PRODUCT CONTAINER INCLUDING SURFACE WITH BUMPS

Abstract:

A product container (10) includes a tray. The tray (20) includes a bottom surface (22) and at least one side wall (24) extending from the bottom surface. A plurality of bumps (26) is disposed along the bottom surface.
PRODUCT CONTAINER INCLUDING SURFACE WITH BUMPS

BACKGROUND
[0001] The present invention relates to a container for product pieces.
[0002] Containers for products not only hold the product, but may also provide a desired appearance for marketing purposes. It is desirable to have a container to hold individual product pieces that is easy to fill and easy to remove the product pieces.

BRIEF SUMMARY
[0003] In various aspects, a product container is provided. The product container includes a surface with bumps that help to orient the product pieces when the container is filled. Advantageously, the products can be more efficiently packed as compared to a container without the bumps.
[0004] In one aspect, a product container includes a tray. The tray includes a bottom surface and at least one side wall extending from the bottom surface. A plurality of bumps is disposed along the bottom surface.
[0005] In another aspect, a method of loading product pieces into a product container includes providing a tray and a lid. The tray includes a bottom surface. At least one side wall extends from the bottom surface. A plurality of bumps is disposed along the bottom surface. A plurality of product pieces is provided and disposed into the tray. The tray is vibrated to position the product pieces onto the bottom surface. The lid is then attached to the tray.

BRIEF DESCRIPTION OF THE DRAWINGS
[0006] Fig. 1 is a top view of an embodiment of a tray of a product container.
[0007] Fig. 2 is a side sectional view of the tray of Fig. 1.
[0008] Fig. 3 is a bottom view of an embodiment of a lid of a product container.
[0009] Fig. 4 is a side sectional view of the lid of Fig. 3.
[0010] Fig. 5 is a side sectional view of the lid of Fig. 3 connected to the tray of Fig. 1.
Fig. 6 is a top schematic view of two product pieces disposed on a portion of the tray bottom.

Fig. 7 is a top schematic view of three product pieces disposed on a portion of the tray bottom.

Fig. 8 is a side schematic view of two product pieces disposed on a portion of the tray bottom.

DETAILED DESCRIPTION

The invention is described with reference to the drawings in which like elements are referred to by like numerals. The relationship and functioning of the various elements of this invention are better understood by the following description. Each aspect so defined may be combined with any other aspect or aspects unless clearly indicated to the contrary. The embodiments described below are by way of example only, and the invention is not limited to the embodiments illustrated in the drawings.

The present invention provides a container particularly suitable for product pieces, for example confectionery product pieces. An embodiment of a tray 20 of a product container 10 is shown in Fig. 1. The tray 20 includes a bottom surface 22 and at least one side wall 24 extending from the bottom surface 22. A plurality of bumps 26 is disposed at regular intervals along the bottom surface 22. The bumps are convex protuberances extending from the bottom surface 22. The bumps 26 may be of any suitable shape. In one embodiment, the bumps 26 are semi-spherical in shape. The bumps 26 may also be conical, pyramidal, or cylindrical in shape.

The side wall 24 includes a height 28. The side wall may include four side walls 32, 34, 36, and 38 to provide a rectangular tray 20. The bottom surface 22 includes a length 40 and a width 42. The tray 20 may be generally shallow in height compared to its length and width. In one embodiment, the height 28 of the side wall 24 is less than the longest dimension 61 of the product pieces 60 contained within the container 10. In another embodiment, the interior height 28 of the container 10 is about 1 to 4 mm greater than the thickness 63 of the product
piece 60. Typical dimensions of the product container 10 are between 4 and 6 inches in length, between 2 and 4 inches in width, and between 0.3 and 0.5 inches in height.

[0017] The product container may also include a lid 30, as shown in Figs. 3 and 4. The lid 30 may be connected to the tray 20 in any suitable fashion. In embodiments, the lid is hingedly connected to the tray or connected in other configurations. In the shown embodiment, the lid 30 may be slidingly connected to the tray 20. The slidingly connected lid 30 may also be configured to snap on to the tray 20, particularly in a high-speed filling operation. The lid 30 may include a flat inner surface 31 and rolled edges 43 which slidingly engage corresponding rolled lips 39 on the tray 20. The rolled edges 43 extend along three sides of the lid 30, terminating at a point 33 to allow the lid 30 to slide open to reveal the contents of the container 10. As shown in Figs. 4 and 5, the lid 30 may include side walls 35 that extend over the rolled lip 39 of the tray 20. The lid 30 may include a portion 37 with no side wall or lip, to allow the lid 30 to slide off the tray 20 without interference.

