EUROPEAN PATENT SPECIFICATION

A CONTAINER ORIENTING HOLDER WITH ROLLER SUPPORTS AND A CONTAINER ORIENTING METHOD

BEHÄLTERAUSRICHTUNGSHALTER MIT STÜTZROLLEN UND BEHÄLTERAUSRICHTUNGSVERFAHREN

PORTE-RÉCIPIENT D’ORIENTATION DOTÉ DE SUPPORTS DE CYLINDRES ET PROCÉDÉ D’ORIENTATION DE RÉCIPIENT

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Description

Background of the Invention

[0001] This invention relates to an orienting holder for containers that are being processed on an automated processing line. This invention also relates to a method of holding a container at a particular orientation on a container processing line. More particularly this invention relates to a holder that stabilizes and moves a container along a processing line, such as a filling line, and in addition holds the container in a preset orientation throughout processing. This will allow the container to be in the proper orientation with regard to applying a closure and for any subsequent operations.

[0002] HOLDERS, such as pucks, are used in the manufacturing of a variety of products. However, a main use is in the filling and handling of containers. Many containers are filled with a product on an automated filling line. These filling lines operate at filling speeds of 50 to 300 containers per minute or more. The containers if substantially rectangular can move along the filling line without a holder by each container being stabilized by the trailing container. In order to maintain such containers in the proper orientation the containers will have bumping flats. These are flat areas on containers where the container will be in contact, one to the other. This will prevent a “shingling” of the containers on the filling line. However, for containers of unstable, unique or decorative shapes, or for containers which are substantially circular in cross-section, a holder usually will be used. This particularly is the case where the container subsequent to the filling must be maintained in a particular orientation for applying a closure, labeling, case packing or for some other operation. A holder also will properly orient the container with regard to a filling line filling nozzle. This will prevent filling errors and spills on the filling line.

[0003] Pucks are a type of holders for containers and are available in various shapes and types. The type and shape will be dictated by the shape of the container being filled and the requirements of the filling line. In general pucks will have a base which is adapted to fit onto the filling line and an inner area for placement of the container. This inner area can be a recess within the puck into which the container will fit. The puck can have a surrounding wall that extends only around the base of the container or that substantially encloses the container. In addition the puck can be comprised of the base and only two upwardly extending arms to support the container.

[0004] This type of puck is known as a “goal post” or a “labeling” puck. A variety of such pucks are available from suppliers such as Advantage Pucks Technologies of Corry, Pennsylvania.

[0005] Although these prior art documents disclose various structures for pucks and various holders, nevertheless there is a need in the art for improved orienting holders for containers which are to be processed on a line such as a filling line. In particular, there is still a need for an orienting holder which can provide for the effective handling of containers on a filling line, and in particular containers of a unique shape such as those having a substantially circular cross-section.

[0006] The invention aims at least partially to solve the problem of reliably and securely holding the container in its initial set orientation with regard to its surface bearing the primary graphics while moving along the filling line and while a non-round closure is being attached, such as a closure having a combined pump dispenser.

[0007] There is also a need in the art for an orienting holder which can reliably and securely prevent the container from rotating while on the filling line, in particular in an application in which a spout of each successively attached pump dispenser of a series of containers will need to be in a set orientation with regard to the container graphics, and each container needs to have the spout of the attached pump dispenser in the same orientation for subsequent operations such as case packing.

[0008] Further, there is also a need in the art for an orienting holder which can provide uniformity of the container structure and labeling which in turn can provide for a neater product array when a number of identical products are displayed on a store shelf.

[0009] Also, there is a need in the art for an orienting holder which can provide the ability to quickly insert and to remove containers from the orienting holders and the filling line for case packing.
Finally, there is a need in the art for a low cost solution for improved round container handling on a processing line such as a filling line.

**BRIEF SUMMARY OF THE INVENTION**

Accordingly, a first aspect of the invention provides an orienting holder for holding a container in a desired orientation on a container processing line, the orienting holder being as defined in claim 1.

The invention is directed to an orienting holder for containers. The unit is adapted to hold the container in an upright orientation when the base portion is horizontally oriented. This is a holder that in addition to moving a container along a processing line, such as a filling line, will in addition maintain the container in an initial set orientation during such processing. This orienting holder comprises a unit having at least two rollers, the unit having a base portion, the rollers being connected to the base portion and in contact with the container to be processed on its exterior surface, the rollers in one preferred embodiment being compressible material rollers.

The rollers may be on arms attached to the base portion, and in another preferred embodiment contact the container at an upper part of the container. There may be at least two arms with at least one roller on each arm. The arms optionally can flex or rotate whereby the rollers can move towards and away from the container. The arms, by flexing or rotating, can increase or decrease the contact pressure against the container.

The at least two positions located around the cavity may comprise positions on opposite sides of the cavity, and/or may comprise only two opposite positions. Typically, the at least two positions located around the cavity are positioned so that the rollers at least partly surrounding the cavity temporarily capture a container disposed therein. The rollers may be adapted to provide an inwardly and downwardly oriented holding force on a container disposed in the cavity. Optionally, there is a structure on the base portion adapted to interact with the container processing line. The structure may define forward and rearward ends of the unit, and the at least two positions located around the cavity may comprise positions on opposite sides of the unit, the sides extending between the forward and rearward ends.

The present invention also provides, in a second aspect, a container processing line comprising a series of orienting holders according to the first aspect of the present invention.

The present invention also provides, in a third aspect, a method of holding a container at a particular orientation on a container processing line, the method being as defined in claim 14.

