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ABSTRACT

A lid for a container configured to carry a substance during a heating process, the lid being arranged such that it is adjustable between a first condition having a first axial height and a second condition having a second axial height, wherein the second axial height is greater than the first axial height.

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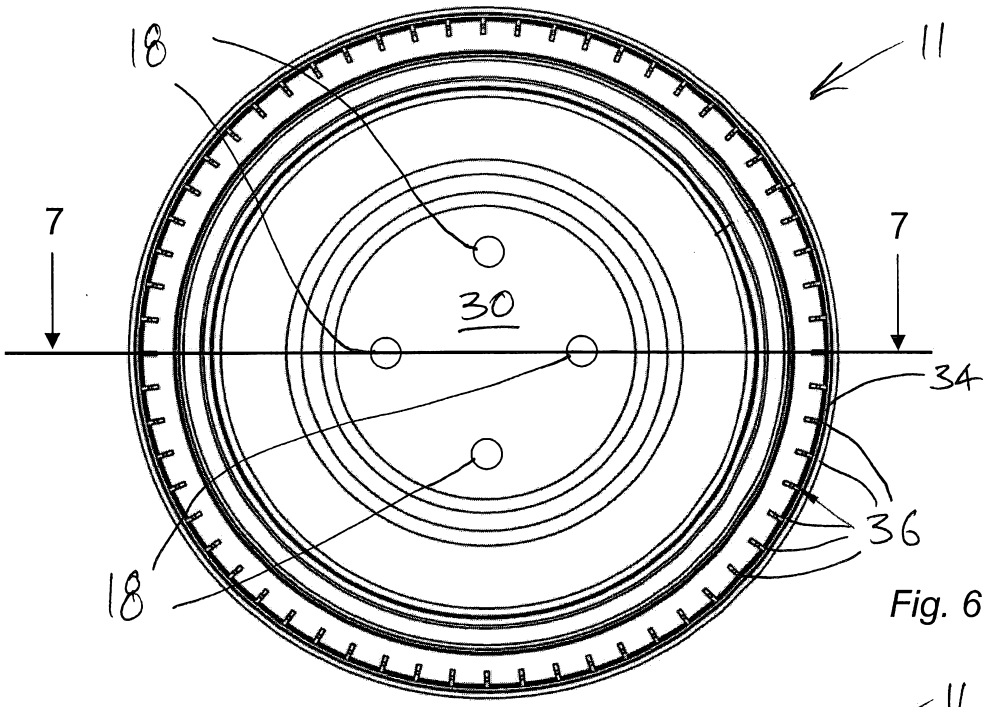