[0018] The lid 30 may also include one or more small bumps 44, 45 projecting into the interior of the container 10. One or more bumps 45 may be positioned roughly adjacent to the back wall 46 to engage the corresponding lip 39 on the tray 20 to act as a detent preventing accidental opening of the container. Additional bumps 44 may be located at chosen distance(s) from the rear wall 46 of the lid 30 to encourage partial opening of the lid 30 to one or more pre-selected positions.

[0019] In an embodiment, the bumps 26 are disposed at regular intervals in a pattern of rows and columns. For example, as shown in Fig. 1, the bottom surface 22 includes multiple rows 50 and columns 52 of bumps 26. The bumps 26 may be disposed at equal intervals 54 along rows 50, and at equal intervals 56 along columns 52. Intervals 54 and 56 may be the same distance or different distances. Additionally, the bumps 26 in adjacent rows and columns may either line up or be offset from each other. The bottom surface 22 includes a plurality of interstitial spaces 58 between the bumps 26. The interstitial spaces 26 are defined by the four
adjacent bumps 26. In other embodiments (not shown) the bumps 26 may be arranged in other patterns or randomly distributed on the bottom surface 22 of the tray 20.

[0020] The tray 20 is adapted to hold a plurality of product pieces 60. Fig. 6 is a top view showing product pieces 60 with a circular cross section disposed in the interstitial spaces 58 between bumps 26. The bumps 26 and interstitial spaces 58 are configured to allow pieces 60 to pack to high density, where each piece 60 touches or almost touches up to four other adjacent pieces 60. In an embodiment, the bumps 26, interstitial spaces 58 and product pieces 60 are sized and shaped to prevent contact between the product pieces 60 when they are precisely positioned in the interstitial spaces 58.

[0021] The product pieces 60 may be any suitable shape. In an embodiment the product pieces 60 include at least one portion with a substantially flat or slightly curved surface, which may be disposed at least partially against the bottom surface 22. In another embodiment, the product pieces 60 are roughly spherical in shape. The product pieces 60 are shown with a curved portion and a round cross section, but other shapes are possible, such as square, rectangular, cylindrical, oval, or spherical. Square product pieces 62 are shown in Fig. 7. Most efficient packing and maximization of the benefits of the bumps 26 occurs when the faces of the pieces are symmetrical in at least four axes, such as for circular and square pieces. As shown in Fig. 8, the curved pieces 60 may have a relatively small flat equatorial portion (called a belly band) 64 to minimize them standing on their sides when the containers 10 are filled. The bumps 26 help to encourage the product pieces 26 to lie down even if the flat equatorial portion 64 is large. The pieces 60 have a longest dimension 61 and a height 63. As shown in Fig. 8, the bumps 26 may facilitate removal of the product pieces 60 by preventing the pieces 60 from lying completely flat on the bottom surface 22 of the tray 20. The exact size and shape of the face of the individual pieces 60 maybe chosen to prevent a piece 60 from simultaneously contacting more than three of the bumps 26 defining the interstitial space 58 in which the pieces 60 resides. This ensures
that the face of the product piece 60 will remain in contact with the tray bottom surface 22.

[0022] The product container 10 may be filled with product pieces 60 via a high speed loading operation. The orientation of the bumps 26 relative to the size of the product pieces 60 is helpful in ensuring proper loading of the product pieces 60. The bumps 26 help disperse the pieces 60 evenly across the surface 22 of the tray 20 in a single plane and reduce the likelihood of a piece 60 being oriented on edge in the container 10. Thus also allows the product pieces 60 to be easily counted, for example, by the use of machine vision. For high speed loading, a prior art practice is to size the product 60 and container 10 such that the height 28 of the interior of the container 10 should be at least equal to the diameter (or longest dimension) of the product pieces 60, plus a clearance factor which is typically 1 to 2 mm for typical confectionery products. This ensures that the pieces 60 will not interfere with the fitting of the lid 30 to the tray 20 after loading by allowing for the likelihood that some pieces 60 might be oriented on edge or on top of one another. It has been found that by utilizing the present invention, the height 28 of the interior of the tray 20 may be somewhat thinner than the prior art practice and still allow for high speed loading. In an embodiment, the interior height 28 of the container 10 will be less than the greatest dimension 61 of the product piece 60. In another embodiment, the interior height 28 of the container 10 will be about 1 to 4 mm greater than the thickness 63 of the product piece 60.

[0023] To load the container 10, a tray 20 is provided. A plurality of product pieces 60 is loaded in the tray. After the pieces 60 are loaded in the tray 20, the tray 20 may be vibrated to position the pieces 60 in the interstitial spaces 58 in the tray 20 and to encourage each piece 60 to lay flat on the bottom surface 22 of the tray 20. The lid 30 may then be attached to the tray 20.

