Oct. 4, 1938. S. A. HURST 2,131,876

APPARATUS FOR BLANKETING COMESTIBLES WITH INERT GAS

Filed July 22, 1936

Fig. 1

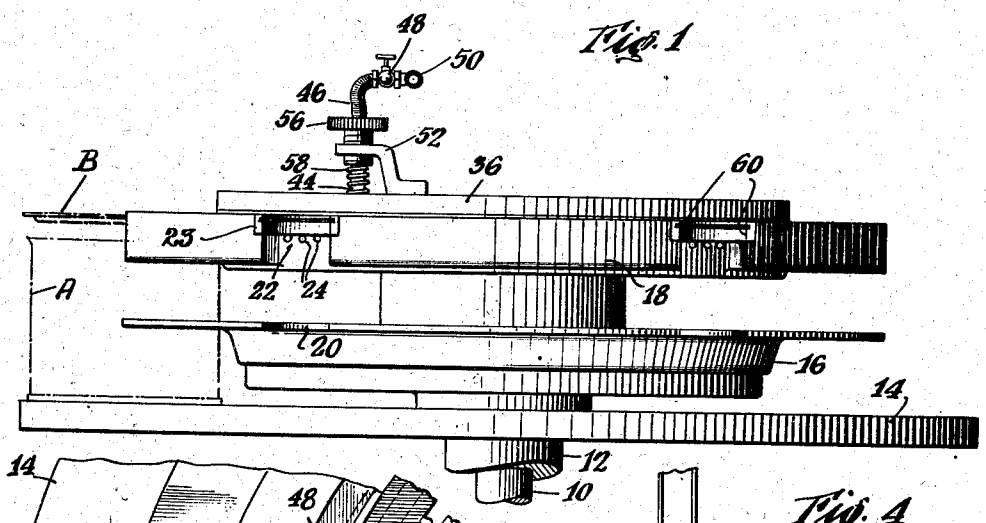


Fig. 2

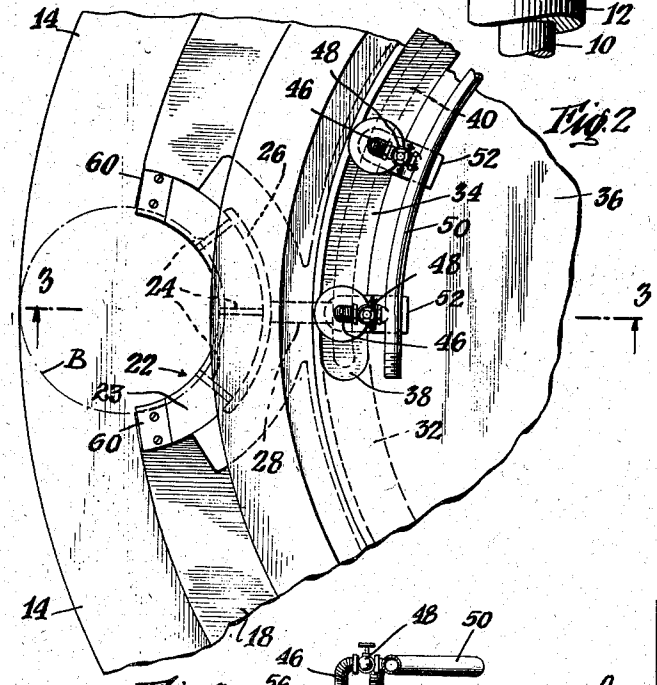


Fig. 3

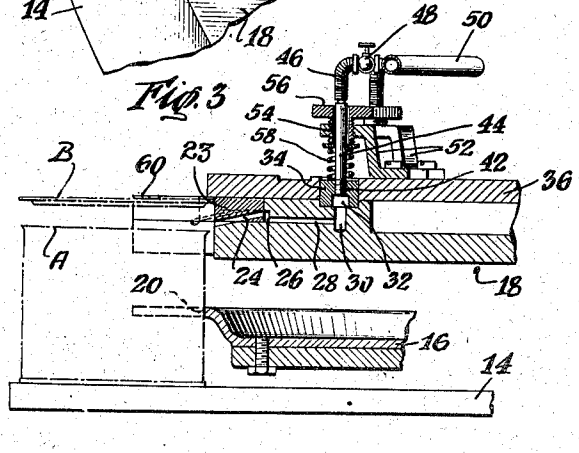
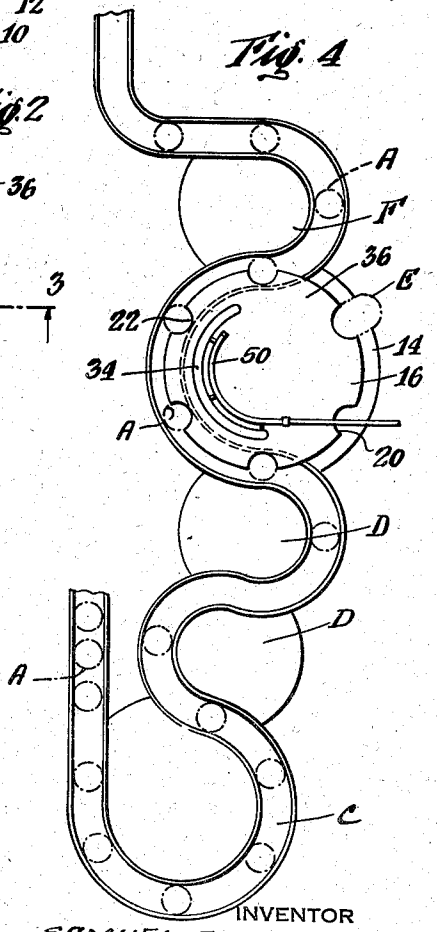


Fig. 4



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APPARATUS FOR BLANKETING COMESTIBLES WITH INERT GAS

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11 Claims. (Cl. 226—68)

The present invention relates to an apparatus for blanketing a product in a container with inert gas for the purpose of preservation and protection.

The value of inert gas as an agent for the prevention of deterioration of comestibles has long been recognized, and many devices have been used for blanketing comestibles in an atmosphere of inert gas. There are generally two types of such devices, namely, the vacuum type and the diffusion type.

The vacuum type of inert gas injecting device consists usually of a chamber or bell which fits over or around a container in gas-tight relation and is alternately connected with a vacuum creating means for withdrawing air from the container, and a source of inert gas, which replaces the air withdrawn from the container.

The diffusion type of gas-injecting device consists generally of a chamber which is normally filled with an inert gas such as nitrogen or carbon dioxide. When a container is placed in the chamber or passed therethrough, the air is replaced by the inert gas because of the difference in their weights. The air, being lighter, diffuses to the top of the chamber, and the inert gas diffuses into the container.

Each of the preceding types of devices is subject to certain inherent disadvantages from a practical commercial point of view.

The vacuum type of gasifying device is expensive to construct and also expensive to operate. The necessity for drawing a high vacuum on the container to provide rapid operation of the device, results in the provision of a costly vacuum pump, and considerable expense in operating the same. Furthermore, proper sequential operation of the vacuumizing means and the gas-injecting means necessitates the provision of a complicated and costly manifold for controlling the alternate vacuumizing and gas-injecting operation.

