Dec. 22, 1959 J. HOHL 2,917,880

METHOD OF AND APPARATUS FOR PACKAGING FOOD PRODUCTS

Filed April 24, 1957 3 Sheets-Sheet 1

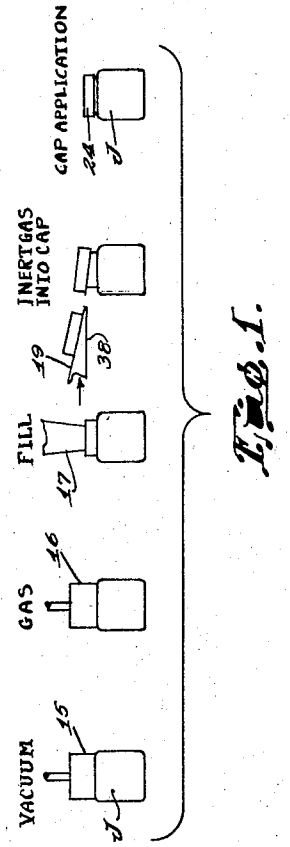


Fig. 1.

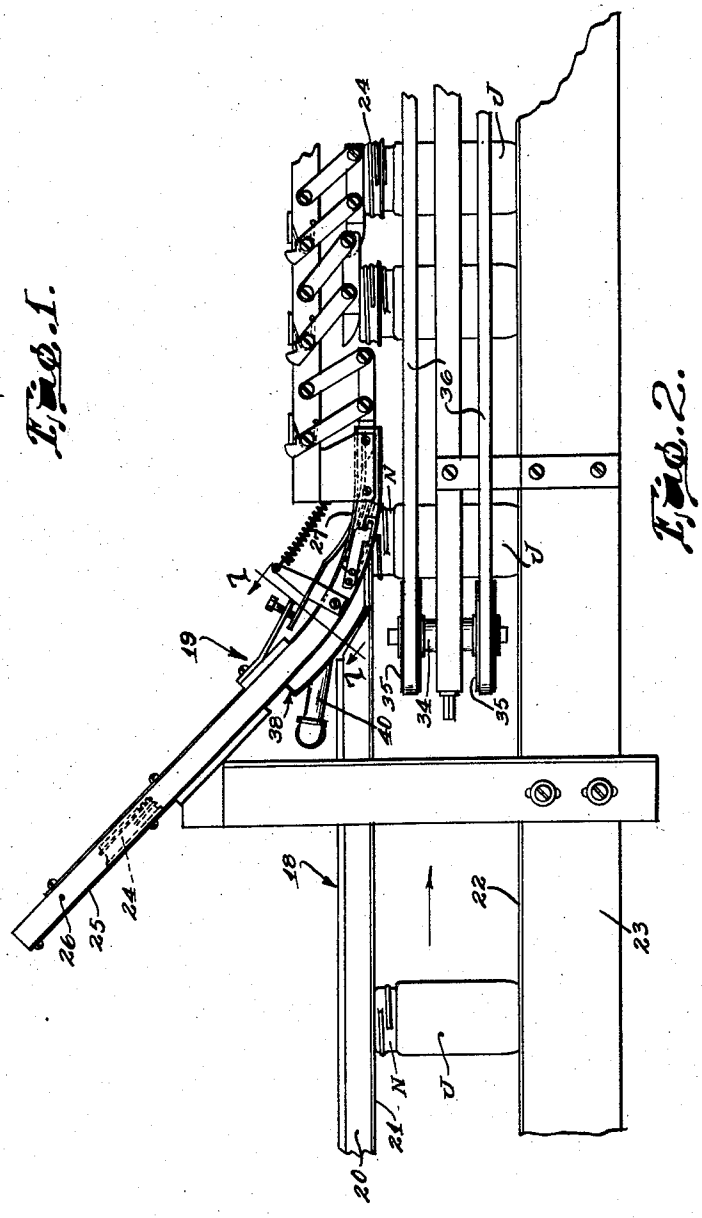


Fig. 2.

