June 22, 1943. J. H. MURCH 2,322,250

CAN CLOSING MACHINE

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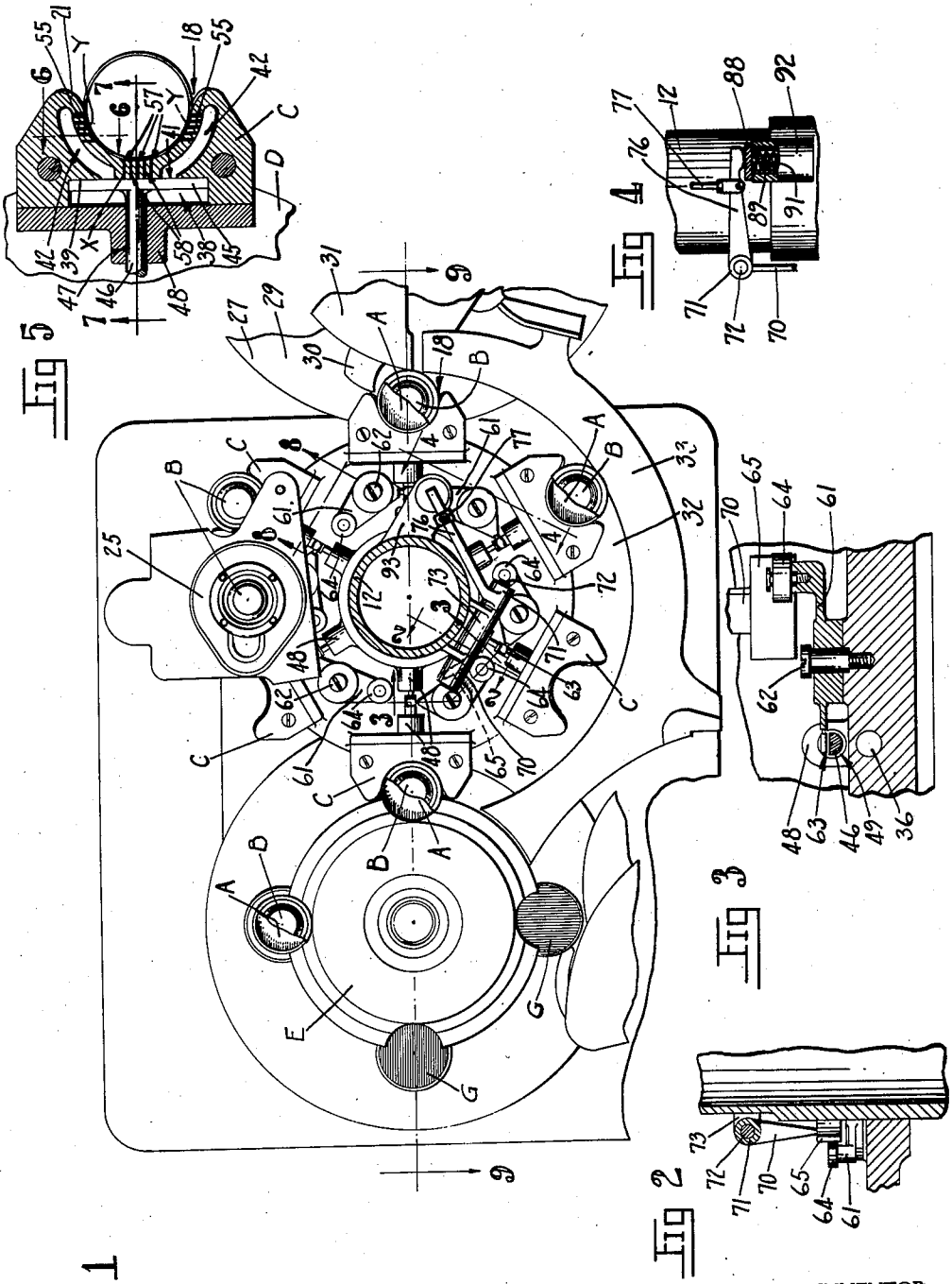


