Dec. 19, 1950 J. FELBER 2,534,254

METHOD OF PACKING FLUID SUBSTANCES IN CANS

Filed Oct. 24, 1946 2 Sheets-Sheet 1

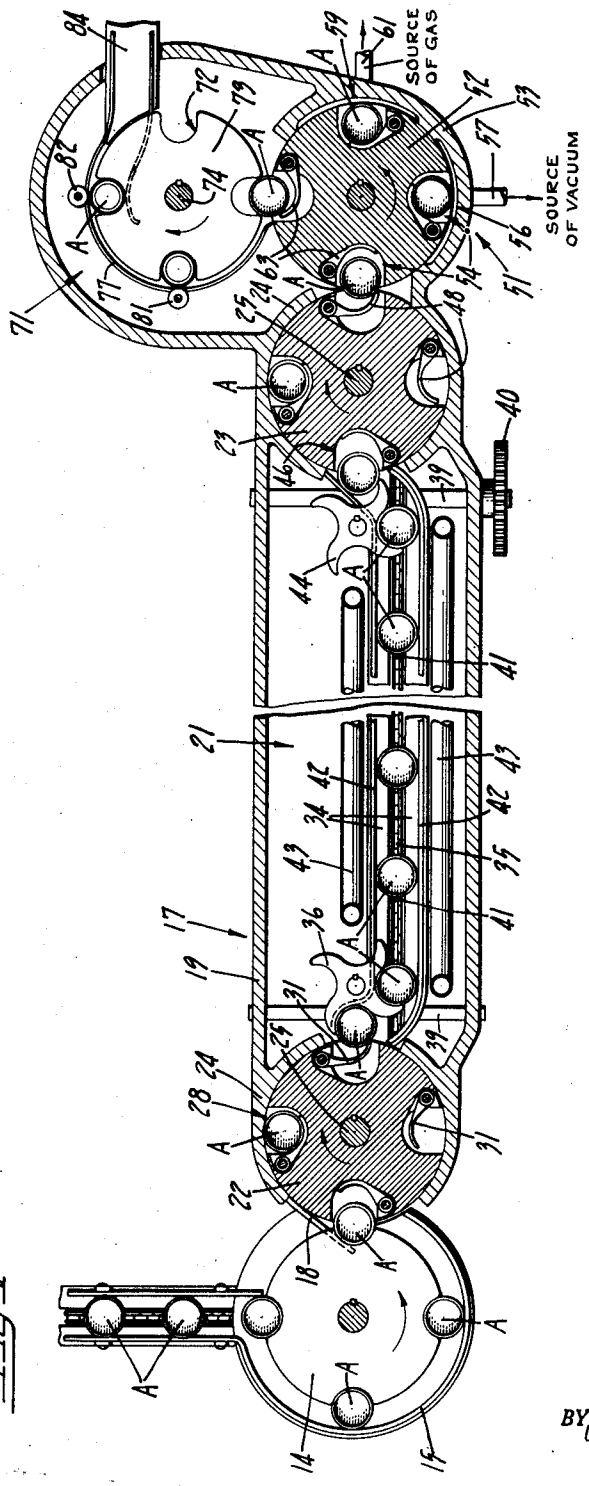


Fig 1

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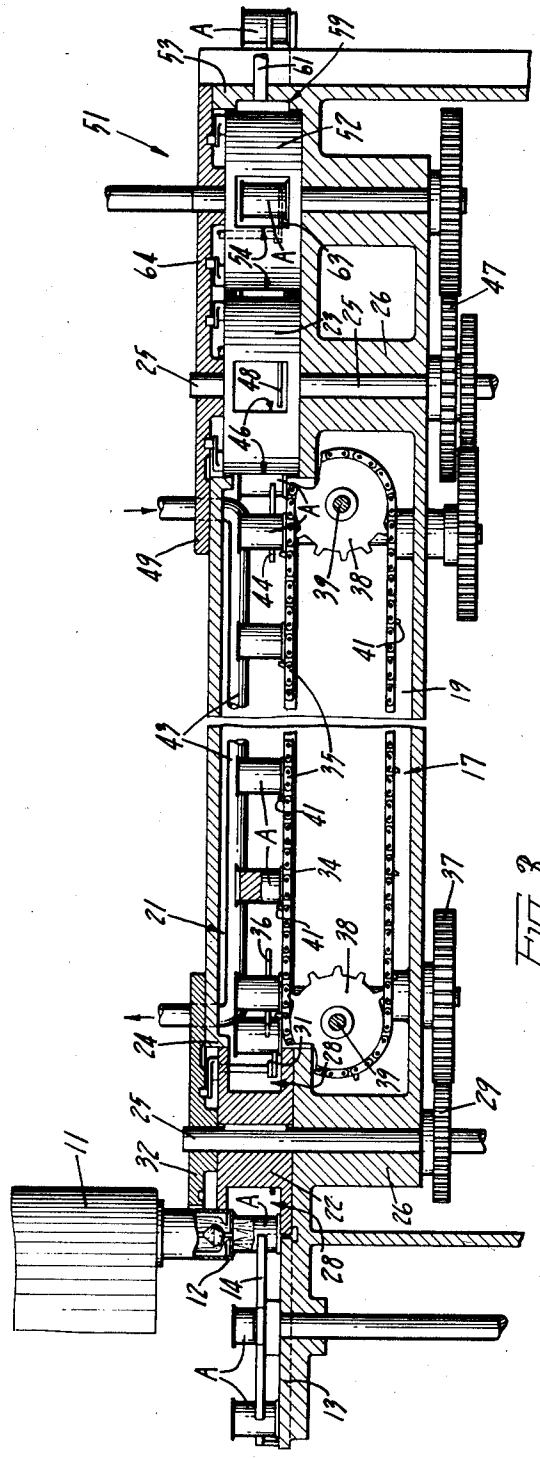


