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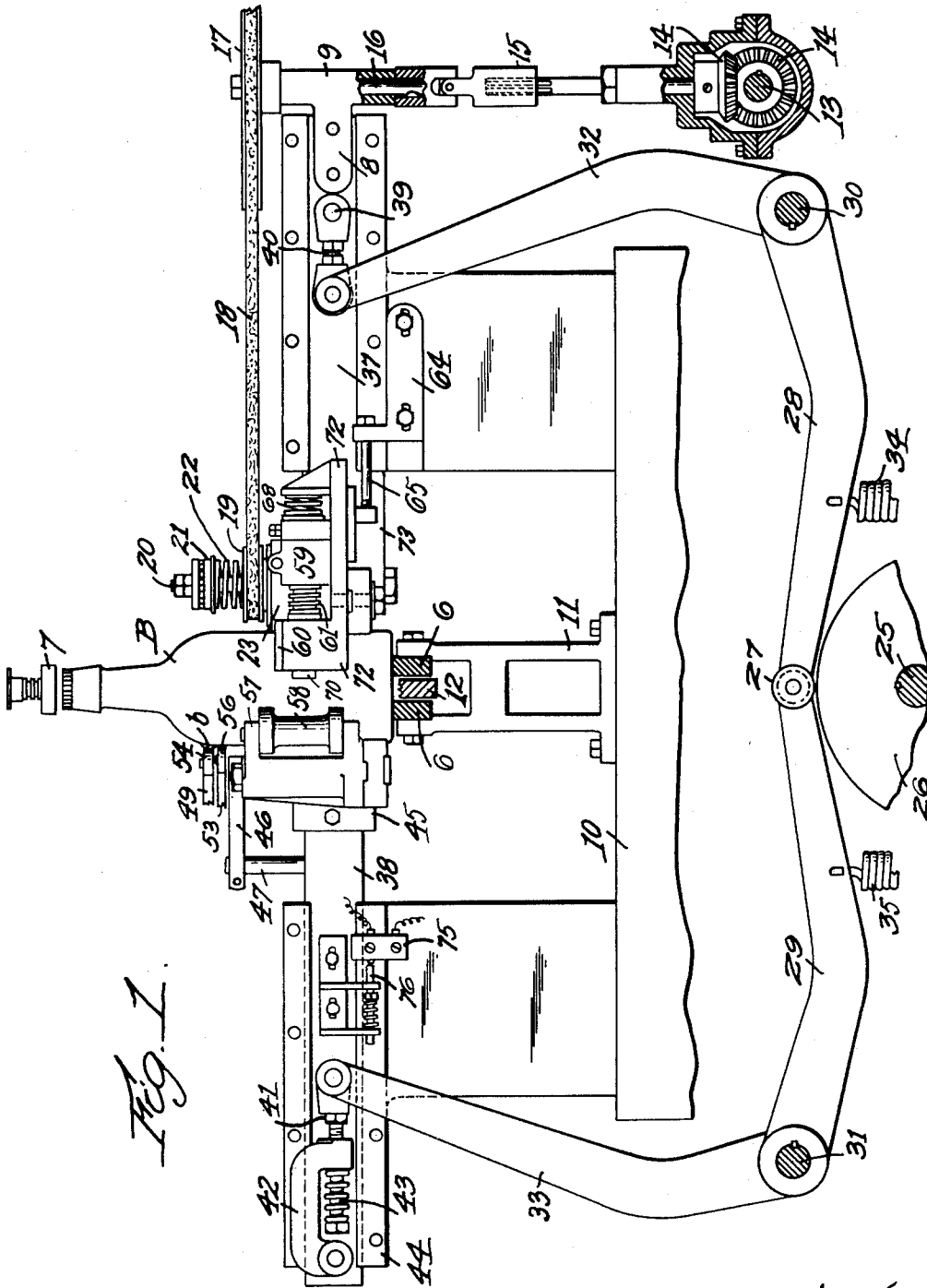
E. E. ESSEN

2,222,503

BOTTLE REGISTERING DEVICE

Filed Dec. 22, 1938

3 Sheets-Sheet 1



Inventor
Eric F. Essen
By atty.
O. E. Fay

Nov. 19, 1940.

