United States Patent

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[54] **MECHANISM FOR THE METERED DISPENSING OF PASTY SUBSTANCES**

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[30] **Foreign Application Priority Data**

Jan. 8, 1969 Germany.....P 19 00 720.6

[52] **U.S. Cl.** **222/132,** 222/144, 222/387, 222/494

[51] **Int. Cl.** **B67d 5/64**

[58] **Field of Search**.....222/132, 135, 144, 253, 490, 222/335, 387, 494, 495, 181, 386, 327, 123, 146 C, 146 R, 51, 142.2–142.3; 312/36, 236

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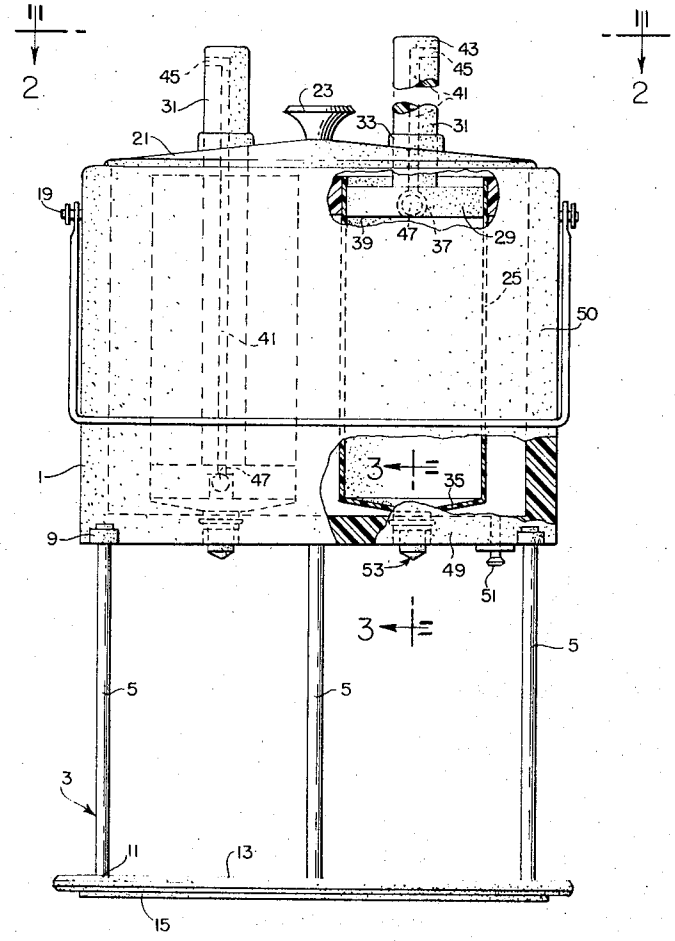
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[57] **ABSTRACT**

A mechanism for dispensing a fluid or pasty mass substance, including a piston device slidably mounted within a container which holds the substance. The container has a dispensing valve which is self-closing and which automatically opens when sufficient pressure is exerted upon the substance. The valve has an elastic conical element having a razor-like incision near the apex of the cone. When sufficient pressure is exerted on the substance, the incision opens to form a narrow slit through which the substance is dispensed.