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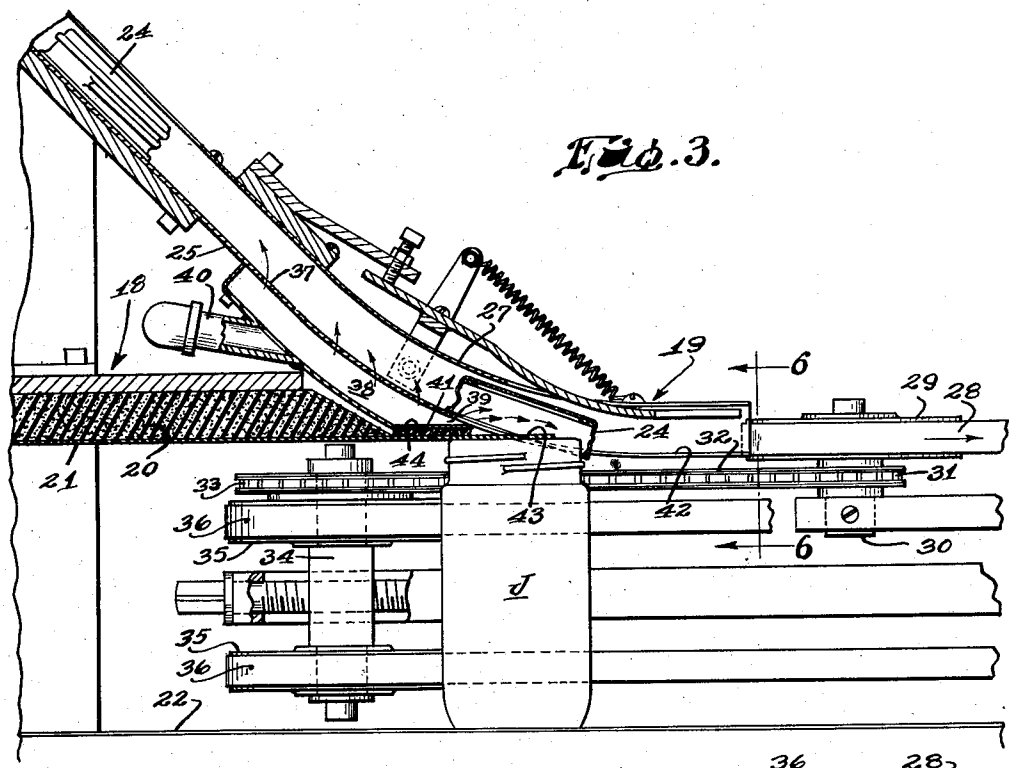


FIG. 3.

