, legalább egy felhordó elemmel (8) ellátott csillag transzporter (5), amivel legalább egy ragasztó vagy tapadó közeg és/vagy legalább egy ragasztó vagy tapadó közeg alkalmazás vihető fel a tartályokra vagy alkalmazható a tartályokon (3), és ahol közvetlenül a központi csillag (12) vagy egy kivezető berendezés (13) után egy elosztó és/vagy tömörítő egység és/vagy egy elosztó és/vagy tömörítő szakasz (22) van elrendezve, egy meghatározott számú tartály (3) csoportosítására és tömörítésére, valamint időleges összeszorítására, ami a tartályokat (3) csomagolási egységekbe fogja össze, és a csillag transzporterektől (5) elszállítja.
2. Az 1. igénypont szerinti berendezés, azzal jellemezve, hogy mindegyik csillag transzporter (5) mindegyik központi csillaga (12) tartalmaz talphoz tartozó vezető elemeket (6) és/vagy fejrészhez tartozó vezető elemeket (7) a tartályok (3) számára.
3. Az 1. vagy 2. igénypont szerinti berendezés, azzal jellemezve, hogy a csillag transzporterek (5) után egy lineáris transzporter (15) van elrendezve, ami egy elosztó és/vagy tömörítő szakaszként (22) működik, és amin a tartályok (3) csomagolási egységekbe (2) vannak összefogva és elszállítva.
4. Az előző igénypontok bármelyike szerinti berendezés, azzal jellemezve, hogy a talphoz tartozó vezető elemek (6) forgótányérként vannak kialakítva, a fejrészhez tartozó vezető elemek (7) pedig lezáró és központosító tulipánnal vannak ellátva vagy akként vannak kialakítva.
5. Az előző igénypontok bármelyike szerinti berendezés, azzal jellemezve, hogy a felhordó elemek (8) a központi csillag (12) forgási irányában egymást követően vannak elrendezve.
6. Az előző igénypontok bármelyike szerinti berendezés, azzal jellemezve, hogy legalább két felhordó elem (8) egymás fölött van elrendezve.
7. Az előző igénypontok bármelyike szerinti berendezés, azzal jellemezve, hogy mindegyik központi csillag (12.1, 12.2) elé egy-egy rendező csillag (23.1, 23.2) van kapcsolva.
8. Eljárás csomagolási egységek előállítására az előző igénypontok bármelyike szerinti berendezés alkalmazásával.
9. A 8. igénypont szerinti eljárás, azzal jellemezve, hogy a felhordó elemekkel (8) folyékony ragasztószert hordunk fel.
10. A 9. igénypont szerinti eljárás, azzal jellemezve, hogy folyékony ragasztószerként UV sugárzással kikeményedő ragasztóanyag vagy forró ragasztó.