1 Claim, 6 Drawing Figures



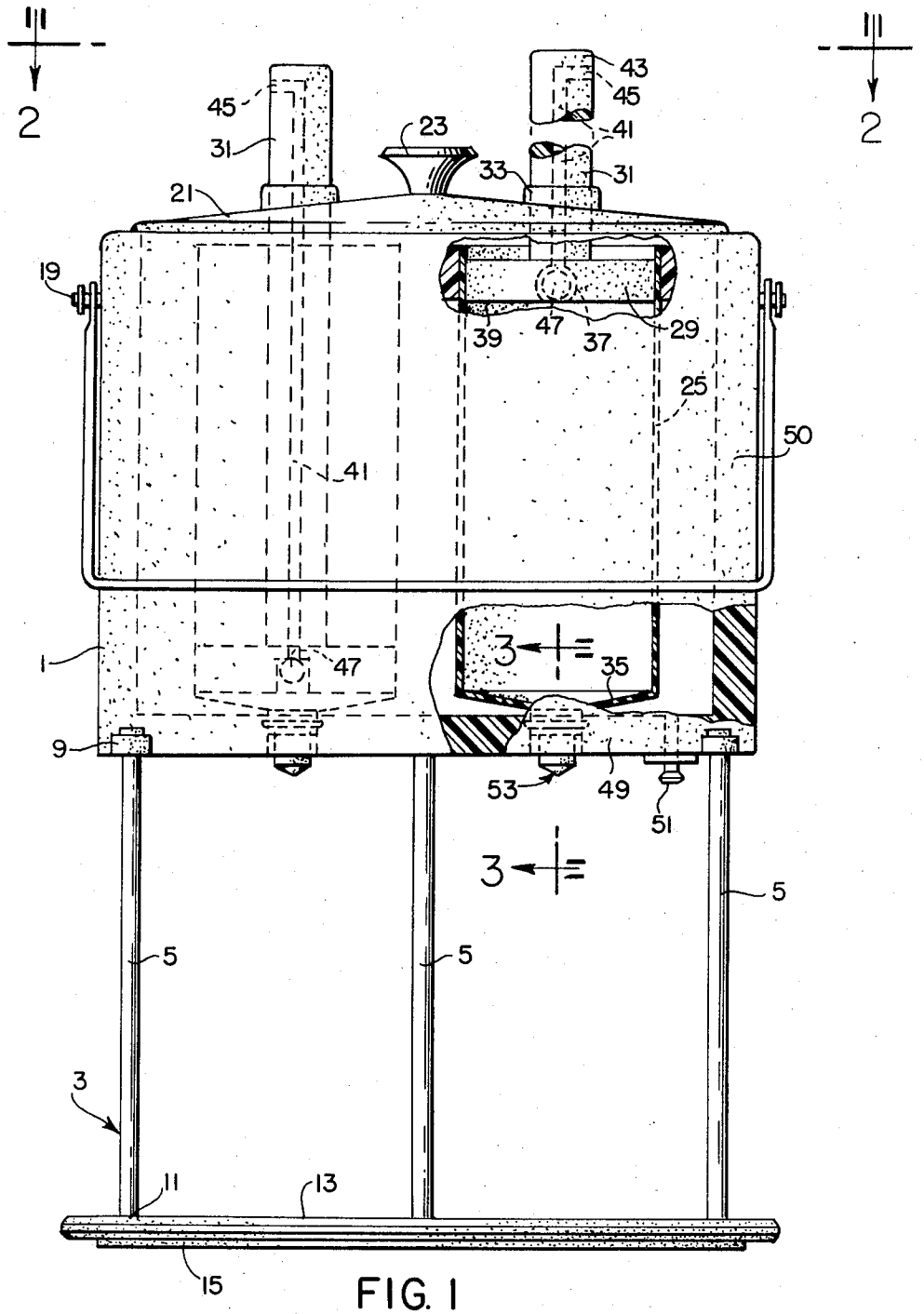


FIG. 1

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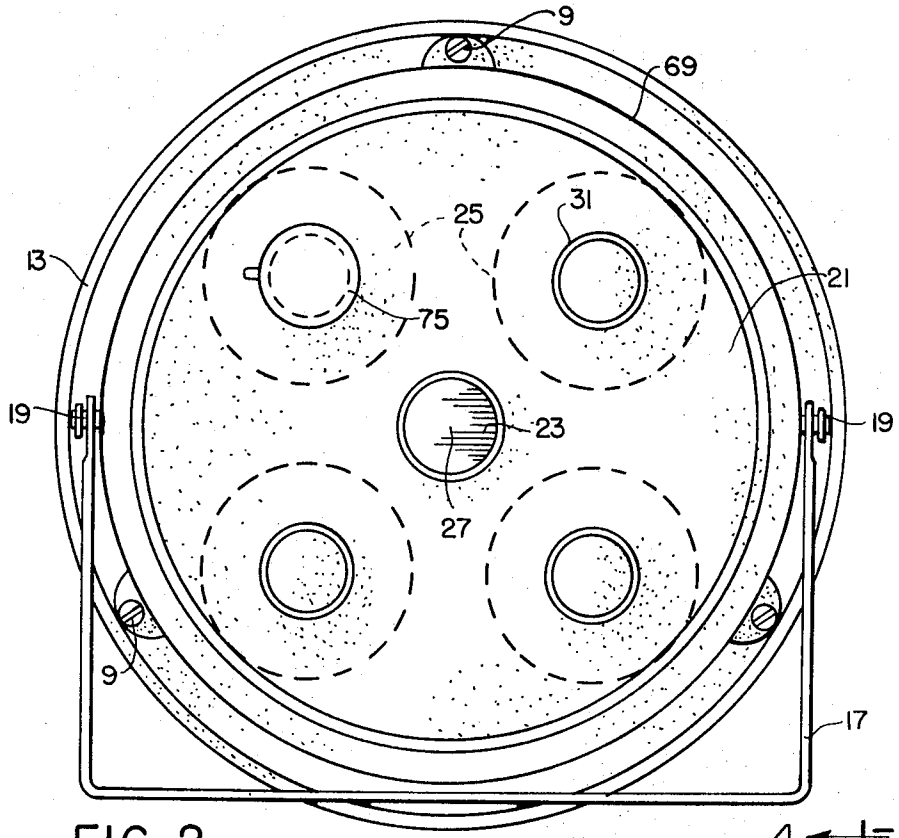