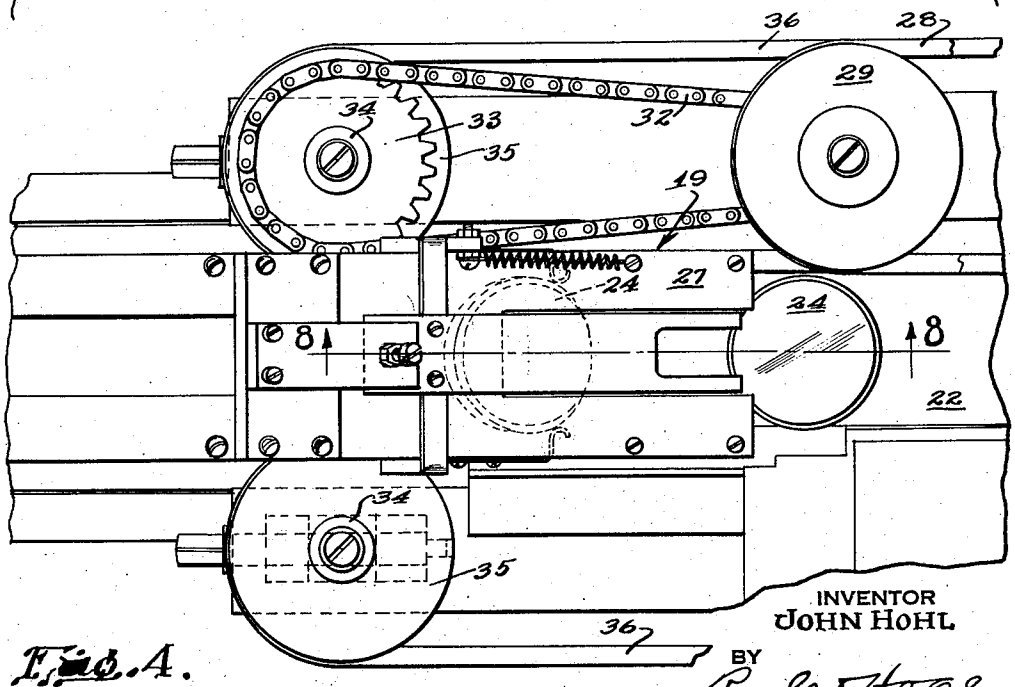


FIG. 4.

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METHOD OF AND APPARATUS FOR PACKAGING FOOD PRODUCTS

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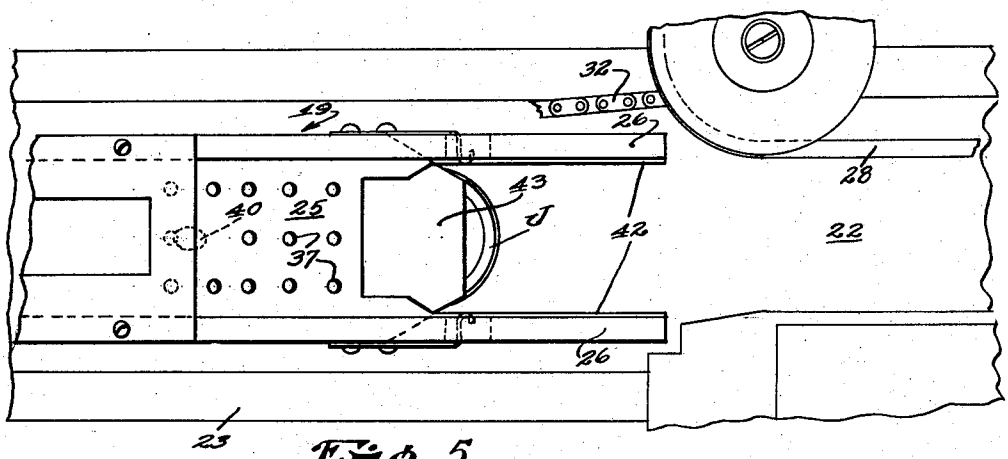


FIG. 5.

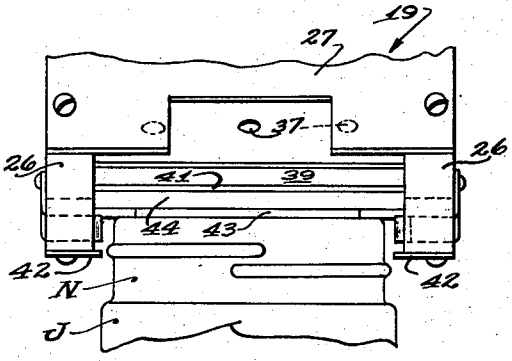


FIG. 6.

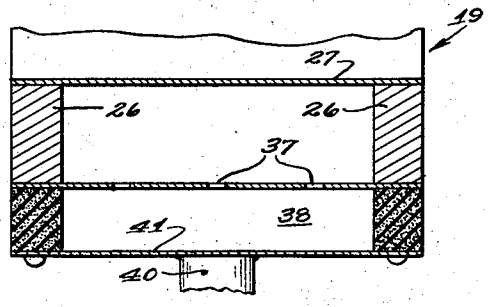


FIG. 7.

