

June 27, 1972

L. E. GRIFFIN

3,672,727

BOTTLE ORIENTING SYSTEM

Filed Dec. 29, 1969

3 Sheets-Sheet 1

FIG. 1

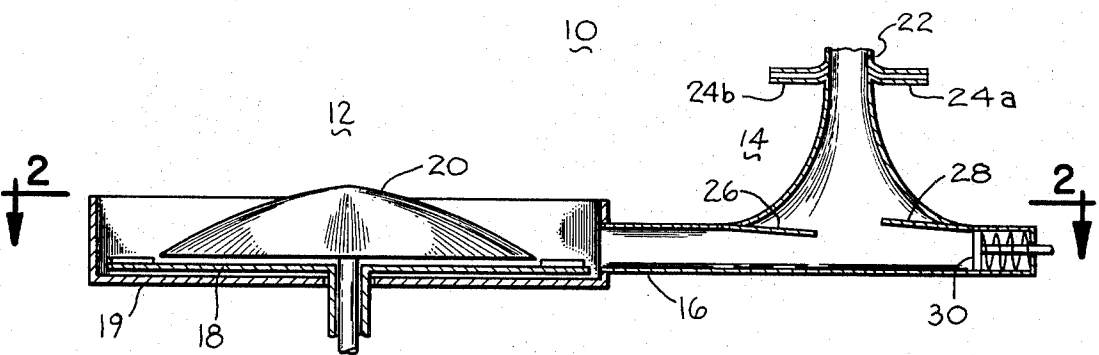
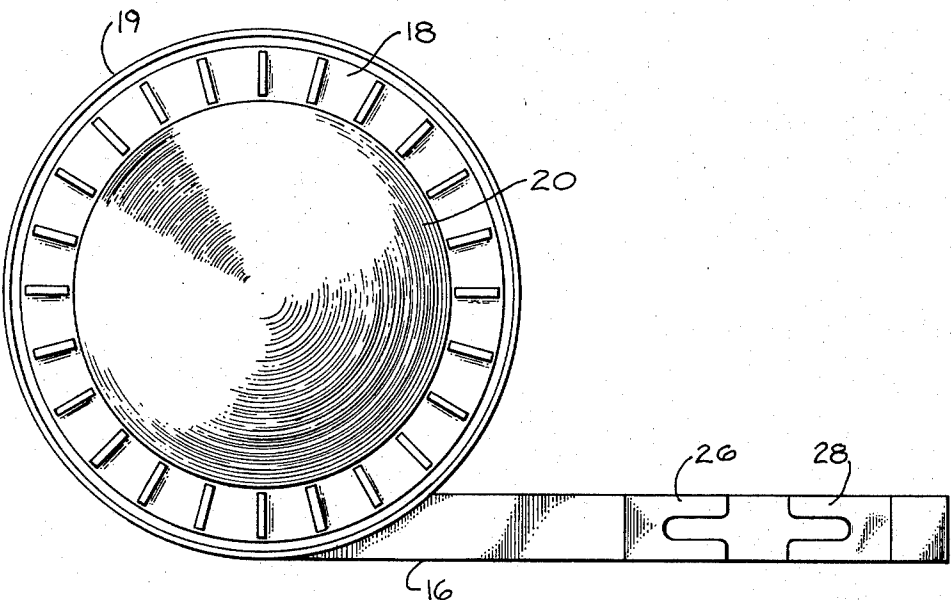


FIG. 2



INVENTOR.
LEONARD E. GRIFFIN

BY
James P. Logmasini
ATTORNEY:

June 27, 1972

L. E. GRIFFIN

3,672,727

BOTTLE ORIENTING SYSTEM

Filed Dec. 29, 1969

3 Sheets-Sheet 2

FIG. 3

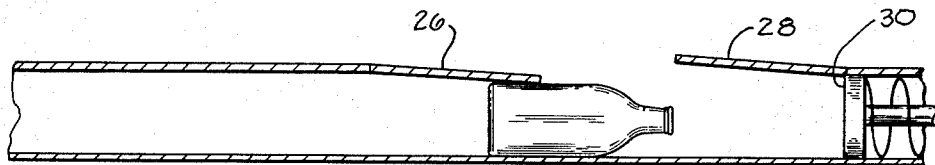


FIG. 4

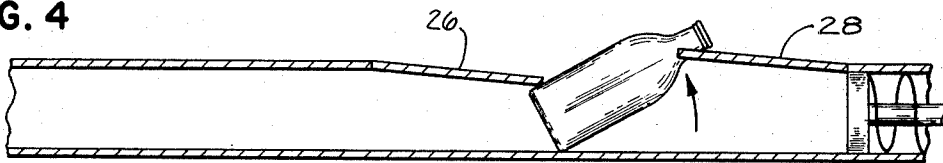


FIG. 5

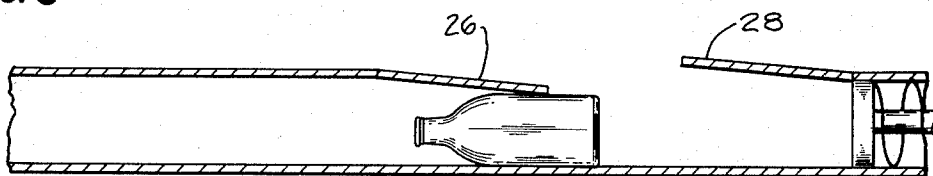
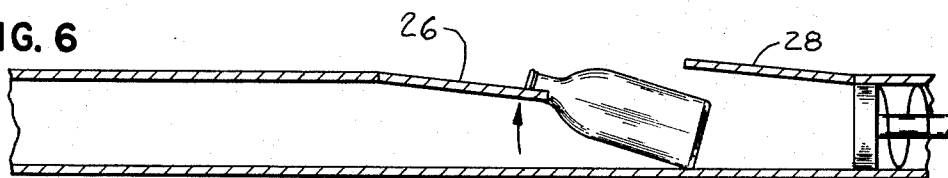


FIG. 6



INVENTOR.
LEONARD E. GRIFFIN

BY *James C. Toyomatsu*
ATTORNEY:

June 27, 1972

L. E. GRIFFIN

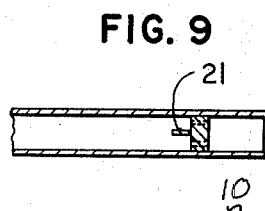
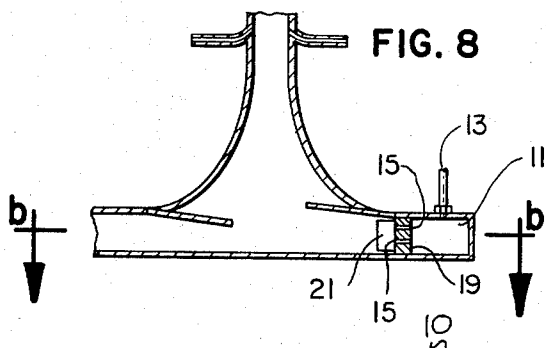
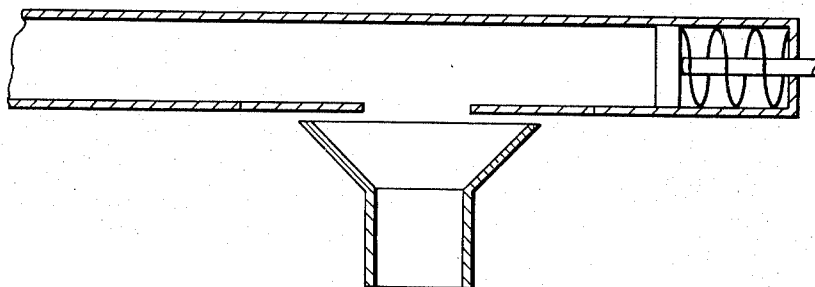
3,672,727

BOTTLE ORIENTING SYSTEM

Filed Dec. 29, 1969

3 Sheets-Sheet 3

FIG. 7



INVENTOR.
LEONARD E. GRIFFIN

BY *James C. Logomies*
ATTORNEY:

1

3,672,727

BOTTLE ORIENTING SYSTEM

Leonard E. Griffin, O'Fallon, Mo., assignor to

Monsanto Company, St. Louis, Mo.

Filed Dec. 29, 1969, Ser. No. 888,387

Int. Cl. B65g 47/24, 51/02

U.S. Cl. 302—2 R

3 Claims

ABSTRACT OF THE DISCLOSURE

A method and apparatus for orienting or aligning bottles utilizing substantially no moving parts in that substantially opposing double prong members permit the bottle neck to pass through one of the double prong members while the opposite end of the bottle is held in place by the other double prong member.