FIG. 2

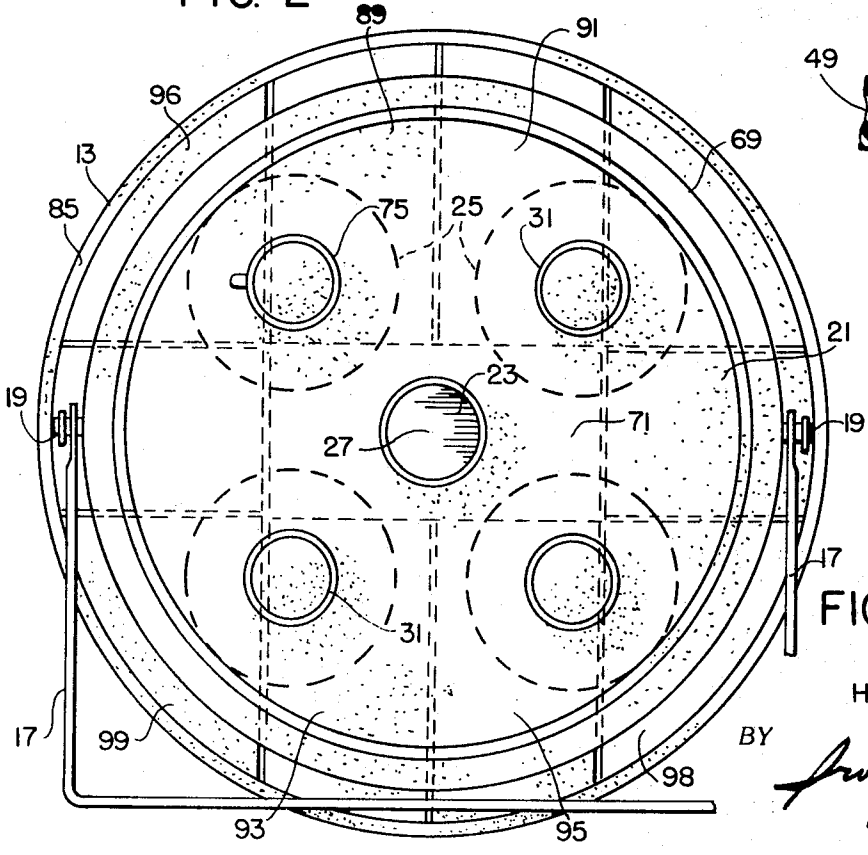


FIG. 6

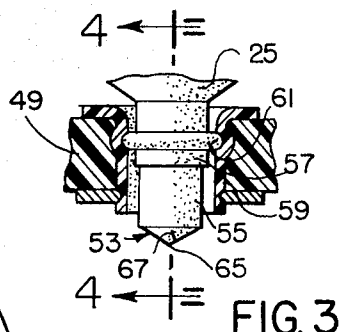


FIG. 3

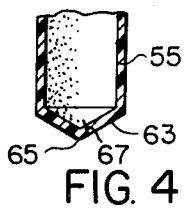


FIG. 4

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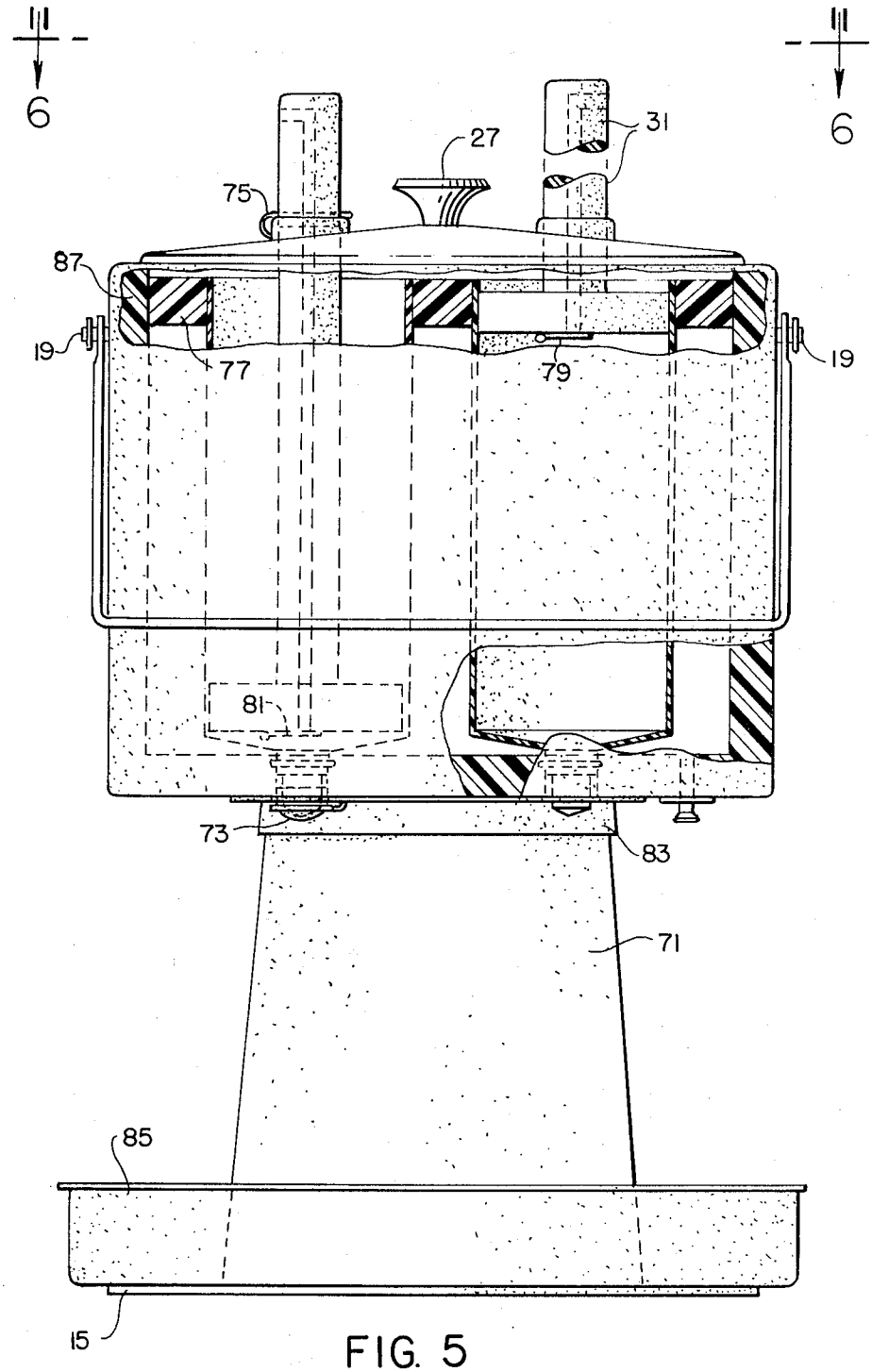


FIG. 5

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MECHANISM FOR THE METERED DISPENSING OF PASTY SUBSTANCES

The invention relates to a mechanism for dispensing a substance which is a fluid or a pasty mass. In particular, the invention relates to a mechanism for the dispensing of pasty masses, especially pasty food, from a container in which the pasty masses are kept and from which they can be dispensed under pressure through a dispensing valve.