Fig. 6

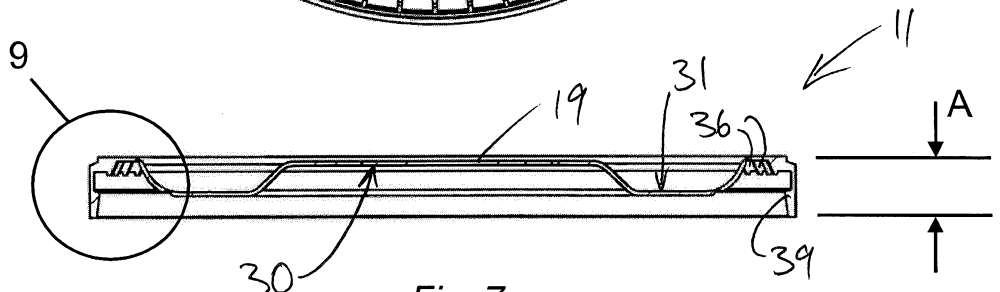

Fig. 7

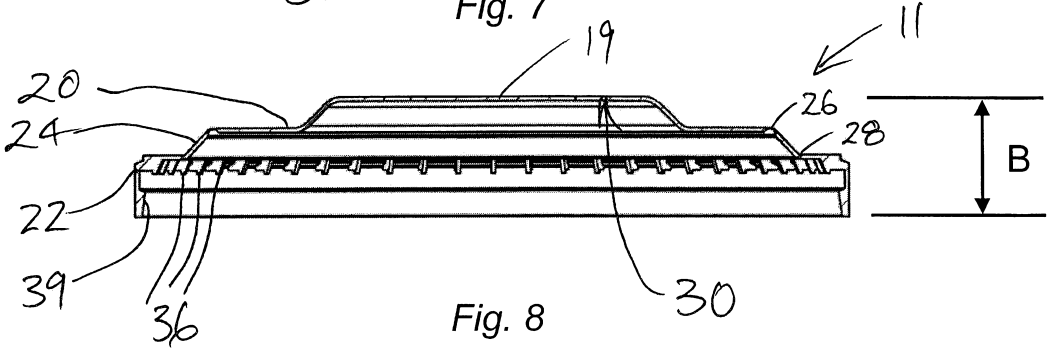

Fig. 8

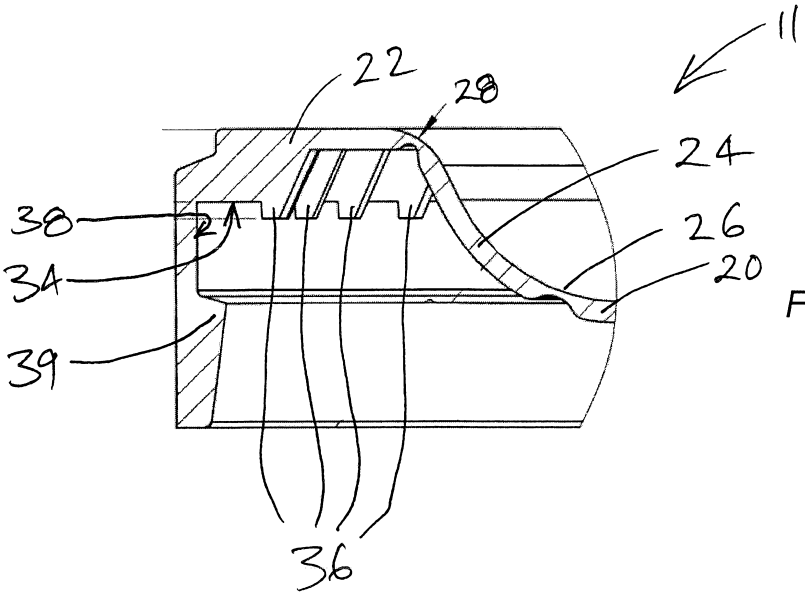

Fig. 9

LID FOR CONTAINER

TECHNICAL FIELD

The present specification relates to lids for containers and in particular to lids and containers which are arranged to carry heatable substances during a heating process, examples of the substances being soups and other foodstuffs.

BACKGROUND ART

The type and availability of "ready-to-eat" meals, including pre-packaged soups, curries, etc, is increasing with time as more people are working longer hours and have less spare time to prepare meals. As the "ready-to-eat" food product market increases, so does the need for suitable containers to carry these foods from food producers to consumers via supermarkets. These containers may be required to contain foodstuffs safely during packaging, transport to supermarket, transport to a consumer's home and then to be heated by conventional oven, stove top (such as being placed in a saucepan of boiling water) or by microwave oven.

One example of such a container and lid is a generic container which has a multilayered polymer cup portion for carrying a foodstuff and a polymeric lid. In this example, an aluminium hermetic seal closes the cup portion and the lid is snap-locked thereupon. When a consumer is ready to eat the foodstuff, the polymeric lid is firstly removed before removing the aluminium lid by tearing it off along a frangible line. The polymeric lid is then

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replaced to cover the now exposed contents of the cup portion prior to heating in a microwave oven. Problems associated with this container include the polymeric lid being dislodged during heating of the contents, and therefore risking spillage of the contents in the microwave oven. Regardless of the polymeric lid having vent holes, it may be dislodged during heating due to expanding air between the foodstuff and the lid escaping from the container. The present inventor has discovered one cause of this problem is due to foodstuff in the cup portion unintentionally blocking one or more of the lid's vent holes.

SUMMARY OF THE INVENTION

According to a first aspect there is provided a lid for a container configured to carry a substance during a heating process, the lid being arranged such that it is adjustable between a first condition having a first axial height and a second condition having a second axial height, wherein the second axial height is greater than the first axial height, wherein the lid in its first or second condition comprises a circumferential channel for receiving a rim of the container, and wherein the channel is adapted such that when the lid is on a container and is heated, it expands such that an inner member of the channel is caused to expand radially outwardly and to abut against the rim of the container.

Such a lid has an axial height that is adjustable. Then is, for example, the lid is used with a container which holds a foodstuff substance to be heated in a microwave, the ability of the lid to adjust to move its

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top surface away from the top surface of the food inside the container can help to reduce circumstances where steam or boiling food in the container ejects or dislodges the lid from or on the container. As will be understood, the term "axial height" means the axial distance from the bottommost edge of the lid to the topmost surface of the substance in the container. This may otherwise be known as an axial lid depth, or depth of the lid along its axis.

Optionally, the lid comprises a first region and a second region, the first region being movable with respect to the second region to allow the lid to adjust between the first and second conditions. The first region may be a central lid region and the second region may be a peripheral lid region. The first region may be hingedly connected to the second region. Preferably, the lid may comprise a third region between the first and second regions, the third region being hingedly connected at one edge to the first region and hingedly connected at another edge to the second region.

Optionally, the lid is a unitary moulded structure. Alternatively, the lid comprises a two-part structure. The first region of the two part structure may be formed from one material and the second region may be formed from another material. Use of two alternate materials to construct the lid can allow for aesthetic improvements as well as resistance to distortion of the lid during heating. It may also lead to a reduction in weight and material content in which there are subsequent cost reductions and environmental savings.

Optionally, a portion of the lid may be invertible to allow the lid to be adjustable from the first condition to the second condition. The invertible portion may comprise

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the first and third regions. The first region may be over-centredly movable with respect to the second region.

The lid in its first and/or second condition comprises a circumferential channel for receiving a rim of the container. The channel is adapted such that when the lid is on a container and is heated, it expands such that an inner member of the channel is caused to expand radially outwardly and to abut against the rim of the container.

Optionally, the lid in its first condition defines an upper stacking channel for receiving a base of another container stacked thereupon. The second axial height may be between 1.1 and 2.5 times the first axial height, or it may be between 1.5 and 2.0 times the first axial height. Additionally, the flexible nature of the top surface of the lid results in a slight downward flexing of the lid top surface when several containers are stacked on top of each other. This can further reduce the overall stacking height and volume of the stacked containers, resulting in a reductions of costs related to transport and logistics.

Optionally, the lid comprises vent holes. The vent holes may assist in allowing steam to escape from the container during heating. The inventors have discovered that with some substances such as relatively thick soups, localised boiling during microwave heating may cause some soup to splash and block the vent holes in prior art lids. The ability of the lid to adjust between first and second axial height conditions can help prevent vent holes being blocked by a substance in the container.

According to a second aspect there is provided a lid for a container configured to carry a substance during a heating process, the lid comprising a circumferential

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channel for receiving a rim of the container and being expandable when heated, the channel defined by an outer wall and at least one inner member, the outer wall extending from the lid to a larger extent than the at least one inner member, wherein the channel is arranged such that, when the lid is on the container and is heated, the at least one inner member of the channel is caused to expand radially outwardly and to abut against the rim of the container, and wherein the lid is arranged such that it is adjustable between a first condition having a first axial height and a second condition having a second axial height, wherein the second axial height is greater than the first axial height.