[0024] The configuration of container 10 allows a thinner (lower height) package and allows more pieces 60 to be fit within a container of a given size, and increase the perception of the consumer that the container 10 is full.
The container 10 may be made of any suitable material. The tray 20 and lid 30 may be made of metal, plastic, molded fiber, wood, or other suitable materials. The container 10 may include an outer covering such as a shrink wrap or a sleeve (made of paperboard or other material). Several containers 10 may be provided in a box or other suitable larger container.

Although the present invention has been described with reference to preferred embodiments, those skilled in the art will recognize that changes may be made and formed in detail without departing from the spirit and scope of the invention. It is therefore intended that the foregoing detailed description be regarded as illustrative rather than limiting, and that it be understood that it is the following claims, including all equivalents, that are intended to define the scope of this invention.
What is claimed is:
1. A product container comprising:
   a tray comprising
   a bottom surface;
   at least one side wall extending from the bottom surface; and
   a plurality of bumps disposed along the bottom surface.
2. The product container of claim 1 further comprising a lid.
3. The product container of claim 2 wherein the lid is hingedly connected to the tray.
4. The product container of claim 2 wherein the lid is slidirigly connected to the tray.
5. The product container of claim 1 wherein the bumps are semi-spherical in shape.
6. The product container of claim 1 wherein the bumps are conical in shape.
7. The product container of claim 1 wherein the bumps are pyramidal in shape.
8. The product container of claim 1 wherein the bumps are disposed at regular intervals in a pattern of rows and columns.
9. The product container of claim 1 further comprising a plurality of product pieces contained within the product container.
10. The product container of claim 9 wherein the bumps are disposed at regular intervals along the bottom surface of the tray, further comprising a plurality of interstitial spaces between the bumps, wherein the pieces fit within the interstitial space.
11. The product container of claim 10 wherein the product pieces have at least one substantially flat surface.
12. The product container of claim 10 wherein the product pieces have at least one slightly curved surface.

13. The product container of claim 10 wherein the product pieces are roughly spherical.

14. The product container of claim 10 wherein the interstitial spaces are defined by four adjacent bumps.

15. The product container of claim 14 wherein the product pieces are shaped so as to be able to simultaneously contact exactly three of the four bumps defining the interstitial space and the bottom surface of the tray.

16. A product container comprising:
   a tray comprising
   a bottom surface;
   at least one side wall extending from the bottom surface;
   a plurality of bumps disposed at regular intervals along the bottom surface; and
   a plurality of interstitial spaces defined by the plurality of bumps; and
   a plurality of product pieces disposed on the bottom surface in the interstitial spaces.

17. A method of loading product pieces into a product container, comprising:
   providing a tray comprising:
   a bottom surface;
   at least one side wall extending from the bottom surface; and
   a plurality of bumps disposed along the bottom surface;
   providing a lid;
   providing a plurality of product pieces;
   disposing the plurality of product pieces into the tray;
   vibrating the tray to position the product pieces onto the bottom surface;
   and
attaching the lid to the tray.

18. The method of claim 17 wherein the bumps are disposed at regular intervals along the bottom surface of the tray, the bumps defining a plurality of interstitial spaces between the bumps, and wherein the product pieces fit within the interstitial spaces.

19. The method of claim 18 wherein the product pieces have at least one substantially flat surface.

20. The method of claim 18 wherein the product pieces have at least one slightly curved surface.

21. The method of claim 18 wherein the product pieces are roughly spherical.

22. The method of claim 18 wherein the interstitial spaces are defined by four adjacent bumps.

23. The method of claim 22 wherein the product pieces are shaped so as to be able to simultaneously contact exactly three of the four bumps defining the interstitial space and the bottom surface of the tray.

24. The method of claim 17 wherein the at least one side wall includes a height and wherein the product pieces include a longest dimension, wherein the height is not greater than about the longest dimension of the product pieces.

25. The method of claim 17 wherein the at least one side wall includes a height and wherein the product pieces include a thickness, wherein the height is between about 1 mm and about 4 mm greater than about the thickness of the product pieces.
INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER
INV. B65D25/10 B65B5/10 B65B35/34 A61J1/03

According to International Patent Classification (IPC) or to both national classification and IPC:

B. RELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
B65D B65B A61J

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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Further documents are listed in the continuation of Box C

See patent family annex

Date of the actual completion of the international search: 22 January 2008

Date of mailing of the international search report: 30/01/2008

Name and mailing address of the ISA/European Patent Office P B 5818 Patentlaan 2 NL - 2280 HV RUISWaal
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