There are many different kinds of substances which may be stored in containers and which, when they are needed, may be withdrawn from the container in small portions or doses. In the case of industrial products, such substances may, for example, be lubricants. In the food industry, such substances may include fats, mayonnaise, dressings, fish pastes, mustard, and many other foodstuffs.

The known devices for the immediate dispensing of pasty masses are generally equipped with complicated dispensing mechanisms which normally make the purchase of these devices prohibitive for the individual consumer. However, there is a need for this type of mechanism especially for large families.

SUMMARY

The present invention provides a mechanism for dispensing a substance which is a fluid or a pasty mass. The mechanism includes a container for holding the substance to be dispensed. A dispensing piston device is slidably mounted within the container, and a dispensing valve is connected to the container. The dispensing valve is capable of self-closing and is capable of automatically opening when sufficient pressure is exerted upon the substance to be dispensed. The dispensing valve includes an elastic conical element having a razor-like incision therein near the apex of the elastic conical element. When sufficient pressure is exerted on the substance to be dispensed the incision in the elastic conical element will open to form a narrow slit through which the substance may pass.

It is the purpose of the invention to create a mechanism for the dispensing of pasty masses which is of a simple design and still satisfies all demands.

According to the invention, this objective is achieved by the fact that a sliding dispensing piston is located in a container which is mounted in a carrying frame, and that the dispensing valve, which is self-closing, opens when a certain pressure is exerted on the mass.

By mounting the container, which contains the pasty masses and which is part of the device, on a carrying frame, it is possible to dispense these pasty masses at the bottom of the container when the dispensing piston acts upon the mass in the container. The self-closing dispensing valve, which opens only when the pressure is exerted, can be of a very simple design and is, in addition, not likely to require repairs.

According to one embodiment of the invention, an upright cylinder serves as the container. The dispensing piston of this cylinder is equipped with a push rod which moves in the axial direction and which protrudes outward through the cylinder cover. Thus, the pressure exerted onto the pasty mass in the interior of the container acts vertically and directly in the direction of the dispensing valve. Furthermore, the vertical pressure application is advantageous since the pressure direction from above is most convenient for the hand of the operator. Another advantage is the fact that the push rod, which protrudes from the device, also constitutes a level indicator.

The dispensing valve may consist of a cone-shaped part made of an elastic synthetic material. At its cover, the part is furnished with a razor cut. Due to the tendency of the elastic synthetic material to return to its original shape, this dispensing valve closes automatically and never leaves a slot which is big enough to permit dripping of the pasty masses. For the opening of the slot, a certain pressure build-up is necessary which causes the pasty mass to be forced into the razor cut, thus opening the latter slightly.

It is especially advantageous when the lower zone of the ejection valve is cone-shaped and the razor cut extends in a tangential direction lateral to the tip of the cone. In this way, the pasty mass which is forced into the dispensing valve acts with force components which are directed laterally toward the outside at an acute angle to the pressure component. This facilitates the opening of the razor cut considerably.

In the case of pasty foods, it is important that they are cooled in the container so that they are protected against spoiling. With the mechanism or device according to the invention, this can be accomplished easily by arranging the container inside a second outer container, the walls of which consist of a heat insulating material. The push rod and the dispensing valve extend through the outer container. This outer container with its heat insulating wall is suitable to keep a pasty mass cool for a prolonged period of time. The hollow space between inner container and outer container may be filled with a cooling agent, such as ice. It is also possible to use a liquid which is cooled by means of a special cooling unit. With the additional use of a coolant, easily spoiling food, e.g., fish pastes, can be kept at the proper temperatures.

The outer container cover is removable and serves at the same time as the cover for the inner container in which the pasty masses are kept. The push rods are guided through the cover of the outer container which, for thermotechnical reasons, consist of a heat insulating material, or is at least equipped with a heat insulating layer. The refilling of the device is facilitated by the construction of the outer container lid and the cover for the inner container in which the pasty masses are kept. The outer container is furnished with a release valve. Through this release valve, coolant or water can be drained after use of the device or in the case of refilling without interfering with the operation of the device.