According to another aspect there is provided a container comprising a lid according to any of the above described aspects.

As will be understood, depending on the context, use of spatial terms such as upper, lower, bottom, top, bottommost, topmost, etc, are to be understood as having been used in a relative sense, rather than a literal sense.

BRIEF DESCRIPTION OF THE DRAWINGS

Specific embodiments will now be described, by way of example only, with reference to the accompanying drawings in which:

Figure 1 is a side elevation of two containers with lids in a stacked configuration;

Figure 2 is a cross-sectional side elevation of the containers of Figure 1 taken on line 2-2;

Figure 3 is perspective view of a lid in accordance with an embodiment;

Figure 4 is a side elevation of the lid of Figure 1;

Figure 5 is a plan view of the lid of Figure 1;

Figure 6 is an underside view of the lid of Figure 1;

Figure 7 is a cross-sectional side elevation of the lid of Figure 6, taken on line 7-7, showing the lid in a first configuration;

Figure 8 is a cross-sectional side elevation showing the lid in a second configuration;

Figure 9 is a detailed view of Figure 5, taken at circle 7;

Figure 10 is an underside view of another embodiment of a lid;

Figure 11 is a cross-sectional side elevation of the lid of Figure 10, taken on line 11-11, showing the lid in a first configuration;

Figure 12 is a cross-sectional side elevation showing the lid of Figure 10 in a second configuration; and

Figure 13 is a detailed view of Figure 11, taken at circle 13.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to Figures 1 and 2, a first specific embodiment provides a container 10 comprising a lid 11 and a vessel. In this embodiment, the vessel is in the form of a bowl 12, however in alternative embodiments it may be in the form of a cup, tray or similar vessel having a base and one or more walls upstanding from the base such that the vessel can carry a heatable liquid, solid or gelatinous-type substance. In this embodiment, the bowl

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12 is formed from a plastic, such as high density polyethylene (HDPE), polypropylene (PP), or other suitable polymer, and the lid 11 from a suitable polymer, such as a soft or other PP blend, HDPE or a linear low density polyethylene (LLDPE). As will be understood, the bowl 12 and lid 11 can be made from any known appropriate plastic, polymer, multilayered polymer, polymer-coated card, etc. The present embodiment is described in terms of its application in carrying a food substance in the form of soup, other liquid-containing foodstuffs, such as meat and/or pasta and/or vegetables suspended or otherwise situated in a broth, gravy or gelatinous substance, or solid foodstuff, such as rice or pasta. The container 10 is arranged to carry such substances during a heating process. In this embodiment, the heating process is typically by a consumer's home microwave oven, but in alternative embodiments, the container 10 and its contents may be heated by a "Bain Marie" process (placing the container in a saucepan of boiling water such that the lid is above the water's surface), or by placing the container 10 in an oven. To safely and hygienically carry the foodstuff in the container from a food packaging facility to the consumer, the bowl 12 is typically hermetically sealed across its rim 14. In the container 10 illustrated in Figure 1, this is achieved using a seal in the form of an aluminium seal 15 at the bowl's rim 14. As is known to the art, such aluminium seals 15 are capped upon the rim 14 at their peripheral edge, and comprise a frangible line near the seal's peripheral edge which is removable by the consumer using an integrated ring-pull 16. In an alternative arrangement, the bowl may be hermetically sealed by a removable thin film plastic which is adhered

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at its peripheral edge to the rim 14 during packaging. A portion of the thin film plastic extends over the rim 14, acting as a tab to facilitate removal of the thin film by the consumer. Similarly, aluminium foil may also be used.

The lid 10 is provided for at least two purposes. Firstly, the lid 11 protects the seal 15 from damage during transport and storage of the container 10. This feature is discussed in more detail below. Secondly, the lid 11 acts as a shield when the foodstuff it carries is being heated to prevent possible food spillage due to boiling. Referring to Figures 3 to 9, the lid comprises vent holes 18 in a top surface 19 to allow passage of heated air or steam from between the foodstuff and the lid 11 to outside the container 10. However, it has been discovered that these vent holes 18 can become blocked by food from the container which, when heated, is splashed onto the holes 18. This is particularly so when the food is relatively thick, or viscous and when the food is a meat containing gravy or meat containing soup. For example, with such foodstuffs, air or gas pockets are often associated with the meat (or other solids) in the gravy or soup. During heating, this gas can rapidly expand to cause gas “explosions”, which in turn can splash food from the bowl 12 onto the lid 11. Blocking of the vent holes 18 to restrict passage of steam or heated air therethrough can cause the lid 11 to become dislodged during a heating process, and therefore increase the risk of spillage of food from the bowl 12. Also, the aforementioned “explosions” in themselves may dislodge the lid 11 from the bowl 12.

To help overcome or ameliorate the problem of the lid 11 being dislodged from the bowl 12, it has been

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configured to be adjustable from a first condition to a second condition, as will now be described. The lid 11 comprises a first, central lid region 20 hingedly connected to a second, peripheral lid region 22 via a third, annular lid region 24 which is located between the first and second lid regions 20, 22. The first and third regions 20, 24 are connected via an inner hinge 26 and the second and third regions 22, 24 are connected via an outer hinge 28. This configuration allows the lid 11 to be adjustable between the first condition, illustrated in Figures 3 to 7, and the second condition, illustrated in Figure 8. In use, the lid 11 is adjusted manually from the first to the second condition by holding the second region 22 of the lid 11 and pushing the first region 20 outwardly with respect thereto upon an underside 30 of the lid 11. This causes the first region 20 to move in an over-centring manner with respect to the second and third regions 22, 24 on inner and outer hinges 26, 28. That is, the lid 11, in part, inverts.

