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VACUUM AND PACKER TREATMENT OF COFFEE

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2 Sheets-Sheet 1

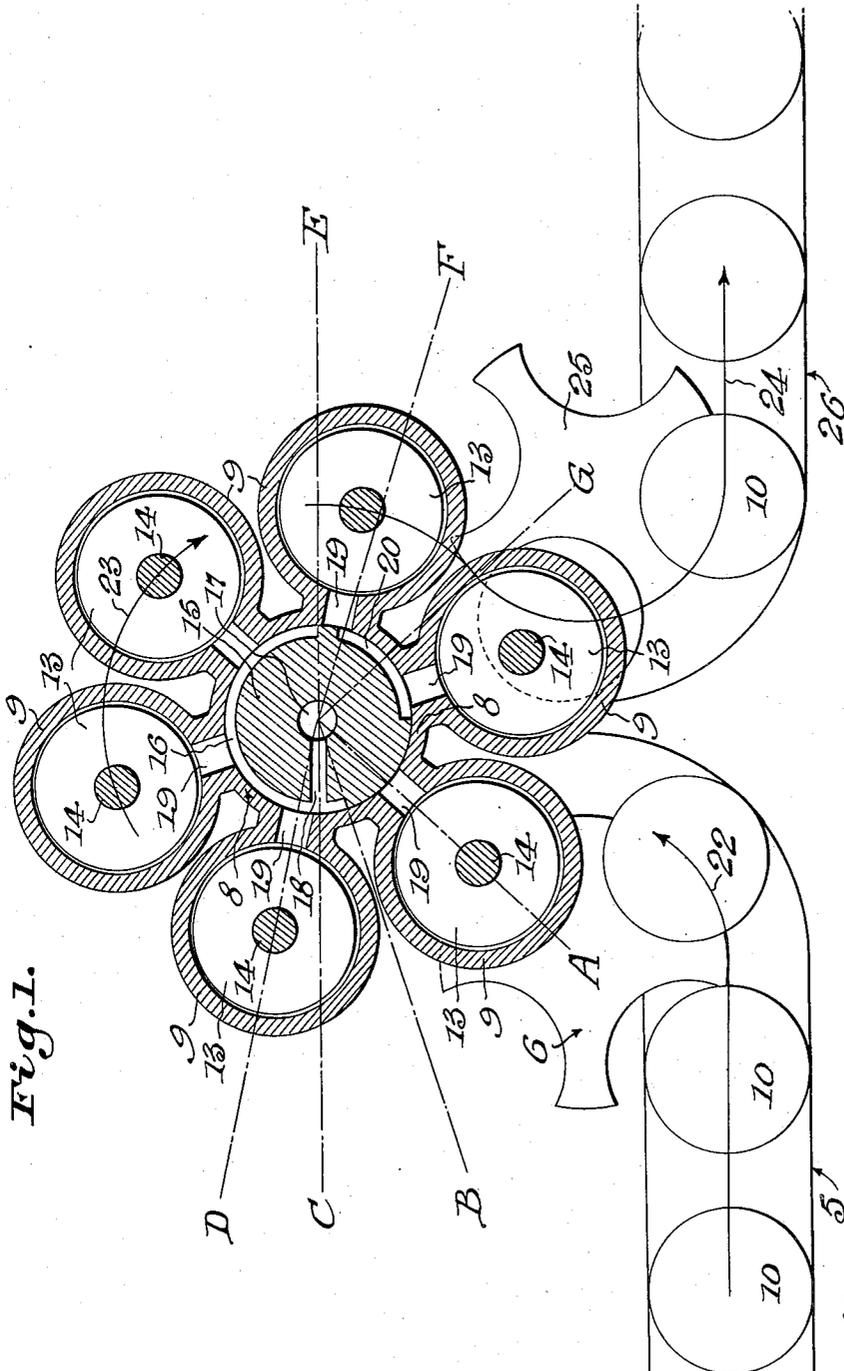


Fig. 1.

