

May 13, 1969

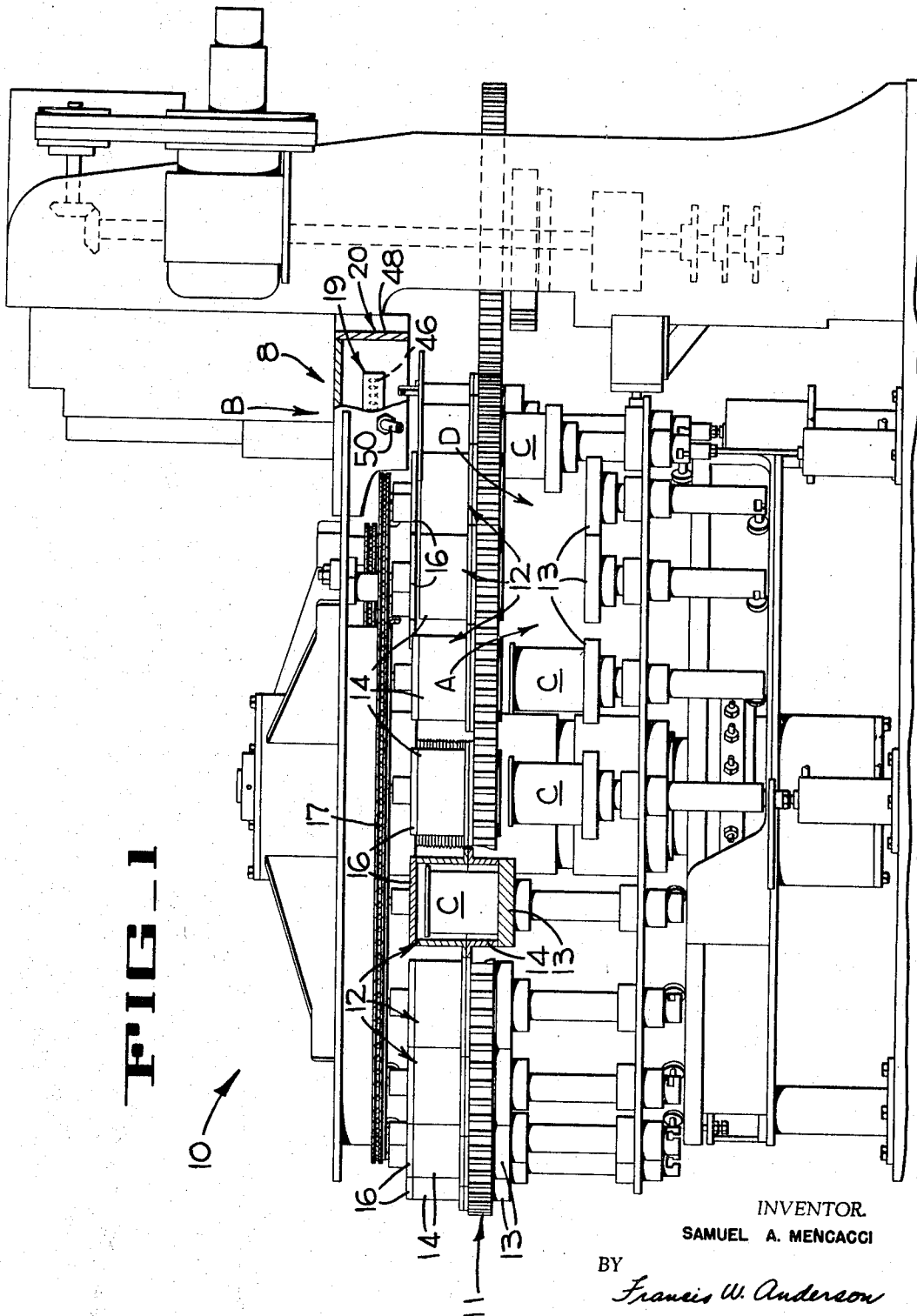
S. A. MENCACCI

3,443,352

PACKAGING MACHINE AND METHOD

Filed April 14, 1967

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**FIG. 1**