As illustrated in a comparison of Figures 7 and 8, the axial height B of the lid 11 in the second condition is greater than the axial height A of the lid 11 in the first condition. The axial height of the lid 11 in its first condition is comparable to the axial height of prior art lids 11, whereas the axial height of the lid 11 in its second condition is greater. Axial lid height B is preferably 1.1 to 2.5 and more preferably 1.5 to 2.0 times axial lid height A. This greater height B in use and in effect positions the top surface 19 of the lid 11 further away from the top surface of the foodstuff in the bowl 12, and therefore reduces the risk of boiling, splashing food from either dislodging the lid 11 from the bowl 12, or

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from blocking the vent holes 18. This difference in axial heights allows the container 10 to have an optimum minimal volume for stacking and transport (lid in first condition) and an increased volume during heating (second condition).

Referring to Figures 2, 3, 5, 6 and 7, the lid 11 further comprises a recessed stacking channel 31 for receiving a bottom surface portion 32 of another container 10 for stacking thereupon. Given the annular shape of the bottom surface portion 32 and the complementary and recessed shape of the stacking channel 31, this combination of portion 32 and channel 31 helps to reduce overall stacking height. Also, due to the configuration and flexible nature of the top surface 19 of the lid 11, the weight of the stacked container thereupon causes a slight downward flexing of the lid top surface 19, meaning a further reduced overall stacking height of stacked containers 10 and therefore reduced volume taken by the stacked containers.

Referring to Figures 2 and 6 to 9, the underside 30 of the lid 11 comprises a circumferential channel 34 defined by inner members, in the form of support ribs 36, and an outer wall 38. As illustrated in use in Figure 2, the channel 34 is configured for receiving the rim 14 of the bowl 12. The lid 11 releasably snap-locks with the rim 14 via beading 39. The support ribs 36 help to support the lid 11 structurally, providing load support when several containers 10 are arranged in a stack, such as illustrated in Figure 1. As will be understood, several containers 10 may be stacked in one column, for example four or five containers, and hence the lid 11 of the bottommost container at least must be able to withstand the load weight from several containers stacked

above it. In an alternative embodiment, an inner wall may be used in place of or together with the support ribs 36, the inner wall then defining the channel with the outer wall 38. Also in a further embodiment, the inner wall and/or support ribs may be larger, defining a deeper channel 34. When the container 10 and its contents are heated, the lid tends to expand slightly. In this embodiment, the structural ribs expand radially, thus pushing against the rim 14 of the container 10 and aiding in more firmly seating the lid 11 on the rim 14. This expansion feature is also true of the alternative embodiments comprising an inner wall in part defining the channel 34.

Figures 10 to 13 illustrate an alternative embodiment of a lid 111 for a container, where like reference numerals denote like parts. In this embodiment, the first and second regions 120 and 122 of the lid 111 are formed from two different materials. The second region 122 is formed from a material such as per the above described embodiment, whereas the first region 120 is formed from a multilayered polymer composite material, such as a polymer coated paperboard or over-moulded pressed board. The lid 111 of this embodiment is adjustable between first and second conditions (illustrated in Figures 11 and 12, respectively) in the same manner as the embodiment described above with respect to Figures 3 to 9. In this embodiment, the third region 124 is integral with the first region 120 and is joined to the second region 122 by connection within a slot 140 in the second region 122, and as such the inner hinge 126 and outer hinge 128 are not so well defined compared with the first mentioned embodiment. The flexible nature of the first and third regions 120,

124 is such that the combined first and third regions 120, 124 are invertible to allow the lid 111 to be adjusted from the first to the second condition. The lid 111 of this embodiment is less distortable during heating compared with the first mentioned embodiment, due to the first/third region 120/124 being less expandable than the polymer of the second region 122. Further, the embodiment illustrated in Figures 10 to 13, being a polymer coated board or similar, is better for carrying indicia thereupon, for example for marketing or labelling, compared with the unitary polymeric lid 11 of the first described embodiment.

In an alternative embodiment, there is provided a lid 11, 111 as described above with reference to the Figures for use with a container 10 or a vessel as described above with reference to the Figures. In another alternative embodiment, there is provided a lid comprising the above described channel feature, but not the above described first and second condition features.

As will be understood, unless the context requires or suggests otherwise, features of any one of the above described embodiments may be used in conjunction with another one or more of the above described embodiments.

While the lid for a container has been described in reference to its preferred embodiments, it is to be understood that the words which have been used are words of description rather than limitation and that changes may be made without departing from its scope as defined herein. For example, whereas the embodiments have been described with reference to heating foodstuffs, the lid may have alternative uses, such as in application to heating liquid, solid, gelatinous, etc non-foodstuffs.

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In the claims which follow and in the preceding description, except where the context requires otherwise due to express language or necessary implication, the word "comprise" or variations such as "comprises" or "comprising" is used in an inclusive sense, i.e. to specify the presence of the stated features but not to preclude the presence or addition of further features in various embodiments of the lid.

A reference herein to a prior art information is not an admission that the information forms part of the common general knowledge of a person of ordinary skill in the art in Australia or elsewhere.

CLAIMS:-

1. A lid for a container configured to carry a substance during a heating process, the lid being arranged such that it is adjustable between a first condition having a first axial height and a second condition having a second axial height, wherein the second axial height is greater than the first axial height, wherein the lid in its first or second condition comprises a circumferential channel for receiving a rim of the container, and wherein the channel is adapted such that, when the lid is on a container and is heated, it expands such that an inner member of the channel is caused to expand radially outwardly and to abut against the rim of the container.