The push rod is equipped with a bore or channel which leads into the valve chamber of a check valve which is closed in the direction of the pressure when the push rod is operated. The bore serves as a pressure equalization channel during the lifting of the dispensing piston by means of the push rod. When the push rod is lifted, a partial vacuum is created which would make the lifting of the piston very difficult. When, however, during the lifting of the piston, the check valve opens the lower hollow space of the container to the bore and, thus, to the atmosphere, the partial vacuum cannot develop and the piston can be raised easily.

The device can be used with only one container for the pasty masses. It is recommended, however, to install several individual containers in one outer container, for instance, four to six containers for different pasty masses, so that the unit can be used for all requirements.

When several containers with various pasty masses are arranged in one outer container, it is advantageous when the carrying frame can be rotated on a platform around the central point of the device. In that case, the device can be arranged at the center of a table and each person or guest can avail himself to any pasty mass of his liking by simply rotating the outer container.

To facilitate the transport, the device is furnished with a carrying handle which is preferably hinged so that it can be folded back.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 shows a partially sectioned side elevational view of a first embodiment of the invention.

FIG. 2 illustrates a top view of the embodiment illustrated in FIG. 1 taken along the line 2—2 shown in FIG. 1.

FIG. 3 illustrates the design of a valve insert taken along line 3—3 shown in FIG. 1.

FIG. 4 illustrates the design of the dispensing valve taken along the line 4—4 shown in FIG. 3.

FIG. 5 depicts a partially sectioned side elevational view of a second embodiment of the invention.

FIG. 6 illustrates a top view of the embodiment shown in FIG. 5 taken along the line 6—6 of FIG. 5.

DETAILED DESCRIPTION OF SOME PREFERRED EMBODIMENTS

According to a first embodiment of the invention, the mechanism for device illustrated in FIGS. 1, 2, 3 and 4 may include an outer container 1 which is arranged on a carrying frame 3. The outer container 1 is made of heat insulating material, the outside of which is coated with an impact-proof material. It is also possible to draw the outer container which has a pot-like shape from a metal, e.g., aluminum, and to coat the inside with a heat insulating material. A suitable coating mass is, for instance, a foaming synthetic material.

The carrying frame 3 consists of three or four columns 5 which are fastened to the outer container 1 at their top by means of screw connections 9 or by other suitable means, while the lower ends 11 rest on a base 13. The latter is arranged on a platform 15 against which it is supported by a ball race (not shown). In this way, the outer container 1 is kept at a distance from a base surface such as a table top (not shown) and can be rotated into any desired position.

In order to facilitate the transport of the device, a carrying handle 17 is located on the outer container 1. The mounting components 19 of carrying handle 17 on the outer container 1 are pivot bearings so that the carrying handle 17 can be folded back when it is not needed.

For the closing of the outer container 1, a cover 21 is provided which is furnished with a centrally located knob 23. The cover 21 is either made of a heat insulating material or it is furnished with a heat insulating coating which may be sprayed onto the interior surface or which is filled into a hollow space.

In the first illustrated embodiment, four containers 25 into which different pasty masses can be filled are arranged within the outer container 1. The containers 25 which contain these pasty masses are cylindrical and are distributed around a vertical central axis 27. The containers 25 are vertically installed in the outer container 1.

In order to obtain a good temperature transfer to the hollow space of the outer container, the containers 25 are made of a material with good temperature conduction, e.g., stainless steel. If good temperature transfer is undesirable, the containers may consist of synthetic material.

Located in each container 25 is a dispensing piston device having a push rod 31 and a piston 29. The latter can be moved vertically. For this purpose, it is fastened to a push rod 31 which protrudes from the device at the top through an opening 33 in cover 21. The length of the push rod 31 is such that the upper end of the push rod still protrudes from the device when the dispensing piston 29 is against the bottom 35 of container 25.

