United States Patent

Kammann

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[54] **APPARATUS FOR ALIGNING AND ARRANGING ARTICLES IN UPRIGHT POSITION**

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[52] **U.S. Cl.** .....**198/33 AA,** 198/53

[51] **Int. Cl.**.....**B65g 47/24**

[58] **Field of Search**....198/33, 33 AA; 271/171, 172, 271/173, 253

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[57] **ABSTRACT**

The present invention relates to an improved apparatus for aligning and erecting articles, more particularly hollow articles such as bottles including

a filling opening for introduction of articles to be set upright;

a plurality of conveying channels rising from said filling opening and each with an arcuate portion in the longitudinal extensions thereof;

conveyor means for said articles including a plurality of drivers engageable with and behind the articles in the region of each conveyor channel;

a plurality of aligning devices provided in the area of transition between the rising receiving area and a descending aligning area said aligning devices each having a catch member which swings about a horizontal axis and is engageable with a neck provided on an end of the article for turning said article and which is swung out of the area of movement of the article by the pressure of the article when arriving with its bottom end first;

an erecting surface provided below the said descending aligning area of the conveyor channel;

a push member associated with all the conveyor channels below the descending aligning area, which push member acts simultaneously on all the articles deposited in upright position on said erecting surface and pushes the said articles onto a conveyor belt serving to remove them;

and displaceable guide means in the region below the said aligning device associated with each conveyor channel, and forming with the descending aligning member of said conveyor channels, a dropping chute for each article descending in an upright position with its bottom directed downwardly.