2. The lid of claim 1 wherein the lid comprises a first region and a second region, the first region being movable with respect to the second region to allow the lid to adjust between the first and second conditions.

3. The lid of claim 2 wherein the first region is a central lid region and the second region is a peripheral lid region.

4. The lid of claim 2 or 3 wherein the first region is hingedly connected to the second region.

5. The lid of any one of claims 2 to 4 wherein the lid comprises a third region between the first and second regions, the third region being hingedly connected at one edge to the first region and hingedly connected at another edge to the second region.

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6. The lid of any one of the preceding claims wherein the lid is a unitary moulded structure.

7. The lid of any one of claims 1 to 5 wherein the lid comprises a two-part structure.

8. The lid of claim 7 wherein the first region of the two-part structure is formed from one material and the second region is formed from another material.

9. The lid of any one of the preceding claims wherein a portion of the lid is invertible to allow the lid to be adjustable from the first condition to the second condition.

10. The lid of claim 9 wherein the first region is over-centredly movable with respect to the second region.

11. The lid of any one of the preceding claims wherein the lid in its first condition defines a stacking channel for receiving a base of another container stacked thereupon.

12. The lid of any one of the preceding claims wherein the second axial height is between 1.1 and 2.5 times the first axial height.

13. The lid of any one of the preceding claims wherein the lid comprises vent holes.

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14. A lid for a container configured to carry a substance during a heating process, the lid comprising a circumferential channel for receiving a rim of the container and being expandable when heated, the channel defined by an outer wall and at least one inner member, the outer wall extending from the lid to a larger extent than the at least one inner member, wherein the channel is arranged such that, when the lid is on the container and is heated, the at least one inner member of the channel is caused to expand radially outwardly and to abut against the rim of the container, and wherein the lid is arranged such that it is adjustable between a first condition having a first axial height and a second condition having a second axial height, wherein the second axial height is greater than the first axial height.

