Dec. 12, 1961 S. T. CARTER 3,012,650

APPARATUS FOR SPOTTING HANDLED JUGS PREPARATORY TO LABELING

Filed Jan. 20, 1959 2 Sheets-Sheet 1

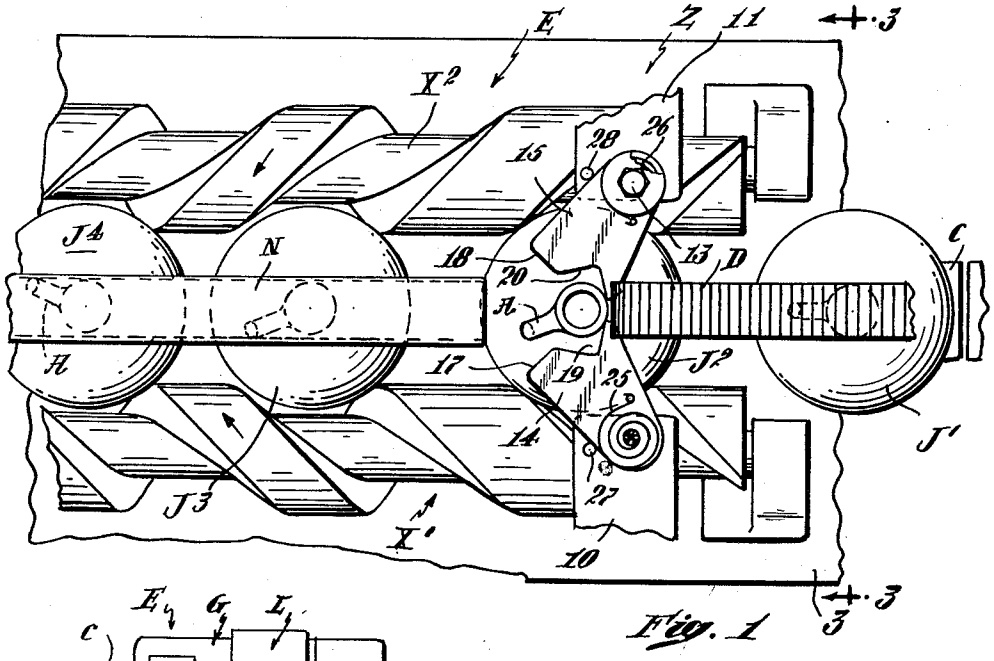

Fig. 1

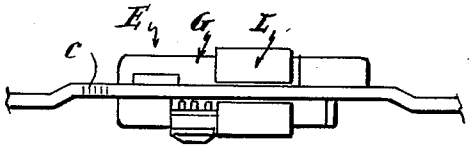

Fig. 1a

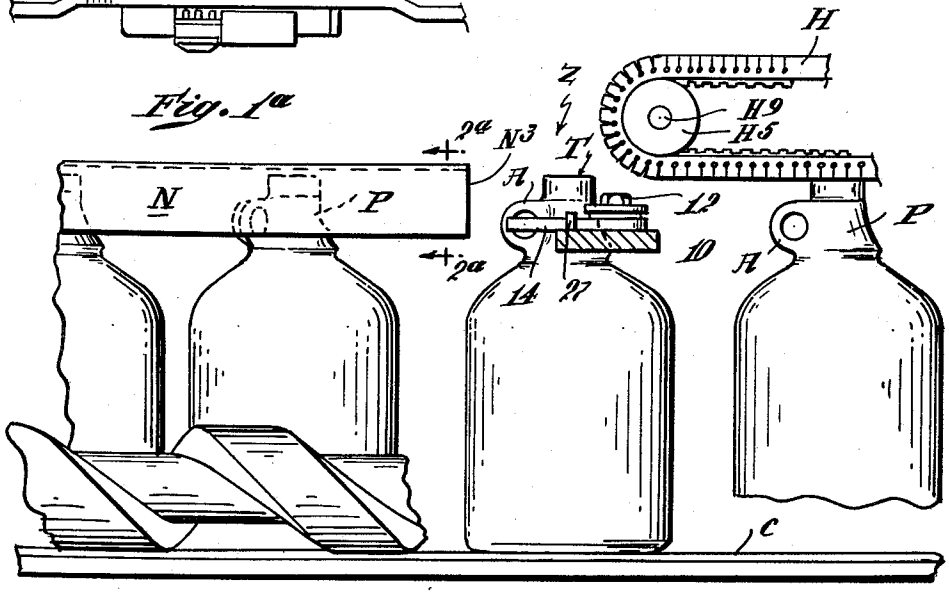

Fig. 2

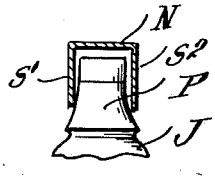

Fig. 2a

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Dec. 12, 1961 S. T. CARTER 3,012,650