Fig 2

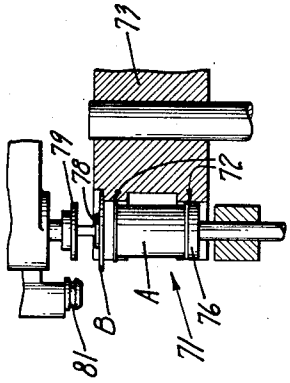


Fig 3

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METHOD OF PACKING FLUID SUBSTANCES IN CANS

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3 Claims. (Cl. 222—116)

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The present invention relates to a method of packing fluid substances in containers or cans adapted to be rotated while being closed and has particular reference to retaining the substance against surging in the cans.

In the hermetic closing or sealing of cans with a cover or end member, the cover is usually permanently secured in place by an interfolding of flanges on the cover and on the can body to produce the well known hermetic double seam. Under high speed rates of production the seaming operation can be performed more rapidly when the can is rotated and the seaming head remains stationary than when the can remains stationary and the seaming head rotates.

However when the product filled into a can prior to sealing is of a fluid nature, the rapid rotation of the can during the seaming operation sets up a centrifugal force which causes the product to surge in the can and come in contact with the cover. Where the product is viscous or tends to harden upon standing, such as for example vegetable cooking compounds or lard products, the surged product in contact with the cover cements the cover in place so that it is extremely difficult to remove upon being released from the can by a can opener or by removal of a tearing strip with a tearing strip type of can. Especially is this so of the reclosure type can or of a type of can in which the cover is hingedly connected to the can upon removal of a tearing strip. Many vegetable compound and lard cans are made this way today.

The present invention contemplates overcoming this difficulty while still allowing rotation of the can by a method of preventing the surging of the substance or product within the can and preventing its resulting clinging effect on the can cover.

An object of the invention is the provision of a method of packing fluid substances in cans adapted to be rotated while being closed wherein the exposed surface of the fluid substance filled into a can is rendered immovable under centrifugal force prior to sealing the can so that upon rotation of the can during the closing operation the fluid substance will be retained against surging.

Another object is the provision of such a method of packing fluid substances in cans wherein the exposed surface of the substance in the can is frozen prior to the can being closed so as to congeal or solidify the surface of the substance against surging thus preventing its coming into contact with the cover during rotation of the can while being closed.

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Another object is the provision of such a method of packing fluid substances in cans wherein the headspace of the filled cans above the solidified contents may be filled with an inert gas to eliminate the air from the can headspace.

Another object is the provision of such a method of packing fluid substances in cans wherein the cans may be filled and closed at high speed rates of production and which results in efficiently sealed cans which may be readily opened by the consumer and wherein the product is contained fully within the can and is not stuck to the cover.

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.

Referring to the drawings:

Figure 1 is a top plan sectional view of an apparatus for carrying out the steps of the instant method invention, with parts broken away;

Fig. 2 is a longitudinal section taken through the apparatus shown in Fig. 1, with parts broken away; and

Fig. 3 is an enlarged sectional detail of the apparatus.

As a preferred embodiment of the invention the drawings disclose principal parts of apparatus for carrying out the steps of a method of sealing a product such as a vegetable cooking compound in sheet metal cans. Such a product as prepared for packing, is in a semi-liquid viscous condition. While in this condition it is filled into the cans. Following this filling operation according to the present invention the exposed surface of the semi-liquid compound is chilled or frozen. This congeals or solidifies the exposed surface of the product and thus renders it immovable under centrifugal force.