9 Claims, 8 Drawing Figures

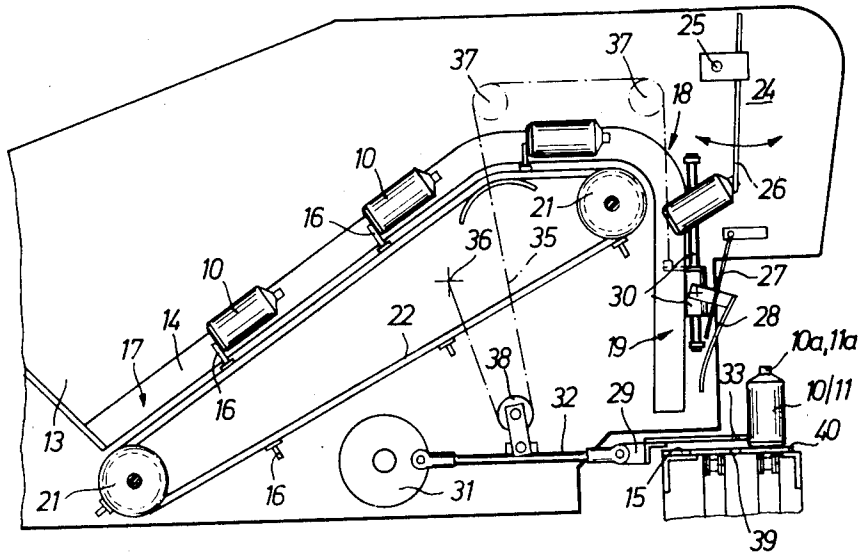


Fig. 1

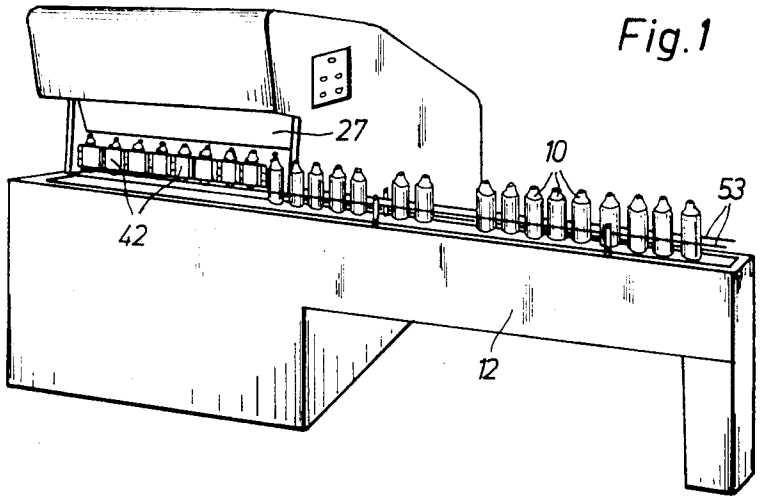


Fig. 2

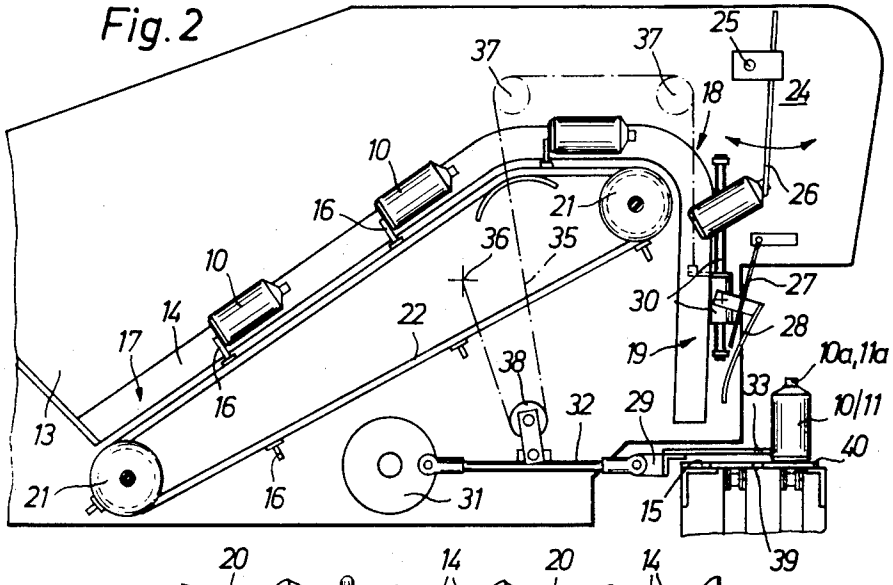


Fig. 3

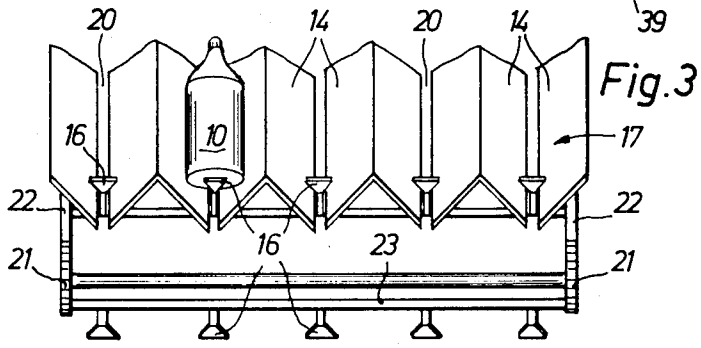


Fig.4