APPARATUS FOR SPOTTING HANDLED JUGS PREPARATORY TO LABELING

Filed Jan. 20, 1959 2 Sheets-Sheet 2

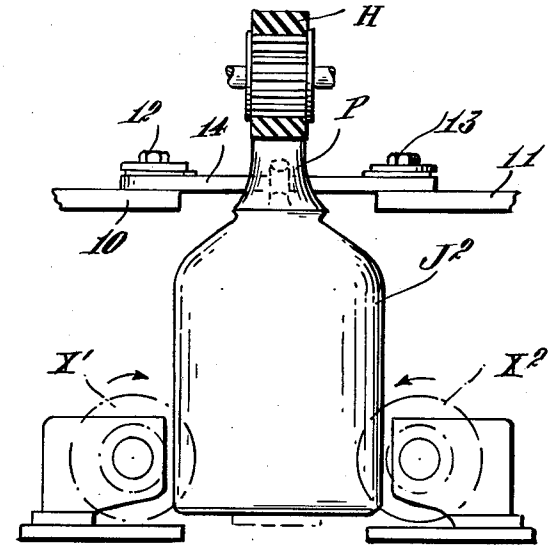

Fig. 3

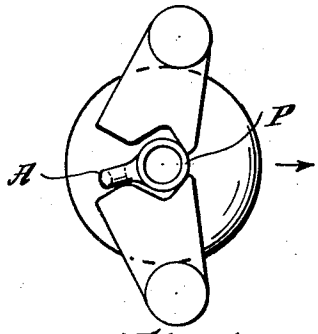

Fig. 4

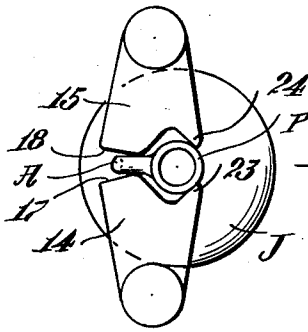

Fig. 5

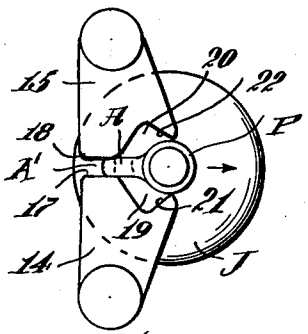

Fig. 6

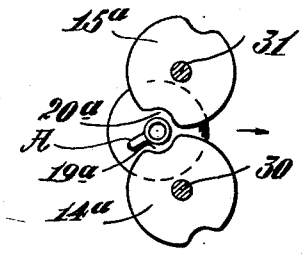

Fig. 8

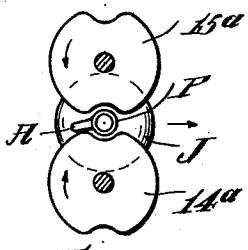

Fig. 9

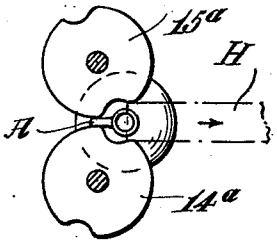

Fig. 10

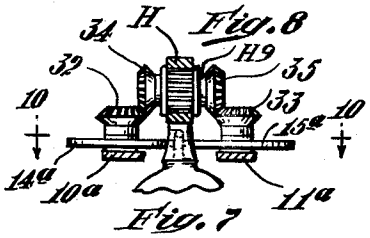

Fig. 7

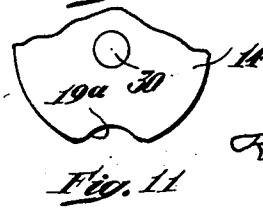

Fig. 11

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Patented Dec. 12, 1961

3,012,650

APPARATUS FOR SPOTTING HANDLED JUGS PREPARATORY TO LABELING

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Filed Jan. 20, 1959, Ser. No. 787,959
7 Claims. (Cl. 198—33)

This invention pertains to labeling machines of the kind wherein articles to be labeled are moved along a predetermined path by a conveyor device and comprising means for applying a label or labels to each article during the travel of the article along said path, and with hold-down means which is brought into engagement with the top of the article to steady it during the application of the label, and wherein, as the articles approach the point at which the hold-down means operatively engages an advancing article, the articles are engaged by spacing means, for example a rotating helix or helices, which spaces the articles uniformly apart, and wherein, as each article approaches the point at which the hold-down device engages the top of the article, the article is engaged by means operative to spot the article by so orienting it (that is to say, turning it about a vertical axis) as to present a predetermined area of the article in accurate position to receive a label.

For cooperation with the spotting means, beverage or similar bottles are customarily provided with small projections or "tear drops" or equivalent elements accurately located circumferentially of the bottle with reference to the area to which the label is to be applied. However, it is not customary to provide such tear drops upon handled jugs, such as are commonly employed in the retail sale of cider, vinegar or the like, and although the handles of such jugs project outwardly beyond the peripheral surface of the jug body, these handles are not of a shape to cooperate with usual types of spotter and, furthermore, are located above the level of the tear drop contacting elements of customary spotters.