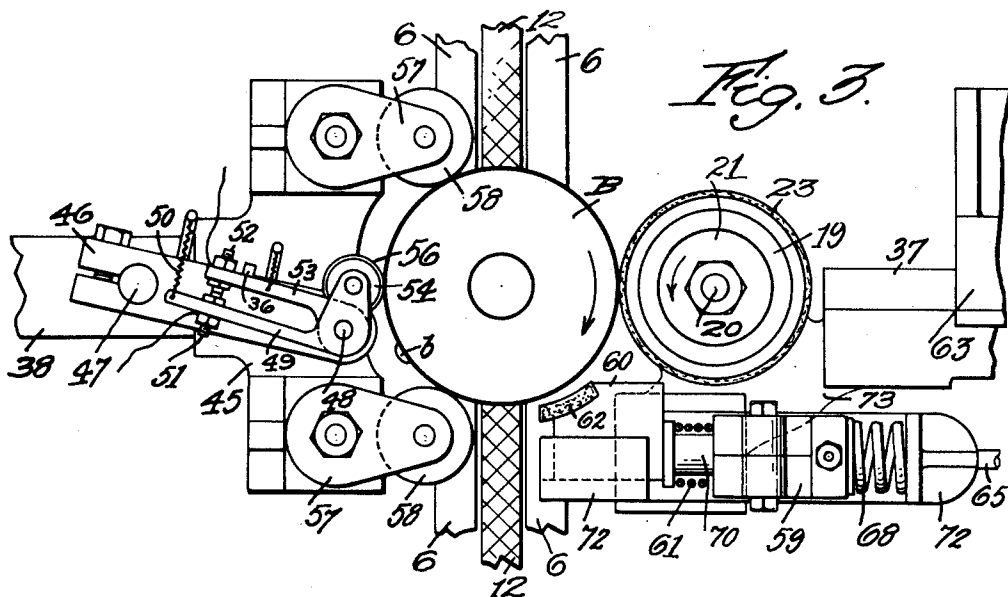
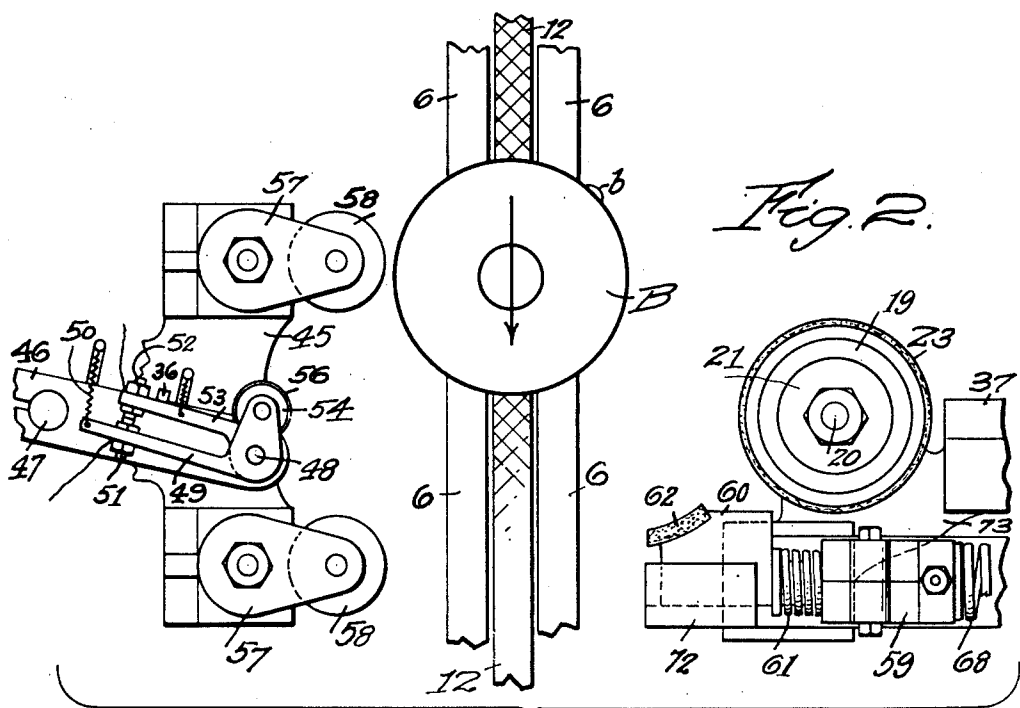
E. E. ESSEN

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BOTTLE REGISTERING DEVICE

Filed Dec. 22, 1938

3 Sheets-Sheet 2



Inventor
Eric E. Essen
By attorney
[Signature]

