A peripheral wall with two spaced partitions extending inwardly therefrom, a cone-shaped floor with a central aperture and peripheral holes, and a lid with an arcuate opening and a downwardly extending skirt comprise a granule dispensing regulator positionable in a container neck. The partitions and wall therebetween define a well which is primed by upending and uprighting the container. Granules are dispensed when the container is next upended.
GRANULE DISPENSING REGULATOR

This invention pertains to dispensers generally, and more specifically to granule dispensers. In particular it relates to a dispensing regulator which regulates the dispensation of granules from a container.

Granule dispensers which dispense regulated or measured amounts of granules are well known in the art. Examples of conventional granule dispensers are taught by M. J. Klygis and W. F. Lodding in their U.S. Pat. No. 3,342,383 and by C. M. Day in his U.S. Pat. No. 1,957,326. Typically, the dispenser has a well in the neck of the container which accommodates the desired amount of granules that are to be dispensed. This well is filled by turning the container upside down and then right side up. The well is thus primed with granules which are then dispensed through an opening in the top of the container above the well when the container is next upended.

These dispensers dispense a measured amount of granules each time the container is tipped. However, if the measured amount is not quite enough to satisfy the user, he must either settle for less than what he wants or pour out another measure and settle for more than he wants. It is not always possible to choose an amount that would be satisfactory to all users. It would be preferable to be able to increase slightly the amount of granules dispensed while the container is upside down.

Accordingly, it is an object of this invention to provide a granule dispensing regulator which can dispense a predetermined amount of granules each time, if desired, and which can also increase said predetermined amount, as desired, without retipping the container.

It is another object of the present invention to provide a granule dispensing regulator with a variable size well.

A further object of this invention is to provide a granule dispensing regulator with multiple wells of various sizes.

These and other objects and advantages of the present invention are achieved by a granule dispensing regulator, positionable in the neck of a container, for regulating the dispensation of granules therefrom. This regulator comprises a peripheral wall with seating means, such as a peripheral lip connected to the top of, and extending outwardly from, the wall, for seating the wall in the neck of a container. Peripherally connected to the wall is an essentially cone-shaped floor with its apex extending toward the plane of the top of the wall. A pair of spaced partitions extend inwardly from the wall and upwardly from the floor to the plane of the top of the wall, the partitions and the wall therebetween defining three sides of a well. A lid is seated on top of the wall and has a portal opening between its center and its periphery. The portal opening is located above the well and is no wider than the well. A skirt extends downward from the edge of the portal opening nearest the lid center toward the floor. The skirt is located between the partitions at an intermediary point of their inward extension. The lid, the skirt, and the portions of the partitions extending beyond the intermediary point define four sides of an inner region. Flow means, such as an aperture in the apex of the floor, allow granules to pour forth from the container into the inner region when the container is tipped upside down. Return means, such as a plurality of return openings, peripherally disposed in the floor externally of said well, allow granules to return to the container when the container is returned upright.

The invention is described in greater detail in conjunction with the accompanying drawings in which:

FIG. 1 is a perspective assembly view of a granule dispensing regulator according to one embodiment of this invention;

FIG. 2 is a plan view of the regulator of FIG. 1;

FIG. 3 is an elevation view of the regulator of FIG. 2 taken along section 3-3;

FIG. 4 is a perspective view of a container with the regulator of this invention seated therein;

FIGS. 5 and 6 are cross-sectional views of the regulator of FIG. 1 disposed within a container and in the process of being used;

FIG. 7 is a perspective assembly view of a granule dispensing regulator according to another embodiment of this invention;

FIG. 8 is a plan view of the regulator of FIG. 7;

FIG. 9 is an elevation view of a multiple-well granule dispensing regulator according to yet another embodiment of this invention; and

FIG. 10 is a plan view of a multiple-well granule dispensing regulator according to still another embodiment of the present invention.

Referring now to FIGS. 1, 2 and 3, there is shown a granule dispensing regulator 1 comprising a cylindrical wall 2 with an external annular lip 4 at the top. An essentially conically shaped floor 6 is peripherally connected to the bottom of the wall 2 and extends upwardly within the wall 2 toward the plane of the lip 4. The apex of the conical floor 6 is truncated by an aperture 8. Spaced about the periphery of the floor 6 are return openings 10. The significance of the aperture 8 and the plurality of return openings 10 will become clear subsequently. Two spaced partitions 12a and 12b extend vertically from the floor 6 to the plane of the lip 4 and inwardly from the wall 2.