INVENTOR  
SAMUEL A. MENCACCI

BY  
*Francis W. Anderson*

ATTORNEY

May 13, 1969

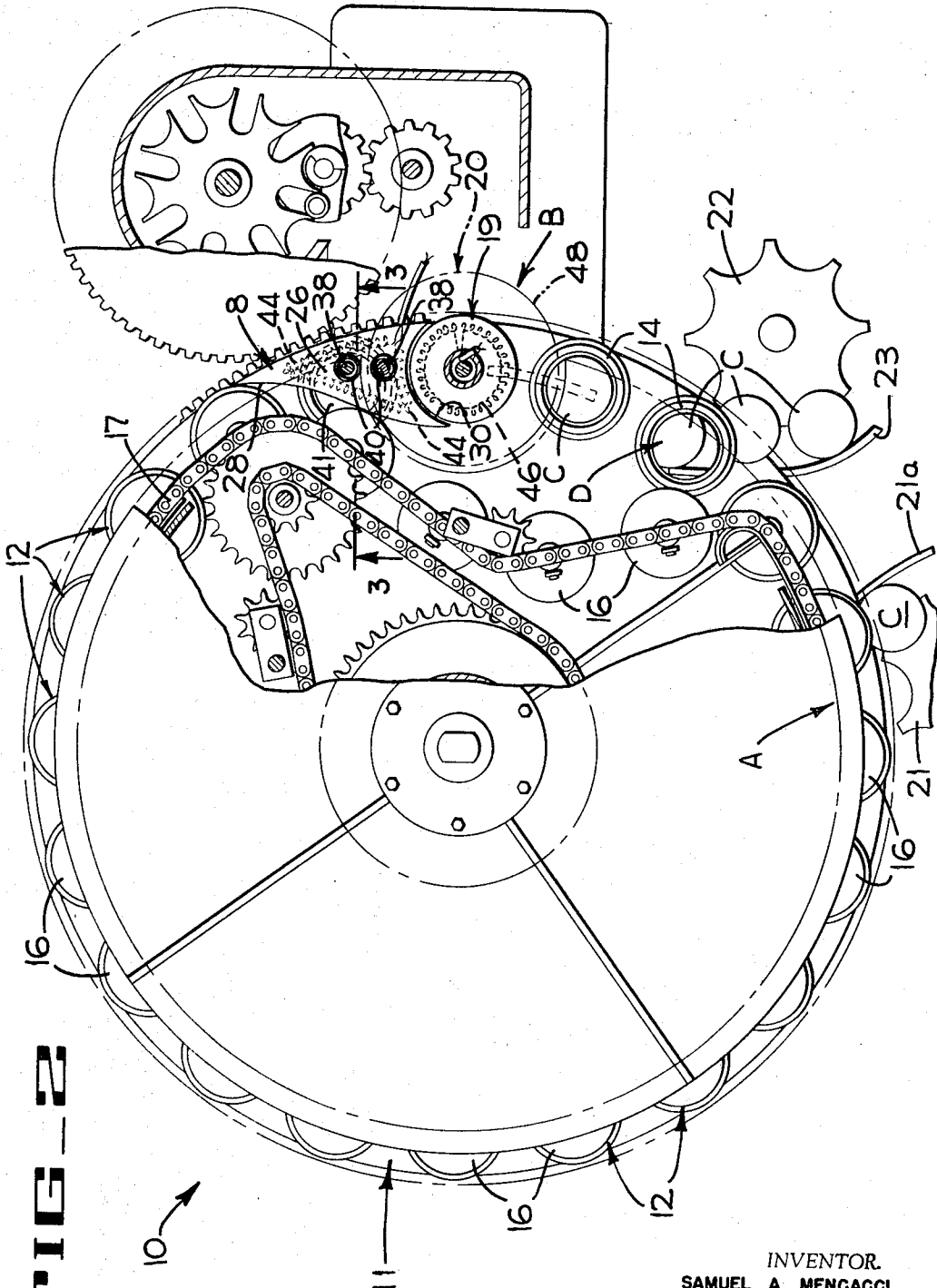
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**FIG-2**