Fig 1

Fig 5

Fig 4

Fig 3

Fig 2

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Fig 7

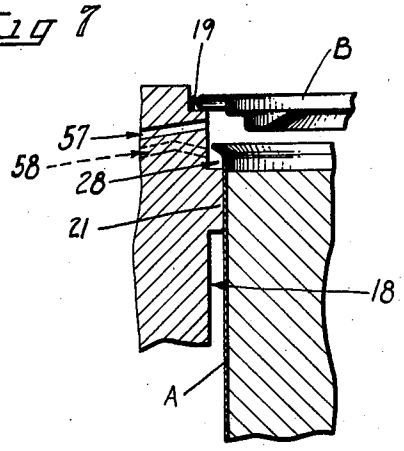


Fig 6

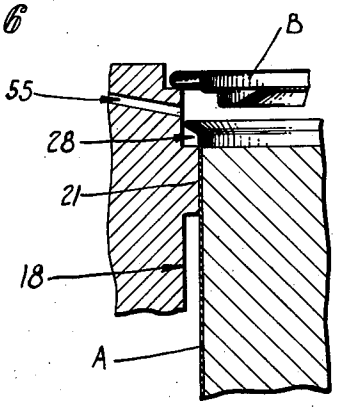
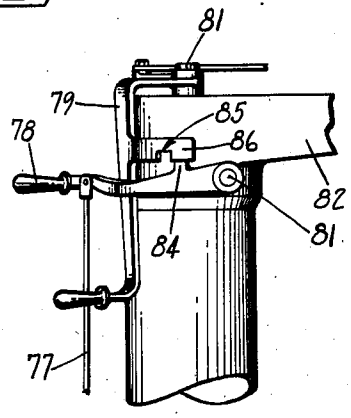


Fig 8



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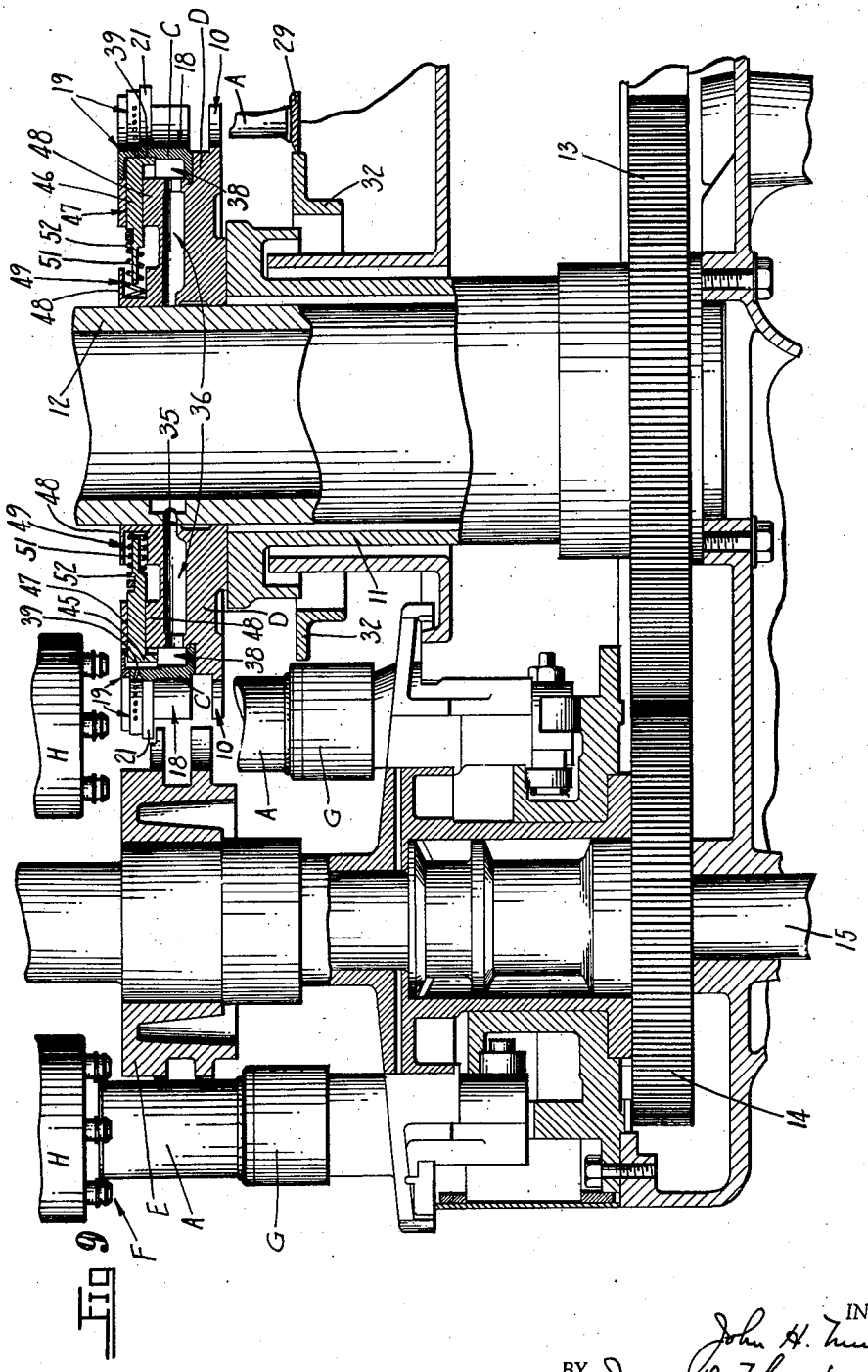