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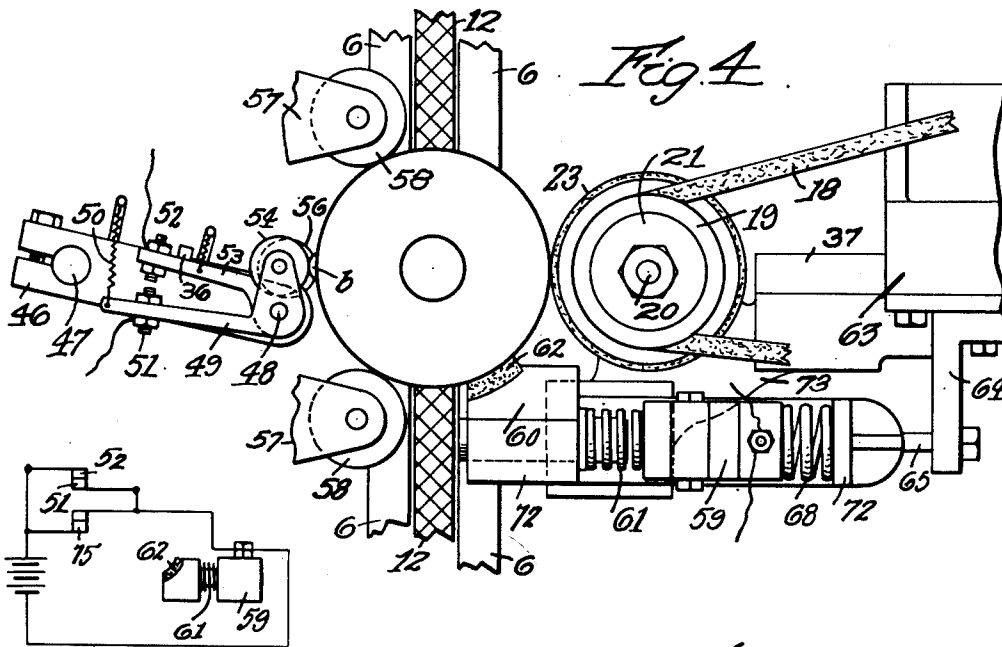
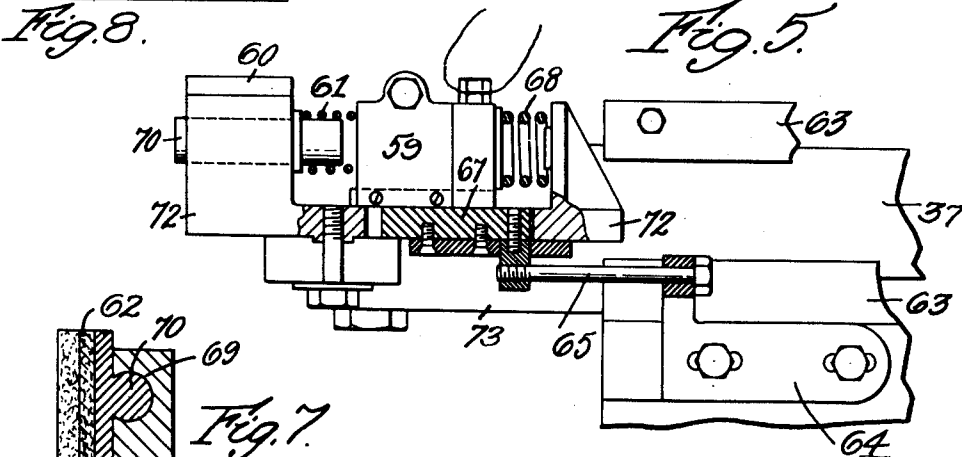
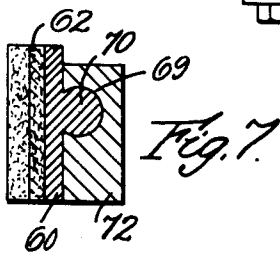
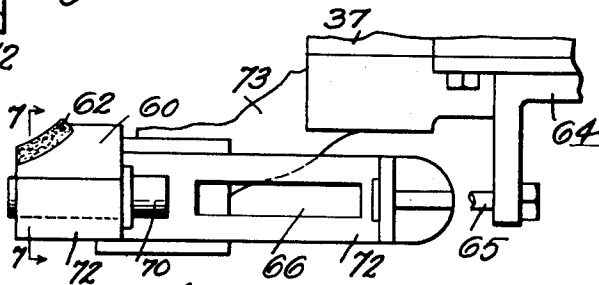
E. E. ESSEN