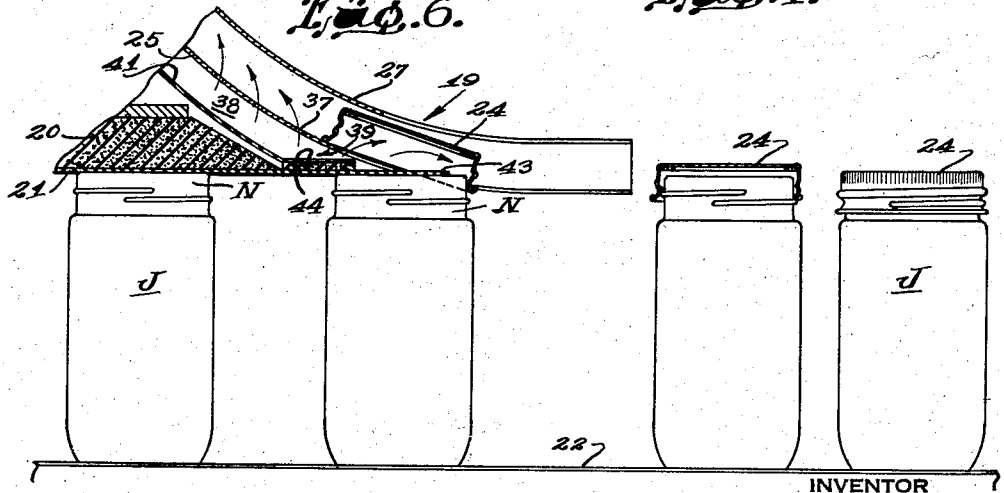


FIG. 8.

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METHOD OF AND APPARATUS FOR PACKAGING FOOD PRODUCTS

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Application April 24, 1957, Serial No. 654,921

4 Claims. (Cl. 53—112)

The present invention relates to improvements in packaging food products and more particularly is a novel and effective method of an apparatus for excluding oxygen from the packed product and substituting therefor an inert gas such as nitrogen.

In the packaging of certain food products, it is essential to satisfactory preservation that atmospheric air or oxygen be excluded from the jar or such container for the products. With some such products deterioration in the presence of oxygen takes place quite rapidly. These are well-known facts.

An important object of my invention is the provision of a novel method and apparatus for insuring that the entire head space and the interior of the closure cap, at the time of placement upon its jar, will contain no oxygen and instead be filled to overflowing with nitrogen, or some other suitable inert gas.

A further object of my invention is the provision of means for introducing an inert gas into a closure cap substantially at the time it is picked off of the discharge end of a cap chute by and partially telescoped over the neck of a jar. Thus as the gas-filled closure cap drops onto the jar it effectively traps a substantial volume of gas and any excess flows outwardly over the container neck to the atmosphere, insuring complete filling of the entire head space above the packed product with the inert gas.

Other objects will be in part apparent and in part pointed out hereinafter.

In the drawings:

Fig. 1 is an elevational view indicating schematically the successive steps and apparatus involved in packaging food products wherein my invention is utilized.

Fig. 2 is a fragmentary side elevational view showing my invention built into a conventional closure cap delivery chute.

Fig. 3 is a fragmentary sectional elevational view, on an enlarged scale, showing the closure cap chute provided with gas injecting means and a gas filled closure cap about to telescope over and enclose the neck of a jar.

Fig. 4 is a top plan view of the apparatus shown in Fig. 3.

Fig. 5 is a fragmentary top plan view of the apparatus shown in Fig. 3 with the closure cap chute cover removed.

Fig. 6 is an end elevational view taken substantially along the line 6—6 of Fig. 3 omitting the chains and belts shown in Fig. 3, for the sake of clarity.

Fig. 7 is a transverse sectional view on an enlarged scale taken along the line 7—7 of Fig. 2.

Fig. 8 is a fragmentary longitudinal sectional view taken substantially along the line 8—8 of Fig. 4.

I am aware of efforts by others to accomplish the results of my invention, one example being that revealed in C. L. Day et al. Patent No. 2,763,107 issued September 18, 1956, but in that patent there is no assurance whatsoever that gas introduced into the closure caps will not be entirely displaced by atmospheric air before they

arrive at the bottom end of the cap chute. Neither is there any certainty that the head space of the container will not contain a substantial amount of oxygen.