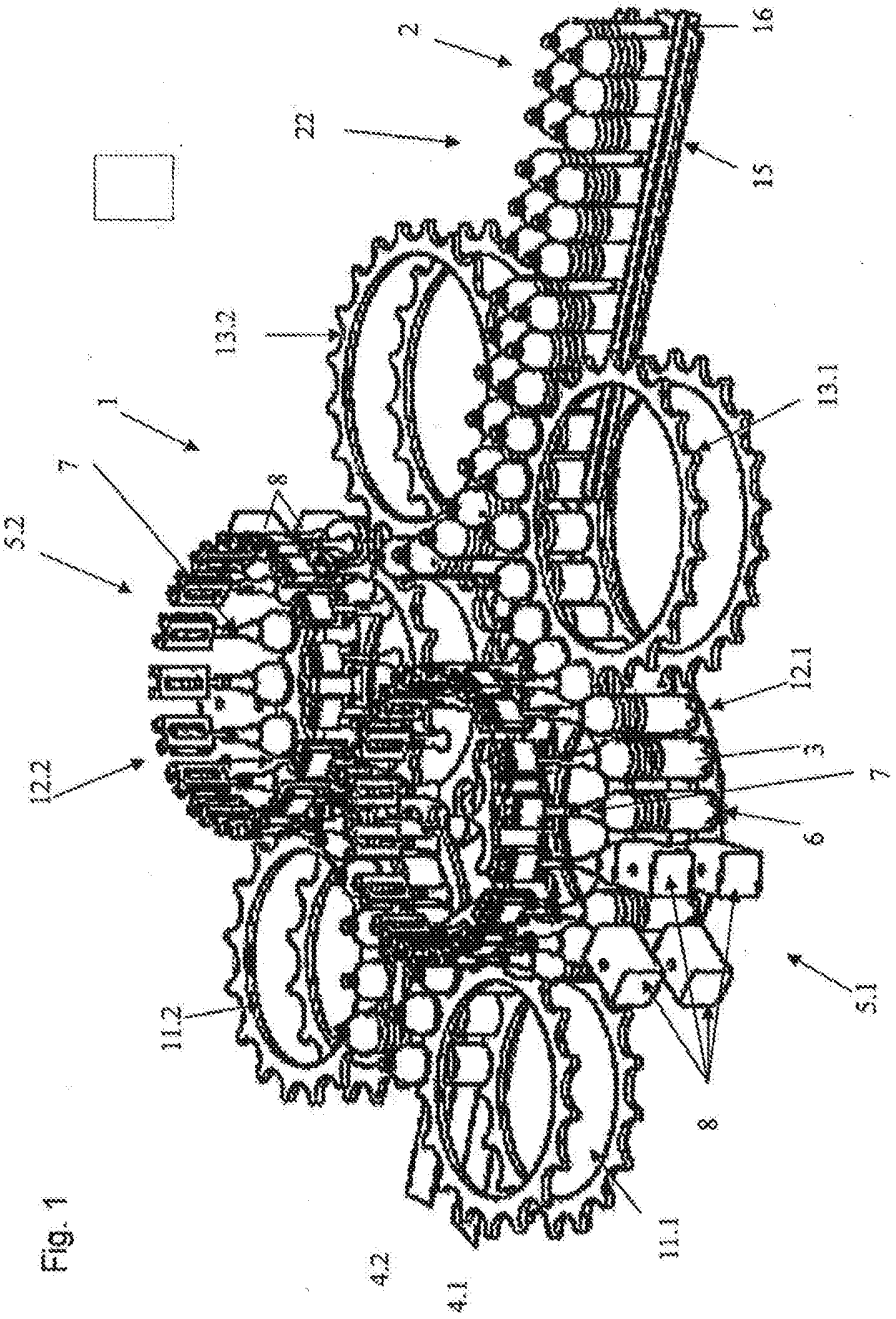


Fig. 1