The present invention has for its primary object the provision of spotting means applicable to existing labeling apparatus capable of labeling handled jugs and without substantial modification of such existing labeling apparatus, and which, by cooperation with the handle of a jug, is operative to spot the jug accurately for the placing of a label. A further object is to provide means for spotting handled jugs preparatory to the application of labels and which is capable of performing the spotting operation without interfering with the normal advance of the jug toward the label-applying devices even though the jugs be advanced by means of a continuously moving conveyor device. A further object is to provide spotting means of simple form which is actuated for the performance of the spotting operation solely by the force exerted upon parts of the spotting means by the advancing jug itself. A further object is to provide means for spotting a handled jug, as it is advanced by a conveyor device from the field of action of means for uniformly spacing successive jugs into the field of action of a hold-down device which, by engagement with the jug, prevents rotation of the jug about its own axis while passing through the label-applying zone, and wherein the spotting means is so located as to perform the spotting operation while the jug is still under control of the spacing means, and wherein the jug is only released from the spacing means just as it comes into the field of action of the hold-down device. A further object is to provide, in a machine for applying labels to handled jugs and which includes label-applying devices, a conveyor for advancing the jugs uninterruptedly and in succession to and through the field of action of the label-applying devices, hold-down means which contacts the top of a jug as the latter enters the field of action of the hold-down device thereby preventing the jug from turning about its axis while the labels are being applied, and having means operative so to confine the jug handle as the jug approaches the hold-down means with its handle directed rearwardly that the included angle between that radial plane of the jug which bisects the handle and the vertical plane of the center line of the conveyor path will not substantially exceed 20°, and having means operative to turn the jug until said radial plane which bisects the handle coincides with the vertical plane of the center line of the conveyor path. Other and further objects and advantages of the invention will be pointed out in the following more detailed description and by reference to the accompanying drawings wherein

