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METHOD OF PACKAGING GRANULAR MATERIALS

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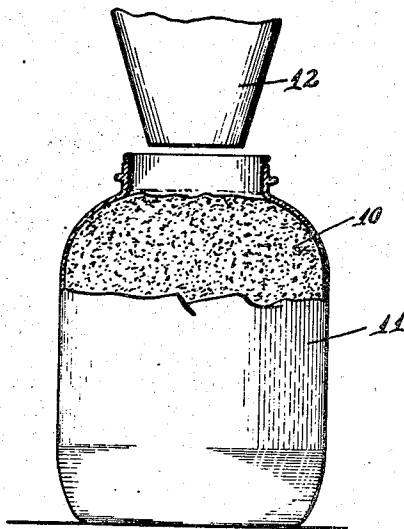


Fig. 1.

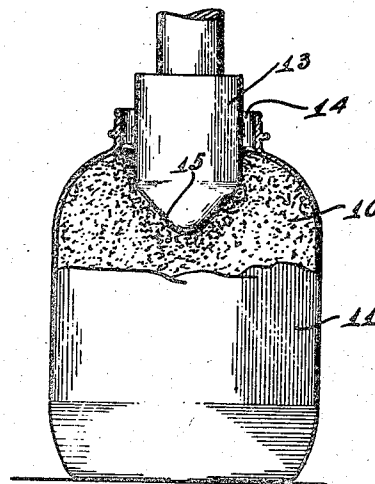


Fig. 2.

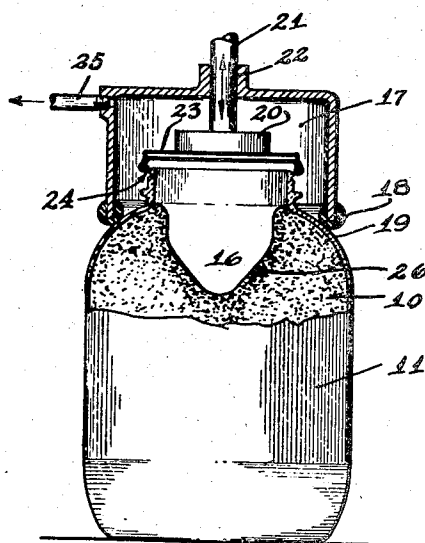


Fig. 3.

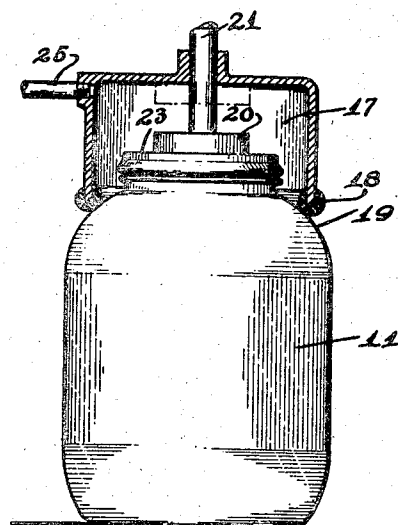


Fig. 4.

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METHOD OF PACKAGING GRANULAR MATERIALS

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6 Claims. (Cl. 226—82)

1 Our invention relates to a method of packaging granular or powdered material by placing the material in containers, then vacuumizing the containers with the material therein, and sealing the containers under the partial vacuum. The invention is herein described and illustrated as used in packing ground coffee in jars which are then vacuumized and sealed. It is to be understood, however, that the invention is not limited to this particular use, but is adapted for packaging other materials.

In packing coffee in jars, it is customary to introduce a measured quantity of the powdered or granulated material into the jar, enclose the upper end of the jar in a vacuum chamber, with a closure device or cap loosely positioned over the mouth of the jar, and then vacuumize said chamber, thereby withdrawing air from the jar. This operation causes considerable disturbance within the comminuted material, particularly the upper layers thereof, causing some of the material to be withdrawn from the jar. This results in loss of material and clogging of the vacuum lines.

An object of our invention is to provide a simple and practical method of overcoming this objection.

Other objects of the invention will appear hereinafter.

Referring to the accompanying drawings:

Fig. 1 is a part-sectional elevation of a jar and a filling spout thereover, a portion of the jar being broken away to show the material therein.

Fig. 2 is a similar view in which a plunger has replaced the filling spout.

Fig. 3 is a similar view in which the plunger has been removed and replaced by a vacuum chamber, chuck, and jar cap.

Fig. 4 is a view showing the cap moved down to sealing position on the jar.

