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PLASTIC CONTAINER WITH SELF-LOCKING LID

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PLASTIC CONTAINER WITH SELF-LOCKING LID

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5 Claims

ABSTRACT OF THE DISCLOSURE

A molded foam plastic container is provided comprising a box and a detachable lid. The lid has a top and downwardly extending side walls, opposite side walls of said lid having on the inner surface thereof locking lugs which project in an inward normal direction. The box of the container comprises a base and side walls which are substantially vertical, with opposite sides of the outer surface of said box having locking wells adapted to receive the locking lugs of the interior surface of said lid to lock the lid in place.

This invention relates generally to containers molded from foam plastic material and more particularly to a container of foam plastic having a self-locking lid for shipping perishable agricultural products.

Containers molded from rigid foams, for example, foam polystyrene, have been found to be very useful for shipping fragile and perishable goods. The containers provide excellent protection from mechanical shock during shipment for perishable agricultural commodities, for example, fruits such as pears, grapes, peaches, etc. which easily become bruised causing them to decrease in value.

Heretofore, containers of foam material have had molded lids which can be constructed so that they are held in place by friction. Friction, however, is not sufficient to keep the lids in place during the rough handling and vibrations which occur during shipment and it has been found necessary to fasten the lids in place by some external means such as tapes or by gluing the lid to the container. This has the disadvantages of being very costly and time-consuming and is uneconomical where handling charges are a significant portion of the ultimate price of the goods, for example, in the large volume shipment of agricultural commodities. Also, fastening by tape is likely to be insecure whereas fastening by gluing, while providing a more secure seal, prevents further use of the container because the glues tend to attack the foam and when the containers are opened they become damaged and must be discarded. Gluing also makes the opening of the containers to inspect the condition of the goods impossible.

This invention, therefore, provides a foamed container which has a self-locking lid which can be easily opened and closed an indefinite number of times.

In accordance with this invention, there is provided a molded foam plastic container comprising a box and a detachable lid. The lid has a top and downwardly depending side walls. The side walls have a recess in the lower portion of their internal faces defining a shoulder and a downwardly extending inner surface. The inner surface on two opposite sides of the lid has locking lugs which project in a normal direction. The box has a base and side walls which are substantially vertical. The side walls have a recess in the upper portion of their exterior faces, a shoulder and an upwardly extending outer surface. The shoulder and outer surface are adapted to snugly engage the inner surface and shoulder of the lid, and outer surface on two opposite sides of the box having

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locking wells adapted to receive the locking lugs on the lid.

The above and further objects and novel features of the invention will appear more fully from the following detailed description when the same is read in conjunction with the accompanying drawings. It is to be expressly understood, however, that the drawings are not intended to be a definition of the invention but are for the purpose of illustration only.

FIG. 1 is a perspective view of an open container constructed in accordance with the invention;

FIG. 2 is an enlarged vertical cross section with parts broken away of the embodiment of the invention shown in FIG. 1 with the lid in place;

FIG. 3 is a perspective view with parts broken away of the box portion of another embodiment of the container constructed in accordance with the invention;

FIG. 4 is a perspective view with parts broken away of another embodiment of the container constructed in accordance with the invention;

FIG. 5 is a perspective view with parts broken away of another embodiment of the container constructed in accordance with the invention.

Turning now to FIG. 1, a container 1 constructed in accordance with the invention is shown in the open position. The box 3 has a base 5 and substantially vertically extending side walls 7a, 7b, 7c, and 7d. The upper portion of the side walls 7a, 7b, 7c, 7d, has a recess 9 forming a shoulder 11 and an upwardly extending outer surface 13. Opposite walls 7b and 7d have locking wells 15 in the outer surface 13 which are adapted to receive the locking lugs 17 of lid 19. Wells 15 are rectangular depressions whose depth is less than the width of lip 23 such that the inner surface of walls 7b and 7d remain intact.

A portion immediately above locking wells 15 of the outer edge 21 of lip 23 of box 3 is beveled to form surface 22. The lower portion 44 of locking lugs 17 are beveled to form surfaces 42.

Lid 19 has a top 25 and downwardly depending side walls 27a, 27b, 27c, 27d. The lower portion of the side walls 27a, 27b, 27c, 27d has a recess 29 forming shoulder 31 and downwardly extending inner surface 33. The dimensions of lid 19 are such that the exterior portion of the side walls 27a, 27b, 27c, 27d of lid 19 are flush with the exterior portions of the side walls 7a, 7b, 7c, 7d of box 3 when the lid 19 is locked in place. The dimensions of the recess 29 are such that the lid 19 snugly engages the recessed portion 9 of box 3 when the top is locked in place. Protrusions 30 on surface 9 aid in producing a snug fit. The locking lugs 17 project in a normal direction from surface 33 such that when lid 19 is placed on box 3 locking lugs extend into locking wells 15 to mechanically lock lid 19 onto box 3 as is shown in more detail in FIG. 2. The lid 19 and box 3 have slots 40 to provide ventilation for the contents of the container.