BACKGROUND OF THE INVENTION

The orientation or alignment of bottles during line operations has become increasingly critical with the increased speeds at which bottles are now being produced, handled, decorated and the like. As a result, various types of machines have been developed for the regulation of bottles during production and filling operations. To insure that each and every bottle in a series is oriented correctly to prevent as much as possible line stoppages the equipment has generally become rather complicated. Now there has been developed a rather simple apparatus which has a high degree of performance in the regulation and control of bottle orientation during line operation.

SUMMARY OF THE INVENTION

The present invention relates to the orientation or alignment of narrow neck containers and more particularly to the orientation or alignment of bottles.

Accordingly, it is a principal object of this invention to provide apparatus and means for the orientation of narrow neck containers.

It is another object of the present invention to provide apparatus and means to orient narrow neck containers at a high rate of speed.

Other objects of this invention will in part be obvious and will in part appear hereinafter.

BRIEF DESCRIPTION OF THE DRAWINGS

The following drawings are provided for illustrating various embodiments of the invention:

FIG. 1 illustrates a side view of a bottle orientation apparatus of the present invention.

FIG. 2 illustrates a top view of the orientation apparatus of FIG. 1 taken through line 2—2.

FIGS. 3 and 4 illustrate the technique of orienting a bottle which is moved neck end first into the apparatus.

FIGS. 5 and 6 illustrate the technique of orienting a bottle which is moved bottom end first into the apparatus.

FIG. 7 illustrates an alternative embodiment of an orientation apparatus wherein gravity is employed to remove the bottles from the system.

FIGS. 8 and 9 illustrate an alternative embodiment of a bottle dampening device used in the orientation apparatus.

DESCRIPTION OF THE ILLUSTRATED EMBODIMENT

Referring in detail to the figures of the drawings and more specifically to FIG. 1, there is schematically shown a narrow neck container orientation apparatus 10 comprising a bottle feed section 12 and a bottle orientation

2

section 14. The bottle feed section 12 can be any type of apparatus which will feed bottles neck end or bottom end first into duct 16. In this instance and as can be seen more clearly in FIG. 2, the bottle feed section comprises a rotatable platform 18 revolving in a basin 19 beneath a circular cone 20 which is rotatable in unison with the platform. In operation bottles coming into the system would drop onto the cone 20 falling to the side or periphery of the basin where they line up along the wall of the basin 19 such that as the platform 18 rotates the bottles will be forced into conduit 16 either neck first or bottom first. Movement along conduit 16 can be also enhanced by any means such as driven conveyor rollers, air pressure and the like. In the embodiment of FIG. 1, a suction is used which is applied by directing an upward air flow in stack 22, located in the orientation section 14 by air jets 24a and 24b. This results in a suction or pull below the air jets drawing the bottles into the orientation section. In the orientation section 14 are two substantially opposing double prong members referred to herein as the initial double prong member 26 and the forward double prong member 28, respectively, and dampening means comprising in this instance a spring backed plate 30. The initial double prong member 26 is shown angled downwardly to a certain extent while the forward double prong member 28 on the far end of the orientation apparatus is shown angled upwardly to a certain extent. The distance between the prongs on each member is large enough to permit the neck but not the body of a bottle to pass between.

The operation of the orientation section 14 can be described by reference to FIGS. 3 to 6 wherein FIGS. 3 and 4 illustrate the situation where the bottle enters the orientation section neck end first. As shown in FIG. 3 both prongs of the initial double prong member 26 on the entry end of the orientation apparatus 10 are in contact with the body portion of the bottle (i.e., below the bottle neck) maintaining the bottle in substantially a horizontal position as it moves towards the dampening plate 30. In FIG. 4, the bottle is shown after it has struck and rebounded to some extent back from dampening plate 30, tilted upwardly as a result of the suction pulling the bottle neck between the prongs of the forward double prong member 28 while the opposite double prong member 26 restrains the bottom portion of the bottle until the bottle is almost vertical.

