June 30, 1936. H. H. FISHER 2,046,256

METHOD AND APPARATUS FOR LIBERATING AIR FROM RECEPTACLES CONTAINING CARBONATED BEVERAGES

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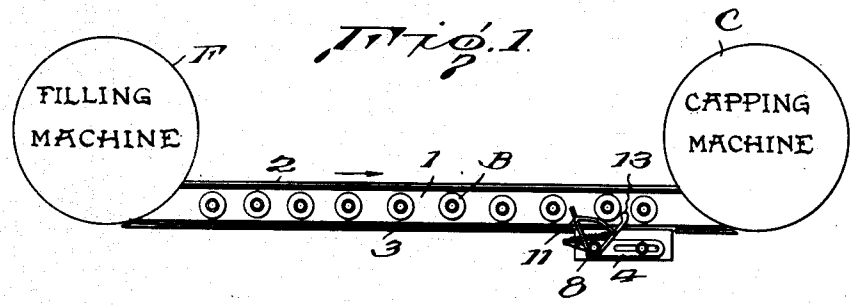


FIG. 1.

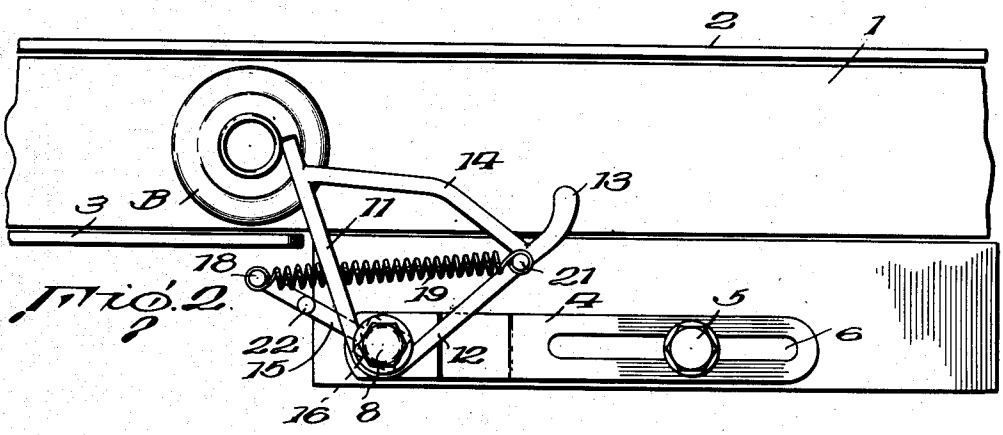


FIG. 2.

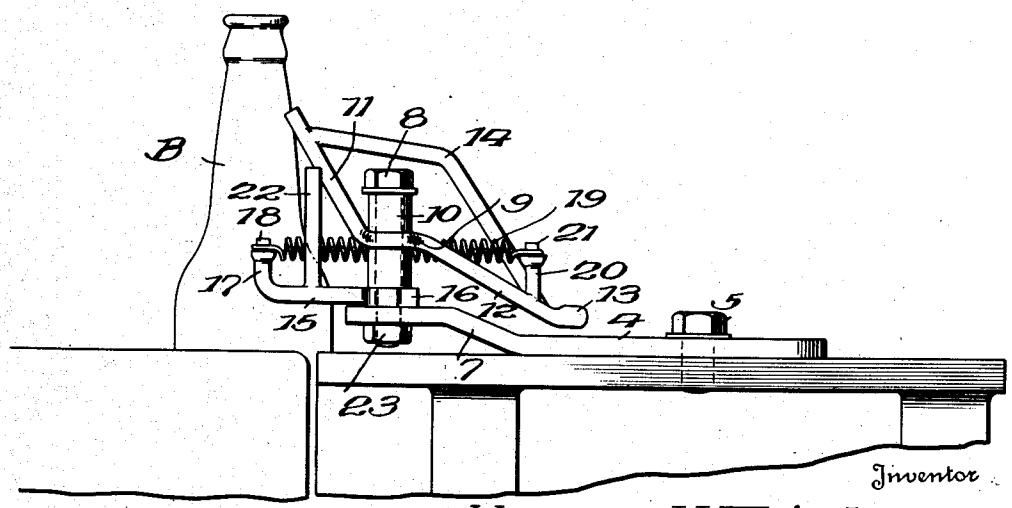


FIG. 3.