FIG. 1 is a fragmentary, plan view, showing certain portions of a labeling machine, including a conveyor for advancing articles along a predetermined path, means for spacing the articles, a hold-down device for engagement with the tops of the articles, and spotting means in accordance with one desirable embodiment of the invention;

FIG. 1*a* is a small scale, diagrammatic plan view illustrative of a labeling machine of the general type to which the present invention is applicable;

FIG. 2 is a fragmentary, side elevation showing the parts illustrated in FIG. 1;

FIG. 2*a* is a fragmentary, vertical section on the line 2*a*—2*a* of FIG. 2, showing guide means for the neck portions of the jugs as they approach the spotting mechanism;

FIG. 3 is a fragmentary section, substantially on the line 3—3 of FIG. 1;

FIGS. 4, 5 and 6 are diagrammatic, plan views of the spotting means shown in FIGS. 1 and 2, illustrating successive steps in the operation of spotting the jug;

FIG. 7 is a fragmentary, vertical section, to smaller scale than FIG. 2, showing a simple form of drive means forming a feature of spotting apparatus of a modified construction;

FIGS. 8, 9 and 10 are diagrammatic, plan views, to smaller scale than FIGS. 4, 5 and 6, partly in horizontal section, illustrating modified spotting means of the kind which employs the drive mechanism of FIGS. 7; and

FIG. 11 is a fragmentary plan view, to larger scale, illustrating one of the spotting discs, such as shown in FIG. 8.

While the spotting means, herein specifically disclosed, is useful in various types of labeling machine, capable of handling articles of as large diameter as a handled jug, it has here been illustrated with particular reference to its installation in a labeling machine of the general type of that disclosed in the co-pending application of Sidney T. Carter, Serial No. 551,012, filed December 5, 1955, 2,940,630 for Labeling Machine.

In FIG. 1*a*, the main features of such a labeling machine are diagrammatically indicated. Thus, in this machine, a horizontal conveyor C moves the article to be labeled uninterruptedly along a predetermined rectilinear path, the articles first passing through the spacing zone E, then through the zone G where the gummed labels are adhered to the articles and where, in certain types of machine, provision is made for orienting or spotting the articles, and then through the zone L in which the labels are finally wiped into firm contact with the articles. Where the articles pass from the spacing zone E to the zone G, they are engaged by a hold-down device which, in this type of machine, is an endless belt having a horizontal run which contacts the tops of the articles and which not only helps to keep the articles upright while the labels are being applied, but also prevents them from turning after they have once been spotted.

Reverting now to FIGS. 1, 2, 2*a* and 3, the zone E in which the articles are spaced is shown as having two oppositely turning helices X^1 and X^2, disposed at opposite sides of the conveyor path and driven by means of suitable drive connections, not herein illustrated, but which may be such, for example, as is shown in detail in the co-pending application of Sidney T. Carter, Serial No. 636,328, filed January 25, 1957, upon which Patent Number 2,890,787 issued on June 16, 1959. These helices turn at an angular velocity such that articles to be labeled, here shown as jugs J1, J2, J3 and J4 which may enter the field of action of the spacing means in contacting relation, are gradually spaced apart by the helices, which are of an increasing pitch, until, when they leave the spacing zone, successive jugs are spaced apart the proper distance to receive the labels applied by the labeling means in the zone G. The jug handle is indicated by the character A.

In accordance with the present invention, there is provided, within the spacing zone E, handle confining means N for keeping the jug handles directed toward the rear as they advance toward the spotting means. As here illustrated, FIG. 2*a*, this confining means N consists of an inverted channel bar having parallel vertical side walls S1 and S2 which are spaced apart a distance such as to permit the neck portion P of the jug J to pass between them, but which are sufficiently close together to keep the jug handles directed toward the rear as the jugs advance. For example, the walls S1 and S2 may be spaced apart so that a radial vertical plane through the axis of the jug and which bisects the handle width-wise cannot make an angle substantially exceeding 20°, in either direction, from the vertical plane through the center line of the article path. It will be understood that, as the jugs are delivered to the labeling apparatus, they will be so placed upon the conveyor that their handles enter the space between walls S1 and S2 of the confining device while directed rearwardly.

