May 20, 1941. L. L. TIRRELL 2,242,686

PACKAGE

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Fig. 1.

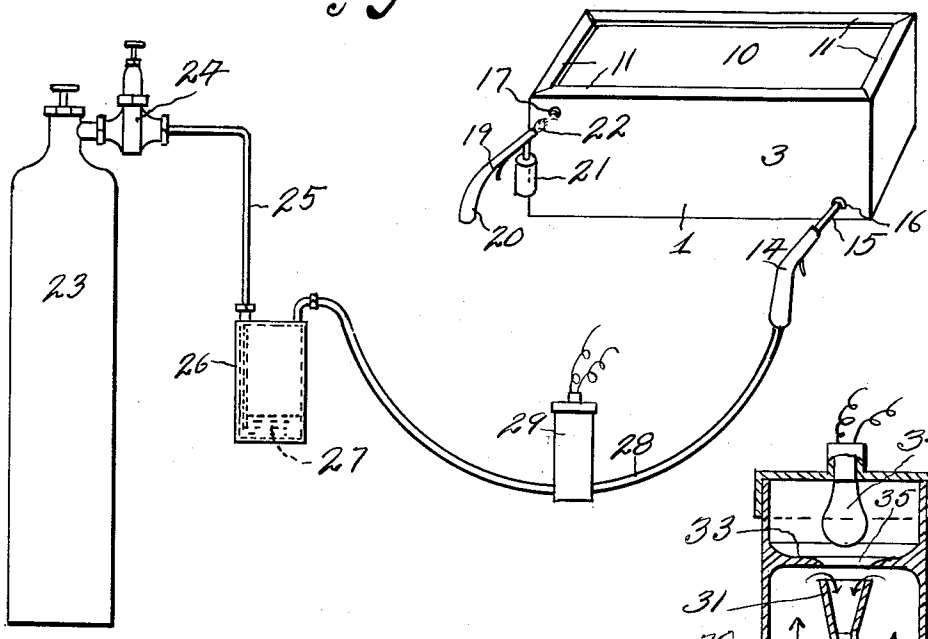
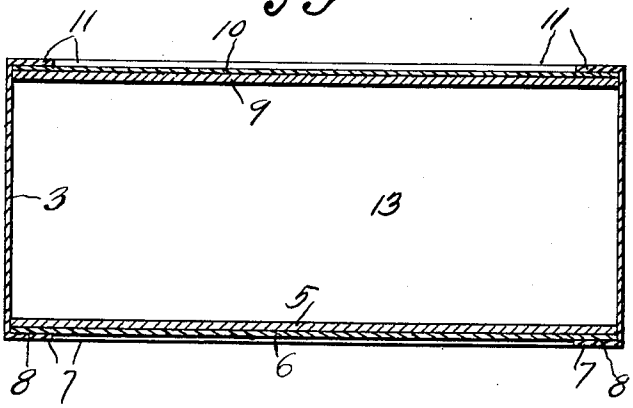


Fig. 2.



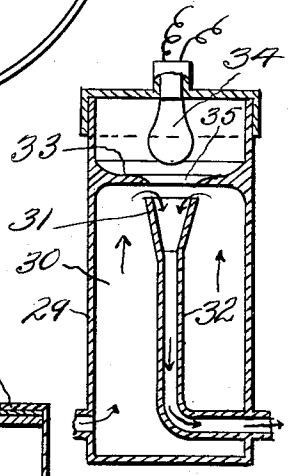


Fig. 8.

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Fig. 4.

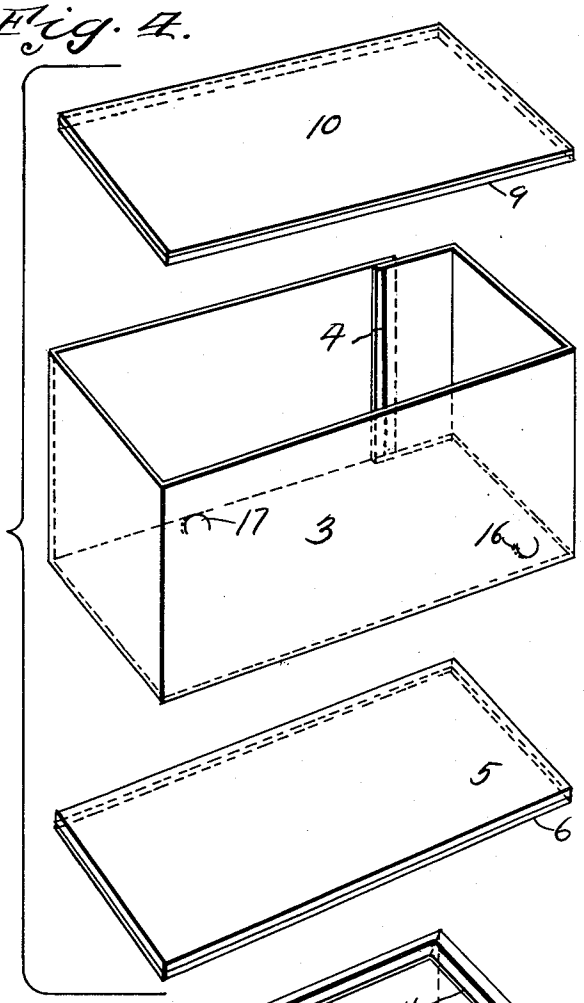


Fig. 3.