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METHOD AND APPARATUS FOR LIBERATING AIR FROM RECEPTACLES CONTAINING CARBONATED BEVERAGES

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13 Claims. (Cl. 226—72)

This invention relates to a method and apparatus for packaging goods and particularly to the packaging of beer or other carbonated beverages.

In the usual method of bottling carbonated beverages the bottles are passed automatically through a filling machine where they are filled to within an inch or two of the top and then to a capping machine or the like where the crown seal or other closure is applied to seal the bottles airtight. Such a method while being satisfactory for bottling some beverages, is not entirely satisfactory for bottling beer or other beverages which contain constituents which may be oxidized or otherwise adversely affected by constituents of the air which remains in the neck of the bottle above the liquid.

In accordance with the present invention, means are provided whereby all or a part of the air remaining in the top of the bottle after filling will be expelled and replaced before the sealing closure is applied by a portion of the inert carbon dioxide with which the beverage was carbonated.

More particularly, the present invention relates to the liberation of a part of the dissolved and/or occluded carbon dioxide while the bottle is in transit from the filling machine to the capping machine, and preferably to means operated by the bottle itself to tap the bottle so that it will be jarred sufficiently to cause a portion of the carbon dioxide in the liquid to be liberated, whereby the same will rise upward though the liquid in the bottle and expel and replace all or a part of the air in the neck of the bottle above the liquid. The automatic tapping means is so positioned with respect to the capping mechanism that the closure will be applied and seal the bottle at about that time when sufficient of the carbon dioxide has been liberated to expel and replace all of the air remaining above the liquid, and in order that the tapping of the bottle may take place at the proper time with respect to the capping thereof, the tapping means preferably is adjustable towards and from the capping mechanism.

The method of the present invention will be further described in connection with the accompanying drawing, which is merely exemplary of one form of apparatus for carrying out the method of the invention.

In the drawing,

Fig. 1 is a diagrammatic plan view of bottle filling and capping mechanisms, and shows the relative position of the tapping mechanism with respect to the bottle filling and bottle capping mechanisms; and

Figs. 2 and 3 are plan and side elevational views respectively of the bottle tapping mechanism.

Referring to the drawing, the bottles to be filled are passed in any suitable manner to the bottle filling machine F, and after being filled are conducted to a bottle capping machine C by a suitably driven conveyor 1 which passes between guide rails 2 and 3 which maintain the bottles in proper alignment to operate the tapping mechanism to be described.

A base member 4 of the bottle tapping mechanism is adjustably secured to the guide rail 3 adjacent the bottle capping machine by a machine bolt 5 which passes through a slot 6 therein. The end of the base member 4 remote from the capping machine is offset as at 7 and forms a support for a bolt 8 about which the tapping mechanism rotates.

The mechanism for tapping the bottles B after they have left the filling machine comprises a member 9 having an elongated bearing collar 10 rotatably mounted on the bolt 8. The member 9 comprises an arm 11 which, as shown in Figs. 2 and 3, extends upwardly and forwardly and normally lies in the path of the necks of the bottles in transit from the bottle filling machine to the bottle capping machine, and an arm 12 which extends downwardly and forwardly and has a hammer 13 at its lower end which, as will presently be described, is adapted to strike a passing bottle with sufficient force to jar it sufficiently to liberate a portion of the CO_2 in the liquid in the bottle. The arms 11 and 12 are connected by an offset portion 14 which acts both as a reinforcing means for the arms 11 and 12 and as means for preventing the bottle from passing into the space between the arms to such an extent that the hammer 13 would not strike the bottle at the proper place.

An arm 15 having a threaded inner end 16 for receiving the threaded lower end of the bolt 8 extends outwardly from the upper side of the offset portion 7 of the base member and has its outer end 17 turned upwardly and formed with a stud 18 to receive one end of a tightly wound tension spring 19. The arm 12 has an upwardly extending part 20 which is formed with a similar stud 21 for receiving the other end of the spring 19. The spring 19 normally retains the arms 11 and 12 in the relative position shown in Figs. 1 and 2, in which the outer end of the arm 11 lies in the path of the necks of the bottles as they pass from the filling machine to the capping machine. A nut 23 is threaded on to the end of

the bolt 8 which passes through the aperture in the offset portion 7 and is tightened against the lower side of the offset portion 7 until the bolt 8 and arm 15 are clamped tightly in the position shown. A stop 22 extends upwardly from the arm 15 and limits the backward movement of the member 9.