2,222,503

BOTTLE REGISTERING DEVICE

Filed Dec. 22, 1938

3 Sheets-Sheet 3



Inventor
Eric E. Essen.
By attorney
W. C. Fay

UNITED STATES PATENT OFFICE

2,222,503

BOTTLE REGISTERING DEVICE

Eric E. Essen, Worcester, Mass., assignor to Economic Machinery Company, Worcester, Mass., a corporation of Massachusetts

Application December 22, 1938, Serial No. 247,250

8 Claims. (Cl. 198—33)

This invention relates to a device to be used in connection with a conveyor for bottles, or other articles, which will turn the articles as they come to a spotting station in such a way that when the feed is taken up again all the articles will be fed forward at the same angle. In the labeling of bottles or other articles the article itself may have markings thereon with reference to which the label must be accurately located. For example, certain types of bottles have a word or character formed in the glass and projecting from the normal surface of the bottle, and the label is to be applied directly below or beside this word or character. The present invention relates to machines adapted for orienting the bottle or other article so that it will be located in predetermined relation to a labeling device or other mechanism acting on the article.

The principal objects of this invention are to provide for rotating the article on its own axis and thereby provide for locating it in the proper angular relation to enable a label to be placed on the article. The invention includes means whereby, when the article on the conveyor comes to a certain position, rolls will engage the article on different sides and one of those rolls will rotate for the purpose of rotating the article on its own axis until the article is properly located, and means whereby, when a projection on the bottle reaches a certain point in its circumferential course, a wedge will be forced against the convex surface of the bottle and while the bottle is held against relative motion on the conveyor, that wedge will lock the bottle in its position so as to get the proper angular location of the bottle for labeling purposes.

A further feature of the invention resides in the provision of electromagnetic means for controlling the operation of the wedge so that the latter is normally withdrawn from the bottle or article and may be released at the proper point in the rotation of the article to bring the article to rest. The wedge is mounted so that it will engage the article properly at the desired angle and assure a positive and practically immediate stopping of the article's rotation; the article at this time is supported by a series of rolls in such a manner that the wedge may function properly for prompt stopping of the article.

Other objects and advantages of the invention will appear hereinafter.

Reference is to be had to the accompanying drawings, in which

Fig. 1 is a front elevation of a machine em-

bodiment of the invention, with the conveyor for the bottles shown in section;

Fig. 2 is a plan view of the machine of Fig. 1, with the parts in withdrawn position and with the bottle advancing on the conveyor into orienting position;

Fig. 3 is a plan view similar to Fig. 2 showing the bottle in orienting position;

Fig. 4 is a plan view similar to Figs. 2 and 3 showing the bottle stopped in the predetermined oriented position;

Fig. 5 is a side elevation, with certain parts in section, showing the wedge mechanism;

Fig. 6 is a plan view of the wedge and associated mechanism, with parts removed;

Fig. 7 is a sectional view on the line 7—7 of Fig. 6;

Fig. 8 is a wiring diagram.

In attaching labels to round bottles it is sometimes required that these be placed in a certain position relative to lettering or other projections on the bottle. To accomplish this result on what is known as a hand fed labeling machine, the operator may readily turn the bottle to the desired position when placing it on the labeling machine. However, when it comes to the fully automatic high speed labelers where the bottles are fed to the machine by conveyors, there is neither time nor room to turn the bottle to the desired position manually and fully automatic mechanical means for orienting the bottles must be employed.

This is not the first invention used for the purpose of placing a bottle in a certain angular position controlled by integral projecting marks or characters on the bottle. Heretofore, as shown for example in the Perchard Patent No. 1,608,119, means have been employed whereby, when the projections on a rotating can or bottle came to a certain predetermined position, direct mechanical obstructions engage the projections, thereby stopping the rotation of the can or bottle or, as in the Magnusson et al. Patent No. 1,743,018, means have been employed whereby, when the projecting part came to a position where it interrupted an electric circuit, locking means were applied to the spinner roller in a train of gears operating the same, thereby indirectly stopping the bottle rotated by them.

The increasing demand for high operating speeds makes the first mentioned means entirely unsatisfactory, as beyond a certain speed the kinetic energy in the revolving bottle becomes so great that the impact of the projections and the

obstructions in the stopping means damage the bottle as well as the mechanism itself.

The second type mentioned depends on mechanical clutches, gears, ratchet wheels and pawls, etc., with the uncertainties of the latter when subject to continued wear and tear, as well as their limitations to certain speeds of operation beyond which these parts will not function.