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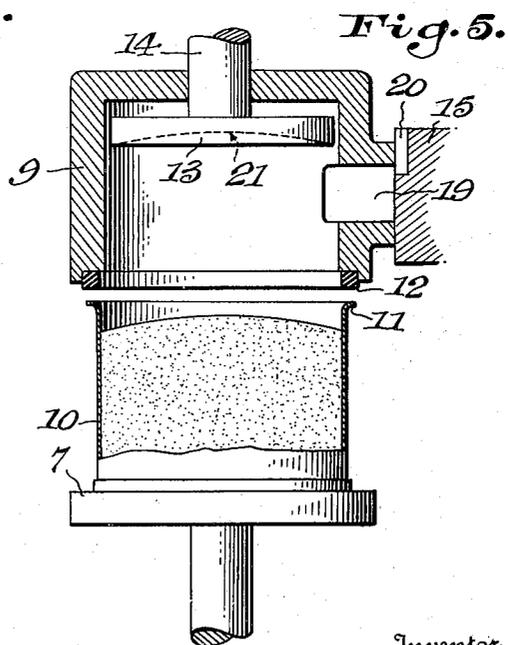
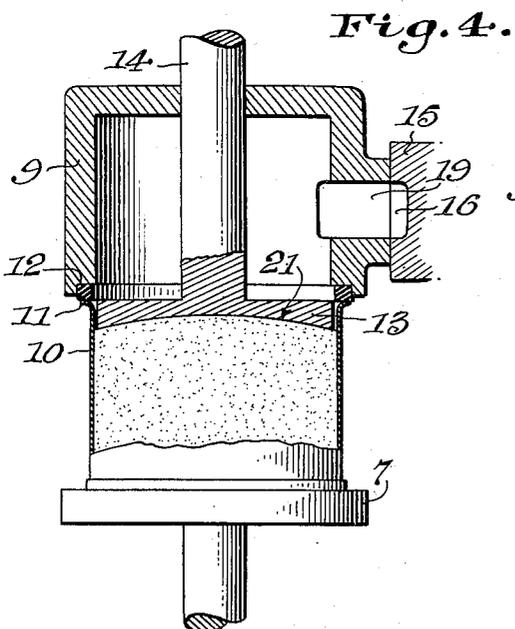
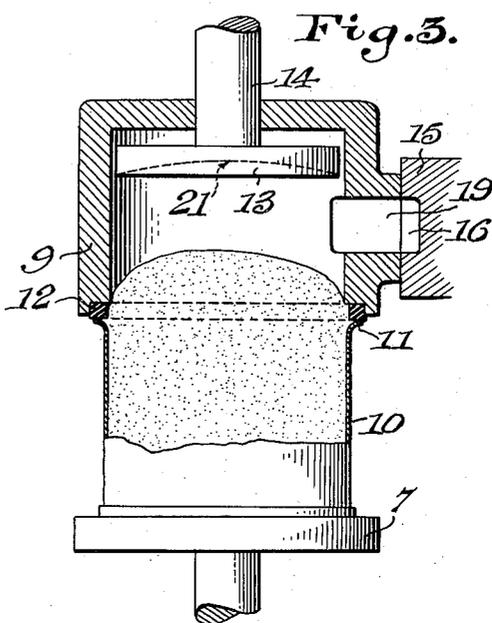
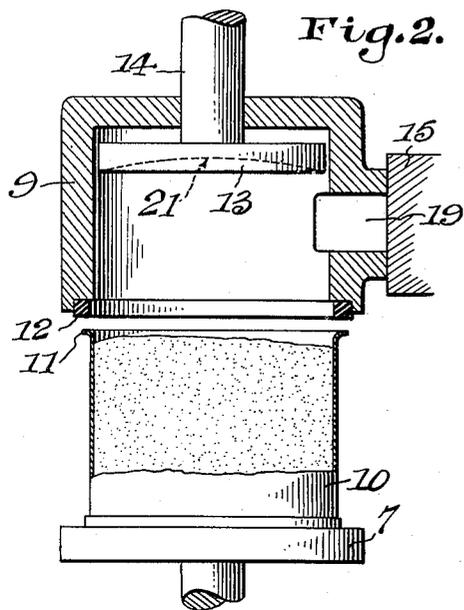
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VACUUM AND PACKER TREATMENT OF COFFEE

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2 Claims. (Cl. 99—152)

The invention relates to certain new and useful improvements in methods of vacuum-packing products of a powdery nature.

In the packaging of products of a powdery nature, of which ground coffee constitutes an example, considerable difficulty has been experienced in attempting to draw a vacuum in the containers prior to the sealing thereof because in rapidly drawing the vacuum, air entrapped in the powdered contents of the containers rapidly expands and rushes out of the containers, and some of the powdery substance becomes entrained in said air and is carried out into the space surrounding the containers, resulting in loss of said substance and the dusting and clogging of mechanisms or parts contained in said space. Very often the containers being vacuumized have covers loosely applied thereon and which are subsequently secured in place while in the vacuum chamber. It will be obvious that in such cases, any powdered material which lodges between the covers and the containers during the drawing of the vacuum will seriously hamper the efficient sealing of the containers. The present invention has for its object the remedying of these objectionable conditions.