15. A container comprising a lid according to any one of the preceding claims.

16. A lid or container substantially as herein described with reference to the accompanying drawings.

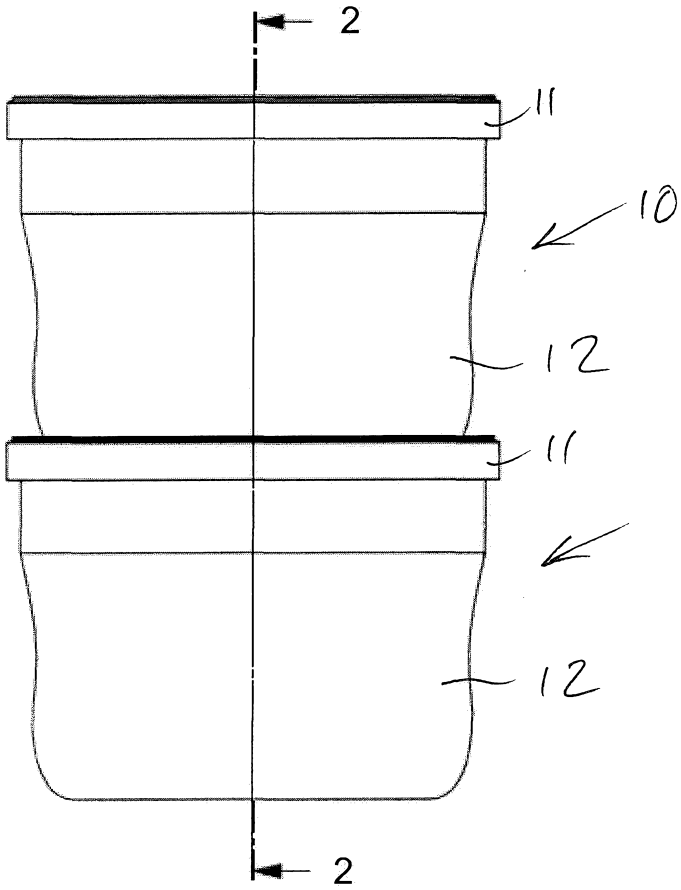

Fig. 1

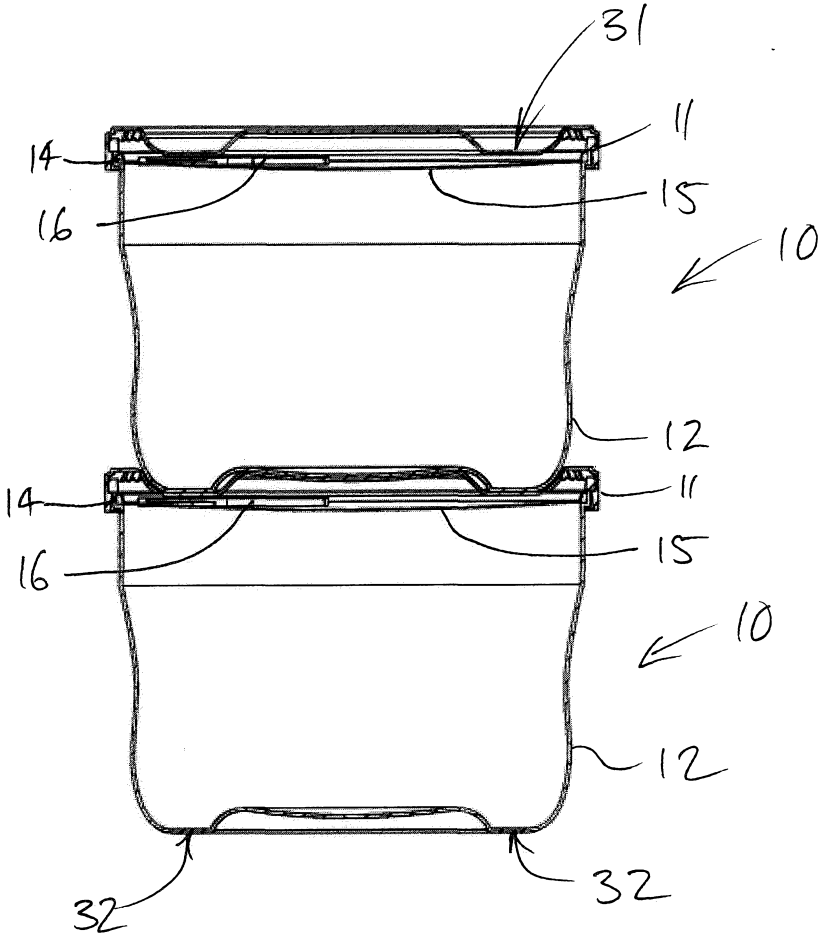

Fig. 2

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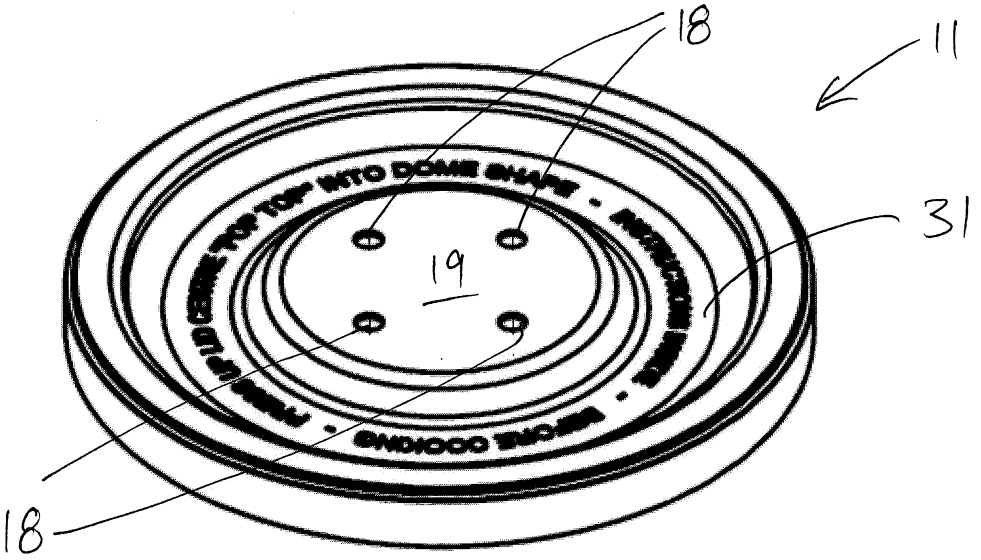