The rollers may be comprised of elastic materials. The elastic materials may include elastomers. Elastomers are inclusive of polymeric foams. Polymeric foams are a type of a compressible material. In one embodiment the rollers have a plurality of channels to enhance the elasticity and/or the compressibility of the rollers. In another embodiment the rollers are of a continuous structure with no channels. In a further embodiment the rollers have a modified outer surface to enhance contact with the container. The elastomer can be a natural or a synthetic material such as natural or synthetic rubbers, a polymer or copolymer containing ethylene units, a polymer or copolymer containing propylene units or a polymer or copolymer containing butylene units. When a polymeric foam is used the elastomer can be a polyurethane foam, a polyethylene foam, an ethylene-vinyl acetate foam, or a polypropylene foam.

The rollers may have a stiffness factor of about 0.8N to about 80N per 4mm deflection, and preferably about 3 to about 18N per 4mm deflection. As a result rollers can be chosen from these ranges to suit the needs for a particular container. This increases the versatility of the holders which can then be used for various shaped containers.

The holder according to the preferred embodiments of the present orienting holder can provide for the effective handling of containers on a filling line, and in particular containers of a unique shape such as those having a substantially circular cross-section. It solves the problem of holding the container in its initial set orientation with regard to its surface bearing the primary graphics while moving along the filling line and while a non-round closure is being attached, such as a closure having a combined pump dispenser. The holders prevent the containers from rotating while on the filling line. Additionally, in many instances the spout of each pump dispenser will need to be in a set orientation with regard to the container graphics, and each container needs to have the spout of the attached pump dispenser in the same orientation for subsequent operations such as case packing. Further, it provides for a neater product array when displayed on a store shelf. Also provided is the ability to quickly insert and to remove containers from the orienting holders and the filling line for case packing.

These advantages and technical effects may all be accomplished by a holder having rollers in contact with the container surface. The rollers may be comprised of an elastic material, and in one preferred embodiment, are comprised of a compressible elastic material. Elastic materials are those that can deform upon the application of a force, but which will likewise substantially regain their original shape. Compressible materials are a type of elastic material which have a higher degree of deformation upon the application of a force but which will likewise substantially regain their original shape upon the removal of the force. The rollers by rotating will minimize the required inserting and removing forces, and by being in contact with the container will hold the container in an initial set orientation while on the filling line. The use of holders with rollers provides for these significant advantages over other holders. The use of compressible rollers provides for an enhancement of these advantages. These are low cost solutions for im-
proven round container handling.

**Brief Description of the Drawings**

- Figure 1 is a front elevation view of an orienting holder according to a first embodiment of the present invention, the holder being shown in combination with a container, the base portion of the holder showing part of the inner structure of the holder.

- Figure 2 is a right side elevation view of the holder of Figure 1, the base portion showing part of the inner structure.

- Figure 3 is a top plan view of the holder of Figure 1.

- Figure 4 is a cross-sectional view of the holder of Figure 1 along line 4-4 of Figure 3, the base portion showing part of the inner structure.

- Figure 5 is a cross-sectional view of the holder of Figure 4 without the container.

- Figure 6 is a right side view of the holder of Figure 4, the base portion showing part of the inner structure.

- Figure 7 is a top plan view of the holder of Figure 1 without the container.

- Figure 8 is a bottom plan view of the holder of Figure 1 without the container.

- Figure 9 is a front elevation view of an orienting holder according to a second embodiment of the present invention, the holder being shown in combination with a container, the base portion in section showing part of the inner structure of the holder, the arms holding the compressible rollers being pivotally adjustable.

- Figure 10 is a cross-sectional view of the holder of Figure 10 along line 11-11 of Figure 10 without the container, the base portion showing part of the inner structure.

- Figure 11 is a perspective view of a first compressible roller with channels for use in any of the embodiments of the orienting holder of the present invention.

- Figure 12 is a perspective view of a second alternative compressible roller with an enhanced gripping surface for use in any of the embodiments of the orienting holder of the present invention.

- Figure 13 is a perspective view of a third alternative compressible roller with an enhanced gripping surface for use in any of the embodiments of the orienting holder of the present invention.

**Detailed Description of the Invention**

- The invention will now be described in its preferred embodiments with reference to the attached drawings. It is to be understood that the preferred embodiments disclose a concept for a novel holder that can be subject to modifications for adaption to specific environments and particular uses. All such modifications are deemed to be within the present concept.

- Figure 1 shows the orienting holder 10 in combination with a container in front elevation with part of the inner structure the base portion 12 of the holder 10 in dashed lines. The base portion 12 has a bottom surface 11. Shown are holder first side wall 23 and holder second side wall 24. Arm 15 is attached to the inner surface of first side wall 23 and arm 16 is attached to the inner surface of second side wall 24. Arm 15 supports a roller 18 and arm 16 supports another roller 18. Typically, the arms 15, 16 are rigid, or flexible, and the rollers 18 are compressible. Each roller 18 rotates on an axle 19 which has a fastener 17 to maintain the axle on its respective arms. Each roller 18 is mounted at a common height above the base portion 12. Shown as a part of the base portion 12 is a holder cup 20 and vertical supports 43 and 45. Also shown in a lower part 13 of the front wall 22 of the base portion 12 is a slot 14. The slot 14 interacts with a projection on a processing line to maintain the holder on the processing line. The processing line usually will be a filling line.

- Also shown in this view is a container 30 supported in holder cup 20. The container is received in a cavity defined above the holder cup 20.

- The container has an enclosing surface 31 and a closure 32. The closure 32 has an attached pump dispenser comprised of an actuator 34 with a spout 33, a pump body 37 and a dip tube 35. The product in the container 30 will exit the container through spout 33. The closure 32 is attached to the neck of the container by mating threads 36 which are on both the closure and the container. Essentially any conventional pump dispenser can be used.