The headspace of the filled can prior to sealing is usually filled with an inert gas, such as nitrogen to eliminate the air from the can. This gassing of the can is performed preferably after the freezing step although it may be preformed before this step if desired. In some cases the gassing step may be eliminated.

After gassing, the filled can is sealed or closed by attaching an end member thereto. The sealing step is effected preferably by rotating the can, as hereinbefore mentioned. During this sealing step the congealed surface of the product in the can remains immovable under the centrifugal force set up in the can and thus the

product is prevented from surging into contact with the end member.

One form of apparatus, as disclosed in the drawings, for carrying out these method steps includes a conventional filling machine of desired type such as the machine shown in United States Patent 1,523,607 issued January 20, 1925, to F. W. Prael on Filling Machine. Such a machine comprises a reservoir 11 (Fig. 2) containing a supply of the product. The reservoir is provided with nozzles 12 for dispensing the product into the cans. Cans A to be filled are supported on a table 13 and are propelled into position under the nozzles for filling in any suitable manner, as for example, by a rotating turret 14 (see also Fig. 1). The cans are directed in the desired path of travel by stationary guide rails 15 surrounding the turret.

After the filling operation the filled can is transferred to a freezing unit 17 being wiped out of the turret pocket by a discharge guide bar 18. This unit 17 comprises an elongated housing 19 which encloses a freezing chamber 21. The ends of the housing are closed with rotatable valves 22, 23 which operate in valve seats 24 formed in the housing. These valves are mounted on vertical shafts 25 which are journaled in bearings 26 formed in the housing.

Valve 22 is the can entrance valve and is formed with pockets 28 for receiving the filled cans A from the filling machine and for carrying them into the freezing chamber 21 as the valve rotates. The valve is rotated in its seat in any suitable manner in time with the filling machine as for example by a gear 29 mounted on the lower end of valve shaft 25.

Upon being introduced into the freezing chamber 21, the filled can is ejected from its valve pocket 28. This is effected by an ejector finger 31 which is a usual part of such valves and which is pivotally mounted in the valve pocket. There is one of these fingers in each pocket and they are actuated in time with the rotation of the valve by a stationary cam 32 mounted on the housing 19. Such a valve and its parts is disclosed in some detail in United States Patent 2,039,338, issued May 5, 1936 to R. E. J. Nordquist et al. on Vacuum Closing Machine.

A filled can A introduced into the freezing chamber 21 is received on a table 34 having a continuously operating endless chain conveyor 35 which extends the full length of the chamber. A rotary star wheel 36 disposed adjacent the valve places the can onto the conveyor. This star wheel is rotated in time with the valve by way of a gear 37 which meshes with the gear 29.

The conveyor 35 operates over a pair of spaced sprockets 38 carried on cross shafts 39 journaled in bearings formed in the housing 19. One of the shafts extends beyond the housing and carries a gear 40 for driving the conveyor. The conveyor is provided with spaced feed dogs 41 which engage behind the cans as they are received and propels them along the table. Guide rails 42 maintain the cans in line as they move along the table.

Adjacent the guide rails 42, the freezing chamber 21 is equipped with freezing units 43. These freezing units may be of any suitable variety. The drawings show a continuous pipe line for conveying a freezing medium such as brine or the like through the chamber. One end of the line leads from a suitable source of the medium while the opposite end leads back to the source or to a suitable place of discharge.

It is the passage of the filled can A through this freezing chamber 21 adjacent the freezing units 43 that chills or freezes the exposed surface of the product, as hereinbefore mentioned.

At the discharge end of the conveyor 35 in the freezing chamber 21, the chilled can is swept off the conveyor 35 by a star wheel 44 and is introduced into a pocket 46 of the valve 23 disposed at this end of the housing 19. This valve is a discharge valve and as it rotates it carries the received can out of the freezing chamber. The valve is rotated continuously by a gear 47 mounted on the lower end of its shaft 25. The star wheel 44 is rotated in time with this valve by way of a gear which meshes with the gear 47. The valve carries discharge fingers 48 which are similar to the ejector fingers 31 in the entrance valve 22. These discharge fingers 48 are actuated in time with the rotation of the valve by a stationary cam 49 mounted on the housing 19 and which is similar to the entrance valve cam 32.

The discharge valve 23 of the freezing unit 17 preferably transfers the chilled can to a gassing unit 51. This unit preferably includes a valve 52 which continuously rotates in a seat formed in a cylindrical casing 53. The valve is rotated in any suitable manner in time with the valves of the freezing unit. The valve is formed with pockets 54 for receiving the chilled can and for carrying them through the casing.