The diffusion type of gasifying device is less expensive to construct and operate, but has a serious disadvantage of a low operating capacity. The containers must remain in the diffusion chamber for an extended period of time, and unless a chamber of great size is used, only a small number of containers can be treated in an operating period.

The present invention is a gasifying device of simple construction, which may be economically operated, and has a speed of operation suitable for large scale handling of filled containers.

An object of the invention is to overcome the necessity for use of vacumizing means to insure proper displacement of the air in a container.

A further object of the invention is to overcome the low operating capacity inherent in devices which are not equipped with vacuumizing means.

A still further object of the invention is to provide a construction which has a minimum of movable wearing parts, and yet one which will continuously and rapidly handle a succession of filled containers.

To achieve the objects of the invention, my new gasifying device is provided with container supporting means which continuously advances the containers from a container filling device to a final sealing device. During the travel of the containers through the gasifying device, the air is effectually displaced through the agency of a stream of inert gas directed across and into the top of the container. By blowing the gas across and into the top of the container, the air is positively displaced and the gas diffuses into and replaces the air in the container.

More specifically, my invention includes a rotary gas injecting head portion having container-receiving notches in its periphery, and gas ports disposed along a portion of the periphery of the notches, so that the inert gas is directed from one side of the container to the other, thus blowing away the air that is normally in the container.

In addition, the gas injecting head is provided with means for carrying the container lids in alignment with but spaced from the containers, in order to provide a restricted space into which the inert gas is blown. With this construction the volume of inert gas required to displace the air is reduced greatly and results in economical operation of the device.