Fig. 3

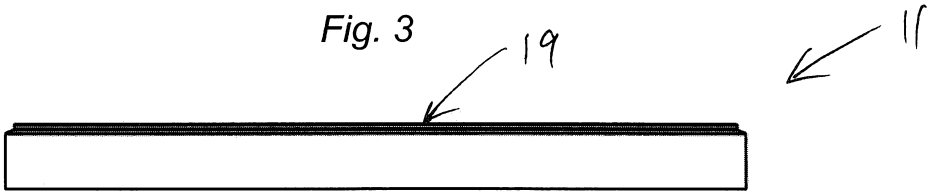

Fig. 4

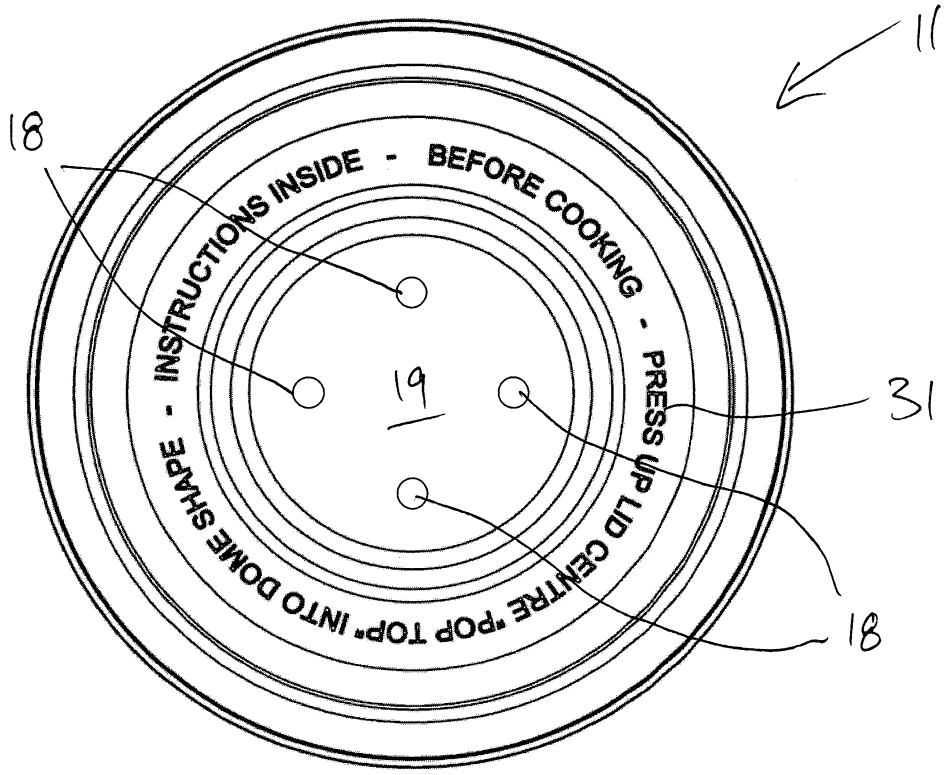

Fig. 5

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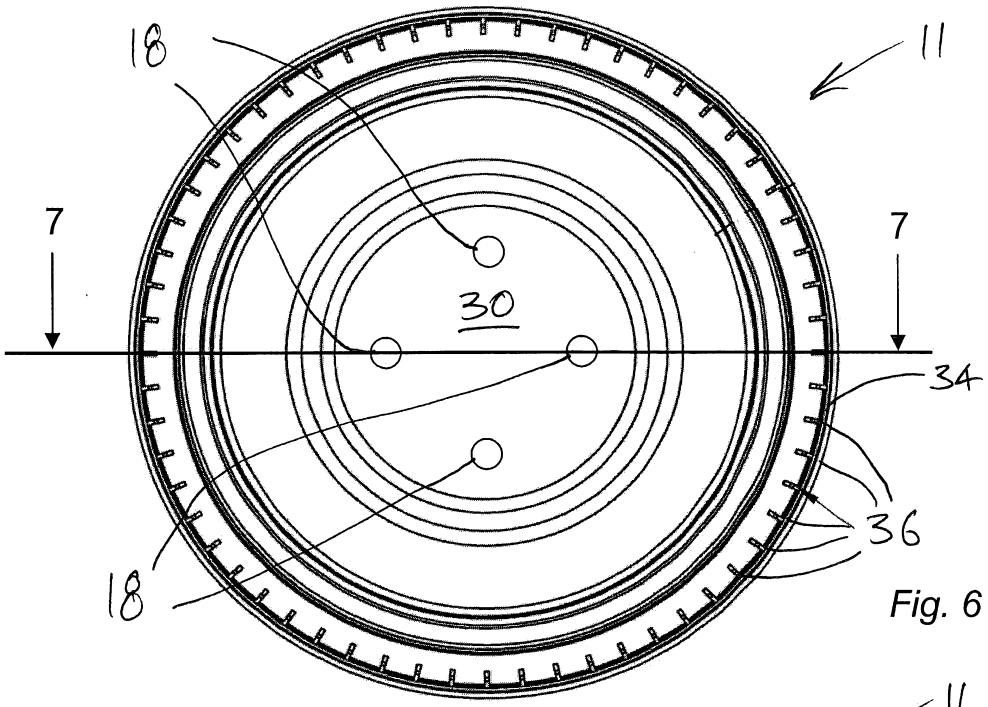