Located in the dispensing piston 29 is a hollow space 37 which is open toward the lower piston surface 39, thereby being connected with the cylinder space below the dispensing piston. Also located in push rod 31 is a central bore or channel 41 which extends almost to the upper end 43 of the push rod 31 and which leads to the outside via a transverse channel 45. Located within the hollow space 37 in piston 29 is a valve ball 47 which closes the bore 41 when the push rod 31 is being pushed down (FIG. 1, left container). The valve ball 47 opens bore 41 only when the pushing rod 41 is pulled upward (FIG. 1, right container).

When the push rod 31 is forced downward, the container is filled with a pasty mass. Normally, these pasty masses are sensitive to contact with air. When the valve ball 47 closes bore 41 during the downward motion of the push rod 31 and piston 29, no atmospheric air can enter the interior of the filled container 25. Thus, the pasty mass in the container 25 is absolutely closed off from the air from the outside and is secured against spoiling as much as possible.

The hollow space 50 between the outer container 1 and the individual containers 25 may be filled with ice. In this way, the mass within the containers can be cooled to a low temperature, thus preventing early spoiling. The disadvantage of the use of ice, however, is the fact that the latter must be frequently refilled. The refilling presents no major problems since a release or drain valve 51 for melt water is provided at the bottom 49 of the outer container, but cover 21 must be removed for the refilling and pieces of ice can be filled into space 50.

It is more advantageous during prolonged use of the device to fill the space 50 with a coolant which is kept at the desired low temperature by means of an external cooling unit (not shown).

Located at the bottom 35 of container 25 is the dispensing valve 53 shown in FIG. 3. This dispensing valve 53 consists of a thimble-like, cap-shaped, molded synthetic part 55 which is furnished with a sealing flange 57 at its open edge. The sealing flange 57 is inserted in a sleeve 59 at the bottom 49 of the outer container 1. A convex indentation 61 in sleeve 59 guarantees firm seating of the thimble-like synthetic part 55.

With reference to FIG. 4, the cover zone 63 of the synthetic thimbleelike part 55 is cone-shaped. Located beside the cone tip or apex 65 is a tangentially extending razor cut or incision 67 which is closed when piston 29 does not exert pressure onto the mass in container 25. As soon as piston 29 exerts pressure onto the mass within the container 25, the pressure in the cap-shaped part 55 of the dispensing valve 53 increases and the razor cut opens to form a slot through which the pasty mass can flow out of container 25. A plate, container or other vessel or other food which is arranged below the dispensing valve 53 can then be used to catch the outflowing pasty mass. As soon as the pressure at the upper end 43 of the push rod 31 stops, the slot 67 which is formed by the razor cut closes and the pasty mass is again enclosed in container 25 and protected against germs or similar adverse effects.

If the pasty mass or substance in container 25 is an easily spoiling food, it is again securely protected against germs for a prolonged period of time. This is especially the case when it is additionally cooled from the outside, i.e., from space 50.

FIGS. 1 and 2 illustrate that four individual containers 25 are distributed around the central axis 27. Protruding from the cover 21 of the outer container 1 are the push rods 31 with the aid of which the dispensing pistons 29 can be pushed into the cylinders 25. Carrying handle 17 lies flat against the outer wall 69 of the outer container so that it is not in the way during the operation of the device. The fasteners 9 for the support rods 5 are shown as screws. There is also a centrally located knob 23 for the removal of cover 21 from the top.

FIG. 5 and 6 illustrate a second embodiment of the invention. Many of the elements shown in FIGS. 1, 2, 3, and 4 may be identical or similar to those corresponding elements shown in FIGS. 5 and 6. Accordingly, the same reference numerals apply to identical elements throughout all of the drawings.

The second embodiment may include a pedestal 71 which is rigidly affixed and mounted upon a compartmentalized tray 85. If desired, the tray 85 and the entire mechanism mounted thereupon may be mounted on a rotary platform 15 for facilitating access to the various portions of the mechanism by any intended user.

The tray 85 may include catch or spill basins 89, 91, 93 and 95 for catching any possible spillage and for holding the various pasty substances for very short periods of time during, for example, a meal. The tray 85 may also include compartments 96, 97, 98, 99 which may be used, for example, for holding salt and pepper shakers and the like.