The member N terminates at N3, FIG. 2, at a distance from the receiving end of the hold-down device H sufficient to permit the location of the spotting mechanism of the present invention between the point at which the handle of the jug leaves the confining device N and the point in its travel at which the top of the jug is engaged by the hold-down device H. The spotting means of the present invention is located in the zone Z (FIGS. 1 and 2), at a point at which the jugs have been spaced apart to the proper distance and just before they are engaged by the hold-down.

As illustrated in FIGS. 1 to 6 inclusive, the spotting device comprises relatively movable parts, mounted upon fixed supports 10 and 11, arranged at opposite sides of the conveyor path just above the level of the shoulder of the jug and which are carried in any desired manner by the machine frame. These supports carry vertical pivot members 12 and 13, respectively, upon which levers 14 and 15 are arranged to swing in a horizontal plane which is located between the horizontal planes of the upper and lower limits of the jug handle A. These levers 14 and 15 are of a more or less segmental shape, each having an edge 17 and 18 respectively, at its free end which, as illustrated, is substantially rectilinear. The pivot members 12 and 13 are so spaced apart, and the levers are of such dimensions that, when the levers are swung toward each other so that their edges 17 and 18 are parallel, these edges define between them a channel A', FIG. 6, which is of substantially the exact width of the outer end portion of the jug handle A. The free ends of the levers 14 and 15 are also so shaped as to provide recesses 19 and 20, here shown as more or less V-shaped, the recess 19 having the forward edge wall 21 (FIG. 6), and the recess 20 having the forward edge wall 22. These recesses are of such dimensions that, when the free ends of the levers are directed toward each other, these recesses collectively form a chamber of a size such as to receive the neck portion P of the jug. However, the forward tips 23 and 24 (FIG. 5) of the levers are so spaced apart, when the free ends of the levers are directed toward each other and in their normal inoperative position, as illustrated in FIG. 1, that although the jug neck may enter the chamber comprised of the combined recesses, the neck of the jug cannot pass between the levers except by engaging the walls 21 and 22 of the recesses and thereby swinging the levers to a position such as shown in FIG. 6 at which position the tips 23 and 24 have been so spaced apart by the camming action of the jug neck P as to permit the jug neck to move forwardly and escape from said chamber.

The levers 14 and 15 are urged into the normal or inoperative position shown in FIG. 1 by springs 25 and 26, their motion in this direction being limited by the stops 27 and 28. With the levers thus positioned, the neck of a jug may enter the chamber, collectively formed by the recesses 19 and 20, with the handle A of the jug located either to the right or left of the vertical plane of the center line of the conveyor path to the maximum amount permitted by the spacing of the walls S1 and S2 of the confining member N, but as the neck P of the jug contacts the edges 21 and 22 of the levers 14 and 15, it acts as a cam to swing the free ends of the levers toward each other as shown in FIG. 4. As the jug continues to advance, this camming action brings the levers 14 and 15 into the position shown in FIG. 5. During this motion, one or the other of the edges 17 or 18, by contact with the jug handle, swings the latter toward the central, vertical plane of the conveyor path, thus turning the jug until eventually the jug handle is brought into the position shown in FIG. 6 where it is confined between the then parallel edges 17 and 18 which, being equidistant from the central, vertical plane of the article path, thus accurately position that vertical, radial plane of the jug which bisects the handle into coincidence with the vertical, central plane of the conveyor path. As the jug continues to advance, the neck portion P of the jug passes between the tips 23 and 24 of the levers 14 and 15, said tips being so spaced apart as to permit the neck of the jug to pass freely between them while the handle of the jug is still confined between the parallel edges 17 and 18. The parts are so relatively arranged that, before the jug handle escapes from between the edges 17 and 18, the hold-down device H has come into engagement with the top T of the jug, thus preventing the jug from turning after it has once been oriented to the proper position by the operation of the levers 14 and 15. The jug now continues to advance while held in position by the hold-down device H until it has received a label or labels and has passed through the wiping zone L. As soon as the jug handle escapes from between the edges 17 and 18, the springs 25 and 26 restore the levers 14 and 15 to the position shown in FIG. 1 in readiness to receive the neck of the next jug as it is advanced by the conveyor.