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INVENTOR.  
SAMUEL A. MENGACCI

BY  
*Francis W. Anderson*

ATTORNEY

May 13, 1969

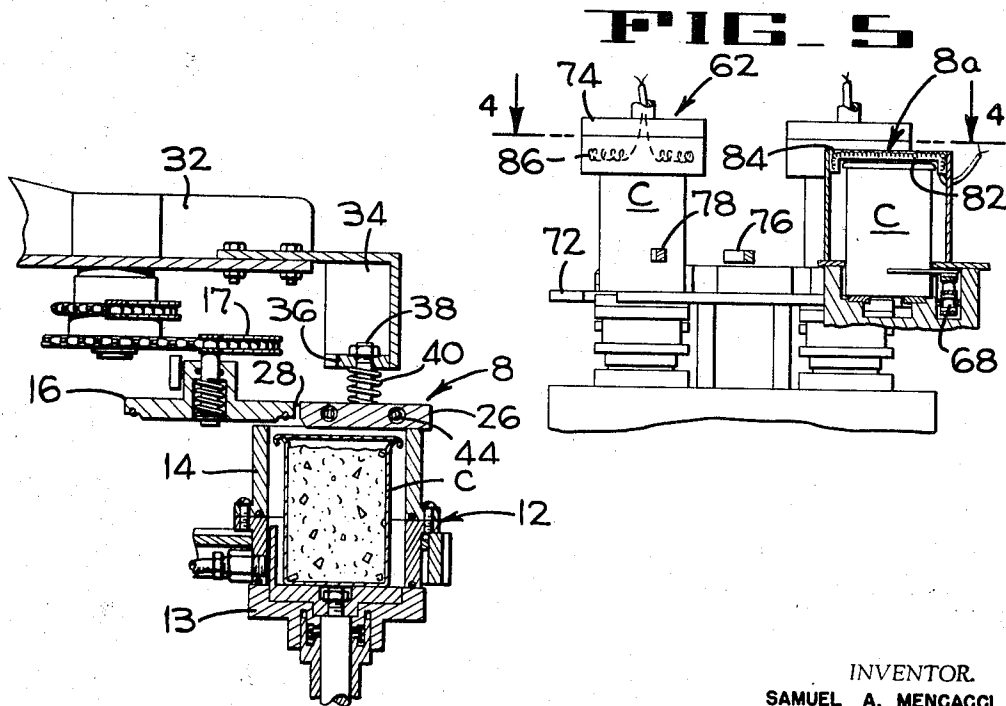
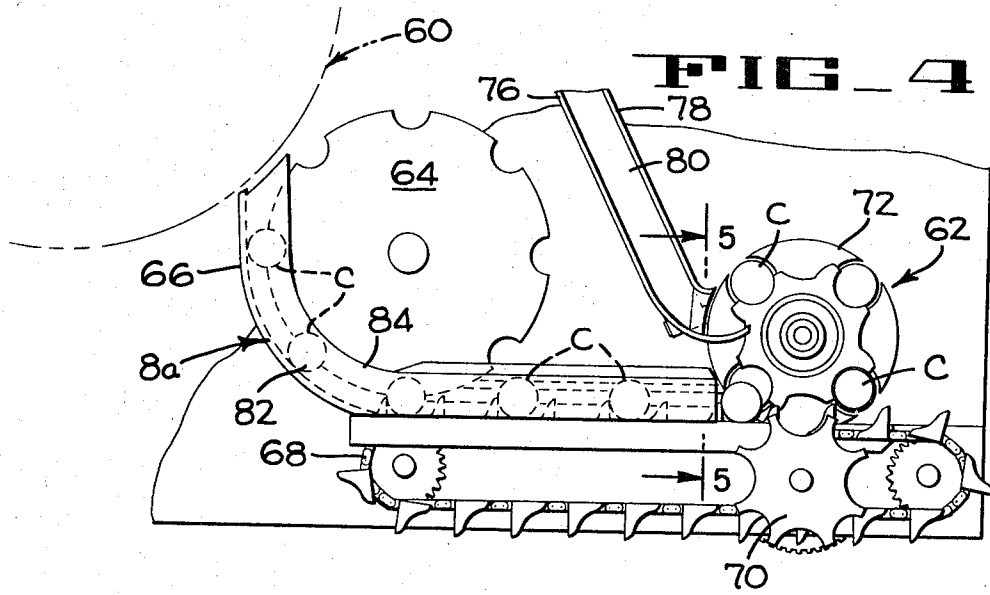
S. A. MENCACCI