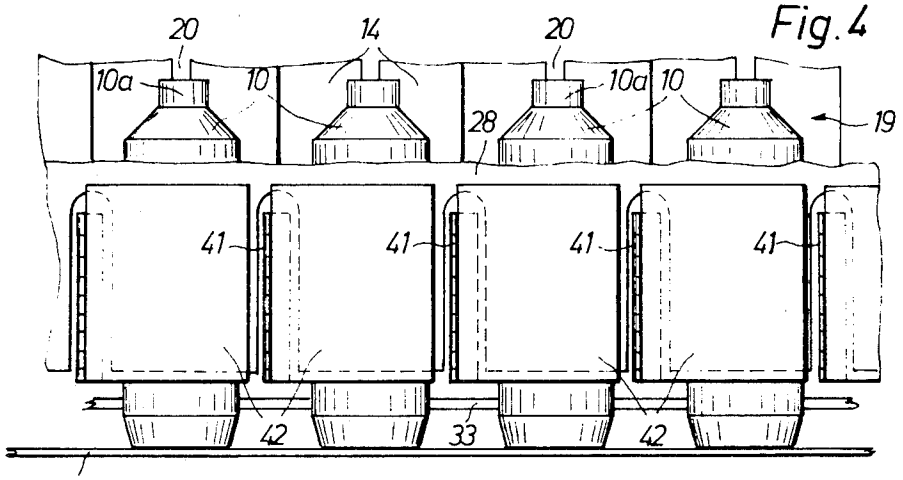


Fig.5

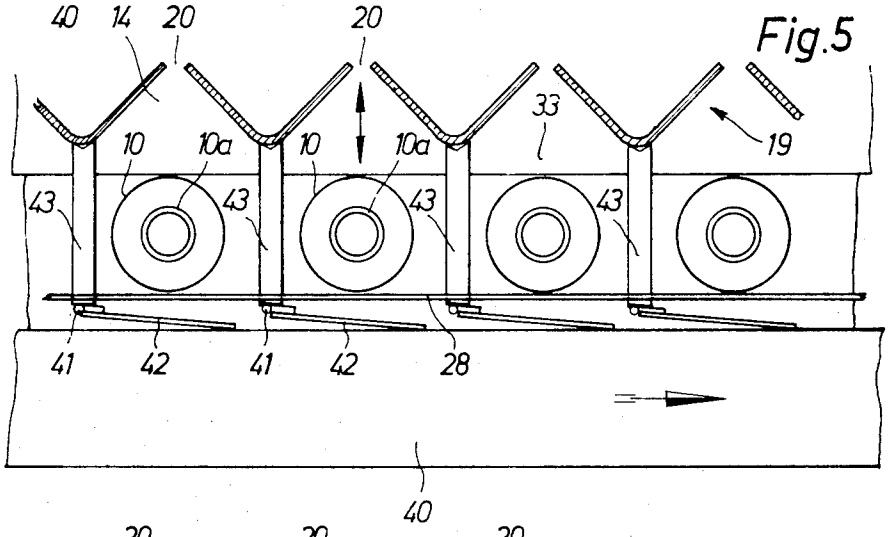


Fig.6

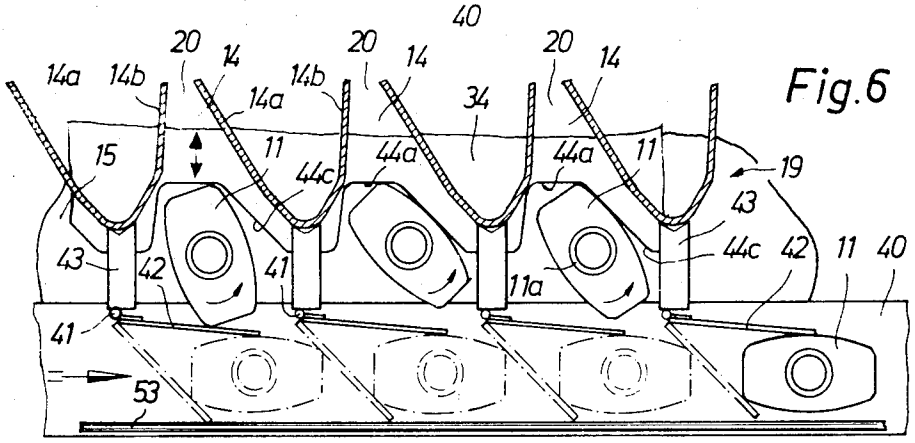


Fig. 7

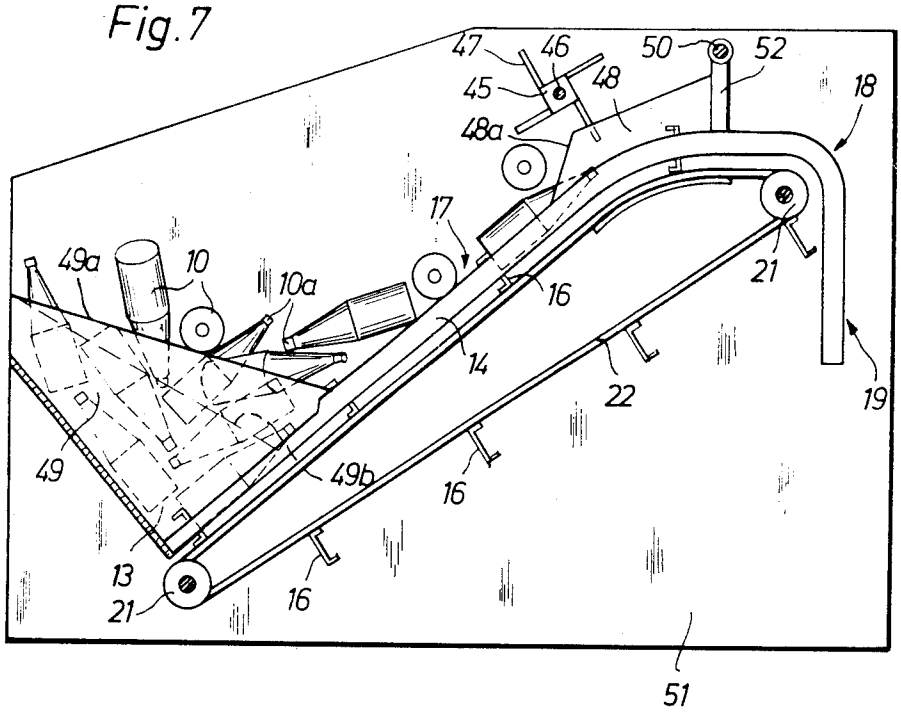
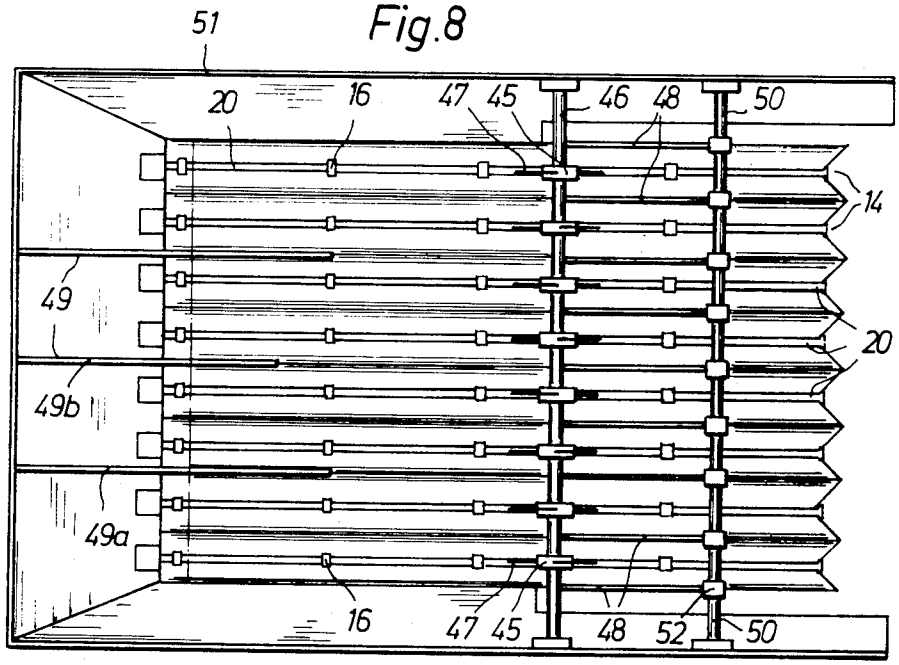