In Fig. 1, I have illustrated schematically the several steps and apparatus involved in the packaging of food products wherein my invention has been incorporated. As has been pointed out previously, complete removal of oxygen and absence of same from jars or the like containers at the time they are being filled and hermetically sealed, is essential to the preservation of certain kinds of foods and maintenance of color, quality and flavor. In the disclosure in Fig. 1, the jar J first is vacuumized by a vacuum head **15**, then is filled with an inert gas such for example as nitrogen by means of a gas injector **16**. Thereafter, and while the jar is filled with the inert gas the product to be packaged is introduced thereinto through a funnel guide **17** or the like device. I provide a cushioned canopy **18** (Figs. 3 and 8) for closing the jar and retarding any loss or dilution of the introduced nitrogen, so that upon completion of placement of the the product in the jar, the usual head-space above the product fill line, contains only inert gas, to the total exclusion of oxygen. Thus the filled jar arrives at a closure cap applying zone devoid of any entrapped oxygen. In this zone, a closure cap, also filled with an inert gas, is dropped or otherwise positioned over the jar neck and then secured thereto. Thus there is positive assurance that the jar head-space and interior of the closure cap will be purged of all oxygen at the time of final sealing, all with the beneficial and essential results explained heretofore.

Filled jars J arrive in succession at the discharge end of an inclined closure cap chute **19** and up to this point are effectively closed to prevent loss of inert gas from the head-space, by means of the previously mentioned canopy **18**. This canopy may well be a foam rubber pad **20** having a facing sheet **21** of rubber or such material on its lower side for sliding contact with the rim of the jar neck. This sheet **21** may also be lubricated on its lower surface to insure easy, relatively unimpeded advance of the jars in normal upright positions, with the conveyor **22**, which is mounted upon a frame **23**.

Closure caps **24**, shown for the purpose of illustration as skirted screw-threaded caps flow by gravity and in succession down the chute **19** which is a covered trough having a bottom **25**, a pair of side walls **26** and a removable cover **27**. In general, this chute and the cap holding and releasing devices are standard apparatus obtainable on the open market. The closure caps have their open sides facing generally downward and the foremost cap **24** in the chute (Figs. 3 and 8) occupies a slightly inclined position with a portion protruding beyond the end of the chute into the path of travel of the jar neck. As the jar moves beneath the cap chute, hte neck N engages the protruding portion of said cap and pulls it out of the chute. Immediately the cap **24** drops by gravity and encloses the upper end of the jar neck (Fig. 8) and thereupon cap affixing means including a rapidly moving belt **28** rotates and secures the cap to the jar. This belt is trained over a pulley **29** which is carried by a shaft **30**, the latter supporting a sprocket **31**. A sprocket chain **32** is trained over said sprocket **31** and a second driving sprocket **33**. This second or driving sprocket **33** is carried by one of a pair of vertical shafts **34** which support pulleys **35** and over these pulleys **35** pairs of stabilizing belts **36** are trained. These operate to hold the jars against rotation about their axes.

Removal of oxygen from the closure caps, as they leave the cap chute and are about to drop and telescope over the jar necks, is effected by providing a plurality of ports **37** in the floor or bottom **25** of the chute in prox-

imity to its discharge end. These ports open into a distributor chamber 38 which is of a width substantially the same as that of the chute. At the forward end of this chamber 38 it is provided with a transverse slot-like discharge port 39 of about the width of the chute proper. A supply pipe 40 for nitrogen or the like inert gas is connected to the distributor chamber 38. At the slotted end of this chamber, is a wall section 41 of small area lying in a substantially horizontal plane with its forward edge terminating so that the port 39, one wall of which it forms, faces both upwardly and forwardly. Thus emitted gas will be directed both upwardly and forwardly into the closure caps 24 and effectively displace and replace oxygen therein. The floor or bottom 25 of the chute (Figs. 3 and 5) is cut away centrally near the discharge end to provide a pair of transversely spaced cap supporting rails 42. This structure permits free and rapid access of the gas to the cap interior, as is apparent by reference to Figs. 3 and 8. In order to insure against objectionable disturbance of the gas in the head-space of the jar and provide for maximum concentration of gas in the closure cap 24, I extend the facing sheet 21 of the canopy 18 to form a tongue-like cover 43 (Figs. 3 and 5). This cover 43 lies in a horizontal position and maintains the jar neck opening substantially closed up to a split second prior to actual dropping of the closure cap into place. This tongue-like cover 43 is flexible and at its base may be spaced from the lower side of the chamber wall section 41 by means of a pad 44 of foam rubber.