After a bottle has been filled to the desired extent in the filling machine F it is automatically discharged on to the conveyor 1 which carries it to the capping machine C. As each bottle passes the tapping mechanism the neck thereof engages the outer end of the arm 11 and rotates the member 9 in a clockwise direction (simultaneously loading the spring 19) until the bottle neck eventually rides over the end of the arm. The member 9 is then free to return to its normal position under the influence of the spring 19 and as it flips back the hammer 13 carried on the end of the arm 12 strikes the bottle and jars it sufficiently to liberate a portion of the carbon dioxide which is dissolved or occluded in the liquid in the bottle. The liberated carbon dioxide instantly rises to the top of the liquid and expels and replaces all or a part of the air in the bottle above the liquid. The bottle then passes into the capping machine and the crown seal or other closure is applied to seal the bottle with the chemically inert carbon dioxide above the liquid.

By merely loosening the nut 23 the arm 15 may be adjusted to vary the extent to which the spring 19 will be loaded as the bottle passes the end of the arm 11 and thereby vary the force of the blow of the hammer 13 against the bottle, which in turn determines the amount of carbon dioxide which will be liberated from the liquid in the bottle. The relative position of the tapping mechanism with respect to the capping machine may be varied within limits by means of the slot 6 in the base member 4.

The invention has been disclosed in connection with a system in which separate machines are used for the filling and sealing operations, but it is to be understood that the tapping means may be used with equal facility in a combined filling and sealing machine, it being necessary merely to interpose the same between the filling and sealing operations. It will also be understood that the invention is not limited to the displacing of air from bottles but also may be used for the displacing of air from the tops of cans or any other type of container in which it may be desired to package carbonated beverages.

I claim:

1. The method of packaging beverages containing carbon dioxide which comprises partially filling a receptacle with the beverage in an atmosphere containing air whereby the space in the container above the liquid will contain air, jarring the receptacle to cause a part of the carbon dioxide in the liquid to be liberated and thereby expel at least a part of the air from the space above the liquid, and then sealing the container.

2. The method of packaging beverages containing carbon dioxide which comprises partially filling a receptacle with the beverage in an atmosphere containing air whereby the space in the container above the liquid will contain air, tapping the receptacle to cause a part of the carbon dioxide in the liquid to be liberated and thereby expel at least a part of the air from the space above the liquid, and then sealing the container.

3. A system for packaging carbonated beverages comprising means for partially filling receptacles with the beverage in an atmosphere containing air whereby the space above the liquid will contain air, a closure-applying means, means for transferring the receptacle from the receptacle-filling means to the closure-applying means, and means for jarring the receptacle while it is in transit from the receptacle-filling means to the closure-applying means to cause a portion of the carbon dioxide in the beverage to be liberated whereby the same will rise to the surface of the liquid and displace at least a part of the air in the receptacle above the liquid.

4. A system for packaging carbonated beverages comprising means for partially filling receptacles with the beverage in an atmosphere containing air whereby the space above the liquid will contain air, a closure-applying means, means for transferring the receptacle from the receptacle-filling means to the closure-applying means, and means for tapping the receptacle while it is in transit from the receptacle-filling means to the closure-applying means to cause a portion of the carbon dioxide in the beverage to be liberated whereby the same will rise to the surface of the liquid and displace at least a part of the air in the receptacle above the liquid.

5. A system for packaging carbonated beverages comprising means for partially filling receptacles with the beverage in an atmosphere containing air whereby the space above the liquid will contain air, a closure-applying means, means for transferring the receptacle from the receptacle-filling means to the closure-applying means and means operated by the receptacle itself for jarring the receptacle while it is in transit from the receptacle-filling means to the closure-applying means to cause a portion of the carbon dioxide in the beverage to be liberated whereby the same will rise to the surface of the liquid and displace at least a part of the air in the receptacle above the liquid.

6. A system for packaging carbonated beverages comprising means for partially filling receptacles with the beverage in an atmosphere containing air whereby the space above the liquid will contain air, a closure-applying means, means for transferring the receptacle from the receptacle-filling means to the closure-applying means, and means operated by the receptacle itself for tapping the receptacle while it is in transit from the receptacle-filling means to the closure-applying means to cause a portion of the carbon dioxide in the beverage to be liberated whereby the same will rise to the surface of the liquid and displace at least a part of the air in the receptacle above the liquid.