An object of the invention is to provide a novel method of vacuum-packing powdery material which includes the steps of temporarily sealing the containers and subjecting the material therein to air removing vacuum and pressure treatment prior to permanent sealing of the containers.

Another object of the invention is to provide a method of the character stated in which the vacuum and pressure treatments of the material occur simultaneously.

Another object of the invention is to provide a method of the character stated in which the pressure treatment of the material begins prior to termination of the vacuum treatment and terminates after termination of said vacuum treatment.

With the above and other objects in view that will hereinafter appear, the nature of the invention will be more clearly understood by following the detailed description, the appended claims, and the several views illustrated in the accompanying drawings.

In the drawings:

Figure 1 is a diagrammatic plan view and part horizontal section illustrating the invention.

Figure 2 is a diagrammatic vertical cross section taken through one of the vacuum chambers, the container supporting pad being illustrated in

its lowered, normal position, the vacuum port being closed and the packer head in its normal elevated position.

Figure 3 is a view similar to Figure 2 illustrating the initial stage of the vacuum drawing step.

Figure 4 is a view similar to Figure 2 illustrating the intermediate stage of the vacuum drawing step, the plunger being illustrated in its lowered, mass pressing position.

Figure 5 is a view similar to Figure 2 illustrating the position of the parts following the conclusion of the mass vacuumizing and pressing steps, the container and pad being lowered to its normal position, the packer head raised to its normal position, and the vacuumizing chamber being opened to atmospheric air.

In the example of embodiment of the invention herein disclosed, I have diagrammatically illustrated an apparatus for performing the method and which includes a conveyor feed line 5 for feeding conveyors filled with coffee or similar powdery material from any suitable filling machine not shown. From the in-feeding conveyor 5 the filled containers are transferred, one by one, by a transfer wheel 6 onto individual receiving pads 7 equidistantly spaced about the periphery of a rotatable turret.

The turret includes a head or rotor 8 having a plurality of individual hollow bells or vacuumizing chambers 9, one of which is disposed in vertical alignment with each of the pads 7. Each of the pads 7 is carried by a plunger structure and, in addition to rotating with the head 8, is lifted at suitable intervals to move a container thereon into position for causing its flanged mouth portion 11 to engage in container and vacuumizing chamber sealing contact with a gasket 12 carried by the lower edge of the vertically aligned bell 9.

Within each bell 9 is mounted a packer head 13 supported on the lower end of a plunger 14 vertically reciprocable through an aperture in the ceiling portion of the bell. The plungers 14 and the plungers which support the pads 7 may be actuated by any suitable cam and roller equipments well known in the art and not disclosed herein.

The rotor head 8 is rotatable about a stationary valve member 15, the peripheral surface of which is equipped with a cutout or a valve duct 16 extending about slightly more than one hundred and eighty degrees of the periphery of the member 15 in the manner illustrated in Figs. 1 and 3 of the drawings. The member 15 in-

cludes a center duct 17 which may be connected with any suitable source of negative pressure and is connected by a radial duct 18 with the peripheral valve duct 16.

The vacuumizing chamber within each bell 9 communicates through a radial port 19 with the interior of the head 8 which opposes the peripheral valve duct 16 so that as the head 8 is rotated about the valve member 15 the vacuumizing chambers of the respective bells will be caused to serially communicate with the source of negative pressure through the respective port 19 and the valve duct equipments 16, 18, 17. Another duct 20 shorter than the duct 16 is formed in the periphery of the valve member 15 and extends through the top surface of said member so that each time one of the bell ports 19 registers with it, atmospheric air communication will be afforded between the external atmosphere and the interior of the particular bell 9 in the manner illustrated in Fig. 5.

The lower or pressing face of each packer head 13 preferably is cupped as at 21 in the manner best illustrated in Figs. 2 and 4 of the drawings.

In performing the improved method by use of the apparatus herein diagrammatically illustrated, the containers are forwarded to the rotating turret in the manner illustrated by the arrow 22, around with the turret in the manner illustrated by the arrow 23, and from the turret in the manner illustrated by the arrow 24. The treated containers are transferred from the turret by a transfer wheel 25 and are delivered one by one onto a feed-off conveyor diagrammatically indicated at 26 and which preferably delivers them to any suitable vacuumizing and closing machine (not shown).

