The present invention allows a user to scoop material from a container without having to bend over when the container is empty. The container has a material containing pan wherein the height of the pan is determined by springs which respond to the weight of material on the pan. If the weight on the pan is relatively great, for example, 40 pounds of pet food, then the pan is at the bottom portion of the container and the user is able to scoop out the pet food from the top of the container. If the weight on the pan is relatively small, for example 5 pounds of pet food, then the pan is at the top portion of the container and the user is able to scoop out the dog food from the top of the container.
CONTAINER WITH CONTENT LIFT SYSTEM

BACKGROUND OF THE INVENTION

[0001] 1. Technical Field

[0002] The present invention relates to the field of containers, and more particularly to the area of containers with a variable height storage area adapted to retain bulk particulate matter.

[0003] 2. Description of Related Art

[0004] Solid particulate matter such as grains, pet food, chemicals are often stored in large bin containers for incremental dispensing by a subject. Pet food, for example, is commonly available in dry food forms such as cereals which is stored in relatively large bin-type containers. This type of pet food is commonly referred to as kibble.

[0005] One problem with storing kibble and other like bulk particulate matter in a bin type container is that upon removal and depletion of the particulate matter from the bin, a person must progressively reach further into the container toward its bottom to access the remaining bulk material. This can be difficult for those with physical limitations, such back problems, arthritis, and nervous system disorders, making it difficult to bend or reach for objects. Reaching further into the bin each succeeding time can only be temporarily resolved by filling the bin. However, this is only a temporary solution because as the bin is depleted over time once again the same difficulties develop in removing material from the bin.

[0006] Therefore, a device that allows a person to withdraw bulk material from a container having a design that eliminates, or at least substantially reduces a person’s need to bend or reach for material located towards the bottom of the container is needed and desired. It would be particularly beneficial if the container could be used for storing a variety of bulk material such as powdered laundry detergent, pet food, grains, and other foods such as beans, and snack chips. The container should also be available in numerous sizes and shapes.

SUMMARY OF THE INVENTION

[0007] The container of the present invention allows a user to scoop bulk material from without the need to bend over or reach into a significant portion of the container as it is emptied. The container has a material containing pan wherein the height of the pan relative to the height of the container is determined by the weight of the material resting on the pan. To effectuate the ability to alter the pan height within the container, springs are provided to respond accordingly to the weight of material on the pan which thereby provides a force for pushing upward on the pan. If the weight on the pan is relatively great, for example, 40 pounds of dog food, then the downward force from the weight on the pan is greater than the upward force from the springs. Thereby, the pan is designed to be at the bottom portion of the container so the user is able to scoop out the pet food from the top of the storage container. If using the same container and the weight on the pan is relatively small, for example 5 pounds of dog food, then the downward force from the weight on the pan is less than the upward force from the springs and the pan is essentially closer to the top portion of the container thereby enabling the user to reach and scoop out the dog food from the top of the container.

[0008] The container can be used to store a variety of bulk particulate material such as powdered laundry detergent, pet food, grains, other foods such as beans, chips, or other bulk particulate food matter and is available in numerous sizes and shapes. If, for example, the container is to be used for detergent soap, then springs with the correct compression rating are used such that when the container is full of detergent soap, the pan is at the bottom of the container and when the container is relatively empty of detergent soap, then the pan is relatively close to the top of the container.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] The novel features believed characteristic of the invention are set forth in the appended claims. The invention itself, however, as well as a preferred mode of use, further objectives and advantages thereof, will be best understood by reference to the following detailed description of illustrative embodiments when read in conjunction with the accompanying drawings, wherein:

[0010] FIG. 1 is an exploded view of a container with lift system in accordance with the present invention;

[0011] FIG. 2 is a perspective view of the material pan of the present invention;

[0012] FIG. 3 is a perspective view of an alternate embodiment of the present invention;

[0013] FIG. 4 is a perspective cross-sectional view of an alternate embodiment of the present invention;

[0014] FIG. 5 is a perspective cross-sectional view of an alternate embodiment of the present invention.

DETAILED DESCRIPTION

[0015] In the descriptions that follow, like parts are marked throughout the specification and drawings with the same numerals, respectively. The drawing figures are not necessarily drawn to scale and certain figures may be shown in exaggerated or generalized form in the interest of clarity and conciseness.

[0016] As shown in FIG. 1, container 102 comprises front wall 104a, back wall 104b, side wall 106a, side wall 106b, floor 136, lid 108, retainer ring 110, material pan 112, rubber gasket 114, spring insert 116, lower spring insert 142, and springs 118.