A well 14 for temporarily receiving a desired amount of granules comprises a semi-enclosure bounded partially by the partitions 12 and the wall 2 therebetween. A portion 6a of the floor 6 between the partitions 12 forms the bottom of the well 14 and may follow the contour of the rest of the conically shaped floor 6, or it may be specially shaped, as shown, for example, to accommodate a greater amount of granules. The aforementioned return openings 10 are external to the well 14. The floor portion 6a as shown extends from the wall 2 to a vertical extension 6b of the floor 6, said extension 6b forming another boundary of the well 14.

A lid 16 is seated, preferably permanently, on the lip 4 and has an arcuate portal opening 18 above the well 14. The opening 18 is preferably arcuate to conform to the shape of the well 14, however, it may have any other shape so long as it is otherwise consistent with the teachings of this invention. For reasons which will become clear subsequently, the width of the opening 18 is no greater than the width of the well 14.

A skirt 20 extends vertically downwardly from the innermost edge 22 of the opening 18 and between the partitions 12, as shown, to essentially the plane of the aperture 8. The skirt 20 could alternatively be connected to the partitions 12 rather than to the lid 16, so long as it is essentially in the same position. Specifically, the skirt 20 is aligned vertically with the edge 22
and the floor extension 6b and is in continuous contact with the edge 22.

FIGS. 4, 5 and 6 show the regulator 1 of this invention seated in a neck 24 of a granule container 26. The regulator 1 can be secured in the neck 24 by conventional means for example, it can be positioned with the lip 4 seated on the rim 28 of the container 26 and held there by a cap 30 which is screwed onto the container 26, as shown. The cap 30 has an arcuate port 32 which is aligned with and is of the same size and shape as the arcuate portal opening 18 in the lid 16. If desired, the port 32 can have a perforated cover therein to facilitate sprinkling the granules rather than pouring them. This might be desirable if the granules are salt or spices as opposed to sugar or instant coffee which are usually poured.

As an alternative to securing the regulator 1 in the container by a cap, the wall 2 could be threaded on the outside and the neck 24 could be threaded internally to receive the threaded wall. The wall could then be screwed into the neck until the lip 4 rested on the rim 28. A cap would then be needed merely to cover the container, rather than to hold the regulator 1 in place, in which event there would be no need for an arcuate port in the cap.

The operation of the regulator 1 is best described in conjunction with FIGS. 5 and 6. Initially, the container 26 is tipped from an upright position to the inverted position shown in FIG. 5. Granules 34 pour through the aperture 8 in the floor 6 and accumulate in an interim region 36 partially bounded by the lid 16, the skirt 20 and the partitions 12. The container 26 is then returned to an upright position, as in FIG. 6. During this step, the granules in the interim region 36 pass between the skirt 20 and the floor 6 into the well 14. The well 14 is now said to be primed.

When the container 26 is next tipped into the position of FIG. 5, the granules in the well 14 pour through the opening 18 and through the port 32. Simultaneously granules from within the container 26 once again fill the interim region 36. Thereafter, during each cycle of tipping and returning the container 26, a measured amount of granules are dispensed from the well 14 through the port 32, and the well 14 is reprimed with another measured amount of granules.

In the course of tipping the container 26, granules 34 accumulate to either side of the interim region 36. When the container 26 is then tipped back to the upright position, these granules fall back into the container 26 via the return openings 10.

The conical shape of the floor 6 is preferred in order to encourage the flow of granules 34 through the opening 8 when the container is upside down and back through the return openings 10 when the container is returned upright. The size of the opening 8 should be large enough to allow the granules in the container to pour freely through the opening 8. The shape of the floor portion 6a may be flat, as shown, or rounded, if desired, and may be deeper than as shown, if necessary to accommodate the desired amount of granules.

In order to accomplish the regulation of the granules as they are dispensed in the aforementioned manner, the location of the skirt 20 relative to the floor 6 is important. The skirt 20 must extend vertically downward essentially to the plane of the aperture 8 and arcuately from partition 12a to partition 12b and should be located essentially above the extension 6b. The shortest distance between the skirt 20 and the floor 6 is herein identified as distance 38 and is limited to within the range essentially from 1 to 2 times the largest linear dimension of the granules being dispensed and is preferably 1 1/2 times that dimension. This provides the necessary amount of restriction on the flow of granules from the interim region 36 to the well 14. If the distance 38 is larger, the granules will tend to pour freely into the well 14 and out the port 32 when the container is tipped, instead of accumulating in the interim region 36, thereby eliminating the regulation. If the distance 38 is smaller, the granules would jam there and stop flowing into the well 14 altogether, thereby eliminating the dispensation.