- Figure 2 is a right side elevation view of the base portion 12 with container 30 of Figure 1. Shown is base portion front wall 22 and rear wall 21. The lower part 13 of the base portion 12 has slots 14 for interacting with a structure of the processing line. The container 30 is supported in holder cup 20. The roller 18 is supported within arm 16 which has two support parts for the axle 19. Another roller 18 is similarly supported by arm 15. Optionally the arms 15 and 16 can be of a one piece construction solely with an opening for the mounting of the rollers. The axles 19 with the rollers 18 are secured to arms 15 and 16 by fasteners 17. The container 30 has the same components as in Figure 1 and will not be described with
regard to this view.

[0027] Figure 3 is a top plan view of the holder 10 of Figure 1. Shown is the base portion 12 with front wall 22, rear wall 21, first side wall 23 and second side wall 24. Vertical supports 43 and 45 reinforce each of the front and rear walls 22, 21. Arms 15 and 16 reinforce first side wall 23 and second side wall 24 respectively as well as serving as mounting structures for the rollers 18 when attached to these side walls 23, 24. As an alternative, the arms 15, 16 can be attached to the bottom wall 11 of the base portion 12. The rollers 18 are supported on arms 15 and 16 by their respective axles 19 and fasteners 17. Horizontal supports 40 and 42 disposed beneath the holder cup 20 and extending between the first side wall 23 and second side wall 24 provide support for lower parts of the vertical supports 43 and 45 which extend inwardly form the which in turn support the holder cup 20. The container 30 has the same components as in Figure 1 and will not be described in detail with regard to this view.

[0028] Figure 4 is a front cross-sectional view of the holder 10 and container 30. Figure 5 is the same cross-sectional view but without the container 30. The container 30 has the same components as in Figure 1 and will not be described in detail with regard to this view. The holder cup 20 has a bottom wall 25 with an aperture 26 to assist in unloading the container from the holder. During such an unloading step, an ejection pin (not shown) moves up through the aperture 26 to contact the container 30 and move the container 30 upwards. The rollers 18 are shown as having a plurality of channels 27. The channels 27 extend substantially radially outwardly, the channels preferably being arcuate and arranged in a spiral configuration, from a radially central part 129 of the roller 18 adjacent to the axle 19 to an outer circumferential surface 29 of the roller 18. These channels 27 function to increase the degree of compression, in a substantially radial direction, of the roller 18 during contact with the container wall 31. In this view, the surface 29 of the rollers 18 is shown as compressed against the container surface 31. The structure of the base portion 12 is described in detail in the description of the prior Figures. It has a first side wall 23 and a second side wall 24. There is a slot 14 for interaction with a processing line structure. Vertical supports 43 and 45 reinforce the front wall 22 and rear wall 21.

[0029] Figure 6 is a right side view of the holder 10 with the container 30 removed. The base portion 12 is shown with lower part 13 with slot 14 for interaction with the processing line. Shown is the front wall 22, the rear wall 21 and the holder cup 20 with bottom wall 25. Also shown are vertical reinforcing supports 43, 45. The roller 18 has a surface 29 and is mounted to arm 16 by axle 19 and fastener 17.

[0030] Figures 7 and 8 are top and bottom plan views respectively of the base portion 12. In each view there is shown front wall 22, rear wall 21, first side wall 23 and second side wall 24. Holder cup 20 is shown with bottom wall 25 which has an aperture 26. The holder cup 20 is supported by inwardly located ends of lower portions of the reinforcing supports 43, 45 and of the arms 15, 16. The rollers 18 are supported by arms 15 and 16. The rollers have a surface 29 which will contact the container surface 31. The rollers rotate on axle 19 which has a fastener 17 to attach it to an arm 15 or 16.

[0031] Figures 9 and 10 are elevation views, in partial section, showing an additional embodiment of the orienting holder of the invention.

[0032] Figure 9 shows the embodiment of the orienting holder 10 with a container 30 and Figure 10 without the container 30. In this embodiment the rollers 18 are not in a fixed relationship relative to the base portion 12, and consequently to the container 30 when in use, but rather are movable relative to the base portion 12 and the container 30. The rollers 18 also are adjustable relative to the container 30.

[0033] The base portion 12 is similar to that for the embodiment of Figures 1 to 8. The difference primarily is in the structure for holding the rollers 18. The base portion 12 has first and second side walls 23 and 24 respectively. The lower part 13 has slot 14 for interaction with the processing line. The holder cup 20 has side wall 23 and lower wall 25 with aperture 26. Vertical supports 43 and 45 reinforce front wall 22 and rear wall 21. In this embodiment, the rollers 18 have the same construction as described for the first embodiment of figures 1 to 8.

[0034] The rollers 18 are attached to movable arms 47 and 48, each being mounted at a respective opposite side of the base portion 12, adjacent to and inwardly of a respective side wall 23, 24. The rollers 18 constitute upper rollers 18 and are attached to respective upper ends 100 of arms 47 and 48 by axes 19 and fasteners 17. The arms 47 and 48 pivot on fasteners 49, a central part 102 of each arm 47, 48 being mounted to a respective fastener 49 which constitutes a pivot mount for the respective arm 47, 48. Each fastener 49 is located substantially at an elbow 104 of the respective arm 47, 48, the elbow 104 being the junction of upper and lower portions 106, 108 of the arm 47, 48. The concave side of the elbow 104 is directed inwardly from the respective side wall 23, 24, and oriented towards the container 30 in use. Pivoting arm 47 is attached to support brace 55 by fastener 49, support brace 55 being disposed at the inner surface of first side wall 23. Pivoting arm 48 is attached to support brace 56 by another fastener 49, support brace 56 being disposed at the inner surface of second side wall 24. The lower end 110 of each arm 47, 48 has mounted thereon a respective lower roller 50. The lower roller 50 is rotationally supported on an axle 53. Each upper roller 18 is mounted at a common first height above the base portion 12 and each lower roller 50 is mounted at a common second height above the base portion 12.