Fig 9

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2,322,250

CAN CLOSING MACHINE

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Application June 7, 1939, Serial No. 277,912

10 Claims. (Cl. 226—82)

The present invention relates to container or can closing machines and has particular reference to improved devices for replacing the air in the head space of a filled can with an inert gas, whereby the gas is caused to flow so as to drive out the air after which the gas charged can is hermetically sealed.

An object of the invention is the provision, in a can closing machine or the like, of can gassing devices which direct an inert gas into the can from a plurality of sides thereof, so that a more efficient displacement of the air in the can will result.

Another object is the provision of such a machine wherein the gassing devices sweep away the air from the bottom surfaces of the cover so that air will not be trapped in the uneven surfaces such as the grooves and curls provided therein, the gas also displacing the air between the can contents and the cover while the latter is held in a superimposed spaced relation to the can.

Another object is the provision of a machine of this character wherein the air around the top edge of the can is dissipated so that this air will not be syphoned over the edge and into the can while the latter is being gassed or between the gassing and closing operations.

Another object is the provision of such a machine wherein there are a plurality of gassing devices arranged for synchronized rotation through a predetermined cycle and operated at the proper time to gas charge the cans brought within the function of the gassing devices, such a gassing operation being performed only when the machine is in operation and being rendered inoperative as soon as the machine stops, thus preventing waste of gas.

Numerous other objects and advantages of the invention will be apparent as it is better understood from the following description, which, taken in connection with the accompanying drawings, discloses a preferred embodiment thereof.

Figure 1 is a top plan view of a can closing machine embodying the instant invention, parts being broken away;

Figures 2 and 3 are enlarged sectional details taken substantially along the lines 2—2 and 3—3 in Fig. 1, with parts broken away, Fig. 3 being drawn at a larger scale than Fig. 2;

Fig. 4 is a side elevation taken substantially along a vertical plane indicated by the line 4—4 in Fig. 1, with parts broken away;

Fig. 5 is an enlarged horizontal section taken through one of the gassing heads shown in Fig. 1;

Figs. 6 and 7 are enlarged vertical sections taken substantially along the respective lines 6—6, 7—7 in Fig. 5, the views also showing fragmentary portions of a can and its cover in place;

Fig. 8 is a side elevation of the upper portion of the machine as viewed substantially along a plane indicated by the line 8—8 in Fig. 1; with parts broken away; and

Fig. 9 is an enlarged longitudinal section taken substantially along the line 9—9 in Fig. 1.