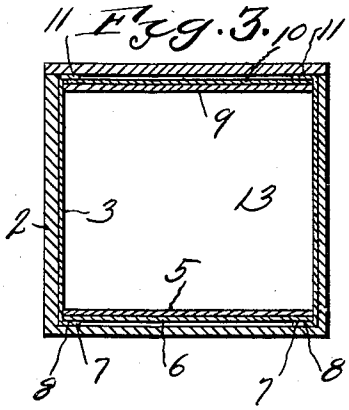
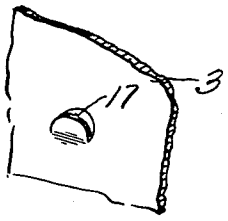


Fig. 5.



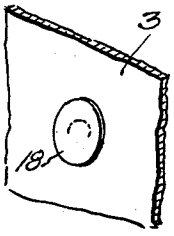


Fig. 6.

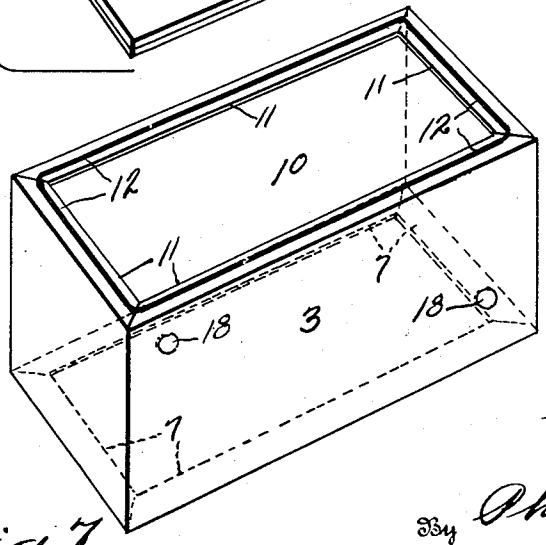


Fig. 7.

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2,242,686

UNITED STATES PATENT OFFICE

2,242,686

PACKAGE

Leslie L. Tirrell, Eau Claire, Mich.

Application March 9, 1938, Serial No. 194,928

2 Claims. (Cl. 217—3)

The invention relates to packages, particularly of the type wherein fruit and vegetables are packed for shipment, and has for its object to provide a thin rubber casing, in which the articles are placed, and from the chamber of the casing the air is forced by a preservative gas entering the chamber and displacing the air, said preservative gas being preferably carbon dioxide.

A further object is to provide a hermetically sealed package which will retain a gas mixture without loss, incident to an inner rubber composition liner, and through the wall of the liner a preserving gas may be forced for displacing the air and forcing the same out of the liner chamber through a port, which port may be sealed after the air displacing operation.

A further object is to place the gas intake port adjacent the lower end of the hermetically sealed liner, and the exhaust port adjacent the upper side of the liner to insure the displacement of all the air by the inrushing gas, preferably a heavy gas, for instance carbon dioxide.

A further object is to form the liner from a relatively thin transparent rubber material, which is acid resistant and non-porous, thereby preventing loss of gas by filtration and at the same time has stretching qualities which prevent the liner from being easily fractured or torn.

A further object is to provide a method of preserving articles of food within a package liner comprising forcing carbon dioxide through the liner into the chamber thereof for displacing air within the chamber, and forcing the displaced air through an exhaust port to the atmosphere. Also to provide means for indicating when the liner chamber is filled with carbon dioxide comprising a flame adjacent the exhaust port, which flame is extinguished when the carbon dioxide passes through the exhaust port against the flame.

A further object is to provide means whereby the gas, in its course to the package, is sterilized and purified by subjecting the same to the action of ultra-violet rays.

A further object is to provide the liner with bottom and top members formed from rigid material having rubber sheets on the outer sides thereof, and to which rubber sheets the overlying edges of the body of the liner are secured by an adhesive or by vulcanizing to form a hermetically sealed package which will retain a gas mixture without loss.

With the above and other objects in view the invention resides in the combination and arrangement of parts as hereinafter set forth, shown in the drawings, described and claimed, it being understood that changes in the precise embodiment of the invention may be made within the scope of what is claimed without departing from the spirit of the invention.