In the diagrammatic illustration in Fig. 1 of the drawings, positions at which various phases of the method are accomplished are indicated by lines or stations A, B, C, D, E, F and G. It will be observed by reference to Fig. 1 that the peripheral duct 16 extends about slightly more than one hundred and eighty degrees of the circumference of the valve member 15, starting at station B and ending at station E. The atmospheric air communicating duct 20 is considerably shorter and this duct starts just beyond the end of the duct 16 and extends slightly less than ninety degrees about the circumference of the valve member 15.

In carrying out the method, the containers are serially delivered onto the pads at station A, at which time the parts are positioned as illustrated in Fig. 2 of the drawings, that is, with the pad 7 lowered, the flanged mouth of the container out of contact with the bell gasket 12, the packer head 13 at its elevated position and the bell port 19 out of communication with the vacuumizing duct 16. At station B the pad 7 has been lifted to seal the container mouth 11 against the gasket 12, thus sealing the container and the bell against external atmosphere. The packer head 13 remains in its elevated position and the bell port 19 is about to open communication with the source of negative pressure through the peripheral port 16.

At station C the parts remain in the position which they occupied at station B but it will be observed that the bell port 19 is now in communication with the source of negative pressure through the vacuumizing duct 16 and a vacuum is being drawn in the interior of the bell and the container 10. This condition of the parts, illustrated in Fig. 3 of the drawings, represents

the initiation of the vacuumizing step, and by thus subjecting the interior of the container to a vacuum, air contained in the mass of coffee or other powdery material in the container will be drawn out. At this stage of the rotation of the head 8 the packer head 13 is about to start downwardly to engage and mechanically press the mass of coffee or powdery material in the container 10.

In Fig. 4 of the drawings the mass pressing function of the plunger is illustrated, it being understood that when the plunger is in engagement with the mass the mass is being simultaneously vacuumized and mechanically pressed for the purpose of eliminating air in the mass. The position of the parts illustrated in Fig. 4 of the drawings pertains through the portion of movement of the turret or head 8 from station D to station E. At station F the packer head 13 starts to rise and relieve the powdery mass of the previously applied pressure and the container supporting pad 7 starts downwardly toward the normal position illustrated in Fig. 2. At this time communication is opened to atmosphere through the respective port 19 and the duct 20.

At station G, just before the treated container is transferred onto the feed-off conveyor, the parts are positioned as illustrated in Fig. 5 of the drawings with the container supporting pad 7 in its normal lowered position, the packer head 13 in its elevated position and with the port and duct equipment 19, 20 still in communication.

It will be observed by reference to Fig. 3 of the drawings and the station by station description just concluded that the drawing of a vacuum in the respective bell 9 and container 10 is initiated before mechanical pressure is applied by the respective presser head 13 and that this mechanically applied pressure is not relieved until the drawing of said vacuum has been terminated. In other words, the vacuum and pressure treatments of the mass of material occur simultaneously but the pressure treatment of said material begins prior to termination of the vacuum treatment and terminates after termination of said vacuum treatment.

By practicing the herein described method, the coffee or other powdery material in the containers is subjected to a low vacuum and pressure treatment which substantially eliminates all air in the mass prior to delivery of the containers into the machine in which they are finally vacuumized and closed, and by this means the drawing off of powdery substance from the containers within the machine in which they are finally vacuumized and closed is substantially eliminated.

It is to be understood that the apparatus herein diagrammatically illustrated is but one example of mechanism that can be employed in practicing the herein disclosed method and that various other forms of apparatus may be employed in practicing the method.

I claim:

1. The method of excluding air from containers filled with ground coffee prior to permanently sealing them in vacuo for marketing, which comprises temporarily sealing said containers, steadily drawing a low vacuum in said sealed containers, mechanically pressing and maintaining pressure on the ground coffee in said containers for a considerable interval of time while drawing the steady low vacuum therein, discontinuing the drawing of the vac-

uum while maintaining the pressure application, and subsequently discontinuing the application of pressure.

2. The method of excluding air from containers filled with ground coffee prior to permanently sealing them in vacuo for marketing, which comprises temporarily sealing said containers, steadily drawing a low vacuum in said sealed containers, and mechanically pressing and

maintaining pressure on the ground coffee in said containers for a considerable interval of time while drawing the vacuum therein, said pressure application being commenced after the drawing of the vacuum has been initiated maintained continuously throughout said considerable interval of time and then terminated after said vacuum drawing has been discontinued.

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