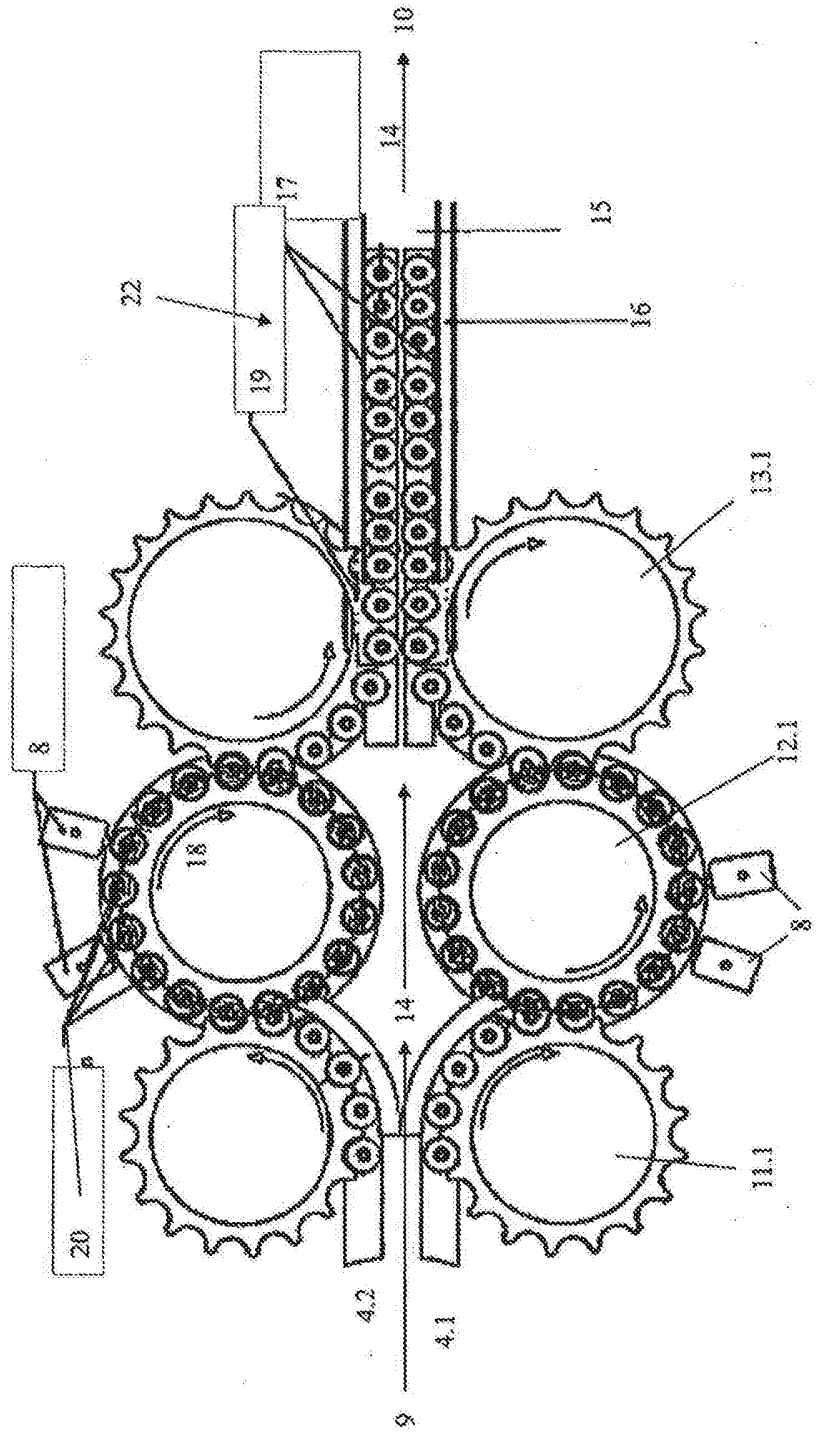


Fig. 2

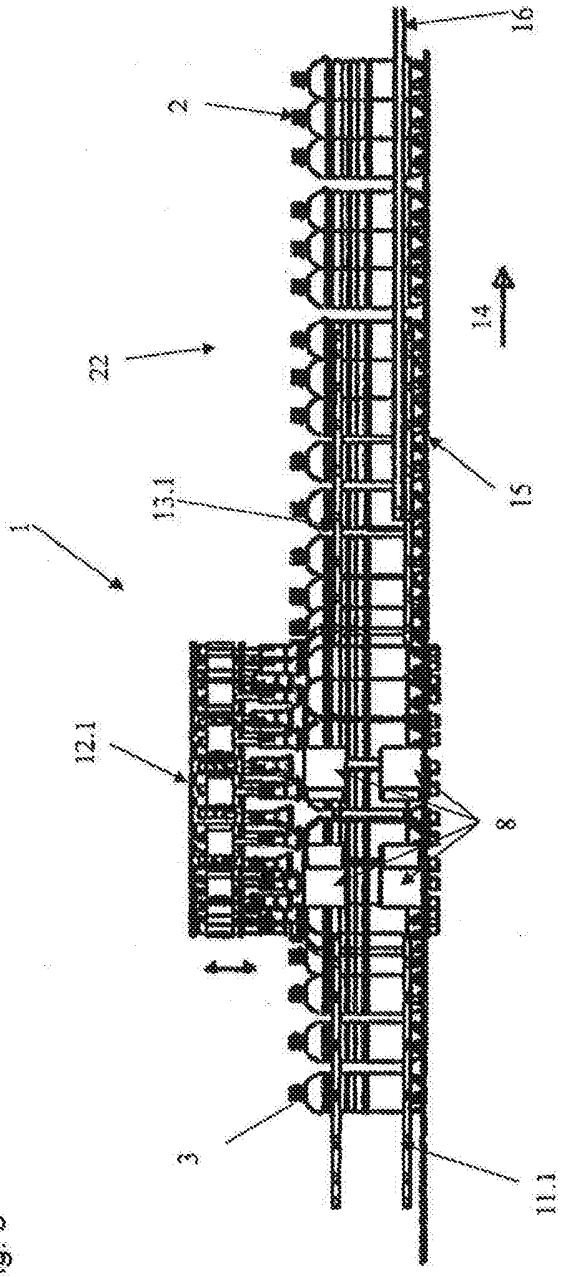