It will be appreciated that the spotting means above described is of very simple form and depends for its operation solely upon the force exerted by the neck of the jug as it advances.

In FIGS. 7 to 10, there is illustrated a modified spotting device which accomplishes the same result as that above described, but which is power driven so that it offers no resistance whatsoever to the normal advance of the jug by the conveyor. In this alternative embodiment of the invention, the levers 14 and 15, above described, are replaced by discs 14*a* and 15*a* which are fixed to vertical shafts 30 and 31 which turn in bearings carried by supports 10*a* and 11*a* (FIG. 7) corresponding to the supports 10 and 11 above described. These discs 14*a* and 15*a* are disposed in a horizontal plane which is located intermediate the horizontal planes of the upper and lower limits of the jug handles. To the upper ends of these shafts 30 and 31, beveled gears 32 and 33 are fixed, these gears meshing with bevel gears 34 and 35, respectively, fixed to the opposite ends of a shaft H9, FIGS. 2 and 7,

on which is mounted a sprocket wheel H5, FIG. 2, which forms a guide for one end of the endless belt hold-down H and which is driven by the motion of the hold-down, the latter being driven by means (not herein shown) in accurately timed relation to the conveyor. With the arrangement just above described, the discs **14***a* and **15***a* are turned in opposite direction, the drive gearing employed being such that each disc makes a half revolution during the time in which a jug is being advanced through the spotting zone Z. Each disc, for example, the disc **14***a*, as shown in FIG. 8, is provided at diametrically opposite points with a recess such as the recess **19***a* and the recess **20***a* and the shafts **30** and **31** are so spaced apart and the recesses **19***a* and **20***a* are of such radial depth that, when the recesses of the two discs are directly opposed to each other, they collectively form a chamber of a size sufficient to receive the jug neck. On the other hand, the diameters of the discs are such that the unrecessed portions of their peripheries are spaced apart from each other a distance substantially equal to the thickness of the jug handle.

The drive means for the discs is so adjusted that the discs occupy substantially the position as shown in FIG. 8, as a jug is delivered to the spotting device by the spacing helices X1 and X2, the recesses **19***a* and **20***a* of the two discs being at this time so arranged as to permit the jug neck to enter freely between the discs. The discs turn continuously in the direction indicated by the arrows in FIG. 9 and, as the jug advances, the neck of the jug passes freely between the discs and eventually the peripheral edge of one or the other of the discs will contact the jug handle and thus turn the jug until the radial, vertical plane of the jug, which bisects the thickness of the handle, coincides with the vertical plane of the center line of the conveyor as shown in FIG. 10. At approximately this instant, the hold-down H contacts the top of the jug and, since the handle of the jug is now in the accurately spotted position desired, the jug handle, when released from between the discs by this continued rotation is held in the properly spotted position as the jug advances through the label receiving and wiping zones.

As above noted, the discs, as shown in FIGS. 8 to 10 are provided with recesses at diametrically opposite points thus making it unnecessary to turn the discs as rapidly as would be required if but one recess were provided, and it will be obvious that, if desired, a greater number of such recesses, symmetrically disposed about the circumference of each disc, might be employed, thus making it possible to turn the discs at an even slower angular velocity. However, if desired, only a single recess may be provided in each disc with an appropriate velocity of rotation.