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Fig. 8


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APPARATUS FOR ALIGNING AND ARRANGING ARTICLES IN UPRIGHT POSITION

The present invention concerns apparatus for aligning and arranging articles in upright position and particularly hollow articles, such as bottles or the like containers.

It is an object of the present invention to provide a simply constructed apparatus by which articles of different shapes and sizes can be aligned in the same direction and erected.

A further object of the invention is to provide apparatus which erects the aligned articles in a stable position and steadily conveys them in said stable position to a removing device.

Another object of the invention is to provide an apparatus in which the articles, aligned with their longitudinal extension in the direction of travel, are fed to the apparatus serving to align them and erect them same way up from a container having articles introduced at random and located in any position.

A further object of the invention is to ensure supply of the aligning device always with single articles located in the longitudinal direction (pre-aligned with the neck or bottom of the container located forwardly with respect to and in the direction of movement).

In accordance with the invention, apparatus for aligning and erecting articles, particularly hollow articles, such as bottles, containers or the like, includes a filling aperture for the introduction of the articles to be erected, a plurality of conveying channels rising from this filling aperture and being arcuate in the longitudinal direction, conveyor means for said articles including several driving members engaging thereon in the region of each conveying channel, and engaging behind the articles to be moved. A plurality of aligning devices are provided for each conveyor channel in the area of transition or turning area between the rising transfer area and descending aligning area, said aligning devices each having a catching portion which swings about a horizontal axis and engages a neck provided at one end of the article for guiding said article, or engages in an opening in the front of the article or is swung out of the path of movement of the article by the pressure of the article arriving with its bottom end first. An erecting surface is arranged below said descending aligning area of the conveyor channel and a push member which is associated with all the conveyor channels below the descending aligning area and acts simultaneously on all the articles deposited upright onto the erecting surface and pushes the said articles onto a conveyor belt used to remove said articles. At least one retaining wall is provided in the area below the said aligning device and forms, with the descending aligning member of said conveyor channels, a dropping chute for each article in an upright position and with its bottom extending downwardly. The chute may be a transversely extending upwardly and downwardly reciprocating plate or flap associated with each conveyor chain and displaceable about a vertical axis.

It is preferable to construct the erecting surface of the aligned articles rigidly and to associate one or two removing conveyor belts therewith.

In order to ensure erection of the articles in a stable position and removal without wobbling the conveyor channels are provided with pivotable flaps which are openable and closable by the articles and with which

flaps the articles are in contact during the movement from their erecting surface to the conveyor device for removal.

In addition, the expelling member may be formed of a strip having trapezoidal recesses associated with each conveyor channel. These recesses with the pivotable flaps produce an axial twisting of the articles of oval cross-section, said articles being turned by their greater base surface extension in the direction of removal and thus given great stability.

The receiving container is provided with several guide tracks which extend in the longitudinal direction of the conveyor channels and prealign the randomly introduced articles by producing an alignment of the articles with their longitudinal axes in the longitudinal direction of the conveyor channels.

Furthermore, rejecting tracks and expellers are provided in the vicinity of the conveyor channels which feed only one article at a time to the aligning device in each conveyor channel.

The apparatus of the present invention for the erection and alignment of articles is characterized by a simple design, economical manufacture and smooth operation. It is a particular advantage that articles of different shapes and sizes can be aligned and erected by the apparatus.

The individual articles are received in random manner by the apparatus in any desired manner from a hopper and then automatically brought into a certain position. The apparatus of the present invention operates automatically and gives a high output per hour. The articles are erected in a stable position and then removed.

The invention will be described further, by way of example with reference to the accompanying drawings, in which:

FIG. 1 is a perspective view of an apparatus for aligning and erecting articles;

FIG. 2 is side view of the apparatus of FIG. 1 with cover removed and showing a conveyor channel, aligning device and push mechanism;

FIG. 3 is a front view of several adjacently arranged conveyor channels with drive members for the articles;

FIG. 4 is a front view of part of the same apparatus having aligned and erected articles which are stabilized in position in the erecting area by pivotable retaining walls (flaps);

FIG. 5 is a plan view of several conveyor channels provided with the associated flaps, shown partly in section;

FIG. 6 is a plan view shown partly in section of several conveyor channels in another embodiment having the associated flaps and a push member (slider) provided with recesses;

FIG. 7 is a side view of the apparatus of FIG. 6 comprising a receiving container provided with guide paths, rejecting paths and expellers provided in the area of the conveyor channels, shown partly in section, and

FIG. 8 is a plan view of a receiving container including guide paths, the conveyor channels with rejecting paths and expellers.