Fig. 3

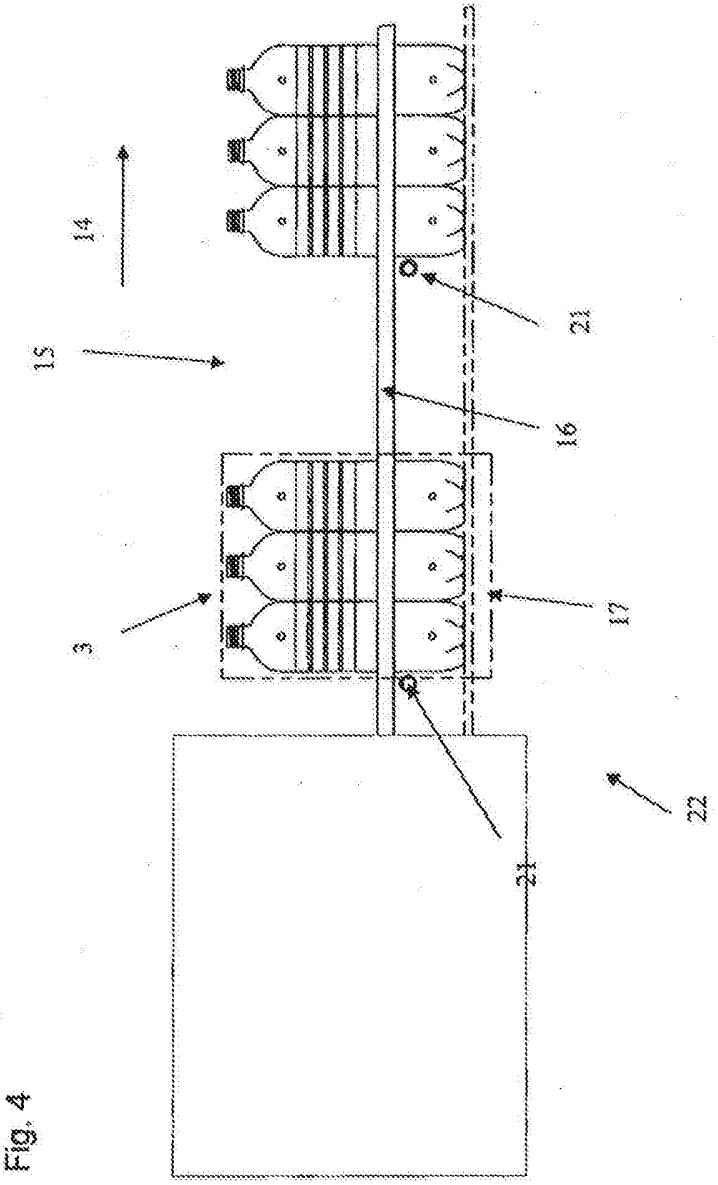