7. A system for packaging carbonated beverages comprising means for partially filling receptacles with the beverage in an atmosphere containing air whereby the space above the liquid will contain air, a closure-applying means, means for transferring the receptacle from the receptacle-filling means to the closure-applying means, means for jarring the receptacle while it is in transit from the receptacle-filling means to the closure-applying means to cause a portion of the carbon dioxide in the beverage to be liberated whereby the same will rise to the surface of the liquid and displace at least a part of the air in the receptacle above the liquid, and means for adjusting the relative position of the receptacle-jarring means with respect to the closure applying means.

8. A system for packaging carbonated beverages comprising means for partially filling receptacles with the beverage in an atmosphere

containing air whereby the space above the liquid will contain air, a closure-applying means, means for transferring the receptacle from the receptacle-filling means to the closure-applying means, means for tapping the receptacle while it is in transit from the receptacle-filling means to the closure-applying means to cause a portion of the carbon dioxide in the beverage to be liberated whereby the same will rise to the surface of the liquid and displace at least a part of the air in the receptacle above the liquid, said tapping means comprising an oscillatable member having a pair of horizontally spaced arms, the arm nearer to the receptacle-filling means normally lying in the path of a receptacle in transit from the receptacle-filling means to the closure-applying means, said oscillatable member being displaceable by the force of a moving receptacle against the arm lying in its path, and means tending to quickly return said member to its normal position when the receptacle rides past the end of the arm nearest the receptacle-filling means, whereby the second arm strikes against the receptacle to jar the same.

9. A tapping device for receptacles partially filled with a carbonated beverage which comprises an oscillatable member, said member having a pair of angularly disposed, vertically spaced arms, one of which acts as a tapper, and means for normally maintaining said member in a predetermined position, including means tending to quickly return said member, when oscillated, to its predetermined position.

10. In apparatus for liberating gas from a carbonated beverage in a receptacle, a pathway along which the receptacle is adapted to move, a tapping device including a member adapted to strike the receptacle, and a member normally positioned in the path of the receptacle as it moves along said pathway, said last mentioned member being operable by the movement of the receptacle there past to cause the tapping member to strike the receptacle with force sufficient to jar the same and the liquid therein, to cause a portion of the carbon dioxide in the liquid to be liberated.

11. In apparatus for liberating gas from a carbonated beverage in a receptacle, a pathway along which the receptacle is adapted to move, a tapping device including a pivotally mounted tapping member, and a pivotally mounted member normally positioned in the receptacle as it moves along said pathway, said last mentioned member being operable by the movement of the receptacle there past to cause the tapping member to strike the receptacle with force sufficient to jar the same and the liquid therein, to cause a portion of the carbon dioxide in the liquid to be liberated.

12. In apparatus for liberating gas from a carbonated beverage in a receptacle, a pathway along which the receptacle is adapted to move, a tapping device including a pivoted member having a pair of angularly disposed arms, one of which acts as a tapper and the other of which normally is positioned in the path of a receptacle moving along said pathway, said last mentioned arm being operable by the movement of the receptacle there past to cause an oscillation of said member and a striking of the receptacle by the other arm with force sufficient to jar the same and the liquid therein, to cause a portion of the carbon dioxide in the liquid to be liberated.

13. In apparatus for liberating gas from a carbonated beverage in a receptacle, a pathway along which the receptacle is adapted to move, a tapping device including a pivoted member having a pair of angularly disposed arms, one of which acts as a tapper and the other of which normally is positioned in the path of the receptacle as it moves along said pathway, a spring tending to maintain said member in such position that said last mentioned arm is in its normal position, said last mentioned arm being operable by the movement of the receptacle there past to cause an oscillation of said member and a striking of the receptacle by the other arm as the member returns to its normal position under the influence of said spring, with force sufficient to jar the same and the liquid therein, to cause a portion of the carbon dioxide in the liquid to be liberated.

HORACE H. FISHER.

DISCLAIMER

2,046,256.—*Horace H. Fisher*, Salt Lake City, Utah. METHOD AND APPARATUS FOR LIBERATING AIR FROM RECEPTACLES CONTAINING CARBONATED BEVERAGES. Patent dated June 30, 1936. Disclaimer filed December 2, 1939, by the assignee, *Crown Cork & Seal Company, Inc.*

Hereby enters this disclaimer to claims 1, 2, 3, 4, and 7 in said specification.

[*Official Gazette December 26, 1939.*]