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**FIG. 3**

INVENTOR  
SAMUEL A. MENCACCI

BY  
*Francis W. Anderson*

ATTORNEY

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**PACKAGING MACHINE AND METHOD**

Samuel A. Mencacci, Wilrijk-Antwerp, Belgium, assignor to International Machinery Corporation, St. Nikolaas-Waas, Belgium, a corporation of Belgium

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Int. Cl. B65b 55/00

U.S. Cl. 53—22

10 Claims

**ABSTRACT OF THE DISCLOSURE**

A vacuumizing, gassing and closing machine for moving covered but unsealed containers having an inert noncondensable gas therein below a plate heated slightly above the ambient temperature for causing the inert noncondensable gas in the containers to expand slightly and flow out of the containers thereby preventing air from entering the containers.

*Background of the invention*

This invention pertains to improvements in a machine and method for vacuumizing, gassing and closing containers and more particularly relates to a method and apparatus for heating an inert noncondensable gas within filled containers which have covers clinched thereon to gradually expand and flow out of the containers until the covers are sealed thereon thereby preventing the entry of air into the containers with the resulting adverse oxidizing effect on the product therein.

The cover heating apparatus is designed for use in the type of packaging machine disclosed in United States Letters Patent No. 3,236,023, which issued to Samuel A. Mencacci on Feb. 22, 1966. In this prior Mencacci type packaging machine, filled containers with covers clinched, but not sealed, thereon are individually confined within vacuumizing and gassing chambers which first evacuate the air from the chambers and from the head space in the containers and thereafter release the vacuum and directs an inert noncondensable gas into the chambers and into the head space of the containers. The chambers are then opened and the containers are moved to a sealing mechanism so that the covers can be hermetically sealed onto the containers. Cover sealing mechanisms of the type disclosed in my copending application Ser. No. 598,069 which was filed on Nov. 30, 1966, now Patent No. 3,378,129, or of the type disclosed in Jordan Patent No. 2,393,988 may be used for closing the covers.

*Summary of the invention*

The cover heating apparatus of the present invention is provided for preventing entry of air into the gassed containers between the time the chambers are opened and the covers are sealed onto the containers. The cover heating apparatus includes a plate that is disposed above the covers and is heated to a temperature of about 5° above the temperature surrounding the containers so that the inert noncondensable gas in the head space of each container will expand and gradually flow out of the container thereby preventing air from entering the container.

*Brief description of drawings*

FIGURE 1 is a side elevation, with parts broken away and other parts in section, of a first embodiment of a vacuumizing, gassing and closing machine which employs the cover heating apparatus of the present invention.

FIGURE 2 is a plan of the apparatus of FIGURE 1 with certain parts being broken away and others shown in section and in phantom.

FIGURE 3 is an enlarged section taken along lines 3—3 of FIGURE 2.

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FIGURE 4 is a horizontal section taken along lines 4—4 of FIGURE 5 of a second embodiment of the invention illustrating the heating apparatus associated with a closing machine that is spaced from the vacuumizing and gassing machine.