Apparatus for the alignment and erection of articles 10, 11 and more especially hollow bodies, such as bottles, containers or the like, comprises a base 12 in the side portion of which a hopper (receiving chamber or

reservoir) 13 is provided as a filling aperture for the articles 10, 11 to be aligned and erected.

From the container 13 at least one conveyor channel 14 extends to an erecting surface 15 on which the individual articles 11 are moved by drivers 16 arranged in spaced series relationship from the container 13 to the erecting surface 15 and are aligned and erected during this movement.

It is preferable to arrange several conveyor channels 14 adjacently to one another and to associate a series of drivers 16 in spaced relationship with each conveyor channel 14. The conveyor channels 14 are provided with a receiving portion 17 extending obliquely and upwardly out of the container 13 at a certain angle, preferably at an angle of 45°, and merging into a deflecting or turning area 18. The area 18 is followed by an aligning area 19 of the conveyor channels 14 extending vertically downwardly to the erecting surface 15, so that the individual articles 10, 11 are moved in channels 14 which are arcuate in the longitudinal direction.

The individual adjacently arranged conveyor channels 14 are formed as receiving prisms which have a V-cross-section or are partly circular. Also, in the center longitudinal area each channel 14 has a slot or passage opening 20 extending over the entire length of the channel and provided to enable displacement of the drivers 16.

It is preferable to form the adjacent conveyor channels 14 with a roof shape in one side portion or as section rails or the like which are arcuate in cross section and which leave free the passage opening 20 for the drivers 16 in the series of contact areas. In this embodiment, two adjacent conveyor channels 14 each occupy one side area of a common section rail (see FIGS. 3, 5 and 6.).

Each of the drivers 16 may be secured to at least one endless conveyor belt or chain 22 circulating over guide members 21, such as wheels, rollers or drums and driven intermittently or continuously, as the conveyor means, while the conveying length of the belt or chain 22 extends parallel to the conveyor channel 14. Where several adjacent conveyor channels 14 are provided a belt or chain 22 may be provided to circulate endlessly over the guide rollers 21 in the side areas of the outer channels 14 and the drivers 16 may be provided, corresponding to the conveyor channels 14 on rods 23 connecting the two lateral belts or chains 22.

In vertical aligning area 19 of the conveyor chain 14, a device 24, which actuable according to the position of the bodies 10, 11 and which erects the articles 10, 11 in the same manner, is associated with each conveyor channel 14. Each aligning device 24 is mounted to swing about an axis 25 extending parallel to the aligning area 19 and can thus be moved in the direction of the aligning area 19 or moved outwardly thereby (see direction of arrow in FIG. 2).

The individual aligning devices 24 each have a catching member 26 provided at a space from the axis 25 for engaging the bodies 10, 11 which have a neck 10*a*, 11*a* and/or an opening at the end. The catching members 26 each engage on extensions 10*a*, 11*a* or in an opening and turning the articles 10, 11 through approximately 180° said catch member 26 engages the unaligned articles 10, 11, aligns them and conveys them further to the vertical aligning area 19 or allows the correctly aligned arriving articles to slide into the aligning area 19 without engaging them, since the aligned articles 10, 11 merely press against the catch member 26 which pivots outwardly about the axis 25 and can thus freely continue to move in the particular conveyor channel 14. The catch member 26 is preferably hook-shaped so that the said catch member 26 encloses the extension 10*a*, 11*a* of the bodies or can engage in an opening in the front end of the body. In addition, the catch member 26 provided with a receiving aperture for the extension 10*a*, 11*a* of the article 11, can be engaged by the extension 10*a*, 11*a* of the arriving article 10, 11. The catch member 26 may be held, for example in the aligning position (article engaging position) by spring force.

Below the aligning devices 24 in the conveyor channel area 19 and extending perpendicularly to and spaced from the erecting surface 15 there is associated, a guide plate 27 extends into the conveying channel 14 and is directed at a certain angle to the conveyor channel 19 to form an insertion surface for the articles 10, 11 into the channels or chutes.

In addition, the conveyor channels 14 are provided in the aligning area 19 with a retaining wall 28, such as a plate or strip, which is vertically displaceably and is displaceably connected to a push mechanism 29 for releasing the bodies 10, 11 located in the channels or chutes at a right angle to their axes of erection.

The retaining plate 28 extends over the entire width of the adjacently arranged conveyor channels 14 and is displaceably mounted in a vertical plane on one or more vertical guides 30. The movement of the retaining plate 28 is adjustable in accordance with the height of the particular article so that the reciprocating motion of the retaining plate 28 for releasing the articles 10, 11 is executed outwardly according to the particular heights of the articles. The retaining plate 28 extends out of the guide plate 27 and closes the individual conveyor channels 14, as passages, chutes or the like from the outside in the lower position as an extension of the guide plate 27.