A can in a pocket 54 of the gassing valve 52 first passes by and thus communicates with a vacuumizing recess 56 formed in the casing. This recess is maintained in a vacuumized condition by a pipe line 57 which leads to a suitable source of vacuum. As a can passes this recess, its headspace above the congealed exposed surface of the product in the can is vacuumized to eliminate the air therefrom.

Continued rotation of the valve carries the vacuumized can out of communication with the vacuumizing recess 56 and passes it adjacent a gassing recess 59 formed in the casing, alongside the vacuumizing recess. This gassing recess is maintained in a gas filled condition by a pipe line 61 which leads from a suitable supply of an inert gas and under a slight pressure. As the can passes this recess, its vacuumized headspace is filled with the gas.

Following this gassing operation the can is discharged from the valve 52. This discharge of the can is effected by a pusher finger 63 which is located in each valve pocket and is similar to the ejector finger 31 in the valve pocket of the entrance valve 22 of the freezing unit 18. Finger 63 is actuated in time with the rotation of the valve in a manner similar to actuation of the finger 31, i. e., by a stationary cam 64 which is mounted above the gassing casing 53.

A chilled and gassed can A discharged from the gassing valve 52 is immediately picked up by a closing unit or machine 71. In this closing unit the can is received in a pocket 72 of a continuously rotating turret 73. This turret pocket also carries a can end member or cover B disposed in a recess formed in the turret just above the pocket. This cover is deposited in its recess (see Fig. 3) in any suitable manner from a supply of such covers disposed in the machine. The turret is mounted on a vertical shaft 74 journaled in bearings formed in the machine and is rotated in conventional manner in time with the other parts of the apparatus.

A can in its pocket 72 of the turret 73 rests on a vertically movable lifter pad 76 (Fig. 3) and

is retained in the pocket by a guide rail 77. The lifter pad is moved in time with the rotation of the turret in any suitable manner.

Hence as the chilled and gassed can moves through a curved path of travel with the turret 73, the lifter pad lifts the can into engagement with its superimposed cover B and thus picks up the cover. A spring held knockout 78 disposed above the cover holds it in place on the can. Continued upward travel of can and its cover brings the cover into engagement with a continuously rotating chuck 79. This engagement of the chuck with the cover rapidly rotates the can at high speed. The lifter pad holds the rotating can and its cover in this position against the chuck while the turret carries them past a pair of seaming rollers 81, 82. These rollers preferably are first and second operation seaming rollers.

As the rotating can and cover pass these rollers, the rollers engage a flange part formed on the cover and interfolds it with a similar flange part on the can and thus permanently unites the cover with the can in the well known double seam hereinbefore mentioned. During this double seaming operation the congealed exposed surface of the chilled product prevents surging of the product and thus prevents the product from coming into contact with the newly attached cover. Hence when the can is opened at the time its contents is to be used its cover may be readily removed without difficulty.

Upon completion of the seaming operation, the closed can is released from the rotating chuck 79 by a downward movement of the lifter pad 76. The lifter pad returns the closed can to its original position in the turret 73. This completes the steps of packing the can. The turret thereupon carries it into engagement with a stationary discharge rail 84 which discharges the closed can from the closing or seaming unit and directs it to any suitable place of deposit for shipment and storage.

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 steps of the process described and their order of accomplishment without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the process hereinbefore described being merely a preferred embodiment thereof.

I claim:

1. The method of packing fluid substances in cans adapted to be rotated while being closed, comprising filling the can with its fluid contents, exposing the filled open can to a chilling temperature to congeal the exposed surface of the can contents and thereby hold the contents against surging under centrifugal force, and sealing a cover onto the filled can while rapidly rotating the can with its fluid contents so held.

2. The method of packing fluid substances in cans adapted to be rotated while being closed, comprising filling the can with its fluid contents, freezing the contents of the filed open can to congeal the exposed surface thereof and thereby hold the can contents against surging under centrifugal force, and sealing a cover onto the filled can while rapidly rotating the can with its fluid contents so held.

3. The method of packing fluid substances in cans adapted to be rotated while being closed, comprising filling the can with its fluid contents, passing the filled open can through a zone of freezing temperature to congeal the exposed surface of the can contents and thereby hold the contents immovable against surging under centrifugal force, vacuumizing the head space of the filled open can to exhaust air therefrom and replacing the exhausted air with gas, and sealing a cover onto the can so treated while rapidly rotating the can and cover with the congealed can contents so held against surging movement relative to the can.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
698,701	Guenther	Apr. 29, 1902
1,434,397	Mock	Nov. 7, 1922
1,888,133	Kronquest	Nov. 15, 1932
2,031,853	Potts	Feb. 25, 1936
2,283,181	Cabot	May 19, 1942
2,362,799	Boyd et al.	Nov. 14, 1944