The present invention uses neither of these means but instead stops the rotation of the bottle by means of a flying wedge, which, when released, engages the circumference of the bottle at an angle to the axis at the point of contact. The use of the wedge type of locking means being simple in construction, eliminates a great number of complicated parts, thereby reducing the cost of manufacture, and more particularly, maintenance. Moreover, the use of a wedge for stopping the bottle makes the rate of stopping of the bottle independent of friction which would be necessary if a brake were utilized and there is moreover practically no wear on the wedge.

While a wedge is one of the most powerful mediums in mechanics, in its present application, having semi-resilient shoes in the side contacting the bottle, there is no damage to the bottle regardless of the speed in which it is desired to operate.

An important feature of this flying wedge is that the required initial pressure of the wedge against the bottle is comparatively slight, merely enough to bring it into positive contact with the rotating bottle. After this action has taken place, the kinetic energy of the rotating bottle itself furnishes the power to draw the wedge into the vertex of the angle formed by the outside of the bottle and the plane of the slide supporting the wedge. The force generated will always be in direct proportion to the speed of the bottle, never more or less than the amount required to bring the bottle to rest.

With this improved type of stopping means the speed of orienting or registering the bottle is limited only by the speed at which subsequent labeling on the machine can be done.

As the means for transporting the bottle into and out of what is called the spotting or orienting station is part of the labeling machine itself and therefore only indirectly covered by the present application, a description of the labeling machine in which this spotting device is mounted is as follows:

After filling and capping, the bottles are carried to the feed end of the labeling machine by means of a belt conveyor. Here, they are transferred to a different type of conveying means forming part of the labeling machine and running lengthwise thereof, the registering device operating while the bottles are located on this conveying means.

The last named conveying means consists of two spaced parallel supporting rails 6 on which the bottle rests at stated intervals during its travel through the machine. Between the rails is a horizontally extending feed bar 12 extending the full length of the rails to engage and raise the bottles from the supporting rails, said feed bar advancing the bottles, when lifted, a set distance. Then the bar descends between the stationary rails, leaving the bottle at rest on them. The bar is retracted while out of engagement with the bottles for the beginning of the next cycle of operations. Above the bottle is another bar 7 that has coordinating movement with the bottom bar. This bar is lowered to engage the bottle from the

top at the same time the feed bar is raised into engagement.

During these periods when the bottle is at rest on the supporting rails, the actual labeling of the bottles takes place by the action of a slide (not shown) movable substantially transversely to the supporting rails of the machine. In the present invention similar slides are used to carry the bottle spinner and wedge shuttle assembly on one side and the bottle back supporting roller assembly with the spot indicating means on the opposite side. It is at one of these registering stations, ahead of the actual labeling station, that the spotting of the bottle takes place.

The release of the wedge is effected by means contacting with projections extending beyond the periphery of the bottle, with reference to which the registering or spotting is done. This means can be electrical or mechanical; in the particular form shown, an electro-magnet acts as a latch withholding the flying wedge, this form being used to eliminate so far as possible failure due to wear and dislocation inherent in any purely mechanical device.

In the form of the invention shown, the machine is mounted on a base 10 which carries an upright 11 for supporting the stationary rails 6 which run lengthwise of the machine. The bottle B, supported alternately on the rails 6 or feed bar 12, is provided with a projection b which may be in the form shown in the drawings but more often in the form of letters or characters cast in relief and constituting integral projections. In this case, as in the inventions mentioned above, these projections, or the first edge of these projections, constitute means for initiating the stopping of the rotation of the bottle in order that each bottle may be stopped at the same angular position with relation to this projection. The purpose of this is to insure that the labels will be put on each of the bottles successively in the same places circumferentially of each bottle. In this case, the gearing and associated parts heretofore employed are eliminated.

The power for rotating or orienting the bottle is provided by a driven shaft 13 connected to one of an intermeshing pair of bevel gears 14. The other bevel gear is connected through a pivoted universal joint 15 to a shaft 16. This shaft is journaled in a bracket 9 supported by an integral arm 8 secured to a slide 37. On the top of this shaft 16 is a pulley 17 which, through a belt 18, drives a pulley 19 journaled on a shaft 20. This shaft has mounted thereon an anti-friction ball race 21 pressing on a spring 22, which in turn presses downwardly on the pulley 19 to press the pulley frictionally against the end face of a roll 23 also journaled on the shaft 20 and having its periphery covered with rubber or some other comparatively soft substance. This roll constitutes the means for rotating the bottle B on the supporting rails 6.