Fig. 4

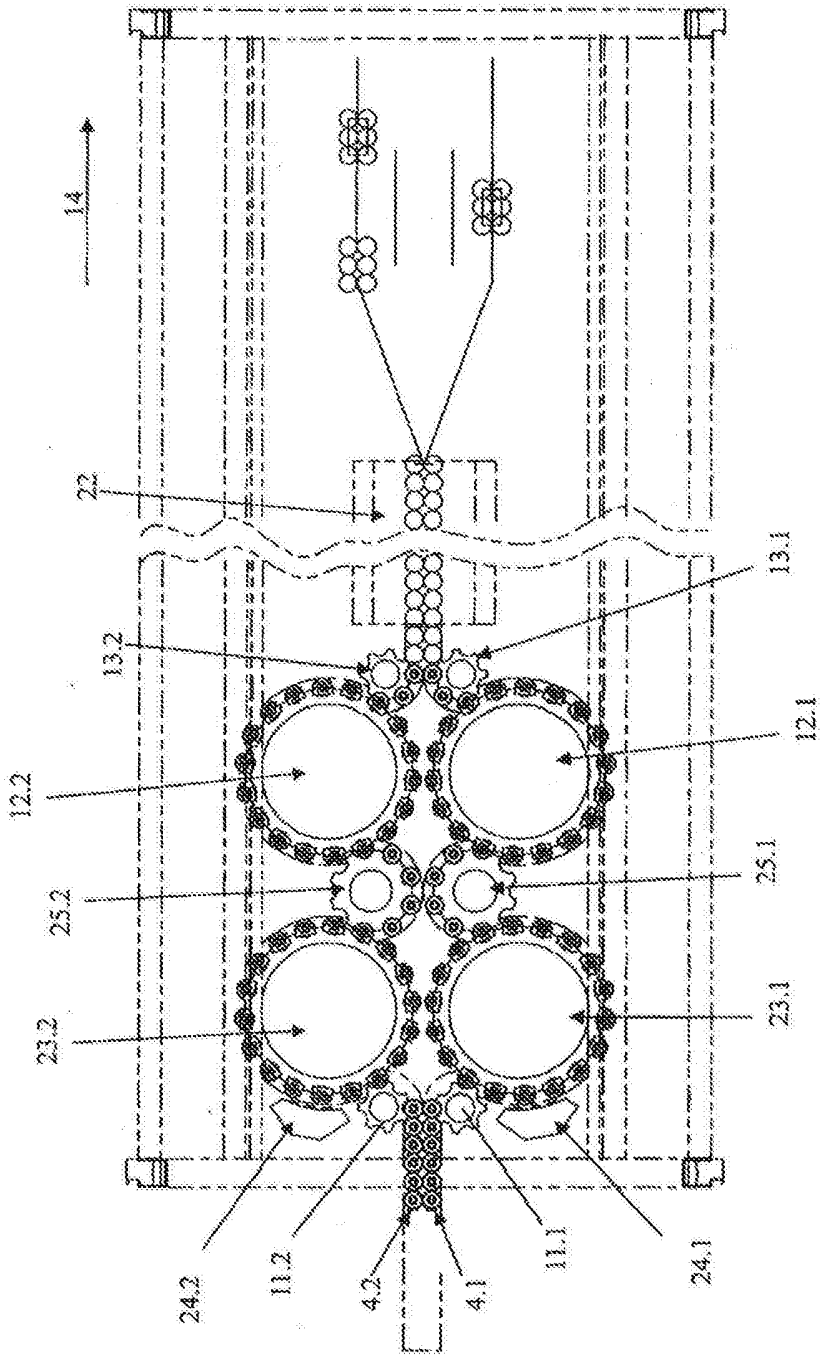


Fig. 5