FIGURE 5 is an enlarged section taken substantially along lines 5—5 of FIGURE 4 illustrating a heating tunnel and a fragment of the heated closing heads.

*Description of the preferred embodiment*

The cover heating apparatus 8 (FIGS. 1 and 2) of the present invention is associated with a packaging machine 10. In general, the packaging machine 10 comprises an intermittently driven turret 11 having a plurality of equally spaced container receiving receptacles or housings 12 thereon which, when sealed, provide vacuumizing and gassing chambers within which containers C are confined. Each housing 12 includes a vertically reciprocable container supporting mechanism 13 which is moved from a position spaced below the body 14 of the housing 12 for receiving or discharging containers from the body, to a position in sealed engagement with the lower end of the body. Each container receiving housing 12 also includes a vertically reciprocable disc-like cover 16 which is movable between a lowered position closing the upper end of the associated body 14 to an elevated position spaced above the upper end of the associated body. Each cover disc 16 is associated with a particular housing body 14 and is mounted on a chain 17 which is guided along a path that registers the cover with the associated body for a major portion of the travel of the body 14 along its circular path, and which thereafter guides the cover away from the circular path so as to open the upper end of the body as the body is registered with the closing head 19 of a closing machine 20 of any suitable standard design. The closing head 19 in the preferred embodiment of the invention may be of the type disclosed in the aforementioned Jordan patent.

Feed means such as a star wheel 21 (FIG. 2) and a suitable guide rail 21a are provided to feed filled containers C, with covers loosely fitted thereon, onto each container supporting mechanism 13 as the mechanism is stopped at a feed station A. Each mechanism 13 is then moved upwardly against the lower end of the body 14 to seal the same. Substantially simultaneously with this upward movement of the mechanism 13, the cover 16 is moved downwardly into sealing engagement against the upper surface of the associated body to confine the containers within the vacuumizing and gassing chamber defined by the housing body 14, the container support 13, and the cover 16.

The intermittent movement in a clockwise direction (FIG. 2) of the turret 11 then advances the container receiving housings 12, with the filled containers therein, past the low vacuum zone where the housings are subjected to a low vacuum which partially evacuates the air from within the housings as well as from within the filled containers in the housings. Continued movement of the turret advances the housings past the high vacuum zone which more completely evacuates the air from the housing and from the head spaces within the containers therein. With the air fully evacuated from the housings and from within the head spaces of the containers in the housings, the housings are advanced past the gassing zone where an inert noncondensable gas introduced into the housings and into the head space of the filled containers.

The covers 16 are then deflected from their closed positions in registry with the upper ends of the bodies 14 to open the chambers, and the bodies are, in turn, moved to a closing station B in alignment with the closing head 19 position thereabove. The container in the body 14 at the closing station B is then elevated through the upper

open end of the body 14, permitting the closing head 19 to hermetically seal the cover onto the container body. With the covers sealed onto the container, the container is then lowered to its normal position within the body 14 and, after another indexing movement of the turret 11, is lowered below the lower edge of the body 14 and is subsequently indexed at a discharge station D where any suitable discharge means, such as a star wheel 22 (FIG. 2) and an associated deflecting rail 23, discharges the sealed containers from the packaging machine 10.

It will be understood that the specific details of the closing head 19, the feed means, and the discharge means form no part of the present invention and may be of any suitable type for performing the desired functions on the particular type of container being handled by the packaging machine 10. Likewise, the specific details of the turret and of the mechanism for vacuumizing and directing an inert noncondensable gas into the containers form no part of the present invention and accordingly will not be described in further detail. If a more complete description of these parts is desired, reference may be had to the aforementioned Mencacci Patent 3,236,023.