[0035] The lower roller 50 in this embodiment has the same construction as that of the upper roller 18, in particular is compressible and provided with a plurality of
substantially radially directed channels 51, which are arcuate and spirally arranged. The arms 47, 48, each carrying a respective upper and lower roller 18, 50 pair, can pivot about fastener 49 so that the upper and lower rollers 18, 50 can move in the same rotational direction but opposite translational directions with respect to the respective side wall 23, 24, and the container 30 in use. The upper roller 18 can contact an upper surface of the container 30 while the lower roller 50 contacts a lower surface of the container 30 and/or the exterior surface 38 of holder cup 20. In this way, by providing pairs of upper and lower rollers on opposite sides of the container to be held, some variations in the shape of the containers 30 can be accommodated by the same orienting holder 10. Also, the container 30 is more securely held within the orienting holder 10.

[0036] Figures 11 to 13 show three respective alternative constructions for the rollers 18, 50 for use in the embodiments of the present invention. The various roller constructions described may be used independently or in any combination, either for the opposite sides of the orienting holder and/or for the upper and lower rollers.

[0037] Figure 11 is an enlarged view of the compressible roller 18 of the embodiment of Figures 1 to 8. The same construction may be provided for upper and lower rollers 18, 50 of the embodiment of Figures 9 and 10. The roller 18 has a central shaft opening 39 for an axle. There is a peripheral circumferential outer surface 29. The outer surface 29 and the axle opening 39 are circular in cross-section. A plurality of spirally arranged arcuate channels 27 is provided in the roller, each extending between opposed inner and outer channel ends 130, 131 from the radially central part 129 to the circumferential outer surface 29 of the roller 18. Each channel 27 has a longitudinal direction extending in an axial direction through the roller 18. The substantially radially oriented channels 27 enhance the compressibility of the roller 18 when the outer surface 29 is compressed, for example by contact with the outer surface of the container 30 in a substantially radial direction. The roller 18 can also rotate in order to more readily be deformed by compression when rolled against the container surface when the container 30 is inserted into or removed from the orienting holder 10.

[0038] Figure 12 illustrates an alternate roller to that of Figure 11. This roller 60 is a solid roller composed of an elastic and compressible material which is not provided with channels. Roller 60 has a central opening 61 for an axle (not shown). The roller 60 has a continuous region 63 between the opening 61 and the peripheral surface 62. The peripheral surface 62 may have, as illustrated, an irregular three-dimensional relief profile 64 on at least a part of the surface 62. The relief profile 64 may comprise ridges and/or grooves, typically extending circumferentially around the surface 62, so that the surface 62 may resemble that of a vehicle tire. This relief profiling can enhance the gripping of a container 30 by the roller 60 as the container 30 is inserted into or removed from the holder 10.

[0039] Figure 13 illustrates a further alternate roller. The roller 70 is again solid, as the roller of Figure 12, and has a continuous region 73 between the axle opening 71 and the peripheral surface 72. The peripheral surface 72 has an undulating surface with hills and valleys, the undulations being oriented in an axial direction of the roller 70. This likewise can enhance the gripping of a container 30 by the roller 70 as the container 30 is inserted into or removed from the holder 10.

[0040] The rollers 18, 50, 60, 70 are elastic and are composed of an elastic material such as an elastomer, for example a polymeric foam. The polymeric foam may be an open cell or closed cell foam. Categories of elastomers are compressible to varying degrees depending on their stiffness. The rollers 18, 50, 60, 70 preferably exhibit at least some compressible deformation at the point of contact with the container 30, or the holder cup 20 for the lower roller 50, in order to better hold the container 30 and to accommodate variations in container shapes. The rollers 18, 50, 60, 70 regain their original shape upon the removal of the deforming force since they are composed of elastically deformable material.

[0041] The elastomer may form a solid body, with or without pores, and may contain additives to adjust the elasticity. Elastomeric polymers that are useful for the rollers include natural and synthetic rubbers, ethylene polymers and copolymers, propylene polymers and copolymers, and butylene polymers and copolymers. Elastomeric polymers, in particular suitable for forming foams, are well known to those skilled in the art. Useful elastomeric foams are polyurethane foams, ethylene-vinyl acetate foams, and expanded polyethylene foams and expanded polypropylene foams. Closed cell foams are preferred since they are more easily maintained in processing operations because there are no open cells to absorb contaminants or liquid debris. Durable elastomer materials, such as polyurethanes, are generally preferred. Such materials have good wear resistant properties while retaining compressibility. This results in less processing line maintenance. Elastic materials further have the advantage that they can automatically adjust to imperfections in a container surface.

[0042] Depending on the degree of the imperfections rollers composed of a solid elastomer or a foam elastomer may be sufficient to effectively hold the container in the set orientation. However, where the imperfections can be more significant, elastomers with channels may be preferred since they will more readily conform into the imperfections to grip and hold the container in the set orientation. The channels can be of essentially any shape and size. The selected shape and size depend on the particular elastomer and the degree of compressibility desired. The objective in the use of channels is to increase the compressibility of elastomers, such as durable elastomers. Channels can also be used with foam elastomers. As a result rollers can be chosen for a particular container shape. Thus the holders are versatile and can
be used for differing container shapes through the selection of the best rollers for a container.

The rollers preferably have a stiffness factor of about 0.8N to about 80N per 4mm deflection, and preferably about 3N to about 18N per 4mm deflection (N = Newtons). The stiffness factor is determined using an Instron test machine, such as an Instron 4301. The rollers with the axles in place are placed between two flat plates. The upper plate is attached to the head of the Instron test machine and is lowered at a rate of 12.7mm per minute for a distance of 4mm. The surface a roller is deflected against each surface. The deflection force required is indicated directly by the Instron test machine.

In the use of the holder 10 there are a plurality of these holders 10 fitted onto a container processing line, such as a container filling line. While the line is operating continuously, the empty containers to be filled are inserted into the holders. The containers are inserted into the holders in a set orientation. It is important that the containers retain this orientation throughout the container filling step until removal of the containers from the filling line. The grip of the rollers onto the containers is maintained throughout the filling process, and any preliminary or subsequent processing steps, prior to removal of the container from the processing line.