In the drawings:

Figure 1 is a perspective view of the sealed liner illustrating the method of charging the same.

Figure 2 is a vertical longitudinal sectional view through the liner.

Figure 3 is a vertical transverse sectional view through the liner.

Figure 4 is a collective view of the parts of the liner showing the same in position to be assembled.

Figure 5 is a detailed perspective view of a portion of the liner wall showing the air exhaust port, partially open.

Figure 6 is a view similar to Figure 5, but showing the sealing wafer over one of the ports.

Figure 7 is a perspective view of the liner after the filling operation.

Figure 8 is a vertical transverse sectional view through the ultra-violet ray sterilizing device.

Referring to the drawings, the numeral 1 designates the liner which is adapted to be put in a conventional form of crate 2. The liner 1 comprises a body portion 3, formed from a thin transparent rubber material, vulcanized at 4. Disposed within the body 3 is a rigid bottom formed from a cardboard sheet 5, to the outer side of which is secured a rubber sheet 6 in any suitable manner, for instance by an adhesive. The bottom is placed within the body 3 and the lower end of the body has portions 7 which are turned over the sheet 6, and vulcanized thereto at 8, to form a leakproof connection. The liner so formed is placed within the crate 2, and fruit or vegetables packed therein. After the packing operation, the rigid top is placed within the top of the body as clearly shown in Figure 3. The rigid top is formed from a cardboard member 9 having a rubber sheet 10 thereon.

After the top is placed in position the upper edges 11 of the body are turned over the sheet 10 and vulcanized thereto along the lines 12 as shown in Figure 7, hence it will be seen that an hermetically sealed package is formed with air in the chamber 13.

To preserve the contents for shipping and storage purposes it will be necessary to exhaust the air from the chamber 13 and replace the same

with a preserving gas, for instance carbon dioxide. To accomplish this result an injecting gun 14 is provided having a discharge and piercing member 15 thereon, and this member is forced through the wall of the body 3 at 16 adjacent the lower side thereof. An exhaust port 17 is also formed in the body, adjacent its upper side by the piercing member 15. As the carbon dioxide is forced into the lower end of the chamber 13, the air is forced therefrom through the exhaust port 17, and when the air is exhausted from the liner chamber, the ports 16 and 17 are sealed by adhesive wafers 18, therefore it will be seen that an hermetically sealed container is formed.

To prevent the possibility of sealing the container before all of the air is forced from the chamber 13, a testing device 19 is provided, which device comprises a handle member 20, a liquid reservoir 21 for supplying an inflammable liquid to a wick 22. The wick is ignited and as long as air is discharged from the port 17, the flame will be maintained, however when the carbon dioxide is discharged the oxygen will be eliminated and the flame extinguished.

The carbon dioxide is furnished to the injecting device 14 from a tank 23 through a pressure regulating valve 24, and thence through a pipe 25 which extends into the container 26 of a sterilizing device and into a sterilizing liquid 27.

After the carbon dioxide is sterilized it passes from the receptacle 26 through the flexible pipe 28 to the injector 14.

It is to be understood the liner can be placed in any type of crate or receptacle, and applicant does not limit himself in this particular. The rubber material preferably used is relatively thin and transparent and has the general appearance of commercial "Cellophane," however "Cellophane" does not entirely exclude moisture, is solvent and is not gas and acid resisting as rubber, nor does it have the stretching qualities of rubber, and it easily tears. By using a rubber, heavy articles within the crate will not puncture the same. By using carbon dioxide as a preservative, a natural element in the growth and development of all fruits and vegetables is used, and it serves to aid the cell structure in retaining the original firmness and freshness of the fruits and vegetables for a long period, which is essential in shipping and storage.

As the carbon dioxide passes through the washing device 26 and through the tube 28, it is subjected to the action of ultra-violet rays within the sterilizer 29 at the lower end thereof, and then passes upwardly through the chamber 30 and thence downwardly through the flared upper end 31 of the tube 32. The gas is deflected by the baffle member 33 into the tube 32, hence it does not come into engagement with the mercury lamp 34. It will be seen that all of the gas is subject to the action of ultra violet rays through the opening 35 and will be discharged into the package 1 with the carbon dioxide gas.

The invention having been set forth what is claimed as new and useful is:

1. The combination with a receptacle, of an hermetically sealed gas retaining liner therein having a chamber for the reception of a preserving gas, said liner comprising a body portion formed from thin stretchable rubber and top and bottom walls also formed from thin stretchable rubber, rigid reinforcing members secured to the inner faces of the top and bottom walls, the top and bottom edges of the body portion being hermetically sealed to the outer sides of the top and bottom walls of the liner adjacent the peripheral edges thereof above and below the rigid top and bottom members.

2. A device as set forth in claim 1 wherein the reinforcing members are adhesively secured to the inner side of the top and bottom walls of the liner.

LESLIE L. TIRRELL.