As a preferred embodiment of the invention, the drawings illustrate the principal parts of a can closing machine such as that disclosed in United States Patent 1,601,910, issued October 5, 1926, to P. W. Fleischer et al. on Multispindle double seamer. Reference should be had to this patent if a more complete disclosure is desired beyond that mentioned herein.

In a machine shown in the drawings filled cans A and loose covers B are fed into a gassing head C of a rotating transfer turret or can positioning means D where the cover is held in superimposed and spaced relation to the can. The rotating transfer turret slides the can over a stationary can support plate and carries it and the cover toward a rotating turret E of a can closing or sealing mechanism F, the transfer turret positioning the can on a lifter plate G disposed under the can closing turret. While the can is on the stationary support and still under control of the transfer turret, the head space of the can, i. e., the space between the can contents and the cover, and the under surface of the cover are swept free of air by a blast of an inert gas such as carbon dioxide, nitrogen or the like. This gas is effective in blocking out the air.

During the termination of the gassing step, the can is being transferred to the lifter plate and the latter is moving up bringing the can into engagement with its cover. Both can and cover are thus moved up into a suitable seaming head H. Here the cover is united with the gassed can, preferably in a double seam by an interfolding of flange parts provided on both can and cover. This completes the closing operation. The closed can is then lowered to the level of its original position and is discharged from the machine in any suitable manner.

There are preferably a plurality of the gassing heads C and these heads are spaced around the outer periphery of the transfer turret D in vertical alignment with spaced pockets or can re-

cesses 10 which are formed in the turret. The turret is carried on a sleeve 11 (Fig. 9) which surrounds a vertical stationary column 12 of the machine and is rotated by a gear 13. The gear 13 meshes with a gear 14 carried on a vertically disposed driving shaft 15 which may be rotated by a suitable source of power. This may operate through a clutch mechanism, such as that disclosed in the Fleischer patent hereinbefore mentioned. Driving shaft 15 also carries the can closing turret E and the lifter plates G. Hence the closing turret E, lifter plates G, and the transfer turret D rotate in unison.

Each gassing head C is formed with a pocket or auxiliary recess 18, the side wall of which is provided with a cover step or ledge 19 and a half mould shoulder 21 disposed below the cover ledge. As these gassing heads travel with the transfer turret, they first move past a suitable cover feeding device 25 (Fig. 1) and pick up a cover B, the cover being positioned on the cover ledge 19 of the head pocket 18.

Further rotation of the transfer turret D brings a recess and its aligned gassing head C adjacent a can feeding device 27 (Fig. 1) which places a can A into the turret recess, the upper end of the can being inserted into the head pocket 18 and seated against the half mould 21. In this position of the can, the half mould fits tightly around the can just below the can flange and thereby sets off substantially half of an annular space 28 adjacent the flange. The can feeding device preferably includes a rotating feed disc 29, feed fingers 30, and a can guide 31 as shown in the Fleischer patent. The can guide directs the can into the passing turret recess and head pocket.

A can advancing toward the sealing mechanism in its recess 10 of the transfer turret D, is supported on and slides over a stationary base plate 32 which surrounds the turret. A curved guide rail 33 disposed adjacent the plate retains the can in its turret recess and its cover in place in the pocket of the head.

Gassing of the cans as hereinbefore mentioned is effected by devices located in the gassing heads C and in the transfer turret D and these devices operate to control the dispensing of the gas from a main source of supply such as a reservoir or the like. In the instant machine the stationary column 12 is hollow and serves as a reservoir, the gas being maintained under pressure within the column from a suitable outside source of supply.

The column 12 is provided with an outlet port 35 which extends through the column wall on the side of the column facing the sealing mechanism F as shown in Fig. 9. Cooperating with this outlet port there is provided in the transfer turret D a plurality of radial passageways 36 disposed in the horizontal plane of the port. There is one of these passageways for each gassing head C. The inner end of each terminates in the central bore of the transfer turret.