Fig. 6

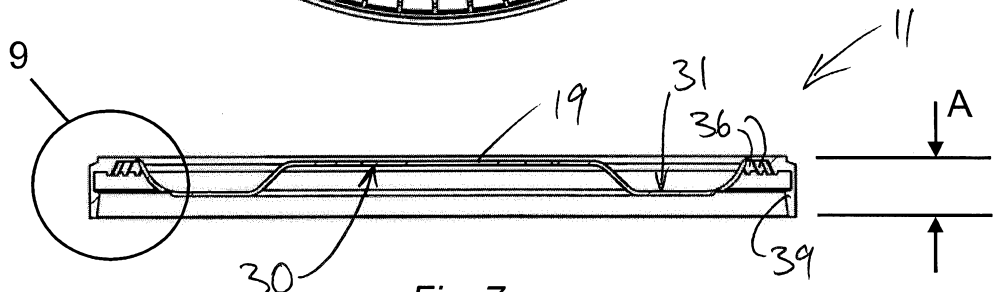

Fig. 7

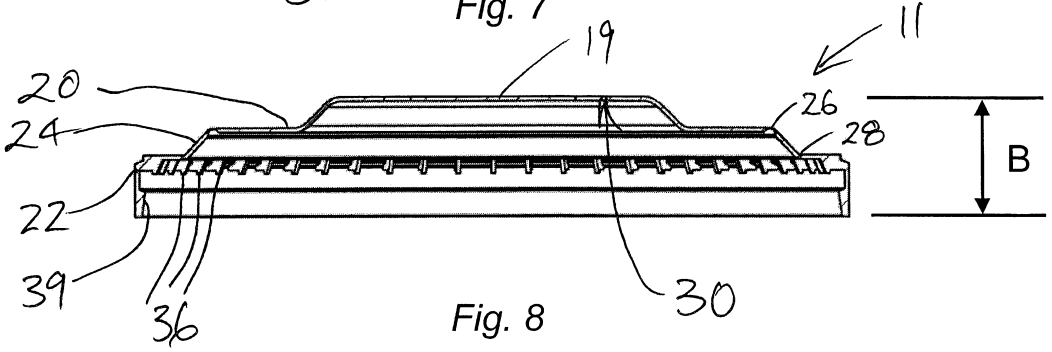

Fig. 8

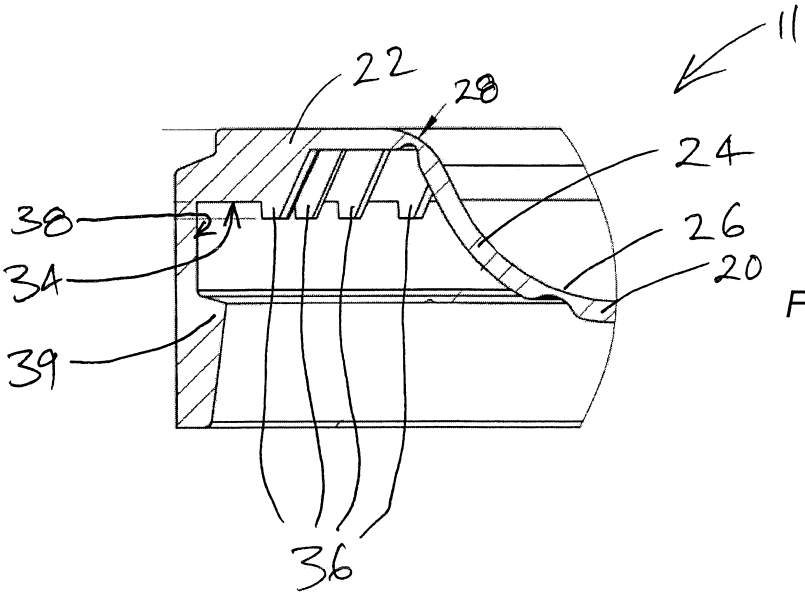

Fig. 9

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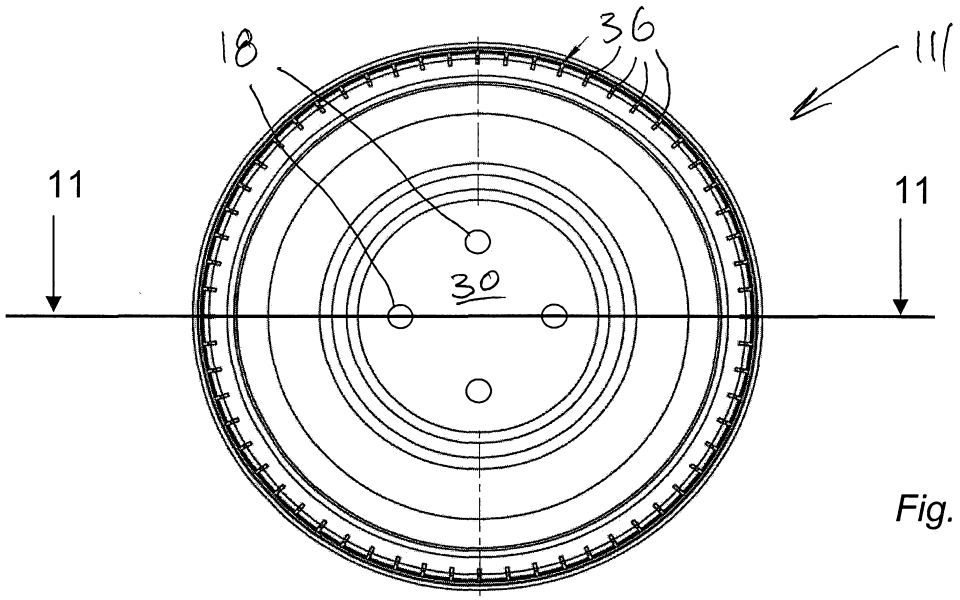

Fig. 10

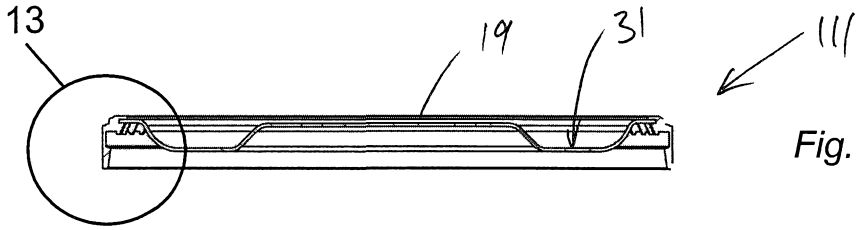

Fig. 11

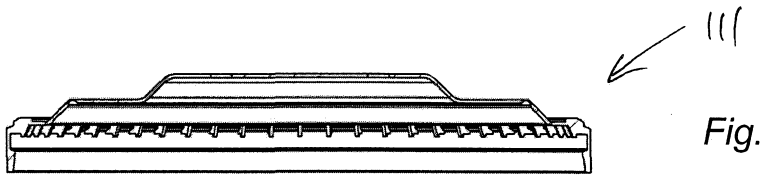

Fig. 12

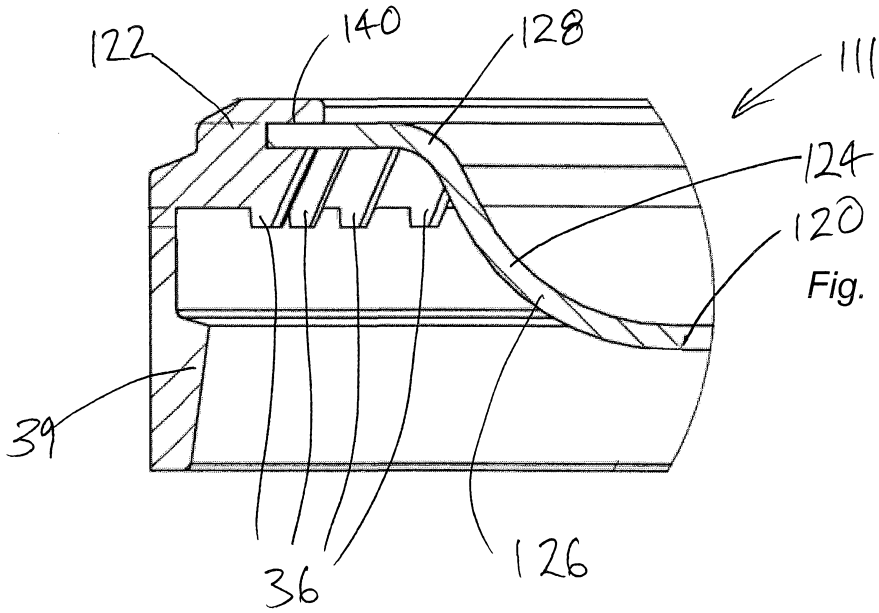

Fig. 13