The push device 29 is displaceably connected to an eccentric drive 31 and has an expelling slider or strip 33, 34 connected thereto by means of push rod 32; said strip extending above the erecting surface 15 and parallel thereto.

The eccentric drive 31 is displaceably connected to the retaining plate 28 by way of at least one cable or chain member or members 35, the reciprocating motion of the retaining plate 28 being effected by shortening or lengthening the cable or chain member 35. The member 35 are secured at one end to the retaining plate 28 or the guide 30 and at the other end to a fixed point 36 and run over guide pulleys 37 and a length adjusting roller 38 of the push rod 32 of the eccentric drive 31.

The displacement of the aligned articles 10, 11 on the erection surface is effected by two adjacent endless conveyor belts or chains 39, 40 which circulate at right angles to the channels 14 and which have an upper conveyor length which lies in a horizontal plane with the erecting surface 15. The two conveyor belts 39 40 have different speeds of rotation, the conveyor belt 39 adjacent to the erecting surface running more slowly than

the outer conveyor belt **40**, so that the articles **10, 11** are pushed by the push mechanism **29** gradually and not suddenly into motion from a rest position.

The conveyor belts **39, 40** may be provided with perforations which enable a vacuum to act upon the base surfaces of the articles **10, 11** to stabilize them by a suction device.

Since the articles **10, 11** aligned in the region of the conveyor channels and sliding downwardly preferably drop onto expelling strip **33**. Strip **33** is preferably made of a damping material, such as felt or the like.

With a return stroke of the expelling strip **33**, the articles **10, 11** can slide from the strip **33** onto the erecting surface **15** or the more slowly circulating conveyor belt **40**, while they are retained in their upright position by the retaining plate **28**. During the subsequent advancing stroke of the expelling a strip **33**, the articles **10, 11** are pushed thereby onto the more rapidly circulating conveyor belt **40**.

In addition to the retaining plate **28** which is adjustable in height, or instead of the retaining plate **28**, a flap- or door-shaped retaining wall **42** is preferably associated with each channel **14** in its vertically descending alignment area **19** and is pivotable about a vertical axis **41**. Each flap or door **42** is mounted to be easily movable on a supporting member **43**, and secured to the conveyor channels **16**, by means of a hinge or the like forming the vertical pivotal axis **31**. When the aligned articles **10, 11** and standing on the surface **15** are expelled, they press against the flaps **42** and open them so that the articles **10, 11** are slipped onto the moving removing belt **40** while in contact with the flaps **42** and thus with the stabilizing of the upright position. The opened flaps projecting into the area of the removing belt **40** above said belt **40** are closed again by the articles **10, 11** moving transversely past the channels **14** by the conveyor belt **40**.

The flaps **42** are provided more particularly for articles **10, 11** having a small cross section or for articles **10, 11** with a small standing surface, since the articles **10, 11** suddenly changing from a stationary surface **15** to a moving surface (conveyor belt **40**) are stabilized (held vertically) in their upright position by the flaps **42** and secured against falling-over. The flaps **42** may be provided both in the case of devices having a fixed erecting surface **15** and a removing belt **40**, and also in the case of devices having two adjacent belts **39, 40** running at different speeds.

In order to align articles **11** not having a circular cross section, such as oval or rectangular articles **11**, with their maximum standing or base surface in the direction of movement, the conveyor channels **14** have an asymmetrical cross section, the push member **34** is provided with trapezoidal recesses **44**, and the flaps **42** are provided.

The asymmetrical channels **14** have two walls **14*a***, **14*b*** located at an acute angle relatively to each other and tapering in cross section towards the opening **20** for the drivers **16**. The bisectors of the angle between the walls subtends an obtuse angle with the removing device, so that the oval articles **11** drop onto the erecting surface **15** already in an axial position and turned in the direction of travel with their maximum base area forming an acute angle with the removing direction.

The push member **34** has a trapezoidal recess in the region of each channel **14** and a surface **44*a*** extending parallel to the removing direction and two surfaces **44*b*, 44*c*** opposed to each other and directed towards the surface **44*a*** at different obtuse angles. Recessing surface **46*c*** subtends a greater obtuse angle with the surface **44*a*** than with the surface **44*b*** and is arranged ahead of the surface **44*b*** in the removing direction.

During the movement of the articles **11** onto the removing belt **40** by the expeller **34**, the article **11** comes into contact with the surfaces **44*a*** **44*c***, an oval portion and flap **42** by the diagonally opposed oval portion so that the article **11** is axially twisted during the displacement and, by its loose surface is pushed in the removing direction onto the conveyor belt **40**, whereby its stability is increased (see FIG. **6**).

The articles **11** of oval cross section, all drop with approximately the same cross sectional position onto the erecting surface **15** and receive an axial twisting movement during the displacement onto the removing belt **40** from the recessed expeller **34** and the flaps **42**.