On a control shaft 25 is a pair of cams 26 one behind the other, the cams being in engagement with two rollers or cam followers 27. One of these rollers is mounted to rotate on the end of an arm 28 extending to the right, Fig. 1, and being keyed or otherwise secured to a shaft 30 suitably journaled in a part of the machine base. The other roller 27 is rotatably mounted on the end of an arm 29 extending through the left, Fig. 1. The arm 29 is fixed to a shaft 31 suitably journaled in a part of the machine base. The shafts 30 and 31 have upright arms 32 and

33 respectively. The arms 28 and 32 and also the arms 29 and 33 constitute bell cranks.

It will be obvious that when the cams push the rolls 27 up, for example, the upper ends of the arms 32 and 33 will be moved outwardly and when the cam falls away from the rolls 27, two springs 34 and 35 connected respectively to the arms 28 and 29 keep the rolls down on the low part of the cam. The arms 32 and 33 are respectively connected to a pair of slides 37 and 38 suitably guided for reciprocatory movement at right angles to the rails 6. The arm 32 is connected to the slide 37 by means of a pivot pin 39 and adjustable connecting link 40. The arm 33 is connected to the slide 38 by means of an adjustable pin 41 extending through a bracket 42 and engaging the end of a spring 43, as shown in Fig. 1, thereby providing a resilient connection between the slide and the arm 33. The slide 38 is mounted to operate in guides 44 extending laterally of the base substantially at right angles to the rails 6 and the slide has mounted thereon a bracket 45. On the slide 38 is also mounted a stud 47 on which an arm 46 is pivotally supported. On this arm 46 is a stud 48 on which is pivoted a lever 49 pulled by a spring 50 in a direction to hold a contact 51 thereon against a contact 52 located on a second arm 53 also pivoted on the stud 48.

On the lever 49 beyond the stud 48 is a roll 54 and on substantially the same axis is another roll 56 on the arm 53. As shown in Fig. 1, this roll 56 contacts the circumference of the bottle. The contacts 51 and 52 are normally in engagement and hold the roll 54 slightly away from the bottle until the latter is turned to such point that the projection b on the bottle will engage the roll 54 (but not roll 56) and move it away from the surface of the bottle to open the circuit through the contacts 51 and 52. Opening of the circuit through these contacts will stop the rotation of the bottle as will hereinafter appear.

On the projection 45 of the slide 38 on opposite sides of the rollers 54 and 56 are supports 57 on which are mounted the idler or supporting rolls 58. These idler rolls engage the surface of the bottle throughout a large part of the height thereof and constitute a backing for the bottle when the driving roll 23 is in contact with it on the other side, as shown in Fig. 3. These rolls 58, therefore, insure that a series of bottles moved successively into orienting position shall all be rotated on the same axis. The roll 54 is thus in the proper position to engage with the projection b as the bottle rotates.

Normally, the result of the opening of this circuit through contacts 51 and 52 is to deenergize an electromagnet 59, which heretofore has been energized and has held back a wedge or brake slide 60 against the action of a spring 61. On this brake slide 60 is located the shoe 62, of rubber or other material, soft enough to engage the bottle without any damage thereto and stop it.

When released this slide 60 advances in a line substantially tangential to the periphery of the bottle. The spring 61 having placed the wedge in contact with the bottle the kinetic energy of the rotation of the bottle itself provides the energizing force for the wedge 60.

With the wedge in the bottle stopping position of Fig. 4, the bottle cannot rotate and any torque applied to the bottle by the roll 23 merely causes the wedge to hold more tightly and prevent any rotation. Although the roll 23, driven only by frictional contact exerted by the spring 22, comes

to rest, being in contact with the now stationary bottle.

Referring to Figs. 5 and 7, a bracket 72 supports a plunger 70, carrying the slide 60. This bracket 72 also supports the slide 67, on which the magnet is mounted, as well as forming a backing for one end of a spring 68. The bracket 72 is rigidly attached to the bracket 73 which also supports the stud 20 for the roll 23, the bracket 73 being attached to the slide 37. Fig. 5 shows the location, partly in cross section, of the associated parts in the position shown in Fig. 4.

The electromagnet 59 functions as a latch to hold the plunger 70 and the associated parts in retracted position, until released by the opening of the electrical circuit through contacts 51 and 52. The magnet 59 has held the plunger 70 in retracted position against the spring 61, which provides the moving means for the plunger 70.