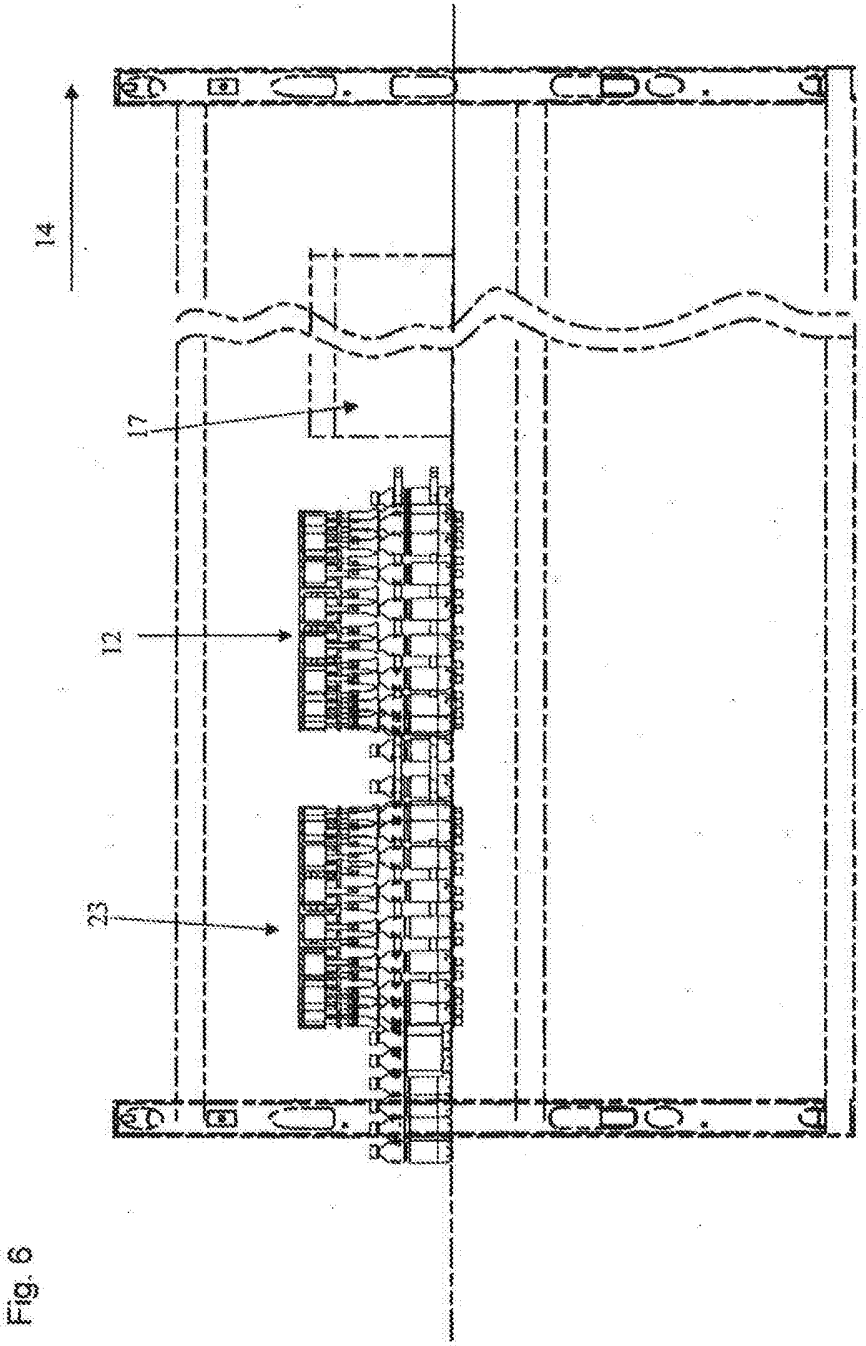


Fig. 6