A particular advantage of this invention is that the user may increase the amount of granules emerging from the port 32 by a fraction of the measured amount accommodated by the well 14. If the amount desired by the user is more than the measured amount but less than twice the measured amount, the user can jiggle the container slightly while it is upside down until the desired amount of granules is dispensed. This can be accomplished because of the juxtaposition of the skirt 20 and the floor 6 and the size of the distance 38. While the granules 34 do jam between the skirt 20 and the floor 6 when the interim region 36 is filled, the slight jiggling of the container will loosen a small amount of those granules, allowing them to enter the well 14 and emerge from the port 32.

If the skirt 20 does not extend down to the plane of the aperture 8, the granules will tend to pour into the well 14 and through the port 32 when the container is tipped rather than accumulate in the interim region 36. If the skirt 20 extends beyond the plane of the aperture 8, it will impede the flow of granules into the well 14 when the container is jiggled in the inverted position of FIG. 5.

In the Klygis patent, the plane of the free edge 20 is analogous to the plane of the aperture 8 herein, and the wall 33 therein is analogous to the skirt 20 herein. It will be seen that in Klygis the wall 33 extends beyond the plane of the free edge 20. Klygis points this out on page 3 and further indicates that this "... prevents material flowing outwardly of the container body from admixing with the portion P1 being dispensed ..." (page 3, lines 32 to 35). In the Day patent, the plane of the edge of the baffle 14 is analogous to the plane of the aperture herein, and the wall 12 therein is analogous to the skirt 20 herein. It is seen that in Day, the wall 12 extends below the plane of the edge of the baffle 14. Day points out on page 2, lines 97 to 104, that because of the relative locations of the edge of baffle 14 and the end of wall 12, further flow of granules or particles into the measuring compartment 10 is precluded. In both Klygis and Day, it is clearly pointed out that while the container is inverted, once the measuring chamber or dispensing chamber is charged with the desired or measured amount of material, further flow or admixing is precluded. No suggestion is made to jiggle the upturned container to slightly increase the dispensed amount. Indeed the very opposite is suggested; nor are they able to do so with those inventions.

In FIGS. 7 and 8, there is shown another embodiment of the present invention having a variable size well 14. The lid 16 is rotatably seated on the lip 4 in this embodiment, and partition 12b is attached to the lid 16 instead of to the wall 2 and floor 6 as in FIGS. 1, 12 and
3. Two sets of notches 40a and 40b set in the top of the lip 4 at opposite ends thereof are designed to receive the bottom ends 42a and 42b of stubs 44a and 44b, respectively, which protrude beneath opposite ends of the lid 16. The lid 16 can be revolved relative to the lip 4 by pushing in opposite directions on the top ends 46a and 46b of the stubs 44a and 44b, respectively. When the lid 16 is turned clockwise, partition 12b approaches partition 12a, thereby diminishing the size of the well 14. Turning the lid 16 counterclockwise increases the size of the well 14. Thus, the lid 16 can be calibrated so that each position of the lid 16 corresponds to a predetermined size of the well 14, e.g., ½ teaspoon, 1 teaspoon and 1 tablespoon.

Partition 12a has a wing 13 laterally attached thereto externally of the well 14 and in the plane of the lip 4. The arcuate width of the wing 13 is determined as follows: When the lid 16 is rotated clockwise to the last calibrated position, corresponding to the smallest separation between partitions 12a and 12b, the arcuate width of the wing 13 is equal to at least the difference between the arcuate width of the opening 18 and the arcuate separation between the partitions 12a and 12b. The purpose of the wing 13 is to prevent granules from flowing freely along the outside of the well 14 alongside partition 12a and then through the portion of the opening 18 extending laterally beyond the well 14 when the lid 16 has been rotated counterclockwise and the container is upside down.

FIG. 9 shows another embodiment of this invention wherein the device comprises three wells 14a, 14b and 14c of various sizes. As shown, the wells 14 vary in depth and have the same arcuate width. It is preferable that the wall 2 extend, as shown, to the bottom of the deepest well 14a for ease of manufacturing. However, the wells 14 may extend below the bottom of the wall 2, if desired.