While the slide 37 with all the associated parts is moving forward into engagement with the bottle, the magnet slide 67 is stopped in its forward motion before the rest of the assembly reaches the end of its stroke at which point the roll 23 engages the bottle. This stopping of the slide 67 is accomplished by the head of a bolt 65, which is attached to the magnet slide 67, and which engages the bracket 64 attached to the stationary stand supporting the slide 37.

While the slides 37 and parts thereon are advancing toward the bottle the spring 68, which is stronger than the spring 61, has kept the slide 67 with its magnet 59 in a forward position in engagement with the plunger 70. On reaching the point when the forward motion of the magnet is arrested by the bolt 65 and bracket 64, the forward motion of the plunger also is stopped, the magnet being energized and in engagement with the end of the plunger. Thus as the slide continues to advance the wedge is held against further forward movement relative to the base of the machine and is thus held out of engagement with the bottle.

After the bottle has been rotated until the projection b on the bottle engages the roller 54 and causes a rocking of the arm 49 to separate the contacts 51 and 52, the electrical connection to the magnet 59 is broken and the wedge 60 is brought into engagement with the bottle by the pressure of the spring 61. When rotation of the bottle is arrested, the entire unit is drawn away from the bottle by the return of the slide 37 to the beginning of its stroke.

It will be understood that the stopping of the rotation of the bottle by the action of the wedge 60 occurs directly following the separation of the contacts 51 and 52. The bottle, however, is rotating at a comparatively high speed and thus the projection b goes as far as, or slightly further than, the position of Fig. 4 before the wedge has entirely stopped the bottle's rotation. The distance that the projection b moves after the separating of the contacts 51 and 52 is constant for a predetermined size and type of bottle and may be compensated for so that the projection will be in predetermined position with respect to the subsequent applied label.

The slide 37 on which the driving roll 23 is mounted is moved in timed relation to the movement of the slide 38 which carries the backing or idler rolls 58 by the cams 26 above referred to. The mechanism for reciprocating the slides is so arranged that the slide 37 is advanced from the position of Fig. 2 into the operative position of Fig. 3 at such a rate that the roll 23 engages the

bottle and moves it a short distance beyond the center of the support 12 on which the bottle is positioned. This movement of the bottle brings it into engagement with the rolls 58 and as the slide 38 carrying these rolls continues to advance toward the operative position of Fig. 3, the slide 37 moves slightly backward to its original position, thereby allowing the bottle to be restored to a position centrally above the support 12. It is during the period that the slide 37 is advanced beyond the position of Fig. 3 that the plunger 70 is retracted to the inoperative position of Fig. 3 through the action of the limiting bolt 75.

The advancing movement of the slide 37, which, as above stated, carries the roll 23 slightly beyond the operative position of Fig. 3, also makes sure that the bottle is actually rotating before the movement of the roller 54 by the projection 5 sufficient to release the wedge to stop the bottle from turning. To this end the slide 38 has mounted thereon a plunger 76, Fig. 1, which is yieldably mounted and which engages the control button of a switch or circuit breaker 75 mounted on the base of the machine. This switch is normally closed and is opened by the movement of the slide 38 into operative position. The plunger 76 is so adjusted that the bottle has been moved into engagement with the rollers 58 by the roll 23 and is rotating before the switch 75 is opened. As shown in Fig. 8, the switch 75 is in parallel relation with the contacts 51 and 52 in the circuit, which includes the electromagnet 59. Thus, if the bottle should be in the position of Fig. 4 at the time that the roll 23 first engages it, the resultant opening of the circuit through the contacts 51 and 52 will have no effect on the magnet 59 since the switch 75 will not yet have been opened by the advancing movement of the slide 38.

The electromagnet 59, having insufficient power to draw the plunger 70 back into positive contact when the latter is in the bottle stopping position of Fig. 4, though capable of holding the plunger 70 against pressure of the spring 61 when brought into direct contact, this positive contact between the magnet 59 and plunger 70 is effected through the pressure of a stronger spring 68 which moves the magnet with its slide 67 forward in relation to its support 72 when the entire assembly is withdrawn by the return stroke of the slide 37 to the inoperative position of Fig. 2. The spring 68 is no longer prevented from moving the magnet 59 with its slide 67 toward the plunger 70, by reason of the spacing of the head of the bolt 65 from the stationary bracket 64.

As previously pointed out the entire operation of rotating and stopping the bottle at a predetermined point has been accomplished by direct, simple, though powerful means, without the use of any complicated or intermediary gears, clutches, ratchets, pawls, etc., and at a speed beyond the handling capacity of the older type of device for the purpose.