FIG. 5 illustrates the situation when the bottle moves into the orientation section 14 bottom end first such that shortly after the bottom end has rebounded to some extent off of the dampening plate the neck end is again pulled upwardly by the suction. However, in this instance the situation is reversed in that the bottle neck passes between the prongs of the initial double prong member 26 while the opposing or forward double prong member 28 restrains the lower portion of the bottle. Thus, no matter which end of the bottle enters the orientation section first the bottle will leave the orientation section with the neck end forward.

FIG. 7 illustrates an alternative embodiment utilizing opposing double prong members positioned below the path of bottle travel causing the bottles to leave the orientation section by gravity as opposed to suction pull.

FIGS. 8 and 9 illustrate an alternative embodiment of the dampening means which may be used in the orientation apparatus. More specifically, FIG. 9 illustrates a side view of a pneumatic bottle dampening device 10 and FIG. 8 illustrates a top view of the same bottle dampening device taken along the line b—b of FIG. 8. As can be seen in FIG. 8, the dampening device comprises a pneumatic chamber 11 having an air input line 3 connected to the chamber and air outlet ports 15 drilled in plate 19 which faces the direction of the oncoming bottles.

In operation, air passing from chamber 11 through the ports 15 serve to cushion the impact of the oncoming bottles. In addition, the increased air input at this point serves to assist the suction force which is employed as described above to lift the bottles upwardly and out of the system. Also shown in FIG. 8 is a projection or flap 21 which may be used to stop the bottles at an exact point in the conduit before they reach the ports 15. The impact of the bottles against the edge of the flap is substantially dampened due to the cushioning effect of the air emanating from the ports 15.

In summary the two opposing double prong members are contoured and spaced relative to each other to permit the neck of a bottle to pass laterally between the prongs of one member while the prongs of the opposite member restrain the lower portion of the bottle causing it to pivot around the end of the latter member. In this manner, the bottles are oriented with the bottle neck always aligned forwardly in the direction of the bottle's exiting motion. The distance between the double prong members must be less than the length of the body of the bottle (i.e., excluding neck) while at the same time great enough about to permit the lower body portion of the bottle to pivot around the contacting double prong member as shown in FIG. 4. In general, it has been found the optimum distance between the double prong members will vary from $\frac{1}{8}$ to 1 inch less than the length of the bottle body, that is, the total length of the bottle minus the neck portion. In addition, the initial double prong positioned at the entry to the system should be angled downwardly to maintain the bottle in a substantially horizontal plane to permit the leading portion of the bottle to pass under the opposing or forward double prong member. Preferably the forward double prong member is angled upwardly to prevent the prong tips from striking the oncoming bottle.

The dampening means may be any device which will dampen the impact of the bottles entering the orientation section to not only prevent breakage but also to minimize rebound of the bottles so that the bottles will pivot around the forward double prong member rather than being forced back into the inlet duct which would only cause jamming of the bottles to occur.

What is claimed is:

1. An apparatus for orienting narrow necked containers which comprises a chamber having an outlet and inlet of sufficient size to accommodate the passage of a bottle longitudinally and an initial double prong member with prongs angled inwardly toward the direction of a line taken co-extensively from the longitudinal axis of the inlet and extending from approximately one side of the inlet, a substantially similar forward double prong member situated opposite the initial double prong member with the prongs extending generally in the direction of the initial double prong member and dampening means associated with the forward double prong member adapted to minimize the rebound of bottles striking the dampening means.

2. An apparatus for orienting narrow necked bottles which comprises a chamber having an outlet and inlet of sufficient size to accommodate the passage of a bottle longitudinally, an initial double prong member with prongs extending from approximately one side of the inlet, a substantially similar forward double prong member situated opposite the initial double prong member with the prongs extending generally in the direction of the initial double prong member, dampening means associated with the forward double prong member adapted to minimize the rebound of bottles striking the dampening means and means to create a suction in said chamber to draw the bottles being oriented into said chamber.

3. The apparatus of claim 2 wherein the dampening means comprises a reverse air flow emanating from air ports in a plate associated with the forward double prong member.

References Cited

UNITED STATES PATENTS

1,657,680	1/1928	Lorenz	198—33 AD
2,377,154	5/1945	Hurley Jr.	193—43 B
1,658,428	2/1928	Charles	193—43 B

EVON C. BLUNK, Primary Examiner

W. S. CARSON, Assistant Examiner

U.S. Cl. X.R.

193—43 B, 43 D; 198—33 AA; 302—11