While certain desirable embodiments of the invention have herein been disclosed by way of example, it is to be understood that the invention is broadly inclusive of any and all modifications falling within the scope of the appended claims.

I claim:

1. Article-spotting apparatus useful in a labeling machine of the kind wherein an article to be labeled is moved by a conveyor device along a predetermined path through the field of action of label-applying mechanism, said spotting apparatus being operative to orient a handled jug so as to position that vertical radial plane of the jug, which bisects the jug handle, at a predetermined angle relatively to the vertical plane of the center line of the article path, said spotting apparatus comprising fixed supports, located at opposite sides respectively, of the article path, and a movable element mounted upon each respective support, said elements being operative, collectively, by engagement with the handle of a jug and without interference with the motion of the jug along said path, to turn the jug until said radial plane of the jug makes the desired angle with the vertical plane through the center of the article path, and wherein the supporting means comprises fixed parts located respectively at opposite sides of the conveyor path and in a horizontal plane approximating that of the shoulder of the jug, and the movable means for orienting the jug comprises two similar parts each mounted upon one of said fixed supporting members to turn about a vertical axis, each of the said movable parts having a notch so shaped and dimensioned that when the notches in the two parts are opposed to each other, they collectively form a recess capable of receiving the jug neck, said movable parts also having surfaces, adjacent to their notches, and which, when opposed to each other, define a channel of a width to receive the jug handle with a snug fit.

2. Article-spotting apparatus useful in a labeling machine of the kind wherein an article to be labeled is moved by a conveyor device along a predetermined path through the field of action of label-applying mechanism, said spotting apparatus being operative to orient a handled jug so as to position that vertical radial plane of the jug, which bisects the jug handle, at a predetermined angle relatively to the vertical plane of the center line of the article path, said spotting apparatus comprising fixed supports, located at opposite sides respectively, of the article path, and a movable element mounted upon each respective support, said elements being operative, collectively, by engagement with the handle of a jug and without interference with the motion of the jug along said path, to turn the jug until said radial plane of the jug makes the desired angle with the vertical plane through the center of the article path, and wherein the movable means whereby the movable means whereby the jug is oriented comprises a pair of levers each, respectively, pivoted to turn about a vertical axis, said axes being located at opposite sides of the article path, the levers being arranged to turn in a horizontal plane located between the upper and lower limits of the jug handle, the free ends of the levers being directed toward each other, each lever having in its free end a notch so shaped and dimensioned that when said notches are opposed they collectively form a chamber such as to receive the jug neck, spring means tending to turn said levers in opposite directions and so that their notches are directed toward an advancing jug, stop means for limiting such movement, one wall of each notch, when the levers are so positioned, being so disposed as to be contacted by the neck of an advancing jug and thereby moved by the force exerted by said neck, whereby the levers are turned oppositely and in opposition to their springs, the other wall of each notch intersecting an edge surface of the corresponding lever, said edge surfaces being so shaped that, when the notches are directly opposed, said edge surfaces define a channel of a width to receive the jug handle with a snug fit and with the center line of the channel in the vertical plane of the center line of the article path.

3. In a machine for applying labels to handled jugs and which includes label-applying devices, a conveyor for advancing jugs uninterruptedly and in succession to and through the field of action of the label-applying devices, hold-down means which contacts the top of a jug as the latter enters the field of action of the hold-down means and thereby prevents the jug from turning about its vertical axis while the label is being applied, in combination, means operative so to confine the jug handle, as the jug approaches the hold-down means with its handle directed rearwardly, that the included angle between the radial plane of the jug which bisects the handle and the vertical plane of the center line of the conveyor path will not substantially exceed 20°, and means operative just prior to the engagement of the jug by the hold-down means to turn the jug until said radial plane, which bisects the handle, coincides with the vertical plane of the center line of the conveyor path, the means for turning the jug comprising handle-engaging elements disposed at opposite sides, respectively, of the conveyor path, said elements being pivotally mounted to turn about vertical axes, each of said elements having a handle-engaging surface, the

pivotal axes about which said parts turn being so spaced apart that, when said handle-engaging surfaces are at their nearest point of approach, they define between them a passage of a width equalling the thickness of the jug handle and whose center of width is directly above the center line of the conveyor path, and means for so actuating said elements as to permit the neck of the jug to pass between them immediately before said handle-engaging surfaces are brought into their position of nearest approach.