The gas is delivered to the rotary gas-injecting head through the medium of an improved manifold which maintains a tight gas-sealing engagement with the rotary head and is capable of adjustment to compensate for wear. The manifold may be readily replaced when it becomes too badly worn to maintain a gas-sealing relation with the head. If the device becomes worn it is necessary to replace only one simple and relatively inexpensive element of my improved manifold construction. Thus I overcome the necessity of replacing a complicated, costly manifold such as is found in the more complicated mechanisms of the vacuumizing type.

For a better understanding of my inventive construction, reference may be had to the accompanying drawing in which:

Figure 1 is an elevation of my gasifying device, partly broken away;

Figure 2 is a fragmentary plan view of one of the container-receiving portions of my gasifying device;

Figure 3 is a sectional view taken on line 3—3 of Figure 2, partly broken away; and

Figure 4 is a diagrammatic view of a typical installation including my gasifying device.

Illustrative of my invention, Figure 1 discloses a typical embodiment of my gas injecting means consisting of a fixed shaft 10, mounted in a base-member (not shown) and having a sleeve 12 rotatably mounted thereon. Sleeve 12 is driven by any desired means to impart rotation to a container support 14, a container locating guide 16 and a gas-injecting head 18, each of these members being fixedly attached to sleeve 12. The guide 16 and gas-injecting head 18 are each provided with a series of peripheral recesses or can pockets 20 and 22, respectively, which receive containers A and hold them in proper position on the container support 14.

The recesses 22 of the gas-injecting head 18 are notched to receive apertured arcuate members 23 which are provided with inclined bores. The inclined bores form in conjunction with inclined grooves in the gas injecting head 18 a series of downwardly inclined gas-injecting ports 24 through which the gas may be blown into the containers A, as shown in Figure 3. If desired, the gas-injecting ports may take the form of a continuous narrow slot extending around a portion of the periphery of the recesses 22. Connecting the inner ends of ports 24 in each recess 22 is an arcuate conduit 26 which communicates through a passageway 28 and a vertical bore 30 with an annular groove 32 in the upper surface of gas-injector head 18. Resting in and slidable with respect to the groove 32 as the head 18 is rotated, is an arcuate channel member 34 carried by a manifold plate 36 fixed to vertical shaft 10.

The channel member 34 is provided with closed ends 38 forming a gas-tight seal around the channel 40, and a plurality of threaded bores 42 into which are threaded a corresponding number of tubular members 44 communicating with channel 40. Flexible couplings 46 connect the tubes 44 to individually adjustable valves 48 mounted on a common gas-supplying pipe 50. The amount of gas supplied to channel 40 may be closely regulated and a constant pressure maintained throughout the extent of the channel 40 by means of the individually regulated valves 48. The main gas supply pipe 50 is connected to a source of inert gas which may be provided with the usual filters and main control valve (not shown).

In order to maintain the channel member 34 in gas-tight relation to the gas-injector head 18, the fixed plate 36 is provided with a plurality of brackets 52 having threaded bores 54 in which are mounted externally threaded hollow studs 56. The tubes 44 pass loosely through the studs 56 and the channel member 34 is forced downwardly into the groove 32 by springs 58 surrounding the tubes 44 and bearing against studs 56 and channel member 34. Adjustment of studs 56 varies the pressure with which channel member 34 is forced in groove 32.

As illustrated in Figure 4, the channel member 34 extends throughout approximately 180° of the extent of the plate 36, and gas is injected into the containers, throughout the major extent of their path in the gas-injecting device.

As it is desirable to maintain the gas loss at as low a point as possible, the gas injecting head 18 is also utilized to carry the lids B for the containers A in closely spaced relationship to the open tops of containers A, thereby producing restricted spaces into which the inert gas is injected. At the outer edge of head 18 adjacent the container pockets 22, (Figs. 1 to 3) are oppositely disposed under-cut lugs 60 which receive the lids B from any desirable type of lid hopper and carry the lids B in alignment with the containers A to the can sealing machine, where they are finally clinched to the containers.

Diagrammatically shown in Figure 4 is a typical layout utilizing my gas injecting means. The containers A are fed into a container filling device C where the containers are filled, and then are passed over rotary conveyors D to my gas injector. The containers A are fed into the recesses 22 of the gas-injector head 18 and the lids B are fed from hopper E under the lugs 60, thereby aligning the containers and the lids. As the containers A are advanced around the gas injector, the bores 30 communicate with channel member 34 and gas is blown through ports 24 across the open tops of the containers, thus displacing the air. The inert gas is injected into successive cans as they travel to the sealing machine F where the bores 30 move out of communication with the channel member 34 just prior to transfer of the lids B and the containers A to the sealing machine where the lids are clinched to the containers.