The cover heating apparatus 8 of the present invention is provided for preventing air from entering the containers between the time the disc-like covers 16 of the gassing chambers are moved out of sealing engagement with the housing bodies 14 and when the container covers are fully sealed on the containers. The cover heating apparatus 8 (FIGS. 2 and 3) comprises a plate 26 having one edge 28 curved to conform closely to the path of movement of the outer edge of the housing cover 16 as the cover is withdrawn from the housing 14. Another edge 30 (FIG. 2) is curved to conform closely to the circular path of movement of the rotating portion of the closing head 19.

The plate 26 is supported from the frame 32 of the machine 10 by a bracket 34. The bracket 34 includes a lower flange 36 that is drilled to slidably receive two cap screws 38 that are screwed into the plate 26. Compression springs 40 are disposed around the cap screws and between the plate 26 and flange 36 and serve to urge the plate 26 downwardly against the upper open end of the housings 14 as they move therepast. Thus, the plate 26 cooperates with the cover 16 as the cover moves away from the upper end of the housing 14 to retain a major portion of the upper end of the housing 14 closed until the housing enters the closing station B.

In order to minimize entry of air into the housing and prevent air from entering the container through the small opening 41 (FIG. 2) at the upper end of the housing, it is an important feature of the invention to cause expansion of the inert noncondensable gas in the housing 14 and in the container C so that the gas will gradually flow out of the opening 41 thereby preventing entry of air into the container C. It has been determined that by raising the temperature of the inert gas only a few degrees, for example 5 degrees F. above the ambient temperature, that air will be prevented from entering the container C and will permit a very gradual continuous flow of inert noncondensable gas out of the container until the container covers are sealed on the containers C. Accordingly, heating means such as an electrical resistance coil 44 is fitted in the plate 26 and is connected to a suitable power source so as to raise the temperature of the plate about 5 degrees F. above the temperature surrounding the container.

As diagrammatically illustrated in FIGURE 2, the rotary portion of the closing head 19 is also provided with an electrical resistance coil 46 which likewise heats the closing head 19 about 5° F. above the ambient temperature thus causing continued expansion of the inert noncondensable gas until the container is hermetically sealed. The rotatable portion of the closing head 19 is disposed within a housing 48 which is open at its lower end. A supply of the inert noncondensable gas is directed into the

housing 48 through a conduit 50 to maintain the housing 48 substantially free of air.

In FIGURES 4 and 5 a second embodiment of the cover heating apparatus 8a of the present invention is disclosed. The apparatus 8a is intended for use with a continuously driven, rather than intermittently driven, vacuumizing and gassing machine 60, and a continuously driven closing machine 62. The specific details of the machines 60 and 62 form no part of the present invention and accordingly will not be described in detail, however, the closing machine may be of the type illustrated in my copending application Ser. No. 598,069, which was filed on Nov. 30, 1966.

The vacuumizing and gassing machine 60 directs a series of filled containers C having covers clinched, but not sealed, thereon and having an inert noncondensable gas in its head space. The containers C are transferred by a continuously driven star wheel 64 and guide rod 66 to a continuously driven conveyor 68. The conveyor 68 with the aid of another star wheel 70 transfers the containers onto a continuously driven turret 72 of the closing machine 62 which includes four equally spaced closing heads 74 (FIG. 5). The closing heads hermetically seal the covers on each container and discharge the sealed containers from the closing turret 72 by means of guide rails 76 and 78 and an endless discharge conveyor 80.

In order to prevent air from entering the containers between the time they are discharged from the vacuumizing and gassing machine 60 and the time they are sealed by the closing heads 74, the containers move through a tunnel 82 having a cover plate 84 disposed closely adjacent the upper end of the containers C. As indicated in FIGURE 5, the plate 84 is heated to about 5° F. above the ambient temperature thereby causing the inert noncondensable gas within the containers to expand and gradually flow therefrom thus preventing air from entering the same. The tunnel 82 prevents currents of cool air from contacting and chilling the containers which would cause the gas therein to contract. As in the first embodiment of the invention, the rotating portion of each closing head 74 may also be provided with electrical heating elements 86 for the purpose of maintaining the temperature of each head about 5° F. above the temperature surrounding the head.