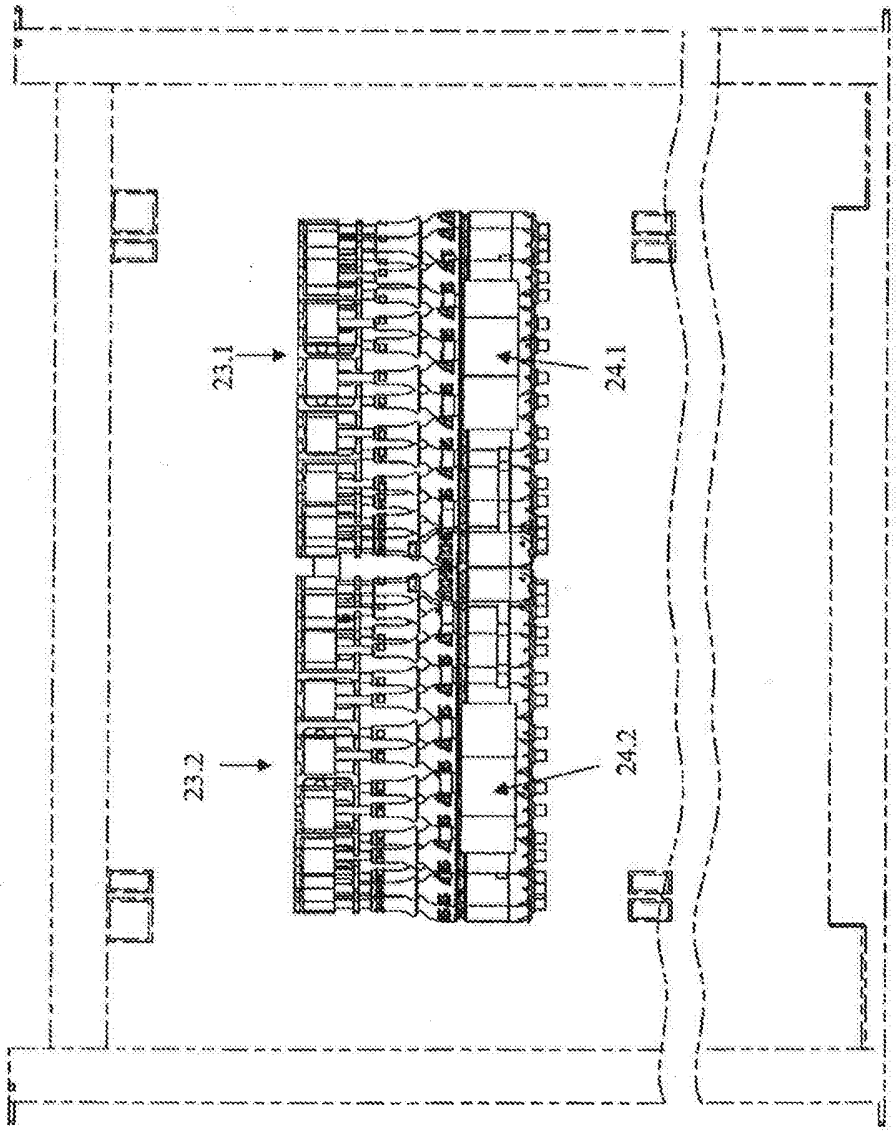


Fig. 7

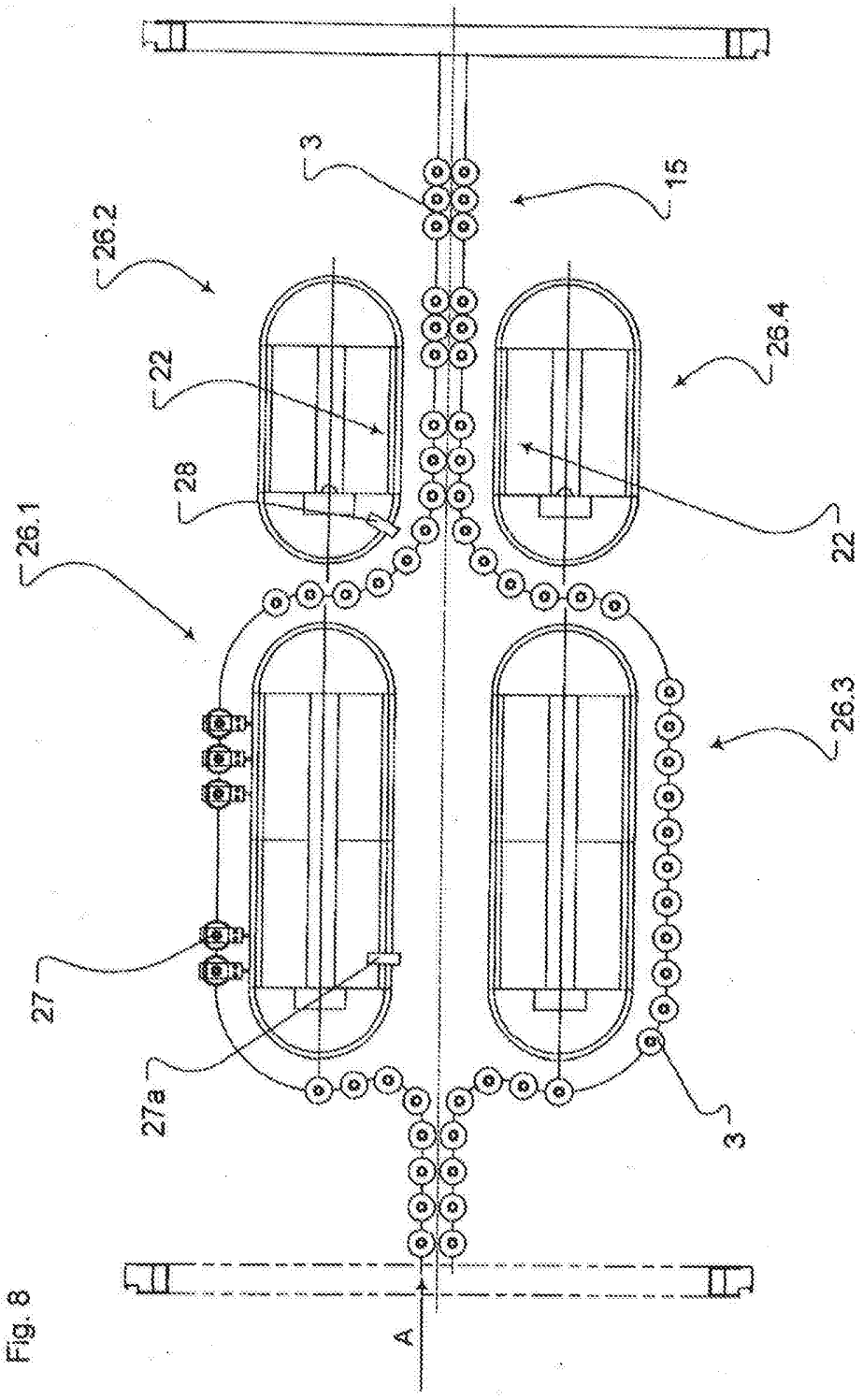