[0017] Front wall 104a and back wall 104b may be made of metal, plastic, rubber, or other similar rigid or semi-rigid material capable of supporting container 102. By way of example and not of limitation, front wall 104a and back wall 104b in FIG. 1 are approximately 21 inches high and 21 inches wide. In other embodiments, the dimensions can change and such changes are apparent to one skilled in the art. Front wall 104a and back wall 104b have outside edges 119a and 119b, respectively, and inside edges 120a and 120b, respectively. Front wall 104a and back wall 104b are connected to side walls 106a and 106b.

[0018] Side walls 106a and 106b may be made of metal, plastic, rubber, or some other similar rigid or semi-rigid material capable of supporting container 102. In the embodiment shown in FIG. 1, side walls 106a and 106b are
approximately 21 inches high and 15 inches wide. In other embodiments, the dimensions can change and such changes are known to one skilled in the art. Side walls 106a and 106b have outside edges 122a and 122b, respectively, and inside edges 124a and 124b, respectively. Inside edges 120a, 120b, 124a, and 124b define cavity 126.

[0019] Cavity 126 has a top portion 128 and a bottom portion 130. In use, cavity 126 contains material pan 112, rubber gasket 114, spring inserts 116, lower spring inserts 142, and springs 118. Top portion 128 of cavity 126 contains retainer ring 110.

[0020] Retainer ring 110 may be made of metal, plastic, rubber, or some other similar rigid or semi-rigid material and is secured to container 102. Retainer ring 110 extends from inside edges 120a, 120b, 124a and 124b into top portion 128 of cavity 126 and prevents material pan 112 from extending past retainer ring 110.

[0021] Material pan 112 is made of made of metal, plastic, rubber, or some other similar rigid or semi-rigid material and, as shown in FIG. 2, has an upper portion 202 and a lower portion 204. By way of example and not of limitation, in the embodiment shown in FIG. 2, upper portion 202 is approximately 20 inches wide, 14 inches long and fits inside cavity 126 (FIG. 1). In other embodiments, the dimensions can change and such changes are known to one skilled in the art. Upper portion 202 contains rubber gasket 114.

[0022] Rubber gasket 114 surrounds upper portion 202 of material pan 112 such that a seal is made between inside edges 120a, 120b, 124a and 124b and upper portion 202 of material pan 112. The seal may be a waterproof seal but is at least such that the contents in material pan 112 are prevented from spilling outside material pan 112 and into bottom portion 130 of cavity 126.

[0023] Lower portion 204 of material pan 112 contains spring insert 116. Spring insert 116 contains a cavity for housing spring 118.

[0024] Spring 118 is a compression helical spring with about 39 active coils and a spring rate of approximately 1.125 lbf/sq inch such that the spring forces material pan 112 to contact retainer ring 110 when material pan 112 does not contact any bulk material. Spring 118 has a top 138 and a bottom 140. Top 138 can fit inside spring insert 116 and is secured to lower portion 204 of material pan 112 by spring insert 116. Spring 118 may be secured to material pan 112 by means other than by spring insert 116 such as a groove, indentation, or notch in material pan 112 or by the pressure spring 118 exerts on material pan 112. Such other means to secure spring 118 to material pan 112 would be obvious to one skilled in the art.

[0025] Bottom 140 of spring 118 is secured to floor 136 by lower spring insert 142. Spring 118 may be secured to floor 136 by means other than lower spring insert 142 such as a groove, indentation, or notch in floor 136 or by the pressure spring 118 exerts on floor 136. Such other means to secure spring 118 to floor 136 would be obvious to one skilled in the art. Floor 136 forms the base of container 102 and is attached to front wall 104a, back wall 104b, and side walls 106a and 106b.

[0026] In use 40 pounds of commercially available dog food is inserted into container 102. The weight of the dog food compresses spring 118 such that material pan 112 is lowered into bottom portion 130 of cavity 126. Rubber gasket 114 prevents any of the dog food from spilling into bottom portion 130 of cavity 126.

[0027] Removable lid 108 may be secured to container 102 to prevent unwanted material and moisture from contacting the dog food. Removable lid 108 has lip 134 and may be placed on top portion 128 of cavity 126 such that lip 134 is in contact with outside edges 119a, 119b, 122a, and 122b. Removable lid 108 may be made of metal, plastic, rubber, or some other similar rigid or semi-rigid material and may be secured to container 102 by a snap closure or some other lid locking mechanism known in the art to secure a removable lid on a container and prevent unwanted substances from entering cavity 126.

[0028] When dog food is removed from container 102, the weight of the dog food contained within material pan 112 is reduced and spring 118 pushes material pan 112 towards bottom portion 128 of cavity 126. Because material pan 112 is raised by spring 118 relative to the amount of dog food removed from container 102, the dog food is always at the top of container 102. When all or almost all of the dog food has been removed from container 102, material pan 112 is in contact with retainer ring 110 and retainer ring 110 prevents compression spring 118 from pushing material pan 112 outside of cavity 126.