The lid 16 in FIG. 9 is similar to the one in FIGS. 7 and 8, having stubs 44a and 44b at opposite ends thereof and being rotatable to three distinct positions on the lip 4 such that in each position the opening 18 is directly above one of the three wells 14. It is distinct in that the partition 12b is attached to the wall 2, rather than to the lid 16 as in FIGS. 7 and 8. The lip 4 has two sets of notches 41a and 41b distributed therabouts so that the aforementioned lid positions are achieved.

In another embodiment of this invention, shown in FIG. 10, comprising multiple wells 14 of various sizes, the depths of the wells 14 are the same, the wells 14 extend to the bottom of the wall 2 but their arcuate widths vary. The lid 16 is the same as in FIG. 9, the portal opening 18 being equal in arcuate width to that of the largest well 14a. The lid 16 is again rotatable to each of three positions corresponding to each of the three wells 14. The ends 42 of the stubs 44 fit in the notches 41 to secure the lid in one of the three aforementioned positions.

The largest well 14a with partitions 12a and 12b is similar to the well 14 in FIG. 2. However, wells 14b and 14c have partitions 47 and 48, respectively, with wings 50 and 52, respectively, laterally attached thereto externally of the wells 14b and 14c, respectively, and in the plane of the lip 4. The arcuate distance between outer edges 54 of the wings 50 is at least equal to the arcuate width of the largest well 14a, as is the arcuate distance between outer edges 56 of the wings 52.
portal opening being located above said well; and
a skirt extending downward from the edge of said portal opening nearest said center of said lid essentially to the plane of said aperture;

2. The granule dispensing regulator claimed in claim 1 wherein the smallest distance between the lowestmost part of said skirt and said floor is larger than the largest linear dimension of said granules, and no larger than essentially twice said largest linear dimension.

3. A granule dispensing regulator, positionable in the neck of a container, for regulating the dispensation of granules therefrom, comprising:
a peripheral wall;
seating means associated with said wall for seating said wall in the neck of a container;
an essentially cone-shaped floor peripherally connected to said wall with its apex extending towards the plane of the top of said wall;
a plurality of pairs of spaced partitions extending inwardly from said wall and upwardly from said floor to said plane of the top of said wall, each of said pairs of partitions and said wall therebetween defining three sides of a well, said walls varying in depth and being equal in width; a lid seated on top of said wall;
a portal opening in said lid between its center and its periphery, said portal opening being located above said well and being no wider than the widest of said wells;
pairs of wings secured to the top of, and extending laterally from those pairs of spaced partitions defining all but the widest of said wells, the distance between the farthest edges of each pair of said wings being at least equal to the width of said portal opening;
rotating means associated with said lid for rotating said portal opening to a position above each well as desired;
a skirt extending downward from the edge of said portal opening nearest said center of said lid toward said floor and between said partitions at an intermediary point of their inward extension, said lid, said skirt and the portions of said partitions extending beyond said intermediary point defining four sides of an interim region;
flow means associated with said floor for allowing granules to pour forth from said container into said interim region when said container is tipped upside down; and return means associated with said floor for allowing granules to return to said container when said container is returned upright.

4. The granule dispensing regulator claimed in claim 3 wherein the smallest distance between the lowestmost part of said skirt and said floor is larger than the largest linear dimension of said granules, and no larger than essentially twice said largest linear dimension.

5. The granule dispensing regulator claimed in claim 4 wherein said skirt extends to essentially the plane of said aperture.

6. A granule dispensing regulator, positionable in the neck of a container, for regulating the dispensation of granules therefrom, comprising:
a peripheral wall;
seating means associated with said wall for seating said wall in the neck of a container;
an essentially cone-shaped floor peripherally connected to said wall with its apex extending towards the plane of the top of said wall;
a plurality of pairs of spaced partitions extending inwardly from said wall and upwardly from said floor to said plane of the top of said wall, each of said pairs of partitions and said wall therebetween de-
a skirt extending downward from the edge of said portal opening nearest said center of said lid toward said floor and between said partitions at an intermediary point of their inward extension, said lid, said skirt and the portions of said partitions extending beyond said intermediary point defining four sides of an interim region; flow means associated with said floor for allowing granules to pour forth from said container into said interim region when said container is tipped upside down; and return means associated with said floor for allowing granules to return to said container when said container is returned upright.

10. The granule dispensing regulator claimed in claim 9 wherein the smallest distance between the lowermost part of said skirt and said floor is larger than the largest linear dimension of said granules, and no larger than essentially twice said largest linear dimension.

11. The granule dispensing regulator claimed in claim 10 wherein said skirt extends to essentially the plane of said aperture.

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