Claims

1. An orienting holder (10) for holding a container in a desired orientation on a container processing line, the orienting holder (10) comprising a unit having a base portion (12) for supporting a container disposed thereon, a cavity for receiving a container and at least two supports located around the cavity for engaging an exterior surface of a container received within the cavity, at least one of the supports being located at an upper end (100) thereof and a lower roller (50,60,70) mounted at a position adapted to permit the roller (18,60,70) to contact an upper portion of the container disposed on the base portion (12), or the arm (15,16,47,48) is rigid and the roller (18,60,70) is compressible, or the arm (15,16,47,48) is flexible and the roller (18,60,70) is compressible.

2. An orienting holder (10) as in claim 1 wherein at least one of the rollers (18,50,60,70) is composed of an elastic material, optionally an elastomer, further optionally wherein the elastomer is composed of a polyurethane or a polymeric foam.

3. An orienting holder (10) as in claim 2 wherein the elastic material has a stiffness factor of 0.8 N to 80N per 4mm deflection, optionally wherein the elastic material has a stiffness factor of 3N to 18N per 4mm deflection.

4. An orienting holder (10) as in claim 1 wherein at least one of the rollers (18,50) has a plurality of substantially radially oriented channels (27).

5. An orienting holder (10) as in claim 1 wherein an outer circumferential surface (62,72) of at least one of the rollers (60,70) has an enhanced gripping surface.

6. An orienting holder (10) as in claim 5 wherein the enhanced gripping surface comprises a threedimensional relief profile (64) on at least a part of the outer circumferential surface (62), optionally wherein the relief profile (64) comprises at least one of a circumferential ridge and a circumferential groove extending around the outer circumferential surface (62); or wherein the enhanced gripping surface comprises surface undulations, the undulations being oriented in an axial direction of the roller (70).

7. An orienting holder (10) as in claim 1 wherein the rollers (18,50,60,70) are rotationally mounted on arms (15,16,47,48) that project upwardly from the base portion (12); optionally wherein each roller (18,60,70) is mounted on an upper end of a respective arm (15,16,47,48); further optionally wherein each roller (18,60,70) is mounted at a position adapted to permit the roller (18,60,70) to contact an upper portion of the container disposed on the base portion (12), or the arm (15,16,47,48) is rigid and the roller (18,60,70) is compressible, or the arm (15,16,47,48) is flexible and the roller (18,60,70) is compressible.

8. An orienting holder (10) as in claim 7 wherein each roller (18,60,70) is mounted at a common height above the base portion (12).

9. An orienting holder (10) as in claim 7 wherein each arm (47,48) has an upper roller (18,60,70) mounted at an upper end (100) thereof and a lower roller (50,60,70) mounted at a lower end (110) thereof, and a central part (102) of the arm (47,48) is pivotally mounted to the unit; optionally wherein the central part (102) of the arm (47,48) includes an elbow (104), a concave side of the elbow (104) being directed toward the cavity, or the upper roller (18,60,70) is mounted at a position adapted to permit the upper roller (18,60,70) to contact an upper portion of the container disposed on the base portion (12) and the lower roller (50,60,70)
is mounted at a position adapted to permit the lower roller (50,60,70) to contact a lower portion of the container disposed on the base portion (12), or each upper roller (18,60,70) is mounted at a common first height above the base portion (12) and each lower roller (50,60,70) is mounted at a common second height above the base portion (12).

10. An orienting holder (10) as in claim 1 wherein the at least two positions located around the cavity comprise positions on opposite sides of the cavity; or wherein the at least two positions located around the cavity comprise only two opposite positions; or wherein the at least two positions located around the cavity are positioned so that the rollers (18,50,60,70) at least partly surrounding the cavity temporarily capture a container disposed therein, optionally wherein the rollers (18,60,70) are adapted to provide an inwardly and downwardly oriented holding force on a container disposed in the cavity.

11. An orienting holder (10) as in claim 1 wherein the base portion (12) includes a holder cup (20) for receiving a base of a container; or wherein the unit is adapted to hold the container in an upright orientation when the base portion (12) is horizontally oriented.

12. An orienting holder (10) as in claim 1 wherein there is a structure (14) on the base portion (12) adapted to interact with the container processing line, optionally wherein the structure defines forward and rearward ends of the unit, and the at least two positions located around the cavity comprise positions on opposite sides of the unit, the sides extending between the forward and rearward ends.

13. A container processing line comprising a series of orienting holders (10) according to any preceding claim.

14. A method of holding a container (30) at a particular orientation on a container processing line, the method comprising the steps of: locating a container (30) on a base portion (12) of a unit of an orienting holder (10) mounted on a processing line and holding an exterior surface of a portion of the container (30) between opposed supports of the unit mounted above the base portion (12), the supports holding the container (30) at a particular orientation; characterized in that each support is a roller (18,50,60,70).

15. A method as in claim 14 wherein the container (30) is held at an upright orientation when the base portion (12) is horizontally oriented; or wherein a lower portion of the container (30) is received in a cavity and an upper portion of the container (30) is held between the opposed rollers (18,50,60,70); or wherein the rollers (18,50,60,70) are at least partly elastically compressed when engaging the container (30).

16. A method as in claim 14 wherein the rollers (18,50,60,70) are rotationally mounted on arms (47,48) that project upwardly from the base portion (12), and the arms (47,48) rotate towards the container (30) to hold the container (30) by the rollers (18,50,60,70) thereon.