An expeller **45** forming a passage opening with the channel **14** is associated with each channel **14** in the end portion of the rising member **17** of the conveyor channel. Said expeller **45** prevents the conveying of two superimposed articles **10, 11** into the deflecting area **18**.

The expeller **45** has several arms **47** which are mounted to rotate about an axis **46** and project into the channel **14** so as to leave a certain passage open for an article **10, 11**. If two superimposed articles **10, 11** move in front of this expeller **45**, the arms **47**, rotating oppositely to the direction of movement of the articles, return the article **10, 11** in the channel **14** to the container **13**. All the expellers **45** are arranged on a common axis **46** driven symmetrically with the conveyor means **22**, so that the number of expellers **45** corresponds to the number of adjacent channels **14**. It is also preferable to provide the area of the rising part **17** of the channel with expeller tracks **48** which are secured to the highest edges of the channels **14** at the transition between adjacent channels **14** — (viewed in cross-section) and are formed by baffles, plates, bars or the like.

The expeller tracks **48** each have an upwardly inclined expelling surface **48*a*** rising in the direction of movement of the articles and against which an article **10, 11** disposed transversely to the direction of movement, strikes and is thereby prevented from forward movement and drops back into the channel **14** or container **13**. In the area between the container **13** and expeller **45**, the tracks **48** may be provided over the entire length of the part **17** of the conveyor channel on each channel **14** or on individual adjacent channels.

The funnel-like container **13** is provided with guide tracks **49** extending in the longitudinal direction of the conveyor channels in spaced adjacent relationship and are formed of guide plates, bars, ribs or the like. The tracks **49** are of different sizes and have upper edges **49*b*** which have a different incline and rise from the part of the container at the side of the channel with different inclines to the part of the container remote from the channels **14**. A guide path **49** with a more intensely inclined edge **49*b*** and consequently a smaller base form, is arranged between two guide paths **49** having

edges 49*a* of the same size and inclination. The articles 10, 11 dropping into the container 13 are aligned by these guide tracks 49 with respect to their longitudinal extension, in the longitudinal extension of the channel. The articles 10, 11 with their longitudinal surfaces randomly disposed, drop due to the differently inclined guide path edges 49*a*, 49*b*, between the guide tracks 49 and then extend by their longitudinal surface in the longitudinal direction of the channels 14 so that they reach the channels 14 arranged in their longitudinal direction.

If, however, articles 10, 11 reach a channel 14 transversely, one above the other or adjacent to each other, they are pushed by the forward movement of the driver 16 onto the inclined expeller surfaces 48*a* and are thus gradually withdrawn from contact with the drivers 16, whereby, on the one hand, squashing or deforming of the articles is avoided and, on the other hand, the articles are returned to the container 13 by the expeller 45 over the articles conveyed in the correct position to the channels 14.

The articles 10, 11 because of the action of guide paths 49, are accepted by the conveying channels 14 having been pre-aligned during transport, with either the bottom or the neck of the articles 10, 11 forwardly located in the direction of travel. Articles 10, 11 outside the range of the guide paths 49 and transversely arriving at the drivers 15, are aligned in their longitudinal position or raised by the expeller paths 48*a* and brought to a position suitable for the rejector 45.

An advantageous conveying capacity is provided by the preset apparatus, since the channels 14 convey a larger number of articles i.e., the articles 10, 11 are conveyed more closely one behind the other and comparatively large spaces between the articles 10, 11 to be moved in the channels 14 are avoided.

The rejecting paths 48 prevent the jamming of articles 10, 11 between the channels 14 and the expellers 45 and superimposition of two or more articles 10, 11 is prevented by the expellers 45 and the rejecting paths 48 and reliable and smooth conveying is ensured.

The channels 14 and the rejecting paths 48 are supported for example by supports 52 mounted on an axis 50, said axis 50 being secured between two side plates 51 limiting the width of the container and receiving the channels 14 between them.

The apparatus of the present invention makes it possible to align and erect articles 10, 11, in a simple and reliable manner. The articles 10, 11 in the container 13 are engaged by the drivers 16 and are removed from the container 13 on the channels 14. If the articles 10, 11 reach the aligning device 24 for example, with the neck or an opening of the bottle in front, a catch member 26 of the aligning device engaged round the neck or in the opening of the article and retains this front end. The article 10, 11 continuing to move by its own weight is turned through approximately 180° by means of the aligning device 24, so that the bottom (the plane end) of the article 10, 11 moves downwardly in the direction of the erecting surface 15. After turning round, the article 10, 11 can slip out of the catch member 26 and downwardly through the passages formed by the channels 14 and guide plate 27 or retaining plate 28 and flaps 42, until it is deposited on the erecting surface 15. In this position the article 10, 11 stand with its plane end surface on the erecting surface 15 the neck or opening of the bottle projecting upwardly. If an article 10, 11 reaches the aligning device 24 with a plane end located forwardly, the catch member 26 has no point of engagement with the article 10, 11 and the catch member 26 presses its plane bottom outwardly about the axis 25, the article 10, 11 continuing to slide in the channel 14 since a turn of 180° is not necessary. The aligned articles 10, 11 located on the erecting surface 15 are then pushed by the push mechanism 33 for removal onto the conveyor belt or belts 39, 40 moving at different speeds. The eccentric drive 31 effects, by way of the push rod 32, a change in the length of the cable or chain member resulting in a rising movement of the retaining plate 28, according to the height of the article and, also achieves a displacement of the expelling strip 33 in the direction of the conveyor belts 39, 40 so that the articles 10, 11 are moved by the strip 33 from the erecting surface 15 onto the conveyor belt 40 or firstly onto the slowly moving and subsequently onto the more rapidly moving conveyor belt 39, 40. During the return of the strip 33 to the starting position, the retaining plate 28 also moves downwardly again into the locking position. The articles 10, 11 being removed on the belt 40 are prevented from falling over by lateral guides (bars) 53.