Hence as the transfer turret rotates around the column, the inner end of a radial passageway 36 is blocked off by the column until it passes into alignment with the column outlet port 35. This happens just as the sealing head C connected with the passageway, is moving a can A into gassing position. Gas thereupon flows from the column through the outlet port 35 into and through the passageway 36 and into the gassing head C.

Gas passing into a gassing head C is received in a gas chamber 38 which is formed in the head adjacent the head pocket 18. Along the outer side of the gas chamber, there is provided a flat wall 39 (Figs. 5, 6 and 7) having a group X of gassing ports which lead into the pocket. The wall is also provided with a pair of openings 41 which lead into a pair of curved channels 42 extending adjacent the pocket wall on each side of the group X of ports as shown in Fig. 5. Each channel 42 is in communication with a group Y of ports also leading into the head pocket from each side thereof.

These groups X, Y of ports and the channel openings 41 are normally closed off from communication with the gas chamber 38 by a valve element including a movable plate 45 which is housed within the chamber and which normally seats against the flat wall 39. This valve plate is formed on the end of a radial stem 46 which slides in a bore 47 provided in a lug 48 on the transfer turret D.

The inner end of the stem 46 is disposed in a spring recess 49 which houses a compression spring 51. The spring surrounds the stem and presses against a shoulder 52 formed thereon and thus normally keeps the valve plate tight against the chamber wall 39. Opening and closing of this valve is effected in time with the rotation of the transfer turret D, as will be hereinafter explained.

When the valve is open, the gas in the chamber 38 flows out through the port group X and also through the openings 41 into the channels 42 and thus through the port groups Y. These groups of ports are so arranged as to direct the gas along predetermined paths of travel relative to a can and cover in the head pocket. For this purpose the two groups Y include a plurality of inclined parallel ports 55 (Figs. 5 and 6) which slope downwardly and outwardly, converging from opposite sides of the pocket, toward the interior of the can in the pocket as shown in Fig. 6. The outlet ends of the ports are located in the pocket wall in a position which is just above the flange of the can in the pocket.

Thus gas issuing from these inclined ports 55 sweeps down from both sides of the pocket simultaneously, rushing into the can head space from opposite sides thereof and displacing the air contained therein. Simultaneously with this action the gas also issues from the ports in the other group X.

In group X there are preferably five ports. The two outer ports and the middle port marked 57, are preferably inclined upwardly and outwardly toward the bottom of the cover B in place within its pocket 18 as shown in Fig. 7. Gas issuing from these ports is directed upwardly against and across the bottom of the cover B and thus sweeps away any air lingering adjacent the cover and in its curls and grooved surface. This gas also sweeps the air out from between the cover and the can.

Between the ports 57 of group X, there is provided two ports 58 which extend upwardly and thence downwardly and outwardly, terminating just below the top flange of the can A in the head pocket and thus leading into the half section of the annular space 28 between the can flange and the half mould shoulder 21. Thus the gas issuing from the ports 58 flows into the space 28 and displaces the air therefrom.

The purpose of this gas filled space 28 around and below the top can flange is to prevent syphoning of air up over the can flange when the gas is introduced into the head space by way of the

ports 55 hereinbefore mentioned. With this half mould construction if any of the atmosphere surrounding the top flange of the can is drawn into the can when the head space is gassed it will be gas instead of air. This insures more perfect gassing of the can with practically complete elimination of air.

After a gassing operation the valve plate 45 closes against the chamber wall 39 under the resistance of the valve spring 51. The ports 55, 57, 58 and the channels 42 are thus closed off and gas ceases to issue from them.

Opening of the valve element 45 of each gassing head C is effected at the proper time by a lever 61 (Figs. 1 and 3) which is carried adjacent the head on a pivot stud 62 threaded into the transfer turret D. There is one of these levers for each head. One end of the lever fits into a groove 63 formed in the valve stem 46. The other end of the lever carries a cam roller 64 which is adapted to engage against a cam shoe 65 disposed adjacent the column as shown in Fig. 1.