17. A method as in claim 16 wherein each roller (18,60,70) is mounted at a common height above the base portion (12).

18. A method as in claim 16 wherein each roller (18,60,70) is mounted at a position adapted to permit the roller (18,60,70) to contact an upper portion of the container (30) disposed on the base portion (12); optionally wherein each arm (47,48) has an upper roller (18,60,70) mounted at an upper end (100) thereof and a lower roller (50,60,70) mounted at a lower end (110) thereof, and a central part (102) of the arm (47,48) is pivotally mounted to the base portion (12); further optionally wherein the upper roller (18,60,70) is mounted at a position adapted to permit the upper roller (18,60,70) to contact an upper portion of the container (30) disposed on the base portion (12) and the lower roller (50,60,70) is mounted at a position adapted to permit the lower roller (50,60,70) to contact a lower portion of the container (30) disposed on the base portion (12), or wherein each upper roller (18,60,70) is mounted at a common first height above the base portion (12) and each lower roller (50,60,70) is mounted at a common second height above the base portion (12).

19. A method as in claim 14 wherein the rollers (18,50,60,70) are located at two opposite positions and engage opposite sides of the container (30); or wherein the container (30) has a circular cross-section; or wherein the container (30) is held in an upright orientation by the rollers (18,50,60,70) during filling of the container with a product.

Patentansprüche

1. Ein Ausrichtungshalter (10), um einen Behälter auf einer Behälterverarbeitungslinie in gewünschter Ausrichtung zu halten, wobei der Ausrichtungshalter (10) eine Einheit umfasst, die einen Basisabschnitt (12) zum Unterstützen eines darauf abgesetzten Behälters, eine Aushöhlung zum Aufnehmen eines Be-
hälters und mindestens zwei um die Aushöhlung herum angeordnete Stützen umfasst, um eine Außenfläche eines in der Aushöhlung abgesetzten Behälters zu erfassen, wobei sich mindestens eine der Stützen in einer von mindestens zwei Positionen im Umkreis der Aushöhlung befindet; dadurch gekennzeichnet, dass jede Stütze eine Rolle (18, 50, 60, 70) ist.

2. Ein Anspruch 1 entsprechender Ausrichtungshalter (10), wobei mindestens eine der Rollen (18, 50, 60, 70) aus einem elastischen Material, wahlweise einem Elastomer, besteht, wobei das Elastomer wahlweise aus einem Polyurethan- oder Polymerschaumstoff besteht.

3. Ein Anspruch 2 entsprechender Ausrichtungshalter (10), dessen elastisches Material einen Steifigkeitsfaktor von 0,8 N bis 80 N pro 4 mm Durchbiegung bzw. wahlweise einen Steifigkeitsfaktor von 3 N bis 18 N pro 4 mm Durchbiegung hat.

4. Ein Anspruch 1 entsprechender Ausrichtungshalter (10), wobei mindestens eine der Rollen (18, 50) eine Vielzahl von wesentlich radial ausgerichteten Kanälen (27) aufweist.

5. Ein Anspruch 1 entsprechender Ausrichtungshalter (10), wobei mindestens eine der Rollen (60, 70) eine äußere Umfangsfläche (62, 72) mit griffiger Oberfläche aufweist.

6. Ein Anspruch 5 entsprechender Ausrichtungshalter (10), wobei die griffigere Oberfläche ein dreidimensionales Reliefprofil (64) auf einer äußeren Umfangsfläche (62) bzw. das Reliefprofil (64) wahlweise zumindest einen Umfangsgrat und eine Umfangsnut aufweist, die sich um die äußere Umfangsfläche (62) herum erstrecken; oder wobei die griffigere Oberfläche gewellt und die äußere Umfangsfläche (62, 72) mit griffiger Oberfläche aufweist.

7. Ein Anspruch 1 entsprechender Ausrichtungshalter (10), dessen Rollen (18, 50, 60, 70) rotationsfähig auf Armen (15, 16, 47, 48) montiert sind, die vom Basisabschnitt (12) nach oben hochragen; bzw. wobei jede Rolle (18, 50, 70) wahlweise auf einem oberen Ende eines jeweiligen Arms (15, 16, 47, 48) montiert ist; bzw. wobei jede Rolle ((18, 60, 70) wahlweise ferner in einer Position montiert ist, die gestaltet ist, um der Rolle (18, 60, 70) den Kontakt mit einem oberen Teil des auf dem Basisabschnitt (12) abgesetzten Behälters zu ermöglichen, oder wobei der Arm (15, 16, 47, 48) starr und die Rolle (18, 60, 70) kompressibel ist, oder wobei der Arm (15, 16, 47, 48) flexibel und die Rolle (18, 60, 70) kompressibel ist.

8. Ein Anspruch 7 entsprechender Ausrichtungshalter (10), wobei jede Rolle (18, 60, 70) auf einer gemeinsamen Höhe über dem Basisabschnitt (12) montiert ist.

9. Ein Anspruch 7 entsprechender Ausrichtungshalter (10), wobei am oberen Ende (100) eines jeden Arms (47, 48) eine obere Rolle (18, 60, 70) und am unteren Ende (110) eines jeden Arms eine untere Rolle (50, 60, 70) montiert ist, und wobei ein zentraler Teil (102) des Arms (47, 48) drehbar auf der Einheit montiert ist; bzw. wobei der zentrale Teil (102) des Arms (47, 48) wahlweise einen Ellbogen (104) umfasst und eine konkave Seite des Ellbogens (104) zur Aushöhlung hin gerichtet ist, oder wobei die obere Rolle (18, 60, 70) in einer Position montiert ist, die gestaltet ist, um der oberen Rolle (18, 60, 70) den Kontakt mit einem unteren Teil des auf dem Basisabschnitt (12) abgesetzten Behälters zu ermöglichen, und wobei die untere Rolle (50, 60, 70) in einer Position montiert ist, die gestaltet ist, um der unteren Rolle (50, 60, 70) den Kontakt mit einem unteren Teil des auf dem Basisabschnitt (12) abgesetzten Behälters zu ermöglichen, oder wobei jede obere Rolle (18, 60, 70) auf einer gemeinsamen ersten Höhe über dem Basisabschnitt (12) und jede untere Rolle (50, 60, 70) auf einer gemeinsamen zweiten Höhe über dem Basisabschnitt (12) montiert ist.