It is within the scope of the present invention to provide this apparatus with one or more further processing device, such as a filling device, packing means or the like. It is also within the scope of the present invention to modify this apparatus with regard to construction in any desired manner and to adapt it to particular requirements.

I claim:

1. Apparatus for aligning and erecting articles, more particularly hollow articles such as bottles including

a filling opening for introduction of articles to be set upright;

a plurality of conveying channels rising from said filling opening and each with an arcuate portion in the longitudinal extensions thereof;

conveyor means for said articles including a plurality of drivers engageable with and behind the articles in the region of each conveyer channel;

a plurality of aligning devices provided in the area of transition between the rising receiving area and a descending aligning area, said aligning devices each having a catch member which swings about a horizontal axis and is engageable with a neck provided on an end of the article for turning said article and which is swung out of the area of movement of the article by the pressure of the article when arriving with its bottom end first;

an erecting surface provided below the said descending aligning area of the conveyor channel;

a push member associated with all the conveyor channels below the descending aligning area, which push member acts simultaneously on all the articles deposited in upright position on said erecting surface and pushes the said articles through a lateral opening onto a conveyor belt serving to remove them;

displaceable guide means in the region below the said aligning device associated with each conveyor channel, and forming with the descending aligning

member of said conveyor channels, a dropping chute for each article descending in an upright position with its bottom directed downwardly;

said guide means comprising a vertically displaceable retaining plate;

and means operatively connecting said retaining plate and said push member for raising said retaining plate when said push member advances to expose the lateral opening and lowering said retaining plate when said push member retracts to close the lateral opening.

2. Apparatus according to claim 1, wherein said push member has an expelling strip which is connected to an eccentric drive for the displacement movement, said eccentric drive is connected by way of a cable or chain drive to raise and lower the said retaining plate.

3. Apparatus according to claim 1, wherein said erecting surface is formed by a rigid base plate located in a horizontal plane and has associated therewith two juxtapositioned conveyer belts moving at different speeds, the conveyor belt adjacent to the erecting surface running more slowly than the other removing belt so that the articles moved laterally from the erecting surface toward the conveyor belts are gradually accelerated to the speed of the other conveyor belt from which the articles are eventually discharged.

4. Apparatus according to claim 1, in which each said conveyor channel is tapered in cross section to form a passage opening for said drivers secured to a chain in which a strap or a belt is provided as conveyor means, and in which each said conveyor channel has a V-shaped or partially circular cross section.

5. Apparatus according to claim 1, wherein each conveyor channel has an asymmetrical cross section, two walls extending towards each other with an acute angle, the angle bisectors of these two walls subtends an obtuse angle with the removing arrangement, the push member has an expelling strip with a trapezoidal recess provided in the region of each conveyor channel and each recess is provided with a surface extending parallel to the removing direction, two opposing surfaces extend towards the surface with obtuse angles of different size, and the surface located with a greater obtuse angle relatively to said surface is disposed forwardly in the direction of removal.

6. Apparatus according to claim 1, wherein the conveyor channel carrier parts are mounted at right angles to the direction of movement of the conveyor belt in the region of the erecting surface, readily displaceable doors or flaps mounted for pivotal movement about a vertical axis by means of hinges on said carrier parts and in the opening position are located over the conveyor belt, said flap being opened and then closed again by the erected articles during their movement of expulsion and with said articles stabilized.

7. Apparatus according to claim 1, wherein, in the rising receiving area of each conveyor channel an expeller, forming with the channel cross section, a passage opening for an article is mounted to rotate, said expeller having a plurality of arms and all the adjacently disposed expellers being mounted to rotate about a common horizontal axis against the direction of motion of the article, said expeller being drivingly connected to the said conveyor means.

8. Apparatus according to claim 1, wherein the filling opening is formed by a funnel-like container having guide paths such as guide plates arranged therein, extending adjacently to each other in spaced relationship in the longitudinal direction of the conveyor channels, and having upper edges inclined at different angles, for aligning the article by their longitudinal direction in the longitudinal direction of the conveyor channels.

9. Apparatus according to claim 1, wherein rejecting guide plates are provided between two adjacent conveyor channels in said rising receiving area which retain articles disposed transversely.

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