To assemble lid 19 on box 3, locking lugs 17 on wall 27d are placed in locking wells 15 on wall 7d. Vertical pressure is then applied to lid 19 to cause beveled surfaces 42 on locking lugs 17 on wall 27b to slide over beveled surface 22 of box 3 until locking lugs 17 enter locking wells 15 as shown in FIG. 2 thus firmly locking lid 19 onto box 3.

To open the container, horizontal pressure is applied to wall 7b or 7d of box 3 in the area immediately below locking wells 15 so that the wall bows in slightly and exposes the lower edge 39 of lid 19. While maintaining the horizontal pressure on box 3, upward pressure is exerted against the lower edge 39 of lid 19 causing the locking lugs 17 to move out of locking well 15 and detaching lid 19 from box 3.

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FIG. 3 illustrates another embodiment of the box portion of a container 41 in which a cone-shaped depression 43 is located at the point below locking wells where the unlocking pressure is to be applied to the box wall 45. This localizes the unlocking pressure and exposes a portion of the lower edge of the lid (not shown) which prevents damage to the box wall 45 and facilitates the removal of the lid (not shown) of the container 41.

FIG. 4 illustrates another embodiment of a container 51 constructed in accordance with the invention. In this embodiment, a single locking lug 53 is located on the inner face 55 of lid 57 and locking well 59 is a slot extending through the inner surface 63 of box 61. The locking and unlocking of box 61 and lid 57 is accomplished in the same manner as the container 1 illustrated in FIGS. 1 and 2.

FIG. 5 illustrates another embodiment of a container 71 constructed in accordance with the invention. In this embodiment, the lower portion 73 of lid 75 is offset in an outward direction from the side walls 77a, 77b, 77c. Locking lugs 79 project normally from the inner surface 81 of the offset portion. Box 83 has a top portion 85 which is offset inwardly from the side walls 87a, 87b. The offset portions 73 and 85 are of such dimensions that the lid 75 rests in a sealing fashion on the box 83. The outer surface (not shown) of the offset portion 85 of side 87b of box 83 has a pair of locking wells (not shown) which are adapted to receive the locking lugs 79 of lid 75.

It is to be understood that the material utilized in the construction of the container of my invention may be any suitable rigid foam plastic material. Preferably, the container is molded from expandable polystyrene, such for example as that sold under the trademark Dylite. The molding of expandable polystyrene into foamed structures is well known and is described, for example, in the article "Expandable Polystyrene" by Edwin A. Edberg in Modern Plastics, Encyclopedia Issue, September 1957, pp. 347-350.

The foregoing has described novel containers of foam materials with self-locking lids which can be easily and rapidly opened and closed and are suitable for either manual or automated loading operations. The containers require no external devices such as bands, tapes or adhesives to hold the lids firmly in place and the containers are not destroyed or damaged by removing the lid to unpack the contents thus permitting the containers to be reused.

What is claimed is:

1. A molded foam plastic container comprising a box

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and a self-locking detachable lid, said lid having a top and downwardly depending side walls, said side walls having a recess in the lower portion of their internal faces which defines a first shoulder and a downwardly extending inner surface, said inner surface on two opposite sides of said lid having locking lugs projecting in a normal direction therefrom, and said box having a base and side walls which are substantially vertical, said side walls having a recess in the upper portion of their exterior faces which defines a second shoulder and an upwardly extending outer surface, said first shoulder and outer surface being adapted to snugly engage the inner surface and second shoulder of said lid, and said outer surface on two opposite sides of said box having locking wells adapted to receive said locking lugs when said lid is placed on said box.

2. The container of claim 1 wherein said lid and said box have slots therein to provide ventilation.

3. The container of claim 1 wherein said box has depressions in the outer surfaces of said two opposite sides, said depressions extending downwardly from said shoulder and being located adjacent to said locking wells.

4. The container of claim 1 wherein each of said two opposite sides of said lid have a pair of locking lugs and each of said two opposite sides of said box have a pair of locking wells which are adapted to receive said locking lugs.

5. A container comprising a box and a locking lid, said box and lid being of a foamed polymeric material, said box having a base and side walls which are substantially vertical, the top portion of said box being offset with respect to said side walls, said lid having dimensions conforming to said box and having a top and depending side walls, the lower portion of said lid being offset with respect to said depending side wall in a direction inverse to the offset of said top portion of said box whereby said lid rests in a sealing fashion on said box, and lugs projecting from at least one of the offset portions and apertures in the mating one of the offset portions to receive said lugs and lock said lid securely in place on said box.

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