May 8, 1951 W. G. MALO 2,552,440

BOTTLE DRINK MIXING MACHINE

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Fig. 1

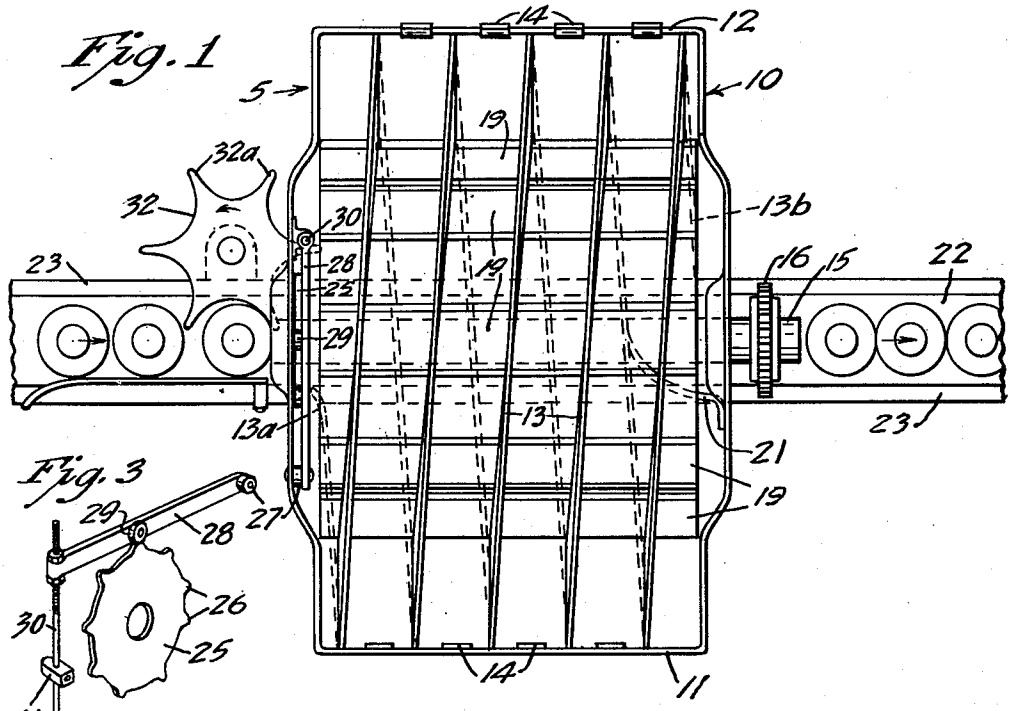
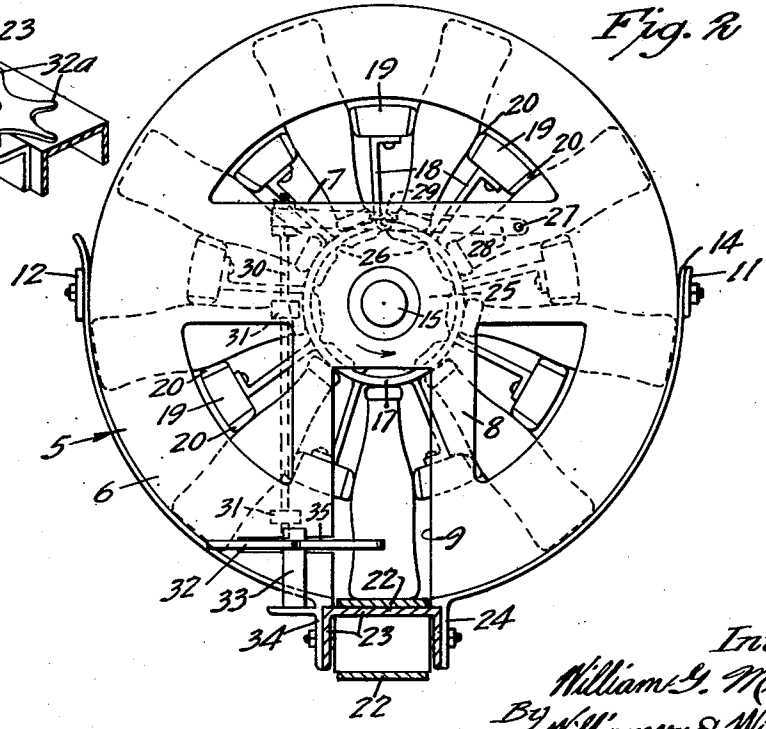


Fig. 3

Fig. 2



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BOTTLE DRINK MIXING MACHINE

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1 Claim. (Cl. 259—57)

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This invention relates to apparatus for mixing liquids in closed containers and more particularly for mixing bottled goods such as beverages which include a flavoring syrup and water.

In the preparation of so-called "soft drinks" when the flavoring syrup and water are placed in a container or botle they are not uniformly mixed, and it is necessary to agitate the bottle in some way in order that the proper mixture of water and syrup is produced.

It is a general object of the invention to provide relatively simple and compact apparatus for receiving filled and capped bottles from a conventional straight line bottle conveyor, tumbling the bottles and redepositing them on the conveyor so that proper mixture of the liquid in the bottles or other containers will result.

Another object of the invention is to provide apparatus for mixing liquids in containers wherein the mixing apparatus includes a plurality of spaced bottle receiving pockets and wherein means is provided for feeding the filled bottles to the mixing apparatus so that they will be deposited properly in successive pockets in the mixing machine without jamming and without skipping any of the bottle receiving pockets.