10. Ein Anspruch 1 entsprechender Ausrichtungshalter (10), wobei die zumindest zwei Positionen, die um die Aushöhlung herum angeordnet sind, Positionen auf gegenüberliegenden Seiten der Aushöhlung umfassen; oder wobei die zumindest zwei Positionen, die um die Aushöhlung herum angeordnet sind, nur zwei gegenüberliegende Positionen umfassen; oder wobei die zumindest zwei Positionen, die um die Aushöhlung herum angeordnet sind, derart positioniert sind, sodass die Rollen (18, 50, 60, 70), die die Aushöhlung zumindest teilweise umgeben, einen in ihr abgesetzten Behälter vorübergehend einfangen, wahlweise wobei die Rollen (18, 60, 70) gestaltet sind, um auf einen in der Aushöhlung abgesetzten Behälter eine nach innen und unten gerichtete Haltekraft auszuüben.

11. Ein Anspruch 1 entsprechender Ausrichtungshalter (10), dessen Basisabschnitt (12) einen Haltenapf (20) zur Aufnahme einer Behälterbasis umfasst; oder wobei die Einheit gestaltet ist, um den Behälter in einer aufrechten Ausrichtung zu halten, wenn der Basisabschnitt (12) horizontal ausgerichtet ist.

12. Ein Anspruch 1 entsprechender Ausrichtungshalter (10), dessen Basisabschnitt (12) eine Struktur (14) aufweist, die zur Interaktion mit der Behälterverar-
Ein Anspruch 16 entsprechendes Verfahren, bei dem
18.
Ein Anspruch 18 entsprechendes Verfahren, bei dem
17.
Ein Anspruch 16 entsprechendes Verfahren, bei dem
16.
Ein Anspruch 14 entsprechendes Verfahren, bei dem
15.
Eine Behälterverarbeitungslinie, die eine am vor-
14.
Ein Verfahren, um einen Behälter (30) auf einer Be-
13.
Eine Behälterverarbeitungslinie, die eine am vor-

Ein Anspruch 12 entsprechende Serie von Aus-
richtungshaltern (10) umfasst.

Ein Anspruch 14 entsprechendes Verfahren, bei dem

Ein Anspruch 13 entsprechendes Verfahren, bei dem

Ein Anspruch 12 entsprechendes Verfahren, bei dem

Revendications

1. Un porte-récipient d’orientation (10) pour maintenir un récipient dans une orientation désirée sur une chaîne de traitement de récipient, le porte-récipient d’orientation (10) comprenant une unité possédant une partie de base (12) pour supporter un récipient déposé sur celle-ci, une cavité pour recevoir un récipient et au moins deux supports situés autour de la cavité pour un engagement avec une surface extérieure d’un récipient reçu à l’intérieur de la cavité, au moins un des supports étant situé à une position respective d’au moins deux positions situées autour de la cavité; caractérisé en ce que chaque support est un cylindre (18, 50, 60, 70).

2. Un porte-récipient d’orientation (10) selon la revendication 1 dans lequel au moins un des cylindres (18, 50, 60, 70) est constitué d’une matière élastique, facultativement un élastomère, de plus facultativement dans lequel l’élastomère est constitué d’un polyuréthane ou d’une mousse polymère.

3. Un porte-récipient d’orientation (10) selon la reven-
Un porte-récipient d'orientation (10) selon la revendication 1 dans lequel au moins un des cylindres (18, 50) possède une pluralité de canaux orientés sensiblement radialement (27).

Un porte-récipient d'orientation (10) selon la revendication 1 dans lequel une surface circonférentielle extérieure (62, 72) d’au moins un des cylindres (60, 70) possède une surface de préhension améliorée.

Un porte-récipient d'orientation (10) selon la revendication 5 dans lequel la surface de préhension améliorée comprend un profil en relief tridimensionnel (64) sur au moins une partie de la surface circonférentielle extérieure (62), facultativement dans lequel le profil en relief (64) comprend au moins un rebord circonférentiel et une rainure circonférentielle s’étendant autour de la surface circonférentielle extérieure (62) ; ou dans lequel la surface de préhension améliorée comprend des ondulations de surface, les ondulations étant orientées dans une direction axiale du cylindre (70).

Un porte-récipient d'orientation (10) selon la revendication 1 dans lequel les cylindres (18, 50, 60, 70) sont montés en rotation sur des bras (15, 16, 47, 48) qui font saillie vers le haut à partir de la partie de base (12) ; facultativement dans lequel chaque cylindre (18, 60, 70) est monté sur une extrémité supérieure d’un bras respectif (15, 16, 47, 48) ; de plus facultativement dans lequel chaque cylindre (18, 60, 70) est monté à une position adaptée pour permettre au cylindre (18, 60, 70) de venir en contact avec une partie supérieure du récipient déposé sur la partie de base (12), ou le bras (15, 16, 47, 48) est rigide et le cylindre (18, 60, 70) est compressible, ou le bras (15, 16, 47, 48) est flexible et le cylindre (18, 60, 70) est compressible.

Un porte-récipient d'orientation (10) selon la revendication 7 dans lequel chaque cylindre (18, 60, 70) est monté à une hauteur commune au-dessus de la partie de base (12).