[0029] FIG. 3 is an alternate embodiment of the present invention wherein the springs are attached to the top portion of the container instead of the bottom portion and shows container 402, front wall 410, back wall 404, side wall 406, material pan 412, and channel 430. Container 402 has a top portion 426 and a bottom portion 428. FIG. 4 is a perspective cutaway view of container 402 cut along plane 302 shown in FIG. 3.

[0030] As shown in FIG. 4, container 402 has a top portion 426 and a bottom portion 428, comprises front wall 410, back wall 404, side wall 406, floor 408, material pan 412, and spring 414. Spring 414 has an upper section 416 and a lower section 418. Front wall 410, back wall 404, side wall 406, floor 408, and material pan 412 may be made of metal, plastic, rubber, or some other similar rigid or semi-rigid material.

[0031] Side wall 406 comprises outside wall 420 and inside wall 422. Outside wall 420 and inside wall 422 define spring cavity 424. Spring cavity 424 houses spring 414. Upper section 416 of spring 414 is attached to top portion 426 of container 402. Lower section 418 of spring 414 is attached to material pan 412. Inside wall 422 contains channel 430 which is wide enough to accommodate at least a portion of material pan 412 so material pan can extend from one spring cavity 424 to the spring cavity on the opposite side of container 402.

[0032] Spring 414 is of sufficient strength to lift material pan 412 to the top portion 426 of container 402 when material pan 412 is relatively empty. However, when bulk material is added to material pan 412, the weight causes spring 414 to stretch and material pan 412 to be lowered into bottom portion 428 of container 402 such that the bulk material is contained within and does not spill outside of container 402. As shown in FIG. 4, more than one spring 414 may be used.
FIG. 5 shows a perspective cutaway view of an alternate embodiment of the present invention. Container 602 is a drum container, such as a common 55 gallon drum container, and comprises wall 604, floor 606, removable lid 608, retainer ring 610, material pan 612, rubber gasket 614, spring inserts 616, lower spring inserts 618, and spring 620.

Wall 604 is made of metal, plastic, rubber, or some other similar rigid or semi-rigid material and provides support for container 602. Wall 604 has an outside edge 622 and an inside edge 624. Inside edge 624 defines cavity 626.

Cavity 626 has a top portion 628 and a bottom portion 630. Cavity 626 contains material pan 612, rubber gasket 614, spring inserts 616, lower spring inserts 618, and springs 620. Top portion 628 contains retainer ring 610.

Retainer ring 610 may be made of metal, plastic, rubber, or some other similar rigid or semi-rigid material. Retainer ring 610 extends from inside edge 624 into top portion 628 of cavity 626 and prevents material pan 612 from extending past retainer ring 610.

Material pan 612 may be made of metal, plastic, rubber, or some other similar semi-rigid material and has an upper portion 632 and a lower portion 634. Rubber gasket 614 surrounds upper portion 632 of material pan 612 such that a seal is made between inside edge 624 and upper portion 632 of material pan 612. The seal may be a water-proof seal but is at least such that the contents in material pan 612 are prevented from spilling outside material pan 612 and into bottom portion 630 of cavity 626.

Lower portion 634 of material pan 612 contains spring insert 616. Spring insert 616 houses spring 620. Spring 620 is a compression helical spring with about 39 active coils and a spring rate of approximately 1.125 lbs/sq in such that the spring forces material pan 612 to contact retainer ring 610, when material pan 612 does not contain any bulk material. Spring 620 has a top 638 and a bottom 640. Top 638 is secured to lower portion 634 of material pan 612 by spring insert 616. Spring 620 may be secured to material pan 612 by means other than spring insert 616 such as a groove, indentation, or notch in material pan 612 or by the pressure spring 620 exerts on material pan 612. Such other means to secure spring 620 to material pan 612 would be obvious to one skilled in the art.

Bottom 640 is secured to floor 606 by lower spring insert 618. Spring 620 may be secured to floor 606 by means other than lower spring insert 618 such as a groove, indentation, or notch in floor 606 or by the pressure spring 620 exerts on floor 606. Such other means to secure spring 620 to floor 606 would be obvious to one skilled in the art. Floor 606 forms the base of container 602 and is attached to wall 604.

In use 40 pounds of commercially available dog food is inserted into container 602. The weight of the dog food compresses spring 620 such that material pan 612 is lowered into bottom portion 630 of cavity 626. Rubber gasket 614 prevents any of the dog food from spilling into bottom portion 630 of cavity 626.

Removable lid 608 may be secured to container 602 to prevent unwanted material and moisture from contacting the dog food. Removable lid 608 is made of made of metal, plastic, rubber, or some other similar rigid or semi-rigid material and may be secured to container 602 by a snap closure or some other lid locking mechanism known in the art to secure a removable lid on a container and prevent unwanted substances from entering cavity 626.