Fig. 8

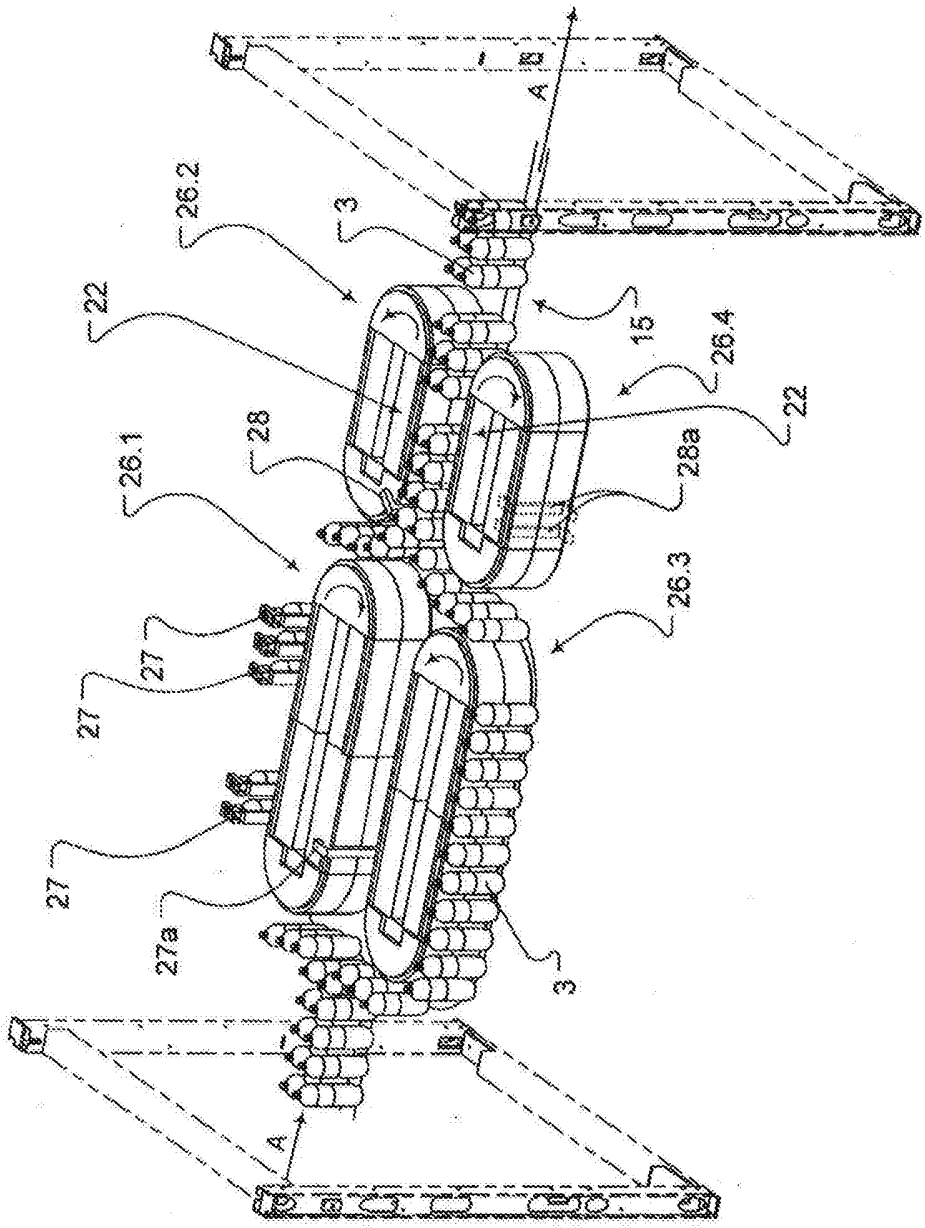


Fig. 9