4. Article-spotting apparatus useful in a labeling machine of the kind wherein an article to be labeled is moved by a conveyor device along a predetermined path through the field of action of label-applying mechanism, said spotting apparatus being operative to orient a handled jug so as to position that vertical radial plane of the jug, which bisects the jug handle, at a predetermined angle relatively to the vertical plane of the center line of the article path, said spotting apparatus comprising fixed supports, located at opposite sides respectively, of the article path, and a movable element mounted upon each respective support, said elements being operative, collectively, by engagement with the handle of a jug and without interference with the motion of the jug along said path, to turn the jug until said radial plane of the jug makes the desired angle with the vertical plane through the center of the article path, and wherein the movable means whereby the jug is oriented comprises a pair of discs each arranged to turn about a vertical axis, said axes being located at opposite sides respectively of the article path and the discs being arranged to turn in a horizontal plane which is located between the upper and lower limits of the jug handle, the discs being of such diameter and their axes so spaced apart that at the vertical plane connecting their axes the circumferential edges of the discs are spaced apart a distance such as to receive a jug handle between them with a close fit, each disc having a notch in its peripheral edge, each notch being so shaped and dimensioned that when the notches of the two discs are directly opposed to each other they collectively form a chamber capable of receiving the neck of the jug, and means for turning the discs in opposite directions and at such angular velocity and so timed relatively to the article spacing means that as an article is delivered by the spacing means the notches of the two discs are presented to receive the neck of the jug between them.

5. Article-spotting apparatus according to claim 4, wherein each disc has a plurality of equally spaced peripheral notches, the spacing of the notches and the angular velocity of the discs being such that as successive jugs are advanced by the conveyor, the neck of each successive jug always finds a pair of notches disposed to receive it.

6. Article-spotting apparatus, according to claim 4, for use in a labeling machine wherein an endless hold-down device has a horizontal run which is driven at the same linear velocity and in the same direction as the conveyor, the means for driving the discs comprising means for transmitting motion from the drive of the hold-down device to the discs.

7. Article-spotting apparatus useful in a labeling machine of the kind wherein an article to be labeled is moved by a conveyor device along a predetermined path through the field of action of label-applying mechanism, said spotting apparatus being operative to orient a handled jug so as to position that vertical radial plane of the jug, which bisects the jug handle, at a predetermined angle relatively to the vertical plane of the center line of the article path, said spotting apparatus comprising fixed supports, located at opposite sides respectively, of the article path, and a movable element mounted upon each respective support, said elements being operative, collectively, by engagement with the handle of a jug and without interference with the motion of the jug along said path, to turn the jug until said radial plane of the jug makes the desired angle with the vertical plane through the center of the article path, and movable means for orienting the jug comprising a pair of rotary parts arranged respectively at opposite sides of the article path, means for turning said parts in opposite directions and so that, at their nearest point of approach, they are moving in the same direction and at the same linear velocity as the conveyor device, said rotary parts being so constructed and arranged as, by contact with the handle of a jug, to orient the latter while permitting the neck and handle of the jug to advance uninterruptedly between said parts.

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UNITED STATES PATENT OFFICE

CERTIFICATION OF CORRECTION

Patent No. 3,012,650 December 12, 1961

Sidney T. Carter

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 6, line 30, strike out "the movable means whereby".

Signed and sealed this 24th day of April 1962.

(SEAL)

Attest:

ESTON G. JOHNSON
Attesting Officer

DAVID L. LADD
Commissioner of Patents