The bottom of the outer container 1 may be provided with a special retainer flange 83 which is shaped to fit tightly over the top of the pedestal 71, but yet permit the easy removal of the entire outer container 1 with its associated elements from the pedestal 71. This mentioned removal may be desired when the container 1 is to be used for purposes other than delivering or dispensing fluids or pasty substances, or when the platform 15, tray 85 and pedestal 71 are to be used for other purposes.

The outer container 1 may be provided with an insulating internal cover 77 which is fitted around the individual containers 25 and between the thermal insulating material 87 provided in the walls of the outer container 1. The insulating internal cover 77 minimizes or completely eliminates temperature exchange when the cover member 21 is removed, for example, to replenish the supply of the various substances in the containers 25.

The embodiment of the invention depicted in FIGS. 5 and 6 has exceptional versatility, for example, when it is desired to use the outer container 1 for other purposes when the inner containers 25 with their associated dispensing piston devices are removed. In particular, there are provided plugs 75 to close the openings in the cover member 21 when the dispensing piston devices have been removed from the outer container 1. In addition, at the bottom of the outer container 1, there are provided plugs 73 for placement in the openings at the bottom of outer container 1 prior to removal of the inner containers 25 and their associated dispensing piston devices. These plugs 73 minimize temperature exchange, loss of coolant, and loss of any other spillage.

It can thus be readily seen that the outer container 1 may be used very satisfactorily and independently for purposes other than dispensing pasty substances when the inner containers 25 have been removed and the plugs 73 and 75 are employed.

It should be noted that the embodiment illustrated in FIG. 5 employs a different type of valve, such as flap valve 79, as compared to the check valve arrangement including valve space 37 and valve ball 47 which are shown in the FIG. 1 embodiment. With reference to the embodiment illustrated in FIGS. 5 and 6, on the downstroke of the push rod 31, the pressure beneath the dispensing piston device pushes the flap valve 79 against the bottom opening of the air channel 41 to seal the channel in an airtight condition. On the upstroke of the dispensing piston device, the flap valve 79 is pulled or pushed away from the bottom of the opening of the air channel 41 due to the difference in the atmospheric pressure and the partial vacuum tending to form within the container 25. This opening of the flap valve 79 permits air to enter the container 25 through the air channel 41.

I claim:

1. A mechanism for dispensing a substance which is a fluid or a pasty mass, comprising, in combination:

a container for holding said substance to be dispensed;

a dispensing piston device slidably mounted within said container;

a dispensing valve connected to said container;

said dispensing valve being capable of self-closing and being capable of automatically opening when sufficient pressure is exerted upon said substance to be dispensed;

said dispensing valve including an elastic conical element having a razor-like incision therein near the apex of said elastic conical element;

and when sufficient pressure is exerted on said substance to be dispensed, said incision in said elastic conical element will open to form a narrow slit through which said substance may pass;

a plurality of said containers each of which is capable of holding a supply of a substance to be dispensed;

each of said plurality of containers having an associated dispensing piston device slidably mounted in its associated container;

at least one of said plurality of containers having said dispensing valve connected thereto;

an outer container within which said plurality of containers is disposed;

a rotary platform, a tray mounted upon said rotary platform, said tray being divided into compartments for salt and pepper shakers and the like and for basins to catch the spillage from said plurality of containers which are capable of holding a substance to be dispensed, a pedestal structure rigidly affixed to said tray, means for removably mounting said outer container upon said pedestal, a cover member which simultaneously serves as a cover for said outer container and for said plurality of containers which hold substances to be dispensed, each said dispensing piston device including an air channel connecting the space within said first-mentioned container with the atmosphere, each said dispensing piston device including a flap valve which seals said air canal airtight on the down stroke of said dispensing piston device and which opens to establish communication between the space within said first-mentioned container and the atmosphere upon the upstroke of said dispensing piston device, each said dispensing valve being provided with a plug to minimize spillage and temperature exchange when said first-mentioned container is not in use, said cover member being provided with a plug member for each of said plurality of containers to close the opening in said cover member after a dispensing piston device has been removed and its associated first-mentioned container is no longer in use, and an internal insulating cover disposed about said plurality of containers to minimize temperature exchange when said cover member is removed to replenish the varous substances in said plurality of said containers.

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