Hence as the rotating transfer turret D carries the gassing heads C toward the sealing mechanism F, the cam roller 64 engages the cam shoe 65 and thus pivots the lever 61. The lever thus draws the valve stem 46 back against the resistance of the spring 51 and hence opens the valve as hereinbefore mentioned. The cam shoe is positioned relative to the sealing mechanism so that the valve will be opened prior to the can being placed on a lifter plate G. The valve then remains open until the gassing head comes adjacent to the seaming mechanism and until the can has moved onto the lifter plate.

Provision is made for shifting the cam shoe 65 out of the path of travel of the cam rollers 64 when the machine stops operating so that gas will not be wasted if a cam roller happens to be engaged with the cam and is thus holding a gassing valve open when the machine stops. This provision insures that all gassing valves will be closed when the machine is not in operation.

For this purpose the cam shoe 65 is formed on the lower end of a depending arm 70 (Figs. 1, 2, 3 and 4) of a bell crank lever 71 which is mounted on a pivot shaft 72 carried in a bearing 73 formed on the stationary column 12. The other end of the pivot shaft carries a substantially horizontal arm 76 the outer end of which is secured to a vertical link 77 (see also Fig. 8). The link extends up toward the top of the column 12 and connects with a locking lever 78 associated with a machine starting clutch lever 79 which when manually actuated starts and stops the machine through the clutch mechanism hereinbefore mentioned. Both levers 78, 79 are mounted on pivot studs 81 secured in a driving mechanism bracket 82 carried on the top of the column.

When the machine is stopped, a lug 84 formed on the locking lever 78 engages in a notch 85 in a projection 86 of the starting handle and thereby locks the handle in position. The locking handle is maintained in locking position through the link 77, by a spring pad 88 (Fig. 4) which engages against the outer end of the arm 76. The pad is provided with a depending hollow stem 89 which confines a compression spring 91 within a boss 92 formed on a lug 93 (see also Fig. 1) of the column 12.

When the locking handle 78 is in starting handle locking position, i. e., when the lug 84 is engaged in the notch 85 of the starting handle, the cam shoe is swung back in non-operating position so that a passing cam roller 64 will not engage it. All of the gas valves are therefore closed.

To start the machine the locking lever must first be pulled down so that its lug 84 will be disengaged from the notch 85. The starting handle 79 may then be shifted sidewise to bring the clutch mechanism into operation for starting and operating the machine. Pulling down of the locking lever 78 depresses the link 77 and thereby rocks the cam arms 76, 70 of the bell crank 71. This shifts the cam shoe 65 forward into the path of travel of passing cam rollers 64. In such position the shoe will be engaged by the rollers, as the transfer turret rotates.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and it will be apparent that various changes may be made in the form, construction and arrangement of the parts without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the form hereinbefore described being merely a preferred embodiment thereof.

I claim:

1. In a machine for gassing containers, the combination of a stationary support for containers to be gassed, devices for advancing the containers along said support, a gassing head movable with said advancing devices and adapted to receive a container on said support, means connected with said head for directing jets of gas into a received container in a plurality of up and down directions to displace the air therefrom, valve mechanism associated with said means for controlling the flow of gas therefrom, actuating means for said valve mechanism, said actuating means opening and closing said valve in time with the movement of a container along the support, and instrumentalities for rendering said actuating means inoperable when the machine is stopped so that a valve which is open when the machine stops will be automatically closed and thus prevent waste of gas.

2. In a machine for gassing containers, the combination of a gassing head for receiving a container to be gassed, and means for supporting a container cover in superimposed spaced relation to the container, said gassing head being provided with ports for directing gas downwardly at an angle into the container from opposite sides thereof to displace the air therefrom and also being provided with other ports for directing gas upwardly at an angle against the bottom of said cover to displace the air from the surface thereof and from between the container and the cover.

3. In a machine for gassing containers, the combination of a gassing head for receiving a container to be gassed, means connected with said head for directing jets of gas thereinto and also for directing gas around and immediately below the top edge of the container, and an element engaging around the container and setting off a space adjacent the top edge thereof for confining the gas directed thereagainst to prevent syphoning of air over the top edge of the container during the gassing operation.