As previously explained, the jars are vacuumized, gas-filled and then the product to be packed is placed therein. Such procedure obviously removes some of the inert gas, but insures that any space not occupied by the product itself will be gas-filled and that such gas will also fill the customary head-space above the packed product. The canopy (Figs. 2 and 3) retards any loss of gas from the jars. Thus when a jar reaches the closure cap receiving position, it still is effectively closed by the tongue-like cover 43. The closure cap 24 while awaiting the arrival of a jar is exposed to the gassing operation and such continues for a period of time during the actual deposition of the closure cap 24 onto the jar (Fig. 8) so that the cap is completely gas-filled. As the cap drops over the jar neck, any excess gas in such cap escapes over the rim of the jar neck between it and the skirt of the closure cap. Thus one is assured, owing to the speed of the described operation, that the entire head-space and the closure cap interior will be free of oxygen and instead completely filled with the inert gas.

Modifications may be resorted to within the spirit and scope of the appended claims.

I claim:

1. Apparatus for closing containers for food products and the like comprising a horizontal conveyor for supporting open, product-filled jars in normal upright positions with a head-space filled with an inert gas, means for moving the conveyor continuously to thereby transport the jars one at a time through a closure cap receiving zone and a closure affixing zone, closure cap feeding means having a delivery end in said receiving zone, means for transferring skirted closure caps from the feeding means to positions in which they are telescoped over a part of the jars, means common to all jars moving to the cap feeding means for temporarily closing the jars until initiation of the closure cap telescoping step means for introducing an inert gas into the closures during initiation of the telescoping operation and means for affixing the closures to said jars and a flexible forwardly extending tongue-like cover positioned to overlie and at least in part close the jars during initial telescoping of the caps thereover.

2. In combination a horizontal continuously moving conveyor for supporting in upright position open product-filled jars, an inclined closure cap chute including a floor portion overlying a part of said conveyor and having a cap discharge opening facing substantially in the direction of movement of the conveyor, said floor having a plurality of ports therein near the discharge opening, an inert gas distributing chamber exterior to said floor and enclosing the plurality of ports, said floor forming one wall of the distributing chamber and together with another wall thereof providing an upwardly and forwardly facing slot-like outlet for the inert gas, means for supplying gas to said chamber, a cover projecting horizontally forward immediately below the gas outlet to overlie and normally close at least a major part of the open end of a container being moved therebeneath, means releasably supporting a closure cap in an inclined position with its open side facing and immediately above the gas outlet and cover and with a portion of such cap positioned to be engaged by the open end of a moving jar and thereby removed from the cap chute whereby to effect telescoping of the closure cap over said open end while gas is being introduced into said cap and means for securing the closure cap to the jar and entrapping inert gas in the head-space of the latter.

3. Apparatus as defined in claim 2, said cover being tongue-like and formed of flexible material and capable of vertical movement relative to the conveyor.

4. In apparatus for closing containers for food products and the like comprising means for conveying open product-filled containers in normal upright positions in succession and by continuous movement through closure cap receiving and affixing zones, the containers each having a head-space substantially filled with an inert gas, means for telescoping a skirted closure cap over the open end of each container while in the receiving zone, means for introducing an inert gas into the closure cap to purge it of oxygen during at least the initial stages of telescoping the cap over said open end of the container, means overlying a portion of the path of travel of the containers for temporarily closing the open end of each until initiation of the cap telescoping step to thereby confine gas in the head-space, means for affixing each closure cap to its container to hermetically seal and entrap gas in the head-space of the container, the inert gas introducing means comprising an inclined chute having a floor portion provided near its lower end with a plurality of apertures, a gas distributor chamber communicating with and common to all of said apertures and extending along and beneath a portion of said chute, said chamber having a transverse horizontal discharge port for directing gas forwardly and upwardly into the closure caps, there being a flexible forwardly extending tongue-like cover positioned to overlie and at least in part close the containers during initial telescoping of the caps thereover and aid in directing gas into the closure caps.

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