When dog food is removed from container 602, the weight of the dog food contained within material pan 612 is reduced and spring 620 pushes material pan 612 towards top portion 628 of cavity 626. Because material pan 612 is raised by spring 620 relative to the amount of dog food removed from container 602, the dog food is always at the top of container 602. When all or almost all of the dog food has been removed from the container, material pan 612 is in contact with retainer ring 610 and retainer ring 610 prevents spring 620 from pushing material 612 outside of cavity 626.

While springs 118, 418, and 620 are shown as helical springs, it is understood by those skilled in the art that a suitable substitution may be made for the springs. One such embodiment (not shown) may use hydraulic chambers connected to a mechanical or electrical controlling device for effecting changes of height of the material pans 112, 412, and 612 within their respective containers.

Although the invention has been described with reference to one or more preferred embodiments, this description is not to be construed in a limiting sense. There is modification of the disclosed embodiments, as well as alternative embodiments of this invention, which will be apparent to persons of ordinary skill in the art, and the invention shall be viewed as limited only by reference to the following claims. For example, material other than dog food may be used in the container. If other material is used, then the spring ratio of the spring may have to be adjusted. Any necessary adjustments would be known to those skilled in the art. Also, the container does not have to be rectangular in shape, it may be square, oval, or any other shape.

What is claimed is:
1. A container having variable height storage wherein the container comprises:
   a. a floor;
   at least one wall connected to the floor wherein the one wall has an inside portion and an outside portion wherein the inside portion defines a cavity having an upper portion and a lower portion;
   a material pan having a top and a bottom inside the cavity wherein the outside walls of the material pan are in contact with the inside portion of the at least one wall;
   at least one spring wherein the spring is in contact with the bottom of the material pan and the floor of the container.
2. The container of claim 1 wherein the upper portion of the cavity contains a retainer ring which extends from the inside portion of the at least one wall into the upper portion of the cavity and prevents the passage of the material pan.
3. The container of claim 1 wherein the top of the material pan contains a gasket which surrounds the top of the material pan and is in contact with the inside portion of the at least one wall.
4. The container of claim 1 wherein the gasket makes a watertight seal between the top of the material pan and the inside portion of the at least one wall.
5. The container of claim 1 wherein the bottom of the material pan contains at least one spring insert to house the at least one spring.

6. The container of claim 1 wherein the bottom of the container contains at least one spring insert to house the at least one spring.

7. The container of claim 1 wherein the spring has a spring rating such that the material pan is at the top portion of the cavity.

8. The container of claim 1 wherein the spring has a spring rating such that the weight of bulk material inserted into the container causes the material pan to lower such that the bulk material is at the top portion of the cavity.

9. The container of claim 1 wherein the container is round.

10. The container of claim 1 wherein the container is square shaped.

11. The container of claim 1 wherein the container is triangular shaped.

12. The container of claim 1 wherein the container also comprise a removable lid.

13. The container of claim 1 wherein the removable lid is secured with a snap closure.

14. A method for storing bulk particular material in a container with variable height storage, the method comprising the steps of:

   inserting the bulk material into the variable height storage container wherein the container comprises
   
a floor;

   at least one wall connected to the bottom wherein the one wall has an inside portion and an outside portion wherein the inside portion defines a cavity having an upper portion and a lower portion;

   a material pan having a top and a bottom inside the cavity wherein the outside walls of the material pan are in contact with the inside portion of the at least one wall; and

   at least one spring wherein the spring is in contact with the bottom of the material pan and the floor of the container and the spring has a spring rating such that the weight of the bulk material inserted into the container causes the material pan to lower such that the bulk material is at the top portion of the cavity; and

   removing at least a portion of the bulk material wherein the removal reduces the weight of the bulk material inserted into the container causes the material pan to raise such that the bulk material remains at the top portion of the cavity.

15. The method of claim 14 wherein the top of the material pan contains a gasket which surrounds the top of the material pan and is in contact with the inside portion of the at least one wall.

16. The method of claim 14 wherein the container also comprises a removable lid.

17. The method of claim 14 wherein the container is round.

18. The method of claim 14 wherein the container is square shaped.

19. The method of claim 14 wherein the container is triangular shaped.

20. A container having variable height storage wherein the container comprises:

   a floor;

   at least one wall connected to the bottom wherein the one wall has an inside portion and an outside portion wherein the inside portion defines a cavity;

   a material pan having a top and a bottom inside the cavity wherein the outside walls of the material pan are in contact with the inside portion of the at least one wall; and

   at least one spring wherein the spring is in contact with the bottom of the material pan and the floor of the container.