It will be understood that the device disclosed is illustrative only and that there can be many variations in the construction thereof, all falling within the scope of the invention as defined in the appended claims.

I claim:

1. In a device for injecting inert gas into containers, a rotatable container support, rotatable means for maintaining containers in position on said support, means rotatable with the position maintaining means for supporting container lids in alignment with but spaced from the tops of the containers, and a device carried by the position maintaining means for injecting inert gas from one side only into the space between the top of the container and the lid.

2. In a device for injecting inert gas into containers, movable means for supporting a series of containers, means movable with the supporting means for maintaining the position of the containers on the latter, and a device carried by the positioning means adjacent one portion only, of the periphery of a container for injecting inert gas into and across the top of the container.

3. In a device for injecting inert gas into containers, movable means for supporting a series of containers, means movable with the supporting means for maintaining the position of the containers on the latter, means carried by the positioning means for supporting container lids in alignment with but spaced from the tops of the containers, and a device carried by the positioning means adjacent one portion only, of the periphery of a container for injecting inert gas between a lid and the top of the container.

4. In a device for injecting inert gas into containers, rotatable means for supporting a series of containers, rotatable means having a plurality of peripheral recesses for receiving containers and positioning them on the supporting means, and mechanisms extending around the recesses adjacent the tops of the containers for directing

gas across the tops of the containers to displace the air therefrom.

5. In a device for injecting inert gas into containers, rotatable means for supporting a series of containers, rotatable means having a plurality of peripheral recesses for receiving and positioning containers on the supporting means, means on the positioning means for supporting container lids in spaced vertical alignment with the containers, and mechanisms extending around said recesses between the tops of the containers and the lids for directing gas across the tops of the containers.

6. In a device for injecting inert gas into containers, rotatable means for supporting containers, coaxial rotatable means having a series of peripheral recesses therein for receiving and positioning containers on said support, means for rotating said rotatable means, mechanisms in said recesses for injecting gas into the containers and a fixed manifold member having gas conduits communicating with said mechanisms during a portion of the rotating movement of said positioning means.

7. In a device for injecting inert gas into containers, a base, a container-support rotatably mounted on said base, a coaxial member having a plurality of container-positioning recesses in its periphery rotatably mounted on the base, mechanisms in the periphery of said recesses for injecting gas into said containers, a member fixed to the base adjacent the recessed member, said fixed member being provided with a channel member resiliently urged into contact with said recessed member, gas supplying means communicating with said channel member, and conduits in said recessed member communicating said channel member with the gas-injecting mechanisms.

8. In a device for injecting inert gas into containers, a rotatable container support, a coaxial rotatable member having container-positioning recesses in its periphery, devices in said recesses for injecting gas into the containers, means for rotating the support and the recessed member, a relatively fixed member adjacent the recessed member, a movable arcuate channel member in the fixed member, gas supplying means communicating with said channel member, conduits in said recessed member communicating with said gas-injecting devices and resilient means urging the channel member into engagement with the conduits whereby gas may be successively supplied to said gas-injecting devices.

9. In a gas-injecting device having a mechanism for injecting gas into a container, the combination of a disk member having an arcuate slot therein, an arcuate channel member in the slot, gas supplying means communicating with the channel, a rotatable disk engaging the channel member and having conduits communicating with the channel and the gas-injecting mechanism, and resilient means urging the channel member into engagement with the rotatable disk.

10. In a device for injecting gas into containers, the combination of a rotatable support for receiving containers, a coaxial rotatable member having recesses for receiving the open ends of containers, mechanisms for injecting gas into containers communicating with and disposed around a portion only of the recesses, a stationary member, an arcuate channel member mounted on the stationary member and resiliently urged into engagement with the recessed member, means for supplying gas to the channel member, and means in said recessed member for delivering gas to the gas injecting mechanisms from the channel member during a part of the rotary movement of the recessed member.

11. In a device for injecting gas into containers the combination of a rotatable support for receiving containers, a coaxial rotatable member having recesses for receiving the open ends of the containers, mechanisms for injecting gas into the containers communicating with the recesses and a surface of the rotatable member and disposed around a portion of the recesses only, a stationary member, a member having a channel supported on the stationary member, means urging the channel member into engagement with the surface of the recessed member with the channel communicating with some but not all of the said mechanisms, and means for supplying gas to the channel.

SAMUEL A. HURST.