The above and other objects and advantages of the invention will more fully appear from the following description made in connection with the accompanying drawings, wherein like reference characters refer to the same parts throughout the views, and, in which:

Figure 1 is a plan view of an embodiment of the invention showing it associated with a straight line bottle conveyor;

Figure 2 is a front end elevation with the bottle conveyor in section; and

Figure 3 is a perspective view of the bottle inlet gate and its control mechanism.

The apparatus includes a front end piece 5 including a circular circumferential portion 6, a horizontal cross member 7, and a vertical member 8 having a vertical rectangular opening 9 therein. There is a rear end plate 10 shaped approximately the same as the front end piece or plate 5. The end plates are connected by horizontal members 11 and 12 approximately midway of the plates vertically.

A spiral guideway 13 of the same width and diameter as the end plates 5 and 10 is located between the end plates. The forward end of the spiral is shown at 13a and its rearward or outlet end is shown at 13b.

Between the spaced convolutions of the spiral guideway 13 are straps 14 which are spaced from

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the adjacent convolutions and lie approximately at the circumference of the cylinder of revolutions defined by the spiral guideway. As shown best in Figure 2, the straps 14 lie only in the lower 180 degrees of said spiral guideway.

Mounted between the end plates 5 and 10 is a shaft 15 which, as shown in Figure 1, is provided at one end with a gear 16 adapted to be connected to any suitable drive mechanism such as a motor not shown. On the shaft 15 is a cylinder 17 which is adapted to rotate with the shaft. Extending radially from the cylinder 17 is a series of arms 18 which extend approximately throughout the length of the spiral guideway concentric to its axis. The radial arms 18 have blocks 19 thereon whose sides 20 are in the form of cushions of rubber or other suitable material.

The outlet end of the spiral mixing device, which is the right hand end shown in Figure 1, has a bottle deflector 21 associated therewith. This deflector is connected to the end plate 10 and extends inwardly to intersect the path of movement of bottles passing along the last convolution of the spiral guideway and insuring their deposit on the bottle conveyor 22 which passes longitudinally beneath the mixing apparatus. The bottle supporting straps 14 may be cut so that the conveyor 22 can cross through the opening provided by the cut, or said straps may lie just above the bottle conveyor as desired. If the straps are cut away the bottles will still slide across the conveyor as they pass around the spiral convolutions since conveyors in bottling works and the like are customarily soaped or treated with some other lubricant and the bottles will merely slide across the conveyor without hindrance.

The cage which comprises the spiral guideway may be connected to a channel 23 shown best in Figure 2. This channel, in the embodiment shown, constitutes a support for the movable conveyor belt 22. It is connected by ears 24 which extend downwardly in spaced pairs from the end plates 5 and 10.

Secured to the shaft 15 at the inlet end of the mixing apparatus is a cam wheel 25 which has a series of cams 26 thereon, there being a cam for each bottle receiving pocket defined by the spaced radial arms 18. Pivotally mounted at 27 on the cross member 7 of the inlet end plate 5 is a lever arm 28 which lies just above the cam wheel 25. On the lever 28 is a cam roller 29. The other end of the lever 28 is connected to a vertical rod 30 which extends through guide blocks 31 mounted on the inside of the end plate

5. The lower end of the rod 30 extends downwardly to a star wheel 32 which provides a bottle feeding gate. The wheel 32 is mounted for free rotation on a post 33 on a bracket 34 which is in turn supported by the conveyor channel 23. The star wheel 32 extends through a slot 35 in the end plate 5 so that a portion of the wheel lies outside of the end plate and a smaller portion thereof extends through the plate. The star wheel 32 has its arms 32a so arranged that they will swing across the path of movement of bottles traveling along the conveyor 22 to the mixing apparatus.

Each time one of the cams 26 raises the lever 28 and rod 30 the star wheel 32 will be released so that a bottle on the conveyor will pass into the mixing apparatus, pushing the star wheel around as the bottle moves. The star wheel or feed gate 32 will then be locked by reason of the cam follower 29 dropping from the cam which has just raised it and the rod 30 will drop so that the star wheel can move only until the next successive arm comes into contact with the rod 30.

The structure of the cam wheel 25 and its cams 26, the throw of the rod 30 and the spacing of the arms on the star wheel 32 are all correlated into rotary movement of the radial arms 18 so that successive bottles are fed into successive pockets defined by the spaces between said arms 18. By reason of this there is no possibility of the bottles feeding into the machine too fast or of them feeding in at a time which would cause jamming by reason of improper arrival of a bottle at the point where it is to be fed between two of the arms 18.

It will, of course, be understood that various changes may be made in the form, detail, arrangement and proportions of the various parts without departing from the scope of my invention.

What I claim is:

Apparatus for mixing liquids in closed upstanding containers comprising a continuous helical guideway structure mounted in fixed relation with its axis disposed substantially horizontal and having convolutions spaced apart a distance slightly greater than the width of said containers, said guideway structure having an open receiving end in the lower portion thereof providing lateral access for an upstanding container to the first convolution of said guideway when said container is delivered in upstanding position moving toward said open end, a rotor co-axially mounted in said guideway structure and have a plurality of radial arms extending outwardly from its axis toward the inner periphery of but not to said helical guideway, the free end portions of each of said arms being of substantially greater thickness than the remaining portion of said arms and being adapted to move said containers continuously in positions radial to said rotor through said guideway and to, at all times, prevent said containers from twisting or flopping rearwardly or forwardly in the direction in which said convolutions extend.

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