4. In a machine for gassing containers, the combination of a gassing head having a pocket for receiving a container to be gassed, a half mould in said pocket for engaging the sides of the container and for setting-off a space adjacent the top edge of the container, said gassing head being provided with ports above the container for directing gas thereinto to displace the air therefrom and also being provided with other ports for

filling the set-off space with gas to prevent syphoning of air into the container over the top edge thereof while the container interior is being gassed.

5. In a machine for gassing containers, the combination of a rotatable turret having a plurality of pockets for receiving containers to be gassed, devices carried on said turret for directing gas into the containers to displace the air therein, valve mechanism associated with each of said devices for controlling the discharge of gas therefrom, a valve actuating lever adjacent each valve mechanism, a movable cam shoe disposed in the path of travel of said actuating levers for shifting them at a predetermined place in their cycle of travel, means for starting and stopping the machine and for locking the same in stop position, and instrumentalities connecting said cam shoe with said starting, stopping and locking means for shifting said cam shoe away from a valve actuating lever when the machine ceases operation.

6. In a machine for gassing containers, the combination of a gassing head for receiving an open top container to be gassed and means for supporting a container cover in superimposed spaced relation to the open top of said container, said gassing head being provided with a plurality of groups of gas ports, one group of ports directing gas at a downward angle into the interior of said container, another group directing gas at an upward angle against the undersurface of said container cover and a third group directing gas around the upper outer surface of said container, and means for separating said surface from the remainder of said container at the gassing area.

7. In a machine for gassing containers, the combination of a gassing head for receiving an open top container to be gassed and means for supporting a container cover in superimposed spaced relation to said container, said gassing head having a plurality of individual gas ports arranged in said head to deliver jets of gas in a plurality of directions, one of said ports being disposed in a plane relative to the container top to direct a jet of gas directly into the open top container, another of said ports being disposed in a different plane to direct a jet of gas against the undersurface of said superimposed container cover and a third of said ports being disposed in a still different plane to direct a jet of gas against the upper outer surface of said container, whereby said container and said cover are freed of air at all essential points prior to the hermetic sealing of said cover to said container.

8. In a machine for gassing containers, the combination of a stationary support for containers to be gassed, devices for advancing the containers over and relative to said support, a gassing head movable with said advancing devices and adapted to receive the upper end of a container on said support with a partially defined space within the gassing head disposed below the upper edge of the container, means carried by said head for holding a container cover in spaced relation to and above the top of the container, and separate means carried by said head for respectively directing a jet of gas in one direction into the space between the container and cover and another jet of gas in a different direction into said partially confined space below the container upper edge to displace the air from said localities while the container is moving along said stationary support.

9. In a machine for gassing containers, the combination of a stationary support for a plurality of containers to be gassed, a rotatable turret for advancing the containers over and relative to said support, a plurality of gassing heads on said turret each having a pocket for receiving a container to retain the containers in spaced relation, each of said gassing heads having means for supporting a container cover in superimposed spaced relation to the container and a plurality of spaced ports disposed in angular relation for directing separate jets of gas in different directions relative to and towards a said container and its cover, one of said ports being disposed to direct gas downwardly at an angle into the container head space from a side thereof, another of said ports being disposed to direct gas in an upward direction against the bottom of the container cover to displace the air from portions thereof and from the space between the can and said cover, instrumentalities for bringing the gassed cover and the gassed container together to confine the gas in the container, and means for sealing said cover onto the container.

10. In a machine for gassing containers, the combination of a stationary support for open top containers to be gassed, devices for advancing the containers along said support, a gassing head movable with said advancing devices and adapted to receive a container and a cover for said container in superimposed spaced relationship, a stationary hollow column disposed centrally of said support and constituting a main gas reservoir, an auxiliary gas chamber connecting with said reservoir and with said head at spaced intervals for supplying a measure of gas to said container through said head, and spaced means carried by said head and disposed in relative angular relation for directing separate jets of gas in different directions relative to and towards a said container and its superimposed cover.

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