Un porte-récipient d'orientation (10) selon la revendication 7 dans lequel chaque bras (47, 48) possède un cylindre supérieur (18, 60, 70) monté à une extrémité supérieure (100) de celui-ci et un cylindre inférieur (50, 60, 70) monté à une extrémité inférieure (110) de celui-ci, et une partie centrale (102) du bras (47, 48) est montée de manière pivotante à l’unité ; facultativement dans lequel la partie centrale (102) du bras (47, 48) comprend un coude (104), un côté concave du coude (104) étant dirigé vers la cavité, ou le cylindre supérieur (18, 60, 70) est monté à une position adaptée pour permettre au cylindre supérieur (18, 60, 70) de venir en contact avec une partie supérieure du récipient déposé sur la partie de base (12) et le cylindre inférieur (50, 60, 70) est monté à une position adaptée pour permettre au cylindre inférieur (50, 60, 70) de venir en contact avec une partie inférieure du récipient déposé sur la partie de base (12), ou chaque cylindre supérieur (18, 60, 70) est monté à une première hauteur commune au-dessus de la partie de base (12) et chaque cylindre inférieur (50, 60, 70) est monté à une seconde hauteur commune au-dessus de la partie de base (12).

Un porte-récipient d'orientation (10) selon la revendication 1 dans lequel les au moins deux positions situées autour de la cavité comprennent des positions sur des côtés opposés de la cavité ; ou dans lequel les au moins deux positions situées autour de la cavité comprennent seulement deux positions opposées ; ou dans lequel les au moins deux positions situées autour de la cavité sont positionnées de manière à ce que les cylindres (18, 50, 60, 70) entourant au moins en partie la cavité capturent temporairement un récipient déposé à l’intérieur de celle-ci, facultativement dans lequel les cylindres (18, 60, 70) sont adaptés pour fournir une force de maintien orientée vers l’intérieur et vers le bas sur un récipient déposé dans la cavité.

Un porte-récipient d’orientation (10) selon la revendication 1 dans lequel la partie de base (12) comprend une coupelle de porte-récipient (20) pour recevoir une base d’un récipient ; ou dans lequel l’unité est adaptée pour maintenir le récipient dans une orientation à la verticale quand la partie de base (12) est orientée à l’horizontale.

Un porte-récipient d’orientation (10) selon la revendication 1 dans lequel chaque structure (14) existe sur la partie de base (12) adaptée pour interagir avec la chaîne de traitement de récipient, facultativement dans lequel la structure définit les extrémités avant et arrière de l’unité, et les au moins deux positions situées autour de la cavité comprennent des positions sur des côtés opposés de l’unité, les côtés s’étendant entre les extrémités avant et arrière.

Une chaîne de traitement de récipient comprenant une série de porte-récipient d’orientation (10) selon l’une quelconque des revendications précédentes.
14. Un procédé pour maintenir un récipient (30) à une orientation particulière sur une chaîne de traitement de récipient, le procédé comprenant les étapes de :
situer un récipient (30) sur une partie de base (12) d’une unité d’un porte-récipient d’orientation (10) montée sur une chaîne de traitement et maintenant une surface extérieure d’une partie du récipient (30) entre des supports opposés de l’unité montés au-dessus de la partie de base (12), les supports maintenant le récipient (30) à une orientation particulière ;
caractérisé en ce que chaque support est un cylindre (18, 50, 60, 70).

15. Un procédé selon la revendication 14 dans lequel le récipient (30) est maintenu dans une orientation à la verticale quand la partie de base (12) est orientée à l’horizontale ;
ou dans lequel une partie inférieure du récipient (30) est reçue dans une cavité et une partie supérieure du récipient (30) est maintenue entre les cylindres opposés (18, 50, 60, 70) ;
ou dans lequel les cylindres (18, 50, 60, 70) sont au moins en partie compressés de manière élastique lorsqu’ils engagent le récipient (30).

16. Un procédé selon la revendication 14 dans lequel les cylindres (18, 50, 60, 70) sont montés en rotation sur des bras (47, 48) qui font saillie vers le haut à partir de la partie de base (12), et les bras (47, 48) tournent vers le récipient (30) pour maintenir le récipient par les cylindres (18, 50, 60, 70) sur celui-ci.

17. Un procédé selon la revendication 16 dans lequel chaque cylindre (18, 60, 70) est monté à une hauteur commune-au-dessus de la partie de base (12).

18. Un procédé selon la revendication 16 dans lequel chaque cylindre (18, 60, 70) est monté à une position adaptée pour permettre au cylindre (18, 60, 70) de venir en contact avec une partie supérieure du récipient (30) déposé sur la partie de base (12) ;
facultativement dans lequel chaque bras (47, 48) possède un cylindre supérieur (18, 60 70) monté à une extrémité supérieure (100) de celui-ci et un cylindre inférieur (50, 60, 70) monté à une extrémité inférieure (110) de celui-ci, et une partie centrale (102) du bras (47, 48) est montée de manière pivotante à la partie de base (12) ;
de plus facultativement dans lequel le cylindre supérieur (18, 60, 70) est monté à une position adaptée pour permettre au cylindre supérieur (18, 60, 70) de venir en contact avec une partie supérieure du récipient (30) déposée sur la partie de base (12) et le cylindre inférieur (50, 60, 70) est monté à une position adaptée pour permettre au cylindre inférieur (50, 60, 70) de venir en contact avec une partie inférieure du récipient (30) déposé sur la partie de base (12), ou dans lequel chaque cylindre supérieur (18, 60, 70) est monté à une première hauteur commune au-dessus de la partie de base (12) et chaque cylindre inférieur (50, 60, 70) est monté à une seconde hauteur commune au-dessus de la partie de base (12).

19. Un procédé selon la revendication 14 dans lequel les cylindres (18, 50, 60, 70) sont situés à deux positions opposées et engagent des côtés opposés du récipient (30) ;
ou dans lequel le récipient (30) possède une section transversale circulaire ;
ou dans lequel le récipient (30) est maintenu dans une orientation à la verticale par les cylindres (18, 50, 60, 70) durant le remplissage du récipient avec un produit.
REFERENCES CITED IN THE DESCRIPTION

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