In packaging ground coffee or other granulated, powdered or comminuted material in accordance with the present invention, a measured quantity of the material 10 is introduced into a container 11 through a spout 12. The container is herein shown as a glass jar. Following the introduction of the material into the jar, the latter is brought beneath a plunger 13 which is then moved downward through the open mouth 14 of the jar, into contact with the granular material. The plunger is preferably formed with a convex or tapered end or tip 15 which as shown is conical in form with the lower end rounded.

When the plunger is lowered, the granular material 10 is molded thereby to a certain extent, particularly the upper layers or portions imme-

2 diately adjacent to the plunger, so that when the plunger is withdrawn, a corresponding depression 16 (Fig. 3) is left in the material. The pressure applied by the plunger packs the material together sufficiently to cause it to retain this form when the plunger is withdrawn.

The next step in the process consists in enclosing the upper end of the jar in a vacuum chamber 17 (Fig. 3). The latter is substantially in the form of a circular drum open at its lower side and of a size to fit over the jar. An annular gasket 18 of rubber or the like, attached to the lower rim of the drum, seats on the shoulder 19 of the jar to make a seal. Within the drum is a magnetic chuck 20 on the lower end of a stem 21 which extends through an opening 22 in the drum and has a close sliding fit therein. A closure device or cap 23 carried by the chuck is held over the mouth of the jar and a slight distance 20 thereabove, thus providing an annular space 24 through which air is withdrawn from the jar.

When the parts are in the position shown in Fig. 3, air is withdrawn from the chamber 17 through a suction pipe 25, thereby vacuumizing the jar and its contents. We have discovered that by making a depression 16 in the mass of comminuted material, the usual disturbance of the material, produced by the vacuumizing process is substantially prevented so that little or none of the contents is drawn from the jar. The compacting of the surface layers 26 of the material by the pressure applied thereto by the plunger, materially assists in stabilizing the material and preventing the small particles from being lifted and drawn off into the vacuum chamber.

After the jar and its contents have been vacuumized, the plunger rod 21 is moved downward so that the chuck 20 forces the cap downward into position on the jar, so that the rubber gasket or liner in the cap forms a hermetic seal between the jar and cap.

Modifications may be resorted to within the spirit and scope of our invention.

We claim:

1. The method which consists in placing a measured quantity of granular material in a container having a filling opening, slightly compressing the material by a pressure applied at and distributed over the major portion of the top surface of the mass of material and simultaneously producing a depression in the top surface of the mass, supporting a closure in spaced relationship to and above the filling opening, exhausting the air from the container through the

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space between the closure and container, and sealing the closure upon the container.

2. The method which comprises introducing a measured quantity of granular material into an open-mouthed container, compacting a top surface layer of the material directly beneath the mouth of the container to a greater density than the subjacent body of material by surface pressure applied to the material and distributed over said surface, applying suction through the mouth of the container and thereby partially vacuumizing the container and its contents, and then sealing the vacuumized container.

3. The method which comprises introducing a measured quantity of granular material into an upright, open-mouthed container, applying downward pressure to substantially the entire upper surface of the mass of said material and thereby molding a depression in said surface and compacting a surface layer of the material to a greater density than that of the body of material beneath said layer, thereafter applying suction through the mouth of the container and producing a partial vacuum therein, and sealing the vacuumized container.

4. The method which comprises introducing a measured quantity of granular material in an upright, open-mouthed container, applying downward pressure to approximately the entire upper surface of the mass of said material and thereby molding a depression in said surface and compacting and stabilizing a surface layer of the material while the body of material beneath said layer remains comparatively loose and open, supporting a closure cap over the mouth of the container and in close proximity thereto, applying suction to the interior of the container through a restricted passageway between the closure cap and container, and thereafter moving the cap to sealing position on the container.

5. The method which comprises introducing a measured quantity of granular or comminuted

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material into an upright, open-mouthed jar and approximately filling the jar, moving a shaping and compressing element having a convex shaping surface approximately the same dimensions laterally as the mouth of the jar, downward through the open mouth of the jar and causing it to compress a surface layer of the material to a greater density than the body of material therebeneath and thereby form a concave surface layer of comparatively compact and stable material overlying a body of the material in a comparatively loose, open condition, withdrawing said element, positioning a closure cap over and spaced from the mouth of the jar, exhausting air from the jar through the space between the cap and the mouth of the jar, and moving the cap to sealing position on the jar.

6. The method which comprises substantially filling an open-mouthed container with a compressible granular material, compacting the top surface layer of the material by downward pressure through the mouth of the container of a molding element having a convex molding surface and thereby simultaneously molding the said top surface to a concave shape, applying suction through the mouth of the container while a closure cap is in non-sealing position thereover, and thereafter moving the closure cap to sealing position on the container before the suction is discontinued.

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

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