I claim:

1. In a machine for orienting articles, each of which has a projection thereon, the combination with driving means engageable with the article to rotate the article on its axis, a pair of rolls movable relative to each other, one of which is supported for engagement with the article out of the path of the projection thereon, and the other being located for engagement with the projection as the article rotates, a brake adapted for engagement with the article, said brake being movable in a direction substantially

tangential to the periphery of the article, and means operative upon movement of said other roll when engaged by the projection for procuring movement of the brake into bottle engaging position.

2. In a machine for orienting articles, each of which has a projection thereon, the combination with means for rotating an article on its axis and a member engageable by the projection as the article rotates, of a stopping means for the article, including an element engageable with the periphery of the bottle and movable in a direction substantially tangential to the bottle, and means responsive to movement of the member by the projection for causing the stopping means to engage the article.

3. In a machine for orienting articles, each of which has a projection thereon, the combination with means for rotating an article on its axis, idler rolls for supporting said article during its rotation, and a member engageable by the projection as the article rotates, of a stopping means for engagement with the periphery of the article, said stopping means including a slide movable in a plane substantially tangential to the article's periphery, and having a bottle engaging member thereon, and means for causing said slide to be moved toward the bottle in response to movement of the member by the projection on the article.

4. In a device for locating a bottle having a projection thereon in a predetermined angular position for the subsequent application thereon of a label, a pair of oppositely movable slides, one slide having idler rolls to support the bottle rotation on a predetermined axis, means on the opposite slide for rotating the bottle by engagement with its periphery, a member on one of said slides for engagement with the projection on the bottle, stopping means on one of said slides for engagement with the article's periphery, said means including a bottle engaging element movable in a path substantially tangential to the bottle, and means for moving said bottle engaging element into bottle stopping position in response to movement of the member by the projection.

5. In a device for locating a bottle having a projection thereon in a predetermined angular position for the subsequent application thereon of a label, a pair of oppositely movable slides, one slide having idler rolls to support the bottle rotation on a predetermined axis, a member located between said rolls and positioned for engagement with the projection on the bottle, means on the other slide for procuring rotation of the bottle on its axis, a stopping member on said other slide, said stopping member having a bottle engaging surface and said stopping member being movable in a direction substantially tangential to the bottle, and means responsive to movement of the projection engaging member for procuring operation of the stopping member.

6. In a machine for orienting articles, each of which has a projection thereon, a pair of oppositely reciprocable slides, idler rolls on one of said slides for supporting the article for rotation on a predetermined axis, driving means engageable with the periphery of the article for procuring its rotation, means for removing said slides to advance the slide carrying the driving means beyond its normal article rotating position before the slide carrying the idler rolls has been advanced into normal article support-

ing position, a stopping means to discontinue the article's rotation, and means to operate said stopping means only when the slide carrying the idler rolls is in normal article supporting position.

5 7. In a device for locating a bottle having a projection thereon in a predetermined angular position, means for supporting the bottle for rotation on a predetermined axis, a slide, a positively driven roll on said slide and movable by
10 said slide into and out of engagement with a bottle's periphery, a stopping member on said slide having a movement independently of the slide in a plane substantially tangential to the
15 bottle for engagement with the periphery thereof, a spring for moving said stopping member into bottle engaging position, means for holding said stopping member in inoperative position against the action of the spring, and means operative
20 during movement of the slide for shifting the stopping member into inoperative position to be held by said holding means.

8. In a device for locating a bottle having a projection thereon in a predetermined angular position, means for supporting the bottle for rotation on a predetermined axis, a slide, a positively driven roll on said slide and movable by
5 said slide into and out of engagement with a bottle's periphery, a stopping member on said slide having a movement independently of the slide in a plane substantially tangential to the bottle for engagement with the periphery thereof, a spring
10 for moving said stopping member into bottle engaging position, means for holding said stopping member in inoperative position against the action of the spring, means operative during movement of the slide for shifting the stopping member into
15 inoperative position to be held by said holding means, and means located in predetermined relation to the first means and in a position for engagement with the projection to be moved thereby for releasing the stopping means in re-
20 sponse to movement by the projection.

ERIC E. ESSEN.

CERTIFICATE OF CORRECTION.

Patent No. 2,222,503.

November 19, 1940.

ERIC E. ESSEN.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 3, first column, line 74, after the word "although" insert --the pulley 19 continues to rotate,--; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 31st day of December, A. D. 1940.

(Seal)

Henry Van Arsdale,
Acting Commissioner of Patents.