From the foregoing description it is apparent that the cover heating method and apparatus of the present invention heats an inert noncondensable gas disposed within the head space of a filled container that has the cover clinched, but not sealed thereon, thereby causing the gas to expand and slowly bleed out of the container thus preventing air from entering the container and contaminating its contents. The heating apparatus is raised to a temperature only slightly above the ambient temperature, for example 5° F., so as to avoid a too rapid expansion of the gas within the head space thereby assuring that a small amount of gas will flow out of the head space until the cover is sealed onto the container thus preventing air flow into the head space.

Although the best mode contemplated for carrying out the present invention has been herein shown and described, it will be apparent that modifications and variations may be made without departing from what is regarded to be the subject matter of the invention as set forth in the appended claims.

Having completed a detailed description of the invention so that those skilled in the art could practice the same, I claim:

1. In a vacuumizing, gassing and closing machine having means for confining filled containers with covers clinched but not sealed thereon in a vacuumizing and gassing chamber, means for vacuumizing and thereafter filling the chamber and head space within the container with an inert noncondensable gas, means for opening the chamber to the atmosphere, and container closing means having a closing head spaced from the opening means

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for closing the container, the improvement which comprises means for advancing the container along a predetermined path between said chamber opening means and said closing means, and means for heating the head space causing the inert noncondensable gas therein to expand and slowly flow out of the head space as the container is moving along said path and until the container is hermetically sealed by the closing means.

2. An apparatus according to claim 1 wherein said heating means includes a heated plate disposed above and immediately adjacent the container cover as the container moves along said predetermined path.

3. An apparatus according to claim 2 wherein means are provided for heating said plate to about 5° F. above the ambient temperature.

4. An apparatus according to claim 2 wherein said heating means additionally includes the closing head, and means for heating said plate and said closing head to about 5° F. above the ambient temperature.

5. An apparatus according to claim 2 and additionally comprising side walls projecting downwardly from said heated plate to define a tunnel through which the containers pass as they move along said path to isolate the containers from cooling currents of air.

6. An apparatus according to claim 4 and additionally comprising side walls projecting downwardly from said heated plate to define a tunnel through which the containers pass as they move along said path.

7. In a method of vacuumizing, gassing and closing

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filled containers having covers clinched but not sealed thereon, the steps of confining the containers, filling the head space of the filled containers with an inert noncondensable gas while confined, releasing the containers from confinement, moving the containers along a predetermined path, heating the gas within the head spaces of the containers while the containers are moving along said path to cause the noncondensable gas to flow out of the containers thereby preventing air from entering the containers, and hermetically sealing the containers.

8. A method according to claim 7 wherein the heating step raises the temperature of the noncondensable inert gas to about 5° F. above the ambient temperature.

9. A method according to claim 7 and additionally including the step of heating the gas within the head space when the container is being closed.

10. A method according to claim 9 wherein both heating steps raise the temperature of the gas to about 5° F. above the ambient temperature.

#### References Cited

##### UNITED STATES PATENTS

2,154,266	4/1939	Ford	53—110	X
2,369,762	2/1945	Stewart et al.	53—110	

TRAVIS S. MCGEHEE, *Primary Examiner.*

U.S. Cl. X.R.

53—110

UNITED STATES PATENT OFFICE  
CERTIFICATE OF CORRECTION

Patent No. 3,443,352

May 13, 1969

Samuel A. Mencacci

It is certified that error appears in the above identified patent and that said Letters Patent are hereby corrected as shown below:

Column 2, line 64, after "gas" insert -- is --. Column 3, line 70, "about", second occurrence, should read -- above --.

Signed and sealed this 21st day of April 1970.

(SEAL)

Attest:

Edward M. Fletcher, Jr.

Attesting Officer

WILLIAM E. SCHUYLER, JR.

Commissioner of Patents